UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND - REGION I
ONE CONGRESS STREET
BOSTON, MASSACHUSETTS 02114
FACT SHEET

DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES

NPDES PERMIT NO.: MA0001520

NAME AND ADDRESS OF APPLICANT:

City of Holyoke Gas and Electric Department (HG&E)
99 Suffolk Street
Holyoke, MA 01040

NAME AND LOCATION OF FACILITY WHERE DISCHARGE OCCURS:

Cabot Street Station
102 Cabot Street
Holyoke, MA 01040

RECEIVING WATER: Holyoke Canal System (Basin code MA 34-05)

CLASSIFICATION: Class B (warm water)

CURRENT PERMIT **ISSUED:** 09-09-1988
EXPIRED: 09-09-1993
REVISED RE-APPLICATION: 10-20-2004

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1.0 Proposed Action, Type of Facility, and Discharge Location

On October 31, 1991, the Holyoke Gas and Electric Department (HG&E) re-applied to the U.S. Environmental Protection Agency (EPA) for re-issuance of its NPDES permit to discharge wastewater from their Cabot Street Station (Station) into the Connecticut River, via the Holyoke Canal System, in Holyoke, Massachusetts. HG&E most recently revised its application for permit re-issuance by a submission to EPA dated October 20, 2004.

The facility is engaged in the generation and distribution of steam and electric power. The Station is a "peaking" facility, meaning that it primarily generates electricity during peak demand. Electricity is generated by means of two boilers fired by either natural gas or number 6 fuel oil that provide steam to two Westinghouse 10 megawatt (MW) steam turbines and one Westinghouse 5.5 MW steam turbine. The Cabot Street Station has a total combined generating capacity of 25.5 MW. The Cabot Street Station also produces steam, 24 hours a day all year long, for commercial and municipal customers in Holyoke.

Since the issuance of the current permit, the Station has modified certain operations and equipment. In some cases, these modifications have resulted in changes in the draft NPDES permit. These modifications and the appropriate permit changes are described in this fact sheet and include the elimination of chlorine use, the removal of sand filters, the re-configuration of cooling water for the Unit 9 condenser, and the introduction of new fish exclusion mechanisms in the canal system. Many of these changes will reduce the adverse effects of plant operations on the aquatic ecosystem and are necessary to assure compliance with federal and state environmental requirements.

2.0 Site Overview

2.1 Permitting History

HG&E has been discharging wastewater from its Cabot Street Station under a five year NPDES permit issued on September 9, 1988, which expired on September 9, 1993. Since the expiration date, the 1988 permit has been administratively continued as the permittee has satisfied the conditions regarding timely filing of an application for permit renewal as listed in Section 122.6 of Chapter 40 of the Code of Federal Regulations (CFR) and Title 314 of the Code of Massachusetts Regulation (CMR) Section 3.08 and Chapter 40. No permit modifications have been issued to the 1988 NPDES permit.

The permittee submitted an initial renewal application dated October 31, 1991. On July 9, 1993, EPA sent a letter to HG&E stating EPA had received a complete application. The permittee submitted a revised application on November 1, 1999. EPA conducted a site visit on November 8, 2002 and requested additional information from the permittee in a letter dated July 23, 2004. The permittee submitted a revised permit renewal application dated October 20, 2004. EPA has reviewed the application and deemed it to be complete in a letter dated June 15, 2005. EPA conducted a second site visit on December 20, 2004.

2.2 Facility Overview

The Cabot Street Station produces steam for a district heating system and commercial sales, as well as electricity during peak demand. The Station has an electricity generating capacity of 25.5 MW, with two 10 MW steam turbines and one 5.5 MW steam turbine. The Station uses natural gas as its primary fuel, with number 6 fuel oil as a backup.

2.3 Description of Discharge

Wastewater effluent discharges from Cabot Street Station consist of (1) once-through cooling water, (2) low volume waste sources, and (3) storm water. As described in section 5.2.1 of this fact sheet, all storm water discharges from the facility are covered under EPA's Multi-Sector General Permit rather than under this permit. The non-storm water discharges from the facility, as well as the internal water processes, are shown in schematic drawings presented as Figure 1 (summer flows) and Figure 2 (winter flows).

Cabot Street Station discharges its wastewater to the Connecticut River, via the Holyoke Canal System, in Holyoke, Massachusetts. Once-through condenser cooling water, which contains waste heat from steam turbines, is discharged through outfall 001 to the First Level Canal. (See Section 3 of this fact sheet for a description of the canal system.) When the facility is generating electricity, an average of 13.16 million gallons of condenser cooling water is used and discharged per day during the summer, and an average of 7.01 million gallons per day is used during the winter. Discharge Monitoring Report (DMR) data is summarized in Table 1. In addition, flow data from 1996 through 2003 for outfall 001, as summarized by the permittee, is presented in Table 2 (titled "CWIS Data") and Table 3 (titled "Demonstration Data").

Low volume waste sources at the Station, as defined in 40 § CFR Part 423.11(b), consist of process water from floor drains, clarifier blowdown, pressure filter backwash, and regenerant from the ion exchange water treatment system.

The ion exchange water treatment system creates demineralized water for use in generating steam and also produces a waste water stream of demineralized regenerant. This demineralized regenerant is treated with sulphuric acid in a neutralization tank, and then discharged to the Second Level Canal through outfall 002. An average of 13,204 gallons per day (gpd) is discharged through outfall 002, based on data from 1998 through 2003. Flow data for outfall 002, as summarized by the permittee, is presented in Table 4 (titled "Flow and pH for 002 Discharge").

Wastewater from the other low volume waste sources (floor drains, clarifier blowdown, and pressure filter backwash), is returned to the traveling screen well. From the traveling screen well, it is pumped either to the clarifier clear well to begin the steam generation process, or, when the facility is generating electricity, to the condensers as once-through cooling water.

3.0 Environmental Setting

3.1 Receiving Water Description

The Holyoke Canal System consists of three levels, referred to as the First, Second, and Third Level Canals, and ultimately flows to the Connecticut River. This canal system extends through the lower areas of the City of Holyoke and provides water for industrial and hydro-power generation. A diagram of the canal system is provided in Figure 3 and a map in Figure 4. Typical water surface elevations of the First, Second, and Third Level Canals are 100.0 ft, 80.0 feet, and 67.5 feet above sea level, respectively. Water from the Connecticut River enters the First Level Canal through a headgate structure, which includes a trash rack to prevent debris from entering the canal system, followed by a louver facility intended to prevent adult and juvenile fish from gaining entrance to the canal system. This fish bypass, known as the fish excluder system (FES) is explained further in Section 5.4.2.2 of this fact sheet and in the Essential Fish Habitat Report correspondence to NOAA Fisheries, included as Attachment E herein. Water from the First Level Canal is discharged into the Second Level Canal, which then discharges into either to the Third Level Canal or directly to the Connecticut River. Water from the Third Level Canal discharges to the Connecticut River.

HG&E's Cabot Street Station is located on the First Level Canal, downstream of the Holyoke #1 & #4 hydroelectric facility. The Cabot Street Station draws water through a cooling water intake from the First Level Canal. The facility then discharges from Outfall 001 back to the First Level Canal, approximately 245 feet downstream from the intake structure. Outfall 002 discharges to the Second Level Canal, approximately 200 feet downstream of the discharge from the Holyoke #2 hydroelectric facility.

The volume of water in the First Level Canal is approximately 12,675,00 cubic feet ([total length of 6,500 ft] x [average depth of 15 ft] x [average width of 130 ft] = 12,675,000 ft^3). The First Level Canal dimensions in the area of Outfall 001 are approximately 130 feet wide and 15 feet deep. From Outfall 001, wastewater travels between 0.5 and 1.5 canal miles before entering the Connecticut River, depending on whether the water overflows directly to the river from the Second Level Canal or flows through the Third Level Canal and then to the river.

3.2 Canal Flow and Time of Travel

The last Federal Energy Regulatory Commission (FERC) re-licensing of the Holyoke Hydroelectric Project (FERC No. 2004), located in the main stem of the Connecticut River within the City of Holyoke, established a year-round continuous minimum flow rate of 400 cubic feet per second (cfs) through the Holyoke Canal System downstream of the FES.

Cooling water that is discharged through outfall 001 remains in the canal system for a period of 1.6 - 10.5 hours, depending on canal velocity and the point of discharge into the Connecticut River. When the First Level Canal is at the velocity of 400 cfs, cooling water remains in the canal system for a period of 3.5 - 10.5 hours before reaching the main stem of the Connecticut River. When the canal is at the velocity of 900 cfs, this time period is 1.6 - 4.8 hours. The range is a function of whether water is discharged to the river from the Second Level Canal or the Third Level Canal.

3.3 Receiving Water Classification

The main stem of the Connecticut River, in the area of the Holyoke Canal System, from the Holyoke Dam to the Connecticut State Line, miles 96.6 - 70.7, is classified as a Class B warm water fishery under the Massachusetts Surface Water Quality Standards, with warm water and combined sewer overflow (CSOs) restrictions according to Table 7 titled "Connecticut River Basin" of 314 Code of Massachusetts Regulations (CMR) Section 4.06. The water quality classification for the Holyoke Canal System is not listed in this table. The Holyoke Canal System is a Class B water in accordance with 314 CMR Section 4.06(2)(b), titled "Unlisted Waters", which states "those inland waters not otherwise designated are designated Class B."

Title 314 CMR 4.05(3)(b) states that Class B waters have the following designated uses: "These waters are designated as habitat for fish, other aquatic life, and wildlife, and for primary and secondary contact recreation. Where designated they shall be suitable as a source of public water supply with appropriate treatment. They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value." Warm water fisheries are defined as those waters in which the maximum mean monthly temperature generally exceeds 68 degrees F (20 degrees C) during the summer months and are not capable of sustaining a year-round population of cold water stenothermal aquatic life.

Section 303(d) of the Federal Clean Water Act (CWA) requires States to identify those water bodies that are not expected to meet surface water quality standards after the implementation of technology-based controls and to develop total maximum daily loads (TMDL) of particular pollutants for such water bodies. The Holyoke Canal System is not listed on the Massachusetts Department of Environmental Protection's (DEP) 2002 Integrated List of Waters (which combines lists required by Sections 303(d) and 305(b) of the CWA). However, DEP's 2002 Integrated List of Waters does list the main stem of the Connecticut River (Basin MA34-05) in the area of the canal system, from the Holyoke Dam to the Connecticut State Line, as not attaining water quality standards due to priority organics, pathogens, and suspended solids. In the 2002 Integrated List this water body is included in Category 5, "Waters Requiring a TMDL." Discharges from the Cabot Street Station are not considered a source of priority organics or pathogens. Total Suspended Solids are discussed in Section 5.3.4.

