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,"

Northeast Gateway Energy Bridge, LLC
1330 Lake Robbins Drive, Suite 270
The Woodlands, TX 77380

is authorized to discharge from a facility located at

Northeast Gateway Energy Bridge
Massachusetts Bay

to receiving waters named

Massachusetts Bay

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

This permit shall become effective on the first day of the calendar month following thirty (30) days after the date of signature.

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

The authorizations to discharge contained in this permit shall be effective only during time periods when a National Oceanic and Atmospheric Administration Incidental Take Statement which exempts the U.S. Environmental Protection Agency from the take prohibitions of the Endangered Species Act is in effect for the Northeast Gateway Energy Bridge Project.

This permit consists of 7 pages in Part I including effluent limitations, monitoring requirements, etc., 25 pages in Part II including General Conditions and Definitions, and 9 pages (plus introductory pages) in Attachment A, *Operational Monitoring Program for the Northeast Gateway Port Massachusetts Bay Offshore Gloucester, MA, August 2007.*

Signed this 27th day of October, 2007

/S/ SIGNATURE ON FILE

_____

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

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. Any regasification vessel while moored at the Northeast Gateway Energy Bridge deepwater port must comply with this permit, and this permit applies only when the regasification vessel is moored at the Northeast Gateway Energy Bridge deepwater port.

2. During the period beginning on the effective date of the permit and lasting through expiration, the permittee is authorized to discharge through **outfall serial numbers 01A and 01B: Main Condenser Cooling Water.** Discharges shall be limited and monitored by the permittee as specified below:

OUTFALL 01A- Buoy A
Latitude 42º 23' 38.46" Longitude 70º 35' 31.02"

OUTFALL 01B- Buoy B
Latitude 42º 23' 56.40" Longitude 70º 37' 0.36"

Effluent Characteristic (units)	Discharge Limitations			Monitoring Requirements	
	Annual Total	Monthly Average	Maximum Daily	Measurement Frequency	Sample Type
Total Discharge Time (hours)[1]	520	----	----	Continuous	Estimate[2]
Flow rate (MGD)[3]	----	----	7.82	Continuous	Estimate[4]
Temperature Rise, ΔT (°C)[5]	----	Report	2.6	Hourly	Calculation

[1] Total Discharge Time equals the sum of the discharge time from outfalls 01A and 01B. Annual total will be based on the calendar year. Report year-to-date totals for each outfall on monthly discharge monitoring reports. Total discharge time limit is based on a maximum flow rate of 32,700 gallons per minute.

[2] For each delivery, Northeast Gateway will log the time of the following events: (a) the beginning of the regasification process; (b) the beginning of heat recovery system (HRS) closed loop operation; (c) the end of HRS operation; and (d) the end of the regasification process and cessation of commercial delivery of natural gas. For each delivery, Discharge Time for Outfalls 01A, 01B, 02A and 02B will be calculated by adding the following two intervals: (1) the time between (a) and (b); and (2) the time between (c) and (d).

[3] Flow rate is the flow from each outfall (01A and 01B).

[4] The daily flow rate shall be calculated based upon the pump curve values and the hours of operation for the pump(s) during the reporting period and shall be reported in the units of millions of gallons per day (MGD). The permittee shall also report the total number of days during the reporting period in which there was a discharge from the outfall(s) (to be noted on Discharge Monitoring Report under the "event total" parameter).

[5] Temperature Rise (ΔT) is the difference between the discharge temperature and the intake temperature. The intake and discharge temperatures shall be continuously measured and recorded by instruments or computers (thermistors) which record a minimum of 12 times per hour. The intake temperature shall be monitored at the intake structure of each unit that is operating. The temperature rise shall be calculated as an hourly average, based on the hourly average intake temperature and the hourly average discharge temperature measured during the same hour.

3. During the period beginning on the effective date of the permit and lasting through expiration, the permittee is authorized to discharge through **outfall serial numbers 02A and 02B: Auxiliary Seawater Service Cooling.** Discharges shall be limited and monitored by the permittee as specified below:

OUTFALL 02A- Buoy A
Latitude 42º 23' 38.46" Longitude 70º 35' 31.02"

OUTFALL 02B- Buoy B
Latitude 42º 23' 56.40" Longitude 70º 37' 0.36"

Effluent Characteristic (units)	Discharge Limitations			Monitoring Requirements	
	Annual Total	Monthly Average	Maximum Daily	Measurement Frequency	Sample Type
Discharge Time (hours)[1]	520	----	----	Continuous	Estimate[2]
Flow rate (MGD)[3]	----	----	0.99	Continuous	Estimate[4]
Temperature Rise, ΔT, (°C)[5]	----	Report	5.5	Hourly	Calculation

[1] Total Discharge Time equals the sum of the discharge time from outfalls 02A and 02B. Annual total will be based on the calendar year. Report year-to-date totals for each outfall on monthly discharge monitoring reports. Total discharge time limit is based on a maximum flow rate of 4,200 gallons per minute.

[2] For each delivery, Northeast Gateway will log the time of the following events: (a) the beginning of the regasification process; (b) the beginning of heat recovery system (HRS) closed loop operation; (c) the end of HRS operation; and (d) the end of the regasification process and cessation of commercial delivery of natural gas. For each delivery, Discharge Time for Outfalls 01A, 01B, 02A and 02B will be calculated by adding the following two intervals: (1) the time between (a) and (b); and (2) the time between (c) and (d).

[3] Flow rate is the flow from each outfall (02A and 02B).

[4] The daily flow rate shall be calculated based upon the pump curve values and the hours of operation for the pump(s) during the reporting period and shall be reported in the units of millions of gallons per day (MGD). The permittee shall also report the total number of days during the reporting period in which there was a discharge from the outfall(s) (to be noted on Discharge Monitoring Report under the "event total" parameter).

[5] Temperature Rise (ΔT) is the difference between the discharge temperature and the intake temperature. The intake and discharge temperatures shall be continuously measured and recorded by instruments or computers (thermistors) which record a minimum of 12 times per hour. The intake temperature shall be monitored at the intake structure of each unit that is operating. The temperature rise shall be calculated as an hourly average, based on the hourly average intake temperature and the hourly average discharge temperature measured during the same hour.

4. During the period beginning on the effective date of the permit and lasting through expiration, the permittee is authorized to discharge through **outfall serial numbers 03A and 03B: Water Curtain.** Discharges shall be limited and monitored by the permittee as specified below:

OUTFALL 03A- Buoy A
Latitude 42º 23' 38.46" Longitude 70º 35' 31.02"

OUTFALL 03B- Buoy B
Latitude 42º 23' 56.40" Longitude 70º 37' 0.36"

Effluent Characteristic (units)	Discharge Limitations		Monitoring Requirements	
	Annual Total	Maximum Daily	Measurement Frequency	Sample Type
Total Discharge Time (hours)[1]	9,640	----	Continuous	Estimate[2]
Flow rate (MGD)[3]	----	0.6	Continuous	Estimate[4]

[1] Total Discharge Time equals the sum of the discharge time from outfalls 03A and 03B. Annual total will be based on the calendar year. Report year-to-date totals for each outfall on monthly discharge monitoring reports. Total discharge time limit is based on a maximum flow rate of 400 gallons per minute.

[2] For each delivery, Northeast Gateway will log the time of the following events: (a) the beginning of the regasification process; (b) the beginning of heat recovery system (HRS) closed loop operation; (c) the end of HRS operation; and (d) the end of the regasification process cessation of commercial delivery of natural gas. For each delivery, Discharge Time for Outfalls 03A and 03B will be based on the time between events (a) and (d).

[3] Flow rate is the flow from each outfall (03A and 03B).

[4] The daily flow rate shall be calculated based upon the pump curve values and the hours of operation for the pump(s) during the reporting period and shall be reported in the units of millions of gallons per day (MGD). The permittee shall also report the total number of days during the reporting period in which there was a discharge from the outfall(s) (to be noted on Discharge Monitoring Report under the "event total" parameter.

Part I.A (continued)

5. In addition to any other grounds specified herein, this permit shall be modified or revoked at any time if, on the basis of any new data, the Director determines that continued discharges may cause unreasonable degradation of the marine environment.
6. The discharge shall not cause objectionable discoloration of the receiving waters.
7. The effluent shall not contain visible oil sheen, foam, or floating solids at any time.
8. The discharge shall not contain materials in concentrations or combinations which are hazardous or toxic to human health or the aquatic life of the receiving waters.
9. Pollutants which are not limited by this permit, but which have been specifically disclosed in the permit application, may be discharged up to the frequency and level disclosed in the application, provided that such discharge does not violate Section 307 or 311 of the Clean Water Act (CWA).
10. The permittee shall identify potential sources of pollution that may reasonably be expected to affect the quality of the curtain water discharges, and ensure implementation of best management practices (BMPs) which will be used to eliminate or minimize any exposure of the curtain water to pollutants. BMPs must include good housekeeping measures, preventative maintenance programs, spill prevention and response procedures, and runoff management practices. All BMPs shall be properly maintained and be in effective operating condition.
11. All existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe:
    a. That any activity has occurred or will occur which would result in the discharge, on a routine basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"
        i One hundred micrograms per liter (100 µg/l);
        ii Two hundred micrograms per liter (200 µg/l)for acrolein and acrylonitrite; five hundred micrograms per liter (500 µg/l) for 2,4-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
        iii Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 C.F.R.§122.21(g)(7); or
        iv Any other notification level established by the Director in accordance with 40C.F.R.§122.44(f)
    b. That any activity has occurred or will occur which would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"
        i Five hundred micrograms per liter (500 µg/L);
        ii One milligram per liter (1 mg/L) for antimony;
        iii Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 C.F.R.§122.21(g)(7).

iv Any other notification level established by the Director in accordance with 40C.F.R.§122.44(f).

c. That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant which was not reported in the permit application.

12. The discharge shall comply with any applicable regulations promulgated by the Secretary of the department in which the Coast Guard is operating, that establish specifications for safe transportation, handling, carriage, and storage of pollutants and which are then in effect.

B. COOLING WATER INTAKE AND THERMAL DISCHARGE MONITORING REQUIREMENTS

1. Regasification vessels that use the Northeast Gateway Energy Bridge deepwater port shall be constructed, maintained and operated to ensure compliance with the following cooling water intake structure (CWIS) location, design, construction and capacity criteria:

    a. CWISs are located at least 23 feet below the water surface,

    b. CWISs (including the structure and associated intake pumps) maintain a controlled intake velocity no greater than 0.5 feet per second, except during the 4-hour start-up and shut-down periods when intake velocity may not exceed 0.82 feet per second,

    c. CWISs maintain screen openings no greater than 0.83 inches, and

    d. the regasification vessels only use closed loop shell-and-tube vaporization technology to regasify LNG.

2. No regasification vessel that utilizes the Northeast Gateway Energy Bridge deepwater port may vary from the criteria specified in paragraph I.B.1 above unless the permittee first applies for and obtains a permit modification under 40 C.F.R. § 122.62.

3. The permittee is required to monitor the potential impact of the thermal discharge and ongoing water withdrawal. This monitoring should be done in accordance with requirements in the monitoring program in Attachment A to this permit. If, during thermal monitoring, measured temperatures at the 500 meter sampling location exceed ambient temperatures, the permittee shall continue to measure water temperatures in a direction away from the discharge every 25 meters until ambient temperatures are attained. The final distance where ambient temperatures were attained shall be recorded and reported within 30 days to EPA's Ocean & Coastal Unit, the National Marine Fisheries Service, and the Stellwagen Bank National Marine Sanctuary Office, at the addresses listed below.

    The permittee shall submit an annual report detailing the results of this monitoring effort no later than March 1 of the following year. This report shall also state the following information for the year: total discharge time in hours; total number of hours during which both outfall 01A and 01B discharged simultaneously; a detailed listing of the start and stop times for each discharge from each outfall; a summary of potential sources of pollution

identified and BMPs implemented pursuant to paragraph I.A.10; a narrative description of any malfunctions, operator or equipment failures, or unusual events, including natural events, that occurred during the year; for any such malfunction, failure, or unusual event, a detailed description of any discharges to waters of the United States that may have occurred as a result of such event; and a description of how, if at all, the facility's operations (including number and duration of Port visits) differed from the plans stated in the FEIS and/or the NPDES permit application, and if so, why. Copies of this report shall be submitted to the address listed in paragraph I.C.3 below, to the following persons, and to such other persons as EPA may designate:

Phil Colarusso
Ocean & Coastal Unit
U.S. Environmental Protection Agency
One Congress Street (COP)
Boston, MA 02114-2023

Chris Boelke
National Marine Fisheries Service
1 Blackburn Drive
Gloucester, MA 01930

Leila Hatch
Stellwagen Bank National Marine Sanctuary Office
175 Edward Foster Road
Scituate, MA 02066

C. MONITORING AND REPORTING

1. The permittee shall notify EPA at least 48 hours prior to any regasification vessel's arrival at the Northeast Gateway Energy Bridge deepwater port, by calling George Harding, EPA (617-918-1870), or another person designated by EPA. The permittee shall provide transportation for inspectors by appointment, as requested by EPA, from a coastal port location to, and from, the regasification vessel.
2. Monitoring results obtained during the previous month shall be summarized for each month and reported on separate discharge monitoring report (DMR) forms postmarked no later than the 15th day of the month following the effective date of the permit.
3. Signed and dated originals of these, and all other reports required herein, shall be submitted to the Director at the following address:

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

ATTACHMENT A

Operational Monitoring Program for the Northeast Gateway Port Massachusetts Bay Offshore Gloucester, MA

OPERATIONAL MONITORING PROGRAM
FOR THE
NORTHEAST GATEWAY PORT
MASSACHUSETTS BAY
OFFSHORE GLOUCESTER, MA

Prepared for

TETRA TECH EC, INC.
133 Federal Street, 6th Floor
Boston, MA 02110

and

EXCELERATE ENERGY, LLC
1330 Lake Robbins Dr., Suite 270
The Woodlands, TX 77380

Prepared by

NORMANDEAU ASSOCIATES, INC.
25 Nashua Road
Bedford, NH 03110

R-20152.008

August 2007

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1.0 INTRODUCTION

Excelerate Energy LLC ("Excelerate") has been licensed by the Department of Transportation Maritime Administration ("MARAD") and the U.S. Coast Guard ("USCG") under the Deepwater Port Act of 1973 ("DWP") as amended in 2002 to construct and operate an offshore deepwater port in Massachusetts Bay for the delivery through regasification and offloading via pipeline of liquefied natural gas ("LNG") from specially equipped vessels (Energy Bridge Regasification Vessels or EBRVs). Resource agencies have identified water use (uptake and discharge) during operation as the primary concern related to the port. Withdrawal of seawater for daily operations and ballast will result in the entrainment of ichthyoplankton. Discharge has the potential to affect the quality of the receiving water (Massachusetts Bay). Both of these potential impacts were thoroughly addressed in the Deep Water Port application and the EIS using available data and modeling. This document describes a five-year operational monitoring program designed to confirm the results of the previous impact assessment.

1.1 PROJECT DESCRIPTION

Northeast Gateway Energy Bridge, L.L.C. (Northeast Gateway) has received a license to construct, own, and operate the Northeast Gateway Deepwater Port (Northeast Port or Port), located approximately 13 miles southeast of Gloucester, MA (Figure 1). The Port, which will be located in Massachusetts Bay, will consist of a submerged buoy system to dock specifically designed Liquified Natural Gas (LNG) carriers approximately 13 mi (21 km) offshore of Massachusetts in federal waters approximately 270 to 290 ft (82 to 88 m) in depth. This facility will deliver regasified LNG to onshore markets via new and existing pipeline facilities owned and operated by Algonquin Gas Transmission, LLC (Algonquin). Algonquin will build and operate a new, 16.06-mile (25,8 km) long, 24-in (61-cm) diameter natural gas pipeline (called the Norheast Gateway Pipeline Lateral or Pipeline Lateral) to connect the Port to Algonquin's existing offshore natural gas pipeline system in Massachusetts Bay, called the HubLine.

Northeast Gateway's fleet of purpose built Energy Bridge Regasification Vessels (EBRVs) are conventional LNG transport vessels fitted with patented regasification equipment on board, and will transport LNG to the Port. Once at the Port, the EBRVs will begin regasification of the LNG back into gaseous natural gas and deliver the natural gas into a submerged pipeline system connected to existing pipeline infrastructure delivering in to the New England energy market. Excelerate has committed to using a closed loop system for regasification, thereby limiting the amount of sea water required for this process.

Water requirements will vary over the time that the ship is at port. During start-up and shut-down, each taking approximately four hours, the ship will withdraw 8.82 million gallons for engine condenser cooling and main seawater cooling. During routine operations (including the start-up and shut-down periods), the ship will withdraw 2.77 MGD for ballast, water curtain and freshwater generation. Water will be brought into the ship via both the upper and lower sea chests. The depth of the intakes on the ship ranges from 23-38 feet.

Water from several sources will be discharged from a depth of 17-28 feet (5-8 meters) below the surface into Massachusetts Bay while the EBRVs are moored. The discharge volume will vary according to the types of operations, similar to the seawater intake. On the first and last days that an

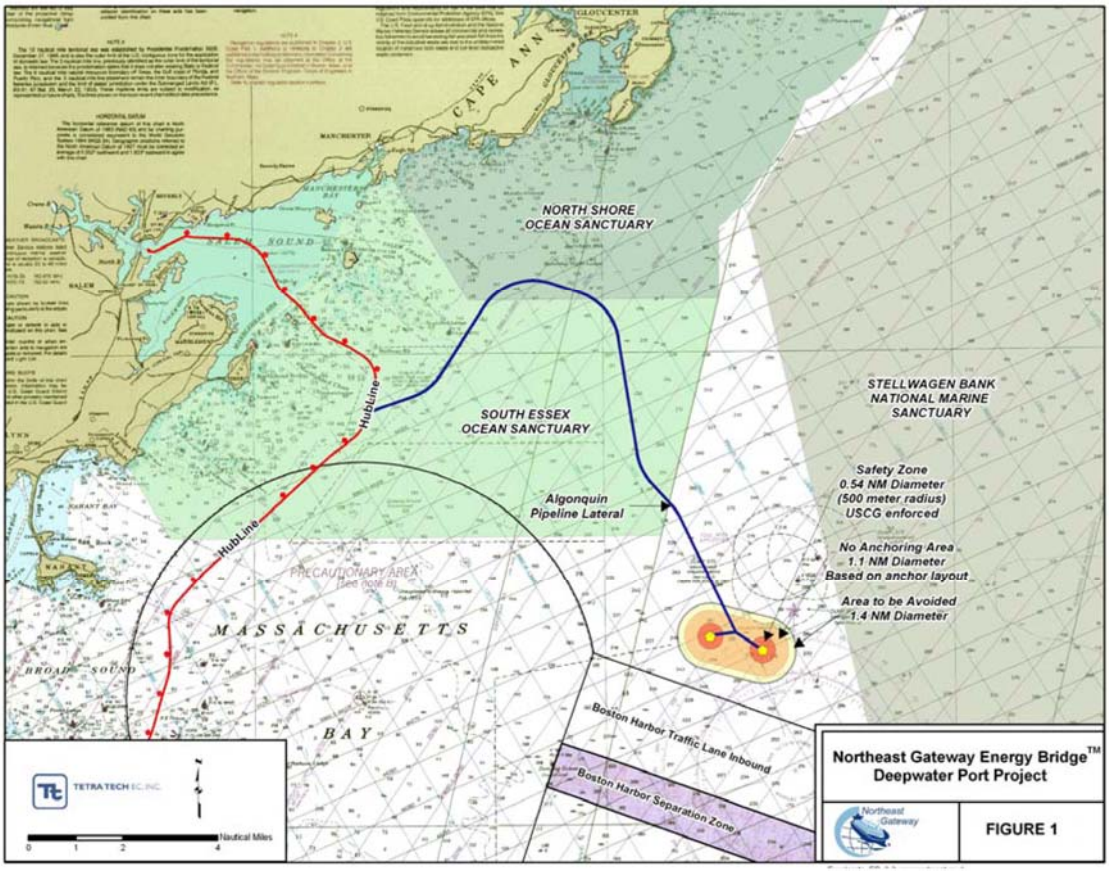

Figure 1. Northeast Gateway Deepwater Port and Pipeline Lateral Location.

EBRV is at port, the discharge volume will be approximately 9.69 MGD. During the remaining period, the discharge volume will be approximately 0.88 MGD. It is estimated that the discharge of treated wastewater will not exceed 0.005 MGD and will be compliant with MARPLO and EPA regulations. No bilge water will be discharged. The majority of the seawater withdrawn will be used for the main condenser cooling (7.82 MGD) and auxiliary seawater service cooling (0.99 MGD) during start-up and shut-down. No chemicals will be added to the water used for these purposes, but contact with the evaporation system will increase the water temperature. A small component of the discharge (0.27 MGD) will come from the freshwater generator and have slightly elevated salinity.

1.2 POTENTIAL FISHERIES IMPACTS

Entrainment of ichthyoplankton through water intake for various ship operations is a potential fisheries impact of concern to resource managers and regulators related to operation of Northeast Gateway. Comments related to fisheries issues from National Marine Fisheries Service on the DWP application centered on the suitability of available ichthyoplankton data for estimating impacts due to entrainment in the general shipboard water uptake system. Impact analysis during the licensing process used a variety of data sources, including general (non-quantitative) information for Massachusetts Bay, quantitative data from waters offshore of Hampton, NH (hydrologically linked, but somewhat distant from the project area), and quantitative data from NMFS's MARMAP and EcoMon programs.

MARMAP and EcoMon are broad scale programs that include stations in the vicinity of the proposed Northeast Gateway. MARMAP ended in the mid-1980s during a period when fisheries resources in New England waters were starting to undergo substantial declines. Ichthyoplankton data from the period prior to the decline, therefore, are unlikely to be representative of current conditions. The EcoMon program was initiated shortly after MARMAP ended, although ichthyoplankton data for the project area are available only for the period from 2000 through 2004. Data from these programs were used to quantify anticipated impacts to ichthyoplankton and adult populations caused by entrainment.

The purpose of the proposed sampling plan is to provide project-specific data to aid in quantifying the impacts related to entrainment of ichthyoplankton. Survey techniques are designed to sample the portion of the water column that will be affected by the EBRV intakes, a portion of that sampled during the MARMAP and EcoMon programs. Thus, sampling has been conducted prior construction to provide a recent baseline against which to compare operational data.

Entrainment losses of ichthyoplankton can appear to be very high in terms of absolute numbers, but the extremely high natural mortality rate for ichthyoplankton means that very few of these organisms would survive to maturity. These losses can be put into perspective through Equivalent Adult (EA) calculations that use natural mortality rates of individual species during their developmental stages to estimate the number of equivalent adults that are represented by the losses of eggs and larvae. Preliminary calculations for EA for several species were included in the Northeast Gateway EIS based on MARMAP and EcoMon data. These predictions will be evaluated based on the results of the preconstruction sampling and annually based on the operational period data.

