

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),

**New England Aquarium Corporation**

is authorized to discharge from a facility located at

**Central Wharf  
Boston, MA 02110**

to the receiving water named Boston Inner Harbor, a Class SB (CSO) water, in accordance with effluent limitations, monitoring requirements, and other conditions set forth herein.

This permit shall become effective upon the date of signature.

This permit expires at midnight, five (5) years from the last day of the month preceding the effective date.

This permit supersedes the permit issued on July 31, 2007.

This permit consists of 8 pages in Part I including effluent limitations, monitoring requirements, and state permit conditions, Attachment A - Marine Acute Toxicity Test Protocol (September 1996), Table 1 – List of Medications and Chemicals, and 25 pages in Part II, Standard Conditions.

Signed this 1<sup>st</sup> day of August, 2013.

**/S/ SIGNATURE ON FILE**

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Ken Moraff, Acting Director  
Office of Ecosystem Protection  
Environmental Protection Agency  
Boston, MA

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David Ferris, Director  
Massachusetts Wastewater Management Program  
Department of Environmental Protection  
Commonwealth of Massachusetts  
Boston, MA

**PART I.A. Effluent Limitations and Monitoring Requirements**

1. During the period beginning the effective date and lasting through the expiration date, the permittee is authorized to discharge disinfected tank and aquaria waters, steam condensate, and filter backwash from outfall serial number <b>001</b> . Such discharges shall be limited and monitored by the permittee as specified below:				
<u>EFFLUENT CHARACTERISTIC</u>	<u>EFFLUENT LIMITS</u>		<u>MONITORING REQUIREMENTS</u>	
<u>PARAMETER</u>	<u>AVERAGE MONTHLY</u>	<u>MAXIMUM DAILY</u>	<u>MEASUREMENT FREQUENCY</u>	<u>SAMPLE <sup>1</sup> TYPE</u>
Flow	100,000 GPD	150,000 GPD	Continuous	Recorder <sup>2</sup>
pH Range <sup>3</sup>	6.5 – 8.5 standard units		1/Week	Grab
Total Suspended Solids	30 mg/l	60 mg/l	2/Month	24-Hour Composite <sup>4</sup>
Total Suspended Solids	25 lbs/day	75 lbs/day	2/Month	24-Hour Composite <sup>4</sup>
Total Residual Chlorine	1.0 mg/l	1.0 mg/l	1/Week	Grab
<i>Enterococci</i> bacteria <sup>3,5</sup>	35 cfu/100 ml	276 cfu/100 ml	1/Month	Grab
<i>Fecal Coliform</i> bacteria <sup>3,5</sup>	Report cfu/100 ml	Report cfu/100 ml	1/Month	Grab
Copper, Total	Report ug/l	Report ug/l	1/Month	24-Hour Composite <sup>4</sup>
Whole Effluent Toxicity <sup>6,7,8,9</sup>	Report LC <sub>50</sub> , % and A-NOEC, %		1/Permit Term <sup>6</sup>	24-Hour Composite <sup>4</sup>

- a. The discharge shall not cause a violation of the water quality standards of the receiving waters.
- b. The pH of the effluent shall be in the range of 6.5 to 8.5 standard units and not more than 0.2 s.u. outside of the naturally occurring range.
- c. The discharge shall not cause objectionable discoloration of the receiving waters.
- d. The discharge shall contain neither a visible oil sheen, foam, nor floating solids at any time.
- e. The permittee shall minimize the use of chlorine while maintaining adequate bacterial control.
- f. The results of sampling for any parameter above its required frequency must also be reported.  
(Footnotes are listed on Page 3)

## Footnotes:

1. Sampling shall be conducted at a point prior to discharge to Outfall 001. Any change in sampling location must be reviewed and approved in writing by EPA and MassDEP. All samples shall be tested using the analytical methods found in 40 CFR §136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR 136.
2. For flow, report maximum and minimum daily rates and total flow for each operating date. Attach these data to each DMR form.
3. Requirement for State Certification.
4. A 24-hour composite sample will be comprised of at least twenty four (24) grab samples taken during a consecutive 24 hour period (e.g. 7:00 A.M. Monday to 7:00 A.M Tuesday).
5. *Enterococci* and *fecal coliform* monitoring shall also be conducted year round. *Enterococci* shall not exceed a monthly geometric mean of 35 colony forming units (cfu) per 100 ml, nor shall it exceed 276 cfu per 100 ml as a daily maximum. Monitoring for *Enterococcus* and *fecal coliform* shall be conducted on the same day and concurrently with the total residual chlorine sample.
6. The permittee shall conduct one acute toxicity testing screening during the fourth full calendar year of this permit. The acute test may be used to calculate the acute LC50 at the 48 hour exposure interval. The permittee shall test the Mysid shrimp, *Mysidopsis bahia* and the Inland silverside, *Menidia beryllina*. Toxicity test samples shall be collected during the calendar quarter ending September 30. The test results shall be submitted no later than October 31 of the testing year. The test must be performed in accordance with test procedures and protocols specified in **Attachment A** of this permit and conducted during normal operating conditions.
7. The LC50 is the concentration of effluent which causes mortality to 50% of the test organisms.
8. The A-NOEC (acute-no observed effect concentration) is defined as the highest effluent concentration at which there is no statistically-significant adverse effect on the survival of the test organisms when compared with the diluent control survival at the time of observation.
9. If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall follow procedures outlined in **Attachment A, Section IV**, of this permit in order to obtain permission to use an alternate dilution water. In lieu of individual approvals for alternate dilution water required in **Attachment A**, the permittee may use the EPA New England guidance document entitled Self-Implementing Alternative Dilution Water Guidance (“Guidance Document”) to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. If the Guidance Document is revoked, the permittee shall revert to obtaining approval as outlined in **Attachment A**. The Guidance Document is included as Attachment G of the DMR Instructions on the EPA website at <http://www.epa.gov/region1/enforcementandassistance/dmr.html> and is not intended as a direct attachment to this permit. Any modification or revocation to the Guidance Document will be transmitted to the permittees as part of the annual DMR instruction package. However, at any time, the permittee may choose to contact EPA New England directly using the approach outlined in **Attachment A**.

## Part I.A.

## 2. 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.

## 3. Numerical Effluent Limitations for Toxicants

EPA or MassDEP may use the results of the 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.

## 4. Medications

- a. The permittee shall use only medications and disease control chemicals in dosages and combinations that are appropriate to control short term outbreaks of disease and non-native organisms. These medications and chemicals can be used and discharged only in accordance with the maximum dosage rates, application frequency, application duration, application method, and detoxification method identified in **Table 1**.
- b. Annually, upon the anniversary of the effective date of the permit, the permittee shall provide to EPA and MassDEP at the addresses in Part I.C.1.c, a listing of any new medications or chemicals that it has begun to use or expects to use in the coming year for any tank or aquarium. For each new medication or chemical, the permittee shall identify:
  1. The product name and chemical formulation of the medication or chemical.
  2. The purpose of the chemical or medication.
  3. The dosage rate, frequency of application (hourly, daily, etc.), and the duration of treatment.
  4. The method of application.
  5. The method or methods used to detoxify the wastewater prior to discharge, if necessary.
  6. Information on the persistence and toxicity of each medication or chemical such as may be found on a Material Safety Data Sheet (MSDS).
  7. Information on the U.S. Food and Drug Administration (FDA) approval for use of the medication or chemical for human consumption, if applicable.
- c. The permittee must ensure the proper storage of medications and disease control chemicals in a manner designed to prevent spills that may result in the discharges of

these substances to the receiving water. The permittee shall implement procedures for properly containing, cleaning, and disposing of any spilled material.

- d. The permittee shall periodically evaluate the use of alternative chemicals and medications which are less toxic to the receiving water and to substitute these if feasible. A description of such evaluation and any findings shall be submitted with the annual listing of chemicals and medications used, which is due on the anniversary of the effective date of the permit.
5. All existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe:
    - a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
      - (1) One hundred micrograms per liter (100 ug/l);
      - (2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/l) for antimony;
      - (3) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 C.F.R. §122.21(g)(7); or
      - (4) Any other notification level established by the Director in accordance with 40 C.F.R. §122.44(f).
    - b. That any activity has occurred or will occur which would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
      - (1) Five hundred micrograms per liter (500 ug/l);
      - (2) One milligram per liter (1 mg/l) for antimony;
      - (3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 C.F.R. §122.21(g)(7); or
      - (4) Any other notification level established by the Director in accordance with 40 C.F.R. §122.44(f).
    - c. That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant which was not reported in the permit application.
  6. This permit may be modified, or revoked and reissued, on the basis of new information in accordance with 40 CFR §122.62.

## B. UNAUTHORIZED DISCHARGES

The permittee is authorized to discharge only in accordance with the terms and conditions of this permit and only from the outfall listed in Part I.A.1. of this permit. Discharges of wastewater from any other point sources are not authorized by this permit and shall be reported in accordance with Section D.1.e. (1) of the General Requirements (Part II) of this permit (Twenty-four hour reporting).

## C. MONITORING AND REPORTING

1. **For a period of one year from the effective date of the permit**, the permittee may either submit monitoring data and other reports to EPA in hard copy form or report electronically using NetDMR, a web-based tool that allows permittees to electronically submit discharge monitoring reports (DMRs) and other required reports via a secure internet connection. **Beginning no later than one year after the effective date of the permit**, the permittee shall begin reporting using NetDMR, unless the facility is able to demonstrate a reasonable basis that precludes the use of NetDMR for submitting DMRs and reports. Specific requirements regarding submittal of data and reports in hard copy form and for submittal using NetDMR are described below:

- a. Submittal of Reports Using NetDMR

NetDMR is accessed from: <http://www.epa.gov/netdmr>. **Within one year of the effective date of this permit**, the permittee shall begin submitting DMRs and reports required under this permit electronically to EPA using NetDMR, unless the facility is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for submitting DMRs and reports (“opt-out request”).

