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October 15, 2010

Mr. David Webster
Chief, Industrial Permits Branch
Office of Ecosystem Protection
US EPA, Region 1
5 Post Office Square - Suite 100
Boston, MA 02109-3912

Delivery: By Email with FedEx to Follow

**Subject: Mirant Kendall Cogeneration Station
NPDES Permit No. MA0004898
Permit Modification Request**

Dear Mr. Webster:

Mirant Kendall, LLC ("Mirant Kendall"), provides this letter pursuant to 40 CFR §§ 122.62 and 124.5 to request modification of the above-referenced permit for the Mirant Kendall Cogeneration Station (the "Facility"), located at 265 First Street, Cambridge, Massachusetts. As you know, this permit was renewed in 2006 and modified by the Environmental Protection Agency ("EPA") in 2008. Mirant Kendall timely appealed the 2006 permit and 2008 modification; those appeals are pending before the Environmental Appeals Board ("EAB").

While those appeals were pending, Mirant Kendall developed a proposal to make certain modifications to the Facility which would allow it, in conjunction with certain other developments outside the Facility, to continue operating economically, while at the same time vastly decreasing the Facility's water use and discharge to the Charles River. The result will be substantial environmental benefits with respect to the ecosystem of the Charles River, and the improvements will allow this centrally located cogeneration facility to produce significant air quality benefits through increased steam sales to local users.

Since late in 2008, when Mirant Kendall developed the proposal, Mirant Kendall, EPA, the Massachusetts Department of Environmental Protection ("MassDEP"), and the intervenors in Mirant

Kendall's pending appeal, the Charles River Watershed Association and the Conservation Law Foundation, have engaged in productive discussions to incorporate the project into a modified permit, which can revise and supersede the 2006 permit as modified in 2008. We appreciate the hard work and cooperative approach that you and your staff – and the other parties – have shown during these discussions.

The result of those discussions is the modified permit attached to this letter as Exhibit 1. For the reasons stated below, Mirant Kendall requests that the permit be modified as provided in the attached draft permit. The attached draft modified permit includes all relevant permit provisions, including those not being modified. Mirant Kendall requests that the modified permit supersede the 2006 permit as modified in 2008.

The permit modification is warranted under 40 CFR § 122.62(a)(1), which provides for modifications when there

[a]re material and substantial alterations or additions to the permitted facility or activity ... which occurred after the permit issuance which justify the application of permit conditions that are different or absent in the existing permit.

As you know, Mirant Kendall's proposal involves the construction and operation of a back pressure steam turbine ("BPST") and air cooled condenser ("ACC"). Operation of the new equipment, along with the installation of a new steam pipeline described below, will enable the Facility to operate more economically, by allowing Mirant Kendall to sell up to twice as much steam into Boston as is currently possible. Importantly, it will also reduce heat discharged to the Charles River by more than 95% under normal operations. Operating details of the BPST and ACC are provided in Exhibits 2 and 3, respectively.

Mirant Kendall cannot justify the investments necessary to install the ACC or BPST without construction and operation of a new steam line across the Charles River by Trigen-Boston Energy Corp. ("Trigen"), because the new steam pipeline is a necessary element to the plan to generate increased steam sales from the Facility into Boston. Increased steam sales will also lead to air quality improvements in the greater Boston area, as steam produced by Mirant Kendall's cogeneration Facility displaces steam generated by older, less-efficient boilers.

Normal operations once the new equipment has been installed and is operating will be as shown in the flow diagram shown on Exhibit 4. Exhibit 5 is a table providing information concerning relevant parameters under both current and future operations, including water withdrawals from the River, discharge volumes, maximum temperature and heat load to the River in BTU/day.

In short, the maximum water withdrawal will decrease from a monthly average of 70 million gallons per day (MGD) and a daily maximum of 80 MGD to 3.17 MGD, a more than 95% reduction in cooling water intake. Similarly, the discharge volume limit will be reduced from a maximum of 80 MGD to 3.2 MGD, a 96% reduction. The average discharge will be reduced from 70 MGD to 2.34 MGD, or an almost 97% reduction.

