

# **EXHIBIT B**

MASSACHUSETTS DEPARTMENT OF  
ENVIRONMENTAL PROTECTION  
COMMONWEALTH OF MASSACHUSETTS  
1 WINTER STREET  
BOSTON, MASSACHUSETTS 02108

UNITED STATES ENVIRONMENTAL  
PROTECTION AGENCY  
OFFICE OF ECOSYSTEM PROTECTION  
REGION I  
BOSTON, MASSACHUSETTS 02203

JOINT PUBLIC NOTICE OF A DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE INTO THE WATERS OF THE UNITED STATES UNDER SECTION 301 AND 402 OF THE CLEAN WATER ACT (THE "ACT"), AS AMENDED, AND REQUEST FOR STATE CERTIFICATION UNDER SECTION 401 OF THE ACT.

DATE OF NOTICE: April 20, 2006

PERMIT NUMBER: MA0100617

PUBLIC NOTICE NUMBER: MA-030-06

NAME AND MAILING ADDRESS OF APPLICANT:

**City of Leominster  
Department of Public Works  
109 Graham Street  
Leominster, MA 01453**

NAME AND ADDRESS OF THE FACILITY WHERE DISCHARGE OCCURS:

**Leominster Water Pollution Control Facility  
109 Graham Street  
Leominster, MA 01453**

RECEIVING WATER: North Nashua River (Nashua River Watershed - MA81-04)

RECEIVING WATER CLASSIFICATION: Class B

PREPARATION OF THE DRAFT PERMIT:

The U.S. Environmental Protection Agency, (EPA) and the Massachusetts Department of Environmental Protection (MADEP) have cooperated in the development of a permit for the above identified facility. The effluent limits and permit conditions imposed have been drafted to assure that State Water Quality Standards and provisions of the Clean Water Act will be met. EPA has formally requested that the State certify this draft permit pursuant to Section 401 of the Clean Water Act and expects that the draft permit will be certified.

INFORMATION ABOUT THE DRAFT PERMIT:

A fact sheet or a statement of basis (describing the type of facility; type and quantities of wastes; a brief summary of the basis for the draft permit conditions; and significant factual, legal and policy questions considered in preparing this draft permit) may be obtained at no cost by writing or calling EPA's contact person named below:

Michele Cobban Barden  
US Environmental Protection Agency  
Mail Code: CMP  
1 Congress Street, Suite 1100  
Boston, MA 02114-2023  
Telephone: (617) 918-1539

The administrative record containing all documents relating to this draft permit is on file and may be inspected at the EPA Boston office mentioned above between 9:00 a.m. and 5:00 p.m., Monday through Friday, except holidays.

**PUBLIC COMMENT PERIOD:** The public comment period for the draft permits begins on 4/20/06 and ends on 5/19/06. All persons, including applicants, who believe any condition of the draft permit is inappropriate, must raise all reasonably ascertainable issues and submit all reasonably available arguments and factual grounds supporting their position, including all supporting material, by the close of the public comment period (See 40 C.F.R. § 124.13), on 5/19/06

Comments should be directed to:

U.S. Environmental Protection Agency  
Office of Ecosystem Protection - NPDES Permit Unit  
1 Congress Street - Suite 1100  
Mail Code: CMP  
Boston, MA 02114-2023  
Attn: Michele Barden

If during the public comment period, significant new questions are raised concerning the permit, EPA may require a new draft permit or fact sheet or may reopen the public comment period. A public notice will be issued for any of these actions.

**FINAL PERMIT DECISIONS AND APPEALS:**

After the public hearing, and following the close of the comment period, the Regional Administrator will issue a final permit decision and forward a copy of this final decision to the applicants and each person who has submitted written comments or requested notice. Within 30 days following the notice of the final permit decision, any interested person may submit a request for a formal hearing to reconsider or contest the final decision. Requests for formal hearings must satisfy the requirements of 40 C.F.R. §124.74. 48 Fed. Reg. 14279 - 14280 (April 1, 1983)

GLENN HAAS, DIRECTOR  
DIVISION OF WATERSHED MANAGEMENT  
MASSACHUSETTS DEPARTMENT OF  
ENVIRONMENTAL PROTECTION

LINDA M. MURPHY, DIRECTOR  
OFFICE OF ECOSYSTEM PROTECTION  
ENVIRONMENTAL PROTECTION  
AGENCY

**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);

**City of Leominster  
Department of Public Works**

is authorized to discharge from the facility located at:

**Leominster Water Pollution Control Facility  
436 Mechanic Street  
Leominster, MA 01453**

to receiving water named:

**North Nashua River (MA-81)**

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

The Town of Lunenburg is a co-permittee for Part I.D., Operation and Maintenance and Part I.E., Unauthorized Discharges from the Sewer System, which include conditions regarding the operation and maintenance of the collection systems, owned and operated by the Town. The responsible Town Department is:

**Town of Lunenburg  
Department of Public Works  
520 Chase Road  
Lunenburg, MA 01462**

This permit shall become effective on (See \*\* below)

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

This permit supersedes the permit issued on July 28, 2000.

This permit consists of 12 pages in Part I including effluent limitations, monitoring requirements, Attachments A, B, C & D and 35 pages in Part II including General Conditions and Definitions.

Signed this    day of

\_\_\_\_\_  
Director  
Office of Ecosystem Protection  
Environmental Protection Agency  
Boston, MA

\_\_\_\_\_  
Director  
Division of Watershed Management  
Department of Environmental Protection  
Commonwealth of Massachusetts  
Boston, MA

\*\* This permit will become effective on the date of signature if no comments are received during public notice. If comments are received during public notice, this permit will become effective 60 days after signature.

PART I

EFFLUENT CHARACTERISTIC	EFFLUENT LIMITS										MONITORING REQUIREMENTS	
	Mass Limits					Concentration Limits						
	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	AVERAGE WEEKLY	AVERAGE MONTHLY	MAXIMUM DAILY	MEASUREMENT FREQUENCY		SAMPLE TYPE <sup>3</sup>
FLOW <sup>1</sup>	***	***	***	Report MGD	***	Report MGD	***	Report MGD	Report MGD	CONTINUOUS	RECORDER	
FLOW <sup>2</sup>	***	***	***	9.3 MGD	***	Report MGD	***	Report MGD	Report MGD	CONTINUOUS	RECORDER	
BOD <sub>5</sub> <sup>4</sup> (November 1 to April 30)	2327 lbs/Day 1057kgs/Day	3490 lbs/Day 1586 kgs/Day	Report	30 mg/l	45 mg/l	Report mg/l	45 mg/l	Report mg/l	Report mg/l	2/WEEK	24-HOUR COMPOSITE <sup>5</sup>	
CBOD <sub>5</sub> <sup>4</sup> (May 1 to October 31)	1163 lbs/Day 529 kgs/Day	1163 lbs/Day 529 kgs/Day	Report	15 mg/l	15 mg/l	Report mg/l	15 mg/l	Report mg/l	Report mg/l	2/WEEK	24-HOUR COMPOSITE <sup>5</sup>	
TSS <sup>4</sup> (November 1 to April 30)	2327 lbs/Day 1057kgs/Day	3490 lbs/Day 1586 kgs/Day	Report	30 mg/l	45 mg/l	Report mg/l	45 mg/l	Report mg/l	Report mg/l	2/WEEK	24-HOUR COMPOSITE <sup>5</sup>	
TSS <sup>4</sup> (May 1 to October 31)	1551 lbs/Day 705kgs/Day	1551 lbs/Day 705kgs/Day	Report	20 mg/l	20 mg/l	Report mg/l	20 mg/l	Report mg/l	Report mg/l	2/WEEK	24-HOUR COMPOSITE <sup>5</sup>	
pH RANGE <sup>6</sup>	6.0 - 8.3 SU SEE PERMIT PAGE 5 OF 12, PARAGRAPH I.A.1.b.										GRAB	
DISSOLVED OXYGEN	***	***	***	6.0 mg/l minimum					***	6.0 mg/l minimum	2/DAY	GRAB
FECAL COLIFORM <sup>6,7</sup>	***	***	***	200 cfu/100 ml	***	***	***	***	400 cfu/100 ml	2/WEEK	GRAB	
TOTAL RESIDUAL CHLORINE <sup>7,8</sup>	***	***	***	0.022 mg/l	***	***	***	***	0.039 mg/l	2/DAY	GRAB	
TOTAL PHOSPHORUS (April 1 - October 31) <sup>9</sup>	***	***	***	0.2 mg/l	***	***	***	***	Report mg/l	2/WEEK	24-HOUR COMPOSITE <sup>5</sup>	

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

Part I.A.1. continued										
EFFLUENT CHARACTERISTIC	EFFLUENT LIMITS					MONITORING REQUIREMENTS				
	Mass Limits					Concentration Limits				
TOTAL PHOSPHORUS (November 1- March 31) <sup>10</sup>	***	***	***	***	***	1.0 mg/l	***	Report mg/l	1/WEEK	24-HOUR COMPOSITE <sup>5</sup>
ORTHO PHOSPHORUS, DISSOLVED <sup>10</sup> (November 1- March 31)	***	***	***	***	***	Report mg/l	***	Report mg/l	1/Week	24-HOUR COMPOSITE <sup>5</sup>
TOTAL AMMONIA, as N (May 1- May 31)	***	***	***	***	***	Report mg/l	***	Report mg/l	2/MONTH	24-HOUR COMPOSITE <sup>5</sup>
TOTAL AMMONIA, as N (June 1- October 31)	101 lbs/Day	***	154 lbs/Day	***	***	1.3 mg/l	***	2.0 mg/l	2/WEEK	24-HOUR COMPOSITE <sup>5</sup>
TOTAL AMMONIA, as N (November 1-April 30)	***	***	***	***	***	Report mg/l	***	Report mg/l	1/MONTH	24-HOUR COMPOSITE <sup>5</sup>
TOTAL COPPER	***	***	***	***	***	7.6 ug/l	***	10.4 ug/l	1/MONTH	24-HOUR COMPOSITE <sup>5</sup>
WHOLE EFFLUENT TOXICITY <sup>11,12, 14, 15</sup>						Acute LC <sub>50</sub> ≥ 100%				
WHOLE EFFLUENT TOXICITY <sup>13, 14, 15</sup>						Chronic NOEC >50%				

## Footnotes:

1. The monthly average and maximum daily flows for each month shall be reported.
2. This is an annual average limit, which shall be reported as a rolling average. The first value will be calculated using the monthly average flow for the first full month ending after the effective date of the permit and the eleven previous monthly average flows. Each subsequent month's DMR will report the annual average flow that is calculated from that month and the previous 11 months.
3. Effluent samples shall be taken after appropriate treatment and prior to discharge to Outfall 001. All sampling shall be representative of the effluent that is discharged through Outfall 001 to the North Nashua River. A routine sampling program shall be developed in which samples are taken at the same location, same time and same day(s) of every month. Any deviations from the routine sampling program shall be documented in correspondence appended to the applicable discharge monitoring report that is submitted to EPA. In addition, all samples shall be analyzed using the analytical methods found in 40 CFR §136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR §136.
4. Sampling required for influent and effluent.
5. A 24-hour composite sample will consist of at least twenty four (24) grab samples, flow proportional, taken for a consecutive 24 hour period (e.g. 0700 Monday - 0700 Tuesday).
6. Required for State Certification.
7. Fecal coliform bacteria and total residual chlorine limits and monitoring requirements are in effect year round. The average monthly limit is expressed as a geometric mean. Samples for fecal coliform bacteria shall be taken at the same time as a total residual chlorine sample.
8. Chlorination and dechlorination systems shall include an alarm system for indicating system interruptions or malfunctions. Any interruption or malfunction of the chlorine dosing system that may have resulted in levels of chlorine that were inadequate for achieving effective disinfection or interruptions or malfunctions of the dechlorination system that may have resulted in excessive levels of chlorine in the final effluent shall be reported with the monthly DMRs. The report shall include the date and time of the interruption or malfunction, the nature of the problem, and the estimated amount of time that the reduced levels of chlorine or dechlorination chemicals occurred.
9. \*\*\*Schedule for 0.2 mg/l total phosphorus\*\*\*
10. The permittee shall comply with the 1.0 mg/l monthly average total phosphorus limit within one year of the issuance date of the permit. The maximum daily concentration and loading values reports for dissolved ortho phosphorus shall be the same values from the same day that the maximum daily total phosphorus concentration and loading values were measured.
11. The permittee shall conduct chronic (and modified acute) toxicity tests four (4) times per year using a single species, the daphid, Ceriodaphnia dubia. The chronic test may be used to calculate the acute LC<sub>50</sub> at the 48 hour exposure interval. Toxicity test samples shall be collected during the second week of the months of March, June, September and December. The test results shall be submitted by the last day of the month following the completion of the test. The results are due by April 30, July 31, October 31 and January 31, respectively. The tests must be performed in accordance with test

procedures and protocols specified in **Attachment A** of this permit

12. The  $LC_{50}$  is the concentration of effluent which causes mortality to 50% of the test organisms. Therefore, a 100% limit means that a sample of 100% effluent (no dilution) shall cause no more than a 50% mortality rate.
13. 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 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 "50% or greater" limit is defined as a sample which is composed of 50% (or greater) effluent, the remainder being dilution water. This is a maximum daily limit.
14. 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 B Section IV., DILUTION WATER** in order to obtain permission to use an alternate dilution water. In lieu of individual approvals for alternate dilution water required in **Attachment B**, 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 B**. 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 B**.
15. The permittee must continue to run the required sets of controls including chemistry (e.g. site water controls and lab water controls) when utilizing alternative dilution water as detailed in **Attachment B**.

Part I.A.2.

- 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 nor greater than 8.3 during the summer months (May 1 – October 31) and shall not be less than 6.0 or greater than 8.3 SU during the winter months (November 1 – April 30).
- c. The discharge shall not cause objectionable discoloration of the receiving waters.
- d. The effluent shall contain neither a visible oil sheen, foam, nor 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. The results of sampling for any parameter above its required frequency must also be reported.

3. 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.

4. 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.
- b. If, within 30 days after notice of an interference or pass through violation has been sent by EPA to the POTW, and to persons or groups who have requested such notice, the POTW fails to commence appropriate enforcement action to correct the violation, EPA may take appropriate enforcement action.

5. 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.

6. 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. INDUSTRIAL PRETREATMENT PROGRAM**

- 1. 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.

