

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",

Neptune LNG LLC

is authorized to discharge from the facility located at

**Neptune Deepwater Port
Massachusetts Bay**

to receiving water 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 expire at midnight, five (5) years from the last day of the month preceding the effective date.

The authorization 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 Neptune LNG Deepwater Port.

This permit consists of 8 pages in Part I including effluent limitations, and monitoring requirements, 25 pages in Part II including Standard Conditions, and 5 pages (including cover) in Attachment A, *Operational Monitoring Program for the Neptune Deepwater LNG Port, Massachusetts Bay Offshore Gloucester, MA.*

Signed this 6th day of June 2008

/S/ SIGNATURE ON FILE

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

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. Any regasification vessel, while moored at the deepwater port, must comply with this permit and this permit applies only when the regasification vessel is moored at the deepwater port.
2. During the period beginning on the effective date of the permit and lasting through expiration, the permittee is authorized to **discharge pipe flushing and hydrostatic test water** from **outfall 003**. Discharge shall be limited and monitored by the permittee as specified below:

OUTFALL 003 – Latitude 42°27'21" Longitude 70°36'07"

Effluent Characteristic (units)	Discharge Limitations	Monitoring Requirements	
	Maximum	Measurement Frequency	Sample Type
Flow rate (gpm) ¹	2,101	Continuous	Estimate ²
Total suspended solids (mg/l)	100	2/discharge	Grab

¹ Total flow from Outfall 003 shall not exceed twice the total volume required to fill the pipeline lateral and flowline.

² The maximum flow rate, which is to be reported in units of gallons per minute (gpm), shall be either measured or estimated based upon the summation of the pump curve value(s) for all pumps operating and controlling the rate of flow.

3. During the period beginning on the effective date of the permit and lasting through expiration, the permittee is authorized to **discharge non-contact cooling water** from **outfall 04A or outfall 04B** during the commissioning of the deepwater port and regasification vessels for a **total of not more than 45 days for any individual vessel**. Discharge shall be limited and monitored by the permittee as specified below:

OUTFALL 04A - Latitude 42°29'13" Longitude 70°36'30"

OUTFALL 04B - Latitude 42°27'21" Longitude 70°36'07"

Effluent Characteristic (units)	Discharge Limitations	Monitoring Requirements	
	Maximum Daily	Measurement Frequency	Sample Type
Flow (MGD)	8.2 ³	Continuous	Estimate
Temperature Rise, ΔT (°C) ⁴	8 ⁵	Continuous	Grab

³ Flow rate shall not exceed 13,900 gallons per minute during any period.

⁴Temperature 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.

⁵ Maximum instantaneous temperature rise shall not exceed 10°C.

4. During the period beginning on the effective date of the permit and lasting through expiration, the permittee is authorized to **withdraw cooling water from high and low sea chests** located on each regasification vessel as described in section I.B.1 of this permit. Cooling water withdrawal from each vessel moored at the deepwater port shall be limited and monitored by the permittee as specified below:

COOLING WATER INTAKE⁶ AT HIGH AND LOW SEA CHESTS

Effluent Characteristic (units)	Intake Limitations	Monitoring Requirements	
	Maximum Daily	Measurement Frequency	Sample Type
Flow rate (gpm)	2.25 MGD ^{7,8}	Continuous	Estimate ²

⁶ Cooling water shall not be discharged while the regasification vessel is moored at the deepwater port.

⁷ The total number of hours during which cooling water is withdrawn from both of the deepwater port's two buoys simultaneously shall not exceed 550 hours per year. Each year, the number of hours in that year during which cooling water was withdrawn from both of the deepwater port's two buoys simultaneously shall be reported in the annual report, as described in section I.C.1.

⁸ During initial Neptune Deepwater Port and regasification vessel commissioning activities, cooling water intake shall be limited to 8.2 MGD for 45 days for each individual vessel in accordance with section I.A.3. At all other times, the maximum intake flow shall be limited to 2.25 MGD.

5. Total withdrawals of seawater through the cooling water intake structures while regasification vessels are moored at the deepwater port shall not exceed 873 million gallons in any calendar year. Each year, the total annual volume of seawater withdrawal through the cooling water intake structures shall be reported in the annual report, as described in section I.C.1.
6. The pH of the effluent shall be neither less than 6.5 nor greater than 8.5 at any time, nor changed more than 0.2 units outside of the naturally occurring variation.
7. The discharge shall not cause objectionable discoloration of the receiving waters.
8. The effluent shall not contain visible oil sheen, foam, or floating solids at any time.
9. Rainwater and oil from the utility areas that include power generation, boil-off gas compressor, emergency diesel generator, diesel tank, and diesel loading areas where there is a potential for the presence of petroleum hydrocarbons shall be collected in dedicated drip pans. Discharge of rainwater from the drip pans is prohibited.
10. At no time shall the filled pipeline be left open. Tie-in to the Hubline shall be accomplished in a manner to prevent water and sediments from entering the pipe.
11. The discharges shall not contain materials in concentrations or combinations which are hazardous or toxic to human health or aquatic life of the receiving surface waters.
12. Fluorescein dye may be utilized and discharged for the purpose of hydrostatic testing. The amount of dye used shall not exceed the amount required for the hydrostatic test, nor shall it exceed the dosage recommended by the manufacturer for this purpose.
13. Chemicals (e.g., disinfecting agents, detergents, emulsifiers, etc.) shall not be discharged into waters of the United States without prior approval by the U.S. Environmental Protection Agency (EPA).
14. 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.
15. The permittee shall report the results of sampling for any parameter above its required frequency, in accordance with 40 CFR §122.41(1)(4)(ii).
16. The permittee shall notify EPA in writing within 20 days after any changes in the operations, including the use of chemical additives, at the facility that may have an effect on the permitted discharge of wastewater from the facility.
17. EPA may modify this permit in accordance with EPA regulations in 40 CFR §122.62 and §122.63 to incorporate more stringent effluent limitations, increase the frequency of analyses, or impose additional sampling and analytical requirements.
18. This permit shall be modified, or revoked and reissued to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:

- a. contains different conditions or is otherwise more stringent than any effluent limitation in this permit; or
- b. controls any pollutant not limited by this permit.

If the permit is modified or reissued, it shall be revised to reflect all currently applicable requirements of the Act.

19. 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 discharge may cause unreasonable degradation of the marine environment.
20. 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.
21. All existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe (40 CFR §122.42):
 - a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - i. One hundred micrograms per liter (100 µg/l);
 - ii. Two hundred micrograms per liter (200 µg/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/l) for 2,4-dinitrophenol and for 2-methyl-4, 6-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 CFR §122.21(g)(7); or
 - iv. The level established by the Director in accordance with 40 CFR §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 CFR §122.21(g)(7); or
 - iv. The level established by the Director in accordance with 40 CFR §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.

B. COOLING WATER INTAKE STRUCTURE

1. Shuttle and regasification vessels (SRVs) using the Neptune deepwater port shall be constructed, maintained and operated to ensure that:
 - a. Each CWIS is located at least 20 feet below the surface of the water,
 - b. cooling water intake systems (including the structure and associated intake pumps) maintain a controlled intake velocity no greater than 0.5 feet per second at all times.
 - c. CWISs maintain screen slot openings no greater than 1 inch, and
 - d. the SRVs use the closed-loop heat vaporization system to regasify LNG.
2. No regasification vessel that utilizes the Neptune 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.

C. COOLING WATER INTAKE MONITORING

1. The permittee shall monitor the potential impact of water withdrawal in accordance with requirements in the monitoring program in Attachment A to this permit. For each calendar year, 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: the number of hours in that year during which cooling water was withdrawn from both of the deepwater port's two buoys simultaneously, as described in section I.A.4 footnote 7; the total volume of sea water withdrawal through the cooling water intake structures, as described in section I.A.5; 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 unanticipated withdrawals or 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.D.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

and

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

D. MONITORING AND REPORTING

1. The permittee shall notify the EPA, 48 hours prior to each regasification vessel's arrival at the port, by calling George Harding, EPA (617-918-1870) or Denny Dart (617-918-1850), or such other persons as EPA may designate. The permittee shall provide transportation for inspectors by appointment, as requested by EPA, from a coastal port location to, and from, the regasification vessel and/or deepwater port.
2. Monitoring results obtained during each calendar month for the monitoring required under Part I.A of this permit shall be summarized and reported on Discharge Monitoring Report Form(s) postmarked **no later than the 15th day of the following month.**
3. Signed and dated originals of these, and all other reports required herein, shall be submitted to the Director at the following address:

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

ATTACHMENT A

Operational Monitoring Program for the Neptune Deepwater LNG Port
Massachusetts Bay Offshore Gloucester, MA

1.0 ICHTHYOPLANKTON MONITORING STUDY DESIGN

1.1 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 where the seawater intakes will be located. 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 m³) will be multiplied by estimated volume of water withdrawn (m³) to estimate the number of ichthyoplankton entrained by each vessel.

Mortality rates for early life stages are 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

1.2 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 Neptune vessels.

The sampling location was defined as a polygon encompassing the two licensed buoy locations. Coordinates for the corners of the polygon are:

Corner	Longitude	Latitude
1 NW	70.3624°	42.2940°
2 SW	70.3624°	42.2630°
3 SE	70.3622°	42.2630°
4 NE	70.3622°	42.2940°

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 m³. 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 Neptune Ichthyoplankton Monitoring Program

Diel Period	Number of Samples
Day	144
Night	144
Crepuscular	144**
TOTAL	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 m² 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 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 standard chain-of-custody forms that will accompany the samples to the laboratory. The permittee may, at its option and with the agreement of Northeast Gateway, LLC, share crepuscular period samples with Northeast Gateway, LLC, at the midpoint between their respective deepwater port locations. However, the preceding sentence shall not be construed to impose any obligations on Northeast Gateway, LLC, nor to affect in any way Northeast Gateway's obligations under its own NPDES Permit No. MA0040266, nor to diminish or relieve in any way the permittee's obligation to satisfy all requirements of this permit.

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

Neptune shall provide a detailed QA/QC program for review and approval by EPA and NMFS.

2.5 DATA ANALYSIS

2.5.1 Community Structure

Density of eggs and larvae will be presented as twice-monthly mean abundances (no./1000 m³). 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 Neptune. It will be assumed that 100% of the organisms entrained in the vessel will be killed.