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PART I.A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the Effective Date of the permit and lasting through expiration, the permittee is authorized to discharge through any combination of outfall serial numbers 001, 002, 003 and 004: once-through cooling water, ultrafilter and reverse osmosis (UF & RO) treatment system reject and backwash waters, other low-volume waste streams and boiler blowdown⁽¹⁾. Such discharges shall be limited and monitored by the permittee as specified below:
 - a. Effluent samples shall be taken prior to mixing with other waste streams through Outfalls 001, 002, 003 and/or 004.
 - b. The results of sampling for any parameter above its required frequency must be reported.
 - c. There shall be no discharge of floating solids, oil sheen or visible foam in other than trace amounts.

<u>Effluent Characteristic</u>		<u>Discharge Limitations</u>		<u>Monitoring Requirements</u>
	<u>Average Monthly</u>	<u>Maximum Daily</u>	<u>Measurement Frequency</u>	<u>Sample Type</u>
Flow Rate, million gallons per day	3.2 ⁽²⁾	3.2 ⁽²⁾	Daily ⁽⁹⁾	Recorder or Calculated ⁽⁴⁾
Flow Rate, million gallons per day under Planned Maintenance Operations or Unplanned Repair Operations	52.2 ^(2,3)	52.2 ^(2,3)	Daily ⁽⁹⁾	Recorder or Calculated ⁽⁴⁾
Total Residual Chlorine ⁽⁵⁾ , mg/l	Report	0.1	1/chlorination event	Grab during chlorination event
Temperature (°F), Discharge	Report	105 ⁽⁶⁾	Continuous	Recorder
Temperature (°F), In-stream	Report	Report ^(7,8)	See Part I.A.14 and Attachment D	Recorder
Facility Temperature Rise; Discharge °F minus Inlet °F	Report	20 ⁽⁹⁾	Continuous	Recorder
pH, standard units	6.5 – 9.0		Daily	Grab

Dissolved oxygen, mg/l, in-stream ^(7,15)	Report	Report	See Part I.A.14.a.2	Recorder
Heat Load, in millions of BTUs ⁽¹⁰⁾	Report	Report	Hourly and Daily	Calculated
Electricity generation, in megawatts	Report ⁽¹⁵⁾	Report ⁽¹⁵⁾	Hourly and Daily	Recorder
Whole Effluent Toxicity Testing, ⁽¹¹⁾ LC50, C-NOEC, % ^(12,13,14)	Report	Report	1/Quarter	24 hour composite

Footnotes:

1. There have been separate permit conditions established for the discharge of reject and backwash waters, other low-volume waste streams, and boiler blowdown from internal Outfall 009. See Part I.A.3.
2. For flow, report maximum and minimum daily rates and total flow for each calendar date. The limit of 3.2 MGD is a daily maximum limit. See Footnote 3 regarding exceptions for Planned Maintenance Operations and Unplanned Repair Operations. Outfalls 001, 002, 003, and 004 are designated collectively as SUM T.
3. The limit of 52.2 MGD is the daily maximum flow for each calendar date of Planned Maintenance Operations or Unplanned Repair Operations. See Part I.A.11 for definitions of, and requirements applicable to, Planned Maintenance Operations or Unplanned Repair Operations.
4. The Flow Rate may be estimated from circulating and raw water pump capacity curves and operational hours or calculated based on data logger or other digital means. This flow rate is comprised of the combined flow rates of the total cooling water flow, blowdown from the new heat recovery steam generator (HRSG) unit, boiler blowdown, and reject and backwash waters from the UF & RO water treatment units.
5. The quantity of total residual chlorine (TRC) discharged from any of these outfalls shall not exceed 0.1 mg/l as an “instantaneous maximum concentration” at a representative and accessible point of discharge to the Charles River. TRC may not be discharged from any generating unit for more than two hours in any one day. For this permit, the minimum level (ML) for TRC is defined as 20 ug/l. This value is the minimum level for chlorine using EPA-approved methods found in the most currently approved version of Standard Methods for the Examination of Water and Wastewater, Method 4500 CL-E and G, or USEPA Manual of Methods of Analysis of Water and Wastes, Method 330.5. One of these methods must be used to determine TRC. Sample results of 20 ug/l or less shall be reported as zero on the discharge monitoring report. The ML is not

the minimum level of detection, but rather the level at which the entire analytical system shall give recognizable signal and acceptable calibration points. Chlorine may be used as a biocide. Sampling shall be conducted only during periods of chlorination at the Facility, when chlorine is being discharged. No other biocide shall be used without explicit approval from the Regional Administrator and the Commissioner (See Part I.A.4). The term "Regional Administrator" means the Regional Administrator of Region I of the U. S. Environmental Protection Agency (EPA) and the term "Commissioner" means the Commissioner of the Massachusetts Department of Environmental Protection (MassDEP) or their designees. The TRC limit of 0.1 mg/l does not apply to Outfall 009 in Part I.A.3.

6. The 1-minute average discharge temperature shall not exceed 105 °F at any time. The maximum 1-minute average temperature for each day may be recorded by a data scan, data logger, instruments, or computers.
7. The permittee may not discharge heated effluent, unless, for each Monitoring Point at Monitoring Station 3, one or more of the following is true:
 - a. The Station 3 Measured Temperature at such Monitoring Point does not exceed the Actually Applicable Temperature Limit; or
 - b. The Highest Cross-Transect Temperature corresponding to such Monitoring Point does not exceed the Cross-Transect Reference Temperature; or
 - c. Such Monitoring Point is 24 feet or deeper, and the Station 3 Measured Dissolved Oxygen at such Monitoring Point is below 5.0 mg/l; or
 - d. Such Monitoring Point is 24 feet or deeper, and the date is between November 1 and March 29; or
 - e. The permittee claims an available Springtime Exception, and the Station 3 Temperature at such Monitoring Point does not exceed the Springtime Exception Limit;

See **Attachment A** for definitions of terms in this footnote. The monitored temperatures may be recorded by a data logger, instruments, computers, or other digital means. See Part I.A.14.d.2.(d) for monthly instream temperature and DO reporting requirements. This data shall be attached to the monthly DMRs as shown in the sample tables of Attachment G as required.

8. Notwithstanding footnote 7, the permittee shall not discharge heated effluent on any day if, for each of the two preceding calendar days, all three of the following were true:
 - a. The permittee discharged heated effluent; and

- b. The permittee was required to conduct Compliance Temperature Monitoring and the Station 3 Measured Temperature at any Monitoring Point that exceeded the Actually Applicable Temperature Limit by more than 0.28° C (0.5° F); and
- c. The Station 3 Vertical Average Shallow Temperature exceeded the Average Afternoon Intake Temperature by more than 0.56° C (1.0° F).

For purposes of this footnote, “Station 3 Vertical Average Shallow Temperature” means the average of the Station 3 Measured Temperatures for the 2 foot depth, the 6 foot depth, and the 12 foot depth; and “Average Afternoon Intake Temperature” means the average of all instantaneous temperature readings measured at the Kendall Station cooling water intake at evenly spaced intervals between 2:00 PM and 5:00 PM. See Attachment A for definitions of other terms in this footnote. The monitored temperatures may be recorded by a data logger, instruments, computers, or other digital means.

- 9. Facility Temperature Rise is the difference between the discharge temperature (to be flow weighted if necessary if apportioned between more than one outfall) and intake temperature. The intake and discharge temperatures may be recorded by a data logger, instruments, or computers. The Facility Temperature Rise and Flow Rate shall be calculated as hourly averages based upon readings every fifteen (15) minutes. These hourly average values will be tabulated for each month and attached to the monthly Discharge Monitoring Reports (DMR). The hourly average discharge temperature shall be the average of the temperatures measured by temperature probes in Outfalls 001 and 002 or Outfalls 003 and 004, depending on which combination are in use (flow weighted if necessary) and shall not exceed a 20 °F rise over the hourly average temperature of the intakes on the Broad Canal for the corresponding hour.
- 10. The Heat Load shall be calculated on an hourly basis using the following equation: $Q = Cpm(\Delta T)/24 \text{ hours}$

Where Q = Heat Load, British Thermal Units (BTU)/hour

Cp = Heat Capacity (Specific Heat) of water = 1.0 BTU/pound-°F

m = mass of water = cooling water flow rate (MGD) x density of river water =
cooling water flow rate (MGD) x 8.34 pounds/gallon

ΔT = discharge temperature - intake temperature, °F, hourly average (See footnote 9 above) The monthly heat load shall be calculated by adding together each day's heat load for that month. Each day's heat load shall be calculated by adding together each hour's heat load for that day.

11. The permittee shall conduct chronic (and modified acute) Whole Effluent toxicity (WET) toxicity tests four times per year. The chronic test may be used to calculate the acute LC50 at the 48-hour exposure interval. Prior to taking the first sample for this test, the permittee shall measure the salinity in its intake water. If such salinity is measured at less than 1 part per thousand (ppt), the permittee shall follow the testing protocol specified in Attachment C1 for freshwater species. If the measured salinity is 1 ppt or greater, the permittee shall follow the testing protocol specified in Attachment C2 for marine species. Toxicity test samples shall be collected during the calendar quarters ending March 31, June 30, September 30 and December 31. The test results shall be submitted by the last day of the month following the completed quarter, April 30, July 31, October 31 and January 31, respectively. The tests must be performed in accordance with test procedures and protocols specified in **Attachments C1 and C2** of this permit, follow the conditions set forth in the table below and be conducted during normal operating conditions. On the DMR, report the results for the WET species used. For those species not used, enter the no discharge (NODI) code of “9”.

Day 1 (Acute and sample #1 for chronic)	Day 3 (sample #2 for chronic)	Day 5 (sample #3 for chronic)
Discharge of Sodium Bisulfite HRSG Blowdown UF and RO Water Treatment Reject Water	HRSG Blowdown UF and RO Water Treatment Reject Water	HRSG Blowdown UF and RO Water Treatment Reject Water

After submitting one year and a minimum of four consecutive sets of WET test results (one per quarter), the permittee may request a reduction or elimination of the WET testing requirements, based upon the test results. The permittee is required to continue testing at the frequency specified in the permit until notice is received by certified mail from the EPA that the WET testing requirement has been changed. Days 3 and 5 may or may not include the discharge of sodium bisulfite.

12. The LC50 is the concentration of effluent which causes mortality to 50% of the test organisms.
13. C-NOEC (chronic-no observed effect concentration) is defined as the highest concentration of toxicant or effluent to which organisms are exposed in a life cycle or partial life cycle test which causes no adverse effect on growth, survival, or reproduction at a specific time of observation as determined from hypothesis testing where the test results exhibit a linear

dose-response relationship. However, where the test results do not exhibit a linear dose-response relationship, the permittee must report the lowest concentration where there is no observable effect.

14. If toxicity test(s) using receiving water as diluent show the receiving water to be toxic or unreliable, the permittee shall follow procedures outlined in **Attachment C, Section IV**, of this permit in order to obtain permission to use an alternate dilution water. In lieu of individual approvals for alternate dilution water required in **Attachment C**, the permittee may use the EPA New England guidance document entitled Self-Implementing Alternative Dilution Water Guidance (“Guidance Document”) to obtain automatic approval of an alternate dilution water, including the appropriate species for use with that water. If the Guidance Document is revoked, the permittee shall revert to obtaining approval as outlined in **Attachment C**. The Guidance Document has been sent to all permittees with their annual set of DMRs and Revised Updated Instructions for Completing EPA’s Pre-Printed NPDES Discharge Monitoring Report (DMR) Form 3320-1 and is not intended as a direct attachment to this permit. Any modification or revocation to the Guidance Document will be transmitted to the permittees as part of the annual DMR instruction package. However, at any time, the permittee may choose to contact EPA New England directly using the approach outlined in **Attachment C**.
15. The monitored electricity generation, in megawatts or megawatt hours, and the dissolved oxygen in mg/l, may be recorded by a data logger, instruments, computers, or other digital means.

Part I.A.2.

During the period beginning on the Effective Date and lasting through expiration, the permittee is authorized to discharge intake screen backwash water from outfall serial numbers 005, 006 and 007 at a total daily maximum Flow Rate not to exceed 0.1 MGD for each outfall.

<u>Effluent Characteristic</u>		<u>Discharge Limitations</u>		<u>Monitoring Requirements</u>
	<u>Average Monthly</u>	<u>Maximum Daily</u>	<u>Measurement Frequency</u>	<u>Sample Type</u>
Flow Rate, million gallons per day	-----	0.1	1/Month	Estimate
pH, standard units	See part c.	See part c.	1/Month	Meter

- a. There shall be no discharge of floating solids, oil sheen or visible foam in other than trace amounts.
- b. The water used for intake screen backwashing shall be comprised of the receiving water only. The permittee may not use any cooling or process water associated with the operation of this facility for this backwashing operation.
- c. The pH shall not be less than 6.5 standard units and not more than 9.0 standard units, unless these values are exceeded due to natural causes. The pH shall be no more than 0.5 units outside the natural background range. To demonstrate that pH values of the effluent are outside the permitted pH range due to natural causes, the permittee must show that pH measurements of the source water and the effluent are the same. Documentation of such conditions must be submitted by the permittee with the discharge monitoring reports.
- d. See Parts I.A.11.d.(5) and (6) and I.A.13 regarding the operation of the traveling screens at the intake structures and impingement related conditions.

Part I.A.3. During the period beginning on the Effective Date and lasting through expiration, the permittee is authorized to discharge low-volume waste from outfall serial number 009: UF & RO water treatment system reject and backwash waters, other low-volume waste streams and boiler blowdown. This is an internal outfall.

<u>Effluent Characteristic</u>	<u>Discharge Limitations</u>		<u>Monitoring Requirements</u>	
	<u>Average Monthly</u>	<u>Maximum Daily</u>	<u>Measurement Frequency</u>	<u>Sample Type</u>
Flow Rate, million gallons per day	Report	3.2	Daily	Recorder or Calculated ⁽¹⁾
Total Suspended Solids, mg/l	30	100	1/Week	24 hour composite
Oil and Grease, mg/l	15	20	1/Week	Grab
Total Residual Chlorine, mg/l	Report	Report	1/Week, when in use	Grab during chlorination event ⁽²⁾

- a. There shall be no discharge of floating solids, oil sheen or visible foam in other than trace amounts.
- b. The results of sampling for any parameter above its required frequency must be reported.
- c. The combination of these streams will be monitored prior to joining the condenser cooling water stream.
- d. The monitoring of this outfall must coincide with the approximate time period of the maximum use of the chemicals listed in Table 1 at the end of this permit.

Footnotes:

1. The Flow Rate may be estimated from circulating and raw water pump capacity curves and operational hours or calculated based on data logger or other digital means.
2. See Footnote 5 on Pages 3 and 4.

The permittee shall collect a grab sample of this outfall and analyze it for the 126 priority pollutants found on Appendix A of 40 CFR 423 during the first month of discharge from the UF & RO system under the permit. This sampling and analysis shall also be conducted annually thereafter during the period of July through September except as provided in Part I.A.15.c.

Part I.A. (continued)

4. The chemicals listed in Table 1 are approved for water discharge. A generic equivalent of any chemical in Table 1 may be substituted if the permittee documents that such chemical causes no greater aquatic toxicity than the chemical it replaces, based on the aquatic LC50 values in such chemical's Material Safety Data Sheet (MSDS). If aquatic toxicity data is not available, the permittee must make an alternative demonstration. If the permittee substitutes a generic equivalent pursuant to this provision, the permittee shall retain all records pertaining to its determination that the generic equivalent causes no greater aquatic toxicity than the listed chemical as long as the permit is effective or for five years after it ceases discharge of the generic equivalent, whichever is later. The permittee may propose to conduct feasibility studies involving new chemicals not currently approved for water discharge. The permittee shall gain approval from the Regional Administrator (RA) and the Commissioner before any discharges to the river resulting from such studies takes place. A report summarizing the results of any such studies shall be submitted to the RA and the Commissioner regarding discharge frequency, concentration, and the impact, if any, on the indigenous populations of the receiving water. The RA or the Commissioner may require WET testing as part of any feasibility study.
5. The discharges shall not cause a violation of any applicable water quality standards (WQS) or degrade the aquatic habitat quality.
6. Any change in the location, design or capacity of the present cooling water intake structures shall be approved by the RA and the Commissioner.
7. This permit may be modified, revoked or reissued to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b) (2), and 207(a) (2) of the Act, if the effluent standard or limitation so issued or approved:
 - a. contains different conditions or is otherwise more stringent than any effluent limitation in this permit; or
 - b. controls any pollutant not limited by this permit.

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

8. There shall be no discharge of polychlorinated biphenyl (PCB) compounds. The permittee shall dispose of all known PCB equipment, articles, and wastes in accordance with 40 CFR § 761. The permittee shall certify to EPA at the address in Part I.B.3. that this disposal has been accomplished.

9. All existing manufacturing, commercial, mining, and silvicultural dischargers must notify the RA as soon as they know or have reason to believe (40 CFR §122.42):
 - a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant (as defined at 40 CFR §122.2) which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - (1) One hundred micrograms per liter (100 ug/L);
 - (2) Two hundred micrograms per liter (200 ug/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/L) for 2,4-dinitrophenol and for 2-methyl- 4,6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
 - (3) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR §122.21(g)(7); or
 - (4) Any other notification level established by the RA of EPA in accordance with 40 CFR §122.44(f).
 - b. That any activity has occurred or will occur which would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - (1) Five hundred micrograms per liter (500 ug/L);
 - (2) One milligram per liter (1 mg/L) for antimony;
 - (3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR §122.21(g)(7); or
 - (4) Any other notification level established by the Director of EPA in accordance with 40 CFR §122.44(f).
 - c. That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant which was not reported in the permit application.
10. [Reserved – Left intentionally blank]
11. Cooling Water Intake Structure (CWIS) Requirements to Minimize Adverse Environmental Impacts from Impingement and Entrainment
 - a. The design, location, construction, and capacity of the permittee's CWIS shall reflect the best technology available (BTA) for minimizing the adverse environmental impacts from the entrainment and impingement of fish eggs and

larvae, as well as impingement of adult and juvenile fish, due to the CWIS. In order to satisfy this BTA standard, the permittee shall install and operate as necessary an air cooled condenser (ACC) and back pressure steam turbine (BPST) and, except as specifically provided in Part I.A.11.b or 11.c below, shall comply with Part I.A.11.a.(1)-(5) below.

- (1) The permittee shall not withdraw more than 3.2 million gallons of water through the CWIS on any day.
 - (2) The permittee shall restrict the effective through-screen velocity through each of the traveling screens to no more than 0.5 feet per second (fps) at any point on the screen.
 - (3) The permittee shall inspect the traveling screens at least monthly. The permittee shall repair damage that compromises performance as soon as practicable.
 - (4) The permittee shall clean, rotate, and otherwise maintain the traveling screens as often as needed to maintain a through-screen velocity no greater than 0.5 fps. When cleaning, rotating, or otherwise maintaining the traveling screens, the permittee shall comply with Parts I.A.11.d.5 and I.A.11.d.6 below.
 - (5) Within 90 days of the Effective Date of the permit, the permittee shall submit calculations to verify that, except as provided in Parts I.A.11.b and I.A.11.c, the through-screen velocity through each of the traveling screens is no greater than 0.5 fps. This and all other submittals in this Part shall be made to EPA and MassDEP at the addresses in Part I.B.3.
- b. The permittee may conduct Planned Maintenance Operations from time to time consistent with the limitations and obligations described in Part I.A.11.b.(1)-(6). Planned Maintenance Operations means continued operation of the Facility when the Facility's discharge or withdrawal is in excess of 3.2 MGD due to the unavailability of the BPST, the ACC, and/or any steam line from Mirant Kendall Cogeneration Station due to scheduled maintenance. The permittee may only conduct Planned Maintenance Operations in compliance with Part I.A.11.b.(1)-(6).
- (1) Planned Maintenance Operations may only be conducted between October 15 and December 15, except as described in Part I.A.11.b.1.a-c below.
 - a. If, before conducting activities that require the permittee to avail itself of the provisions of Part I.A.11.b, the permittee is required by the mandatory requirements of ISO New England, Inc. ("ISO-NE"), or its successor, to obtain ISO-NE's approval to engage in such activities, then the permittee must timely request such approval, must request approval for a time period within the period of October 15-December 15, must advise ISO-NE of the requirements of Part I.A.11.b of this permit, and

must inform ISO-NE that the permittee is able to conduct such activities anytime between October 15-December 15.

- b. If ISO-NE does not authorize the permittee to conduct such activities within the period of October 15-December 15, then the permittee must seek approval to conduct the activities that require ISO-NE's approval during a time period as reasonably proximate to October 15-December 15 as ISO-NE will approve. However, regardless of the conditions of any ISO-NE approval, the permittee may not conduct any activities pursuant to Part I.A.11.b from January 1 through September 30. If the conditions of ISO-NE's approval, or any other factors, require the permittee to conduct activities that the permittee cannot conduct consistent with the requirements of Part I.A.11.a from January 1 through September 30, then any such activities conducted from January 1 through September 30 shall be considered Unplanned Repair Operations under Part I.A.11.c rather than Planned Maintenance Operations under Part I.A.11.b, and such days from January 1 through September 30 shall be counted against the total Unplanned Repair Operations days available to the permittee under Part I.A.11.c.2.
 - c. Within 10 days of receiving approval from ISO-NE to conduct such activities in a time period other than October 15-December 15, the permittee will notify EPA of that approval, and provide EPA with copies of correspondence between the permittee and ISO-NE leading to that result.
- (2) The permittee must notify EPA and MassDEP in writing at least 10 business days in advance of initiation of Planned Maintenance Operations.
 - (3) The permittee may not conduct Planned Maintenance Operations for more than a total of 30 days out of any rolling five-year period.
 - (4) Whenever the permittee is conducting Planned Maintenance Operations under Part I.A.11.b, the requirements of Part I.A.11.d apply.
 - (5) Within 90 days after completion of Planned Maintenance Operations, the permittee shall submit a report to EPA and MassDEP explaining whether the permittee had discovered any issues during the Planned Maintenance Operations that are likely to require additional Planned Maintenance Operations or Unplanned Repair Operations in the next twelve months, and detailing all biological and fish monitoring information collected pursuant to Parts I.A.11.d.
 - (6) In order to continue withdrawals under this section, the permittee shall conduct any required maintenance activities as expeditiously as can be achieved (using commercially reasonable methods) without compromising

safety or reliability, or violating any applicable Federal, State, local, and/or ISO-NE requirements.

- c. The permittee may conduct Unplanned Repair Operations from time to time if necessary, consistent with the limitations and obligations described in Part I.A.11.c. Unplanned Repair Operations means continued operation of the Facility when the Facility's discharge or withdrawal is in excess of 3.2 MGD due to the unplanned unavailability (for physical, technical, and/or safety reasons) of the back pressure steam turbine, the air cooled condenser, and/or the steam line. The permittee may withdraw water through the CWIS during periods of Unplanned Repair Operations only in compliance with Part I.A.11.c.(1)-(6).
- (1) The permittee shall notify EPA and MassDEP as soon as practicable after it becomes aware or determines that Unplanned Repair Operations will occur, but in any event must notify EPA and MassDEP within 24 hours after Unplanned Repair Operations have begun.
 - (2) The permittee shall not withdraw water through any of the CWISs under Part I.A.11.c for more than a total of 30 days out of any rolling five-year period.
 - (3) The permittee may conduct Unplanned Repair Operations pursuant to Part I.A.11.c consecutively with Planned Maintenance Operations pursuant to Part I.A.11.b, but the total combined period shall not exceed 30 consecutive days.
 - (4) Whenever the permittee is conducting Unplanned Repair Operations under Part I.A.11.c, the requirements of Part I.A.11.d apply.
 - (5) Within 90 days after conclusion of Unplanned Repair Operations, the permittee shall submit a report to EPA and MassDEP explaining the circumstances that led to the necessity for Unplanned Repair Operations, the actions taken in response, all biological and fish monitoring information collected pursuant to Parts I.A.11.d and/or I.A.12-14 below, the volume of water withdrawn for each day during the Unplanned Repair Operations period, and steps already taken and/or to be taken (with a proposed schedule) to avoid a similar event in the future, if applicable.
 - (6) In order to continue withdrawals under this section, the permittee shall conduct any required maintenance activities as expeditiously as can be achieved (using commercially reasonable methods) without compromising safety or reliability, or violating any applicable Federal, State, local, and/or ISO-NE requirements.
- d. When conducting Planned Maintenance Operations pursuant to Part I.A.11.b or Unplanned Repair Operations pursuant to Part I.A.11.c, the permittee shall operate the cooling water pumps and traveling screens at Units 1 and 2 in accordance with Part I.A.11.d.(1)-(6) below.

- (1) The permittee shall not withdraw more than 52.2 million gallons of water through the CWIS on any day.
- (2) The permittee shall restrict the effective through-screen velocity through each of the traveling screens to no more than 0.8 feet per second (fps) at any point on the screen.
- (3) The permittee shall inspect the traveling screens at least every eight hours. The permittee shall repair damage that compromises performance of the traveling screens as soon as practicable.
- (4) The permittee shall clean, rotate and otherwise maintain the traveling screens at least once every eight hours. Each screen rotation shall be for a time sufficient to dislodge and collect any impinged organisms. This screen rotation shall continue until such time that normal operating conditions are re-established and intake flow is reduced to no greater than 3.2 million gallons on any day.
- (5) As soon as practicable following each rotation, material collected must be inspected for live fish, either by plant personnel or another method, in a manner that maximizes the survival of impinged fish. All live adult and juvenile fish collected or trapped on the traveling screens shall be identified to species, measured in millimeters (mm), or if greater than 100 mm in length, to the nearest centimeter (cm), inspected to determine overall health and reproductive condition (if possible) and returned to the lower Basin downstream of the head wall of the Broad Canal. Fish may be carried in buckets of river water and released by hand or by any other method that sufficiently ensures survival of the organisms as described in advance in writing by a biologist on behalf of the permittee. Dead fish collected or trapped on the traveling screen shall be identified to species (if possible) and measured in millimeters, or if greater than 100 mm in length, to the nearest cm. All fish collection information shall be included in the Annual Monitoring Report.
- (6) All other material shall be removed from the traveling screens and disposed of in accordance with all existing Federal, State, and/or local laws and regulations that apply to waste disposal. Such material shall not be returned to the receiving waters.