1.3 POTENTIAL WATER QUALITY IMPACTS

Discharge plume modeling has been performed on the Project to estimate the estent of the thermal discharge plume from the EBRVs into Massachusetts Bay. Modeling was conducted on the EBRV Main Condenser and Auxiliary Seawater Cooling System two 4-hour discharge event estimates of 8.81 million gallons using the CORMIX Model. CORMIX is an analytical tool recommended by the EPA in several key guidance documents on the permitting of industrial, municipal, thermal, and other point source discharges to receiving waters. CORMIX was used to develop predictions related to the thermal plume behavior of the EBRV discharge quantity including the initial mixing, transport, and dilution in the nearfield plus 1,640 feet (500 meters).

Under various scenarios, the modeled plumes showed rapid transport of 33 feet (10 meters) or less to the surface within 65 to 130 feet (20 to 40 meters) horizontally downdrift of the discharge points. During this time, the plumes remained as a more or less coherent jet of warm water. With some spreading and diluting occurring as ambient water is entrained into the jet. Once at the surface, the buoyant plumes spread out rapidly and further mixed with the ambient surface water. The resulting surface plume was also transported downdrift of the vessel with the ambient current. The maximum surface temperature elevation estimated by CORMIX was 0.61°C (1.1°F) during summer conditions. The estimated surface temperature elevation at a distance of 1,640 feet (500 meters) downdrift from the discharge point was 0.10°C (0.18°F).

About 90% of the water processed through the freshwater generator will be discharged with a salinity about 10% higher than ambient conditions. This brinewater (0.27 MGD) will be mixed with other

sources prior to being discharged (0.88 to 9.69 MGD total) so that the salinity of the resulting discharge will be only negligibly higher than ambient.

2.0 ICHTHYOPLANKTON MONITORING STUDY DESIGN

2.1 STUDY PARAMETERS

The study is designed to collect site-specific data in the immediate port area over a pre-operational period of one year and an operational period of five years on ichthyoplankton diversity and abundance per volume of water at depths typically withdrawn by EBRVs. During operational period monitoring, additional collections will be made over the entire water column to ensure that impacts to species that exhibit diurnal vertical migrations are fully accounted for. These data will be analyzed in terms of likely impact to Massachusetts Bay fish populations in two ways—by comparing the population per volume withdrawn with the overall Massachusetts Bay volumes at equivalent depths, and by estimating the EA mortality implied by the entrainment.

Study parameters therefore include time of year and abundance by species of all identifiable finfish and lobster eggs and larvae. Densities of ichthyoplankton in the Port (no./1000 m^3) will be multiplied by estimated volume of water withdrawn (m^3) to estimate the number of ichthyoplankton entrained at the EBRVs.

Mortality rates for early life stages were generally available for the species of interest in the literature. Larval length data obtained during this monitoring program will be examined to evaluate whether they can be used to refine the mortality rates used in the Equivalent Adult modeling conducted for the Environmental Impact Statement for Northeast Gateway.

2.2 STUDY LOCATIONS

One general survey area was used to represent the two buoy sites during preconstruction sampling and the same area will be used during operational monitoring as well. The laboratory methods are designed to ensure that appropriate data are available to develop life stage-specific mortality rates for numerically or ecologically important species. Long-term monitoring of ichthyoplankton for power plants with open water intakes, such as Seabrook Nuclear Power Station located in coastal New Hampshire, has demonstrated that spatial differences in the ichthyoplankton populations in the source water body can not be readily detected even with a Before-After Control-Impact (BACI) sampling design because stations well outside the zone of influence of the intake are hydrologically linked to the intake area. Given the circulation patterns in outer Massachusetts Bay, therefore, additional survey areas would provide no greater resolution of the potential impacts of the Northeast Gateway system.

The sampling location was defined as a polygon encompassing the three alternative buoy locations analyzed during the licensing process. The polygon extends 0.5 nmi east and south of Buoy A and 0.5 nmi north and west of buoy C. The relationship of the sampling polygon to the buoys is depicted on Figure 2. Coordinates for the corners of the polygon are:

Corner	Longitude	Latitude
1 NW	70.6453°	42.4154°
2 SW	70.6457°	42.3872°
3 SE	70.5823°	42.3867°
4 NE	70.5819°	42.4149°

2.3 FIELD METHODS

Sampling will be conducted twice monthly and focus on two depth regimes: the depth zone (approximately 20-40 feet) where the intakes are located, and, hence, that is most vulnerable to withdrawal; and the full water column (within about 15 feet of the bottom, consistent with ECOMON protocols). The collection gear will be towed in an oblique manner through the depth zone. Three pseudo-replicate (sequential) samples will be taken in each depth zone (i.e., intake and full water column), each with a target volume of 300 m^3. Sampling will be conducted during daylight hours as well as at night. Night is defined as the period from 2+ hours after sunset to 2+ hours before sunrise. Daylight is defined as 2+ hours after sunrise to 2+ hours before sunset. Additional samples will be collected during the crepuscular period (i.e., the period from 1 hour before to 1 hour after sunrise and sunset), but will only be analyzed if results from the day and night collections are statistically different (e.g., through numerical classification), suggesting a period of significant vertical migration. The total number of samples collected annually is shown in Table 1.

Table 1. Planned Sampling Effort (number of samples) for Northeast Gateway Ichthyoplankton Monitoring Program

Diel Period	May 2006 – May 2007	Operational Period Years 1 - 5
Day	72	144
Night	72	144
Crepuscular	72**	144**
TOTAL	144**	288**

** totals exclude samples collected during crepuscular period that are to be archived and processed only if necessary.

Collection gear will be a 1.0 m^2 Tucker trawl, or a similar plankton net that can be opened or closed at depth, equipped with a 0.330 mm mesh net and a calibrated flowmeter. The net will be lowered to the target depth in a closed position and then opened with a messenger activating a double trip release mechanism (DTRM). At the end of the approximate 10- minute tow a second messenger will be sent down the wire to close the net. Pre- and post-deployment flowmeter readings will be recorded. The nets will be washed down using filtered seawater and the contents preserved in 5 to 10 percent buffered formalin. Preserved samples will be transported to the Biological Laboratory for analysis.

A detailed field log will be maintained by the Chief Scientist during each survey. All station

Figure 2. Ichthyoplankton Sampling Area (scale incorrect).

locations (starting point of tow) will be recorded using GPS. Water depth, bottom depth for full water column tows, and tidal stage will be recorded. Samples will be logged on Normandeau's standard chain-of-custody forms that will accompany the samples to the laboratory.

2.4 LABORATORY METHODS

All samples collected during daytime and nighttime periods will be processed in the laboratory. Samples collected during the crepuscular periods will be archived until the data analyst determines whether it would be necessary to analyze them. In the laboratory, all eggs and larvae will be identified to the lowest practical taxon. Subsampling will be allowed following Normandeau's standard laboratory procedures so that a minimum of 200 eggs and 100 larvae are identified. For eggs it may be necessary to group some taxa such as Labridae/yellowtail flounder, and hake/fourbeard rockling due to similarities in morphology and spawning season. Larvae are typically identified to the species level. For species that have clearly defined larval life stages (e.g., yolk sac, post-yolk sac, etc.), individuals will be assigned to the appropriate life stage. During the permitting process, 12 species of commercial or ecological importance (Table 2) were identified for impact assessment using Equivalent Adult Loss modeling techniques. Laboratory analysis will include length measurement to the nearest 0.5 mm will be made for these species, and any other abundant species, because length is a necessary parameter for estimating mortality rates for larvae. In addition, if lobster larvae are present in the samples, they will be enumerated by life stage.

Table 2. Fish species for which the Port area has been designated Essential Fish Habitat for larvae.

Common Name	Scientific Name
Atlantic cod	*Gadus morhua*
Atlantic herring	*Clupea harengus*
Atlantic mackerel	*Scomer scombrus*
Butterfish	*Peprilus triacanthus*
Cunner	*Tautogolabrus adspersus*
Haddock	*Melanogrammus aeglefinus*
Hake	*Urophycis* spp.
Pollock	*Pollachius virens*
Sand lance	*Ammodytes* spp.
Silver hake	*Merluccius bilinearis*
Winter flounder	*Pseudopleuronectes americanus*
Yellowtail flounder	*Limanda ferruginea*

Laboratory personnel will participate in Normandeau's standard Quality Control program in which 10% of each sorter's samples (randomly selected out of batches of 10 samples) are reexamined by a qualified supervisor to ensure a minimum of 95% of the ichthyoplankton individuals have been removed. Sorting efficiency (%) will be calculated as:

$$\frac{\text{QC count} - \text{original count}}{\text{QC count}} \times 100$$

Taxonomists also participate in the Quality Control program, with a randomly selected 10% of each taxonomist's samples being reanalyzed by a senior taxonomist to ensure a minimum taxonomic efficiency of 95%. Accuracy is calculated by species and lifestage as:

$$\frac{\text{QC count} - \text{original count}}{\text{QC count}} \times 100$$

Data will be recorded on laboratory data sheets and submitted to Normandeau's Data Processing Department. Normandeau typically includes several steps in the initial data processing to ensure quality of the data file. These steps include double keying of the original data, development of numerous range checks, and QC of the data entry by a taxonomist familiar with the data.

2.5 DATA ANALYSIS

2.5.1 Community Structure

Density of eggs and larvae will be presented as twice-monthly mean abundances (no./1000 m^3). Seasonal patterns will be described using numerical classification techniques. Life history of common species will be discussed in reference to Port construction and operation.

2.5.2 Entrainment Impacts

Twice-monthly mean abundances will be used to calculate the number of individuals (by species, life stage, and size class) that are vulnerable to entrainment by multiplying abundance by intake volume. To place these numbers in perspective, however, it is important to account for the naturally high mortality rates experienced by early life stages of marine organisms. With knowledge of life stage-specific mortality rates for individual species, entrainment losses can be converted to Equivalent Adult losses. The term Equivalent Adults reflects the number of fish that would survive to adulthood (at a defined age) assuming natural mortality rates.

Length measurements obtained during sample analysis will be used to develop regressions of density versus length with the slope of this line representing the mortality rate. If the site-specific samples do not provide sufficient data to estimate mortality rates for each species, values will be derived from the literature.

Ichthyoplankton abundance data will be used to estimate the reduction in reproductive age fish populations caused by entrainment of fish eggs and larvae by Northeast Gateway. It will be assumed that 100% of the organisms entrained in the vessel will be killed.

3.0 DISCHARGE WATER QUALITY MONITORING STUDY DESIGN

Discharge of heated water into Massachusetts Bay is the primary impact to water quality caused by operation of the Northeast Gateway Deepwater Port. Modeling of the discharge occurring on the first and last days at port has indicated that changes to water quality will be limited in space. Sampling will be conducted to confirm the model predictions, to demonstrate that a persistent discharge plume is not discernable at a great distance from the vessel, and to document plume characteristics during

winter mixed water column conditions, spring and fall transitional conditions, and summer stratified conditions.

Modifications to this study design may be made as a result of requirements outlined in the NPDES permit.

3.1 STUDY PARAMETERS

Water quality monitoring will be conducted on a quarterly basis for a period of five years with the primary purpose of documenting the extent of the thermal plume. Additional parameters that will be measured are salinity, dissolved oxygen, and current direction.

3.2 FIELD METHODS

At a distance of up to 3000 feet (1000 meters) from an EBRV in the first or last day of operation (highest discharge volume), average current direction of the uppermost 30 feet (10 meters) of the water column will be measured using an Acoustic Doppler Current Profiler (ADCP). This information will be used to determine the orientation of the sampling transect. The sampling vessel will maneuver as close to the EBRV's discharge as possible. Operating along a downcurrent transect, the field crew will collect temperature, salinity, and dissolved oxygen profiles at 300 foot (100 meter) intervals. The length of the transect will be a minimum of 1,640 feet (500 meters) and extend until two adjacent sampling points have surface temperatures within 0.5°C of each other. At each sampling location, measurements will be made at 3-foot (1-meter) intervals using appropriate probes along a vertical profile through the uppermost 30 feet (10 meters) of the water column.

3.3 DATA ANALYSIS

Geo-referenced data from the quarterly water column sampling will be plotted to document the two-dimensional behavior of the discharge plume. Results will be compared to the predictions of the CORMIX model.

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.

RESPONSE TO COMMENTS

REGARDING THE REISSUANCE OF THE FOLLOWING NPDES PERMIT

NORTHEAST GATEWAY LIQUEFIED NATURAL GAS (LNG) DEEPWATER PORT MA0040266

INTRODUCTION

On August 24, 2007, the New England office of the U.S. Environmental Protection Agency (EPA) submitted for public notice a draft National Pollution Discharge Elimination System (NPDES) permit (Draft Permit) to Northeast Gateway Energy Bridge, LLC (NEG). EPA solicited public comments on the Draft Permit from August 24, 2007 through September 25, 2007. In addition, EPA heard comments on the permit at a public hearing held on September 24, 2007, at the Beverly Public Library, 32 Essex Street, Beverly, Massachusetts.

The Draft NPDES Permit would authorize and set limits for the discharge of non-contact cooling water and seawater from the NEG liquefied natural gas (LNG) deepwater port. The facility proposes to discharge to the Massachusetts Bay.

During the public-notice (comment) period EPA received comments from the following individuals on behalf of various organizations or themselves. All comments were submitted in writing unless otherwise noted in the responses below.

Hope Benne

Polly Bradley, Nahant Safer Waters in Massachusetts, Inc. (SWIM)

Priscilla M. Brooks, Ph.D., Director, Ocean Conservation Program, Conservation Law Foundation

Rob Bryngelson, Executive Vice President and Chief Operating Officer, NEG

John D. Crawford, Ph.D., Senior Scientist, Conservation Law Foundation

Jay Havighurst

Rosemary A. Maglio, SWIM

Renee M. Mary

Joanne McBrien, Supervisor, Reliability and Strategic Planning, Massachusetts Division of Energy Resources

Heidi Roberts, Sierra Club

Mary Rodrick, SWIM

Mike Trammel, Director – Environmental, Excelerate Energy, LLC

Mason Weinrich, Executive Director and Chief Scientist, Whale Center of New England.

In accordance with the provisions of 40 C.F.R. § 124.17, this document presents EPA's responses to comments, including all significant comments, received on the draft permit and details any changes made to the draft permit as a result of the comments.

EPA received several comments regarding proposed LNG deepwater ports that were not specifically related to the NPDES permit in question. EPA has responded to those comments to the extent they relate to other EPA functions. However, EPA does not represent any other

federal, state or local agency in responding to these comments and does not provide responses to comments concerning the responsibilities of such other agencies.

EPA's decision-making for this permit has benefited from the comments submitted. The information and arguments submitted in the comments resulted in a number of improvements to the permit. In addition, EPA noted some errors in the permit which were corrected. Changes from the Draft Permit, summarized below, are reflected in the Final Permit. These changes do not represent significant changes from the Draft Permit.

Changes Made in the Final Permit

1. References to the Massachusetts Clean Water Act and requirements to submit reports to the state were removed from the permit.
2. The discharge time sample type was changed to "estimate" for all outfalls and a defining footnote was added to the tables in parts I.A.2, I.A.3 and I.A.4.
3. Minor edits were made to the permit to be consistent with the language and formats used in 40 C.F.R. Part 122.
4. Section I.A.12 was added to comply with 40 CFR 122.44(p) and CWA 402(g). This condition requires that discharge comply with any applicable Coast Guard regulations.
5. Section I.B.2 has been revised for clarity.
6. Section I.B.3 has been revised to include a requirement to report annually certain information pertaining to Port operations over the preceding calendar year.
7. Section I.B.3 has been revised to expand the scope of the thermal monitoring, if the sampling at the nearfield station detects temperatures that are greater than ambient.
8. Sections I.B.3 and I.C.1 have been revised to clarify that EPA may designate other individuals besides those named therein to receive the communications described.

RESPONSE TO COMMENTS

Comments 1 through 3 from Mike Trammel, Director-Environmental, Excelerate Energy, L.L.C.:

COMMENT 1

Northeast Gateway Energy Bridge, L.L.C. (Northeast Gateway) appreciates this opportunity to comment on the Environmental Protection Agency's (EPA) August 24, 2007, draft National Pollutant Discharge Elimination System (NPDES) permit (Draft Permit) and accompanying Fact Sheet for the operation of Northeast Gateway's LNG Deepwater Port (the Port).

Northeast Gateway, as detailed in the Final Environmental Impact Statement, has made significant design changes to substantially reduce water discharges from the Port. Because the Draft Permit reflects a workable approach to the Port's remaining discharges, our comments are limited to a few requests for minor clarifications and edits.

The Draft Permit contains references to compliance with the Massachusetts Clean Water Act. Given that the Port is located only in federal waters, the Massachusetts Clean Water Act does not apply to the NPDES permit for Port operation. Thus, both the reference to the

Massachusetts Clean Water Act on Page 1 and the requirement to submit reports to the State (Part I.C.) should be removed.

RESPONSE 1

EPA agrees with the comment. References to the Massachusetts Clean Water Act and requirements to submit reports to the state have been removed from the permit.

COMMENT 2

As written, each outfall contains a discharge limitation on "Total Discharge Time." The sample type is listed as "Meter." Northeast Gateway requests clarification that there is no physical "meter" associated with each individual outfall. Rather, Northeast Gateway will keep a log of (1) when the regasification process begins and ends and (2) when the use of the Heat Recovery System (HRS), which is utilized for the closed-loop process, begins and ends. Towards that end, we suggest the following footnotes to clarify the term "Meter":

(a) Footnotes to "Meter" in the last column of the tables in Parts I.A.2 and I.A.3: "For each delivery, Northeast Gateway will log the time of the following events: (a) the beginning of the regasification process; (b) the beginning of HRS operation; (c) the end of HRS operation; and (d) the end of the regasification process and cessation of commercial delivery of natural gas. For each delivery, Discharge Time for Outfalls 01A, 01B, 02A and 02B will be calculated by adding the following two intervals: (1) the time between (a) and (b); and (2) the time between (c) and (d).

(b) Footnote to "Meter" in the last column of the table in Part I.A.4: "For each delivery, Northeast Gateway will log the time of the following events: (a) the beginning of the regasification process; (b) the beginning of HRS operation; (c) the end of HRS operation; and (d) the end of the regasification process cessation of commercial delivery of natural gas. For each delivery, Discharge Time for Outfalls 03A and 03B will be based on the time between events (a) and (d).

RESPONSE 2

EPA agrees with this comment. The requested footnotes have been incorporated into the final permit (with a clarifying definition of HRS). EPA has also changed the term "meter" to "estimate" to better describe the discharge time sample type for all the permitted outfalls.

COMMENT 3

Northeast Gateway also suggests the following minor edits:

- **Pg. 1: The heading should read "Authorization to Discharge Under the National Pollutant Discharge Elimination System";**
- **Part I.A.5: "director" should be "Director."**
- **Part I.A.8: Redraft to read: "The discharge shall not contain materials in concentrations or combinations which are hazardous or toxic to human health or the aquatic life of the receiving waters."**
- **Part I.B.1.b should begin with "CWISs" instead of "cooling water intake systems."**
- **Part I.B.3: "Permitee" in various places should be "permittee."**

- **Fact Sheet, pg. 17: the reference to "open loop STV technology" should be changed to "closed loop STV technology."**

RESPONSE 3

EPA agrees with the minor edits and has incorporated them into the final permit.

Finally, although the fact sheet will not be reissued (this response to comments explains any changes to the draft permit and serves as an addendum to the fact sheet), EPA acknowledges the error in the second full paragraph on page 17 of the fact sheet. The fourth sentence should read: "Although seawater intake will be necessary to provide cooling water for the engines powering the regasification process, NEG has minimized its cooling water withdrawals needs by selecting closed loop STV technology that minimizes the need for seawater withdrawal." This clarification does not warrant any changes in the final permit.

Comment 4 from Paul Doremus, Acting Assistant Administrator for Program Planning and Integration, U.S. Department of Commerce National Oceanic and Atmospheric Administration (NOAA)

COMMENT 4

Thank you for the opportunity to comment on the U.S. Environmental Protection Agency's (EPA's) National Pollution Discharge Elimination System (NPDES) permit (MA0040266) for discharges associated with the operation of the Northeast Gateway Liquefied Natural Gas Deepwater Port (NEG Port). The following are the National Oceanic and Atmospheric Administration's (NOAA's) comments on the draft NPDES permit, including comments relevant to NOAA's jurisdiction under the Endangered Species Act (ESA), Marine Mammal Protection Act, the Magnuson Stevens Fishery Conservation and Management Act and the National Marine Sanctuaries Act.

NOAA's National Marine Fisheries Service (NOAA's Fisheries Service) previously evaluated the effects of discharges associated with the NEG Port on listed species in a February 5, 2007 Biological Opinion issued to the Maritime Administration (MARAD) for the construction and operation of the NEG Port. Consequently, no further consultation pursuant to Section 7 of the ESA is required. Reinitiation of consultation under the ESA would be required, however, where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount of extent of incidental take is exceeded; (2) a new species is listed or critical habitat designated that may be affected by the action; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not previously considered; or (4) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered.

In addition, NOAA Fisheries Service, in a letter dated July 3, 2006, provided Magnuson-Steven Fisheries Conservation and Management Act Essential Fish Habitat (EFH) conservation recommendations to the U.S. Coast Guard (USCG) and Army Corps of Engineers. EPA incorporated NOAA Fisheries Service's conservation recommendations into the draft NPDES permit relative to water usage and therefore, EFH consultation is concluded.

Finally, water discharge as allowed by the EPA NPDES permit for operation of the NEG Port is likely to affect resources of the Stellwagen Bank National Marine Sanctuary. These effects were considered during consultations between the NOAA National Marine

Sanctuary Program (NMSP) and the USCG and MARAD (on behalf of EPA) pursuant to section 304 of the National Marine Sanctuaries Act. Recommendations made by NMSP to date (submitted July3, 2006 and further clarified in a letter from the NMSP to the USCG/MARAD on October 13, 2006) as a result of those consultations are based upon the water rates and/or levels as described in the project's Final Environmental Impact Statement (FEIS). Further consultation under the NMSA relative to water usage may be required if rates and /or levels associated with the NEG Port were to exceed those considered in the FEIS.

RESPONSE 4

EPA acknowledges NOAA comments and clarifications regarding ESA, EFH and NMSA consultation and agrees that consultations for all three are complete.

Comment 5 from Joanne McBrien, Supervisor, Reliability and Strategic Planning, Massachusetts Division of Energy Resources:

COMMENT 5

The Massachusetts Division of Energy Resources (DOER) appreciates this opportunity for the public to provide comments on the draft National Pollution Discharge Elimination System (NPDES) permit for the Northeast Gateway LNG project. While DOER is not making specific recommendations concerning this draft permit, DOER wishes to express its continued support for the Northeast Gateway LNG project.

DOER is the state agency responsible for implementing and advocating for energy policies that ensure an adequate supply of reliable, affordable and clean energy for the businesses and residents of Massachusetts. We see the Northeast Gateway project as a new and important supply of natural gas for the citizens of the Commonwealth. In fact, the ability of Northeast Gateway to be in-service by year-end 2007 was a critical consideration in the Commonwealth's approval of this project in December 2006 pursuant to the Governor's responsibilities under the federal Deepwater Port Act.

DOER recognizes the importance of and growing demand for natural gas to meet New England's energy needs, especially to fuel space heating and electric generation in peak winter months. Gas use in the electric power sector has risen sharply due to the influx of gas-fired power plants in New England over the past decade. Almost every power plant built in the past 10 years has been gas-fired. Gas currently fuels about 40% of the region's electricity supply. The region's electric grid operator, ISO-New England, has called for aggressive energy efficiency and demand-reduction actions, but recognizes that New England will continue to depend on natural gas-fired generation for a large percentage of its electricity. In addition to increasing electricity demand for gas, traditional gas use in homes and businesses continues to rise.