2. The permittee shall develop and enforce specific effluent limits (local limits) for Industrial User(s), and all other users, as appropriate, which together with appropriate changes in the POTW Treatment Plant's Facilities or operation, are necessary to ensure continued compliance with the POTW's NPDES permit or sludge use or disposal practices. Specific local limits shall not be developed and enforced without individual notice to persons or groups who have requested such notice and an opportunity to respond. Within (120 days of the effective date of this permit), the permittee shall prepare and submit a written technical evaluation to the EPA analyzing the need to revise local limits. As part of this evaluation, the permittee shall assess how the POTW performs with respect to influent and effluent of pollutants, water quality concerns, sludge quality, sludge processing concerns/inhibition, biomonitoring results, activated sludge inhibition, worker health and safety and collection system concerns. In preparing this evaluation, the permittee shall complete and submit the attached form (Attachment D) with the technical evaluation to assist in determining whether existing local limits need to be revised. Justifications and conclusions should be based on actual plant data if available and should be included in the report. Should the evaluation reveal the need to revise local limits, the permittee shall complete the revisions within 120 days of notification by EPA and submit the revisions to EPA for approval. The Permittee shall carry out the local limits revisions in accordance with EPA's Local Limit Development Guidance (July 2004).
3. The permittee shall implement the Industrial Pretreatment Program in accordance with the legal authorities, policies, procedures, and financial provisions described in the permittee's approved Pretreatment Program, and the General Pretreatment Regulations, 40 CFR 403. At a minimum, the permittee must perform the following duties to properly implement the Industrial Pretreatment Program (IPP):
  - a. Carry out inspection, surveillance, and monitoring procedures which will determine independent of information supplied by the industrial user, whether the industrial user is in compliance with the Pretreatment Standards. At a minimum, all significant industrial users shall be sampled and inspected at the frequency established in the approved IPP but in no case less than once per year and maintain adequate records.
  - b. Issue or renew all necessary industrial user control mechanisms within 90 days of their expiration date or within 180 days after the industry has been determined to be a significant industrial user.
  - c. Obtain appropriate remedies for noncompliance by any industrial user with any pretreatment standard and/or requirement.
  - d. Maintain an adequate revenue structure for continued implementation of the Pretreatment Program.
4. The permittee shall provide the EPA (and State) with an annual report describing the permittee's pretreatment program activities for the twelve (12) month period ending 60 days prior to the due date in accordance with 403.12(i). The annual report shall be consistent with the format described in Attachment C of this permit and shall be submitted **no later than November 1 of each year.**

5. The permittee must obtain approval from EPA prior to making any significant changes to the industrial pretreatment program in accordance with 40 CFR 403.18(c).
6. The permittee must assure that applicable National Categorical Pretreatment Standards are met by all categorical industrial users of the POTW. These standards are published in the Federal Regulations at 40 CFR 405 et. seq.
7. The permittee must modify its pretreatment program, if necessary, to conform to all changes in the Federal Regulations that pertain to the implementation and enforcement of the industrial pretreatment program. The permittee must provide EPA, in writing, **within 180 days of this permit's effective date** proposed changes, if applicable, to the permittee's pretreatment program deemed necessary to assure conformity with current Federal Regulations. At a minimum, the permittee must address in its written submission the following areas: (1) Enforcement response plan; (2) revised sewer use ordinances; and (3) slug control evaluations. The permittee will implement these proposed changes pending EPA Region I's approval under 40 CFR 403.18. This submission is separate and distinct from any local limits analysis submission described in Part I.B.3.b.

### C. CONDITIONS FOR COMBINATION MANHOLES

1. **Combination Manhole Identification**  
Within 90 days of the effective date of the permit, the permittee must submit a report listing the combination manholes in the system including the location and a description of the current control in the structure. The report shall also include a map showing the location of each combination manhole, the sanitary and storm water collection systems in the vicinity of the combination manholes, water resource areas (i.e. rivers, lakes, wetlands, etc) and the location of potential discharge in the event of an overflow.
2. **Combination Manhole Monitoring Requirements**  
All discharges of sanitary sewage to the storm water system are prohibited (see Section E. Unauthorized Discharges). In the event of a discharge to the storm system, the permittee shall notify EPA.

Following storms, the permittee must definitively determine if a combination manhole leaks or fails to separately retain storm water and sewage. In the event of a leak or failure, the permittee shall notify EPA and the MassDEP. Each notification shall be made by telephone within 24 hours and in writing within 5 days of the incident. A notification should contain the following information for a dry weather discharge or a failed combination manhole:

- a. estimated period of discharge;
- b. estimated volume of discharge; and
- c. estimated data on rainfall intensity and cumulative precipitation, which may be obtained from the National Weather Service.

3. **Inspection and Maintenance of Combination Manholes**  
The permittee shall inspect all combination manholes following every storm event or monthly at a minimum. The permittee must definitively determine if there has been overflows from one system to the other (e.g. displacement of covers, block test, chalk test). A summary inspection report shall be submitted to EPA annually by April 1<sup>st</sup>. Reports should ascertain whether or not storm water and sewage have been kept separate at each combination manhole

during the past year.

The permittee shall repair and maintain all combination manholes as necessary. The permittee must propose and adhere to a repair or maintenance schedule each time any such action becomes necessary. EPA shall also be notified at the time of any maintenance or repairs of combination manholes:

**D. 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 and co-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 (6) 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:

- a. 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.
- b. 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.
- c. Identification and prioritization of areas that will provide increased aquifer recharge as the result of reduction/elimination of infiltration and inflow to the system.
- d. An educational public outreach program for all aspects of I/I control, particularly private inflow.

## 4. Reporting Requirements:

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

- a. A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year.
- b. Expenditures for any infiltration/inflow related maintenance activities and corrective actions taken during the previous year.
- c. A map with areas identified for I/I-related investigation/action in the coming year.
- d. A calculation of the annual average I/I, the maximum month I/I for the reporting year.
- e. 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.

## 5. 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)

**E. UNAUTHORIZED DISCHARGES**

The permittee and co-permittee are 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).

**F. 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 (e.g. 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
- a. 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
- |      |                         |            |
|------|-------------------------|------------|
| i)   | less than 290           | 1/ year    |
| ii)  | 290 to less than 1500   | 1 /quarter |
| iii) | 1500 to less than 15000 | 6 /year    |
| iv)  | 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:
- i. Name and address of contractor responsible for sludge disposal
  - ii. Quantity of sludge in dry metric tons removed from the facility by the sludge contractor

**G. MONITORING AND REPORTING**

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, Massachusetts 01608

IPP Reports should be sent to:

Massachusetts Department of Environmental Protection  
Bureau of Waste Prevention  
Industrial Wastewater Program  
1 Winter Street  
Boston, MA 02108

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

**H. 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.





**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
NEW ENGLAND - REGION I  
ONE CONGRESS STREET, SUITE 1100  
BOSTON, MASSACHUSETTS 02114-2023**

**FACT SHEET**

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

**NPDES PERMIT NO: MA0100617**

**NAME AND ADDRESS OF APPLICANT:**

**City of Leominster  
Department of Public Works  
109 Graham Street  
Leominster, MA 01453**

The Town of Lunenburg is a co-permittee for specific activities required by the permit. See Section VI of this fact sheet and Sections I.D., and I.E., of the draft permit. The responsible municipal department is:

**Town of Lunenburg  
Department of Public Works  
520 Chase Road  
Lunenburg, MA 01462**

**NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:**

**Leominster Water Pollution Control Facility  
436 Mechanic Street  
Leominster, MA 01453**

**RECEIVING WATERS: North Nashua River in the Nashua River Watershed - MA81-04**

**CLASSIFICATION: Class B - Warm Water**

**I. PROPOSED ACTION**

The above named applicant has applied to the U.S. Environmental Protection Agency for the re-issuance of its National Pollutant Discharge Elimination System (NPDES) permit to discharge into the designated receiving water. The current permit was signed on July 28, 2000 and became effective sixty (60) days later. The permit expired September 28, 2005. A re-application was received on March 12, 2005. This draft permit, will expire five (5) years from the effective date.

**II. TYPE OF FACILITY AND DISCHARGE LOCATION**

The facility is an advanced wastewater treatment plant with a design flow of 9.3 million gallon per day (mgd) and discharges to the North Nashua River (See Figure I). The collection system is 96% separate sanitary sewer and 4% combined storm and sanitary sewer. Although a portion of the system has combined sewers, there are no combined sewer overflows (CSOs) since the City has reduced I/I and

replaced sewers (increasing capacity, in some cases). Therefore, the capacity now exists to convey combined flows to the treatment facility. The facility serves a population of 42,250 in Leominster and approximately 900 in Lunenburg.

The facility's discharge outfalls are listed below:

<u>Outfall</u>	<u>Description of Discharge</u>	<u>Receiving Water</u>
001	Treated Effluent	North Nashua River

### III. DESCRIPTION OF DISCHARGE

Quantitative descriptions of the discharge in terms of significant effluent parameters, based on discharge monitoring reports (DMRs) submitted for July 2003 through June 2005, and the March 2005 application, are shown in Tables 1 and 2 of this fact sheet, respectively.

### IV. LIMITATIONS AND CONDITIONS

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

### V. PERMIT BASIS AND EXPLANATION OF EFFLUENT LIMITATION DERIVATION

#### A. PROCESS DESCRIPTION

The facility is an advanced activated sludge facility with year-round sodium hypochlorite disinfection, which discharges to the North Nashua River (See Figure 1). The facility has a design flow of 9.3 mgd. In addition to the sanitary flow, there are four non-categorical significant industrial dischargers representing about 2.5% of the average daily plant flow.

The following is a brief description of the treatment process (See Figure 2); raw wastewater enters the aerated grit chamber and then flows into the two primary settling tanks, where floating and settleable solids are removed. The primary effluent then flows into the three aeration tanks, followed by three secondary settling tanks. The secondary effluent is disinfected with sodium hypochlorite, dechlorinated, and the final effluent is discharged over aeration steps into the North Nashua River.

Sludge is co-settled in primary clarifiers and then pumped to water tight trucks for delivery to the East Fitchburg WWTF, where it is dewatered and incinerated.

#### B. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

##### 1. Overview of Federal and State Regulations

Under Section 301(b)(1)(B) of the Clean Water Act ("CWA"), publicly owned treatment works ("POTWs") must have achieved effluent limitations based upon Secondary Treatment by July 1, 1977. The secondary treatment requirements are set forth at 40 C.F.R. Part 133.102. In addition, Section 301(b)(1)(C) of the CWA requires that effluent limitations based on water quality considerations be established for point source discharges when such limitations are necessary to meet state or federal water quality standards that are applicable to the designated receiving water.

Pursuant to 40 C.F.R. § 122.44 (d), permittees must achieve water quality standards established under Section 303 of the Clean Water Act (CWA), including state narrative criteria for water quality. Additionally, under 40 C.F.R. § 122.44 (d)(1)(i), "Limitations must control all pollutants or pollutant parameters which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard." When determining whether a discharge causes, or has the reasonable potential to cause or contribute to an in-stream excursion above a narrative or numeric criterion, the permitting authority shall use procedures which account for existing controls on point and non-point sources of pollution, and where appropriate, consider the dilution of the effluent in the receiving water.

## 2. Water Quality Standards; Designated Use; Outfall 001

The North Nashua River in the vicinity of the discharges is classified as a Class B-warm water fishery in the Massachusetts Surface Water Quality Standards (314 CMR 4.00). Class B waters are designated as a habitat for fish, other aquatic life, and wildlife, and for primary and secondary contact recreation. They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. The waters should have consistently good aesthetic value.

A warm water fishery is defined in the Massachusetts Surface Water Quality Standards (314 CMR 4.02) as waters in which the maximum mean monthly temperature generally exceeds 20° Celsius during the summer months and are not capable of supporting a year-round population of cold water stenothermal aquatic life.

Section 303(d) of the Federal Clean Water Act (CWA) requires states to identify those waterbodies that are not expected to meet surface water quality standards after the implementation of technology-based controls and, as such require the development of total maximum daily loads (TMDL). The segment of the river (MA81-04), North Nashua River, Leominster WWTF, Leominster to confluence with Nashua River, Lancaster, is listed on the Massachusetts 2002 Integrated List of Waters (303d) as impaired and requiring the development of a TMDL. The listed impairments for this segment are pathogens; taste, odor and color; and turbidity. These same impairments are listed for the river segment immediately upstream of this segment. The specific cause(s) of these impairments are unknown.

The MassDEP 1998 Water Quality Assessment Report for the Nashua River, which is the basis for the 303(d) list, notes that the facility is under a MassDEP enforcement order to correct sewer surcharges and infiltration/inflow problems.

### Available Dilution

Water quality based limits are established with the use of a calculated available dilution. Title 314 CMR 4.03(3)(a) requires that effluent dilution be calculated based on the receiving water 7Q10. The 7Q10 is the lowest observed mean river flow for 7 consecutive days, occurring over a 10-year recurrence interval. Additionally, the facility design flow is used to calculate available effluent dilution.

The facility design flow is 9.3 million gallons per day or 14.4 cubic feet per second (cfs). The 7Q10 flow used to calculate the effluent limits in the current permit was 34.9 cfs, resulting in a dilution factor of 3.42. The dilution factor in the draft permit has been reduced based on a new analysis.

The nearest USGS streamflow gaging station is Gage 01094500, North Nashua River, located just downstream of the Leominster POTW discharge, which has a 7Q10 flow of 32.4 cfs and a contributing drainage area of 110 square miles. The drainage area upstream of the Leominster discharge is 100 square miles. Therefore, the 7Q10 flow at the point of discharge can be calculated as follows;

$$7Q10 = (32.4 \text{ cfs}) * \frac{100}{110} = 29.5 \text{ cfs}$$

The dilution factor can then be calculated as follows:

$$\frac{\text{River flow (7Q10)}}{\text{Daily average design effluent flow}} = \text{Dilution}$$

(Note: The daily average design effluent flow is not added to the river flow in the numerator because the gage is located downstream and therefore is already accounted for.)

$$\frac{29.5 \text{ cfs}}{14.4 \text{ cfs}} = 2.04$$

Therefore, the dilution factor is 2.04

**Flow** - The flow limit is based on the annual average design flow of the treatment plant, which is 9.3 mgd. Flow is to be measured continuously. The permittee shall report the annual average monthly flow using the annual rolling average method (See Permit Footnote 2). The maximum, minimum and total flow for each operating date shall also be reported.