DMRs shall be submitted electronically to EPA no later than the 15th day of the month following the completed reporting period. All reports required under the permit shall be submitted to EPA as electronic attachments to the DMRs. Once a permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of DMRs or other reports to EPA and will no longer be required to submit hard copies of DMRs to MassDEP. However, permittees shall continue to send hard copies of reports other than DMRs to MassDEP until further notice from MassDEP.

- b. Submittal of NetDMR Opt-Out Requests

Opt-out requests must be submitted in writing to EPA for written approval at least sixty (60) days prior to the date a facility would be required under this permit to begin using NetDMR. This demonstration shall be valid for twelve (12) months from the date of EPA approval and shall thereupon expire. At such time, DMRs and reports shall be submitted electronically to EPA unless the permittee submits a renewed opt-out request and such request is approved by EPA. All opt-out requests should be sent to the following addresses:

Attn: NetDMR Coordinator  
U.S. Environmental Protection Agency, Water Technical Unit  
5 Post Office Square, Suite 100 (OES04-1)  
Boston, MA 02109-3912

and

Massachusetts Department of Environmental Protection  
Surface Water Discharge Permit Program  
627 Main Street, 2<sup>nd</sup> Floor  
Worcester, Massachusetts 01608

c. Submittal of Reports in Hard Copy Form

Monitoring results shall be summarized for each calendar month and reported on separate hard copy Discharge Monitoring Report Form(s) (DMRs) postmarked no later than the 15<sup>th</sup> day of the month following the completed reporting period. All reports required under this permit shall be submitted as an attachment to the DMRs. Signed and dated originals of the DMRs, and all other reports or notifications required herein or in Part II shall be submitted to the Director at the following address:

U.S. Environmental Protection Agency  
Water Technical Unit (OES04-SMR)  
5 Post Office Square - Suite 100  
Boston, MA 02109-3912

Duplicate signed copies of all reports or notifications required above (including those in Part I.D) shall be submitted to the State at the following address:

Massachusetts Department of Environmental Protection  
Bureau of Waste Prevention (Industrial)  
Northeast Regional Office  
205B Lowell Street  
Wilmington, MA 01887

Duplicate signed copies of all reports or notifications required above, with the exception of DMRs, shall be submitted to the State at the following address:

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

Any verbal reports, if required in Parts I and/or II of this permit, shall be made to both EPA-New England and to MassDEP.

**D. STATE PERMIT CONDITIONS**

1. This authorization to discharge includes two separate and independent permit authorizations. The two permit authorizations are (i) a federal National Pollutant Discharge Elimination System permit issued by the U.S. Environmental Protection Agency (EPA) pursuant to the Federal Clean Water Act, 33 U.S.C. §§1251 et seq.; and (ii) an identical state surface water discharge permit issued by the Commissioner of the Massachusetts Department of Environmental Protection (MassDEP) pursuant to the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53, and 314 C.M.R. 3.00. All of the requirements contained in this authorization, as well as the standard conditions contained in 314 CMR 3.19, are hereby incorporated by reference into this state surface water discharge permit.
2. This authorization also incorporates the state water quality certification issued by MassDEP under § 401(a) of the Federal Clean Water Act, 40 C.F.R. 124.53, M.G.L. c. 21, § 27 and 314 CMR 3.07. All of the requirements (if any) contained in MassDEP's water quality certification for the permit are hereby incorporated by reference into this state surface water discharge permit as special conditions pursuant to 314 CMR 3.11.
3. 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.

**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) 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  
JFK Federal Building (CAA)  
Boston, MA 02203

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:



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

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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>**

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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.

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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		
<u>Total Metals</u>			
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-Karber
- ! Trimmed Spearman-Karber
- ! 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.

NPDES PART II STANDARD CONDITIONS  
(January, 2007)

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NPDES PART II STANDARD CONDITIONS  
(January, 2007)

PART II. A. GENERAL REQUIREMENTS

1. Duty to Comply

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

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

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

2. Permit Actions

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

3. Duty to Provide Information

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

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4. Reopener Clause

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

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

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

5. Oil and Hazardous Substance Liability

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

6. Property Rights

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

7. Confidentiality of Information

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

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8. Duty to Reapply

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

9. State Authorities

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

10. Other Laws

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

PART II. B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

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

2. Need to Halt or Reduce Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3. Duty to Mitigate

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

4. Bypass

a. Definitions

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

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- (2) *Severe property damage* means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can be reasonably expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

### b. Bypass not exceeding limitations

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

### c. Notice

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

### d. Prohibition of bypass

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

- (1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
- (2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and
- (3)
  - i) The permittee submitted notices as required under Paragraph 4.c. of this section.
  - ii) The Regional Administrator may approve an anticipated bypass, after considering its adverse effects, if the Regional Administrator determines that it will meet the three conditions listed above in paragraph 4.d. of this section.

## 5. Upset

- a. Definition. *Upset* means an exceptional incident in which there is an unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
- b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of paragraph B.5.c. of this section are met. No determination made during

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

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

**PART II. C. MONITORING REQUIREMENTS**

1. Monitoring and Records

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

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

### 2. Inspection and Entry

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

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

## PART II. D. REPORTING REQUIREMENTS

### 1. Reporting Requirements

- a. **Planned Changes.** The permittee shall give notice to the Regional Administrator as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is only required when:
  - (1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR§122.29(b); or
  - (2) The alteration or addition could significantly change the nature or increase the quantities of the pollutants discharged. This notification applies to pollutants which are subject neither to the effluent limitations in the permit, nor to the notification requirements at 40 CFR§122.42(a)(1).
  - (3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition or change may justify the application of permit conditions different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.
- b. **Anticipated noncompliance.** The permittee shall give advance notice to the Regional Administrator of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- c. **Transfers.** This permit is not transferable to any person except after notice to the Regional Administrator. The Regional Administrator may require modification or revocation and reissuance of the permit to change the name of the permittee and

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

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

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

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

## PART II. E. DEFINITIONS AND ABBREVIATIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

*Discharge of a pollutant* means:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

*Waters of the United States* means:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

*Range land* is open land with indigenous vegetation.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3. Commonly Used Abbreviations

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

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

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

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
NEW ENGLAND - REGION I  
5 POST OFFICE SQUARE, SUITE 100  
BOSTON, MASSACHUSETTS 02109-3912**

**FACT SHEET**

**DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM  
(NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES  
PURSUANT TO THE CLEAN WATER ACT (CWA)**

**NPDES PERMIT NUMBER: MA0003123**

**PUBLIC NOTICE START AND END DATES: June 12, 2013 – July 11, 2013**

**NAME AND MAILING ADDRESS OF APPLICANT:**

**New England Aquarium Corporation  
Central Wharf  
Boston, MA 02110**

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

**New England Aquarium  
Central Wharf  
Boston, MA 02110**

**RECEIVING WATER(S): Boston Inner Harbor  
{USGS Hydrologic Code #01090001 – Boston Harbor Watershed (70)}**

**RECEIVING WATER CLASSIFICATION(S): Class SB (CSO)**

**SIC CODES: 8422, 0279, 0921**

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Figure 1 - Facility Location, Intake and Outfall

Figure 2 - Facility Location

Figure 3 - Water Flow Schematic

Attachment A – Outfall 001 Discharge Monitoring Data

Attachment B – Reasonable Potential Analysis – Whole Effluent Toxicity Testing

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

The New England Aquarium (NEA) is a public aquarium that is owned and operated by the New England Aquarium Corporation (NEAC), the permittee. This reissued permit will authorize the discharge of tank and aquaria water, filter backwash, and steam condensate at a rate of up to 150,000 gallons per day (GPD) through Outfall 001 to Boston Inner Harbor. See **Figures 1 and 2** for the facility and outfall location.

## **II. Description of Treatment System and Discharges**

### **Outfall 001**

The permittee utilizes two (2) water intakes pipes which extend about 300 feet from the facility into Boston Inner Harbor. The intakes are about three feet above the harbor bottom and draw water for use in the aquarium's tanks and aquaria. These intakes are covered by a set of louvers that stay closed when water is not being withdrawn. This water is used in at least 14 separate areas, mainly exhibits and galleries which contain a variety of aquatic plants and animals for display.

Water from these tanks is periodically pumped to a 30,000 gallon sump which is located beneath the basement floor. This water contains low levels of medicines and other chemicals, including chlorine, as shown in **Table 1** of the draft permit. These chemicals and medications are required to maintain healthy animals, to prevent and control the spread of disease in these exhibits, and to control the presence of non-native organisms that could be pathogenic to the fishery resources of Inner Boston Harbor. Some exhibits pump out water continuously at low flow rates, while others, such as the main marine mammal exhibits, are periodically drained out to perform medical procedures. See **Figure 3** for a schematic of the water flow through the facility. Although not shown in **Figure 3**, all of the water that is used in the tanks and aquaria is withdrawn from Boston Inner Harbor, as previously discussed. The flow amounts shown on the right side of **Figure 3** and labeled "water to sump from trickles" represents the water that is continuously pumped out of these tanks.

Sodium hypochlorite (chlorine solution) is added at the sump pump for disinfection. There is no other treatment provided in this sump. There are two discharge pumps associated with the sump, only one of which typically operates at any given time. Each discharge pump has an injector pump which injects hypochlorite solution into the discharge pump's suction line when it is operating. The accumulated solids in the sump are periodically pumped out and disposed of off site. This sump discharges water through a pipe with a discharge point at about 300 feet out into Inner Boston Harbor and about three feet from the harbor bottom. The 2007 permit limited flow to a monthly average of 150,000 gallons per day (GPD) which is still appropriate and has been maintained as the flow limit in this permit.

