

Suggested Questions

MWRA Review Panel



Ad Hoc Legislative Panel
On the
MWRA Water Main Breach
Of Saturday, 1 May 2010

Hearing DateWednesday, 14 July 2010

HOUSE..... No. 4702

The Commonwealth of Massachusetts

PRESENTED BY:

Robert A. DeLeo

Order relative to authorizing the Senate committee on Post Audit and Oversight, the House committee on Post Audit and Oversight and the joint committee on Environment, Natural Resources and Agriculture to sit jointly and hold hearings on the rupture of the MetroWest Water Supply Tunnel.

Members of the Ad Hoc Legislative Panel on the MWRA Water Main Break

HOUSE POST AUDIT AND OVERSIGHT

Members of the committee:

DAVID PAUL LINSKY of Natick - *Chair*
BENJAMIN SWAN of Springfield- *Vice Chair*
JAMES R. MICELI of Wilmington
WALTER F. TIMILTY of Milton
THOMAS M. STANLEY of Waltham
JAMES T. WELCH of West Springfield
SARAH K. PEAKE of Provincetown
PAM RICHARDSON of Framingham
STEPHEN STAT SMITH of Everett
ROBERT S. HARGRAVES of Groton

SENATE POST AUDIT AND OVERSIGHT

Members of the committee:

MARC R. PACHECO of First Plymouth and
Bristol - *Chair*
SUSAN C. FARGO of Third Middlesex – *Vice
Chair*
STEVEN A. BADDOUR of First Essex
GALE D. CANDARAS of Berkshire, Hampden,
Hampshire and Franklin
MICHAEL O. MOORE of Worcester and
Norfolk
MICHAEL W. MORRISSEY of Norfolk and
Plymouth
ROBERT L. HEDLUND of Plymouth and
Norfolk

JOINT COMMITTEE ON ENVIRONMENT, NATURAL RESOURCES & AGRICULTURE

Members of the committee:

Senate

ANTHONY W. PETRUCCELLI of First Suffolk
And Middlesex - *Chair*
JAMES B. ELDRIDGE of Middlesex And
Worcester - *Vice-Chair*
JENNIFER L. FLANAGAN of Worcester and
Middlesex
ROBERT A. O'LEARY of Cape and Islands
MICHAEL O. MOORE of Second Worcester
BRUCE E. TARR of Essex and Middlesex

House of Representatives

WILLIAM M. STRAUS of Mattapoisett- *Chair*
DENIS E. GUYER of Dalton- *Vice-Chair*
DEMETRIUS J. ATSALIS of Barnstable
MICHAEL F. RUSH of Boston
BRIAN P. WALLACE of Boston
SEAN GARBALLEY of Arlington
CAROLYN C. DYKEMA of Holliston
ANN-MARGARET FERRANTE of Gloucester
TIMOTHY R. MADDEN of Nantucket
SUSAN WILLIAMS GIFFORD of Wareham
LEWIS G. EVANGELIDIS of Holden

Zorica Pantic, Ph.D., President, Wentworth Institute of Technology

Ronald Ballinger, Sc.D. Professor of Nuclear Science and Engineering and Materials Science and Engineering at MIT, and the Director of the H. H. Uhlig Corrosion Laboratory;

John H. Bambei, Jr. , Chief of Engineering for Denver Water and Chairman of the American Waterworks Associations' Committee on Steel Pipe.

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Appointment dates followed by brief biographies of the MWRA Review Panel Investigating May 1 Water Main Break

May 26, 2010

MWRA Appoints Chair of Independent Review Panel

Zorica Pantić to Lead Expert Panel to Investigate Causes of the May 1, 2010 Water Main Break

June 30, 2010

MWRA Appoints Two Additional Members to Panel Investigating May 1 Water Main Break

The appointees are:

Ronald Ballinger, Professor of Nuclear Science and Engineering and Materials Science and Engineering at MIT, and the Director of the H. H. Uhlig Corrosion Laboratory;

and

John H. Bambei, Jr., Chief of Engineering for Denver Water and Chairman of the American Waterworks Associations' Committee on Steel Pipe.