12. Fish Mortality Requirements

Each day through the year that the permittee is discharging heated effluent, the permittee shall visually inspect (1) the Broad Canal and (2) the Charles River in the vicinity of Outfall 001 for dead fish. A fish, defined for this purpose as any juvenile or adult fish, shall be considered dead if it is observed to have a loss of equilibrium for at least two minutes.

a. Initial Notification and Response

1. If the permittee observes three or more dead fish, the frequency of observation shall be increased to not less than once every two hours until no additional dead fish are observed. If 25 or more dead fish are observed within any 24 hour period in either of the areas specified above, the permittee shall provide telephone notification to the Massachusetts Division of Marine Fisheries (DMF), EPA's Office of Ecosystem Protection, and the MassDEP, within four hours of such observation. See contact names for the EPA and DMF in Part I.B.3. of this permit and for MassDEP in Part I.A.14.g. If 25 or more dead fish are observed during a 24 hour weekend, holiday or evening period, the permittee shall notify the DMF, EPA and MassDEP on the next business day.

2. Upon observation of fish mortalities sufficient to require notification, the permittee shall make a concerted effort to collect and report the following information, if practicable: (1) the hourly Facility discharge temperatures for the 24 hours prior to and including the time of the fish mortality, (2) the dissolved oxygen levels and river temperatures at Monitoring Stations 2 through 6, (3) the dissolved oxygen levels and river temperature, from surface to bottom, at the approximate location of the fish kill, (4) the number of dead fish observed, by species, and (5) the length of all dead fish collected, in millimeters, or if greater than 100 mm in length, to the nearest centimeter (cm). If more than 100 dead fish are collected, a representative subset of the fish may be measured for total length.

Dissolved oxygen and river temperature values shall be collected once a day, unless directed otherwise by MassDEP or EPA. Facility discharge temperature data is already recorded on a continuous basis and would be sufficient to meet Part I.A.12.a.2.(1) of the requirement above. The information collected in Part I.A.12.a.2 shall be included in the written report documenting the event, as required in Part I.A.12.c, below.

3. On observation of fish mortalities sufficient to require notification, the permittee shall suspend all unit chlorination operations, and if the discharge temperature is greater than 95°F, the permittee shall reduce the discharge temperature to no more than 95°F within two hours of such observation.

4. If, at the end of the 24 hour period from the initial observation, fish mortalities are no longer occurring and EPA or the MassDEP do not advise otherwise, the permittee shall cease monitoring under this section of the permit and return to normal station operation, including unit chlorination.

- b. In the event of fish mortalities sufficient to require notification in the Broad Canal or the Charles River in the vicinity of Outfall 001, the permittee will begin removing all dead fish within four hours after the fish mortalities have been observed. The dead fish shall be enumerated in accordance with Part I.A.12.a.2.(4) and (5), above.

- c. The permittee shall make a written report of any documented fish mortalities to DMF, EPA, and MassDEP, within ten (10) business days of the event. Included in this report shall be (1) the status of operation at the Facility before and during the event, along with all information required in Part I.A.12.a.2 of this permit, (2) any meteorological or other environmental conditions that may have contributed to the event, (3) the opinion of the permittee as to the cause of the event, and (4) what actions the Facility shall take in the future to reduce the recurrence of fish kills (if applicable). The MassDEP and EPA addresses to be used are found in Part I.B.3. of this permit.

13. Unusual Impingement Events

The permittee shall report all "unusual impingement events" at the Facility. The beginning of an "unusual impingement event" (UIE) is defined as any occasion on which the permittee's rotation of one or more traveling screens yields 15 or more total fish (of all species) that were impinged upon the screens. UIEs will be reported to EPA, MassDEP and DMF designees by telephone no later than twelve (12) hours after the permittee is aware of or has reason to believe an UIE has occurred. If the UIE is observed during weekend, holiday or evening periods, the permittee shall notify the EPA, MassDEP and DMF on the next business day. The permittee shall prepare and submit a written report regarding such UIE within ten (10) business days to EPA, MassDEP and DMF. The MassDEP and EPA addresses to be used are found in Part I.B.3. of this permit. Upon the initial observation of a UIE, the permittee shall rotate all traveling screen[s] once every hour until the impingement rate is less than 15 fish per hour. Impinged fish shall be enumerated in accordance with Part I.A.12.a.2.(4) and (5). Any live impinged fish shall be treated in accordance with the live fish requirements specified in Part I.A.11.d.(5). The permittee shall refer to Part I.A.11.d of this permit regarding inspection requirements. The permittee shall report any UIE that takes place during these required inspections or during any other periods.

14. Temperature and Water Quality Monitoring

a. In-stream Compliance Monitoring Program

1. Compliance Temperature Monitoring

- (a) In-stream compliance temperature monitoring shall be conducted throughout the year for the effective period of the permit in accordance with the following provisions:
 - (1) When specified in Attachment D, and/or
 - (2) On any day that the effluent flow exceeds 3.2 MGD.

- (b) Whenever in-stream compliance temperature monitoring is required pursuant to Part I.A.14.a.1.(a), the permittee shall conduct in-stream compliance temperature monitoring at discrete Monitoring Points in the water column at Monitoring Station 1 (Background) and Monitoring Station 3, shown in Attachment B, to determine permit compliance as specified in Part I.A.1. footnote 7.
 - (c) When in-stream compliance temperature monitoring data collection is required at Monitoring Station 1, the permittee shall obtain temperature data at Monitoring Points at depths of 2 feet, 6 feet and 12 feet.
 - (d) When in-stream compliance temperature monitoring data collection is required at Monitoring Station 3, the permittee shall obtain temperature data at Monitoring Points at depths of 2 feet, 6 feet, 12 feet, 24 feet (when station depth allows), and approximately 3 feet above the bottom (when the river depth at Monitoring Station 3 is equal to or greater than 30 feet).
 - (e) At a minimum, the permittee shall record one temperature value at each discrete Monitoring Point depth specified in Part I.A.14.a.1.(c) and 1.(d). The permittee shall also record the time and date of each in-stream compliance temperature monitoring collection.
 - (f) The permittee shall collect in-stream compliance temperature monitoring data at all Monitoring Point depths of Station 3 and Station 1 between the hours of 2:00 pm and 2:45 pm. An average temperature for each Monitoring Point may be substituted for a single temperature measurement, providing the collection and calculation of the average temperature meets the “Average Temperature” definition specified in Attachment A.
 - (g) [Reserved – Left intentionally blank]
 - (h) When unsafe conditions beyond the control of the permittee prevent data collection as specified in Part I.A.14.a.1.(f), data shall be collected as close as possible to the time frame specified in Part I.A. 14.a.1.(f), once in-stream data collection can be conducted safely.
2. Dissolved Oxygen Monitoring
- (a) The permittee shall collect dissolved oxygen (DO) concentrations at each Monitoring Point depth specified in Part I.A.14.a. when an in-stream temperature is collected in the Charles River to determine compliance as specified in Attachment A. DO shall be reported as part of the Monthly Monitoring Report as described in Part I.A.14.d.

b. In-Stream Compliance Support Monitoring Program

1. Compliance Support Temperature Monitoring

- (a) The permittee shall conduct compliance support in-stream temperature monitoring at the locations identified in Part I.A.14.b.1.(b), throughout the year for the effective period of the permit in accordance with the following provisions:
 - (1) Whenever the Station 3 Measured Temperature (as defined in Attachment A) is above the corresponding Actually Applicable Temperature Limit as specified in Attachment A, and/or
 - (2) On any day that the effluent flow exceeds 3.2 MGD.
- (b) The permittee shall conduct compliance support temperature monitoring at the following discrete Monitoring Points in the water column at Monitoring Stations 2, 4, 5, 6, 7 and 8, shown in Attachment B.
 - (1) Monitoring Station 7, as represented in Attachment B, is located at the midpoint of the Old Locks at the Museum of Science. The midpoint of the Old Locks will be sampled when conditions make such sampling feasible. When conditions such as boat traffic make sampling the midpoint infeasible, a sample will be collected at the nearest feasible location downstream of the Old Locks.
- (c) When compliance support temperature monitoring is required at the Monitoring Stations identified in Part I.A.14.b.1(b), the permittee shall obtain temperature data at depths of 2 feet, 6 feet, 12 feet, 24 feet (when station depth allows), and approximately 3 feet above the bottom (when the river depth at the Monitoring Station is equal to or greater than 30 feet deep).
- (d) At a minimum, the permittee shall record one temperature value at each discrete Monitoring Point depth specified in Part I.A.14.b.1.(c) at Monitoring Stations 2, 4, 5, and 6 throughout the year, when required. The time and date of each temperature collection must also be recorded.
- (e) At a minimum, the permittee shall record one temperature value at each discrete Monitoring Point depth specified in Part I.A.14.b.1.(c) at Monitoring Stations 7 and 8 from April 1 through October 31, when required. The time and date of each temperature collection must also be recorded.
- (f) When required, compliance support in-stream temperature monitoring shall be performed between the hours of 2:00 pm and 5:00 pm. An average temperature for each Monitoring Point may be substituted for a single temperature

measurement, providing the collection and calculation of the average temperature meets the “Average Temperature” definition specified in Attachment A. Temperature data shall be reported as part of the Monthly Monitoring Report as described in Part I.A.14.d.

- (g) When unsafe conditions beyond the control of the permittee prevent data collection as specified in Part I.A.14.b.1.(f) the permittee shall collect data as close as possible to the time frame specified in Part I.A.14.b.1.(f), once in-stream data collection can be conducted safely.

2. Dissolved Oxygen Monitoring

- (a) DO concentrations shall be collected at each Monitoring Point depth in the water column when a temperature reading is collected in the Charles River, as specified in Part I.A.14.b.1. DO shall be reported as part of the Monthly Monitoring Report as described in Part I.A.14.d.

c. Supplemental Monitoring Program

1. Supplemental In-stream Temperature Monitoring

- (a) The permittee shall conduct supplemental in-stream temperature monitoring at the locations identified in Part I.A.14.c.1.(b) for twenty-four (24) consecutive months beginning on the Effective Date of the permit, in accordance with the following provisions:
 - (1) The permittee shall conduct supplemental in-stream temperature monitoring on any day when in-stream compliance temperature monitoring is required by Attachment D but the Station 3 Measured Temperature (as defined in Attachment A) for each depth at Monitoring Station 3 is at or below the Actually Applicable Temperature Limit specified in Attachment A, provided that the permittee is not required to conduct supplemental in-stream temperature monitoring pursuant to this provision (Part I.A.14.c.1.(a)(1) for more than one day within a week (Sunday through Saturday).
 - (2) If no in-stream compliance monitoring has been required by Attachment D during the first three weeks of a calendar month, then the permittee shall conduct supplemental in-stream temperature monitoring once during the last week of the month at all Monitoring Points at the Monitoring Stations specified in Part I.A.14. c.1.(b), as well as at all Monitoring Points at compliance Monitoring Stations 1 and 3.

- (b) The permittee shall conduct supplemental in-stream temperature monitoring at the discrete Monitoring Points in the water column at the Monitoring Stations identified in section Part I.A.14.b.1.(b) and shown in Attachment B.
- (c) The permittee may voluntarily conduct supplemental in-stream temperature monitoring according to Part I.A.14.c.1. at any time. All data collected must be submitted as part of the Monthly Monitoring Report as described in Part I.A.14.d.
- (d) When supplemental in-stream temperature monitoring is conducted at the Monitoring Stations identified in Part I.A.14.1.c., the permittee shall obtain temperature data at depths of 2 feet, 6 feet, 12 feet, 24 feet (when station depth allows), and approximately 3 feet above the bottom, when a Monitoring Station depth is equal to or greater than 30 feet deep.
- (e) At a minimum, the permittee shall record one temperature value at each discrete Monitoring Point depth specified in Part I.A.14.c.1.(d). at Monitoring Stations 2, 4, 5, and 6 throughout the year, when required. The time and date of each temperature collection must also be recorded.
- (f) From April 1 through October 31, the permittee shall, at a minimum, record one temperature value at each discrete Monitoring Point depth specified in Part I.A.14.c.1.(d) at Monitoring Stations 7 and 8, when required. The time and date of each temperature collection must also be recorded.
- (g) When required, supplemental in-stream temperature monitoring shall be performed between the hours of 2:00 pm and 5:00 pm. An average temperature for each Monitoring Point may be substituted for a single temperature measurement, providing the collection and calculation of the average temperature meets the "Average Temperature" definition specified in Attachment A. Temperature data shall be reported as part of the Monthly Monitoring Report as described in Part I.A.14.d.
- (h) When unsafe conditions beyond the control of the permittee prevent data collection as specified in Part I.A.14.c.1.(g) the permittee shall collect data as close as possible to the time frame specified in Part I.A.14.a.1.(g), once in-stream data collection can be conducted safely.

2. Dissolved Oxygen Monitoring

- (a) DO concentrations shall be collected at each Monitoring Point depth in the water column when a temperature reading is collected in the Charles River, as specified in Part I.A.14.c.1. DO shall be reported as part of the Monthly Monitoring Report as described in Part I.A.14.d.

d. General and Reporting

1. Additional Data Collection

For each day when in-stream temperature monitoring is required pursuant to Part I.A.14.a., b, and/or c, the permittee shall obtain and report the following data:

- (a) Meteorological and Charles River data: local air temperature at the time of monitoring, river flow at the time of monitoring, as measured at the USGS Waltham Gage and local precipitation on the day of monitoring (24 hour total).
- (b) Facility operation data: the hourly intake temperature, the hourly discharge temperature, the hourly Facility temperature rise (intake versus discharge), the hourly discharge flow rate and the hourly Facility megawatt generation (related to heat load to the river) from 0000 hrs (midnight) to 2359 hrs on the day the monitoring took place. This information shall be obtained for each day that in-stream monitoring takes place.

2. Reporting Requirements

- (a) The permittee shall conduct the monitoring and reporting described in Parts I.A. 14.a., b. and c., and present the information in a “Monthly Monitoring Report” (MMR) and an “Annual Monitoring Report” (AMR). After one year’s collection of data under the Monitoring Program (MP), and before the permit’s expiration date, the permittee may request a modification to the Monitoring Program pursuant to Part I.A.15.a of this permit.
- (b) Unless otherwise specified, the results of all monitoring, including monitoring that is performed in addition to what is required in Part I.A.14.a., b. and c., shall be reported in the MMR and the AMR. The MMR shall contain all monitoring conducted during the month and be submitted as an attachment to the Facility Discharge Monitoring Report (DMR). The AMRs shall be submitted ninety (90) days after the end of the calendar year and include a compilation of all monthly data collections. All of these reports shall be sent to the same address as the DMR reports, under separate cover letter and as provided at the end of this permit. During any period after expiration date of this permit and before reissuance, the Monitoring Program will continue and the Annual Monitoring Report submittals will be made each year.
- (c) Each AMR shall present the previous year’s information. The AMR shall identify any anomalies or unexpected patterns or trends that appear in the annual data collection. The report must offer possible reasons for the anomalies, along with

supporting information, if available. The permittee will make recommendations for any additional or revised monitoring to better understand such anomalies should they reoccur.

- (d) Temperature and DO data recorded to determine compliance at all depths at Monitoring Stations 1 and 3 (including, whenever calculated, the Station 1 Measured Temperature and the Substituted Ambient Temperature Limit, as defined in Attachment A) shall be reported in the Compliance Section of the MMR and the AMR as well as stored electronically. If there were any occasions where the Station 3 Measured Temperature exceeded the Actually Applicable Temperature Limit (regardless of whether such exceedances constituted permit violations), the permittee shall include a separate table to be attached to the monthly DMR which will list the specifics of such exceedances (i.e. time of day, depth). The permittee may use the table shown in Attachment G or similar table to list these exceedances.
- (e) Compliance support temperature and DO data recorded at all depths at Monitoring Stations 2, 4, 5, 6, and when applicable, Monitoring Stations 7 and 8 (including the calculated Highest Cross-Transect Temperature, and Cross-Transect Reference Temperature, as defined in Attachment A), shall be reported in the Compliance Support Data Section of the MMR and AMR as well as stored electronically.
- (f) Supplemental temperature and DO data recorded at all depths at Monitoring Stations 2, 4, 5, 6, and when applicable, Monitoring Stations 7 and 8 (including the calculated Highest Cross-Transect Temperature, and Cross-Transect Reference Temperature, as defined in Attachment A), shall be reported in the Supplemental Data Section of the MMR and AMR as well as stored electronically.
- (g) For all water quality data described in Parts I.A.14.a., b. and c., the time and date of each collection, the associated meteorological and river flow data described in Part I.A.14.d.1(a), and the facility operation information described in Part I.A.14.d.1(b) for the day of monitoring will be assembled and, together with an electronic copy of the raw data, be included in the MMR and the AMR. Any electronic information must be compatible with a generally available spreadsheet program.
- (h) When in-river data cannot be collected due to unsafe conditions, as stated in Part I.A.14.a.1.(h), Part I.A.14.b.1(g) and Part I.A.14.c.1.(h) the permittee must document the specific reason(s) that prevented the data collection, including supporting information when appropriate. The permittee shall include this information in the MMR and the AMR.

3. Quality Assurance Project Plan (QAPP)

- (a) The permittee shall develop and submit to EPA at the address in Part I.B.3. a Quality Assurance Project Plan (QAPP) within sixty (60) days after the Effective Date of the permit in conformance with the applicable requirements of the EPA QA/R-5 document, published in March of 2001. This document is available at www.epa.gov/quality1/qa_docs.html. The QAPP shall encompass all measurements of all instream monitoring data and must describe how data will be reported and reviewed for accuracy and usability prior to its submittal to EPA and MassDEP. The permittee shall also provide its methods for calibrating the equipment that measures its influent and effluent temperature.
- (b) All Quality Assurance/Quality Control data will be reported and summarized in the AMR, including a detailed Materials and Methods and Instrument Calibration Section, supporting the results of the monitoring.
- (c) Instrument calibration and maintenance will be done in accordance with the manufacturers' recommendations and accepted water quality data collection practices and with the QAPP described in this Part. Instrument calibration and maintenance logs will be maintained for a minimum of five years and be made available for agency review upon request. Calibration or maintenance problems that have the potential to impact the accuracy of the data will be reported in the monthly DMR and also noted in the Annual Monitoring Report.

4. Adjustment To Monitoring Station Locations

- (a) As of the Effective Date of the permit, the Monitoring Stations identified in Part I.A.14 shall be located as shown in Attachment B. The following Monitoring Stations are expected to monitor areas of the Charles River with these water quality characteristics:
 - (1) Monitoring Station 1 – monitor an area of the lower Basin that is not influenced by the thermal plume from the facility discharge.
 - (2) Monitoring Stations 3, 4, 5, and 6 - evenly spaced Stations on a bank-to-bank transect perpendicular to the river flow that monitors the cross-section of the river where the thermal plume is expected to have the greatest impact. The distance between any two adjacent Monitoring Stations in this transect is the same as the distance from the Boston shoreline to Monitoring Station 3 and the distance from the Cambridge shoreline to Monitoring Station 6.

- (b) The permittee shall collect the following information under the conditions identified to determine whether the water quality characteristics listed in Part I.A.14.d.4.(a)(1) and (2) are generally represented by the locations of Monitoring Stations 1, 3, 4, 5, and 6, as shown in Attachment B:
- (1) The permittee shall collect temperature data on at least one occasion (i.e., the permittee must collect temperature data on one occasion, but may collect temperature data on additional occasions) that meet(s) all of the following conditions:
 - (i) during the first continuous July through August time period after the permit's Effective Date,
 - (ii) when the Charles River flow as measured at the Waltham USGS Gage is less than 150 cfs, and
 - (iii) when the facility is discharging at or near the maximum heatload and at or near a flow of 3.2 MGD.
 - (2) Temperature data shall be collected at Monitoring Stations 1, 3, 4, 5, and 6 as specified in Part I.A.14.a.1.(c) - (e) and Part I.A.14.b.1.(c) and (d).
 - (3) Temperature data shall also be collected, at a minimum, at locations approximately 400 feet upstream and downstream of Monitoring Stations 1, 3, 4, 5, and 6 as specified in Part I.A.14.a.1.(c) - (e) and Part I.A.14.b.1.(c) - (d).
- (c) Within 60 days of the last data collection event (but in no case later than October 31 of the year in which the data collection occurred), the permittee shall submit to EPA and MassDEP the complete temperature data required in Part I.A.14.d.4.(b) as part of a Monitoring Station Report. The report shall recommend whether the location of Monitoring Stations 1, 3, 4, 5, and/or 6 should be adjusted to better monitor the water quality characteristics listed in Part I.A.14.d.4.(a)(1) and (2).
- (d) Upon receipt of the Monitoring Station Report, EPA and MassDEP may accept or reject the permittee's recommendation. If EPA and MassDEP determine that the locations of one or more of Monitoring Stations 1, 3, 4, 5, and/or 6 should be adjusted to better monitor the water quality characteristics listed in Part I.A.14.d.4.(a)(1) and (2), EPA and MassDEP shall revise Attachment B to reflect any adjustment to the Monitoring Station locations, and shall send a revised Attachment B to the permittee by certified mail. This revised Attachment B will

take effect 30 days after it is mailed, and will be available to any person upon request to EPA or MassDEP.

e. In-stream Total Residual Chlorine (TRC) Monitoring

The permittee shall monitor for in-stream TRC once per month, only for those months during which the permittee chlorinates its cooling water. Sampling shall be conducted at the surface at Stations 2, 4 and 7 within one (1) to eight (8) hours of chlorination and be consistent with other conditions in footnote 5 of Part I.A.1. of this permit. This sampling shall be conducted concurrently with the effluent TRC monitoring, during or immediately after periods of chlorination at the Facility. The EPA reserves the right to waive this requirement after at least one year of sampling.

f. Outfall Pipe Monitoring

Once per month during April, May and June and for as long as the permit remains effective, the permittee shall conduct surveillance of Outfalls 001 and 002 and the Charles River in the vicinity of these outfalls. This monitoring is not required for any particular month that there is no discharge from these outfalls. For each such surveillance event, the permittee shall make reasonable efforts to document the presence, abundance and behavior of fish. Each surveillance event shall include visual inspection, photography or other means to effectively estimate fish numbers, characteristics and behavior (e.g.; spawning and congregating). These surveillance results shall be reported annually in the AMR.

g. In the event that the temperature monitoring or data logging equipment referenced herein is damaged, lost, or moved away from its standard location and the Facility becomes aware of the situation during a business day between 9 AM to 5 PM, the permittee shall notify EPA (G. Papadopoulos, ph: 617-918-1579) and MassDEP (G. Szal, ph: 508-767-2789) by telephone on that business day. If the temperature monitoring or data logging equipment is damaged, lost or moved away from its standard location and the Facility becomes aware of the situation at any other time, the permittee must notify EPA and MassDEP as early as practicable on the following business day. The permittee will have five (5) days from the discovery of the damage, loss or movement of such temperature monitoring equipment to re-establish the data collection and data logging capability.

h. The following parameters of Facility operation data, collected in accordance with Part I.A.1 of this permit, shall be collected continuously, with at least one recorded value (by data logger or other electronic means) per hour, for the same time intervals: intake temperature, discharge temperature, Facility temperature rise (intake versus discharge), discharge flow rate, Facility megawatt generation, and heat load to the river).

i. Regular Monitoring Program Evaluation

If DMRs or other required monitoring for any calendar year identify any anomalies or unexpected patterns or trends, the cover letter to the January DMR for the following calendar year must offer possible reasons for the anomalies, along with supporting information, if available. The permittee will make recommendations for any changes in the monitoring program considered necessary to understand the anomalies, if any.

15. Contingency for Reopener

a. If any of the monitoring conducted pursuant to this permit and/or any related studies indicate that there are water quality violations, that the Balanced Indigenous Population (“BIP”) is not being adequately protected due to the discharges from the Facility, or that a modification to the Monitoring Program of Part I.A.14 is warranted, or if a TMDL is approved for the Charles River basin, then this permit may be modified to include numerical limitations and/or other new or revised permit conditions. Any permit modification will be conducted according to 40 CFR §122.62, 122.63, 122.64 and 124.5.

b. Notwithstanding Part I.A.15.a, EPA and MassDEP may revise Attachment D by letter in accordance with Part I.A.15.b.1-3 below:

- (1) EPA and MassDEP may revise Attachment D by letter upon their own initiative, or upon the request of the permittee or any other person, if EPA and MassDEP have received, for each flow range depicted in Attachment D, as to which a revision is proposed, complete and QAPP-validated supplemental monitoring results for at least ten days on which Attachment D had predicted a temperature that was warmer than 1° F below the applicable temperature limit, and cooler than 5° F above the applicable temperature limit. These data will be available to any person upon request to EPA or MassDEP.
- (2) EPA and MassDEP may also revise Attachment D by letter if they determine in writing that application of the same or similar statistical techniques that generated Attachment D, or application of other generally accepted statistical techniques, shows that proposed revisions to Attachment D would predict the observed data described in Part I.A.15.b.1 more accurately, without increasing the percentage of false predictions of compliance, as compared to the version of Attachment D then in effect.
- (3) If EPA and MassDEP decide to so revise Attachment D, each agency shall send the permittee a letter by certified mail including the final revision to Attachment D. This letter will be available to any person upon request to EPA or MassDEP.

c. Notwithstanding Part I.A.15.a, EPA and MassDEP may revise Part I.A.3 by letter as follows. After two consecutive years of non-detect results for one or more of the priority pollutants analyzed, the permittee may submit to EPA and MassDEP a request to remove

the requirement to sample such pollutant(s). EPA and MassDEP may then remove or, alternatively, reduce the sampling frequency of the requirement to sample such pollutant(s). If EPA and MassDEP decide to so revise Part I.A.3, EPA shall send the permittee a letter by certified mail stating the revisions. This letter will be available to any person upon request to EPA or MassDEP.