There is a small amount of steam condensate from the facility's steam heat distribution system which also enters this sump, estimated to be up to 10 gallons per hour. The permittee also discharges filter backwash water to the sump. During the current permit term, the permittee has improved the filtration system for its tank water which has reduced the amount of solids and filter backwash water which is discharged to the sump.

A summary of recent Discharge Monitoring Reports (DMRs) data may be found in **Attachment A**. These data comprise the period between January 2009 and July 2012 which is referred to as the "monitoring period" in this fact sheet.

### **III. Receiving Water Description**

The Massachusetts Surface Water Quality Standards (SWQS), found at 314 CMR 4.00, designate Boston Inner Harbor (Segment MA70-02) as a Class SB (CSO) water.

Class SB waters are described in the MA SWQS (314 CMR 4.05(4)(b)) and designated as a habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. In certain waters, habitat for fish, other aquatic life and wildlife may include, but is not limited to, seagrass. Where designated in the tables to 314 CMR 4.00 for shellfishing, these waters shall be suitable for shellfish harvesting with depuration (Restricted and Conditionally Restricted Shellfish Areas). These waters shall have consistently good aesthetic value. Waters with a SB (CSO) designation are occasionally subject to short-term impairment of swimming or other recreational uses due to untreated combined sewer overflows (CSO) discharges in a typical year [314 CMR 4.06(1)(d)11]. The SB (CSO) designation for this water was adopted by MassDEP and approved by EPA, based on information included in the Massachusetts Water Resource Authority's (MWRA) July 1997 Combined Sewer Overflow Plan and Environmental Impact Report.

Sections 305(b) and 303(d) of the CWA require that States complete a water quality inventory and develop a list of impaired waters. Specifically, Section 303(d) of the CWA requires States to identify those water bodies that are not expected to meet surface water quality standards after the implementation of technology-based controls, and as such, require the development of a Total Maximum Daily Load (TMDL) for each pollutant that is prohibiting a designated use(s) from being attained. In Massachusetts, these two evaluations have been combined into an Integrated List of Waters. The integrated list format provides the status of all assessed waters in a single, multi-part list.

Boston Inner Harbor is listed on the *Final Massachusetts Year 2012 Integrated List of Waters*<sup>1</sup> as a Category 5 waterbody, which are those classified as "Waters requiring a TMDL". The pollutants and conditions contributing to this impairment are as follows: fecal coliform, *Enterococcus*, dissolved oxygen, and Polychlorinated Biphenyls (PCBs) in fish tissue.

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<sup>1</sup> <http://www.mass.gov/eea/agencies/massdep/water/watersheds/total-maximum-daily-loads-tmdls.html>

MassDEP is required under the CWA to develop a TMDL for waterbodies that are identified as impaired. A TMDL is essentially a pollution budget designed to restore the health of a water body. A TMDL first identifies the source(s) of the pollutant from direct and indirect discharges in order to next determine the maximum amount of pollutant (including a margin of safety) that can be discharged to a specific water body while maintaining water quality standards for designated uses. It then outlines a plan to meet the goal.

A draft pathogen TMDL has been prepared by MassDEP for the Boston Harbor Watershed, excluding the Neponset River sub-basin, which includes Boston Inner Harbor. The majority of pathogen impairments among the various segments in the watershed are due to dischargers from Combined Sewer Overflows (CSOs), municipal point sources, illicit sewer connections, and urban runoff/storm sewers, while for other impaired segments, the potential contamination sources are unknown. For Boston Inner Harbor, the potential source of bacteria is listed in this draft TMDL as unknown.

#### **IV. Limitations and Conditions**

The effluent limitations and all other requirements described in Part VI of this Fact Sheet may be found in the draft permit.

#### **V. Permit Basis: Statutory and Regulatory Authority**

##### **General Requirements**

The Clean Water Act (CWA) prohibits the discharge of pollutants to waters of the United States without a National Pollutant Discharge Elimination System (NPDES) permit unless such a discharge is otherwise authorized by the CWA. The NPDES permit is the mechanism used to implement technology and water quality-based effluent limitations and other requirements including monitoring and reporting. This draft NPDES permit was developed in accordance with various statutory and regulatory requirements established pursuant to the CWA and any applicable State regulations. The regulations governing the EPA NPDES permit program are generally found at 40 CFR Parts 122, 124, 125, and 136.

When developing permit limits, EPA must consider the most recent technology-based treatment and water quality-based requirements. Subpart A of 40 CFR Part 125 establishes criteria and standards for the imposition of technology-based treatment requirements in permits under Section 301(b) of the CWA, including the application of EPA-promulgated effluent limitations and case-by-case determinations of effluent limitations under Section 402(a)(1) of the CWA. EPA is required to consider technology and water quality-based requirements as well as all limitations and requirements in the existing permit when developing permit limits.

## Technology-Based Requirements

Technology-based treatment requirements represent the minimum level of control that must be imposed under Sections 301(b) and 402 of the CWA (see 40 CFR §125 Subpart A) to meet best practicable control technology currently available (BPT) for conventional pollutants and some metals, best conventional control technology (BCT) for conventional pollutants, and best available technology economically achievable (BAT) for toxic and non-conventional pollutants.

In general, the statutory deadline for non-POTW, technology-based effluent limitations must be complied with as expeditiously as practicable but in no case later than three years after the date such limitations are established and in no case later than March 31, 1989 (see 40 CFR §125.3(a)(2)). Compliance schedules and deadlines not in accordance with the statutory provisions of the CWA cannot be authorized by a NPDES permit.

In the absence of published technology-based effluent guidelines, the permit writer is authorized under Section 402(a)(1)(B) of the CWA to establish effluent limitations on a case-by-case basis using best professional judgment (BPJ).

The effluent monitoring requirements have been established to yield data representative of the discharges under the authority of Section 308(a) of the CWA, according to regulations set forth at 40 CFR § 122.41(j), 122.44(i) and 122.48. The monitoring program in the permit specifies routine sampling and analysis which will provide continuous information on the reliability and effectiveness of the installed pollution abatement equipment. The approved analytical procedures are to be found in 40 CFR 136 unless other procedures are explicitly required in the permit.

This aquarium is characterized as a Concentrated Aquatic Animal Production (CAAP) facility, as defined at 40 CFR §122.24 and Appendix C of 40 CFR Part 122, which reads in part:

*A hatchery, fish farm, or other facility is a concentrated aquatic animal production facility for purposes of § 122.24 if it contains, grows, or holds aquatic animals in either of the following categories:*

*(a) Cold water fish species or other cold water aquatic animals in ponds, raceways, or other similar structures which discharge at least 30 days per year but does not include:*

*(1) Facilities which produce less than 9,090 harvest weight kilograms (approximately 20,000 pounds) of aquatic animals per year; and*

*(2) Facilities which feed less than 2,272 kilograms (approximately 5,000 pounds) of food during the calendar month of maximum feeding.*

*(b) Warm water fish species or other warm water aquatic animals in ponds, raceways, or other similar structures which discharge at least 30 days per year, but does not include:*

*(1) Closed ponds which discharge only during periods of excess runoff; or*

*(2) Facilities which produce less than 45,454 harvest weight kilograms (approximately 100,000 pounds) of aquatic animals per year.*

NEA raises approximately 5380 pounds of a variety of cold water species annually and 9,150 pounds of a variety of warm water species annually and uses about 10,795 pounds of feed in the highest feeding month of the calendar year. Although neither weight threshold for fish production is reached, the permittee feeds more than 5,000 pounds of feed in the highest feed month and is therefore characterized as a CAAP and subject to NPDES permitting.

Even if NEA did not meet the definition of a CAAP facility strictly on these figures, EPA could still classify NEA as a CAAP facility on a case-by-case determination, as detailed in 40 CFR § 122.24(c). This Part allows for consideration of factors including the quantity and nature of the pollutants reaching the receiving water. The chemicals and medications used at the facility and discharged to Boston Inner Harbor would serve as a sufficient justification for EPA to classify NEA as a CAAP facility.

On August 23, 2004, the EPA promulgated new Effluent Limitation Guidelines (ELGs) and New Source Performance Standards (NSPS) for CAAP facilities at 40 CFR Part 451. Typically, ELGs express effluent limitations in the form of numeric standards for specific pollutants, but these ELGs express effluent limitations in the form of narrative standards in order to achieve reduced discharges of TSS and other materials that are associated with the raising of aquatic animals. These ELGs apply to the discharge of pollutants from facilities that produce 100,000 pounds or more per year of aquatic animals using flow-through, net pens or recirculating or submerged cage systems and became effective on September 22, 2004 [See Federal Register on August 23, 2004 (69FR 51892 – 51930)].

Since the NEA produces about 15,000 pounds of aquatic animals annually, far below the 100,000 pounds for which these ELGs apply, it will not be subject to such guidelines. However, there were chemical storage and spill control measures established in the 2007 permit and proposed to be continued in this permit in Part I.A.4.c. This condition is derived from these guidelines and continues to be based on BPJ due to the variety of chemicals and medications which are used at this site.

### **Water Quality-Based Requirements**

Water quality-based limitations are required in NPDES permits when EPA and the State determine that effluent limits more stringent than technology-based limits are necessary to maintain or achieve state or federal water quality standards (WQS). See Section 301(b)(1)(C) of the CWA.

Receiving water requirements are established according to numerical and narrative standards adopted under state law for each water quality classification. When using chemical-specific numeric criteria to develop permit limits, both the acute and chronic

aquatic-life criteria, expressed in terms of maximum allowable in-stream pollutant concentration, are used. Acute aquatic-life criteria are considered applicable to daily time periods (maximum daily limit) and chronic aquatic-life criteria are considered applicable to monthly time periods (average monthly limit). Chemical-specific limits are allowed under 40 CFR § 122.44(d)(1) and are implemented under 40 CFR § 122.45(d).

