Table 1 Massachusetts Department of Environmental Protection Comments and Responses (November 7, 2017)

Comment	Response
In accordance with performance standards under 310 CMR 10.57(4) and 310 CMR 10.58, what mitigation measures will be implemented for the 22,800 s.f. of Bordering Land Subject to Flooding and 17,000 s.f. of Riverfront Area that are impacted from this project?	Mitigation measures to be implemented for the Bordering Land Subject to Flooding and Riverfront Area include the design of compensatory flood storage; use of stormwater best management practices (BMP's) including installation of haybales and silt fences as necessary, redirecting stormwater runoff back into the adjacent ground, and limiting the use of bituminous concrete paving to areas directly around the caisson and electrical building; and site restoration measures such as loaming and seeding.
Include a plan identifying those areas of the project that are within Wetland Protection Act jurisdiction.	A plan identifying areas of the project within Wetland Protection Act jurisdiction has been included as Appendix I.
What stormwater Best Management Practices will be utilized? Include calculations demonstrating compliance with stormwater standards.	Stormwater BMP's will include haybales and silt fence as necessary, redirecting stormwater runoff back into the adjacent ground, and limiting the use of bituminous concrete paving to areas directly around the caisson and electrical building. To comply with CMR 10.05, the Massachusetts Stormwater Handbook was reviewed to find pertinent design criteria. The following design criteria was identified: • Stormwater management systems (SMSs) shall be designed so that the post-development peak discharge rates do not exceed pre-development peak discharge rates for the following storm events: 2-Year/24-Hour, 10-Year/24-Hour, and 100-Year/24-Hour • The annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. • SMS shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). • Required water quality volume equals 1.0 inch of runoff times the total impervious are of the pond-development project site for a discharge within a Zone II or Interim Wellhead Protection Area. • For infiltration of stormwater runoff from land uses in a Zone II of public water supply, at least 44% of the total suspended solids must be removed prior to discharge to the infiltration structure. • Infiltration of runoff from a metal roof that is located within the Zone II of public water supply requires pretreatment by means of a BMP capable of removing metals, such as a sand filter, organic filter, filtering bioretention area or equivalent. • Infiltration systems must be installed in soils capable of absorbing the recharge volume and must be able to drain fully within 72 hours. In addition, there must

Comment	Response
	be at least a two-foot separation between the bottom of the infiltration structure and the seasonal high groundwater table. • Infiltration systems must be setback 100 feet from private well, 50 feet from septic systems, outside Zone I for public wells, 50 feet from surface waters, and 10 feet from property line Preliminary stormwater calculations have been performed for the preparation of the DEIR. As design is further developed, final stormwater calculations will be included in the FEIR.
How many lateral screens will be installed?	There will be 5 lateral screens installed in the radial collector well.
Will the existing raw water main from Millvale Reservoir to Kenoza Lake be replaced as a part of this project?	The existing raw water main from Millvale Reservoir to Kenoza Lake will not be altered or replaced as part of the project scope.
The EIR should not be submitted until after the prolonged pumping test has been completed.	The City of Haverhill submitted an Approval to Site Source (BRP WS17) application on May 25, 2018 to evaluate whether the well site is suitable for public water supply and review of the design for a prolonged pumping test. However, MEPA has requested that the permit to construct and test the Merrimack River radial collector well typically issued from the MassDEP Drinking Water Program not be issued until the Environmental Impact Report (EIR) has been submitted and approved. At the same time, the well cannot be constructed nor pump tested until MEPA has reviewed the potential impacts and mitigation measures for construction. Therefore, it is not possible to perform the prolonged pumping test prior to submitting the EIR.
MassDEP believes that Water Management Act approval is required. The application must be submitted to MassDEP when the Source Final Report permit application is submitted.	We will be preparing applications for Water Management Act approval for Phases I and III of the project. These filings will be submitted to MassDEP when the Source Final Report (BRP WS19) application is submitted.
MassDEP will want to review the resulting data from the pumping tests as part of the Approval to Site Source (BRPWS17) permit application.	Acknowledged. Once results are obtained they will be sent to MassDEP for approval under a BRP WS 19, Approval of Pumping Test Report.

