Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

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NPDES PERMIT
issued to

Pfizer Inc.
Eastern Point Road
Groton, Connecticut 06340

Location Address:

Pfizer Inc.
445 Eastern Point Road
Groton, Connecticut 06340

Facility ID: 059-003

Permit ID: CT0000957

Receiving Stream: Thames River

Permit Expires: MAY 21, 2019

Receiving Water Body ID: CT-E1_014-SB

SECTION 1: GENERAL PROVISIONS

(A) This permit is re-issued in accordance with Section 22a-430 of Chapter 446k, Connecticut General Statutes ("CGS"), the Regulations of Connecticut State Agencies ("RCSA") adopted thereunder, as amended, and Section 402(b) of the Clean Water Act ("CWA"), as amended, 33 USC 1251, *et. seq.*, and pursuant to an approval dated September 26, 1973, by the Administrator of the United States Environmental Protection Agency for the State of Connecticut to administer a NPDES permit program.

(B) **PFIZER INC.** ("Permittee") shall comply with all conditions of this permit including the following sections of the RCSA which have been adopted pursuant to Section 22a-430 of the CGS and are hereby incorporated into this permit. Your attention is especially drawn to the notification requirements of subsections (i)(2), (i)(3), (j)(1), (j)(6), (j)(8), (j)(9)(C), (j)(10)(C), (j)(11)(C), (D), (E), and (F), (k)(3) and (4) and (*l*)(2) of Section 22a-430-3.

Section 22a-430-3: *General Conditions*

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(a) Duty to Apply
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(r) Secondary Treatment Requirements
(s) Treatment Requirements for Metals and Cyanide
(t) Discharges to POTWs - Prohibitions

(C) Violations of any of the terms, conditions, or limitations contained in this permit may subject the Permittee to enforcement action including, but not limited to, seeking penalties, injunctions and/or forfeitures pursuant to applicable sections of the CGS and RCSA.

(D) Any false statement in any information submitted pursuant to this permit may be punishable as a criminal offense under Section 22a-438 or 22a-131a of the CGS or in accordance with Section 22a-6, under Section 53a-157b of the CGS.

(E) The authorization to discharge under this permit may not be transferred without prior written approval of the Commissioner of Energy and Environmental Protection ("Commissioner"). To request such approval, the Permittee and proposed Transferee shall register such proposed transfer with the Commissioner, at least 30 days prior to the Transferee becoming legally responsible for creating or maintaining any discharge which is the subject of the permit transfer. Failure, by the Transferee, to obtain the Commissioner's approval prior to commencing such discharge(s) may subject the Transferee to enforcement action for discharging without a permit pursuant to applicable sections of the CGS and RCSA.

(F) No provision of this permit and no action or inaction by the Commissioner shall be construed to constitute an assurance by the Commissioner that the actions taken by the Permittee pursuant to this permit will result in compliance or prevent or abate pollution.

(G) Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local law.

(H) An annual fee shall be paid for each year this permit is in effect as set forth in Section 22a-430-7 of the Regulations of Connecticut State Agencies.

(I) This permitted discharge is consistent with the applicable goals and policies of the Connecticut Coastal Management Act (Section 22a-92 of the CGS).

SECTION 2: DEFINITIONS

(A) The definitions of the terms used in this permit shall be the same as the definitions contained in Section 22a-423 of the CGS and Section 22a-430-3(a) and 22a-430-6 of the RCSA.

(B) In addition to the above, the following definitions shall apply to this permit:

"---" in the limits column on the monitoring table means a limit is not specified but a value must be reported on the DMR.

"40 CFR" means Title 40 of the Code of Federal Regulations.

"Annual" in the context of any sampling frequency found in Section 5, shall mean the sample must be collected in the month of August.

"Average Monthly Limit" means the maximum allowable "Average Monthly Concentration" as defined in Section 22a-430-3(a) of the RCSA when expressed as a concentration (e.g., mg/l); otherwise, it means "Average Monthly Discharge Limitation" as defined in section 22a-430-3(a) of the RCSA.

"Daily Concentration" means the concentration of a substance as measured in a daily composite sample, or, the arithmetic average of all grab sample results defining a grab sample average.

"Daily Quantity" means the quantity of waste discharged during an operating day.

"Instantaneous Limit" means the highest allowable concentration of a substance as measured by a grab sample, or the highest allowable measurement of a parameter as obtained through instantaneous monitoring.

"In-stream Waste Concentration" (IWC) means the concentration of a discharge in the receiving water after mixing has occurred in the allocated zone of influence. It is the inverse of the dilution factor.

"LC" means Lethal Concentration

"LC_{50}" means the concentration lethal to 50 percent of the test organisms.

"Lowest Observed Effect Concentration" ("LOEC") means the lowest concentration of an effluent or toxicant that results in adverse effects on the test organisms.

"Maximum Daily Limit", means the maximum allowable "Daily Concentration" (defined above) when expressed as a concentration (e.g., mg/l); otherwise, it means the maximum allowable "Daily Quantity" as defined above, unless it is expressed as a flow quantity. If expressed as a flow quantity it means "Maximum Daily Flow" as defined in Section 22a-430-3(a) of the RCSA.

"No Observed Effect Concentration" ("NOEC") means the highest tested concentration of an effluent or toxicant at which no adverse effects are observed on the aquatic test organisms at a specific time of observation.

"Quarterly", in the context of a sampling frequency, means sampling is required in the months of February, May, August, and November.

"Range During Sampling" ("RDS"), as a sample type, means the maximum and minimum of all values recorded as a result of analyzing each grab sample of: 1) a Composite Sample or, 2) a Grab Sample Average. For those Permittees with continuous monitoring and recording pH meters, Range During Sampling means the maximum and minimum readings recorded with the continuous monitoring device during the Composite or Grab Sample Average sample collection.

"Semi-Annually" in the context of a sampling frequency, means the sample must be collected in the months of February and August.

"Weekly" in the context of sampling frequency means that at least one sample will be collected in any week commencing at 12:00 AM on Sunday and ending at 12:00 AM on the following Sunday, during which a discharge occurs.

SECTION 3: COMMISSIONER'S DECISION

(A) The Commissioner has issued a final determination based on Application 201207927 for permit re-issuance received on December 24, 2012, and the administrative record established in the processing of that application, and has found that:

(1) With respect to INTAKE 01H, the location, design, construction, and capacity of the cooling water intake structure reflects the best technology available for minimizing adverse environmental impact. This determination was made in accordance with Section 316(b) of the CWA, 33 U.S.C. § 1326(b), and CGS Section 22a-430. The Commissioner's decision is contingent upon the actions required to be undertaken by the Permittee as set forth in Section 10 of this permit.

(2) With respect to DSN 008-1, continuance of the existing system to treat the discharge will protect the waters of the state from pollution. The alternative thermal effluent limitations for DSN 008-1 were established consistent with Section 316(a) of the CWA, 33 U.S.C. § 1326(a), Subpart H of 40 CFR 125, and CGS Section 22a-430. These limitations will assure the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife in and on the receiving water.

(3) With respect to DSN 009-1, continuance of the existing discharge will not cause pollution of the waters of the state.

(B) The Commissioner hereby authorizes the Permittee to discharge in accordance with the provisions of this permit, the above referenced application, and all approvals issued by the Commissioner or the Commissioner's authorized agent for the discharges and/or activities authorized by, or associated with, this permit in accordance with the following:

(1) From the issuance of this permit through and including May 31, 2014, the Commissioner hereby authorizes the Permittee to discharge in accordance with the terms and conditions of Permit CT0000957, issued by the Commissioner to the Permittee on July 29, 2008, the previous application submitted by the Permittee on January 30, 1996, and all modifications and approvals issued by the Commissioner or the Commissioner's authorized agent for the discharge and/or activities authorized by, or associated with, Permit CT0000957, issued by the Commissioner to the Permittee on July 29, 2008.

(2) From June 1, 2014 until this permit expires or is modified or revoked, the Commissioner hereby authorizes the Permittee to discharge in accordance with the terms and conditions of Permit CT0000957, issued by the Commissioner to the Permittee on the date identified on the signature page of this permit, Application No. 201207927 received by the Department on December 24, 2012, and all modifications and approvals issued by the Commissioner or the Commissioner's authorized agent for the discharge and/or activities authorized by, or associated with, Permit CT0000957, issued by the Commissioner to the Permittee on the date identified on the signature page of this permit.

(C) The Commissioner reserves the right to make appropriate revisions to the permit in order to establish any appropriate effluent limitations, schedules of compliance, or other provisions which may be authorized under the Federal Clean Water Act or the CGS or regulations adopted thereunder, as amended. The permit as modified or renewed under this paragraph may also contain any other requirements of the Federal Clean Water Act or CGS or regulations adopted thereunder which are then applicable.

SECTION 4: GENERAL EFFLUENT LIMITATIONS

(A) No discharge shall contain, or cause in the receiving stream, a visible oil sheen or floating solids, or cause visible discoloration or foaming in the receiving stream.

(B) No discharge shall cause acute or chronic toxicity in the receiving water body beyond any zone of influence specifically allocated to that discharge in this permit.

(C) The temperature of any discharge shall not increase the temperature of the receiving stream above 83 °F, or in any case, raise the temperature of the receiving stream by more than 4 °F beyond any approved thermal zone of influence. The incremental temperature increase in coastal and marine waters during the period including July, August, and September is limited to 1.5 °F beyond any approved thermal zone of influence.

SECTION 5: SPECIFIC EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

(A) The discharges shall not exceed and shall otherwise conform to the specific terms and conditions listed in the following tables. The discharges are restricted by, and shall be monitored in accordance with the following tables.

(B) All samples shall be comprised of only the wastewater described in these tables. Samples shall be collected prior to combination with receiving waters or wastewater of any other type, and after all approved treatment units, if applicable. All samples collected shall be representative of the discharge during standard operating conditions.

(C) In cases where limits and sample type are specified but sampling is not required by this permit, the limits specified shall apply to all samples which may be collected and analyzed by the Department of Energy and Environmental Protection ("Department") personnel, the Permittee, or other parties.

Table A

Intake: **01H** | Monitoring Location: 7

Description: **Saltwater intake**

Monitoring Location Description: **At the saltwater pumping intake structure (Building 109)**

Source Water: **Thames River**

PARAMETER	NET DMR CODE	UNITS	FLOW/TIME BASED MONITORING				INSTANTANEOUS MONITORING		
			Average Monthly Limit	Maximum Daily Limit	Sample//Reporting Frequency [2]	Sample Type or Measurement to be reported	Instantaneous limit or required range	Sample// Reporting Frequency[2]	Sample Type or measurement to be reported
Flow, Average Monthly[1]	00056	MGD	25.0	NA	Daily//Monthly	Intake Flow	NA	NR	NA
Flow, Maximum Daily[1]	50047	MGD	NA	45.0	Daily//Monthly	Intake Flow	NA	NR	NA
Temperature, Maximum	00011	°F	NA	NA	NR	NA	---	Weekly	Grab

TABLE A FOOTNOTES AND REMARKS

Footnotes:

[1] The Permittee shall maintain at the facility a record of the total Intake Flow for each day and shall report the Average Daily Flow and the Maximum Daily Flow for each month. The measurement of total Intake Flow shall be an estimate based on best engineering practices.

[2] The first entry in this column is the 'Sample Frequency'. If a 'Reporting Frequency' does not follow this entry and the 'Sample Frequency' is more frequent than monthly then the 'Reporting Frequency' is monthly. If the 'Sample frequency' is specified as monthly, or less frequent, then the 'Reporting Frequency' is the same as the 'Sample Frequency'.

Remarks:

1. Abbreviations used for units are as follows: MGD means million gallons per day; °F means degrees Fahrenheit.

2. Debris collected on the intake racks shall not be re-introduced into the Thames River.

3. In the event of unusual incidents of large numbers of schooling fish being impinged over a short period of time, the Department of Energy and Environmental Protection, Bureau of Materials Management and Compliance Assurance, Water Permitting and Enforcement Division shall be notified immediately and a written report of the incident shall be filed within 5 days. The report shall be directed to the Permitting Director and shall include, at a minimum, the following information: the species, size, approximate numbers, time of occurrence, operating mode of the plant at the time of the incident, and any possible reasons for the occurrence.

4. Flow shall be reported to 0.1 MGD. Temperature shall be reported to 0.1 °F.

5. Supplemental data shall be provided, at a minimum, for those monitoring parameters identified on Attachment B of this permit and submitted consistent with Section 8(A) of this permit. The supplemental data can be provided in any acceptable format as long as it contains the information identified on Attachment B.

Table B

Discharge Serial Number: **008** | Monitoring Location: **1**

Wastewater Description: ***Air Compressor Condensate; Air Conditioner Condensate; Backflow Preventer Wastewater; Boiler Bleed Off/Draining; Boiler Blowdown; Boiler Laboratory Testing Wastewater; Boiler Washdown; Building Maintenance Wastewater; Chilled Water; Cooling Tower Blowdown/Draining; Dewatering Wastewater; Fire Suppression Test Water; Hydrostatic Test Water; Non-Contact Cooling Water; Pump Seal Water; Resin Regeneration Wastewater; Reverse Osmosis Brine; Sand Filter Backwash; Shell and Tube Heat Exchanger Wastewater; Spill Containment Stormwater; Steam Cleaning and Powerwashing Wastewater; Steam Condensate; Stormwater; Strainer Cleaning Wastewater; Water Softener Regeneration Wastewater***

Monitoring Location Description: **Basin instrument trailer on the west side of the effluent basin**

Receiving Water: **Thames River** | Dilution Factor (Ammonia, Copper, Nickel, Zinc): **46:1** | In-Stream Waste Concentration: **2.17%**

PARAMETER	NET DMR CODE	UNITS	FLOW/TIME BASED MONITORING				INSTANTANEOUS MONITORING			Minimum Level[3]	Chemical Analysis Required With Toxicity Test
			Average Monthly Limit	Maximum Daily Limit	Sample// Reporting Frequency[2]	Sample Type or Measurement to be reported	Instantaneous limit or required range	Sample// Reporting Frequency[2]	Sample Type or measurement to be reported		
Acute Aquatic Toxicity[4] *Americamysis bahia*	TAA3E	%	NA	LC_{50}≥100%	Semi-annually	Daily Composite	LC_{50}≥33%	NR	Grab		
Acute Aquatic Toxicity[4] *Cyprinodon variegates*	TAA6A	%	NA	LC_{50}≥100%	Semi-annually	Daily Composite	LC_{50}≥33%	NR	Grab		
Chronic Aquatic Toxicity (Survival)[5] *Americamysis bahia*	TOP3E	%	NA	---	Semi-annually	Daily Composite	NA	NR	NA		
Chronic Aquatic Toxicity (Growth)[5] *Americamysis bahia*	TPP3E	%	NA	---	Semi-annually	Daily Composite	NA	NR	NA		
Chronic Aquatic Toxicity (Fecundity)[5] *Americamysis bahia*	TVP3E	%	NA	---	Semi-annually	Daily Composite	NA	NR	NA		
Chronic Aquatic Toxicity (Survival)[5] *Cyprinodon variegates*	TOP6A	%	NA	---	Semi-annually	Daily Composite	NA	NR	NA		
Chronic Aquatic Toxicity (Growth)[5] *Cyprinodon variegatus*	TPP6A	%	NA	---	Semi-annually	Daily Composite	NA	NR	NA		
Ammonia (as N)	00610	mg/L	---	---	Monthly	Daily Composite	NA	NR	NA		✔
Bis(2-ethylhexyl) phthalate	39100	µg/L	2.2[6]	3.2[6]	Monthly	Daily Composite	4.8[6]	NR	Grab	5	✔
Bis(2-ethylhexyl) phthalate	39100	g/day	208	304	Monthly	Daily Composite	NA	NR	NA		
Biochemical Oxygen Demand, 5-Day (BOD_5)	85002	mg/L	---	---	Monthly	Daily Composite	NA	NR	NA		✔
Chlorine, Total Residual	50060	µg/L	---	---	Quarterly	Grab Sample Average	NA	NR	NA	20	✔
Chromium, Total	01034	mg/L	---	---	Quarterly	Daily Composite	NA	NR	NA	0.005	✔
Copper, Total	01042	mg/L	---	---	Quarterly	Daily Composite	NA	NR	NA	0.003	✔
Enterococci[7]	61211	cfus/100ml	NA	NA	NR	NA	---	Quarterly	Grab		
Fecal coliform[8]	74055	cfus/100ml	NA	NA	NR	NA	---	Quarterly	Grab		
Flow, Average Monthly[1]	00056	MGD	25.0	NA	Continuous	Daily Flow	NA	NR	NA		
Flow, Maximum Daily [1]	50047	MGD	NA	45.0	Continuous	Daily Flow	NA	NR	NA		
Flow Rate, Day of Sampling	74076	MGD	NA	45.0	Monthly	Daily Flow	NA	NR	NA		✔
Iron, Total	01045	µg/L	3000	5000	Quarterly	Daily Composite	7500	NR	Grab		✔
Kjeldahl Nitrogen, Total (as N)	00625	mg/L	---	---	Monthly	Daily Composite	NA	NR	NA		✔
Lead, Total	01051	mg/L	---	---	Quarterly	Daily Composite	NA	NR	NA	0.005	✔

Table B

Discharge Serial Number: **008** | Monitoring Location: **1**

Wastewater Description: ***Air Compressor Condensate; Air Conditioner Condensate; Backflow Preventer Wastewater; Boiler Bleed Off/Draining; Boiler Blowdown; Boiler Laboratory Testing Wastewater; Boiler Washdown; Building Maintenance Wastewater; Chilled Water; Cooling Tower Blowdown/Draining; Dewatering Wastewater; Fire Suppression Test Water; Hydrostatic Test Water; Non-Contact Cooling Water; Pump Seal Water; Resin Regeneration Wastewater; Reverse Osmosis Brine; Sand Filter Backwash; Shell and Tube Heat Exchanger Wastewater; Spill Containment Stormwater; Steam Cleaning and Powerwashing Wastewater; Steam Condensate; Stormwater; Strainer Cleaning Wastewater; Water Softener Regeneration Wastewater***

Monitoring Location Description: **Basin instrument trailer on the west side of the effluent basin**

Receiving Water: **Thames River** | Dilution Factor (Ammonia, Copper, Nickel, Zinc): **46:1** | In-Stream Waste Concentration: **2.17%**

PARAMETER	NET DMR CODE	UNITS	FLOW/TIME BASED MONITORING				INSTANTANEOUS MONITORING			Minimum Level[3]	Chemical Analysis Required With Toxicity Test
			Average Monthly Limit	Maximum Daily Limit	Sample// Reporting Frequency[2]	Sample Type or Measurement to be reported	Instantaneous limit or required range	Sample// Reporting Frequency[2]	Sample Type or measurement to be reported		
Nickel, Total	01067	mg/L	---	---	Quarterly	Daily Composite	NA	NR	NA	0.005	✔
Nitrate (as N)	00620	mg/L	---	---	Monthly	Daily Composite	NA	NR	NA		✔
Nitrite (as N)	00615	mg/L	---	---	Monthly	Daily Composite	NA	NR	NA		✔
Nitrogen, Total	00600	lbs/day	331	---	Monthly	Calculation[9]	NA	NR	NA		
Oil and Grease, Total	00556	mg/L	---	5.0	Quarterly	Grab Sample Average	7.5	NR	Grab		✔
Oxygen, Dissolved	00300	mg/L	NA	NA	NR	NA	---	Quarterly	Grab		✔
pH, Day of Sampling	00400	SU	NA	NA	NR	NA	6.0-9.0	Monthly	RDS		✔
pH, Minimum	61942	SU	NA	NA	NR	NA	6.0	Continuous	Continuous		
pH, Maximum	61941	SU	NA	NA	NR	NA	9.0	Continuous	Continuous		
Solids, Total Suspended	00530	mg/L	NA	---	Monthly	Daily Composite	NA	NR	NA		✔
Temperature, Maximum	00011	°F	NA	NA	NR	NA	90.0	Continuous	Continuous		✔
Temperature Difference (Sample & Upstream)	00018	°F	NA	32.1	Daily//Monthly	Calculation[10]	NA	NR	NA		
Waste Heat Rejection Rate	00179	Btus/day	NA	---	Daily//Monthly	Calculation[11]	NA	NR	NA		
Zinc, Total	01092	mg/L	---	---	Quarterly	Daily Composite	NA	NR	NA	0.010	✔

TABLE B FOOTNOTES AND REMARKS

Footnotes:

[1] For this parameter, the Permittee shall maintain at the facility a record of the total Daily Flow for each day of discharge and shall report the Average Daily Flow and the Maximum Daily Flow for each month.

[2] The first entry in this column is the 'Sample Frequency'. If a 'Reporting Frequency' does not follow this entry and the 'Sample Frequency' is more frequent than monthly then the 'Reporting Frequency' is monthly. If the 'Sample frequency' is specified as monthly, or less frequent, then the 'Reporting Frequency' is the same as the 'Sample Frequency'.

[3] Minimum Level refers to Paragraph (6)(A)(4) of this permit.

(CONTINUED ON NEXT PAGE)

TABLE B FOOTNOTES AND REMARKS (CONTINUED)

[4] The duration of the acute toxicity testing is 48 hours. The LC_{50} results for the acute toxicity testing shall be reported on the DMR.

[5] The duration of the chronic toxicity testing is 7 days. The C-NOEC (Chronic-No Observed Effect Concentration) results for the lethal and specified sub-lethal conditions noted in this table shall be reported on the DMR. Supplemental data collected during the chronic toxicity event shall be provided for those parameters identified on Attachment A of this permit and such data shall be submitted consistent with Section 8(A) of this permit. The supplemental data can be provided in any acceptable format as long as it contains the information identified on Attachment A.

[6] The noted permit limit is below the Minimum Level (ML). Therefore, compliance with this limit will be determined based on the ML. The Permittee shall conduct analysis for this parameter in accordance with a "sufficiently-sensitive" approved test method. If the measured value is less than the ML, the results shall be reported in accordance with Section 6(A)(6) and the results will be considered to be in compliance with the permit limit. If the measured value is greater or equal to the ML, the actual results obtained shall be reported on the DMR and these results will be considered a violation of the permit limit.

[7] Monitoring for *Enterococci* shall be conducted once per quarter from May 1st to September 30th. If less than five samples are collected in a month, the maximum value in that sample set shall be reported on the DMR. If five or more samples are collected in a month, the results of the geometric mean of those samples shall be reported on the DMR for that month.

[8] Monitoring for Fecal coliform shall be conducted once per quarter from May 1st to September 30th. If less than five samples are collected in a month, the maximum value in that sample set shall be reported on the DMR. If five or more samples are collected in a month, the results of the geometric mean of those samples shall be reported on the DMR for that month.

[9] Total Nitrogen concentration means the sum of the concentrations of: Ammonia Nitrogen + Organic Nitrogen + Nitrate Nitrogen + Nitrite Nitrogen. The concentration-based value shall be converted to lbs/day and reported on the DMR.

[10] Temperature Difference (Sample & Upstream) is calculated as follows: Effluent Temperature (Maximum Daily) – Water Temperature @ NOAA Station 8461490 (Maximum Daily). The Permittee shall report the maximum value determined in a month on the DMR.

[11] Waste Heat Rejection Rate is calculated as follows:

$$Waste\ Heat\ Rejection\ Rate\ \left(\frac{Btus}{day}\right) = \left(1.0\ \frac{Btus}{lb\ °F}\right) * \left(Flow\ \frac{gallons}{day}\right) * \left(8.34\ \frac{lbs}{gallon}\right) * (\Delta T, °F)$$

ΔT = Effluent Temperature – Intake Temperature
Where: Effluent Temperature is the maximum temperature value of the effluent (DSN 008-1) in a 24-hour period
Intake Temperature is the temperature value of the intake water (INTAKE 01H) that was collected in the prior 7-day period

Remarks:

1. Abbreviations used for units are as follows: MGD means million gallons per day; mg/L means milligrams per liter; µg/L means micrograms per liter; g/day means grams per day; lbs/day means pounds per day; °F means degrees Fahrenheit; SU means Standard Units; Btus/day means British thermal units per day; cfus/100 ml means colony forming units per 100 milliliters. Other abbreviations are as follows: NA means Not Applicable; NR means Not Reportable; RDS means Range During Sampling.

2. Flow shall be reported to 0.1 MGD. Temperature (Maximum and Difference) shall be reported to 0.1 °F. Dissolved Oxygen shall be reported to 0.1 mg/L. pH shall be reported to 0.1 SU. Waste Heat Rejection Rate shall be reported to 1 Btu/day. Total Nitrogen shall be reported to 1 lb/day. All other values shall be reported to the level of precision/accuracy reported by the laboratory.

3. Supplemental data shall be provided, at a minimum, for those monitoring parameters identified on Attachment C of this permit and such data shall be submitted consistent with Section 8(A) of this permit. The supplemental data can be provided in any acceptable format as long as it contains the information identified on Attachment C.

Table C

Discharge Serial Number: **009** | Monitoring Location: **1**

Wastewater Description: **Intake structure screen backwash**

Monitoring Location Description: **Traveling screen outfall pipe**

Receiving Water: **Thames River** | Dilution Factor: **None** | In-Stream Waste Concentration: **N/A**

PARAMETER	NET DMR CODE	UNITS	FLOW/TIME BASED MONITORING				INSTANTANEOUS MONITORING		
			Average Monthly Limit	Maximum Daily Limit	Sample//Reporting Frequency [2]	Sample Type or Measurement to be reported	Instantaneous limit or required range	Sample// Reporting Frequency[2]	Sample Type or measurement to be reported
Duration of Discharge	81381	days/month	NA	---	Daily//Monthly	Days of Flow	NA	NR	NA
Flow, Average Monthly[1]	00056	gpd	300,000	NA	Daily//Monthly	Daily Flow	NA	NR	NA
Flow, Maximum Daily[1]	50047	gpd	NA	600,000	Daily//Monthly	Daily Flow	NA	NR	NA
Solids, Total Suspended	00530	mg/L	NA	NA	NR	NA	---	Annual	Grab

TABLE C FOOTNOTES AND REMARKS

Footnotes:

[1] For this parameter, the Permittee shall maintain at the facility a record of the total Daily Flow for each day of discharge and shall report the Average Daily Flow and the Maximum Daily Flow for each month. The measurement of total Daily Flow shall be an estimate based on best engineering practices.

[2] The first entry in this column is the 'Sample Frequency'. If a 'Reporting Frequency' does not follow this entry and the 'Sample Frequency' is more frequent than monthly then the 'Reporting Frequency' is monthly. If the 'Sample frequency' is specified as monthly, or less frequent, then the 'Reporting Frequency' is the same as the 'Sample Frequency'.

Remarks:

1. Abbreviations used for units are as follows: gpd means gallons per day; mg/L means milligrams per liter

2. Total Suspended Solids shall be reported to the level of precision/accuracy reported by the laboratory.

SECTION 6: SAMPLE COLLECTION, HANDLING AND ANALYTICAL TECHNIQUES

(A) Chemical Analysis

(1) Chemical analyses to determine compliance with limits and conditions established in this permit shall be performed using "sufficiently-sensitive" methods approved pursuant to 40 CFR 136 for the analysis of pollutants having approved methods under that part unless an alternative method has been approved in writing pursuant to 40 CFR 136.4 or as provided in Section 22a-430-3(j)(7) of the RCSA. Monitoring parameters which do not have approved methods of analysis defined in 40 CFR 136 shall be analyzed in accordance with "sufficiently-sensitive" methods specified in Section 6(A)(2) of this permit, unless an alternative method had been specifically approved in writing by the Commissioner.

(2) The following test method shall be used to analyze the parameter identified below:

PARAMETER	METHOD OF ANALYSIS
Iron, Total	EPA Method 6020 & 1640 with chelation

(3) All metals analyses identified in this permit shall refer to analyses for Total Recoverable Metal as defined in 40 CFR 136, unless otherwise specified.

(4) The Minimum Levels specified in Table B represent the concentrations at which quantification must be achieved and verified during the chemical analyses for those noted parameters. Analyses for these parameters must include check standards within ten percent of the specified Minimum Level or calibration points equal to or less than the specified Minimum Level.