A facility's design flow is used when deriving constituent limits for daily and monthly time periods as well as weekly periods where appropriate. Also, the dilution provided by the receiving water is factored into this process where appropriate. Narrative criteria from the state's water quality standards are often used to limit toxicity in discharges where (a) a specific pollutant can be identified as causing or contributing to the toxicity but the state has no numeric standard; or (b) toxicity cannot be traced to a specific pollutant.

EPA regulations require NPDES permits to contain effluent limits more stringent than technology-based limits where more stringent limits are necessary to maintain or achieve state or federal WQS. The permit must address any pollutant or pollutant parameter (conventional, non-conventional, toxic and whole effluent toxicity) that is or may be discharged at a level that causes or has "reasonable potential" to cause or contribute to an excursion above any water quality criterion. See 40 CFR §122.44(d)(1). An excursion occurs if the projected or actual in-stream concentration exceeds the applicable criterion. In determining reasonable potential, EPA considers (a) existing controls on point and non-point sources of pollution; (b) pollutant concentration and variability in the effluent and receiving water as determined from the permit application, monthly Discharge Monitoring Reports (DMRs), and State and Federal Water Quality Reports; (c) sensitivity of the species to toxicity testing; (d) known water quality impacts of processes on wastewater; and, where appropriate, (e) dilution of the effluent in the receiving water.

WQS consist of three parts: (a) beneficial designated uses for a water body or a segment of a water body; (b) numeric and/or narrative water quality criteria sufficient to protect the assigned designated use(s); and (c) antidegradation requirements to ensure that once a use is attained it will not be degraded. The MA SWQS, found at 314 CMR 4.00, include these elements. The state will limit or prohibit discharges of pollutants to surface waters to assure that surface water quality standards of the receiving waters are protected and maintained or attained. These standards also include requirements for the regulation and control of toxic constituents and require that EPA criteria, established pursuant to Section 304(a) of the CWA, shall be used unless a site-specific criterion is established. The conditions of the permit reflect the goal of the CWA and EPA to achieve and then to maintain WQS.

Consistent with the MA SWQS promulgated at 314 CMR 4.03(2) and MassDEP guidance documents, MassDEP may set water quality based discharge limits based on a "mixing zone". Generally, mixing zones are areas in which exceedances of numeric WQS are allowed, provided that, among other things, these exceedances do not result in acute toxicity and that the mixing zone will still be protective of the narrative requirements of the WQS. In addition, mixing zones cannot be disproportionately large so as to interfere with the attainment of the designated uses assigned to the water body

segment. All applicable numeric water quality criteria must be met at the edge of the mixing zone, and the other requirements of the state mixing zone must also be satisfied.

### **Antibacksliding**

A permit may not be renewed, reissued or modified with less stringent limitations or conditions than those contained in the previous permit unless in compliance with the antibacksliding requirements of the CWA [see Sections 402(o) and 303(d)(4) of the CWA and 40 CFR §122.44(1)(1 and 2)]. EPA's antibacksliding provisions prohibit the relaxation of permit limits, standards, and conditions except under certain circumstances. Effluent limits based on BPJ, water quality, and state certification requirements must also meet the antibacksliding provisions found at Section 402(o) and 303(d)(4) of the CWA.

The whole effluent toxicity (WET) testing requirement of the 2007 permit has been eliminated in this draft permit based on past monitoring results as discussed in Part VI. below. This change is consistent with the “new information” provision of the antibacksliding regulations. There has been a one time WET testing screening requirement established during the fourth year of the permit, in order to confirm that the discharge does not have a toxic effect on the receiving water.

The limits for *fecal coliform* bacteria have been replaced with a monitor only requirement. As discussed in Part VI below, most sampling for fecal coliform has been non-detect, but monitoring is still required as *fecal coliform* remains the appropriate bacterial indicator for shellfishing uses

All other proposed permit limitations are at least as stringent as those of the current permit, and antibacksliding is not applicable for all other parameters.

### **Antidegradation**

Federal regulations found at 40 CFR §131.12 require states to develop and adopt a statewide antidegradation policy which maintains and protects existing instream water uses and the level of water quality necessary to protect the existing uses, and maintains the quality of waters which exceed levels necessary to support propagation of fish, shellfish, and wildlife and to support recreation in and on the water. The Massachusetts Antidegradation Regulations are found at 314 CMR 4.04. There are no new or increased discharges being proposed with this permit reissuance. Therefore, EPA does not believe that the MassDEP is required to conduct an antidegradation review regarding this permit reissuance.

### **State Certification**

Under Section 401 of the CWA, EPA is required to obtain certification from the state in which the discharge is located that all water quality standards or other applicable requirements of state law, in accordance with Section 301(b)(1)(C) of the CWA, are satisfied. EPA permits are to include any conditions required in the state's certification

as being necessary to ensure compliance with state water quality standards or other applicable requirements of state law. See CWA Section 401(a) and 40 CFR §124.53(e). Regulations governing state certification are set out at 40 CFR §124.53 and §124.55. EPA regulations pertaining to permit limits based upon water quality standards and state requirements are contained in 40 CFR §122.44(d).

## **VI. Explanation of Permit's Effluent Limitations**

### **Outfall 001 - Flow**

The current flow limit is a monthly average of 150,000 GPD. For the period between January 2009 and July 2012, which is referred to as the “monitoring period” in this fact sheet, the average monthly effluent flow has averaged 33,479 GPD, with a high monthly average value of 49,989 GPD. The highest maximum daily value measured was 76,393 GPD. The permittee measures the flow continuously when the sump is discharging. In order to have the flow limits be reflective of the actual conditions at the facility, the monthly average flow limit has been changed to 100,000 GPD and a daily maximum flow limit of 150,000 GPD has been established in the draft permit.

### **pH**

The pH range is limited to the Class SB range of 6.5 to 8.5 standard units which is the range required by state WQS and which can be found at 314 CMR 4.05. During the monitoring period, the effluent pH has ranged from 7.63 to 8.08 s.u., with no violations of the permitted range.

### **Total Suspended Solids (TSS)**

Total suspended solids continue to be limited in this permit, due to solids originating in the tanks that accumulate in the sump. During the current permit term, the permittee has installed more efficient filtering equipment which produces less filter backwash effluent and lower amounts of solids being discharged to the sump. In the last few years, there has been a considerable decline in the effluent TSS levels. The permittee removes accumulated solids from the sump as necessary and disposes of them off-site.

The 2007 permit limited TSS to 30 mg/l as a monthly average and 60 mg/l as a daily maximum. Since 2009, effluent TSS values have ranged from 0.11 to 17.9 mg/l, with no violations of the permit limits. The 2007 permit also included mass limits for TSS to control the mass loading to Boston Harbor. These mass limits of 38 lbs/day and 75 lbs/day were based on the flow of 150,000 GPD, the monthly average permitted flow level. Since the monthly average flow limit for this draft permit has been changed to 100,000 GPD, the monthly average mass limit for TSS, which was previously based on the flow of 150,000 GPD, needs to be revised as follows, with the figure of 8.34 being a conversion factor:

(Concentration limit, mg/l) (flow, million gallons per day) (8.34) = mass limit (lbs/day)

30 mg/l (0.10 MGD) (8.34) = **25 lbs/day**

The daily maximum limit will remain 75 lbs/day, calculated as follows:

60 mg/l (0.15 MGD)(8.34) = **75 lbs/day**

EPA believes that these limits are appropriate and achievable by this treatment system and are consistent with State WQS which require that waters be free from floating, suspended or settleable solids in concentrations that would impair any use assigned to this Class SB water. The monitoring frequency for TSS has been maintained at twice per month to assure that these limits are met on a consistent basis and to more quickly detect sudden increases in TSS levels which may indicate a need to pump solids out of the sump or a malfunction of the facility's filtering system.

### **Bacteria**

Since there is fecal matter in the tanks and aquaria that is discharged to the sump, the current permit included year round bacteria limits to assure that there is adequate disinfection of these bacteria. The 2007 permit limited *fecal coliform* bacteria, consistent with the Massachusetts SWQS for Class SB waters. The 2007 permit established a *fecal coliform* monthly average limit of 200 colony forming units (cfu)/100 ml and a maximum daily limit of 400 cfu/100 ml. There have been no violations of the *fecal coliform* limits during the monitoring period, with most samples being non-detect for this parameter.

Since the issuance of the 2007 permit, MassDEP has revised the criteria for bacteria in the Massachusetts SWQS for protecting recreational uses. The bacteriological criteria for the protection of recreational uses in salt water were revised from *fecal coliform* bacteria to *Enterococci*, while *fecal coliform* remains the criteria for protecting shellfishing use. The criteria for *Enterococci* for Class SB waters are a monthly geometric mean of 35 cfu/100 ml and single sample maximum (SSM) of 104 cfu/100 ml. MassDEP views the use of the 90% upper confidence level of 276 cfu/100 ml as appropriate for setting the maximum daily limit for *Enterococci* in the draft permit. Accordingly, these limitations have been included in the draft permit. Sampling for *Enterococci* shall be conducted monthly and applies year round.

Since *fecal coliform* is still the appropriate indicator for shellfishing uses, which are currently prohibited in the area of the discharge, monthly monitoring for this parameter has been maintained in the draft permit, replacing the limits in the 2007 permit. The last few years of data have shown that the *fecal coliform* levels are mostly not detected.

## Copper

The 2007 permit included a monthly total copper monitoring requirement due to the permittee's use of a copper sulfate solution in one or more tanks to control for certain diseases. Since copper sulfate is still used at the aquarium, monitoring for copper has been maintained in this permit. The marine water quality criteria for total copper are 3.1 ug/l (chronic) and 4.8 ug/l (acute). During the monitoring period, total copper has ranged from 2.4 to 113.1 ug/l, with an average of 15.2 ug/l.