4.0 Limitations and Conditions

The proposed effluent limitations and the monitoring requirements of the draft permit may be found in Part I (Effluent Limitations and Monitoring Requirements) of the draft NPDES permit.

5.0 Permit Basis and Explanation of Effluent Limitations Derivations

5.1 General Requirements

The Clean Water Act (CWA) prohibits the discharge of pollutants to waters of the United States without a National Pollutant Discharge Elimination System (NPDES) permit unless such a discharge is otherwise authorized by the CWA. The NPDES permit is the mechanism used to

implement technology-based effluent limitations, cooling water intake requirements, water quality-based effluent limitations, and other requirements including monitoring and reporting. This draft NPDES permit and fact sheet were developed in accordance with various statutory and regulatory requirements established pursuant to the CWA and any applicable State regulations. The regulations governing the EPA NPDES permit program are generally found at 40 CFR Parts 122, 124, 125, and 136.

When developing permit limits, EPA must consider the most recent technology-based treatment and water quality-based requirements. Under 40 CFR Part 125, Subpart A, EPA establishes criteria and standards for the imposition of technology-based treatment requirements in permits under Section 301(b) of the CWA, including the application of EPA promulgated effluent limitations and case-by-case determinations of effluent limitations under Section 402(a)(1) of the CWA. EPA is required to consider technology and water quality-based requirements as well as all limitations and requirements in the current/existing permit when developing permit limits.

Technology-based treatment requirements represent the minimum level of control that must be imposed under Sections 301(b) and 402 of the CWA (see 40 CFR Part 125, Subpart A) to meet best conventional control technology (BCT) for conventional pollutants, and best available technology economically achievable (BAT) for metals, other toxic pollutants and non-conventional pollutants. Effluent limitations guidelines for the Steam Electric Power Generating Point Source Category are found at 40 CFR Part 423.

In the absence of published technology-based effluent guidelines, the permit writer is authorized under Section 402(a)(1)(B) of the CWA to establish effluent limitations on a case-by-case basis using best professional judgement (BPJ). See also 40 CFR 125.3.

Water quality-based limitations are required in NPDES permits when EPA and the State determine that effluent limits more stringent than technology-based limits are necessary to maintain or achieve state or federal water-quality standards (see Section 301(b)(1)(C) of the CWA). State water quality standards are adopted by states under state law and set requirements, including designated uses and numeric and narrative criteria, for each receiving water in the state. When using chemical-specific numeric criteria to develop permit limits, both the acute and chronic aquatic-life criteria, expressed in terms of maximum allowable in-stream pollutant concentration, are used. Acute aquatic-life criteria are considered applicable to daily time periods (maximum daily limit) and chronic aquatic-life criteria are considered applicable to monthly time periods (average monthly limit). Chemical-specific limits are required under 40 CFR §122.44 (d)(1) and are implemented under 40 CFR §122.45(d). EPA Region I has established, pursuant to 40 CFR §122.45 (d)(2), a maximum daily limit and average monthly discharge limit for specific chemical pollutants.

The facility's design flow is used when deriving constituent limits for daily and monthly time periods as well as weekly periods where appropriate. In addition, the dilution provided by the receiving water is factored into this process. Narrative criteria from the state's water-quality standards are often used to limit toxicity in discharges where: (1) a specific pollutant can be identified as causing or contributing to the toxicity but the state has no numeric standard; or (2)

toxicity cannot be traced to a specific pollutant.

EPA regulations require NPDES permits to contain effluent limits more stringent than technology-based limits where more stringent limits are necessary to maintain or achieve state or federal water-quality standards.

The NPDES permit must limit any pollutant or pollutant parameter (conventional, non-conventional, toxic and whole effluent toxicity) that is or may be discharged at a level that causes or has "reasonable potential" to cause or contribute to an excursion above any water-quality criterion (refer to 40 CFR §122.44(d)(1)). An excursion occurs if the projected or actual in-stream concentration exceeds the applicable criterion.

In determining reasonable potential, EPA considers: (1) existing controls on point and non-point sources of pollution; (2) pollutant concentration and variability in the effluent and receiving water as determined from the permit application, Monthly Discharge Monitoring Reports (DMRs), and State and Federal Water Quality Reports; (3) sensitivity of the affected species to toxic pollutants; (4) known water-quality impacts of processes on wastewater; and, where appropriate, (5) dilution of the effluent in the receiving water.

The CWA requires that EPA obtain state certification confirming that all state water-quality standards will be satisfied. The permit must conform to the conditions established in a State Certification under Section 401 of the CWA (see 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).

State water quality standards consist of three parts: (1) beneficial designated uses for a water-body or a segment of a water-body; (2) numeric and/or narrative water quality criteria sufficient to protect the assigned designated use(s); and (3) antidegradation requirements to ensure that once a use is attained it will not be degraded. The Massachusetts Surface Water Quality Standards, found in 314 CMR 4.00, include these elements. The State will limit or prohibit discharges of pollutants to surface waters to assure that surface Water Quality Standards of the receiving waters are protected and maintained or attained. These standards also include requirements for the regulation and control of toxic constituents and require that EPA criteria, established pursuant to Section 304(a) of the CWA, shall be used unless a site specific criterion is established. The conditions of this draft permit reflect the requirement of the CWA and EPA to achieve, and then to maintain, Water Quality Standards.

The permit's effluent monitoring requirements are designed to yield data representative of the facility's discharges and are established under the authority of Sections 308(a) and 402(a)(2) of the Clean Water Act, according to regulations set forth at 40 CFR. §122.41(j), §122.44(i) and §122.48. The monitoring program in this draft permit specifies routine sampling and analysis which will provide regular information on the levels of regulated materials in the wastewater discharge streams. The approved analytical procedures for required monitoring are found in 40 CFR § 136 unless other procedures are explicitly required in the permit.

A permit may not be renewed, reissued or modified with less stringent limitations or conditions than those contained in the previous permit unless in compliance with the anti-backsliding requirements of the CWA [see Sections 402(o) and 303(d)(4) of the CWA and 40 CFR §122.44(l)(1) and (2)]. EPA's anti-backsliding provisions found at 40 CFR §122.44(l) generally prohibit the relaxation of permit limits, standards, and conditions in subsequent permits, with some limited exceptions. Effluent limits based on BPJ, water quality, and state certification requirements must also meet the anti-backsliding provisions found at Section 402(o) and 303(d)(4) of the CWA.

The permit contains thermal discharge limits and cooling water intake limits developed pursuant to CWA Sections 316(a) and (b), respectively. These particular limits are discussed in greater detail in Section 5.4 of this fact sheet, below.

5.2 Facility Information

Operation of the Cabot Street Station began in the 19th century, when the Holyoke Water Power Company used it as a hydroelectric test facility for hydroelectric turbines. In 1902 ownership of the facility was transferred from the Holyoke Water Power Company to its current owner, the City of Holyoke Gas and Electric Department (HG&E).

The First Level Canal borders the Station to the north, while the Second Level Canal borders it to the south, and private industry borders it to the east and west. The intake for turbine condenser cooling water, steam generation and auxiliary cooling water is located on the First Level Canal, which is supplied from the Connecticut River as previously discussed. This intake water passes through a 9-foot diameter penstock opening in the canal wall which is covered by a bar rack and enters the Cabot Street Station into the traveling screen well. From the traveling screen well, this intake water is then pumped through two separate screens designed to remove debris, such as leaves and trash. These screens rotate during the generation of electricity, and they are referred to as the traveling screens. These traveling screens are rinsed with water pumped from the canal and automatically and continuously sprayed on the screens. The spray water then returns to traveling screen well. At Cabot Street Station, the leaves and other debris that are rinsed off the traveling screen are collected with a rake once a day and transferred to a dumpster for disposal.

From the traveling screen well intake water is pumped through the traveling screens to the steam generation process, and, when producing electricity, through the condensers as well. There are seven intake pumps at the Station. When the Station is generating electricity, five intake pumps withdraw canal water for condenser cooling for Units 6, 8, and 9. The other two (2) intake pumps provide water for steam production in boilers #5 and #6 as well as for auxiliary cooling. As discussed in more detail below, canal water used directly for steam production is treated, whereas canal water used for cooling is not.

As previously indicated, the Cabot Street Station's electric generating capability includes two 10 MW steam turbines (Units 6 and 8). In addition, Unit 9, a 5.5 MW steam turbine, is available for generation on an emergency basis. The current equipment used in the generation of electricity at the Cabot Street Station is summarized in Table 5.2.

Table 5.2: Power Generation Equipment Information for Cabot Street Station

UNIT NUMBER	DESCRIPTION	NOMINAL CAPACITY	START DATE	MAXIMUM COOLING WATER USAGE
6	Steam Turbine	10 MW	New in 1955	9.8 MGD
8	Steam Turbine	10 MW	New in 1951	6.2 MGD
9	Steam Turbine	5.5 MW	New in 1941	8.9 MGD

HG&E's Cabot Street Station is called upon to produce electricity during high power demand periods with Steam Turbine Units #6, #8, and #9 providing electricity. A review of the last eight (8) years of data shows the facility produced electricity between 6 and 40 days per year. Table 2, titled "CWIS DATA", shows the number of days, number of hours, and the total flow for each month that the Station has been on line for electricity production from 1996 through 2003. A percent capacity utilization rate is based on the 5-year Average Annual Electrical Output divided by the Total Net Capacity, multiplied by 100. According to the permittee, the Station continues to operate at a 0.97 % capacity utilization rate for electrical generation (Martel,C., electronic message with attachment, November 3, 2004). This calculation is shown below.

$$\frac{\text{5-year Average Electrical Output}}{\text{Total Net Capacity}} \times 100 = \frac{1{,}353.68 \text{ MWh}}{140{,}184.00 \text{ MWh}} \times 100 = 0.97\%$$

The CWIS data from 1996 – 2003 in Table 2 shows that the Station produced electricity six (6) days over calendar year 2003, which was the lowest in the last eight years. Electricity generation occurred approximately 22 days per year, as an eight-year average from 1996 through 2003. During this eight year period, the highest electricity generation of 40 days occurred in 2000.