(5) The value of each parameter for which monitoring is required under this permit shall be reported to the maximum level of accuracy and precision possible, consistent with the requirements of this section of the permit.

(6) Effluent analyses for which quantification was verified during the analysis at or below the minimum levels specified in this section, and which indicate that a parameter was not detected, shall be reported as "less than x" where 'x' is the numerical value equivalent to the analytical method detection limit for that analysis.

(7) Results of effluent analyses which indicate that a parameter was not present at a concentration greater than or equal to the Minimum Level specified for that analysis shall be considered equivalent to zero (0.0) for purposes of determining compliance with effluent limitations or conditions specified in this permit.

SECTION 7: TOXICITY MONITORING

(A) *Acute Toxicity Monitoring: DSN 008-1 (Grab Samples Only)*: If instantaneous monitoring for acute aquatic toxicity is conducted, it shall be performed in accordance with the following:

(1) **TEST METHOD**: Acute aquatic toxicity monitoring shall be performed as prescribed in *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* (EPA-821-R-02-012), or the most current version, with any exceptions or clarifications noted below.

(2) **SAMPLE COLLECTION & HANDLING**:

(a) Grab samples shall be chilled immediately following collection. Samples shall be held at 4 °C until aquatic toxicity testing is initiated.

(b) Effluent samples shall not be dechlorinated, filtered, or, modified in any way, prior to testing for aquatic toxicity unless specifically approved in writing by the Commissioner for monitoring at this facility.

(c) Tests for aquatic toxicity shall be initiated within 36 hours of sample collection.

(3) **TEST SPECIES & TEST DURATION**: Monitoring for acute aquatic toxicity shall be conducted as follows:

(a) For 48-hours utilizing neonatal *Americamysis bahia* (1-5 days old with no more than 24-hours range in age).

(b) For 48-hours utilizing larval *Cyprinodon variegatus* (1-14 days old with no more than 24-hours range in age).

(4) **TEST CONDITIONS**:

(a) Tests for aquatic toxicity shall be conducted as prescribed for static non-renewal acute tests.

(b) At a minimum, pH, specific conductance, salinity, alkalinity, hardness, and total residual chlorine shall be measured in the highest concentration of effluent test solution and in the dilution (control) water at the beginning of the test and at test termination. If total residual chlorine is not detected at test initiation, it does not need to be measured at test termination. Dissolved oxygen, pH, and temperature shall be measured in the control and all test concentrations at the beginning of the test, daily thereafter, and at test termination. Salinity shall be measured in each test concentration at the beginning of the test and at test termination.

(c) For tests with saltwater organisms that require salinity adjustment of the effluent, chemical analysis of the parameters identified in Section 5, Table B under "Monitoring Required With Toxicity Test" shall be conducted on an aliquot of the effluent sample collected for Aquatic Toxicity testing and on an aliquot of the effluent following salinity adjustment. Both sets of results shall be reported on the Aquatic Toxicity Monitoring Report (ATMR).

(d) Multi-concentration (definitive) testing, with LC_{50} as the endpoint, shall be conducted to determine compliance with limits on Aquatic Toxicity and shall incorporate, at a minimum, the following effluent concentrations: 100%, 75%, 50%, 25%, 12.5%, and 6.25%.

(e) Organisms shall not be fed during the tests.

(f) Aquatic toxicity tests shall be conducted at a salinity of 28 ppt ±2 ppt.

(g) Sodium lauryl sulfate or sodium dodecyl sulfate shall be used as the reference toxicant.

(h) Synthetic seawater for use as dilution water or controls shall be prepared with deionized water and artificial sea salts as described in EPA-821-R-02-012.

(i) If the salinity of the source water is more that 5 ppt, or lower than the culture water used for rearing the organisms, a second set of controls matching the salinity of the culture water shall be added to the test series. Test validity shall be determined using the controls adjusted to match the source water salinity.

(j) The actual effluent concentrations in definitive tests with saltwater organisms shall be used in calculating test results.

(5) **TEST ACCEPTABILITY CRITERIA**: For the test result to be acceptable, control survival must equal or exceed 90%. If the laboratory control fails to meet the test acceptability criteria for either of the organisms at the end of the test period, then the test is considered invalid and the test must be repeated.

(B) *Chronic (and Modified Acute) Toxicity Monitoring: DSN 008-1.* The Permittee shall conduct chronic (and modified acute) toxicity testing semi-annually for DSN 008-1 in accordance with the following:

(1) **TEST METHOD**: Chronic (and modified acute) toxicity monitoring shall be performed as prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*, EPA 821-R-02-014, or the most current version, with any exceptions or clarifications noted below or identified in Attachment D.

(2) **SAMPLE COLLECTION & HANDLING**:

(a) Composite samples shall be chilled as they are collected. Samples shall be held at 4 °C until aquatic toxicity testing is initiated.

(b) Effluent samples shall not be dechlorinated, filtered, or, modified in any way, prior to testing for Aquatic Toxicity unless specifically approved in writing by the Commissioner for monitoring at this facility.

(c) Tests for aquatic toxicity shall be initiated within 36 hours of sample collection.

(3) **TEST SPECIES & TEST DURATION**: Monitoring for aquatic toxicity to determine compliance with the chronic (and modified acute) toxicity limits/conditions shall be conducted as follows:

(a) For seven days utilizing neonatal *Americamysis bahia* (1-5 days old with no more than 24-hours range in age).

(b) For seven days utilizing larval *Cyprinodon variegatus* (1-14 days old with no more than 24-hours range in age).

Survival results of the first 48 hours for *Americamysis bahia* and the first 48 hours for *Cyprinodon variegatus*, shall be used for determining compliance with acute toxicity limits.

(4) **CHRONIC ENDPOINTS**:

(a) *Americamysis bahia*: Survival, growth, and egg development (fecundity)

(b) *Cyprinodon variegatus*: Larval survival and growth

(5) **DILUTION WATER**: Thames River water collected immediately upstream of the area influenced by the discharge shall be used as site water control (0% effluent) and dilution water in the toxicity tests. The Permittee shall document the dilution water sampling location by providing USGS coordinates and/or a map of the location.

(6) **TEST CONDITIONS**:

(a) Tests for Aquatic Toxicity shall be conducted as prescribed in the referenced test manual for static daily renewal tests and in accordance with Attachment D of the permit. Daily composite samples of the discharge and grab samples of the Thames River for use as site water control and dilution water shall be collected on: Day 1 of the test (for test initiation and renewal on Day 2 of the test); Day 3 of the test (for test solution renewal on Day 3 and Day 4 of the test); and on Day 5 of the test (for test solution renewal on Day 5, 6, and 7 of the test). Samples shall not be dechlorinated, pH or hardness adjusted, or chemically altered in any way.

(b) Tests concentrations shall be comprised of: 100% effluent, 50% effluent, 25% effluent, 12.5% effluent, 6.25% effluent, 2.17% effluent (IWC% concentration), laboratory water control, and site dilution water.

(c) Laboratory control water shall be adjusted to a salinity of 28 ppt ±2 ppt.

(7) **CHEMICAL ANALYSIS**: Each 100% effluent sample and each Thames River water sample used in the chronic toxicity test, shall, at a minimum, be analyzed for those parameters identified in Section 5, Table B under "Chemical Analysis Required With Toxicity Test" and the following parameters: specific conductance, alkalinity, hardness, and salinity. Analysis of the effluent shall be the same sample as the sample tested for aquatic toxicity.

(8) **TEST ACCEPTABILITY CRITERIA**: Test acceptability criteria is summarized in Attachment D. If the laboratory control fails to meet test acceptability criteria for either of the test organisms at the end of the respective test periods, then the test is considered invalid, and the test must be repeated.

(9) **REPORTING**: A report detailing the results of the chronic and modified acute toxicity monitoring shall be submitted no later than 60 days following the day sampling was concluded for that test. The report shall include a summary of the test results which includes, at a minimum, percent survival in each replicate test chamber and all supporting chemical/physical measurements performed in association with the toxicity test. Endpoints to be reported are: 48-hour LC_{50} (survival), 7-day LC_{50} (survival), 7-day C-NOEC (survival), 7-day C-LOEC (survival), 7-day C-NOEC (growth), 7-day C-LOEC (growth), 7 day C-NOEC (fecundity), 7-day C-LOEC (fecundity).

SECTION 8: REPORTING REQUIREMENTS

(A) The results of chemical analyses and any aquatic toxicity test required above shall be entered on the Discharge Monitoring Report (DMR), provided by this office, and reported to the Bureau of Materials Management and Compliance Assurance (Attn: DMR Processing) at the following address. Except for continuous monitoring, any monitoring required more frequently than monthly shall be reported on an attachment to the DMR, and any additional monitoring conducted in accordance with 40 CFR 136 or other methods approved by the Commissioner shall also be included on the DMR, or as an attachment, if necessary. All aquatic toxicity reports shall also be included as an attachment to the DMR. The report shall also include a detailed explanation of any violations of the limitations specified. The DMR shall be received at this address by the last day of the month following the month in which samples are collected.

Bureau of Materials Management and Compliance Assurance
Water Permitting and Enforcement Division (Attn: DMR Processing)
Connecticut Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

(B) Complete and accurate aquatic toxicity test data, including percent survival of test organisms in each replicate test chamber, LC_{50} values and 95% confidence intervals for definitive test protocols, and all supporting chemical/physical measurements performed in association with any aquatic toxicity test, including measured daily flow and hours of operation for the 30 consecutive operating days prior to sample collection, shall be included in the Aquatic Toxicity Monitoring Report (ATMR) and sent to the Bureau of Water Protection and Land Reuse at the following address. The ATMR shall be received at this address in accordance with the timeframe identified in Section 7(B)(9) above:

Bureau of Water Protection and Land Reuse (Attn: Aquatic Toxicity)
Connecticut Department of Energy and Environmental Protection
79 Elm St.
Hartford, CT 06106-5127

(C) If this permit requires monitoring of a discharge on a calendar basis (e.g., monthly, quarterly, etc.), but a discharge has not occurred within the frequency of sampling specified in the permit, the Permittee must submit the DMR and ATMR, as scheduled, indicating "NO DISCHARGE". For those Permittees whose required monitoring is discharge dependent (e.g., per batch), the minimum reporting frequency is monthly. Therefore, if there is no discharge during a calendar month for a batch discharge, a DMR must be submitted indicating such by the end of the following month.

(D) NetDMR Reporting Requirements: Prior to one-hundred and eighty (180) days after the issuance of this permit, the Permittee may either submit monitoring data and other reports to the Department in hard copy

form or electronically using NetDMR, a web-based tool that allows Permittees to electronically submit discharge monitoring reports (DMRs) and other required reports through a secure internet connection. Unless otherwise approved in writing by the Commissioner, no later than one-hundred and eighty (180) days after the issuance of this permit, the Permittee shall begin reporting electronically using NetDMR. Specific requirements regarding subscription to NetDMR and submittal of data and reports in hard copy form and for submittal using NetDMR are described below:

(1) Submittal of *NetDMR Subscriber Agreement:* On or before fifteen (15) days after the issuance of this permit, the Permittee and/or the person authorized to sign the Permittee's discharge monitoring reports ("Signatory Authority") as described in RCSA Section 22a-430-3(b)(2) shall contact the Department to initiate the NETDMR subscription process for electronic submission of Discharge Monitoring Report (DMR) information. A copy of the NetDMR subscriber form is available on the Department's website. On or before ninety (90) days after issuance of this permit the Permittee shall submit a signed and notarized copy of the *Connecticut DEEP NetDMR Subscriber Agreement* to the Department.

(2) Submittal of Reports Using NetDMR: Unless otherwise approved by the Commissioner, on or before one-hundred and eighty (180) days after issuance of this permit, the Permittee and/or the Signatory Authority shall electronically submit DMRs and reports required under this permit to the Department using NetDMR in satisfaction of the DMR submission requirement of Section 5(C) of this permit.

DMRs shall be submitted electronically to the Department no later than the 30th day of the month following the completed reporting period. All reports required under the permit, including any monitoring conducted more frequently than monthly or any additional monitoring conducted in accordance with 40 CFR 136, shall be submitted to the Department as an electronic attachment to the DMR in NetDMR. Once a Permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of DMRs or other reports to the Department. The Permittee shall also electronically file any written report of non-compliance described in Section 6 of this permit as an attachment in NetDMR. NetDMR is accessed from: http://www.epa.gov/netdmr.

(3) Submittal of NetDMR Opt-Out Requests: If the Permittee is able to demonstrate a reasonable basis, such as technical or administrative infeasibility, that precludes the use of NetDMR for electronically submitting DMRs and reports, the Commissioner may approve the submission of DMRs and other required reports in hard copy form ("opt-out request"). Opt-out requests must be submitted in writing to the Department for written approval on or before fifteen (15) days prior to the date a Permittee would be required under this permit to begin filing DMRs and other reports using NetDMR. This demonstration shall be valid for twelve (12) months from the date of the Department's approval and shall thereupon expire. At such time, DMRs and reports shall be submitted electronically to the Department using NetDMR unless the Permittee submits a renewed opt-out request and such request is approved by the Department.

(4) All opt-out requests and requests for the NetDMR subscriber form should be sent to the following address or by email at: deep.netdmr@ct.gov

Attn: NetDMR Coordinator
Connecticut Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

SECTION 9: RECORDING AND REPORTING OF VIOLATIONS, ADDITIONAL TESTING REQUIREMENTS

(A) If any sample analysis indicates that an Aquatic Toxicity effluent limitation in Section 5 of this permit has been exceeded, or that the test was invalid, another sample of the effluent shall be collected and tested for Aquatic Toxicity and associated chemical parameters, as described above in Sections 5, 6, and 7, and the results reported to the Bureau of Materials Management and Compliance Assurance (Attn: DMR Processing), at the address listed above, within 30 days of the exceedance or invalid test. Results of all tests, whether valid or invalid, shall be reported.

(B) If any two consecutive test results or any three test results in a twelve-month period indicates that an Aquatic Toxicity Limit has been exceeded, the Permittee shall immediately take all reasonable steps to eliminate toxicity wherever possible and shall submit a report to Bureau of Materials Management and Compliance Assurance (Attn: Aquatic Toxicity) for the review and approval of the Commissioner in accordance with Section 22a-430-3(j)(10)(c) of the RCSA describing proposed steps to eliminate the toxic impact of the discharge on the receiving water body. Such a report shall include a proposed time schedule to accomplish toxicity reduction and the Permittee shall comply with any schedule approved by the Commissioner.

(C) The Permittee shall notify the Bureau of Materials Management and Compliance Assurance, Water Permitting and Enforcement Division, within 72 hours and in writing within thirty days of the discharge of any substance listed in the application but not listed in the permit if the concentration or quantity of that substance exceeds two times the level listed in the application.

SECTION 10: COMPLIANCE SCHEDULE

(A) **Requirements Associated with Section 316(a) and 316(b) of the CWA.** By way of documentation dated September 26, 2011, December 21, 2011, January 9, 2012, and February 22, 2013, the Permittee provided the Department with an evaluation of those technologies and/or operational measures that represent the best technology available for minimizing the adverse environmental impact associated with its cooling water intake structure. This evaluation has been reviewed by Department staff and consistent with the requirements of Section 316(b) of the CWA, a determination has been made for this Permittee that closed-cycle cooling is the best technology available to minimize the adverse environmental impact associated with its cooling water intake structure. This 316(b) determination will result in a reduction/elimination of the thermal load associated with DSN 008-1, and consequently, this 316(b) determination affects Section 316(a) requirements also. The Permittee shall implement the 316(b) determination as follows:

(1) Within ninety day of the issuance of this permit, the Permittee shall submit for the review and written approval of the Commissioner, a detailed plan and schedule for the implementation of the expansion/upgrades of the existing cooling tower ("project"). The proposed schedule shall represent the most expeditious time frame to complete the project required by this section of the permit.

(2) The Permittee shall perform the project in accordance with the approved plan and schedule.

(3) Within fifteen days of completion of the project, the Permittee shall certify in writing to the Commissioner that the project has been completed as approved and that the use of the cooling water intake structure at the site has been eliminated.

(4) Until such time as the project is completed, the Permittee shall use best efforts to ensure that the amount of cooling water that it withdraws into its cooling water intake structure is limited to the lowest amount feasible.

(B) Until the project described in Section 10(A) is completed as approved, the Permittee shall submit to the Commissioner quarterly status reports on March 1st, June 1st, September 1st, and December 1st. Status reports shall include, but not be limited to, a detailed description of progress made by the Permittee in performing actions required by this section of the permit in accordance with the approved schedule including, but not limited to, development of engineering plans and specifications, construction activity, contract bidding, operational changes, preparation and submittal of permit applications, and any other actions specified per the applicable sections.

(C) The Permittee shall use best efforts to submit to the Commissioner all documents required by this section of the permit in a complete and approvable form. If the Commissioner notifies the Permittee that any document or other action is deficient, and does not approve it with conditions or modifications, it is deemed disapproved, and the Permittee shall correct the deficiencies and re-submit it within the time specified by the Commissioner or, if no time is specified by the Commissioner, within thirty days of the Commissioner's notice of deficiencies. In approving any document or other action under this Compliance Schedule, the Commissioner may approve the document or other action as submitted or performed or with such

ATTACHMENT A

Supplemental Monitoring Data: Chronic Toxicity

PARAMETER	UNITS	EFFLUENT SAMPLE RESULTS			THAMES RIVER SAMPLE RESULTS			MINIMUM LEVEL
		DATE ANALYZED	DATE ANALYZED	DATE ANALYZED	DATE ANALYZED	DATE ANALYZED	DATE ANALYZED	
Alkalinity, Total	mg/L							
Ammonia (as N)	mg/L							
Bis(2-ethylhexyl) phthalate	µg/L							
BOD_5	mg/L							
Chlorine, Total Residual	µg/L							
Chromium, Total	mg/L							
Copper, Total	mg/L							
Hardness, Total	mg/L							
Iron, Total	µg/L							
Kjeldahl Nitrogen (as N)	mg/L							
Lead, Total	mg/L							
Nickel, Total	mg/L							
Nitrate (as N)	mg/L							
Nitrite (as N)	mg/L							
Oil & Grease, Total	mg/L							
Oxygen, Dissolved	mg/L							
pH	SU							
Specific Conductance	µmhos							
Total Suspended Solids	mg/L							
Zinc, Total	mg/L							

Indicate the location where the Thames River sample was collected: (USGS coordinates):_____

ATTACHMENT B

Supplemental Monitoring Data: INTAKE 01H

Month: _____

DAY	FLOW	TEMPERATURE
	MGD	°F
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
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26		
27		
28		
29		
30		
31		

ATTACHMENT C

Supplemental Monitoring Data: DSN 008-1

Month:_____

DAY	FLOW	pH (min)	pH (max)	MAX DAILY TEMP	NOAA STATION 8461490 TEMP	TEMP CHANGE IN RIVER	HEAT LOAD
	MGD	SU	SU	°F	°F	°F	Btus/day
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
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31							

ATTACHMENT D

TABLE 1: Testing Protocols for DSN 008-1 for: *Americamysis bahia* (48-hour acute and 7-day chronic tests)	
Testing procedure	*Acute*: DEP standard toxicity test procedures, except as modified below. *Chronic*: EPA 821-R-02-014, except as modified below.
Test type	Static renewal
Salinity	28 ± 2 ppt
Temperature	26 °C ± 1 °C. Test temperature must not deviate (i.e., maximum minus minimum temperature) by more than 3 °C during the test
Light quality	Ambient laboratory illumination
Light intensity	10-20μE/m^2/s (50-100 ft-c)
Photoperiod	16-h light, 8-h darkness, with phase in/out period
Test chamber	Glass or plastic (250 – 400 mL capacity) beakers
Test solution volume	200 mL per replicate
Renewal of test solutions	Daily
No. of test organisms per chamber	5 per replicate test chamber
No of replicate test chambers per concentration	12 (per effluent concentration), 12 (control water), 12 (dilution water)
No. larvae per concentration	40
Source of food	Newly hatched *Artemia* nauplii (less than 24-h old)
Feeding regime	Feed 150 24h old nauplii per mysid daily, half after test solution renewal and half after 8-12 h
Cleaning test chambers	Pipette excess food daily, immediately before test solution renewal and feeding.
Aeration	None unless dissolved oxygen falls below 4.0 mg/l, then gently aerate all chambers.
Control/Dilution water	Laboratory control and Thames River water samples. Three separate collections must be made on the following days: Day 1, Day 3, and Day 5.
Effluent	Composite sample collected at DSN 008-1. Three separate sample collections must be made on the following days: Day 1, Day 3, and Day 5.
Test duration	*Acute*: 48 hours *Chronic*: 7 days
Endpoint	*Acute*: Survival *Chronic*: Survival, growth, and egg development
Test acceptability criteria	*Acute:* 90% survival in 48 hours. *Chronic*: 80% survival (averaged) in controls after 7 days. A minimum average dry weight of 0.2 mg per surviving organism in controls is required. Fecundity may be used if 50% of the females in the controls produce eggs.
Mortality observations	Each test chamber is examined for mortality at 24-h intervals. Dead individuals are removed and if any individuals are missing (via cannibalism) they are noted.
Physical- chemical measurements of solutions in test chambers	Dissolved oxygen, temperature, salinity and pH of the effluent and control test solutions are measured at the beginning, at 24-h intervals, and at test termination. These parameters are measured prior to and after test solution renewals. Because of possible harm or stress to the test organisms with meter probes, these parameters are not measured in the test chambers while conducting the test; instead dissolved oxygen and pH measurements are made in separate surrogate chambers without test organisms, prepared from effluent and control water. The surrogate chambers are maintained similar to test chambers (i.e., daily solution renewals). At the end of the chronic test, after the number of live specimens has been determined, measure dissolved oxygen, temperature, salinity, and pH in all effluent and control test chambers.
Physical-chemical measurements of effluent sample and control sample	The parameters identified in Table B under "Chemical Analysis Required With Toxicity Test" and the additional parameters identified in Section 7(B)(7) are measured in each sample of DSN 008-1 and each Thames River sample.
Reference toxicant	Sodium dodecyl sulfate with an acute endpoint (48 hours) and a chronic endpoint (7 days).

(CONTINUED ON THE NEXT PAGE)

ATTACHMENT D

TABLE 2: Testing Protocols for DSN 008-1 for: *Cyprinodon variegatus* (48-hour acute and 7-day chronic tests)	
Testing procedure	*Acute*: DEP standard toxicity test procedures, except as modified below. *Chronic*: EPA 821-R-02-014, except as modified below.
Test type	Static renewal
Salinity	28 ±2 ppt
Temperature	26°C ± 1
Light quality	Ambient laboratory illumination
Photoperiod	16-h light, 8-h dark
Test chamber type	Glass or plastic (1000 mL capacity)
Test solution volume	750 mL per replicate
Renewal of test solutions	Daily
No. of test organisms per chamber	10 per replicate test chamber
No. of replicate test chambers per concentration	6 (per effluent concentration), 6 (dilution water), 6 (lab control water)
Source of food	Newly hatched (less than 24-h old) *Artemia* nauplii. Concentrate *Artemia* nauplii with a ≤ 150 um sieve mesh and rinse with seawater.
Feeding regime	Feed once a day concentrated *Artemia* nauplii at a rate per replicate of 0.1 mL (2 drops) on days 0-2 and 0.15 mL (3 drops) on days 3–6. Feed after test solution renewal.
Cleaning test chambers	Siphon excess food prior to test solution renewal.
Aeration	None, unless dissolved oxygen falls below 4.0 mg/l, then gently aerate all chambers
Control/Dilution water	Laboratory control and Thames River water samples. Three separate collections must be made on the following days: Day 1, Day 3, and Day 5.
Effluent	Composite sample collected at DSN 008-1. Three separate sample collections must be made on the following days: Day 1, Day 3, and Day 5.
Test duration	*Acute*: 48 hours *Chronic*: 7 days
Endpoint	*Acute*: Survival *Chronic*: Survival, growth
Test acceptability criteria	*Acute*: 90% survival in 48 hours *Chronic*: 80% survival (averaged) in controls after 7 days. A minimum average dry weight of 0.6 mg per surviving organism in controls is required.
Mortality observations	Each test chamber is examined for mortality at 24-h intervals. Dead individuals are removed and if any individuals are missing they are noted.
Physical- chemical measurements of solutions in test chambers	Dissolved oxygen, temperature, salinity and pH of the effluent and control test solutions are measured at the beginning, at 24-h intervals, and at test termination. These parameters are measured prior to and after test solution renewals. Because of possible harm or stress to the test organisms with meter probes, these parameters are not measured in the test chambers while conducting the test; instead dissolved oxygen and pH measurements are made in separate surrogate chambers without test organisms, prepared from effluent and control water. The surrogate chambers are maintained similar to test chambers (i.e., daily solution renewals). At the end of the chronic test, after the number of live specimens has been determined, measure dissolved oxygen, temperature, salinity, and pH in all effluent and control test chambers.
Physical-chemical measurements of effluent sample and control sample	The parameters identified in Table B under "Chemical Analysis Required With Toxicity Test" and the additional parameters identified in Section 7(B)(7) are measured in each sample of DSN 008-1 and each Thames River sample.
Reference toxicant	Sodium dodecyl sulfate with an acute endpoint (48 hours) and a chronic endpoint (7 days).

conditions or modifications as the Commissioner deems necessary to carry out the purposes of this section of the permit. Nothing in this paragraph shall excuse noncompliance or delay.

(D) Dates. The date of submission to the Commissioner of any document required by this section of the permit shall be the date such document is received by the Commissioner. The date of any notice by the Commissioner under this section of the permit, including but not limited to, notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the Commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" as used in this section of the permit means calendar day. Any document or action which is required by this section only of the permit, to be submitted, or performed, by a date which falls on, Saturday, Sunday, or, a legal Connecticut or federal holiday, shall be submitted or performed on or before the next day which is not a Saturday, Sunday, or legal Connecticut or federal holiday.

(E) Notification of noncompliance. In the event that the Permittee becomes aware that it did not or may not comply, or did not or may not comply on time, with any requirement of this section of the permit, except for final compliance dates, the Permittee shall immediately notify the Commissioner and shall take all reasonable steps to ensure that any noncompliance or delay is avoided or, if unavoidable, is minimized to the greatest extent possible. In so notifying the Commissioner, the Permittee shall state in writing the reasons for the noncompliance or delay and propose, for the review and written approval of the Commissioner, dates by which compliance will be achieved, and the Permittee shall comply with any dates that may be approved in writing by the Commissioner. Notification by the Permittee shall not excuse noncompliance or delay, and the Commissioner's approval of any compliance dates proposed shall not excuse noncompliance or delay unless specifically so stated by the Commissioner in writing.

(F) Notice to Commissioner of changes. Within fifteen days of the date the Permittee becomes aware of a change in any information submitted to the Commissioner under this section of the permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the Commissioner.