In order to determine whether the discharge levels of total copper would cause or contribute to surface water quality violations, an assessment of the dilution available in Boston Harbor was made in the 2007 permit. Modeling has been conducted on the tidal exchange experienced in Boston Harbor by Signell and Butman (1992)<sup>2</sup>. The authors used a box model, which is a hydrodynamic model to describe flushing dynamics between Massachusetts Bay and Boston Harbor. As described in Kelly (1998)<sup>3</sup>, this modeling showed that the volume of water exchanged during tidal mixing represented an annual average of 3500 to 4300 m<sup>3</sup>/sec. The lower figure is equivalent to about 123,500 cfs or 79,840 MGD. In comparison to tidal exchange, the average freshwater flow to the entire harbor was 37 m<sup>3</sup>/sec, or about 1300 cfs. Thus, the available dilution is dominated by the tidal exchange. It is assumed that the Inner Harbor, where NEA's discharge is located, experiences a moderate amount of the estimated 79,840 MGD of tidal flushing that occurs in the main harbor. With the conservative assumption that the area of NEA's discharge receives only 1% of this tidal exchange, or about 800 MGD, NEA's maximum daily discharge amount of 150,000 GPD or 0.15 MGD, would still be diluted about 5333 times (800/0.15). With this magnitude of available dilution, there is not a reasonable potential that the discharge of copper will cause or contribute to a water quality violation.

The 2007 permit required the permittee to evaluate its use of copper containing compounds, including copper sulfate and Cupramine and to consider ways to reduce the discharge of copper to the receiving water. Copper sulfate remains the most consistently effective method and industry standard for elimination of protozoal parasites of fish, and it remains in use at NEA. The permittee evaluated the potential of hyposalinity treatment rather than copper treatment during a parasite outbreak in its Giant Ocean Tank in 2011, but found it to be ineffective and it resulted in significant fish mortality. The permittee has been using the antiprotozoal drug "Chloroquine" as an alternative to copper compounds during quarantine of fish, and is optimistic that this could be used as a substitute for copper during treatment of larger tank systems. The permittee expects to use Chloroquine if and when it experiences another parasite outbreak in a large system, and would at that time evaluate its practicality, safety, and efficacy. This evaluation would be consistent with Part I.A.4.d of the permit that requires the permittee to periodically evaluate the use of less toxic chemicals in its operations.

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<sup>2</sup> Signell, R.P. Butman, B. (1992) Modeling tidal exchange and dispersion in Boston Harbor. *J. Geophysical Resources* 97:15191-15606

<sup>3</sup> Kelly, J.R. (1988) Quantification and potential role of ocean nutrient loading to Boston Harbor, MA *Marine Ecology Progress Series*, Vol. 173: 53-65, 1998

**Total Residual Chlorine (TRC)**

Sodium hypochlorite is added to the outlet pipe of the sump to control bacteria and non-native organisms. The use of hypochlorite in individual tanks for disinfection purposes has been discontinued. The TRC limit was limited in the 2007 permit at a monthly average and daily maximum of 1.0 mg/l. The permittee injects the hypochlorite solution at the sump in order to maintain the target level of 1.0 mg/l at the discharge point of the sump, in order to sufficiently disinfect the discharge.

During the monitoring period, the effluent TRC has averaged 0.42 mg/l with a high reading of 10 mg/l. There were 5 effluent violations during this period. The permittee reported that the reading of 10 mg/l in June of 2012 was a result of a valve failure that resulted in an elevated TRC level in a secondary containment tank which was not effectively neutralized before being released into the main sump. Since that incident, the permittee has instituted a Standard Operating Procedure (SOP) in the event of a chlorine spill which will prevent the reoccurrence of such an event. This SOP explains steps that employees would need to take relative to containing the spill, dechlorinating when necessary, and confirming by on-site lab testing that the residual chlorine level in the secondary containment is below 1.0 mg/l.

The marine water quality criteria for TRC are 7.5 ug/l for the chronic and 13 ug/l for the acute. EPA has made a determination that the instream TRC criteria will be met based on the dilution available for this discharge, as noted in the copper discussion above. In addition, as the effluent travels the approximately 300 foot length of the discharge pipe, there would be some level of degradation expected in the TRC levels prior to discharging to Boston Inner Harbor. Therefore, the permit limit for TRC has been maintained at 1.0 mg/l, as a monthly average. The daily maximum limit for TRC of 1.0 mg/l has been maintained to assure that the monthly average level is consistently kept below at or below 1.0 mg/l.

**Whole Effluent Toxicity**

Whole effluent toxicity (WET) testing is conducted to assess whether certain effluents, often containing potentially toxic pollutants, are discharged in a combination which produces a toxic amount of pollutants in a receiving water. Therefore, toxicity testing may be used in conjunction with pollutant specific control procedures to control the discharge of toxic pollutants.

There are two specific sources of legal authority which explain how regulatory authorities have the legal basis for establishing toxicity testing requirements and toxicity-based permit limits in NPDES permits. Sections 402(a)(2) and 308(a) of the CWA provide EPA and States with the authority to require toxicity testing data. Section 308 specifically describes biological monitoring methods as techniques which may be used to carry out objectives of the Act. Under certain State narrative water quality standards, and

Sections 301, 303 and 402 of the CWA, EPA and the States may establish toxicity-based limits to implement the narrative "no toxics in toxic amounts".

The regulations at 40 CFR Part 122.44(d)(ii) state, "When determining whether a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard, the permitting authority shall use procedures which account for existing controls on point and non-point sources of pollution...(including) the sensitivity of the species to toxicity testing..." In the previous permit, EPA and MassDEP had determined that the composition of this effluent was such that WET testing was required to evaluate and address any potential water quality impacts. MassDEP, in its "*Implementation Policy for the Control of Toxic Pollutants in Surface Waters*" (February 23, 1990), sets forth toxicity limits according to dilution factors based on perceived risk. Results of these toxicity tests may demonstrate compliance with the Massachusetts SWQS.

Based on regulations at 40 CFR 122.44(d)(1) and the MA SWQS [(314 CMR 4.05(5)(e))], NPDES permits must include limitations for WET when there is reasonable potential for discharges to cause or contribute pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife. The method recommended in the *Technical Support Document for Water Quality-based Toxics Control (TSD)* combines knowledge of effluent variability as estimated by a coefficient of variation (CV) with uncertainty due to the number of data (n) to project an estimated maximum concentration for the effluent using a reasonable potential multiplying factor. An evaluation of reasonable potential by the TSD method requires that the projected toxicity be compared to an applicable criterion using a toxic units (TU) approach. This approach uses an effect concentration (EC) in its analysis. One type of EC is the LC<sub>50</sub>, which is the concentration of effluent which causes mortality to 50% of the test organisms. Toxicity involves an inverse relationship to the effect concentration (EC), in other words, the lower the EC, the higher the toxicity of the effluent. It is more understandable to translate concentration-based toxicity measurements into toxic units (TUs), overcoming the potential confusion involving the inverse relationship. The number of toxic units in an effluent is defined as 100 divided by the EC measured (i.e.  $TU = 100/LC_{50}$ ). For example, an effluent with an LC<sub>50</sub> of 50% effluent is an effluent containing 2 TUs ( $100/50 = 2$ ).

The TSD recommends an acute criterion of 0.3 toxic units (TUs) and a chronic criterion of 1.0 TUs. Interpretation of the narrative criterion in *Implementation Policy for the Control of Toxic Pollutants in Surface Waters* recommends an acute criterion of 0.3 toxic units and a chronic criterion in which the no observed effect concentration is greater than or equal to the receiving water concentration. Depending on available dilution, the end of pipe limits range from 1.0 to 2.0 toxic units.

In its 2001 permit, the permittee was required to conduct acute toxicity tests twice per year using 2 species, the Mysid Shrimp, *Mysidopsis bahia* and the Inland Silverside, *Menidia beryllina*. This testing was required to assess whether the permittee's use of various chemicals and medications would result in the effluent exhibiting any toxic effects. There was an LC<sub>50</sub> limit of 100% established in order to ensure that there were no effects to organisms in the vicinity of the discharge and a reporting requirement for

the acute no effect concentration level (A-NOEC) for both species. The LC<sub>50</sub> is defined as the concentration of the effluent which causes mortality to 50% of the test organisms. When this permit was reissued in 2007, the WET testing requirement was reduced to once per year with 2 species based on the previous WET testing results. Since 2002, all WET testing has resulted in LC<sub>50</sub> values of >100% for both species, with the exception of a 35% value in 2002 and a 6.25% value in 2003, both for the Mysid shrimp.

The permittee has requested that WET testing be eliminated from this permit. In consideration of this request, EPA has conducted a Reasonable Potential (RP) Analysis using the method recommended by the TSD and considering worst-case conditions. The results of this RP analysis are discussed below.

Although there is no specific dilution factor calculated for this discharge, the estimated dilution factor of 5333 was discussed above, which was based on previous hydrodynamic modeling results. To be conservative, a dilution factor of 100 was used in these calculations. For discharges with a dilution factor of 100 or less, the end-of-pipe effluent limit established in the Toxics Policy for acute effects in the mixing zone is 1.0 toxic unit (TU), or an LC<sub>50</sub> of 100%. To evaluate whether the NEA discharge has reasonable potential to exceed this level of toxicity, EPA converted the WET test results for the facility based on the definition of a toxic unit, defined as 100 divided by the LC<sub>50</sub> and the results are as follows.