With respect to heat, current operations generate a maximum heat load to the River of 13344 mmBTU/day. This will be reduced to a maximum of 533.8 mmBTU/day, a reduction of 96%. We predict that the current average heat load of 8535 mmBTU/day will be reduced to an average heat load of 315.5 mmBTU/day, a reduction of more than 96%.

As we have also discussed with you, while the information described above represents normal operations that we expect to obtain almost all the time, it is necessary that the modified permit make provision for both forced and planned outages. Mirant Kendall, subject to the approval of ISO New England, is prepared to limit planned outages to times, described with specificity in the modified permit, at which cooling water intake and thermal discharge concerns are minimized. Obviously, unplanned outages cannot be scheduled. However, because the BPST and ACC will be new equipment, we expect it to be reliable. Moreover, Mirant Kendall is prepared to accept limits on the total number of days during which the Facility can operate during unplanned outages over the life of the permit.

As reflected in Exhibit 5, the intake from the River would be limited to 52.2 MGD during outages and the heat load to the River would be limited to 8707 mmBTU/day. As proposed, the Facility could withdraw this volume of water from the River under the specified outage conditions. However, Mirant Kendall would remain subject to the thermal limitations in the permit, even under outage conditions.

As reflected in the proposed permit, Mirant Kendall believes that it should not require more than 30 days over any five-year period to accommodate planned outages. This is based on industry experience regarding the frequency of planned repairs for this type of equipment. We thus propose to limit the Facility's ability to operate under planned outage conditions described above to 30 days out of any rolling five-year period. Similarly, Mirant Kendall requests 30 days over five years to accommodate potential unplanned outages. The equipment to be installed is expected to be quite reliable, and Mirant Kendall is hopeful that unplanned outages will not happen in most five-year periods. However, if outages do occur, it can take several weeks to repair and bring the equipment back on-line. We thus propose, as with planned outages, to limit the Facility's ability to operate during unplanned outages to 30 days out of any rolling five-year period. Moreover, in order to further minimize the impacts of operations during outages, Mirant Kendall proposes to allow planned and unplanned outage operations to occur consecutively, but the Facility would not operate under the outage conditions for more than 30 consecutive days, regardless of the reason for the outage.

Mirant Kendall believes and formally requests that EPA find that the proposed technology and the cooling water intake structure provisions of the modified permit reflect the best technology available within the meaning of § 316(b) of the Clean Water Act. As noted above, cooling water intake volume will be limited to 3.2 MGD under the modified permit, an almost 96% reduction from current operations. This reduction is comparable to use of closed cycle cooling and Mirant Kendall does not believe that there is any superior technology available at this time for this Facility to minimize impingement and entrainment.

Similarly, and as noted above and on Exhibit 1, because of the reduction in discharge volume, the increase in steam sales, and the use of the ACC, the heat load to the River will be reduced to a maximum of 533.8 mmBTU/day, and an average of 390.3 mmBTU/day, decreases of at least 96% over current operations. There is no other technology or set of technologies available that would be feasible for this Facility that would achieve a greater reduction. Mirant Kendall therefore believes and requests that EPA find that this proposal represents the best available technology for limiting thermal discharge from the Facility. The reduction in heat load will be sufficient to ensure a balanced, indigenous population, or BIP, of shellfish, fish, and wildlife in the Charles River, and thus justifies the grant of a variance under § 316(a) of the Clean Water Act.

The modified permit is complex and its provisions largely speak for themselves. However, it is important to emphasize that it contains a number of provisions designed to ensure that the Facility

impacts are reasonably minimized and comply with statutory and regulatory requirements, such as the preservation of a BIP. For example, while the dramatic reductions in intake, discharge, and thermal load will clearly lead to equally substantial reductions in impact, the modified permit nonetheless contains a robust monitoring program to verify that those impacts are indeed consistent with statutory and regulatory requirements. As another measure of the conservatism build into the modified permit, Mirant Kendall has agreed to a fail-safe provision, by which, under certain circumstances, if the Facility has discharged on the two most recent prior days and if the relevant temperature at Station 3 (the primary compliance point) has exceeded the relevant limit by at least 0.5⁰ F. and exceeded the Facility afternoon intake temperature (all defined in the modified permit) by at least 1.0⁰ F., then the Facility will not discharge heated effluent on the third day, even though it may be able to do so safely and even though it may not be conclusively established that the Facility discharge was the cause of such exceedances. This fail-safe provision will also help ensure preservation of a BIP.