B. MONITORING AND REPORTING

For a period of one year from the effective date of the permit, the permittee may either submit monitoring data and other reports to EPA in hard copy form or report electronically using NetDMR, a web-based tool that allows permittees to electronically submit discharge monitoring reports (DMRs) and other required reports via a secure internet connection. Specific requirements regarding submittal of data and reports in hard copy form and for submittal using NetDMR are described below:

1. Submittal of Reports Using NetDMR

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

DMRs shall be submitted electronically to EPA no later than the 21st day of the month following the completed reporting period. All reports required under the permit shall be submitted to EPA as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it will no longer be required to submit hard copies of DMRs or other reports to EPA and will no longer be required to submit hard copies of DMRs to MassDEP. However, permittees shall continue to send hard copies of reports other than DMRs to MassDEP until further notice from MassDEP.

2. Submittal of NetDMR Opt-Out Requests

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

Permit No. MA0004898 Draft Permit Modification

Attn: NetDMR Coordinator

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

and

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

3. Submittal of Reports in Hard Copy Form

Monitoring results obtained during the previous month shall be summarized for each month and reported on separate discharge monitoring report (DMR) forms and other forms as described in **Attachment G** and postmarked no later than the 21st day of the month following the Effective Date of the permit and monthly thereafter. The **Annual Monitoring Report** is also due no later than ninety (90) days after the Effective Date of the permit and annually thereafter, as described in Part I.A.14.a. In addition, a record of monitoring data in an electronic format must be provided to EPA and/or MassDEP upon request, within a reasonable time period. The electronic format must be readable and presented in a generally available spreadsheet software program.

Mirant Kendall, LLC, may assert a business confidentiality claim with respect to part or all of the information submitted to EPA in the manner described at 40 CFR Part 2.203(b). Information covered by such a claim will be disclosed by EPA only to the extent, and by means, of the procedures set forth in 40 CFR Part 2, Subpart B. If no such claim accompanies the information when it is submitted to EPA, it may be made available to the public by EPA without further notice to Mirant Kendall. Effluent information shall not be regarded as confidential.

Signed and dated originals of the DMRs, and AMRs required herein, shall be submitted to the Director and the State at the following addresses:

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

The State Agency is:

Massachusetts Department of Environmental Protection
Bureau of Resource Protection
Northeast Regional Office
205B Lowell Street
Wilmington, MA 01887

In addition, copies of all DMRs only and all other notifications shall be submitted to the following address:

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

Copies of all notifications, data submittals, and QAPPs, with the exception of DMRs and AMRs shall be sent to the following address:

U.S. Environmental Protection Agency
5 Post Office Square - Suite 100
Mailcode OEP 06-1
Boston, MA 02109-3912
Attention: George Papadopoulos

The AMRs will also be submitted to the following addresses:

Massachusetts Coastal Zone Management
251 Causeway Street, Suite 800
Boston, MA 02114
Attention: Todd Callaghan

and

Massachusetts Division of Marine Fisheries
Annisquam River Marine Fisheries Station
30 Emerson Avenue
Gloucester, MA 01930
Attention: Jack Schwartz, Ph.D.

C. STATE PERMIT CONDITIONS

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

This authorization also incorporates the state water quality certification issued by MassDEP under § 401(a) of the Federal Clean Water Act, 40 C.F.R. 124.53, M.G.L. c. 21, § 27 and 314 CMR 3.07. All of the requirements (if any) contained in MassDEP's water quality certification for the permit are hereby incorporated by reference into this state surface water discharge permit as special conditions pursuant to 314 CMR 3.11.

Each agency shall have the independent right to enforce the terms and conditions of this permit. Any modification, suspension or revocation of this permit shall be effective only with respect to the agency taking such action, and shall not affect the validity or status of this permit as issued by the other agency, unless and until each agency has concurred in writing with such modification, suspension or revocation. In the event any portion of this permit is declared invalid, illegal or otherwise issued in violation of state law such permit shall remain in full force and effect under federal law as a NPDES Permit issued by the U.S. Environmental Protection Agency. In the event this permit is declared invalid, illegal or otherwise issued in violation of federal law, this permit shall remain in full force and effect under state law as a permit issued by the Commonwealth of Massachusetts.

NPDES PART II STANDARD CONDITIONS
(January, 2007)

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PART II. A. GENERAL REQUIREMENTS

1. Duty to Comply

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

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

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

2. Permit Actions

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

3. Duty to Provide Information

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

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4. Reopener Clause

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

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

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

5. Oil and Hazardous Substance Liability

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

6. Property Rights

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

7. Confidentiality of Information

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

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8. Duty to Reapply

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

9. State Authorities

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

10. Other Laws

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

PART II. B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

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

2. Need to Halt or Reduce Not a Defense

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

3. Duty to Mitigate

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

4. Bypass

a. Definitions

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

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

b. Bypass not exceeding limitations

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

c. Notice

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

d. Prohibition of bypass

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

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

5. Upset

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

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

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

PART II. C. MONITORING REQUIREMENTS

1. Monitoring and Records

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

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

2. Inspection and Entry

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

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

PART II. D. REPORTING REQUIREMENTS

1. Reporting Requirements

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

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

- d. Monitoring reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.
 - (1) Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Director for reporting results of monitoring of sludge use or disposal practices.
 - (2) If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of the monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Director.
 - (3) Calculations for all limitations which require averaging or measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.
- e. Twenty-four hour reporting.
 - (1) The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances.

A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
 - (2) The following shall be included as information which must be reported within 24 hours under this paragraph.
 - (a) Any unanticipated bypass which exceeds any effluent limitation in the permit. (See 40 CFR §122.41(g).)
 - (b) Any upset which exceeds any effluent limitation in the permit.
 - (c) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Regional Administrator in the permit to be reported within 24 hours. (See 40 CFR §122.44(g).)
 - (3) The Regional Administrator may waive the written report on a case-by-case basis for reports under Paragraph D.1.e. if the oral report has been received within 24 hours.

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- f. Compliance Schedules. Reports of compliance or noncompliance with, any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.
- g. Other noncompliance. The permittee shall report all instances of noncompliance not reported under Paragraphs D.1.d., D.1.e., and D.1.f. of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in Paragraph D.1.e. of this section.
- h. Other information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Administrator, it shall promptly submit such facts or information.

2. Signatory Requirement

- a. All applications, reports, or information submitted to the Regional Administrator shall be signed and certified. (See 40 CFR §122.22)
- b. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than 2 years per violation, or by both.

3. Availability of Reports.

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

PART II. E. DEFINITIONS AND ABBREVIATIONS

1. Definitions for Individual NPDES Permits including Storm Water Requirements

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

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

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

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

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

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

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

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

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

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

Construction Activities - The following definitions apply to construction activities:

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

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

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

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

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

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

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

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

Discharge of a pollutant means:

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

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

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

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

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

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

EPA means the United States “Environmental Protection Agency”.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

NPDES means “National Pollutant Discharge Elimination System”.

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

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

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

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

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

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

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

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

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

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

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

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

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

Secondary Industry Category means any industry which is not a “primary industry category”.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Waters of the United States means:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Feed crops are crops produced primarily for consumption by animals.

Fiber crops are crops such as flax and cotton.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Range land is open land with indigenous vegetation.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3. Commonly Used Abbreviations

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

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

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

Attachment A-Charles River Temperature Limits By Date

The **Maximum Temperature Limit (MTL)** for a given date is the temperature listed in Table A-1 below for each date range.

Table A-1: Maximum Temperature Limits

Date	Maximum Temperature Limits
November 1 – November 14	10.0°C (50.0°F) ¹
November 15 - March 29	10.0°C (50.0°F)
March 30 - April 1	13.3°C (56.0°F)
April 2 - April 14	16.1°C (61.0°F)
April 15 - April 30	18.3°C (65.0°F)
May 1 - May 10	19.1°C (66.4°F)
May 11 - May 22	20.0°C (68.0°F)
May 23 - May 31	21.1°C (70.0°F)
June 1 - June 7	22.2°C (72.0°F)
June 8 - June 11	23.9°C (75.0°F)
June 12 - Oct. 31 (see footnotes 2-4 for depth specifications)	27.2°C (81.0°F) ² 28.0°C (83.0°F) ^{3,4}

Footnotes:

1. The November 1-14 MTL of 10.0°C (50°F) does not go into effect until the Chill Period Trigger Event occurs (as defined below). Until that occurs, the applicable MTL during this period remains the temperature limit specified for October 31.
2. The primary summer MTL of 27.2°C (81.0°F) applies at Monitoring Station 3, except as provided in footnotes 3 and 4 below.
3. At the Monitoring Point at a depth of 2 ft at Monitoring Station 3, the alternate summer MTL of 28.0°C (83.0°F) applies, not the primary summer MTL of 27.2°C (81.0°F).
4. On any day during the period June 12 - October 31, the permittee may apply the alternate summer MTL of 28.0°C (83.0°F) to *either* the 6 ft *or* the 12 ft Monitoring Point at Monitoring Station 3, but not to *both* the 6 ft *and* 12 ft Monitoring Points on the same day. If the permittee applies this alternate summer MTL to a Monitoring Point at a given depth in accordance with the preceding sentence, then, for that day, that alternate

Attachment A-Charles River Temperature Limits By Date

summer MTL shall constitute the MTL for that depth for the purpose of all permit conditions and definitions that refer to the MTL.

A **Monitoring Station** is an identified surface location in the Charles River where temperatures and dissolved oxygen values are obtained at discrete depths, known as Monitoring Points, when specified. See Part I.A.14 and Attachment B.

A **Monitoring Point** is defined as the position in the water column at a discrete depth (2 ft, 6 ft, 12 ft, and other depths where identified) where in-stream temperatures and dissolved oxygen values shall be obtained.

The **Measured Temperature** for a given Monitoring Station and a given depth is defined as the temperature measured at the Monitoring Point at that Monitoring Station for that depth. The permittee is required to obtain the Measured Temperature when required by Part I.A.14. The permittee shall obtain the Measured Temperature as follows: A temperature measurement shall be taken within the time period specified in the applicable subparagraph of Part I.A.14 at each of the temperature Monitoring Points at a given Monitoring Station whenever required by Part I.A.14. See Parts I.A.14.a.1.f (Compliance Temperature Monitoring), I.A.14.b.1.f (Compliance Support Temperature Monitoring), I.A.14.c.1.g (Supplemental In-stream Temperature Monitoring). All temperature measurements shall be rounded to the nearest 0.1 °F for subsequent reference. An average temperature for each Monitoring Point at that Monitoring Station may be substituted for single temperature measurements, provided the collection and calculation of average temperatures meet the requirements of Average Temperature as specified below.

Exceptions:

1. For any depth below 12 feet, the Station 1 Measured Temperature for that depth is defined to be the Station 1 Measured Temperature calculated from the Monitoring Point depth of 12 feet at Monitoring Station 1.
2. On any day on which the permittee is not required by Part I.A.14 and Attachment D to monitor the temperature at Monitoring Station 3, then, for any Monitoring Point at any Monitoring Station used to determine compliance under Part I.A.1 note 7 for which no temperature measurement has been taken, the Measured Temperature at each such Monitoring Point shall be presumed to less than or equal to the applicable MTL for that Monitoring Point on that day.

The **Measured Dissolved Oxygen** for a given Monitoring Station and a given depth is defined as the dissolved oxygen value measured at the Monitoring Point at that Monitoring Station for that depth. If the Measured Temperature at that Monitoring Station is calculated by averaging multiple temperature measurements, then the Measured Dissolved Oxygen is defined as the highest dissolved oxygen value measured in association with those temperature measurements.

Attachment A-Charles River Temperature Limits By Date

The **Chill Period Trigger Event** occurs the first time in any winter season (November 1-March 29) that the Daily Average Ambient River Temperature (as defined below) attains a temperature of 10.0° C (50.0° F) or lower for three consecutive days. The permittee shall notify EPA and MassDEP at the addresses in Part I.B.3. of the permit in writing within five business days after the Chill Period Trigger Event occurs in each calendar year.

The **Upstream-Downstream Buffer** is 0.56° C (1.0° F), except as provided below:

1. For any day between November 15-March 29, if the Chill Period Trigger Event has not yet occurred that season, then the Upstream-Downstream Buffer for that day is 1.1° C (2.0° F).
2. For any day between November 1-March 29, if the Chill Period Trigger Event has already occurred that season, but the Daily Average Ambient River Temperature (as defined below) for that day or the prior day exceeds 10.0° C (50.0° F), then the Upstream-Downstream Buffer for that day is 1.1° C (2.0° F).
3. Notwithstanding subparagraphs 1-2 above, on any day when the Station 1 Measured Dissolved Oxygen at 2 feet, the Station 1 Measured Dissolved Oxygen at 6 feet, the Station 3 Measured Dissolved Oxygen at 2 feet, and the Station 3 Measured Dissolved Oxygen at 6 feet are *all* below 5.0 mg/l, then the Upstream-Downstream Buffer for that day is 0.0° C (0.0° F).

The **Substituted Ambient Temperature Limit (SATL)** for a given depth is defined as the Station 1 Measured Temperature for that depth, plus the Upstream-Downstream Buffer.

The **Actually Applicable Temperature Limit (AATL)** for a given depth is defined as the greater of (a) the Substituted Ambient Temperature Limit for that depth, or (b) the MTL.

A **Springtime Exception** is available only under limited circumstances as described herein. The permittee may claim a Springtime Exception for up to six (6) non-consecutive days per year between April 15-June 7. Only three (3) uses of a Springtime Exception may occur in any four-week period. Unused days will not be carried over to future years. When the permittee claims a Springtime Exception, that entire Springtime Exception is deducted from the balance available to the permittee for that year, regardless of how many Monitoring Points for which the permittee actually relies on the Springtime Exception.

The **Springtime Exception Limit**, when it is available as described in the definition of Springtime Exception (above), is defined as the Station 1 Measured Temperature for that depth plus up to 1.1° C (2.0° F), but in no case exceeding the following: from April 15-May 31, 22.2° C (72.0° F); from June 1-7, 23.3° C (74.0° F).

Attachment A-Charles River Temperature Limits By Date

The **Highest Cross-Transect Temperature** for a given depth is defined as the highest of the Measured Temperatures for that depth at the following Monitoring Stations:

- a. For the 2 foot depth and the 6 foot depth, Monitoring Stations 4 and 5.
- b. For all other depths, Monitoring Stations 4, 5, and 6.

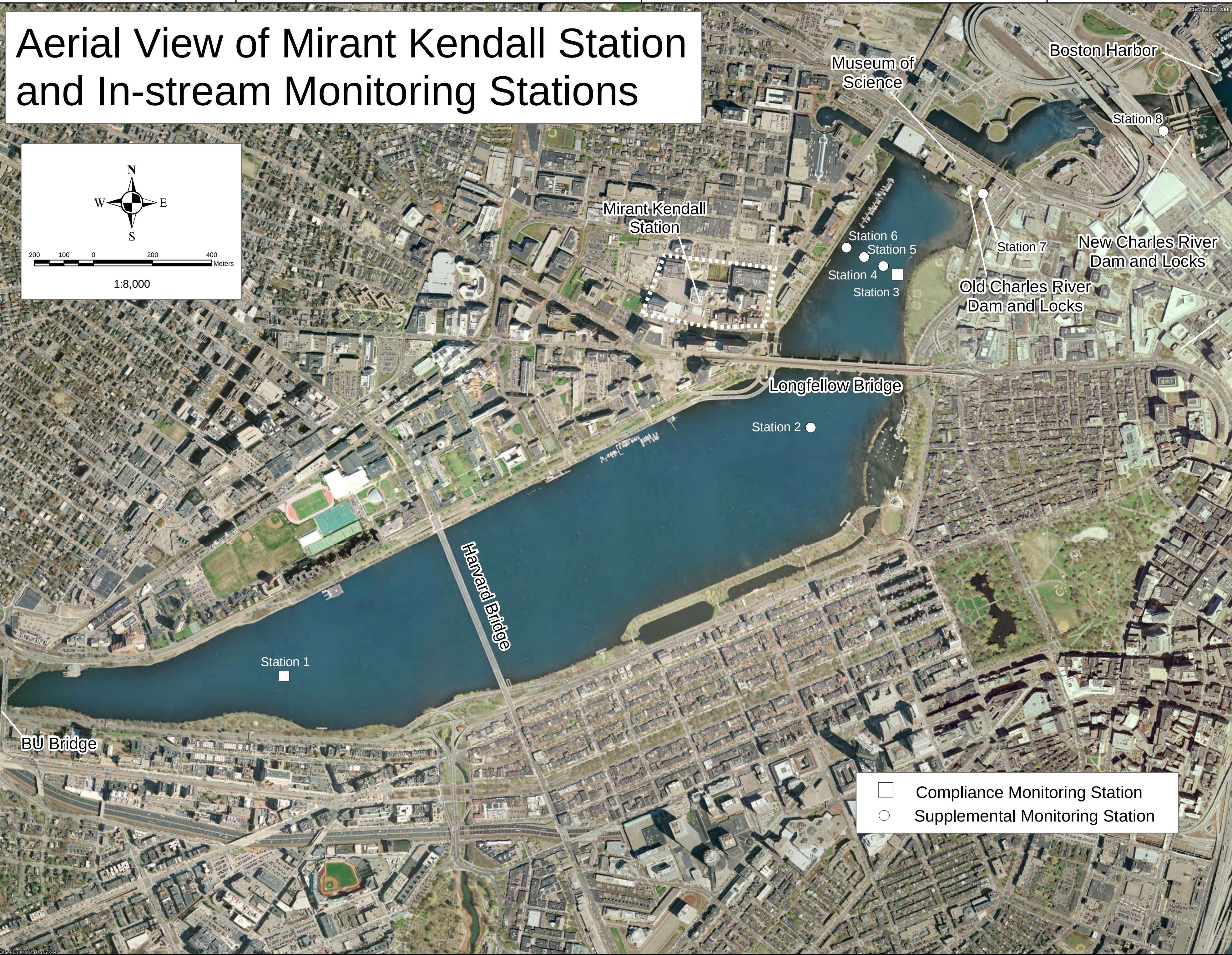
On those instances when the permittee is required to monitor the temperature at Monitoring Stations 4, 5, and 6, the permittee shall calculate the Highest Cross-Transect Temperature for each Monitoring Point at Monitoring Station 3 by comparing the temperatures from the Monitoring Points at the corresponding depths at each of Monitoring Stations 4 and 5 (and, for Monitoring Points 12 feet and deeper, Monitoring Station 6), and selecting the highest. Multiple temperature measurements may be taken at Monitoring Stations 4, 5, and 6 and averaged pursuant to the definition of Average Temperature below.

The **Cross-Transect Reference Temperature** for a given depth is defined as the greater of (a) the Station 1 Measured Temperature for that depth, or (b) the MTL.

Average Temperature

- a. Additional temperatures may be recorded and an average temperature value may be calculated at each Monitoring Point from two or more temperature measurements, provided that one temperature measurement is taken within the time period specified in the applicable subparagraph of Part I.A.14, and all additional measurements are taken between 2:00 and 5:00 PM. If more than two temperature measurements are recorded to calculate an average temperature at a Monitoring Point, the permittee shall use reasonable efforts to ensure that the time intervals between readings are evenly spaced. All recorded temperatures must be used to calculate the average. Exception: For the Monitoring Points 24 feet and deeper at Monitoring Station 3, a temperature value shall not be used to calculate an average if the associated dissolved oxygen reading is below 5.0 mg/l.
- b. If the permittee elects to use an average temperature to determine the Station 3 Temperature for a given Monitoring Point at Station 3, and the permittee is also required (or elects) to measure the temperature(s) at the corresponding Monitoring Point(s) at Station 1, 4, 5, and/or 6 on that same day, then the permittee must measure and calculate an equivalent average temperature at the corresponding Monitoring Point(s) at Monitoring Station 1 (and, if applicable, Monitoring Stations 4, 5, and 6).

Daily Average Ambient River Temperature (DAART): This definition applies only to the definitions of the Chill Period Trigger Event and the Upstream-Downstream Buffer (above). The Daily Average Ambient River Temperature is calculated as the average of at least 24 instantaneous temperature readings, measured at the Kendall Station cooling water intake (CWI) at evenly spaced hourly intervals, beginning at 0900 hours (9:00 AM) and ending at 0859 hours (8:59 AM). Additional instantaneous temperature readings taken at the CWI may be included in the daily average calculation, provided that all data collected is evenly spaced in time (e.g., a reading taken every 30 minutes over the 24 hour period).



FRESHWATER CHRONIC TOXICITY TEST PROCEDURE AND PROTOCOL USEPA Region 1

I. GENERAL REQUIREMENTS

The permittee shall be responsible for the conduct of acceptable chronic (and modified acute) toxicity tests using three fresh samples collected during each test period. The following tests shall be performed as prescribed in Part 1 of the NPDES discharge permit in accordance with the appropriate test protocols described below. (Note: the permittee and testing laboratory should review the applicable permit to determine whether testing of one or both species is required).

- **Daphnid (Ceriodaphnia dubia) Survival and Reproduction Test.**
- **Fathead Minnow (Pimephales promelas) Larval Growth and Survival Test.**

Chronic and modified acute toxicity data shall be reported as outlined in Section VIII. The chronic fathead minnow and daphnid test data can be used to calculate an LC50 at the end of 48 hours of exposure when both acute (LC50) and chronic (C-NOEC) test endpoints are specified in the permit.

II. METHODS

Methods to follow are those recommended by EPA in: Short Term Methods For Estimating The Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, Fourth Edition, October 2002. United States Environmental Protection Agency. Office of Water, Washington, D.C., EPA 821-R-02-013. The methods are available on-line at <http://www.epa.gov/waterscience/WET/> . Exceptions and clarification are stated herein.

III. SAMPLE COLLECTION AND USE

A total of three fresh samples of effluent and receiving water are required for initiation and subsequent renewals of a freshwater, chronic, toxicity test. The receiving water control sample must be collected immediately upstream of the permitted discharge's zone of influence. Fresh samples are recommended for use on test days 1, 3, and 5. However, provided a total of three samples are used for testing over the test period, an alternate sampling schedule is acceptable. The acceptable holding times until initial use of a sample are 24 and 36 hours for on-site and off-site testing, respectively. A written waiver is required from the regulating authority for any hold time extension. All test samples collected may be used for 24, 48 and 72 hour renewals after initial use. All samples held for use beyond the day of sampling shall be refrigerated and maintained at a temperature range of 0-6° C.

All samples submitted for chemical and physical analyses will be analyzed according to Section VI of this protocol.

Sampling guidance dictates that, where appropriate, aliquots for the analysis required in this protocol shall be split from the samples, containerized and immediately preserved, or analyzed as per 40 CFR Part 136. EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection. Testing for the presence of total residual chlorine (TRC) must be analyzed immediately or as soon as possible, for all effluent samples, prior to WET testing. TRC analysis may be performed on-site or by the toxicity testing laboratory and the samples must be dechlorinated, as necessary, using sodium thiosulfate prior to sample use for toxicity testing.

If any of the renewal samples are of sufficient potency to cause lethality to 50 percent or more of the test organisms in any of the test treatments for either species or, if the test fails to meet its permit limits, then chemical analysis for total metals (originally required for the initial sample only in Section VI) will be required on the renewal sample(s) as well.

IV. DILUTION WATER

Samples of receiving water must be collected from a location in the receiving water body immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location. Avoid collection near areas of obvious road or agricultural runoff, storm sewers or other point source discharges and areas where stagnant conditions exist. EPA strongly urges that screening for toxicity be performed prior to the set up of a full, definitive toxicity test any time there is a question about the test dilution water's ability to achieve test acceptability criteria (TAC) as indicated in Section V of this protocol. The test dilution water control response will be used in the statistical analysis of the toxicity test data. All other control(s) required to be run in the test will be reported as specified in the Discharge Monitoring Report (DMR) Instructions, Attachment F, page 2, Test Results & Permit Limits.

The test dilution water must be used to determine whether the test met the applicable TAC. When receiving water is used for test dilution, an additional control made up of standard laboratory water (0% effluent) is required. This control will be used to verify the health of the test organisms and evaluate to what extent, if any, the receiving water itself is responsible for any toxic response observed.

If dechlorination of a sample by the toxicity testing laboratory is necessary a "sodium thiosulfate" control, representing the concentration of sodium thiosulfate used to adequately dechlorinate the sample prior to toxicity testing, must be included in the test.

If the use of an alternate dilution water (ADW) is authorized, in addition to the ADW test control, the testing laboratory must, for the purpose of monitoring the receiving water, also run a receiving water control.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable an ADW of known quality with hardness similar to that of the receiving water may be substituted. Substitution is species specific meaning that the decision to use ADW is made for each species and is based on the toxic response of that particular species. Substitution to an ADW is authorized in two cases. The first is the case where repeating a test due to toxicity in the site dilution water requires an **immediate decision** for ADW use be made by the permittee and toxicity testing laboratory. The second is in the case where two of the most recent documented incidents of unacceptable site dilution water toxicity requires ADW use in future WET testing.

For the second case, written notification from the permittee requesting ADW use **and** written authorization from the permit issuing agency(s) is required **prior to** switching to a long-term use of ADW for the duration of the permit.

