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),

Division of Fisheries and Wildlife
Commonwealth of Massachusetts

is authorized to discharge from the facility located at

Sunderland State Fish Hatchery
Route 116
Sunderland, MA 01375

to receiving water named

Russellville Brook (Connecticut River Basin, MA-34)

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

This permit shall become effective on the date of signature.

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

This permit supersedes the permit issued on September 26, 2007.

This permit consists of 16 pages in Part I including effluent limitations, monitoring requirements, and state permit conditions; 25 pages in Part II, Standard Conditions; and Attachment A – Freshwater Acute Toxicity Test Procedure and Protocol (February 2011).

Signed this 2nd day of October, 2015

/S/SIGNATURE ON FILE
Ken Moraff, Director
Office of Ecosystem Protection
Environmental Protection Agency
Boston, MA

/S/SIGNATURE ON FILE
David Ferris, Director
Massachusetts Wastewater Management Program
Department of Environmental Protection
Commonwealth of Massachusetts
Boston, MA

PART I

A. EFFLUENT LIMITS AND MONITORING REQUIREMENTS

1. During the period beginning the effective date and lasting through expiration, the permittee is authorized to discharge from outfall serial number **001,** treated fish culture water to Russellville Brook. Such discharges shall be limited and monitored by the permittee as specified below. Samples taken in compliance with the monitoring requirements specified below shall be taken at a location that provides a representative analysis of the effluent.

EFFLUENT CHARACTERISTIC		EFFLUENT LIMITS			MONITORING REQUIREMENTS	
PARAMETER	UNITS	AVERAGE MONTHLY	AVERAGE WEEKLY	MAXIMUM DAILY	MEASUREMENT FREQUENCY	SAMPLE TYPE
Flow	MGD	Report Only	***	Report Only	Daily[1]	Instantaneous
BOD_5	mg/l lbs/day	***	***	10 97	2X/Quarter[2]	Composite[3]
TSS	mg/l lbs/day	***	***	10 97	2X/Quarter[2]	Composite[3]
Total Nitrogen, as N[4]	mg/l	***	***	Report Only	2X/Quarter[2]	Composite[3]
Total Phosphorus, as P	mg/l	***	***	Report Only	2X/Quarter[2]	Composite[3]
pH	std units	(see condition I.A.3. of this permit)			Monthly	Grab
Dissolved Oxygen	mg/l	$\geq$ 5.0 mg/l			1X/event, when formalin in use[5]	Grab
Formaldehyde	mg/l	***	***	0.74	1X/event, when formalin in use[5]	Grab
Hydrogen Peroxide	mg/l	***	***	0.7	1X/event, when Perox-aid® in use	Grab
Whole Effluent Toxicity Testing[6, 7]	%	Acute LC_{50} $\geq$ 100%			1X/event, when formalin in use[5]	Grab

Footnotes:

1. The effluent flow shall be measured daily at the weir structure located at the hatchery discharge. Daily flows shall be recorded and the average monthly and maximum daily values shall be reported.

2. Monitoring shall be conducted during each quarter beginning January 1, April 1, July 1, and October 1. During each three-month period, BOD, TSS, Nitrogen, and Phosphorus samples shall be taken immediately following two separate raceway cleaning and/or maintenance activities when pollutant concentrations in the discharge are likely to be at a maximum. The highest value for each parameter within a quarter shall be reported on the DMRs. If raceway cleaning does not take place within a quarter, a "no discharge" code of "c" must be entered on the DMR.

3. Composite Sampling - The composite samples shall consist of at least 8 grab samples collected at approximately equal intervals during the day. For those composite samples collected during cleaning operations:

    a. If raceway flows are continuously discharging through a settling pond or are diverted through a settling pond during cleaning, a representative composite sample shall be taken of the settling pond overflow, during cleaning operations.

    b. If raceway flows during cleaning operations are diverted to treatment lagoons which are continually discharging, a representative composite sample shall be taken of the lagoon discharge at the time of maximum concentration or design detention time, whichever is best representative of maximum concentration.

    c. If lagoons are batch discharged, a representative composite sample shall be taken at the time of discharge.

    d. If raceway or tanks are vacuumed, a representative composite sample of hatchery discharge shall be taken during the vacuuming cycle.

4. Total Nitrogen shall be determined by performing the "Total Kjeldahl Nitrogen (as N)" test and the "Nitrate-Nitrite (as N)" test and adding the two test results together to produce a value for mg/l of Total Nitrogen.

5. Sampling for dissolved oxygen, formaldehyde, and Whole Effluent Toxicity testing shall be conducted once per event during formalin use, when effluent pollutant concentrations are likely to be at a maximum. Sampling is not required if formalin is not

used during the quarter. In such cases, "No Discharge" shall be reported on the Discharge Monitoring Reports. The permittee is required to conduct Whole Effluent Toxicity (WET) testing following EPA Region I Protocols. The test species is

6. *Ceriodaphnia dubia*. A cover letter indicating the sampling location shall be submitted with the test results. The test results shall be submitted by the last day of the month following completion of the test. A test must be performed in accordance with test procedures and protocols specified in **Attachment A** of this permit.

7. The acute Whole Effluent Toxicity test limit is the LC50≥100%. The LC50 is the concentration of effluent which causes mortality to 50% of the test organisms. Therefore, a 100% limit means that a sample of 100% effluent (no dilution) shall cause no more than 50% mortality.

8. If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall either follow procedures outlined in **Attachment A (Toxicity Test Procedure and Protocol**) **Section IV., DILUTION WATER** in order to obtain an individual approval for use of an alternate dilution water, or the permittee shall follow the Self-Implementing Alternative Dilution Water Guidance which may be used to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. This guidance is found in Attachment G of NPDES Program Instructions for the Discharge Monitoring Report Forms (DMRs) which is sent to all permittees with their annual set of DMRs and may also be found on the EPA, Region I web site at http://www.epa.gov/region1/enforcementandassistance/dmr.html. If this guidance is revoked, the permittee shall revert to obtaining individual approval as outlined in **Attachment A**. Any modification or revocation to this guidance 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**.

I.A. (Continued)

2. The discharge shall not cause a violation of the water quality standards of the receiving waters.

3. The pH of the effluent shall not be less than 6.5 nor greater than 8.3 standard units (SU) and not more than 0.5 units outside of the natural background range. There shall be no change from natural background conditions that would impair any designated use assigned to a Class B water.

4. The discharge shall not cause objectionable discoloration of the receiving waters.

5. The effluent shall not contain visible oil sheen, foam, floating solids, or settleable solids at anytime.

6. The permittee shall not discharge into the receiving water any pollutant or combination of pollutants in toxic amounts.

7. There shall be no discharge of sodium hypochlorite or other chlorination chemicals from the hatchery into the receiving water unless EPA is notified and the permit modified as necessary to protect the receiving water against toxicity.

8. There shall be no discharge of untreated wastewaters resulting from cleaning accumulated solids in the raceways, culture tanks, screens and associated equipment.

9. The results of sampling for any parameter done more often than its required frequency in accordance with EPA approved methods must also be reported.

10. The permittee shall notify EPA and the State within 24-hours upon the occurrence of a water quality induced mortality of greater than 25 percent in any aquatic species under culture at the facility in accordance with reporting requirements in the Standard Conditions, Part II.D.1.e.

11. In accordance with 40 Code of Federal Regulations (CFR) §122.42, 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 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 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 CFR §122.21(g)(7); or

(4) Any other notification level established by the Director in accordance with 40 CFR §122.44(f) and Massachusetts regulations.

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 CFR §122.21(g)(7); or

(4) Any other notification level established by the Director in accordance with 40 CFR §122.44(f) and Massachusetts regulations.

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.

12. No components of the effluent shall result in any demonstrable harm to aquatic life or violate any 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, with the permittee being so notified.

13. This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable standard or limitation promulgated or approved under sections 301(b)(2)(C) and (d), 304(b)(2), and 307(a)(2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:

    a. Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

    b. Controls any pollutants not limited in the permit.

14. Any change in: 1) the fish species to be raised at this facility or, 2) the development stage to be attained at this facility, will require written notification to EPA and the State and possible permit modification.

I.B. NARRATIVE EFFLUENT LIMITATION REQUIREMENTS

1. Drug Use

Except as noted below, the permittee must notify EPA and the MassDEP in accordance with the following procedures of any investigational new animal drug (INAD) or extra-label drug use which may lead to a discharge of the drug to waters of the United States as stipulated below. However, reporting is not required for any INAD or extra-label drug use that has been previously approved by the US Food and Drug Agency (USFDA) for a different species or disease if the INAD or extra-label use is at or below the approved dosage and involves similar conditions of use.

a. The permittee must provide to EPA and MassDEP a written report of the impending use of INAD within seven (7) days of agreeing or signing up to participate in an INAD study. The written report must identify the INAD to be used, method of use, the dosage, and the disease or condition the INAD is intended to treat.

b. For INAD's and extra-label drug uses, the permittee must provide an oral report to EPA and MassDEP as soon as possible, preferably in advance of use, but no later than seven (7) days after initiating use of that drug. The oral report must identify the drugs used, method of application, and the reason for using that drug.

c. For INAD's and extra-label drug uses, the permittee must provide a written report to EPA and MassDEP within thirty (30) days after initiating use of that drug. The written report must identify the drug used and include: the reason for

treatment, date(s) and time(s) of the addition (including duration), method of application; and the amount added.

2. Structural Failure and/or Damage to Culture Units

The permittee must notify EPA and MassDEP in accordance with the following procedures when there is a "reportable failure" in, or damage to, the structure of an aquatic animal containment system (i.e, culture unit) or its wastewater treatment system that results in an unanticipated material discharge of pollutants to waters of the United States.

a. For this facility, a "reportable failure" applies only to active culture units (ones that contain fish and flowing water) and their ancillary components and refers to the collapse or damage of a rearing unit or its wastewater treatment system; damage to pipes, valves, and other plumbing fixtures; and damage or malfunction to screens or physical barriers in the system, which would prevent the rearing unit from containing water, sediment (i.e. settled solids), and the aquatic animals being reared. Wastewater treatment systems include ponds or settling tanks to which cleaning water is directly discharged and culture units which are used for the temporary storage of settled solids removed from active culture units.

b. The permittee must provide an oral report to EPA and MassDEP within twenty-four (24) hours of discovery of any reportable failure as defined in item 2.a. or damage that results in a material discharge of pollutants. The report shall describe the cause of the failure or damage in the containment system and identify materials that have been released to the environment as a result of that failure.

c. The permittee must provide a written report to EPA and MassDEP within seven (7) days of discovery of the failure or damage documenting the cause, an estimate of the material released as a result of the failure or damage, and steps being taken to prevent a recurrence.

3. Spills

In the event a spill of drugs, pesticides or feed occurs that results in a discharge to "waters" or "a water" of the United States, the permittee must provide an oral report of the spill to EPA and MassDEP within twenty-four (24) hours of its occurrence and a written report within seven (7) days to the above Agencies. The report shall include the identity and quantity of the material spilled.

4. Best Management Practices (BMP) Plan

The permittee must implement and maintain a BMP Plan (PLAN) on site that describes how the following requirements will be achieved. The permittee will make the current version of that PLAN available to EPA and/or the MassDEP upon request. The permittee shall implement the intent of the BMP following requirements upon the permit's effective date. The permittee, however, has ninety (90) days following the permit's effective date to certify in writing to EPA and MassDEP that a written PLAN has been developed in accordance with requirements listed in this part and must submit that certification with the appropriate DMR.

Further, the permittee shall amend the PLAN within thirty (30) days following any change in facility design, construction, operation, or maintenance which affects the potential for the discharge of pollutants into surface waters or after the EPA and/or MassDEP determine certain changes are required following an event that results in non-compliance, a facility inspection, or review of the PLAN. The permittee shall place in the PLAN a written documentation of each amended change along with a brief description stating the reason for the amendment, including the date of the change that triggered the amendment. The permittee shall also document what date the amended PLAN was implemented.

The PLAN must address, at a minimum, the following requirements:

a. Solids Control

i. Employ efficient feed management and feeding strategies that limit feed input to the minimum amount reasonably necessary to achieve production goals and sustain targeted rates of aquatic animal growth in order to minimize potential discharges of uneaten feed and waste products to waters of the United States.

ii. In order to minimize the discharge of accumulated solids from settling tanks, basins and production systems, identify and implement procedures for routine cleaning of rearing units and settling tanks, and procedures to minimize any discharge of accumulated solids during the inventorying, grading and harvesting of aquatic animals in the production system. Part I.A.8. prohibits the direct discharge of cleaning water absent some form of solids removal prior to discharge.

iii. If any material is removed from the rearing units and/or settling tanks, describe where it is to be placed and the techniques used to prevent it from entering the surface waters from any on-site storage. If the material is

removed from the site, describe who received the material and its method of disposal and/or reuse.

iv. Remove and dispose of aquatic animal mortalities properly on a regular basis to prevent discharge to waters of the United States, except in cases where EPA and MassDEP authorizes such discharges in order to benefit the aquatic environment.

b. Biological Control

i. Describe in detail the precautions that will be exercised by the facility to prevent aquatic organisms that are neither indigenous nor naturalized to Massachusetts waters from becoming established in the local surface waters.

ii. Provide a description of any storage and/or treatment strategies designed to prevent biological pollution (non-indigenous organisms including fish parasites and fish pathogens and dead or dying fish) from entering the receiving water when the cultured fish population or a portion thereof are showing signs of stress.

c. Materials Storage

i. Ensure proper storage of drugs, pesticides, and feed in a manner designed to prevent spills that may result in the discharge of drugs, pesticides or feed to water of the United States.

ii. Implement procedures for properly containing, cleaning, and disposing of any spilled material.

d. Structural Maintenance

i. Inspect the production system and the wastewater treatment system on a routine basis in order to identify and promptly repair any damage.

ii. Conduct regular maintenance of the production system and the wastewater treatment system in order to ensure that they are properly functioning.

e. Recordkeeping

i. In order to show how representative feed conversion ratios were calculated, maintain records documenting the feed amounts and estimates of the number and weight of aquatic animals for each rearing unit.

ii. Keep records that document the frequency of cleaning, inspections, repairs and maintenance. In addition, records of all medicinal and chemical usage (i.e., for each occurrence) at the facility shall be recorded and filed in the PLAN to include the dosage concentration, frequency of application (hourly, daily, etc.) and the duration (hours, days) of treatment, and the method of application.

f. Training

i. In order to ensure the proper clean-up and disposal of material, adequately train all relevant facility personnel in spill prevention and how to respond in the event of a spill.

ii. Train staff on the proper operation and cleaning of production and wastewater treatment systems including training in feeding procedures and proper use of equipment.

g. Aquaculture Drugs and Chemicals Used for Disease Control and/or Prevention

List in the PLAN all aquaculture drugs and chemicals including all INAD and extra-label drugs and for each, identify:

i. Product name and manufacturer.

ii. Chemical formulation.

iii. Purpose/reason for its use.

iv. Dosage concentration, frequency of application (hourly, daily, etc.) and the duration (hours, days) of application.

v. The method of application.

vi. Material Safety Data Sheets (MSDS), Chemical Abstracts Service Registry number for each active therapeutic ingredient.

vii. The method or methods, if any, used to detoxify the wastewater prior to its discharge.

viii. Information on the persistence and toxicity in the environment.

ix. Information on the USFDA approval for the use of said medication or chemical on fish or fish related products used for human consumption.

x. Available aquatic toxicity data (vendor data, literature data, etc.); Lethal Concentration to 50 percent test organisms (LC_{50}) at 48 and/or 96 hours and No Effect Level (NOEL) concentrations for typical aquatic organisms (salmon, trout, daphnia, fathead minnow, etc.).