As noted above, the Facility cannot justify the investment necessary for the BPST and ACC and thus cannot comply with the limits stated in the modified permit without construction of the new steam line by Trigen and cannot comply with the terms of the modified permit unless and until the equipment has been installed. For that reason, while we are today applying to modify the permit in order to expedite the necessary process, we do not request or expect the modified permit to take effect until Mirant Kendall, MassDEP, and EPA have agreed to the terms of an Administrative Consent Order (“ACO”) specifying a schedule for installation of the equipment and the effective date of the modified permit itself. We look forward to finalizing the terms of the ACO as well as EPA’s approval of the request to modify the permit.

If you have any questions or require additional information please contact me at 617.529.3874.

Very truly yours,



Shawn Konary
Director, Environmental Policy and Regulatory Affairs

Attachments

Copies: G. Papadopoulos, EPA
R. Bevacqua, Mirant
H. Davenport, Mirant
A. Murphy, Mirant
J. Perry, Mirant
D. Whitman, Mirant
R. Child, Mintz Levin
S. Jaffe, Foley Hoag
File

Exhibit 1

Modified Permit

MODIFICATION OF AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Clean Water Act, as amended, (33 U.S.C. §§1251 et seq.; the "CWA"), and the Massachusetts Clean Water Act, as amended (M.G.L. Chap. 21, §§ 26-53),

Mirant Kendall, LLC

is authorized to discharge from the facility located at

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

to receiving water named

Charles River

in accordance with effluent limitations, monitoring requirements and other conditions set forth in this modified permit. This modified permit is issued pursuant to 40 C.F.R. § 124.5, and revises and supersedes the permit that was issued on September 26, 2006, appealed on October 30, 2006, modified on December 18, 2008, and appealed on February 2, 2009.

This modified permit shall become effective on the first day of the calendar month following sixty (60) days after the date of signature, or "Effective Date."

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

This permit consists of 30 pages in Part I including effluent limitations, monitoring requirements, and state permit conditions, Table 1, Attachments A through G (Attachments E and F are reserved), and 25 pages in Part II including General Conditions and Definitions.

Signed this day of , 2010

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

David Ferris, Director
Massachusetts Wastewater Management Program
Department of Environmental Protection
Commonwealth of Massachusetts
Boston, MA

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, and boiler blowdown⁽¹⁾. Such discharges shall be limited and monitored by the permittee as specified below:
- Effluent samples shall be taken prior to mixing with other waste streams through Outfalls 001, 002, 003 and/or 004.
 - The results of sampling for any parameter above its required frequency must be reported.
 - 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	Various ^(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 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 and 002 are designated collectively as SUM A; Outfalls 003 and 004 are also designated collectively as SUM B.
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.

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 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-EF

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, EF, 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.

<p style="text-align: center;">Day 1 (Acute and sample #1 for chronic)</p>	<p style="text-align: center;">Day 3 (sample #2 for chronic)</p>	<p style="text-align: center;">Day 5 (sample #3 for chronic)</p>
<p style="text-align: center;">Discharge of Sodium Bisulfite HRSG Blowdown UF and RO Water Treatment Reject Water</p>	<p style="text-align: center;">HRSG Blowdown UF and RO Water Treatment Reject Water</p>	<p style="text-align: center;">HRSG Blowdown UF and RO Water Treatment Reject Water</p>

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⁾
126 Priority pollutants ⁽³⁾	Report	Report	1/Year ⁽⁴⁾	Grab

- 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.

3. The list of these may be found at 40 CFR 423, Appendix A.

4. The priority pollutants shall be sampled for during the first month of discharge from the UF & RO system under the permit and 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 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
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.
- 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 and phone numbers for the EPA and MassDEP in Part B. of this permit. 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 B 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 MADMF 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. 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]
 - (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 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 and DO.
- (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 (i.e. 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.

PART B. MONITORING AND REPORTING

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. 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 Section 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.

The permittee shall notify EPA and MassDEP in writing within five business days after the Chill Period Trigger Event (as defined in **Attachment A**) occurs in each calendar year.

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

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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 only 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.

PART 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.

