STAFF SUMMARY

TO: Board of Directors
FROM: Frederick A. Laskey, Executive Director
DATE: May 26, 2021
SUBJECT: Update on Section 79 Water Main Break, Melrose

COMMITTEE: Water Policy & Oversight

X INFORMATION
_____ VOTE

Valerie Moran, P.E., Director, Waterworks
Cori Barrett, Director, Construction
Preparer/Title

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

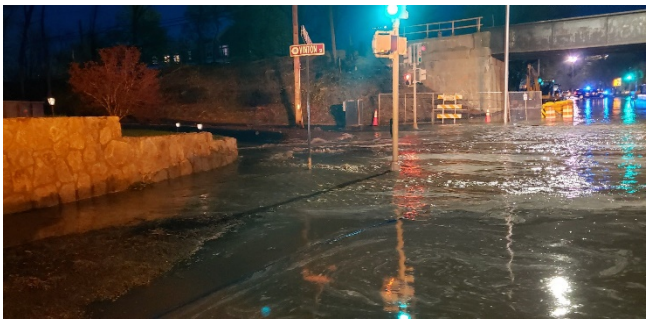
RECOMMENDATION:

For information only.

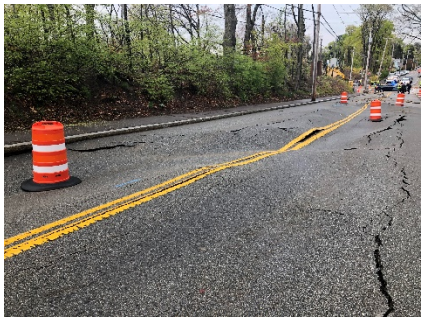
DISCUSSION:

On Tuesday, April 27, 2021, MWRA's Section 79, a 20-inch cast iron pipeline in the Fells Service Area had a major break. This water main is the primary supply to Wakefield meter 172, which is the sole supply to Wakefield's Linden Street Pumping Station. It is located on Vinton Street in Melrose, parallel to and eventually crossing MBTA commuter rail lines, and continues through Messenger Playground, Belmont Street and ends on Greenwood Street at the Melrose/Wakefield line.

The break occurred at approximately 7:50 p.m. on Vinton Street, 375 feet from the Lynn Fells Parkway. An MWRA valve crew was working on Lynn Fells Parkway filling a portion of MWRA Section 70 and was able to isolate the water main quickly. The rupture of pipe caused significant damage to Vinton Street, buckling the road and damaging Melrose's sewer main as well as MWRA Section 79.



Lynn Fells Parkway at Vinton 4/27/21


Vinton Street 4/28/21

A portion of both Vinton Street and Lynn Fells Parkway had to be shut down and traffic rerouted. A MWRA pipeline crew was called in to clear debris and open the Lynn Fells Parkway to traffic as soon as possible. It was clear that Vinton Street could not be reopened until the damage to the utilities and the roadway were repaired.

RJV Construction Corporation in Canton was contacted to perform emergency repairs to MWRA's Section 79 water main. A site meeting was held with RJV staff on Wednesday morning, April 28, to assess the post-break roadway conditions and investigate potential scope of emergency repairs. Of immediate concern was safe roadway access for the residents of the four houses impacted on Vinton Street, since homeowners' vehicles were unable to exit their driveways. RJV mobilized equipment to the site by mid-morning to remove the damaged asphalt paving and grade the roadway for temporary access for homeowners. This activity was completed on Wednesday, April 28, and homeowners were able to move their vehicles.

Also on Wednesday April 28, staff developed a scope of work for the Contractor to remove and replace up to 350 linear feet of MWRA's 20-inch cast iron water main with new 20-inch ductile iron pipe within Vinton Street. The scope also includes repair or replacement of other damaged utilities such as local water, sewer, and drainage piping and structures. In addition, the work includes removal and replacement of granite curbing, concrete sidewalks, traffic signal loops, and furnishing and installing full width curb to curb paving in Vinton Street and patching and mill and overlay in the Fellsway, pavement markings, and traffic management including signage and police details. All work will be performed in compliance with the Commonwealth's Covid-19 Guidelines and Procedures and Massachusetts prevailing wage rates.

In addition to the water main break within Vinton Street, a leak was discovered at the interconnection between MWRA's Section 70 (36-inch steel pipe) and Section 79 (20-inch cast iron pipe) within the Lynn Fells Parkway. Investigation and repair of this leak is included in the Contractor's scope of work. Work includes traffic management, excavation, shoring, leak repair, and roadway restoration.

A Purchase Order was issued to RJV with a not-to-exceed amount of $750,000 and a contract duration of 90 calendar days. All work will be completed by July 26, 2021 with the exception of permanent paving. The city of Melrose has requested that the temporary pavement be allowed to settle over a winter season prior to the installation of permanent pavement.