Multiple independent reports verify that both Massachusetts and New England need additional supplies of natural gas as early as winter 2007/08. Northeast Gateway is the only proposed energy project that is able to provide a new supply of energy as early as this year. Therefore, in order to achieve a prompt in-service date of December, 2007, the Commonwealth made best efforts to expedite decision-making on all state permits, licenses and authorizations require for the project, consistent with state agencies' legal authorities.

DOER appreciates EPA's efforts to carefully review the record for this NPDES permit. Our hope is that any issues that might arise concerning the permit can be resolved expeditiously to allow this project to be built and operational by December 2007.

RESPONSE 5

EPA appreciates DOER's concern that the NPDES permit be issued in a timely fashion and shares the goal of issuing the final permit to be effective as soon as possible.

Comments 6 through 13 from Mason Weinrich, Executive Director and Chief Scientist, The Whale Center of New England:

COMMENT 6

We are writing to comment on the Draft Authorization To Discharge Under The National Pollution Discharge Elimination System, for Algonquin Gas Transmission, LLC, and Northeast Gateway Energy Bridge, LLC, for the ongoing discharge of warmed seawater into the Massachusetts Bay ecosystem. We thank you for the opportunity to provide comments on the proposal.

The Whale Center of New England has been following and commenting on this project throughout the application process. We have been conducting research on marine mammals in and around the project area since 1979. Our studies of endangered right, humpback, fin and other whales in the area have resulted in over 40 peer-reviewed publications. Our sightings data have been extensively used by the Stellwagen Bank National Marine Sanctuary (SBNMS), the National Marine Fisheries Service (NMFS), the Environmental Protection Agency (EPA), and others to make informed management decisions about marine mammal use of the area. Our staff currently serves on nearly every regional team dealing with large whale conservation and management, including the Northeast Large Whale Recovery Plan Implementation Team (Steering Committee members), the Atlantic Large Whale Take Reduction Team, the Stellwagen Bank National Marine Sanctuary Advisory Council, and the scientific committee of the International Whaling Commission, among others. Further, we were contracted by the project proponents to provide information on whale use of the project area for their initial Environmental Report and subsequent Environmental Impact Statements. Hence, we can speak to the concerns about potential impacts of the project on whales and their environment with expertise and authority.

First, we would like to emphasize the importance of this review process for the proposed discharge as undertaken by the EPA. As you may know, the review process for the FEIS of this project was rushed to say the least. The review and comment period was limited to 30 days, which is hardly sufficient time for such a complex document with so many issues and components. If that were not enough, the review was essentially simultaneous with that of the nearby Neptune LNG project, who had an equally complex project and accompanying FEIS. The EPA review of this discharge request should therefore proceed in a cautious and critical manner.

RESPONSE 6

The Deepwater Port Act directs relevant federal agencies to act on an expedited schedule for certain aspects of the licensing process. See 29 U.S.C. § 1504. With respect to this NPDES permit, EPA has proceeded appropriately.

EPA received the NPDES permit application in December of 2005 and began actively working on preparation of the draft permit in late 2006 after the issuance of the FEIS by the U.S. Coast Guard. During the preparation of the draft permit, EPA requested additional information from NEG to ensure that the permit was based on a comprehensive understanding of the regasification discharges. EPA relied heavily on the in depth considerations developed in the Biological Opinion issued by NOAA in drafting permit requirements for biological monitoring.

With respect to the public comment periods, EPA notes that the relevant federal agencies provided separate comment periods on the EIS and then on the NPDES permit. The public comment period on the EIS closed well over a year ago. With respect to the public comment process for this NPDES permit, EPA has provided the 30-day comment period required by 40 CFR § 124.10(b). Although the scheduling of a public hearing is at the discretion of the EPA Regional Administrator, see 40 CFR § 124.12, EPA anticipated continued interest in the project and permit and held a public informational meeting and hearing on September 24, 2007 and accepted substantial written and oral comments. These comments have been carefully considered, as documented in this Response to Comments.

COMMENT 7

As we repeatedly commented during the EIS process, the proponents have chosen one of the most important marine environments in which to locate their deep water port. The location is designated Essential Fish Habitat, is immediately adjacent to the Stellwagen Bank National Marine Sanctuary, and our own sighting data shows that it is an important marine mammal feeding habitat, especially for humpback and fin whales in September and October (Weinrich and Sardi 2005; Dickey et al. 2006; Weinrich et al. 2006), and for North Atlantic right whales in the winter and early spring (Weinrich and Sardi 2005; Weinrich et al. 2006). To substantiate this, we have attached several maps of whale distribution around the site, and several photos obtained in the past few weeks of whales in close proximity to the project's construction equipment. Hence, we urge the EPA to proceed with extreme caution in allowing discharges with largely unknown consequences, simply because unforeseen circumstances or unexpected outcomes could disrupt this vital ecosystem.

RESPONSE 7

EPA agrees that the NEG deepwater LNG port is located in a biologically important resource area. As a result, during the EIS process, EPA strongly urged the applicant to dramatically reduce its water usage, discharge of heated cooling water, and air emissions. In part to respond to EPA and others, and after consideration of other factors, the applicant did choose to modify its initial proposal to address these and other concerns. The NEG deepwater port license requires an extensive monitoring program, including a multimillion dollar acoustic buoy array to monitor whale vocalizations. In this discharge permit, EPA has developed effluent limitations, structural requirements for cooling water intake structures, and monitoring requirements that reflect these shared concerns for the aquatic environment. We believe the combination of technological changes to the vessels, stringent discharge limits and continued monitoring is a prudent and protective permitting approach.

COMMENT 8

The Whale Center of New England is ultimately opposed to the issuance of this discharge permit, as being far too risky in a fragile and important marine location. If, however, the EPA chooses to issue the permit, we would like to see a number of modifications made to the draft permit in order to insure that unforeseen and drastic consequences result from the discharge. Everyone involved in the review of this project knows that it has the potential to be an environmental disaster, and that despite that risk it is being undertaken to provide the region with energy and to generate a profit for private corporations. We think it is a terrible tragedy to risk such an important part of the ocean for energy which could be obtained in many other ways. There are risks to the environment from many components of the project, including increased traffic of massive ships and production of significant man-made noise.

The proposed discharge of warmed water is one of the risks of primary concern. Already, changes in the distribution of several fin-fish species in response to small amounts of warming has been documented on a regional scale. The key issue with this discharge is its potential to affect plankton abundance and distribution in both the near and far fields from the project. Many species of plankton are highly temperature dependent, and even minor changes to their habitats can result in shifts of abundance and distribution between species. Since each plankton species plays a different role in the ecosystem, such changes can have cascading and unforeseen effects. Warmed waters have also been tied to increased presence of harmful algal blooms, with disastrous consequences for marine life.

Based on the above, we would ideally urge the EPA to decline the permit. However, we are also realists. We see the construction being undertaken at the site on a daily basis, and realize the pressure the EPA faces to approve this permit. Given that, we would suggest several important modifications to the draft permit and its accompanying monitoring plan that we would see incorporated if the permit were to be approved.

The draft permit states, as one of its conditions, "this permit shall be modified or revoked at any time if, on the basis of any new data, the director determines that continued discharges may cause unreasonable degradation of the marine environment." The associated fact sheet further states "These guidelines define "unreasonable degradation of the marine environment" to mean:

- **Significant adverse changes in ecosystem diversity, productivity, and stability of the biological community within the area of discharge and surrounding biological communities;**
- **Threat to human health through direct exposure to pollutants or through consumption of exposed aquatic organisms; or**
- **Loss of aesthetic, recreational, scientific or economic values which is unreasonable in relation to the benefit derived from the discharge."**

These are all very vague terms, which would be very hard to apply in any realistic sense. We would like to see pre-defined specific, quantitative levels at which appropriate actions would be taken. Ideally, these would exist in the form of a document legally attached to the permit which could be modified and overseen by a working group of project personnel, EPA staff, independent scientists, and area environmentalists. We would envision this process and document to be similar to the Massachusetts Water Resources Authority's contingency plan for its 10-mile long outfall pipe, which was first used in the early part of

this decade. That plan has specific levels at which caution and warning actions are triggered, with those actions clearly stated. The Whale Center of New England would commit to be glad to participate in both development of such a plan, and on-going review of the results which indicate whether or not such effects are being seen.

RESPONSE 8

1. EPA notes the commenter's opposition to issuance of this NPDES permit, although EPA notes that some of the concerns alluded to within the comment are outside the scope of matters that EPA can address through the NPDES permitting process.

2. With respect to the proposed thermal discharge, it is not appropriate to compare the warming that the commenter mentions to the potential impact of this relatively small thermal discharge. The discharge at issue here represents several orders of magnitude less heat than the regional-scale warming the comment discusses. Regional finfish distribution will not be affected by the intermittent, relatively small thermal discharge from these vessels. The impact of thermal discharge was examined within the context of the EIS process and EPA is satisfied with that analysis. The proposed thermal discharge, with a relatively small delta T and short duration, is not likely to have a measurable effect on the marine environment. That being said, EPA is requiring monitoring of the thermal discharge for two reasons: (1) to confirm the findings of the thermal modeling effort, and (2) for compliance purposes.

3. The commenter questions the adequacy of the permit provision (I.A.5) that states: "In addition to any other grounds specified herein, this permit shall be modified or revoked at any time if, on the basis of any new data, the director determines that continued discharges may cause unreasonable degradation of the marine environment." This precise language is required by 40 C.F.R. § 125.123(d)(4). The definition of "unreasonable degradation of the marine environment" on page 9 of the Fact Sheet is quoted directly from 40 C.F.R. § 125.121(e).

4. The commenter proposes that EPA develop a monitoring plan similar to one that was developed for the Massachusetts Water Resources Authority (MWRA). The MWRA monitoring plan contained numerous thresholds developed *a priori* that will trigger specific action. This plan was developed by a multi-agency advisory group, which meets periodically to review the monitoring data. While such mechanisms are appropriate for certain permits, they are not required for every permit, and are not necessary here. The volume of the MWRA discharge is several orders of magnitude greater than this proposed discharge. The MWRA is a continuous discharge of municipal sewerage of over 500 MGD. This proposed permit allows for a discharge of heated seawater at a maximum flow of 7.82 MGD for a total of 520 hours over the entire year. EPA believes that the proposed monitoring program meets the requirements of 40 C.F.R. § 125.123(d)(2) and is appropriately scaled for the possible adverse environmental effects of this proposed project.

COMMENT 9

We are also concerned that the permit does not deal with the cumulative effects of the release of warmed water from four offloading stations that are in close proximity to each other. We appreciate that the EPA has set a limit on the number of hours of discharge which can take place from the project. However, we are concerned that the permit states that the "Overlap between vessels is only anticipated to occur during 10 percent of all annual operations at Port." If this were to be exceeded, (and there is no commitment that it will not), it could result in "shocks" to the system of a sudden infusion of high quantities of warmed waters. These effects could easily exceed those of a steady flow of much lower

quantities. Hence, we suggest including a limitation on the number of dual discharges as a part of the permit in addition to the proposed cap on the number of hours of discharge. Further, the permit never acknowledges the existence of the Neptune LNG project, due to begin construction nearby in the near future, which will also put the nearby ecosystem at serious risk. This cumulative impact also needs to be addressed, and should be part of the same monitoring and contingency requirements as suggested above.

RESPONSE 9

EPA agrees that the cumulative impact of multiple vessels from multiple projects is appropriate for consideration. After evaluation of those impacts, however, EPA has determined that in this case the cumulative impacts are acceptable. That said, because the evaluation of thermal impacts is based on the estimate by the permittee that use of the two buoys simultaneously will occur only 10 percent of the time, EPA has revised the permit to include a requirement to document and report the actual schedule of use and discharge at each buoy.

EPA examined the projected size of the thermal plumes from vessels from both Northeast Gateway and Neptune and determined that there would not be unacceptable cumulative impacts even if there were vessels on all four buoys. As an initial matter, the vessels from the Neptune project will have no thermal discharges as they would recycle their cooling water into ballast. Consequently, the only thermal discharges would be from the vessels at Northeast Gateway.

The buoy locations for Northeast Gateway are 1 mile apart. Thermal modeling shows that ambient temperatures are attained within 500 meters of the discharge point, so there would be little if any overlap of thermal plumes from multiple vessels. The thermal plumes emanating from the vessels are extremely small, especially when taken within the context of the open ocean area in which the buoys occur. The delta T associated with the thermal discharge and the small area associated with the measurable plumes from 1 or even 2 vessels should not result in significant thermal avoidance of this area by marine organisms. See also Response 25.

COMMENT 10

Of course, understanding the effects, or lack thereof, from the warm water discharge depends on monitoring data gathered during the project, especially in its early phases, and a realistic test against baseline data. We are concerned about whether appropriate baseline data exists for the area in most measurable biological features (see below for one area where we *do* think such data exists). Because the ocean is a highly variable environment, appropriate baseline data requires a time series of data across several years with consistent methodologies, against which environmental variability can be teased apart from project effects. The EPA should examine whether such data actually exists and, if it does not, how impacts of the warmed water could be assessed.

RESPONSE 10

Northeast Gateway has collected icthyoplankton data for the past year and a half, which EPA (and others) can use as a baseline. In addition, NOAA monitors icthyoplankton and zooplankton throughout the Gulf of Maine. Several of NOAA's sampling stations are near the project sites. NOAA's data collection has run significantly longer than the Northeast Gateway effort. The combination of these two sampling efforts should provide an amply representative baseline for icthyoplankton.

COMMENT 11

We have reviewed the monitoring plan attached to the proposal, and have also found what we feel is a significant flaw in the proposed sampling scheme. The plan proposes to sample plankton in two ways: at the 20-40 foot depth, where the warm water discharge takes place, and in a vertical average throughout the water column to within 15 feet of the bottom. However, plankton tends to aggregate at marine borders: the ocean surface, the sea floor, and thermoclines. At these edges, plankton concentrations can be spectacular. It is these concentrations on which many marine predators rely. For instance, Dr. Charles "Stormy" Mayo's work on feeding right whales in Cape Cod Bay has shown that they require plankton in concentrations of 3,750 organisms/m^3 in order to feed, and such concentrations are only found along these edges. However, by averaging plankton concentrations across the entire water column, the actual density of plankton in these aggregations is lowered several-fold. Further, the bottom layer would not even be sampled. This both makes it hard to know when such aggregations are present and, by default, makes it harder to show a statistically significant or biologically meaningful change. The monitoring program needs to find some way to determine the potential effects on plankton aggregations, which is what any marine predator looks for.

RESPONSE 11

The proposed sampling takes place in two ways, at the 20-40 foot depth and vertically averaged over the water column. The sample at the 20-40 foot depth represents the area in the water column which corresponds with the intake structure. EPA agrees with the commenter that plankton aggregations occur along edges, at the surface, near the bottom or on thermoclines. These vessels are not drawing water from near the sea floor or from the sea surface, but at least 20 feet below the surface. The most likely way for these plankton aggregations to be entrained is for them to be associated with thermoclines that may have formed between the 20-40 foot depths. Thus, the sampling scheme is designed to identify plankton aggregations at greatest risk of entrainment, if they occur within the project area.

COMMENT 12

We also question the *a priori* conclusion based on the CORMIX model that effects would be only in the immediate vicinity (within 500 m) of the ports itself. Conclusions from models can be misleading; many models fail to take into account the full complexity of a natural system, and fail to accurately predict true project effects. We suggest that monitoring occur in the far-field (to two miles from the site) as well as the near-field, at no less than five far-field stations, for at least five years. Based on those results, it may then be possible to restrict future monitoring to the near-field, but that possibility should not be assumed at this early stage of determining true environmental effects.

RESPONSE 12

CORMIX is an EPA-approved model that has been used extensively within this region. EPA has not received any evidence suggesting that the CORMIX model is inappropriate here, nor has the commenter explained why it believes the model is inappropriate here. In EPA's judgment, near-field monitoring is scientifically adequate and satisfies 40 C.F.R. § 125.123(d)(2). If a targeted near-field sampling effort shows that the thermal plume may be more extensive than the model predicts, then at that time it may be prudent to expand the geographic scope of the thermal monitoring. EPA has also revised Section I.B.3 of the permit to expand the scope of the thermal

monitoring, if the sampling at the 500 meter sampling location detects temperatures that are higher than ambient levels.

COMMENT 13

The draft permit states that "The permitee is required to monitor the potential impact of the thermal discharge and ongoing water withdrawal." Based on previous experience, we do not trust the permittee or its primary contractor, Normandeau Associates (who is identified by name on each page of their proposed monitoring plan), to fairly and honestly monitor and report on such a critical piece of potential project effects. In the early stages of this project, Normandeau Associates contracted the Whale Center of New England for a report on the whale use of the project site, for its required Environmental Report to be submitted with the original permit application for the project. We agreed, with the condition that we be allowed to review and edit any passage which used our data prior to the reports issuance. They agreed in writing. Not only did they fail to live up to their agreement, and issued the report before we had ever seen it, they repeatedly mis-used and drew inappropriate conclusions from our report. Further, many of their statements about the biology of endangered whales in the area were drawn from other inappropriate sources, and were often simply wrong. Not surprisingly, all of the problems led to a picture which made the project site seem less important to endangered whales. Our response letter upon reading the report issued by Normandeau is attached. They also did an equally poor job when they applied to National Marine Fisheries Service for their Incidental Take Permit. In that application they used an inappropriate data set to propose that humpback and fin whales did not occur in the project area[1]. They did this despite having our plots, attached to this letter, in their Impact Statements. Given this history, how can we trust the same company to reliably monitor any effects of the project?

We understand that the EPA does not have the resources to monitor the water flow, plankton concentrations, and other potential effects of the project. However, we suggest that in order to make sure that fair and accurate monitoring takes place, a working group of project personnel, EPA staff, and concerned local citizens and environmental groups together agree on an independent party to monitor the discharge, to be paid for by the project proponents. Ideally, this group would also review the monitoring results, and suggest changes to the monitoring program as required. One obvious way to do this would be to combine this group with the one suggested above for the contingency planning. The Whale Center of New England would commit to participating in this effort.

Finally, we would suggest to the EPA that there is a way to monitor whether there are effects on the ecosystem from the project: through monitoring the area for its use by large whales. In the reports we prepared for both Northeast Gateway and Neptune, we have shown how important the near- and far-field is to feeding whales (The Northeast gateway report is attached). Right whales in the area feed on calenoid copepods; humpback and fin

[1] Their application states: "However, from the most conservative estimates of both marine mammal densities in the Project area and the size of the 120-dBZOI, the calculated number of individual marine mammals for each species that could potentially be harassed is: one right whale (1.23), seven dolphins, and three seals." (p. 17 of their application).

whales in the area feed on either eupahsiids or amphipods. All of these prey species are plankton that could be affected by warm water infusion, and they are all prey to many species besides whales. However, whales have been shown to require dense concentrations of their prey to feed; they are easily detectable from the surface; and The Whale Center of New England has an on-going 27-year database of whale use of the area to act as a baseline for comparison. Monitoring of these three species, through methods consistent with those used to develop the baseline, should be a required part of the permit if approved.

We appreciate all that the project proponents have done to minimize the amount of warmed water that will be introduced into the ecosystem, and would point out that they have done so out of the legitimacy of the concerns. Along with everyone else involved in the projects, we hope that these efforts will result in no serious environmental effects. However, we also realize that there is a significant risk that this assumption may not be realized, and it is critical that we protect the marine wildlife that relies on this habitat to the best extent possible. We feel that incorporating an independently agreed upon monitoring plan, that incorporates near and far-field monitoring, better plankton assessments, and a component that includes endangered whales as representatives of the ecosystem, reporting to a fair and balanced review panel is a proper way to proceed.

RESPONSE 13

1. Third party monitoring: Adopting the change suggested by the commenter would be a notable departure from standard NPDES program practice. The program relies on information collected by the permittee as part of its permit obligations. EPA recognizes the need for establishing and following protocols for data quality assurance and quality control, and is satisfied that the monitoring plan includes appropriate QA/QC provisions. Further, there are significant penalties for falsifying information, and the permittee must certify each monthly discharge monitoring report. Permit oversight is provided by EPA with assistance as needed from resource agencies. EPA has the authority to conduct unannounced spot inspections to verify the quality and veracity of monitoring data.

2. EPA agrees that tracking whale usage of this general area is important, but does not believe that this NPDES permit (which regulates only discharges and cooling water intake) is the proper mechanism to address that concern. NOAA has determined (and EPA agrees) that the entrainment losses will have minimal impact on whale feeding activities. EPA does agree that vessel noise may affect the use of this area by whales. However, an NPDES permit is not the proper mechanism to regulate vessel noise, which EPA does not regulate under the Clean Water Act.

3. Finally, as stated in Response 8, EPA does not believe that the size of this discharge warrants convening an advisory committee or developing monitoring plans with triggers or contingency measures. Monitoring results submitted to EPA will be available to interested parties and periodic review of that data may suggest that additional monitoring is required in the future. If necessary, EPA has the authority to modify the permit's monitoring program under 40 C.F.R. § 122.62, and/or ask for additional information pursuant to Section 308 of the Clean Water Act.

Comments 14 and 15 from Polly Bradley, Secretary, Safer Waters in Massachusetts (SWIM)

COMMENT 14

Safer Waters in Massachusetts (SWIM) is a citizens' environmental group that since 1984 has worked to protect the waters of both Boston Harbor and Massachusetts Bay. SWIM is based in Nahant, where it is widely supported by the citizens of this peninsula surrounded by the ocean.

SWIM has many concerns about the offshore liquefied natural gas (LNG) terminals now under construction and proposed in Massachusetts Bay. These include the presence of toxic, chemical, hazardous and radioactive wastes in close proximity to the new LNG terminals; the effect on the fisheries; the proximity of three ocean protected areas, including Stellwagen Bank National Marine Sanctuary; safety in case of an LNG spill/explosion, a terrorist attack, or a disabled tanker drifting to shore in a major storm; and the lack of a regional energy plan that would accentuate renewable and alternative energy sources as well as conservation.

However, SWIM will focus on two issues directly raised by the Northeast Gateway Energy Bridge LLC application for a National Pollutant Discharge Elimination System (NPDES) permit: the need for a well-designed independent monitoring program and the potentially damaging effect of the discharge on the plankton, the food of the critically endangered North Atlantic Right Whale.

1. <u>Monitoring</u>. Qualified third party experts, not liquefied natural gas (LNG) corporations or governmental bodies, should be monitoring every step of the way. Improvements need to be made in monitoring the discharge of cooling water at the 4-hour start-up and shut-down periods. The Energy Bridge Regasification Vessel will require 7.82 million gallons of seawater with discharge temperatures raised by 5ºF (page 11, NPDES MA 0040266 Fact Sheet). Moreover, .99 million gallons of water will be discharged at temperatures 10ºF greater than the ambient seawater (page 14).

In the meantime, the plankton, which are extremely sensitive to temperature, are subjected to temperature increases high enough to kill them even if they escape being entrained in the seawater withdrawn or being caught up with fish and other organisms in the intake screens and racks.