Written requests for use of ADW must be mailed with supporting documentation to the following addresses:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency-New England
One Congress St., Suite 1100
Boston, MA 02114-2023

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
One Congress Street, Suite 1100
Boston, MA 02114-2023

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

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

V. TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

Method specific test conditions and TAC are to be followed and adhered to as specified in the method guidance document, EPA 821-R-02-013. If a test does not meet TAC the test must be repeated with fresh samples within 30 days of the initial test completion date.

V.1. Use of Reference Toxicity Testing

Reference toxicity test results and applicable control charts must be included in the toxicity testing report.

If reference toxicity test results fall outside the control limits established by the laboratory for a specific test endpoint, a reason or reasons for this excursion must be evaluated, correction made and reference toxicity tests rerun as necessary.

If a test endpoint value exceeds the control limits at a frequency of more than one out of twenty then causes for the reference toxicity test failure must be examined and if problems are identified corrective action taken. The reference toxicity test must be repeated during the same month in which the exceedance occurred.

If two consecutive reference toxicity tests fall outside control limits, the possible cause(s) for the exceedance must be examined, corrective actions taken and a repeat of the reference toxicity test must take place immediately. Actions taken to resolve the problem must be reported.

V.1.a. Use of Concurrent Reference Toxicity Testing

In the case where concurrent reference toxicity testing is required due to a low frequency of testing with a particular method, if the reference toxicity test results fall slightly outside of laboratory established control limits, but the primary test met the TAC, the results of the primary test will be considered acceptable. However, if the results of the concurrent test fall well outside the established **upper** control limits i.e. ≥ 3 standard deviations for IC25s and LC50 values and $\geq$ two concentration intervals for NOECs or NOAECs, and even though the primary test meets TAC, the primary test will be considered unacceptable and must be repeated.

V.2. For the *C. dubia* test, the determination of TAC and formal statistical analyses must be performed using only the first three broods produced.

V.3. Test treatments must include 5 effluent concentrations and a dilution water control. An additional test treatment, at the permitted effluent concentration (% effluent), is required if it is not included in the dilution series.

VI. CHEMICAL ANALYSIS

As part of each toxicity test's daily renewal procedure, pH, specific conductance, dissolved oxygen (DO) and temperature must be measured at the beginning and end of each 24-hour period in each test treatment and the control(s).

The additional analysis that must be performed under this protocol is as specified and noted in the table below.

<u>Parameter</u>	Effluent	Receiving Water	ML (mg/l)
Hardness ^{1, 4}	x	x	0.5
Total Residual Chlorine (TRC) ^{2, 3, 4}	x		0.02
Alkalinity ⁴	x	x	2.0
pH ⁴	x	x	--
Specific Conductance ⁴	x	x	--
Total Solids ⁶	x		--
Total Dissolved Solids ⁶	x		--
Ammonia ⁴	x	x	0.1
Total Organic Carbon ⁶	x	x	0.5
Total Metals ⁵			
Cd	x	x	0.0005
Pb	x	x	0.0005
Cu	x	x	0.003
Zn	x	x	0.005
Ni	x	x	0.005
Al	x	x	0.02

Other as permit requires

Notes:

1. Hardness may be determined by:

(May_2007)

- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
 - Method 2340B (hardness by calculation)
 - Method 2340C (titration)
2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.
- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
 - Method 4500-CL E Low Level Amperometric Titration
 - Method 4500-CL G DPD Colorimetric Method
 - USEPA 1983. Manual of Methods Analysis of Water and Wastes
 - Method 330.5
3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing
4. Analysis is to be performed on samples and/or receiving water, as designated in the table above, from all three sampling events.
5. Analysis is to be performed on the initial sample(s) only unless the situation arises as stated in Section III, paragraph 4
6. Analysis to be performed on initial samples only

VII. TOXICITY TEST DATA ANALYSIS AND REVIEW

A. Test Review

1. Concentration / Response Relationship

A concentration/response relationship evaluation is required for test endpoint determinations from both Hypothesis Testing and Point Estimate techniques. The test report is to include documentation of this evaluation in support of the endpoint values reported. The dose-response review must be performed as required in Section 10.2.6 of EPA-821-R-02-013. Guidance for this review can be found at

<http://www.epa.gov/waterscience/methods/wet/pdf/wetguide.pdf> . In most cases, the review will result in one of the following three conclusions: (1) Results are reliable and reportable; (2) Results are anomalous and require explanation; or (3) Results are inconclusive and a retest with fresh samples is required.

2. Test Variability (Test Sensitivity)

This review step is separate from the determination of whether a test meets or does not meet TAC. Within test variability is to be examined for the purpose of evaluating test sensitivity. This evaluation is to be performed for the sub-lethal hypothesis testing endpoints reproduction and growth as required by the permit. The test report is to include documentation of this evaluation to support that the endpoint values reported resulted from a toxicity test of adequate sensitivity. This evaluation must be performed as required in Section 10.2.8 of EPA-821-R-02-013.

To determine the adequacy of test sensitivity, USEPA requires the calculation of test percent minimum significant difference (PMSD) values. In cases where NOEC determinations are made based on a non-parametric technique, calculation of a test PMSD value, for the sole purpose of assessing test sensitivity, shall be calculated using a comparable parametric statistical analysis technique. The calculated test PMSD is then compared to the upper and lower PMSD bounds shown for freshwater tests in Section 10.2.8.3, p. 52, Table 6 of EPA-821-R-02-013. The comparison will yield one of the following determinations.

- The test PMSD exceeds the PMSD upper bound test variability criterion in Table 6, the test results are considered highly variable and the test may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC). If the test results indicate that the discharge is not toxic at the PLC, then the test is considered insufficiently sensitive and must be repeated within 30 days of the initial test completion using fresh samples. If the test results indicate that the discharge is toxic at the PLC, the test is considered acceptable and does not have to be repeated.
- The test PMSD falls below the PMSD lower bound test variability criterion in Table 6, the test is determined to be very sensitive. In order to determine which treatment(s) are statistically significant and which are not, for the purpose of reporting a NOEC, the relative percent difference (RPD) between the control and each treatment must be calculated and compared to the lower PMSD boundary. See *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program*, EPA 833-R-00-003, June 2002, Section 6.4.2. The following link: [Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program](#) can be used to locate the USEPA website containing this document. If the RPD for a treatment falls below the PMSD lower bound, the difference is considered statistically insignificant. If the RPD for a treatment is greater than the PMSD lower bound, then the treatment is considered statistically significant.
- The test PMSD falls within the PMSD upper and lower bounds in Table 6, the sub-lethal test endpoint values shall be reported as is.

B. Statistical Analysis

1. General - Recommended Statistical Analysis Method

Refer to general data analysis flowchart, EPA 821-R-02-013, page 43

For discussion on Hypothesis Testing, refer to EPA 821-R-02-013, Section 9.6

For discussion on Point Estimation Techniques, refer to EPA 821-R-02-013, Section 9.7

2. *Pimephales promelas*

Refer to survival hypothesis testing analysis flowchart, EPA 821-R-02-013, page 79

Refer to survival point estimate techniques flowchart, EPA 821-R-02-013, page 80

Refer to growth data statistical analysis flowchart, EPA 821-R-02-013, page 92

3. *Ceriodaphnia dubia*

Refer to survival data testing flowchart, EPA 821-R-02-013, page 168

Refer to reproduction data testing flowchart, EPA 821-R-02-013, page 173

VIII. TOXICITY TEST REPORTING

A report of results must include the following:

- Test summary sheets (2007 DMR Attachment F) which includes:
 - Facility name
 - NPDES permit number
 - Outfall number
 - Sample type
 - Sampling method
 - Effluent TRC concentration
 - Dilution water used
 - Receiving water name and sampling location
 - Test type and species
 - Test start date
 - Effluent concentrations tested (%) and permit limit concentration
 - Applicable reference toxicity test date and whether acceptable or not
 - Age, age range and source of test organisms used for testing
 - Results of TAC review for all applicable controls
 - Test sensitivity evaluation results (test PMSD for growth and reproduction)
 - Permit limit and toxicity test results
 - Summary of test sensitivity and concentration response evaluation

In addition to the summary sheets the report must include:

- A brief description of sample collection procedures
- Chain of custody documentation including names of individuals collecting samples, times and dates of sample collection, sample locations, requested analysis and lab receipt with time and date received, lab receipt personnel and condition of samples upon receipt at the lab(s)
- Reference toxicity test control charts
- All sample chemical/physical data generated, including minimum limits (MLs) and analytical methods used
- All toxicity test raw data including daily ambient test conditions, toxicity test chemistry, sample dechlorination details as necessary, bench sheets and statistical analysis
- A discussion of any deviations from test conditions
- Any further discussion of reported test results, statistical analysis and concentration-response relationship and test sensitivity review per species per endpoint

Attachment D

In-stream Monitoring

In accordance with Section I.A.14 of the permit, the permittee is required to conduct in-stream compliance, in-stream compliance support, and in-stream supplemental monitoring as specified in Part I.A.14 and summarized in Table D-1.

In-stream compliance monitoring is required when 1) the afternoon Monitoring Station 3 temperature is predicted to be greater than or equal to the Maximum Temperature Limit less 2°F based on the Kendall Station cooling water intake temperature at 9 am and the river flow recorded at the Waltham USGS gage (USGS 01104500), or 2) when cooling water intake flows exceed 3.2 million gallons per day (MGD).

The following grids (one for each unique temperature value and corresponding time period specified in Attachment A) shall be used to determine when in-stream compliance monitoring is required (at flows no greater than 3.2 MGD). Between November 1 and November 14, the permittee shall continue to use the grid corresponding to a maximum temperature limit (MTL) of 83°F (June 12 to October 31) to determine when in-stream compliance monitoring is required until the Chill Period Trigger Event (defined in Attachment A) occurs. Following the Chill Period Trigger Event, monitoring shall be triggered by the grid corresponding to a MTL of 50°F (November 15 to March 29).

The permittee shall cross-reference the facility's intake temperature as measured at the cooling water intake at 9:00 AM (or if it is not practicable to determine the intake temperature at 9:00 AM, at a time between 8:55 AM and 9:05 AM) with the predicted afternoon temperature at Monitoring Station 3 under the column corresponding to the appropriate flow regime based on the most recent flow measurement at the Waltham gage reported by USGS before 9:00 AM that morning.

If the corresponding cell is blue, no in-stream compliance or compliance support monitoring is required. If the corresponding cell is orange, in-stream monitoring shall be performed as described in Part I.A.14. The grid is expressed in 0.5°F intervals, inclusive, meaning that the 9:00 AM intake temperature should be rounded down to the nearest 0.5°F for purposes of grid cross-reference. For example, a 9:00 AM intake temperature of 76.7°F should be cross-referenced using the corresponding grid temperature of 76.5°F.

Table D-1. Summary of the type of monitoring, locations, and when each type of monitoring is required in Part I.A.14.

Type of Monitoring	Duration	Monitoring Stations	Required:
In-stream compliance monitoring	Effective Period of the Permit	1,3	When predicted afternoon surface temperature at Monitoring Station 3 is greater than or equal to the temperature value presented in the following tables less 2°F (i.e., “orange” cell).
			On any day with effluent flow greater than 3.2 MGD.
In-stream compliance support monitoring	Effective Period of the Permit	2,4,5,6, 7,8 ^a	When in-stream temperature at Monitoring Station 3 exceeds the Actually Applicable Temperature Limit (AATL).
			On any day with effluent flow greater than 3.2 MGD.
Supplemental in-stream monitoring	2 years	2,4,5,6, 7,8 ^a	At a minimum, the first time during a single week (Sunday to Saturday) when in-stream compliance monitoring is required (“orange” day) and Monitoring Station 3 temperature is at or below the AATL.
	2 years	1,2,3,4,5, 6,7,8 ^b	Once during the last week of month when no in-stream compliance temperature monitoring has been required during that month based on the CWI temperature and grid (i.e., all days up to that time of the month were “blue”).

^a In-stream compliance support and supplemental in-stream monitoring shall be conducted at Stations 2, 4, 5, 6, 7 and 8 from April 1 to October 31, and at Stations 2, 4, 5, and 6 from November 1 to March 31.

^b Supplemental in-stream monitoring during a month in which no in-stream compliance temperature monitoring was required shall be conducted at all Stations from April 1 to October 31, and at Stations 1 through 6 from November 1 to March 31.

Definitions

See Attachment A for definition of Actually Applicable Temperature Limit (AATL).

Temperature Chart for Mar 30 through Apr 1				Permit Limit =56°F			
Ambient Intake Temp		Flow	≤50	51-150	151-300	301-600	> 600
9 am (actual)	2 pm (predicted)	Δ T	3.5	3.0	2.5	2.0	1.5
83.0	83.5		87.0	86.5	86.0	85.5	85.0
82.5	83.0		86.5	86.0	85.5	85.0	84.5
82.0	82.5		86.0	85.5	85.0	84.5	84.0
81.5	82.0		85.5	85.0	84.5	84.0	83.5
81.0	81.5		85.0	84.5	84.0	83.5	83.0
80.5	81.0		84.5	84.0	83.5	83.0	82.5
80.0	80.5		84.0	83.5	83.0	82.5	82.0
79.5	80.0		83.5	83.0	82.5	82.0	81.5
79.0	79.5		83.0	82.5	82.0	81.5	81.0
78.5	79.0		82.5	82.0	81.5	81.0	80.5
78.0	78.5		82.0	81.5	81.0	80.5	80.0
77.5	78.0		81.5	81.0	80.5	80.0	79.5
77.0	77.5		81.0	80.5	80.0	79.5	79.0
76.5	77.0		80.5	80.0	79.5	79.0	78.5
76.0	76.5		80.0	79.5	79.0	78.5	78.0
75.5	76.0		79.5	79.0	78.5	78.0	77.5
75.0	75.5		79.0	78.5	78.0	77.5	77.0
74.5	75.0		78.5	78.0	77.5	77.0	76.5
74.0	74.5		78.0	77.5	77.0	76.5	76.0
73.5	74.0		77.5	77.0	76.5	76.0	75.5
73.0	73.5		77.0	76.5	76.0	75.5	75.0
72.5	73.0		76.5	76.0	75.5	75.0	74.5
72.0	72.5		76.0	75.5	75.0	74.5	74.0
71.5	72.0		75.5	75.0	74.5	74.0	73.5
71.0	71.5		75.0	74.5	74.0	73.5	73.0
70.5	71.0		74.5	74.0	73.5	73.0	72.5
70.0	70.5		74.0	73.5	73.0	72.5	72.0
69.5	70.0		73.5	73.0	72.5	72.0	71.5
69.0	69.5		73.0	72.5	72.0	71.5	71.0
68.5	69.0		72.5	72.0	71.5	71.0	70.5
68.0	68.5		72.0	71.5	71.0	70.5	70.0
67.5	68.0		71.5	71.0	70.5	70.0	69.5
67.0	67.5		71.0	70.5	70.0	69.5	69.0
66.5	67.0		70.5	70.0	69.5	69.0	68.5
66.0	66.5		70.0	69.5	69.0	68.5	68.0
65.5	66.0		69.5	69.0	68.5	68.0	67.5
65.0	65.5		69.0	68.5	68.0	67.5	67.0
64.5	65.0		68.5	68.0	67.5	67.0	66.5
64.0	64.5		68.0	67.5	67.0	66.5	66.0
63.5	64.0		67.5	67.0	66.5	66.0	65.5
63.0	63.5		67.0	66.5	66.0	65.5	65.0
62.5	63.0		66.5	66.0	65.5	65.0	64.5
62.0	62.5		66.0	65.5	65.0	64.5	64.0
61.5	62.0		65.5	65.0	64.5	64.0	63.5
61.0	61.5		65.0	64.5	64.0	63.5	63.0
60.5	61.0		64.5	64.0	63.5	63.0	62.5
60.0	60.5		64.0	63.5	63.0	62.5	62.0

Temperature Chart for Mar 30 through Apr 1					Permit Limit =56°F		
Ambient Intake Temp		Flow	≤50	51-150	151-300	301-600	> 600
9 am (actual)	2 pm (predicted)	Δ T	3.5	3.0	2.5	2.0	1.5
59.5	60.0		63.5	63.0	62.5	62.0	61.5
59.0	59.5		63.0	62.5	62.0	61.5	61.0
58.5	59.0		62.5	62.0	61.5	61.0	60.5
58.0	58.5		62.0	61.5	61.0	60.5	60.0
57.5	58.0		61.5	61.0	60.5	60.0	59.5
57.0	57.5		61.0	60.5	60.0	59.5	59.0
56.5	57.0		60.5	60.0	59.5	59.0	58.5
56.0	56.5		60.0	59.5	59.0	58.5	58.0
55.5	56.0		59.5	59.0	58.5	58.0	57.5
55.0	55.5		59.0	58.5	58.0	57.5	57.0
54.5	55.0		58.5	58.0	57.5	57.0	56.5
54.0	54.5		58.0	57.5	57.0	56.5	56.0
53.5	54.0		57.5	57.0	56.5	56.0	55.5
53.0	53.5		57.0	56.5	56.0	55.5	55.0
52.5	53.0		56.5	56.0	55.5	55.0	54.5
52.0	52.5		56.0	55.5	55.0	54.5	54.0
51.5	52.0		55.5	55.0	54.5	54.0	53.5
51.0	51.5		55.0	54.5	54.0	53.5	53.0
50.5	51.0		54.5	54.0	53.5	53.0	52.5
50.0	50.5		54.0	53.5	53.0	52.5	52.0
49.5	50.0		53.5	53.0	52.5	52.0	51.5
49.0	49.5		53.0	52.5	52.0	51.5	51.0
48.5	49.0		52.5	52.0	51.5	51.0	50.5
48.0	48.5		52.0	51.5	51.0	50.5	50.0
47.5	48.0		51.5	51.0	50.5	50.0	49.5
47.0	47.5		51.0	50.5	50.0	49.5	49.0
46.5	47.0		50.5	50.0	49.5	49.0	48.5
46.0	46.5		50.0	49.5	49.0	48.5	48.0
45.5	46.0		49.5	49.0	48.5	48.0	47.5
45.0	45.5		49.0	48.5	48.0	47.5	47.0
44.5	45.0		48.5	48.0	47.5	47.0	46.5
44.0	44.5		48.0	47.5	47.0	46.5	46.0
43.5	44.0		47.5	47.0	46.5	46.0	45.5
43.0	43.5		47.0	46.5	46.0	45.5	45.0
42.5	43.0		46.5	46.0	45.5	45.0	44.5
42.0	42.5		46.0	45.5	45.0	44.5	44.0
41.5	42.0		45.5	45.0	44.5	44.0	43.5
41.0	41.5		45.0	44.5	44.0	43.5	43.0
40.5	41.0		44.5	44.0	43.5	43.0	42.5
40.0	40.5		44.0	43.5	43.0	42.5	42.0

Temperature Chart for Apr 2 through Apr 14					Permit Limit =61°F		
Ambient Intake Temp		Flow	≤50	51-150	151-300	301-600	> 600
9 am (actual)	2 pm (predicted)	Δ T	3.5	3.0	2.5	2.0	1.5
83.0	84.0		87.5	87.0	86.5	86.0	85.5
82.5	83.5		87.0	86.5	86.0	85.5	85.0
82.0	83.0		86.5	86.0	85.5	85.0	84.5
81.5	82.5		86.0	85.5	85.0	84.5	84.0
81.0	82.0		85.5	85.0	84.5	84.0	83.5
80.5	81.5		85.0	84.5	84.0	83.5	83.0
80.0	81.0		84.5	84.0	83.5	83.0	82.5
79.5	80.5		84.0	83.5	83.0	82.5	82.0
79.0	80.0		83.5	83.0	82.5	82.0	81.5
78.5	79.5		83.0	82.5	82.0	81.5	81.0
78.0	79.0		82.5	82.0	81.5	81.0	80.5
77.5	78.5		82.0	81.5	81.0	80.5	80.0
77.0	78.0		81.5	81.0	80.5	80.0	79.5
76.5	77.5		81.0	80.5	80.0	79.5	79.0
76.0	77.0		80.5	80.0	79.5	79.0	78.5
75.5	76.5		80.0	79.5	79.0	78.5	78.0
75.0	76.0		79.5	79.0	78.5	78.0	77.5
74.5	75.5		79.0	78.5	78.0	77.5	77.0
74.0	75.0		78.5	78.0	77.5	77.0	76.5
73.5	74.5		78.0	77.5	77.0	76.5	76.0
73.0	74.0		77.5	77.0	76.5	76.0	75.5
72.5	73.5		77.0	76.5	76.0	75.5	75.0
72.0	73.0		76.5	76.0	75.5	75.0	74.5
71.5	72.5		76.0	75.5	75.0	74.5	74.0
71.0	72.0		75.5	75.0	74.5	74.0	73.5
70.5	71.5		75.0	74.5	74.0	73.5	73.0
70.0	71.0		74.5	74.0	73.5	73.0	72.5
69.5	70.5		74.0	73.5	73.0	72.5	72.0
69.0	70.0		73.5	73.0	72.5	72.0	71.5
68.5	69.5		73.0	72.5	72.0	71.5	71.0
68.0	69.0		72.5	72.0	71.5	71.0	70.5
67.5	68.5		72.0	71.5	71.0	70.5	70.0
67.0	68.0		71.5	71.0	70.5	70.0	69.5
66.5	67.5		71.0	70.5	70.0	69.5	69.0
66.0	67.0		70.5	70.0	69.5	69.0	68.5
65.5	66.5		70.0	69.5	69.0	68.5	68.0
65.0	66.0		69.5	69.0	68.5	68.0	67.5
64.5	65.5		69.0	68.5	68.0	67.5	67.0
64.0	65.0		68.5	68.0	67.5	67.0	66.5
63.5	64.5		68.0	67.5	67.0	66.5	66.0
63.0	64.0		67.5	67.0	66.5	66.0	65.5
62.5	63.5		67.0	66.5	66.0	65.5	65.0
62.0	63.0		66.5	66.0	65.5	65.0	64.5
61.5	62.5		66.0	65.5	65.0	64.5	64.0
61.0	62.0		65.5	65.0	64.5	64.0	63.5
60.5	61.5		65.0	64.5	64.0	63.5	63.0
60.0	61.0		64.5	64.0	63.5	63.0	62.5

Temperature Chart for Apr 2 through Apr 14					Permit Limit =61°F		
Ambient Intake Temp		Flow	≤50	51-150	151-300	301-600	> 600
9 am (actual)	2 pm (predicted)	Δ T	3.5	3.0	2.5	2.0	1.5
59.5	60.5		64.0	63.5	63.0	62.5	62.0
59.0	60.0		63.5	63.0	62.5	62.0	61.5
58.5	59.5		63.0	62.5	62.0	61.5	61.0
58.0	59.0		62.5	62.0	61.5	61.0	60.5
57.5	58.5		62.0	61.5	61.0	60.5	60.0
57.0	58.0		61.5	61.0	60.5	60.0	59.5
56.5	57.5		61.0	60.5	60.0	59.5	59.0
56.0	57.0		60.5	60.0	59.5	59.0	58.5
55.5	56.5		60.0	59.5	59.0	58.5	58.0
55.0	56.0		59.5	59.0	58.5	58.0	57.5
54.5	55.5		59.0	58.5	58.0	57.5	57.0
54.0	55.0		58.5	58.0	57.5	57.0	56.5
53.5	54.5		58.0	57.5	57.0	56.5	56.0
53.0	54.0		57.5	57.0	56.5	56.0	55.5
52.5	53.5		57.0	56.5	56.0	55.5	55.0
52.0	53.0		56.5	56.0	55.5	55.0	54.5
51.5	52.5		56.0	55.5	55.0	54.5	54.0
51.0	52.0		55.5	55.0	54.5	54.0	53.5
50.5	51.5		55.0	54.5	54.0	53.5	53.0
50.0	51.0		54.5	54.0	53.5	53.0	52.5
49.5	50.5		54.0	53.5	53.0	52.5	52.0
49.0	50.0		53.5	53.0	52.5	52.0	51.5
48.5	49.5		53.0	52.5	52.0	51.5	51.0
48.0	49.0		52.5	52.0	51.5	51.0	50.5
47.5	48.5		52.0	51.5	51.0	50.5	50.0
47.0	48.0		51.5	51.0	50.5	50.0	49.5
46.5	47.5		51.0	50.5	50.0	49.5	49.0
46.0	47.0		50.5	50.0	49.5	49.0	48.5
45.5	46.5		50.0	49.5	49.0	48.5	48.0
45.0	46.0		49.5	49.0	48.5	48.0	47.5
44.5	45.5		49.0	48.5	48.0	47.5	47.0
44.0	45.0		48.5	48.0	47.5	47.0	46.5
43.5	44.5		48.0	47.5	47.0	46.5	46.0
43.0	44.0		47.5	47.0	46.5	46.0	45.5
42.5	43.5		47.0	46.5	46.0	45.5	45.0
42.0	43.0		46.5	46.0	45.5	45.0	44.5
41.5	42.5		46.0	45.5	45.0	44.5	44.0
41.0	42.0		45.5	45.0	44.5	44.0	43.5
40.5	41.5		45.0	44.5	44.0	43.5	43.0
40.0	41.0		44.5	44.0	43.5	43.0	42.5