(G) Submission of documents. Any document, other than a discharge monitoring report, required to be submitted to the Commissioner under this section of the permit shall, unless otherwise specified in writing by the Commissioner, be directed to:

Christine Gleason, Sanitary Engineer
Department of Environmental Protection
Bureau of Materials Management and Compliance Assurance
Water Permitting and Enforcement Division
79 Elm Street
Hartford, CT 06106-5127

This permit is hereby issued on

5/22/14

MACKY MCCLEARY
Deputy Commissioner

MM/CMG

DISCHARGE CODE	WASTEWATER CATEGORY (per 22a-430-7)	MAXIMUM GPD	DSNs	ANNUAL FEE (per 22a-430-7)
1080000	***Stormwater*** *(Spill Containment Stormwater; Stormwater)*	---	*008-1*	*2,912.50*
1060000	***Water Production Wastewater*** *(Resin Regeneration Wastewater; Reverse Osmosis Brine; Sand Filter Backwash; Water Softener Regeneration Wastewater)*	---	*008-1*	*660.00*
---	***Miscellaneous*** *(Air Compressor Condensate; Air Conditioner Condensate; Backflow Preventer Wastewater; Building Maintenance Wastewater; Chilled Water; Dewatering Wastewater; Fire Suppression Test Water; Pump Seal Water; Shell and Tube Heat Exchanger Wastewater; Steam Cleaning and Powerwashing; Steam Condensate; Strainer Cleaning Wastewater)*	---	*008-1*	*0*
---	***Miscellaneous*** *(Intake Structure Screen Backwash)*	---	*009-1*	*0*
TOTAL				***$16,995.00***

I. PERMIT APPLICATION

On December 24, 2012, the Department of Energy and Environmental Protection ("Department") received an application (Application 201207927) from Pfizer Inc. ("Pfizer", "Permittee", "Applicant") for the renewal of its NPDES permit, CT0000957. A Notice of Permit Application was published in *The Day* on December 26, 2012 consistent with the requirements of Section 22a-6g of the Connecticut General Statutes ("CGS"). On January 17, 2013, the application was determined to be timely and administratively sufficient. Pfizer's application seeks authorization for the following activities:

To withdraw the following:

INTAKE	PROPOSED AVERAGE MONTHLY INTAKE FLOW (gpd)	PROPOSED MAXIMUM DAILY INTAKE FLOW (gpd)	SOURCE WATER
01H	25,000,000	45,000,000	Thames River

To discharge the following:

DISCHARGE SERIAL NUMBER (DSN)	PROPOSED AVERAGE MONTHLY FLOW (gpd)	PROPOSED MAXIMUM DAILY FLOW (gpd)	PROPOSED WASTESTREAMS	TREATMENT TYPE	RECEIVING WATER
008-1	25,000,000	45,000,000	*Air Compressor Condensate; Air Conditioner Condensate; Backflow Preventer Wastewater; Boiler Bleed Off/Draining; Boiler Blowdown; Boiler Laboratory Testing Wastewater; Boiler Washdown; Building Maintenance Wastewater; Chilled Water; Cooling Tower Blowdown/Draining; Dewatering Wastewater; Fire Suppression Test Water; Hydrostatic Test Water; Non-Contact Cooling Water; Pump Seal Water; Resin Regeneration Wastewater; Reverse Osmosis Brine; Sand Filter Backwash; Shell and Tube Heat Exchanger Wastewater; Spill Containment Stormwater; Steam Cleaning and Powerwashing Wastewater; Steam Condensate; Stormwater; Strainer Cleaning Wastewater; Water Softener Regeneration Wastewater*	Oil/Water Separation (select wastestreams); Equalization; pH adjustment	Thames River
009-1	300,000	600,000	*Intake structure screen backwash*	None	Thames River

PROPOSED CHANGES: 1) The wastestreams identified in the application that are proposed to be discharged are more specifically described in this application than as they appear in the existing permit; 2) Pfizer proposes to reduce the average monthly discharge flow associated with DSN 008-1 from 70 million gallons per day ("MGD") to 25 MGD and proposes to reduce the maximum daily discharge flow associated with DSN 008-1 from 70 MGD to 45 MGD.

II. SUMMARY OF MODIFICATIONS MADE TO THE EXISTING NPDES PERMIT

On July 29, 2008, Pfizer was issued a NPDES permit, CT0000957, for the authorization of the discharge of utilities-related wastewaters from its Groton facility into the Thames River. NPDES Permit CT0000957 includes two discharge points (DSN 008-1 and DSN 009-1) and one intake (INTAKE 01H). This permit was modified five times during its term. These modifications are as follows: 1) **Modification 1** (August 7, 2008): A minor modification to correct a typographical error in Table A of the permit; 2) **Modification 2** (October 23, 2008): A minor modification to clarify the effective date of the effluent limitations associated with Bis(2-ethylhexyl) phthalate; 3) **Modification 3** (April 16, 2009): A modification increasing the average monthly discharge flow of DSN 009-1 from 75,000 gpd to 300,000 gpd and the maximum daily discharge flow of DSN 009-1 from 75,000 gpd to 600,000 gpd; 4) **Modification 4** (issued April 23, 2010): This modification: *a*) reduced the monitoring frequency of Bis(2-ethylhexyl) phthalate from weekly to monthly; *b*) reduced the time frame associated with entrainment monitoring from two years to one year; *c*) included requirements to complete a study designed to evaluate the best technology available for minimizing the environmental impact associated with the operation of the cooling water intake structure; *d*) reduced the average monthly intake flow associated with INTAKE 01H from 30,000,000 gpd to 25,000,000 gpd and reduced the maximum daily intake flow associated with INTAKE 01H from 80,000,000 gpd to 45,000,000 gpd; 5) **Modification 5** (April 16, 2009): A minor modification to clarify a reporting discrepancy in Table A of the permit.

III. STATUS OF SPECIAL CONDITIONS/COMPLIANCE SCHEDULES IN PERMIT

NPDES Permit CT0000957 includes four special conditions/compliance schedules:

1: Section 10(A): Section 10(A) of the permit required the Permittee to undertake certain closure activities associated with the Biological Treatment System (BTS) that it had used to treat the wastewaters associated with its pharmaceutical manufacturing operations. Pfizer satisfied these requirements and documented closure of the former BTS in November 2008. The Department approved the requirements associated with Section 10(A) on January 9, 2009. [See Attachment 1].

2: Section 10(B)(1)-(5): Subsections 1-5 of Section 10(B) of the permit required that Pfizer conduct a study to assess the impact of the operation of its intake structure on the fisheries resources in the Thames River. Specifically, Section 10(B) required that Pfizer conduct a one-year impingement study and a two-year entrainment study in order to accomplish the requirements set forth in this section. In October 2009, Pfizer requested a reduction in the duration of the entrainment study from two years to one year; this request was formalized in the permit modification that was issued on April 23, 2010. On August 19, 2010, the Department approved the impingement and entrainment reports associated with Section 10(B). [See Attachment 2].

3: Section 10(C): Bis(2-ethylhexyl) phthalate has sporadically been detected in Pfizer's discharge, DSN 008-1, at levels in excess of the water quality criteria. Therefore, Section 10(C) of the permit required that Pfizer investigate any and all sources of Bis(2-ethylhexyl) phthalate at its facility and then implement actions in order to achieve compliance with the water quality-based effluent limitations for DSN 008-1 for this pollutant. Pfizer conducted this investigation and determined that the source of the Bis(2-ethylhexyl) phthalate appeared to be associated with the plastic components in the DSN 008-1 autosampler. Pfizer replaced these components with phthalate-free materials. Following this replacement, the level of Bis(2-ethylhexyl) phthalate in DSN 008-1 was reduced to non-detectable levels. On November 20, 2008, the Department approved the actions taken by Pfizer to achieve compliance with the Bis(2-ethylhexyl) phthalate effluent limitations in its permit. [See Attachment 3].

4: Section 10(B)(6)-(9): The original requirements in Section 10(B) of the permit were expanded (as part of Modification 4) to include a requirement that Pfizer conduct a study to evaluate the best technology available for minimizing the environmental impact associated with the operation of its cooling water intake structure. Based on this study it has been determined that expansion/upgrading of the existing cooling tower is the best technology available. Implementation of this technology will allow Pfizer to eliminate the use of its cooling water intake structure. Pfizer expects to complete the work associated with the cooling tower expansion/upgrade by 2015 (4^{th}Q). See Section XIX of the fact sheet for more details.

IV. GENERAL SITE INFORMATION

A. FEDERALLY-RECOGNIZED INDIAN LAND

As provided in the permit application, the site is not located on federally-recognized Indian land.

B. COASTAL AREA/COASTAL BOUNDARY

The activity is located within a coastal boundary as defined in CGS 22a-94(b). However, the application is for a renewed activity and therefore, a coastal consistency review is not required.

C. ENDANGERED, THREATENED, AND SPECIAL-CONCERN SPECIES

The natural diversity database maintained by the Department's Bureau of Natural Resources indicates that there are records of State-threatened *Alosa aestivalis* (blueback herring) in the vicinity of the site. Staff of the Department's Inland Fisheries Division has conducted an evaluation of the proposed activities identified in Application 201207927 and has determined that the continuance of DSN 008-1 and DSN 009-1 as well as the continued use of INTAKE 01H at the site would not be expected to impact the blueback herring. [See Attachment 4].

D. AQUIFER PROTECTION AREAS

The project site is not located within a town required to establish Aquifer Protection Areas.

E. CONSERVATION OR PRESERVATION RESTRICTION

As provided in the permit application, the property is not subject to a conservation or preservation restriction.

F. PUBLIC WATER SUPPLY WATERSHED

The site is not located within a public water supply watershed.

V. RECEIVING WATER INFORMATION

Pfizer discharges into the section of the Thames River identified as Waterbody Segment ID CT-E1_014-SB. This segment is classified as an "SB" water. Class SB waters are designated for: habitat for marine fish, other aquatic life, and wildlife; commercial shellfish harvesting; recreation; industrial water supply; and navigation. This waterbody segment is identified on the 2012 *Integrated Water Quality Report* as an impaired waterbody. There are two impaired designated uses associated with this waterbody: 1) an impairment to commercial shellfish harvesting (where authorized) caused by fecal coliform; 2) an impairment to the habitat for marine fish, other aquatic life, and wildlife, caused by low dissolved oxygen levels and impaired biological/habitat conditions. As of September 2013, Segment CT-E1_014-SB ("Estuary 11") was incorporated into the *Statewide Total Maximum Daily Load for Bacteria-Impaired Waters,* September 2012. In addition, this segment of the Thames River is also subject to *A Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound,* December 2000.

VI. NATURE OF BUSINESS GENERATING THE DISCHARGE

Pfizer is primarily engaged in pharmaceutical research operations at the site. The Standard Industrial Classification (SIC) code for this activity, as provided by the applicant, is: 8731 (Commercial Physical and Biological Research).

VII. FACILITY DESCRIPTION

Pfizer operates a pharmaceutical research and development facility on Eastern Point Road in Groton. The facility is located on a total of 148 acres and consists of two campuses on opposite sides of Eastern Point Road. The section of Pfizer known as East Campus is dedicated to pharmaceutical research and development activities and contains hundreds of labs and related support operations. The section of Pfizer opposite East Campus and adjacent to the Thames River is known as West Campus and had historically been used for pharmaceutical manufacturing operations. In 2007, the pharmaceutical manufacturing operations ceased at the site. West Campus is now used to conduct limited research and development operations, pilot plant operations, and research and development associated with solid dose clinical trials. Any laboratory wastewaters associated with research and development that are generated on either East Campus or West Campus are collected, treated, and directed into the City of Groton's sewer system; these discharges are authorized by SPDES Permit SP0000083. The discharges associated with NPDES Permit CT0000957 are related to the facility's support/utilities operations only.

The support/utilities operations that occur at the facility include: power and steam generation and chilled water generation. Pfizer uses Thames River water as a source of non-contact cooling water for its power, steam, and chilled water generation operations. A Diversion Permit (3000-018-IND-RI) exists that allows for the withdrawal of up to 182.9 million gallons Thames River water per day for these activities. A summary of the support/utilities operations is as follows:

Power and Steam Generation: The Pfizer Utilities Team produces electricity and steam that is used to support operations at the Groton site. The co-generation system is capable of producing up to 35 MW/hr of electricity and 420,000 pounds/hour of steam. The powerhouse is located on West Campus in Buildings 101, 160, and 168. The three primary boilers in B101, as well as the Heat Recovery Steam Generation unit in B160, which are all fired with natural gas as the primary fuel and ultra-low sulfur diesel as an alternate fuel, generate steam which is used by the turbine generators to produce electricity. City water is used as make-up water to the boilers. The electricity generated from the system is primarily used for the Groton site, however, in times of peak demand, the electricity produced by Pfizer can be distributed off-site to Groton Utilities. The steam output from the generators is sent out to the east and west campuses for use in building heating and certain research-related applications and is then returned back to the powerhouse as condensate which is re-used in the boilers.

In periods of high power demand or during maintenance activities associated with the co-generation turbines, Pfizer activates a fourth turbine generator ("4TG"). When 4TG is activated, water from the Thames River is used to provide cooling to the steam condensate unit associated with 4TG. It is estimated that 4TG operates approximately 35 days per year (i.e., 14 days of scheduled maintenance and 21 days during demand response with a typical 3 hour requirement). The amount of Thames River water used per month to operate 4TG is approximately 1 MGD. This represents approximately 10% of Thames River water used by Pfizer.

Chilled Water Generation: On the Pfizer site, chilled water is used for building air conditioning and process cooling. The water is chilled using either steam absorption (installed in 1992 and 2006) and/or electric chillers (installed in 2008). The electric chillers are generally used year-round, whereas the steam absorption chillers are generally used in periods of high electrical demand (i.e., summer) or periods of significant steam production (i.e., winter). Thames River water is used for once-through, non-contact cooling for the condenser-water side of the heat exchangers. The amount of Thames River water used per month to operate these units can be up to 10 MGD. This represents approximately 90% of the Thames River water used by Pfizer.

The non-contact cooling water associated with the above-noted support/utilities operations is conveyed into the West Equalizing Basin on West Campus and into the Thames River via discharge point DSN 008-1.

In addition to the non-contact cooling water, additional wastestreams associated with the support/utilities operations at the site are also conveyed into the West Equalizing Basin and discharged via DSN 008-1. These are as follows:

WASTESTREAM	DESCRIPTION	CHEMICALS USED IN PROCESS
AIR COMPRESSOR CONDENSATE	Moisture from the ambient air that condenses during the compression cycle in oil-free compressors.	
AIR CONDITIONER CONDENSATE	Moisture from ambient air that condenses on the HVAC coils.	
BACKFLOW PREVENTER WASTEWATER	Backflow preventers are tested semi-annually. City water is used in the operation.	
BOILER BLEED OFF/DRAINING	Maintenance activities on the boilers periodically require that the contents of the boiler water tanks be drained.	NALCO NexGuard 22310 NALCO Surguard 1700
BOILER BLOWDOWN	Blowdown is manually released from the five boilers on-site and the heat recovery boiler on the co-generation turbine in order to maintain the proper chemistry in the system.	NALCO NexGuard 22310 NALCO Surguard 1700
BOILER LABORATORY TESTING WASTEWATER	Wastewater generated from performing analytical testing on the boiler feed water.	
BOILER WASHDOWN	Once per year the internal section of the boilers are washed down using city water following removal of all solid waste from the soot hopper.	
BUILDING MAINTENANCE WASTEWATER	City water is used to remove dust, dirt from the floors, walls, and other building structures.	
CHILLED WATER	Chilled water is infrequently discharged due to operating or maintenance needs.	NALCO Trac 107* NALCO 7320*
COOLING TOWER BLOWDOWN/DRAINING	Cooling towers are located in Buildings 101 and 160; Building 84 is a cooling tower. Periodically, blowdown is released from the cooling towers in order to maintain the proper chemistry in the system. Periodically, tower sumps, condenser water piping, and chilled water piping connected to the tower would be drained for maintenance or freeze protection.	Stabrex ST-70 Trasar 3DT294 NALCO 7320 NALCO 73199 NALCO 73551 NALSPERSE 73551* NALCO 71D5 Plus Trasar 3DTBR20
DEWATERING WASTEWATER	When the groundwater table rises, groundwater can enter the basements of Buildings 101 and 168.	
FIRE SUPPRESSION TEST WATER	Quarterly, Pfizer Fire Department tests the flows on the fire protection systems at the site. City water is used in the systems.	
HYDROSTATIC TEST WATER	City water is used periodically to hydrostatically test newly installed or repaired pipe lines or tanks. The pipes/tanks are cleaned prior to adding the city water for the test.	
PUMP SEAL WATER	City water is used to provide a seal on the various pumps used throughout the facility.	
RESIN REGENERATION WASTEWATER	Approximately once per month, the resin used to polish the steam condensate is regenerated with salt/water and a resin cleaner.	NALCO 4264
REVERSE OSMOSIS BRINE	A reverse osmosis unit is used to treat the city water make-up to the boiler. A continuous discharge of brine/non-permeate is associated with the operation of this system.	
SAND FILTER BACKWASH	Approximately once per day, the sand filters associated with the cooling tower systems in Buildings 84 and 160 are backwashed with city water/cooling tower water.	
SHELL AND TUBE HEAT EXCHANGER WASTEWATER	Shell and tube heat exchangers are used to generate site chilled water and typically do not generate wastewater with the exception of once-through cooling saltwater. However, leaks, as well as operation and maintenance activities, will generate some wastewater from the exchangers. In addition, wastewater is also generated when the heat exchangers are periodically cleaned with city water.	NALCO Trac 107
SPILL CONTAINMENT STORMWATER	Precipitation (rain or snow) collects in the secondary containment structures associated with exterior tanks. Prior to transfer, the collected stormwater is visually inspected for oil sheen and tested for pH.	
STEAM CLEANING AND POWER WASHING WASTEWATER	City water or steam is used to power wash air coils/fins, instrumentation, or seals. Power washing occurs after any chemicals/oils have been removed.	
STEAM CONDENSATE	Any steam condensate that is not returned for use as boiler feed water.	NALCO 8735 NALCO NexGuard 22310 NALCO Surgard 1700
STORMWATER	Stormwater collected from a West Campus parking area, from a section of road to the east of the south end of the West Basin, and from a roadway north of B168.	
STRAINER CLEANING WASTEWATER	City water is periodically used to clean the strainers associated with the salt water lines and the chilled water system.	

WASTESTREAM	DESCRIPTION	CHEMICALS USED IN PROCESS
WATER SOFTENER REGENERATION WASTEWATER	Approximately twice per week, the water softener used to treat the city water make-up to the boiler is regenerated with a brine/salt water solution	

* Not presently used, but will be used in the future.

[See Attachments 5, 6, and 7 for the site map, location map, and line diagram].

VIII. THE ON-SITE WASTEWATER TREATMENT SYSTEM

As noted above, wastewaters from several different areas on-site are conveyed to the wastewater treatment system for treatment and discharge, including: once-through cooling waters which are piped directly into the system; utilities wastewaters from Buildings 101, 165, and 168 which are directed into the system through Pump Stations 2 & 4; stormwater from secondary containment areas and floor drain wastewater from Building 160 which are initially directed into an oil/water separator and are then conveyed into the treatment system. These wastestreams are collected in a 1,140,633 gallon equalization tank ("West Equalizing Basin"). The primary function of the West Equalizing Basin is to provide equalization for high temperature cooling waters. If necessary, pH adjustment can also take place in West Equalizing Basin, although this is generally unnecessary since 99% of the incoming wastewater is comprised of non-contact cooling water. Following equalization and pH adjustment, the wastewater is discharged from the West Equalizing Basin via DSN 008-1 into the Thames River through a submerged multiport diffuser.

IX. EFFLUENT QUALITY DATA

See Attachment 8 for a summary of DMR data from 2008 to 2013.

X. MONITORING/EFFLUENT VIOLATIONS

Based on a review of Pfizer's DMRs from August 2008 to August 2013, the following effluent violations were noted:

MONTH/YEAR	DSN	PARAMETER VIOLATED	TYPE OF LIMIT	PERMITTED LIMIT	REPORTED VALUE
August 2008	008-1	Oil and Grease	Maximum Daily	5.0 mg/L	5.42 mg/L
REASON: ☐ **Equipment Related** ☐ **Operator Error** ☐ **Other** ☒ **Unknown**					
Pfizer indicates that one of the grab samples taken for Oil & Grease analysis was either contaminated during sample collection or was the result of a laboratory error.					

MONTH/YEAR	DSN	PARAMETER VIOLATED	TYPE OF LIMIT	PERMITTED LIMIT	REPORTED VALUE
November 2008	009-1	Flow	Maximum Daily	75,000 gpd	313,200 gpd
REASON: ☐ **Equipment Related** ☐ **Operator Error** ☒ **Other** ☐ **Unknown**					
The maximum daily flow limit for DSN 009-1 was exceeded on three days in November. The exceedences were caused because the intake screens required more frequent backwashing on those days as excess debris had built up on the screens as a result of inclement weather conditions. A permit modification for a flow increase for DSN 009-1 was received on January 23, 2009 and was issued on April 16, 2009.					

MONTH/YEAR	DSN	PARAMETER VIOLATED	TYPE OF LIMIT	PERMITTED LIMIT	REPORTED VALUE
December 2008	009-1	Flow	Maximum Daily	75,000 gpd	115,857 gpd
REASON: ☐ **Equipment Related** ☐ **Operator Error** ☒ **Other** ☐ **Unknown**					
The maximum daily flow limit for DSN 009-1 was exceeded on one day in December. The exceedence was caused because the intake screens required more frequent backwashing on that day as excess debris had built up on the screens as a result of inclement weather conditions. A permit modification for a flow increase for DSN 009-1 was received on January 23, 2009 and was issued on April 16, 2009.					

MONTH/YEAR	DSN	PARAMETER VIOLATED	TYPE OF LIMIT	PERMITTED LIMIT	REPORTED VALUE
February 2009	009-1	Flow	Maximum Daily	75,000 gpd	417,600 gpd
REASON: ☐ **Equipment Related** ☐ **Operator Error** ☒ **Other** ☐ **Unknown**					
The maximum daily flow limit for DSN 009-1 was exceeded on five days in February. The exceedences were caused because the intake screens required more frequent backwashing on those days as excess debris had built up on the screens as a result of inclement weather conditions. A permit modification for a flow increase for DSN 009-1 was received on January 23, 2009 and was issued on April 16, 2009.					

MONTH/YEAR	DSN	PARAMETER VIOLATED	TYPE OF LIMIT	PERMITTED LIMIT	REPORTED VALUE
May 2012	008-1	Bis(2-ethylhexyl) phthalate	Average Monthly Maximum Daily	6 µg/L 12 µg/L	98.2 µg/L 98.2 µg/L
REASON: ☐ **Equipment Related** ☐ **Operator Error** ☐ **Other** ☒ **Unknown**					
Pfizer conducted an investigation of all process, operational, and sample collection issues related to the exceedence but was unable to identify any source of Bis(2-ethylhexyl) phthalate. Pfizer concluded that the exceedence may have been caused by laboratory error or sample bottle contamination.					

Based on a review of Pfizer's DMRs from August 2008 to March 2013, the following reporting violations were noted:

- ***August 2008***: Quantification could not be verified at or below the minimum level of 10 µg/L. The value was reported at 25 µg/L.
- ***September 2008***: One of the weekly samples for Bis(2-ethylhexyl) phthalate was not collected over a 24-hour period.
- ***December 2008***: Quantification could not be verified at or below the minimum level of 10 µg/L. The value was reported at 100 µg/L.
- ***May 2013***: All of the required parameters were not collected in this month due to operator error. These samples were collected in June 2013.

XI. ENFORCEMENT & COMPLIANCE HISTORY

With respect to the wastewater regulations, there has been one action issued to the Permittee during this permit term: NOVWRIN13301 was issued on July 25, 2013 regarding the operation and maintenance of the wastewater treatment system. The issue was addressed when Pfizer applied for and received a RCSA 22a-430-3(i)(3) approval for a treatment system modification. The NOV was closed on August 8, 2013.

Nothing in the Permittee's compliance history precludes re-issuance of this permit or would require the imposition of any conditions to ensure compliance, as set forth in CGS Section 22a-6m.

XII. SPILL HISTORY (LAST FIVE YEARS):

In the last five years, Pfizer has had releases of chilled water, re-heat water, and ethylene/propylene glycol. These releases have generally occurred due to the failure of mechanical systems in the various buildings on-site (e.g., a rooftop chiller cracks in the cold weather releasing chilled water into the stormwater collection system).

XIII. EFFLUENT GUIDELINES

EPA's June 30, 1988 memorandum entitled "Guidance for NPDES Permits Issued to Electric Cogenerating Plants and Industrial Facilities with Electric Generating Plants" summarizes the applicability of 40 CFR 423 to a cogeneration plant or an industrial source with an on-site steam electric power generating facility.

In that memorandum, EPA states that the Part 423 requirements are specifically applicable under the following conditions:

1. At least 50 percent of the facility revenue is derived from the generation of electricity;
2. At least 50 percent of the fuel is oil, gas, coal, and/or nuclear
3. A steam-electric cycle is used, and
4. A discharge exists to waters of the United States or a POTW

The memo further states that if all of these conditions are not met, Part 423 requirements are not specifically applicable.

Pfizer does not meet Condition 1 of this test in that it does not derive at least 50 percent of its revenue from the cogeneration operations. Therefore, 40 CFR 423 does not apply to DSN 008-1.

None of the other Effluent Limitation Guidelines set forth in 40 CFR 405 - 471 apply to either DSN 008-1 or DSN 009-1.

XIV. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

RESOURCES USED TO DRAFT PERMIT			DISCHARGE POINT(S)
☐	Federal Effluent Limitation Guideline (ELG)		
☒	Regulations of Connecticut State Agencies (RCSA)	RCSA 22a-430-3 & 4	DSN 008-1 DSN 009-1
☒	Code of Federal Regulations (CFR)	40 CFR 122-125	DSN 008-1 DSN 009-1
☐	Performance Standards		
☐	Federal Development Document		
☐	Treatability Manual		
☒	Department File Information	Previous permit	
☒	Connecticut Water Quality Regulations	*Water Quality Standards*, October 10, 2013	DSN 008-1
☐	Antidegradation Policy		
☐	Coastal Management Consistency Review Form		
☒	Other	*A Statewide Total Maximum Daily Load ("TMDL") Analysis for Bacteria-Impaired Waters,* Estuary 11, September 2013 *A Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound,* December 2000 *Technical Support Document for Water Quality-Based Toxics Control,* 1991 ("TSD")	DSN 008-1

BASIS FOR LIMITS, STANDARDS OR CONDITIONS		DISCHARGE POINT(S)
☐	Best Available Technology (BAT)	
☐	Best Practicable Technology (BPT)	
☐	Best Conventional Technology (BCT)	
☐	New Source Performance Standards (NSPS)	
☒	Case-by-Case Determination using Best Professional Judgment (BPJ)	DSN 008-1 DSN 009-1
☐	Secondary Treatment	
☒	In order to meet in-stream water quality	DSN 008-1

A. WASTESTREAMS AUTHORIZED FOR DISCHARGE UNDER DSN 008-1: *Air Compressor Condensate; Air Conditioner Condensate; Backflow Preventer Wastewater; Boiler Bleed Off/Draining; Boiler Blowdown; Boiler Laboratory Testing Wastewater; Boiler Washdown; Building Maintenance Wastewater; Chilled Water; Cooling Tower Blowdown/Draining; Dewatering Wastewater; Fire Suppression Test Water; Hydrostatic Test Water; Non-Contact Cooling Water; Pump Seal Water; Resin Regeneration Wastewater; Reverse Osmosis Brine; Sand Filter Backwash; Shell and Tube Heat Exchanger Wastewater; Spill Containment Stormwater; Steam Cleaning and Powerwashing Wastewater; Steam Condensate; Stormwater; Strainer Cleaning Wastewater; Water Softener Regeneration Wastewater*

B. POLLUTANTS OF CONCERN FOR DSN 008-1:

The following pollutants are included as monitoring pollutants in the permit for the reasons noted below:

POLLUTANT	REASON FOR INCLUSION		
	POLLUTANT WITH AN APPLICABLE TMDL	IDENTIFIED AS PRESENT IN THE EFFLUENT THROUGH SAMPLING	POLLUTANT OTHERWISE EXPECTED TO BE PRESENT IN THE EFFLUENT
Ammonia		✓	
Bis(2-ethylhexyl) phthalate		✓	
BOD_5		✓	
Chlorine, Total Residual		✓	
Chromium		✓	
Copper		✓	
Enterococci			✓
Fecal coliform			✓
Iron		✓	
Kjeldahl Nitrogen		✓	
Lead		✓	
Nickel		✓	
Nitrate		✓	
Nitrite		✓	
Nitrogen, Total	✓		
Oil & Grease		✓	
Temperature/Waste Heat		✓	
Total Suspended Solids		✓	
Zinc		✓	

C. BASIS FOR DSN 008-1 LIMITS:

Technology and water-quality based requirements are considered when developing permit limits. Technology-based limits represent the minimum level of control imposed under the Clean Water Act ("CWA"). Industry-specific technology-based limits are set forth in 40 CFR 405 – 471 (EPA's Effluent Limitation Guidelines). Water quality-based limits are required when any pollutant or pollutant parameter (conventional, non-conventional, toxic, and whole effluent toxicity) is or may be discharged at a level that causes, has reasonable potential to cause, or contributes to an excursion above any water quality criteria. Should both technology and water quality-based limits apply to a particular pollutant, the more stringent limit would apply.

