



Massachusetts Water Resources Authority

Presentation to the

**Joint Committee on Natural Resources
and Agriculture**

***Blue Hills Covered Storage Project:
Need and Purpose***

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May 22, 2006



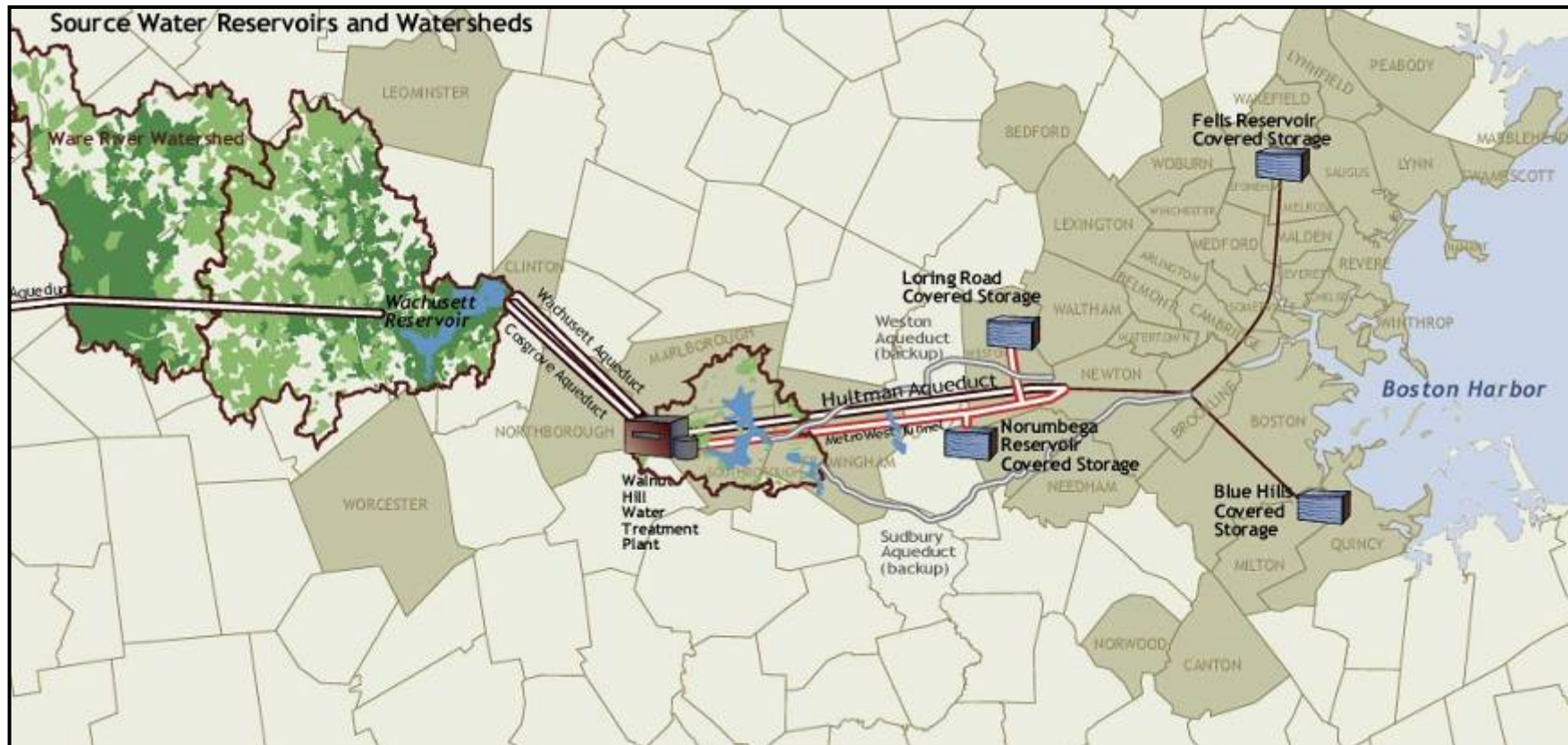
MWRA Covered Storage Plan

- System-wide evaluation completed in 1993
 - DEP Guidelines and Ten State Standards recommend at least 1 day of storage
 - Industry Practice:
 - Most similar systems have 1 maximum day or more of storage
 - Hydraulic Analysis of Water Service Area
 - Recommended 408 Million Gallons of Covered Distribution Storage
 - Including 29 million gallons at Blue Hills