Condenser Cooling Water (Outfall 001)

When the Station is called upon to generate electricity, each of the five condenser pumps are run at variable rates depending on the season. Unit 6 runs its one pump at 100% during the summer and 25% during the winter. Unit 8, which has two pumps, runs one pump at 100% and the other at 33% during the summer, but during the winter runs one pump at 100% and the other at 25%. This accounts for a difference in discharge volumes between the summer and winter operations.

The Unit 9 steam turbine is for emergency usage and operated only once in 2004. Although there are two cooling water intake pumps for Unit 9, each capable of pumping 3,100 gallons per minute (4.5 mgd), only one pump is operated at a time. One pump is steam driven and the other has an electric motor. Originally, the Unit 9 condenser was connected to a closed loop cooling tower located on the roof of the Station. In April 1998 the discharge from the Unit 9 condenser was redirected to the Unit 8 condenser cooling water discharge line prior to the existing sample port. The cooling tower became unsafe and was demolished in 2002. The reconfiguration of the Unit 9 discharge from a closed loop system to a once through system necessitated an increase in the Stations's pumping capacity, which is now 24.9 mgd. Because the intake pumps for Unit 9 are run on an infrequent basis, the permittee has not requested an increase in their permitted flow limit of 23 mgd in the 1993 permit. Station pump capacity and limitations on permitted flow are further discussed in Section 5.2.1 titled Permitted Outfalls. When it is necessary to operate the Unit 9 turbine and condenser, the combined discharge of the Unit 8 condenser and the Unit 9 condenser can be sampled at the Unit 8 sample location.

Steam generation (Outfall 002)

HG&E provides steam to commercial and municipal customers in Holyoke. This steam, which condenses in customers' equipment during use, is returned as condensate to the Cabot Street Station through return lines that parallel the steam supply lines. Within the Station, the condensate is deposited in the clear well, located just after the traveling screens, to be treated for reuse in steam generation.

Unlike the untreated canal water used for cooling water, canal water used for steam production is treated by clarification and pressure filters, followed by an ion exchange system which produces demineralized water for steam production. This ion exchange system removes dissolved solids from the canal water. The demineralized water that is produced by this water treatment system is fed to Boilers #5 and #6, and then fed as steam to the turbines and/or to customers. A waste water stream of demineralizer regenerant with a pH of 9.8 - 10.0 standard units (su) is generated in the ion exchange system as a low volume waste source, as defined in 40 CFR Part 423.11(b). A 30,456 gallon neutralization tank, located outside and open to the atmosphere, treats demineralizer regenerant with sulfuric acid to reduce the pH before discharging to the Second Level Canal through outfall 002. A more detailed description of this water treatment process can be found in Attachment A, and flow diagrams are presented in Figure 1 and Figure 2.

Other Low Volume Waste Sources

Along with the demineralizer regenerant produced by the ion exchange water treatment system described in the previous section, other low volume waste sources at the Station, as defined in 40 CFR § 423.11(b), are process water from floor drains, clarifier blowdown, and pressure filter backwash.

Floor drains and clarifier blowdown are the two low volume water sources that collect in the hot well sump prior to being pumped back to the traveling screen well. Water that is collected in floor drains originates from spills of equipment cooling water. This is demineralized water from the steam process, that overflows from filling tanks. The floor drains in the boiler room empty into the sludge sump and then this water collects in the hot well. The floor drains in the turbine room collect steam condensate leakage and drain directly into the hot well. Clarifier blowdown from the clear well travels to the sludge sump and then also to the hot well. The supernatant from the hot well is pumped back to the traveling screen well and is re-circulated through the water treatment system for steam generation and, when the Station is on-line for electricity generation, through the condensers as non-contact cooling water. For the purposes of this draft permit, a new internal outfall 004 has been designated to allow for monitoring of, and establishing effluent limits for, the combined low volume waste source discharging from the hot well to the traveling screen well.

The hot well serves as a settling basin where particles collect. The hot well's dimensions are 40-feet long by 5-feet wide by 4-feet deep. The approximate total volume of the hot well is 6,000 gallons. Sludge from the hot well is tested and pumped out annually or whenever needed. Clean Ventures, Incorporated, of Elizabeth, NJ, completed the last sludge removal on November 7, 2003, and 2,700 gallons of sludge was disposed of as non-RCRA, non-DOT Regulated Material at General Chemical Corporation in Framingham, MA. On October 22, 2002, United Industrial Services of Meriden, CT, pumped 3,750 gallons of non-State Regulated Waste from the hot well. On March 3, 2001, United Industrial Services pumped sludge from the hot well. The sludge has had Toxicity Characteristic Leaching Procedure (TCLP) analysis conducted and was found to be non-hazardous material.

In addition to the waste waters entering the traveling screen well from the hot well sump, there are two other separate sources of water entering the traveling screen well. These sources are pressure filters backwash and the traveling screens rinse.

Pressure filter backwash is produced in the use of pressure filters, one of the steps in treating canal water for use in steam generation. The backwash from these pressure filters is a low volume waste source, as defined in 40 CFR § 423.11(b). This filter backwash is transported from the pressure filters to the traveling screen wells to be pumped back through the steam generation process and, when the facility is generating electricity, through the condensers. For the purposes of this draft permit, a new internal outfall 005 has been designated to allow for monitoring of, and establishing effluent limits for, the pressure filters backwash low volume waste source.

The Station's traveling screens are rinsed with water pumped from the canal and automatically and continuously sprayed on the screens. The spray water then returns to the traveling screen well. From the traveling screen well, this traveling screen rinse is pumped back through the steam generation process and, when the facility is generating electricity, through the condensers. This recycled water is composed of canal water commingled at times with effluent from internal outfalls 004 and 005. Therefore, this is not a waste stream, and additional separate monitoring of the traveling screen rinse water is not required in this draft permit.

Thus, process water from floor drains, clarifier blowdown, and pressure filter backwash are all low volume waste sources which are returned to the traveling screen well to be pumped through the steam generation process and, when the facility is generating electricity, through the condensers. The permittee is investigating measures to prevent the discharge of untreated waters that are returned to the traveling screens from the hot well and the pressure filters. In the meantime, and for the purposes of this draft permit, new internal outfalls 004 and 005 have been designated to allow for monitoring and establishing appropriate technology based effluent limits for these low volume waste sources.

Auxiliary cooling water is a non-contact cooling water system that is used to cool pumps, fans, and bearings. Prior to use, this auxiliary cooling water is treated in the pressure filters. After use, this auxiliary cooling water is directed to the filter water sump and then returned to the clarifier clear well. Thus, this water is internally recycled and is not a waste stream.

Manual boiler blowdown occurs once a week. It is conducted by Station personnel. This manual blowdown waste water goes to the blowdown tank, and then out to the sanitary sewer.

In addition to this manual boiler blowdown, continuous boiler blowdown water, the layer of water at the top of the steam drum containing a concentration of dissolved solids from an active boiler, is discharged to the filter water sump, and then back to the clarifier clear well. Thus, this water is internally recycled and not a waste stream.

Former and Other Waste Water Streams

Prior to 1995, water from the hot well would pass though sand filters before being returned to the traveling screens. These sand filters are no longer in service and are scheduled for removal in 2005. The last time the sand filters were backwashed was in 1994.

The on-site laboratory conducts testing for pH, alkalinity, and hardness, and discharges its wastewater into the sanitary sewer system. Sanitary wastes from the Station also are discharged into the sanitary sewer system.

Storm water discharges that are associated with industrial activity have the potential to cause contamination. Storm water from roofs and yard drains are discharged to the Second Level Canal through outfall 003, and are covered under EPA's Storm water Multi-Sector General Permit, as described in Section 5.2.1 of this fact sheet. This discharge and outfall are not shown in Figure 1 or Figure 2.

New Equipment

The Cabot Street Station currently has two (2) field-erected boilers that generate steam continuously for steam sales. Operation of these Boilers #5 and #6 began in 1953 and 1955, respectively, and Boilers #7 and #8 have been off line since 1991. Demolition of these two off-line boilers occurred in 2002. In October 2003, two 80,000-lbs/hr natural gas, package boilers were installed, primarily for steam sales. These new boilers primarily will burn natural gas, with limited use of #2 fuel oil also possible. In addition, these new boilers are also equipped with low NO_x burners to effectively control air emissions. These two new boilers will be labeled new # 7 and new # 8. The NO_x test was scheduled for late November 2004. Because these two new boilers must undergo various tests, the permittee is not certain when new Boilers #7 and #8 will actually go on-line. Boilers #7 and #8 were not included in the October 2004 renewal application and are not listed in Figures 1 and 2. Since these new boilers are primarily for steam generation, no new wastewater streams will be generated that will be discharged to the canal system.

New packed bed demineralizers were ordered in March 2002 and are estimated to go on-line during the Fall 2005. This new demineralization equipment will produce a reduced waste stream estimated at 1,500,000 gallons per year in comparison to the Station's current waste stream of 4,775,000 gallons per year in 2002 and 4,767,000 gallons per year in 2003. This equates to a reduced waste stream discharge of over 69%.

5.2.1 Permitted Outfalls

The Cabot Street Station has two external outfalls discharging to the Holyoke Canal System that are covered by this NPDES permit. Outfall 001 is for condenser cooling water. Outfall 002 is for the discharge of treated demineralized regenerate from the neutralization tank. Outfall 003 is for storm water and is covered under Sector O of EPA's NPDES Multi-Sector General Permit for storm water discharges, issued on October 30, 2000. This draft permit has added two internal outfalls, at the traveling screen well, to sample for low volume waste sources in accordance with the provisions of 40 CFR §423.12 (b)(3). These are numbered outfall 004 and outfall 005.