5. General Definitions

a. Approved Dosage - the dose of a drug that has been found to be safe and effective under the conditions of a new animal drug application.

b. Aquatic Animal Containment System - a culture or rearing unit such as a raceway, pond, tank, net or other structure used to contain, hold or produce aquatic animals. The containment system includes structures designed to hold sediments and other materials that are part of a wastewater treatment system.

c. Drug - any substance defined as a drug in section 201(g)(2) of the Federal Food, Drug and Cosmetic Act (21 U.S.C. 321).

d. Extra-label Drug Use - a drug approved under the Federal Food, Drug and Cosmetic Act that is not used in accordance with the approved label direction, see 21 CFR Part 530.

e. Investigational New Animal Drug (INAD) - drug for which there is a valid exemption in effect under section 512(j) of the Federal Food, Drug, and Cosmetic Act, 21 U.S.C. 360b(j), to conduct experiments.

f. New Animal Drug Application - defined in 512(b)(1) of the Federal Food, Drug, and Cosmetic Act [21 U.S.C. 360(b)(1)].

g. Pesticide - any substance defined as a “pesticide” in section 2(u) of the Federal Insecticide, Fungicide, and Rodenticide Act [7 U.S.C. 136(u)].

I.C. 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 Part II Standard Conditions of this permit (Twenty-four hour reporting).

I.D. MONITORING AND REPORTING

The monitoring program in the permit specifies sampling and analysis, which will provide continuous information on compliance and the reliability and effectiveness of the installed pollution abatement equipment. The approved analytical procedures found in 40 CFR Part 136 are required 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. Unless otherwise specified in this permit, the permittee shall submit reports, requests, and information and provide notices in the manner described in this section.

1. Submittal of DMRs Using NetDMR

   The permittee shall continue to submit its monthly monitoring data in discharge monitoring reports (DMRs) to EPA and MassDEP no later than the 15th day of the month electronically using NetDMR. When the permittee submits DMRs using NetDMR, it is not required to submit hard copies of DMRs to EPA or MassDEP.

2. Submittal of Reports as NetDMR Attachments

   Unless otherwise specified in this permit, the permittee shall electronically submit all reports to EPA as NetDMR attachments rather than as hard copies. Permittees shall continue to send hard copies of reports other than DMRs to MassDEP until further notice from MassDEP. (See Part I.D.5. for more information on state reporting.) Because the due dates for reports described in this permit may not coincide with the due date for submitting DMRs (which is no later than the 15th day of the month), a report submitted electronically as a NetDMR attachment shall be considered timely if it is electronically submitted to EPA using NetDMR with the next DMR due following the particular report due date specified in this permit.

3. Submittal of Requests and Reports to EPA

   The following requests, reports, and information described in this permit shall be submitted to the EPA NPDES Applications Coordinator in the EPA Office Ecosystem Protection (OEP).

a. Transfer of permit notice
b. Request for changes in sampling location
c. Notification of proposal to add or replace chemicals and bio-remedial agents including microbes

These reports, information, and requests shall be submitted to EPA/OEP electronically at R1NPDES.Notices.OEP@epa.gov or by hard copy mail to the following address:

U.S. Environmental Protection Agency
Office of Ecosystem Protection
EPA/OEP NPDES Applications Coordinator
5 Post Office Square - Suite 100 (OEP06-03)
Boston, MA 02109-3912

4. Submittal of Reports in Hard Copy Form

Any hard copies that are submitted to EPA shall be submitted to the Director at the following address:

U.S. Environmental Protection Agency
Office of Environmental Stewardship
Water Technical Unit
5 Post Office Square - Suite 100 (OES04-04)
Boston, MA 02109-3912

5. State Reporting

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

Massachusetts Department of Environmental Protection
Western Regional Office
Bureau of Water Resources
436 Dwight Street
Springfield, Massachusetts 01103

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

A copy of all technical information associated with medications and chemicals used for disease/parasite control and complementary aquatic

toxicology and biological pollution shall be submitted to the following:

U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, Massachusetts 01035-9589

Massachusetts Department of Environmental Protection
Watershed Planning Program
8 New Bond Street
Worcester, Massachusetts 01606

Massachusetts Department of Fisheries, Wildlife and
Environmental Law Enforcement
Massachusetts Division of Fisheries and Wildlife
Field Headquarters
One Rabbit Hill Road
Westborough, Massachusetts 01581

Copies of toxicity tests only shall be submitted to:

Massachusetts Department of Environmental Protection
Watershed Planning Program
8 New Bond Street
Worcester, Massachusetts 01606

Additional monitoring and recordkeeping requirements are contained in Section C of the Part II Standard Conditions of this permit. Section C includes, but is not limited to, the requirements to record: the date, exact place, and time of sampling, measurements, and analyses; the individual(s) who performed the sampling, measurements, and analyses; the analytical techniques or methods used; and the results of such analyses. Section C of Part II also includes the requirements to retain records of all monitoring information, including all data, for a period of at least 3 years from the date of the sample, measurement, report or application.

Additional reporting requirements are contained in Section D of the Part II Standard Conditions of this permit. Section D requires reporting of monitoring results on a Discharge Monitoring Report (DMR), as well as reporting within 24 hours of any noncompliance which may endanger health or the environment. Section D also requires reporting to EPA if a variety of conditions exist, including planned changes to the facility and anticipated or unanticipated noncompliance. This section also sets the signatory and public availability requirements of reports sent to EPA.

I.E. 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 CMR 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 a 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.

USEPA REGION 1 FRESHWATER 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:

- **Daphnid (Ceriodaphnia dubia) definitive 48 hour test.**
- **Fathead Minnow (Pimephales promelas) definitive 48 hour test.**

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

II. METHODS

The permittee shall use 40 CFR Part 136 methods. Methods and guidance may be found at:

http://water.epa.gov/scitech/methods/cwa/wet/disk2_index.cfm

The permittee shall also meet the sampling, analysis and reporting requirements included in this protocol. This protocol defines more specific requirements while still being consistent with the Part 136 methods. If, due to modifications of Part 136, there are conflicting requirements between the Part 136 method and this protocol, the permittee shall comply with the requirements of the Part 136 method.

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 chemical and physical analyses required. The remaining sample shall be measured for total residual chlorine and 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 chlorine (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. If dechlorination is necessary, a thiosulfate control (maximum amount of thiosulfate in lab control or receiving water) must also be run in the WET test.

All samples held overnight shall be refrigerated at 1- 6^{o}C.

IV. DILUTION WATER

A grab sample of dilution water used for acute toxicity testing shall be collected from the receiving water at a point immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location. Avoid collection near areas of obvious road or agricultural runoff, storm sewers or other point source discharges and areas where stagnant conditions exist. In the case where an alternate dilution water has been agreed upon an additional receiving water control (0% effluent) must 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 hardness, pH, conductivity, alkalinity, organic carbon, and total suspended solids 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 alternate dilution water should be mailed with supporting documentation to the following address:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency-New England
5 Post Office Sq., Suite 100 (OEP06-5)
Boston, MA 02109-3912

and

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

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

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

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

The following tables summarize the accepted daphnid and fathead minnow toxicity test conditions and test acceptability criteria:

EPA NEW ENGLAND EFFLUENT TOXICITY TEST CONDITIONS FOR THE DAPHNID, CERIODAPHNIA DUBIA 48 HOUR ACUTE TESTS[1]

1.	Test type	Static, non-renewal
2.	Temperature (^{o}C)	20 $\pm$ 1^{o}C or 25 $\pm$ 1^{o}C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hour light, 8 hour dark
5.	Test chamber size	Minimum 30 ml
6.	Test solution volume	Minimum 15 ml
7.	Age of test organisms	1-24 hours (neonates)
8.	No. of daphnids per test chamber	5
9.	No. of replicate test chambers per treatment	4
10.	Total no. daphnids per test concentration	20
11.	Feeding regime	As per manual, lightly feed YCT and Selenastrum to newly released organisms while holding prior to initiating test
12.	Aeration	None
13.	Dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q^{R} or equivalent deionized water and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC
15.	Number of dilutions	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution

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

Footnotes:

1. Adapted from EPA-821-R-02-012.
2. Standard prepared dilution water must have hardness requirements to generally reflect the characteristics of the receiving water.

EPA NEW ENGLAND TEST CONDITIONS FOR THE FATHEAD MINNOW (PIMEPHALES PROMELAS) 48 HOUR ACUTE TEST[1]

1.	Test Type	Static, non-renewal
2.	Temperature (^{o}C)	20 $\pm$ 1 ^{o} C or 25 $\pm$ 1^{o}C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hr light, 8 hr dark
5.	Size of test vessels	250 mL minimum
6.	Volume of test solution	Minimum 200 mL/replicate
7.	Age of fish	1-14 days old and age within 24 hrs of each other
8.	No. of fish per chamber	10
9.	No. of replicate test vessels per treatment	4
10.	Total no. organisms per concentration	40
11.	Feeding regime	As per manual, lightly feed test age larvae using concentrated brine shrimp nauplii while holding prior to initiating test
12.	Aeration	None, unless dissolved oxygen (D.O.) concentration falls below 4.0 mg/L, at which time gentle single bubble aeration should be started at a rate of less than 100 bubbles/min. (Routine D.O. check is recommended.)
13.	dilution water[2]	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q^{R} or equivalent deionized and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	$\geq$ 0.5, must bracket the permitted RWC

15.	Number of dilutions	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution series.
16.	Effect measured	Mortality-no movement on gentle prodding
17.	Test acceptability	90% or greater survival of test organisms in dilution water control solution
18.	Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples are used within 36 hours of collection.
19.	Sample volume required	Minimum 2 liters

Footnotes:

1. Adapted from EPA-821-R-02-012
2. Standard dilution water must have hardness requirements to generally reflect characteristics of the receiving water.

VI. CHEMICAL ANALYSIS

At the beginning of a static acute toxicity test, pH, conductivity, total residual chlorine, oxygen, hardness, alkalinity and temperature must be measured in the highest effluent concentration and the dilution water. Dissolved oxygen, pH and temperature are also measured at 24 and 48 hour intervals in all dilutions. The following chemical analyses shall be performed on the 100 percent effluent sample and the upstream water sample for each sampling event.

Parameter	Effluent	Receiving Water	ML (mg/l)
Hardness[1]	x	x	0.5
Total Residual Chlorine (TRC)[2, 3]	x		0.02
Alkalinity	x	x	2.0
pH	x	x	--
Specific Conductance	x	x	--
Total Solids	x		--
Total Dissolved Solids	x		--
Ammonia	x	x	0.1
Total Organic Carbon	x	x	0.5
Total Metals			
Cd	x	x	0.0005
Pb	x	x	0.0005
Cu	x	x	0.003
Zn	x	x	0.005
Ni	x	x	0.005
Al	x	x	0.02
Other as permit requires			

Notes:

1. Hardness may be determined by:
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 2340B (hardness by calculation)
     - Method 2340C (titration)
2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.
   - APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
     - Method 4500-CL E Low Level Amperometric Titration
     - Method 4500-CL G DPD Colorimetric Method
3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing.

VII. TOXICITY TEST DATA ANALYSIS

LC50 Median Lethal Concentration (Determined at 48 Hours)

Methods of Estimation:

- Probit Method
- Spearman-Karber
- Trimmed Spearman-Karber
- Graphical

See the flow chart in Figure 6 on p. 73 of EPA-821-R-02-012 for appropriate method to use on a given data set.

No Observed Acute Effect Level (NOAEL)

See the flow chart in Figure 13 on p. 87 of EPA-821-R-02-012.

VIII. TOXICITY TEST REPORTING

A report of the results will include the following:

- 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
- 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 toxicant test data should be included.
- All chemical/physical data generated. (Include minimum detection levels and minimum quantification levels.)
- Raw data and bench sheets.
- Provide a description of dechlorination procedures (as applicable).
- Any other observations or test conditions affecting test outcome.

NPDES PART II STANDARD CONDITIONS
(January, 2007)

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PART II. A. GENERAL REQUIREMENTS

1. Duty to Comply

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

a. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirements.

b. The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any of such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402 (a)(3) or 402 (b)(8) of the CWA is subject to a civil penalty not to exceed $25,000 per day for each violation. Any person who negligently violates such requirements is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both. Any person who knowingly violates such requirements is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both.

c. Any person may be assessed an administrative penalty by the Administrator for violating Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.

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

2. Permit Actions

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

3. Duty to Provide Information

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

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.

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.

(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

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

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

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.

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.

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.

(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

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

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).

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.

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.

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.

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.

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,

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.

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 1×10^{-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.

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 or 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.

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.

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_2	Total residual chlorine
TRC	Total residual chlorine which is a combination of free available chlorine (FAC, see below) and combined chlorine (chloramines, etc.)

TRO	Total residual chlorine in marine waters where halogen compounds are present
FAC	Free available chlorine (aqueous molecular chlorine, hypochlorous acid, and hypochlorite ion)
Coliform	
Coliform, Fecal	Total fecal coliform bacteria
Coliform, Total	Total coliform bacteria
Cont. (Continuous)	Continuous recording of the parameter being monitored, i.e. flow, temperature, pH, etc.
Cu. M/day or M^3/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_3-N	Ammonia nitrogen as nitrogen
NO_3-N	Nitrate as nitrogen
NO_2-N	Nitrite as nitrogen
NO_3-NO_2	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

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_{50}	LC_{50} is the concentration of a sample that causes mortality of 50% of the test population at a specific time of observation. The LC_{50} = 100% is defined as a sample of undiluted effluent.
ZID	Zone of Initial Dilution means the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports.

UNITED STATES ENVIRONMENTAL PROTECTION
AGENCY NEW ENGLAND - REGION I
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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: **MA0110035**

PUBLIC NOTICE START AND END DATES: **August 14, 2015 – September 12, 2015**

NAME AND MAILING ADDRESS OF APPLICANT:

Division of Fisheries and Wildlife
Commonwealth of Massachusetts
McLaughlin State Fish Hatcheries
90 East Street
Belchertown, MA 01007

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Sunderland State Fish Hatchery
Route 116
Sunderland, MA 01375

RECEIVING WATER: **Russellville Brook (Connecticut River Basin, MA-34)**

RECEIVING WATER CLASSIFICATION: **Massachusetts Class B (Warm Water)**

SIC CODE: **0921**

Table of Contents

ATTACHMENTS

1.0 PROPOSED ACTION, TYPE OF FACILITY AND DISCHARGE LOCATION

1.1 Proposed Action

The Massachusetts Division of Fisheries and Wildlife (MassWildlife, or the permittee) operates the Sunderland State Fish Hatchery (Sunderland, or the hatchery) in Sunderland, Massachusetts (see Attachment A for site location). The hatchery is primarily engaged in the production of brook trout, brown trout, and rainbow trout to support stocking in a number of waterbodies throughout Massachusetts.

MassWildlife has applied to the U.S. Environmental Protection Agency (EPA) for reissuance of its NPDES permit to discharge into Russellville Brook. The previous permit was issued on September 26, 2007 (2007 Permit), and expired on November 30, 2012. EPA received the application for permit re-issuance on May 21, 2012. Since the application for permit re-issuance was considered timely and complete by EPA, the previous permit has been administratively continued until EPA takes action on the re-issuance. *See* 40 C.F.R. §122.6.

1.2 Type of Facility and Discharge Location

The Sunderland State Fish Hatchery began operation in 1913. Brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*) and rainbow trout (*Onchorhynchus mykiss*) have been in culture at the hatchery from its construction through the present day. The water source is from natural springs and two (2) gravel packed wells. There are eight natural bottom raceways and six earthen ponds in which the fish are raised at the facility. See Attachment B for a schematic diagram of the hatchery. The hatchery raceways and ponds are in a natural setting of trees, meadows and wetlands, which results in substantial input of natural allocthonous matter (carbon or nutrients that come from outside the aquatic system) into the raceway/pond system. The natural allocthonous matter provides a natural food source for the fish and promotes natural decomposition and processing of the fish waste within the raceway system.