Temperature Chart for Apr 15 through Apr 30					Permit Limit =65°F		
Ambient Intake Temp		Flow	≤50	51-150	151-300	301-600	> 600
9 am (actual)	2 pm (predicted)	Δ T	3.5	3.0	2.5	2.0	1.5
83.0	84.0		87.5	87.0	86.5	86.0	85.5
82.5	83.5		87.0	86.5	86.0	85.5	85.0
82.0	83.0		86.5	86.0	85.5	85.0	84.5
81.5	82.5		86.0	85.5	85.0	84.5	84.0
81.0	82.0		85.5	85.0	84.5	84.0	83.5
80.5	81.5		85.0	84.5	84.0	83.5	83.0
80.0	81.0		84.5	84.0	83.5	83.0	82.5
79.5	80.5		84.0	83.5	83.0	82.5	82.0
79.0	80.0		83.5	83.0	82.5	82.0	81.5
78.5	79.5		83.0	82.5	82.0	81.5	81.0
78.0	79.0		82.5	82.0	81.5	81.0	80.5
77.5	78.5		82.0	81.5	81.0	80.5	80.0
77.0	78.0		81.5	81.0	80.5	80.0	79.5
76.5	77.5		81.0	80.5	80.0	79.5	79.0
76.0	77.0		80.5	80.0	79.5	79.0	78.5
75.5	76.5		80.0	79.5	79.0	78.5	78.0
75.0	76.0		79.5	79.0	78.5	78.0	77.5
74.5	75.5		79.0	78.5	78.0	77.5	77.0
74.0	75.0		78.5	78.0	77.5	77.0	76.5
73.5	74.5		78.0	77.5	77.0	76.5	76.0
73.0	74.0		77.5	77.0	76.5	76.0	75.5
72.5	73.5		77.0	76.5	76.0	75.5	75.0
72.0	73.0		76.5	76.0	75.5	75.0	74.5
71.5	72.5		76.0	75.5	75.0	74.5	74.0
71.0	72.0		75.5	75.0	74.5	74.0	73.5
70.5	71.5		75.0	74.5	74.0	73.5	73.0
70.0	71.0		74.5	74.0	73.5	73.0	72.5
69.5	70.5		74.0	73.5	73.0	72.5	72.0
69.0	70.0		73.5	73.0	72.5	72.0	71.5
68.5	69.5		73.0	72.5	72.0	71.5	71.0
68.0	69.0		72.5	72.0	71.5	71.0	70.5
67.5	68.5		72.0	71.5	71.0	70.5	70.0
67.0	68.0		71.5	71.0	70.5	70.0	69.5
66.5	67.5		71.0	70.5	70.0	69.5	69.0
66.0	67.0		70.5	70.0	69.5	69.0	68.5
65.5	66.5		70.0	69.5	69.0	68.5	68.0
65.0	66.0		69.5	69.0	68.5	68.0	67.5
64.5	65.5		69.0	68.5	68.0	67.5	67.0
64.0	65.0		68.5	68.0	67.5	67.0	66.5
63.5	64.5		68.0	67.5	67.0	66.5	66.0
63.0	64.0		67.5	67.0	66.5	66.0	65.5
62.5	63.5		67.0	66.5	66.0	65.5	65.0
62.0	63.0		66.5	66.0	65.5	65.0	64.5
61.5	62.5		66.0	65.5	65.0	64.5	64.0
61.0	62.0		65.5	65.0	64.5	64.0	63.5
60.5	61.5		65.0	64.5	64.0	63.5	63.0
60.0	61.0		64.5	64.0	63.5	63.0	62.5

Temperature Chart for Apr 15 through Apr 30					Permit Limit =65°F		
Ambient Intake Temp		Flow	≤50	51-150	151-300	301-600	> 600
9 am (actual)	2 pm (predicted)	Δ T	3.5	3.0	2.5	2.0	1.5
59.5	60.5		64.0	63.5	63.0	62.5	62.0
59.0	60.0		63.5	63.0	62.5	62.0	61.5
58.5	59.5		63.0	62.5	62.0	61.5	61.0
58.0	59.0		62.5	62.0	61.5	61.0	60.5
57.5	58.5		62.0	61.5	61.0	60.5	60.0
57.0	58.0		61.5	61.0	60.5	60.0	59.5
56.5	57.5		61.0	60.5	60.0	59.5	59.0
56.0	57.0		60.5	60.0	59.5	59.0	58.5
55.5	56.5		60.0	59.5	59.0	58.5	58.0
55.0	56.0		59.5	59.0	58.5	58.0	57.5
54.5	55.5		59.0	58.5	58.0	57.5	57.0
54.0	55.0		58.5	58.0	57.5	57.0	56.5
53.5	54.5		58.0	57.5	57.0	56.5	56.0
53.0	54.0		57.5	57.0	56.5	56.0	55.5
52.5	53.5		57.0	56.5	56.0	55.5	55.0
52.0	53.0		56.5	56.0	55.5	55.0	54.5
51.5	52.5		56.0	55.5	55.0	54.5	54.0
51.0	52.0		55.5	55.0	54.5	54.0	53.5
50.5	51.5		55.0	54.5	54.0	53.5	53.0
50.0	51.0		54.5	54.0	53.5	53.0	52.5
49.5	50.5		54.0	53.5	53.0	52.5	52.0
49.0	50.0		53.5	53.0	52.5	52.0	51.5
48.5	49.5		53.0	52.5	52.0	51.5	51.0
48.0	49.0		52.5	52.0	51.5	51.0	50.5
47.5	48.5		52.0	51.5	51.0	50.5	50.0
47.0	48.0		51.5	51.0	50.5	50.0	49.5
46.5	47.5		51.0	50.5	50.0	49.5	49.0
46.0	47.0		50.5	50.0	49.5	49.0	48.5
45.5	46.5		50.0	49.5	49.0	48.5	48.0
45.0	46.0		49.5	49.0	48.5	48.0	47.5
44.5	45.5		49.0	48.5	48.0	47.5	47.0
44.0	45.0		48.5	48.0	47.5	47.0	46.5
43.5	44.5		48.0	47.5	47.0	46.5	46.0
43.0	44.0		47.5	47.0	46.5	46.0	45.5
42.5	43.5		47.0	46.5	46.0	45.5	45.0
42.0	43.0		46.5	46.0	45.5	45.0	44.5
41.5	42.5		46.0	45.5	45.0	44.5	44.0
41.0	42.0		45.5	45.0	44.5	44.0	43.5
40.5	41.5		45.0	44.5	44.0	43.5	43.0
40.0	41.0		44.5	44.0	43.5	43.0	42.5

Temperature Chart for May 1 through May 10					Permit Limit =66.4°F		
Ambient Intake Temp		Flow	≤50	51-150	151-300	301-600	> 600
9 am (actual)	2 pm (predicted)	Δ T	3.5	3.0	2.5	2.0	1.5
83.0	84.0		87.5	87.0	86.5	86.0	85.5
82.5	83.5		87.0	86.5	86.0	85.5	85.0
82.0	83.0		86.5	86.0	85.5	85.0	84.5
81.5	82.5		86.0	85.5	85.0	84.5	84.0
81.0	82.0		85.5	85.0	84.5	84.0	83.5
80.5	81.5		85.0	84.5	84.0	83.5	83.0
80.0	81.0		84.5	84.0	83.5	83.0	82.5
79.5	80.5		84.0	83.5	83.0	82.5	82.0
79.0	80.0		83.5	83.0	82.5	82.0	81.5
78.5	79.5		83.0	82.5	82.0	81.5	81.0
78.0	79.0		82.5	82.0	81.5	81.0	80.5
77.5	78.5		82.0	81.5	81.0	80.5	80.0
77.0	78.0		81.5	81.0	80.5	80.0	79.5
76.5	77.5		81.0	80.5	80.0	79.5	79.0
76.0	77.0		80.5	80.0	79.5	79.0	78.5
75.5	76.5		80.0	79.5	79.0	78.5	78.0
75.0	76.0		79.5	79.0	78.5	78.0	77.5
74.5	75.5		79.0	78.5	78.0	77.5	77.0
74.0	75.0		78.5	78.0	77.5	77.0	76.5
73.5	74.5		78.0	77.5	77.0	76.5	76.0
73.0	74.0		77.5	77.0	76.5	76.0	75.5
72.5	73.5		77.0	76.5	76.0	75.5	75.0
72.0	73.0		76.5	76.0	75.5	75.0	74.5
71.5	72.5		76.0	75.5	75.0	74.5	74.0
71.0	72.0		75.5	75.0	74.5	74.0	73.5
70.5	71.5		75.0	74.5	74.0	73.5	73.0
70.0	71.0		74.5	74.0	73.5	73.0	72.5
69.5	70.5		74.0	73.5	73.0	72.5	72.0
69.0	70.0		73.5	73.0	72.5	72.0	71.5
68.5	69.5		73.0	72.5	72.0	71.5	71.0
68.0	69.0		72.5	72.0	71.5	71.0	70.5
67.5	68.5		72.0	71.5	71.0	70.5	70.0
67.0	68.0		71.5	71.0	70.5	70.0	69.5
66.5	67.5		71.0	70.5	70.0	69.5	69.0
66.0	67.0		70.5	70.0	69.5	69.0	68.5
65.5	66.5		70.0	69.5	69.0	68.5	68.0
65.0	66.0		69.5	69.0	68.5	68.0	67.5
64.5	65.5		69.0	68.5	68.0	67.5	67.0
64.0	65.0		68.5	68.0	67.5	67.0	66.5
63.5	64.5		68.0	67.5	67.0	66.5	66.0
63.0	64.0		67.5	67.0	66.5	66.0	65.5
62.5	63.5		67.0	66.5	66.0	65.5	65.0
62.0	63.0		66.5	66.0	65.5	65.0	64.5
61.5	62.5		66.0	65.5	65.0	64.5	64.0
61.0	62.0		65.5	65.0	64.5	64.0	63.5
60.5	61.5		65.0	64.5	64.0	63.5	63.0
60.0	61.0		64.5	64.0	63.5	63.0	62.5

Temperature Chart for May 1 through May 10					Permit Limit =66.4°F		
Ambient Intake Temp		Flow	≤50	51-150	151-300	301-600	> 600
9 am (actual)	2 pm (predicted)	Δ T	3.5	3.0	2.5	2.0	1.5
59.5	60.5		64.0	63.5	63.0	62.5	62.0
59.0	60.0		63.5	63.0	62.5	62.0	61.5
58.5	59.5		63.0	62.5	62.0	61.5	61.0
58.0	59.0		62.5	62.0	61.5	61.0	60.5
57.5	58.5		62.0	61.5	61.0	60.5	60.0
57.0	58.0		61.5	61.0	60.5	60.0	59.5
56.5	57.5		61.0	60.5	60.0	59.5	59.0
56.0	57.0		60.5	60.0	59.5	59.0	58.5
55.5	56.5		60.0	59.5	59.0	58.5	58.0
55.0	56.0		59.5	59.0	58.5	58.0	57.5
54.5	55.5		59.0	58.5	58.0	57.5	57.0
54.0	55.0		58.5	58.0	57.5	57.0	56.5
53.5	54.5		58.0	57.5	57.0	56.5	56.0
53.0	54.0		57.5	57.0	56.5	56.0	55.5
52.5	53.5		57.0	56.5	56.0	55.5	55.0
52.0	53.0		56.5	56.0	55.5	55.0	54.5
51.5	52.5		56.0	55.5	55.0	54.5	54.0
51.0	52.0		55.5	55.0	54.5	54.0	53.5
50.5	51.5		55.0	54.5	54.0	53.5	53.0
50.0	51.0		54.5	54.0	53.5	53.0	52.5
49.5	50.5		54.0	53.5	53.0	52.5	52.0
49.0	50.0		53.5	53.0	52.5	52.0	51.5
48.5	49.5		53.0	52.5	52.0	51.5	51.0
48.0	49.0		52.5	52.0	51.5	51.0	50.5
47.5	48.5		52.0	51.5	51.0	50.5	50.0
47.0	48.0		51.5	51.0	50.5	50.0	49.5
46.5	47.5		51.0	50.5	50.0	49.5	49.0
46.0	47.0		50.5	50.0	49.5	49.0	48.5
45.5	46.5		50.0	49.5	49.0	48.5	48.0
45.0	46.0		49.5	49.0	48.5	48.0	47.5
44.5	45.5		49.0	48.5	48.0	47.5	47.0
44.0	45.0		48.5	48.0	47.5	47.0	46.5
43.5	44.5		48.0	47.5	47.0	46.5	46.0
43.0	44.0		47.5	47.0	46.5	46.0	45.5
42.5	43.5		47.0	46.5	46.0	45.5	45.0
42.0	43.0		46.5	46.0	45.5	45.0	44.5
41.5	42.5		46.0	45.5	45.0	44.5	44.0
41.0	42.0		45.5	45.0	44.5	44.0	43.5
40.5	41.5		45.0	44.5	44.0	43.5	43.0
40.0	41.0		44.5	44.0	43.5	43.0	42.5

Temperature Chart for May 11 through May 22					Permit Limit =68°F		
Ambient Intake Temp		Flow	≤50	51-150	151-300	301-600	> 600
9 am (actual)	2 pm (predicted)	Δ T	3.5	3.0	2.5	2.0	1.5
83.0	84.0		87.5	87.0	86.5	86.0	85.5
82.5	83.5		87.0	86.5	86.0	85.5	85.0
82.0	83.0		86.5	86.0	85.5	85.0	84.5
81.5	82.5		86.0	85.5	85.0	84.5	84.0
81.0	82.0		85.5	85.0	84.5	84.0	83.5
80.5	81.5		85.0	84.5	84.0	83.5	83.0
80.0	81.0		84.5	84.0	83.5	83.0	82.5
79.5	80.5		84.0	83.5	83.0	82.5	82.0
79.0	80.0		83.5	83.0	82.5	82.0	81.5
78.5	79.5		83.0	82.5	82.0	81.5	81.0
78.0	79.0		82.5	82.0	81.5	81.0	80.5
77.5	78.5		82.0	81.5	81.0	80.5	80.0
77.0	78.0		81.5	81.0	80.5	80.0	79.5
76.5	77.5		81.0	80.5	80.0	79.5	79.0
76.0	77.0		80.5	80.0	79.5	79.0	78.5
75.5	76.5		80.0	79.5	79.0	78.5	78.0
75.0	76.0		79.5	79.0	78.5	78.0	77.5
74.5	75.5		79.0	78.5	78.0	77.5	77.0
74.0	75.0		78.5	78.0	77.5	77.0	76.5
73.5	74.5		78.0	77.5	77.0	76.5	76.0
73.0	74.0		77.5	77.0	76.5	76.0	75.5
72.5	73.5		77.0	76.5	76.0	75.5	75.0
72.0	73.0		76.5	76.0	75.5	75.0	74.5
71.5	72.5		76.0	75.5	75.0	74.5	74.0
71.0	72.0		75.5	75.0	74.5	74.0	73.5
70.5	71.5		75.0	74.5	74.0	73.5	73.0
70.0	71.0		74.5	74.0	73.5	73.0	72.5
69.5	70.5		74.0	73.5	73.0	72.5	72.0
69.0	70.0		73.5	73.0	72.5	72.0	71.5
68.5	69.5		73.0	72.5	72.0	71.5	71.0
68.0	69.0		72.5	72.0	71.5	71.0	70.5
67.5	68.5		72.0	71.5	71.0	70.5	70.0
67.0	68.0		71.5	71.0	70.5	70.0	69.5
66.5	67.5		71.0	70.5	70.0	69.5	69.0
66.0	67.0		70.5	70.0	69.5	69.0	68.5
65.5	66.5		70.0	69.5	69.0	68.5	68.0
65.0	66.0		69.5	69.0	68.5	68.0	67.5
64.5	65.5		69.0	68.5	68.0	67.5	67.0
64.0	65.0		68.5	68.0	67.5	67.0	66.5
63.5	64.5		68.0	67.5	67.0	66.5	66.0
63.0	64.0		67.5	67.0	66.5	66.0	65.5
62.5	63.5		67.0	66.5	66.0	65.5	65.0
62.0	63.0		66.5	66.0	65.5	65.0	64.5
61.5	62.5		66.0	65.5	65.0	64.5	64.0
61.0	62.0		65.5	65.0	64.5	64.0	63.5
60.5	61.5		65.0	64.5	64.0	63.5	63.0
60.0	61.0		64.5	64.0	63.5	63.0	62.5

Temperature Chart for May 11 through May 22					Permit Limit =68°F		
Ambient Intake Temp		Flow	≤50	51-150	151-300	301-600	> 600
9 am (actual)	2 pm (predicted)	Δ T	3.5	3.0	2.5	2.0	1.5
59.5	60.5		64.0	63.5	63.0	62.5	62.0
59.0	60.0		63.5	63.0	62.5	62.0	61.5
58.5	59.5		63.0	62.5	62.0	61.5	61.0
58.0	59.0		62.5	62.0	61.5	61.0	60.5
57.5	58.5		62.0	61.5	61.0	60.5	60.0
57.0	58.0		61.5	61.0	60.5	60.0	59.5
56.5	57.5		61.0	60.5	60.0	59.5	59.0
56.0	57.0		60.5	60.0	59.5	59.0	58.5
55.5	56.5		60.0	59.5	59.0	58.5	58.0
55.0	56.0		59.5	59.0	58.5	58.0	57.5
54.5	55.5		59.0	58.5	58.0	57.5	57.0
54.0	55.0		58.5	58.0	57.5	57.0	56.5
53.5	54.5		58.0	57.5	57.0	56.5	56.0
53.0	54.0		57.5	57.0	56.5	56.0	55.5
52.5	53.5		57.0	56.5	56.0	55.5	55.0
52.0	53.0		56.5	56.0	55.5	55.0	54.5
51.5	52.5		56.0	55.5	55.0	54.5	54.0
51.0	52.0		55.5	55.0	54.5	54.0	53.5
50.5	51.5		55.0	54.5	54.0	53.5	53.0
50.0	51.0		54.5	54.0	53.5	53.0	52.5
49.5	50.5		54.0	53.5	53.0	52.5	52.0
49.0	50.0		53.5	53.0	52.5	52.0	51.5
48.5	49.5		53.0	52.5	52.0	51.5	51.0
48.0	49.0		52.5	52.0	51.5	51.0	50.5
47.5	48.5		52.0	51.5	51.0	50.5	50.0
47.0	48.0		51.5	51.0	50.5	50.0	49.5
46.5	47.5		51.0	50.5	50.0	49.5	49.0
46.0	47.0		50.5	50.0	49.5	49.0	48.5
45.5	46.5		50.0	49.5	49.0	48.5	48.0
45.0	46.0		49.5	49.0	48.5	48.0	47.5
44.5	45.5		49.0	48.5	48.0	47.5	47.0
44.0	45.0		48.5	48.0	47.5	47.0	46.5
43.5	44.5		48.0	47.5	47.0	46.5	46.0
43.0	44.0		47.5	47.0	46.5	46.0	45.5
42.5	43.5		47.0	46.5	46.0	45.5	45.0
42.0	43.0		46.5	46.0	45.5	45.0	44.5
41.5	42.5		46.0	45.5	45.0	44.5	44.0
41.0	42.0		45.5	45.0	44.5	44.0	43.5
40.5	41.5		45.0	44.5	44.0	43.5	43.0
40.0	41.0		44.5	44.0	43.5	43.0	42.5

Temperature Chart for May 23 through May 31					Permit Limit =70°F		
Ambient Intake Temp		Flow	≤50	51-150	151-300	301-600	> 600
9 am (actual)	2 pm (predicted)	Δ T	3.5	3.0	2.5	2.0	1.5
83.0	84.0		87.5	87.0	86.5	86.0	85.5
82.5	83.5		87.0	86.5	86.0	85.5	85.0
82.0	83.0		86.5	86.0	85.5	85.0	84.5
81.5	82.5		86.0	85.5	85.0	84.5	84.0
81.0	82.0		85.5	85.0	84.5	84.0	83.5
80.5	81.5		85.0	84.5	84.0	83.5	83.0
80.0	81.0		84.5	84.0	83.5	83.0	82.5
79.5	80.5		84.0	83.5	83.0	82.5	82.0
79.0	80.0		83.5	83.0	82.5	82.0	81.5
78.5	79.5		83.0	82.5	82.0	81.5	81.0
78.0	79.0		82.5	82.0	81.5	81.0	80.5
77.5	78.5		82.0	81.5	81.0	80.5	80.0
77.0	78.0		81.5	81.0	80.5	80.0	79.5
76.5	77.5		81.0	80.5	80.0	79.5	79.0
76.0	77.0		80.5	80.0	79.5	79.0	78.5
75.5	76.5		80.0	79.5	79.0	78.5	78.0
75.0	76.0		79.5	79.0	78.5	78.0	77.5
74.5	75.5		79.0	78.5	78.0	77.5	77.0
74.0	75.0		78.5	78.0	77.5	77.0	76.5
73.5	74.5		78.0	77.5	77.0	76.5	76.0
73.0	74.0		77.5	77.0	76.5	76.0	75.5
72.5	73.5		77.0	76.5	76.0	75.5	75.0
72.0	73.0		76.5	76.0	75.5	75.0	74.5
71.5	72.5		76.0	75.5	75.0	74.5	74.0
71.0	72.0		75.5	75.0	74.5	74.0	73.5
70.5	71.5		75.0	74.5	74.0	73.5	73.0
70.0	71.0		74.5	74.0	73.5	73.0	72.5
69.5	70.5		74.0	73.5	73.0	72.5	72.0
69.0	70.0		73.5	73.0	72.5	72.0	71.5
68.5	69.5		73.0	72.5	72.0	71.5	71.0
68.0	69.0		72.5	72.0	71.5	71.0	70.5
67.5	68.5		72.0	71.5	71.0	70.5	70.0
67.0	68.0		71.5	71.0	70.5	70.0	69.5
66.5	67.5		71.0	70.5	70.0	69.5	69.0
66.0	67.0		70.5	70.0	69.5	69.0	68.5
65.5	66.5		70.0	69.5	69.0	68.5	68.0
65.0	66.0		69.5	69.0	68.5	68.0	67.5
64.5	65.5		69.0	68.5	68.0	67.5	67.0
64.0	65.0		68.5	68.0	67.5	67.0	66.5
63.5	64.5		68.0	67.5	67.0	66.5	66.0
63.0	64.0		67.5	67.0	66.5	66.0	65.5
62.5	63.5		67.0	66.5	66.0	65.5	65.0
62.0	63.0		66.5	66.0	65.5	65.0	64.5
61.5	62.5		66.0	65.5	65.0	64.5	64.0
61.0	62.0		65.5	65.0	64.5	64.0	63.5
60.5	61.5		65.0	64.5	64.0	63.5	63.0

Temperature Chart for May 23 through May 31					Permit Limit =70°F		
Ambient Intake Temp		Flow	≤50	51-150	151-300	301-600	> 600
9 am (actual)	2 pm (predicted)	Δ T	3.5	3.0	2.5	2.0	1.5
60.0	61.0		64.5	64.0	63.5	63.0	62.5
59.5	60.5		64.0	63.5	63.0	62.5	62.0
59.0	60.0		63.5	63.0	62.5	62.0	61.5
58.5	59.5		63.0	62.5	62.0	61.5	61.0
58.0	59.0		62.5	62.0	61.5	61.0	60.5
57.5	58.5		62.0	61.5	61.0	60.5	60.0
57.0	58.0		61.5	61.0	60.5	60.0	59.5
56.5	57.5		61.0	60.5	60.0	59.5	59.0
56.0	57.0		60.5	60.0	59.5	59.0	58.5
55.5	56.5		60.0	59.5	59.0	58.5	58.0
55.0	56.0		59.5	59.0	58.5	58.0	57.5
54.5	55.5		59.0	58.5	58.0	57.5	57.0
54.0	55.0		58.5	58.0	57.5	57.0	56.5
53.5	54.5		58.0	57.5	57.0	56.5	56.0
53.0	54.0		57.5	57.0	56.5	56.0	55.5
52.5	53.5		57.0	56.5	56.0	55.5	55.0
52.0	53.0		56.5	56.0	55.5	55.0	54.5
51.5	52.5		56.0	55.5	55.0	54.5	54.0
51.0	52.0		55.5	55.0	54.5	54.0	53.5
50.5	51.5		55.0	54.5	54.0	53.5	53.0
50.0	51.0		54.5	54.0	53.5	53.0	52.5
49.5	50.5		54.0	53.5	53.0	52.5	52.0
49.0	50.0		53.5	53.0	52.5	52.0	51.5
48.5	49.5		53.0	52.5	52.0	51.5	51.0
48.0	49.0		52.5	52.0	51.5	51.0	50.5
47.5	48.5		52.0	51.5	51.0	50.5	50.0
47.0	48.0		51.5	51.0	50.5	50.0	49.5
46.5	47.5		51.0	50.5	50.0	49.5	49.0
46.0	47.0		50.5	50.0	49.5	49.0	48.5
45.5	46.5		50.0	49.5	49.0	48.5	48.0
45.0	46.0		49.5	49.0	48.5	48.0	47.5
44.5	45.5		49.0	48.5	48.0	47.5	47.0
44.0	45.0		48.5	48.0	47.5	47.0	46.5
43.5	44.5		48.0	47.5	47.0	46.5	46.0
43.0	44.0		47.5	47.0	46.5	46.0	45.5
42.5	43.5		47.0	46.5	46.0	45.5	45.0
42.0	43.0		46.5	46.0	45.5	45.0	44.5
41.5	42.5		46.0	45.5	45.0	44.5	44.0
41.0	42.0		45.5	45.0	44.5	44.0	43.5
40.5	41.5		45.0	44.5	44.0	43.5	43.0
40.0	41.0		44.5	44.0	43.5	43.0	42.5