Exhibit 2

Description of Back Pressure Steam Turbine

Exhibit 2

DESCRIPTION OF BACK PRESSURE STEAM TURBINE (PRELIMINARY DESIGN)*

Steam Flow Rate: *560,000 lbs/hr*

Steam Pressure Inlet: *1,300 Psig*

Steam Temp inlet: *900° F*

Steam Pressure Outlet: *220 Psig*

Steam Temp Inlet: *520° F*

Expected Electrical output: *25,000 kW*

Ancillary piping, electrical connections and control systems

*Design information is based on preliminary information regarding equipment necessary to achieve project goals. Additional information obtained during final design and contracting may result in changes to project specifications.

Exhibit 3

Description of Air Cooled Condenser

Exhibit 3

DESCRIPTION OF AIR COOLED CONDENSER (PRELIMINARY DESIGN)*

Steam Flow Rate: *560,000 lbs/hr*

Steam Pressure Inlet: *220 Psig*

Condensate Pressure Outlet: *~215 Psig*

Steam Temp Inlet: *520° F*

Condensate Temp Outlet: *170° F*

Overall Area: *~81'x62' (preliminary design is an 8 cell arrangement)*

Height: *~ 30'*

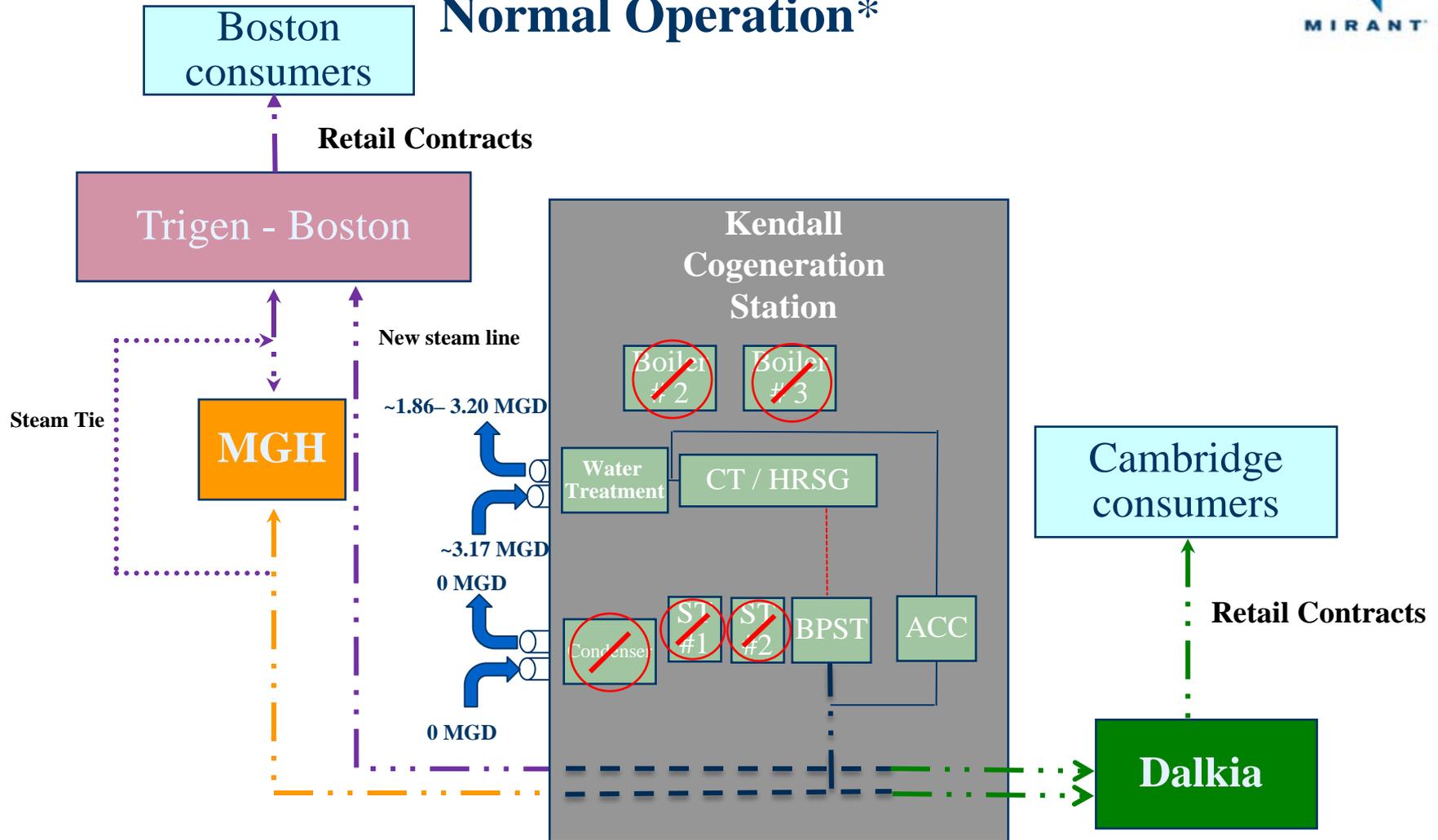
Ancillary piping, electrical connections and control systems

