



STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director 
DATE: November 20, 2019
SUBJECT: America's Water Infrastructure Act: Risk and Resiliency Assessments

COMMITTEE: Water Policy & Oversight

INFORMATION
 VOTE

Stephen Estes-Smargiassi, Dir. of Planning and Sustainability
Andrew Hildick-Smith, P.E., Dir. SCADA, Meter & Monitoring
Preparer/Title


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

RECOMMENDATION:

For information only.

DISCUSSION:

Congress imposed new requirements for assessing and responding to water system vulnerabilities in America's Water Infrastructure Act (AWIA) that was signed into law on October 23, 2018. AWIA requires that community drinking water systems develop or update risk assessments and emergency response plans and certify to EPA that they have been completed or updated by specified deadlines.

The new act essentially renames what were previously called Vulnerability Assessments under Congress' post 9/11 requirements as Risk and Resilience Assessments (RRAs), and expands the threats and consequences covered to include natural hazards. The act also expands the areas of the water system covered to more explicitly evaluate cyber security and aspects of the system's financial systems.

The RAAs must cover:

- Natural hazards and malevolent acts (i.e. all hazards);
- Resilience of water facility infrastructure:
 - physical barriers;
 - water sources;
 - collection, treatment, storage and distribution systems;
 - chemical storage and handling;
 - operation and maintenance;
- Monitoring practices;
- Electronic, computer and other automated systems; and
- Financial systems (e.g., billing and payroll systems).

Water systems must certify to EPA that they have completed or updated their RRAs by:

- March 31, 2020 for systems serving greater than 100,000 people;
- December 31, 2020 for systems serving 50,000 to 99,999 people; or
- June 30, 2021 for systems serving 3,301 to 49,999 people.

The RRAs do not need to be submitted to EPA. MWRA will only need to certify that they have been completed: they will be kept securely at MWRA. In addition, under AWIA, systems must now recertify that they have reviewed and updated their RRAs every five years. This is a new requirement: the previous federal requirements for vulnerability assessments were one-time requirements.

In addition to the Risk and Resilience Assessments, AWIA requires that systems certify to EPA that they have developed or updated their Emergency Response Plans (ERPs) no later than six months after submission of their RRAs. Under AWIA, ERPs must include:

- Strategies and resources to improve resilience, including physical security and cybersecurity;
- Plans and procedures for responding to a natural hazard or malevolent act that threatens safe drinking water;
- Actions and equipment to lessen the impact of a malevolent act or natural hazard, including alternative water sources, relocating intakes and flood protection barriers; and
- Strategies to detect malevolent acts or natural hazards that threaten the system.

MWRA's Approach to Compliance with AWIA

Immediately after passage of AWIA last October, MWRA assembled a team of Operations, Security and Emergency Response, Environmental Quality, SCADA and MIS staff to ensure that MWRA would fully meet all the AWIA requirements. The approach that MWRA has taken includes both internal staff efforts and some external consultant efforts as a means to independently check certain facilities or programs.

The consultant will provide an external review of three newer facilities: Spot Pond Pump Station and Covered Storage, MetroWest Tunnel, and the Brutsch Water Treatment Facility. In addition, teams of experienced and newer MWRA staff will shadow the consultant, who will provide hands on training.

Since there have been many staffing changes due to retirements, promotions and reassignments, staff are using this opportunity for succession planning and knowledge transfer. A team of staff reviewed all the relevant EPA and AWWA standards and manuals, previous vulnerability assessments and emergency response plans to identify gaps and needs for updating. The consultant that developed EPA's Vulnerability Self-Assessment Tool¹ was brought in to provide training to a group of experienced and newer staff who are reviewing a number of facilities that have been constructed or modified over the past several years.

¹ AWIA does not require the use any particular tool or program. MWRA is implementing the AWWA J100 Standard: Risk and Resilience Management of Water and Wastewater Systems using EPA's VSAT tool.

In addition, MWRA will perform an Information Technology risk and resiliency assessment using an external consultant. The project will provide in-depth testing of the non-SCADA computer applications and computer systems that are directly connected to the Internet or deal with finances. The results of that testing will be documented using the Department of Homeland Security's Cyber Security Evaluation Tool (CSET). In a separate effort, the SCADA system will be *re-assessed* by in-house staff using the same tool.