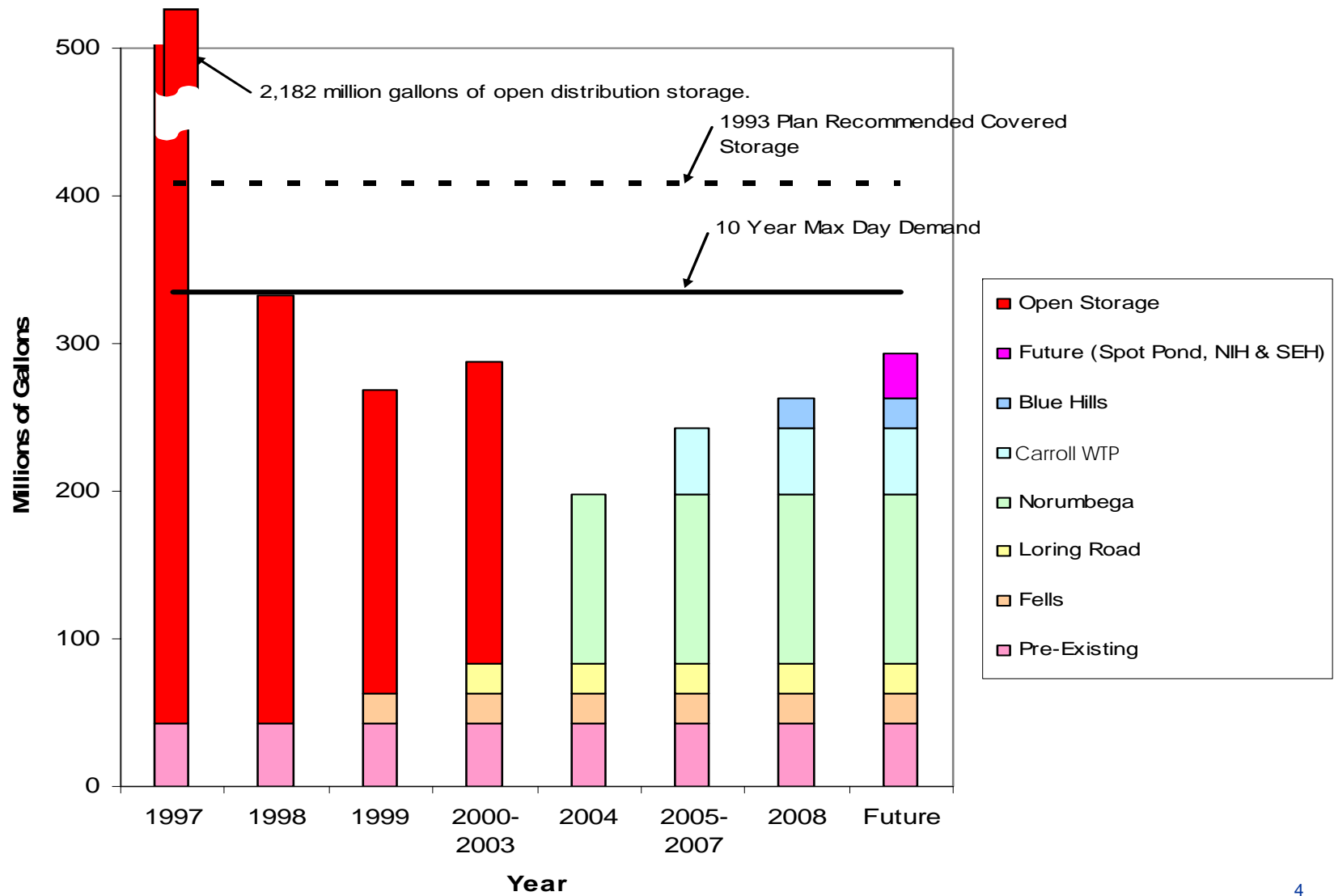
Major Distribution Storage Facilities

- System-wide storage allows short-term shutdown of supply facilities for maintenance/repairs