Brief Biography

Chairwoman of MWRA Review Panel Investigating May 1 Water Main Break

Zorica Pantic, Ph.D. (pronounced Pan – tish)

President, Wentworth Institute of Technology

Dr. Zorica Pantic is the fourth and first female, president in Wentworth's century-long history and the only female engineer to lead an institute of technology in the U.S. She leads and manages efforts related to 3,600 students and 375 faculty and staff, and oversees the institute's operating budget of \$70 million and endowment of \$80 million.

Dr. Pantic earned her bachelor's, master's and doctoral degrees in electrical engineering from the University of Nis in Serbia.

Dr. Pantic was the engineering dean at the University of Texas at San Antonio (2001 - 2005), she spearheaded the university's efforts to become a flagship university in the state of Texas and a top-tier research university in the U.S. She developed three doctoral programs and one master's program, doubled the number of faculty, increased research funding tenfold to \$7 million, and raised more than \$5 million through strategic partnerships. As the director of the School of Engineering at San Francisco State University (1997 - 2001), she helped the school climb into the country's top 50 undergraduate programs and cooperated with fellow California State University engineering deans on a \$10-million California Workforce Initiative.



Brief Biography

Member of the **Independent Review Panel Investigating May 1 Water Main Break**

Ronald George Ballinger, Sc. D.

Professor

Massachusetts Institute of Technology

Departments of Nuclear Science and Engineering

Engineering and Materials Science and Engineering

Ronald G. Ballinger is a Professor of Nuclear Science and Engineering and Materials Science and Engineering. Professor Ballinger is also Head of the H.H. Uhlig Corrosion Laboratory in the Department of Materials Science and Engineering at MIT. Professor Ballinger is active in the teaching of graduate and undergraduate subjects in reactor design, corrosion engineering, chemistry, mechanical behavior and physical metallurgy.

Professor Ballinger served for 8 years in the nuclear navy before attending college. After receiving his B.S. in Mechanical Engineering from Worcester Polytechnic Institute in 1975 he did his graduate work at MIT. He received his S.M. in Nuclear Engineering in 1977 and in Materials Science in 1978. He received his Sc.D. in Nuclear Materials Engineering in 1982 with a thesis entitled "Corrosion Fatigue of Nickel Base Alloys for Nuclear Applications."

Professor Ballinger's areas of specialization are materials selection and engineering of nuclear engineering systems and environmental degradation and life assessment of these systems. Specific areas of active research are as follows: **(1)** environmental effects on material behavior, **(2)** physical metallurgical and electrochemical aspects of environmentally assisted cracking in aqueous systems, **(3)** stress corrosion cracking and hydrogen embrittlement in Light Water Reactor systems, **(4)** failure analysis of engineering structures, **(5)** the effect of radiation on aqueous chemistry, **(6)** experimental fatigue and fracture mechanics, **(7)** degradation of materials properties and their effects on component life, **(8)** nuclear fuel performance including, gas reactor coated particle fuel and environmental degradation, processing, and storage of metallic uranium fuel, and **(9)** materials development for advanced reactor and fusion systems including, supercritical water, supercritical CO₂, liquid metal, high temperature gas reactor and cryogenic structural applications.



Brief Biography

Member of the **Independent Review Panel Investigating May 1 Water Main Break**

John H. Bambei, Jr.

Chief of Engineering

Denver Water, Denver Colorado

Mr. Bambei is the chief of engineering for Denver Water, Colorado's oldest and largest water utility established in 1918.

Mr. Bambei is a graduate of the Colorado State University, Fort Collin, Colorado with a Bachelor of Science majoring in Civil Engineering. He completed additional studies at the University of Colorado-Denver and the University of Kansas.

Mr. Bambei is the Chief of Engineering for Denver Water since 1993 responsible for the preparation of engineering designs, plans and specifications, and studies for capital improvements and maintenance efforts of a wide variety of facilities relating to the water system, including collection, storage, treatment and distribution of treated water. Mr. Bambei is responsible for various engineering disciplines including civil, chemical, mechanical, electrical, dam safety, and drafting functions.

Mr. Bambei is a member of the American Water Works Association (AWWA) and chairman of the AWWA's Standards Committee on Steel Pipe from 2004 to the present. The American Water Works Association was founded in 1881 and presents itself as the authoritative resource on safe water, with more than 60,000 members worldwide sharing knowledge on water resource development, water and wastewater treatment technology, water storage and distribution, and utility management and operations.