<u>Outfall 001</u>

Operating the condenser pumps at different speeds during different seasons accounts for the difference in discharge volumes between the summer and winter operations, as described above. Unit 6 uses up to 6,800 gallons per minute (gpm) or 9.8 million gallons per day (mgd) of non-contact, once through river water for condenser cooling, and Unit 8 uses up to 4,300 gpm or 6.2 mgd. Unit 9, when and if operated, can use up to 6,200 gpm or 8.9 mgd of non-contact, once-through river water and/or Station water for condenser cooling. Based on the maximum capacity of the five intake pumps, as mentioned above, the Station is capable of discharging a maximum of 24.9 mgd (9.8 mgd + 6.2 mgd + 8.9 mgd). Despite this pumping capacity, this draft permit is being reissued with the same flow limits as the current permit (10.8 mgd monthly average and 23.0 mgd daily maximum). An increase in capacity was not requested by the permittee and

would be inconsistent with the requirement under Section 316(b) of the CWA that the capacity of a facility's cooling water intake structure reflect the use of the best technology available to minimize adverse environmental effects.

Intake cooling water passes through each condenser and out to two 24-inch pipes, one from Unit 6 and one that combines the discharge from Units 8 and 9. These two 24-inch pipes then merge into a 32-inch discharge line, terminating 244 feet downstream of the intake structure into the First Level Canal (outfall 001). Each pipe has a sample port attached. Under the current permit, samples are drawn approximately every two hours to measure pH. Flow is estimated based on pump activations. Temperature is monitored via a continuous meter on both discharge pipes. Station personnel record temperatures in an operation log. The minimum, maximum, rise and average temperatures for the day are recorded for each condenser and at the intake structure. The maximum temperature value recorded for either pipe is reported as the daily maximum value on the monthly DMR. Currently, when reporting the monthly average, both pipes are averaged together over the month to report the monthly average temperature value. Average temperature values do not include flow proportional considerations. In the draft permit, outfall 001 sampling of the two 24-inch pipes has been replaced with a requirement to sample in one location after the two 24-inch pipes merge into the 32-inch pipe and before the outfall to the First Level Canal. This is to improve the monitoring of temperature, temperature rise, and pH to consider flow proportional averaging.

Outfall 002

A neutralization tank treats demineralizer regenerants with sulfuric acid and discharges to the second level canal through outfall 002. Table 4 titled "Flow and pH for 002 Discharge" shows the average discharges for each year from 1998 to 2003. The largest daily maximum flow occurred in 1998 with a value of 46,400 gpd. Based on the predictions in the October 20, 2004 revised NPDES permit application, the seasonal average flows from the neutralization tank through 002 are 10,755 gpd (0.011 mgd) for summer and 18,300 gpd (0.018 mgd) for winter.

A batch discharge through outfall 002 occurs two to four times per week during the summer and daily during the winter. Discharge of the entire batch takes approximately three hours. Composite sampling for Total Suspended Solids (TSS) and copper is conducted at the beginning, middle and end of the batch discharge, via a spigot on the discharge line. Outfall 002 is a 4-inch diameter pipe entering a 9-foot tailrace to the Second Level Canal, located 348 feet downstream of the centerline of Sargent Street.

Internal Outfall 004

This draft permit has added internal outfall 004 at the traveling screen well. The permitee shall conduct sampling, at a location after the hot well and before the traveling screen well, for TSS and Oil and Grease as listed in the low volume waste provisions found in 40 CFR §423.12(b)(3).

Internal Outfall 005

This draft permit has added internal outfall 005 at the traveling screen well. The permitee shall conduct sampling, at a location after the pressure filter backwash and before the traveling screen well, for TSS and Oil and Grease as listed in the low volume waste provisions found in 40 CFR §423.12(b)(3).

5.2.2 Discharge Monitoring Report Data

Information submitted on monthly DMRs from January 1997 to July 2004 has been summarized in Table 1. In January 2004 a Total Suspended Solids (TSS) monthly average violation of 50 mg/l occurred. Since there was only one value recorded for this month, the daily maximum also equaled the monthly average. A similar incident of only one sample in a month occurred in August 1989 for Oil and Grease (11.8 mg/l) for outfall 002, and September 1989 for flow through outfall 001 (13.9 MGD), which caused a violation for the respective monthly average limit. In order to obtain a more representative indication of monthly average effluent concentrations, the frequency of sampling of Oil and Grease and TSS at outfalls 002, 003, and 004 has been increased in the draft permit to once weekly.

5.2.3 Chemicals Used

Chemicals used at the facility include aluminum sulfate, sulfuric acid, sodium hydroxide, sodium sulfite, disodium phosphate, diethylethanolamine, and hydrazine. The first three chemicals are for process and/or cooling water treatment, and the last four are used for boiler internal treatment. Attachments B describes the purpose of each chemical, and Table 5 presents the amounts used over the last five years. (As discussed below, chlorine is not used at the facility.)

In a scan of 126 priority pollutants conducted by the permittee in October 2004, copper and Polychlorinated Biphenyl (PCB) Aroclor 1260 were detected. Based on this result, further outfall 002 monitoring requirements are included in Part I.A.2 of the draft permit. This monitoring is an annual scan for priority pollutants, described further in sections 5.3.3 and 5.3.7 below.

5.2.4 Site Remediation

A review of the MA DEP's Bureau of Waste Site Cleanup website http://www.mass.gov/dep/bwsc/sites/report.htm for Holyoke, Massachusetts, indicated that HG&E had one oil spill at 102 Cabot Street. This two hour event occurred on February 15, 2002. No remediation action was required.

5.3 Derivation of Effluent Limits under the Federal CWA and the Commonwealth of Massachusetts' Water Quality Standards

5.3.1 Chlorine

The current 1988 permit has a total residual chlorine (TRC) concentration limit of 0.1 mg/l for both the monthly average and daily maximum at outfall 001. In a February 9, 1995 letter to EPA, the permittee requested that the total chlorine analysis requirement be removed from its NPDES permit. The permittee had all chlorine and related equipment removed from its premises on June 17, 1992, by Jones Chemical Co. of Warwick, New York. The permittee does not use chlorine in its operation and does not intend on purchasing or using chlorine in the future. Therefore, EPA has removed the TRC requirements for outfall 001 in this draft permit. The use of chlorine is prohibited in the draft permit.

No bio-fouling agent is currently used. According to the permittee, because the facility generates electricity on an infrequent basis, the condenser tubes do not have a chance to foul with algae or slime and are not used enough to warrant the use of chemicals. According to the permittee, the heat exchangers will be manually cleaned for bio-growth, when necessary. The discharge of such cleaning water is not authorized under this permit.

5.3.2 pH

The pH range for Class B waters is from 6.5 to 8.3 standard units (s.u.) as defined in the Massachusetts Surface Water Quality Standards, found at 314 CMR 4.00. At outfall 001 and outfall 002, these water quality-based pH limits replace the existing pH limits of 6.0 to 8.5 s.u. because the Massachusetts Surface Water Quality Standards were revised since the last permit issuance. DMR data listed in Table 1 indicates that the permittee will need to adjust the pH of its discharge to remain in compliance with the new water quality-based permit limits.

5.3.3 Polychlorinated Biphenyl Compounds

Pursuant to 40 CFR Part 423, discharge of polychlorinated biphenyl compounds (PCBs) is prohibited and any PCB's at the facility must be disposed of in accordance with 40 CFR Part 761.

In a priority pollutant scan of the discharge from outfall 002 conducted by the permittee in October 2004, low level PCB contamination (1.1 ug/l) was detected. According to the permittee's laboratory report, "the [PCB] samples were re-extracted and analyzed outside method holding time and both samples [the original and the re-extracted sample] were non-detect." (Severn Trent Westfield, "Acute and Chronic Toxicity Test Report" prepared for City of Holyoke Gas & Electric, Holyoke, Massachusetts, September 2004). While this low-level PCB contamination in the sample is not likely to be from the facility, an annual scan of the discharge from outfall 002 for priority pollutants has been added as a monitoring requirement in Part I.A.2 of the draft permit.

5.3.4 TSS

The quantity of Total Suspended Solids (TSS) that can be discharged from low volume waste sources is limited by 40 CFR § 423.12. Furthermore, 40 CFR § 423.12 (b)(11) states that the permitting authority has the discretion to express permit limits on a concentration basis as opposed to mass-based limits. The draft permit includes concentration-based limits for outfalls 002, 004 and 005. These limits prohibit discharges of more than a 30 mg/l average monthly concentration of TSS and a 100 mg/l maximum daily concentration of TSS, consistent with 40 CFR § 423.11(b). These limits remain unchanged from the existing permit for outfall 002 and are added to for the two new low volume waste source outfalls 004 and 005. These TSS limits are not expected to contribute to water quality impairments in the receiving waters.

5.3.5 Oil and Grease

The current 1988 permit has an Oil and Grease concentration limit of 10 mg/l monthly average and 15 mg/l daily maximum for outfall 002. According to the permit fact sheet dated June 2, 1988, this limit was based on the technology-based standards for Steam Electric Power Generating Point Sources listed in 40 CFR Part 423 and Section 301(b) of the CWA, which refers to the application of the best practicable control technology no later than July 1, 1977. However, the Oil and Grease limits are more stringent than the requirements currently listed in 40 CFR Part 423. Nevertheless, the draft permit has retained these Oil and Grease limits for outfall 002 based on anti-backsliding provisions. For outfalls 004 and 005, the limits of 15.0 mg/l monthly average and 20.0 mg/l daily maximum are established based on the effluent guideline limitations found in 40 CFR § 423.12, which limits the quantity of Oil and Grease that can be discharged from low volume waste streams.

5.3.6 Heat

The temperatures presented in Table 6, titled "Average Summer and Winter Canal Water Temperatures", demonstrates the fluctuation in intake water temperatures from season to season.

The State classification for the receiving waters of the Cabot Street Station is Class B (warm water). Thus, the Water Quality Standards require that the in-stream water temperature shall not exceed 83 °F (28.3°C) and the rise in temperature due to discharge shall not exceed Δ5°F (2.8°C). Furthermore, any mixing zone applied to this discharge to achieve Water Quality Standards would need to conform to the mixing zone requirements applicable under that state's Water Quality Standards. In applying a mixing zone for thermal discharge, the thermal discharge from the facility would be allowed to exceed these Water Quality Standard criteria due to the temperature rise within the mixing zone, but subject to any limits on such exceedances imposed by the terms of the mixing zone.