Upon completion of these assessments, MWRA will be able to certify that it has completed and updated its RRAs by the deadline of March 31, 2020. Staff will move directly to any necessary development or updates of Emergency Response Plans so that the second required certification can be completed within 6 months of the first.

Teams of staff have already begun reviewing all of MWRA's existing ERPs, updating them and incorporating the changes into the regular training and review sessions that are conducted for each facility.

Assistance to MWRA Customer Communities

As part of MWRA's regular community Emergency Response Plan training program, conducted to help communities meet annual DEP training requirements, MWRA staff included a module on the AWIA requirements in both the spring and fall 2019 classes. Topics covered included the requirements of AWIA, its deadlines, and how the communities could coordinate their efforts with MWRA's.


MWRA staff have also directly coordinated with the Boston Water and Sewer Commission on its on-going efforts. While most MWRA communities are on later a schedule than MWRA, BWSC has the same deadlines as MWRA.

On November 5, 2019, MWRA hosted EPA's AWIA training session for Region 1 at the Chelsea Facility. In addition to MWRA and our community staff, attendees came from all over New England.

BUDGET/FISCAL IMPACT:

The Task Order for completion of the three Risk and Resilience Assessments has a not to exceed amount of \$121,523.43. The contract for Information Technology Assessment has a not to exceed amount of \$149,722.49. The cost for these assessments will be absorbed in the FY20 CEB.


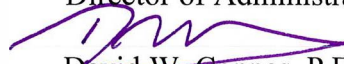
STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director 
DATE: November 20, 2019
SUBJECT: Sections 53 and 99 Improvements
Design and Engineering Services During Construction
Hazen and Sawyer, P.C.
Contract 7485

COMMITTEE: Water Policy & Oversight

INFORMATION
 VOTE

Milan A. Horbaczewski, P.E., Program Manager
John P. Colbert, P.E., Chief Engineer
Preparer/Title

Michele S. Gillen 
Director of Administration
David W. Coppes, P.E. 
Chief Operating Officer

RECOMMENDATION:

To approve the recommendation of the Consultant Selection Committee to award Contract 7485, Sections 53 and 99 Improvements, Design and Engineering Services During Construction, to Hazen and Sawyer, P.C., and to authorize the Executive Director, on behalf of the Authority, to execute said contract in the amount of \$4,985,263, for a contract term of 102 months from the Notice to Proceed.

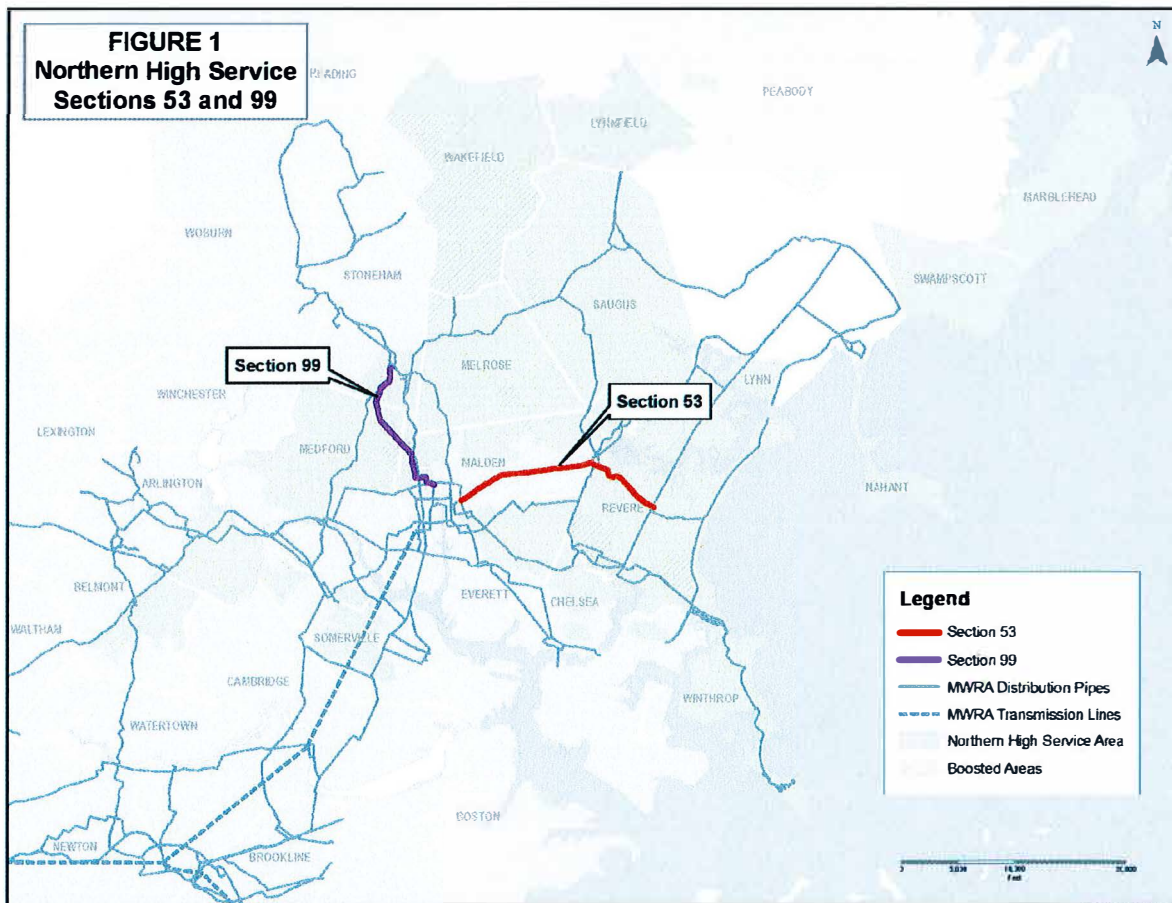
BACKGROUND:

This project will improve the hydraulic capacity and reliability of the Northern High pressure zone by upgrading and or installing new pipelines interconnected to Sections 53 and 99 (see Figure 1). Section 53 is a 48-inch diameter, steel pipeline that was constructed in 1993. It is aligned in an east-west direction along Route 60 in Malden and serves the Northern High system. It normally receives water from the City Tunnel Extension at Shaft 9A and carries it through Malden towards Revere before connecting with Sections 68, 72 and 91, which then carry the water to Saugus, Peabody, Wakefield, Lynnfield, Nahant, Swampscott and Marblehead. During emergencies and during the course of normal system repairs, Section 53 also acts to supplement the southeastern portions of the Northern High system (Sections 14, 15, 49 and 84) that ordinarily deliver water to Everett, Chelsea, parts of Malden and Revere, and also to Winthrop and Deer Island.

At its western end, Section 53 is interconnected with the Shaft 9A surface pipelines through a 30-inch diameter pipeline constructed in 1895 (approximately 4,000 linear feet of Section 14) and a 24-inch diameter pipeline constructed in 1922 (approximately 3,500 linear feet of Section 49 and

49A). The eastern end of Section 53 interconnects with Sections 72 and 91 through a single 30-inch diameter pipe. The smaller diameter connections at either end of Section 53 act as hydraulic restrictions in the system and effectively reduce the capacity of Section 53. Four hundred linear feet of Section 14 was constructed in 2017 to replace a section of pipe that had been relocated in 1972. This project will improve the condition, hydraulic capacity, and reliability of these interconnecting pipelines.