#### OUTFALL 001 - CONVENTIONAL POLLUTANTS

**Biochemical Oxygen Demand (BOD<sub>5</sub>)/ Carbonaceous Biochemical Oxygen Demand (CBOD<sub>5</sub>)** - The draft permit carries forward the BOD<sub>5</sub> and CBOD<sub>5</sub> limits in the current permit. The water quality based limits are from a wasteload allocation developed by the MassDEP and published in The Nashua River Water Quality Management Plan 1981 (MassDEP 1981). The limits in the draft permit are seasonal. During the period of November 1 to April 30, the average monthly and average weekly limits are based on the secondary treatment requirements set forth at 40 CFR 133.102 (a)(1), (2) and 40 CFR 122.45 (f). The secondary treatment limitations are a monthly average BOD<sub>5</sub> concentration of 30 mg/l and a weekly average concentration of 45 mg/l. The draft permit requires the permittee to report the maximum daily BOD value each month, but does not establish an effluent limit. For the period of May 1 to October 31, CBOD<sub>5</sub> is limited, rather than BOD<sub>5</sub>, to account for ammonia conversion. The CBOD<sub>5</sub> average monthly limit is 15 mg/l and the average weekly limit is 15 mg/l; the maximum daily discharge is not limited, but must be reported each month. The mass limitations for BOD and CBOD are based on a 9.3 MGD design flow. The monitoring frequency continues to be two times per week.

**Total Suspended Solids (TSS)** - The draft permit carries forward the TSS limits in the current permit. The water quality based limits are from a wasteload allocation developed by the MassDEP and published in The Nashua River Water Quality Management Plan 1981 (MassDEP 1981). The limits in the draft permit are seasonal. During the period November 1 to April 30, the average monthly and average weekly limits are based on the secondary treatment requirements set forth at 40 CFR 133.102 (b)(1), (2) and 40 CFR 122.45 (f). The secondary treatment limitations are a monthly average TSS

concentrations of 30 mg/l, weekly average concentrations of 45 mg/l. The draft permit requires the permittee to report the maximum TSS value each month, but does not establish an effluent limit. For the period of May 1 to October 31, the average monthly limit is 20 mg/l and the average weekly limit is 20 mg/l. The permittee shall report the maximum daily TSS value monthly; however, a limit has not been set. The mass limitations for TSS are based on a 9.3 MGD design flow. The monitoring frequency continues to be two times per week.

BOD<sub>5</sub> and TSS Mass Loading Calculations:

Calculations of maximum allowable loads for average monthly and average weekly BOD<sub>5</sub>, CBOD<sub>5</sub>, and TSS are based on the following equation:

$$L = C \times DF \times 8.34 \text{ or } L = C \times DF \times 3.79 \text{ where:}$$

L = Maximum allowable load in lbs/day.

C = Maximum allowable effluent concentration for reporting period in mg/l.

Reporting periods are average monthly and weekly and daily maximum.

DF = Design flow of facility in MGD.

8.34 = Factor to convert effluent concentration in mg/l and design flow in MGD to lbs/day.

3.79 = Factor to convert effluent concentration in mg/l and design flow in MGD to kgs/day.

$$\text{(Concentration limit) [45] X 8.34 (Constant) X 9.3 (design flow) = 3490 lb/day}$$

$$\text{(Concentration limit) [45] X 3.79 (Constant) X 9.3 (design flow) = 1586 kg/day}$$

$$\text{(Concentration limit) [30] X 8.34 (Constant) X 9.3 (design flow) = 2327 lb/day}$$

$$\text{(Concentration limit) [30] X 3.79 (Constant) X 9.3 (design flow) = 1057 kg/day}$$

$$\text{(Concentration limit) [15] X 8.34 (Constant) X 9.3 (design flow) = 1163 lb/day}$$

$$\text{(Concentration limit) [15] X 3.79 (Constant) X 9.3 (design flow) = 529 kg/day}$$

$$\text{(Concentration limit) [20] X 8.34 (Constant) X 9.3 (design flow) = 1551 lb/day}$$

$$\text{(Concentration limit) [20] X 3.79 (Constant) X 9.3 (design flow) = 705 kg/day}$$

Eighty-Five Percent (85%) BOD<sub>5</sub> and TSS Removal Requirement - The provisions of 40 CFR §§133.102(a)(3) and (b)(3) requires that the 30 day average percent removal for BOD<sub>5</sub>/CBOD<sub>5</sub> and TSS be not less than 85%. These limits are maintained in the draft permit.

pH - The draft permit includes pH limitations which are required by state water quality standards, and are at least as stringent as pH limitations set forth at 40 C.F.R. §133.102(c). During the summer months (May 1 through October 31), the pH of the effluent shall not be less than 6.5 or greater than 8.3 standard units at any time. During the winter months (November 1 through April 30), the pH of the effluent shall not be less than 6.0 or greater than 8.3 standard units at any time.

The lower effluent pH limit of 6.0 SU for the winter months was formally approved in a permit modification which became effective November 19, 2003. The cause of the depressed pH is the

nitrification of ammonia; in order to achieve the seasonal ammonia limit in effect from June to October lime is added to raise the influent alkalinity to support nitrification. During the winter months lime is not added to the system and the effluent pH can drop below the previous effluent limit of 6.5 SU. This is caused by nitrification, which is an approved process, continuing throughout the year. MassDEP reviewed this information at the time of the permit modification and determined that the lower effluent pH will not have an adverse effect to the receiving water during the winter months.

Fecal Coliform Bacteria - The draft permit includes fecal coliform bacteria limitations which are in accordance with the Massachusetts Surface Water Quality Standards, 314 CMR 4.05 (3)(b)(4). The proposed limits in the draft permit are 200 colony forming units (cfu)/100 ml for the average monthly geometric mean limit and 400 colony forming units (cfu)/100 ml for the maximum daily limit. These limits are the same as the previous permit and the monitoring frequency continues to be two times per week. This limit is year round due to downstream water supply withdrawals.

Dissolved Oxygen - The draft permit includes a limitation of not less than 6.0 mg/l for dissolved oxygen (DO) which is the same as the previous permit and is therefore consistent with the anti-backsliding provision of the CWA § 402(o).

#### OUTFALL 001 - NON-CONVENTIONAL POLLUTANTS

Total Residual Chlorine - Chlorine is a toxic chemical. DMRs show chlorine residual levels below the minimum detection level for the past 24 months. The draft permit includes Total Residual Chlorine (TRC) limitations which are based on state water quality standards [Title 314 CMR 4.05(5)(e)]. Chlorine compounds produced by the chlorination of wastewater can be extremely toxic to aquatic life.

The acute and chronic water quality criteria for chlorine defined in the 2002 EPA National Recommended Water Quality Criteria for freshwater are 19 ug/l and 11 ug/l, respectively. Given the dilution factor of 2, total residual chlorine limits have been calculated as 38 ug/l maximum daily and 22 ug/l average monthly. Sampling is continued at twice (2) per day. Twice per week, when Fecal Coliform Bacteria samples are collected, TRC samples must be collected concurrently.

Total Residual Chlorine Limitations:

(acute criteria \* dilution factor) = Acute (Maximum Daily)  
(19 ug/l x 2) = 38 ug/l = 0.038 mg/l

(chronic criteria \* dilution factor) = Chronic (Monthly Average)  
(11 ug/l x 2) = 22 ug/l = 0.022 mg/l

Total Phosphorus - The Massachusetts Surface Water Quality Standards (314 CMR 4.00) do not contain numerical criteria for total phosphorus. The narrative criteria for nutrients is found at 314 CMR 4.05(5) (c), which states that nutrients "shall not exceed the site specific limits necessary to control accelerated or cultural eutrophication". The Standards also require that "any existing point source discharges containing nutrients in concentrations which encourage eutrophication or the growth of weeds or algae shall be provided with the highest and best practicable treatment to remove such nutrients (314 CMR 4.04). MassDEP has established that a monthly average total phosphorus limit of 0.2 mg/l represents highest and best practical treatment for POTWs.

EPA has produced several guidance documents which contain recommended total phosphorus criteria for receiving waters. The 1986 Quality Criteria of Water ("the Gold Book") recommends in-stream

phosphorus concentrations of 0.05 mg/l in any stream entering a lake or reservoir, 0.1 mg/l for any stream not discharging directly to lakes or impoundments, and 0.025 mg/l within a lake or reservoir.

More recently, EPA has released "Ecoregional Nutrient Criteria", established as part of an effort to reduce problems associated with excess nutrients in water bodies in specific areas of the country. The published criteria represent conditions in waters in each specific ecoregion which are minimally impacted by human activities, and thus representative of waters without cultural eutrophication. Leominster is within Ecoregion XIV, Eastern Coastal Plains. The recommended total phosphorus criteria for this Ecoregion XIV is 24 ug/l (0.024 mg/l) and can be found in the Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Ecoregion XIV, published in December 2000.

Data collected for the 1998 Nashua River Water Quality Assessment Report shows that the average instream concentration of total phosphorus in the North Nashua River downstream of the Leominster discharge averages 0.1 mg/l. This value exceeds the ecoregion criteria of 0.024 mg/l. This value is also a significant increase over the average upstream value of 0.03 mg/l. Streamflows during the sampling events had a wide range 37 cfs to 999 cfs. A quick analysis of the limited dataset shows correlation between the mean monthly streamflow and the instream total phosphorus concentrations. During the low flow period of July through September, the instream total phosphorus concentrations were significantly higher. A maximum instream concentration of 0.18 mg/l was sampled in August.

MassDEP has included the segment of the Nashua River immediately downstream of the confluence with North Nashua River, on the 303(d) list for nutrients and noxious aquatic plants. MassDEP has recently completed modeling which will serve as the basis for the Total Maximum Daily Load Study of the Nashua and North Nashua Rivers. The preliminary model results indicate the proposed seasonal total phosphorus limit of 0.2 mg/l to be appropriate (E. Hartmann, MassDEP, personal communication, December 2005). The State plans on presenting the results of the model at public meetings to be held in early 2006. The TMDL document will be written following these meetings and then submitted to EPA for approval.

Furthermore, the State has also documented the eutrophication of the Pepperell Impoundment, located downstream of the Leominster WPCF. The Impoundment is the downstream point of accumulation for any biomass produced upstream as the result of Leominster phosphorus inputs.

Discharge Monitoring Reports (DMRs) submitted by the permittee over the last 24 months report average monthly total phosphorus values between 0.34 mg/l and 0.86 mg/l with a maximum daily value of 1.19 mg/l. The calculated instream contribution at the current monthly average limit of 1 mg/l (1 mg/l divided by the dilution factor of 2) would be 0.5 mg/l, which is higher than both the ecoregion criteria and the "Gold Book" criteria.

Based on the downstream impairments (e.g. 303(d) listing of the North Nashua River segment MA81-05, and the documented eutrophication of the Pepperell Impoundment), the ambient total phosphorus levels, and the current nutrient criteria, EPA determined that a more stringent total phosphorus limit is necessary. A 0.2 mg/l monthly average limit based on highest and best practical treatment was evaluated; the expected instream concentration at a discharge concentration of 0.2 mg/l and a dilution factor of 2 would be 0.1 mg/l, which is the "Gold Book" recommendation for flowing waters, although not the more stringent "Ecoregion" recommendations. EPA has determined that a seasonal limit (April 1 to October 31) of at least 0.2 mg/l is necessary to achieve water quality standards. EPA has also included a winter limit of 1 mg/l to ensure that particulate phosphorus is not discharged in significant quantities during this period. Particulate phosphorus discharged during the winter months



could settle in the downstream impoundments and be available to support plant growth during the growing season.

Ammonia - The draft permit includes seasonal effluent limitations for ammonia nitrogen. During the month of April, the average monthly limit for ammonia nitrogen is 10 mg/l and the maximum daily discharge during each month must be reported. For the month of May, the average monthly effluent limit is reduced to 5 mg/l and the maximum daily discharge during each month must be reported. For the summer months, defined as June 1 through October 31, the draft permit includes an average monthly limit of 1 mg/l, an average weekly limit of 1 mg/l and a maximum daily limit of 1.5 mg/l. A report-only requirement for average monthly is in effect November 1 through March 31. These limits are carried forward from the existing permit and are based on the 1981 waste load allocation. Monitoring frequency April 1 through October 31 continues to be twice per week. During the period of November 1 through March 31, the frequency is once per month.

Copper - Certain metals, like copper, can be toxic to aquatic life. The current permit includes monthly average and daily maximum copper limits of 13.1 ug/l and 17.8 ug/l, respectively. These limits were calculated using the 1998 Water Quality criteria for copper calculated at a hardness of 35 mg/l as CaCO<sub>3</sub> and a dilution factor of 3.42.

Analytical data submitted with toxicity test results and past Discharge Monitoring Reports (DMRs: see Table 1) indicates that the facility has not consistently achieved the limitations in the previous permit.

The limits for copper were re-calculated based on the National Recommended Water Quality Criteria published in the Federal Register on December 27, 2002, with a dilution factor of 2. A hardness of 35 mg/l was used based on the previous permit and data in the Nashua River Basin 1998 Water Quality Assessment Report.

The calculations are shown below:

Water Quality Criteria for hardness-dependent metals:

$$\text{Acute criteria (dissolved)} = \exp \{ m_a [\ln(\text{hardness})] + b_a \} \cdot (\text{CF})$$

$m_a$  = pollutant specific coefficient

$b_a$  = pollutant specific coefficient

$h$  = hardness

$\ln$  = natural logarithm

CF = pollutant specific conversion factor used to convert total recoverable to dissolved metal

Calculation of acute limit for copper:

$$m_a = 0.9422 \quad b_a = -1.700 \quad \text{CF} = 0.960 \quad h = 35$$

$$\text{Acute criteria (dissolved)} = \exp \{ 0.9422 [\ln(35)] + -1.700 \} \cdot (0.960) = 5.0 \text{ ug/l}$$

Dilution factor = 2

$$\text{Effluent limitation for dissolved copper} = 2 \cdot 5.0 \text{ ug/l} = 10.0 \text{ ug/l}$$

$$\text{Effluent limitation for total recoverable copper} = 10.0/0.96 = 10.4 \text{ ug/l}^*$$

The maximum daily water quality based limitation for total recoverable copper is 10.4 ug/l

$$\text{Chronic criteria (dissolved)} = \exp \{ m_c [\ln(\text{hardness})] + b_c \} \cdot (\text{CF})$$

$m_c$  = pollutant specific coefficient

$b_c$  = pollutant specific coefficient

$h$  = hardness

$\ln$  = natural logarithm

CF = pollutant specific conversion factor used to convert total recoverable to dissolved metal

Calculation of chronic limit for copper:

$$m_c = 0.8545 \quad b_c = -1.702 \quad CF = 0.960 \quad h = 35$$

$$\text{Chronic criteria (dissolved)} = \exp \{0.8545 [\ln (35)] + -1.702\} * (0.960) = 3.65 \text{ ug/l}$$

$$\text{Dilution factor} = 2$$

$$\text{Effluent limitation for dissolved copper} = 2 * 3.65 \text{ ug/l} = 7.3 \text{ ug/l}$$

$$\text{Effluent limitation for total recoverable copper} = 7.3/0.96 = 7.6 \text{ ug/l}^*$$

The monthly average water quality based limitation for total recoverable copper is 7.6 ug/l.