Temperature Chart for Jun 1 through Jun 7					Permit Limit =72°F		
Ambient Intake Temp		Flow	≤50	51-150	151-300	301-600	> 600
9 am (actual)	2 pm (predicted)	Δ T	3.5	3.0	2.5	2.0	1.5
83.0	84.0		87.5	87.0	86.5	86.0	85.5
82.5	83.5		87.0	86.5	86.0	85.5	85.0
82.0	83.0		86.5	86.0	85.5	85.0	84.5
81.5	82.5		86.0	85.5	85.0	84.5	84.0
81.0	82.0		85.5	85.0	84.5	84.0	83.5
80.5	81.5		85.0	84.5	84.0	83.5	83.0
80.0	81.0		84.5	84.0	83.5	83.0	82.5
79.5	80.5		84.0	83.5	83.0	82.5	82.0
79.0	80.0		83.5	83.0	82.5	82.0	81.5
78.5	79.5		83.0	82.5	82.0	81.5	81.0
78.0	79.0		82.5	82.0	81.5	81.0	80.5
77.5	78.5		82.0	81.5	81.0	80.5	80.0
77.0	78.0		81.5	81.0	80.5	80.0	79.5
76.5	77.5		81.0	80.5	80.0	79.5	79.0
76.0	77.0		80.5	80.0	79.5	79.0	78.5
75.5	76.5		80.0	79.5	79.0	78.5	78.0
75.0	76.0		79.5	79.0	78.5	78.0	77.5
74.5	75.5		79.0	78.5	78.0	77.5	77.0
74.0	75.0		78.5	78.0	77.5	77.0	76.5
73.5	74.5		78.0	77.5	77.0	76.5	76.0
73.0	74.0		77.5	77.0	76.5	76.0	75.5
72.5	73.5		77.0	76.5	76.0	75.5	75.0
72.0	73.0		76.5	76.0	75.5	75.0	74.5
71.5	72.5		76.0	75.5	75.0	74.5	74.0
71.0	72.0		75.5	75.0	74.5	74.0	73.5
70.5	71.5		75.0	74.5	74.0	73.5	73.0
70.0	71.0		74.5	74.0	73.5	73.0	72.5
69.5	70.5		74.0	73.5	73.0	72.5	72.0
69.0	70.0		73.5	73.0	72.5	72.0	71.5
68.5	69.5		73.0	72.5	72.0	71.5	71.0
68.0	69.0		72.5	72.0	71.5	71.0	70.5
67.5	68.5		72.0	71.5	71.0	70.5	70.0
67.0	68.0		71.5	71.0	70.5	70.0	69.5
66.5	67.5		71.0	70.5	70.0	69.5	69.0
66.0	67.0		70.5	70.0	69.5	69.0	68.5
65.5	66.5		70.0	69.5	69.0	68.5	68.0
65.0	66.0		69.5	69.0	68.5	68.0	67.5
64.5	65.5		69.0	68.5	68.0	67.5	67.0
64.0	65.0		68.5	68.0	67.5	67.0	66.5
63.5	64.5		68.0	67.5	67.0	66.5	66.0
63.0	64.0		67.5	67.0	66.5	66.0	65.5
62.5	63.5		67.0	66.5	66.0	65.5	65.0
62.0	63.0		66.5	66.0	65.5	65.0	64.5
61.5	62.5		66.0	65.5	65.0	64.5	64.0
61.0	62.0		65.5	65.0	64.5	64.0	63.5
60.5	61.5		65.0	64.5	64.0	63.5	63.0
60.0	61.0		64.5	64.0	63.5	63.0	62.5

Temperature Chart for Jun 1 through Jun 7				Permit Limit =72°F			
Ambient Intake Temp		Flow	≤50	51-150	151-300	301-600	> 600
9 am (actual)	2 pm (predicted)	Δ T	3.5	3.0	2.5	2.0	1.5
59.5	60.5		64.0	63.5	63.0	62.5	62.0
59.0	60.0		63.5	63.0	62.5	62.0	61.5
58.5	59.5		63.0	62.5	62.0	61.5	61.0
58.0	59.0		62.5	62.0	61.5	61.0	60.5
57.5	58.5		62.0	61.5	61.0	60.5	60.0
57.0	58.0		61.5	61.0	60.5	60.0	59.5
56.5	57.5		61.0	60.5	60.0	59.5	59.0
56.0	57.0		60.5	60.0	59.5	59.0	58.5
55.5	56.5		60.0	59.5	59.0	58.5	58.0
55.0	56.0		59.5	59.0	58.5	58.0	57.5
54.5	55.5		59.0	58.5	58.0	57.5	57.0
54.0	55.0		58.5	58.0	57.5	57.0	56.5
53.5	54.5		58.0	57.5	57.0	56.5	56.0
53.0	54.0		57.5	57.0	56.5	56.0	55.5
52.5	53.5		57.0	56.5	56.0	55.5	55.0
52.0	53.0		56.5	56.0	55.5	55.0	54.5
51.5	52.5		56.0	55.5	55.0	54.5	54.0
51.0	52.0		55.5	55.0	54.5	54.0	53.5
50.5	51.5		55.0	54.5	54.0	53.5	53.0
50.0	51.0		54.5	54.0	53.5	53.0	52.5
49.5	50.5		54.0	53.5	53.0	52.5	52.0
49.0	50.0		53.5	53.0	52.5	52.0	51.5
48.5	49.5		53.0	52.5	52.0	51.5	51.0
48.0	49.0		52.5	52.0	51.5	51.0	50.5
47.5	48.5		52.0	51.5	51.0	50.5	50.0
47.0	48.0		51.5	51.0	50.5	50.0	49.5
46.5	47.5		51.0	50.5	50.0	49.5	49.0
46.0	47.0		50.5	50.0	49.5	49.0	48.5
45.5	46.5		50.0	49.5	49.0	48.5	48.0
45.0	46.0		49.5	49.0	48.5	48.0	47.5
44.5	45.5		49.0	48.5	48.0	47.5	47.0
44.0	45.0		48.5	48.0	47.5	47.0	46.5
43.5	44.5		48.0	47.5	47.0	46.5	46.0
43.0	44.0		47.5	47.0	46.5	46.0	45.5
42.5	43.5		47.0	46.5	46.0	45.5	45.0
42.0	43.0		46.5	46.0	45.5	45.0	44.5
41.5	42.5		46.0	45.5	45.0	44.5	44.0
41.0	42.0		45.5	45.0	44.5	44.0	43.5
40.5	41.5		45.0	44.5	44.0	43.5	43.0
40.0	41.0		44.5	44.0	43.5	43.0	42.5

Temperature Chart for Jun 8 through Jun 11					Permit Limit =75°F		
Ambient Intake Temp		Flow	≤50	51-150	151-300	301-600	> 600
9 am (actual)	2 pm (predicted)	Δ T	3.5	3.0	2.5	2.0	1.5
83.0	84.0		87.5	87.0	86.5	86.0	85.5
82.5	83.5		87.0	86.5	86.0	85.5	85.0
82.0	83.0		86.5	86.0	85.5	85.0	84.5
81.5	82.5		86.0	85.5	85.0	84.5	84.0
81.0	82.0		85.5	85.0	84.5	84.0	83.5
80.5	81.5		85.0	84.5	84.0	83.5	83.0
80.0	81.0		84.5	84.0	83.5	83.0	82.5
79.5	80.5		84.0	83.5	83.0	82.5	82.0
79.0	80.0		83.5	83.0	82.5	82.0	81.5
78.5	79.5		83.0	82.5	82.0	81.5	81.0
78.0	79.0		82.5	82.0	81.5	81.0	80.5
77.5	78.5		82.0	81.5	81.0	80.5	80.0
77.0	78.0		81.5	81.0	80.5	80.0	79.5
76.5	77.5		81.0	80.5	80.0	79.5	79.0
76.0	77.0		80.5	80.0	79.5	79.0	78.5
75.5	76.5		80.0	79.5	79.0	78.5	78.0
75.0	76.0		79.5	79.0	78.5	78.0	77.5
74.5	75.5		79.0	78.5	78.0	77.5	77.0
74.0	75.0		78.5	78.0	77.5	77.0	76.5
73.5	74.5		78.0	77.5	77.0	76.5	76.0
73.0	74.0		77.5	77.0	76.5	76.0	75.5
72.5	73.5		77.0	76.5	76.0	75.5	75.0
72.0	73.0		76.5	76.0	75.5	75.0	74.5
71.5	72.5		76.0	75.5	75.0	74.5	74.0
71.0	72.0		75.5	75.0	74.5	74.0	73.5
70.5	71.5		75.0	74.5	74.0	73.5	73.0
70.0	71.0		74.5	74.0	73.5	73.0	72.5
69.5	70.5		74.0	73.5	73.0	72.5	72.0
69.0	70.0		73.5	73.0	72.5	72.0	71.5
68.5	69.5		73.0	72.5	72.0	71.5	71.0
68.0	69.0		72.5	72.0	71.5	71.0	70.5
67.5	68.5		72.0	71.5	71.0	70.5	70.0
67.0	68.0		71.5	71.0	70.5	70.0	69.5
66.5	67.5		71.0	70.5	70.0	69.5	69.0
66.0	67.0		70.5	70.0	69.5	69.0	68.5
65.5	66.5		70.0	69.5	69.0	68.5	68.0
65.0	66.0		69.5	69.0	68.5	68.0	67.5
64.5	65.5		69.0	68.5	68.0	67.5	67.0
64.0	65.0		68.5	68.0	67.5	67.0	66.5
63.5	64.5		68.0	67.5	67.0	66.5	66.0
63.0	64.0		67.5	67.0	66.5	66.0	65.5
62.5	63.5		67.0	66.5	66.0	65.5	65.0
62.0	63.0		66.5	66.0	65.5	65.0	64.5
61.5	62.5		66.0	65.5	65.0	64.5	64.0
61.0	62.0		65.5	65.0	64.5	64.0	63.5
60.5	61.5		65.0	64.5	64.0	63.5	63.0
60.0	61.0		64.5	64.0	63.5	63.0	62.5

Temperature Chart for Jun 8 through Jun 11					Permit Limit =75°F		
Ambient Intake Temp		Flow	≤50	51-150	151-300	301-600	> 600
9 am (actual)	2 pm (predicted)	Δ T	3.5	3.0	2.5	2.0	1.5
59.5	60.5		64.0	63.5	63.0	62.5	62.0
59.0	60.0		63.5	63.0	62.5	62.0	61.5
58.5	59.5		63.0	62.5	62.0	61.5	61.0
58.0	59.0		62.5	62.0	61.5	61.0	60.5
57.5	58.5		62.0	61.5	61.0	60.5	60.0
57.0	58.0		61.5	61.0	60.5	60.0	59.5
56.5	57.5		61.0	60.5	60.0	59.5	59.0
56.0	57.0		60.5	60.0	59.5	59.0	58.5
55.5	56.5		60.0	59.5	59.0	58.5	58.0
55.0	56.0		59.5	59.0	58.5	58.0	57.5
54.5	55.5		59.0	58.5	58.0	57.5	57.0
54.0	55.0		58.5	58.0	57.5	57.0	56.5
53.5	54.5		58.0	57.5	57.0	56.5	56.0
53.0	54.0		57.5	57.0	56.5	56.0	55.5
52.5	53.5		57.0	56.5	56.0	55.5	55.0
52.0	53.0		56.5	56.0	55.5	55.0	54.5
51.5	52.5		56.0	55.5	55.0	54.5	54.0
51.0	52.0		55.5	55.0	54.5	54.0	53.5
50.5	51.5		55.0	54.5	54.0	53.5	53.0
50.0	51.0		54.5	54.0	53.5	53.0	52.5
49.5	50.5		54.0	53.5	53.0	52.5	52.0
49.0	50.0		53.5	53.0	52.5	52.0	51.5
48.5	49.5		53.0	52.5	52.0	51.5	51.0
48.0	49.0		52.5	52.0	51.5	51.0	50.5
47.5	48.5		52.0	51.5	51.0	50.5	50.0
47.0	48.0		51.5	51.0	50.5	50.0	49.5
46.5	47.5		51.0	50.5	50.0	49.5	49.0
46.0	47.0		50.5	50.0	49.5	49.0	48.5
45.5	46.5		50.0	49.5	49.0	48.5	48.0
45.0	46.0		49.5	49.0	48.5	48.0	47.5
44.5	45.5		49.0	48.5	48.0	47.5	47.0
44.0	45.0		48.5	48.0	47.5	47.0	46.5
43.5	44.5		48.0	47.5	47.0	46.5	46.0
43.0	44.0		47.5	47.0	46.5	46.0	45.5
42.5	43.5		47.0	46.5	46.0	45.5	45.0
42.0	43.0		46.5	46.0	45.5	45.0	44.5
41.5	42.5		46.0	45.5	45.0	44.5	44.0
41.0	42.0		45.5	45.0	44.5	44.0	43.5
40.5	41.5		45.0	44.5	44.0	43.5	43.0
40.0	41.0		44.5	44.0	43.5	43.0	42.5

Temperature Chart for Jun 12 through Oct 31				Permit Limit =83°F			
Ambient Intake Temp		Flow	≤50	51-150	151-300	301-600	> 600
9 am (actual)	2 pm (predicted)	Δ T	3.5	3.0	2.5	2.0	1.5
83.0	84.0		87.5	87.0	86.5	86.0	85.5
82.5	83.5		87.0	86.5	86.0	85.5	85.0
82.0	83.0		86.5	86.0	85.5	85.0	84.5
81.5	82.5		86.0	85.5	85.0	84.5	84.0
81.0	82.0		85.5	85.0	84.5	84.0	83.5
80.5	81.5		85.0	84.5	84.0	83.5	83.0
80.0	81.0		84.5	84.0	83.5	83.0	82.5
79.5	80.5		84.0	83.5	83.0	82.5	82.0
79.0	80.0		83.5	83.0	82.5	82.0	81.5
78.5	79.5		83.0	82.5	82.0	81.5	81.0
78.0	79.0		82.5	82.0	81.5	81.0	80.5
77.5	78.5		82.0	81.5	81.0	80.5	80.0
77.0	78.0		81.5	81.0	80.5	80.0	79.5
76.5	77.5		81.0	80.5	80.0	79.5	79.0
76.0	77.0		80.5	80.0	79.5	79.0	78.5
75.5	76.5		80.0	79.5	79.0	78.5	78.0
75.0	76.0		79.5	79.0	78.5	78.0	77.5
74.5	75.5		79.0	78.5	78.0	77.5	77.0
74.0	75.0		78.5	78.0	77.5	77.0	76.5
73.5	74.5		78.0	77.5	77.0	76.5	76.0
73.0	74.0		77.5	77.0	76.5	76.0	75.5
72.5	73.5		77.0	76.5	76.0	75.5	75.0
72.0	73.0		76.5	76.0	75.5	75.0	74.5
71.5	72.5		76.0	75.5	75.0	74.5	74.0
71.0	72.0		75.5	75.0	74.5	74.0	73.5
70.5	71.5		75.0	74.5	74.0	73.5	73.0
70.0	71.0		74.5	74.0	73.5	73.0	72.5
69.5	70.5		74.0	73.5	73.0	72.5	72.0
69.0	70.0		73.5	73.0	72.5	72.0	71.5
68.5	69.5		73.0	72.5	72.0	71.5	71.0
68.0	69.0		72.5	72.0	71.5	71.0	70.5
67.5	68.5		72.0	71.5	71.0	70.5	70.0
67.0	68.0		71.5	71.0	70.5	70.0	69.5
66.5	67.5		71.0	70.5	70.0	69.5	69.0
66.0	67.0		70.5	70.0	69.5	69.0	68.5
65.5	66.5		70.0	69.5	69.0	68.5	68.0
65.0	66.0		69.5	69.0	68.5	68.0	67.5
64.5	65.5		69.0	68.5	68.0	67.5	67.0
64.0	65.0		68.5	68.0	67.5	67.0	66.5
63.5	64.5		68.0	67.5	67.0	66.5	66.0
63.0	64.0		67.5	67.0	66.5	66.0	65.5
62.5	63.5		67.0	66.5	66.0	65.5	65.0
62.0	63.0		66.5	66.0	65.5	65.0	64.5
61.5	62.5		66.0	65.5	65.0	64.5	64.0
61.0	62.0		65.5	65.0	64.5	64.0	63.5
60.5	61.5		65.0	64.5	64.0	63.5	63.0
60.0	61.0		64.5	64.0	63.5	63.0	62.5

Temperature Chart for Jun 12 through Oct 31					Permit Limit =83°F		
Ambient Intake Temp		Flow	≤50	51-150	151-300	301-600	> 600
9 am (actual)	2 pm (predicted)	Δ T	3.5	3.0	2.5	2.0	1.5
59.5	60.5		64.0	63.5	63.0	62.5	62.0
59.0	60.0		63.5	63.0	62.5	62.0	61.5
58.5	59.5		63.0	62.5	62.0	61.5	61.0
58.0	59.0		62.5	62.0	61.5	61.0	60.5
57.5	58.5		62.0	61.5	61.0	60.5	60.0
57.0	58.0		61.5	61.0	60.5	60.0	59.5
56.5	57.5		61.0	60.5	60.0	59.5	59.0
56.0	57.0		60.5	60.0	59.5	59.0	58.5
55.5	56.5		60.0	59.5	59.0	58.5	58.0
55.0	56.0		59.5	59.0	58.5	58.0	57.5
54.5	55.5		59.0	58.5	58.0	57.5	57.0
54.0	55.0		58.5	58.0	57.5	57.0	56.5
53.5	54.5		58.0	57.5	57.0	56.5	56.0
53.0	54.0		57.5	57.0	56.5	56.0	55.5
52.5	53.5		57.0	56.5	56.0	55.5	55.0
52.0	53.0		56.5	56.0	55.5	55.0	54.5
51.5	52.5		56.0	55.5	55.0	54.5	54.0
51.0	52.0		55.5	55.0	54.5	54.0	53.5
50.5	51.5		55.0	54.5	54.0	53.5	53.0
50.0	51.0		54.5	54.0	53.5	53.0	52.5
49.5	50.5		54.0	53.5	53.0	52.5	52.0
49.0	50.0		53.5	53.0	52.5	52.0	51.5
48.5	49.5		53.0	52.5	52.0	51.5	51.0
48.0	49.0		52.5	52.0	51.5	51.0	50.5
47.5	48.5		52.0	51.5	51.0	50.5	50.0
47.0	48.0		51.5	51.0	50.5	50.0	49.5
46.5	47.5		51.0	50.5	50.0	49.5	49.0
46.0	47.0		50.5	50.0	49.5	49.0	48.5
45.5	46.5		50.0	49.5	49.0	48.5	48.0
45.0	46.0		49.5	49.0	48.5	48.0	47.5
44.5	45.5		49.0	48.5	48.0	47.5	47.0
44.0	45.0		48.5	48.0	47.5	47.0	46.5
43.5	44.5		48.0	47.5	47.0	46.5	46.0
43.0	44.0		47.5	47.0	46.5	46.0	45.5
42.5	43.5		47.0	46.5	46.0	45.5	45.0
42.0	43.0		46.5	46.0	45.5	45.0	44.5
41.5	42.5		46.0	45.5	45.0	44.5	44.0
41.0	42.0		45.5	45.0	44.5	44.0	43.5
40.5	41.5		45.0	44.5	44.0	43.5	43.0
40.0	41.0		44.5	44.0	43.5	43.0	42.5

Temperature Chart for Nov 1 through Mar 29					Permit Limit =50°F		
Ambient Intake Temp		Flow	≤50	51-150	151-300	301-600	> 600
9 am (actual)	2 pm (predicted)	Δ T	3.5	3.0	2.5	2.0	1.5
83.0	83.5		87.0	86.5	86.0	85.5	85.0
82.5	83.0		86.5	86.0	85.5	85.0	84.5
82.0	82.5		86.0	85.5	85.0	84.5	84.0
81.5	82.0		85.5	85.0	84.5	84.0	83.5
81.0	81.5		85.0	84.5	84.0	83.5	83.0
80.5	81.0		84.5	84.0	83.5	83.0	82.5
80.0	80.5		84.0	83.5	83.0	82.5	82.0
79.5	80.0		83.5	83.0	82.5	82.0	81.5
79.0	79.5		83.0	82.5	82.0	81.5	81.0
78.5	79.0		82.5	82.0	81.5	81.0	80.5
78.0	78.5		82.0	81.5	81.0	80.5	80.0
77.5	78.0		81.5	81.0	80.5	80.0	79.5
77.0	77.5		81.0	80.5	80.0	79.5	79.0
76.5	77.0		80.5	80.0	79.5	79.0	78.5
76.0	76.5		80.0	79.5	79.0	78.5	78.0
75.5	76.0		79.5	79.0	78.5	78.0	77.5
75.0	75.5		79.0	78.5	78.0	77.5	77.0
74.5	75.0		78.5	78.0	77.5	77.0	76.5
74.0	74.5		78.0	77.5	77.0	76.5	76.0
73.5	74.0		77.5	77.0	76.5	76.0	75.5
73.0	73.5		77.0	76.5	76.0	75.5	75.0
72.5	73.0		76.5	76.0	75.5	75.0	74.5
72.0	72.5		76.0	75.5	75.0	74.5	74.0
71.5	72.0		75.5	75.0	74.5	74.0	73.5
71.0	71.5		75.0	74.5	74.0	73.5	73.0
70.5	71.0		74.5	74.0	73.5	73.0	72.5
70.0	70.5		74.0	73.5	73.0	72.5	72.0
69.5	70.0		73.5	73.0	72.5	72.0	71.5
69.0	69.5		73.0	72.5	72.0	71.5	71.0
68.5	69.0		72.5	72.0	71.5	71.0	70.5
68.0	68.5		72.0	71.5	71.0	70.5	70.0
67.5	68.0		71.5	71.0	70.5	70.0	69.5
67.0	67.5		71.0	70.5	70.0	69.5	69.0
66.5	67.0		70.5	70.0	69.5	69.0	68.5
66.0	66.5		70.0	69.5	69.0	68.5	68.0
65.5	66.0		69.5	69.0	68.5	68.0	67.5
65.0	65.5		69.0	68.5	68.0	67.5	67.0
64.5	65.0		68.5	68.0	67.5	67.0	66.5
64.0	64.5		68.0	67.5	67.0	66.5	66.0
63.5	64.0		67.5	67.0	66.5	66.0	65.5
63.0	63.5		67.0	66.5	66.0	65.5	65.0
62.5	63.0		66.5	66.0	65.5	65.0	64.5
62.0	62.5		66.0	65.5	65.0	64.5	64.0
61.5	62.0		65.5	65.0	64.5	64.0	63.5
61.0	61.5		65.0	64.5	64.0	63.5	63.0
60.5	61.0		64.5	64.0	63.5	63.0	62.5
60.0	60.5		64.0	63.5	63.0	62.5	62.0

Temperature Chart for Nov 1 through Mar 29				Permit Limit =50°F			
Ambient Intake Temp		Flow	≤50	51-150	151-300	301-600	> 600
9 am (actual)	2 pm (predicted)	Δ T	3.5	3.0	2.5	2.0	1.5
59.5	60.0		63.5	63.0	62.5	62.0	61.5
59.0	59.5		63.0	62.5	62.0	61.5	61.0
58.5	59.0		62.5	62.0	61.5	61.0	60.5
58.0	58.5		62.0	61.5	61.0	60.5	60.0
57.5	58.0		61.5	61.0	60.5	60.0	59.5
57.0	57.5		61.0	60.5	60.0	59.5	59.0
56.5	57.0		60.5	60.0	59.5	59.0	58.5
56.0	56.5		60.0	59.5	59.0	58.5	58.0
55.5	56.0		59.5	59.0	58.5	58.0	57.5
55.0	55.5		59.0	58.5	58.0	57.5	57.0
54.5	55.0		58.5	58.0	57.5	57.0	56.5
54.0	54.5		58.0	57.5	57.0	56.5	56.0
53.5	54.0		57.5	57.0	56.5	56.0	55.5
53.0	53.5		57.0	56.5	56.0	55.5	55.0
52.5	53.0		56.5	56.0	55.5	55.0	54.5
52.0	52.5		56.0	55.5	55.0	54.5	54.0
51.5	52.0		55.5	55.0	54.5	54.0	53.5
51.0	51.5		55.0	54.5	54.0	53.5	53.0
50.5	51.0		54.5	54.0	53.5	53.0	52.5
50.0	50.5		54.0	53.5	53.0	52.5	52.0
49.5	50.0		53.5	53.0	52.5	52.0	51.5
49.0	49.5		53.0	52.5	52.0	51.5	51.0
48.5	49.0		52.5	52.0	51.5	51.0	50.5
48.0	48.5		52.0	51.5	51.0	50.5	50.0
47.5	48.0		51.5	51.0	50.5	50.0	49.5
47.0	47.5		51.0	50.5	50.0	49.5	49.0
46.5	47.0		50.5	50.0	49.5	49.0	48.5
46.0	46.5		50.0	49.5	49.0	48.5	48.0
45.5	46.0		49.5	49.0	48.5	48.0	47.5
45.0	45.5		49.0	48.5	48.0	47.5	47.0
44.5	45.0		48.5	48.0	47.5	47.0	46.5
44.0	44.5		48.0	47.5	47.0	46.5	46.0
43.5	44.0		47.5	47.0	46.5	46.0	45.5
43.0	43.5		47.0	46.5	46.0	45.5	45.0
42.5	43.0		46.5	46.0	45.5	45.0	44.5
42.0	42.5		46.0	45.5	45.0	44.5	44.0
41.5	42.0		45.5	45.0	44.5	44.0	43.5
41.0	41.5		45.0	44.5	44.0	43.5	43.0
40.5	41.0		44.5	44.0	43.5	43.0	42.5
40.0	40.5		44.0	43.5	43.0	42.5	42.0

Attachment G - Table 1

Kendall Station In-Stream Compliance Report Form

Actually Applicable Temperature Limit Exceedance ¹

[illegible]

Footnotes:

1. Definitions as specified in Attachment A.
2. Refer to Part I.A.1 footnote 7, subparagraphs (b)-(e).

Attachment G - Table 2

Kendall Station In-Stream Compliance Report Form

Actually Applicable Temperature Limit Exceedance During Chill Period ¹

[illegible]

Footnotes:

1. Definitions as specified in Attachment A.
2. Daily Ambient Average River Temperature as defined in Attachment A
3. Refer to Part I.A.1 footnote 7, subparagraphs (b)-(e).