According to the application, "The CORMIX model estimated that although the discharge would not meet the water quality criteria at the discharge port, the change in temperature at the water surface would meet the criteria of less than 1ºC." The application also speaks of averaging water temperatures. This method of analysis seems to be designed to intentionally avoid other sensitive areas. Although much of the plankton is at the surface, there are also large concentrations at the thermocline and near the bottom, and the plankton migrate up and down the water column under different conditions. Averaging is not the answer. This makes me think of the old story of the man with his head in the oven and his feet in the refrigerator: on the average he was just right.

A monitoring program with specific, quantitative limits designed to trigger action, including if necessary closing down the LNG terminal temporarily or permanently if limits are exceeded. A model for this is the monitoring program set up years ago by the Massachusetts Water Resources Authority (MWRA) in construction and operation of the wastewater treatment system for greater Boston. This plan set very specific limits to trigger action.

Safer Waters in Massachusetts endorses the comments by Mason Weinrich of the Whale Center of New England and urges you to follow the Whale Center's suggestions for improving monitoring.

RESPONSE 14

1. Third-party monitoring: See Response 13.1.

2. Effects of discharge: Due to the limited spatial extent of the thermal plume and limited duration of the discharge, EPA believes that the thermal discharge should have minimal impacts on plankton communities in the area of the discharge.

3. Vertical differences: The thermal plume would be a near surface or surface phenomenon because of the physics of such plumes. Warm water is less dense than cold water and the heated effluent would move vertically up the water column while losing thermal energy. The commenter incorrectly suggests that water temperatures from the CORMIX model were vertically averaged. The model represents a reasonable attempt to simulate how the thermal plume should dissipate over time and space. EPA has determined that CORMIX was the appropriate tool and it was applied in an appropriate fashion. The model predicts that the thermal plume would quickly dissipate. Furthermore, the applicant will be required to document this thermal dissipation with actual monitoring.

4. EPA believes that the proposed monitoring plan is the appropriate scale for the size of the proposed discharge. Based on available information, data and reasonable projections, a discharge of this size does not warrant a monitoring plan similar to the plan required for the MWRA. If monitoring reveals adverse impacts that are greater in magnitude than EPA has reasonably projected, the monitoring program can be expanded. See also Responses 8, 13.

COMMENT 15

2. <u>Whales</u>. Where there is plankton in Massachusetts Bay, there are baleen whales, including the critically endangered North Atlantic Right Whale. SWIM urges the EPA to consult carefully with the Commonwealth of Massachusetts in accordance with the federal-state agreement concerning protection of the North Atlantic Right Whale. SWIM is also concerned about the other endangered species that frequent Massachusetts Bay: blue whale, humpback whale, fin whale, sei whale, Kemp's ridley sea turtle, leatherback sea turtle, loggerhead sea turtle, hawksbill sea turtle and green sea turtle.

Where the plankton is destroyed, baleen whales in particular suffer. The whole ecological structure surrounding the LNG terminals can be altered in ways deleterious to the health and safety of endangered whales and sea turtles. More and more the whales are being found nearer shore from Stellwagen Bank, perhaps because of global warming. Adding a local water temperature increase to global warming will not help the whales of Stellwagen Bank and adjacent waters. For these reasons and others, SWIM opposes the issuance of this permit.

Nowhere is mention made of the Neptune LNG facility already approved nearby and the fact that all the harmful effects of the Northeast Gateway project will in essence be doubled.

For a moment, I would like you to consider what happens when a whale opens its mouth and goes after the plankton while the LNG vessels are weathervaning -- moving around their anchoring points with the currents and winds. Whales have not evolved to avoid a

moving "island" in the sea, and as the vessel moves with the wind and the whales chase the plankton, collisions are probable. Remember from high school physics:

force = mass x acceleration

The mass of an LNG tanker is still much, much greater than even the greatest Great Whale. When a whale hits a moving tanker, the result can be disastrous.

The same is true when a moving tanker hits a whale. There is no way a huge LNG tanker can stop to avoid a whale in its path. It simply takes too long to stop.

In summary, Safer Waters in Massachusetts requests that you improve the monitoring plan, incorporating the recommendations of the Whale Center of New England, studying carefully the Massachusetts Water Resources Authority monitoring model, and consulting with the Commonwealth of Massachusetts on protection of the North Atlantic Right Whale.

RESPONSE 15

The EIS assessed a wide range of possible adverse impacts to marine mammals and sea turtles. The applicant determined that the quantity of plankton lost from entrainment over the course of a year would have minimal impact on feeding whales. NOAA and EPA agree with this conclusion, and the permit provides additional protection by requiring that CWISs be located at least 23 feet below the water surface. If monitoring results in the future suggest an impact greater than anticipated, then the permit can be modified to address the issue. At this point in time, the best data available and reasonable projections do not point to entrainment of plankton as having a significant effect on whale feeding. With respect to the cumulative impact of the Neptune LNG facility, see Response 9.

Although no state is issuing this permit in conjunction with EPA (since the port lies in federal, but not state waters), the Massachusetts Division of Marine Fisheries (DMF), which implements the Commonwealth's right whale conservation program, and other Commonwealth agencies were sent public notices to solicit comments on the draft permit. No comments were received from these agencies other than the one above from the Massachusetts Division of Energy Resources. However, Massachusetts agencies, including DMF, were involved in the review of the project during the EIS phase of work, in compliance with the Massachusetts Environmental Policy Act, and the project ultimately gained approval from the Governor of Massachusetts in 2006 as required by the Deepwater Port Act.

EPA agrees with the concern expressed for the potential for vessel strikes against whales due to the increase in vessel traffic around the port area. Under the Clean Water Act, however, the NPDES permit regulates water intake and discharges associated with the operation of the port, rather than vessels in transit. The issue of vessel strikes was addressed in the Biological Opinion and the Incidental Take Statement (ITS) issued by NOAA. The NPDES permit is contingent on the port having an effective ITS, as stated on page 1 of the permit.

Comments 16 through 18 from Ocean Conservation Program Director Priscilla Brooks and Senior Scientist John Crawford of the Conservation Law Foundation:

COMMENT 16

The Conservation Law Foundation (CLF) offers the following comments on the draft National Pollution Discharge Elimination System (NPDES) permit to discharge pollutants associated with operations of a liquefied natural gas regasification facility into the waters of Massachusetts Bay.

The discharge will be the result of the intake and use of seawater for engine and boiler cooling, a safety-related water curtain, and seawater for a closed-loop warming ("condenser") system that will service the proposed offshore liquefied natural gas terminal in Massachusetts Bay being constructed by Algonquin Gas Transmission, LLC and Northeast Gateway Energy Bridge, LLC. CLF notes that the proposed quantity of condenser cooling water discharge contemplated in the application, 7.82 million gallons per day (MGD) is significant, given that this quantity will be discharged within a very short time frame (two four-hour periods each time the Port undertakes a regasification). The quantity of discharge that will result from the auxiliary seawater service cooling (for boilers and engines) and from the safety-related water curtain is relatively small, at 0.99 MGD and 0.6 MGD, respectively. However, even these smaller amounts of discharge are significant and may have the potential to cause negative impacts to aquatic life.

<u>Regulation of LNG Regasification Facilities Under NPDES Program</u>

CLF supports the determination that moored vessels undertaking regasification operations, such as the proposed Northeast Gateway Energy Bridge, <u>are</u> subject to regulation under the NPDES similarly to other vessel-based or land-based industrial operations. CLF concurs that the requirements of 316(a) [*sic*] are applicable to the facility's cooling water intake structures and that the permit's requirements apply to all discharges from and intakes into the Energy Bridge Regasification Vessels when they are interconnected with the STL buoys and integrated into the port.

<u>Potential Impacts on Species/Aquatic Life</u>

CLF is concerned that the permit anticipates water intake at a velocity above 0.5 feet per second. EPA has acknowledged in other rulemakings, that a water intake velocity of 0.5 feet per second or less should enable most motile marine organisms, including fish, to swim away from the cooling water intake structure. EPA further states that it is "noteworthy" that new offshore oil and gas extraction facilities are required to have cooling water intake structures with a water intake velocity that does not exceed 0.5 feet per second (pp. 16-17 NPDES MA0040266 Fact Sheet). It is not clear why this offshore LNG facility should be allowed to exceed this established limit and how allowing this facility to intake water at above 0.5 feet per second will be protective of marine resources in the vicinity of this project. EPA downplays the potential impact of this higher water intake velocity by stating that the increase in intake velocity will only occur between 4 and 8 percent of the time per port visit. CLF believes that this could nonetheless result in significant mortality of marine species and that the EPA must strictly limit the maximum water intake velocity at any one time to 0.5 feet per second or less.

RESPONSE 16

EPA disagrees that the projected discharges associated with regasification have the potential to cause significant negative impacts to aquatic life. That said, the permit includes effluent limits, as well as monitoring and management practice requirements to ensure that the discharges and any potential impacts are not greater than projected.

EPA believes that the risk of significant impingement mortality due to cooling water intake is relatively small, due to the limited amount of time that the vessels will be withdrawing water, the relatively low intake velocities and the swimming strength of the species most at risk. The intakes on these vessels are located well up off the sea floor, so the types of fish most likely to encounter them will be open ocean pelagic species. Open ocean pelagic species are swimming continuously and as a result are very strong swimmers. Thus, their risk of impingement is much lower than demersal species, which are much weaker swimmers.

COMMENT 17

Monitoring

CLF believes strongly that the permit should require strict monitoring of water quality and the likely entrainment and impingement of marine organisms by the cooling water intake structures. While the permit properly requires monitoring for water quality and entrainment, no such requirement has been set for the equally problematic phenomenon of impingement. The cooling water intake will be located mid-water, 23 below the surface, and will be equipped with an intake screen. During operation, water will be withdrawn at velocities as high 0.82 feet per second and there is significant potential for fish and other marine life mortality due to impingement on the intake screen. In the NPDES Fact Sheet (p. 19) EPA indicates that it is not feasible to monitor the intake screen for impingement and therefore does not make such monitoring a condition of the permit. CLF feels strongly that monitoring of impingement at the cooling water intake screen is essential and must be a condition of the permit, particularly as the proposed facility will operate in a very biologically rich and sensitive body of water and because this particular facility is the first of its kind not only in Massachusetts Bay, but in the entire Gulf of Maine. We do not agree with EPA's assessment that such monitoring is beyond technological reach. At a minimum, a video monitoring system should be affixed at the intake so that visual quantification of impingement can be carried out. Underwater video is widely use by commercial fishermen, marine scientists, ocean engineers, and search and recovery teams, and is clearly readily available and within reach for a large scale and technologically sophisticated project of this kind, operating in waters that support a large diversity of fishes as detailed in the NPDES Fact Sheet Attachment A on essential fish habitat. Monitoring of impingement is a reasonable and prudent requirement for this permit and should not add substantial burden in the context of a robust monitoring program.

RESPONSE 17

Due to the position in the water column of the intakes and the type of fish most likely to encounter those intakes and the limited amount of time of water withdrawal, EPA does not believe that impingement losses will be significant (see Response 16).

Given the limited anticipated impingement impacts, EPA does not believe that implementing a video monitoring program is warranted. Video monitoring of the intake screen presents significant technological challenges. For example, at 23 to 38 feet below the water surface, in

the North Atlantic and within the recesses of a hull, ambient light would not be sufficient to generate useful video. Therefore, substantial lighting would be required. Frequent maintenance would be required of the camera and lighting ports to remove biofouling and ensure that images are of useful quality. Additionally, the presence of the lights would serve as an attractant and may actually increase the risk of impingement.

COMMENT 18

Adaptive Management

Because the vessel design and technology proposed for the Northeast Gateway regasification facility is relatively new and the first of its kind in the waters off New England, there will be unknowns that emerge during construction and operation. Impacts on aquatic life cannot be fully quantified until after the facility begins operation. Therefore, the monitoring provisions proposed in this draft permit and the additional monitoring recommended by CLF are necessary to ensure the protection of aquatic life in Massachusetts Bay. The final permit should also include an adaptive management plan that will be in place before construction and operation commences and that will specify the steps that need to be taken to address impacts as they are discovered, including additional monitoring and mitigation measures.

EPA has acknowledged that even though the design of this facility has taken measures to reduce cooling water intake volume, "the vessels will still require large volumes of seawater" that will represent a new source of mortality for fish eggs and larvae (NPDES Fact Sheet, p. 19). Additionally, the impacts of the thermal plume are still not fully understood although preliminary modeling was conducted. In order to ensure the proper level of environmental consideration while allowing the relatively new technologies in this LNG regasification project to move forward, there must be a rigorous adaptive management protocol in the final permit that will address the inevitable unknown factors that will come with this new use of our offshore ocean waters. A discussion of and requirements for Adaptive Management should be added to this permit and any other permits for offshore LNG regasification in Region 1.

Adaptive management is a process by which data that is collected on an ongoing basis informs real changes in practices to abate unanticipated environmental consequences and compensate for truly unavoidable impacts.[2] "Adaptive management is not a trial and error approach."[3] Rather, an adaptive management plan should be agreed on and put in place *before the facility begins operation*. A good adaptive management plan must be predicated on an appropriate plan for ongoing monitoring during operation of the facility to detect unexpected harm to the environment or unexpected conflicts with other uses.

The Adaptive Management Plan should include provisions for: (1) additional data collection by the project owner/operator in the event that a harmful impact is detected or suspected; (2) a mechanism by which the owner/operator will report back results of

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[2] See Shawn Smallwood and Linda Spiegel, California Energy Commission, *Assessment To Support An Adaptive Management Plan For The APWRA*, (January 19, 2005), *available at* http://www.biologicaldiversity.org/swcbd/Programs/bdes/altamont/CEC-assessment-mitigation-plan.pdf (last accessed 5/14/07).

[3] Id., at 2.

monitoring data collection and make such data publicly available; (3) thresholds over which the facility will take action to mitigate/eliminate harms; (4) a plan specifying the types of actions the facility will take in the event of each category of environmental impact; and (5) provisions for monitoring to assess whether the adaptive measures are effective at remedying the impact, and a re-evaluation of goals if it is determined that the prescribed actions are not working.[4] Finally, EPA should include a re-opener in this permit that would allow EPA to require the project to modify its operations for a portion or all of the facility if ongoing monitoring data reveals that the project's environmental impacts are significant.

RESPONSE 18

The NPDES permit regulations, and this permit in particular, contain several mechanisms to assist EPA in assessing the facility's impacts and, if necessary, taking responsive action.

The permit contains monitoring requirements for each discharge outfall and a monitoring program in Part I.B.3. The Water Technical Unit of EPA Region 1's Office of Environmental Stewardship would review the regular monthly monitoring reports to ensure that discharges are meeting effluent limits prescribed in the permit, as well as for compliance with the conditions applicable to the intakes. In addition, the Ocean and Coastal Unit of EPA Region 1's Office of Ecosystem Protection would review the annual biological monitoring reports on an annual basis as meaningful data sets are developed. These annual reports will be submitted to the aforementioned EPA offices, to NMFS, and to the Stellwagen Bank National Marine Sanctuary Office.

EPA has revised Part I.B.3 to include requirements that otherwise respond to the suggestion of adaptive management proposed by the commenter. Specifically, EPA has added permit requirements that will (1) expand the scope of the thermal monitoring if the sampling at the nearfield station detects temperature increases that are greater than ambient levels, and (2) require annual reporting of certain information pertaining to Port operations over the preceding calendar year. Furthermore, if appropriate, EPA may request information under Section 308 of the Clean Water Act. Finally, any interested person may submit data at any time.

If necessary and appropriate, EPA may modify, revoke, or terminate the permit pursuant to applicable procedures. See 40 C.F.R. §§ 122.62, 122.64, 124.5; Permit Part I.A.5.

Comments 19 through 25 received from Renee M. Mary, Prides Crossing, MA:

COMMENT 19

1) Dumping polluted water from the ships so close to our highly populated shoreline is not good. All of the waves transport the water back to beaches where children play and wild birds feed, not to mention all of the ecosystem in the shallow water where waves break and in salt marshes.

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[4] Shawn Smallwood and Linda Spiegel, California Energy Commission, *Assessment To Support An Adaptive Management Plan For The APWRA*, (January 19, 2005), *available at* http://www.biologicaldiversity.org/swcbd/Programs/bdes/altamont/CEC-assessment-mitigation-plan.pdf (last accessed 5/14/07).

RESPONSE 19

The discharges authorized by the permit will not have any adverse environmental or health impact on persons or ecosystems at or near the shoreline. First, the project will add no chemicals to the seawater that would be used for cooling and for the safety water curtain. Second, the impact of elevated temperature associated with the discharge will dissipate within close proximity to the vessel, which would be moored 13 miles from the shoreline.

COMMENT 20

2) Initially a total of 4 LNG ships will anchor at the 2 ports. Last night, it was suggested that additional ones are highly possible.

RESPONSE 20

Initially, the NEG deepwater port would provide pipeline access and mooring for up to two vessels. The Neptune deepwater port is scheduled to be constructed in 2009 and would provide pipeline access and mooring for up to two more vessels. EPA is not aware of any other deepwater LNG port projects planned for Massachusetts Bay.

COMMENT 21

3) The total cumulative effect of an enlarging industrial zone so close to population centers will have unanticipated, undesirable impacts, the possibilities of which have not been presented.

4) The possibility of either a natural gas or steam explosion is terrifying to us. Frankly, we do not want to be incinerated. I challenge the idea that the anchors will hold: These vessels, when fully loaded, will break free and be smashed onto our rocky shores. The Atlantic is volatile, and because of climate change, storms have become more intense (reference not just to hurricanes, but to regular storms).

RESPONSE 21

The scope of the NPDES permit is limited to the discussion of the adverse environmental impacts due to water intakes and discharges associated with the NEG deepwater port project. Other impacts were addressed during the environmental impact study phase of the project and are summarized in the FEIS.

COMMENT 22

5) The applicant has carefully picked and chosen his data. Important details are missing, as was revealed at last night's public hearing. I, myself, point out that in the DANVERS HERALD (weekly newspaper published in Danvers), I read that a large fire boat would be available in case it was needed. Why have we not heard about this in hearings during the last 2 years.

RESPONSE 22

The NPDES permit is limited to discharges and cooling water intakes associated with vessels when they are moored to the buoys at the NEG deepwater port. If the commenter is concerned that the very availability of a fire boat implies a risk of fire, EPA notes the safety concern, but the Clean Water Act does not regulate fire safety. The Deepwater Port Act license does, however, require safety-related measures. Alternatively, if the commenter is concerned about

discharges from the fire boat itself, the NPDES program specifically exempts discharges from vessels operating as a means of transportation from requiring a permit. See 40 C.F.R. § 122.3(a).

COMMENT 23

6) The plan for this complex project has never been presented in a logical order, generally from beginning to end. For such a complex project the public is entitled to a presentation of this kind, including the possibility of unexpected impacts and how to deal with them before, not after, the project is permitted and construction completed and operations have begun. Right now, I am extremely skeptical about this project and the second one proposed by Suez (Neptune) due to my experience challenging local environmental projects, which were approved by the DEP, and subsequent impacts, like flooding occurred.

7) I totally concur with the technical presentations of 2 speakers – Ms. Polly Bradley of Nahant SWIM, Inc. and the Director of the Whale Center of New England. Please consider me an "unofficial co-author" of the data they presented last night (9/24/07).

RESPONSE 23

In response to this comment, EPA refers to the FEIS executive summary description of public involvement for the NEG deepwater port project environmental review prior to the issuance of the deepwater port license by the Maritime Administration. On pages ES-4 and ES-5, the public involvement activities were summarized as follows:

"On September 21, 2005, the USCG [(United States Coast Guard)] and MARAD *[(United States Department of Transportation Maritime Administration)*] issued a Notice of Intent (NOI) to prepare an EIS in the Federal Register. The NOI described the proposed project and the joint environmental review process, provided a preliminary list of issues to be addressed in the EIS, invited written comments on the environmental issues, and listed the dates and locations of two open house and public scoping meetings to be held in communities in proximity to the project area. The NOI was also published in The Boston Globe; The Boston Herald; The Gloucester Daily Times; The Salem News; and The Daily New of Newburyport. An "Interested Party" letter, the NOI, and a fact sheet describing the proposed project and announcing the location and dates of the open houses and public scoping meetings were mailed to 106 parties on October 5, 2005. The USCG and MARAD sponsored open houses and public scoping meetings in Boston and Gloucester, Massachusetts, on October 18, and 19, 2005 that were also attended by FERC and EOEA [*(Massachusetts Executive Office of Environmental Affairs)*] staff. Public comments submitted in the public scoping meetings and by letter were considered in scoping the DEIS [*(draft environmental impact statement)*].

The EPA published a Notice of Availability (NOA) of the draft EIS in the *Federal Register* on May 19, 2006, that initiated a 45-day period for the public and agencies to review and comment on the draft EIS. The USCG and MARAD also announced the informational open houses and public hearings, and invited public comments on the Draft EIS in the *Federal Register* notice. On June 14, and 15, 2006, the USCG and MARAD held informational open houses and public hearings at the Gloucester High School, Gloucester, Massachusetts, and Salem State Community College, in Salem, Massachusetts. The meetings were attended by over 40 individuals, 30 of whom provided verbal or written comments on the draft EIS at the public meetings. Transcripts of the public hearings are included in Appendix C.

Written comments were submitted to the federal docket by 16 government agencies or public officials and 21 individuals or non-government organizations, and 36 comment letters were submitted to MEPA during the draft EIS review period."

Comment 24 received from John Havighurst, Essex, MA:

COMMENT 24

The formula for averaging water temperature, by averaging water intake and discharge temperatures, does not give an accurate output temperature. It needs to be looked at scientifically – in terms of how it affects the sensitive marine ecosystem of Stellwagen Bank.

Due to the extreme sensitivity of the deep water port in close proximity to our marine sanctuaries, a closer investigation of the effects on marine life should postpone the permit process until a further study is done that takes into consideration the new temperature outflows and the impact on endangered species, toxic algae blooms, and the disruption of plankton growth (the food supply for right whales in this area).

I feel this lack of oversight as to the actual disruption of the marine environment that is protected under the Clean Water Act and Magnuson-Stevens Fishery Conservation and Management Act (1998), and thereby should not be granted a permit.

RESPONSE 24

The CORMIX model estimated the difference (not the average) between the ambient water temperature and the discharge water temperature. As previously stated, EPA reasonably projects that the thermal discharge should have minimal impacts on aquatic life in the area of discharge. If monitoring reveals that impacts are greater than were anticipated, the monitoring program can be expanded. See Responses 8, 9, 13, 14, 18.

Comments 25 through 33 from Rosemary Maglio, Beverly, MA:

COMMENT 25

I am writing to ask that NPDES permit number:MA0040266 should NOT be issued UNLESS and UNTIL it has been unequivocally proven that

a.) **Heat discharge into Massachusetts Bay waters at the outfalls for buoy A and buoy B on EBRVs**

b.) **Sea water intakes at the four designated sea chests on each EBRV**

c.) **Surface pollutants and air condensate pollutants from ship's water curtain and surface pollutants from ship's engine operation's smokestack emissions and ship's surface contaminants (leaks, spills, condensation/"soot" of air emissions/particulate matter)**

d.) **Noise discharge**

e.) **Wastewater treatment/disposal**

f.) **Catastrophic event on EBRV at DWP [deepwater port]**

"will not result in unreasonable degradation of the marine environment"; i.e. will not result in "significant adverse changes in ecosystem diversity, productivity and stability of the biological community within the area of discharge and surrounding biological communities."

