STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: September 18, 2019
SUBJECT: Design and Engineering Services During Construction for Quinapoxet Dam Removal
Milone & MacBroom, Inc.
Contract 7347

COMMITTEE: Water Policy & Oversight

___ INFORMATION
__X__ VOTE

Michele S. Gillen
Director of Administration

John J. Gregoire, Program Manager, Reservoir Operations
Beth Card, Director, Env. and Regulatory Affairs
Preparer/Title

David W. Coppes, P.E.
Chief Operating Officer

RECOMMENDATION:

To approve the recommendation of the Consultant Selection Committee to award Contract 7347, Design and Engineering Services During Construction for Quinapoxet Dam Removal, to Milone & MacBroom, Inc., and to authorize the Executive Director, on behalf of the Authority, to execute said contract in an amount not to exceed $425,442.07 for a contract term of 24 months from the Notice to Proceed.

BACKGROUND:

The Quinapoxet Dam is an earthen embankment and stone masonry horseshoe dam that spans the Quinapoxet River from bank to bank. The Quinapoxet Dam was built in 1905 when the Wachusett Reservoir was constructed as part of an effort to straighten and widen the riverbed to drop sediment before entering the reservoir. The Dam was intended to prevent upcutting of the channel. The dam is owned by the Commonwealth of Massachusetts and is under the care and control of the DCR Division of Water Supply Protection, which is funded by MWRA.

The Department of Fish and Game, Division of Ecological Restoration (DER) has documented naturally reproducing coldwater fishes in the Quinapoxet River and Wachusett Reservoir, and has done analysis on what the potential would be if habitat above the dam were accessible. DER has quantified the habitat available for salmon in the Stillwater (now available) and the Quinapoxet (available after dam removal). Dam removal could increase the salmon population and establish a highly valued fishery.

The Quinapoxet Dam is in need of repair and will require continued maintenance and regulatory inspection into the future for a dam of questionable service to the present-day reservoir. When the reservoir was created, this dam was completed as part of the lower river channel widening and collectively served to mitigate sediment impact on the reservoir. This riverine system has stabilized over the last 115 years. MWRA has modified the reservoir elevation to a stable operating band to eliminate highs and lows in elevation. MWRA also has a sophisticated real-time water quality monitoring system in place. Additionally, removal of obsolete dams are finding favor in the environmental community for the substantial benefits that result.

This dam falls under the jurisdiction of the Massachusetts Office of Dam Safety. It is listed as a Significant Hazard class dam, mainly due to public infrastructure downstream (MWRA's Oakdale power station and the 3-arch bridge on Thomas Street) and the potential for that infrastructure to be adversely impacted should the Quinapoxet Dam fail. A 2007 inspection report included a *Fair* ranking and noted that significant operational and maintenance deficiencies existed which, under unusual loadings (e.g., excessively high Quinapoxet River flows) could further degrade the dam. The estimated capital repair costs are in the range of $200,000 to $400,000.

MWRA has the in-house capacity and experience in managing a wide range of consultant and contractor procurements, as well as managing construction and ESDC. DCR does not have this capability and depth of experience. MWRA has set precedent for managing other construction contracts for DCR that were deemed important to the mission of the MWRA/DCR reservoir system.

In addition, MWRA understands the potential environmental benefit associated with reproducing a cold water fishery (i.e., restoring a salmon population formerly impacted by creation of the dam). This project is consistent with the goals of the Executive Office of Energy and Environmental Affairs and the Department of Fish and Game, and it makes sense to support their efforts.