There are five quiescent zone settling basins (Settling Basins A – E; Attachment B) located at various points of the raceway/pond system in the hatchery. In addition, at the terminal end of the hatchery, there are also four settling pools. These settling areas allow the fish wastes produced at the hatchery to be treated by natural decomposition. The outflow from the final settling pools flows into a drainage ditch, which was likely originally constructed to reduce flooding of the adjacent fields. The ditch flows to the west and then south, is joined by some other drainage channels and then joins "named" Russellville Brook north of Plum Tree Road and west of Route 116, about one-quarter to one-half mile from the hatchery. Russellville Brook is a tributary to the Connecticut River.

A concentrated aquatic animal production (CAAP) facility based on criteria found in 40 C.F.R. §122.24(b) and 40 C.F.R. Part 122 Appendix C is defined as a hatchery, fish farm, or other facility that "contains, grows, or holds 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 facilities which produce less than 9,090 harvest weight kilograms

(approximately 20,000 pounds) of aquatic animals per year; and facilities which feed less than 2,272 kilograms (approximately 5,000 pounds) of food during the calendar month of maximum feeding". According to MassWildlife, annual production is estimated at 13,000 pounds (lbs) of brook trout, 29,000 pounds of brown trout, and 37,000 pounds of rainbow trout, for a total of approximately 79,000 pounds of aquatic animals per year. During the month of maximum feeding (August), the facility estimates the use of 16,680 lbs of feed. Based on their production levels and feed use, as well as monthly Discharge Monitoring Reports (DMRs), the facility will likely: (1) discharge more than 30 days per year; (2) produce more than 20,000 lbs harvest weight of fish per year; and (3) feed more than 5,000 lbs of food during the month of maximum feeding during the next permit cycle. Therefore the Sunderland Hatchery is defined as a CAAP facility according to the regulations at 40 C.F.R. §122.24(c) and its discharge must be authorized by an NPDES permit.

Discharges from CAAP operations, such as the Sunderland Hatchery, typically contain organic and inorganic solids, nutrients, and chemicals used in the prevention and treatment of various diseases. Any of these constituents could impair the water quality in the receiving water. Dissolved and particulate solids in the discharge result from fish feces and uneaten food particles. Nutrients, such as phosphorus and nitrogen, are associated with these solids. The presence of nutrients can result in excessive growth of any or all of the three main algae types: phytoplankton (floating freely in water column), periphyton (attached to aquatic vegetation or other structures) and benthic (attached to bottom sediments). The decay of organic solids resulting from excessive concentrations of solids and nutrients can cause low levels of dissolved oxygen in the receiving water.

The fish culture wastewater, which contains metabolic waste products from the fish, had a monthly average flow of 2.09 million gallons per day (MGD), with a maximum daily flow of 3.07 MGD, based on Discharge Monitoring Report (DMR) data at the hatchery from January 2008 through May 2015. About 75% of the water is from uncontrolled flowing springs, and the remainder is from wells. Floating feed is used, which does not carry over into the discharge. Most of the solid wastes from the fish are settled and captured in the raceways and ponds, and periodically removed by a vacuum pump. The solids are disposed of on land at the facility. At the end of the series of raceways and ponds, there is a settling pond to capture solids which escape the ponds and raceways. The final discharge is to Russellville Brook, a tributary to the Connecticut River.

The effluent quality reported on DMR forms from January 2008 through May 2015 is summarized in Attachment C.

1.3 Chemicals, Drugs, and Disinfectants Currently Used at Sunderland

MassWildlife's biosecurity procedures, including obtaining eggs and fish from certified disease free sources, covering outdoor raceways with nets to minimize contact with birds, and limiting hatch house access, are designed to minimize the need for chemotherapeutic agents and medications. MassWildlife's goal is to use as few chemotherapeutic agents as possible. However, if a disease or parasitic outbreak occurs at the hatchery, a specific diagnosis is made

by the Fish Pathologist and only drugs and chemicals approved by the U.S. Food and Drug Administration (FDA) for aquaculture or low regulatory priority drugs for aquaculture as regulated by the FDA are used. The hatchery follows all required FDA procedures and recommendations for use of any drugs or chemotherapeutic chemicals. Below is a list of all the chemicals/drugs that may be used at Sunderland along with their intended use.

37% formalin solution – for treatment of the FDA-approved species of external protozoan parasites and monogenetic trematodes on trout. Formalin has not been used at the hatchery from January 2008 through May 2015. Still, the draft permit retains limitations specific to the use of formalin should it be used in the future.

Oxytetracycline medicated feed – FDA approved use for treatment of ulcer disease, furunculosis, bacterial hemorrhagic septicemia and pseudomonas disease.

Sulfadimethoxine/ormetprim medicated feed (Romet 30) – FDA approved as medicated feed to treat furunculosis.

Hydrogen peroxide solution 35% (PEROX-AID®) – to control for the mortality of eggs due to saprolegniasis and bacterial gill disease of fish caused by *Flavobacterium branchiophilum.* FDA considers PEROX-AID® a low regulatory priority.

NaCl solution 0.5-3% - as an osmoregulatory aid for the relief of stress and prevention of shock in transport tank when moving fish and as a dip treatment to reduce excess mucous on the skin of fish caused by a heavy parasite load. FDA considers NaCl solution to be a low regulatory priority drug.

Florfenicol – to treat coldwater disease and furunculosis in trout as an in-feed antibiotic.

Tricaine S (MS222) - FDA approved use as a fish anesthetic.

All of the listed drugs that may be used at Sunderland are FDA-approved and administered in accordance with FDA recommendations. The draft permit contains effluent limitations that apply when formalin or hydrogen peroxide are in use. See sections entitled “Hydrogen Peroxide” and “Formalin” later in this fact sheet. The listed drugs above, if used at the hatchery, would eventually be discharged as part of the facility’s effluent.

The hatchery may also use sodium hypochlorite to sterilize the on-station stocking tanks and sodium thiosulfate, which is used to neutralize chlorine. When used, these two chemicals are drained onto the hatchery lawn in a location where they will not enter the effluent.

2.0 RECEIVING WATER DESCRIPTION

2.1 River Classification

Russellville Brook is designated as a Class B waterbody and warm water fishery by the Massachusetts Surface Water Quality Standards (314 CMR 4.06). Class B waters are designated as a habitat for fish, other aquatic life, and wildlife, and for primary and secondary contact recreation. Where designated they shall be suitable as a source of public water supply with appropriate treatment. They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value (314 CMR 4.05(3)(b)).

2.2 Water Quality Assessment

Section 303(d) of the Federal Clean Water Act (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 total maximum daily loads (TMDLs). Russellville Brook is not included in the most recently EPA approved Massachusetts list of waters requiring the development of TMDLs (i.e., 303(d) list or Category 5 of the Massachusetts Year 2012 Integrated List of Waters and proposed 2014 Integrated List of Waters). However, Russellville Brook joins the Connecticut River at segment MA34-04. This segment of the Connecticut River is listed as Category 5 water ("waters requiring a TMDL") for *Escherichia coli* and PCBs in fish tissue. The Sunderland Hatchery discharge will not cause or contribute to either impairment of the Connecticut River. Since the hatchery discharge enters the Connecticut River via Russellville Brook, and the Connecticut River discharges to Long Island Sound, EPA has considered the input of pollutants to Long Island Sound from the hatchery as part of this proposed permit action, specifically nutrients (nitrogen), in accordance with the TMDL (See Section 5.5).

3.0 PERMIT BASIS: STATUTORY AND REGULATORY AUTHORITY

3.1 General Background

The 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. The draft NPDES permit was developed in accordance with various statutory and regulatory requirements established pursuant to the CWA and applicable State regulations. The regulations governing the EPA NPDES permit program are generally found at 40 C.F.R. Parts 122, 124, 125, and 136. In this permit EPA considered (a) technology-based requirements, (b) water quality-based requirements, and (c) all limitations and requirements in the current permit, when developing the permit limits.

3.2 Technology-Based Requirements

Subpart A of 40 C.F.R. 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.

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 C.F.R. §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 available (BAT) for toxic and non-conventional pollutants. In general, technology-based effluent guidelines for non-POTW facilities must have been 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 C.F.R. §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.

On August 23, 2004, EPA promulgated technology-based effluent limitations guidelines (ELGs) for the Concentrated Aquatic Animal Production (CAAP) Point Source Category at 40 C.F.R. Part 451, Subpart A (Flow-through and Recirculating Systems Subcategory) for facilities that contain, hold, or produce more than 100,000 pounds of aquatic animals per year. *See* 69 Fed. Reg. 51906 (August 23, 2004). Compliance with the newly promulgated effluent limitations guidelines for fish hatcheries is, effectively, from date of permit issuance. *See* 69 Fed. Reg. 51893 (August 23, 2004). In the final rule, EPA concluded that "the key element in achieving effective pollution control at CAAP facilities is a well-operated program to manage feeding, in addition to good solids management" (69 Fed. Reg. 51907). The promulgated ELGs require facilities to comply with specific operational and management requirements (*i.e.*, best management practices) for solids control, materials storage, structural maintenance, recordkeeping, and training. The ELGs are not applicable at the Sunderland State Fish Hatchery because the facility produces less than 100,000 pounds of aquatic animals per year. Still, the draft permit applies requirements to implement best management practices (BMPs) informed by the ELGs under best professional judgment and incorporates some of the requirements of the ELGs, particularly the narrative requirements in the current permit in compliance with antibacksliding regulations at 40 C.F.R. §122.44.

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 C.F.R. §§122.41(j), 122.44(i) and 122.48. The approved analytical procedures are to be found in 40 C.F.R. Part 136 unless other procedures are explicitly required in the permit.

3.3 Water Quality-Based Requirements

Section 301(b)(1)(C) of the CWA requires that effluent limitations based on water quality considerations be established for point source discharges when such limitations are necessary to

meet state or federal water quality standards that are applicable to the designated receiving water. This is necessary when technology-based limitations would interfere with the attainment or maintenance of water quality in the receiving water.

Under Section 301(b)(1)(C) of the CWA and EPA regulations, NPDES permits must contain effluent limits more stringent than technology-based limits where more stringent limits are necessary to maintain or achieve state or federal water quality standards. Water quality standards consist of three parts: (1) beneficial designated uses for a waterbody or a segment of a waterbody; (2) numeric and/or narrative water quality criteria sufficient to protect the assigned designated use(s); and (3) antidegradation requirements to ensure that once a use is attained it will not be degraded. The Massachusetts Surface Water Quality Standards, 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 criteria is established.

3.3.1 Reasonable Potential

The Draft Permit must limit any pollutant or pollutant parameter (conventional, non-conventional, and toxic) that is or may be discharged at a level that causes or has the "reasonable potential" to cause or contribute to an excursion above any water quality standard (40 C.F.R. §122.44(d)). An excursion occurs if the projected or actual in-stream concentration exceeds an applicable water quality criterion. In determining "reasonable potential" EPA considers: (1) existing controls on point and non-point sources of pollution; (2) pollutant concentration and variability in the effluent and receiving water as determined from the permit's re-issuance application, monthly discharge monitoring reports (DMRs), and State and Federal Water Quality Reports; (3) sensitivity of the indicator species used in toxicity testing; (4) the statistical approach outlined in *Technical Support Document for Water Quality-Based Toxics Control* (TSD), March 1991, EPA/505/2-90-001 in Section 3; and, where appropriate, (5) dilution of the effluent in the receiving water.

3.3.2 Dilution Factor

Water quality-based effluent limitations are established using available dilution. 314 CMR 4.03(3)(a) requires that water quality criteria must be applied at the most severe hydrologic condition. Those standards allow the use of dilution by the receiving waters for certain types of effluent parameters, using the seven-day, once in ten year, drought flow (7Q10). However, because the receiving water, Russellville Brook, is so small, its 7Q10 is essentially zero. Thus, during drought periods, essentially all of the flow downstream from the hatchery is from the natural spring water and well water used to raise fish. Thus, there is no dilution of the discharge water, and no dilution has been used in calculating effluent limit.

3.3.3 Antidegradation

The Commonwealth of Massachusetts' antidegradation provisions found in 314 CMR 4.04

ensure that provisions in 40 C.F.R. §131.12 are met. These provisions ensure that all existing uses in the receiving water, along with the level of water quality necessary to protect those existing uses, are maintained and protected. The effluent limits in the draft permit should ensure that provisions in 314 CMR 4.04 are met. The State is also asked to certify that the antidegradation provisions in State law are met. EPA anticipates that the MassDEP shall make a determination that there shall be no significant adverse impacts to the receiving water and no loss of existing uses as a result of the discharge authorized by this permit.

3.4 Antibacksliding

A permit may not be renewed, reissued, or modified with less stringent limitations or conditions than the comparable effluent limitations in the previous permit unless in compliance with the antibacksliding requirements of the CWA. *See* Sections 402(o) and 40 C.F.R §122.44(l)(1) and (2). These 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.

This draft permit complies with the anti-backsliding requirements of the CWA. All proposed limitations in the draft permit are at least as stringent as those included in the 2007 Permit.

4.0 OUTFALL DESCRIPTION

The Draft Permit authorizes the discharge of treated culture water from Outfall 001 subject to the effluent limitations and best management practices described below. Effluent from the hatchery is discharged at the terminal end of the settling pond where it flows into a drainage ditch. The ditch flows to the west and then south, is joined by some other drainage channels and then joins Russellville Brook north of Plum Tree Road and west of Route 116, about one-quarter to one-half mile from the hatchery (see site map in Attachment A). A summary of discharge data from the facility's discharge monitoring reports from January 2008 to May 2015 is included in Attachment C.

5.0 PROPOSED PERMIT EFFLUENT LIMITATIONS AND CONDITIONS

5.1 Effluent Flow

The Sunderland Hatchery is supplied, in part, by natural springs that flow via gravity from the upland forest through the raceways. There is no pumping from these springs and the facility has a limited amount of control over the flow rate through the raceways. The flow from the hatchery is greatly influenced by the natural variability of the springs, along with the two wells that are used at the facility. The 2007 Permit requires reporting of the average monthly flow and the maximum daily flow but does not include numeric limits. Based on DMR data submitted from January 2008 through May 2015, average monthly flow ranged from 1.1 to 2.9 MGD with a long-term average of 2.1 MGD and maximum daily flow ranged from 1.2 to 3.1 MGD with a

long-term average of 2.4 MGD (see Attachment C). The reporting requirements for average monthly and maximum daily flow have been carried forward in the proposed draft permit.

5.2 Biochemical Oxygen Demand (BOD_5)

Biochemical oxygen demand (BOD_5) is used to measure the amount of oxygen consumed by microorganisms when they decompose the organic matter in a waterbody. The greater the BOD_5, the greater the degree of pollution and the less oxygen available to aquatic life. The 2007 Permit includes mass- and concentration-based BOD_5 maximum daily limitations of 97 pounds per day (lbs/day) and 10 mg/l carried forward from the previous permit cycle. These limitations are based on Best Professional Judgment (BPJ) from a review of effluent data from CAAP facilities located in Massachusetts and New Hampshire, as well as review of general NPDES permits developed for similar facilities in Idaho, Oregon and South Carolina. Recently re-issued permits for CAAP facilities in Massachusetts and New Hampshire include BOD_5 limits no more stringent than these limits.

According to twice quarterly DMR data between January 2008 and May 2015, the maximum daily mass of BOD_5 ranged from 18 to 60 lbs/day with an average of 42 lbs/day. The maximum daily BOD_5 concentration ranged from 2.0 to 3.3 mg/l with an average of 2.4 mg/l (see Attachment C). Neither the mass- or concentration-based limits were exceeded.