Distribution Storage – Metropolitan and MetroWest Areas





Benefits of Blue Hills Covered Storage: Normal Daily Operations

- Will improve service on a daily basis for Quincy, Milton and parts of Boston
 - Storing treated water close to users
 - Stabilizing water pressure
 - Increasing pressure during periods of high use
 - Providing redundancy
 - Providing safe and secure storage



Benefits of Blue Hills Covered Storage: Emergency Operations

- Quincy has experienced peak hourly pressure problems at higher elevations (Hospital Hill, Penn's Hill, and vicinity of Nut Island)
- Pressure complaints from Quincy common during high demand periods/pipeline maintenance

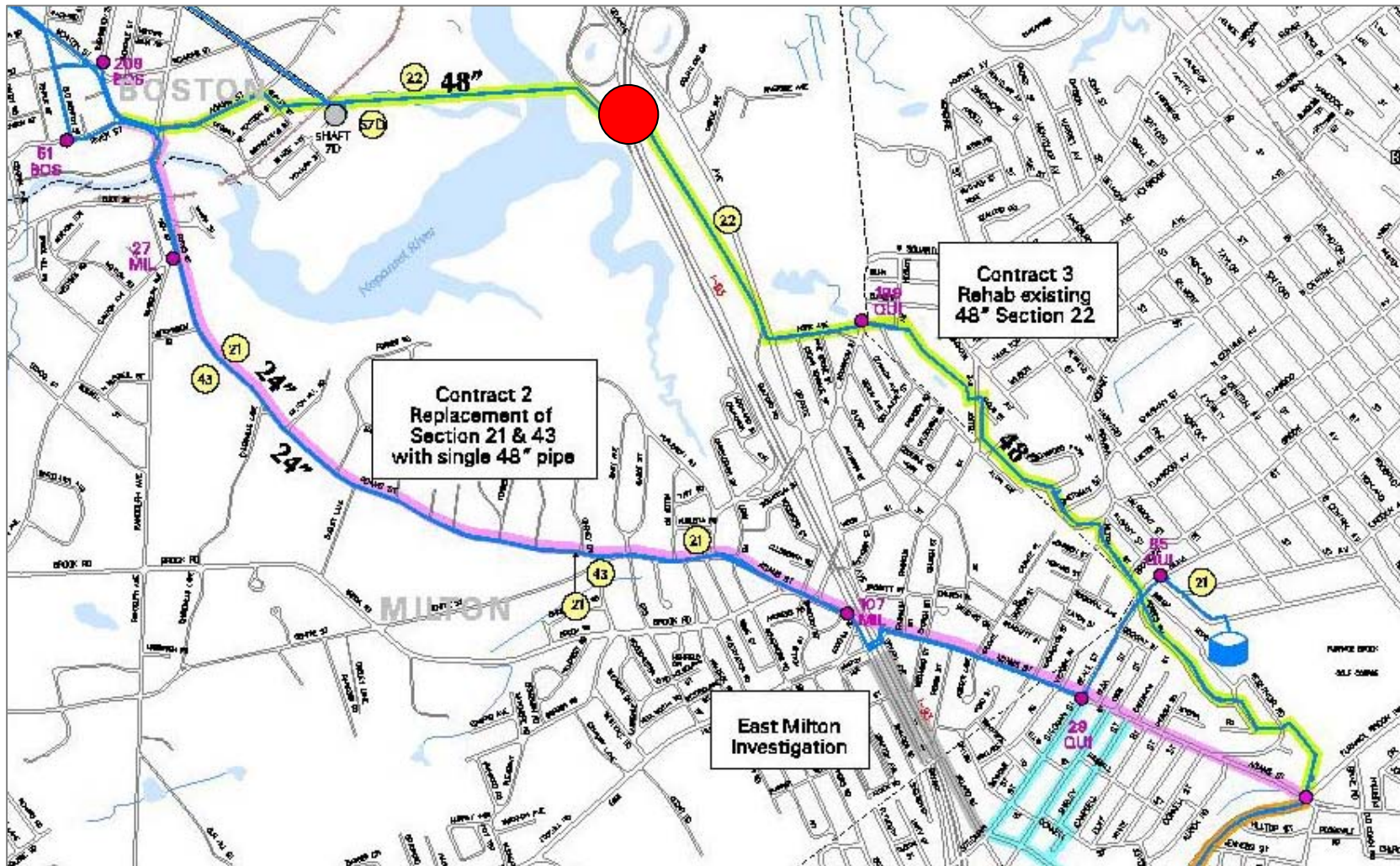


Existing and Future Pressures at Quincy Meter 166 Maximum Day Demands (Feet of Head)