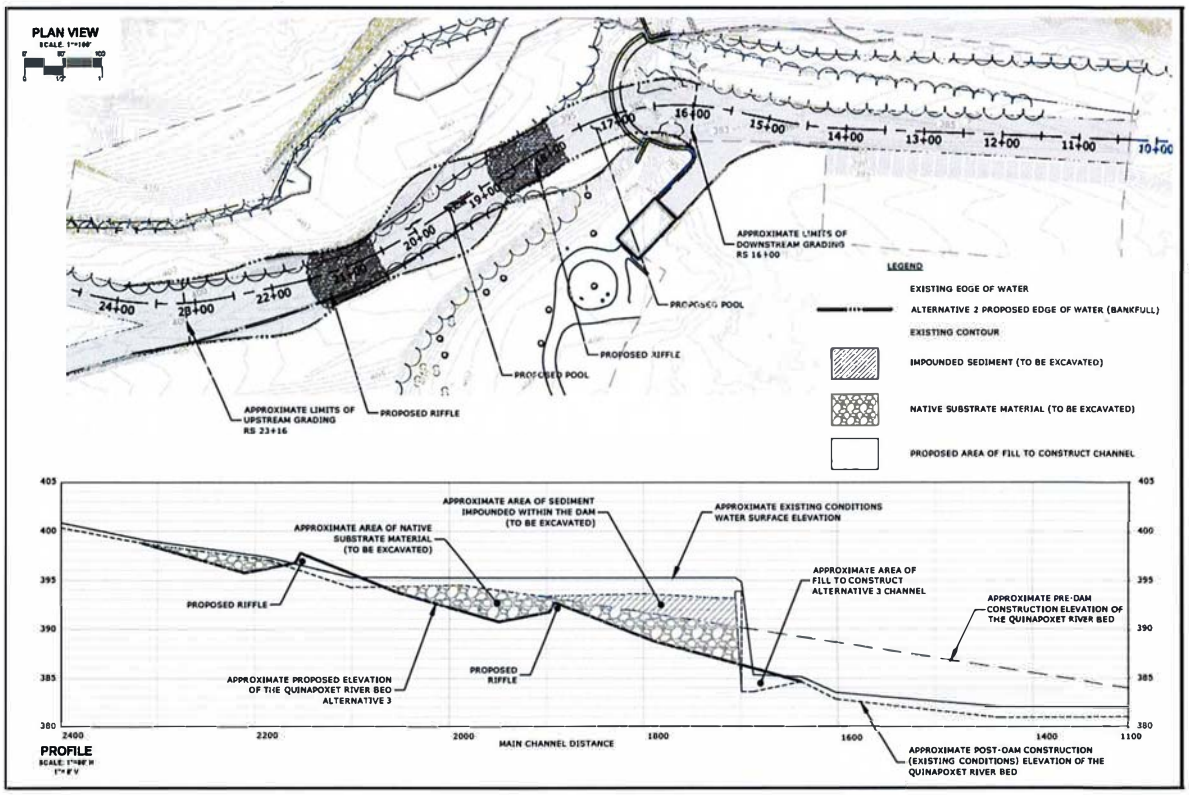
Over the last several years there have been many meetings between MWRA, DCR, and DER to discuss the various elements of removing the Quinapoxet Dam. In 2016, the feasibility of removing the dam was studied by Milone & MacBroom, Inc., under contract to DER, and under the direction of DER, MWRA and DCR. The feasibility study resulted in the identification of three preliminary conceptual designs. At MWRA's request, an additional structural assessment was conducted in 2017 to further inform advancing engineering design. In the meantime, MWRA has secured one grant for $40,000 and is currently pursuing another grant for $120,000 to support the design and permitting work. DER is the source of both grants. MWRA staff have developed the Scope of Work for a consultant contract for Design, Bid Support, and Engineering Services During Construction.

The recommendation from the Consultant Selection Committee is to support an award that includes design, permitting and ESDC for the Quinapoxet Dam Removal, which is described in detail below. This procurement does not include construction to remove the dam. At this time, MWRA has not made any commitment to fund the construction, which has been estimated to cost approximately $1.2 million. MWRA, DCR, and DER intend to seek state and federal construction grants. Given that dam removal is a priority for EEA, environmental groups, and sport fishing associations, strong support for securing such funds is anticipated.

DISCUSSION:

Contract 7347 builds on prior project phases and provides a refinement of the conceptual design that was previously developed. The project will address outstanding structural and constructability questions related to maintaining downstream water quality, to establish engineering design plans to support all required environmental and historic permitting. This will include participating in project management and consultation meetings with MWRA, DER, DCR, and regulatory agencies. An architectural rendering of the final design and anticipated riverine conditions proximal to the dam removal at project completion will also be required.

The project team identified a likely conceptual design option from the 2016 feasibility study to pursue further. This option will see removal of much of the dam, very limited river channel work downstream of the dam, and establishment of a regraded area with riffles and pools to mimic a natural regime for fish passage (image below). Emphasis on this option was included in the RFQ/P and then further highlighted at the pre-bid site visit.



Conceptual Design

Concerns that must be addressed in more detailed design relate to ensuring the structural integrity of proximate MWRA water supply infrastructure during and after construction, and sediment management to ensure water quality can be protected during construction and long-term post dam removal. The design must also consider MWRA operational practices, such as the transfer of water from Quabbin to Wachusett Reservoir. The Quabbin Aqueduct discharge flows are as much as 300 MGD and create an attraction flow for fish, which must be mitigated. These considerations

will have implications for both the design and construction approach.