Heat, particulate and dissolved pollutants, noise, and loss of organisms via entrainment will impact the stability of this marine environment. Diversity, productivity, and stability of the biological community within the area of discharge/cooling water intake systems will definitely be negatively impacted and the tampering with the ecological balance in this area is to an unreasonable extent , since this area is an area "enclosed" by marine sanctuaries and is an essential fish habitat area. To industrialize this site is unthinkable.

Diversity, productivity and stability of this biological community will be degraded and altered by

1.) **Δtemps – discharge water temperature 2.6ºC (5º) greater (warmer) than ambient seawater (main condenser cooling and Δtemps discharge water temperatures 5.5ºC (10º) greater (warmer) than ambient seawater (auxiliary seawater service cooling). The water temperatures at the discharge ports would be 2.6 – 5.5 ºC warmer that the ambient seawater temperature. These elevated temperatures do NOT meet the water quality criteria at the discharge port locations (criteria of less than 1 ºC) The criteria of less than 1 ºC ΔT would only be met at the water surface, but what about all the depths in between (discharge port up to the water's surface) The heated, warmer water leaving the discharge port would rise vertically to the surface (explaining why the temp Δ is not seen as much in the 500 m horizontal direction downdrift) but there is also a horizontal temp Δ. Notation, monitoring ought to be made of the seawater temperature at different depths in the vertical column between surface and the discharge ports and below the discharge port as well. An expert has testified at the hearing that plankton, icthyoplankton, are sensitive to temperature and would be negatively effected by temp increases. Other organisms (invasive/harmful organisms) might thrive better in this warmer volume of seawater and change the delicate existing balance of this ecosystem (i.e. organisms from ship's hull coming from Trinidad or enroute to port DWP). Movement (circulation) of water up will affect water flow, nutrient and organism flow, density of organisms, types of organisms, potential blooms of algae, turbidity, and dissolved oxygen.**

2.) **These changes in water temperature (discharge water temp to ambient seawater temp.) are most drastic on days #1 and #8 when the 4 hour start-up and shut-offs occur. SO there will NOT be stability of the environment.**

3.) **The loss of eggs, larvae, plankton, icthyoplankton in the cooling water intake system (CWIS)'s entrainment of organisms will affect diversity, productivity, and stability of this marine environment (especially on day 1 and day 8)**

The size of slots between grids on each of 4 sea chests (between metal gratings) of 21 mm (0.83 inches) will still allow smaller organisms to pass through (such as eggs, larvae, and plankton) and would selectively lead to loss of equivalent adults of those organisms that can not avoid being sucked in with the intake water. For example, fish species for which the Port area has been designated essential fish habitat for eggs and larvae (ex. atlantic cod, haddock, whiting, hake, flounder, halibut, sea scallops, herring) and what

about lobsters larvae and clams, quahops, and squids (n/a) and the food sources for these larvae – conditions will be altered by entrainment – which species will be significantly effected? These are unknown.

In conclusion, these are comments to protect this ecosystem, albeit made by an ordinary citizen –

1.) <u>Do not issue this permit</u> (despite prior laying of pipelines)

RESPONSE 25

The Clean Water Act and its NPDES regulations include provisions that specify when a discharge must be prohibited (i.e. when a permit must be denied). See CWA § 403(c), 33 U.S.C. § 1343(c); 40 CFR §§ 122.4, 125.123(b). EPA, in the environmental impact study (EIS) phase of the project, concurred with the FEIS conclusion that an NPDES permit could be issued for this discharge and that there would not be cause to deny a permit under the Clean Water Act. Therefore, EPA has developed an NPDES permit that would ensure operational consistency with the environmental commitments made by NEG during the EIS and provide adequate monitoring to ensure that, as concluded in the FEIS, the impacts on the marine environment are indeed minimal. Specifically:

1. Delta T: Because EPA has not promulgated nationally-applicable effluent limitation guidelines for discharges associated with LNG deepwater ports, EPA develops effluent limits on a case-by-case basis using best professional judgment. The CWA does not require attaining water quality criteria at the point of discharge. The Ocean Discharge Criteria (required by CWA § 403(c) and published at 40 CFR Part 125 Subpart M) require evaluation of nearfield effects, i.e., at the boundary of a zone of initial dilution, rather than at the point of discharge. See 40 CFR § 125.123(d)(1). (This is similar to application of water quality standards for in-land waters, where States and tribes have discretion to allow dilution as part of their water quality standards and implementation procedures.) In addition, EPA has issued guidance to states and tribes that incorporate mixing zone policies into their water quality standards.[5] While the guidance provides states and tribes broad leeway in considering the specific characteristics of the receiving waters, it offers general criteria which require that mixing zones be free from:

- concentrations causing acute toxicity,
- concentrations forming objectionable debris,
- floating debris, oil, scum and other nuisance materials,
- substances producing objectionable color, odor, taste, or turbidity, and
- substances that result in a dominance of nuisance species.

EPA considered this guidance, as well as the physical and biological characteristics of the Massachusetts Bay discharge location, in evaluating the CORMIX model results in developing the effluent limits. The thermal discharge of relatively low delta T and for a limited duration will not result in acute toxicity or unreasonable degradation of the marine environment.

[5] EPA, *Technical Support Document For Water Quality-based Toxics Control*, EPA/505/2-90-001, Office of Water, March 1991.

EPA believes that the ephemeral nature of the discharge will prevent the thermal discharge from contributing to the spread of invasive species. However, in addition to the biological monitoring required in the NPDES permit, the New England Aquarium will be conducting a broad range biological monitoring program designed to detect long term changes of the ecological balance in the port area. See also Response 30.

2. Stability: EPA acknowledges that there will be a discharge of heated water for a 4 hour period every 7 or 8 days. This thermal discharge will affect a small spatial area and persist for a short period of time. EPA believes that the adverse impacts of the first- and last-day temperature changes on the stability of the local aquatic environment will be minimal due to limited delta T, duration and spatial scope of the resultant plumes.

3. Entrainment: The Operational Monitoring Program is specifically designed to collect data regarding icthyoplankton diversity and abundance per volume of water at depths typically withdrawn by the EBRVs. The data would enable analysis in terms of likely impact to the Massachusetts Bay fish populations, as described in the monitoring plan which is attached to the permit (Attachment A).

COMMENT 26

2.) If you do issue this permit, then you MUST add greater limitations, frequent independent monitoring (and avoid averaging ranges), and immediate cease and desist, STOP operations when operations clearly impact the environment negatively – temp., pollutants prior to reversible loss of species.

RESPONSE 26

EPA does not anticipate any substantial biological impacts from the intakes or discharges associated with this permit. The permit does include, however, a variety of monitoring and reporting requirements, including those in Part I.B.3, and, in the event of unanticipated impacts, EPA has various options for responding. See Response 18. The Deepwater Port Act license does, under specified circumstances, provide for immediate operational shut-downs.

COMMENT 27

3.) Have a sound contingency plan in place for handling catastrophic event at this site – containment of environmental effects on this marine environment and its surroundings.

RESPONSE 27

The required response to an accidental release of pollutants due to “upset” in port operations is defined and discussed in Part II.B.5 of the permit. Although “catastrophic” events are not specifically addressed, the safety hazards associated with the port operation were discussed in Section 5.0 of the FEIS. In accordance with the Deepwater Port Act, NEG is required to develop plans to address potential hazards in conjunction with the U.S. Coast Guard which would be the primary responding agency in the event of a disaster at the port. Finally, in the event of unanticipated impacts, EPA has various options for responding with respect to the permit itself. See Response 18.

COMMENT 28

4.) Eliminate entirely open-loop system on day 1 and day 8 which requires use of seawater intake to cool engines and the heated seawater discharge.

RESPONSE 28

EPA requested technical input from NEG regarding the feasibility of the change recommended in the comment. NEG submitted the following response:

> "The Northeast Gateway Deepwater Port utilizes the closed-loop regasification process and does not utilize a direct use of seawater to re-vaporize the LNG. The water intakes and discharges associated with an EBRV during the 4-hour start-up and shut-down of operations on day 1 and day 8 of each Port visit are not related to regasification activities. Energy Bridge Regasification Vessels (EBRVs) are steam driven vessels and water is used to operate the vessels. There is no alternative to using water to safely cool the machinery and support the basic operational needs of the vessel and its crew. This water usage is typical of most LNG and/or large crude carriers that are currently in service today. All vessels regardless of propulsion method (steam turbine/diesel) utilize seawater for cooling and continue to do so regardless of whether or not they are actually underway. What is unique about the EBRVs is that once in the regasification state the vessels can operate under an innovative Heat Recovery System (HRS). Unlike other steam driven vessels, once in HRS the EBRVs can maintain the appropriate engine temperature requirements by using the cold temperatures associated with the LNG cargo to cool the heated machinery water and intake of the normal seawater for the vessel's cooling needs can be halted."

Based on all information in the record, EPA concludes that the closed loop STV system currently represents the best available technology economically achievable (as required by Clean Water Act section 301(b)(2)(A)) for the reduction of "heat" (a non-conventional pollutant) in the discharge from the NEG Port. EPA likewise concludes that the closed loop STV system represents the best technology available (as required by Clean Water Act section 316(b)) for minimizing the adverse environmental impact of the CWIS, at the NEG Port.

COMMENT 29

5.) Reduce the total discharge time (hours) below the 520 annual total and restrict/limit the daily discharge time (to less than 4 hr. start-up day 1/8) and reduce fluctuation of discharge (reduce the high discharge volumes of day 1 and day 8).

RESPONSE 29

EPA requested technical input from NEG regarding the feasibility of the change recommended in the comment. NEG submitted the following response:

> "Northeast Gateway (NEG) is committed to reducing impacts on environmental resources and has worked diligently to reduce water usage to the maximum extent practicable (95 percent) and still maintain safe operations of the EBRVs. Northeast Gateway is also committed to provide a reliable and timely supply of natural gas to meet the demands of the New England markets. To do so, Northeast Gateway has estimated the delivery of 65 cargos per year. The 520 hour cap provided by the EPA represents the minimum amount of discharge hours (with a 10 percent vessel overlap) to achieve 65 cargos. If the hours of

discharges were reduced from 520 to 180, Northeast Gateway would be unable to service the projected gas needs of the region."

Based on all information in the record, EPA concludes that the closed loop STV system currently represents the best available technology economically achievable for the reduction of "heat" in the discharge from the NEG Port.

While reducing the hours of operation would undoubtedly reduce the potential for adverse environmental impacts from the NEG Port, EPA has not received any information suggesting that permitting NEG to operate for less than 520 hours per year is necessary to meet either the Clean Water Act's technology-based standards or the Ocean Discharge Criteria.

COMMENT 30

6.) Decrease the temp. rise (∆T) <u>to less than 1ºC at the discharge port</u> (not 2.6 ºC, not 5.5 ºC) (not just at surface water/or within 500 m. from discharge port). Retain the water for discharge on board <u>until</u> the seawater temp. decreases to less than 1 ºC.

RESPONSE 30

See Response 25. EPA also requested technical input from NEG regarding the feasibility of the operational change recommended in this comment. NEG submitted the following response:

"The operation of all vessels similar in design to the EBRVs utilized at the NEG Port require seawater to maintain the operating temperature for the machinery used for propulsion and electric generation, whether the vessel is moored at a deepwater port or at a dockside facility. NEG is unique in its design to all other vessels with the development of the Heat Recovery System (HRS) system which can be used during the regasification process. During the first four hours of regasification on the EBRV, the intake of seawater absorbs heat from the machinery and is immediately discharged with only a slight increase in temperature. Once in HRS the EBRVs can maintain the appropriate machinery temperature requirements by using the cold temperatures associated with the LNG cargo to cool the heated machinery water and thus the intake of the normal seawater for the vessel's cooling needs can be halted. With regard to the comments suggestion that the cooling water be held on board the vessel, retaining the water on board the vessel poses a fundamental problem; retaining the warmer discharge water on board the vessel will only increase in temperature as the warm effluent is continuously added to the storage. This risks overheating the engines and equipment. For this reason, it is not feasible to retain the water onboard in an attempt to reduce the discharge temperature."

Based on all information in the record, EPA concludes that the closed loop STV system currently represents the best available technology economically achievable for the regulation of "heat" in the discharge from the NEG Port.

COMMENT 31

7.) <u>Monitor</u> also <u>for dissolved air pollutants at port site</u> and along <u>plume trail for smokestack emissions</u>. These pollutants are entering or "discharging" into the water by indirect route of fallout and into seawater. (Ex. NOx, formalin, particulate matter, lead, benzene, SO2 – see air emissions HAP – hazardous pollutants from smokestack emissions)

RESPONSE 31

EPA notes the commenter's concern and is sensitive to the fact that airborne pollutants can be incorporated into the hydrologic cycle through precipitation. The Clean Water Act, however, regulates point source discharges to waters of the United States. EPA currently considers the deposition of air pollutants as a result of precipitation or "fallout" to be non-point discharges, rather than point source discharges, and thus that deposition is not regulated by the permit. The facility's air emissions are regulated by a minor New Source Review permit (No. RG1-DPA-CAA-01) that reflects Best Available Control Technology for control of the relevant pollutants and will ensure that the National Ambient Air Quality Standards are not violated. Furthermore, EPA has no evidence before it suggesting that the facility's air emissions would result in appreciable deposition of air pollutants into the ocean water.

COMMENT 32

8.) Decrease cooling water intake systems to maintain controlled intake velocity no greater than 0.5 feet per second or less with NO exceptions for the 4 hr start-up/shut down intake velocity of 0.82 ft/sec. Eggs are not able to "swim away" or resist the suction action of high velocity water intake and thus loss of eggs and not motile larvae forms will decrease productivity for this area resulting in decreased number of equivalent adults.

RESPONSE 32

EPA agrees that eggs and non-motile larvae forms cannot swim away from the cooling water intake structure and that there will be a decrease number of equivalent adults as a result. The impact of this decrease was evaluated in the FEIS and was estimated to be low. However, the Operational Monitoring Program (Attachment A to the permit) is specifically designed to collect additional data regarding icthyoplankton diversity and abundance per volume of water at depths typically withdrawn by the EBRVs. EPA would analyze this data in terms of the likely adverse impact to the Massachusetts Bay fish populations, as described in the monitoring plan.

COMMENT 33

9.) Use of this DWP should be (after baselines are established year round at various depths)

- **Gradual**
- **<u>Phased in gradually</u> and <u>monitored</u> for effects first before any increase in hours of operation (esp day 1 and 8)**
- **Much less than 520 hours in draft permit perhaps limit to ¼ time or 180 hours for first year of operation for example.**
- **Hours of operation should be minimal during first year of operation and 1st year monitoring (especially day 1 and day 8 and day 4 and incorporate rest period or longer cycle so that discharge water has more time to cool – perhaps 12 day cycle if better)**

- **Effects of the water discharge temp may be cumulatively negative water temp (i.e. – ambient seawater temperature itself may be rising and is changed each 8 days by increased water temp discharge)**

- **Allow for recovery time between use and longer time for discharge water to cool on EBRV (to less than 1 ºC above ambient seawater temperature)**

I know you have a difficult job to balance energy needs and protection of this ecosystem. The protection of this biologically rich and diverse ecosystem is of paramount importance and it truly ought not be made into an industrial area to regasify liquid natural gas. All safeguards, limitations, conditions, monitoring and <u>yes even denial</u> of NPDES permit must be carried out to ensure the protection of this unique marine ecosystem.

RESPONSE 33

EPA acknowledges and agrees that the port area is in an ecologically sensitive area that should be developed cautiously for the sake of maintaining a healthy and ecologically diverse ecosystem. Although this deepwater port is the first of its kind in Massachusetts Bay, it will lie adjacent to protected resource areas, but also in an area that has been used for waste disposal, and is scheduled to contain a second deepwater LNG port within the next few years. Because of the ecological sensitivity of the site, EPA commented and provided input, along with other federal and Commonwealth agencies and the public, during the development of the FEIS to ensure that the project's impact on the aquatic environment would be fully evaluated and minimized. As a result of these efforts, the cooling water intake and discharges associated with the regasification process were reduced by an order of magnitude to a level that EPA believes should have minimal, if any, adverse impact on the aquatic environment.

EPA also requested input from NEG regarding the feasibility of phasing in port operation, as recommended in the comment. NEG submitted the following response:

> "As stated in Section 1.4 of the FEIS, a report of the New England Governors Conference (NEGC) concluded that given the time required for LNG project development, the region must either substantially reduce demand for natural gas or start now to develop infrastructure to ensure reliable delivery of natural gas in the winters beyond 2010. A report from the Special Commission for New LNG Infrastructure in Massachusetts and New England also predicted a regional shortage in natural gas supply as early as 2007 and as late as 2010 (Tierney, 2005).
>
> The Northeast Gateway Deepwater Port will add between 150 Bcf to 175 Bcf of natural gas to New England annually, or approximately 400 MMcfd, depending on operational conditions, by the winter of 2007, to provide the gas necessary to meet the projected increase in demand. Bringing the project online would represent an approximate 8 percent increase in the region's overall delivery capacity. However, if the project was "phased" into operation, New England would potentially be unable to meet both the short and long-term natural gas needs of the region."

Based on all the information in the record, EPA has determined that the permit provisions are adequately protective, and it is neither necessary nor appropriate to phase in operation as proposed in the comment.

Comment 34 received from Heidi Roberts, Sierra Club

COMMENT 34

I am with the local group of the Sierra Club. The Sierra Club supports the organizations like the Whale Center and the Nahant SWIM Team in their efforts to stop this process. And I think we are being misled. I attended all these hearings for several years now when we were told it was a closed loop. Now, to me, a layperson, I thought there was no water in and out. No -- you know -- versus an open loop. Now, that's what I thought. But now today, I hear that the water comes in and goes back out. That's not a closed loop to me.

The other thing, years -- years ago, when all this started, the Algonquin pipeline, which is coming through Boxford and down from Canada and comes through – through the harbor here, at the time when they brought up this -- the LNG vessels coming in, the LNG ports, when they proposed it, they said there was a miscalculation. There wasn't enough gas up in Canada. Now, today in the paper is that they are going to increase or build a -- some sort of station in Boxford to increase capacity for the gas coming from Canada. Apparently, they just found some more.

So -- and at the time, too, the people in Boxford and North Andover were told this pipeline would go through, that the Salem power plant, which is powered by coal, would tie into gas. Well, that's not quite happen, because that's owned by Dominion Coal. So, that was not right. The other thing was, I think, all of this was decided at the LNG conference in Rome several years ago which also, incidentally, an official from the State Energy Commission attended. This was who's who and LNG was there. You know, all the Middle East countries, everybody, Russia, so forth.

And you can see this on what is called PLATTS, which is the energy -- it's on the internet. So, that's all I wanted to say. I feel it was a done deal years ago. Sorry. That's it.

RESPONSE 34

1. The draft permit and attached fact sheet reflect the system described in the NPDES permit application submitted to EPA, which does include cooling water intake and discharge at startup and shutdown.

EPA believes that the relatively small intake and discharge (when compared to open loop regasification systems) should not be a detriment to the environment. The regasification systems to be used at Northeast Gateway are the current state of the art for on-board closed loop regasification systems since they have been retrofitted with heat recovery systems that reuse the warming water for engine cooling. No other such vessels are currently in use anywhere in the world. EPA expects that new vessels will be specifically designed and built to operate with fewer or no discharges.

2. The development of regional natural gas infrastructure is outside the scope of the NPDES permit under consideration in this response to comments which pertain to discharges and cooling water intake associated with the operation of a specific deepwater port.

At the public hearing, Mary Roderick, of Beverly Massachusetts, made the following comments:

COMMENT 35

I believe there are too many issues still in with the whales. And also recently, in fact, in today's newspaper, there is an article about a local issue which means the pipeline is going to have to be -- another site is going to be considered in the local places, Danvers and Boxford, which will connect to this pipeline. And none of us knew that there was any more work to be done within the local area. All of it theoretically is still out in the ocean. We haven't heard about that before. I think, we are all very concerned about not only the whales, but the quality of life for a lot of other sea life.

The temperature of the water coming in and going out, these are serious issues. And I don't think that they have been considered, but I don't think that the EPA has considered them strongly enough for the local area. Especially for the lobsters. Lobsters are not just little, you know, those orange things that we see. They are little baby things that are actually not very -- the size of plankton when they are very small. And these could be affected in that situation. The temperature of the water, anything chemical in the water, we haven't actually seen that data. I believe that this project should not be approved. If it were approved, I think a lot of significant changes have to be made to it.

RESPONSE 35

1. The development of regional natural gas infrastructure is outside the scope of the NPDES permit under consideration in this response to comments which pertain to discharges and cooling water intake associated with the operation of a specific deepwater port.

2. The permittee does not propose to add any chemicals to the cooling water, and the permit therefore does not authorize the discharge of any such chemicals. The permit specifically prohibits the addition of chemicals to the discharge without prior approval from EPA.

3. Early larval stages of lobster are pelagic and thus could be present just below the water surface in close proximity to the thermal discharge. The thermal discharge would occur for a limited duration (4 hours at a time) within a relatively small affected geographical area. Due to the limited temporal and spatial scale of this discharge, EPA does not believe that it has the potential to pose a significant risk to larval lobsters.

At the public hearing, Hope Benne made the following comments:

COMMENT 36

I just want to agree with all of the people here who vehemently oppose this project. This is just another example of a reckless project that's been railroaded through. The burden of proof has not been on the people who will profit from this. The burden of proof is on some of us. We local activists and local environmental organizations who aren't being paid high salaries railroad through a reckless project. And you wonder where the conscience is, the conscience that I feel rests in each of us to search for sensible policies and exercise the precaution -- precautionary principle which has been advanced that, before constructing an extremely complex project such as this, that all questions will be thoroughly exhausted

before the project goes forward. So, yes, I just want to add my voice to the others that oppose this project.

RESPONSE 36

EPA notes the commenter's opposition to issuance of this NPDES permit. With respect to the EIS and permitting processes, see Responses 6 and 23.

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

FACT SHEET

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

NPDES PERMIT NUMBER: MA0040266

PUBLIC COMMENT PERIOD: August 24, 2007 – September 25, 2007

NAME AND MAILING ADDRESS OF APPLICANTS:

Northeast Gateway Energy Bridge, LLC
1330 Lake Robbins Drive, Suite 270
The Woodlands, TX 77380

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Northeast Gateway Energy Bridge Deepwater Port
Massachusetts Bay

RECEIVING WATER(S):

Massachusetts Bay

SIC CODE: 4491

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1.0 Proposed Action, Type of Facility, and Discharge Location

1.1 Brief Summary of Proposed Action

The above-named applicant has applied to the U.S. Environmental Protection Agency (EPA) for a NPDES permit to authorize it to withdraw seawater (for cooling) from, and discharge pollutants to, Massachusetts Bay from its proposed new deepwater port. The new port is proposed for the regasification of liquefied natural gas (LNG) and the transmission of the gas into a network of undersea natural gas transmission pipelines. The LNG will be delivered to the port by specially equipped LNG tanker vessels. The LNG tankers will connect to, and become integrated within, the deepwater port by coupling with one of the facilities two "submerged turret loading buoys." These buoys are, in turn, connected to the existing undersea transmission pipeline network by flexible risers, subsea flowlines and pipeline laterals. Once integrated within the deepwater port, the LNG tankers will regasify their cargo of LNG using their specially designed onboard regasification equipment. Following regasification, the natural gas will be odorized and metered out, through the flexible risers and subsea flowlines, to the pipeline laterals and the undersea pipeline transmission network. Thus, the deepwater port will be the functional equivalent of a land-based or marine platform-based LNG regasification and import terminal, although the regasification and transmission of the gas will occur on the tanker vessels.