Monitoring Period End Date	LC <sub>50</sub> Static 48 Hr Acute Inland silverside	LC <sub>50</sub> Static 48Hr Acute Mysid shrimp	Toxic Units Equivalent (Silverside/Shrimp)
	%	%	T.U.
Feb 2005	100	100	1.0 / 1.0
August 2005	100	100	1.0 / 1.0
May 2006	100	100	1.0 / 1.0
Sept 2006	100	100	1.0 / 1.0
March 2007	100	100	1.0 / 1.0
Sept 2007	100	100	1.0 / 1.0
Sept 2008	100	100	1.0 / 1.0
August 2009	100	100	1.0 / 1.0
Sept 2010	100	100	1.0 / 1.0
August 2011	100	100	1.0 / 1.0

Using the toxic unit equivalents calculated above and consistent with the approach used in the TSD, EPA determined the 95<sup>th</sup> and 99<sup>th</sup> percentile projected effluent concentrations to both be 0 (zero) TU.

Based on the lack of toxicity in the effluent and the projected effluent toxic units calculated above, EPA has determined that WET testing is no longer routinely required for this facility in order to fully characterize water quality impacts and to ensure that discharges from the facility do not exceed Massachusetts WQSs for toxic pollutants when

discharged in combination. For a facility with a dilution factor greater than 1,000:1, EPA's *Technical Support Document for Water Quality-based Toxics Control* (1991) recommends acute toxicity testing. Therefore, EPA has determined that a one time, acute WET screening for the same two species shall be required during the fourth year of the reissued permit in order to confirm that the discharge does not have a toxic effect on the receiving water.

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

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq. (1998)), EPA is required to consult with the National Marine Fisheries Services (NMFS) if EPA's action or proposed actions that it funds, permits, or undertakes, may adversely impact any EFH such as: waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (16 U.S.C. § 1802 (10)). Adversely impact means any impact which reduces the quality and/or quantity of EFH (50 C.F.R. § 600.910 (a)). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

As described in Section I of this Fact Sheet, NEAC has applied for reissuance of the NPDES Permit for the NEA on February 3, 2012. With limitations, the permit allows NEA to discharge chlorinated tank and aquaria water, filter backwash water, and steam condensate to Inner Boston Harbor. EPA intends to reissue the facility's NPDES permit for this discharge. Thus, NEA will continue to discharge these waters to Inner Boston Harbor through Outfall 001. This outfall's characteristics are described earlier in this Fact Sheet.

EFH is only designated for species for which federal fisheries management plans exist (16 U.S.C. § 1855(b) (1) (A)). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999. The following is a list of the EFH species and applicable lifestage(s) for Massachusetts Bay, which includes Inner Boston Harbor:

<b>Species</b>	<b>Eggs</b>	<b>Larvae</b>	<b>Juveniles</b>	<b>Adults</b>
Atlantic cod ( <i>Gadus morhua</i> )	X	X	X	X
Haddock ( <i>Melanogrammus aeglefinus</i> )	X	X		
pollock ( <i>Pollachius virens</i> )	X	X	X	X
whiting ( <i>Merluccius bilinearis</i> )	X	X	X	X
Red hake ( <i>Urophycis chuss</i> )	X	X	X	X
white hake ( <i>Urophycis tenuis</i> )	X	X	X	X

winter flounder ( <i>Pseudopleuronectes americanus</i> )	X	X	X	X
yellowtail flounder ( <i>Pleuronectes ferruginea</i> )	X	X	X	X
windowpane flounder ( <i>Scophthalmus aquosus</i> )	X	X	X	X
American plaice ( <i>Hippoglossoides platessoides</i> )	X	X	X	X
ocean pout ( <i>Macrozoarces americanus</i> )	X	X	X	X
Atlantic halibut ( <i>Hippoglossus hippoglossus</i> )	X	X	X	X
Atlantic sea scallop ( <i>Placopecten magellanicus</i> )	X	X	X	X
Atlantic sea herring ( <i>Clupea harengus</i> )		X	X	X
long finned squid ( <i>Loligo pealei</i> )	n/a	n/a	X	X
short finned squid ( <i>Illex illecebrosus</i> )	n/a	n/a	X	X
Atlantic butterfish ( <i>Peprilus triacanthus</i> )	X	X	X	X
Atlantic mackerel ( <i>Scomber scombrus</i> )	X	X	X	X
Summer flounder ( <i>Paralichthys dentatus</i> )				X
scup ( <i>Stenotomus chrysops</i> )	n/a	n/a	X	X
black sea bass ( <i>Centropristus striata</i> )	n/a		X	X
surf clam ( <i>Spisula solidissima</i> )	n/a	n/a	X	X
bluefin tuna ( <i>Thunnus thynnus</i> )			X	X

A review of the relevant essential fish habitat information provided by NMFS indicates that EFH has been designated for 23 managed species within the NMFS boundaries encompassing Massachusetts Bay. It is possible that a number of these species utilize these receiving waters for spawning, while others are present seasonally.

Based on the relevant information examined, EPA finds that adoption of the draft permit will satisfy EFH requirements. The discharges from this facility are not expected to adversely impact the EFH directly or indirectly. As described in Section VI of this Fact Sheet, the dilution available to this discharge along with the effluent limits are expected to be protective of the aquatic species in Inner Boston Harbor and to result in compliance with applicable Federal and State water quality standards. During the public comment period, EPA has provided a copy of the Draft Permit and Fact Sheet to NMFS for consultation with NMFS under Section 305(b)(2) of the Magnuson-Stevens Act for EFH.

### **VIII. Endangered Species Act**

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

EPA has reviewed the federal endangered and threatened species of fish, wildlife, and plants to see if any such listed species might potentially be impacted by the reissuance of this NPDES permit. The review has focused primarily on marine mammals, sea turtles and anadromous fish since the discharge is into Inner Boston Harbor. Based on the normal distribution of these species, it is highly unlikely that they would be present in the vicinity of this discharge. Furthermore, effluent limitations and other permit conditions which are in place in this draft permit should preclude any adverse effects should there be any incidental contact with listed species either in Boston Harbor.

The proposed effluent limits in the draft permit are sufficiently stringent to assure that WQS will be met for aquatic life protection and for all species, including endangered and threatened species. During the public comment period, EPA has provided a copy of the Draft Permit and Fact Sheet to both NMFS and USFWS.

### **IX. Monitoring and Reporting**

The permit’s monitoring requirements have been established to yield data representative of the facility’s pollutant discharges under the authority of Sections 308(a) and 402(a)(2) of the CWA and consistent with 40 C.F.R. §§ 122.41 (j), 122.43(a), 122.44(i) and 122.48. The monitoring program in the permit specifies routine sampling and analysis which will provide ongoing, representative information on the levels of regulated constituents in the wastewater discharge streams. The approved analytical procedures are found in 40 C.F.R. Part 136 unless other procedures are explicitly required in the permit.

The Permittee is obligated to monitor and report sampling results to EPA and the MassDEP within the time specified within the permit. Timely reporting is essential for the regulatory agencies to expeditiously assess compliance with permit conditions.

The Draft Permit includes new provisions related to DMR submittals to EPA and the State. The Draft Permit requires that, no later than one year after the effective date of the permit, the Permittee submit all monitoring data and other reports required by the permit

to EPA using NetDMR, unless the Permittee is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for submitting DMRs and reports (“opt-out request”). In the interim (until one year from the effective date of the permit), the Permittee may either submit monitoring data and other reports to EPA in hard copy form, or report electronically using NetDMR.

NetDMR is a national web-based tool for regulated Clean Water Act permittees to submit DMRs electronically via a secure Internet application to U.S. EPA through the Environmental Information Exchange Network. NetDMR allows participants to discontinue mailing in hard copy forms under 40 C.F.R. § 122.41 and § 403.12. NetDMR is accessed from the following url: <http://www.epa.gov/netdmr>. Further information about NetDMR, including contacts for EPA Region 1, is provided on this website.

EPA currently conducts free training on the use of NetDMR, and anticipates that the availability of this training will continue to assist permittees with the transition to use of NetDMR. To participate in upcoming trainings, visit <http://www.epa.gov/netdmr> for contact information for Massachusetts.

The Draft Permit requires the Permittee to report monitoring results obtained during each calendar month using NetDMR, no later than the 15th day of the month following the completed reporting period. All reports required under the permit shall be submitted to EPA as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of DMRs or other reports to EPA and will no longer be required to submit hard copies of DMRs to MassDEP. However, permittees must continue to send hard copies of reports other than DMRs to MassDEP until further notice from MassDEP.

The Draft Permit also includes an “opt-out” request process. Permittees who believe they cannot use NetDMR due to technical or administrative infeasibilities, or other logical reasons, must demonstrate the reasonable basis that precludes the use of NetDMR. These permittees must submit the justification, in writing to EPA, at least sixty (60) days prior to the date the facility would have otherwise been required to begin using NetDMR. Opt-outs become effective upon the date of written approval by EPA and are valid for twelve (12) months. The opt-outs expire at the end of this twelve (12) month period. Upon expiration, the permittee must submit DMRs and reports to EPA using NetDMR, unless the permittee submits a renewed opt-out request sixty (60) days prior to expiration of its opt-out, and such a request is approved by EPA.

Until electronic reporting using NetDMR begins, or for those permittees that receive written approval from EPA to continue to submit hard copies of DMRs, the Draft Permit requires that submittal of DMRs and other reports required by the permit continue in hard copy format. Hard copies of DMRs must be postmarked no later than the 15th day of the month following the completed reporting period.

## **X. State Certification Requirements**

EPA may not issue a permit unless the State Water Pollution Control Agency with jurisdiction over the receiving waters certifies that the effluent limitations contained in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State Water Quality Standards. The staff of MassDEP have reviewed the draft permit and advised EPA that the limitations are adequate to protect water quality. EPA has requested permit certification by the State pursuant to 40 CFR 124.53 and expects that the draft permit will be certified.

## **XI. Public Comment Period, Public Hearing, 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, Massachusetts Office of Ecosystem Protection (CIP), 1 Congress Street, Suite 1100, Boston, Massachusetts 02114-2023. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates 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 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. 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 CFR 124.74, 48 Fed. Reg. 14279-14280 (April 1, 1983).