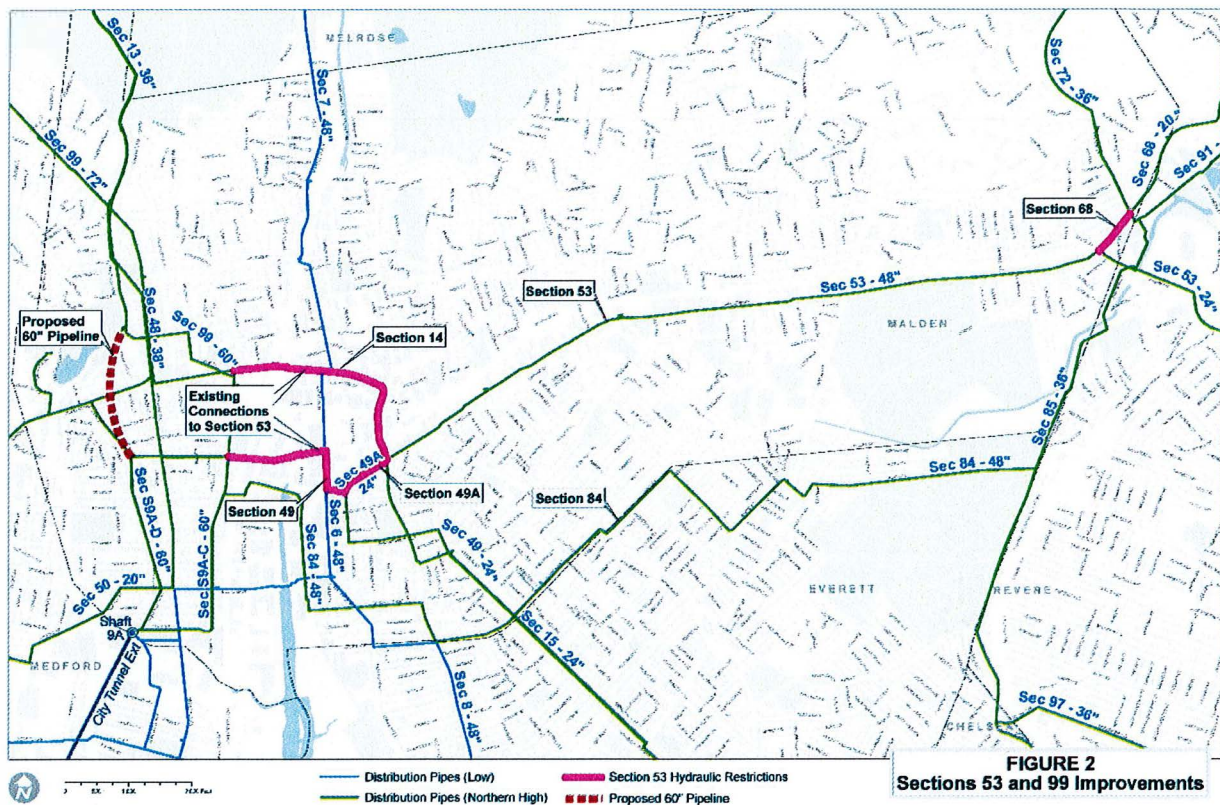
Section 99 is a 72-inch and 60-inch diameter pre-stressed concrete cylinder pipe constructed in 1997. The pipeline normally receives water from the City Tunnel Extension and carries it to the Gillis Pump Station at Spot Pond. When the City Tunnel Extension is off line, Section 99 becomes a critical connection to carry water from the Gillis Pump Station to the Shaft 9A surface piping, which then delivers it to the Northern High system. The 60-inch section of Section 99 acts as a hydraulic restriction between Gillis Pump Station and the Northern High system. This project will provide a second 60-inch section of pipe to reinforce this connection.



DISCUSSION:

The project will include the development of design documents for three construction contracts as follows (see Figure 2):

- (1) the replacement of approximately 2,600 linear feet of Section 49, 900 linear feet of Section 49A, and 1,000 linear feet of Section 68 with new 48-inch diameter pipelines;
- (2) the rehabilitation (cleaning and cement mortar lining) of approximately 4,000 linear feet of Section 14; and
- (3) the installation of 3,000 feet of new 60-inch diameter pipeline from Section 9A-E to Section 99.



The Scope of Services for this project includes project administration, preliminary and final design, and engineering services during construction. Resident engineering and resident inspection services are not included in this scope and will be procured separately.

The Consultant shall provide and perform all professional engineering services, including civil, geotechnical, environmental, permitting and all supporting services required to perform the work of this contract. Under this project, the Consultant will provide design and produce construction

documents for three separate construction contracts in order to provide the required water supply to communities during construction activities. The Consultant will also perform hydraulic analysis and an evaluation of alternative improvements, develop sequencing to maintain service to revenue meters during construction, and develop a water supply plan for future uninterrupted service to communities during construction of these pipes. Design and construction bidding services are estimated to take 36 months from Notice to Proceed. Construction is estimated to take 54 months plus a 12-month warranty period.