Northeast Gateway Energy Bridge, LLC's (Northeast Gateway) NPDES permit application was deemed complete by EPA. The Northeast Gateway Energy Bridge deepwater port will be located in federal waters of Massachusetts Bay approximately 13 miles south-southeast of Gloucester, Massachusetts, as shown in Figure 1. This permit addresses cooling water withdrawals and pollutant discharges associated with operation of the deepwater port. Discharges associated with construction of the port were addressed in NPDES Permit MA0040240.

1.2 Type of Facility

Northeast Gateway will construct, own and operate the Northeast Gateway Deepwater Port (Port) to import LNG into the New England Region. The Port will support the delivery of LNG, the regasification of LNG, and the delivery of natural gas to onshore markets via the following major components.

- **Energy Bridge™ Regasification Vessels (EBRVs) -** EBRVs are purpose-built LNG carriers that incorporate onboard equipment for the vaporization of LNG and delivery of high pressure natural gas. The major components of the specialized onboard equipment include:
    - High Pressure Pumps and Vaporizers. High pressure pumps take LNG from the EBRV's cargo tanks and bring it up to pipeline pressure in its liquid state. The LNG is then passed through closed-loop, shell-and-tube vaporizers to convert it back to vaporous natural gas, which is then odorized and metered out to the undersea pipeline network.
    - Boilers. EBRVs are equipped with oversized boilers capable of burning either natural gas or fuel oil to provide the steam and power necessary to sustain vessel operations and the shipboard regasification process.

- STL Buoy Compartment. The hull of an EBRV includes a specialized compartment to accommodate the STL Buoy system (see below).
- Reinforced LNG Containment System. The LNG containment on the EBRV is reinforced to withstand the sloshing loads encountered while at sea.

- **Two Submerged Turret Loading™ (STL) Buoy Systems** – Each STL buoy will consist of a flexible riser, pipeline end manifold, and flowline. The buoys will serve both as a single-point mooring system for the EBRVs and the delivery conduit for natural gas. Figure 2 illustrates the Port's STL buoy system.
- **Pipeline Lateral** – The Pipeline Lateral will connect the STL buoy flowlines to the existing offshore pipeline system (Hubline) and enable the transfer of natural gas from the Port to onshore markets. The Pipeline Lateral will be owned and operated by Algonquin Gas Transmission, LLC (Algonquin). Figure 1 shows the Pipeline Lateral route.

1.3 Discharge Locations

The intake of seawater and discharge of cooling and curtain water will be from the Port's EBRVs which will be connected with the two STL buoys. Therefore, the intake and discharge location will be in the Port location, approximately 13 miles south-southeast of the city of Gloucester, Massachusetts, in federal waters. The Port is also located in Minerals Management Service (MMS) Lease Blocks NK 19-04 6625 and 6675. This section of the Massachusetts Bay is commonly referred to as Block 125. Water depth in the Port area is 270 to 290 feet.

The two STL buoys will be separated by approximately one nautical mile (1,850 meters) which would allow two vessels to "weathervane" (i.e., move around their anchoring points with the currents) without interference when moored simultaneously and also provide sufficient room for maneuvering.

The Port is located outside of, but in the vicinity of, federal and state designated marine sanctuaries and the Boston Harbor traffic lanes.

1.4 Port Operation

EBRVs are expected to take approximately eight days to regasify and "send out" each cargo of LNG delivered to the Port. On the first day of regasification, the regasification process will be initiated and a steady state natural gas transmission of approximately 150 million cubic feet per day (MMcfd) will be achieved. On days two through seven, when the Port is operating in steady state, the regasification process will be a closed loop system with no intake of seawater for cooling (or warming) and no discharge of heated water (or chilled water). On days one and eight, seawater intake for cooling and related thermal discharges will be required for four hours on each day.

In addition to those associated with regasification, seawater intake and effluent discharges will be required for the day-to-day functions of the EBRV, including maintaining the vessel's main cooling systems, ballast water, a safety water curtain, the generation of fresh water, graywater and blackwater, and emergency needs as described in the following text.

To accommodate continuous delivery of natural gas, deliveries of LNG will be scheduled consecutively. As delivery into one of the two buoys is finishing, a second vessel will arrive and

attach to the other buoy to commence discharge of its cargo. The port has been designed to allow for the simultaneous operation of two EBRVs. However, for the majority of all operations at Port (90 percent of total annual operations) only one EBRV is expected to be servicing the Port at any given time. Overlap between vessels is only anticipated to occur during 10 percent of all annual operations at Port.

2.0 Description of Intakes

EBRVs are expected to take approximately eight days to regasify each cargo of LNG delivered to the Port. Water use during these eight days is dependent upon the phase of regasification. Table 1 illustrates the water use for each vessel while in port.

Table 1 – Summary of Maximum Water Intake for One EBRV in Port (Flows in MGD)

Day of operation	Main Condenser Cooling	Auxilary Seawater Cooling	Ballast Water	Safety Water Curtain	Freshwater Generator	Daily Total
1	7.82	0.99	1.87	0.6	0.3	**11.58**
2	0	0	1.87	0.6	0.3	**2.77**
3	0	0	1.87	0.6	0.3	**2.77**
4	0	0	1.87	0.6	0.3	**2.77**
5	0	0	1.87	0.6	0.3	**2.77**
6	0	0	1.87	0.6	0.3	**2.77**
7	0	0	1.87	0.6	0.3	**2.77**
8	7.82	0.99	1.87	0.6	0.3	**11.58**

All water used in support of EBRV ship operations will be drawn through a total of four sea chests (cavities in the hull of a vessel which are exposed to the ocean; water is drawn into the vessel through the cavity): starboard high, starboard low, port high, and port low (see Figure 4). Each sea chest will draw water through a series of grids (see Table 2).

Table 2 - Summary of Sea Chest Grid Numbers and Open Areas

Sea Chest	Grids	Open Area per Grid (square feet)	Total Open Area (square feet)
Starboard High	4	8.2	32.8
Starboard Low	6	6.9	41.4
Port High	8	8.2	65.6
Port Low	8	6.9	55.2

Each sea chest grid will have metal gratings with 21 mm (0.83 inch) slots between the grating bars. The high sea chests will be located on the rounded portion of the hull near the bilge, approximately 23 feet below the surface of the water. The low sea chests will be located further down on the flat portion of the hull, with the centerline approximately 38 feet below the surface

of the water. Seawater will be drawn horizontally through the high sea chests and vertically through the low sea chests.

3.0 Description of Discharges

Each EBRV will discharge from five different outfalls during the eight day regasification process. Table 3 summarizes all the flows from the EBRVs. More detailed descriptions of the source and characteristics of the discharge from each outfall are provided in section 6.0.

Table 3 – Summary of Maximum Water Discharge for One EBRV in Port (Flows in MGD)

Day of operation	Main Condenser Cooling	Auxilary Seawater Cooling	Safety Water Curtain	Freshwater Generator	Hotelling & Sanitary Treatment	Daily Total
1	7.82	0.99	0.6	0.27	0.005	9.685
2	0	0	0.6	0.27	0.005	0.875
3	0	0	0.6	0.27	0.005	0.875
4	0	0	0.6	0.27	0.005	0.875
5	0	0	0.6	0.27	0.005	0.875
6	0	0	0.6	0.27	0.005	0.875
7	0	0	0.6	0.27	0.005	0.875
8	7.82	0.99	0.6	0.27	0.005	9.685

4.0 Environmental Review under the National Environmental Policy Act

Section 511(c)(1) of the Clean Water Act (CWA), 33 U.S.C. § 1371(c)(1), expressly provides that EPA issuance of an NPDES permit under CWA § 402, 33 U.S.C. § 1341, to a facility that is a "new source" under CWA § 306, 33 U.S.C. § 1316, is one of only two types of EPA actions under the CWA that are subject to review under the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. §§ 4321, *et seq.* Where such an action is determined to be a major federal action significantly affecting the quality of the human environment, NEPA requires that the federal agency or agencies proposing, major federal actions significantly affecting the quality of the human environment to first complete an "environmental impact statement" (EIS) evaluating the proposed action, reasonable alternatives to it and the environmental effects of the proposed and alternative actions. *See* 40 C.F.R. Part 1502. EPA regulations at 40 C.F.R. Part 6, Subparts A, B, D, and F also address the preparation of EISs in conjunction with EPA proposals to issue NPDES permits to new sources.

Several criteria must be satisfied before a facility will be deemed a new source under CWA Section 306. One of these criteria is that the facility must fall within an industrial category for which new source performance standards have been developed. *See* 33 U.S.C. § 1316(a)(2). *See also* 40 C.F.R. §§ 122.2 (definition of "new source") and 122.29(b)(2). EPA has not, however, promulgated new source performance standards for deepwater ports generally or for LNG import terminals in particular, whether based on the land or the water. Therefore, the LNG deepwater port in question here would not generally be considered a new source under CWA Section 306,

and preparation of an EIS would not be required in connection with the proposed issuance of an NPDES permit for its discharges. Nevertheless, the Deepwater Port Act (DPA), 33 U.S.C. §§ 1501 *et seq.*, specifies that deepwater ports shall be considered "new sources" under the CWA. *See* 33 U.S.C. § 1502(9)(D). As a result, by operation of the DPA, NEPA applies to EPA's proposal to issue an NDPES permit to the NEG deepwater port. At the same time, the DPA also specifies that:

> [f]or all [Deepwater Port Act license] applications, the Secretary [of Transportation], in cooperation with other involved Federal Agencies and departments, shall comply with the National Environmental Policy Act of 1969 (42 U.S.C. 4332). Such compliance shall fulfill the requirement of all Federal agencies in carrying out their responsibilities under the National Environmental Policy Act pursuant to this Act.

33 U.S.C. § 1504(f). Consistent with this provision of the DPA, the United States Coast Guard (USCG) and the United States Maritime Administration (MARAD) served as lead agencies preparing an EIS to satisfy NEPA, and EPA (and other agencies) cooperated with the USCG and MARAD in the preparation of the EIS. *See* USCG's Draft and Final EISs for the Northeast Gateway Energy Bridge LLC Liquefied Natural Gas Deepwater Port License Application. Also consistent with the DPA, this EIS satisfies EPA's NEPA obligations with respect to issuance of this NPDES permit.

The EIS includes detailed discussion of the proposed project and alternatives considered to it. Many aspects of the project are discussed in the EIS, including pollutant discharges and cooling water withdrawals. This fact sheet provides additional discussion focused specifically on aspects of the proposed facility that are subject to regulation under the NPDES permit.

5.0 Limitations and Conditions

The limits on pollutant discharges and cooling water withdrawals, as well as the monitoring requirements, proposed by EPA for the Port may be found in the draft NPDES permit. The basis for these requirements is discussed below.

6.0 Permit Basis: Statutory and Regulatory Authority

6.1 Permit Requirements, Generally

The Clean Water Act (CWA) prohibits the discharge of pollutants to waters of the United States without authorization by a National Pollutant Discharge Elimination System (NPDES) permit, unless the discharge is otherwise authorized by the CWA. Technology and water quality-based effluent limitations and other requirements, including monitoring and reporting, are typically implemented by including them in NPDES permits issued to specific facilities. *See* 33 U.S.C. §§ 1311(a) and (b), 1313, 1318(a), 1326(b), 1341, 1342, 1343. The draft NPDES permit here was developed in accordance with various statutory and regulatory requirements established pursuant to the CWA. The regulations governing the EPA NPDES permit program are generally found at 40 CFR Parts 122, 124, 125, and 136. For this permit, EPA considered technology-based and water quality-based requirements under the CWA, including the CWA's Ocean Discharge Criteria. In addition, EPA considered any requirements that might arise out of any applicable

statutes in addition to the CWA.

6.2 Technology-Based Requirements for Pollutant Discharges

Technology-based effluent limits represent the minimum level of pollutant discharge control that dischargers must achieve under the CWA. The CWA requires that different types of pollutant discharges be controlled to levels that reflect the capability of certain technological measures. These technology standards vary depending on the type of pollutant and facility in question. *See* 33 U.S.C. §§ 1311(b), 1314, 1316; 40 C.F.R. § 125.3. Sections 301(b) and 306 of the CWA (*see* 40 CFR §125 Subpart A) require that pollutant discharges be reduced to a level equivalent to using the best practicable control technology currently available (BPT), best conventional control technology (BCT) for conventional pollutants, the best available technology economically available (BAT) for toxics and non-conventional pollutants, and the best available demonstrated control technology (BADCT) for discharges from "new sources," as defined under the CWA. *See* 33 U.S.C. §§ 1316(a); 40 C.F.R. §§ 122.2, 122.29. BAT limits are also supposed to "result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants." 33 U.S.C. § 1311(b)(2)(A). These technology-based requirements are then to be reflected in NPDES permits issued to specific facilities. *See* 33 U.S.C. §§ 1311, 1316, 1342(a); 40 C.F.R. §§ 122.29, 125.3. In general, technology-based effluent guidelines for non-POTW facilities must have been complied with as expeditiously as practicable. *See* 40 CFR §125.3(a)(2). Any applicable new source performance standards must be complied when the new source commences operations. *See* 40 C.F.R. § 122.29(d)(4) and (5). Compliance schedules and deadlines not in accordance with the statutory deadlines of the CWA cannot be authorized by a NPDES permit.

EPA regulations found at 40 C.F.R. Part 125, Subpart A, set forth procedures, standards and criteria for the development and imposition of technology-based requirements in NPDES permits under Section 301(b) of the CWA, including the application of EPA-promulgated National Effluent Guidelines (NEGs) (i.e., technology-based effluent limitations developed for entire industrial categories which are then applied to specific facilities through NPDES permits) and, when no relevant NEGs are in effect, the development of case-by-case, Best Professional Judgment (BPJ) determinations of technology-based discharge limits under Section 402(a)(1) of the CWA. *See* 40 C.F.R. § 125.3.

EPA has not promulgated technology-based NEGs for pollutant discharges from LNG deepwater ports or any other type of deepwater port. In addition, EPA has not promulgated any new source performance standards for deepwater ports. Therefore, all technology-based effluent limits for the Port's NPDES permit have been developed on a case-by-case, BPJ basis, as discussed further below.

6.3 Ocean Discharge Criteria under CWA § 403

Point source pollutant discharges to marine waters are subject to the federal Ocean Discharge Criteria (ODC) under Section 403 of the Clean Water Act (CWA). 33 U.S.C. § 1343. The ODC apply to NPDES permits for pollutant discharges into the territorial seas, the contiguous zone and the ocean. EPA has promulgated guidelines for regulating discharges to satisfy CWA section 403 and give effect to the ODC. *See* 40 C.F.R. Part 125, Subpart M.

EPA may not issue an NPDES permit to authorize any pollutant discharge that the Agency

determines will cause "unreasonable degradation of the marine environment." 40 C.F.R. 125.123(b). EPA conducts an Ocean Discharge Criteria Evaluation (ODCE) using the guidelines in 40 C.F.R. Part 125, Subpart M to determine whether and the extent that the discharge will cause degradation of the marine environment. 40 C.F.R. 125.122(a). These guidelines define "unreasonable degradation of the marine environment" to mean:

- Significant adverse changes in ecosystem diversity, productivity, and stability of the biological community within the area of discharge and surrounding biological communities;
- Threat to human health through direct exposure to pollutants or through consumption of exposed aquatic organisms; or
- Loss of aesthetic, recreational, scientific or economic values which is unreasonable in relation to the benefit derived from the discharge.

See 40 C.F.R. 125.121(e). CWA Section 403(c) guidelines require that a number of factors be considered in the determination of degradation. These factors include the amount and nature of the pollutants, the potential transport of the pollutants, the character and uses of the receiving water and its biological communities, the existence of special aquatic sites (including parks, refuges, etc.), any applicable requirements of an approved Coastal Zone Management plan, marine water quality criteria developed by EPA pursuant to CWA Section 304(a)(1), and potential impacts on water quality, ecological health and human health.[1] EPA may include limits in NPDES permits in order to ensure that discharges will not result in unreasonable degradation of the marine environment and, as stated above, discharges that would cause such unreasonable degradation may not be permitted. 40 C.F.R. §§ 125.123(a) and (b). If EPA has insufficient information to determine prior to permit issuance that there will be no unreasonable degradation of the marine environment, the Agency may not issue the permit unless, among other requirements, it finds that such discharge will not cause irreparable harm. 40 C.F.R. 125.123(c).

6.4 Section 316(b) of the Clean Water Act

CWA Section 316(b), 33 U.S.C. § 1326(b), imposes a technology standard for cooling water intake structures (CWISs) at facilities with pollutant discharges subject to NPDES permitting, where the CWIS will withdraw cooling water from the waters of the United States. CWA Section 316(b) requires "that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact" (BTA). 33 U.S.C. § 1326(b). As with technology standards for effluent discharges, EPA imposes conditions in NPDES permits to ensure that the technology standard for CWISs is met at individual facilities.

In December 2001, EPA promulgated a regulation to implement a first phase of performance standards under CWA Section 316(b). *See* 40 C.F.R. Part 125, Subpart I; 66 Fed. Reg. 65338 (Dec. 18, 2001) (Final Phase I Rule). The Phase I Rule set national performance standards for

[1] The EPA National Recommended Water Quality Criteria, 2006, contain applicable water quality criteria for marine discharges.

CWISs at "new facilities," as defined in the regulations, that are subject to the Rule. An April 22, 2004, memorandum from EPA's Office of Water to EPA Regions and the National Oceanic and Atmospheric Administration (NOAA), confirms that CWISs offshore LNG terminals with NPDES permits would be subject to CWA Section 316(b)'s BTA standard, but also directs that such limits should be developed on a case-by-case, BPJ basis, rather than the Phase I regulations. The memorandum explains that EPA's Phase I regulations for new facilities with cooling water intake structures did not contemplate, and were not intended to be applied to, offshore facilities of this type. While the memorandum also noted that it was possible that EPA's then as yet-to-be-developed Phase III Rule under CWA Section 316(b) might provide national categorical standards applicable to offshore LNG import terminals, EPA later issued the Phase III Rule and decided not to promulgate national standards for this type of facility and to leave permit limit development under Section 316(b) for these facilities to the case-by-case, BPJ process. *See* 40 C.F.R. §§ 125.131(d), 125.133; 71 Fed. Reg. 35008 (June 16, 2006) (Final Phase III Rule). *See also* 40 C.F.R. §§ 401.14.

The operation of CWISs can cause or contribute to a variety of adverse environmental effects, such as killing or injuring fish larvae and eggs by entraining them in the water withdrawn from a water body and sent through the facility's cooling system, or by killing or injuring fish and other organisms by impinging them against the intake structure's screens, racks, or other structures. CWA Section 316(b) applies to this permit due to the presence and operation of CWISs on the EBRVs, specifically, the sea chests when the EBRVs are interconnected with the STL buoys and integrated within the Port.

6.5 Special Considerations Regarding the EBRVs and NPDES Permitting

As explained above, the EBRVs are ocean-going LNG tanker vessels that are specially equipped so that they can interconnect with the STL buoys and be integrated into the deepwater port and conduct the LNG regasification and send out operation onboard. Once connected to the STL buoy and integrated into the Port, the EBRVs are essentially anchored to the seafloor and stationary in the water (of course, they will be able to "weathervane" around their anchor points), and they will be connected to the undersea natural gas pipeline network via the flexible riser and flowlines. Thus, the Port, including the EBRVs, is functionally equivalent to both land-based and marine platform-based LNG import terminals.

CWA Section 502(14) states that "[t[he term 'point source' means . . . [, among other things, a] vessel or other floating craft, from which pollutants are or may be discharged." CWA Section 502(12)(B) defines "discharge of a pollutant" to mean any addition of any pollutant to waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft. Thus, pollutant discharges to federal waters from vessels or other floating craft generally would *not* be considered to constitute a "discharges of pollutants" subject to NPDES permitting requirements under the CWA. Longstanding EPA regulations, however, have interpreted the reference in CWA Section 502(12)(B) to "vessels or other floating craft" as inapposite to discharges when the vessel is operating in a capacity other than as a means of transportation. *See* 40 C.F.R. § 122.3. NPDES permits have been required for discharges associated with various types of vessel-based or otherwise floating industrial facilities (e.g., seafood processing vessels, offshore oil and gas extraction extraction facilities). *See* Technical Development Document for the Final Section 316(b) Phase III Rule, p. 1-2 (EPA-821-R-06-003) (EPA, 2006).

For these reasons, EPA does not assert NPDES jurisdiction over discharges of pollutants (or cooling water withdrawals) from the EBRVs when they are in transit and, therefore, are operating primarily as a means of transportation. When the EBRVs are interconnected to the STL buoys and integrated into the Port, however, NPDES permitting requirements do apply to the associated discharges (and CWISs). Therefore, the draft permit's pollutant discharge and cooling water intake requirements discussed below all apply to discharges from/intakes into the EBRVs when they are interconnected with the STL buoys and integrated within the Port.

7.0 Explanation of the Permit's Effluent Discharge Limits

The operation of the Port will entail the operation of two LNG regasification and transmission units, each consisting of an EBRV interconnected with one of the two in-place STL Buoy systems (referred to here as Buoy A and Buoy B). Up to ten percent of the total annual port operations will involve having separate EBRVs interconnected with Buoys A and B simultaneously. Outfalls marked "A" represent the outfalls of an EBRV connected with Buoy A and outfalls marked "B" represent the outfalls of an EBRV connected with Buoy B.

7.1 Outfall 01A and 01B – Main Condenser Cooling

The EBRVs utilize steam (from the onboard boilers) to drive the main propulsion turbine and turbo generators that provide power for the vessel's propulsion, auxiliaries, and electric power generation. As part of the steam vessel's normal propulsion systems, seawater is used to cool exhaust steam in the main condenser. While at port, the EBRVs' main condenser cooling system will operate under normal capacity water intake and discharge conditions during two 4-hour periods at the beginning and end of the regasification sequence. During each of these 4-hour periods of normal capacity water use, this system will require the intake and discharge of approximately 7.82 million gallons of seawater for cooling for each EBRV, with discharge temperatures 2.6ºC (5ºF) greater than the ambient seawater.

Seawater to support this system will enter into the EBRV via both high and low starboard and port sea chests. When interconnected to Buoys A and B and integrated into the Port, EPA considers these sea chests to constitute CWISs for the purposes of CWA Section 316(b). Water will circulate through the engine condenser cooling system at a flow rate of approximately 7,400 m^3/hr, and then be discharged through a 55-inch diameter pipe 17 to 24 feet below the sea surface. No chemicals will be added to the seawater as it circulated through the system, but the water will have been warmed prior to discharge. Thus, heat is the primary pollutant being discharged and this discharge of heat is a point source discharge of pollutants subject to regulation under CWA Section 301.