## **XII. EPA & MassDEP Contacts**

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 the EPA and MassDEP contacts below:

George Papadopoulos, Industrial Permits Branch  
5 Post Office Square - Suite 100 - Mailcode OEP 06-1  
Boston, MA 02109-3912  
Papadopoulos.george@epa.gov  
Telephone: (617) 918-1579 FAX: (617) 918-1505

Cathy Vakalopoulos, Massachusetts Department of Environmental Protection

Surface Water Discharge Permit Program  
1 Winter Street, Boston, Massachusetts 02108  
catherine.vakalopoulos@state.ma.us  
Telephone: (617) 348-4026; FAX: (617) 292-5696

May 23, 2013  
Date

Ken Moraff, Acting Director  
Office of Ecosystem Protection  
U.S. Environmental Protection Agency

**FIGURE 1 - FACILITY LOCATION  
INTAKE AND OUTFALL LOCATION**

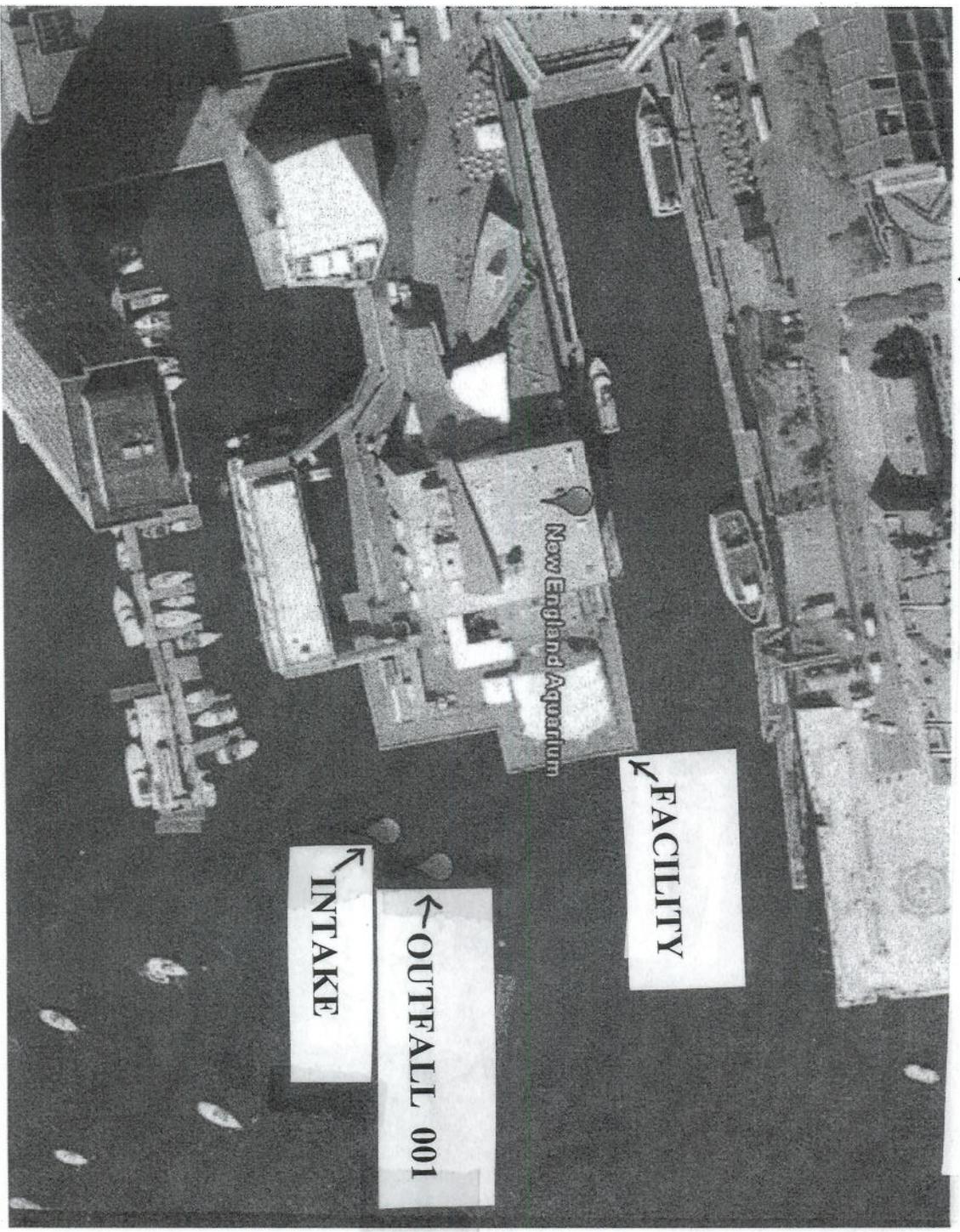
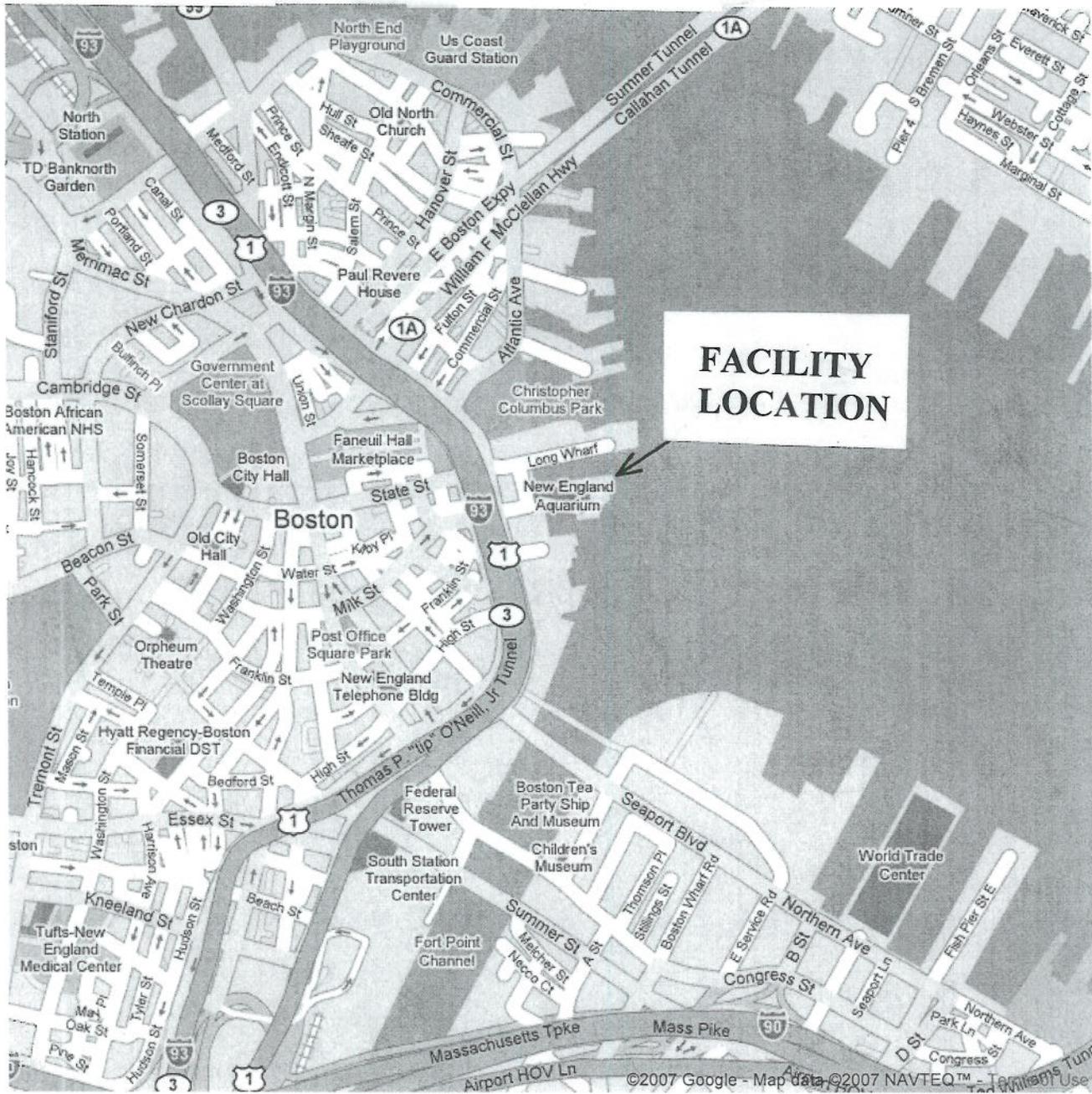
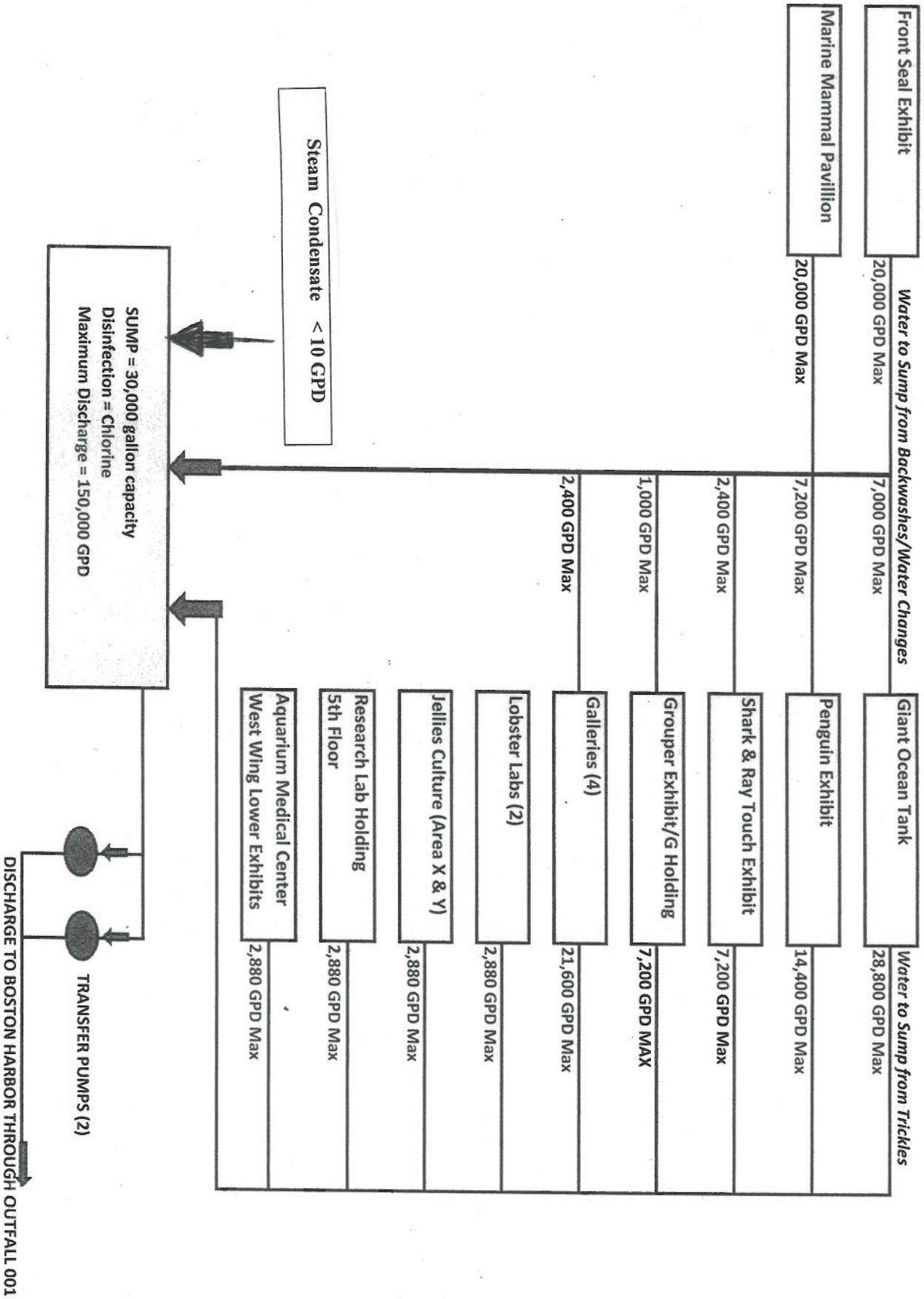