Procurement Process

On May 1, 2019, MWRA issued a one-step Request for Qualifications Statements/Proposals (RFQ/P) that was publicly advertised in the Central Register, Boston Herald, Banner Publication and El Mundo, with notice sent directly to 29 firms. Thirty-eight firms requested the RFQ/P documents.

The RFQ/P included the following evaluation criteria: Cost – 25 points; Qualifications & Key Personnel – 25 points; Experience, Past Performance on Similar Non-Authority Projects, Past Performance on Authority Projects – 20 points; Technical Approach – 20 points; and Capacity/Organization and Management Approach – 10 points.

A pre-proposal conference and site visit was held on May 23, 2019, and ten firms attended. MWRA received three proposals on July 12, 2019, from GZA GeoEnvironmental, Inc., Milone & MacBroom, and Pare Corporation. The proposed costs and levels of effort by the three firms are as follows:

PROPOSER	PROPOSED CONTRACT COST	LEVEL OF EFFORT
Engineer's Estimate	*$250,000.00*	
Milone & MacBroom, Inc.	$425,442.07	3035.5 hours
Pare Corporation	$469,790.42	3072.5 hours
GZA, Inc.	$577,316.57	3898.5 hours

The selection committee reviewed, scored, and ranked the proposals as follows:

PROPOSER	TOTAL POINTS	*ORDER OF PREFERENCE/ TOTAL SCORE	FINAL RANKING
Milone & MacBroom, Inc.	444	6	1
GZA, Inc.	428	9	2
Pare Corporation	309	15	3

*Order of Preference represents the sum of the individual Selection Committee members' rankings where the firm receiving the highest number of points is assigned a "1," the firm receiving the next highest number of points is assigned a "2," and so on.

Milone & MacBroom presented very strong qualifications, experience, past performance, technical approach and capacity. The Milone & MacBroom team will be led by a project manager/sediment specialist with significant, recent experience working on dam rehabilitation and deconstruction efforts in Massachusetts and across the country. The project manager is supported by a highly skilled group of professionals including a structural engineer, permitting specialist, and historic architecture experts all with decades of experience.

Notable in Milone & MacBroom's recent experience and past performance is engineering and design services provided to New York City DEP. This work was done in accordance with the

City's watershed management strategy in order to aid in reducing turbidity in the water supply reservoirs in the Catskills (NYC, like the MWRA, has EPA-mandated filtration avoidance requirements). In addition, Milone & MacBroom's proposed project manager recently completed the design and permitting for the Holmes Dam Removal in Plymouth, MA. This project included many important components, which mirror those in this project. References for work on similar projects were very favorable; NYC-DEP ranked the firm's performance as excellent. Milone & MacBroom's cost is the lowest of the three proposals and includes the highest level of effort of the three firms for the permitting and final design task. Due to complexity of the design and permitting for this work, staff are of the opinion that Milone & MacBroom's estimate appropriately reflects the costs and hours required for this project.

GZA also presented very strong qualifications, experience, and past performance. Its proposal included a thoughtful and comprehensive technical approach that demonstrated a clear understanding of the project. The staff proposed were well qualified with valuable, relevant experience, and the firm's proposal presented multiple examples of highly relevant experience. Internal and external references were very favorable. GZA had the highest cost of the three proposals, primarily due to a high overall level of effort, with GZA's overhead rate as a contributing factor.

Pare did not demonstrate the same understanding of the project as the other firms, and had a heavy reliance on its subcontractor. Pare's costs were the second lowest; however, the level of effort for preliminary design was disproportionately high, while the level of effort for permitting and final design were disproportionately low.

The cost for each proposal was higher than the staff estimate of $250,000. Having reviewed all three proposals, staff believe that the selected proposal is appropriate for a project of this size and scope. Milone & MacBroom submitted a high quality proposal with an excellent engineering team, excellent technical approach, and proven prior experience conducting designing dam removal and restoration projects, and an appropriate level of effort for this project. Based on final rankings and for the reasons set forth above, the Selection Committee recommends the award of this contract to Milone & MacBroom, in an amount not to exceed $425,442.07.

BUDGET/FISCAL IMPACT:

The FY20 CIP includes a budget of $200,000 for contract 7347. The award amount is $425,442.07, or $225,442.07 over budget. This amount will be absorbed within the five-year CIP spending cap.

MBE/WBE PARTICIPATION:

There were no MBE or WBE participation requirements established for this contract due to limited opportunities for subcontracting.