D. TECHNOLOGY-BASED LIMITS FOR DSN-008-1:

As noted above, DSN 008-1 is not subject to 40 CFR 423 or any other ELG. Therefore, there are no technology-based limits associated with any ELG for this discharge.

E. MIXING ZONES FOR DSN 008-1:

- **Toxic Mixing Zone**: In 1986, a dye dilution study was conducted at Pfizer. The results of this study were evaluated under the proposed permit conditions in order to determine a mixing zone that is applicable to DSN 008-1. See Attachment 9 for detail.

- **Thermal Mixing Zone**: In 2013, Pfizer conducted a study to evaluate the thermal impact of DSN 008-1. Modeling was also conducted in order to determine the size and extent of the thermal plume in the receiving stream. See Attachment 10 for detail.

F. WATER QUALITY-BASED LIMITS FOR DSN 008-1:

As defined in the TSD, reasonable potential is where an effluent is projected or calculated to cause an excursion above a water quality standard based on a number of factors, including at a minimum, the four factors listed in 40 CFR 122.44(d)(1)(ii). A reasonable potential analysis was conducted for each parameter that could be expected to be in the discharge. [See Attachment 11 for the reasonable potential analysis.] This analysis indicates that reasonable potential exists for Bis(2-ethylhexyl) phthalate to exceed the applicable water quality criteria. Therefore, consistent with 40 CFR 122.44(d)(1)(iii), the permit will include water quality-based limits for this parameter.

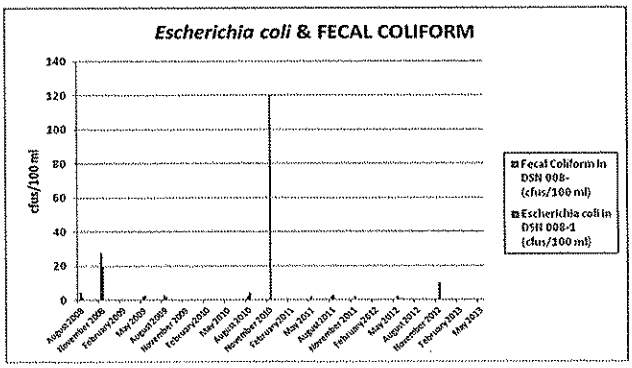
G. CASE-BY-CASE LIMITS FOR DSN 008-1:

Case-by-case limits consistent with RCSA Section 22a-430-4(m) were developed for: Oil & Grease (based on a visual standard of 5 ppm) and Total Iron (based on the limits set forth in RCSA Section 22a-430-4(s)).

H. COMMENTS ON OTHER MONITORING PARAMETERS FOR DSN 008-1:

- **Dissolved Oxygen**: Section 22a-426-9(a)(1) of the *Water Quality Standards* sets forth Dissolved Oxygen criteria for Class SB waters. The Permittee shall determine, on a quarterly basis, the Dissolved Oxygen content of its discharge and that of the receiving water.

- **Fecal Coliform & *Enterococci***: Pfizer's existing permit requires monitoring for both fecal coliform and *Escherichia coli*. Both of these parameters were included for monitoring due to historic issues concerning bacteria content in DSN 008-1. As of September 2013, a State-wide bacteria TMDL for the Thames River segment that Pfizer discharges into became effective. While Pfizer is not specifically allocated a load in that TMDL, continued monitoring of DSN 008-1 for bacterial indicators is recommended. Consistent with the subject TMDL and the existing *Water Quality Standards*, the bacterial indicator species for marine waters are: fecal coliform and *Enterococci*. Therefore, these two parameters will be included for monitoring in the permit.

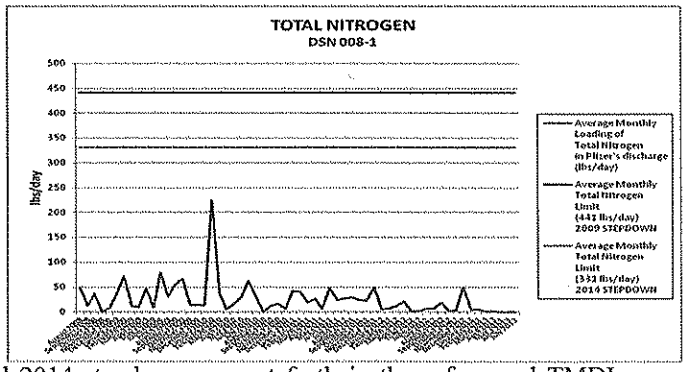


- **Temperature/Temperature Rise/Waste Heat**: In July 2013, Pfizer conducted an evaluation of the impact of the thermal component of DSN 008-1 on the Thames River. The results of this study indicate that a maximum effluent temperature limit of 90 °F and a maximum temperature rise of 32.1 °F is protective of fisheries resources in the subject area. [See Attachment 10 for details.]

- **Total Iron**: EPA Method 200.7 had been used to analyze DSN 008-1 for Total Iron. However, it was determined that there were some possible matrix interferences associated with the use of this method. Since 2011, Pfizer has been using EPA Method 6020 to analyze DSN 008-1 for Total Iron and it has not experienced any interferences with the use of this method. Therefore, EPA Method 6020 will be the test method that Pfizer uses

for Total Iron testing under this permit. This is incorporated at Section 6(A)(2) of the permit because this test method is not included in 40 CFR 136.

- **Total Nitrogen**: The TMDL, *A Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound*, December 2000, assigns Total Nitrogen allocations, by zone, to certain facilities that discharge into Long Island Sound watershed basins. This TMDL is structured so that reductions to baseline allocations occur in steps. The reduction schedule published in the TMDL is specified as follows: a 25% reduction of the baseline through 2008; a 47.6% reduction of the baseline from 2009 through 2013; and a final 63.5% reduction of the baseline by 2014. Pfizer's 2009 and 2014 stepdowns, as set forth in the referenced TMDL, were adjusted before the last permit term to reflect a value in line with the changes made to the facility since the original baseline values were determined. The adjusted 2014 stepdown is 331 lbs/day (average monthly). This will continue to be the limit in the permit.



I. WHOLE EFFLUENT TOXICITY:

Pfizer's existing permit requires semi-annual acute toxicity testing and semi-annual chronic toxicity testing for DSN 008-1 using *Mysidopsis bahia* and *Cyprinodon variegates*. The existing permit includes limits for acute toxicity (>90% Survival in 100% effluent) and requires monitoring only for chronic toxicity. Results of the acute and chronic toxicity conducted under the existing permit are as follows:

	ACUTE (48 HOURS)		CHRONIC (7 DAYS)						
	M. bahia	*C. variegates*	*M. bahia*				*C. variegates*		
	% Survival in 100% effluent	% Survival in 100% effluent	% Survival in 100% effluent	SURVIVAL	GROWTH	FECUNDITY	% Survival in 100% effluent	SURVIVAL	GROWTH
	%	%	%	% C-NOEC	% C-NOEC	% C-NOEC	%	% C-NOEC	% C-NOEC
AUG 2008	100	98	90	100	100	46	98	100	100
FEB 2009	100	100	98	100	100	100	100	100	100
AUG 2009	97	100	82	100	100	100	100	100	100
FEB 2010	100	100	98	100	100	100	100	100	100
AUG 2010	98	98	92	100	<100	100	97	100	100
FEB 2011	93.3	98.3	88.3	100	100	100	98.3	100	100
AUG 2011	100	98	97	100	100	100	98	100	100
FEB 2012	96.7	98.3	90	100	100	50	98.3	100	100
AUG 2012	98.3	98.3	93.3	100	100	47	98.3	100	<100
FEB 2013	100	100	100	100	<100	15.3	100	100	100

As required, Pfizer shall continue to perform acute aquatic toxicity and chronic aquatic toxicity for DSN 008-1. The frequency shall remain semi-annual. An analysis of the receiving water in the vicinity of Pfizer's discharge indicates that the salinity values are generally higher than 20 ppt. Therefore, consistent with RCSA Section 22a-430-3(j)(7)(A)(iii)(c), the test species for the aquatic toxicity testing shall remain *Mysidopsis bahia* (now identified as *Americamysis bahia*) and *Cyprinodon variegates*. The only change with respect to the toxicity testing is the expression of the limits for acute toxicity which should be LC_{50}, consistent with other like discharges. Based on the semi-annual testing performed from 2008 until 2013, there is no reasonable potential that the discharge could contribute to chronic toxicity at the edge of the chronic mixing zone (i.e., at an IWC of 2.17%). Therefore, chronic toxicity shall continue to be monitoring only.

K. MONITORING FREQUENCY:

The *Monitoring Schedule* set forth in RCSA 22a-430-3 does not prescribe a frequency for DSN 008-1. Therefore, the monitoring frequency shall be based on a case-by-case basis.

L. WASTESTREAMS AUTHORIZED FOR DISCHARGE UNDER DSN 009-1:

DSN 009-1 consists of the discharge of intake screen backwash water only. Backwashing the screens is conducted using Thames River water only. Therefore, the only pollutant of concern that could be introduced into the Thames River from this operation is Total Suspended Solids.

M. BASIS FOR DSN 009-1 PARAMETERS, LIMITS, AND MONITORING FREQUENCIES:

There are no changes in the permit to any of the monitoring parameters or flows associated with DSN 009-1. Total Suspended Solids is the only parameter of concern associated with this discharge and it will continue to be a monitoring parameter.

N. WASTESTREAMS AUTHORIZED FOR DISCHARGE UNDER INTAKE 01H:

INTAKE 01H consists of Thames River intake water only.

O. BASIS FOR INTAKE 01H PARAMETERS, LIMITS, AND MONITORING FREQUENCIES:

The only monitoring parameters required for the intake include flow and temperature. The other monitoring parameters which are in the existing permit (e.g., metals, toxicity, etc.) are not required and are duplicative since the Thames River water is being tested for these parameters as part of the chronic toxicity testing.

XV. EXPRESSION OF EFFLUENT LIMITATIONS

The DSN 008-1 discharge operates continuously. Therefore, the permit limits for DSN 008-1 are expressed as average monthly and maximum daily, unless impracticable. Limits based on water quality are expressed as both mass and concentration. There are no monitoring limits for DSN 009-1 and INTAKE 01H except for flow.

XVI. ANTI-BACKSLIDING

An antibacksliding analysis was conducted on the final effluent limitations. None of the effluent limitations are less stringent than the limits in the existing permit. Total Residual Chlorine is no longer limited since there is now no reasonable potential for that pollutant to exceed water quality criteria.

XVII. ANTIDEGRADATION

The renewed permit does not reflect any new or expanded discharges.

XVIII. SECTION 316(a) OF THE CWA

There is a thermal component associated with the DSN 008-1 discharge. Section 316(a) of the CWA and the implementing regulations at 40 CFR 125, Subpart H allow for the imposition of alternative limitations for control of the thermal component of a discharge in lieu of effluent limitations that would otherwise be required under Sections 301 or 306 of the CWA if the Permittee can demonstrate (by submission of a variance request) that the alternative limits will assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the waterbody into which the discharge is made. A summary of the history of the studies/requests conducted relative to the thermal component of DSN 008-1 is summarized in Appendix 10.

XIX. SECTION 316(b) OF THE CWA

Pfizer operates a cooling water intake structure on the Thames River. The water withdrawn from the river is used by Pfizer in its support/utilities operations. All of the water withdrawn is used as cooling water. Consequently, the operation of the intake structure is subject to Section 316(b) of the CWA. Section 316(b) requires that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available (BTA) for minimizing adverse environmental impact. The CWA does not describe either the technologies or the factors to be considered in establishing Section 316(b) requirements that reflect the best technology available for minimizing the adverse environmental impact. In April 2011, EPA proposed regulations entitled *Cooling Water Intake Structures at Existing Facilities* which would impose certain performance standards associated with the operation of a cooling water intake structure which, when implemented, would minimize its adverse environmental impact. To date, these regulations have not been finalized. Therefore, the BTA determination for Pfizer was made using Best Professional Judgment, considering site-specific factors.

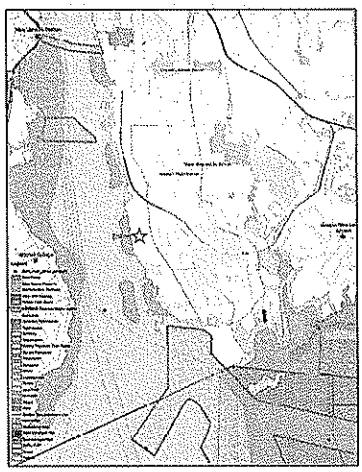
As noted previously, Pfizer's permit was modified (by incorporation of Paragraphs 10(B)(6) through 10(B)(10)) to include a requirement that it evaluate its cooling water intake structure consistent with the provisions in Section 316(b) of the CWA. Pfizer undertook the requisite biological studies to evaluate the environmental impact of its cooling water intake structure in 2009. On September 26, 2011, Pfizer submitted a report entitled, *BTA Evaluation*, prepared by its consultant, Kleinschmidt Associates, in response to Paragraph 10(B)(7) of its permit. Supplemental information relative to the evaluation dated December 21, 2011, January 9, 2012, and February 22, 2013 was also provided to the Department. The information provided in these documents was used in making the site-specific BTA determination for Pfizer. A summary of these factors is as follows:

Site Make-up

Pfizer is located in a mixed residential/commercial/industrial area in Groton. The West Campus portion of the property is adjacent to the Thames River and is approximately 60 acres in size. Pfizer uses once-through cooling water for its operations that is provided by a salt water intake structure located on the Thames River on the West Campus side of the property. West Campus had formerly been used for pharmaceutical manufacturing operations. When the manufacturing operations ceased, many of the buildings and related equipment associated with manufacturing were demolished. Consequently, West Campus now contains a large amount of open space.

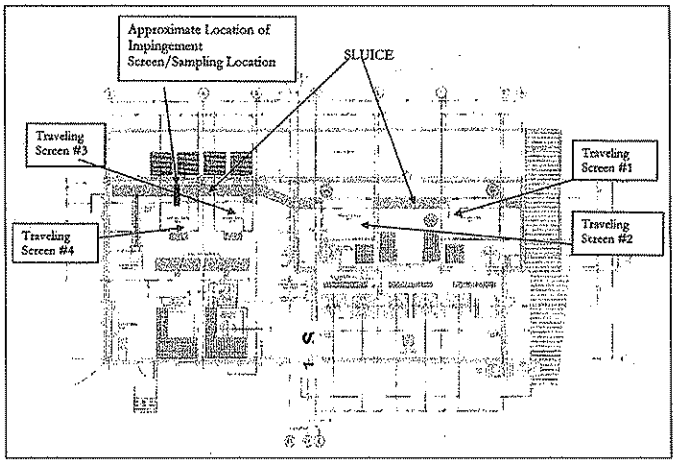
Source Water Information

The Thames River is a 16-mile long tidal river that begins in Norwich at the confluence of the Yantic and Shetucket rivers and ends at Long Island Sound (LIS). Pfizer is located in the lower Thames River, approximately a mile from the mouth. The depth of the river in this area averages 16 feet (below MLLW) but extends up to 45 feet at the deepest location (in the navigation channel). The width of the river in the location of Pfizer's intake is approximately 4,000 feet. Portions of the LIS cable are located in the lower Thames River. Town and State-managed shellfish beds are located in proximity of Pfizer. State-threatened *Alosa aestivalis* (blueback herring) inhabit the Thames River. The segment of the Thames River that Pfizer discharges into is impaired for commercial shellfish harvesting and fish habitat. The salinity in the lower Thames River ranges from 26 to 30 ppt (surface to bottom) year-round. The mean tidal range in the lower Thames River is approximately 2.2 feet with a tidal cycle occurring every 12.5 hours/day. The average current measured in the area is 0.26 knots.



Cooling Water Intake Structure

Pfizer withdraws water from the Thames River for its operations from a single submerged shoreline intake structure in Building 109 (known as INTAKE 01H in the NPDES Permit) located on the east side of the Thames River at 41° 19' 56 N (latitude) and 72° 4' 46 W (longitude). The intake structure consists of two sections: the original section ("pump house") was constructed in 1951; in 1972, an addition to the pump house was constructed. The pump house contains one low pressure pump and two high pressure pumps; the newer-constructed section contains one low pressure pump. The two low-pressure pumps are the primary pumps and provide 7,500 gallons per minute (gpm) and 3,500 gpm of water to the facility. These pumps are routinely operated 24 hours/day on a year-round basis. At full capacity (i.e., operating at 24 hours/day), the low-pressure pumps would provide 10.8 MGD and 5 MGD of cooling water. As demand increases in July through September, one or both of the high-pressure pumps may be put into service. The two high-pressure pumps are each designed to provide 10,000 gpm of water to the facility (i.e., 14.4 MGD each). The total design intake flow (DIF) is 44.6 MGD.



There are currently three traveling screens in use in the pump house which are designed to divert fish and debris away from the intake system. A fourth traveling screen was removed from service in 2009. Traveling screens #1 and #2 (both by Envirex) are oriented perpendicular to the river. These screens are each nine feet wide and are equipped with 3/8-inch 304-stainless steel, 14-gauge mesh and with 6-inch high "lift trays" every 24 inches. These traveling screens are designed at a velocity of 1.86 feet per second (fps) at 60,000 gpm. Traveling screen #3 (by FMC) is oriented parallel to the river and is equipped with 1/4-inch 304-stainless steel, 14-gauge mesh and has 2-two inch high lift trays every 18 inches. This traveling screen is designed for a velocity of 1.82 fps at 30,000 gpm of pumping capacity. Periodically, the traveling screens are backwashed with Thames River water to remove solids build-up; this activity occurs more frequently during inclement weather. The wastewater associated with this operation is discharged via a concrete sluice back into the Thames River via DSN 009-1 in the NPDES Permit.

Recent Intake Water Reductions & Future Site Activities

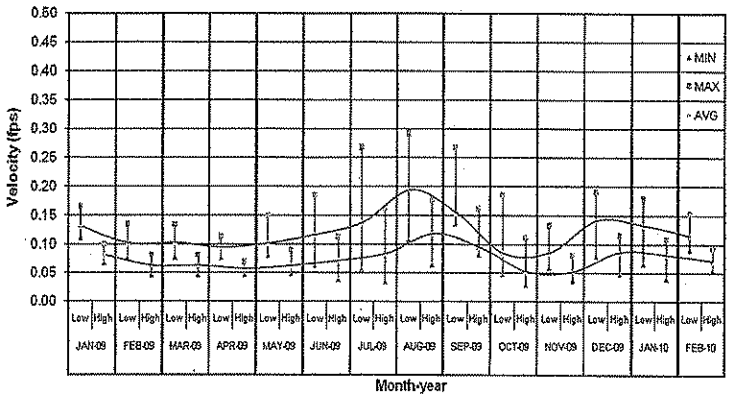
Pfizer has experienced numerous changes to site conditions and operations in recent years that have significantly altered the size and scope of its activities. Prior to 2007, when manufacturing operations took place at the site, the average monthly intake flows were approximately 40-50 MGD. After manufacturing ceased at the facility, the average monthly intake flows were about 20-25 MGD. Since re-activation of the Building 84 cooling tower in May/June 2011, additional reductions in Thames River water usage have occurred. Given the direct relationship between intake water withdrawals and entrainment, it is assumed that reductions in entrainment have also occurred. Pfizer has no plans to make any changes to its existing site activities that would increase water usage in the next five years. A summary of the last five years of intake flows are as follows:

MONTH	2008		2009		2010		2011		2012		2013	
	AVERAGE INTAKE FLOW (MGD)	MAXIMUM INTAKE FLOW (MGD)	AVERAGE INTAKE FLOW (MGD)	MAXIMUM INTAKE FLOW (MGD)	AVERAGE INTAKE FLOW (MGD)	MAXIMUM INTAKE FLOW (MGD)	AVERAGE INTAKE FLOW (MGD)	MAXIMUM INTAKE FLOW (MGD)	AVERAGE INTAKE FLOW (MGD)	MAXIMUM INTAKE FLOW (MGD)	AVERAGE INTAKE FLOW (MGD)	MAXIMUM INTAKE FLOW (MGD)
JANUARY			10.83	13.89	11.01	15.29	5.74	8.77	5.00	6.11	5.44	11.57
FEBRUARY			8.53	11.31	9.48	12.83	5.21	6.39	5.35	6.72	4.76	5.04
MARCH			8.47	11.22	9.02	14.14	5.10	6.59	5.01	6.80	5.28	11.20
APRIL			7.88	9.53	4.72	9.12	5.19	7.02	5.29	6.06	4.90	8.99
MAY			8.43	12.61	7.01	14.57	5.93	9.40	5.45	7.32	4.87	8.31
JUNE			9.70	15.55	11.04	25.09	7.26	11.18	5.80	10.82	6.30	10.52
JULY			11.46	22.50	17.77	27.16	5.35	12.62	4.58	7.59	5.10	9.37
AUGUST	6.19	12.23	16.21	24.47	19.63	24.23	3.73	6.17	5.47	8.69		
SEPTEMBER	4.51	9.78	15.85	22.50	13.66	21.69	3.99	10.59	4.84	5.84		
OCTOBER	5.92	9.89	6.97	15.56	5.95	14.41	5.95	8.76	5.49	7.37		
NOVEMBER	7.31	10.71	6.99	11.14	5.36	10.37	4.62	9.04	7.23	9.62		
DECEMBER	9.25	11.64	11.79	15.98	7.22	10.88	5.73	11.49	7.46	9.80		
			10.26		10.16		5.32		5.58			

Actual Intake Flow (AIF): 7.83 MGD

Impingement Study

From February 2009 to January 2010, a study was conducted by Fuss and O'Neill and Aquatec Biological Sciences, Inc. to evaluate the extent of fish impingement associated with Pfizer's cooling water intake structure. The results of this study are summarized in the document entitled, *An Evaluation of Pfizer Inc. Intake Fish Impingement February 2009 to January 2010*, June 2010. As part of this study, fish impingement was monitored at various frequencies (weekly to bi-monthly) for a duration of one year. During this time, 41 samples were collected and only one fish was impinged during the entire study. During the study period, average through-screen velocities were calculated to be between 0.05 to 0.19 fps; the maximum through-screen velocity was determined to be approximately 0.29 fps. The maximum (through-screen) design intake velocity is 0.52 fps. Due to the low impingement rate associated with its intake structure, Pfizer was not required to implement technologies or operational measures in order to address impingement.



Entrainment Study

From February 2009 to January 2010, a study was conducted by Fuss and O'Neill and Aquatec Biological Sciences Inc. to evaluate the extent of ichthyoplankton entrainment associated with Pfizer's cooling water intake structure. The results of this study are summarized in the document entitled, *An Evaluation of the Pfizer Inc. Saltwater Intake Ichthyoplankton Entrainment, February 2009 – January 2010*, July 2010. Samples for the entrainment study were taken at various frequencies (weekly to bi-monthly) for a duration of one year from both Pfizer's intake and from four locations in the Thames River. Results of this study indicate that three species primarily dominate Pfizer's intake: cunner, tautog, and bay anchovy. There was one anomaly noted during the study and this concerned the absence of winter flounder larvae in Pfizer's intake, despite the fact that winter flounder were found in the four Thames River samples. The absence of winter flounder larvae in the intake was proposed to be attributable to either: reduced intake/velocity rates, thereby leading to a lower potential for winter flounder to be present in the water column, or the non-homogeneous distribution of winter flounder.

The entrainment study results associated with Pfizer's intake are as follows:

		FEB 2009	MAR 2009	APR 2009	MAY 2009	JUN 2009	JUL 2009	AUG 2009	SEPT 2009	OCT 2009	NOV 2009	DEC 2009	JAN 2009
WITHDRAWAL RATES (MGD)	MIN	6.36	6.39	6.34	6.65	5.24	4.73	8.94	11.31	4.02	4.94	6.67	5.51
	AVG	8.53	8.47	7.88	8.43	9.70	11.46	16.21	12.86	6.89	7.01	11.81	11.04
	MAX	11.31	11.22	9.53	12.61	15.55	22.50	24.47	22.49	15.57	11.16	16.02	15.08
SAMPLING EVENTS:		4	4	5	4	5	4	4	5	2	2	2	2

# EGGS ENTRAINED IN PFIZER'S INTAKE/500 m^3:													TOTAL	%
Cunner	0	0	22	112	4941	6933	4012	91	15	0	0	0	16,126	52
Tautog	0	0	9	266	3906	3645	583	0	0	0	0	0	8,409	27
Bay anchovy	0	0	9	13	513	1024	15	0	0	0	0	0	1,574	5
Butterfish	0	0	0	0	134	954	192	0	0	0	0	0	1,280	4
Atlantic mackerel	0	18	4	0	873	0	0	0	0	0	0	0	895	3
Silver hake	0	0	8	0	214	543	92	0	0	0	0	0	857	3
Sea robins	0	0	4	0	385	370	15	0	0	0	0	0	774	2
Morone	0	0	0	0	410	49	0	0	0	0	0	0	459	1
Hogchoker	0	0	0	0	20	30	5	0	0	0	0	0	55	0
Windowpane flounder	0	10	0	0	0	0	0	0	0	0	0	0	10	0
Winter flounder	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atlantic tomcod	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Four-beard rockling	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Menidia	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scup	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	22	224	229	55	15	10	5	0	0	0	560	2
	0	28	78	615	11625	13603	4929	101	20	0	0	0	30,999	

# LARVAE ENTRAINED IN PFIZER'S INTAKE/500 m^3:													TOTAL	%
Bay anchovy	0	0	0	0	0	0	2263	36	0	0	0	0	2,299	63
Atlantic menhaden	0	0	0	0	0	0	310	0	0	0	0	0	310	9
Cunner	0	0	0	0	0	55	10	0	0	0	0	0	65	2
Naked goby	0	0	0	0	0	0	30	0	0	0	0	0	30	1
Butterfish	0	0	0	0	0	5	10	0	0	0	0	0	15	0
Rock gunnel	0	11	0	0	0	0	0	0	0	0	0	0	11	0
Grubby/little sculpin	5	0	4	0	0	0	0	0	0	0	0	0	9	0
Tautog	0	0	0	0	0	0	5	0	0	0	0	0	5	0
Windowpane flounder	0	0	0	5	0	0	0	0	0	0	0	0	5	0
Alosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0
American sand lance	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atlantic cod	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atlantic mackerel	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atlantic tomcod	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Four-beard rockling	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lobster	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Menidia	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morone	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northern pipefish	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Radiated shanny	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scup	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summer flounder	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Winter flounder	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow perch	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5	11	4	5	0	60	2628	36	0	0	0	0	2,749	

NOTE: Adult equivalents of entrained tautog eggs and larvae were calculated using the methodology described by Horst. The equivalent adult losses (using an Age 3 Adult) were less than one.