FIGURE 2



# Figure 3 – Water Flow Schematic



## Attachment A

## Outfall 001 Discharge Monitoring Data

NEW ENGLAND AQUARIUM - MA0003123										
Outfall Serial Number 001										
Monitoring Period End Date	Flow, total		Copper, Total		pH		TSS			
	gal/day	gal/day	mg/l	mg/l	SU	SU	mg/l	mg/l	lbs/ day	lbs/ day
	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Min	Max	Monthly Avg	Daily Max	Monthly Avg	Daily Max
Jan-09	26998	35481	12	12	7.85	8.03	4.25	6.09	18.9	20.6
Feb-09	24752	30079	4.1	4.1	7.81	8.01	2.29	3.35	11.1	13.3
Mar-09	25380	36089	6.8	6.8	7.82	7.98	1.5	2.65	7.1	8.8
Apr-09	28155	36211	4.4	4.4	7.81	7.96	4.21	4.64	17.95	15.4
May-09	25579	51116	4.7	4.7	7.81	8.04	1.09	2.34	5.15	5.5
Jun-09	26575	33288	3.3	3.3	7.98	7.82	3.03	3.88	13.7	14
Jul-09	29832	42896	5.4	5.4	7.88	7.98	3.41	5.79	13.7	16.2
Aug-09	35675	55574	5.6	5.6	7.89	7.98	3.95	8.25	13.3	17.8
Sep-09	34492	51826	5.8	5.8	7.82	8	3.1	6.09	10.8	14.1
Oct-09	32286	43646	4.5	4.5	7.86	8.08	2.23	3.12	8.3	8.6
Nov-09	30049	43795	4.8	4.8	7.93	8.05	2.84	4.1	11.35	11.6
Dec-09	30515	35463	17.1	22.2	7.85	8.01	2.46	3.16	9.7	10.7
Jan-10	27661	35437	17.1	22.2	7.85	8.01	2.24	3.16	9.7	10.7
Feb-10	28109	42244	10.3	10.3	7.83	7.98	1.93	3.27	8.25	9.3
Mar-10	26538	35857	13.9	13.9	7.72	7.95	1.68	2.27	7.6	7.6
Apr-10	30770	38626	7.5	7.5	7.68	7.98	2.18	3.47	8.5	10.8
May-10	30260	41702	11.9	11.9	7.73	7.92	1.51	3.54	6.15	10.2
Jun-10	30842	64819	16.8	16.8	7.63	7.99	1.73	5.5	6.75	10.2
Jul-10	34913	49099	18.6	18.6	7.89	8.01	4.43	6.34	15.25	15.5
Aug-10	33325	49916	2.4	2.4	7.83	7.96	2.2	5.3	8.05	12.8
Sep-10	35965	54230	64.05	97	7.9	8.02	1.8	4.9	6.2	10.9
Oct-10	49989	76393	113.1	113.1	7.77	7.93	1.73	3.89	4.15	6.1
Nov-10	48213	54436	18	18	7.86	7.99	4.11	4.64	1	1
Dec-10	40950	53750	5.3	5.3	7.9	8	3.75	4.93	1.1	1.1
Jan-11	32681	52573	7.5	7.5	7.87	8.02	10.89	17.53	4	4
Feb-11	24946	31318	10.45	11.2	7.9	8.02	0.54	0.8	2.6	3.1
Mar-11	29848	43198	4.8	4.8	7.85	8.01	3.7	10.1	15.1	28
Apr-11	36033	46561	2.4	2.4	7.8	8	0.961	2.13	3.2	5.5
May-11	34406	55395	18.8	18.8	7.83	7.94	1.3	2.1	4.55	4.7
Jun-11	45548	70048	35.9	38	7.72	8.07	9.01	17.87	23.75	30.6
Jul-11	40023	57454	9.7	9.7	7.78	7.89	1.3	2.01	4.05	4.2
Aug-11	37634	46124	4.8	4.8	7.75	8.03	2.83	5.65	9.05	14.7
Sep-11	36017	43686	8	8	7.77	7.9	0.9	1.09	3	3



NEW ENGLAND AQUARIUM - MA0003123								
Outfall Serial Number 001								
Monitoring Period End Date	Total Residual Chlorine		Fecal coliform		Enterococcus		Whole Effluent Toxicity Testing	
	mg/l	mg/l	cfu/ 100 ml	cfu/ 100 ml	cfu/ 100 ml	cfu/ 100 ml	A-NOEC, %	LC50, %
	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Minimum	Maximum		
							----	----
Jan-09	0.51	<b>1.15</b>	<4	<4	<10	<10	----	----
Feb-09	0.285	0.36	<4	<4	<10	<10	----	----
Mar-09	0.372	0.57	<4	<4	<10	<10	----	----
Apr-09	0.668	0.97	<4	<4	<10	<10	----	----
May-09	0.67	<b>1.54</b>	<4	<4	<10	<10	----	----
Jun-09	0.78	0.91	<4	<4	<10	<10	----	----
Jul-09	0.67	0.87	<4	<4	<10	<10	----	----
Aug-09	0.31	0.66	<4	<4	<10	<10	----	----
Sep-09	0.58	0.76	<4	<4	<10	<10	100	100
Oct-09	0.7	0.91	<4	<4	<10	<10	----	----
Nov-09	0.846	0.93	<4	<4	<10	<10	----	----
Dec-09	0.624	0.95	<4	<4	<10	<10	----	----
Jan-10	0.57	0.95	<4	<4	<10	<10	----	----
Feb-10	0.48	0.88	<4	<4	<10	<10	----	----
Mar-10	0.16	0.22	<4	<4	<10	<10	----	----
Apr-10	0.39	<b>1.05</b>	<4	<4	<10	<10	----	----
May-10	0.12	0.37	<4	<4	20	20	----	----
Jun-10	0.29	0.52	<4	<4	<10	<10	----	----
Jul-10	0.35	0.88	<4	<4	<10	<10	----	----
Aug-10	0.26	0.58	54	64	<10	<10	----	----
Sep-10	0.266	0.43	122	240	<10	41	100	100
Oct-10	0.26	0.37	6	8	<10	<10	----	----
Nov-10	0.146	0.4	<4	<4	<10	<10	----	----
Dec-10	0.42	0.98	<4	<4	<10	<10	----	----
Jan-11	0.32	0.6	<4	<4	<10	<10	----	----
Feb-11	0.414	0.85	8	8	<10	<10	----	----
Mar-11	0.18	0.35	8	8	<10	<10	----	----
Apr-11	0.317	0.51	<10	<10	<4	<4	----	----
May-11	0.24	0.55	<4	<4	<10	<10	----	----
Jun-11	0.19	0.52	<4	<4	<10	<10	----	----
Jul-11	0.23	0.44	<4	<4	<10	<10	----	----
Aug-11	0.35	0.65	<4	<4	<10	<10	----	----
Sep-11	0.175	0.28	<4	<4	<10	<10	100	100
Oct-11	0.33	0.5	<4	<4	<10	<10	----	----
Nov-11	0.28	0.6	<4	<4	<10	<10	----	----