Attachment G - Table 3

Kendall Station In-Stream Compliance Report Form

Actually Applicable Temperature Limit Exceedance At Monitoring Station 3

Date	Time	Depth (feet)	Monitoring Station 3 Temperature (deg F)	Single Reading or Average	AATL in Effect ¹ (deg F)	DO Reading (mg/l)	Indicate if any exception applies ²

Footnotes:

- 1. Actually Applicable Temperature Limit (AATL) as specified in Attachment A.
- 2. Refer to Part I.A.1 footnote 7, subparagraphs (b)-(e).

Attachment G - Table 4

Kendall Station In-Stream Compliance Report Form

Springtime Exception Analysis ¹

[illegible]

Footnotes:

1. Definitions as specified in Attachment A.

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

STATEMENT OF BASIS

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

NPDES PERMIT NUMBER: **MA0004898**

PUBLIC NOTICE START AND END DATES: October 25, 2010 – November 23, 2010

NAME AND MAILING ADDRESS OF APPLICANT:

**Mirant Kendall, L.L.C.
1099 Hingham Street
Rockland, MA 02370**

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

**Mirant Kendall Cogeneration Station
265 First Street
Cambridge, MA 02142**

RECEIVING WATER(S): **Charles River and Broad Canal**

RECEIVING WATER CLASSIFICATION(S): **Class B - Warm water fishery,
Restrictions: CSO**

SIC CODE: **4961**

CURRENT PERMIT - ISSUED: September 26, 2006; **APPEALED:** October 30, 2006

MODIFIED: December 18, 2008; **APPEALED:** February 2, 2009

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I. Summary of Proposed Action

EPA is proposing a modification to the Final Permit issued by EPA Region 1 to Mirant Kendall Station on September 26, 2006 (the Final Permit or the 2006 Final Permit). The Final Permit has yet to take effect because in October 2006, both the permittee (Mirant Kendall) and the Conservation Law Foundation (CLF), with Charles River Watershed Association (CRWA) as co-petitioner, petitioned EPA's Environmental Appeals Board (EAB) in Washington, D.C., for review of the Final Permit.

This modification concerns the major changes that the permittee is proposing for its facility which will substantially reduce the intake of cooling water from the Broad Canal and result in a commensurate reduction in the volume and heat load associated with the effluent discharged to the Charles River.

A. Background

1. 2006 Permit, 2008 Modification, and Ongoing Appeal

The Final Permit included both thermal discharge limits imposed under Clean Water Act (CWA) § 316(a) and cooling water intake structure (CWIS) requirements imposed under CWA §§ 316(b), 301(b)(1)(C), and 401(a)(1) and (d). In October 2006, both the permittee (Mirant Kendall) and CLF, with CRWA as co-petitioner, petitioned EPA's Environmental Appeals Board (EAB) in Washington, D.C., for review of the Final Permit. Following a decision of the United States Court of Appeals for the Second Circuit and EPA's subsequent suspension of a regulation upon which the Final Permit had been partly based, the Region requested (and the EAB granted) a stay of proceedings so that it would withdraw the provisions of the 2006 Final Permit that were informed by the suspended portions of the regulation and prepare a permit modification to address the withdrawn permit provisions.

A permit modification was issued on December 18, 2008 containing specific requirements related to Kendall Station's cooling water intake structures (CWISs) which established requirements designed to minimize both entrainment and impingement mortality of fish. The biological data indicates that, under current operation, Kendall Station's CWISs entrain significant numbers of fish eggs and larvae on a seasonal basis (from approximately April through July). At that time, the technological data indicated that screening systems exist that should be able to reduce entrainment while also allowing the organisms blocked from being entrained to escape the screening system without suffering impingement mortality. The permit modification required, among other things, the use of an aquatic organism exclusion technology meeting certain technical design standards (*e.g.*, a maximum screen opening or pore size) that should minimize entrainment (the "primary BTA technology"). The permit modification further sought to minimize impingement mortality by requiring that whenever the primary BTA technology is not in place and functioning properly, the permittee must implement a coarse-mesh barrier net system meeting certain design criteria geared to minimize impingement mortality (the "secondary BTA technology"). The permit modification

further required that whenever neither the primary BTA technology nor the secondary BTA technology are in place and functioning properly, the permittee must operate the existing traveling screens in a manner intended to minimize impingement mortality (the “tertiary BTA technology”).

On February 3, 2009, Mirant Kendall appealed the 2008 permit modification to the EAB.

2. Discussions Regarding Further Permit Modification

As EPA was completing the 2008 permit modification, the parties (Mirant Kendall, EPA, MassDEP, CLF, and CRWA) began discussing a potential facility upgrade and accompanying NPDES permit modification that could resolve the appeal. The parties requested (and the EAB granted) a stay of proceedings to explore settlement, and, over the course of 2009 and 2010, the EAB extended this stay at the parties’ request on several occasions. This proposed permit modification is the outcome of these settlement discussions.

3. Current Proposed Permit Modification

On October 15, 2010, Mirant Kendall submitted to EPA a formal request for a permit modification. The request included an explanation of Mirant Kendall’s proposed upgrade and post-upgrade operations, and of why Mirant Kendall believes a modification is appropriate. The request also included, as an attachment, a proposed permit modification, which forms the basis of this draft permit modification.

Although this new draft permit modification is formally a modification of the 2006 Final Permit, rather than a new draft permit, it replaces many of the provisions of both the 2006 Final Permit and the 2008 modification, and therefore effectively supersedes them. The permittee’s proposed reductions in pollutant discharges and intake water volume have been determined to meet Best Available Technology, CWA § 316(a) variance, and Best Technology Available requirements. Therefore, many of the thermal control provisions of the 2006 Final Permit, and the screening technologies and related measures required by the 2008 modification, are not needed anymore and have been removed from the permit and replaced with new provisions.

II. Permit Modification and Basis

A. Current Facility Operation

Water needed to cool and condense steam exiting the Facility’s turbines is withdrawn from the Broad Canal, which is a channel connected to the Charles River, through three permitted intake structures. This cooling water is circulated through the Facility’s three condensers, where the heat from the condensers is transferred to the water. This heated water is eventually discharged to the Charles River.

The Facility's CWISs include a multi-tiered system of screens designed to minimize the amount of debris entering the Facility. The existing intake water (approach) velocities range from approximately 0.8 to 0.9 feet per second (fps) at the intake screens (Alden Research Laboratory, November 21, 2007). There are two intake water screen houses, with one housing 2 CWISs and the other housing the third CWIS. Six pumps (each capable on average of producing a flow of approximately 13 million gallons per day (MGD)) are used to control flow of the cooling water through the screen houses and to the condensers, two per CWIS and condenser. The Facility does not have variable control speed pumps but rather can regulate flow by turning on or off any sequence of pumps. Each intake structure includes a trash rack and traveling screen. The trash racks are located across the three six-by-ten-foot inlets along the Broad Canal; their steel bars are spaced three inches apart and collect large debris such as plastic and wood fragments that may be in the intake water.

Located downstream of the trash racks are the traveling screens that intersect each intake's cross-sectional area. The traveling screens are divided into six-foot-by-one-foot panels and are located perpendicular to the flow of the water. The screen mesh size is three-eighths (3/8) of an inch. This mesh size is too large to prevent the entrainment of any fish eggs or larvae, or other tiny organisms, present in the water withdrawn for cooling. The traveling screens are rotated three times per day and cleaned with river water that is returned to the Broad Canal. Any fish or debris caught on the screens is placed in a holding bin and eventually disposed of so that impingement mortality is 100%.

B. Proposed Facility Operation

Mirant has proposed to make significant changes to its facility which will allow it to produce considerably more steam for sale than it is currently producing. This will eventually result in a significant reduction in the withdrawal of water from the Lower Charles Basin as well as a commensurate reduction in the heat load discharged from the facility. This is also expected to result in indirect air quality improvements as Kendall Station's steam sales into Boston may replace steam that is currently supplied by other sources (e.g., older, less-efficient boilers) that have higher air emissions than Kendall Station. Mirant's plan relies on the construction of a new steam pipeline to be constructed along the Longfellow Bridge, which will be owned and operated by Trigen-Boston Energy Corporation, or "Trigen."¹ Mirant has determined that the construction and operation of a back pressure steam turbine (BPST) and an air cooled condenser (ACC), in conjunction with the proposed steam pipeline, will allow it to sell up to twice as much steam as it is currently able to.

Since the construction and operation of the steam line along with the BPST and ACC are multi-year projects, the parties have discussed, and EPA plans to issue, an administrative compliance order which will set timelines for construction and operation of the BPST and

¹ The Trigen steam line will be built in coordination with the Massachusetts Department of Transportation's Longfellow Bridge Rehabilitation Project. For more information on that project, see: <http://www.massdot.state.ma.us/Highway/abp/longfellow.aspx>.

ACC, and establish interim permit limits and conditions. The final compliance order would not be issued until after this permit modification has been finalized, and is not part of the comment process for this draft permit modification.

Once the facility upgrades have been completed and Mirant is selling steam as planned, it expects that the non-contact cooling water flow will be reduced from a daily maximum of 80 MGD to 3.2 MGD, which represents a reduction of over 95%. The through-screen velocity at the intake screens would also be reduced to 0.5 feet per second or less. Mirant also expects the heat load to be reduced from the currently permitted 13,344 million (mm) BTUs/day to a maximum of 534 mm BTUs/day, a decrease of more than 96%. Moreover, according to Mirant, these upgrades will allow Kendall Station to operate more economically, by allowing Kendall Station to sell up to twice as much steam into Boston as is currently possible. Mirant has proposed, and EPA agrees, that these reductions represent the Best Technology Available (BTA) for minimizing adverse environmental impacts from the impingement and entrainment of fish as required under Section 316(b) of the CWA, and the Best Available Technology (BAT) for controlling the discharge of heat, as required under Section 301(b) of the CWA.

However, even after installation of this technology, the Station's discharge would cause certain portions of the Lower Charles River Basin to exceed the in-stream temperature criteria of the Massachusetts water quality standards (83 °F for Class B waters). Therefore, the permittee has requested a variance from this water quality standard under Section 316(a) of the Clean Water Act.

The permittee has also requested that the permit provide alternate technology-based limitations under Section 316(b) during certain operational conditions. According to the permittee, while the BPST and ACC are reliable technologies, industry experience regarding this type of equipment indicates the need for occasional planned shutdowns of the BPST and ACC to conduct preventive maintenance or repairs, as well as occasional shutdowns for unplanned repairs. These conditions would be characterized as either Planned Maintenance Operations (PMO) or Unplanned Repair Operations (URO). PMO occurs when the permittee would conduct scheduled maintenance for the BPST, the ACC, and/or any steam line from the site which would necessitate open-cycle operations with intake and discharge flow of 52.2 MGD (and concomitant increase in total heat load to the river). URO occurs if there is an unexpected failure of a component of the BPST, ACC, and/or the steam line from the site, which would require a similar shutdown of a major system component as with the PMO, but without the advanced knowledge of such an event. In order to account for these conditions, the permit will allow for operations under either of these scenarios which would allow for the intake and discharge of up to 52.2 MGD under specified limited circumstances.

The permittee may operate under a PMO only for the time period and duration specified in the draft permit and may not conduct PMO for more than a total of 30 days out of any rolling five-year period. See Part I.A.11.b. of the draft permit modification for other requirements related to PMO operations. Under URO, the permittee would be authorized to continue operating the Facility, resulting in the discharge or withdrawal in excess of

3.2 MGD, due to the unplanned unavailability (for physical, technical, and/or safety reasons) of the BPST, the ACC, and/or the steam line. The permittee shall not withdraw water through any of the CWISs under Part I.A.11.c for more than a total of 30 days out of any rolling five-year period. See Part I.A.11.c of the draft permit modification for other requirements related to URO operations. In addition, any time the facility operates under PMO or URO, the draft permit modification includes specific technology-based permit provisions related to the operation of the CWISs in compliance with CWA § 316(b).

As previously indicated, the BPST/ACC technologies include, as an inherent limitation in the technologies themselves, the occasional necessity for planned maintenance and/or unplanned repairs. Because of this, EPA has determined that, at a maximum daily intake of 52.2 MGD, and in combination with the limitation on total number of days of PMO/URO operation, the requirements associated with intake velocity and screen rotation, inspection, and handling of live fish during PMO/URO operation, as specified in Part I.A.11.d of the draft permit, are consistent with BTA to reduce impingement mortality at the CWIS.

C. Section 316(a) Variance and Thermal Limits

Under CWA § 316(a), if a permittee can demonstrate to the satisfaction of EPA that a technology-based or water quality-based effluent limit for heat is “more stringent than necessary to assure the projection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made,” then EPA may impose an alternate heat effluent limitation “that will assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on that body of water.” 33 U.S.C. § 1326(a).

The 2006 permit contained end-of-pipe thermal limits and enforceable in-stream thermal limits that were based on a § 316(a) variance designed to maintain a zone of passage and habitat protective of a balanced, indigenous population (BIP). See “Clean Water Act NPDES Permitting Determinations for Thermal Discharge and Cooling Water Intake from Mirant Kendall Station in Cambridge, MA” (“Determination Document”), *available at* http://epa.gov/ne/npdes/mirantkendall/assets/pdfs/draftpermit/Kendall_Determin-Doc_06_08_04.pdf. At that time, EPA concluded that the need to discharge more heat than would be allowed by setting end-of-pipe limits protective of in-stream temperatures required a more complex and innovative thermal monitoring regime than is typical of NPDES permits in order to support a BIP, as required under § 316(a). In this modification, EPA has not changed the end-of-pipe thermal limits or in-stream thermal endpoints from the 2006 permit because they were based on an extensive analysis of the thermal requirements of the BIP. However, because the proposed changes to the operations at Mirant Kendall will reduce the discharge volume and heat load to the river, the thermal impacts of the discharge are not expected to be as detrimental as the impacts under current (pre-upgrade) operating conditions. The end-of-pipe thermal limits in the 2006 Final Permit (105° F, with a 20° F facility temperature rise) at the reduced volume are expected to maintain protective in-stream temperatures under most circumstances, but

there will be circumstances under which Kendall Station's discharge, even at lower levels, has the reasonable potential to cause or contribute to an exceedance of these protective in-stream temperatures. Mirant proposes, and EPA agrees, that further temperature restrictions should be based on an in-stream temperature measurement and compliance mechanism, similar to (but less complex than) the mechanism in the 2006 Final Permit.

The draft permit modification proposes a less complex and intensive monitoring regime based on the use of a temperature grid that predicts afternoon river temperatures based on morning intake temperatures. This approach employs a predictive approach regarding whether the in-stream temperature limits are expected to be met and determines if the permittee is required to monitor river temperature on a given day. To be clear, this permit modification does *not* alter the biologically-based in-stream temperature endpoints set forth in EPA's 2006 permit, but rather provides a simpler, less expensive compliance mechanism to ascertain whether the facility's (now greatly reduced) discharges are achieving those endpoints.

1. Summary of Compliance Mechanism

The 2006 Permit defined seasonal protective maximum temperatures (known as the Maximum Temperature Limits, or MTLs), at an extensive array of points (eight locations and approximately four depths at each location) in the Charles River, and then required real-time in-stream compliance monitoring at each of those points.² The currently proposed operation (including use of an ACC and BPST) will drastically reduce the heat load to the Charles River. As such, EPA believes that the in-stream thermal limits will likely be met much of the time, and intensive real-time monitoring is no longer necessary.

Instead, EPA has developed a new framework to direct in-stream monitoring (see Attachment D of the permit modification). While the resulting mechanism still has many complex elements, it is in most respects simpler than (but just as protective as) operating a network of in-stream real-time monitoring stations.

The draft permit modification retains the MTLs as the in-stream temperature endpoints that constitute protection of the BIP. EPA has developed a simple but conservative model (in the form of a grid) to predict, given morning temperatures and river flows, whether in-stream temperatures may approach the MTLs during the hottest part of the day (the afternoon). Each day, Mirant must consult the grid based on the morning's river temperature and river flow. If the grid predicts that afternoon temperatures may approach the MTLs, then Mirant must conduct in-stream temperature monitoring that afternoon to determine if there is actually an exceedance. Such an exceedance constitutes a permit violation unless Mirant can demonstrate that one of several precisely defined exceptions applies. In addition, the permit also contains a "failsafe" condition under which Mirant will curtail operations if there are several consecutive days of high temperatures. Details of this approach are discussed below.

² See Determination Document at 122-170.

2. Selection of compliance monitoring location (Monitoring Station 3)

As noted above, the extensive modifications associated with the proposed operation of the ACC and BPST are expected to result in a 95% reduction in intake water and 96% reduction in heat load to the Charles River. Given that these reductions will likely lead to improvements in water quality and habitat, EPA examined surface temperatures recorded at several monitoring locations during 2008 to determine if attainment of the protective in-stream temperatures in the 2006 Permit could be ensured by measuring at a single location.

Of the four monitoring locations downstream of the Harvard Bridge (Boston, Longfellow, Museum, and Dam), the Boston thermistor consistently recorded the highest maximum daily 4-hour average, and would have consistently captured a maximum daily 4-hour average temperature in exceedance of the proposed in-stream thermal limits when any other monitoring location also recorded an exceedance if these limits were effective in 2008. EPA concludes that a location near the Boston thermistor would be a suitable monitoring location to use as a proxy for the rest of the monitoring locations in order to determine if the facility is meeting in-stream thermal limits. The modification applies the numeric, in-stream thermal limits from the 2006 permit at one location (Monitoring Station 3) near the Boston Thermistor, but also requires additional supportive and supplemental monitoring at several additional locations to ensure that Station 3 accurately reflects temperatures in the Lower Basin.

3. Calculation of Predictive Temperature Grid (Attachment D)

As noted above, the draft permit modification's compliance mechanism requires Mirant to consult a grid that is designed to predict whether the in-stream temperatures are likely to approach or exceed the MTL. To develop this grid, EPA used existing in-stream temperature and facility heat load data to model afternoon river temperature based on the morning intake temperature at the CWIS. EPA calculated a predicted afternoon temperature in two stages: (1) a standard increase to model the increase in intake temperature from 9:00 AM to 2:00 PM, and (2) the difference (delta T) between the observed temperature at the Boston thermistor and the temperature at Mirant Kendall's intake based on temperature and heat load data between 2003 and 2008. The underlying assumption was that, if reliably defined, the relationship between the morning intake temperature and the afternoon river temperature could be used to predict whether the facility would exceed in-stream compliance temperatures on a given day. In turn, this prediction determines whether afternoon in-stream monitoring is required on a given day. As a conservative measure, in-stream monitoring is triggered when the afternoon temperature is expected to be within 2°F of the MTL. Conversely, if the afternoon temperature on the Boston side is predicted to be cooler than the MTL by more than 2°F, in-stream monitoring is not required.

4. In-stream Temperature Compliance Requirements

The in-stream temperature compliance requirements are contained in Part I.A.1 footnote 7 and Attachment A. Broadly speaking, Attachment A defines certain key terms, and Part I.A.1 footnote 7 provides the operational conditions. Briefly, the in-stream temperature compliance requirements are designed to prohibit Kendall Station from discharging heated effluent that causes, or contributes to, an exceedance of protective in-stream temperature endpoints. The central element of the compliance requirement is a prohibition on discharge of heated effluent unless MTLs are attained at all depths at Monitoring Station 3. However, the permit modification contains a set of carefully circumscribed exceptions through which the permittee can demonstrate that, despite a measured exceedance of an MTL at Monitoring Station 3, Kendall Station did not cause or contribute to that exceedance,³ or (for other exceptions) the exceedance is still consistent with protection of the BIP. Very briefly (and as explained in more detail below), those exceptions are:

- i. *The “upstream/downstream exception.”* Natural variability can result in the river already exceeding MTLs even without Kendall Station’s discharge. In some cases this can occur throughout the river; in other cases, upstream conditions (as measured at the B.U. Bridge) may fall below the MTL but temperatures near Monitoring Station 3 can be warmer due to natural variability. This could potentially result in an exceedance of the MTL at Station 3 that may not be attributable to the facility’s discharge. Therefore, the draft permit modification allows the measured temperature at Station 3 to exceed the MTL if Mirant can demonstrate that the Station 3 temperature does not exceed the upstream temperature plus an “upstream/downstream buffer” (which varies depending on circumstances, but is typically 1.0° F) to account for natural upstream/downstream variation.
- ii. *The “cross-transect exception.”* Natural variability can also result in the temperature at Monitoring Station 3 (on the Boston side of the river) being warmer than the temperatures closer to the Cambridge side of the river (where Kendall Station discharges). In other words, it is possible that Kendall Station’s thermal plume might dissipate mid-river, yet due to entirely unrelated circumstances, the Boston side of the river could be warmer than the MTL. This could potentially result in an exceedance of the MTL at Station 3 that may not be attributable to the facility’s discharge. Therefore, the draft permit modification allows the measured temperature at Station 3 to exceed the MTL if Mirant can

³ To be clear, the draft permit modification does not rely on case-specific demonstrations as to whether Kendall Station’s discharge did or did not “cause or contribute to” a particular in-stream temperature exceedance. Rather, in developing the draft permit modification, EPA has defined precise exceptions to the general prohibition on discharge of heat, whereby certain categories of in-stream temperature exceedances are excepted because of insufficient certainty that exceedances in that category would be caused or contributed to by Kendall Station’s discharge. By contrast, in-stream temperature exceedances that do *not* qualify for one of the defined exceptions are, *per se*, permit violations.

- demonstrate that mid-river temperatures do not exceed the MTL (or, if higher, the background temperature).
- iii. *Deep measurement exceptions.* The draft permit modification allows the deepest monitoring point (24-foot depth) to exceed the MTL when it is unlikely to be used as habitat due to low dissolved oxygen, or during the winter when a type of unique “reverse” thermal stratification may occur.
 - iv. *Springtime exceptions.* As in the 2006 permit, the draft permit modification recognizes that temperatures can vary widely during the spring, and allows the permittee to exceed applicable temperatures up to six times during the period of April 15 to June 7.

These exceptions are discussed below in more detail.

i. Upstream/Downstream Exception

In a November 24, 2009 email, Mirant stated that, based on historical data, “differences of 1° F or more between background temperatures and Station 3 were not uncommon even with zero thermal discharge.” Consequently, Mirant requested that a buffer be built into the permit that would provide that certain small exceedances of the MTL at Station 3 would not constitute permit violations. This buffer would account for natural sources of variability in the river that could cause the temperature at Station 3 to exceed the MTL without the contribution of the thermal discharge from Outfall 001 of the facility.

EPA recognizes that natural variability between the upstream Station 1 (near the B.U. Bridge) and Station 3 could potentially result in an exceedance of the MTL at Station 3 that may not be attributable to the facility’s discharge. To this end, EPA proposes that when the temperature at Station 3 is above the MTL, the applicable temperature limit shall be the background temperature (i.e., the corresponding-depth temperature at Station 1), plus an “upstream/downstream buffer” that, under most circumstances, is 1.0° F. EPA believes a 1.0° F buffer is appropriate because, based on analysis of the differences between Mirant’s Harvard Bridge Station and a location upstream of EPA’s Station 3 (Mirant’s Boston location) at times when the facility was not operating, a 1° F buffer sufficiently encompasses the natural variability between the two monitoring locations. Thus, if the Station 3 temperature is within 1° F of the Station 1 temperature, the facility is not in violation of the permit. If the Station 3 temperature is 0.4° F above the MTL, but the Station 1 temperature is 0.6° F below the MTL, then the Station 3 temperature is meeting its applicable temperature limit because it is within 1.0° F of the Station 1 temperature. In other words, the applicable temperature limit at Station 3 is the MTL or the Station 1 temperature plus 1.0° F, whichever is greater.

The upstream/downstream buffer is 1.0° F under most anticipated circumstances. A 1° F buffer adequately captures the natural variability between the monitoring stations in the permit. To be specific, based on present information, EPA is *not* stating that any Station 3 MTL exceedances that are within 1° F of the Station 1 temperature are necessarily protective, *nor* that such exceedances are not attributable to Kendall Station’s discharge. Rather, for any given Station 3 MTL exceedance that is within 1° F of the Station 1

temperature, there is insufficient certainty (based on present information) that such an exceedance would be wholly or partly attributable to Kendall Station's discharge. For this reason, with a few exceptions, Station 3 temperatures that are within 1° F of the corresponding-depth Station 1 temperature qualify for this exception. On the other hand, present information suggests that differences above 1° F are sufficiently likely to be wholly or partly attributable to effects of the plant's heated effluent that, in the context of the entire permit scheme and absent another exception provided by the permit itself, it is appropriate for the permit to provide that any Station 3 exceedances that are more than 1° F above the Station 1 temperature are (absent another applicable exception) *per se* permit violations on days when Mirant Kendall is discharging heat.

As noted above, the upstream/downstream buffer is normally 1.0° F. However, there are two potential instances that may occur within the Chill Period (November 1 through March 29) where the exception has been increased to 2.0° F. Both these instances allow for an increased buffer to account for natural variability during a mild late fall/early winter that could result in higher temperatures at Monitoring Station 3 independent of Kendall Station's thermal discharge. In this case, EPA believes a 2.0° F buffer is appropriate because, based on an analysis of Kendall Station intake water temperatures from 1994 through 2002 (Kendall Station Determination Document; Figures 5.9.2-15 to 5.9.2-23) ambient water temperatures in the Charles River were sometimes seen to remain above a temperature of 50° F during the onset of the Chill Period or be slightly below 50° F and then increase above 50° F during a mild weather pattern. An addition of 1.0° F to the exception of 1.0° F is still protective of the BIP when water temperatures are cool and uniform in the lower Basin. The additional 1.0° F buffer provides the Facility with some operational flexibility when the ambient river temperature has exceeded the maximum temperature in effect for the chill period, without diminishing protection of the BIP.