Table 2 Lurie Friedman Comments and Responses (November 13, 2017)

Comment	Response
The ENF does not adequately consider the comparative environmental impact of withdrawing 7.0 MGD from an untapped aquifer and must be compared to alternatives of adding a back-up source of lesser volume or the alternative of doing nothing.	An analysis of alternative water sources is illustrated in Section 4 of the DEIR report. It evaluates alternative options including interconnections with neighboring communities, connection to the Massachusetts Water Resources Authority (MWRA), reactivating former sources, seeking new groundwater sources, and a direct intake from the Merrimack River.
The ENF does not adequately consider the comparative environmental impact of direct withdrawal from the Merrimack River.	A direct intake from the Merrimack River was not further evaluated for environmental impacts. This alternative was evaluated in a study performed in 2000 by Earth Tech which in included in Appendix D.
The ENF does not adequately explain the contention that a new supply at such a massive volume is necessary. The need is unclear why an additional fully redundant new source needs to be added to this already diverse system.	A source of equal yield will ensure a supplemental source if needed in the event of a catastrophic event such as contamination of the existing supplies or impacts from weather or climate events. It will also extend the life of and relieve the pressure on the existing sources. This will reduce the need to utilize Crystal Lake and Millvale Reservoir which will stabilize water levels in these sources and reduce environmental burden.
The city conceded during the MEPA site review on November 3, 2017, that it was contemplating selling approximately 300,000 gallons per day from this Project to the town of Plaistow, NH. The Proponent must be required to describe further this aspect of the Project and detail its anticipated arrangements for sale and distribution of the water to Plaistow and any other municipality or private body and the intended use of the monetary proceeds.	Plaistow negotiated an agreement to join the Southern New Hampshire Regional Water Project to obtain their drinking water from Manchester Water Works as part of a plan by New Hampshire Department of Environmental Services Therefore, Plaistow will not be seeking to purchase water from Haverhill.
Explain how much water is expected or intended to be withdrawn from this Project and for what purpose and where this proposed source would fit in the City's water source rotation.	It is the intent that the proposed supply be used to replenish the volume of Kenoza Lake when water from the Merrimack River is plentiful such as winter and early spring. Additionally, the new source can be used when maintenance is required on the existing sources. Currently any required maintenance that requires the lowering of water levels in any of the sources can only be accomplished when water levels in the remaining sources are high and demands are low.
Describe, in detail, how the proposed well would impact the Merrimack River and if the well would be capable of collecting and transmitting of the volume of water claimed.	An analysis of the Merrimack River was performed as a part of the BRP WS 17 application with MassDEP to evaluate the impacts of the Merrimack River flows which can be found in Appendix H of Appendix A. In summary, by using stream screening criteria to determine the flow rate of the Merrimack River at the project site, withdrawal of the volume desired as a part of the project was determined to have a de minimis effect on the total flow rate of the river.

Comment	Response
	Impacts to resource areas including wetlands, flood zones, priority habitats of rare species, and historical and archaeological resources are described in detail in Section 5.2 of the DEIR. Yield potential was based on evaluation from two independent firms using site geology and data from a five day constant rate pumping test conducted by Wright-Pierce in April 2017. Using this data, the estimated yield could be between 3.9 and 5 million gallons per day (MGD) potentially up to 10 MGD. Without testing of the full scale proposed well, a more narrowed range cannot be inferred.
Describe when the Manchester, NH radial well was constructed, why it is not live and when it is scheduled to go live.	A new radial collector well was developed, designed, and was successfully permitted for 7 MGD by Wright-Pierce and was constructed by Layne in 2017. The well will eventually serve as a public water supply source for the Manchester Water Works (MWW) in Hooksett, New Hampshire. The well is anticipated to go online by late 2023 after the construction of a new water treatment plant.
Explain how the technology has worked elsewhere, with all side effects and impacts fully described, and set forth why it is believed that it is likely to work as intended.	Approximately 200 high-yielding radial collector wells have been installed and are active across the United States. About 170 of these are used by municipalities for potable water. The majority of these radial collector wells adjoin large rivers like the Merrimack River including one in Manchester, NH. The Haverhill radial collector well is proposed to be of similar depth, yield, and construction as the Manchester, NH radial collector well. It is believed to work as intended due to extensive hydrogeological explorations and careful selection of the site due to preferable conditions.
How would turning off the pump prevent the passive collection of polluted water and how could polluted water once collected into the well be safely removed from the well.	The passive collection of water through the screens will be regularly monitored and tested for water quality in accordance with MassDEP requirements and any further treatment will be performed at the existing Haverhill Water Treatment Plant.
The ENF is silent as to the anticipated scope and schedule of maintenance of the proposed well.	Maintenance of radial collector wells requires periodic mechanical cleaning and redevelopment of the laterals. Rotary cleaning with high pressure water or nitrogen and the application of various well cleaning acids are common approaches to redevelop the laterals. Predicting the maintenance schedule of the well in a meaningful way is nearly impossible without constructing and pump testing the well to obtain final water quality from the well resulting in the mixing of infiltrated surface water and groundwater. Generally, the timeframe for cleaning radial collector wells ranges from 5 to 15 years or more.