When the EBRV is regasifying under steady-state discharge conditions equal to or greater than 150 MMcfd of natural gas, the EBRV will be operating in the closed-loop recovery and exchange mode. When operating in this mode, no seawater will be required for vessel condensing cooling and no water will be discharged through outfalls 01A and 01B.

7.1.1 Flow

In accordance with NPDES regulations in 40 C.F.R. § 122.45(d), continuous industrial discharge flows must be limited as maximum daily and average monthly maximums, unless specific

facility operations make this approach impracticable. Since the use of the deepwater port, and the resulting frequency of discharge, will be dependent on both seasonal demand and market conditions for LNG in the New England region and elsewhere, EPA has found the use of a monthly average flow limit to be impracticable. In order to provide for maximum seasonal and market flexibility in port operation, NEG requested that instead of using a monthly average, the discharge flow be limited by total number of hours of discharge per calendar year for the port. rather than an average monthly maximum flow. EPA agrees with this approach and finds that a limit on the total hours of discharge per year, in combination with the maximum daily flow limit at each buoy, will ensure that the flows do not cause unreasonable degradation of the marine environment and are consistent with the flows evaluated in the FEIS.

Each regasification visit will result in four hours discharge from outfalls 01A and 01B only on the first and last days of regasification, or a total of 8 hours of flow per visit. NEG anticipates no more than 65 visits per year to the port. Therefore, the draft permit provides for a maximum of 520 hours of discharge per year at a maximum rate of 32,700 gallons per minute (gpm). EPA proposes to include a limitation on flow consistent with NEG's proposed port operation and to ensure compliance with the permit's proposed thermal discharge and cooling water intake limits**.**

7.1.2 Temperature

Heat is a non-conventional pollutant subject to the BAT standard under the CWA.[2] Because there are neither ELGs nor new source performance standards for thermal discharge from deepwater LNG regasification port facilities, EPA determines the BAT technology-based standards for pollutant discharges from such facilities on a case-by-case, BPJ basis.[3] When imposing BAT limits using BPJ, a permit writer applies the statutory BAT factors, 33 U.S.C. § 1314(b)(2)(B), and the factors specified in 40 C.F.R. § 125.3(d)(3), and considers both the "appropriate technology for the category of point sources of which the applicant is a member, based on all available information," and "any unique factors relating to the applicant."[4] The factors considered under 40 C.F.R. 125.3(d)(3) are the age of the equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process change, the cost of achieving effluent reduction, and non-water quality environmental impact (including energy requirements).[5]

EPA developed the thermal discharge limits in the Draft permit based on the discharge volumes and temperature change (or "delta-T") values specified above in order to satisfy the BAT standard on a BPJ basis. As stated above, BAT limits should "result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants." Alternative LNG regasification technologies were evaluated in the FEIS for the NEG deepwater port. In addition to the closed loop shell and tube vaporization technology (STV) proposed by the

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[2] *See* 33 U.S.C. §§ 1311(b)(2), 1314(a)(4), 1362(6); 40 C.F.R. §§ 125.3(a)(2)(v).

[3] *See* 33 U.S.C. §§ 1342(a)(1)(B) and 1316; 40 C.F.R. § 125.3. *See also* April 3, 2006, Memorandum from Benjamin H. Grumbles, EPA Assistant Administrator for Water, to EPA Regional Administrators, "Subject: Deepwater Liquefied Natural Gas Terminals and Clean Water Act Technology-Based Limitations and Conditions."

[4] *See also* 40 C.F.R. § 125.3(c)(2).

[5] *See also* 33 U.S.C. § 1314(b)(2)(B).

applicant, the FEIS considered open rack vaporizers, submerged combustion vaporizers, and intermediate fluid vaporizers. These alternatives were evaluated based on the BAT factors listed above, including consideration of the engineering feasibility of installing them on existing NEG LNG vessels, the environmental effects of the technologies (including temperature impact on the marine environment) and whether the technologies being considered were proven. The closed loop STV system was identified as the alternative resulting in the least thermal discharge and smallest thermal impact on the Massachusetts Bay marine environment. [6] Therefore, EPA concludes that the closed loop STV system represents the BAT for the NEG Port and that the effluent limits in the draft permit, which are based on the operation of that system, represent reasonable further progress toward the national goal of eliminating the discharge of all pollutants. EPA also concludes, based on the information discussed in the EIS and NEG's NPDES permit application, that the effluent temperature limits in the draft permit are technologically and economically feasible for NEG and that any potentially negative non-water environmental or energy effects that might result from taking these steps would be inconsequential and should not stand in the way of imposing these limits.

As discussed above, EPA has also applied the Ocean Discharge Criteria (ODC) under CWA Section 403 in setting the permit's thermal discharge limits. Under 40 C.F.R. 125.122(a), EPA may not issue an NPDES permit if it determines the effects of a discharge to the ocean will cause "unreasonable degradation" to the marine environment as defined in 40 CFR 125.121(e).

If EPA determines that "unreasonable degradation" will not occur, then it may issue a discharge permit. The permit may be conditioned as necessary to assure that the discharge will not cause unreasonable degradation of the marine environment (40 C.F.R. 125.123(a)). Based on our consideration of the above factors, EPA concludes that, if the Port's thermal discharges comply with the thermal limit in the Draft NPDES permit, the discharge will not cause unreasonable degradation of the marine environment. The small thermal discharge authorized by the permit will ensure that neither water quality nor local biological communities nor any other aspect of the marine environment will suffer any significant adverse impacts from the facility's thermal discharges. These water quality and other environmental effects are also assessed and discussed in the above-referenced FEIS for the NEG Port.

In determining whether a discharge may cause unreasonable degradation of the marine environment, any applicable EPA marine water quality criteria are among the factors to be considered. EPA issued guidelines for assuring protection of marine aquatic life from the thermal discharges in the Quality Criteria for Water 1986, otherwise known as the "Gold Book" (EPA, 1986). The Water Quality Criteria state that:

> In order to assure protection of the characteristic indigenous marine community of a water body segment from adverse thermal effects:
>
> a. the maximum acceptable increase in the weekly average temperature resulting from artificial sources is 1ºC (1.8 F) during all seasons of the year, providing the summer maxima are not exceeded; and
>
> b. daily temperature cycles characteristic of the water body segment should

[6] US Coast Guard, *Northeast Gateway Deepwater Port Final Environmental Impact Statement Final Environmental Impact Report, Volume I: Impact Analysis*, pp 2-38 – 2-41, October 2006.

not be altered in either amplitude or frequency.

Summer thermal maxima, which define the upper thermal limits for the communities of the discharge area, should be established on a site specific basis.

In its NPDES permit application, NEG has requested permission to discharge non-contact cooling water from outfalls 01A and 01B at temperatures which are 2.6ºC (5ºF) greater than the ambient seawater. NEG then used a commonly utilized hydrodynamic model developed at Cornell University, the CORMIX model, to make projections of the thermal plume's behavior including the initial mixing transport and dilution in the near-field plus 500 meters. The near-field was defined as the region in which the plume rises to the ocean surface under the influence of buoyancy. The CORMIX model estimated that although the discharge would not meet the water quality criteria at the discharge port, the change in temperature at the water surface would meet the criteria of less than 1ºC. Table 4 summarizes the CORMIX model results.

Based on our review of the results of the thermal modeling and the more complete analysis contained in the permit application, EPA is requiring quarterly monitoring of the thermal discharge plume to ensure that the predictions of the computer model are accurate, but otherwise determines that the discharge will not cause unreasonable degradation of the marine environment.

Table 4 – CORMIX Estimated Temperature Difference at the Surface[7]

	Summer		Winter	
Discharge	Max Surface Temperature Elevation (ΔTº)	Surface Temperature Elevation 500 m Downdrift (ΔTº)	Max Surface Temperature Elevation (ΔTº)	Surface Temperature Elevation 500 m Downdrift (ΔTº)
Outfall 01A, 01B	0.61	0.10	0.12	<0.01
Outfall 02A, 02B	0.46	0.04	0.12	<0.01

7.2 Outfalls 02A and 02B – Auxiliary Seawater Service Cooling

As described in section 7.1, the EBRVs must operate under normal capacity water use and discharge to support the start-up and shut-down of the regasification operations – it takes approximately 4 hours from the initiation of the closed-loop regasification mode for the process to achieve steady state and allow for the system to begin operation in the heat recovery and exchange mode.

During each of these 4-hour start-up and shut-down periods, the EBRVs moored at the Port will require the use of approximately 0.99 million gallons of seawater, which will be discharged at temperatures which are 5.5ºC (10ºF) greater than the ambient seawater. Water will circulate through the evaporation system at approximately 4,100 gallons per minute (gpm) and then be discharged through a 16-inch diameter pipe 21 to 28 feet below the sea surface. No chemicals

[7] Batelle, *Northeast Gateway Deepwater Port Project – Assessment of Thermal Plume of Cooling Water Discharge During Energy Bridge Regasification Vessel Operations* (provided at Appendix A to the Northeast Gateway Deepwater Port NPDES Permit Application), December 22, 2005.

will be added to the water as it circulates through the system.

7.2.1 Flow

As described in section 7.1.1, flow limits in the draft permit will limit the maximum daily flow and total annual hour of discharge from each outfall. Each regasification visit will result in four hours discharge from outfalls 02A and 02B only on the first and last days of regasification, or a total of 8 hours of flow per visit. NEG anticipates no more than 65 visits per year to the port. So, the draft permit provides for a maximum of 520 hours of discharge per year at a maximum rate of 4,200 gpm. EPA proposes to include a limitation on flow consistent with NEG's proposed port operation and to ensure compliance with the permit's proposed thermal discharge and cooling water intake limits**.**

7.2.2 Temperature

EPA has determined that the thermal discharge limits in the Draft permit, which are based on the discharge volumes and temperature change (or "delta-T") values specified above, satisfy the BAT standard as applied on a BPJ basis to the NEG Port. The basis for this is essentially identical to the BAT analysis presented in section 7.1.2, above, for thermal discharges from Outfalls 01A and 01B.

NEG used the Cornell hydrodynamic model, CORMIX, to make projections of the thermal plume behavior including the initial mixing transport, and dilution in the near-field plus 500 meters. The near-field was defined as the region in which the plume rises to the ocean surface under the influence of buoyancy. (Battelle, 2007). The CORMIX model estimated that although the discharge would not meet the water quality criteria at the discharge port, the change in temperature at the water surface would meet the criteria of less than 1ºC. The results of the CORMIX model are summarized in Table 4 above.

EPA also determines that the thermal discharge from these outfalls will not cause unreasonable degradation of the marine environment. The intermittent thermal discharge volume requested by NEG for outfalls 02A and 02B, and proposed to be authorized by EPA, adds only a small fraction by volume (approximately 13 percent on an annual basis) to the discharge allowed for outfalls 01A and 01B. EPA concludes that the thermal discharges from Outfalls 02A and 02B will not, individually or in combination with thermal discharges from outfalls 01A and 01B, cause unreasonable degradation of the marine environment based on evaluation of the ODC. EPA is requiring quarterly monitoring of the thermal discharge plume to ensure that the predictions of the computer model are accurate.

7.3 Outfalls 03A and 03B – Water Curtain

For safety purposes the EBRVs will maintain a constant flow of water, referred to as a "water curtain", over the deck and hull of the vessel during the regasification process. In the event of a leak of LNG during regasification, the presence of the water curtain will help protect the metal hull from any potential cracking or stress. The seawater used to support this system will enter into the vessel via both high and low starboard and port sea chests. Water will then be pumped onto the deck of the EBRV at a flow rate of 0.6 MGD and discharged over the sides of the vessel.

The water used for the water curtain will undergo no temperature change and no chemicals will be added to the water as it circulates through the system. Whether operating at full water use capacity or under the closed-loop heat recovery and exchange system, the quantity of water required for this regasification safety measure will remain the same. In addition, no alternative safety system to the water curtain has been identified. Once regasification is complete and EBRV cargo has been completely unloaded, the water curtain will be shut off prior to the vessel leaving the Port.

Because the water for the water curtain is not being withdrawn for cooling, these withdrawals are not subject to any CWIS requirements under CWA Section 316(b) However, EPA finds that, similar to stormwater flowing over an industrial facility, the curtain water could carry pollutant spills, if any, into the marine environment. To prevent that from occurring, the draft permit includes requirements that the permittee identify potential sources of pollution that may reasonably be expected to affect the quality of the curtain water discharges, and ensure implementation of best management practices (BMPs) which will be used to eliminate or minimize any exposure of the curtain water to pollutants. EPA finds that, with the implementation of the BMPs, the water curtain will not cause any unreasonable degradation of the marine environment under 40 C.F.R. Part 125, Subpart M, so that the ODC will be satisfied.

7.3.1 Flow

As described in section 7.1.1, flow limits in the draft permit will limit the maximum daily flow and total annual hour of discharge from each outfall. The water curtain will be activated for the entire time that the vessel is regasifying, including the initialization and departure periods (4 hours each). NEG estimates that there will be 65 cargoes per year delivered to the port and that, while regasification may take up to 8 days, there will only be one vessel in the port at a time, except for 10 percent of the time. Therefore, the draft permits allows maximum total of 9,640 hours of discharge per year from both buoys at a maximum flow rate of 400 gpm at each buoy. EPA proposes to include a limitation on flow consistent with NEG's proposed port operation.

8.0 316(b) Cooling Water Intake Requirements

Section 316(b) of the CWA addresses the adverse environmental impact of CWISs at facilities requiring NPDES permits. EPA has assessed the four factors set forth in Section 316(b), i.e., location, design, construction, and capacity of the CWIS at this facility which may contribute to adverse impacts. Information used in this assessment includes, but is not limited to, the following: the application for re-issuance of the permit; the NEG EIS; EPA's Technical Development Document for the Phase III CWA Section 316(b) Rule; and supplemental information submitted by the permittee.

Location: The location of the CWIS on the vessel is judged to be a factor that affects the potential for impingement and entrainment at the facility. The high sea chests will be located on the rounded portion of the hull near the bilge, approximately 23 feet below the surface of the water. The low sea chests will be located further down on the flat portion of the hull, with the centerline approximately 38 feet below the surface of the water. Seawater will be drawn horizontally through the high sea chests and vertically through the low sea chests.

EPA finds that the sea chest locations, below the water surface, are a BTA factor which minimizes harm due to entrainment and impingement by avoiding withdrawing seawater close to

the ocean surface where the planktonic life stage of many aquatic organisms are more numerous.

Capacity: The "capacity" of the CWIS refers to the volume of cooling water that it withdraws. ("Capacity" has also been used at times to refer to the CWIS's water intake velocity, but in this document intake velocity is discussed as a function of CWIS design further below.) Because the NEG regasification system will operate on a closed-loop system, seawater will not be directly used to warm and vaporize the LNG. Heated freshwater will be used to warm and vaporize the LNG, and the chilled water will then be re-heated in the closed loop system, and used for regasification of additional LNG. Although seawater intake will be necessary to provide cooling water for the engines powering the regasification process, NEG has minimized its cooling water withdrawals needs by selecting open loop STV technology that minimizes the need for seawater withdrawal.[8] Moreover, as discussed above, cooling water use will be intermittent at each buoy, with entirely closed-loop operations prevailing during the vast majority of each 8-day regasification operation. In addition, NEG's operations will alternate between the two buoys the large majority of the time. As indicated in the permittee's application, the maximum cooling water withdrawal at each buoy will be 8.81 MGD.

EPA has determined that the use of the closed-loop heat recovery and exchange regasification system is a significant BTA factor which minimizes harm due to entrainment by minimizing the volume of seawater withdrawn for cooling because the proportion of eggs, larvae and juvenile fish entrained from a population is roughly directly proportional to the volume of water withdrawn from the habitat and pumped through the cooling system. The use of this intermittent, closed loop system will also minimize impingement because of the limited flow and intake duration during events with the potential to cause impingement. Because NEG will use existing EBRVs, it should be clear that shifting to the closed-loop STV system will involve retrofitting or reconfiguring existing facilities and/or altering existing operational protocols. EPA is unaware of any practicable method of further reducing cooling water withdrawals from these existing EBRVs.

Design and Construction: Water used for cooling, ballast and other needs will be withdrawn from Massachusetts Bay through the EBRV's CWISs. Design measures for minimizing adverse impacts from the impingement and/or entrainment of marine life through these CWISs may involve, for example, installing screens and reducing intake velocity so that fewer organisms will be drawn into the CWIS.[9] Physical exclusion occurs when the mesh size of the screen is smaller than the organisms susceptible to entrainment. The EBRVs are expected to use screens with openings of 0.83 inches on their sea chests and should be capable of physically excluding most adult and juvenile fish.

In addition, EPA's research supporting its Phase I, Phase II and Phase III regulations has indicated that CWIS intake velocities of 0.5 feet/second or less should enable most motile marine organisms, including fish, to swim away from the CWIS and avoid being impinged. While the Phase III Rule is not applicable to the Port, it is nevertheless noteworthy that the Phase III Rule

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[8] US Coast Guard, *Northeast Gateway Deepwater Port Final Environmental Impact Statement Final Environmental Impact Report, Volume I: Impact Analysis*, pp 2-38 – 2-41, October 2006.

[9] EPA, *Technical Development Document for the Proposed Section 315(b) Phase III Rule,* Document Number EPA-821-R-04-015, 2004; and *Technical Development Document for the Final Section 315(b) Phase III Rule,* Document Number EPA-821-R-06-003, 2006.

requires new offshore oil and gas extraction facilities to have CWISs designed to ensure a maximum through-screen design intake velocity not to exceed 0.5 feet/second. Additionally, as noted in the TDD, other applicants for offshore LNG import terminals seeking Deepwater Port Act licenses have proposed cooling water intakes to ensure a maximum through-screen design intake velocity not to exceed 0.5 feet/second. Given the similarity of location, design, construction and capacity of these other cooling water intake structures (e.g. both industrial sectors use sea chests for cooling water withdrawals above 2 MGD), EPA proposes to require that a maximum through-screen design intake velocity not to exceed 0.5 feet/second, which represents an appropriate component of the BTA for minimizing adverse environmental impacts from impingement.

NEG certified in the NPDES permit application that when operating in the closed-loop heat recovery and exchange mode, the intake velocity will be below 0.5 ft/second. During the 4 hour initialization period, intake velocity will slow from 0.82 ft/second to less than 0.5 ft/second. During the 4 hour departure period, intake velocity will rise from less than 0.5 ft/second to the normal intake velocity of 0.82 ft/second. Because port visits will range in length from four to eight days, intake velocity will exceed the maximum 0.5 ft/sec four to eight percent of the time.

Components of BTA for the CWIS: In making this determination, EPA considered the adverse environmental effects from operation of the facility's CWIS and technology options for minimizing these adverse effects by altering the CWIS location, design, construction, and capacity. This site-specific, BPJ determination of BTA for NEG is based on the following considerations:

1. The location of the CWIS well below the water surface is a component of BTA which minimizes adverse effects, due to the less likely habitat for eggs, larvae, and juvenile fish at that elevation.
2. The design and construction of the CWIS is a component of BTA which minimizes impingement of fish by using small screen openings and the controlled intake velocity.
3. The capacity of the CWIS is also a component of BTA which minimizes entrainment and impingement of adult fish because of relatively low and intermittent intake flows.

To minimize adverse impact of cooling water intake associated with the operation of the NEG deepwater port, the draft permit requires that the EBRVs be constructed, maintained and operated to ensure that:

- CWISs are located at least 23 feet below the surface of the water,
- cooling water intake systems (including the structure and associated intake pumps) maintain a controlled intake velocity no greater than 0.5 feet per second during the regasification process, except during the 4 hour start-up and shut-down periods when the intake velocity may not exceed 0.82 feet per second.
- CWISs maintain screen openings no greater than 0.83 inches, and
- the EBRVs use the proposed closed-loop heat STV system to regasify LNG.

9.0 Thermal Discharge and Cooling Water Intake Monitoring Requirements

EPA reviewed the projected impacts in the EIS resulting from impingement of fish, entrainment

of eggs and larvae and the impact of the discharge of water with elevated temperature. An estimate of entrainment losses can be generated by sampling icthyoplankton density in near proximity to the buoys and tracking water usage, and the permit requires implementation of this type of an entrainment assessment. While EPA has concluded that Northeast Gateway has minimized cooling water intake flow to the extent that is practicable, the vessels will still require large volumes of seawater. This facility represents a new source of mortality for fish eggs and larvae in this area and thus EPA believes it warrants close scrutiny. Therefore, EPA proposes to require entrainment monitoring as described in the monitoring plan attached to the draft permit (Attachment A).

The FEIS predicts that impingement losses should be minimal. This is largely due to the fact that pelagic species tend to be less susceptible to impingement than demersal ones, because they are stronger swimmers, because intake volumes are low, and because intake velocities are not high. Logistically, there is no readily available access point to sample the intake screens. Thus, due to the limited environmental impact and the great logistical challenge, EPA is not proposing to require impingement monitoring at this time.

Finally, the EIS assessed the potential impact of the thermal plume. Computer modeling suggested that the area affected by elevated water temperature would be fairly small. Monitoring of water temperature around the buoys during operations is proposed in the permit to verify the conclusions of this modeling effort.

10.0 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)), federal agencies are required to consult with the National Marine Fisheries Service (NMFS) if proposed actions that are funded, permitted, or undertaken "may adversely impact any essential fish habitat" (EHF) as: "waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity", 16 U.S.C. § 1802(10). "Adverse impact" means any impact which reduces the quality and/or quantity of EFH (50 C.F.R. §600.910(a). Adverse effects may include direct (e.g., contamination of 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 fish species for which federal Fisheries Management Plans exist. EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999. A listing of the essential fish habitat designation for the 10 minute by 10 minute square coordinates containing the discharge locations for Outfalls 01, 02 and 03 are provided in Attachment B.

During the EIS process for the proposed Port, NOAA conducted a formal EFH consultation with the federal agencies issuing licenses or permits for the Port, including EPA. The U.S. Coast Guard (USCG) was the lead federal agency in this consultation. NOAA issued conservation recommendations on November 27, 2006. USCG completed the consultation process on the DPA license with a response to NOAA dated February 6, 2007. The NPDES permit that EPA proposes today is consistent with the recommendations resulting from that the USCG consultation on the DPA license.

11.0 Endangered Species Act

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA) 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 the Interior or Commerce, as appropriate, 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 & Wildlife Service (USFWS) administers Section 7 consultations for freshwater species. The National Oceanic and Atmospheric Administration (NOAA) administers Section 7 consultations for marine species and anadromous fish.

The following listed species are known to inhabit (seasonally) the Massachusetts Bay in the area of the proposed discharge: North Atlantic right whale, blue whale, humpback whale, fin whale, sei whale, Kemp's ridley sea turtle, leatherback sea turtle, loggerhead sea turtle, hawksbill sea turtle and green sea turtle.

EPA, the other permitting agencies, and NEG all consulted with the NMFS during the planning stages of this project to minimize impacts to marine and anadromous species. Specifically, the federal agencies issuing permits and licenses for this Deepwater Port Act project engaged in a formal consultation under Section 7 of the Endangered Species Act (ESA) with the National Oceanic and Atmospheric Administration (NOAA). The Maritime Administration (MARAD) served as the lead agency for this consultation on behalf of the other involved federal agencies, including EPA.