The current permit's mass-based limit of 97 lbs/day is based on a flow of 1.16 MGD. During issuance of the current permit in 2007, EPA calculated maximum daily mass-based limit for BOD_5 using, according to the fact sheet, an average monthly flow value of 1.16 MGD. As stated above, the actual reported flow values from 2008 to 2015 for the facility are generally greater than 1.16 MGD. Even with the reported increase in both monthly average and daily maximum flow, the facility's BOD_5 loadings are still substantially less than the calculated permitted value of 97 lbs/day. EPA calculated an updated maximum daily flow value for this permit issuance, consistent with the 99th percentile value of the most recent maximum daily flow values between January 2008 and March 2015. The 99th percentile maximum daily flow value is 3.8 MGD.

Applying the Maximum Daily BOD_5 calculation, using the updated 99th percentile maximum daily flow:

Maximum Daily BOD_5 = 3.8 MGD x 10 mg/l x 8.3379 (conversion factor)

Maximum Daily BOD_5 = 317 lbs/day

The reported BOD_5 loading over the past 7 years (maximum of 60 lbs/day) has consistently been substantially lower than both the 99th percentile maximum daily flow calculated load of 317 lbs/day as well as the 2007 permitted limit of 97 lbs/day, EPA proposes to retain the maximum daily mass based limit of 97 lbs/day in the draft permit. The maximum daily BOD_5 concentration-based limit of 10 mg/l has also been carried forward in the draft permit. The draft permit continues to require a frequency of twice quarterly composite monitoring at Outfall 001.

5.3 Total Suspended Solids (TSS)

The 2007 permit includes mass- and concentration-based maximum daily total suspended solids (TSS) limitations of 97 lbs/day and 10 mg/l carried forward from the previous permit cycle. The concentration based limitation was based on Best Professional Judgment (BPJ) from a review of effluent data from CAAP facilities located in Massachusetts and New Hampshire, as well as review of general NPDES permits developed for similar facilities in Idaho, Oregon and South Carolina. Recently re-issued permits for CAAP facilities in Massachusetts and New Hampshire include TSS limits no more stringent than these limits. As with BOD_5, the mass-based maximum daily limit of 97 lbs/day was based on an average flow of 1.16 MGD, which is about half of the reported average flow of about 2.1 MGD from January 2008 through May 2015. As discussed in the section above, EPA calculated an updated maximum daily flow value for this permit issuance, consistent with the 99th percentile value of the most recent maximum daily flow values between January 2008 and March 2015. The 99th percentile maximum daily flow value is 3.8 MGD. This flow results in a maximum daily TSS mass based limit of 317 lbs/day.

According to twice quarterly DMR data between January 2008 and May 2015, the maximum daily mass of TSS ranged from 10 to 110 lbs/day with an average of 53 lbs/day. The maximum daily TSS concentration ranged from 1.2 to 6.4 mg/l, with an average of 3.1 mg/l (see Attachment C).

The concentration-based maximum daily limit of 10 mg/l was not exceeded during the permit term. However, the mass-based limitation of 97 lbs/day was exceeded a single time, when a value of 110 lbs/day was calculated for November 2011. This value coincided with the month of the highest monthly average flow (2.86 MGD) and daily maximum flow (3.1 MGD) recorded for the entire January 2008 through May 2015 monitoring period. The high relative flow from the hatchery was responsible, in part, for the mass-based exceedance in November 2011.

The continued use of the nets to minimize predation, coupled with ongoing feed management and solids handling practices, will continue to minimize the discharge of TSS to the receiving water. The TSS load in the quarterly samples reported subsequent to the elevated November 2011 sample, displayed a range of from 25 to 90 lbs/day. The long term average load, as mentioned previously, was 53 lbs/day.

The reported TSS loading over the past 7 years (average of 53 lbs/day) only exceeded the current limit of 97 lbs/day on one occasion and has generally been substantially lower than both the 99th percentile maximum daily flow calculated load of 317 lbs/day as well as the 2007 permitted limit of 97 lbs/day, EPA proposes to retain the maximum daily mass based limit of 97 lbs/day in the draft permit. The maximum daily TSS concentration-based limit of 10 mg/l has also been carried forward in the draft permit. The draft permit continues to require a frequency of twice quarterly composite monitoring at Outfall 001.

5.4 pH

Massachusetts Surface Water Quality Standards for Class B waters at 314 CMR 4.05(3)(b)(3)

require a pH in the range of 6.5 to 8.3 standard units (s.u.). According to DMR data from January 2008 through May 2015, the pH at Sunderland Hatchery ranged from 6.5 to 7.7 s.u. (see Attachment C). In accordance with antibacksliding regulations at 40 C.F.R. §122.44(l), the water quality-based average monthly and daily pH limits have been carried forward in the draft permit.

5.5 Nutrients

Massachusetts Surface Water Quality Standards at 314 CMR 4.05(5)(c) state "Unless naturally occurring, all surface waters shall be free from nutrients in concentrations that would cause or contribute to impairment of existing or designated uses and shall not exceed the site specific criteria developed in a TMDL or as otherwise established by the Department pursuant to 314 CMR 4.00."

Discharges from CAAP operations like Sunderland typically contain organic and inorganic solids, nutrients, and chemicals used in the prevention and treatment of various diseases. Any of these constituents could impair the water quality in the receiving water. Dissolved and particulate solids in the discharge result from fish feces and uneaten food particles. Nutrients, such as phosphorus and nitrogen, are associated with these solids. The presence of nutrients can result in excessive growth of any or all of the three main algae types: phytoplankton (floating freely in water column), periphyton (attached to aquatic vegetation or other structures) and benthic (attached to bottom sediments). The decay of organic solids resulting from excessive concentrations of solids and nutrients can cause low levels of dissolved oxygen in the receiving water. To assess the concentration of nutrients in the fish hatchery effluent, the current permit requires twice quarterly reporting of maximum daily total nitrogen and maximum daily total phosphorus.

5.5.1 Total Nitrogen

Long Island Sound experiences low levels of dissolved oxygen (hypoxia) that can exceed water quality standards and impair the function and health of the Sound. The low dissolved oxygen levels are linked to excessive human-generated sources of nitrogen, including from the Connecticut River. To protect Long Island Sound and improve water quality conditions, Connecticut and New York have developed a total maximum daily load (TMDL) for Long Island Sound that specifies a 58.5% reduction in nitrogen load from Connecticut and New York and requires additional action to reduce nitrogen loading from sources north of the state of Connecticut, including Massachusetts.[1]

The TMDL included a waste load allocation (WLA) for point sources and a load allocation (LA) for non-point sources. The point source WLA for out-of-basin sources (Massachusetts, New Hampshire and Vermont wastewater facilities discharging to the Connecticut, Housatonic and

[1] A Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound. December 2000. Prepared by New York State Department of Environmental Conservation and Connecticut State Department of Environmental Protection. http://longislandsoundstudy.net/wp-content/uploads/2010/03/Tmdl.pdf

Thames River watersheds) requires an aggregate 25 percent reduction from the baseline total nitrogen loading estimated in the TMDL. The Connecticut Department of Energy and Environmental Protection (CTDEEP) also applied a threshold of 20 lbs/day, equivalent in impact to a 35 lbs/day threshold at facilities upstream in MA and NH, when imposing nitrogen controls on existing facilities. See *Nitrogen Control for Small Sewage Facilities* (CT DEEP) and the Fact Sheet for the 2010 Reissuance of the Privately Owned Treatment Works General Permit (EPA pp. 19-21). EPA considers facilities discharging more than 35 lbs/day of total nitrogen to these receiving waters significant sources of nitrogen which could subject a facility to more stringent requirements or numeric limits for nitrogen.

Because the effluent from the Sunderland Hatchery discharges to Russellville Brook, a tributary to the Connecticut River, EPA considered the nitrogen load from the hatchery with respect to the continued efforts to reduce nitrogen loading in the Connecticut River watershed. The current permit's reporting of total nitrogen enables EPA to estimate total nutrient loadings to the watershed.

EPA typically utilizes the average total nitrogen from the previous 12 consecutive samples to determine a Facility's baseline nitrogen load. For the current permit term, Sunderland Hatchery reported total nitrogen (calculated by performing the "total Kjeldahl Nitrogen (as N)" test and the "Nitrate-Nitrite (as N)" test and adding the two results together to produce a value of Total Nitrogen) at a monitoring frequency of quarterly for a total of 22 monthly average observations. EPA evaluated the estimated nitrogen loading based on current average concentration of total nitrogen and current flow limitation using available nitrogen data collected from August 2012 to May 2015 shown in Table 1 below. To calculate the maximum nitrogen load, EPA used the average daily maximum effluent flow reported during the last permit cycle (2.39 MGD).

Table 1: Summary of Nitrogen Data for the Facility

Monitoring Period End Date	Total Nitrogen (Maximum Daily) (mg/l)
8/31/2012	1.60
11/30/2012	0.73
2/28/2013	1.53
5/31/2013	1.41
8/31/2013	1.02
11/30/2013	1.33
2/28/2014	1.68
5/31/2014	1.54
8/31/2014	1.16
11/30/2014	1.31
2/28/2015	1.56
5/31/2015	1.52
AVERAGE	**1.37**

Using these data, the Facility's nitrogen mass load is as follows:

Mass Loading (lbs/day) = Average N Concentration (mg/l)*Flow (MGD)*8.34 (conversion factor)

Therefore:

Mass Loading, average max flow = (1.37 mg/l)*(2.39 MGD)*(8.34) = **27.3 lbs/day**

The value of 27.3 lbs/day is likely a realistic upper level mass loading projection. This value is below the threshold of 35 lbs/day.

The draft permit requires the Facility to monitor nitrogen load twice per quarter to continue to provide data with which to evaluate the current mass loading of total nitrogen. The baseline load will be calculated on an annual basis.

There have been significant efforts by the New England Interstate Water Pollution Control Commission (NEIWPCC) work group and others since completion of the 2000 TMDL, which are anticipated to result in revised wasteload allocations for in-basin and out-of-basin facilities. In the event of a revised TMDL, nitrogen monitoring data indicating the need for additional nitrogen limitations, or other new information, the permit may be modified pursuant to 40 C.F.R. §122.62.

5.5.2 Total Phosphorus

Fish hatcheries, such as the Sunderland Hatchery, have the potential to contribute phosphorus to the receiving water. State water quality standards require any point source discharge containing nutrients in concentrations that encourage eutrophication or growth of weeds or algae be provided with the highest and best practicable treatment to remove such nutrients. Phosphorus and other nutrients promote the growth of nuisance algae and aquatic plants. When these plants and algae undergo their decay processes, they generate strong odors, depress dissolved oxygen levels in the river, and impair benthic habitat.

The Massachusetts State Water Quality Standards (MA SWQS) (314 CMR 4.00) do not contain numerical criteria for total phosphorus. The narrative criteria for nutrients at 314 CMR 4.05(5)(c) state that:

> Unless naturally occurring, all surface waters shall be free from nutrients in concentrations that would cause or contribute to impairment of existing or designated uses and shall not exceed the site specific criteria developed in a TMDL or as otherwise established by the Department pursuant to 314 CMR 4.00. Any existing point source discharge containing nutrients in concentrations that would cause or contribute to cultural eutrophication, including the excessive growth of aquatic plants or algae, in any surface water shall be provided with the most appropriate treatment as determined by the Department, including, where necessary, highest and best

> practical treatment (HBPT) for POTWs and BAT for non POTWs, to remove such nutrients to ensure protection of existing and designated uses. Human activities that result in the nonpoint source discharge of nutrients to any surface water may be required to be provided with cost effective and reasonable best management practices for nonpoint source control.

EPA has published national guidance documents that contain recommended total phosphorus criteria and other indicators of eutrophication. EPA's 1986 Quality Criteria for Water ("the Gold Book") generally recommends a maximum in-stream phosphorus concentration of 0.1 mg/l in streams and other flowing waters. Concentrations of total phosphorus in effluent from the Sunderland Hatchery, on average, exceeded the recommended Gold Book value of 0.1 mg/l in the last permit cycle (see Attachment C). More recently, EPA released Ecoregional Nutrient Criteria, established as part of an effort to reduce problems associated with excess nutrients in water bodies in specific areas of the country. The ecoregion-specific criteria represent conditions in waters minimally impacted by human activities, and thus representative of water without cultural eutrophication.

According to the Gold Book, there are two basic needs in establishing a phosphorus limit: 1) to control the development of plant nuisances within the flowing water; and 2) to protect the downstream receiving waterway. The Gold Book also recognizes that there may be instances where higher concentrations of phosphorus do not produce eutrophic conditions, as well as instances where lower concentrations may be associated with populations of nuisance organisms. As an example, fast-flowing waters with substantial canopy cover that limits light penetration may represent conditions that would be less suitable for excessive plant growth than a slow moving stream with an open canopy and high light penetration, and therefore warrant less stringent permit conditions to control phosphorus.

In this case, the best management practices for solids control implemented during the last permit issuance has substantially reduced the concentration of phosphorus in the effluent compared to the previous issuance from a daily max average of 0.26 mg/l to a daily max average of 0.12 mg/l. Continued exploration and refinement of these and other BMPs to control solids and maximize feeding efficiency may further minimize phosphorus concentrations in hatchery effluent. Additional dilution downstream of the effluent discharge, in this case from the additional drainage area, may also minimize the potential impacts of the discharge of phosphorus from the hatchery.

Finally, while the segment of the Connecticut River that includes the confluence with Russellville Brook (Connecticut River Basin, MA-34) is listed as Category 5 water ("waters requiring a TMDL") for *Escherichia coli* and PCBs in fish tissue, this assessment suggests that the downstream receiving segment of the Connecticut River is representative of surface waters that are minimally impacted by nutrients and is not adversely affected by nutrient overenrichment from hatchery effluent.

To address the potential that phosphorus discharges from the hatchery may cause or contribute to the development of excessive plant and algal growth within Russellville Brook consistent with

the narrative requirements of MassDEP's water quality standards, the permit requires narrative effluent limitations in the form of BMPs to control solids and maximize feeding efficiency.

EPA concludes that the Connecticut River downstream of the hatchery is currently protected from nutrient enrichment, and that the continuation and enhancement of best management practices for solids control contained in the draft permit, including prohibiting the discharge of untreated wastewater prior to solids removal and efficient feed management, will continue to minimize the discharge of phosphorus from the facility and ensure that the discharge is not contributing to a water quality impairment in Russellville Brook.

The 2007 permit requires the permittee to report the maximum daily total phosphorus twice per quarter. According to data reported from January 2008 through May 2015, the maximum daily total phosphorus concentration ranged from 0.05 to 0.42 mg/l with an average concentration of 0.12 mg/l (see Attachment C). The draft permit continues the requirement for reporting maximum daily total phosphorus concentrations based on twice quarterly monitoring.

5.6 In-stream Dissolved Oxygen

The draft permit includes a limit for DO based on state water quality standards. A minimum concentration of DO is needed to provide a suitable habitat for fish and other aquatic life. The Sunderland Hatchery discharges to Class B waters, warm water fishery, as classified by the Massachusetts Surface Water Quality Standards, and as such it shall have DO levels not less than 5.0 mg/l. The monitoring for dissolved oxygen (DO) shall be conducted during the use of formalin because when present, formalin may deplete oxygen in the water.

5.7 Hydrogen Peroxide

The facility may use 35% PEROX-AID® (hydrogen peroxide solution) as an external microbiocide for the control of mortality in freshwater-reared finfish eggs due to saprolegniasis, in freshwater-reared salmonoids due to bacterial gill disease (*Flavobacterium branchiophilum*), and in freshwater-reared cool water finfish due to external columnaris disease (*Flavobacterium columnae*). PEROX-AID® is an FDA-approved drug for freshwater-reared finfish, and its use must adhere to FDA label instructions.