Sequence of Events

Tuesday morning, April 27, at the intersection of Vinton Street and Lynn Fells Parkway, MWRA valve crews were utilizing a gate valve to fill a portion of MWRA section 70. This line was isolated and dewatered the previous week to allow pipeline staff to complete a blow-off retrofit project located at 736 Lynn Fells Parkway. Adjacent to the filling activities, Barletta Heavy began excavating an existing bridge abutment for a MBTA bridge replacement project.

That afternoon, the Town of Wakefield had a significant break at its Linden Street Pumping Station. It was reported that during an inspection of the station an operator heard loud banging of the pipes and then witnessed the casing of one of their cast iron pumps rupture. The pump station was not in use. Wakefield staff quickly shut down their piping, but could not get a tight shut down and requested MWRA assistance. Wakefield subsequently informed MWRA that its station had significant damage to both equipment and building support systems.

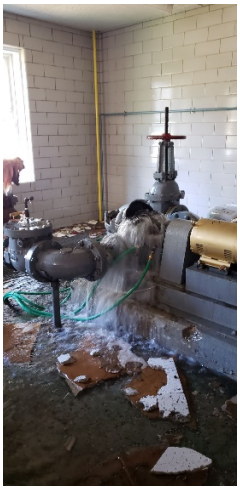
The cause of MWRA's pipe break and the break at the Linden Street Pumping Station has not been determined. MWRA staff have reviewed hydraulic data and the timing of pump and valve operations. The only pressure sensors in the service area with enough sensitivity to record transient pressure surges are on MWRA's SCADA system at the Gillis and Spot Pond Pump Stations. Prior

to the break in Wakefield, there was a three to four psi fluctuation in suction pressure at the Spot Pond Pumping station, but flows at the station remained steady. This fluctuation does not necessarily indicate a water hammer or surge on MWRA's system. These sensors registered more significant pressure transients, 20 to 25 psi, at the time of shutdown of Wakefield's break. Later in the evening when Section 79 broke, data indicated normal operation and a cause was not determined. Listed below is an approximate timeline of system hydraulics and events on April 27.

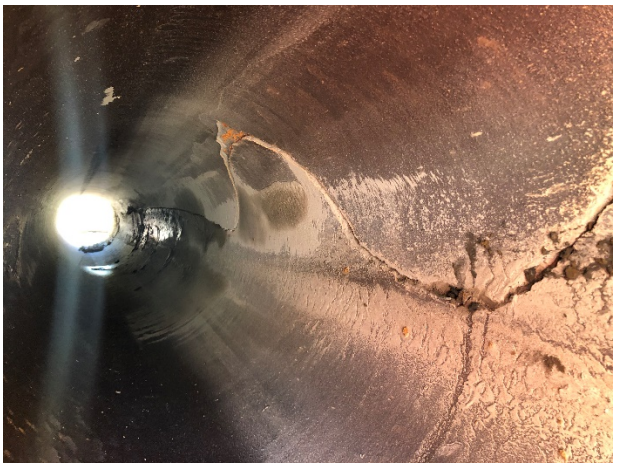
1. Spot Pond Pumping Station is pumping from the Fells Service Area to the Northern Intermediate High Service Area.
2. At 9:25 a.m., MWRA valve crews began filling a portion of MWRA section 70.
3. At 1:50 p.m., Wakefield experienced a rupture at its Linden Street Pumping Station. A MWRA valve crew was sent to aid Wakefield with isolating its pumping station and to isolate MWRA's Wakefield meter 172.
4. At 7:50 p.m., the break on Section 79 occurred.

MWRA staff met with Wakefield's DPW staff to discuss what happened at its station and potential causes for the rupture. Wakefield staff indicated they were not conducting work in the area and their pump station was not in operation. Wakefield staff suggested a shared responsibility for the break at their pump station and questioned if MWRA would contribute to repairs. The available hydraulic data, however, does not provide a conclusion of what caused their break or the subsequent break in MWRA's system.

Wakefield's pump station is over 60 years old and has two of three original cast iron pumps with new motors and VFDs. The third pump in the station has been decommissioned. Wakefield has struggled to obtain a tight shutdown of their old valves and has requested MWRA assistance in working them.



Linden Street Pump Station Wakefield 4/27/21



Cracked section of Section 79

The Contractor's construction progress to date includes removal of pavement and grading of roadway, cleaning and televising drainage system, removal and replacement of sewer piping and manhole, installation of 12-inch gate valve on city of Melrose water main, and installation of temporary water services for residents of Vinton Street. The Contractor began removal and replacement of the damaged sections of MWRA's 20-inch water main and the city's adjacent 12-inch water main. The failure of the cast iron pipeline was at a location where the pipe was constructed in ledge and a significant amount of blast rock was found in the pipe bedding. The

water main repair approach is to replace all pipe in areas of ledge and evaluate the condition of the remaining pipe once it is uncovered. Staff will present an update on the progress of work at the Board Meeting.

BUDGET/FISCAL IMPACT:

The costs related to this incident are being calculated for the repair, staff overtime and equipment. Subject to cost recovery, the costs will be absorbed in FY21 Current Expense Budget.