Comment	Response
In the ENF, under the Land Section (II)(B), the question of whether "any part of the project site has been in active agricultural use in the last five years" was answered no. However, the eight-acre parcel has been actively used as a grazing pasture and for agricultural haying within the last five years. The ENF, therefore, fails to answer how many acres of land in agricultural use will be converted to nonagricultural use. Please note that under M.G.L.c.79 §5B, the City Council must hold a hearing to determine if a non-agricultural site is available.	Personal agricultural applications are not considered active agricultural use for the purposes of the Environmental Impact review. The land is currently classified as nonagricultural use.
Under the Land Section, (II)(E), the ENF indicates that part of the project site is currently subject to a conservation restriction, preservation restriction, agricultural restriction, or watershed preservation restriction. However, ENF fails to answer whether the Project involves the release or modification of any restriction, the description of any restriction and the impacts on the Project. Any restriction and any release or modification of such restriction must be described in detail.	The site does not require the release or modification of any land restriction including but not limited to conservation, preservation, agricultural, or watershed restrictions.
Determine the impact of the construction of the proposed well and how the withdrawal and removal of 7.0 MGD from the river would impact the habitat and the two species of Sturgeon.	The completed laterals will be set 40-50 feet below the river bottom. Construction of the proposed well does not include work within the river itself therefore there will be no effect on the habitat of the Atlantic and Shortnose Sturgeon.
Survey the property for the Eaton's beggars tick and determine the potential impact to the herb and its habitat.	According to the Natural Heritage and Endangered Species Program (NHESP), “The well infrastructure is located very close to habitat for the Eaton's Beggar-Tick, but all work is shown above mean annual high water (upland work)… so appears to be located outside of any habitat of concern."
Obtain a survey in accordance with the Massachusetts Endangered Species Act for each of the three species identified. Identify what permits are required for the Massachusetts Endangered Species Act designation and the recent Federal designation of the area.	A Massachusetts Endangered Species Act (MESA) permit will be filed prior to the construction of the well caisson and transmission main.
Zone I is defined in 310 CMR 22 as "the protective radius around a public well or Wellfield." It specifies that "for Public Water System wells with approved yields of 100,000 gpd or greater, the protective radius is 400 feet." Given that this Project anticipates a yield of up to 7 MGD and utilizes horizontal screens radiating from the base of the wellhead, it is unclear whether the 400 feet radius would apply or if the horizontal screens would be considered "infiltration galleries," in which case a radius exception may apply, rendering the Zone I radius to 250 feet from the beginning point of each screen.	The intent is the City will own the complete Zone I protection radius of the well. The proposed site subdivision is shown in **Appendix G.**