On February 5, 2007, NOAA issued a Biological Opinion under Section 7 of the ESA (the NOAA B.O) concluding that deepwater port project would neither likely jeopardize the continued existence of any listed species nor affect any designated critical habitat (NOAA B.O. at 118). NOAA also found, however, that the construction and operation of the deepwater port is likely to result in the take, in the form of acoustic harassment, of certain endangered whales (*Id.* at 118-119). On May 14, 2007, NOAA also issued an Incidental Take Statement (ITS) under Section 7 of the ESA, as an amendment to the B.O. previously issued to MARAD and the other federal agencies, including EPA. The ITS includes Reasonable and Prudent Measures (RPMs) and Term and Conditions to be implemented to "minimize the potential for and the impact of any incidental take that might otherwise result from the proposed action."

NOAA's ITS expressly exempts EPA for one year from the take prohibitions of Section 9 of the ESA. As a result, EPA has added a provision to the Final NPDES permit indicating that the permit will remain effective only as long as a NOAA ITS remains in effect for this project.

EPA's permit for the Port conditions the Port's operation in a manner consistent with the terms of the project reviewed and evaluated by NOAA in the ESA consultation. Further, EPA's permit is consistent with the conservation recommendations in NOAA's Biological Opinion. As a result, EPA's permit action here complies with the ESA and no further consultation is required with NOAA at this time.

12.0 National Marine Sanctuaries Act

The Stellwagen Bank National Marine Sanctuary (SBNMS) was designated in 1992 and encompasses approximately 842 square miles in the Gulf of Maine and overlapping the eastern edge of Massachusetts Bay. The NEG Port is located 2 to 3 nautical miles from the western edge of the SBNMS. In light of this proximity, the Federal agencies issuing permits or licenses for the proposed NEG Port consulted with NOAA under Section 304(d) of the NMSA, 16 U.S.C. § 1434(d), regarding the potential effects of the Port on the resources of the SBNMS. This consultation was conducted in connection with the National Environmental Policy Act (NEPA) review of the federal actions necessary to authorize the proposed Port. As with the NEPA and Endangered Species Act (ESA) reviews, the United States Maritime Administration (MARAD) and the United States Coast Guard (USCG) were the lead agencies for the NMSA consultation.

As part of the consultation, NOAA's National Marine Sanctuaries Program (NMSP) recommended "reasonable and prudent alternatives" for the federal action agencies to pursue in order to protect sanctuary resources. One of the NOAA/NMSP recommendations relates to the EPA's draft permit for the Port. Specifically, NOAA/NMSP recommended that monitoring of the entrainment of marine organisms from seawater intake during facility operations be required. As discussed above, EPA has considered CWIS entrainment effects in connection with its analyses under CWA Section 316(b), and in the context of the consultation under the ESA, NMSA and the Magnuson Act. EPA's proposed permit includes entrainment monitoring requirements consistent with NOAA's recommendations under the NMSA. Of course, the permit also contains cooling water withdrawal limits that should minimize any adverse effects from entrainment. The monitoring should, nevertheless, help to characterize the entrainment that results from Port operations.

13.0 Comment Period, Hearing Requests, and Procedures for Final

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 Ellen Weitzler, U.S. EPA, Office of Ecosystem Protection, Industrial Permits Branch (CIP), 1 Congress Street, Suite 1100, Boston, Massachusetts 02114-2023 or to the presiding officer at the scheduled public hearing. 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.

14.0 EPA and MassDEP Contacts

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

Ellen Weitzler

Industrial Permits Branch
U.S. Environmental Protection Agency
One Congress Street (CIP)
Boston, MA 02114-2023
Telephone: (617) 918-1582
Email: weitzler.ellen@epa.gov

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

REFERENCES

Batelle, *Northeast Gateway Deepwater Port Project – Assessment of Thermal Plume of Cooling Water Discharge During Energy Bridge Regasification Vessel Operations,* (provided as Appendix A to the *NPDES Northeast Gateway Deepwater Port Permit Application*), December 22, 2005.

EPA, *Allocated Impact Zones for Areas of Non-Compliance,* EPA 823-R-95-003, March 1995.

EPA, *Quality Criteria for Water 1986*, EPA 440/5-86-001, Washington, D.C., May 1, 1986.

EPA, *Technical Development Document for the Proposed Section 316(b) Phase III Rule,* EPA 821-R-04-015, Washington, D.C., November 2004.

Ghiloni, Jennifer, Tetra Tech EC, *NEG Proposal for NPDES Permit Limits on Volume,* Boston, MA, July 2, 2007.

US Coast Guard, *Northeast Gateway Deepwater Port Final Environmental Impact Statement Final Environmental Impact Report, Volume I: Impact Analysis*, pp 2-38 – 2-41, October 2006.

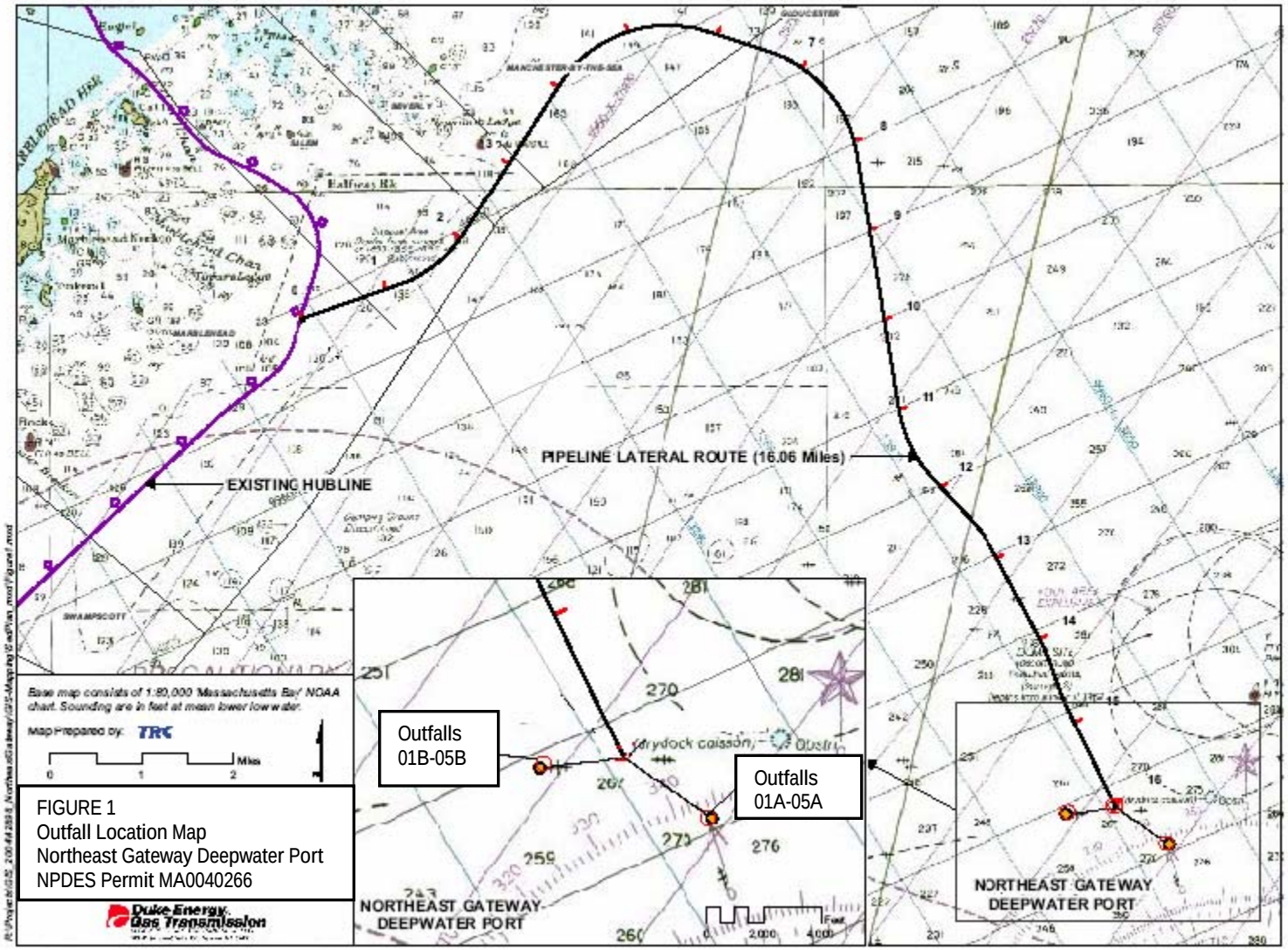

FIGURE 1
Outfall Location Map
Northeast Gateway Deepwater Port
NPDES Permit MA0040266

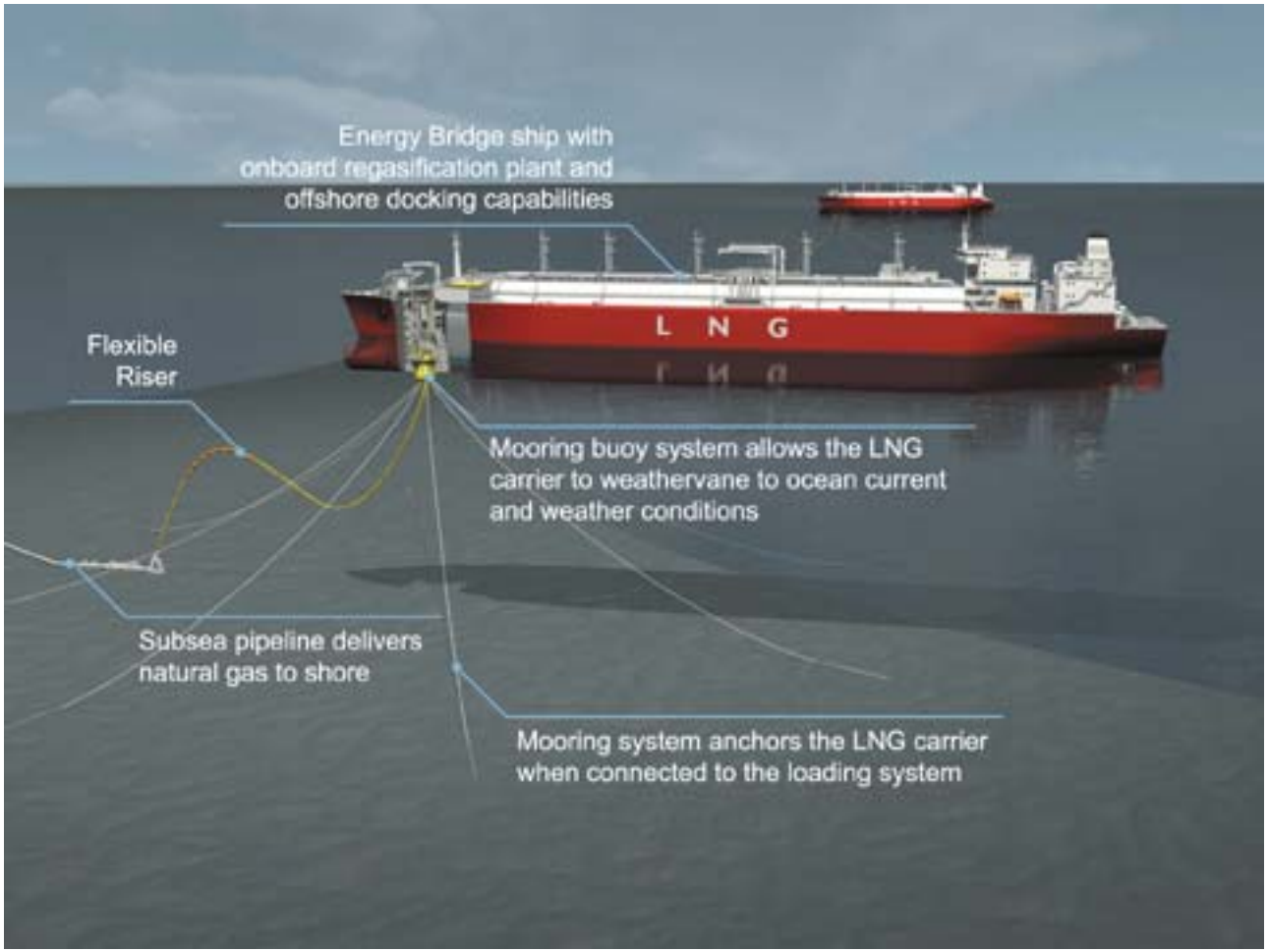

FIGURE 2
Submerged Turret Loading™ System
Northeast Gateway Deepwater Port
NPDES Permit MA0040266

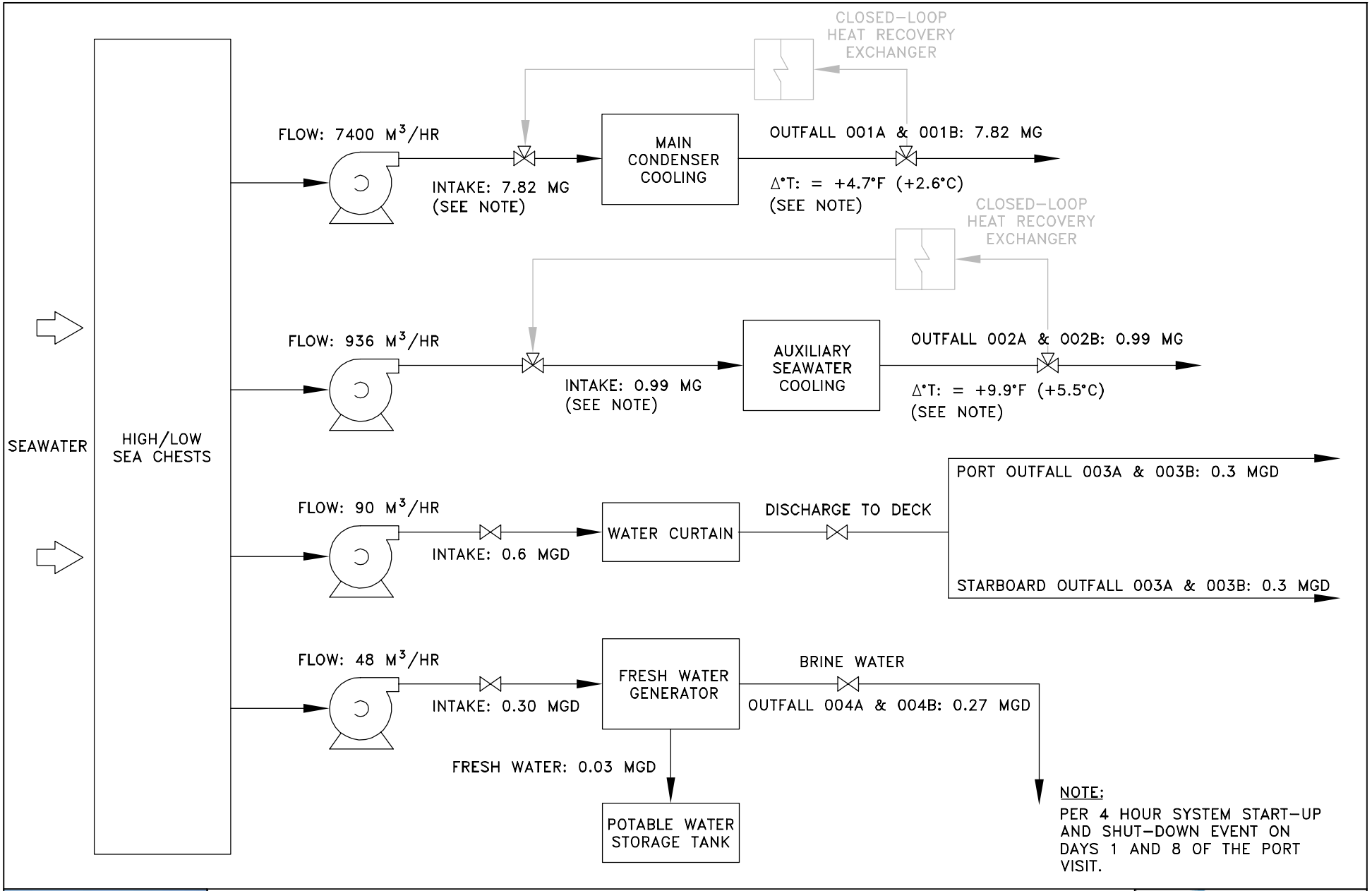

FIGURE 3

EBRV WATER BALANCE

REGASIFICATION START-UP AND SHUT-DOWN

TETRA TECH EC, INC.

Northeast Gateway

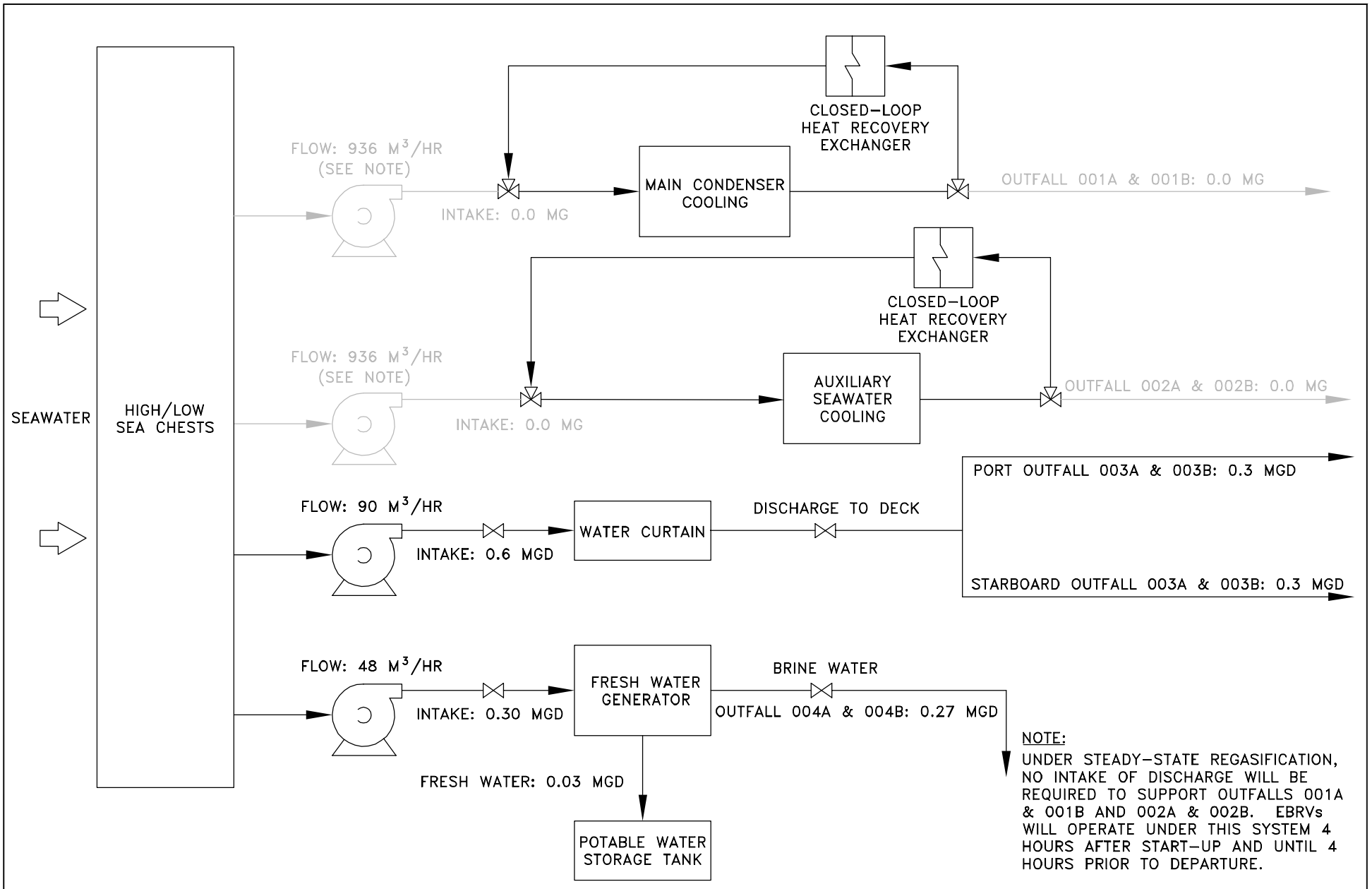

FIGURE 4
EBRV WATER BALANCE
STEADY-STATE REGASIFICATION

TETRA TECH EC, INC.

Northeast Gateway

ATTACHMENT A

Summary of Essential Fish Habitat (EFH) Designation

NEG Deepwater Port - 10' x 10' Square Coordinates:

Boundary	North	East	South	West
Coordinate	42° 30.0' N	70° 30.0' W	42° 20.0' N	70° 40.0' W

Square Description (i.e. habitat, landmarks, coastline markers): Waters within the Atlantic Ocean within Massachusetts Bay within the square one square northeast of Scituate, MA. and Cohasset, MA., and three squares east of Boston, MA. There are three overlapping dump sites within this square, two of which are for dredged material, and one of which is a discontinued site that had industrial wastes dumped in it, all of which are approximately in the middle of the square. Also, on the southwest corner, part of the Boston Harbor Shipping Traffic Lane is affected.

Species	Eggs	Larvae	Juveniles	Adults
Atlantic cod *(Gadus morhua)*	X	X	X	X
haddock *(Melanogrammus aeglefinus)*	X		X	
pollock *(Pollachius virens)*				
whiting *(Merluccius bilinearis)*	X	X	X	X
offshore hake *(Merluccius albidus)*				
red hake *(Urophycis chuss)*	X	X	X	X
white hake *(Urophycis tenuis)*	X	X	X	X
redfish *(Sebastes fasciatus)*	n/a	X	X	X
witch flounder *(Glyptocephalus cynoglossus)*	X	X	X	X
winter flounder *(Pleuronectes americanus)*	X	X	X	X
yellowtail flounder *(Pleuronectes ferruginea)*	X	X	X	X
windowpane flounder *(Scopthalmus aquosus)*	X	X		
American plaice *(Hippoglossoides platessoides)*	X	X	X	X
ocean pout *(Macrozoarces americanus)*	X	X	X	X
Atlantic halibut *(Hippoglossus hippoglossus)*	X	X	X	X
Atlantic sea scallop *(Placopecten magellanicus)*	X	X	X	X
Atlantic sea herring *(Clupea harengus)*		X	X	X
monkfish *(Lophius americanus)*	X	X	X	X
bluefish *(Pomatomus saltatrix)*				
long finned squid *(Loligo pealei)*	n/a	n/a	X	X
short finned squid *(Illex illecebrosus)*	n/a	n/a	X	X
Atlantic butterfish *(Peprilus triacanthus)*	X	X	X	X
Atlantic mackerel *(Scomber scombrus)*	X	X	X	X
summer flounder *(Paralicthys dentatus)*				
scup *(Stenotomus chrysops)*	n/a	n/a		
black sea bass *(Centropristus striata)*	n/a			
surf clam *(Spisula solidissima)*	n/a	n/a		
ocean quahog *(Artica islandica)*	n/a	n/a		
spiny dogfish *(Squalus acanthias)*	n/a	n/a		
tilefish *(Lopholatilus chamaeleonticeps)*				
bluefin tuna *(Thunnus thynnus)*			X	B