Therefore, a monthly average limit of 7.6 ug/l and a maximum daily limit of 10.4 ug/l have been proposed in the draft permit. These limits are more stringent than the limits in the current permit due to the revised dilution factor.

#### OUTFALL 001 - WHOLE EFFLUENT TOXICITY (WET)

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The Massachusetts Surface Water Quality Standards include the following narrative statement and requires 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.

National studies conducted by the EPA have demonstrated that domestic sources contribute toxic constituents to POTWs. These constituents include metals, chlorinated solvents, aromatic hydrocarbons and others. Based on the potential for toxicity from domestic sources, the state narrative water quality criterion, the limited dilution at the discharge location, and in accordance with EPA national and regional policy and 40 C.F.R. § 122.44(d), the draft permit includes a whole effluent chronic and acute toxicity limitations (C-NOEC = 50% and LC50 = 100%). (See also "Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants", 49 Fed. Reg. 9016 March 9, 1984, and EPA's "Technical Support Document for Water Quality-Based Toxics Control", September, 1991.)

The draft permit carries forward the requirements for quarterly Chronic and Acute toxicity tests using the species Ceriodaphnia dubia, only. The tests must be performed in accordance with the test procedures and protocols specified in Permit Attachment A. The tests will be conducted four times a year, during the second week of the following months, March, June, September and December.

The LC<sub>50</sub> limit of  $\geq 100\%$  is established by EPA/MassDEP policy for facilities with less than 10:1 dilution (See MassDEP's "Implementation Policy for the Control of Toxic Pollutants in Surface Waters, February 23, 1990). The C-NOEC is established at the receiving water concentration (1/Dilution Factor = 1/2) which is 50%.

## VI. INFLOW/INFILTRATION REQUIREMENTS

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 to secondary treatment. It greatly increases the potential for sanitary sewer overflows (SSO) in separate systems, and combined sewer overflows in combined systems.

The City's sewer system has historically received large quantities of (I/I) which have caused sanitary sewer overflows. These overflows are exacerbated by combined manholes (approximately 25-50 remain) in the collection system. A combined manhole serves as an access point for both the sanitary sewer and the storm sewer. Because of the close proximity of the two sewers, overflows from the sanitary sewer may be directly conveyed to the storm sewer, which then discharges, untreated to a receiving water. Unauthorized discharges from the sanitary sewers are violations of this permit and the resulting discharge of untreated sewage to receiving waters either directly or through storm drains are violations of this permit and/or the City's municipal separate storm sewer system (MS4) permit.

The City has been issued a series of Administrative Consent Orders (ACOs) by MassDEP, requiring the elimination of sanitary sewer overflows through the reduction of I/I, the increase of sanitary sewer capacity, and the elimination of combined manholes. The most recent ACO, first issued on June 14, 2002, and amended on January 9, 2003 and April 3, 2003, required the permittee to eliminate all sanitary sewer overflows and the combined sanitary and stormwater manholes tributary to these SSOs. Specific tasks required by the ACO and completed by the permittee, according to Mass DEP, are listed below:

- Sewer moratorium on areas tributary to the overflows;
- Sewer Bank established;
- Credited by MassDEP with removing 2.3 mgd of infiltration and inflow (a sewer bank credit of 590,000 gallons);
- Completed a mathematical model of the sewer system;
- Submitted updated Facility Plan;
- Completed installation of a relief sewer on Bascom Road;
- Currently installing a relief sewer on Industrial Road.

The draft permit includes specific requirements for the City of Leominster with regard to the combination manholes including regular monitoring, inspection and maintenance, and reporting.

The draft permit also includes requirements for the permittee and the Town of Lunenburg (the "co-permittee") to control infiltration and inflow (I/I) into the collections systems it owns and operates. The permittee and co-permittee shall each develop an I/I removal program commensurate with the severity of the I/I in the collection system. In sections of the collection system that have minimal I/I, the control program will logically be scaled down. 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 permit standard conditions for 'Proper Operation and Maintenance' are found at 40 CFR §122.41(e). These conditions require proper operation and maintenance of permitted wastewater systems and related facilities to achieve permit conditions. Similarly, the co-permittee has a 'duty to mitigate' as stated in 40 CFR §122.41 (d). This requires the co-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 of ensuring permit compliance under both of these provisions.

#### VII. SLUDGE INFORMATION AND REQUIREMENTS

The draft permit requires that the permittee comply with all existing federal and state laws that apply to sewage sludge use and disposal practices and with the Clean Water Act Section 405(d) technical standards (see 40 CFR Section 503). Sludge from the Leominster WWTF is currently sent to an off-site facility for incineration; because the final disposal or use of the permittees sludge is done by others, the permittee is not subject to the requirements of 40 CFR Section 503. However, if the ultimate sludge disposal method changes, the permittee is responsible for complying with the applicable state and federal requirements.

#### VIII. PRETREATMENT

The facility accepts industrial wastewater from four (4) non-categorical SIUs.

The permittee is required to administer a pretreatment program based on the authority granted under 40 CFR §122.44(j), 40 CFR Part 403 and Section 307 of the Act. The permittee's pretreatment program received EPA approval on September 28, 1990 and, as a result, appropriate pretreatment program requirements were incorporated into the previous permit, which were consistent with that approval and federal pretreatment regulations in effect when the permit was issued.

Upon reissuance of this NPDES permit, the permittee is required to review its pretreatment program and modify it as necessary to ensure that it is consistent with current Federal Regulations. Those activities that the permittee must address include, but are not limited to, the following: (1) develop and enforce EPA approved specific effluent limits (technically-based local limits); (2) revise the local sewer-use ordinance or regulation, as appropriate, to be consistent with Federal Regulations; (3) develop an enforcement response plan; (4) implement a slug control evaluation program; (5) track significant noncompliance for industrial users; and (6) establish a definition of and track significant industrial users.

These requirements are necessary to ensure continued compliance with the POTW's NPDES permit and its sludge use or disposal practices.

Lastly, the permittee must continue to submit an annual report describing the permittee's pretreatment program activities for the twelve (12) month period ending 60 days before the due date in accordance with 403.12(i). The annual report shall be submitted **no later than November 1 of each year.**

#### IX. ANTI-BACKSLIDING

Anti-backsliding, as described in Section 402 (o) of the Clean Water Act and 40 CFR §122.44(l)(1), requires reissued permits to contain limitations as stringent or more stringent than those of the previous permit unless the circumstances allow application of one of the defined exceptions.

#### X. ANTIDegradation

The Massachusetts Antidegradation Policy is found at Title 314 CMR 4.04. All existing uses of the North Nashua River must be protected. This draft permit is being reissued with allowable discharge limits as or more stringent than the current permit with the same parameter coverage. There is no change in outfall location. The public is invited to participate in the anti-degradation finding through the permit public notice procedure.

#### XI. ESSENTIAL FISH HABITAT

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 Service (NMFS) if EPA's action or proposed actions that it funds, permits, or undertakes, "may adversely impact any essential fish habitat," 16 U.S.C. § 1855(b). The Amendments broadly define "essential fish habitat" (EFH) as: "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity," 16 U.S.C. § 1802(10). "Adverse 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. Id.

Essential fish habitat is only designated for fish 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.

Only Atlantic Salmon is believed to be present during one or more life stage within the EFH Area, which encompasses the existing discharge site. No "habitat area of particular concern" as defined under §600.815(a)(9) of the Magnuson-Stevens Act, has been designated for this site. Although EFH has been designated for this general location, EPA has concluded that this activity is not likely to affect EFH or its associated species for the following reasons:

- This is a reissuance of an existing permit with the same or stricter effluent limits;
- The quantity of the discharge from the WWTF is 9.3 MGD monthly average and receives advanced secondary treatment using rapid mix, flocculation and activated sludge processes;
- Limits specifically protective of aquatic organisms have been established for chlorine and copper based on EPA water quality criteria;
- Acute and chronic toxicity testing on *Ceriodaphnia dubia* is required four (4) times per year and the recent toxicity results are in compliance with permit limits;
- The permit prohibits any violation of state water quality standards.

Accordingly, EPA has determined that a formal consultation with NMFS is not required.

#### XII. MONITORING AND REPORTING

The permittee is obliged to monitor and report sampling results to EPA and the MassDEP within the time specified in the permit. The effluent monitoring requirements have been established to yield data representative of the discharge by the authority under Section 308(a) of the CWA in accordance with 40 CFR 122.441(j), 122.44, and 122.48.

The remaining general conditions of the permit are based primarily on the NPDES regulations 40 CFR 122 through 125 and consist primarily of management requirements common to all permits.

#### XIII. STATE PERMIT CONDITIONS

**DRAFT**

Fact Sheet # MA0100617  
2006 Reissuance, Page 13 of 14

The NPDES Permit is issued jointly by the U. S. Environmental Protection Agency and the Massachusetts Department of Environmental Protection under federal and state law, respectively. As such, all the terms and conditions of the permit are, therefore, incorporated into and constitute a discharge permit issued by the MassDEP Commissioner.

**XIV. GENERAL CONDITIONS**

The general conditions of the permit are based on 40 CFR Parts 122, Subparts A and D and 40 CFR 124, Subparts A, D, E, and F and are consistent with management requirements common to other permits.

**XV. STATE CERTIFICATION REQUIREMENTS**

The staff of the Massachusetts Department of Environmental Protection ("MassDEP") has reviewed the draft permit. EPA has requested permit certification by the State pursuant to 40 CFR § 124.53 and expects that the draft permit will be certified.

**XVI. PUBLIC COMMENT PERIOD AND PROCEDURES FOR FINAL DECISION**

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, Office of Ecosystem Protection, MA Unit, One Congress Street, Suite-1100, Boston, Massachusetts 02114. 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. Such requests shall state the nature of the issues proposed to be raised in the hearing. Public hearings may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates a significant public interest. In reaching a final decision on the draft permit, the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston office.

Following the close of the comment period and after a public hearing, if such a hearing is held, 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.

**XVII. EPA CONTACT**

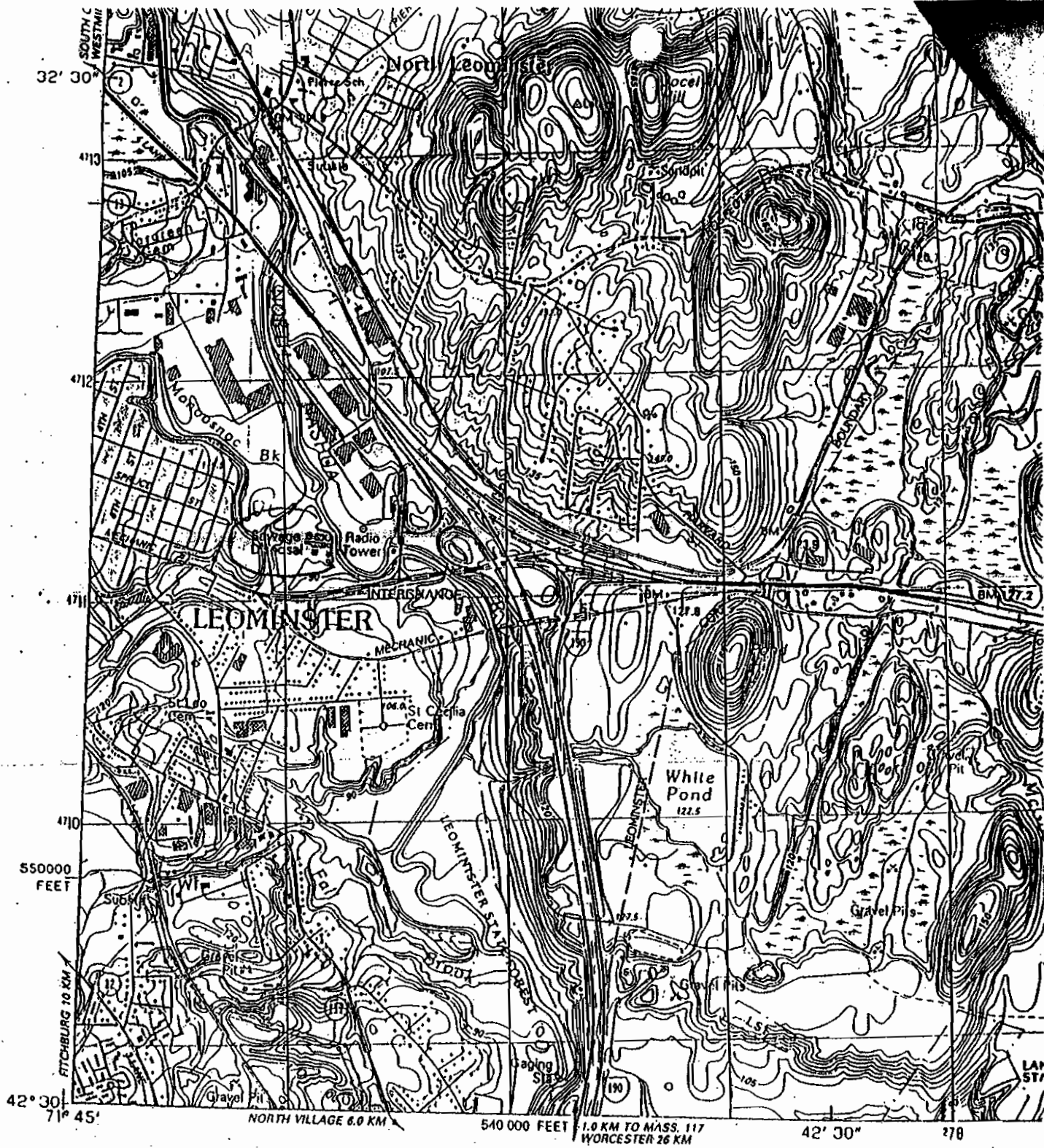
Additional information concerning the draft permit may be obtained between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays from:

Michele Cobban Barden  
Office of Ecosystem Protection  
U.S. Environmental Protection Agency  
One Congress Street, Suite-1100 (CPE)  
Boston, MA 02114-2023  
Telephone: (617) 918-1539  
Barden.Michele@epa.gov

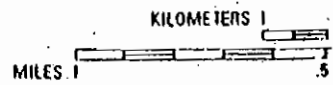
April 3, 2006

Date

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

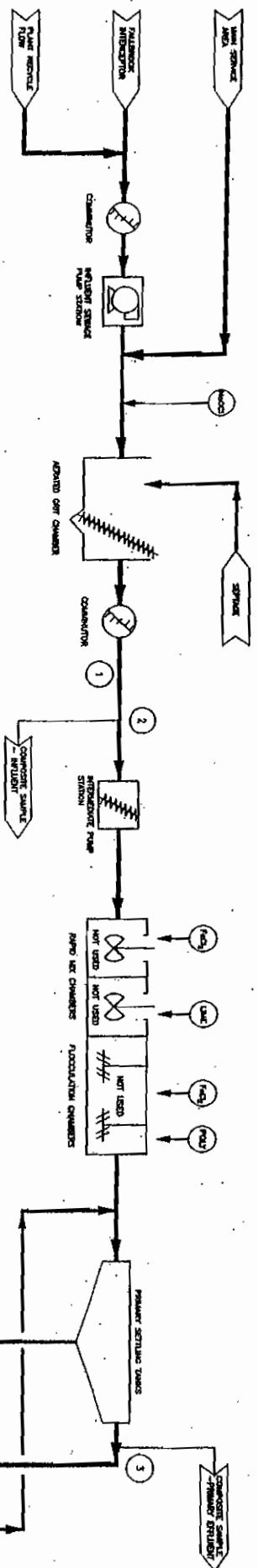


• INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1988



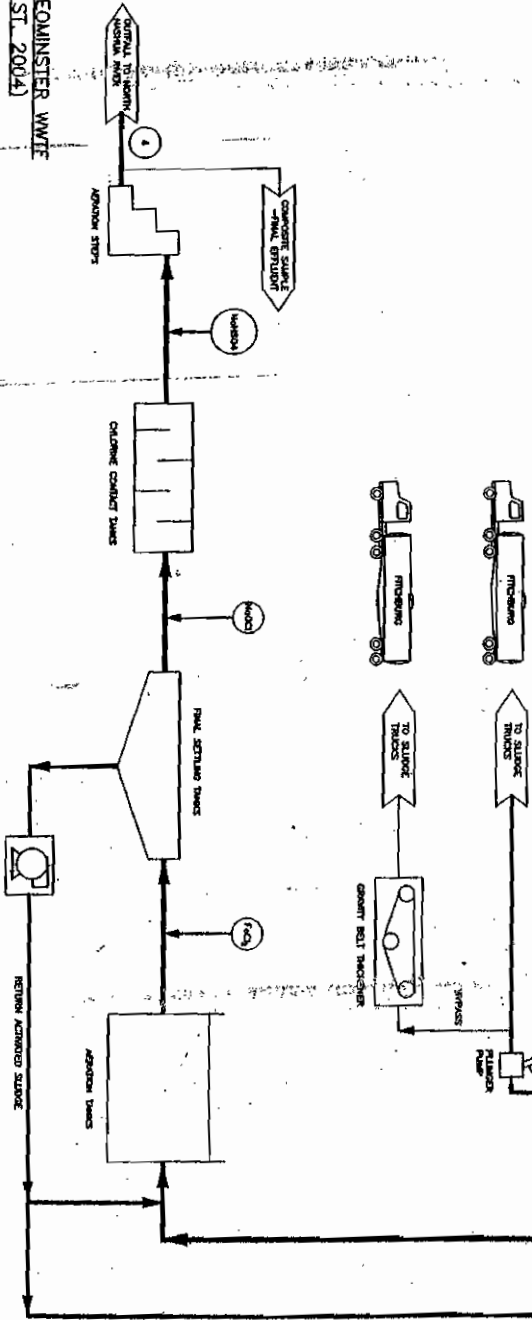
**SCALE 1:25 000**  
 1 CENTIMETER ON THE MAP REPRESENTS 250 METERS ON THE GROUND  
 CONTOUR INTERVAL 3 METERS





TOTAL PHOSPHORUS LOADING TO LEONMINSTER WWT  
 (JULY 1ST, 2003 TO JULY 1ST, 2004)

PLANT FLOW (MGD)	RAW INFLUENT TOTAL P (LBS/D)	PRIMARY EFFLUENT TOTAL P (LBS/D)	PLANT EFFLUENT TOTAL P (LBS/D)	REMOVAL EFFICIENCY	PERMIT LIMITS (LBS/D)
AVERAGE	183.30	136.72	17.52	90.4%	77
MAX	353.44	202.10	40.20	-	154
MIN	87.39	86.44	5.12	-	-



Proj. No. 17103  
 Design: JEC  
 Checked: DMG  
 Scale: AS NOTED  
 Date: 1/5/05

**Maguire Group Inc.**  
 Architects/Engineers/Planners  
 33 Commercial Street, Suite 1  
 Foxborough, MA 02035

**MAGUIRE GROUP**  
 PHOSPHORUS LOADING EVALUATION  
 LEONMINSTER WASTEWATER TREATMENT FACILITY  
 LEONMINSTER, MA  
 PLANT PROCESS FLOW DIAGRAM

Figure No. 5

Estimate Year	Flow (MGD)			BOD <sub>5</sub> (November 1 to April 30) (mg/l)			CBOD <sub>5</sub> (May 1 to October 31) (mg/l)			TSS (November 1 to April 30) (mg/l)			TSS (May 1 to October 31) (mg/l)			pH (S.U.)	
	Average Monthly	Maximum Daily	Report	Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Minimum (11/3/2008 Modification)	Maximum
Jun-05	5.72	11.33	***	***	4.5	Report	4.5	1.5	Report	3.0	4.5	Report	2.0	2.0	Report	6.7	7.0
May-05	5.60	17.38	5	6	7	***	***	***	5	6	7	***	***	157	6.5	7.0	
Apr-05	5.66	18.70	6	13	13	***	***	***	7	9	10	***	***	***	6.2	6.8	
Mar-05	5.48	9.94	8	14	17	***	***	***	6	10	12	***	***	***	6.2	6.7	
Feb-05	5.28	13.52	3	4	4	***	***	***	4	5	5	***	***	***	6.3	6.7	
Jan-05	5.15	9.70	3	4	4	***	***	***	4	5	7	***	***	***	6.2	6.8	
Dec-04	5.12	6.92	2	3	4	***	***	***	3	3	3	***	***	***	6.3	6.7	
Nov-04	5.21	5.83	***	***	4	***	***	***	***	3	3	***	***	***	6.4	7.0	
Oct-04	5.22	7.97	***	***	2	***	***	***	2	3	3	***	***	6.2	6.5	7.0	
Sep-04	5.18	4.21	***	***	1	***	***	***	2	2	2	***	***	2	6.5	7.0	
Aug-04	5.27	5.45	***	***	2	***	***	***	2	2	2	***	***	4	6	6.9	
Jul-04	5.29	5.53	***	***	2	***	***	***	4	4	4	***	***	4	6	6.5	7.1
Jun-04	5.47	7.69	***	***	3	***	***	***	7	5	7	***	***	12	6.1	6.8	
May-04	5.50	19.26	6	11	12	***	***	***	6	9	11	***	***	***	6.5	6.9	
Apr-04	5.35	9.27	3	5	6	***	***	***	4	5	6	***	***	***	6.3	6.9	
Mar-04	5.64	4.45	5	6	8	***	***	***	6	8	10	***	***	***	6.1	7.0	
Feb-04	5.72	6.72	4	5	5	***	***	***	5	7	8	***	***	***	6.4	7.1	
Jan-04	5.75	9.67	3	6	7	***	***	***	5	8	11	***	***	***	6.3	7.2	
Dec-03	5.75	6.59	3	4	5	***	***	***	2	3	4	***	***	***	7.0	7.4	
Nov-03	5.73	9.90	***	***	4	***	***	***	9	9	9	***	***	15	7.0	7.4	
Oct-03	5.66	6.05	***	***	3	***	***	***	4	4	5	***	***	7	7.0	7.4	
Sep-03	5.60	5.90	***	***	4	***	***	***	5	4	5	***	***	4	7.5	7.5	
Aug-03	5.48	5.32	***	***	3	***	***	***	6	6	6	***	***	3	7.1	7.4	
Jul-03	5.32	4.33	2	3	4	***	***	***	2	2	2	***	***	2	6.1	6.7	
Jun-03	5.25	19.26	2	4	17	***	***	***	7	9	12	***	***	21	7.1	7.3	
May-03	5.23	8.03	4	7	8	***	***	***	5	5	5	***	***	5	6.5	7.0	
Apr-03	5.23	8.03	4	7	8	***	***	***	5	5	5	***	***	5	6.5	7.0	

THE UNIVERSITY OF CHICAGO

PHILOSOPHY DEPARTMENT

PHILOSOPHY 101

PHILOSOPHY 101

PERMIT ATTACHMENT A  
MARINE ACUTE  
TOXICITY TEST PROCEDURE AND PROTOCOL

**I. GENERAL REQUIREMENTS**

The permittee shall conduct acceptable acute toxicity tests in accordance with the appropriate test protocols described below:

- Mysid Shrimp (Mysidopsis bahia or Americamysis bahia) definitive 48 hour test.
- Inland Silverside (Menidia beryllina) definitive 48 hour test.

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

**II. METHODS**

Methods to follow are those recommended by EPA in:

Weber, C.I. et al. Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, Fourth Edition. Environmental Monitoring Systems Laboratory, U.S. Environmental Protection Agency, Cincinnati, OH. August 1993, EPA/600/4-90/027F.

Any exceptions are stated herein.

**III. SAMPLE COLLECTION**

A discharge sample shall be collected. Aliquots shall be split from the sample, containerized and preserved (as per 40 CFR Part 136) for the chemical and physical analyses. The remaining sample shall be dechlorinated (if detected) in the laboratory using sodium thiosulfate for subsequent toxicity testing. (Note that EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection.) Grab samples must be used for pH, temperature, and total residual oxidants (as per 40 CFR Part 122.21).

Standard Methods for the Examination of Water and Wastewater describes dechlorination of samples (APHA, 1992). Dechlorination can be achieved using a ratio of 6.7 mg/L anhydrous sodium thiosulfate to reduce 1.0 mg/L chlorine. A thiosulfate control (maximum amount of thiosulfate in lab control or receiving water) should also be run.

All samples held overnight shall be refrigerated at 4°C.

#### IV. DILUTION WATER

A grab sample of dilution water used for acute toxicity testing shall be collected at a point away from the discharge which is free from toxicity or other sources of contamination. Avoid collecting near areas of obvious road or agricultural runoff, storm sewers or other point source discharges. An additional control (0% effluent) of a standard laboratory water of known quality shall also be tested.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable, an alternate standard dilution water of known quality with a conductivity, salinity, total suspended solids, and pH similar to that of the receiving water may be substituted **AFTER RECEIVING WRITTEN APPROVAL FROM THE PERMIT ISSUING AGENCY(S)**. Written requests for use of an alternative dilution water should be mailed with supporting documentation to the following address:

Director  
Office of Ecosystem Protection  
U. S. Environmental Protection Agency-New England  
One Congress Street  
Suite 1100 - CAA  
Boston, MA 02114-2023

It may prove beneficial to have the proposed dilution water source screened for suitability prior to toxicity testing. EPA strongly urges that screening be done prior to set up of a full definitive toxicity test any time there is question about the dilution water's ability to support acceptable performance as outlined in the 'test acceptability' section of the protocol.

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

EPA New England requires tests be performed using four replicates of each control and effluent concentration because the non-parametric statistical tests cannot be used with data from fewer replicates. The following tables summarize the accepted Mysid and Menidia toxicity test conditions and test acceptability criteria:

**EPA NEW ENGLAND RECOMMENDED EFFLUENT TOXICITY TEST CONDITIONS  
FOR THE MYSID, MYSIDOPSIS BAHIA 48 HOUR TEST<sup>1</sup>**

---

1. Test type	Static, non-renewal
2. Salinity	25ppt $\pm$ 10 percent for all dilutions by adding dry ocean salts
3. Temperature ( $^{\circ}$ C)	20 $^{\circ}$ C $\pm$ 1 $^{\circ}$ C or 25 $^{\circ}$ C $\pm$ 1 $^{\circ}$ C
4. Light quality	Ambient laboratory illumination
5. Photoperiod	16 hour light, 8 hour dark
6. Test chamber size	250 ml
7. Test solution volume	200 ml
8. Age of test organisms	1-5 days
9. No. Mysids per test chamber	10
10. No. of replicate test chambers per treatment	4
11. Total no. Mysids per test concentration	40
12. Feeding regime	Light feeding using concentrated <u>Artemia</u> nauplii while holding prior to initiating the test
13. Aeration <sup>2</sup>	None
14. Dilution water	Natural seawater, or deionized water mixed with artificial sea salts
15. Dilution factor	$\geq$ 0.5
16. Number of dilutions <sup>3</sup>	5 plus a control. An additional dilution at the permitted effluent concentration (%effluent) is required if it is not included in the dilution series.

17. Effect measured	Mortality - no movement of body appendages on gentle prodding
18. Test acceptability	90% or greater survival of test organisms in control solution
19. Sampling requirements	For on-site tests, samples are used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples must be first used within 36 hours of collection.
20. Sample volume required	Minimum 1 liter for effluents and 2 liters for receiving waters

---

Footnotes:

1. Adapted from EPA/600/4-90/027F.
2. If dissolved oxygen falls below 4.0 mg/L, aerate at rate of less than 100 bubbles/min. Routine D.O. checks are recommended.
3. When receiving water is used for dilution, an additional control made up of standard laboratory dilution water (0% effluent) is required.