The MA SWQS do not include aquatic toxicity criteria for hydrogen peroxide, but according to the *Environmental Assessment for the Use of Hydrogen Peroxide in Aquaculture for Treating External Fungal and Bacterial Diseases of Culture Fish and Fish Eggs* (United State Geological Survey, 2006, p.72), "the use of hydrogen peroxide as a waterborne therapeutant in intensive and extensive freshwater aquaculture operations constitutes no significant threat to the environment, the populations of organisms residing there, or public health and safety if receiving water concentrations do not exceed 0.7 mg/l on a short-term basis". This acute water quality "benchmark" was determined using EPA guidance for deriving water quality criteria and is intended to serve as a guide to determine effluent discharge limits in NPDES permitting.

PEROX-AID® has not been used in at least two permit terms, but because the facility is

authorized for its use when circumstances dictate, the draft permit includes a new maximum daily effluent limit of 0.7 mg/l to ensure that concentrations in the receiving water remain below the acute water quality benchmark. Monitoring of hydrogen peroxide is required once per event when PEROX-AID® is used at the facility.

5.8 Use of Formalin

CAAP facilities commonly use biocides, the most common of which are formalin products such as Paracide-F, Formalin-F or Parasite-S, which contain approximately 37% by weight of formaldehyde gas. Formalin is used for the therapeutic treatment of fungal infections on the eggs of finfish and to control certain external protozoa and monogenetic trematodes on all finfish species. Because it is formulated to selectively kill or remove certain attached organisms, but not the finfish themselves when properly applied, formalin is more toxic to invertebrate species than to vertebrates. When setting the necessary permit limits to protect the receiving water's aquatic environment from the effects of formalin in a discharge, it is more important to develop limits to protect invertebrate species because they are more sensitive to the effects of formaldehyde. In the receiving waters, these invertebrates are an integral part of the food chain for finfish.

Formalin use must be consistent with U.S. Food and Drug Administration (FDA) labeling instructions as per 21 C.F.R. §529.1030. While the prophylactic use of formalin (i.e., drugs and chemicals used to prevent specific disease(s) in the absence of their symptoms) is not mentioned in those FDA regulations, EPA allows its use only under the extra-label provisions of the Federal Food, Drug and Cosmetic Act as a Best Management Practice (BMP) to control the excessive use of drugs. Formalin was not used at the Sunderland Hatchery in the last permit cycle. However, in the event that application of formalin is necessary, the facility's current Best Management Plan (June 2008) dictates that it be used in strict compliance with FDA recommended dosages and raceways are treated individually. Water volume in the treated raceway is reduced to the minimum possible by lowering the dam boards.

Though formalin was not used during the course of the present permit, the hatchery has asked that the current permit limits be retained to allow for emergency use of formalin. Consistent with antibacksliding provisions found in 40 C.F.R. §122.44(1), the draft permit carries forward the numeric limits for formaldehyde and dissolved oxygen, as well as the acute whole effluent toxicity limit (LC50 ≥100%). According to the Fact Sheet, the current permit limits were included to provide assurance that there is no unacceptable toxicity in the discharge during periods when formalin is being used. However, the draft permit has eliminated the chronic whole effluent toxicity limitation (C-NOEC≥100%). Chronic limits are designed to protect against the long-term effects of a pollutant. In this case, formalin has not been used in more than 10 years, and, in the event that formalin was necessary to protect fish from disease, use of the drug would be restricted as directed by the BMP Plan and consistent with the FDA instructions described above, and the subsequent discharge of effluent treated with formalin would be extremely limited. As such, EPA does not expect any long-term effects from the rare and limited use of formalin at the hatchery. This new information about the rare and limited use of formalin at the hatchery is consistent with the antibacksliding provisions at 40 C.F.R. §122.44(l)(2)(i)(B)(1) and would have justified in not including a chronic WET limit at the time of permit issuance.

The maximum daily formaldehyde limit of 0.74 mg/l was based on MassDEP's review of available aquatic life toxicity information pertaining to formaldehyde during issuance of the 2002 NPDES permit for this facility. The dissolved oxygen limit is consistent with the Massachusetts Surface Water Quality standards at 314 CMR 4.05(3)(b)(1), which state that dissolved oxygen levels "shall not be less than …5.0 mg/l in warm water fisheries. Where natural background conditions are lower, DO shall not be less than natural background conditions. Natural seasonal and daily variations that are necessary to protect existing and designated uses shall be maintained." All permit limits were calculated using zero available dilution.

In the current permit, all limits and monitoring related to the use of formalin apply "when-in-use," since formalin is not typically used at the hatchery, although monitoring is only required quarterly during formalin use. This monitoring frequency may not adequately capture a representative sample of the effluent during the use of formalin. Recently issued NPDES permits for fish hatcheries using formalin have required more frequent monitoring when the drug is in use (see, for example, final permits for Montague State Fish Hatchery MA0110051, Milford State Fish Hatchery NH0110001, and Powder Mill State Fish Hatchery NH0000710). Increased monitoring is warranted at the Sunderland Hatchery because flow varies with the natural springs, thus two treatment events even in the same quarter may not have the same effluent concentration, and because there is no available dilution in Russellville Brook. The draft permit carries forward the numeric limits for formaldehyde, dissolved oxygen, and WET testing from the current permit consistent with antibacksliding requirements, but has increased monitoring frequency from quarterly (when in use) to once during each event in which fish are treated with formalin.

5.9 WET Testing

As mentioned above, the draft permit carries forward the acute whole effluent toxicity limit. The acute Whole Effluent Toxicity test limit is the LC50 equal to 100%. The LC50 is the concentration of effluent which causes mortality to 50% of the test organisms. Therefore, a 100% limit means that a sample of 100% effluent (no dilution) shall cause no more than 50% mortality. According to the fact sheet, the current permit limits were included to provide assurance that there is no unacceptable toxicity in the discharge during periods when formalin is being used. However, the draft permit has proposed the elimination of the chronic whole effluent toxicity limitation (C-NOEC≥100%). Chronic limits are designed to protect against the long-term effects of a pollutant. In this case, in the event that formalin was necessary to protect fish from disease, use of the drug would be restricted as directed by the BMP Plan and consistent with the FDA instructions described above, and the subsequent discharge of effluent treated with formalin would be extremely limited. As such, EPA does not expect any long-term effects from the rare and limited use of formalin at the hatchery. This new information about the rare and limited use of formalin at the hatchery is consistent with the antibacksliding provisions at 40 C.F.R. §122.44(l)(2)(i)(B)(1) and would have justified not including a chronic WET limit at the time of permit issuance.

5.10 Best Management Practices

The ELGs contained in 40 C.F.R. §451.11 are narrative limitations that describe BMPs to which those CAAP facilities that produce more than 100,000 pounds of fish per year must adhere. During development of the ELGs, EPA determined, based on examination of hatchery data, that a combination of settling technology and feed management control practices will achieve low levels of TSS in hatchery effluent. These BMPs require the permittee to develop and employ methods for feed management, removal of accumulated solids, storage of drugs and pesticides, spill prevention, management of the wastewater treatment system, maintaining accurate records, and ensuring that all personnel receive proper training. The Sunderland Hatchery is not subject to ELGs for CAAP facilities because it does not produce more than 100,000 pounds of fish annually. However, the current permit requires BMPs consistent with the ELGs, and Part I.B. of the draft permit carries forward these requirements.

6.0 ESSENTIAL FISH HABITAT

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

Essential fish habitat is only designated for species for which federal fisheries management plans exist (16 U.S.C. §1855(b)(1)(A)). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999. Anadromous Atlantic salmon (*Salmo salar*) is the only managed species believed to be present during one or more lifestages within the area which encompasses the discharge site. Although the last remnant stock of Atlantic salmon indigenous to the Connecticut River was believed to have been extirpated over 200 years ago, an active effort has been underway throughout the Connecticut River system since 1967 to restore this historic run (HG&E/MMWEC, 1997).

The hatchery discharge is to a tributary of the Connecticut River, Russellville Brook, and therefore is designated by NOAA Fisheries as EFH for Atlantic salmon, which migrate up the River and its tributaries to spawn. Atlantic salmon may travel to Russellville Brook. This tributary may be suitable for a number of life stages of Atlantic salmon.

EPA has concluded that the limits and conditions contained in this draft permit minimize adverse effects to Atlantic Salmon EFH for the following reasons:

- This permit action does not constitute a new source of pollutants. It is the reissuance of an existing NPDES permit;

- The Sunderland Facility, by its very nature as a fish hatchery, discharges fish rearing water which supports fish and fish habitat;

- The permit contains requirements to protect the receiving waters from toxic chemicals or medications which might be used in the hatcheries to treat for fish diseases. Whole effluent toxicity testing and water quality based effluent limitations to avoid toxicity are required if and when formalin is used in the hatchery;

- The permit requires development and implementation of best management practices to address issues which are difficult to express as effluent limits, including non-native species, proper operations, and proper use of medications. These factors are designed to be protective of aquatic life, including those with EFH designations;

- The facility withdraws no water from Russellville Brook, so no life stages of Atlantic salmon are vulnerable to impingement or entrainment from this facility;

- The draft permit prohibits the discharge of pollutants or combination of pollutants in toxic amounts;

- The effluent limitations and conditions in the draft permit were developed to be protective of all aquatic life; and

- The draft permit prohibits violations of the state water quality standards.

EPA believes that the draft permit limits adequately protect Atlantic Salmon EFH, and therefore additional mitigation is not warranted. If adverse impacts to EFH are detected as a result of this permit action, or if new information is received that changes the basis for our conclusion, NOAA Fisheries will be notified and an EFH consultation will be initiated.

As the federal agency charged with authorizing the discharge from this facility, EPA has submitted the draft permit and this fact sheet, along with a letter under separate cover, to NMFS Habitat Division for their review.

7.0 ENDANGERED SPECIES ACT

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

habitat. The United States Fish and Wildlife Service (USFWS) administers Section 7 consultations for freshwater species. The National Marine Fisheries Service (NMFS) administers Section 7 consultations for marine species and anadromous fish.

EPA has reviewed the federal endangered or threatened species of fish, wildlife, or plants to determine if any listed species might potentially be impacted by the re-issuance of this NPDES permit. The two listed species that have the potential to be present in the vicinity of the Sunderland Hatchery and Russellville Brook are the shortnose sturgeon (*Acipenser brevirostrum*) and the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*).

Based on the expected distribution of the species, EPA has determined that there are no Atlantic sturgeon in the action area and that the reissuance of the permit will have no effect on the species. Therefore, consultation under Section 7 of the ESA with NMFS for Atlantic sturgeon is not required.

Attachment D provides a complete discussion of EPA's Endangered Species Act assessment as it relates to the renewal of the Sunderland Hatchery NPDES permit. Based on the analysis of potential impacts to shortnose sturgeon presented in Attachment D to this Fact Sheet, EPA has determined that impacts to shortnose sturgeon from the Sunderland Hatchery will be insignificant or discountable and the reissuance of this permit is not likely to adversely affect the shortnose sturgeon or its habitat. EPA is seeking concurrence with this determination from NMFS through the submittal of this fact sheet, Attachment D, the draft permit and a letter under separate cover.

8.0 MONITORING AND REPORTING

The effluent monitoring requirements have been established to yield data representative of the discharge under authority of Section 308 (a) of the CWA in accordance with 40 CFR §§122.41 (j), 122.44 (l), 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 effluent. The approved analytical procedures are found in 40 CFR § 136 unless otherwise explicitly required in the permit.

The Draft Permit requires the permittee to continue to electronically report monitoring results obtained during each calendar month as Discharge Monitoring Report (DMRs) to EPA and the state using NetDMR no later than the 15th day of the month following the completed reporting period.

NetDMR is a national web-based tool for regulated CWA 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 CFR § 122.41 and § 403.12. NetDMR is accessed from the following url: http://www.epa.gov/netdmr. Further information about NetDMR can be found on the EPA Region 1 NetDMR website located at http://www.epa.gov/region1/npdes/netdmr/index.html.

In most cases, reports required under the permit shall be submitted to EPA as an electronic attachment through NetDMR. Certain exceptions are provided in the permit such as for providing written notifications required under the Part II Standard Permit Conditions. With the use of NetDMR to report DMRs and reports, the permittee is no longer be required to submit hard copies of DMRs or other reports to EPA and is 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. State reporting requirements are further explained in the Draft Permit.

9.0 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 the Massachusetts Department of Environmental Protection (MassDEP) has reviewed the draft permit. EPA has requested permit certification by the State pursuant to 40 C.F.R. 124.53 and expects that the draft permit will be certified.

10.0 COMMENT PERIOD, HEARING REQUESTS 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 John Nagle, U.S. EPA, Office of Ecosystem Protection**,** , Suite 100, Boston, Massachusetts 02109-3912. 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 meeting may be held if the criteria stated in 40 C.F.R. §124.12 are satisfied. In reaching a final decision on the draft permit, the EPA 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 any public hearings, if such hearings are held, the EPA 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 petition for review of the permit to EPA's Environmental Appeals Board consistent with 40 C.F.R. §124.19.

11.0 EPA AND STATE CONTACTS

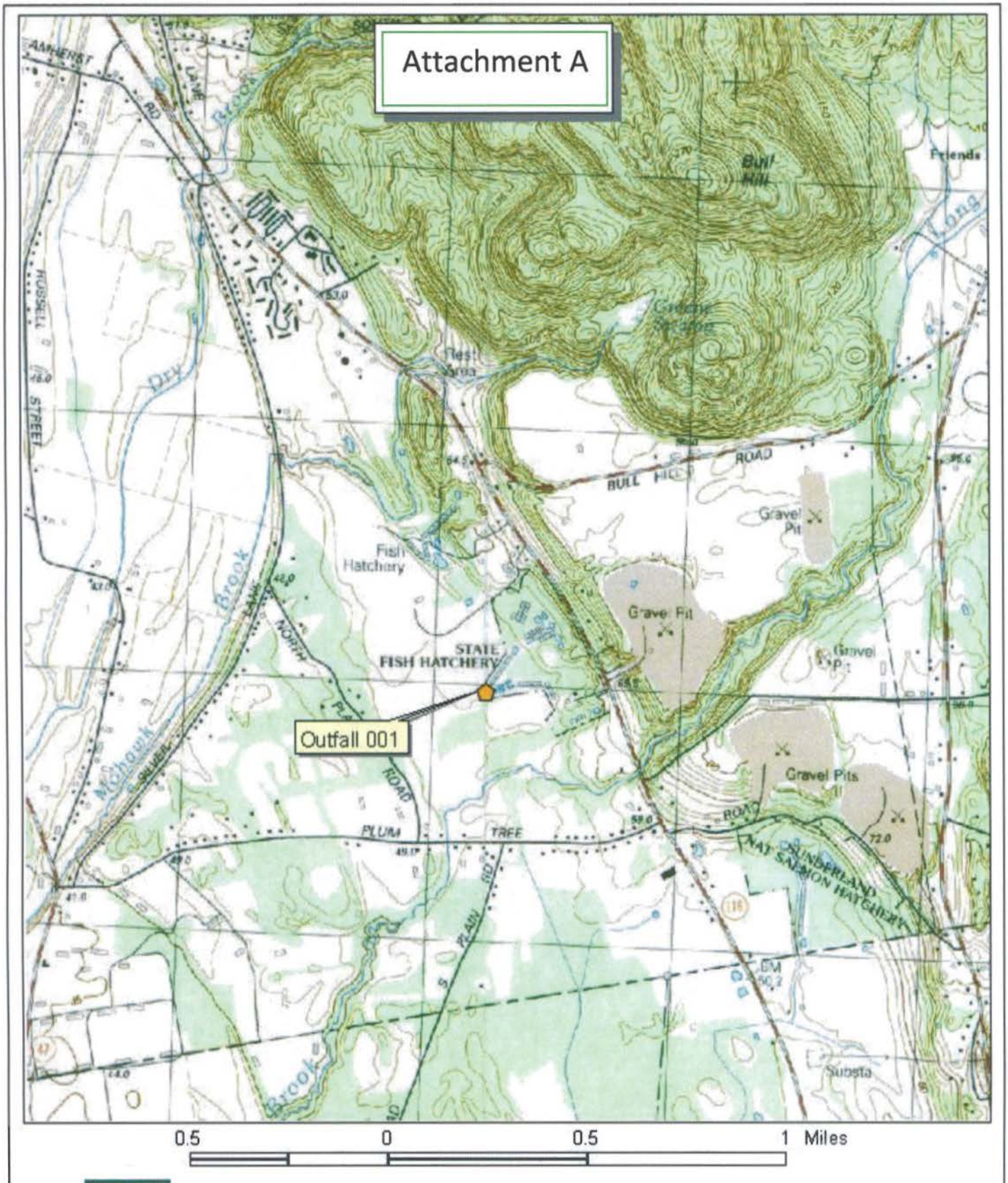
Additional information concerning the draft permit may be obtained between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays from:

John Nagle
EPA Office of Ecosystem Protection
5 Post Office Square, Suite 100 (OEP06-1)
Boston, MA 02109-3912
Tel: (617) 918-1054
email: nagle.john@epa.gov

Cathy Vakalopoulos
MassDEP
Wastewater Management Program
1 Winter Street, 5th Floor
Boston, MA 02108
Tel: (617) 348-4026
catherine.vakalopoulos@state.ma.us

Date: August 11, 2015

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



Sunderland State Fish Hatchery
Sunderland, MA
MA0110043

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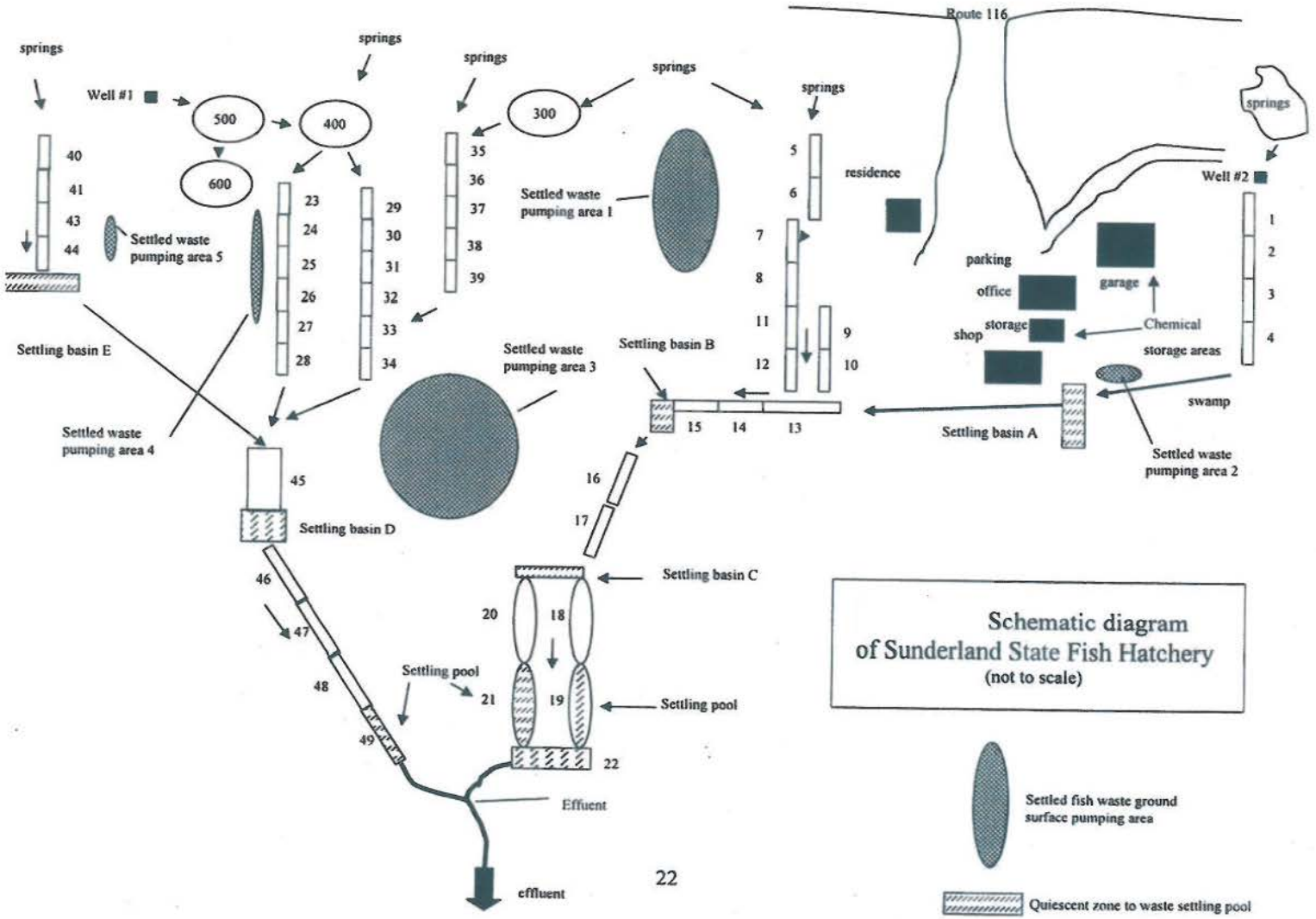
Data from MassGIS & MA DEP.
All Data Subject to Revision

For Intra-Agency Policy Deliberations

4/11/07, Massachusetts DEP

Attachment B. Schematic Diagram of Sunderland Fish Hatchery



Attachment C
SUNDERLAND STATE FISH HATCHERY
NPDES Permit MA0110035
DMR Summary

	BOD	BOD	Formaldehyde	Total N	Total P	TSS	TSS
Sample Month	97 lb/day	10 mg/l		mg/l	mg/l	97 lb/d	10 mg/L
	Daily Max	Daily Max		Daily Max	Daily Max	DAILY MX	DAILY MX
2/29/2008	18	2.19	ND	0.53	0.42	10	1.2
5/31/2008	58	2.74	ND	0.59	0.14	68	3.2
8/31/2008	48	2.11	ND	0.52	0.05	46	2.0
11/30/2008	38	2.25	ND	0.50	0.07	41	2.4
2/28/2009	30	2.25	ND	0.54	0.08	27	2.0
5/31/2009	50	2.17	ND	0.66	0.09	55	2.4
8/31/2009	43	2.03	ND	0.50	0.05	51	2.4
11/30/2009	45	2.26	ND	0.58	0.11	56	2.8
2/28/2010	34	2.13	ND	0.60	0.06	26	1.6
5/31/2010	42	2.18	ND	0.59	0.06	31	1.6
8/31/2010	44	2.36	ND	0.61	0.06	22	1.2
11/30/2010	36	3.13	ND	0.53	0.10	59	5.2
2/28/2011	32	3.29	ND	2.18	0.19	60	6.4
5/31/2011	54	2.57	ND	0.75	0.09	68	3.2
8/31/2011	53	2.21	ND	0.65	0.05	48	2.0
11/30/2011	60	2.63	ND	0.72	0.13	110	4.8
2/29/2012	54	2.19	ND	0.77	0.08	81	3.2
5/31/2012	42	2.18	ND	0.84	0.17	57	2.8
8/31/2012	34	2.27	ND	1.60	0.12	61	5.6
11/30/2012	29	2.13	ND	0.73	0.15	90	6.4
2/28/2013	22	2.30	ND	1.53	0.20	25	2.4
5/31/2013	46	3.05	ND	1.41	0.22	50	3.2
8/31/2013	56	2.47	ND	1.02	0.11	53	2.6
11/30/2013	45	2.62	ND	1.33	0.13	75	4.4
2/28/2014	38	2.79	ND	1.68	0.14	32	2.4
5/31/2014	46	2.69	ND	1.54	0.16	65	3.8
8/31/2014	51	2.33	ND	1.16	0.11	57	2.6
11/30/2014	40	2.16	ND	1.31	0.13	89	4.8
2/28/2015	39	2.77	ND	1.56	0.13	43	2.4
5/31/2015	41	2.56	ND	1.52	0.13	34	2.0
Max	60	3.29	ND	2.18	0.42	110	6.4
Min	18	2.03	ND	0.50	0.05	10	1.2
Average	42	2.43	ND	0.97	0.12	53	3.1
Standard Deviation	10	0.33		0.47	0.07	22	1.4

Attachment C (continued)
SUNDERLAND STATE FISH HATCHERY
NPDES Permit MA0110035
DMR Summary

	Flow	Flow	pH	pH
Sample Month	MGD	MGD	6.5 S.U.	8.3 S.U.
	Monthly Avg	Daily Max	Min	Max
1/31/2008	1.14	1.23	7.0	7.0
2/29/2008	1.45	2.04	7.0	7.0
3/31/2008	2.36	2.80	6.9	6.9
4/30/2008	2.73	2.86	7.1	7.1
5/31/2008	2.72	2.97	7.2	7.2
6/30/2008	2.68	2.97	7.1	7.1
7/31/2008	2.79	3.01	7.0	7.0
8/31/2008	2.46	2.53	7.3	7.3
9/30/2008	2.28	2.53	7.0	7.0
10/31/2008	2.08	2.23	7.0	7.0
11/30/2008	1.29	2.04	7.0	7.0
12/31/2008	1.94	2.53	6.8	6.8
1/31/2009	2.48	2.64	7.1	7.1
2/28/2009	2.45	2.64	7.1	7.1
3/31/2009	2.60	2.80	7.0	7.0
4/30/2009	2.62	2.75	6.9	6.9
5/31/2009	2.54	2.64	7.2	7.2
6/30/2009	2.46	2.97	7.2	7.2
7/31/2009	2.43	2.64	7.1	7.1
8/31/2009	2.60	2.86	7.1	7.1
9/30/2009	2.26	2.53	7.2	7.2
10/31/2009	2.13	2.32	7.2	7.2
11/30/2009	1.90	2.04	7.1	7.1
12/31/2009	1.61	1.94	6.9	6.9
1/31/2010	1.66	1.90	7.3	7.3
2/28/2010	1.72	2.08	7.2	7.2
3/31/2010	2.26	2.64	7.1	7.1
4/30/2010	2.59	2.75	7.1	7.1
5/31/2010	2.52	2.86	7.1	7.1
6/30/2010	2.07	2.53	7.0	7.0
7/31/2010	1.97	2.04	7.0	7.0
8/31/2010	1.61	1.69	7.1	7.1
9/30/2010	1.46	1.60	7.2	7.2
10/31/2010	1.40	2.04	7.2	7.2
11/30/2010	1.24	1.53	7.1	7.1
12/31/2010	1.19	1.94	7.1	7.1
1/31/2011	1.19	1.94	7.7	7.7
2/28/2011	1.29	1.53	7.0	7.0
3/31/2011	1.86	2.32	7.3	7.3
4/30/2011	2.57	2.97	7.2	7.2
5/31/2011	2.76	2.86	7.1	7.1
6/30/2011	2.66	2.86	7.3	7.3
7/31/2011	2.63	2.86	7.1	7.1
8/31/2011	2.48	3.07	7.2	7.2
9/30/2011	2.63	3.02	7.1	7.1
10/31/2011	2.78	2.97	7.2	7.2
11/30/2011	2.86	3.07	7.3	7.3
12/31/2011	2.83	3.02	7.3	7.3

Attachment C (continued)
SUNDERLAND STATE FISH HATCHERY
NPDES Permit MA0110035
DMR Summary

	Flow	Flow	pH	pH
Sample Month	MGD	MGD	6.5 S.U.	8.3 S.U.
	Monthly Avg	Daily Max	Min	Max
1/31/2012	2.66	2.86	6.8	6.8
2/29/2012	2.41	2.43	7.4	7.4
3/31/2012	2.38	2.43	7.3	7.3
4/30/2012	2.32	2.53	7.3	7.3
5/31/2012	1.73	2.13	7.2	7.2
6/30/2012	1.58	2.53	7.2	7.2
7/31/2012	1.69	2.04	7.1	7.1
8/31/2012	1.91	2.23	7.1	7.1
9/30/2012	1.66	1.94	7.0	7.0
10/31/2012	1.49	1.60	6.9	6.9
11/30/2012	1.34	1.45	7.1	7.1
12/31/2012	1.20	1.37	6.8	6.8
1/31/2013	1.17	1.60	6.5	6.5
2/28/2013	1.38	2.04	7.3	7.3
3/31/2013	1.77	2.13	7.0	7.0
4/30/2013	2.32	2.53	6.7	6.7
5/31/2013	2.31	2.43	7.2	7.2
6/30/2013	2.43	2.53	7.2	7.2
7/31/2013	2.54	3.02	7.2	7.2
8/31/2013	2.34	3.02	7.5	7.5
9/30/2013	2.07	2.53	7.4	7.4
10/31/2013	1.96	2.23	7.1	7.1
11/30/2013	1.87	3.02	7.0	7.0
12/31/2013	1.63	1.69	7.4	7.4
1/31/2014	1.79	2.13	7.2	7.2
2/28/2014	2.04	2.13	7.3	7.3
3/31/2014	2.11	2.53	6.6	6.6
4/30/2014	2.44	2.75	6.9	6.9
5/31/2014	2.53	2.64	7.4	7.4
6/30/2014	2.51	2.64	7.5	7.5
7/31/2014	2.00	2.53	7.0	7.0
8/31/2014	2.13	2.43	7.2	7.2
9/30/2014	2.09	2.23	6.9	6.9
10/31/2014	1.95	2.23	7.2	7.2
11/30/2014	1.73	1.94	6.7	6.7
12/31/2014	1.69	2.04	6.6	6.6
1/31/2015	2.05	2.23	6.6	6.6
2/28/2015	1.98	2.53	6.6	6.6
3/31/2015	1.99	2.13	6.8	6.8
4/30/2015	2.07	2.13	7.0	7.0
5/31/2015	2.30	2.43	6.9	6.9
Max	2.86	3.07	7.7	7.7
Min	1.14	1.23	6.5	6.5
Average	2.09	2.39	------	------
Standard Deviation	0.48	0.46	0.2	0.2

ATTACHMENT D

NPDES Permit for the Sunderland State Fish Hatchery
Sunderland, Massachusetts, Permit No. MA0110035
Endangered Species Act Assessment, June 2015

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

The U.S. Environmental Protection Agency, Region 1, New England (EPA) is preparing to reissue the NPDES permit to the Sunderland State Fish Hatchery in Massachusetts (NPDES Permit MA0110035). With limitations, the draft NPDES permit allows the facility to discharge hatchery effluent to Russellville Brook, a tributary that ultimately joins to the Connecticut River near Sunderland, Massachusetts.

As the federal agency charged with authorizing the discharge from this facility, EPA has conducted this analysis as part of our consultation responsibilities under section 7 (a)(2) of the Endangered Species Act (ESA) for potential impacts to federally listed species. In this particular case, there are two endangered species under the jurisdiction of NMFS potentially influenced by the reissuance of this permit. One is the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and the other is the shortnose sturgeon (*Acipenser brevirostrum*). There is no designated critical habitat for either of these species in the Connecticut River at this time. Information included below demonstrates that Atlantic sturgeon are not present in the action area of the discharge and are not affected by the activities of the hatchery.
It is EPA's preliminary determination that the operation of this facility, as governed by the draft permit, is not likely to adversely affect shortnose sturgeon. It is our position that this permit action does not warrant a formal consultation under section 7 of the ESA. The reasoning to support this position follows.

EPA's intent in this ESA assessment is to evaluate the potential impacts to this endangered species and related resources from those components of this facility's operation that are regulated by EPA under the NPDES Program. This review considered the expected habitat utilized by shortnose sturgeon in the Connecticut River. Also considered was the overall action area of the discharge, the duration and volume of the facility's discharge, as well as the type of contaminants that have the potential to be present in the discharge. This information was related to any likely resulting impacts to shortnose sturgeon.