EPA has reviewed the past temperature data submitted by the Cabot Street Station and evaluated the heat balance in the Holyoke Canal System, where the maximum heat discharged by the plant is equivalent to the maximum heat absorbed by the canal water during low flow conditions. This is expressed mathematically by the following equation:

$$C_p \times \Delta T_{plant} \times M_{plant} = C_p \times \Delta T_{canal} \times M_{canal}$$

where C_p = the heat capacity of water

ΔT_{plant} = the maximum change in temperature discharged from the Station = 30° F

M_{plant} = the maximum daily design flow (pump capacity) from the Station = 23.0 MGD*

ΔT_{canal} = the maximum change in temperature in the canal system

M_{canal} = the minimum flow through the canal system = 400 cfs = 258.4 MGD

* The permit limit of 23.0 MGD is used here rather than the pump capacity of 24.9 MGD

Solving the above equation for ΔT_{canal} yields:

$$\Delta T_{canal} = \frac{C_p \times \Delta T_{plant} \times M_{plant}}{C_p \times M_{canal}} = \frac{30° F \times 23.0 \text{ MGD}}{258.4 \text{ MGD}} = 2.7 °F$$

Thus, based on the assumption of complete instantaneous mixing and treating temperature as a conservative pollutant, allowing a 30°F change in temperature will comply with the Massachusetts Water Quality Standards for warm water fisheries (not to exceed Δ5°F). EPA is allowing the whole canal for mixing since no adult or juvenile fish are expected to enter the canal system due to the full-depth fish excluder system (i.e., no fish passage concern). See Section 5.4.2.2 for a detailed description of the fish excluder system.

According to canal intake temperatures presented in Table 6, in most years between 1996 and 2003, the temperature of the First Level Canal at the Station intake exceeded the 83 °F (28.3°C) Water Quality Standard required for in-stream water temperature for warm water fisheries. The maximum canal intake temperature recorded in the last five years on Table 3 is 87°F. Based on the above calculation, temperatures in a mixed canal could rise 2.7 °F above this at low flow, permitted discharge conditions. If so, the temperature in the canal mixing zone would approach but not exceed 90°F, a generally accepted acute temperature threshold. In this case, the mixing zone requirement of the Water Quality Standards, that do not allow for any deleterious acute effects within the mixing zone, are achieved. While one recorded intake temperature of 89°F in 1998 is shown in Table 3, indicating that infrequently the calculated canal temperature in the mixing zone could exceed 90°F, this is expected to be a rare occurrence and this situation is regarded to be acceptable since no adult or juvenile fish are expected in the canal system due to the full-depth fish excluder system. In order to verify the characteristics of the thermal plume from the Station during the warmest days of the year, provisions for thermal sampling events in the First Level Canal are included in Part I.A.10 of the draft permit. Past permits did not require

this type of monitoring so the information is not currently available. Provisions to ensure attainment of the mixing zone requirements for the Water Quality Standards also are contained in Part I.A.10 of the draft permit.

5.3.7 Copper

The permittee conducted a priority pollutant scan of the outfall 002 effluent in conjunction with the October 20, 2004 NPDES renewal application. The laboratory analysis detected 21 µg/l of copper in outfall 002 discharge. EPA applied the recommended copper criterion to determine under 40 CFR § 122.44(d) whether this 21 µg/l copper value has a reasonable potential to cause or contribute to an exceedance of the state criterion for copper.

EPA's recommended criterion for copper, as adopted by Massachusetts into the water quality standards, is hardness-dependent. The toxicity of total copper to aquatic organisms is reduced as the hardness concentration in the receiving water increases. In a letter dated July 7, 2000, EPA's Office of Water - Office of Science and Technology stated that, "the hardness of the water containing the discharged toxic metal should be used for determining the applicable criterion. Thus, the downstream hardness should be used." When a conservative in-stream hardness of 30 mg/l and a dilution factor of 2,586 to1 for outfall 002 were applied to the criterion for copper, water quality based limits for copper were calculated to be a monthly average of 8,600 ug/l and a daily maximum 11,600 ug/l (see Attachment D, entitled "Dissolved Copper Limit Calculations").

Based on this single sample, there is not a reasonable potential for the discharge to cause or contribute to an exceedance of the state criteria for copper as defined in 40 CFR §122.44(d). However, monitoring for total copper has been added to this draft permit for outfall 002, as part of an annual priority pollutant scan. An annual scan of the discharge from outfall 002 for priority pollutants has been added as a monitoring requirement in Part I.A.2 of the draft permit.

5.4 More Detailed Discussion of Permit Limits for Cooling Water Intake Structures and Thermal Discharges

5.4.1 Section 316(a) of the Clean Water Act

In developing effluent limitations, EPA compares technology-based and water quality-based requirements, and whichever is more stringent governs the permit requirements. For thermal discharges, however, EPA may also consider granting a variance under Section 316(a) from either or both the technology-based and water quality-based effluent limitations, if less stringent variance-based limitations will nevertheless be sufficient to "assure the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife in and on the body of water into which the discharge is made." This variance, and the demonstration that an applicant must make to qualify for this variance, are described in CWA § 316(a) and EPA regulations promulgated at 40 CFR Part 125, Subpart H. This demonstration must show that the

alternative effluent limitations desired by the discharger, considering the cumulative impact of its thermal discharge together with all other significant impacts on the species affected, will assure the protection and propagation of the balanced, indigenous population of shellfish, fish and wildlife in and on the body of water into which the discharge is made (BIP).

In this case, the permitee's application of October 20, 2004 did not request any change from the current permit's discharge limits: a maximum temperature of 102° F and a maximum rise in temperature of 30° F. These thermal discharge limits were based on a CWA § 316(a) variance in the current permit. Thus, the permitee's requested thermal discharge limits are identical to those in the current permit and represent a variance request pursuant to Section 316(a).

In reviewing this variance request, EPA considered the water quality-based limits derived in Section 5.3 of this Fact Sheet. Considering (1) the cumulative impact of its thermal discharge together with all other significant impacts on the species affected, (2) the quality of the man-made habitat of the canal system, (3) the barrier in place to prevent juvenile and adult fish from entering the canal, and (4) the effect of periodic de-watering of the receiving water, EPA finds that these water-quality based limitations will assure the protection and propagation of this very unusual BIP, as presently understood in the receiving water. Currently, EPA does not see evidence of appreciable harm to the BIP due to the Station's existing thermal discharge, considering its cumulative impact together with all other significant impacts on the BIP. EPA is aware that there are available technologies, such as closed-cycle cooling towers, that would further reduce thermal discharges from the facility. Thermal discharge limits based on such technologies would be more stringent than the limits based on open-cycle cooling that the permittee is requesting here. Since EPA believes that the limits in the Draft Permit will satisfy the standard of § 316(a), there is no need for EPA to determine fully what technology-based limits would require in this case for thermal discharges because any more stringent limits in this regard would nevertheless be supplanted by the § 316(a) variance-based limits.

At the same time, as discussed above, EPA has determined that the thermal discharge limits requested by the permittee will satisfy the requirements of Massachusetts water quality standards, based on a mixing zone. Thus, there is no need for a variance from the state's water quality standards or to determine whether or not one would be permissible. As a result, the thermal discharge limits in the permit, which are the same as those in the existing permit, are based on both a § 316(a) variance and state water quality standards.

EPA is granting the §316(a) variance based on available data indicating that no appreciable harm to the BIP has occurred from the existing thermal discharge, while acknowledging that additional data characterizing the thermal plume needs to be collected in the future. Accordingly, the draft permit requires the gathering of additional temperature information as specified in Part I.A.10 of the draft permit, to verify that the Station discharge continues to satisfy § 316(a) and meet the relevant water quality standards. The results of this monitoring will be considered by EPA and could lead to changes in future permits.

5.4.2 Derivation of Cooling Water Intake Requirements Under Section 316(b) of the Clean Water Act

5.4.2.1 Introduction and Regulatory Background

With any NPDES permit issuance or reissuance, EPA is required to evaluate or re-evaluate compliance with applicable standards, including those stated in Clean Water Act (CWA) § 316(b) regarding cooling water intake structures. CWA § 316(b) applies if the permit applicant seeks to withdraw cooling water from a water of the United States. To satisfy § 316(b) the permit applicant must demonstrate to the satisfaction of the EPA that the location, design, construction, and capacity of the facility's cooling water intake structure(s) (CWIS) reflect the Best Technology Available (BTA) for minimizing adverse environmental impacts. CWA § 316(b) applies to this permit due to the presence and operation of a cooling water intake structure.

CWA §316(b) governs requirements related to CWISs and requires "that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." The operation of CWISs can cause or contribute to a variety of adverse environmental effects, such as killing or injuring fish larvae and eggs by entraining them in the water withdrawn from a water body and sending them through the facility's cooling system, or by killing or injuring fish and other organisms by impinging them against the intake structure's screens.

In the absence of detailed applicable regulations, for many years EPA has made CWA § 316(b) determinations on a case-by-case basis based on best professional judgment (BPJ), both for new and existing facilities with regulated CWISs. Then, in December 2001, EPA promulgated new final § 316(b) regulations providing specific technology standard requirements for *new* power plants and other types of *new* facilities with CWISs. 66 Fed. Reg. 65255 (Dec. 18, 2001) (the Phase I Regulations). These Phase I Regulations do <u>not</u>, however, apply to *existing* facilities such as HG&E Cabot Street Station.

In July 2004, EPA also published final regulations applying CWA §316(b) to large, existing power plants (referred to hereinafter as either the "Phase II Rule" or the "Phase II Regulations"). EPA's new Final CWA §316(b) Phase II Rule for existing facilities was signed by the Administrator on February 16, 2004, published in the Federal Register on July 9, 2004, and became effective on September 7, 2004. (See 69 Fed. Reg. 41576, July 9, 2004, regulations promulgated at 40 CFR Part 125, Subpart J.) The compliance alternatives of the Phase II rule also do not apply to HG&E Cabot Street Station, however, because HG&E Cabot Street Station does not fit the criteria for Phase II applicability found at 40 CFR § 125.91(a)(2). The compliance alternatives of the Phase II Rule apply to a facility if it "uses or proposes to use cooling water intake structures with a total design intake flow of 50 million gallons per day (mgd) or more to withdraw cooling water from waters of the United States." The design intake flow at HG&E Cabot Street Station, combining the nominal capacity of Units 6, 8, and 9, is 24.9 mgd.