**EPA NEW ENGLAND RECOMMENDED TOXICITY TEST CONDITIONS FOR THE  
INLAND SILVERSIDE, MENIDIA BERYLLINA 48 HOUR TEST<sup>1</sup>**

---

1. Test Type	Static, non-renewal
2. Salinity	25 ppt $\pm$ 2 ppt by adding dry ocean salts
3. Temperature	20°C $\pm$ 1°C or 25°C $\pm$ 1°C
4. Light Quality	Ambient laboratory illumination
5. Photoperiod	16 hr light, 8 hr dark
6. Size of test vessel	250 mL (minimum)
7. Volume of test solution	200 mL/replicate (minimum)
8. Age of fish	9-14 days; 24 hr age range
9. No. fish per chamber	10 (not to exceed loading limits)
10. No. of replicate test vessels per treatment	4
11. total no. organisms per concentration	40
12. Feeding regime	Light feeding using concentrated <u>Artemia</u> nauplii while holding prior to initiating the test
13. Aeration <sup>2</sup>	None
14. Dilution water	Natural seawater, or deionized water mixed with artificial sea salts.
15. Dilution factor	$\geq$ 0.5
16. Number of dilutions <sup>3</sup>	5 plus a control. An additional dilution at the permitted concentration (% effluent) is required if it is not included in the dilution series.
17. Effect measured	Mortality-no movement on gentle prodding.



- |                            |  |
|----------------------------|--|
| 18. Test acceptability     | 90% or greater survival of test organisms in control solution.   |
| 19. Sampling requirements  | For on-site tests, samples must be used within 24 hours of the time they are removed from the sampling device. Off-site test samples must be used within 36 hours of collection. |
| 20. Sample volume required | Minimum 1 liter for effluents and 2 liters for receiving waters.   |
- 

Footnotes:

1. Adapted from EPA/600/4-90/027F.
2. If dissolved oxygen falls below 4.0 mg/L, aerate at rate of less than 100 bubbles/min. Routine D.O. checks recommended.
3. When receiving water is used for dilution, an additional control made up of standard laboratory dilution water (0% effluent) is required.

## VI. CHEMICAL ANALYSIS

At the beginning of the static acute test, pH, salinity, and temperature must be measured at the beginning and end of each 24 hour period in each dilution and in the controls. The following chemical analyses shall be performed for each sampling event.

<u>Parameter</u>	<u>Effluent</u>	<u>Diluent</u>	<u>Minimum Quanti- fication Level (mg/L)</u>
pH	x	x	---
Salinity	x	x	PPT(o/oo)
Total Residual Oxidants* <sup>1</sup>	x	x	0.05
Total Solids and Suspended Solids	x	x	---
Ammonia	x	x	0.1
Total Organic Carbon	x	x	0.5

### Total Metals

Cd		x	0.001
Cr		x	0.005
Pb		x	0.005
Cu		x	0.0025
Zn		x	0.0025
Ni		x	0.004
Al		x	0.02

### Superscript:

#### \*<sup>1</sup> Total Residual Oxidants

Either of the following methods from the 18th Edition of the APHA Standard Methods for the Examination of Water and Wastewater must be used for these analyses:

- Method 4500-Cl E Low Level Amperometric Titration (the preferred method);
- Method 4500-CL G DPD Photometric Method.

or use USEPA Manual of Methods Analysis of Water or Wastes, Method 330.5.

## VII. TOXICITY TEST DATA ANALYSIS

### LC50 Median Lethal Concentration

An estimate of the concentration of effluent or toxicant that is lethal to 50% of the test organisms during the time prescribed by the test method.

Methods of Estimation:

- Probit Method
- Spearman-Kärber
- Trimmed Spearman-Kärber
- Graphical

See flow chart in Figure 6 on page 77 of EPA 600/4-90/027F for appropriate method to use on a given data set.

### No Observed Acute Effect Level (NOAEL)

See flow chart in Figure 13 on page 94 of EPA 600/4-90/027F.

## VIII. TOXICITY TEST REPORTING

The following must be reported:

- Description of sample collection procedures, site description;
- Names of individuals collecting and transporting samples, times and dates of sample collection and analysis on chain-of-custody; and
- General description of tests: age of test organisms, origin, dates and results of standard toxicant tests; light and temperature regime; other information on test conditions if different than procedures recommended. Reference toxicity test data must be included.
- Raw data and bench sheets.
- All chemical/physical data generated. (Include minimum detection levels and minimum quantification levels.)
- Provide a description of dechlorination procedures (as applicable).
- Any other observations or test conditions affecting test outcome.
- Statistical tests used to calculate endpoints.

## Permit Attachment B

### Self-Implementing Alternate Dilution Water Guidance

#### 1. Introduction:

The objective of the Whole Effluent Toxicity (WET) test is to estimate the toxicity of the effluent in uncontaminated receiving water. Ideally, a grab sample of receiving water must be collected upstream and/or outside of the influence of the outfall for use as dilution water in the tests.

EPA-Region I has adopted a *species-specific*, self-implementing policy for switching to an alternate dilution water during the life of the NPDES permit for WET tests where the receiving water is documented to be toxic or unreliable. The policy authorizes alternate dilution water use:

- (1) in any WET test repeated due to site water toxicity. No prior notification to EPA is required for any current test that needs to be repeated due to site water toxicity; and
- (2) in future WET tests where there are two previously documented incidents of site water toxicity associated with a particular test species. Written notification to EPA is required before switching to alternate dilution water testing for the duration of the life of the permit.

The details of EPA-Region I's species-specific, self-implementing policy are provided below.

#### 2. The Details of EPA-Region I's Self-Implementing Alternate Dilution Water Policy

**Case (1):** EPA-Region I authorizes the use of an alternate dilution water for any WET test repeated due to site water toxicity. This authorization is *species-specific*. If the Permittee is required to conduct WET tests using two species, and the receiving water is toxic or unreliable for only one species, then alternate dilution water use is authorized for that species only.

- (a) The Permittee no longer has to *immediately* notify EPA before an invalid WET test is repeated using an alternate dilution water.
- (b) The test must be repeated during the monitoring period specified by the Permit.
- (c) The selected alternate dilution water must have characteristics such as hardness, pH, conductivity, alkalinity, organic carbon, and total suspended solids similar to those of the receiving water, and should not produce a toxic response. Receiving water controls must also be run in alternate dilution water tests.
- (d) A complete WET test report must be submitted by the Permittee as required by the Permit. The report must clearly document:
  - (1) that site water toxicity rendered the first test invalid;
  - (2) that a retest was conducted using an alternate dilution water that matched the characteristics of the site water;

- (3) that site water controls were included in the retest; and
  - (4) whether the site water controls of the retest met the minimum test acceptability criteria.
- (e) If the retest documented that the site water controls met the minimum test acceptability criteria, site water must be used as diluent in future WET tests. If the site water controls of the retest failed to meet test acceptability criteria, an alternate dilution-water may be used in future WET tests using that test organism after submitting written notification to EPA. (See Case (2) below.)

**Case (2):** EPA-Region I authorizes the use of an alternate dilution water in future WET tests (for the duration of the life of the permit) after two documented incidents of site water toxicity to a particular test species.

- (a) Before alternate dilution water testing begins, the Permittee must submit to EPA written notification of site water toxicity, provide supporting data, describe the alternate dilution water selected, and confirm that the required sets of controls will be run in future WET tests (e.g., site water controls, lab water controls, and adjusted lab water controls). This letter shall be sent to both of the following:

Linda Murphy, Director  
Office of Ecosystem Protection (CAA)  
U.S. Environmental Protection Agency  
One Congress Street, Suite 1100  
Boston, MA 02114-2023

Gerard Sotolongo, Chief  
Water Technical Unit (SEW)  
U.S. Environmental Protection Agency  
One Congress Street, Suite 1100  
Boston, MA 02114-2023

- (b) At a minimum, EPA will review alternate dilution water authorizations during permit reissuance.

**3. Telephone Contacts:**

If you have questions, please contact Joy Hilton, Water Technical Unit, at (617)918-1877 or David McDonald, Ecosystem Assessment Unit, at (781)860-4609.

**4. Disclaimer:**

This guidance is intended to promote compliance and enhance program efficiency and effectiveness. This is not intended to, nor does it, constitute rulemaking by EPA and may not be relied upon to create a right or a benefit, substantive or procedural, enforceable at law or in equity, by any person. EPA reserves the right to revoke this guidance at any time and may immediately require the Permittee to use site water as diluent as EPA deems necessary. Such a determination will be provided in writing to the Permittee.

**ATTACHMENT C**  
**NPDES PERMIT REQUIREMENT**  
**FOR**  
**INDUSTRIAL PRETREATMENT ANNUAL REPORT**

The information described below shall be included in the pretreatment program annual reports:

1. An updated list of all industrial users by category, as set forth in 40 C.F.R. 403.8(f)(2)(i), indicating compliance or noncompliance with the following:
  - baseline monitoring reporting requirements for newly promulgated industries
  - compliance status reporting requirements for newly promulgated industries
  - periodic (semi-annual) monitoring reporting requirements,
  - categorical standards, and
  - local limits;
  
2. A summary of compliance and enforcement activities during the preceding year, including the number of:
  - significant industrial users inspected by POTW (include inspection dates for each industrial user),
  - significant industrial users sampled by POTW (include sampling dates for each industrial user),
  - compliance schedules issued (include list of subject users),
  - written notices of violations issued (include list of subject users),
  - administrative orders issued (include list of subject users),
  - criminal or civil suits filed (include list of subject users) and,
  - penalties obtained (include list of subject users and penalty amounts);
  
3. A list of significantly violating industries required to be published in a local newspaper in accordance with 40 C.F.R. 403.8(f)(2)(vii);
  
4. A narrative description of program effectiveness including present and proposed changes to the program, such as funding, staffing, ordinances, regulations, rules and/or statutory authority;

## ATTACHMENT D

### EPA - New England

#### Reassessment of Technically Based Industrial Discharge Limits

Under 40 CFR §122.21(j)(4), all Publicly Owned Treatment Works (POTWs) with approved Industrial Pretreatment Programs (IPPs) shall provide the following information to the Director: a written evaluation of the need to revise local industrial discharge limits under 40 CFR §403.5(c)(1).

Below is a form designed by the U.S. Environmental Protection Agency (EPA - New England) to assist POTWs with approved IPPs in evaluating whether their existing Technically Based Local Limits (TBLLs) need to be recalculated. The form allows the permittee and EPA to evaluate and compare pertinent information used in previous TBLLs calculations against present conditions at the POTW.

**Please read direction below before filling out form.**

#### ITEM I.

- \* In Column (1), list what your POTW's influent flow rate was when your existing TBLLs were calculated. In Column (2), list your POTW's present influent flow rate. Your current flow rate should be calculated using the POTW's average daily flow rate from the previous 12 months.
- \* In Column (1) list what your POTW's SIU flow rate was when your existing TBLLs were calculated. In Column (2), list your POTW's present SIU flow rate.
- \* In Column (1), list what dilution ratio and/or 7Q10 value was used in your old/expired NPDES permit. In Column (2), list what dilution ration and/or 7Q10 value is presently being used in your new/reissued NPDES permit.

The 7Q10 value is the lowest seven day average flow rate, in the river, over a ten year period. The 7Q10 value and/or dilution ratio used by EPA in your new NPDES permit can be found in your NPDES permit "Fact Sheet."

- \* In Column (1), list the safety factor, if any, that was used when your existing TBLLs were calculated.
- \* In Column (1), note how your bio-solids were managed when your existing TBLLs were calculated. In Column (2), note how your

POTW is presently disposing of its biosolids and how your POTW will be disposing of its biosolids in the future.

**ITEM II.**

- \* List what your existing TBLLs are - as they appear in your current Sewer Use Ordinance (SUO).

**ITEM III.**

- \* Identify how your existing TBLLs are allocated out to your industrial community. Some pollutants may be allocated differently than others, if so please explain.

**ITEM IV.**

- \* Since your existing TBLLs were calculated, identify the following in detail:
  - (1) if your POTW has experienced any upsets, inhibition, interference or pass-through as a result of an industrial discharge.
  - (2) if your POTW is presently violating any of its current NPDES permit limitations - include toxicity.

**ITEM V.**

- \* Using current sampling data, list in Column (1) the average and maximum amount of pollutants (in pounds per day) received in the POTW's influent. Current sampling data is defined as data obtained over the last 24 month period.

All influent data collected and analyzed must be in accordance with 40 CFR §136. Sampling data collected should be analyzed using the lowest possible detection method(s), e.g. graphite furnace.

- \* Based on your existing TBLLs, as presented in Item II., list in Column (2) each Maximum Allowable Industrial Headworks Loading (MAIHL) value corresponding to each of the local limits derived from an applicable environmental criteria or standard, e.g. water quality, sludge, NPDES, inhibition, etc. For each pollutant, the MAIHL equals the calculated Maximum Allowable Headwork Loading (MAHL) minus the POTW's domestic loading source(s). For more information, please see p. 3-28 in EPA's Guidance Manual on the Development and Implementation of Local Limits Under the Pretreatment Program, 12/87.



**Item VI.**

- \* Using current sampling data, list in Column (1) the average and maximum amount of pollutants (in micrograms per liter) present your POTW's effluent. Current sampling data is defined as data obtained during the last 24 month period.

**(Item VI. continued)**

All effluent data collected and analyzed must be in accordance with 40 CFR §136. Sampling data collected should be analyzed using the lowest possible detection method(s), e.g. graphite furnace.

- \* List in Column (2A) what the Water Quality Standards (WQS) were (in micrograms per liter) when your TBLs were calculated, please note what hardness value was used at that time. Hardness should be expressed in milligram per liter of Calcium Carbonate.

List in Column (2B) the current WQSs or "Chronic Gold Book" values for each pollutant multiplied by the dilution ratio used in your new/reissued NPDES permit. For example, with a dilution ratio of 25:1 at a hardness of 25 mg/l - Calcium Carbonate (copper's chronic WQS equals 6.54 ug/l) the chronic NPDES permit limit for copper would equal 156.25 ug/l.

**ITEM VII.**

- \* In Column (1), list all pollutants (in micrograms per liter) limited in your new/reissued NPDES permit. In Column (2), list all pollutants limited in your old/expired NPDES permit.

**ITEM VIII.**

- \* Using current sampling data, list in Column (1) the average and maximum amount of pollutants in your POTW's biosolids. Current data is defined as data obtained during the last 24 month period. Results are to be expressed as total dry weight.