Denver Water serves high-quality water and promotes its efficient use to 1.3 million people in the city of Denver and many surrounding suburbs. Denver Water is a public agency funded by water rates and new tap fees, not taxes. It is Colorado's oldest and largest water utility. Denver Water System maintains a water distribution through more than 3000 miles of water mains, 17 pumping stations, and has underground reservoirs in 34 city locations.



Suggested Questions to

Massachusetts Water Resources Authority's Review Panel Investigating May 1 Water Main Break

Hearing Date: Wednesday, 14 July 2010
State House Annex Hearing Room B-2
12 noon – 3 p.m.

Question: Is there a known or highly suspected cause of the break of the pipe?

Was it the clamp?

If yes, what is the evidence of that and who would be able to testify to that.

Was it the pipe itself?

If yes, what is the evidence of that and who would be able to testify to that.

Was this a single, catastrophic event with little chance of repetition?

If yes, what is the evidence of that and who would be able to testify to that.

Was there a combination of factors which together combined to cause a rupture (weak water technology infrastructure or materials, inappropriate installations, unusual water pressures, seismic disturbance, et cetera).

If yes, what is the evidence of that and who would be able to testify to that.

If yes, does this cause or involve any concern going forward?

Question: What is the likelihood of this sort of disruption occurring again with a similar or larger adverse consequence to MWRA customers?

Identify Primary Cause of the water main break?

Question: Can you identify what are the principle cause(s) for the recent water tunnel break?

Question: In regards to the design and construction of the water tunnel, have any defects and/or deficiencies been uncovered?



Search for the Clamp

Question: Has the clamp been located? If yes, where and how was it located?

Question: If the clamp has not been located could you address the conditions or situation that would allow a steel clamp whose diameter (distance through the center) is 10 feet, and its circumference (distance around) is 30 feet [as reported], and which weight a ton (2000 pounds) to be swept away by gushing water?

Question: Is it possible to reach a conclusion regarding the water main breach, absent any remnant parts or identifiable pieces of the clamp that is thought to have held the burst water main pipe together and in place? Please explain in detail.

For Reference: Physical description of the coupling, collar, or cuff as it has been variously referred to:

Diameter:	10 feet
Circumference:	30 feet
Weight:	1 ton (or 2000 pounds)
Material:	Steel
Name:	Depend-O-Lok
Original manufacturer:	Brico, a Georgia company bought by Vitaulic in 1999
Current manufacturer:	Victaulic, Easton, PA.

Investigative Panel Timetable and End Product

Question: What is your timeline in regard to your panel's investigative activities?

Question: What will be the end product of your panel's investigative activities?

Question: Will the MWRA Independent Review Panel have a budget?

Question: Will the MWRA Independent Review Panel be allowed to hire vendors or contractors to assist it in its task?

Question: If yes, what are the guidelines for the hiring of contractors?



Safety of the Water Supply for individual and commercial consumption?

Question: Regarding the safety of the State's water supply with respect to the protection of both the public health and commerce could you respond to the following issues:

- (1) the current and future safety of the State's water supply and delivery system.
- (2) whether there are any other known structural deficiencies in the water supply and delivery system
- (3) the steps that are or will be taken (or plans being recommended or formulated) to correct any such identified structural defects in the water supply and delivery system.

Question: Does this commission plan to survey the MWRA water system for defects or deficiencies which may disrupt future water supply?

Question: Have any systemic problems and/or shortcomings been identified?

Question: Can you offer a risk assessment of the water supply and delivery system?

Does the investigative Panel intend to look at ongoing and future water system inspection?

Question: How are large transmission water tunnels or mains being inspected in this state?

Question: How often is the structural integrity of the large transmission water tunnels or mains being tested?

Question: What actions are being taken and what additional steps or measures are being recommended to strengthen the water system in order to minimize the likelihood of similar water tunnel breaks or to minimize the potential extent of damage?