Environmental Setting
The Sunderland State Fish Hatchery began operation in 1913. Brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*) and rainbow trout (*Onchorhynchus mykiss*) have been in culture at the hatchery from its construction through the present day. The water source is from natural springs and two (2) gravel packed wells. There are eight natural bottom raceways and six earthen ponds in which the fish are raised at the facility. See Attachment B of the fact sheet for a schematic diagram of the hatchery. The hatchery raceways and ponds are in a natural setting of trees, meadows and wetlands, which results in substantial input of natural allocthonous matter (carbon or nutrients that come from outside the aquatic system) into the raceway/pond system. The natural allocthonous matter provides a natural food source for the fish and promotes natural decomposition and processing of the fish waste within the raceway system.

There are five quiescent zone settling basins (Settling Basins A – E; Attachment B) located at various points of the raceway/pond system in the hatchery. In addition, at the terminal end of the hatchery, there are also four settling pools. These settling areas allow the fish wastes produced at the hatchery to be treated by natural decomposition. The outflow from the final settling pools flows into a drainage ditch, which was likely originally constructed to reduce flooding of the adjacent fields. The ditch flows to the west and then south, is joined by some other drainage channels and then joins "named" Russellville Brook north of Plum Tree Road and west of Route 116, about one-quarter to one-half mile from the hatchery. Russellville Brook is a tributary to the Connecticut River.

Connecticut River Basin.
Russellville Brook, the initial receiving water of the hatchery discharge, is designated as a Class B waterbody and warm water fishery by the Massachusetts Surface Water Quality Standards (314 CMR 4.06). Class B waters are designated as a habitat for fish, other aquatic life, and wildlife, and for primary and secondary contact recreation. Where designated they shall be suitable as a source of public water supply with appropriate treatment. They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value (314 CMR 4.05(3)(b)).

The segment of the Connecticut River that includes the confluence of Russellville Brook, from the confluence of the Deerfield River (at river kilometer (rkm) 192) to upstream of the Holyoke Dam (at rkm 144 (“the Deerfield Concentration Area”), contains foraging habitat and wintering sites for shortnose sturgeon. Upstream of where the Deerfield River meets the Connecticut River has been identified as an important spawning and congregation area for all reproductive stages of shortnose sturgeon. A more detailed summary of shortnose sturgeon presence in the area of the facility is included later in this attachment.

Sunderland State Fish Hatchery NPDES Draft Permit Profile
Currently, the Sunderland Hatchery operates a series of natural raceways and earthen ponds for

the purpose of rearing brown, brook, and rainbow trout for stocking in rivers and lakes in the Commonwealth. The draft permit authorizes the discharge of hatchery effluent from one outfall (001) to Russellville Brook, a tributary of the Connecticut River. The hatchery effluent is supplied by natural springs and two wells, flowing over upland forest and comprises the majority of flow of Russellville Brook. During the last permit cycle (January 2008 through May 2015), the maximum daily flow ranged from 1.2 to 3.1 MGD with a long-term average of 2.4 MGD (see Attachment C of the fact sheet). Each series of ponds and raceways includes multiple settling ponds at the terminal end to allow solids to settle prior to discharge. The outflow from the final settling pools flows into a drainage ditch, which was likely originally constructed to reduce flooding of the adjacent fields. The ditch flows to the west and then south, is joined by some other drainage channels and then joins "named" Russellville Brook north of Plum Tree Road and west of Route 116, about one-quarter to one-half mile from the hatchery.

The Draft Permit includes numeric limits for biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH and requires twice quarterly monitoring of these parameters as well as total phosphorus and total nitrogen. In addition, the draft permit includes numeric limits and monitoring requirements for formaldehyde and dissolved oxygen when the USDA-approved drug formalin is used, and limits hydrogen peroxide when the drug PEROX-AID® is used. The hatchery reports that formalin was not used during the last permit cycle (January 2008 through May 2015). Finally, the draft permit requires the facility to maintain a Best Management Practices (BMP) plan and includes narrative requirements consistent with the effluent limitations guidelines for concentrated aquatic animal production facilities, although the ELGs do not specifically apply to the Sunderland Hatchery based on its production levels. The BMP plan and narrative requirements include provisions for drug use, structural failure or damage to culture units, spill prevention, solids control, biological control, materials storage, structural maintenance, and requirements related to training staff and recordkeeping. A complete discussion of the facility, the outfalls, and the justification supporting the permit requirements is included in the draft permit's fact sheet.

A concentrated aquatic animal production (CAAP) facility based on criteria found in 40 C.F.R. § 122.24(b) and 40 C.F.R. Part 122 Appendix C is defined as a hatchery, fish farm, or other facility that "contains, grows, or holds 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 facilities which produce less than 9,090 harvest weight kilograms (approximately 20,000 pounds) of aquatic animals per year; and facilities which feed less than 2,272 kilograms (approximately 5,000 pounds) of food during the calendar month of maximum feeding." According to MassWildlife, annual production is estimated at 13,000 pounds (lbs) of brook trout, 29,000 pounds of brown trout, and 37,000 pounds of rainbow trout, for a total of approximately 79,000 pounds of aquatic animals per year. During the month of maximum feeding (August), the facility estimates the use of 16,680 lbs of feed. Based on their production levels and feed use, as well as monthly Discharge Monitoring Reports (DMRs), the facility will likely: (1) discharge more than 30 days per year; (2) produce more than 20,000 lbs harvest weight of fish per year; and (3) feed more than 5,000 lbs of food during the month of maximum feeding during the next permit cycle. Therefore the Sunderland Hatchery is defined as a CAAP

facility according to the regulations at 40 C.F.R. § 122.24(c) and its discharge must be authorized by an NPDES permit.

Discharges from CAAP operations, such as the Sunderland Hatchery, typically contain organic and inorganic solids, nutrients, and chemicals used in the prevention and treatment of various diseases. Any of these constituents could impair the water quality in the receiving water. Dissolved and particulate solids in the discharge result from fish feces and uneaten food particles. Nutrients, such as phosphorus and nitrogen, are associated with these solids. The presence of nutrients can result in excessive growth of any or all of the three main algae types: phytoplankton (floating freely in water column), periphyton (attached to aquatic vegetation or other structures) and benthic (attached to bottom sediments). The decay of organic solids resulting from excessive concentrations of solids and nutrients can cause low levels of dissolved oxygen in the receiving water.

The fish culture wastewater, which contains metabolic waste products from the fish, had a monthly average flow of 2.09 mgd, with a maximum daily flow of 3.07 mgd, based on Discharge Monitoring Report (DMR) data at the hatchery from January 2008 through May 2015. About 75% of the water is from uncontrolled flowing springs, and the remainder is from wells. Floating feed is used, which does not carry over into the discharge. Most of the solid wastes from the fish are settled and captured in the raceways and ponds, and periodically removed by a vacuum pump. The solids are disposed of on land at the facility. At the end of the series of raceways and ponds, there is a settling pond to capture solids which escape the ponds and raceways. As mentioned previously, the final discharge is to Russellville Brook, a tributary to the Connecticut River.

Action Area of the Facility's Discharge
The action area is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR § 402.02). For this draft permit, the action area is defined as 1) the drainage ditch that flows to the west and then south from the hatchery discharge; 2) the reach of Russellville Brook from the area where the ditch merges with the brook to the confluence of Russellville Brook with the Connecticut River; and 3) an area of the Connecticut River associated with the flow from Russelville Brook that extends approximately one-third of the distance from the east bank of the river toward the midline of the river as well as downstream from this confluence for approximately one-quarter of a mile.

Atlantic Sturgeon Information
NMFS announced a final decision on January 31, 2012, to list five distinct population segments (DPSs) of Atlantic sturgeon under the Endangered Species Act. The Chesapeake Bay, New York Bight, Carolina, and South Atlantic populations of Atlantic sturgeon are listed as endangered, while the Gulf of Maine population is listed as threatened.

The following information was taken primarily from a letter dated December 19, 2011, from Patricia Kurkul, NMFS, to John Nagle, EPA, related to ESA Section 7 consultation for the permit reissuance of the Chicopee Water Pollution Control Facility (WPCF):

> Atlantic sturgeon have some potential to travel up the mainstem of the Connecticut River into the state of Massachusetts. Atlantic sturgeon are a long-lived, late maturing, estuarine-dependent, anadromous species, feeding primarily on benthic invertebrates (ASSRT, 2007). They have been historically reported in the Connecticut River as far upstream as Hadley, MA. However, significant evidence that Atlantic sturgeon moved past Enfield, CT into the upper Connecticut River was previously rare since this species tends to remain in the lower river in the range of the salt wedge (River Mile 6 – 16; Savoy and Shake, 1993). In 2006, an adult Atlantic sturgeon was observed in the spillway lift at the Holyoke dam, providing some indication that this species may move further upstream into the freshwater reaches of the Connecticut River. However, extensive sampling and the lack of any strong evidence of Atlantic sturgeon spawning indicates that the presence of this species in the vicinity of the discharge is unlikely [Chicopee WPCF Discharge].

The Chicopee WPCF, discussed in the paragraph above, is approximately 25 river miles downstream from the confluence of Russellville Brook, which serves as the hatchery's receiving water, and the Connecticut River. The Sunderland Hatchery is further separated from the Chicopee WPCF by the Holyoke Dam, which is approximately 20 river miles downstream. According to this information, based on the normal distribution and the known information about this species in the Connecticut River at this time, it is highly unlikely that Atlantic sturgeon would be present in the vicinity of the Sunderland Hatchery discharge. Therefore, consultation under Section 7 of the ESA with NMFS is not required for this species.

Shortnose Sturgeon Information

Information in this attachment on shortnose sturgeon was taken primarily from the Draft Endangered Species Act Section 7 Consultation Biological Opinion (BO) for the Holyoke Hydroelectric Project (Federal Energy Regulatory Commission (FERC) Permit #2004), issued to FERC by NOAA Fisheries on September 1, 2004.

A general profile of the life history of the species follows. Spawning of this anadromous species occurs over channel habitats containing gravel, rubble, or rock-cobble substrates (Dadswell et al. 1984; NOAA Fisheries 1998). Eggs become adhesive soon after fertilization and are not thought to drift high into the water column. Once hatched, the larvae are photonegative, remaining on the bottom for several days. Buckley and Kynard (1981) found week old larvae to be photonegative and form aggregations with other larvae in concealment. Young-of-the-year shortnose sturgeon are believed to move downstream after hatching (Dovel 1981) but remain within freshwater habitats. Juveniles generally move upstream in spring and summer and move back downstream in fall and winter. Shortnose sturgeon typically occur in the deepest parts of rivers or estuaries where suitable oxygen and salinity values are present (Gilbert 1989).

Shortnose Sturgeon Activity In The Vicinity Of Montague State Fish Hatchery
The Connecticut River near the confluence with Russellville Brook is an important upriver (above the Holyoke Hydroelectric Project) habitat for shortnose sturgeon.[1] According to the 2010 Biological Assessment document, "Upstream of the Holyoke Dam there is a 2-km shortnose sturgeon spawning area at Montague, MA (rkm 194–193; Kynard et al. 2012). Foraging and wintering areas for the shortnose sturgeon upstream lay in the 49-km Deerfield Concentration Area (DCA) between rkm 192–144." The spawning area, located near the Cabot Electrical Generating Station, is more than 8 river miles upstream of the confluence of Russellville Brook. Overwintering and foraging areas are located downstream of Russellville Brook; the most prominent overwintering site ("Whitmore") is located about 6 river miles from the Montague spawning site and about 2 river miles upstream of the confluence with Russellville Brook. Shortnose sturgeon may be present in the vicinity of the confluence of the Connecticut River and Russellville Brook year-round, and would be likely to pass the confluence of Russellville Brook while migrating to and from the Montague spawning site beginning and continuing through early summer. Larvae may be present in the vicinity of Russellville Brook during May and June.

Potential Impacts to Shortnose Sturgeon From Facility Operation
As indicated earlier in this attachment, the single federally listed endangered fish species in the Connecticut River in the vicinity of the facility is the shortnose sturgeon (*Acipenser brevirostrum*). The shortnose sturgeon was placed on the original endangered species list in 1967 [32 Fed. Reg. 4001 (1967)] by the USFWS. Currently, NOAA Fisheries has authority over this species under Section 4(a) (2) of the ESA, 16 U.S.C. Section 1533 (a) (2). At present, there are 20 recognized distinct population segments [63 Fed. Reg. 69613-69615 (1998)], which all remain listed as endangered.

EPA recognizes that the Connecticut River at the confluence with the Russellville Brook (Sunderland Hatchery receiving water) is an important habitat for shortnose sturgeon. The likely natural movement pattern of shortnose sturgeon from spawning areas to foraging and wintering habitat described above could cause shortnose sturgeon to come in contact with the discharge from the Sunderland Hatchery that ultimately reaches the Connecticut River.

Factors That Minimize Adverse Impacts
When evaluating the potential impacts of facility operation on the shortnose sturgeon, there are several factors that are expected to minimize any adverse impacts. For example, the effluent discharges directly to a drainage ditch, which flows to the west and then south, is joined by some other drainage channels and then joins "named" Russellville Brook about one-quarter to one-half mile from the hatchery. Although there is no available dilution at the point of discharge, the brook receives additional input from natural springs and man-made drainage ditches in the upland forests before reaching the mainstem of the Connecticut River. The maximum daily flow from the hatchery, which comprises the majority of the tributary's flow, ranges from 1.2 to 3.1

[1] Shortnose Sturgeon Status Review Team. 2010. A Biological Assessment of Shortnose Sturgeon (*Acipenser brevirostrum*). Report to National Marine Fisheries Service Northeast Regional Office. November 1, 2010. 417 pp.

MGD with a long-term average of 2.4 MGD (based on discharge monitoring reports from the Sunderland Hatchery between January 2008 and May 2015). When it combines with the mainstem of the Connecticut River, the dilution even at a 7-day 10-year low flow (7Q10 flow statistic) is approximately 350 to 1.[2] Also, it is not expected that shortnose sturgeon would come into immediate contact with the hatchery's discharge, as these fish are generally found in deeper river channels rather than shallow brooks. In addition, the primary purpose of the hatchery is to support the trout production and, as a result, must be of sufficient quality to support rearing of brown, brook, and rainbow trout. These salmonids have been classified as relatively intolerant of pollution and require high water quality for their production.[3]

The hatchery's single Outfall (001), is authorized to discharge hatchery effluent continuously under the draft permit. The rate of this continuous discharge varies with the flow of the natural springs that supply the hatchery's water, but generally has a monthly averages about 2.1 million gallons per day (MGD) with a maximum of 2.9 MGD. Another factor that will likely minimize potential adverse impacts to fish communities (including shortnose sturgeon) in the Connecticut River is the settling ponds at the terminal end of each series of raceways and in the hatchery's ponds. As described in the Fact Sheet, suspended solids from the hatchery settle in the large rearing ponds or in the settling ponds located at the terminal end of the raceway system. Most solids decompose naturally and, according to the permittee, large scale removal of solids is not performed at the Sunderland Hatchery. Solids that are removed during weekly cleaning events are typically hand-raked or removed with a vacuum pump and disposed of at established locations on the property where they will not drain back into the raceway system or any other waterway.