Procurement Process

On August 7, 2019, MWRA issued a one-step Request for Qualifications Statements/ Proposals (RFQ/P). The RFQ/P included the following evaluation criteria: Cost - 25 points; Qualifications and Key Personnel - 25 points; Experience/Past Performance on Similar Non-Authority Projects and Past Performance on Authority Projects - 25 points; Technical Approach/Capacity/Organization and Management Approach - 20 points; and MBE/WBE participation - 5 points.

On September 30, 2019, MWRA received proposals from four firms: Black & Veatch Corporation, CDM Smith Inc., Hazen and Sawyer, P.C., and Stantec Consulting Services Inc.

The proposal costs are presented below:

PROPOSER	PROPOSED CONTRACT COST	LEVEL OF EFFORT (LOE)
Hazen and Sawyer*	\$4,985,264	27,278 hours
<i>Engineer’s Estimate</i>	<i>\$5,468,000</i>	<i>28,000 hours</i>
Stantec*	\$5,550,745	23,129 hours
Black & Veatch	\$5,740,000	26,598 hours
CDM Smith*	\$6,983,797	33,039 hours

*Reflects corrections due to math errors/rounding.

The five voting members on the Selection Committee reviewed, scored, and ranked the proposals as follows:

PROPOSER	TOTAL POINTS	*ORDER OF PREFERENCE/ TOTAL SCORE	FINAL RANKING
Hazen Sawyer	362.5	5	1
Black & Veatch	327.0	11	2
CDM Smith	306.5	15	3
Stantec	286.0	19	4

*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.

Hazen and Sawyer's proposed price at \$4,985,264 is 8.8% lower than MWRA's Engineer's Estimate, and its proposed level of effort of 27,278 hours is within 2.6% of the Engineer's Estimate of 28,000. Importantly, Hazen and Sawyer's proposed level of effort for Preliminary Design reflects its understanding of the importance of the alternatives analysis needed prior to Final Design. Hazen and Sawyer's technical approach demonstrates a very thorough understanding of critical design and construction issues and appropriately identifies several key project issues and discussed solutions. Hazen and Sawyer's level of effort is deemed appropriate to complete all scope items.

Hazen and Sawyer's proposal presented very strong qualifications/key personnel, experience, past performance, technical approach and capacity. The firm identified a project team with significant, and highly relevant, recent experience conducting preliminary design and alternative analysis. Hazen and Sawyer's key personnel and technical staff have excellent qualifications with experience that is very applicable to this project. MWRA's previous experience with Hazen and Sawyer has been excellent. Internal and external references were found to be highly favorable and all respondents indicated they would rehire the firm. Hazen and Sawyer also offered significant percentages of MBE and WBE participation. Hazen and Sawyer was ranked first overall by all five Selection Committee members.

Black & Veatch presented very good qualifications and key personnel, experience, past performance, technical approach and capacity, but the Selection Committee deemed Black & Veatch's proposal was not quite as strong overall as Hazen and Sawyer's. Black & Veatch's proposed level of effort was less than that of Hazen and Sawyer's and its cost was greater.

CDM Smith's proposal indicated a very solid understanding of the project and its qualifications and key personnel were very highly regarded, but its proposal contained too high a level of effort in all but the most critical of tasks, Preliminary Design. This approach led to a cost exceeding Hazen and Sawyer's by roughly \$2,000,000 or 40%.

Stantec's project team and key personnel were considered to be very good, but its technical approach was not as detailed as Hazen and Sawyer's. The Selection Committee also judged that capacity was an issue with Stantec given its current commitments.

Based on final rankings, the Selection Committee recommends the award of this contract to Hazen and Sawyer. In accordance with MWRA's procurement procedures, staff entered into discussions with Hazen and Sawyer to confirm costs, level of effort and project management. Based on those discussions, staff are of the opinion that Hazen and Sawyer's proposal provides the best value to MWRA for this project.

BUDGET/FISCAL IMPACT:

The FY20 CIP includes a budget of \$4,500,000 for Contract 7485. The contract award amount is \$4,985,263 or \$485,263 over budget. This amount will be absorbed within the five-year CIP spending cap.

MBE/WBE PARTICIPATION:

The minimum MBE and WBE participation requirements for this project were established at 7.18% and 5.77% respectively. Hazen and Sawyer has committed to 14.66% MBE and 9.54% WBE participation.