*Design information is based on preliminary information regarding equipment necessary to achieve project goals. Additional information obtained during final design and contracting may result in changes to project specifications.

Exhibit 4

Cogeneration Configuration Normal Operations

Exhibit 4 Cogeneration Configuration Normal Operation*



* Normal operation means that the BPST (Back Pressure Steam Turbine) & ACC (Air Cooled Condenser) are available to operate

Exhibit 5

Current and Future Operating Scenarios

Exhibit 5

Current and Future Scenarios



	A	B	C	D	E	F	G	H	I
	SCENARIO	MAJOR COMPONENTS OPERATING	NOMINAL ELECTRIC CAPACITY (MW)	NOMINAL STEAM OUTPUT (Mlbs/hr.)	WATER WITHDRAWAL (MGD)&SOURCE	WATER DISCHARGE (MGD) & DISCHARGE LOCATION	DISCHARGE TEMP	TOTAL CONSUMP USE/ SOURCE	Heat Load (mmBTU/day) to Charles River
1	Current Normal Operations	CT/HRSG ST#1 ST#2 ST#3	W=229 SP/FA=212 SU=220	W=254 SP/FA=218 SU=113	80 MGD (Max Daily Ave) 70 MGD (Monthly Ave) Broad Canal	80 MGD (Max Daily Ave) 70 MGD (Monthly Ave) Charles River	Max 105 deg F. 20 deg F Delta T	0.853MGD (annual average) City of Cambridge	13344 max 8535 (annual daily ave)
2	Proposed Normal Operations	CT/HRSG BPST ACC	W=207 SP/FA=201 SU=185	W=496 SP/FA=379 SU=260	3.17 MGD Broad Canal	Max=3.20 Min=1.98 Ave=2.34 Charles River	Max 105 deg F. 20 deg F Delta T	Max=1.22 Min=0 Ave=0.86 Broad Canal	533.75max 315.5 (predicted annual daily ave)
3	BPST Scheduled Outage	CT/HRSG ST #1 ST #2	W=206 SP/FA=209 SU=202	W=491 SP/FA=379 SU=260	52.17 MGD Broad Canal	Max=52.20 Min=50.98 Ave=51.34 Charles River	Max 105 deg F. 20 deg F Delta T	Max=1.22 Min=0 Ave=0.86 Broad Canal	8707 max 5873 (predicted annual daily ave)
4	BPST Forced Outage	CT/HRSG ST #1 ST #2	W=206 SP/FA=209 SU=202	W=491 SP/FA=379 SU=260	52.17 MGD Broad Canal	Max=52.20 Min=50.98 Ave=51.34 Charles River	Max 105 deg F. 20 deg F Delta T	Max=1.22 Min=0 Ave=0.86 Broad Canal	8707 max 5873 (predicted annual daily ave)
5	Boilers Only	Boiler 2 and or 3	0	W=420 SP/FA=326 SU=228	3.17 MGD Broad Canal	Max=3.20 Min=2.20 Ave=2.42 Charles River	Max 105 deg F. 20 deg F Delta T	Max=1.0 Min=0 Ave=0.78 Broad Canal	533.75 max 315.5 (predicted annual daily ave)

Notes:

1. All values shown are estimates based on currently available information.
2. Abbreviations for Seasons: W=Winter, SP/FA= Spring & Fall SU=Summer