Based on the data collected during the 2009/2010 entrainment study, annual estimates of eggs and larvae entrained are as follows:

SPECIES	NAME	EGGS ESTIMATED TO BE ENTRAINED ANNUALLY
Cunner	*Tautogolabrus adspersus*	10,307,078
Tautog	*Tautoga onitis*	4,837,752
Bay anchovy	*Anchoa mitchilli*	906,732
Butterfish	*Peprilus triacanthus*	812,052
Silver hake	*Merluccius bilinearis*	521,399
Atlantic mackerel	*Scomber scombrus*	456,102
Sea robins	*Prionotus spp.*	434,852
Morone	*Morone spp.*	240,135
Hogchoker	*Trinectes maculates*	32,748
Windowpane flounder	*Scophthalmus aquosus*	4,482
		18,553,332

SPECIES	NAME	LARVAE ESTIMATED TO BE ENTRAINED ANNUALLY
Bay anchovy	*Anchoa mitchilli*	1,965,698
Atlantic menhaden	*Brevoortia tyrannus*	265,919
Cunner	*Tautogolabrus adspersus*	41,934
Naked goby	*Gobiosoma bosc*	25,734
Tautog	*Tautoga onitis*	12,500
Rock gunnel	*Pholis gunnellus*	4,930
Grubby/little sculpin	*Myoxocephalus aeneus*	1,667
		2,318,382

Proposed Entrainment Mortality Control Technologies & Operational Measures

As part of its *BTA Evaluation*, the Permittee has proposed and evaluated certain technologies and operational measures designed to mitigate/eliminate the impact associated with its cooling water intake structure. The specific technologies that were evaluated are as follows:

- *Closed-cycle cooling*
  - *Wet cooling using either municipal water make-up or reclaimed water make-up*
  - *Dry cooling*
- *Variable speed pumps*
- *Aquatic microfiltration barriers*
- *Cylindrical wedgewire screens*
- *Fine-mesh screens*
- *Relocation of the intake structure*

The technologies evaluated involve either flow reduction, screening, or exclusion. Each of these technologies was evaluated in consideration of criteria applicable to site conditions at Pfizer. These criteria included: technical feasibility (i.e., is it technically feasible to construct, operate, and maintain the proposed technology at the site), projected entrainment reductions (i.e., what site-specific reductions in entrainment could be realized using the proposed technology at the site), system reliability (i.e., will installation of the technology still result in a reliable source of water to be provided to the cooling system while reducing entrainment); adverse effects associated with the proposed technology (i.e., what impacts/problems might be caused as a result of installing/operating the technology, including impacts concerning: water resources/supplies, noise, air, aesthetics, navigation, high energy demand, or complex permitting requirements).

A summary of the proposed technologies/operational measures is as follows:

CLOSED-CYCLE COOLING (WET COOLING)

DESIGN & OPERATION	TECHNICAL FEASIBILITY	PROJECTED REDUCTION IN ENTRAINMENT	RELIABILITY	POTENTIAL PROBLEMS AND MEANS TO MINIMIZE/ELIMINATE PROBLEMS
A wet cooling system transfers waste heat from cooling water to the atmosphere by means of evaporation. A wet cooling system allows a facility to re-use its cooling water, thereby eliminating/reducing the use of "once-through" water.	A new cooling tower or an expansion of Pfizer's existing cooling tower could be constructed in the open space on West Campus. Completion of this work is technically feasible with no known constraints.	100%	Wet cooling is a proven technology and requires no extraordinary maintenance. Service life of such a system is in excess of 30 years. Use of this technology will continue to allow Pfizer the ability to deliver power, steam, and chilled water in order to meet its needs while eliminating entrainment.	The operation of a wet cooling tower will generate some level of air emissions (PM_{10}), however, this can be controlled through air emission control devices, if necessary. Blowdown from the cooling tower could contribute additional pollutants (e.g., heat, metals, etc.) to DSN 008-1. However, additional treatment could be provided, if necessary. There is an energy demand associated with the operation of this unit.

CLOSED-CYCLE COOLING (DRY COOLING)

DESIGN & OPERATION	TECHNICAL FEASIBILITY	PROJECTED REDUCTION IN ENTRAINMENT	RELIABILITY	POTENTIAL PROBLEMS AND MEANS TO MINIMIZE/ELIMINATE PROBLEMS
A dry cooling system transfers waste heat from cooling water to the atmosphere by means of convection and radiation. The degree to which heat transfer occurs is governed by the temperature of the ambient air. A dry cooling system allows a facility to re-use its cooling water, thereby eliminating/ reducing the use of "once-through" water.	A dry cooling system could be constructed in the open space on West Campus. Completion of this work is technically feasible with no known constraints.	100%	Dry cooling is a proven technology. Because a dry cooling system operates more efficiently when there is a larger temperature difference between the cooling water and the ambient air temperature, a standard dry cooling system may prove unreliable on those days were the ambient air temperature is high.	The operation of a dry cooling system will generate air emissions, however, this can be controlled through air emission control devices. A dry cooling unit would occupy a large footprint and would consume more energy than a wet cooling unit.

VARIABLE SPEED PUMPS

DESIGN & OPERATION	TECHNICAL FEASIBILITY	PROJECTED REDUCTION IN ENTRAINMENT	RELIABILITY	POTENTIAL PROBLEMS AND MEANS TO MINIMIZE/ELIMINATE PROBLEMS
Pumps that operate in a variable-speed mode (versus a fixed-speed mode) allow for a facility to customize the amount of water that it withdraws, thereby enabling the facility to withdrawn only the water it needs instead of a fixed (maximum) amount of water.	Conversion to the use of variable speed pumps at Pfizer will require the addition of variable frequency drives to the existing pumps or may possibly require the installation of new pumps. Completion of this work is technically feasible with no known constraints.	10%-30%, depending on operational and seasonal conditions.	Variable speed pumps are a proven technology that is used by various industries. Installation of this technology will continue to allow Pfizer the ability to deliver power, steam, and chilled water in order to meet its needs. However, the use of variable speed pumps will only be effective if used during times when biological abundance in the waterbody is at the highest levels. However, this also coincides with times of peak cooling demand for Pfizer. Consequently, reduced intake flows at this time could adversely impact the efficiency of on-site operations.	There are certain limitations associated with variable speed pumps/drives, including the following: the extent to which the speed can be varied is limited to the pump's specific flow range; using less cooling water could result in decreased operational efficiency and a higher thermal component to the water.

AQUATIC FILTRATION BARRIER

DESIGN & OPERATION	TECHNICAL FEASIBILITY	PROJECTED REDUCTION IN ENTRAINMENT	RELIABILITY	POTENTIAL PROBLEMS AND MEANS TO MINIMIZE/ELIMINATE PROBLEMS
An aquatic microfiltration barrier (AMB) is fabric barrier device which is installed around an intake structure, much like a curtain, so that aquatic organisms will be prevented from being drawn into the intake structure. Gunderboom® manufactures and installs an AMB known as Marine Life Exclusion System™ (MLES) which is designed to be used in coastal environments. The MLES is anchored in place in front of the intake structure and is suspended by flotation billets. The MLES can also be equipped with an Automatic AirBurst™ Cleaning System which uses bursts of compressed air to clean off any sediment or organisms that may have gotten trapped onto the fabric barrier.	The system would need to be anchored in front of Pfizer's intake structure. However, a portion of the LIS cable runs in front of Pfizer's intake structure. It's uncertain whether this may pose problems/complications in terms of anchoring the system in place. The expected service life of the AMB is unknown, as the technology is still being developed/tested.	62%-94% (as documented during the study at the Taunton Desalination Plant)	The Gunderboom® systems have only been used at a small number of coastal facilities and all have been tested in environments that would be considered less severe than the coastal conditions at Pfizer's site. The facilities that have used these systems have experienced operational issues including: tearing fabric, damage to the flotation billets, fouling of the fabric caused by colonization of microorganisms, reduced velocity through the fabric as a result of the colonization; and wave overtopping. It is possible that a significant amount of maintenance could be necessary in order to keep the system functioning properly, even if deployed on only a seasonal basis.	There is a high possibility that the fabric could get fouled, particularly by blue mussels. Pfizer would need to ensure that routine maintenance was untaken to keep fouling to a minimum. The concerns about fabric tearing and wave overtopping cannot be minimized or eliminated. The AMB would end up being installed relatively close to the navigation channel. It's not clear whether the vessel traffic in the channel could cause some issues/problems with the AMB.

CYLINDRICAL WEDGEWIRE SCREENS

DESIGN & OPERATION	TECHNICAL FEASIBILITY	PROJECTED REDUCTION IN ENTRAINMENT	RELIABILITY	POTENTIAL IMPACTS AND MEANS TO MINIMIZE/ELIMINATE IMPACTS
A cylindrical wedgewire screen is a passive screening system designed to reduce entrainment by using physical exclusion and hydrodynamics. The design of the screen consists of wedge-shaped wires that are affixed to a cylindrical frame which is submerged in the waterbody in front of the intake. The effectiveness of the screens are dictated by the mesh size and the through-slot velocity. The cylindrical configuration of the screening device combined with the low through-screen velocities reduce the zone of influence of the water being withdrawn, thereby allowing organisms to escape the flow field and drift past the intake.	The proposed system for Pfizer would consist of four screens each 5.5 feet in diameter with 0.5 mm slot widths. The screens are proposed to be manufactured from 316-stainless steel or from a copper-nickel alloy which would aid in minimizing biofouling. The screens must be installed submerged in the waterbody at a prescribed depth. There are no known issues associated with the installation of the screens. An air backwash system (Hydroburst™) would be installed to clean the screens.	58%-72% (in an estuarine setting using slot widths of 0.5 to 1.0 mm)	No documentation was provided as to whether the screens are reliable in a marine setting like Pfizer's. While a 0.5 mm slot would reduce entrainment for the three major species of eggs and larvae that were identified during Pfizer's 2009/2010 entrainment study, this small slot size will result in the potential of clogging from debris, requiring routine cleaning, but should still allow Pfizer the ability to deliver power, steam, and chilled water in order to meet its needs while reducing entrainment.	Construction of the system may create some disruption to the benthic environment, although this would not be expected to be significant.

FINE-MESH SCREENS				
DESIGN & OPERATION	**TECHNICAL FEASIBILITY**	**PROJECTED REDUCTION IN ENTRAINMENT**	**RELIABILITY**	**POTENTIAL IMPACTS AND MEANS TO MINIMIZE/ELIMINATE IMPACTS**
Fine-mesh screens are designed to reduce entrainment by physically excluding eggs, larvae, and juvenile forms of fish from entering the cooling water system. The degree of entrainment reduction is dependent on the size of the mesh used.	The course mesh in Pfizer's existing traveling screens would be replaced by fine-mesh overlays (0.5 mm slot openings). Since the use of the fine-mesh screens will result in increased through-screen velocities, the installation of an upgraded fish handling and return system to address impinged organisms could be necessary also. The fine-mesh overlays are proposed to be used seasonally and would need to be installed during times of plant shutdowns.	up to 90%	A 0.5 mm slot would reduce entrainment for the three major species of eggs and larvae that were identified during the 2009/2010 entrainment study. The small slot size would tend to cause fouling and clogging requiring additional maintenance, but should still allow Pfizer the ability to deliver power, steam, and chilled water in order to meet its needs while reducing entrainment.	Use of fine-mesh screens would result in increased screen velocities and would likely result in increased impingement rates (i.e., as mesh sizes are reduced, through-screen velocities are increased, causing more organisms to become impinged on the screens). Nonetheless, the velocity rates would still be expected to be less than 0.5 fps.

RELOCATION OF THE INTAKE				
DESIGN & OPERATION	**TECHNICAL FEASIBILITY**	**PROJECTED REDUCTION IN ENTRAINMENT**	**RELIABILITY**	**POTENTIAL IMPACTS AND MEANS TO MINIMIZE/ELIMINATE IMPACTS**
The location of a cooling water intake structure would ideally be in an area of a waterbody where the lowest biological populations exist. In marine environments, the shoreline is generally an area of high biological activity where deeper, colder sections of a waterbody are less biologically productive. Therefore, by locating a facility's intake structure in an area with less biological activity (i.e., less eggs and larvae), less organisms are available to be entrained, thus limiting the effects of entrainment mortality.	Relocation of the intake (either to a deeper section of the Thames River or into Long Island Sound) would require the installation of piping from Pfizer's facility to the desired area. The installation of the piping could be complex in terms of logistical and permitting issues. Also, a preliminary investigation, by way of a literature review, did not uncover an acceptable area in Long Island Sound. Therefore, additional studies would need to be undertaken to determine an appropriate area to relocate the intake.	Unknown, contingent on area chosen	Relocated intakes have been installed and used successfully at facilities located in marine environments. Assuming that an appropriate area can be located, a relocated intake would be expected to reduce entrainment mortality while allowing Pfizer the ability to deliver power, steam, and chilled water in order to meet its needs.	Relocation of the intake into Long Island Sound could be a complex project and may disrupt the marine environment during construction. Biofouling may also occur over time; however, this could be addressed through periodic cleaning of the system.

Evaluation of the Technologies & Operational Measures

The results of the criteria evaluation for each of the proposed technologies/operational measures was considered in order to determine which of the proposed technologies/operational measures was the best. In making that determination, the following was considered:

TECHNOLOGY OR OPERATIONAL MEASURE	SUMMARY OF CRITERIA EVALUATION
CLOSED-CYCLE COOLING	The installation of closed-cycle cooling (either dry cooling or wet cooling) would eliminate the need to withdraw water from the Thames River, resulting in no entrainment impacts. The wet cooling system has the advantage of being more reliable in the summer months and has a reduced energy demand. The discharges (air and water) from a wet cooling system require evaluation.
VARIABLE-SPEED PUMPS	The use of variable-speed pumps could be effective at Pfizer if used during those times of high biological productivity (i.e., May through September). However, this time period coincides with periods of highest cooling demand and therefore using less cooling water at this time would likely have impacts to Pfizer's operations. In addition, Pfizer presently controls the amount of water drawn into its facility by use of either low-capacity or high-capacity pumps and by control valves. This configuration would be expected to generate the same level of water reduction as would be realized through the use of variable speed pumps.
AQUATIC MICROFILTRATION BARRIERS	AMBs are not proven technology yet and their use at Pfizer's site may not be technically feasible. Even assuming that the AMB is feasible, it would be challenging to keep the system at peak operating performance.
CYLINDRICAL WEDGEWIRE SCREENS	The use of cylindrical wedgewire screens (either 0.5 to 2 mm) would result in a reduction in entrainment mortality, but not as high as closed-cycle cooling. Also, additional information is required concerning how the system would perform in conditions like those at Pfizer.
FINE-MESH SCREENS	Replacing coarse-mesh screens with fine-mesh screens is projected to decrease entrainment of eggs and larvae. However, use of fine-mesh screens will increase through-screen velocities resulting in increased impingement rates. In addition, the use of fine-mesh screens increases the potential for eggs and larvae larger than the mesh size to become entrapped, resulting in higher impingement mortality rates.
RELOCATION OF THE INTAKE STRUCTURE	Relocation of the intake could be a complex project, especially if the target location was in Long Island Sound. Construction of the relocated intake has the potential to be a lengthy process also and could create some moderate disturbances to the marine environment. Additionally, an assessment is still required to determine a feasible location to site the intake.

Selection of Best Technology Available

After evaluating all of the known and available alternatives, the Department has determined that in this case, closed-cycle cooling represents the best technology available for minimizing the adverse environmental impact associated with Pfizer's cooling water intake structure.

Pfizer has an existing cooling tower on-site (i.e., the Building 84 cooling tower) that it will upgrade in order to meet the requirements of Section 316(b) of the CWA. The two-cell, mechanical, draft cooling tower was custom-designed and manufactured by The Marley Cooling Tower Company (now SPX Cooling Technologies). It was built in 2001 and has a life expectancy in excess of 30 years. When manufacturing operations ceased in 2007, the tower was decommissioned. However, in 2011, Pfizer conducted an evaluation to determine its efficiency in meeting cooling water needs for the West Campus utilities operations. To date, Pfizer has made certain upgrades to the tower to ready it for increased use. Additional upgrades (i.e., re-activation of the second cell) are proposed to be undertaken so that all cooling water used at the facility for support/utilities operations will be re-circulated through this tower. The make-up water to the tower will be a municipal supply. Pfizer evaluated the use of the "gray water" as make-up water to the tower (i.e., the use of treated effluent from either the City of Groton's WPCF or the Town of Groton's WPCF) but this option had some potential problems associated with it (e.g., difficulty in making the tie-ins, pre-treatment would likely be required in order to prevent fouling of the cooling water system). Pfizer has conducted an analysis to evaluate the projected air emissions from the expanded unit. Based on information provided from Pfizer, the worst-case particulate emissions from the expanded cooling tower were calculated to be 0.145 lb/hr and 0.64 tons per year (TPY). These values were determined to be below the regulatory threshold of RCSA 22a-174-18 (65 lb/hr for particulate emissions) and RCSA 22a-174-3a (15 TPY for operating permits). The operation of the expanded tower is not expected to require any permitting, licenses, or additional approvals.

Upon completion of the cooling tower upgrade, the use of the intake structure will be eliminated. The remaining utilities wastestreams that comprise DSN 008-1 will continue to be discharged through DSN 008-1. Any modifications that may be necessary to the existing wastewater treatment system in order to treat these remaining wastestreams will be addressed through a permit modification once the plans are finalized. Any steps necessary to implement this BTA determination are being included as a special condition (i.e., Section 10) in the renewed permit.

XX. COMPLIANCE SCHEDULE

Section 10 of the permit requires that the Permittee develop and submit a plan for implementing the BTA project. This plan is subject to the review and approval of the Commissioner. Pfizer anticipates that the work associated with the BTA project will be completed by the end of 2015. The permit includes no impingement or entrainment requirements since completion of the BTA project will result in the elimination of the cooling water intake structure.

********SECTION BELOW ADDED TO FACT SHEET AFTER PUBLIC NOTICE PERIOD ENDED*******

XXI. NOTICE OF TENTATIVE DETERMINATION

On April 11, 2014, the Department published a Notice of Tentative Determination in *The Day* (of New London) indicating its intent to renew Pfizer's NPDES Permit No. CT0000957 (attached). During the 30-day comment period, no written comments were received.

DOCUMENT REVISION NOTES

REVISION	DATE	NOTES
Revision 1	May 13, 2014	- Added Section XXI concerning the Notice of Tentative Determination
Original	March 2014	N/A: Original Fact Sheet

ATTACHMENT 1

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

APPROVAL

January 9, 2009

James M. Constantine, P.E.
Associate Director, Environmental Health and Safety
Pfizer Inc.
Eastern Point Road, MS 4157
Groton, CT 06340

Re: Permit No. CT0000957
DEP/WPC 059-003
Town of Groton
Thames River Watershed

Dear Mr. Constantine:

Documentation from Pfizer Inc. ("Pfizer") dated November 25, 2008, submitted pursuant to the second part of paragraph 10(A)(4) of Pfizer's NPDES Permit CT0000957, issued on July 29, 2008, has been reviewed by staff of the Department of Environmental Protection's, Bureau of Materials Management and Compliance Assurance. This submittal, which describes the completion of all closure activities associated with Pfizer's former biological wastewater treatment system, is hereby approved in accordance with Sections 22a-424 and 22a-430 of the Connecticut General Statutes, as amended.

This approval does not relieve you of the obligation to obtain any other authorizations as may be required by Federal, State or Local laws or regulations.

If you have any questions regarding this matter, please contact Christine Gleason at (860) 424-3278.

Sincerely,

Oswald Inglese, Jr., Director
Bureau of Materials Management & Compliance Assurance
Water Permitting and Enforcement Division

c: DMR Section
Eric Watters, Pfizer

ATTACHMENT 2

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

APPROVAL

August 19, 2010

Eric Watters
Manager, Environmental
Pfizer Global Operations, US East Region
Eastern Point Road, MS 9090-073
Groton, CT 06340

Re: Permit No. CT0000957
DEP/WPC 059-003
Town of Groton
Thames River Watershed

Dear Mr. Watters:

The submittals entitled, *An Evaluation of Pfizer Inc Intake Fish Impingement, February 2009-January 2010,* June 2010, ("Impingement Report") and *An Evaluation of the Pfizer Inc Saltwater Intake Ichthyoplankton Entrainment, February 2009–January 2010,* July 2010, ("Entrainment Report") prepared for Pfizer Inc. ("Pfizer") by Fuss and O'Neill pursuant to paragraphs 10(B)(4) and 10(B)(5) of Pfizer's NPDES Permit, CT0000957, issued on July 29, 2008, has been reviewed by staff of the Department of Environmental Protection's, Water Permitting and Enforcement Division and Inland Fisheries Division. The Impingement Report and Entrainment Report, which provide the results of the year-long impingement and entrainment studies related to Pfizer's salt water intake structure, are hereby approved in accordance with Sections 22a-424 and 22a-430 of the Connecticut General Statutes, as amended. It should be noted, however, that while the impingement report concludes that there are no recommendations to improve the intake system, this conclusion may change based upon the BTA evaluation.

This approval does not relieve you of the obligation to obtain any other authorizations as may be required by Federal, State or Local laws or regulations.

If you have any questions regarding this matter, please contact Christine Gleason at (860) 424-3278.

Sincerely,

OSWALD INGLESE, JR., Director
Bureau of Materials Management & Compliance Assurance
Water Permitting and Enforcement Division

c: DMR Section
Mark Johnson, Senior Fisheries Biologist, Inland Fisheries Division

ATTACHMENT 3

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

APPROVAL

November 20, 2008

Eric Watters
Manager, Environmental
Pfizer Global Operations, US East Region
Eastern Point Road, MS 4157
Groton, CT 06340

Re: Permit No. CT0000957
DEP/WPC 059-003
Town of Groton
Thames River Watershed

Dear Mr. Watters:

Documentation from Pfizer Inc. ("Pfizer") dated October 23, 2008, submitted pursuant to paragraph 10(C)(2) of Pfizer's NPDES Permit CT0000957, issued on July 29, 2008, has been reviewed by staff of the Department of Environmental Protection's, Bureau of Materials Management and Compliance Assurance. This submittal, which describes and evaluates actions which have and will be taken to achieve bis (2-ethylhexyl) phthalate permit limits, is hereby approved in accordance with Sections 22a-424 and 22a-430 of the Connecticut General Statutes, as amended.

Status reports outlining the progress made by Pfizer in achieving the bis (2-ethylhexyl) phthalate permit limits are due beginning sixty days from the date of this letter, as required by Section 10(D) of the referenced NPDES permit.

This approval does not relieve you of the obligation to obtain any other authorizations as may be required by Federal, State or Local laws or regulations.

If you have any questions regarding this matter, please contact Christine Gleason at (860) 424-3278.

Sincerely,

Oswald Inglese, Jr., Director
Bureau of Materials Management & Compliance Assurance
Water Permitting and Enforcement Division

c: DMR Section

ATTACHMENT 4

Gleason, Christine

From: Johnson, Mark
Sent: Tuesday, May 28, 2013 3:18 PM
To: Gleason, Christine
Subject: RE: Pfizer renewal 201207927 and NDDB 201206233

Chris-

Blueback herring are present in the Thames River system and thus the NDDB has a record for this occurrence. This species is anadromous, meaning the adults migrate from the ocean to spawn in freshwater. In Connecticut, adults enter coastal streams and rivers during May and June. Impingement of adults at the Pfizer intake is unlikely since the adults are channel oriented as they migrate upriver. Egg and larval development will occur in freshwater, so entrainment at the Pfizer intake is not an issue. The juveniles will migrate out in late summer/fall and could be susceptible to impingement as they migrate to Long Island Sound. However, the impingement study conducted at Pfizer during the period February 2009 - January 2010 did not report any blueback herring in the impingement samples (in fact, only one fish was observed during the entire study, perhaps due in large part to the low through-screen velocities). In addition, the thermal discharge will not adversely affect juvenile or adult movements.

Based on the above, the Pfizer facility will not adversely affect blueback herring.

I don't believe there are any outstanding 316(a)(b) issues from the previous permit that need to be addressed in the renewal, but let me know if I am wrong about that and if you need my assistance with anything.

Thanks,

Mark Johnson
Senior Fisheries Biologist
Habitat Conservation and Enhancement Program Bureau of Natural Resources, Inland Fisheries Division DEEP Marine HQ, P.O. Box 719, 333 Ferry Rd, Old Lyme, CT 06371
P: 860.434.6043(F: 860.434.6150 (E: mark.johnson@ct.gov

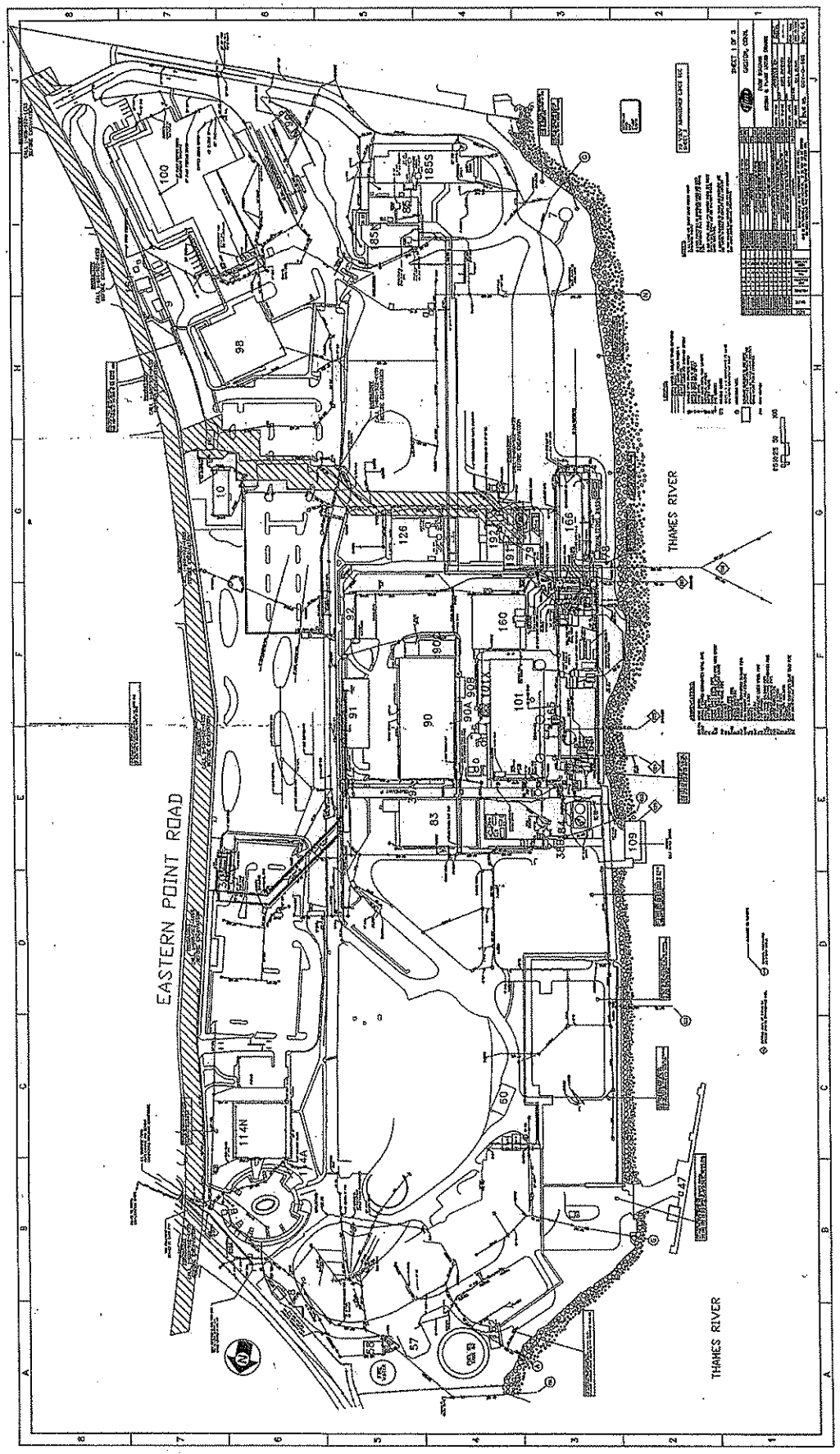
www.ct.gov/deep

Conserving, improving and protecting our natural resources and environment; Ensuring a clean, affordable, reliable, and sustainable energy supply.