Nor would HG&E be covered under the recently proposed Phase III regulations. EPA has now proposed the Phase III Rule which applies CWA §316(b) to certain facilities not covered by either the Phase I Rule or the Phase II Rule (referred to hereinafter as either the "Phase III Rule" or the "Phase III Regulations"). This proposed Phase III Rule was published in the Federal Register on November 24 , 2004 (Federal Register, Vol. 69, No. 226, November 24, 2004). After examining the November 24, 2004 proposed Phase III Rule, it appears HG&E's Cabot Street Station does not meet any of the criteria to be covered by the Phase III compliance options because it has a total design intake flow less than 50 million gallons per day (mgd). Furthermore, even if the proposed Phase III regulations did appear to cover a facility like Cabot Street Station, they would not be binding on the current draft permit since the proposed regulations have yet to be finalized and are currently subject to change.

In the absence of applicable existing regulations, 40 CFR § 125.90(b) of the Phase II Rule requires that permit limits under § 316(b) be set for smaller existing power plants such as HG&E based on best professional judgment. The regulation states that "Existing facilities that are not subject to requirements under this or another subpart of this part must meet requirements under section 316(b) of the CWA determined by the Director on a case-by-case, best professional judgment (BPJ) basis." Therefore, since the compliance standards from the Phase I and Phase II Rules do not apply to HG&E's Cabot Street Station -- indeed, not even the standards from the proposed Phase III Rule would apply -- EPA is making a § 316(b) determination for this permit on a case-by-case basis based on best professional judgment.

Such a determination is not only consistent with 40 CFR 125.90(b), but it is also consistent with the preamble to the proposed Phase III Rule which indicates, "If a facility is a point source that uses a cooling water intake structure and has, or is required to have, an NPDES permit but does not meet the proposed applicable design intake flow/source waterbody threshold or the 25 percent cooling water use threshold, it would continue to be subject to permit conditions implementing CWA section 316(b) set by the permit director on a case-by-case, best professional judgment basis." (69 Fed. Reg. 68452)

In making determinations under CWA §316(b), EPA must consider environmental/ecological issues, engineering issues, economic issues related to the cost of implementing CWIS technology options, legal issues, and, ultimately, policy issues regarding the final choice of appropriate steps to minimize adverse environmental effects. These issues, as well as the permit conditions arising from the CWA §316(b) analysis, are addressed below.

State legal requirements, including state water quality standards, also may apply to the development of permit conditions for cooling water intake structures. State water quality standards set designated uses for water bodies within the State and specify narrative and numeric criteria that the water bodies must satisfy. The limits in EPA-issued NPDES permits that address cooling water intake structures must satisfy both CWA §316(b) and any applicable State requirements, such as appropriate water quality standards. See CWA §§ 301(b)(1)(C), 401(a)(1) and (d), and 510; 40 CFR §§ 122.4(d), 122.44(d), 125.84(e), and

125.94(e). The Massachusetts Department of Environmental Protection (DEP) has primary responsibility for determining what permit limits are necessary to achieve compliance with state law requirements. Since the NPDES permit that EPA expects to issue to Cabot Street Station will be subject to State certification under CWA §401, the permit will also need to satisfy any DEP conditions of such a certification. See also 40 CFR §§ 124.53 and 124.55. EPA anticipates that the DEP will address its certification of this draft permit before the issuance of the final permit.

5.4.2.2 Biological Impacts of Cooling Water Intake

Section 316(b) of the Clean Water Act addresses the adverse environmental impact of cooling water intake structures at facilities requiring NPDES permits. Adverse environmental impact by cooling water intake structures results from the entrainment of fish eggs and larvae and other aquatic life through the plant's cooling system and the impingement of fish and other aquatic life on the intake screens. Adverse impacts can also result in some areas from a power plant's use of limited public water resources for its cooling system.

EPA is not aware of environmental studies that directly document impingement and entrainment at HG&E's Cabot Street Station. However, EPA has reviewed biological studies of the Holyoke Canal System, the Holyoke Hydroelectric Project and the nearby Connecticut River. EPA has also reviewed the man-made systems in the canal that are judged to have an indirect but important effect on the degree to which impingement and entrainment is expected to exist at the location of the Station's CWIS.

Impingement of organisms occurs when water is drawn into a facility through its cooling water intake structures and organisms too large to pass through the protective screens are unable to swim away. These organisms become trapped against the screens and other parts of the intake structure. The quantity of organisms impinged is a function of the intake structure's location, design, capacity and approach velocity, and the abundance of organisms of various species in the general vicinity of the cooling water intake structures. Intake structure location, including the water depth where the intake opening is located, the speed of water entering the intake structure through the screens, screening mechanisms, fish return practices, and the seasonal abundance of fish and other aquatic life affect the quantity of organisms impinged.

In the case of HG&E's Cabot Street Station, the full-depth fish excluder system installed in the First Level of the Holyoke Canal System reduces or eliminates the presence of adult and juvenile fish at the cooling water intakes. Conseqently, any adverse environmental impacts on fish populations in the vicinity of the Station resulting from impingement at the cooling water intakes at the Cabot Street Station are not likely to be significant. As described in further detail below, the location, design and capacity of the CWIS are major components reflecting the Best Technology Available (BTA) for minimizing adverse environmental impacts from impingement.

As explained above with respect to impingement, the location of the intake can also have a major influence on entrainment. Different types of ecosystems may have greater or lesser concentrations of entrainable fish eggs and larvae. Fish eggs and larvae, along with many other organisms, are entrained when cooling water is drawn into the facility and organisms small enough to fit through the mesh of the intake screens pass through the plant cooling system with the cooling water flow. Organisms that transit the plant cooling system are typically exposed to high sheer stress and other physical impacts as the water moves through the system. This water absorbs high quantities of heat from the plant's condenser, and biocides may be added to the water to prevent biofouling of the cooling system. These stresses (physical, thermal and chemical) are easily sufficient to kill the entrained organisms. Generally, the quantity of entrained organisms is a function of cooling water flow through the plant and the concentration of organisms in the source water that are small enough to pass through the intake structure's screening system.

In assessing the impact of entrainment at the Cabot Street Station, indirect evidence must be used to estimate the degree of probable entrainment losses due to Station operation, because no direct measurement of fish egg and larval entrainment has been conducted for the Station. In this site-specific case, however, enough indirect information is available to evaluate impingement impacts and determine permit limits under CWA § 316(b). In the case of HG&E's Cabot Street Station, any adverse environmental impacts on fish populations in the vicinity of the Station resulting from entrainment at the cooling water intake at the Cabot Street Station are not likely to be significant.

The potential components of BTA to minimize adverse impacts from impingement and entrainment for the Cabot Street Station CWIS are addressed in the following discussion.

Location

The location of the Station in the Holyoke Canal System is judged to be an important factor that reduces the potential for impingement and entrainment at the facility. Rather than being located in the main stem of the Connecticut River, the Station's CWIS is located in the protected, man-made, Holyoke Canal System. Larger life stages of fish, including juveniles and adults, are precluded from being drawn into the Cabot Street Station CWIS by the full-depth fish excluder system installed in the First Level of the Holyoke Canal System.

A brief history and detailed description of the fish excluder system follows. A permanent half-depth louver array was installed in 1992 in the First Level Canal to guide downstream migrants entering the canal system to a bypass structure, which is located adjacent to the canal wall. Concerns about out migrations of bottom orientated American eel and endangered shortnose sturgeon prompted agency recommendations to convert the louver array to full-depth. Modified in 2002, this system is now made up of full-depth (surface to

bottom) steel louver slats, with two inch spacing between each slat, positioned at a 15º angle from the direction of the water current. Timbers were installed between the canal bottom and the steel frame supporting the array of louver slats to prevent fish from passing underneath the fish barrier. This system presents a physical barrier to large fish and a behavioral barrier to smaller fish. The fish excluder system has a wedge-wire ramp at the downstream end of the louver array which leads fish through a 3-foot steel pipe to a sampling facility located adjacent to the Hadley Falls tailrace. Fish are then discharged to the tailrace.

This system functions to exclude fish from entering the canal system from the upstream impoundment. Fish can enter the gatehouse at the furthest upstream point of the canal, as there are no barriers to prevent fish from initially entering the canal. Once in the entrance to the canal, larger fish including juveniles and adults are guided along the fish excluder system and into the tailrace of the Holyoke Hydroelectric Project at Hadley Falls facility located on the main stem of the Connecticut River. Because adult and juvenile fish are expected to be guided away from any contact with the influence of the Cabot Street Station's CWIS, the likelihood of impingement is judged to be extremely low.

The fish excluder system will not, however, directly prevent fish eggs and larvae from entering the canal system. This is because the eggs and larvae are smaller than the two-inch spacing of the fish excluder system. As a result, fish eggs and larvae have the potential to be in the vicinity of the Cabot Street Station CWIS and become entrained. These life stages would have to drift from the upstream impoundment, above the Holyoke Hydroelectric Project, into the canal system, and ultimately to the Station's CWIS to become entrained.

With no site-specific ichthyoplankton data available for an assessment of entrainment impacts, the suitability of the local environment as a spawning area was evaluated to indirectly assess the entrainment risk posed by the Cabot Street Station CWIS. Twenty seven fish species have been recorded in the Connecticut River in the vicinity of the Holyoke Canal System, as reported by the permittee (Table 5.4.2.2 below). Of those, juvenile clupeids (American shad and blueback herring) and gizzard shad accounted for a majority of the fish. Because the habitat immediately upstream of the Holyoke Dam and canal system is characterized as an impoundment, rather than a naturally flowing river or stream, it is not thought to be suitable habitat for the spawning of anadromous fish such as these. Habitat just upstream of the canal is also not judged to be suitable as a nursery area for anadromous eggs and larval fish (see Attachment G - Reissuance of National Pollutant Discharge Elimination System Permit for Holyoke Gas & Electric Cabot Street Power Station (Permit No. MA0001520) - Endangered Species Act Correspondence To USFWS, January 10, 2005). This assessment would make the area immediately upstream of the canal system a poor candidate to act as a spawning area, nursery or "feeder" of drifting anadromous eggs and larvae into the canal system from upstream. In this area the densities of fish eggs and larvae are likely to be low, and therefore be unavailable for large scale entrainment by the Station's CWIS.

Table 5.4.2.2 Species and spawning characteristics of fish found in the vicinity of the Holyoke Canal System on the Connecticut River. HG&E 2004.