All biosolids data collected and analyzed must be in accordance with 40 CFR §136.

In Column (2A), list current State and/or Federal sludge standards that your facility's biosolids must comply with. Also note how your POTW currently manages the disposal of its biosolids. If your POTW is planning on managing its biosolids differently, list in Column (2B) what your new biosolids criteria will be and method of disposal.

In general, please be sure the units reported are correct and all pertinent information is included in your evaluation. If you have any questions, please contact your pretreatment representative at EPA - New England.

**REASSESSMENT OF TECHNICALLY BASED LOCAL LIMITS  
(TBLLs)**

POTW Name & Address : \_\_\_\_\_

NPDES PERMIT # : \_\_\_\_\_

Date EPA approved current TBLLs : \_\_\_\_\_

Date EPA approved current Sewer Use Ordinance : \_\_\_\_\_

**ITEM I.**

In Column (1) list the conditions that existed when your current TBLLs were calculated. In Column (2), list current conditions or expected conditions at your POTW.

	Column (1)	Column (2)
	EXISTING TBLLs	PRESENT CONDITIONS
POTW Flow (MGD)	_____	_____
SIU Flow (MGD)	_____	_____
Dilution Ratio or 7Q10 (from NPDES Permit)	_____	_____
Safety Factor	_____	N/A
Biosolids Disposal Method(s)	_____	_____

**ITEM II.**

EXISTING TBLLs

POLLUTANT	NUMERICAL LIMIT	POLLUTANT	NUMERICAL LIMIT
-----------	-----------------	-----------	-----------------

( )  
( )  
(mg/l) or (lb/day)

(mg/l) or (lb/day)

-----	-----	-----	-----
-----	-----	-----	-----
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-----	-----	-----	-----
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**ITEM III.**

Note how your existing TBLs, listed in Item II., are allocated to your Significant Industrial Users (SIUs), i.e. uniform concentration, contributory flow, mass proportioning, other. Please specify by circling.

**ITEM IV.**

Has your POTW experienced any upsets, inhibition, interference or pass-through from industrial sources since your existing TBLs were calculated?

If yes, explain. \_\_\_\_\_  
\_\_\_\_\_

Has your POTW violated any of its NPDES permit limits and/or toxicity test requirements?

If yes, explain. \_\_\_\_\_  
\_\_\_\_\_

**ITEM V.**

Using current POTW influent sampling data fill in Column (1). In Column (2), list your Maximum Allowable Industrial Headwork Loading (MAIHL) values used to derive your TBLs listed in Item II. In addition, please note the Environmental Criteria for which each MAIHL value was established, i.e. water quality, sludge, NPDES etc.

Pollutant	Column (1)		Column (2)	
	Influent Data Maximum	Analyses Average	MAIHL Values	Criteria

	(lb/day)	(lb/day)	(lb/day)	
Arsenic	-----	-----	-----	-----
Cadmium	-----	-----	-----	-----
Chromium	-----	-----	-----	-----
Copper	-----	-----	-----	-----
Cyanide	-----	-----	-----	-----
Lead	-----	-----	-----	-----
Mercury	-----	-----	-----	-----
Nickel	-----	-----	-----	-----
Silver	-----	-----	-----	-----
Zinc	-----	-----	-----	-----
Other (List)				
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----

**ITEM VI.**

Using current POTW effluent sampling data, fill in Column (1). In Column (2A) list what the Water Quality Standards (Gold Book Criteria) were at the time your existing TBLs were developed. List in Column (2B) current Gold Book values multiplied by the dilution ratio used in your new/reissued NPDES permit.

Pollutant	Column (1)		Columns (2A) (2B)	
	Effluent Data Maximum (ug/l)	Analyses Average (ug/l)	Water Quality Criteria (Gold Book) From TBLs (ug/l)	Criteria Today (ug/l)
Arsenic	-----	-----	-----	-----
*Cadmium	-----	-----	-----	-----
*Chromium	-----	-----	-----	-----
*Copper	-----	-----	-----	-----
Cyanide	-----	-----	-----	-----
*Lead	-----	-----	-----	-----
Mercury	-----	-----	-----	-----
*Nickel	-----	-----	-----	-----
Silver	-----	-----	-----	-----
*Zinc	-----	-----	-----	-----
Other (List)				
-----	-----	-----	-----	-----

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\*Hardness Dependent (mg/l - CaCO3)

**ITEM VII.**

In Column (1), identify all pollutants limited in your new/reissued NPDES permit. In Column (2), identify all pollutants that were limited in your old/expired NPDES permit.

Column (1) NEW PERMIT		Column (2) OLD PERMIT	
Pollutants	Limitations (ug/l)	Pollutants	Limitations (ug/l)
-----	-----	-----	-----
-----	-----	-----	-----
-----	-----	-----	-----
-----	-----	-----	-----
-----	-----	-----	-----
-----	-----	-----	-----
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-----	-----	-----	-----
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**ITEM VIII.**

Using current POTW biosolids data, fill in Column (1). In Column (2A), list the biosolids criteria that was used at the time your existing TBLs were calculated. If your POTW is planing on managing its biosolids differently, list in Column (2B) what your new biosolids criteria would be and method of disposal.

Pollutant	Column (1)	Columns	
	Biosolids Data Analyses Average (mg/kg)	(2A) Biosolids Criteria From TBLs (mg/kg)	(2B) New (mg/kg)
Arsenic	-----	-----	-----
Cadmium	-----	-----	-----
Chromium	-----	-----	-----
Copper	-----	-----	-----
Cyanide	-----	-----	-----
Lead	-----	-----	-----
Mercury	-----	-----	-----
Nickel	-----	-----	-----
Silver	-----	-----	-----
Zinc	-----	-----	-----
Molybdenum	-----	-----	-----

Selenium  
Other (List)

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**(September 1, 1993)**

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PART II

SECTION 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 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 Sections 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 knowingly violates such requirements is subject to a fine of not less than 45,000 nor more than \$50,000 per day of violation, or by imprisonment for not more than 3 years, or both. Note: See 40 CFR §122.41(a)2) for additional enforcement criteria.
- c. Any person may be assessed an administrative penalty by the Administrator for violating Sections 301, 302, 306,308, 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.

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.

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

## PART II

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.

Permit modification or revocation will be conducted according to 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 §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.

### 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 t least 180

## PART II

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. Right of Appeal

Within thirty (30) days of receipt of notice of a final permit decision, any interested person, including the permittee, may submit a request to the Regional Administrator for an Evidentiary hearing under Subpart E, or a Non-Adversary Panel Hearing under Subpart E, or a Non-Adversary Panel hearing under subpart F, of 40 CR Part 124, to reconsider or contest that decision. The request for a hearing must conform to the requirements of 40 CFR §124.74.

### 10. 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.

### 11. Other Laws

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

## SECTION 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 operator 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

PART II

- (1) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.
- (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 reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. 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

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.

d. Prohibition of bypass

- (1) Bypass is prohibited, and the Regional Administrator may take enforcement action against a permittee for bypass, unless:
  - (a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
  - (b) There were no feasible alternatives to the by-pass, 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 judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
  - (c)
    - (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

## PART II

### 5. Upset

- a. **Definition.** "Upset" means an exceptional incident in which there is unintentional and temporary non-compliance 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 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 I.e. (24-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.

## SECTION C. MONITORING AND RECORDS

### 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 a 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

## PART II

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 Clean Water Act 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 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 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 authorize 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, or operations regulated or required under this permit; and

## PART II

- d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

### SECTION 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 required only 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 quantity of pollutants discharged. This notification applies neither to pollutants which are subject to the effluent limitations in the permit nor to the notification requirements at 40 CFR §122.42(2)(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 incorporate such other requirements a may be necessary under the Clean Water Act. (See §122.61; in some cases, modification or evocation 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 Repot (DMR) or forms provided or specified by he Regional Administrator 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 procedurés approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR part 136 unless otherwise specified under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit , the results of this monitoring shall be included in the calculation and reporting of the

data submitted

## PART II

- (3) in the DMR or sludge reporting form specified by the Regional Administrator.
- (4) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Regional Administrator 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 §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 §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.

f. Compliance Schedules. Reports of compliance or noncompliance with, or 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



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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 §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 non-compliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than 6 months 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 statement on any such report may result in the imposition of criminal penalties as provided for the Section 309 of the CWA.

## SECTION E. OTHER CONDITIONS.

### 1. DEFINITIONS FOR INDIVIDUAL NPDES PERMITS INCLUDING STORM WATER REQUIREMENTS.

For purposes of this permit, the following definitions shall apply.

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 CWA.

Application means that the EPA standard national forms for apply 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 - 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.

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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" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that 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 Judgement (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).

Class 1 Sludge Management Facility means any POTW identified under 40 CFR §403.8(a) as being required to have an approved pretreatment program (including such POTWs located in a state that has elected to assume local program responsibilities pursuant to 40 CFR §403.10(e)) and any other treatment works treating domestic sewage classified as a "Class 1 sludge Management Facility" by the Regional Administrator, or, in the case of approved State programs, the Regional Administrator in conjunction with the State Director, because of the potential for its sludge use or disposal practices to adversely affect public health and the environment.

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

Composite Sample A sample consisting of a minimum of eight grab samples collected at equal intervals during a 24-hour period (lesser period as specified in the section on Monitoring and Reporting) and combined proportional to flow, or a sample continuously 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.

## PART II

- (d) Final Stabilization means that all soil disturbing activities at the site have been completed, 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 U.S.C. §§1251 et seq.

Daily Discharge means the "discharge of a pollutant measured during a calendar day or any 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 is charged 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 representatives. 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 to a treatment

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

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

Discharge Monitoring Report (DMR) means the EPA uniform 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.

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 limitations 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 collected at a constant time interval, 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 CWA.

Indirect Discharge 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 SWDA), 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 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.

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Large and Medium municipal separate storm sewer system means all municipal separate storm sewer 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 listed in Appendices F and 40 CFR Part 122); or (ii) located in the counties with unincorporated urbanized 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 o a chlorination cycle (or fractions 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 t 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 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 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"; "site".
- (d) Which ha 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 developmental drilling rig) such as seafood processing rig, seafood processing vessel, or aggregate plant, that begins discharging at a "site"

for which it does not have a permit; an any offshore 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

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issuance of a final permit to be 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).

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 operator of any "facility or activity" subject to regulation under the NPDES programs.

Pass through means a Discharge which exists 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, concentrate 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 §122.2)

Pollutant means dredge 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

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- (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 used either to facilitate production or for disposal purposes is approved by 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.

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, 2129 (D.D.C. 1976, modified 12E.R.C. 1833 (D.D.C. 1979)); also listed in appendix A of 40 CFR Part 122.

Privately owned treatments works means any device or system which is (a) use 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 category which is not a "primary industry category."

Second 313 water priority chemical means a chemical or chemical categories which are:

- (1) 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 Re-authorization Act (SARA) of 1986);
- (2) 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 CF §116.4; or
- (iii) are pollutants for which EPA has published acute or chronic water quality criteria.

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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 advance wastewater treatment, scum, septage, portable toilet pumping, Type III Marine Sanitation Device pumping (33 CFR part 159), and sewage sludge products. Sewage sludge does not include grit or screening, or ash generated during the incineration of sewage sludge.

Sewage sludge use or disposal practices 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; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical the facility is required to report pursuant to EPCLA; 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 Clean water Act (see 40 CFR §110.10 and CFR §117.21) or Section 102 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 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 drainage.

Storm Water discharge associated with industrial activity means the discharge from any conveyance with is use 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 system, 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

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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 swage 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.

Waste pile means any non-containerized accumulation of solid, non-flowing water that is used for treatment or storage.

Waters of the United States means:

- (b) All waters which are currently used, were used in the past, or may be susceptible to use interstate or foreign commerce, including
- (c) All interstate waters, including interstate "wetlands",
- (d) All other waters such as intrastate lakes, rivers streams (including intermittent streams), mud flats, sand flats, "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 purposes;
  - (2) From which fish or shell fish are or could be taken and solid interstate or foreign commerce; or
  - (3) Which are used or could be used for industrial purposes by industries in interstate commerce;
- (e) All impoundments of waters otherwise defined as waters of the United States under this definition;
- (f) Tributaries of waters identified in Paragraphs (a) through (d) of this definition;
- (g) The territorial sea; and
- (h) "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 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.

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.)

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Wetlands means those areas that are inundated or saturated by surface or ground water at a frequently and duration sufficient 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.

### 2. DEFINITIONS FOR NPDES PERMIT SLUDGE USE AND DISPOSAL REQUIREMENTS.

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

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 use 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 sewage sludge and auxiliary fuel together). Hazardous wastes are not auxiliary fuel together). Hazardous wastes are not auxiliary fuel.

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

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Bulk sewage sludge is sewage sludge that is not solid or given way 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 to CFR §141.11 to be exceeded in ground water or that causes the existing concentration of nitrate in 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 publically owned treatments works (POTW), as defined in 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, 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 environmental 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 an inorganic pollutant that can be applied to an area of land.

Density of microorganisms is the number of microorganisms per unit mas 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 f rom a septic tank, cesspool, or similar treatment works that receives either cesspool, or similar treatment works that receives either commercial wastewater or industrial wastewater and does no 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

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respect to 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 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.

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 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 a reclamation site located in a populated area (e.g., a construction site located in a city).

Land with a low potential for public exposure is the 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 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.

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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.

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 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, or inorganic substance, a

combination of organic and inorganic substances, or pathogenic organism, 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 of 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 requirement) 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 unit area of land (e.g., kilogram per hectare); or the volume of a material that can be applied to a unit area of land (e.g., gallons per acre).

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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 judgement 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.

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 the site where the sewage sludge incinerator is located.

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

Seismic impact zone is an area that has a 10 percent or greater probability that the horizontal ground level acceleration to the rock in the area exceeds 0.01 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 place 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

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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. 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 Island, the Commonwealth of the North 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.

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 use to treat (including recycle and reclaim) either domestic sewage or a combination of domestic sewage sludge unit. This includes, but is not limited to, land on which the soils are subject to mass movement.