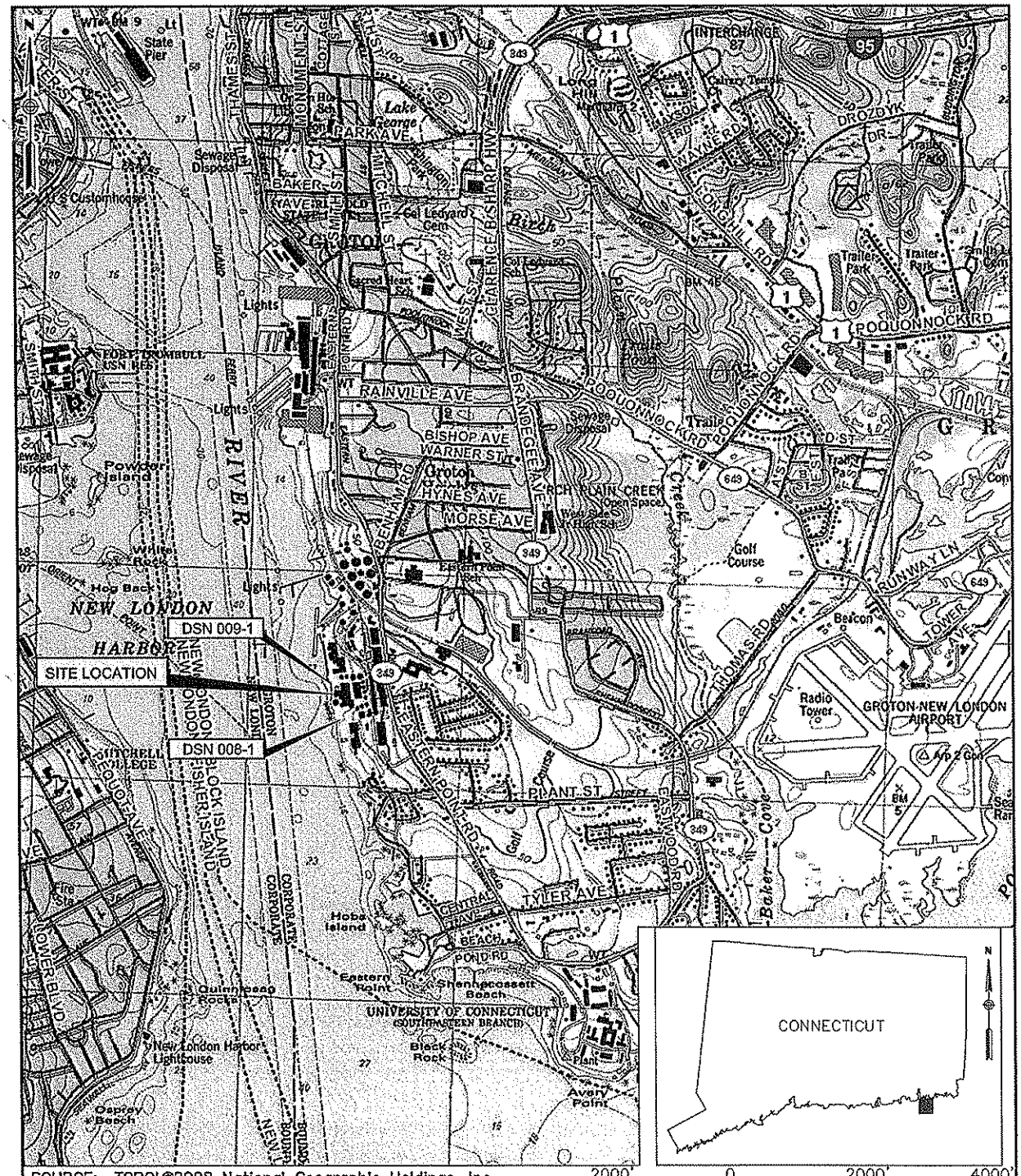
-----Original Message-----
From: Gleason, Christine
Sent: Tuesday, May 28, 2013 1:43 PM
To: Johnson, Mark
Subject: Application 201207927: NPDES Permit Renewal for Pfizer Inc.
Importance: Low

Mark,
I'm working on Pfizer's NPDES permit renewal. Their site is located in an area of Endangered, Threatened, Special-Concern species. Attached is the NDDB information that they included with their permit application. Based on the letter from Dawn, it looks like blueback herring is the issue. Do you have any concerns?
Chris

ATTACHMENT 5



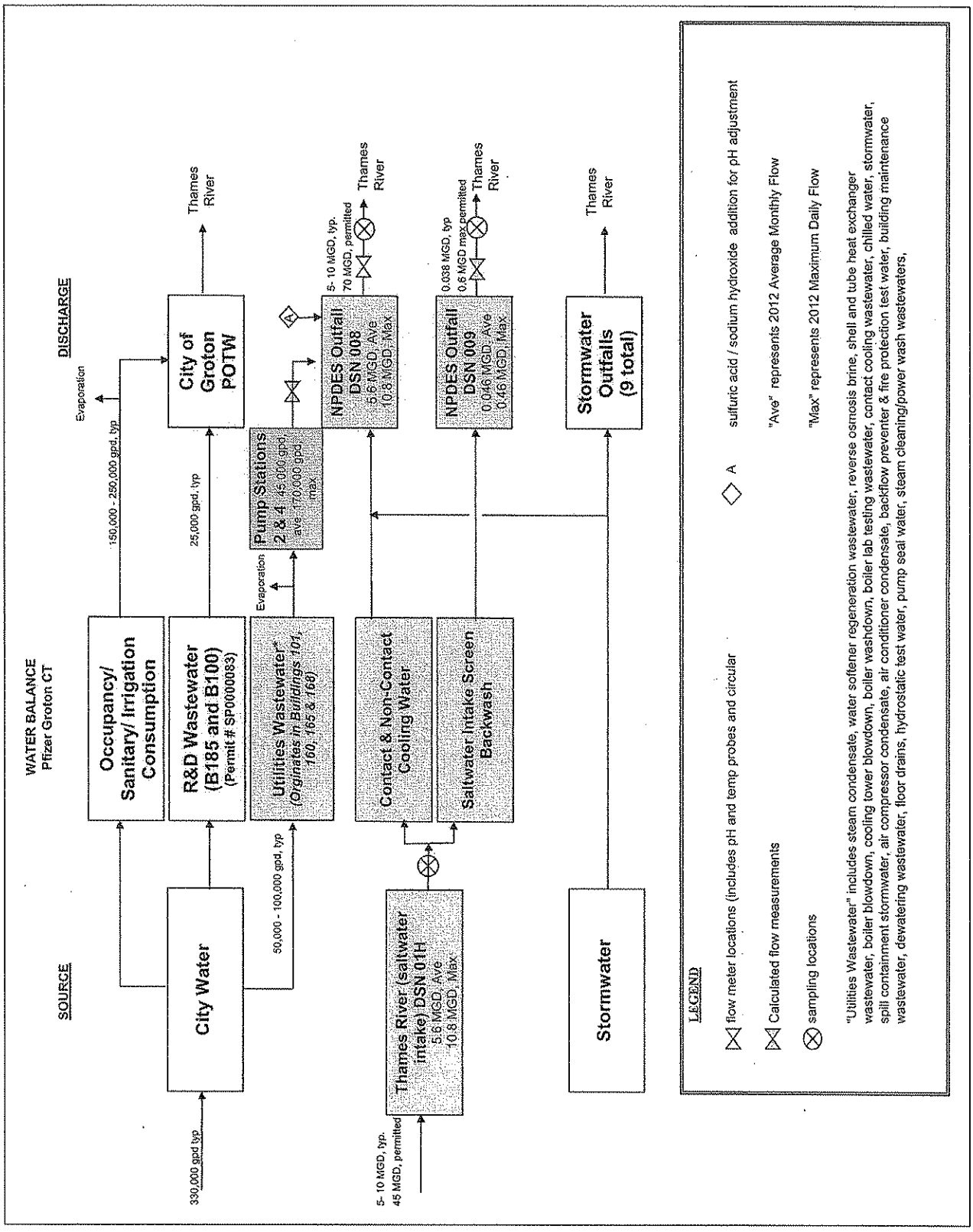
ATTACHMENT 6



SOURCE: TOPO!©2008 National Geographic Holdings, Inc.
New London, CT Quad Map

Pfizer	USGS QUADRANGLE MAP	PFIZER EASTERN POINT ROAD GROTON, CONNECTICUT	JOB NO: 205978.12 DATE: OCTOBER 2012 SCALE: AS NOTED
	DESIGNED BY:	CHECKED BY: GR	PERMIT APPLICATION FOR WASTEWATER DISCHARGES	ATTACHMENT D
	DRAWN BY: SH	Attach D USGS Map.dwg	

ATTACHMENT 7



ATTACHMENT 8
EFFLUENT DATA

DSN 008-1: UTILITIES WASTEWATERS (UNUSED STEAM CONDENSATE; WATER SOFTENER REGENERATION WASTEWATER; SHELL AND TUBE HEAT EXCHANGER WASTEWATER; BOILER BLOWDOWN; BOILER WASHDOWN; BOILER BLOWDOWN LABORATORY WASTEWATER; COOLING TOWER BLOWDOWN); UTILITIES CONTACT COOLING WATER (BAROMETRIC CONDENSOR WATER); CHILLED WATER; STORMWATER

PARAMETER	Units	Flow/Time-Based Limits		Instantaneous Limits	2008 (AUGUST TO DECEMBER)					2009				
		Average Monthly	Maximum Daily		Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n	Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n
Ammonia	mg/L	—	—		0.048		0.150		5	0.102		0.283		12
Bis(2-ethylhexyl) phthalate	µg/L	6.0	12.0		2.92		12.0		23	0.00		0.0		52
BOD_5	mg/L	—	—		0.9		4.6		5	1.5		9.3		12
Chlorine, Total Residual	mg/L	—	0.2		0.00		0.00		2	0.00		0.00		4
Chromium, Total	µg/L	—	—		0.0		0.0		2	0.0		0.0		4
Copper, Total	µg/L	—	—		4.5		9.0		2	2.5		10.0		4
E. Coli	#/100 ml	—	—		16.5		28.0		2	1.3		3.0		4
Fecal coliform	#/100 ml	—	—		11.0		20.0		2	1.3		3.0		4
Flow, Average Daily	gpd	70,000,000	NA		7,256,000				CN	10,283,333				CN
Flow, Maximum During 24 Hours	gpd	NA	70,000,000				12,280,000		CN			24,480,000		CN
Flow, Day of Sampling	gpd	NA	70,000,000				12,280,000		23			22,960,000		52
Iron, Total	mg/L	3.0	5.0		1.1		2.2		3	2.2		4.4		5
Lead, Total	µg/L	—	—		0.0		0.0		2	0.0		0.0		4
Nickel, Total	µg/L	—	—		0.0		0.0		2	1.8		7.0		4
Nitrogen, Kjeldahl	mg/L	—	—		0.270		0.560		5	0.239		0.700		12
Nitrogen, Nitrate	mg/L	—	—		0.098		0.220		5	0.095		0.280		12
Nitrogen, Nitrite	mg/L	—	—		0.010		0.050		5	0.013		0.080		12
Nitrogen, Total	lbs/day	441	661		21.2		47.8		5	37.0		78.3		12
Oil & Grease, Total	mg/L	—	5.0				5.4	1	2			0.0		4
pH, Day of Sampling	SU	6.0	9.0		7.30		8.10		23	7.32		8.35		52
pH, Continuous	SU	6.0	9.0		7.30		8.40		CN	6.79		8.50		CN
Total Suspended Solids	mg/L	—	—		11.1		14.0		5	13.7		20.0		12
Temperature	°F	—	—	90			82.0		CN			86.0		CN
Zinc, Total	µg/L	—	—		0.0		0.0		5	1.0		12.0		12

PARAMETER	2010					2011					2012				
	Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n	Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n	Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n
Ammonia	0.087		0.261		12	0.206		0.474		12	0.000		0.000		12
Bis(2-ethylhexyl) phthalate	0.00		0.0		24	0.00		0.0		12	8.18	1	98.2	1	12
BOD_5	0.5		4.0		12	0.2		2.5		12	2.7		12.0		12
Chlorine, Total Residual	0.00		0.00		4	0.00		0.00		4	0.00		0.00		4
Chromium, Total	0.0		0.0		4	0.0		0.0		4	0.0		0.0		4
Copper, Total	0.0		0.0		4	3.3		13.0		4	3.1		10.0		4
E. Coli	1.0		2.0		4	2.0		2.0		4	0.0		0.0		4
Fecal coliform	31.0		120.0		4	1.3		3.0		4	3.0		10.0		4
Flow, Average Daily	10,153,333				CN	5,340,833				CN	5,578,333				CN
Flow, Maximum During 24 Hours			27,160,000		CN			12,650,000		CN			10,810,000		CN
Flow, Day of Sampling			22,900,000		24			10,810,000		12			9,730,000		12
Iron, Total	1.6		4.9		5	0.1		0.2		5	0.2		0.5		5
Lead, Total	0.0		0.0		4	0.0		0.0		4	0.0		0.0		4
Nickel, Total	12.3		49.0		4	0.0		0.0		4	0.0		0.0		4
Nitrogen, Kjeldahl	0.363		2.800		12	0.328		0.630		12	0.201		0.490		12
Nitrogen, Nitrate	0.051		0.160		12	0.098		0.210		12	0.032		0.116		12
Nitrogen, Nitrite	0.000		0.000		12	0.003		0.090		12	0.016		0.028		12
Nitrogen, Total	37.7		224.0		12	29.8		49.5		12	11.0		49.6		12
Oil & Grease, Total			0.0		4			0.0		4			0.0		4
pH, Day of Sampling	7.02		8.22		24	6.30		8.66		12	6.82		8.30		12
pH, Continuous	7.02		8.31		CN	6.30		8.66		CN	6.77		8.53		CN
Total Suspended Solids	13.3		24.0		12	13.6		23.0		12	42.5		110.0		12
Temperature			84.0		CN			88.0		CN			83.0		CN
Zinc, Total	2.5		17.0		12	20.0		126.0		12	5.6		32.7		12

PARAMETER	2013 (JANUARY TO JULY)					SUMMARY				
	Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n	Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n
Ammonia	0.000		0.000		7	0.074		0.474		60
Bis(2-ethylhexyl) phthalate	0.00		0.0		7	1.85	1	98.2	1	130
BOD_5	0.9		6.0		7	1.1		12.0		60
Chlorine, Total Residual	0.00		0.00		2	0.00		0.00		20
Chromium, Total	0.0		0.0		2	0.0		0.0		20
Copper, Total	6.9		12.1		2	3.4		13.0		20
E. Coli			0.0		2	4.2		28.0		20
Fecal coliform	0.0		0.0		2	7.9		120.0		20
Flow, Average Daily	5,255,714		0		CN	7,311,258				CN
Flow, Maximum During 24 Hours			11,550,000		CN			27,160,000		CN
Flow, Day of Sampling			8,010,000		7			22,960,000		130
Iron, Total	0.1		0.1		2	0.9		4.9		25
Lead, Total	0.0		0.0		2	0.0		0.0		20
Nickel, Total	0.0		0.0		2	2.3		49.0		20
Nitrogen, Kjeldahl	0.030		0.210		4	0.239		2.80		57
Nitrogen, Nitrate	0.025		0.088		4	0.066		0.28		57
Nitrogen, Nitrite	0.002		0.012		4	0.007		0.09		57
Nitrogen, Total	1.6		12.9		4	23.0		224.0		57
Oil & Grease, Total			0.0		2			5.4	1	20
pH, Day of Sampling	7.43		8.17		7	6.30		8.66		130
pH, Continuous	7.17		8.34		CN	6.30		8.66		CN
Total Suspended Solids	38.5		74.0		7	22.1		110.0		60
Temperature			89.0		CN			89.0		CN
Zinc, Total	8.3		20.8		7	6.2		126.0		60

DSN 009-1: INTAKE SCREEN BACKWASH

PARAMETER	Units	Flow/Time-Based Limits		Instantaneous Limits	2008 (AUGUST TO DECEMBER)					2009				
		Average Monthly	Maximum Daily		Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n	Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n
Flow, Average Daily	gpd	See below	NA		51,567					52,728				
Flow, Maximum During 24 Hours	gpd	NA	See below				313,200	4				417,600	5	
Total Suspended Solids	mg/L	NA	NA	—			17.0		1			52.0		1

PARAMETER	2010					2011					2012				
	Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n	Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n	Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n
Flow, Average Daily	77,316					44,027	0				46,159	0			
Flow, Maximum During 24 Hours			460,800					417,216					460,800		
Total Suspended Solids			24.0		1			41.0		1			49.0		1

PARAMETER	2013 (JANUARY TO JULY)					SUMMARY				
	Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n	Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n
Flow, Average Daily	41,982	0				52,297	0			
Flow, Maximum During 24 Hours			422,400					460,800	9	
Total Suspended Solids								52.0		5

From permit issuance until April 15, 2009, the flow limits were: 75,000 gpd (average monthly) and 75,000 gpd (maximum daily). From April 16, 2009 to present, the flow limits are 300,000 gpd (average monthly) and 600,000 gpd

DSN 01H-1: SALT WATER INTAKE

PARAMETER	Units	Flow/Time-Based Limits		Instantaneous Limits	2008 (AUGUST TO DECEMBER)					2009				
		Average Monthly	Maximum Daily		Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n	Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n
Ammonia	mg/L	—	—		0.066		0.13		2	0.125		0.28		4
BOD_5	mg/L	—	—		0.0		0.0		5	0.3		3.0		12
Copper, Total	µg/L	—	—		3.0		6.0		2	0.0		0.0		4
Flow, Average Daily	gpd	See below	NA		6,635,684					10,258,218				
Flow, Maximum During 24 Hours	gpd	NA	See below				12,234,940					24,471,255		
Lead, Total	µg/L	—	—		0.0		0.0		2	0.0		0.0		4
Nickel, Total	µg/L	—	—		0.0		0.0		2	1.3		5.0		4
Oil & Grease, Total	mg/L	—	—		0.0		0.0		2	2.0		7.9		4
pH, Day of Sampling	SU	—	—		7.30		7.85		5	7.59		8.33		12
Temperature	°F	—	—				71.6		2			70.9		4
Total Suspended Solids	mg/L	—	—		9.7		11.0		5	13.8		22.0		12
Zinc, Total	µg/L	—	—		0.0		0.0		2	2.5		10.0		4

PARAMETER	2010					2011					2012				
	Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n	Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n	Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n
Ammonia	0.090		0.13		4	0.146		0.50		4	0.000		0.00		4
BOD_5	0.2		2.5		12	0.2		2.3		12	1.6		12.0		12
Copper, Total	0.0		0.0		4	1.4		17.0		4	2.5		10.0		4
Flow, Average Daily	10,155,747					5,316,667					5,580,833				
Flow, Maximum During 24 Hours			27,160,000					12,620,000					10,820,000		
Lead, Total	0.0		0.0		4	0.5		6.0		4	0.0		0.0		4
Nickel, Total	0.0		0.0		4	0.0		0.0		4	0.0		0.0		4
Oil & Grease, Total	0.0		0.0		4	0.0		0.0		4	0.0		0.0		4
pH, Day of Sampling	7.51		8.81		12	7.69		8.66		12	7.88		8.26		12
Temperature			71.1		4			55.0		4			76.6		4
Total Suspended Solids	13.7		18.0		12	13.5		26.0		12	37.1		71.0		12
Zinc, Total	4.3		15.0		4	18.5		24.0		4	7.6		16.6		4

PARAMETER	2013 (JANUARY TO JULY)					SUMMARY				
	Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n	Average Monthly or pH min	EXCEEDANCE	Maximum Daily or pH max	EXCEEDANCE	n
Ammonia	0.000		0.00		2	0.071		0.50		20
BOD_5	0.0		0.0		7	0.37		12.0		60
Copper, Total	56.5		117.0		2	10.90		117.0		20
Flow, Average Daily	5,235,714					7,197,144				
Flow, Maximum During 24 Hours			11,570,000					27,160,000		
Lead, Total	0.0		0.0		2	0.1		6.0		20
Nickel, Total	5.5		11.0		2	1.1		11.0		20
Oil & Grease, Total	0.0		0.0		2	0.3		7.9		20
pH, Day of Sampling	7.95		8.18		7	7.30		8.81		60
Temperature			47.0		2			76.60		20
Total Suspended Solids	40.6		87.0		7	21.4		87.0		60
Zinc, Total	11.4		18.3		2	7.4		24.0		20

From permit issuance until April 22, 2010, the intake flow limits were: 30,000,000 gpd (average monthly) and 80,000,000 gpd (maximum daily). From April 23, 2010 to present, the intake flow limits are 300,000 gpd (average monthly) and 600,000 gpd

ATTACHMENT 9
TOXIC MIXING ZONE

Receiving Water & Site Information

Pfizer is located on the lower Thames River in Groton, approximately 5,577 feet from Long Island Sound. The Thames River extends from Norwich to Groton/New London, a distance of 16 statute miles. The width of the river in the vicinity of Pfizer's discharge is over 4,000 feet across. The major freshwater inflow to the river is provided by the Shetucket, Yantic, and Quinebaug Rivers, all located at the head of river. The lower Thames River is considered to be generally well mixed, with little stratification occurring in the area where Pfizer is located. The Thames River is tidal for its entire length. The tidal range in the Groton/New London area is 2.2 feet (at neap tides) and 4.1 feet (at spring tides). At maximum flood, the current ranges from 0.209 knots to 0.381 knots; at maximum ebb the current ranges from 0.239 knots to 0.430 knots. There are several other dischargers in the vicinity of Pfizer. The closest one that has been allocated a mixing zone is Electric Boat (General Dynamics), located over 4,000 feet north of Pfizer.

Allocation of Mixing Zones

The Connecticut *Water Quality Standards* allow for the allocation of mixing zones. These mixing zones are portions of the receiving water where water quality criteria are allowed to be exceeded, however, applicable water quality criteria are required to be met at the edge of the mixing zone. Allocations of mixing zones are made on a case-by-case basis in consideration of the criteria set forth in RCSA Section 22a-426-4(*l*). The *Water Quality Standards* state that mixing zones are to be limited to the maximum extent practicable.

Based on an evaluation of the existing effluent quality of DSN 008-1, certain pollutants in the discharge have been detected in excess of the water quality criteria. The following table identifies those pollutants and the effective concentration that would need to be met at the edge of mixing zone should a mixing zone be allocated to the pollutant:

POLLUTANT	LOWEST APPLICABLE WATER QUALITY CRITERIA (ug/L)	MAXIMUM MEASURED EFFLUENT CONCENTRATION (ug/L)	THAMES RIVER CONCENTRATION (ug/L)	MAXIMUM ALLOWABLE CONCENTRATION @ EDGE OF THE MIXING ZONE	COMMENTS
Ammonia	288	474	182	106	
Bis 2-ethylhexyl phthalate	2.2	98	0	NA. Must be met end-of-pipe	No mixing zone allowed. Pollutant is an HB
Copper, Total	3.1	13	0	3.1	
Nickel, Total	8.2	49	0	8.2	
Zinc, Total	81	126	24	57	

Note: Mixing zones are not allocated for pollutants identified in the Water Quality Standards as either: High Potential to Bioaccumulate or Bioconcentrate ("HB"); Class A Known Human Carcinogen ("A"); or Probable or Possible Carcinogen ("C")

Dye Dilution Study

In July 1986 and September 1986, a dye study was conducted at Pfizer by Metcalf & Eddy, the results of which are documented in *Water Quality and Hydraulic Studies in the Lower Thames River,* July 6, 1987. Two outfalls were the subject of the dye study: DSN 001-1 and DSN 008-1. DSN 001-1 was a side bank discharge which is now no longer associated with NPDES Permit CT0000957. DSN 008-1 is/was Pfizer's main wastewater discharge into the Thames River. DSN 008-1 discharges into the river by way of a Y-configured submerged multiport diffuser located at a depth of approximately 18 feet (below MLLW) at a distance of approximately 500 feet from the eastern bank of the river. The 1986 dye studies were conducted under both spring tidal conditions (July dye study) and neap tidal conditions (September dye study). The effluent flows at the time of the dye studies ranged from 10 to 11 million gallons per day for DSN 001-1 and 40 to 65 million gallons per day for DSN 008-1. Dye was injected into each outfall for 31 hours during each event. The receiving water was then sampled/analyzed for dye concentration at varying different depths during the four slack water events that occurred during the dye study period. Results from these two dye studies indicate that the dilutions observed under spring tide conditions resulted in the lowest level of dilution. Results of the tidally-averaged dilutions are below:

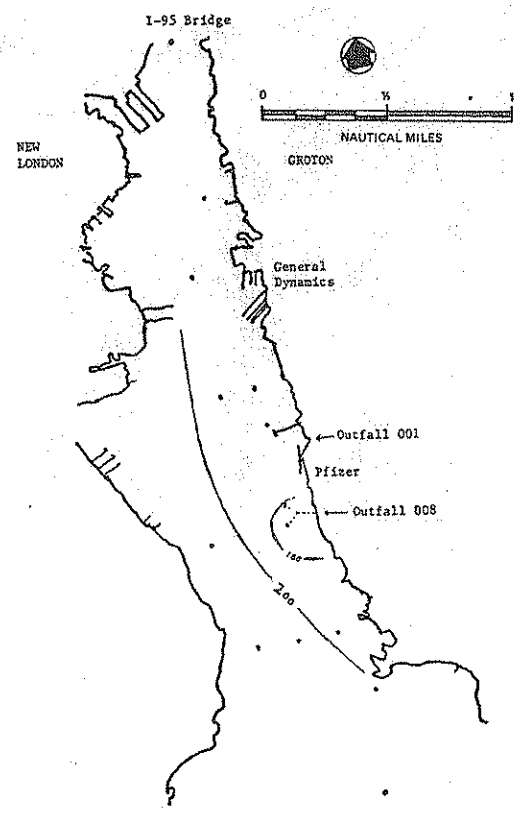


Figure 8. Dilution factors for Pfizer effluent concentration in the Thames River averaged over depth and time for four sampling periods on 24 and 25 July 1986.

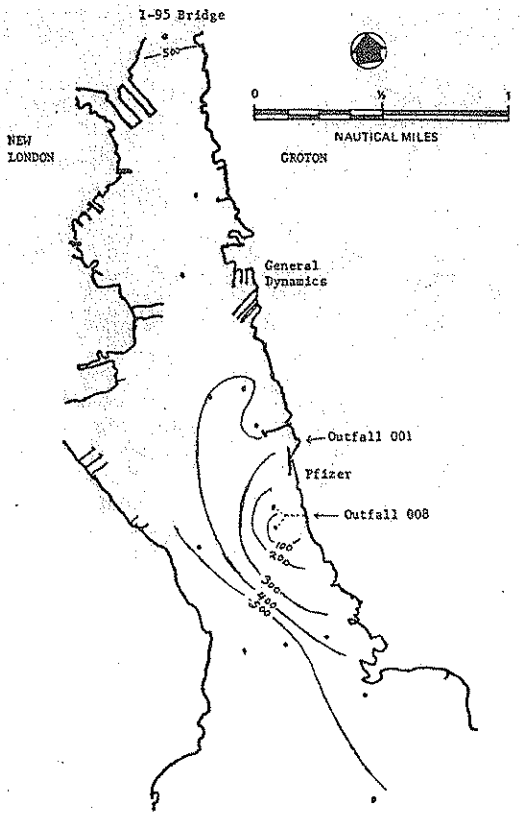


Figure 9. Dilution factors for Pfizer effluent concentration in the Thames River, Conn., averaged over depth and time for four sampling periods on 25 and 26 September 1986.

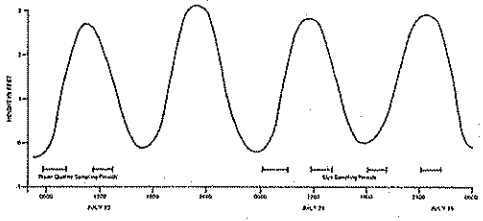


FIGURE 2
HEIGHT OF WATER ABOVE MEAN SEA LEVEL AT NEW LONDON, CONNECTICUT - JULY 24-25, 1986

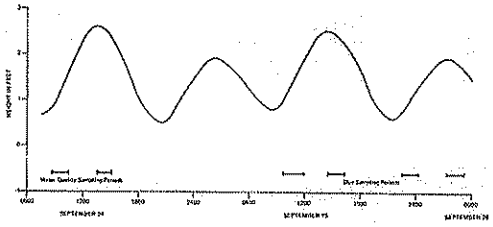


FIGURE 3
HEIGHT OF WATER ABOVE MEAN SEA LEVEL AT NEW LONDON, CONNECTICUT - SEPTEMBER 24-26, 1986

Determination of the Mixing Zone

UM3 in Visual Plumes was run to determine how closely it modeled the 1986 dye study results. The model results did not provide good agreement with the actual dye study results. Therefore, instead of determining the mixing zone by using a model, it was determined by adjusting (i.e., weighting) the 1986 dye study results obtained at spring tide conditions to reflect existing conditions and using that data to determine the dilution at which the applicable water quality criteria would be met. Based on this evaluation, the water quality standards for the applicable pollutants would be met at a distance approximately 95 feet from the diffuser.