Common Name	Scientific Name	Egg/Spawner Type
sea lamprey	*Petromyzon marinus*	nest spawner
American eel	*Anguilla rostrata*	ocean spawner
blueback herring	*Alosa aestivalis*	sink to bottom
American shad	*Alosa sapidissima*	sink to bottom
gizzard shad	*Dorosoma cepedianum*	demersal and adhesive
common carp	*Cyprinus carpio*	adhesive
golden shiner	*Notemigonis crysoleucas*	adhesive
spottail shiner	*Notropis hudsonius*	broadcast spawner
white sucker	*Catostomus commersoni*	adhesive
yellow bullhead	*Ameiurus natalis*	nest spawner
brown bullhead	*Ameiurus nebulosus*	nest spawner
channel catfish	*Ictalurus punctatus*	nest spawner
banded killifish	*Fundulus diaphanous*	in vegetation
white perch	*Morone americana*	demersal and adhesive
striped bass	*Morone saxatilis*	spawn in Hudson River
rock bass	*Ambloplites rupestris*	nest spawner
redbreast sunfish	*Lepomis auritus*	nest spawner
pumpkinseed	*Lepomis gibbosus*	nest spawner
bluegill	*Lepomis macrochirus*	nest spawner
smallmouth bass	*Micropterus dolomieu*	nest spawner
largemouth bass	*Micropterus salmoides*	nest spawner
black crappie	*Pomoxis nigromaculatus*	nest spawner
tessellated darter	*Estheostoma olmstedi*	nest spawner
yellow perch	*Perca flavescens*	adhesive
shortnose sturgeon	*Acipenser brevirostrum*	demersal
Atlantic salmon	*Salmo salar*	nest spawner

Design

The Cabot Street Station has a bar rack over the intake structure and screens, which rotate when the Station is on-line for electricity generation. This bar rack is manually cleaned with a long rake. The Station's intake structure does not have a fish return system. This design

feature, normally a component of BTA, is not judged to be necessary in this specific case, as adult and juvenile fish that first enter the canal system are directed back to the river by the fish excluder system and are not expected to encounter the Cabot Street Station intake. According to the permittee, impingement has not been observed at the intake, although a formalized impingement monitoring program at the intake has never been performed.

As discussed above, anadromous species that migrate upstream and downstream in the mainstem of the Connecticut River adjacent to the canal system and Station are not likely to spawn just upstream of the canal system due to the lack of suitable habitat. The permittee maintains that, except for spottail shiners, the resident fish found in the vicinity of the canal system are either nest spawners, do not spawn in the river, or have demersal and adhesive eggs, meaning eggs that sink to the bottom. The permittee maintains that these early life history strategies drastically reduce the potential of egg entrainment. Based on current information, EPA concludes that this is a plausible characterization. Therefore, in the event that resident species in the vicinity of the Station were to spawn in great numbers, the eggs and larvae produced would not likely be vulnerable to entrainment due to the characteristics of the early life stages of the species in question.

The design of the intake structure further minimizes impacts because the bottom of the circular intake structure is two feet higher than the bottom of the First Level Canal. If any adult or juvenile benthic fish are able to enter the canal system and approach the Station's CWIS, this design feature would likely reduce impingement of these species. In addition, the risk of entrainment of any demersal eggs and larvae that may be present in the canal system would also be reduced by this feature of the CWIS.

Capacity

The "capacity" of the CWIS refers to the volume of cooling water that it withdraws and the velocity at which it does so. The three condenser units, Unit 6, Unit 8, and Unit 9, require non-contact cooling water (NCCW) from the canal system to cool the steam for these units via a heat exchanger. The current permit limits for flow at this location (Outfall 001) are 10.8 mgd average monthly and 23.0 mgd maximum daily. These limits are included in the draft permit, despite the total pumping capacity is now 24.9 mgd with the re-configuration of Unit 9. Increasing the permit flow limits in the absence of increased generation capacity and as a result of the removal of a cooling tower would be inconsistent with the use of the best technology available to minimize adverse environmental effects from the capacity of the cooling water intake structure.

Two specific factors that support EPA's determination that these capacity limits in the draft permit reflect the BTA in this BPJ determination are also benchmarks used by EPA in the new Phase II § 316(b) Rule. First, as a peaking power plant, HG&E's 0.97 % utilization rate for electrical generation is low compared to most power plants. In the final CWA §316(b) Phase II Rule for existing facilities 316(b) Phase II EPA uses a threshold capacity utilization

rate of 15% in determining whether entrainment performance standards apply to an existing Phase II facility (40 CFR 125.94(b)(2)(i)). Facilities with lower capacity utilization rates need only meet impingement mortality performance standard. As explained in the preamble to the Phase II Regulations, "EPA believes that facilities operating below 15% should be subject to less stringent compliance requirements relative to typical base load facilities. The threshold of 15% is based on these facilities' reduced operating levels, low potential for entrainment impacts, and consideration of economic practicability." 69 Fed. Reg. 41616 (July 19, 2004). EPA notes that maintaining a low capacity utilization rate at Cabot Street Station is subject to electricity demands and is not a permit requirement. If capacity utilization increased significantly it might require a reevaluation of the impingement and entrainment impacts from the facility's CWIS. In any event, to minimize environmental impacts, unnecessary circulation of once-through cooling water should be avoided. Therefore, Part I.A.1.d prohibits the discharge from outfall 001 when it is not necessary for electricity generation, maintenance or testing. Since interrupting this discharge of once through cooling water when it is not necessary is achieved only with the suspension of withdrawing canal water through the CWIS, this Part I.A.1.d provision is required to ensure that the CWIS capacity reflects the BTA for minimizing adverse environmental impacts.

The Phase II regulations also excuse facilities using cooling water withdrawn from a freshwater river that have design intake flows less than or equal to five percent of the mean annual flow of the river from the entrainment reduction performance standards, but do require them to meet the impingement mortality reduction performance standards (40CFR125.94(b)(2)(ii)(B)). In general, this reflects a positive correlation between entrainment of aquatic organisms and the volume of water withdrawn at a facility's CWIS, and that a withdrawal volume representing a low percentage of a river's mean annual flow will generally have a relatively small or insignificant effect on the aquatic organisms living in the river. This especially makes sense in this case given that, as discussed above, the canal system and the river near the canal system do not constitute important spawning or nursery habitat. Thus, the relatively low volume of water removed by the Cabot Street Station's CWIS compared to the flow of the Connecticut River is judged to result in a smaller potential for entrainment of aquatic organisms. For comparison, the facility's daily maximum flow limit of 23.0 mgd represents approximately 0.3 % of the annual mean flow of the Connecticut River. Although the permitted intake flow represents a larger percent of the canal flow, it is still no more than 9% of the minimum flow requirements through the canal system. (Attachment C presents these calculations using Connecticut River flow data found in Table 7. The 9% figure represents that fraction of canal flow used by the facility assuming the facility is withdrawing water at the rate of 23.0 mgd and the canal flow is at its regulated minimum of 400 cfs.)

5.2.2.3 316(b) Determination and Summary

This section presents EPA's determination with respect to the application of CWA §316(b), 33 U.S.C. §1326(b), to the NPDES permit for HG&E's Cabot Street Station. CWA §316(b) requires that the design, capacity, location and construction of cooling water intake structures reflect the BTA for minimizing adverse environmental impacts. Entrainment and impingement of aquatic life are the two key adverse environmental impacts potentially associated with cooling water intake structure operations at Cabot Street Station. Based on information available at this time, however, EPA regards the adverse environmental impacts of the CWIS at HG&E Cabot Street Station to be minimal, considering the Station's low capacity utilization rate, the relatively low number of organisms that are likely to have the potential to be entrained, and the small likelihood that any fish are or will be subject to impingement.

No biological monitoring requirements are being proposed as part of this draft permit. Among the factors EPA considered in reaching this decision are the following. First, the adult and juvenile fish excluder system near the entrance to the canal system appears to be performing as expected. Second, fish habitat conditions are generally considered poor in the man-made Holyoke Canal System and this canal system is periodically dewatered, making the establishment of a stable population of fish in the system unlikely. Third, ongoing data collection and environmental studies are being conducted in and around the Holyoke Canal System as part of the FERC Holyoke Hydroelectric Project Relicensing (FERC 2004-073). Results from these studies will be made available to EPA and DEP. These studies should provide useful information for further impingement and entrainment evaluation. Impingement and entrainment studies may be considered in the future, depending on changes to the operation of the Station, in addition to studies concerning the effectiveness of the fish excluder system in the canal, and results from the other environmental studies conducted in and around the Holyoke Canal System.

In making this §316(b) determination, EPA considered the adverse environmental effects from operation of the facility's CWIS and options for minimizing these adverse effects by altering the CWIS's location, design, construction, and capacity. There are a number of technologies, including wet or dry cooling tower systems, that allow cooling water to be reused and could substantially reduce or even eliminate cooling water withdrawals by the Cabot Street Station. Intake flow reductions of this type would proportionally reduce any impingement or entrainment by the facility's CWIS. However, EPA has determined on a qualitative basis that the cost of such technologies would be wholly disproportionate to its benefits at the Station. This conclusion is based on EPA's experience indicating that retrofitting this power plant with closed-cycle cooling towers is expensive and the low capacity utilization rate of the Station as compared to the already low level of entrainment and impingement impacts likely to be resulting from the Station's CWIS.

As described in Section 5.4.2.1, this site-specific determination of BTA for the Cabot Street Station permit is based on best professional judgement (BPJ). This BPJ determination for BTA consists of the following components:

BTA for HG&E Cabot Street Station:

1. The **location** of the intake is a component of BTA. The intake is protected by the full-depth fish excluder system, making it unlikely that juvenile and adult fish are subject to impingement. The intake location in the First Level Canal also minimizes entrainment since anadromous species are not expected to spawn in the Canal or in the impoundment upstream of the canal and resident species in the area produce eggs not generally expected to be subject to entrainment (demersal and adhesive).

2. In the unlikely event that adult and juvenile fish are able to enter the First Level Canal, **design** of the intake structure with the bottom of the circular intake structure two feet higher than the bottom of the First Level Canal is another component of BTA for this facility. This aspect of the design of the intake structure minimizes impacts because the impingement of benthic species is likely reduced and the entrainment of demersal eggs and larvae is likely reduced.