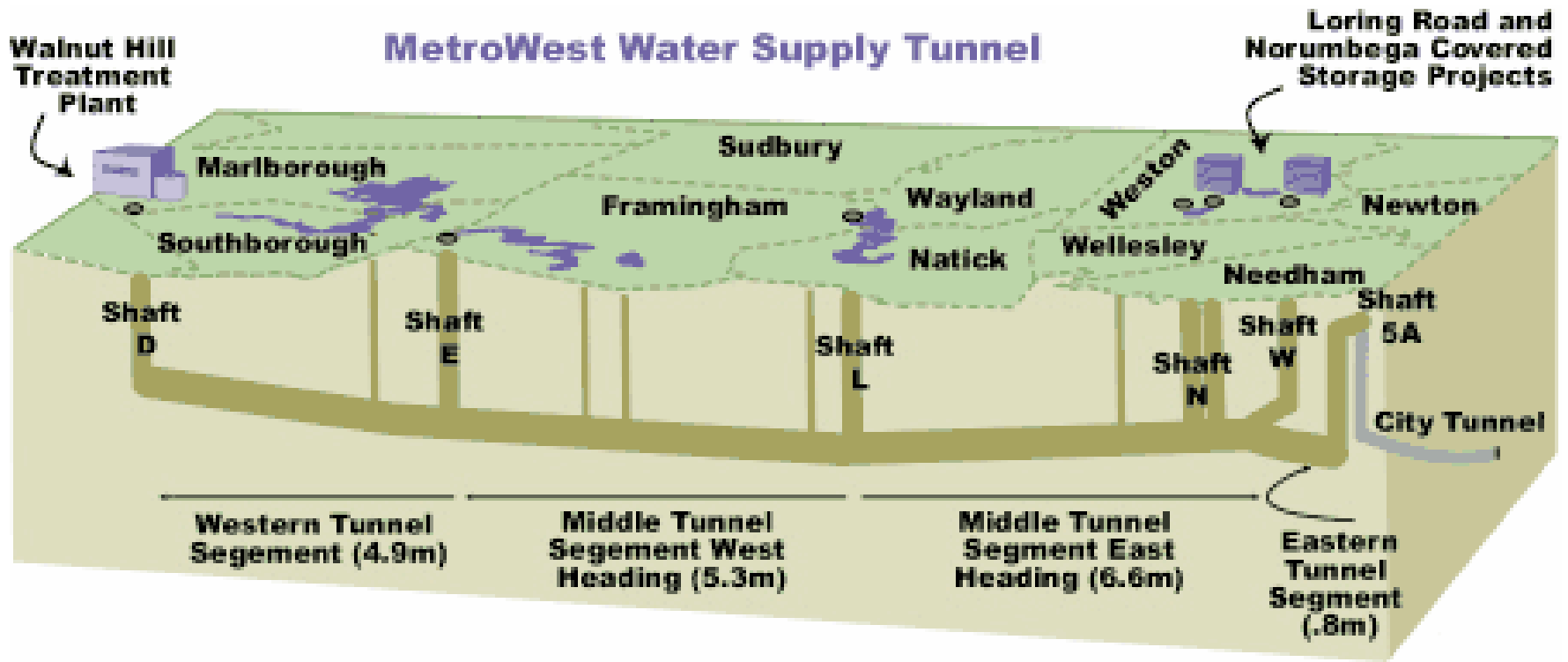
Question: What actions, both preventive and corrective, are currently being taken to secure the water system against damage?

Question: What work is currently planned or in progress that will result in additional recommendations for improving the integrity of the water delivery and distribution systems?