As noted above, the dye samples that were collected during the 1986 studies were taken over approximately two tidal cycles (i.e., during "build-up" conditions). No "quasi-steady state" or "fall-off" samples were collected. EPA's *Technical Guidance Manual for Performing Wasteload Allocations, Book III: Estuaries*, August 1992 suggests that "build-up" and "quasi steady state" samples are necessary to determine far-field accumulation effects in unsteady reversing tidal currents. However, the guidance also indicates that the dye/pollutant accumulation rate is location dependent and is generally considered to be negligible in the immediate near-field. Since Pfizer's mixing zone is located a small distance from the diffuser (and estimated to be a very short distance from the nearfield), any accumulation effects in that area would be negligible. Therefore, this analysis is unnecessary.

As noted above, water quality standards would be met at the edge of the mixing zone which is located approximately 95 feet from the diffuser. [See Figure 1]. The dilution at this point is 46:1. This is the smallest mixing zone that is practicable and which meets all applicable criteria. The mixing zone applies to: ammonia, copper, nickel, and zinc. There is no overlapping of any mixing zones in the area; the edge of the closest mixing zone is over 4,000 feet north (Electric Boat/General Dynamics).

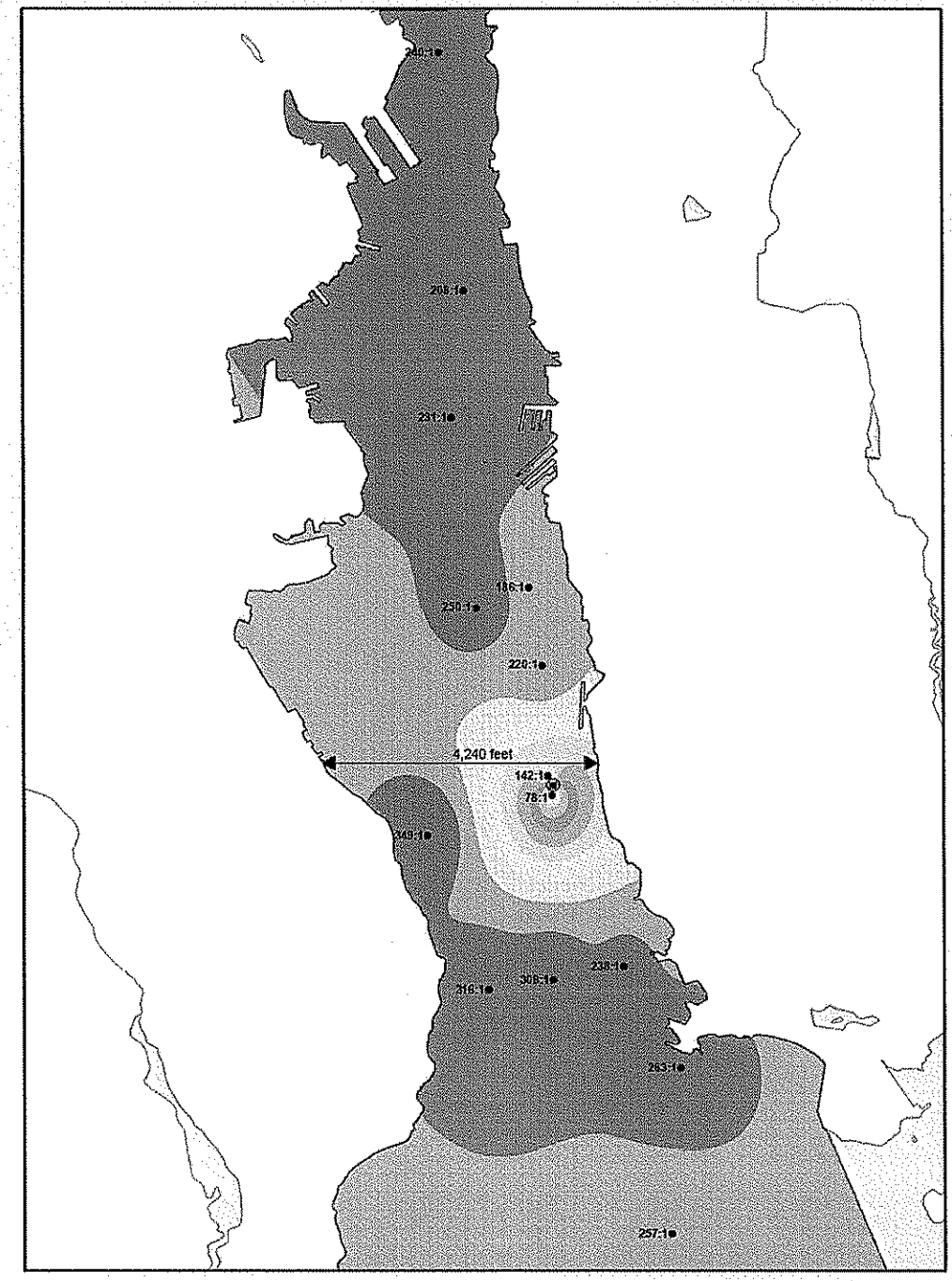


Figure 1: Mixing zone for DSN 008-1.

ATTACHMENT 10
THERMAL MIXING ZONE

There is a thermal component associated with DSN 008-1. DSN 008-1 consists mainly of non-contact cooling water generated from the on-site support/utilities operations. This wastewater is collected and retained in the West Equalizing Basin to allow for temperature dissipation and is then discharged into the Thames River through a submerged multiport diffuser. The discharge temperature information for DSN 008-1 based on the last five years of DMR data is as follows:

	2008			2009			2010			2011			2012			2013		
	DSN 008-1	NOAA 8461490	ΔT	DSN 008-1	NOAA 8461490	ΔT	DSN 008-1	NOAA 8461490	ΔT	DSN 008-1	NOAA 8461490	ΔT	DSN 008-1	NOAA 8461490	ΔT	DSN 008-1	NOAA 8461490	ΔT
JAN				62.0	43.3	18.7	57.0	43.7	13.3	68.0	41.4	26.6	65.0	49.5	15.5	59.0	45.7	13.3
FEB				59.0	41.2	17.8	53.0	39.2	13.8	67.0	37.9	29.1	56.0	45.0	11.0	53.8	42.1	11.7
MAR				54.0	45.5	8.5	58.0	47.8	10.2	64.0	44.4	19.6	59.0	53.2	5.8	52.4	44.2	8.2
APR				66.0	61.2	4.8	70.0	54.7	15.3	67.0	58.1	8.9	62.0	57.7	4.3	60.8	54.3	6.5
MAY				69.0	63.1	5.9	80.0	70.9	9.1	83.0	61.7	21.3	71.0	62.4	8.6	79.9	64.4	15.5
JUN				81.0	64.0	20.0	81.0	70.9	10.1	**84.0**	69.6	14.4	78.0	70.2	7.8	81.0	73.2	7.8
JUL				81.0	---	---	82.0	75.4	6.6	**88.0**	75.0	13.0	82.0	75.6	6.4	**89.0**	75.9	13.1
AUG	82.0	74.1	7.9	**86.0**	76.6	9.4	82.0	76.3	5.7	**84.0**	74.5	9.5	83.0	77.9	5.1			
SEP	71.6	74.8	---	**84.0**	73.4	10.6	82.0	75.9	6.1	82.0	73.0	9.0	76.0	74.8	1.2			
OCT	77.0	67.1	9.9	80.0	71.2	8.8	**84.0**	69.4	14.6	81.0	70.3	10.7	72.3	68.0	4.3			
NOV	70.7	58.5	12.2	71.0	55.6	15.4	83.0	58.5	24.5	72.0	57.7	14.3	70.6	60.6	10.0			
DEC	63.0	50.4	12.6	72.0	53.2	18.8	80.0	50.9	29.1	74.0	54.9	19.1	71.0	51.3	19.7			
				86.0		**20.0**	**84.0**		**29.1**	**88.0**		**29.1**	**83.0**		**19.7**	**89.0**		

Note: Water temperature values from NOAA Station 8461490 were used to estimate temperature rise. This station is located at State Pier in New London, approximately 2 miles upstream from Pfizer. Water temperature at this station is collected at 4.6 feet below MLLW.

Section 22a-426-9(a)(1) of the *Water Quality Standards* states that for Class SB waters:

> *There shall be no changes from natural conditions that would impair any existing or designated uses assigned to this Class and, in no case exceed 83 °F or in any case raise the temperature of the receiving water more than 4 °F. During the period including July, August, and September, the temperature of the receiving water shall not be raised more than 1.5 °F unless it can be shown that spawning and growth of indigenous organisms will not be significantly affected.*

As noted in the table above, the temperature of Pfizer's discharge does occasionally exceed 83 °F and does raise the receiving water temperature more than 4 °F.

In 1986, Pfizer undertook a study designed to evaluate the effects of its discharges on the Thames River (*Water Quality and Hydraulic Studies in the Lower Thames River*, July 1987 by Metcalf & Eddy). While the scope of this study was not specifically designed to evaluate the thermal effects of Pfizer's discharges on the Thames River, some temperature measures of the receiving water were collected during this study. At the time of this study, Pfizer had several discharges with a thermal component, including, DSN 001-1, DSN 002-1, DSN 003-1, DSN 004-1, DSN 005-1, and DSN 008-1. In February 1999, a follow-up study was conducted by Parsons Engineering Science entitled *Thermal Plume Study at Pfizer Inc. Groton.* This study involved no field work and was essentially a verification study designed to evaluate the impact of the three remaining thermal discharges DSN 004-1, DSN 005-1, and DSN 008-1. Since that study was conducted, Pfizer has eliminated DSNs 004-1 and 005-1. In order to evaluate the impact of its remaining thermal discharge point, DSN 008-1, Pfizer undertook a thermal study in July 2013. The results of this study are summarized in *Thermal Plume and Habitat Assessment Study*, September 2013, by Kleinschmidt ("2013 Thermal Study"). The 2013 Thermal Study involved collecting temperature and salinity samples of the Thames River in the vicinity of Pfizer's discharge, DSN 008-1. These samples were collected over a two-day period in July 2013. The effluent flow from DSN 008-1 during the study period ranged from 7,284,000 to 8,526,000 and the maximum temperature of the discharge ranged from 82.9 °F to 85.5 °F over the two-day period. The 2013 Thermal Study concludes that water quality standards are met in a very short distance from the diffuser.

Modeling was performed to determine the impact of DSN 008-1 at the proposed permitted conditions (i.e., an average monthly flow of 25,000,000 gpd and a projected maximum temperature of 89 °F). Both CORMIX Version 8.0 and UM3 within Visual Plumes were used for modeling. Plume size and dilution factors could not obtained

through CORMIX for the simulation time around slack water due to near-field instability. UM3 projected plume size and dilutions for all scenarios. These results are as follows:

> **Critical absolute temperature conditions**: UM3 was run under a variety of tidal, current, and stratified ambient temperature scenarios under typical summer conditions. The results indicate that under worst-case scenario conditions, the maximum plume size was 0.8 foot at its largest point. In-stream water quality standards were met within seconds.
>
> **Critical temperature rise conditions**: UM3 was run under a variety of tidal, current, and uniform ambient temperature scenarios under typical winter conditions. The results indicate that under worst-case scenario conditions, the maximum plume size was 1 foot at its largest point. In-stream water quality standards were met within seconds.

Section 22a-426-4(*l*) of the *Water Quality Standards* allows for the allocation of mixing zones in consideration of certain factors, including: the characteristics of the discharge, the location of the discharge relative to other discharges in the area; the effect of the discharge on spawning grounds and nursery areas; the effect of the discharge on the aesthetic quality of the receiving water; the need to maintain a continuous passage for free swimming and drifting organisms, etc. In addition, allocation of a mixing zone for assimilation of a thermal discharge shall ensure that the mixing zone occupy no greater than 25% of the cross-sectional area or volume of flow of the receiving water.

Pfizer's thermal discharge, DSN 008-1, occupies an insignificant portion of the Thames River (i.e., approximately 0.025% of the cross-section). The plume would not be expected to cause any concerns with respect to the fisheries resources in the lower Thames River, nor would it create any concerns with respect to any of the other criteria associated with the allocation of mixing zones. The 2013 Thermal Study concludes the same.

Therefore, in this case, the temperature limits in the permit are determined statistically based on performance evaluating the worst-case effluent data set (July 2013). The maximum instantaneous limit was determined by applying three standard deviations to the mean ($\mu + 3\sigma$) of the July 2013 data set: $77.5 + 3*4.15 = 89.95 \approx$ **90.0 °F**. [See the next page for data]. The maximum daily limit for the temperature rise (ΔT) was based on the 99% percentile (MDL = $\mu + 2.327*\sigma$) of the last five years of December, January, and February data: $18.0 + 2.327*6.06$ = **32.1 °F**. [See next page for data]. These limits will result in water quality standards being met at the edge of the mixing zone, described above.

Section 316(a) of the CWA allows for thermal effluent limitations to be less stringent than those required by otherwise applicable standards if it can be shown that such limits are more stringent than necessary to assure the protection and propagation of a balanced, indigenous, population of fish, shellfish, and wildlife (BIP) in and on the waterbody receiving the discharge. The Permittee must make a demonstration that these alternative limits will be protective of the BIP. Most recently, Pfizer has submitted the *Thermal Plume and Habitat Assessment Study* in support of a demonstration that its existing permit limits will continue to be protective of the BIP. Based on a review of this study, plume modeling, consultation with the Department's Fisheries Division, the Department does not believe that the continued thermal discharge from Pfizer will result in any appreciable harm to the BIP. In addition, there is no evidence of any past appreciable harm. Therefore, the Department approves the alternative permit limits.

July 2013
82.22
75.20
74.48
73.40
74.30
74.84
74.66
76.64
75.02
75.02
74.84
73.58
74.30
75.02
85.82
82.94
83.30
87.80
88.70
78.26
76.10
76.10
78.08
76.82
75.38
75.20
75.56
76.46
78.26
77.00
76.10

2008-2013
12.6
18.7
17.8
18.8
13.0
13.8
29.1
26.6
29.1
19.1
15.5
11.0
19.7
13.3
11.7

Summary Statistics	
Mean	77.4645161
Standard Error	0.7458944
Median	76.1
Mode	75.02
Standard Deviation	4.15296427
Sample Variance	17.2471123
Kurtosis	1.59401526
Skewness	1.59730722
Range	15.3
Minimum	73.4
Maximum	88.7
Sum	2401.4
Count	31

Summary Statistics	
Mean	17.98667
Standard Error	1.565213
Median	17.8
Mode	29.1
Standard Deviation	6.062044
Sample Variance	36.74838
Kurtosis	-0.33076
Skewness	0.862
Range	18.1
Minimum	11
Maximum	29.1
Sum	269.8
Count	15

DATE	INTAKE 01H-1	NOAA 8461490 (AVERAGE)	NOAA 8461490 (MAXIMUM)
August 18, 2008	71.6	69.8	72.7
November 4, 2008	58.8	57.5	57.7
February 10, 2009	49.0	38.0	38.2
May 13, 2009	54.5	51.6	55.0
August 11, 2009	70.9	---	---
November 4, 2009	58.8	---	---
February 16, 2010	40.6	37.0	37.2
May 12, 2010	54.5	52.1	53.6
August 3, 2010	71.1	72.6	73.9
November 3, 2010	57.6	56.3	57.4
February 6, 2011	43.0	36.2	36.9
May 4, 2011	53.0	48.7	52.3
August 16, 2011	55.0	70.4	72.1
November 2, 2011	45.0	55.7	57.6
February 7, 2012	51.0	43.8	44.6
May 2, 2012	55.0	52.5	54.3
August 12, 2012	76.6	76.3	77.4
November 7, 2012	47.0	57.4	59.0
February 17, 2013	40.0	38.6	39.7
May 1, 2013	47.0	49.3	52.9

ATTACHMENT 11
REASONABLE POTENTIAL DETERMINATION

Discharger:	Pfizer Inc.	Receiving Water:	Thames River (lower)
Address:	445 Eastern Point Road, Groton	Type:	Saltwater
Permit Number:	CT0000957	Average Effluent Flow:	25,000,000 gpd
Application Number:	201207927		
DSN:	008-1		
		Dilution Demonstrated through Dye Study:	46 :1
		Dilution Factor:	46
		Dilution Factor$_{A,C,HB}$:	1.0

POLLUTANT	A,C,HB	Water Quality Criteria			Maximum Measured Effluent Concentration µg/L	Total Observations for Maximum Effluent Concentration	CV	Multiplier	Dilution Factor	Thames River Concentration µg/L	Receiving Water Concentration (acute) µg/L	Receiving Water Concentration (chronic) µg/L	Receiving Water Concentration (human health) µg/L	Is there reasonable potential?
		Aquatic Life		Human Health										
		Acute µg/L	Chronic µg/L	µg/L										
Ammonia (Total as N)		1,918	288		474	76	1.3	2.1	46	182	200	200		NO
Bis 2-ethylhexylphthalate	C-HB			2.2	98	125	0.6	1.0	1	0			98	YES
Chlorine, Total Residual		13	7.5		0	21	0.6	1.0	1	21	0.0	0.0		NO
Chromium, Total				1,009,615	0	31	0.6	1.0	1	0			0	NO
Copper, Total		4.8	3.1		13	39	2.3	4.5	46	0	1.3	1.3		NO
Iron, Total					520	20	0.8	2.9	1	281	1508	1508	1508	N/A, NO CRITERIA
Lead, Total		210	8.1		0	39	0.6	1.0	1	0	0	0		NO
Nickel, Total		74	8.2	4,600	49	35	4.4	7.6	46	0	8.1	8.1	8.1	NO
Zinc, Total		90	81	26,000	126	76	2.1	2.7	46	24	31	31	31	NO

ATTACHMENT 11

WATER QUALITY-BASED LIMITS FOR POLLUTANTS WITH REASONABLE POTENTIAL

Discharger:	Pfizer Inc.	Receiving Water:	Thames River (lower)		
Address:	445 Eastern Point Road, Groton	Average Effluent Flow:	25,000,000 gpd	38.675 cfs	
Permit Number:	CT0000957				
Application Number:	201207927	Dilution Factor	46.0		
DSN:	008-1	Dilution Factor$_{Ac}$	1.0		

POLLUTANT	AC:HB	Dilution Factor	WLA (acute) µg/L	WLA (chronic) µg/L	WLA (human health) µg/L	LTA CV	LTA (acute)	LTA (chronic)	LTA (human health)	Limiting LTA	Limiting criteria	Anticipated Number of Samples per Month	Average Monthly Limit µg/L	Maximum Daily Limit µg/L	Instantaneous Limit µg/L	Average Monthly Limit g/day	Maximum Daily Limit g/day
Ammonia (Total as N)																	
Bis 2-ethylhexylphthalate	C-HB	1			2.2	0.6			2.2	2.2	HUMAN HEALTH	1	2.2	3.2	4.8	208	304
Chlorine, Total Residual																	
Chromium, Total																	
Copper, Total																	
Iron, Total																	
Lead, Total																	
Nickel, Total																	
Zinc, Total																	

ATTACHMENT 11

Pfizer Inc.

Reasonable Potential Evaluation: Data Summary

DSN 008-1 DMR Data: 2008-2013

Ammonia		Bis (2-ethylhexyl phthalate)		Chlorine, Total Residual		Chromium		Copper		Iron		Lead		Nickel		Zinc	
DATE	ug/L	DATE	ug/L	DATE	ug/L	DATE	ug/L	DATE	ug/L	DATE	ug/L	DATE	ug/L	DATE	ug/L	DATE	ug/L
Aug 17, 2008	91	Aug 17, 2008	0	Aug 17, 2008	0	Aug 17, 2008	0	Aug 17, 2008	0	Aug 17, 2008	0	Aug 17, 2008	0	Aug 17, 2008	0	Aug 17, 2008	0
Aug 19, 2008	79	Aug 19, 2008	0	Nov 04, 2008	0	Nov 04, 2008	0	Aug 19, 2008	0	Aug 19, 2008	0	Aug 19, 2008	0	Aug 19, 2008	0	Aug 19, 2008	0
Aug 21, 2008	0	Aug 21, 2008	5.2	Feb 10, 2009	0	Feb 10, 2009	0	Aug 21, 2008	0	Aug 21, 2008	0	Aug 21, 2008	0	Aug 21, 2008	0	Aug 21, 2008	0
Sep 03, 2008	0	Sep 03, 2008	9.6	May 20, 2009	0	May 13, 2009	0	Nov 04, 2008	9	Nov 04, 2008	2200	Nov 04, 2008	0	Nov 04, 2008	0	Sep 03, 2008	0
Oct 01, 2008	150	Sep 08, 2008	12.0	Aug 11, 2009	0	Aug 11, 2009	0	Feb 08, 2009	10	Feb 08, 2009	0	Feb 08, 2009	0	Feb 08, 2009	0	Oct 01, 2008	0
Nov 04, 2008	0	Sep 18, 2008	6.7	Nov 04, 2009	0	Nov 04, 2009	0	Feb 10, 2009	7	Feb 10, 2009	0	Feb 10, 2009	0	Feb 10, 2009	0	Nov 04, 2008	0
Dec 03, 2008	0	Sep 22, 2008	0.0	Feb 16, 2010	0	Feb 16, 2010	0	Feb 12, 2009	0	Feb 12, 2009	0	Feb 12, 2009	0	Feb 12, 2009	0	Dec 03, 2008	0
Jan 07, 2009	200	Sep 29, 2008	7.0	May 12, 2010	0	May 12, 2010	0	May 13, 2009	0	May 13, 2009	2500	May 13, 2009	0	May 13, 2009	0	Jan 07, 2009	0
Feb 08, 2009	182	Oct 01, 2008	6.3	Aug 09, 2010	0	Aug 09, 2010	0	Aug 09, 2009	0	Aug 09, 2009	110	Aug 09, 2009	0	Aug 09, 2009	5	Feb 08, 2009	0
Feb 10, 2009	0	Oct 09, 2008	7.5	Aug 11, 2010	0	Aug 11, 2010	0	Aug 11, 2009	0	Aug 11, 2009	4000	Aug 11, 2009	0	Aug 11, 2009	7	Feb 10, 2009	0
Feb 12, 2009	0	Oct 15, 2008	0	Aug 13, 2010	0	Aug 13, 2010	0	Aug 13, 2009	0	Aug 13, 2009	3600	Aug 13, 2009	0	Aug 13, 2009	0	Feb 12, 2009	0
Mar 04, 2009	0	Oct 22, 2008	0	Nov 11, 2010	0	Nov 03, 2010	0	Nov 04, 2009	0	Nov 04, 2009	4400	Nov 04, 2009	0	Nov 04, 2009	0	Mar 04, 2009	0
Apr 08, 2009	0	Oct 29, 2008	0	Feb 08, 2011	0	Feb 06, 2011	0	Feb 14, 2010	0	Nov 18, 2009	0	Feb 14, 2010	0	Feb 14, 2010	0	Apr 08, 2009	0
May 13, 2009	0	Nov 04, 2008	0	May 04, 2011	0	Feb 08, 2011	0	Feb 16, 2010	0	Feb 14, 2010	90	Feb 16, 2010	0	Feb 16, 2010	5	May 13, 2009	0
Jun 03, 2009	100	Nov 12, 2008	0	Aug 16, 2011	0	Feb 10, 2011	0	Feb 18, 2010	0	Feb 16, 2010	130	Feb 18, 2010	0	Feb 18, 2010	49	Jun 03, 2009	0
Jul 08, 2009	180	Nov 19, 2008	0	Nov 02, 2011	0	May 04, 2011	0	May 12, 2010	0	Feb 18, 2010	4900	May 12, 2010	0	May 12, 2010	0	Jul 08, 2009	0
Aug 09, 2009	283	Nov 25, 2008	0	Feb 07, 2012	0	Aug 14, 2011	0	Aug 09, 2010	0	May 12, 2010	3600	Aug 09, 2010	0	Aug 09, 2010	0	Aug 09, 2009	0
Aug 11, 2009	156	Dec 03, 2008	0	May 02, 2012	0	Aug 16, 2011	0	Aug 11, 2010	0	May 28, 2010	140	Aug 11, 2010	0	Aug 11, 2010	0	Aug 11, 2009	0
Aug 13, 2009	94	Dec 10, 2008	0	Aug 14, 2012	0	Aug 18, 2011	0	Aug 13, 2010	0	Aug 09, 2010	3600	Aug 13, 2010	0	Aug 13, 2010	0	Aug 13, 2009	0
Sep 15, 2009	80	Dec 17, 2008	0	Nov 07, 2012	0	Nov 02, 2011	0	Nov 03, 2010	0	Aug 11, 2010	3600	Nov 03, 2010	0	Nov 03, 2010	0	Sep 15, 2009	0
Oct 07, 2009	119	Dec 23, 2008	0	Feb 19, 2013	0	Feb 26, 2012	0	Feb 06, 2011	0	Aug 13, 2010	3900	Feb 06, 2011	0	Feb 06, 2011	0	Oct 07, 2009	12
Nov 04, 2009	0	Dec 30, 2008	0			Feb 28, 2012	0	Feb 08, 2011	0	Aug 28, 2010	3900	Feb 08, 2011	0	Feb 08, 2011	0	Nov 04, 2009	0
Dec 02, 2009	78	Jan 07, 2009	0			Mar 01, 2012	0	Feb 10, 2011	0	Nov 03, 2010	92	Feb 10, 2011	0	Feb 10, 2011	0	Dec 02, 2009	0
Jan 06, 2010	0	Jan 13, 2009	0			May 02, 2012	0	May 04, 2011	0	Feb 06, 2011	0	May 04, 2011	0	May 04, 2011	0	Jan 06, 2010	0
Feb 14, 2010	175	Jan 21, 2009	0			Aug 12, 2012	0	Aug 14, 2011	0	Feb 08, 2011	0	Aug 14, 2011	0	Aug 14, 2011	0	Feb 14, 2010	0
Feb 16, 2010	180	Jan 28, 2009	0			Aug 14, 2012	0	Aug 16, 2011	0	Feb 10, 2011	80	Aug 16, 2011	0	Aug 16, 2011	0	Feb 16, 2010	0
Feb 18, 2010	0	Feb 03, 2009	0			Aug 16, 2012	0	Aug 18, 2011	0	May 04, 2011	37	Aug 18, 2011	0	Aug 18, 2011	0	Feb 18, 2010	0
Mar 03, 2010	128	Feb 10, 2009	0			Nov 07, 2012	0	Nov 02, 2011	13	Aug 14, 2011	118	Nov 02, 2011	0	May 02, 2012	0	Mar 03, 2010	0
Apr 07, 2010	108	Feb 18, 2009	0			Feb 17, 2013	0	Feb 26, 2012	0	Aug 16, 2011	113	Feb 26, 2012	0	Aug 12, 2012	0	Apr 07, 2010	0
May 12, 2010	261	Feb 25, 2009	0			Feb 19, 2013	0	Feb 28, 2012	6.8	Aug 18, 2011	136	Feb 28, 2012	0	Aug 14, 2012	0	May 12, 2010	0
Jun 02, 2010	0	Mar 04, 2009	0			Feb 21, 2013	0	Mar 01, 2012	0	Nov 02, 2011	166	Mar 01, 2012	0	Aug 16, 2012	0	Jun 02, 2010	0
Jul 07, 2010	143	Mar 10, 2009	0					May 02, 2012	0	Feb 26, 2012	167	May 02, 2012	0	Nov 07, 2012	0	Jul 07, 2010	0
Aug 09, 2010	106	Mar 18, 2009	0					Aug 12, 2012	0	Feb 28, 2012	106	Aug 12, 2012	0	Feb 17, 2013	0	Aug 09, 2010	0
Aug 11, 2010	0	Mar 25, 2009	0					Aug 14, 2012	0	Mar 01, 2012	85	Aug 14, 2012	0	Feb 19, 2013	0	Aug 11, 2010	0
Aug 13, 2010	0	Apr 01, 2009	0					Aug 16, 2012	0	May 02, 2012	224	Aug 16, 2012	0	Feb 21, 2013	0	Aug 13, 2010	0
Sep 01, 2010	0	Apr 08, 2009	0					Nov 07, 2012	10	Aug 12, 2012	170	Nov 07, 2012	0			Sep 01, 2010	0
Oct 12, 2010	99	Apr 14, 2009	0					Feb 17, 2013	0	Aug 14, 2012	520	Feb 17, 2013	0			Oct 12, 2010	0
Nov 03, 2010	89	Apr 22, 2009	0					Feb 19, 2013	5.2	Aug 16, 2012	140	Feb 19, 2013	0			Nov 03, 2010	13
Dec 08, 2010	0	Apr 29, 2009	0					Feb 21, 2013	0	Nov 07, 2012	140	Feb 21, 2013	0			Dec 08, 2010	17
Jan 05, 2011	164	May 05, 2009	0							Feb 17, 2013	130					Jan 05, 2011	14
Feb 06, 2011	270	May 13, 2009	0							Feb 19, 2013	95					Feb 06, 2011	16
Feb 08, 2011	104	May 20, 2009	0							Feb 21, 2013	90					Feb 08, 2011	17
Feb 10, 2011	0	May 27, 2009	0													Feb 10, 2011	12
Mar 02, 2011	272	Jun 03, 2009	0													Mar 02, 2011	16
Apr 06, 2011	220	Jun 09, 2009	0													Apr 06, 2011	16
May 04, 2011	126	Jun 17, 2009	0													May 04, 2011	17
Jun 01, 2011	104	Jun 24, 2009	0													Jun 01, 2011	19
Jul 06, 2011	146	Jul 01, 2009	0													Jul 06, 2011	21
Aug 14, 2011	177	Jul 08, 2009	0													Aug 14, 2011	126
Aug 16, 2011	204	Jul 14, 2009	0													Aug 16, 2011	17
Aug 18, 2011	172	Jul 21, 2009	0													Aug 18, 2011	13
Sep 14, 2011	351	Jul 29, 2009	0													Sep 14, 2011	30
Oct 05, 2011	130	Aug 05, 2009	0													Oct 05, 2011	13
Nov 02, 2011	474	Aug 11, 2009	0													Nov 02, 2011	14
Dec 07, 2011	179	Aug 19, 2009	0													Dec 07, 2011	13
Jan 04, 2012	0	Aug 26, 2009	0													Jan 04, 2012	10.8
Feb 26, 2012	0	Sep 02, 2009	0													Feb 26, 2012	0
Feb 28, 2012	0	Sep 09, 2009	0													Feb 28, 2012	0
Mar 01, 2012	0	Sep 15, 2009	0													Mar 01, 2012	0
Mar 07, 2012	0	Sep 23, 2009	0													Mar 07, 2012	0
Apr 04, 2012	0	Sep 30, 2009	0													Apr 04, 2012	0
May 02, 2012	0	Oct 07, 2009	0													May 02, 2012	7.9
Jun 06, 2012	0	Oct 13, 2009	0													Jun 06, 2012	6.7
Jul 02, 2012	0	Oct 21, 2009	0													Jul 02, 2012	6
Aug 12, 2012	0	Oct 28, 2009	0													Aug 12, 2012	32.7
Aug 14, 2012	0	Nov 04, 2009	0													Aug 14, 2012	5
Aug 16, 2012	0	Nov 10, 2009	0													Aug 16, 2012	0
Sep 05, 2012	0	Nov 18, 2009	0													Sep 05, 2012	9
Oct 03, 2012	0	Nov 24, 2009	0													Oct 03, 2012	0
Nov 07, 2012	0	Dec 02, 2009	0													Nov 07, 2012	7
Dec 05, 2012	0	Dec 08, 2009	0													Dec 05, 2012	6.6
Jan 09, 2013	0	Dec 15, 2009	0													Jan 09, 2013	7.4
Feb 17, 2013	0	Dec 22, 2009	0													Feb 17, 2013	20.8
Feb 19, 2013	0	Dec 29, 2009	0													Feb 19, 2013	7.5
Feb 21, 2013	0	Jan 06, 2010	0													Feb 21, 2013	11.9
Mar 13, 2013	0	Jan 12, 2010	0													Mar 13, 2013	10.9
		Jan 20, 2010	0														
		Jan 27, 2010	0														
		Feb 03, 2010	0														
		Feb 11, 2010	0														
		Feb 16, 2010	0														
		Feb 25, 2010	0														
		Mar 03, 2010	0														
		Mar 10, 2010	0														
		Mar 16, 2010	0														
		Mar 24, 2010	0														
		Mar 31, 2010	0														
		Apr 07, 2010	0														
		Apr 13, 2010	0														
		Apr 21, 2010	0														
		Apr 28, 2010	0														
		May 04, 2010	0														
		Jun 02, 2010	0														
		Jul 07, 2010	0														
		Aug 09, 2010	0														
		Aug 11, 2010	0														
		Aug 13, 2010	0														
		Sep 01, 2010	0														
		Oct 12, 2010	0														
		Nov 03, 2010	0														
		Dec 08, 2010	0														
		Jan 05, 2011	0														
		Feb 06, 2011	0														
		Feb 08, 2011	0														
		Feb 10, 2011	0														
		Mar 02, 2011	0														
		Apr 06, 2011	0														
		May 04, 2011	0														
		Jun 01, 2011	0														
		Jul 06, 2011	0														
		Aug 14, 2011	0														
		Aug 16, 2011	0														
		Aug 18, 2011	0														
		Sep 14, 2011	0														
		Oct 05, 2011	0														
		Nov 02, 2011	0														
		Dec 07, 2011	0														