Other factors that will continue to minimize potential adverse impacts to fish communities include the BMP Plan described above and the numeric limits and monitoring requirements summarized below and presented in detail in the section of the fact sheet to the draft permit entitled "Proposed Permit Effluent Limitations and Conditions" (Section 5.0)

Biochemical Oxygen Demand
Biological oxygen demand (BOD_5) water test is an indicator of the amount of oxygen being used by aerobic microorganisms in the water to decompose organic matter and to ensure there remains sufficient oxygen for other aquatic life in the receiving water. BOD has the potential to affect dissolved oxygen (DO) concentrations in the vicinity of and downstream from the hatchery's

[2] USGS's StreamStats application estimates a 7Q10 low flow statistic of 1690 cubic feet per second (cfs) at the USGS Gage at Montague City (Gage 01170500), which is less than 7 river miles upstream of the confluence with Russellville Brook. At a maximum flow of 3.1 MGD (4.8 cfs) and a 7Q10 flow of 1690 cfs, the dilution factor is 4.8 cfs +1690 cfs/4.8 cfs = 353:1.
[3] Halliwell, D.B., R.W. Langdon, R.A. Daniels, J.P. Kurtenbach, and R.A. Jacobson. 1999. Classification of freshwater fish species of the northeastern United States for use in the development of IBIs. Pages 301-337 in T.P. Simon (editor). Assessing the sustainability and biological integrity of water resources using fish communities. CRC Press, Boca Raton, Florida.

outfall.

The current permit's mass- and concentration-based maximum daily limitations of 97 pounds per day (lb/d) and 10 mg/l, which were based on Best Professional Judgment (BPJ) during a previous permit cycle, have been carried forward in the current permit consistent with antibacksliding regulations at 40 CFR 122.44(l). Neither the mass- or concentration-based limits were exceeded during the last permit cycle.

Shortnose Sturgeon are unlikely to be affected by BOD_5 at the Sunderland Hatchery. First, dissolved oxygen in the hatchery effluent must be sufficient to support the production of brook, brown, and rainbow trout. In addition, the concentration of BOD_5 at the discharge is well below the permitted effluent limitation, and Russellville Brook meanders some distance before joining the Connecticut River. It is at this point that shortnose sturgeon are likely to first come in contact with the effluent from the hatchery. Assuming one-third of the volume of 7Q10 low flow of the Connecticut River for dilution (563 cfs), the dilution of the effluent would be 117 to 1 at the maximum daily reported flow (4.8 cfs). EPA has made the preliminary determination that, given the generally high quality of the effluent and available dilution in the Connecticut River, shortnose sturgeon are unlikely to be affected by BOD_5 in the hatchery effluent.

Total Suspended Solids
TSS can affect aquatic life by reducing growth rate or resistance to disease, by preventing the successful development of fish eggs and larvae, by modifying natural movements and migration, and by reducing the abundance of available food ("The Gold Book," EPA 1986). These effects are caused by TSS decreasing light penetration and by burial of the benthos. Eggs and larvae are most vulnerable to increases in solids. While there have been no directed studies on the effects of TSS on shortnose sturgeon, SNS juveniles and adults are often documented in turbid water. Dadswell (1984) reports that shortnose sturgeon are more active under lowered light conditions, such as those in turbid waters. (Montague Letter) In contrast, brook trout, which are reared at the hatchery, tend to be sight feeders and, as such, can be particularly susceptible to moderate turbidity levels because turbidity can interfere with their ability to locate food (USFWS HSI).

The current permit's mass- and concentration-based maximum daily TSS limitations of 97 lb/d and 10 mg/l, which were based on Best Professional Judgment (BPJ) during a previous permit cycle have been carried forward in the current permit consistent with antibacksliding regulations at 40 CFR 122.44(l).

Shortnose sturgeon eggs and larvae are likely to be less tolerant to sediment levels than juveniles and adults. Several studies have examined the effects of suspended solids on fish larvae, although not shortnose sturgeon. Auld and Schubel (1978) showed that striped bass larvae tolerated 50 mg/l and 100 mg/l suspended sediment concentrations and that survival was significantly reduced at 1000 mg/L. In a study on the effects of suspended sediment on white perch and striped bass eggs and larvae performed by the ACOE (Morgan et al. 1973), researchers found that sediment began to adhere to the eggs when sediment levels of over 1000 mg/l were reached. No adverse effects to demersal eggs and larvae have been documented at levels at or

below 50 mg/L (Montague Letter). This concentration is well above the numeric maximum daily limit of 10 mg/l in the draft permit.

Based on this information, the fact that the effluent from the hatchery must support rearing of brown, brook, and rainbow trout which can be susceptible to suspended solids, and because the hatchery effluent will be diluted by a factor of 117 when Russellville Brook mixes with the Connecticut River (assuming a third of the 7Q10 flow of the river for mixing), EPA has made the preliminary determination that the discharge is unlikely to have any effect on shortnose sturgeon.

pH
The draft permit limits the range of pH to 6.5 – 8.3 standard units (SU) consistent with the Massachusetts Surface Water Quality Standards for Class B waters at 314 C.M.R. 4.05(3)(b)(3). As such, no adverse effects to shortnose sturgeon are likely to occur as a result of the discharge of water of this pH into the Connecticut River.

Nutrients
Fish hatcheries have the potential to contribute nutrients (primarily nitrogen and phosphorus) to the receiving water. Nutrients are a pollutant of concern in fish hatchery wastewater, and the current permit requires twice quarterly reporting of maximum daily total nitrogen and total phosphorus. EPA has made the preliminary determination that the discharge of nutrients from the Sunderland Hatchery is unlikely to impact shortnose sturgeon in the Connecticut River.

Long Island Sound experiences low levels of dissolved oxygen (hypoxia) that can exceed water quality standards and impair the function and health of the Sound. The low dissolved oxygen levels are linked to excessive human-generated sources of nitrogen, including from the Connecticut River. The Total Maximum Daily Load (TMDL) developed for Long Island Sound includes a waste load allocation (WLA) for out-of-basin sources (including Massachusetts facilities discharging to the Connecticut River watershed). In addition, CTDEEP applied a threshold equivalent in impact to a 35 lbs/day threshold at facilities upstream in MA and NH when imposing nitrogen controls on existing facilities (See *Nitrogen Control for Small Sewage Facilities*). EPA considers facilities in Massachusetts discharging more than 35 lbs/day of total nitrogen to receiving waters in the Connecticut River watershed significant sources of nitrogen which could subject a facility to more stringent requirements or numeric limits for nitrogen.

EPA estimated a total nitrogen load of 27.3 lbs/day from the Sunderland Hatchery based on quarterly monitoring data during the previous permit cycle. These loadings indicate that the Facility is unlikely to exceed the threshold of 35 lbs/day for nitrogen.[4] As such, no adverse effects to shortnose sturgeon are likely to occur as a result of the discharge hatchery effluent into the Connecticut River. In addition, the effluent from the hatchery will be diluted by a factor of

[4] EPA does not expect nitrogen concentrations to increase substantially in the next permit cycle. The addition of nitrogen is primarily through fish feed, which the facility closely regulates to meet production goals (which are consistent year to year) in an effort both to maintain water quality for the trout as well as reduce costs associated with production.

117 when Russellville Brook mixes with the Connecticut River (assuming a third of the 7Q10 flow of the river for mixing), further reducing the potential for adverse effects on shortnose sturgeon. The draft permit requires the Facility to continue to monitor total nitrogen twice per quarter.

Phosphorus is not known to be toxic to aquatic life, including shortnose sturgeon. However, elevated phosphorus levels are associated with eutrophication and indicative of water quality problems including lowered dissolved oxygen levels. Massachusetts has not yet established numeric water quality-based criteria for phosphorus, but does include narrative criteria to protect the designated and existing uses of the receiving water from the effects of eutrophication. EPA's 1986 Quality Criteria for Water ("the Gold Book") recommends a maximum in-stream phosphorus concentration of 0.1 mg/l in streams and other flowing waters. Although average total phosphorus concentrations in hatchery effluent exceeded this value in the last permit cycle, observed total phosphorus concentrations in the Connecticut River downstream of the confluence of the unnamed tributary were substantially less than 0.1 mg/l and generally less than EPA's recommended ecoregional criteria for this subecoregion (Ecoregion XIV: Eastern Coastal Plains, Subecoregion 59) [5], which suggests that phosphorus concentrations in the segment of the Connecticut River downstream of the hatchery are representative of surface waters that are minimally impacted by nutrients and do not exhibit the adverse effects of nutrient overenrichment from cultural eutrophication. Additional dilution downstream of the effluent discharge, in this case from the additional drainage area, may also minimize the potential impacts of the discharge of phosphorus from the hatchery. In addition, the best management practices for solids control implemented during the last permit issuance has substantially reduced the concentration of phosphorus in the effluent compared to the previous issuance from a daily max average of 0.26 mg/l to a daily max average of 0.12 mg/l. Continued refinement of these BMPs may further minimize phosphorus concentrations in hatchery effluent.

EPA concludes that the Connecticut River downstream of the hatchery is currently protected from nutrient enrichment, and that the best management practices for solids control contained in the draft permit, including prohibiting the discharge of untreated wastewater prior to solids removal and efficient feed management, will continue to minimize the discharge of phosphorus from the facility. The draft permit carries forward the current permit requirement to monitor maximum daily total phosphorus at Outfall 001 on a twice quarterly basis and requires additional monitoring of the unnamed tributary downstream of the hatchery to determine if a phosphorus limit is necessary to control the development of nuisance plants in the future.

Medications
The facility has the potential to use 35% PEROX-AID® (hydrogen peroxide solution) as an external microbiocide for the control of mortality in freshwater-reared finfish eggs due to

[5] Appendix B of the Connecticut River Watershed 2003 Water Quality Assessment Report: Water Quality Monitoring Data (MassDEP 2008) reports total phosphorus concentrations in Connecticut River segment MA34-04 at Station CT04A located at the Route 5/10 Bridge in Deerfield less than the recommended ecoregional criteria of 0.024 mg/l in monthly samples from April to October 2003 with one exception (total phosphorus concentration of 0.029 mg/l reported in August 2003).

saprolegniasis, in freshwater-reared salmonoids due to bacterial gill disease (*Flavobacterium branchiophilum*), and in freshwater-reared cool water finfish due to external columnaris disease (*Flavobacterium columnae*). PEROX-AID® is an FDA-approved drug for freshwater-reared finfish, and its use must adhere to FDA label instructions. The draft permit had added a maximum daily hydrogen peroxide effluent limit of 0.7 mg/l, which is derived from the acute benchmark (criteria maximum concentration) in *Environmental Assessment for the Use of Hydrogen Peroxide in Aquaculture for Treating External Fungal and Bacterial Diseases of Culture Fish and Fish Eggs* (USGS 2006, p.72). Monitoring of hydrogen peroxide is required in the draft permit once during each period that PEROX-AID® is used at the facility.

The Sunderland Hatchery has also retained authorization to use and discharge formalin (e.g., Paracide-F, Formalin-F or Parasite-S), which contain approximately 37 % by weight of formaldehyde gas. Formalin is used for the therapeutic treatment of fungal infections on the eggs of finfish and to control certain external protozoa and monogenetic trematodes on all finfish species. According to the permittee, formalin has not been used at the Sunderland Hatchery during the last permit cycle. However, the hatchery has requested that the current permit limits be retained to allow for emergency use of formalin. The draft permit includes a maximum daily formaldehyde limit of 0.74 mg/l when formalin is in use. This limit was carried forward from the current permit and is based on MassDEP's review of available aquatic life toxicity information pertaining to formaldehyde. Monitoring has been increased from once per quarter to once per event when formalin is used. In addition, the draft permit requires monitoring of dissolved oxygen and a whole effluent toxicity (WET) test once per event when formalin is used.

EPA concludes that the limited use of PEROX-AID® and/or formalin to treat fish is not likely to adversely impact shortnose sturgeon given that the numeric effluent limitations applied during the use of medications will prevent toxicity and because the hatchery rarely, if ever, uses medications (e.g., formalin was not used at the hatchery during the last permit cycle). In addition, the flow from Russellville Brook is subject to substantial dilution upon mixing with the Connecticut River at the point at which shortnose sturgeon would be exposed to the hatchery's effluent. Assuming one-third of the 7Q10 flow of the river for dilution (563 cfs), the anticipated in-stream concentration of formaldehyde in the Connecticut River from the hatchery would be:

$$C_{river} = [(Q_{discharge} * C_{discharge}) + (Q_{upstream} * C_{upstream})]/(Q_{river})$$

Where:
C_{river} = In-stream concentration in CT river downstream of the confluence with the unnamed tributary
Q_{river} = River flow downstream of confluence with unnamed tributary = $Q_{discharge} + Q_{upstream}$
$Q_{discharge}$ = Maximum reported effluent flow (4.8 cfs)
$C_{discharge}$ = Maximum effluent concentration (equal to permit limit of 0.7 mg/l)
$Q_{upstream}$ = Assumed to be one-third of the 7Q10 low flow for Connecticut River (563 cfs)
$C_{upstream}$ = In-stream concentration of hydrogen peroxide in the CT river, assumed to be 0

$$C_{river} = [(4.8 \text{ cfs} * 0.7 \text{ mg/l}) + (563 \text{ cfs} * 0 \text{ mg/l})]/(566.4 \text{ cfs}) = \mathbf{0.006 \text{ mg/l}}$$

Similarly, the anticipated in-stream concentration of formalin at a maximum discharge of 0.74 mg/l from the hatchery would also be 0.006 mg/l. EPA has made the preliminary determination that these concentrations are unlikely to affect shortnose sturgeon in the Connecticut River.

Data gathered from the required monitoring in the draft permit will provide important information regarding the potential impact of the facility's discharge on the water quality of the Connecticut River. The hatchery is committed to using as few chemotherapeutic agents and/or medications as possible and, in support of this statement, did not used formalin in the last permit cycle. In the event that medications are used, the draft permit includes narrative and reporting requirements for the use of drugs and includes numeric limits and monitoring requirements specific to the use of formalin and PEROX-AID® to minimize impacts to the receiving water. EPA has a range of options to address the presence in the discharge of potentially harmful pollutants. For example, EPA has the statutory authority to "terminate or modify for cause including, but not limited to, ... change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge." See CWA Section 402(b)(1)(C)(iii) as referenced by CWA Section 402(a)(3). Additionally, by regulation EPA has the authority to modify or revoke and reissue a permit for cause in accordance with 40 C.F.R. Section 122.62. A cause for modification "includes any information indicating that cumulative effects on the environment are unacceptable." See 40 C.F.R. Section 122.62(a)(2).

Monitoring Required By Previous Permit

Attachment C of the draft permit's fact sheet summarizes monitoring data at Outfall 001 during the last permit cycle (January 2008 through May 2015). The collection of this information was required by the facility's current NPDES permit. Parameters measured include those summarized above, with the exception of hydrogen peroxide which has been added to the draft permit to protect aquatic life during the use of PEROX-AID® to treat fish disease at the hatchery. Section 5.0 of the Fact Sheet entitled (Proposed Permit Effluent Limitations and Conditions) contains a detailed review of the monitoring data and a discussion of how the data supports limits and monitoring requirements in the proposed draft permit. A review of the data supports the conclusion that, in general, the existing limits and narrative requirements, including the current BMP plan, are minimizing the impact of the hatchery's effluent to the water quality of the receiving water consistent with a determination that the discharge is likely to have an insignificant effect on water quality in the Connecticut River.

EPA Finding

Based on the expected, deeper water, river channel habitat where shortnose sturgeon will occur in the Connecticut River and the fact that the outfall is located about 0.25 miles upstream of the confluence of the receiving water and the Connecticut River, shortnose sturgeon are not likely to come in to contact with direct discharge from the facility. Effluent from the hatchery achieves substantial dilution upon mixing with the Connecticut River (at a factor of 353 to 1) at the point at which shortnose sturgeon would likely first be exposed to hatchery effluent. In addition, the draft permit carries forward the numeric limits and monitoring requirements from the current permit and includes a more stringent monitoring requirement when formalin is in use and had

added a numeric limit for hydrogen peroxide when PEROX-AID® is in use. Based on these factors and a review of the monitoring data, EPA has made the preliminary determination that the reissuance of this permit is not likely to adversely affect the shortnose sturgeon or its habitat. EPA is seeking concurrence with this determination from NMFS through this analysis, the draft permit and a letter under separate cover.