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 no 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, mosquitos, 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 degree 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. THE COMMONLY USED ABBREVIATIONS ARE LISTED BELOW

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BOD	Five-day biochemical oxygen demand unless otherwise specified
CBOD	Carbonaceous BOD
COD	Chemical oxygen demand
CFS	Cubic feet per second
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)
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	Milliliter(s) per liter
MGD	Million gallons per day

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Nitrogen

Total N	Total nitrogen
NH3-N	Ammonia nitrogen as nitrogen
NO3-N	Nitrate nitrogen as nitrogen
No2-N	Nitrite nitrogen as nitrogen
NO3-NO2	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 alkalinity of a liquid or solid material.

Surfactant

Surface-active agent

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

Micrograms 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 specific time of observation.

**A-NOEC**

"Acute (Short-term Exposure Test)-No Observed Effect Concentration". See C-NOEC definition.

**LC-50**

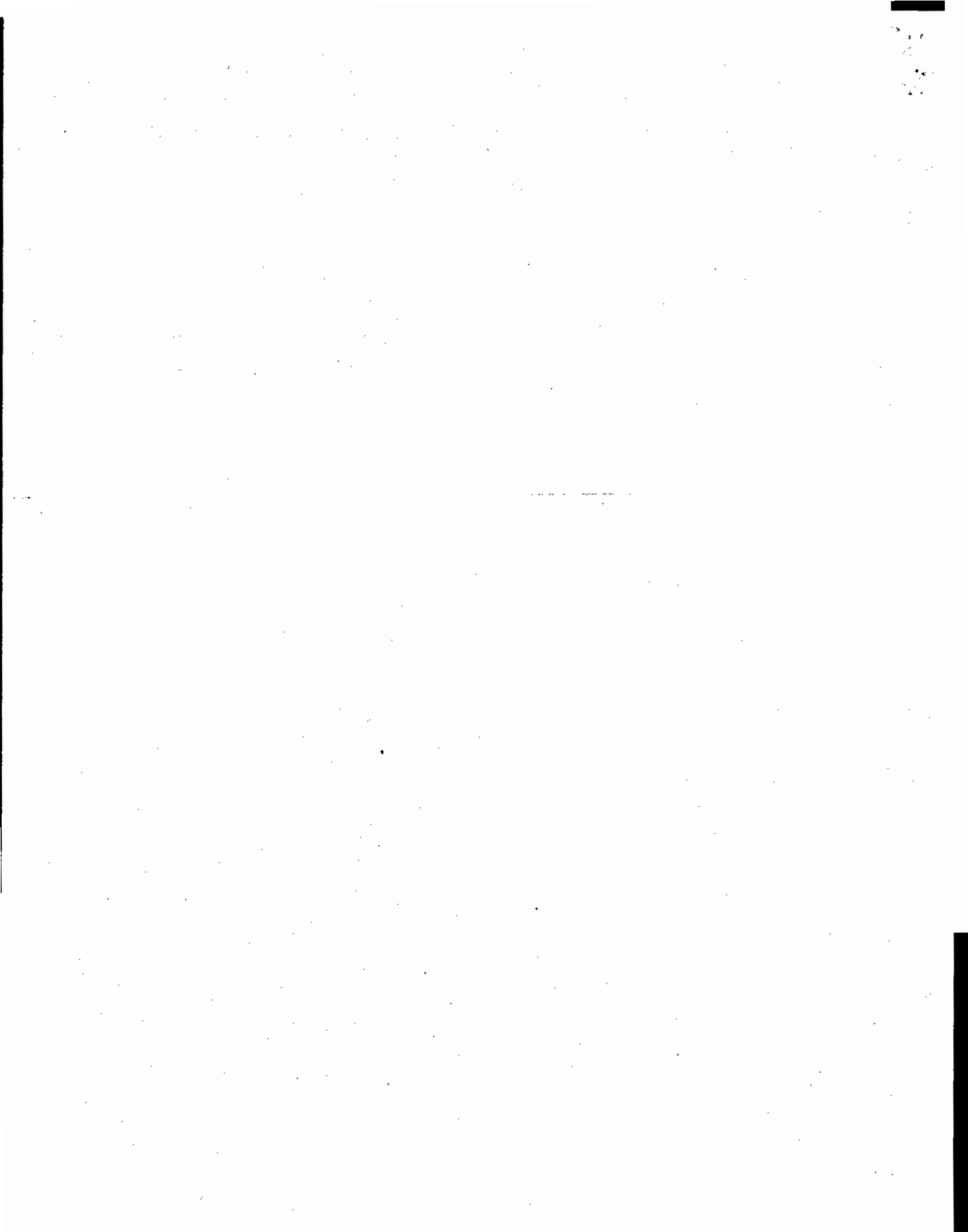
LC-50 is the concentration of a sample that causes mortality

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Of 50% of the test population at a specific time of observation. The LC-50 = 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.

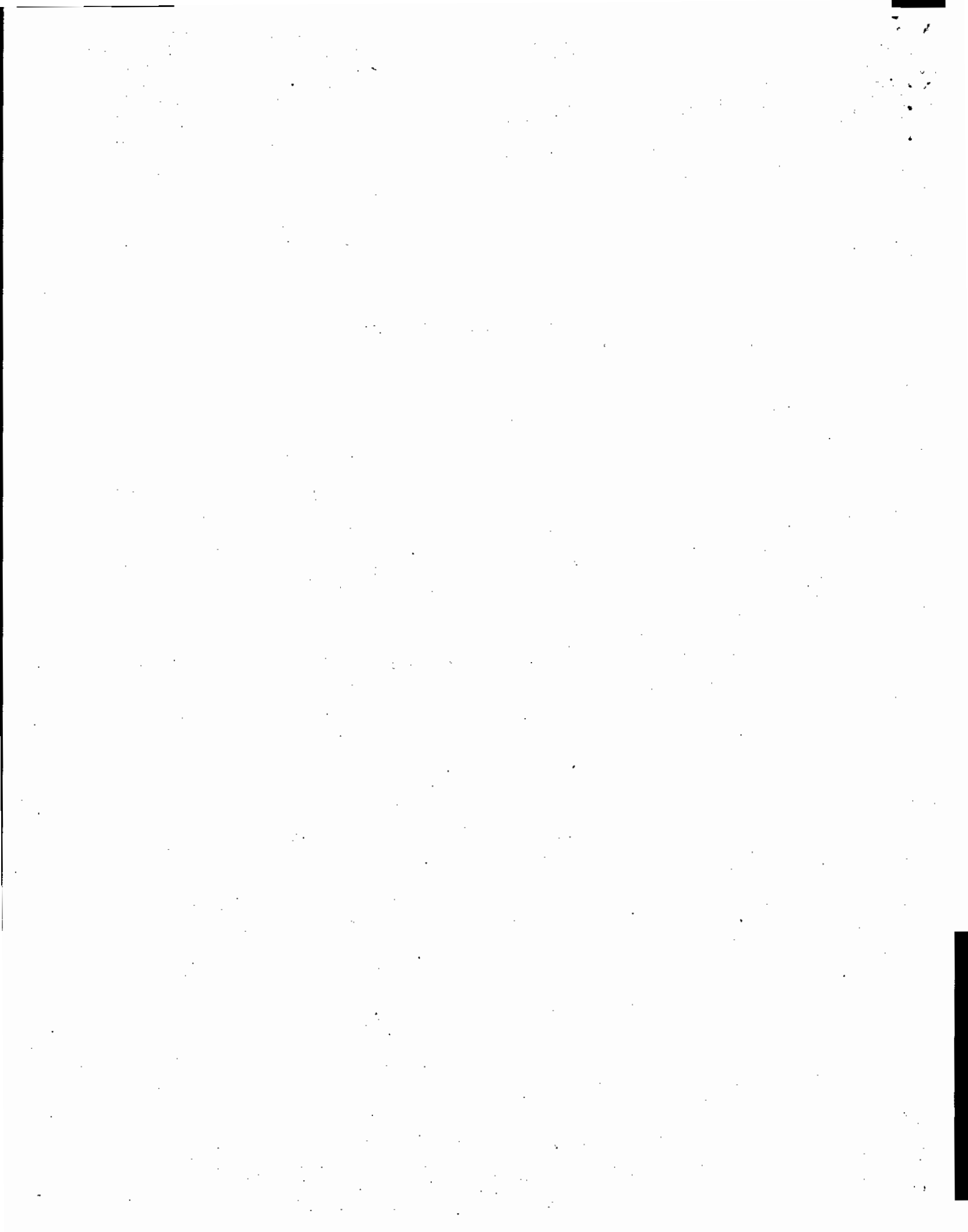


**EPA REGION I**

**NPDES PERMIT**

**SLUDGE COMPLIANCE GUIDANCE**

04 NOVEMBER 1999



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## 1. LAND APPLICATION

This regulation 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 in 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:



**§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**

SEWAGE SLUDGE PRODUCED (metric tons per 365 day period)	SAMPLING FREQUENCY
0 < Sludge (tons) < 290	Once per Year
290 ≤ 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)

**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.

**Land Application Scenario Selection Table**

SCENARIO	LAND TYPE	BULK/ BAGGED	POLLUTANT LIMITS <sup>2</sup>	PATHOGENS <sup>3</sup>	VECTORS <sup>3</sup>
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 Sections (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 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 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.....	300 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 40CFR §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 requirement 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.

1. Bulk sewage sludge sampling and analysis shall be in accordance with the procedures detailed in 40CFR §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 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 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 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 A pathogen requirements utilizing one of the methods specified in 40CFR §503.32
4. The person who applies the bulk sewage sludge shall meet either vector attraction reduction requirement 9 or 10 as specified in 40CFR §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, 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.
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 requirement:

"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 of 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 40CFR §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. Identifies site selection criteria;
  - c. Describes how sites will be managed; and
  - d. Provides 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)(3); 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.
- vi. 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
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 to 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 on 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 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.

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 applicer 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.
10. The permittee shall report the information in Paragraphs 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 Paragraphs 6a through d.
  - d. Site Restrictions in Paragraphs 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. Identifies site selection criteria;
  - c. Describes how sites will be managed; and
  - d. Provides 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

bulk sewage sludge shall meet 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 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 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 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 shall be determined. The permittee shall 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

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
Cadmium.....	39
Copper.....	1500
Lead.....	300
Mercury.....	17
Nickel.....	420
Selenium.....	100
Zinc.....	2800

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 and 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 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 on the land into the groundwater.
7. 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.

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 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 A 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.
8. 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.
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 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 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 applicator 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."
  - d. When the applicator 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.
10. 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.

11. 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 15. Reports shall be submitted to EPA at the address in the Monitoring and Reporting section of this permit.
12. All sludge sampling and analysis shall be in accordance with the procedures detailed in 40CFR §503.8.
13. 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 Paragraphs 8a through g and Paragraphs 9a through d.
  - e. Reporting requirements in Paragraph 11.
14. 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. Provides 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 applicor 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

- 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
Cadmium.....	39
Copper.....	1500
Lead.....	300
Mercury.....	17
Nickel.....	420
Selenium.....	100
Zinc.....	2800

- 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 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. 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.

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 on 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 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 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 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 in Paragraphs 1e (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 d 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 40CFR §503.8

14. The permittee shall notify the applier of the following information/requirements:
  - a. Requirements in Paragraphs 1b, 1d, 1e, 1j, 2c and 2u.
  - b. Information in Paragraph 1c.
  - c. The management practices in Paragraphs 7a through d.
  - d. The site restrictions in Paragraphs 6a through h.
  - d. Record keeping requirements in Paragraphs 9a through g and Paragraphs 10a through d.
  - e. 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. Identifies site selection criteria;
  - c. Describes how sites will be managed; and
  - d. Provides 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 §503.13(b)(4); one of the Class A pathogen requirements are §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 Paragraph 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 to be exceeded. The annual 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 2 c, 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 ASWAR calculated in Paragraph 2 d (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 or 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 2 c to be exceeded.
4. The permittee shall meet Class A pathogen requirements utilizing one of the methods specified in 40CFR §503.32
  5. 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.

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 the 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 40CFR 503.8.



## 2. SURFACE DISPOSAL

facility which is by surface disposed. The permittee should answer the following questions. The answers 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 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. 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 units 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 not 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

SCENARIO	LINED/ UNLINED	DISTANCE TO UNIT BOUNDARY
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 of the lower explosive limit, 1.25 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 ground-water monitoring program developed by a qualified ground water scientist; or (2) submission of a certification by a qualified ground water 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 a 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**

SEWAGE SLUDGE PRODUCTION (metric tons per 365 day period)	SAMPLING FREQUENCY
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)

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 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 pathogen requirements in [insert §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."

- 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 §503.23 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 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 place 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:

**§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

- 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 of the lower explosive limit, 1.25 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 ground-water monitoring program developed by a qualified ground water scientist; or (2) submission of a certification by a qualified ground water 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 a 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**

SEWAGE SLUDGE PRODUCED (metric tons per 365 day period)	SAMPLING FREQUENCY
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)

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)(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.

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."

- 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 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 unit unless the requirement of 40 CFR Part 503, Subpart C are met.

b. An active sewage sludge unit located within an area 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. 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 after 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.
- g.
  - 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.
  - 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.
- h. 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.
- i. 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.
- j. Public access to a surface disposal site shall be restricted for the period that the surface disposal





**Sampling Frequency Table**

SEWAGE SLUDGE TONNAGE (metric tons per 365 day period)	SAMPLING FREQUENCY
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 [insert §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 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 2 a through k are met.
  - c. Documentation that the requirements in Paragraphs 3 a 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 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 land fill 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 a liquid as determined by the Paint Filter Liquids Test method (Method 9095 ad described in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," EPA publication No. SW-846.

### 3. Incineration

Each unit for the incineration of sewage sludge is still subject to 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

The 40 CFR Part 503 section from which each reduction was excerpted is referenced 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 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. 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.

$$D = \frac{131,700,000}{10^{0.1400t}} \quad (3)$$

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 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.
  - a. The pH of the sewage sludge that is used or disposed 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 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 sewage sludge shall be analyzed prior to pathogen treatment to determine whether the sewage sludge contains enteric viruses.
  - b. When the density of enteric viruses 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 when the density of 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 meets 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 or 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 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. 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 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.

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 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 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 disposed 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 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 of the 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 that 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 placed on the land within eight hours after being discharged from the pathogen treatment process.

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

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 that should be address 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 site and 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. Ground water monitoring
- b. Maintenance and inspection schedules
- c. Discussion of land use after cover

d. Copy of notification to subsequent land owner

9.2 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 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 methane gas monitoring and ground water 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

Representative 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", 18th 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", 18th 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", 18th 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", 18th 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.