Jan 04, 2012	0
Feb 26, 2012	0
Feb 28, 2012	0
Mar 01, 2012	0
Mar 07, 2012	0
Apr 04, 2012	0
May 02, 2012	98.2
Jun 06, 2012	0
Jul 02, 2012	0
Aug 12, 2012	0
Aug 14, 2012	0
Aug 16, 2012	0
Sep 05, 2012	0
Oct 03, 2012	0
Nov 07, 2012	0
Dec 05, 2012	0
Jan 09, 2013	0
Feb 17, 2013	0
Feb 19, 2013	0
Feb 21, 2013	0
Mar 13, 2013	0

NOTES:

Corrective actions taken to address the level of bis 2-ethylhexylphthalate in the discharge were undertaken in October 2008. Therefore, only data generated after this time frame is used in the RPA.

Beginning in November 2010, the Permittee started using a different test method for analyzing its effluent for iron because the prior test method appeared to not adequately address salt water interferences. Therefore, only data generated after this time frame is used in the RPA.

	Ammonia	*Bis (2-ethylhexyl phthalate)*	*Chlorine, Total Residual*	*Chromium*	*Copper*	*Iron*	*Lead*	*Nickel*	*Zinc*
MEAN	81	1	0	0	2	130	0	2	7
SD	102	9	0	0	4	107	0	8	16
CV	1.26	11.18	#DIV/0!	#DIV/0!	2.26	0.82	#DIV/0!	4.43	2.13
CV (to 1 decimal place)	1.3	11.2	#DIV/0!	#DIV/0!	2.3	0.8	#DIV/0!	4.4	2.1
MAX	474	98	0	0	13	520	0	49	126
MIN	0	0	0	0	0	0	0	0	0
N	76	125	21	31	39	20	39	35	76
S	0.99	2.20	#DIV/0!	#DIV/0!	1.36	0.70	#DIV/0!	1.74	1.30
Percentile	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Pn	0.94	0.96	0.80	0.86	0.89	0.79	0.89	0.88	0.94
Multiplier	2.1	3.2	#DIV/0!	#DIV/0!	4.5	2.9	#DIV/0!	7.6	2.7

Future variability (CV) associated with bis (2-ethylhexyl phthalate is expected to be substantially different than this data set. Therefore, an estimated CV of 0.6 will be used consistent with Section 5.5.2 of the TSD.

ATTACHMENT 11

Pfizer Inc.

Background Data Summary: Thames River (Lower)

PARAMETER	UNITS	Aug 17, 2008	Aug 19, 2008	Aug 21, 2008	Feb 06, 2009	Feb 10, 2009	Feb 12, 2009	Aug 05, 2009	Aug 11, 2009	Aug 13, 2009	Feb 16, 2010	Feb 17, 2010	Feb 18, 2010	Aug 09, 2010	Aug 11, 2010	Aug 13, 2010	Feb 08, 2011	Feb 08, 2011	Feb 10, 2011	Aug 14, 2011	Aug 16, 2011	Aug 18, 2011	Feb 26, 2012	Feb 28, 2012	Mar 01, 2012	Aug 12, 2012	Aug 14, 2012	Aug 16, 2012	Feb 17, 2013	Feb 19, 2013	Feb 21, 2013	90% Percentile
Ammonia (as N)	ug/L	0	0	0	69	81	77	88	0	115	131	213	0	0	0	0	214	121	150	149	178	223	0	0	0	0	0	0	0	0	0	182
Bis (2-ethylhexyl) phthalate	ug/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chlorine, Total Residual	ug/L	0	0	0	0	0	0	40	20	0	0	0	0	0	0	0	0	0	0	25	7	1	12	0	9	7	14	29	0	3	1	21
Copper, Total	ug/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Iron, Total	ug/L	0	0	0	1800	60	2000	110	3300	9200	60	70	3400	3500	3500	3800	0	0	118	142	342	348	102	37.1	57.6	49	68	190	160	81	58	281
Lead, Total	ug/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nickel, Total	ug/L	0	0	0	0	0	0	0	0	0	6	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zinc, Total	ug/L	11	0	0	0	0	0	22	0	0	10	0	0	0	0	0	23	21	24	105	21	17	5.4	23	7	33.1	9.2	6.9	26.8	8.6	11.0	24

Iron analysis from 2009 until 2010 not included in maximum value; possible iron interference in test method used.

PARAMETER	UNITS	Aug 17, 2008	Aug 19, 2008	Aug 21, 2008	Feb 06, 2009	Feb 10, 2009	Feb 12, 2009	Aug 05, 2009	Aug 11, 2009	Aug 13, 2009	Feb 16, 2010	Feb 17, 2010	Feb 18, 2010	Aug 09, 2010	Aug 11, 2010	Aug 13, 2010	Feb 08, 2011	Feb 08, 2011	Feb 10, 2011	Aug 14, 2011	Aug 16, 2011	Aug 18, 2011	Feb 26, 2012	Feb 28, 2012	Mar 01, 2012	Aug 12, 2012	Aug 14, 2012	Aug 16, 2012	Feb 17, 2013	Feb 19, 2013	Feb 21, 2013	MAXIMUM	MINIMUM
Salinity	ppt	23	26	25	21	18	23	19	25	25	21	20	20	28	28	26	20	16	19	20	11	9	17	28	22	28	25	26	30	21	27		
pH	SU	7.9	8.0	7.8	8.0	7.9	7.9	7.4	7.7	7.9	7.8	7.7	7.9	7.8	8.0	7.9	8.2	7.7	7.9	7.8	7.6	7.7	8.1	7.9	7.8	8.1	7.9	8.0	7.9	8.0	7.9	8.2	9

Temperature Data from NOAA Station ID 8461490 @ State Pier, New London:

Month/Year	°F	°C
Aug 2008	73.94	23.3
Aug 2009	84.20	29.0
Aug 2010	76.28	24.6
Aug 2011	74.48	23.6
Aug 2012	77.90	25.5
Aug 2013	72.86	22.7

Maximum Temperature:	84.20	29.0

ATTACHMENT 11

REASONABLE POTENTIAL ANALYSIS AND WATER QUALITY-BASED LIMIT DETERMINATION SUMMARY SHEET

A "reasonable potential" analysis involves determining whether the facility's discharge has the potential to cause, the reasonable potential to cause, or contributes to an excursion of the State's water quality standards. The analysis involves an effluent characterization process designed to determine which pollutants have the potential to exceed the standards. If the pollutant has the potential or the reasonable potential to exceed the standards, water quality-based limits are required. The reasonable potential analysis and permit limit determinations are performed in accordance with the procedures outlined in the EPA Guidance Manual entitled *Technical Support Document for Water Quality Based Toxics Control*, March 1991.

DATA SOURCES:

Effluent Data: DMR Data: August 2008-March 2013
Background Data: Thames River dilution water from Pfizer's chronic toxicity testing: August 2008 - February 2013; Temperature from NOAA Gage 8461490

DETERMINATION OF FRESHWATER OR SALTWATER CRITERIA:

EPA's document *National Guidance of the Applicablity of Freshwater and Saltwater Criteria* (EPA-822-R-02-047) is used to determine if freshwater criteria or salt water criteria are appropriate.
This document provides the following guidance:
If the receiving waters at the discharge point have salinity values less than 1 ppt, the discharge should be evaluated for freshwater criteria
If the receiving waters at the discharge point have salinity values between 1 ppt and 10 ppt, the discharge should be evaluated for the more stringent of the freshwater or saltwater criteria
If the receiving waters at the discharge point have salinity values greater than 10 ppt, the discharge should be evaluated for saltwater criteria
The salinity in the receiving water is: >10 ppt

CRITERIA:

State of Connecticut's *Water Quality Standards*, October 10, 2013

SITE-SPECIFIC CRITERIA FOR COPPER:

Site-specific criteria exists for copper for the following waterbodies in the State:

Waterbody	*Reach*
Bantam River	Litchfield POTW to confluence with Shepaug River
Blackberry River	Norfolk POTW to confluence with Roaring Brook
	North Canaan POTW to confluence with Housatonic River
Factory Brook	Salisbury POTW to mouth
Five Mile River	New Canaan POTW to mouth
Hockanum River	Vernon POTW to confluence with Connecticut River
Mill Brook	Plainfield Village POTW to mouth
Naugatuck River	Torrington POTW to confluence with Housatonic River
Norwalk River	Ridgefield Brook to Branchville
Pequabuck River	Plymouth POTW to confluence with Farmington River
Pootatuck River	Newington POTW to confluence with Housatonic River
Quinnipiac River	Southington POTW to Broadway, North Haven
Still River	Winsted POTW to confluence with Farmington River
	Lymeklin Brook to confluence with Housatonic River
Williams Brook	Ledyard POTW to mouth
Willimantic River	Stafford Springs POTW to Trout Management Area (Willington)
	Eagleville Dam to confluence with Shetucket River

No site-specific copper criteria applies to this site.

AMMONIA CRITERIA: (SALTWATER)

Saltwater ammonia criteria in the State's *Water Quality Standards* are expressed as un-ionized ammonia (as NH_3). Equivalent total ammonia concentrations are dependent on receiving water temperature, pH, and salinity. "Ambient Water Quality Criteria for Ammonia (Saltwater)-1989" describes the procedure for converting un-ionized ammonia concentrations to total ammonia concentrations. This calculation is as follows:

ACUTE:

$T_{ambient}$=	29.0	°C	*[Enter the highest temperature]*
$pH_{ambient}$=	8.2	SU	*[Enter the highest pH]*
$Salinity_{ambient}$=	9	ppt	*[Enter the lowest salinity]*
pK_a=	9.155		
%UIA=	9.987	%	
Unionized ammonia criteria (as NH_3)=	233	µg/L	
Total ammonia criteria (as NH_3)=	2,333	µg/L	
Total ammonia criteria (as N)=	1,918	µg/L	

CHRONIC:

$T_{ambient}$=	29.0	°C	*[Enter the highest temperature]*
$pH_{ambient}$=	8.2	SU	*[Enter the highest pH]*
$Salinity_{ambient}$=	9	ppt	*[Enter the lowest salinity]*
pK_a=	9.155		
%UIA=	9.987	%	
Unionized ammonia criteria (as NH_3)=	35	µg/L	
Total ammonia criteria (as NH_3)=	350	µg/L	
Total ammonia criteria (as N)=	288	µg/L	

DILUTION FACTOR:

Dye Dilution Re-Modeling:	46	:1
Average flow of DSN 008-1 (gpd):	25,000,000	gpd
Average flow of DSN 008-1 (cfs):	38.7	cfs
Maximum hours of discharge/day	24	hours
Dilution Factor =	46	:1
IWC%=	2.17	%

Dilution is not allowed for carcinogens/bioaccumulative pollutants.

BASIS FOR REASONABLE POTENTIAL:

The maximum receiving water concentration for each pollutant is compared to the appropriate criteria where the maximum receiving water concentration is determined as follows:
MAXIMUM RECEIVING WATER CONCENTRATION=[{(Statistical Multiplier)*(Maximum Effluent Concentration)}+{(Maximum Background Receiving Water Concentration)*(Dilution Factor-1)}]/[Dilution Factor]

If the receiving water concentration is greater than the concentration of the applicable criteria for that pollutant, there is reasonable potential for the discharge to cause an in-stream excursion. If reasonable potential exists, water-quality based limits are included in the permit for the subject pollutant.
Should the receiving water concentration be sufficiently close to the applicable criteria, considering the degree of confidence in the values, the Department may include limits also.

BASIS FOR WATER-QUALITY LIMIT DETERMINATION:

If it is determined that reasonable potential exists, water-quality based permit limits are calculated as follows:

1. Determine the Waste Load Allocation (WLA) for each applicable criteria:
   WLA (acute, chronic, human health)=[(Criteria)*(Dilution Factor)]-(Maximum Background Receiving Water Concentration*(Dilution Factor-1)]

2. Determine the Long Term Average (LTA) for each applicable criteria:
   LTA (acute)=WLA_{acute}*exp[0.5σ^2-zσ]
   LTA (chronic)=$WLA_{chronic}$*exp[0.5σ_4^2-zσ_4]
   LTA (human health)=$WLA_{human\ health}$

3. Determine the limiting LTA (i.e., the lowest LTA of the applicable criteria)

4. Calculate the Average Monthly Limit (AML):
   AML (acute,chronic)=$LTA_{acute\ or\ chronic}$*exp[zσ_n-0.5σ_n^2]
   AML (human health)=$WLA_{human\ health}$

5. Calculate the Maximum Daily Limit (MDL):
   MDL (acute,chronic)=$LTA_{acute\ or\ chronic}$*exp[zσ-0.5σ^2]
   MDL (human health)=$WLA_{human\ health}$*exp[zσ-0.5σ^2]

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Public Notices

NOTICE OF TENTATIVE DECISION
INTENT TO RENEW
A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT
FOR THE FOLLOWING DISCHARGES
INTO THE WATERS OF THE STATE OF CONNECTICUT

TENTATIVE DECISION

The Commissioner of Energy and Environmental Protection ("Commissioner") hereby gives notice of a tentative decision to renew a permit based on an application submitted by PFIZER INC ("the applicant") under Section 22a-430 of the Connecticut General Statutes ("CGS") for a permit to discharge into the waters of the state.

[illegible]

CITY OF NEW LONDON
Proposed CDBG FY2010-2015 Housing and Community Development Action Plan

[illegible]

GENERAL REQUIREMENTS FOR A REQUEST FOR QUALIFICATIONS

[illegible]

CITY OF GROTON
PUBLIC NOTICE

[illegible]

INLAND WETLANDS AND WATERCOURSES COMMISSION
LEGAL NOTICE
TOWN OF OLD LYME

[illegible]

NOTICE OF PERMIT APPLICATION

[illegible]

LEGAL NOTICE
TOWN OF OLD LYME
NOTICE OF PUBLIC HEARING

[illegible]

LEDYARD PLANNING & ZONING COMMISSION
NOTICE OF PUBLIC HEARING

[illegible]

CITY OF GROTON
PLANNING AND ZONING COMMISSION
NOTICE OF PUBLIC HEARING

[illegible]

Legal Notice

[illegible]

Stratford Minority Contracting Opportunity

[illegible]

Liquor Permit

[illegible]

COURT OF PROBATE

[illegible]

TOWN OF GROTON
ZONING COMMISSION
NOTICE OF DECISION

[illegible]

Automobiles

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Connecticut Department of
ENERGY &
ENVIRONMENTAL
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TENTATIVE DECISION

The Commissioner of Energy and Environmental Protection ("Commissioner") hereby gives notice of a tentative decision to renew a permit based on an application submitted by **PFIZER INC.** ("the applicant") under Section 22a-430 of the Connecticut General Statutes ("CGS") for a permit to discharge into the waters of the state.

In accordance with applicable federal and state law, the Commissioner has made a tentative decision that: with respect to DSN 008-1, continuance of the existing system to treat the discharge would protect the waters of the state from pollution; and with respect to DSN 009-1, continuance of the existing discharge would not cause pollution of the waters of the state.

This permit also includes a tentative decision that with respect to INTAKE 01H, the location, design, construction, and capacity of the cooling water intake structure reflects the best technology available for minimizing adverse environmental impact. Specifically, the Commissioner has determined that closed-cycle cooling would be the best technology available for this applicant to meet the requirements of Section 316(b) of the Clean Water Act ("CWA"), 33 U.S.C. § 1326(b). This determination was made in accordance with Section 316(b) of the CWA and Section 22a-430 of the CGS.

This permit also includes a tentative decision that with respect to DSN 008-1, the alternative thermal limitations will assure the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife in and on the receiving water. The alternative thermal effluent limitations were established consistent with Section 316(a) of the CWA, 33 U.S.C. § 1326(a), Subpart H of 40 CFR 125, Section 22a-430-4(q)(2)(A)(ii) of the Regulations of Connecticut State Agencies, and Section 22a-430 of the CGS.

The proposed permit, if issued by the Commissioner, will require that all wastewater be treated to meet the applicable effluent limitations and will require periodic monitoring to demonstrate that the discharge will not cause pollution.

ACTIVITIES INCLUDED IN THE DRAFT PERMIT

Pfizer Inc. has submitted an application for the renewal of its NPDES permit which would continue the authorization of the wastewater discharges associated with the utilities-related operations at its Groton, Connecticut facility.

Pfizer Inc. discharges the following utilities-related wastestreams that are the subject of the draft permit: 1) a maximum of 45,000,000 gallons per day of wastewater from DSN 008-1 into the Thames River which consists of a continuous discharge of treated wastewater associated with the power, steam, and chilled water generation operations at the facility; and 2) a maximum of 600,000 gallons per day of wastewater from DSN 009-1 into the Thames River which consists of the intermittent discharge of backwash water associated with intake structure screen cleaning. In addition, Pfizer Inc. operates a cooling water intake structure at its facility identified in the draft permit as INTAKE 01H. The intake source water is the Thames River.

The activities take place at Pfizer Inc's facility at 445 Eastern Point Road in Groton, Connecticut and are specifically located as follows:

DISCHARGE/INTAKE ID	LATITUDE	LONGITUDE	LOCATION
DSN 008-1	41° 19' 50"	72° 04' 44"	Approx. 2.25 miles south of Gold Star Bridge, east side of Thames River
DSN 009-1	41° 19' 55"	72° 04' 46"	Approx 650 ft north of DSN 008-1
INTAKE 01H	41° 19' 56"	72° 04' 46"	Approx. 675 ft north of DSN 008-1

The name and mailing address of the permit applicant are: Pfizer Inc., 445 Eastern Point Road, MS 9090-073, Groton, Connecticut 06340.

REGULATORY CONDITIONS

Types of Treatment

DSN 008-1: Oil/Water Separation; Equalization; Neutralization

Effluent Limitations

This permit contains the following types of effluent limitations identified in Section 22a-430-4(*l*) of the Regulations of Connecticut State Agencies: 1) limitations based on a Case-by-Case determination using the criteria of Best Professional Judgment established in accordance with Section 22a-430-4(m) of the Regulations of Connecticut State Agencies; 2) limitations based on Section 22a-430-4(s) of the Regulations of Connecticut State Agencies; 3) limitations based on Section 301(b)(1)(C) of the CWA. The permit limits will ensure that Water Quality Standards, including the anti-degradation policy, are met.

In accordance with Section 22a-430-4(*l*) of the Regulations of Connecticut State Agencies, the permit contains effluent limitations for the following types of toxic substances: base-neutral organic compounds and other toxic substances.

The applicant has submitted documentation in support of renewing the variance associated with the alternative thermal limitation for DSN 008-1. DSN 008-1 consists primarily of once-through cooling water which when spent, includes a thermal component. Section 316(a) of the CWA and Section 22a-430-4(q)(2)(A)(ii) of the Regulations of Connecticut State Agencies allow that alternative thermal effluent limitations may be imposed if it has been demonstrated that the limits required by the applicable standards are more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the waterbody into which the discharge is made. The applicant has demonstrated that the thermal component of DSN 008-1 is not causing any appreciable harm on the aquatic life in the Thames River. Furthermore, there has not been any indication that the thermal component of the discharge is causing any adverse effects on aquatic life. Therefore, the alternative thermal effluent limit contained in the existing permit, as well as a thermal limit concerning temperature rise in the receiving water, will be included in the draft permit.

COMPLIANCE SCHEDULE

The applicant has undertaken an evaluation to determine the best technology available to minimize the impact associated with its cooling water intake structure consistent with Section 316(b) of the CWA. Based on the information provided in this evaluation, the Commissioner has determined that closed-cycle cooling represents the best technology available for this applicant. In order to comply with this determination, the applicant will undertake a project designed to expand/upgrade its existing cooling tower. The draft permit includes an enforceable compliance schedule which requires the applicant to complete this project.

COMMISSIONER'S AUTHORITY

The Commissioner is authorized to approve or deny such permits pursuant to Section 22a-430 of the Connecticut General Statutes and the Water Discharge Permit Regulations (Sections 22a-430-3 and 4 of the Regulations of Connecticut State Agencies).

INFORMATION REQUESTS

The application has been assigned the following numbers by the Department of Energy and Environmental Protection. Please use these numbers when corresponding with this office regarding this application.

APPLICATION NO. 201207927 PERMIT ID NO. CT0000957 FACILITY ID NO. 059-003

Interested persons may obtain copies of the application by contacting Eric Watters, Senior Manager/EHS Lead, Pfizer Inc., 445 Eastern Point Road, Groton, Connecticut at (860) 715-0088.

The application is available for inspection by contacting Christine Gleason at (860) 424-3278 at the Department of Energy and Environmental Protection, Bureau of Materials Management and Compliance Assurance, 79 Elm Street, Hartford, CT 06106-5127 from 8:30-4:30, Monday through Friday.

Any interested person may request in writing that his or her name be put on a mailing list to receive notice of intent to issue any permit to discharge to the surface waters of the state. Such request may be for the entire state or any geographic area of the state and shall clearly state in writing the name and mailing address of the interested person and the area for which notices are requested.

PUBLIC COMMENT

Prior to making a final determination to approve or deny any application, the Commissioner shall consider written comments on the application from interested persons that are received within 30 days of this public notice. Written comments should be directed to Christine Gleason, Bureau of Materials Management and Compliance Assurance, Department of Energy and Environmental Protection, 79 Elm Street, Hartford, CT, 06106-5127. The Commissioner may hold a public hearing prior to approving or denying an application if in the Commissioner's discretion the public interest will be best served thereby, and shall hold a hearing upon receipt of a petition signed by at least twenty-five persons. Notice of any public hearing shall be published at least 30 days prior to the hearing.

Petitions for a hearing should include the application number noted above and also identify a contact person to receive notifications. Petitions may also identify a person who is authorized to engage in discussions regarding the application and, if resolution is reached, withdraw the petition. Original petitions must be *mailed or delivered* to: DEEP Office of Adjudications, 79 Elm Street, 3rd floor, Hartford, 06106-5127. Petitions cannot be sent by fax or e-mail. Additional information can be found at www.ct.gov/deep/adjudications.

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OSWALD INGLESE, JR., Director
Water Permitting and Enforcement Division
Bureau of Materials Management and Compliance Assurance

Dated: APR 09 2014