3. Flow limits in the permit which limit the **capacity** of the CWIS are another component of BTA. These limits are 10.8 mgd as a monthly average and 23.0 mgd as a daily maximum. Flows of this magnitude are absent on days when no electricity is being produced, and continuous flows during these down times is precluded in the draft permit by the 10.8 mgd monthly average flow limitation and the prohibition of once-through cooling water use when it is not necessary for electricity generation, maintenance or testing.

6.0 Essential Fish Habitat (EFH)

Under the 1996 Amendments (PL 104-297) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq. (1998)), EPA is required to consult with National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) if EPA's actions, or proposed actions that EPA funds, permits, or undertakes, "may adversely impact any essential fish habitat." 16 U.S.C. § 1855(b). The Amendments broadly define essential fish habitat as, "... those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." 16 U.S.C. § 1802(10). Adverse effect 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.

EFH is only designated for species for which Federal Fisheries Management Plans exist (16 U.S.C. § 1855(b)(1)(A)). EFH designations were approved for New England by the U.S. Department of Commerce on March 3, 1999.

Of the 59 species that are of concern to the National Marine Fisheries Service (NOAA Fisheries) in the Northeast Region (New England and Mid-Atlantic), Atlantic salmon is the only species of concern in the Connecticut River. Although the last remnant stock of Atlantic salmon (*Salmo salar*) indigenous to the Connecticut River was believed to have been extirpated over 200 years ago, an active effort has been underway throughout the Connecticut River system since 1967 to restore this historic run (HG&E/Massachusetts Municipal Wholesale Electric Company [MMWEC], 1997).

EPA generally characterizes the man-made canal where the Cabot Street Station is located as poor or marginal habitat for life stages of Atlantic salmon. In addition, the louver panel assemblage that spans the entire depth and width of the canal (fish excluder system) is thought to be an effective physical barrier which prevents adult and juvenile fish, including Atlantic salmon, from entering the canal. A complete description of the fish excluder system can be found under the "location"subheading in Section 6.2.2 of this fact sheet.

Because of the poor habitat in the Holyoke Canal System, where the Station's water intake and discharge are located, and the exclusion of key life stages from the influence of the intake and discharge of the Cabot Street Station by the full-depth fish excluder system, potential impacts to Atlantic salmon from Station operation are judged by EPA to be minimal. For a detailed discussion of EPA's assessment, see Attachment E - (Reissuance of National Pollutant Discharge Elimination System Permit for Holyoke Gas & Electric Cabot Street Power Station (Permit No. MA0001520) - Essential Fish Habitat Correspondence To NOAA Fisheries, January 10, 2005). Further, the draft NPDES permit requirements restrict the thermal and chemical discharge from the Station to prevent any potentially degrading influence from moving through the entire canal system and reaching the main stem of the Connecticut River.

Based on the relevant information examined, EPA finds that adoption of the draft permit will satisfy Essential Fish Habitat requirements. As the federal agency charged with authorizing the discharge from this facility, EPA is consulting with NOAA Fisheries under section 305(b)(2) of the Magnuson-Stevens Act (Attachment E) to solicit any recommendations that NOAA may have to enable the draft permit to better protect the EFH for Atlantic salmon in the Connecticut River. This consultation will be completed before the permit is finalized.

7.0 Endangered Species Act (ESA)

As the federal agency charged with authorizing the discharge from this facility, EPA is in communication with NOAA Fisheries and the United States Fish and Wildlife Service (USFWS) as part of EPA's consultation responsibilities under section 7 (a)(2) of the Endangered Species Act (ESA) for potential impacts to federally listed species.

EPA has structured the proposed limits to be sufficiently stringent to assure that Water Quality Standards and 316(a) variance provisions will be met, both for aquatic life protection and human health protection. The effluent limits established in this permit ensure the protection of aquatic life and maintenance of the receiving water as an aquatic habitat. EPA finds that adoption of the proposed permit is not likely to adversely affect any threatened or endangered species or its critical habitat.

Specifically, the single federally listed endangered fish species in the Connecticut River in the vicinity of the Station is the shortnose sturgeon (*Acipenser brevirostrum*). The shortnose sturgeon was placed on the original endangered species list in 1967 [32 Fed. Reg. 4001 (1967)] by the USFWS. Currently, NOAA Fisheries has authority over this species under Section 4(a) (2) of the ESA, 16 U.S.C. Section 1533 (a) (2). At present, there are 20 recognized distinct population segments [63 Fed. Reg. No. 242, pp. 69613-69615, December 17, 1998], which all remain listed as endangered.

EPA conducted a review of the physical and biological characteristics of the Holyoke Canal System and surrounding areas in the near-by Connecticut River. The Federal Energy Regulatory Commission's (FERC) Final Environmental Impact Statement for the Holyoke Hydroelectric Project, published in July of 1999, contained environmental information for the near-by Holyoke Canal System, where the Cabot Street Station is located. This document was used to assess any potential ESA impacts from the Station. In addition, EPA considered a determination made by NOAA Fisheries, Northeast Region, regarding that agency's assessment of potential impacts to the shortnose sturgeon by a water user (Holyoke Number 4 Hydroelectric Project) that is adjacent to the Cabot Street Station in the Holyoke Canal System (NOAA Fisheries Correspondence To City of Holyoke Gas & Electric Department, October 28, 2004). In this letter, NOAA Fisheries states "...no shortnose sturgeon are expected to occur in the canal system..." This letter goes on to say that no other federally listed or proposed threatened or endangered species under the jurisdiction of NOAA Fisheries are known to exist in the Holyoke Canal System. Based on the relevant information examined, EPA finds that adoption of the proposed permit is not likely to adversely affect the shortnose sturgeon or its critical habitat. EPA is seeking concurrence with this finding from the NOAA Fisheries Northeast Region (Attachment F - Reissuance of National Pollutant Discharge Elimination System Permit for Holyoke Gas & Electric Cabot Street Power Station (Permit No. MA0001520) - Endangered Species Act Correspondence To NOAA Fisheries, January 10, 2005).

The only other federally listed species in the vicinity of the Station is the dwarf wedge mussel (*Alasmidonta heterodon*). The mussel was listed by the USFWS in 1990. EPA has reviewed several biological surveys of the Holyoke Canal System for information on the presence and potential habitat of the dwarf wedge mussel (D. G. Smith, 1996; HG&E, Fall 2002 and 2003). While no dwarf wedge mussels have been documented in the canal, a Threatened and Endangered Species Protection Plan (July 2002) has been implemented for the canal as part of the Holyoke Hydroelectric Project FERC relicensing effort. This plan includes measures to preserve mussel habitat in the canal, such as the establishment of a minimum flow in the canal, scheduling of canal drawdowns for maintenance during October rather than in the hot summer months, the construction of experimental weirs in the canal to retain critical wetted perimeter during these drawdowns, and periodic monitoring of mussel populations.

Provisions of this draft NPDES permit for Cabot Street Station are not expected to conflict with any aspect of the Holyoke Project Threatened and Endangered Species Protection Plan. Based on this assessment, EPA finds that adoption of the proposed permit is not likely to adversely affect the dwarf wedge mussel or its critical habitat. EPA is seeking concurrence with this finding from USFWS (Attachment G - Reissuance of National Pollutant Discharge Elimination System Permit for Holyoke Gas & Electric Cabot Street Power Station (Permit No. MA0001520) - Endangered Species Act Correspondence To USFWS, January 10, 2005).

8.0 Monitoring Requirements

The effluent monitoring requirements have been established to yield data representative of the discharge under authority of Section 308(a) of the CWA as required by 40 CFR 122.41 (j), 122.41 (j)(4), (5), 122.44 and 122.48.

In addition, three thermal plume characterization sampling events are required in the vicinity of outfall 001 as specified in Part I.A.10 of the draft permit. This temperature data collection activity is necessary to verify that the thermal discharge from the Station's outfall 001 continues to meet the relevant water quality standards and the §316(a) variance.

All monitoring results from sampling in or near the Holyoke Canal System as required by the FERC licence for the Holyoke Hydroelectric Project (FERC No. 2004), including monitoring required by the Threatened and Endangered Species Protection Plan, shall be made available for EPA and DEP inspection during the next NPDES permit renewal process for Cabot Street Station.

9.0 State Certification Requirements

EPA may not issue a permit in the Commonwealth of Massachusetts unless the Massachusetts Department of Environmental Protection (DEP) either certifies that the effluent limitations contained in the permit are stringent enough to assure that the discharge

will not cause the receiving water to violate State's Water Quality Standards or waives this certification. The staff of the DEP has reviewed the draft permit. EPA has requested permit certification by the state pursuant to 40 CFR 124.53 and expects that the draft permit will be certified.

10.0 General Conditions and Definitions

The remaining general and special conditions of the permit are based on the NPDES regulations, 40 CFR Parts 122 through 125, and consist primarily of management requirements common to all permits.

11.0 Comment Period, Hearing Requests, and Procedures for Final Decisions

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to **Jonathan Britt, the U.S. EPA, One Congress Street, Suite 1100, Mail Code CIP, Boston, Massachusetts 02114-2023 and Paul Hogan, Department of Environmental Protection, Division of Watershed Management, 627 Main Street, 2nd Floor, Worcester, MA 01608.** Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. Public hearings may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates a significant public interest. In reaching a final decision on the draft permit, the Regional Administrator 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 the public hearings, 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 a request for a formal evidentiary hearing to reconsider or contest the final decision. Requests for formal evidentiary hearings must satisfy the Requirements of 40 CFR §124.74. In general, the reader should reference 40 CFR 124--PROCEDURES FOR DECISION MAKING, Subparts A, D, E and F for specifics relative to this section.

12.0 EPA Contact

Documents used in the preparation of this draft permit and fact sheet will be included in an administrative record available for review at EPA's office during the public comment period. Arrangements for review of the administrative record may be made, and additional information concerning the draft permit may be obtained, between the hours of 9:00 A.M. and 5:00 P.M. (8:00 A.M. and 4:00 P.M. for the state), Monday through Friday, excluding holidays, by contacting:

Damien Houlihan, Team Leader
Industrial Permits Branch
Office of Ecosystem Protection
U.S. Environmental Protection Agency
One Congress Street, Suite 1100, Mailcode CIP
Boston, Massachusetts 02114-2023
Telephone: (617) 918-1586

August 9, 2005
Date

Linda M. Murphy, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency

* Comments should be addressed to both Jonathan Britt and Paul Hogan, not Linda M. Murphy.