Comment	Response
During the MEPA site review, the Proponent represented that the well is a passive collection system where water flows into the horizontal screened radial pipes and estimated that approximately two-thirds of the water collected would come from the river and that the remaining third would be collected from the river bank. The proper zones need to be determined and their impacts on surrounding land assessed.	Due to the location of the proposed well on the riverbank, two thirds of the lengths of the laterals will sit below the riverbed while one third of the length will be below the riverbank. The Zone I protection radius is demonstrated in Appendix G.
If the Zone I or II were to prevent the current use of the Property for horse-grazing or vegetable cultivation, that impact must be addressed.	The intent is the City will own the complete Zone I protection radius of the well. The proposed site subdivision is shown in **Appendix G.** Horse grazing and vegetable cultivation will not be permitted within the parcel to be owned by the City and Zone I. Establishment of a Zone II protection will not prevent the use of the property owned by Ms. Hill for horse-grazing or vegetable cultivation.
Use of the boat ramp and types of boats permissible must be addressed and whether the entire riverfront bank would still be accessible and free for walking both on Ms. Hill's field edge riverfront and along the low-tide shoreline.	Per the proposed site subdivision is shown in **Appendix G**, the City will own the complete riverfront area. A 15-foot accessway to the river font has been provided to Ms. Hill on the northeast corner of the lot as shown on the proposed site plan.
If the Zone I radius is determined to be 250 feet, that radius would dissect the pasture which has been, and currently is, used for horse grazing. The ENF did not note this use, nor did it address whether the Zone I restrictions would prevent the grazing of horses or other livestock, nor did it consider whether this agricultural use would require additional permitting or other mitigating steps prior to construction and use of a public water supply source on the Property.	The intent is the City will own the complete Zone I protection radius of the well. The proposed site subdivision is shown in **Appendix G.** Horse grazing and other livestock will not be permitted within the parcel to be owned by the City and Zone I.
Construction plans for the well should address the full scope of the Project, including the process of digging up and removing the dirt and soil expected to be excavated, whether the soil will need to be drained and if so where that drainage would take place, where the excavated dirt and soil will be deposited, how many pieces of equipment will be required to be on site and their respective size, where materials will be staged, what materials will be placed into the ground and under the river and the level of disruption to the Property during the entire wellhead construction.	A full scope of excavation, dewatering procedures, and construction vehicle storage per project phase is described in detail in Section 6 of the DEIR. A figure showing the approximate location of the proposed development discharge lagoon is shown in Figure 10 of Appendix A.
With respect to the main line, details are similarly lacking both in terms of its impact on Ms. Hill's property and regarding the use of public environmental space. The pipe is expected to traverse two small streams. The ENF leaves the plan for these crossings open, "the pipe will be installed and anchored on the outside of the bridges that cross the streams or be installed beneath the stream bed."	Construction of the transmission raw water main will be completed in Phases 2 and 3 of the project. A detailed description of the construction mitigation is described in detail in Section 6 of the DEIR. The transmission main will cross East Meadow River in two locations. Preliminary design plans have been included in Appendix G.

Table 3 Natural Heritage and Endangered Species Program (November 16, 2017)

Comment	Response
No alteration to the soil, surface, or vegetation associated with the proposed Project shall occur on the property until the Division has made a final decision pursuant to 321 CMR 10.18.	No alteration to the soil, surface, or vegetation associated with the proposed project will occur on the property until NHESP has made a final decision.
File MESA 321 CMR 10.00 Permit	A Massachusetts Endangered Species Act (MESA) permit will be filed prior to the construction of the well caisson and transmission main.
Army Corps needs to be contacted directly if project qualifies for self-verification.	United States Army Corps of Engineers (USACE) permits will be filed prior to the construction of the well caisson and transmission main.

Table 4 Massachusetts Historical Commission (Various Dates)

Date	Comment	Response
11/9/2017	The MHC requests that an archaeological reconnaissance survey (950 CMR 70) be conducted for the project. A State Archaeologist's Permit (950 CMR 70.03) is required to be obtained for the investigation. The survey should be conducted by a qualified professional archaeological team with experience in the Merrimack River Valley region of Massachusetts.	The Public Archaeology Laboratory, Inc (PAL) performed a field investigation in November 2018.
12/15/2016	Should any unknown submerged cultural resource be encountered during the project, the project's sponsor is required to take steps to limit adverse effects and notify the Board of Underwater Archaeological Resources and other appropriate agencies immediately.	If any unknown submerged cultural resource is encountered during the project, steps will be taken to limit adverse effects and Board of Underwater Archaeological Resources and other appropriate agencies will be notified immediately.
12/20/2016	Submit a scaled existing and proposed conditions project plans, sized no larger than 11" x 17" to MHC for review and comment. Plans should include pipeline routes, pump station location, equipment and materials storage and staging areas.	The proposed site plans are shown in **Appendix G.** The archeological field investigation finding was filed with MHC under permit 3859. Based on the findings of the intensive field investigation, the sites were not considered significant or eligible for listing in the national register of Historic Places. No further archaeological investigations were recommended.
12/20/2016	Submit a copy of the ENF for MHC review and comment when it is filed with the MEPA office.	A copy of the ENF was submitted for Massachusetts Historical Commission review.