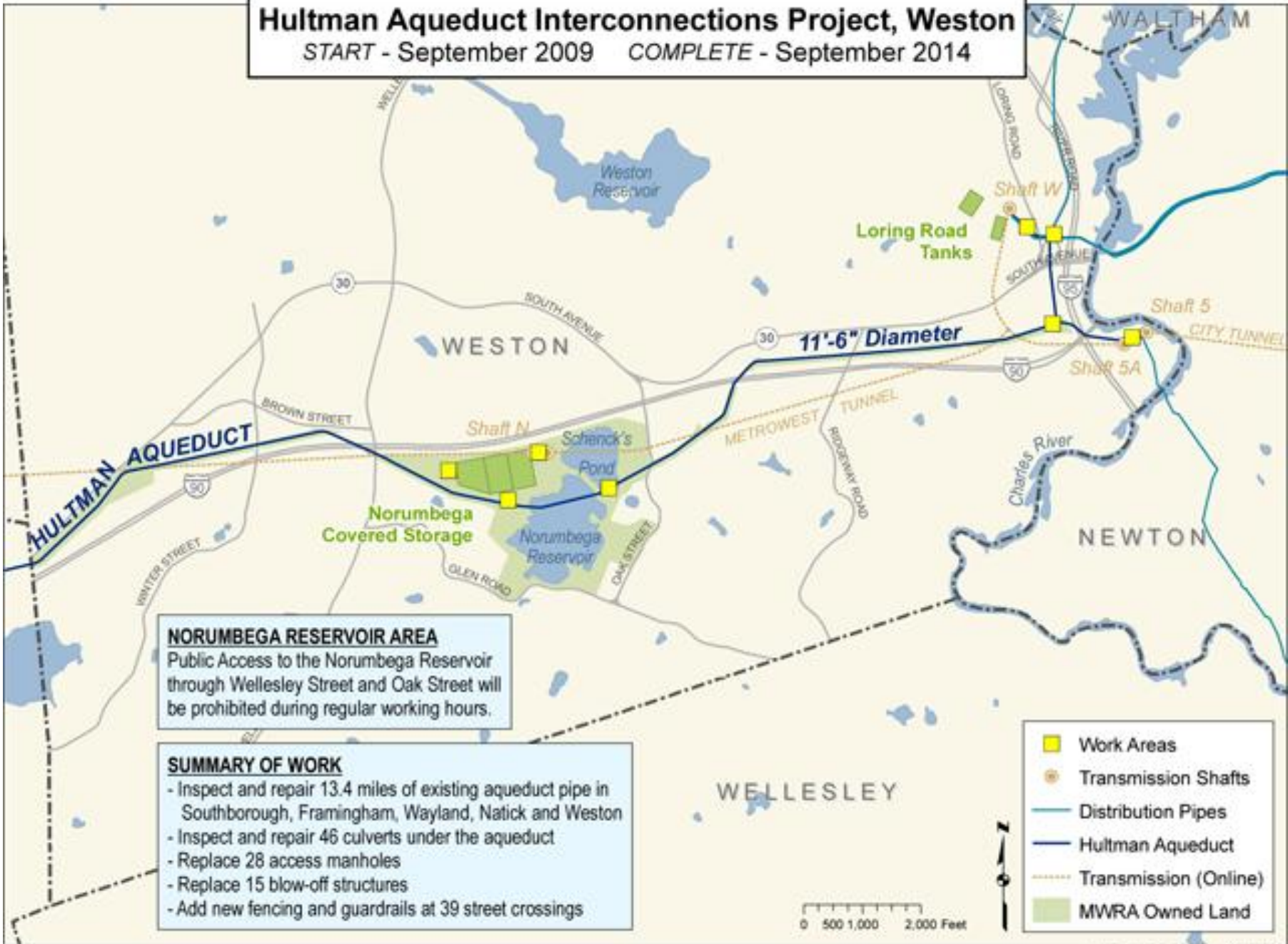
Any suggested improvements that can be made regarding the water tunnel?

Question: As a consequence of the recent water tunnel break, are there areas where improvements can be made in the duties of emergency preparedness planning and the ongoing maintenance of procedures, checklists, communications, utility mutual aid agreements and other elements of a preparedness program necessary for a water system of the size and geographical extent of the one in this state?.

Question: What other improvements or upgrades are being actively pursued or are now under active consideration?



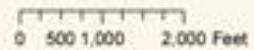
Hultman Aqueduct Interconnections Project, Weston
 START - September 2009 COMPLETE - September 2014



NORUMBEGA RESERVOIR AREA
 Public Access to the Norumbega Reservoir through Wellesley Street and Oak Street will be prohibited during regular working hours.

- SUMMARY OF WORK**
- Inspect and repair 13.4 miles of existing aqueduct pipe in Southborough, Framingham, Wayland, Natick and Weston
 - Inspect and repair 46 culverts under the aqueduct
 - Replace 28 access manholes
 - Replace 15 blow-off structures
 - Add new fencing and guardrails at 39 street crossings

■ Work Areas
● Transmission Shafts
— Distribution Pipes
— Hultman Aqueduct
- - - Transmission (Online)
■ MWRA Owned Land





¹ Biographical sketches provided by MWRA at announcement of panel members.