Finally, certain ambient river conditions can create a scenario where protection of the BIP requires no upstream/downstream buffer. This occurs when dissolved oxygen (DO) values at Station 1 measured at 2 feet and 6 feet, as well as the Station 3 DO values at 2 feet and 6 feet are *all* below 5.0 mg/l. DO values below 5.0 mg/l do not meet Massachusetts Water Quality Standards and are below levels considered suitable for fish habitat. EPA believes that addition of 1.0° F above the Station 1 temperature is no longer appropriate under these extreme conditions, when a large part of the lower Basin is exhibiting depressed DO conditions that are stressful to the balanced indigenous fish population.

On a final note, as stated above, the 1° F buffer and other temperature exceptions included in the draft permit, are based on a review of presently available data comparing Mirant's Harvard Bridge Station to Mirant's Boston thermistor as well as historical intake water temperature data from the Facility. Analysis of data collected under the permit's Supplemental In-stream Temperature Monitoring program (including any data voluntarily collected by Mirant pursuant to the same protocols provided by that program) may justify an adjustment to this buffer in the future.

ii. Cross-Transect Exception

If an exceedance at Station 3 does not qualify under the “upstream/downstream” exception, Mirant may attempt to demonstrate that the cross-transect exception should apply by measuring the temperature at mid-river locations. Mirant must measure the corresponding depths at each of Monitoring Stations 4 and 5 (and, for Monitoring Points 12 feet and deeper, Monitoring Station 6), and select the highest. For example, if the temperature at the 12 foot depth at Monitoring Station 3 exceeds the MTL and also exceeds the upstream temperature by more than the “upstream/downstream buffer,” then the temperatures at the 12-foot depth at each of Monitoring Stations 4, 5, and 6 would be compared. The highest of these three temperatures would constitute the “Highest Cross-Transect Temperature” for that depth. The Highest Cross-Transect Temperature would then be compared to the MTL and the upstream temperature for that depth. If the Highest Cross-Transect Temperature does not exceed the MTL, then the middle portion of the river is at a protective temperature, and the exception applies, because the BIP is protected notwithstanding the Station 3 exceedance. Alternatively, if the Highest Cross-Transect Temperature exceeds the MTL but does not exceed the upstream temperature for that depth, then the middle portion of the river near Kendall Station’s discharge is no warmer than the upstream temperature, and any exceedance on the Boston side is not attributed to Kendall Station’s discharge.

iii. Deep Measurement Exceptions

Two exceptions may apply for the 24-foot depth: one dependent on dissolved oxygen, and one seasonal. First, the draft permit modification allows the deepest monitoring point (24-foot depth) to exceed the MTL when it is unlikely to be used as habitat due to low dissolved oxygen. This provision follows reasoning included in the 2006 permit. It is based on the premise that a zone of depth in the lower Basin, no matter what the temperature, is not considered to be suitable habitat when the accompanying DO is less than 5.0 mg/l (the Massachusetts Water Quality Standard for DO). Areas of low DO may cause fish to abandon that habitat or become stressed if they remain. This degraded habitat does not support a balanced indigenous population, so it is specified as a deep water exception when the accompanying temperature exceeds the MTL.

The second type of exception is only allowed under certain circumstances during the late fall/early winter season, when a type of unique thermal stratification may occur. This “reverse thermal stratification” is characterized by relatively warm (above 50° F), dense, saline water from Boston Harbor, which seeps into the lower Basin through the New Charles River Dam and Locks and sinks to the deepest portions of the river bed. When a large enough volume of this dense water enters the Basin, depths up to 24 feet may be affected. Cold (below 50° F), but less dense fresh water flows downstream from the Charles River Watershed and “floats” at shallower depths on top of the dense saline lens. In this case, the warm deeper water is a result of the site-specific hydrologic conditions of the lower Basin. Kendall Station’s thermal discharge does not contribute to the elevated temperatures of this deep water, so an exception is allowed when this warm, dense water reaches 24 feet and exceeds the MTL.

iv. Springtime Exceptions

These are carried forward from the 2006 permit. While their implementation has been translated into the compliance mechanism of this draft permit modification, the definitions of the springtime exceptions, their applicability, and their justification have not changed from those set forth in the 2004 Draft Permit Determinations Document (pp. 169) and need not be repeated here.

5. Failsafe condition

The draft permit modification also contains a “failsafe” condition proposed by Mirant to ensure that consecutive warm days do not result in an unacceptable condition. The failsafe condition is triggered when three criteria apply for each of two consecutive days:

1. The facility discharged heated effluent.
2. The permittee was required to conduct compliance temperature monitoring (either because the predictive grid predicted warm temperatures, or because the facility was operating under open-cycle conditions) and the temperature at Station 3 at any depth exceeded the applicable temperature limit by more than 0.5° F.
3. The temperature at Station 3 exceeded Kendall Station’s intake temperature by more than 1.0° F (with both the intake and the Station 3 temperatures for this purpose being measured as vertical averages of afternoon temperatures).

If all three criteria are true for both days, then the facility will not discharge any heated effluent at all on the third day. This failsafe condition supplements the core in-stream temperature compliance mechanism and helps ensure protectiveness.

6. In-stream Temperature Monitoring

i. In-stream Temperature Monitoring Under BPST and ACC Operation

Several key operational aspects of Kendall Station justified the continuous, real time in-stream temperature monitoring required in the 2006 permit. The rationale supporting the extensive in-stream temperature monitoring is fully discussed in the 2004 Kendall Station Determination Document at pp. 149-160. One supporting example is given here. The proposed maximum daily water withdrawal at Kendall Station under the 2006 permit was limited to 80 MGD, which is approximately 123 cfs, resulting in a heat load discharge of 556 MMBTU/hour. The average flow of the Charles River near the station is 113 cfs in August, and the low flow, 7Q10 value for the lower Charles River Basin is approximately 22 cfs. Kendall Station’s discharge, under these flow profiles and expected heat load, was likely to be a major thermal influence in the lower Basin that could quickly modify the thermal profile of the lower Basin. The volume of the thermal plume was documented to reach as far upstream as the Harvard Bridge. A real-time temperature monitoring system in the river was deemed the best way for Kendall Station to maintain a degree of

operational flexibility while also providing a mechanism to ensure that fish passage and suitable fish habitat were maintained.

In addition, at the time the permit was written, a validated thermal model of the lower Basin was not available. Only a limited amount of river temperature data from a few in-stream locations and depths was available. The data were insufficient to predict river temperatures in one part of the Basin based on temperatures at another location. EPA determined that a minimum of nine fixed in-stream monitoring stations were required to monitor the thermal plume continuously to ensure that protective in-stream temperatures were maintained.

Under the provisions in this draft permit modification, Kendall Station's BPST and ACC operational profile will be very different. A 3.2 MGD intake flow limit represents a reduction of over 95% from the 2006 permit. The heat load is expected to decrease more than 96%. Coupled with these dramatic operational changes, the permittee submitted additional continuous temperature data from areas in the lower Basin. The analysis of these data sets has allowed EPA to better understand the thermal interactions of the lower Basin when the Facility operated at lower levels.

The large reduction in heat load has greatly reduced the potential for the Facility's discharge to raise temperatures throughout the Basin, especially within a short time period. This has allowed EPA to remove the requirement for real-time, continuous, fixed temperature monitoring stations.

EPA has analyzed supplemental temperature data from the Basin and identified two key representative temperature monitoring locations needed to monitor the thermal profile of the Basin when Kendall Station is withdrawing river water at a rate of 3.2 MGD. EPA has reduced the number of monitoring locations from nine to two when the Facility is operating at this level. Station 1, the upstream station below the B.U. Bridge will serve as the ambient river temperature, or background station. This station location is similar to the Station 1 described in the 2006 permit (Permit Attachment B). Station 3 is also retained as part of the draft permit. This station, nearest to the Boston shore and downstream of the facility's discharge, is placed in a similar location to Station 3 as described in the 2006 permit (Permit Attachment B).

ii. Compliance Support and Supplemental Temperature Monitoring

EPA has identified Station 1 and Station 3 as the two representative locations needed to determine permit compliance in the lower Basin under expected conditions. With temperature information from only these two stations, EPA must assume that the discharge from Kendall Station has the characteristic of a "text book" thermal plume. The plume is expected to move downstream and spread out from the Cambridge side of the river to the Boston side of the river. Water temperatures are expected to diminish as the plume moves downstream and across the river.

However, EPA recognizes that:

- (1) The Charles River lower Basin is a dynamic water body. The river temperature data sets analyzed do not reflect river temperature conditions under all meteorological and hydrologic events. Basin conditions will not always allow the thermal plume to follow a “text book” pattern.
- (2) Other heat sources (solar, runoff water, other discharges) may warm the Boston side of the river independent from the impact of Kendall Station’s thermal plume.
- (3) There is no long term historical record of Kendall Station operation at 3.2 MGD to assist in refining the temperature projections.
- (4) Planned Maintenance Operations (PMO) and Unplanned Repair Operations (URO), although relatively brief in duration, will increase the cooling water intake flow to 52.2 MGD and increase the heat load from approximately 22 MMBTU/hr to approximately 363 MMBTU/hr. There is insufficient in-stream historical temperature data to predict the nature of the thermal plume under these operating conditions.

In order to reduce the degree of uncertainty presented by the factors above, EPA has required that when compliance temperature monitoring is required by provisions in the draft permit, compliance support monitoring or supplemental temperature monitoring shall also be conducted as specified in the permit. This additional monitoring at Stations 2, 4, 5, 6, 7 and 8, will verify the temperature relationships predicted using historical data, more precisely demarcate the thermal plume, provide data needed to evaluate whether Kendall Station’s thermal plume caused or contributed to the temperature exceedance at Station 3 and document whether sufficient fish passage and suitable fish habitat are present in the lower Basin.

7. Other changes

Attachments A, B, D, and G are being modified. Attachments E and F are no longer necessary and have been reserved. Attachments H and I are no longer necessary and have been eliminated. Attachment C is not being modified.

Minor changes to permit modification:

The fish mortality requirements of Part I.A.12 have been revised. Instead of the observance of one dead fish triggering the periodic inspection of the Broad Canal and discharge area, this has been changed to three fish.

The permit limits at Part I.A.2 have been changed to require screen wash water to be monitored once per month at each traveling screen instead of when in use. The flow limit has been changed from a monthly average to a daily maximum of 0.1 MGD to be consistent with the description in the heading of this Part.

A requirement has been added to Part I.A.13 of the permit regarding unusual impingement events (UIE) which requires the permittee, upon the occurrence of a UIE, to rotate all traveling screens once every hour until the impingement rate falls below 15 fish per hour.

The Quality Assurance Project Plan (QAPP) requirement in Part I.A.14.d.3 has added clarification that it applies only to all instream monitoring data. This was believed to be the original intention of this requirement. The permittee shall also provide its methods for calibrating the equipment that measure its influent and effluent temperature.

Language has been added to Part I.A.14. e. regarding the instream total residual chlorine (TRC) monitoring which specifies that this monitoring needs to be conducted only for those months that chlorination occurs and that such sampling be conducted within one (1) to eight (8) hours of chlorination.

The monitoring frequency for certain parameters in Part I.A.3 has been changed from daily to weekly.

Part I.B. has been revised to include language which requires the permittee to begin using a web-based reporting system called “NetDMR” to electronically submit monitoring results within a specified time frame. This language also provides opt-out language if the permittee is unable to use NetDMR.

III. Essential Fish Habitat Determination (EFH)

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

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

Species	Eggs	Larvae	Juveniles	Adults
Atlantic cod (<i>Gadus morhua</i>)	X	X	X	X
Haddock (<i>Melanogrammus aeglefinus</i>)	X	X		
Pollock (<i>Pollachius virens</i>)	X	X	X	X

Whiting (<i>Merluccius bilinearis</i>)	X	X	X	X
Red hake (<i>Urophycis chuss</i>)	X	X	X	X
White hake (<i>Urophycis tenuis</i>)	X	X	X	X
winter flounder (<i>Pseudopleuronectes americanus</i>)	X	X	X	X
yellowtail flounder (<i>Pleuronectes ferruginea</i>)	X	X	X	X
windowpane flounder (<i>Scopthalmus aquosus</i>)	X	X	X	X
American plaice (<i>Hippoglossoides platessoides</i>)	X	X	X	X
Ocean pout (<i>Macrozoarces americanus</i>)	X	X	X	X
Atlantic halibut (<i>Hippoglossus hippoglossus</i>)	X	X	X	X
Atlantic sea scallop (<i>Placopecten magellanicus</i>)	X	X	X	X
Atlantic sea herring (<i>Clupea harengus</i>)		X	X	X
Long finned squid (<i>Loligo pealei</i>)	n/a	n/a	X	X
short finned squid (<i>Illex illecebrosus</i>)	n/a	n/a	X	X
Atlantic butterfish (<i>Peprilus triacanthus</i>)	X	X	X	X
Atlantic mackerel (<i>Scomber scombrus</i>)	X	X	X	X
Summer flounder (<i>Paralichthys dentatus</i>)				X
Scup (<i>Stenotomus chrysops</i>)	n/a	n/a	X	X
black sea bass (<i>Centropristus striata</i>)	n/a		X	X
surf clam (<i>Spisula solidissima</i>)	n/a	n/a	X	X
Bluefin tuna (<i>Thunnus thynnus</i>)			X	X

A review of the 23 species revealed that the life stages of concern are present in the seawater salinity zone (salinity > 25.0 parts per thousand) or the mixing water/brackish salinity zone (0.5 < salinity < 25.0 parts per thousand) only. No life stage is identified as inhabiting the tidal freshwater salinity zone. The freshwater of the Charles River does not experience appreciable mixing with the saline Boston Harbor water, due to the location of New Charles River Dam and Locks at the mouth of the river. This dam highly regulates the river level and flow of the Charles River, resulting in the river possessing the characteristics of the freshwater salinity zone. Although there is seasonal salt water intrusion, this typically results in a temporary salt wedge which is usually confined to the bottom few meters of the lower basin of the Charles River.

In addition, during four years of adult and juvenile fish sampling as well as extensive ichthyoplankton collection in the Charles River (1999, 2000, 2002 and 2003; Mirant Kendall Reports), none of the 23 species listed above has been collected.

Based on the freshwater characteristics of the river and the absence of any of the species listed above, EPA has determined that the conditions of this Permit Modification will not have a direct adverse effect on the EFH species of concern.

However, EPA recognizes that Station operation has the potential to indirectly cause adverse effects to EFH species in Boston Harbor or Massachusetts Bay. The Station is located on the Cambridge side of the Charles River, approximately one mile upstream of the New Charles River Dam and Locks. Anadromous species that enter the Charles River and move past the Station to spawn upstream may be affected by the thermal plume or the cooling water intake operation at the Station, or both. These species (blueback herring and alewife), while not identified as EFH species, may be selected as prey by EFH species. If these prey species are affected by Station operation, this has the potential to indirectly affect EFH species through loss of prey. EPA's Final Permit proposes thermal discharge limits under CWA § 316(a) designed to assure the protection and propagation of the balanced indigenous population of fish, shellfish and wildlife in the lower Charles River basin, including the anadromous fish species discussed above.

Moreover, it has been determined that the operations with the new equipment represents the Best Technology Available for minimizing adverse environmental impact, since the intake of water is substantially reduced. This BTA is expected to reduce losses of blueback herring and other anadromous fish species in the lower Basin, and thereby also reduce losses of these forage sources for certain EFH species that are present in Boston Harbor.

EPA believes that the conditions and limitations contained within the draft permit adequately protects all aquatic life, including those forage sources for EFH species in the receiving water, and that further mitigation is not warranted. Should adverse impacts to EFH be detected as a result of this permit action, or if new information is received that changes the basis for EPA's conclusions, NMFS will be contacted and an EFH consultation will be re-initiated.

As the federal agency charged with authorizing the discharge from this facility, EPA has submitted the draft Permit Modification and Statement of Basis, along with a cover letter to NMFS Habitat Division for their review.

IV. Endangered Species Act (ESA)

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA), grants authority to, and imposes requirements, upon Federal agencies regarding endangered or threatened species of fish, wildlife, or plants ("listed species") and habitat of such species that has been designated as critical (a "critical habitat"). The ESA requires every Federal agency,

in consultation with, and with the assistance of, the Secretary of Interior, to ensure that any action it authorizes, funds, or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The United States Fish and Wildlife Service (USFWS) typically administer Section 7 consultations for bird, terrestrial, and freshwater aquatic species. NOAA Fisheries typically administers Section 7 consultations for marine species and anadromous fish.

EPA has reviewed the federal endangered or threatened species of fish, wildlife, and plants to see if any such listed species might potentially be impacted by this Permit Modification and has not found any such listed species. Upon review of the current listing of endangered and threatened species in Massachusetts, there appear to be no species of concern present in the vicinity of the discharge. Therefore, EPA has determined that this permit action will have no effect on any listed species and that it does not need to consult with NMFS or USFWS under the ESA regarding the effects of this draft Permit Modification. EPA has, however, provided a copy of this draft Permit Modification to both NMFS and USFWS for comment as part of the public comment period.

V. State Certification Requirements

Under Section 401 of the CWA, EPA is required to obtain from the state in which the discharge is located a certification that all water quality standards or other applicable requirements of state law, in accordance with Section 301(b)(1)(C) of the CWA, are satisfied. EPA permits are to include any conditions required in the state's certification as being necessary to ensure compliance with state water quality standards or other applicable requirements of state law. *See* CWA Sections 401(a) and (d), and 40 CFR § 124.53(e). Regulations governing state certification are set out at 40 CFR §§ 124.53 and 124.55. EPA regulations pertaining to permit limits based upon water quality standards and state requirements are contained in 40 CFR § 122.44(d).

The staff of MassDEP has reviewed the draft permit modification and advised EPA that the limitations are adequate to satisfy the Massachusetts water quality standards. *See* generally 314 CMR 4.05(3)(b). EPA has requested permit certification by the State pursuant to 40 CFR 124.53 and expects that the draft permit modification will be certified.

VI. Public Comment Period, Public Hearing, and Procedures for Final Decision

All persons, including applicants, who believe any condition of the Draft Permit modification is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to George Papadopoulos, U.S. EPA, Industrial Permits Branch, Mailcode OEP 06-1, 5 Post Office Square, Suite 100, Boston, Massachusetts 02109-3912. Any person, prior to such date, may submit a request in writing for a public hearing to consider the Draft Permit modification to EPA and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public meeting may be held if

the criteria stated in 40 C.F.R. § 124.12 are satisfied. In reaching a final decision on the Draft Permit modification, the EPA will respond to all significant comments and make these responses available to the public at EPA's Boston office.

Following the close of the comment period, and after any public hearings, if such hearings are held, the EPA will issue a Final Permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice. Within 30 days following the notice of the Final Permit decision, any interested person may submit a petition for review of the permit to EPA's Environmental Appeals Board consistent with 40 C.F.R. § 124.19.

VII. EPA and MassDEP Contacts

Additional information concerning the draft Permit Modification may be obtained between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays, from the EPA and MassDEP contacts below:

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

Kathleen Keohane, Massachusetts Department of Environmental Protection
Division of Watershed Management, Surface Water Discharge Permit Program
627 Main Street, 2nd Floor, Worcester, Massachusetts 01608
Telephone: (508) 767-2856 FAX: (508) 791-4131
e-mail: Kathleen.keohane@state.ma.us

October 18, 2010
Date

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

References

(D. Bailey, 2007) Bailey, D. and G. Allen. 2007. Assessment of Alternative Fish Protection Technologies and Operational Measures for Potential Use at Mirant Kendall LLC. September 19, 2007.

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(MKS, 2007) Personal communication from Shawn Konary of MKS during site visit of June 25, 2007 and phone conversation of November 20, 2007.

(Raffenburg et al., 2001) Raffenburg, M.J., J.A. Matousek, W.D. Saksen, A.J. McCusker, E.W. Radle. Development of Filter Fabric Barrier to Reduce Impacts to Aquatic Populations at Water Intake Structures.

TABLE 1

Treatment Chemicals Used at Mirant Kendall Cogeneration Station					
Chemical Name	Use	Hazardous Constituents and Chemicals of Concern	Where Used	Approximate amount used per year in gallons	Concentration in Process Equipment
Sodium Bisulfite 38-40%	Dechlorination agent	Sodium Bisulfite	In UF Permeate line prior to RO	5,500	10 to 50 ppm
Avista Vitec 3000	Reduces scale precipitates and particulate fouling in RO system	None	RO System	660	5 ppm constantly in influent to RO System
BL-1794 (Phosphate)	Reduce Boiler iron oxide build up	None	Boiler Units	2,200	
BL-1240 (Oxygen Scavenger)	Oxygen Scavenger	Erythorbic Acid	Boiler Units	1,870	
BL-1554 (Amine)	Condensate system corrosion control	Methoxypropylamine and Diethylaminoethanol	Boiler Units	1,150	
BL-129	Oxygen Scavenger	Sodium Sulfite	Boiler Units	< 300	
BL-4350 (Phosphate)	Reduce Boiler iron oxide build up	None	Boiler Units	<300	
Anhydrous Citric Acid	Cleaning Agent	None	UF Filter		
Sulfuric Acid	Neutralization Agent	Corrosive	Prior to Mixed Bed Waste Tank	Variable	96% feed rate a function of the Ph
Sodium Hydroxide	Neutralization Agent and Cleaning Agent to Reduce Fouling	Corrosive	Prior to Mixed Bed Waste Tank and in UF during Backwash	Variable	50% Sodium Hydroxide feed rate a function of Ph
Sodium Hypochlorite	Biocide	Free Chlorine	Influent to water treatment prior to UF and in Plant intake water	Variable. Depends on the Chlorine demand capacity of the river water	20% solution. UF influent at 1-2 ppm and 35-50 ppm in Backflush. Also fed through each intake at a rate of 0.1 ppm free product to control biofouling

MASSACHUSETTS DEPARTMENT OF
ENVIRONMENTAL PROTECTION
COMMONWEALTH OF MASSACHUSETTS
1 WINTER STREET
BOSTON, MASSACHUSETTS 02108

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY
OFFICE OF ECOSYSTEM PROTECTION
REGION I
BOSTON, MASSACHUSETTS 02109

JOINT PUBLIC NOTICE OF A DRAFT NATIONAL POLLUTANT DISCHARGE
ELIMINATION SYSTEM (NPDES) **PERMIT MODIFICATION** TO DISCHARGE INTO
THE WATERS OF THE UNITED STATES UNDER SECTION 301 AND 402 OF THE
CLEAN WATER ACT (THE "ACT"), AS AMENDED, AND REQUEST FOR STATE
CERTIFICATION UNDER SECTION 401 OF THE ACT.

DATE OF NOTICE: October 25, 2010

PERMIT NUMBER: **MA0004898**

PUBLIC NOTICE NUMBER: MA-004-10

NAME AND MAILING ADDRESS OF PERMITTEE:

**Mirant Kendall LLC
1099 Hingham Street
Rockland, MA 02370**

NAME AND ADDRESS OF THE FACILITY WHERE DISCHARGE OCCURS:

**Mirant Kendall Cogeneration Station
265 First Street
Cambridge, MA 02142**

RECEIVING WATER: **Charles River and Broad Canal**
{USGS Hydrologic Code #01090001 – Boston Harbor Watershed (70)}

PREPARATION OF THE DRAFT PERMIT MODIFICATION:

The U.S. Environmental Protection Agency, (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) have cooperated in the development of a permit modification for the above identified facility. The effluent limits and permit conditions imposed have been drafted to assure that State Water Quality Standards and provisions of the Clean Water Act will be met. EPA has formally requested that the State certify this draft permit modification pursuant to Section 401 of the Clean Water Act and expects that the draft permit modification will be certified.

INFORMATION ABOUT THE DRAFT PERMIT MODIFICATION:

A statement of basis (describing the type of facility; type and quantities of wastes; a brief summary of the basis for the draft permit conditions; and significant factual, legal and policy questions considered in preparing this draft permit) and the draft permit modification may be obtained at no cost at: http://www.epa.gov/region1/npdes/draft_permits_listing_ma.html or by writing or calling EPA's contact person named below:

George Papadopoulos, US EPA
5 Post Office Square
Suite 100 (OEP 06-1)
Boston, MA 02109-3912
Telephone: (617) 918-1579

The administrative record containing all documents relating to this draft permit modification is on file and may be inspected at the EPA Boston office mentioned above between 9:00 a.m. and 5:00 p.m., Monday through Friday, except holidays.

PUBLIC COMMENT AND REQUEST FOR PUBLIC HEARING:

All persons, including applicants, who believe any condition of this draft permit modification is inappropriate, must raise all issues and submit all available arguments and all supporting material for their arguments in full by **November 23, 2010**, to the U.S. EPA, 5 Post Office Square, Suite 100, Mailcode OEP 06-1, Boston, Massachusetts 02109-3912. Any person, prior to such date, may submit a request in writing to EPA and the MassDEP for a public hearing to consider this draft permit modification. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least forty five days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on this draft permit modification the Regional Administrator will respond to all significant comments and make the responses available to the public at EPA's Boston office.

FINAL PERMIT DECISION AND APPEALS:

Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice. Within 30 days following the notice of the final permit decision any interested person may submit petition to the Environmental Appeals Board to reconsider or contest the final decision.

David Ferris, Director
MASSACHUSETTS WASTEWATER
MANAGEMENT PROGRAM
MASSACHUSETTS DEPARTMENT OF
ENVIRONMENTAL PROTECTION

Stephen S. Perkins, Director
OFFICE OF ECOSYSTEM PROTECTION
ENVIRONMENTAL PROTECTION
AGENCY