	Low	High	Pressure Variation
Existing	222	268	46
Future	255	265	10
Net Change	+33	-3	36

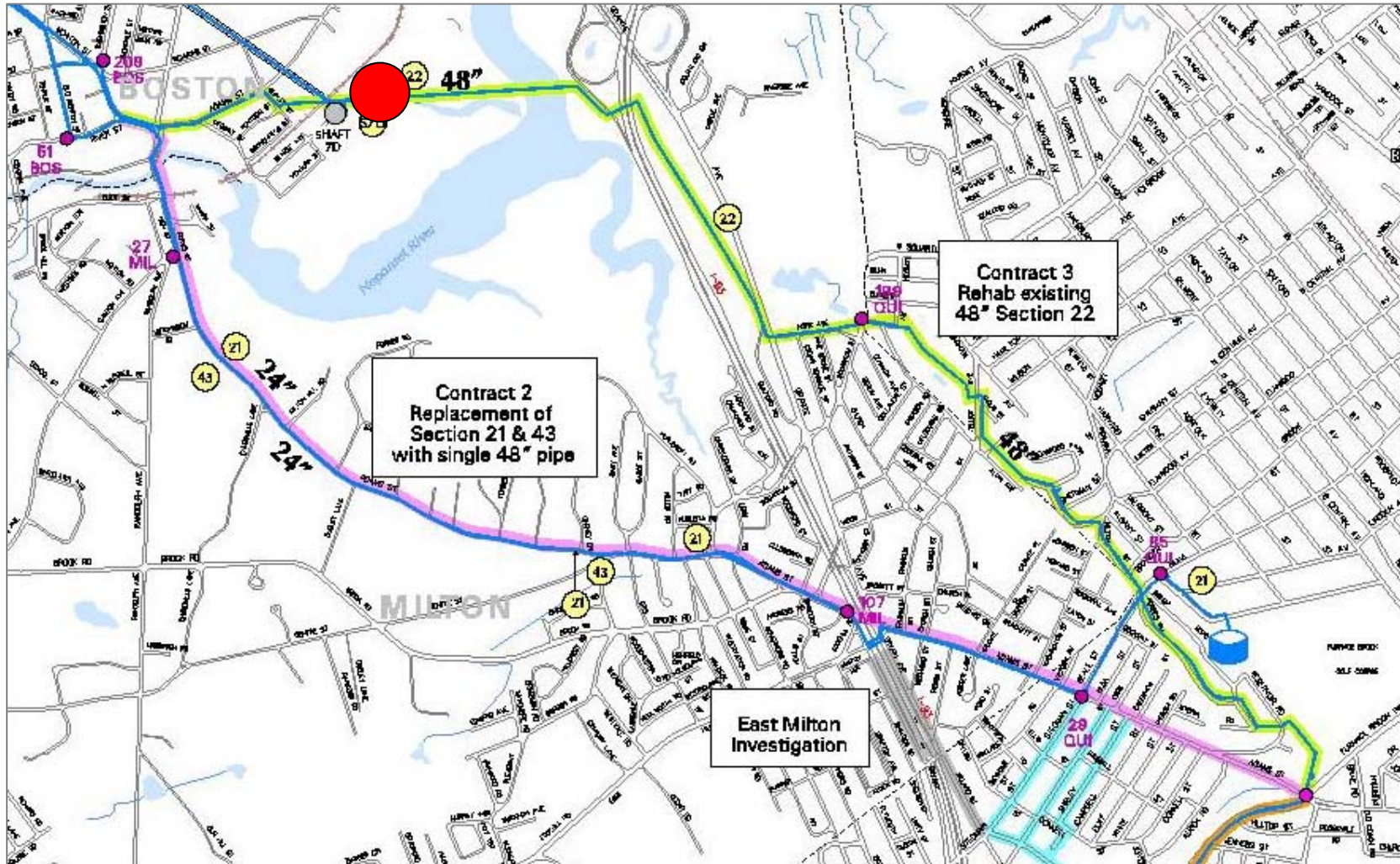


Section 22 Leak – April 2004



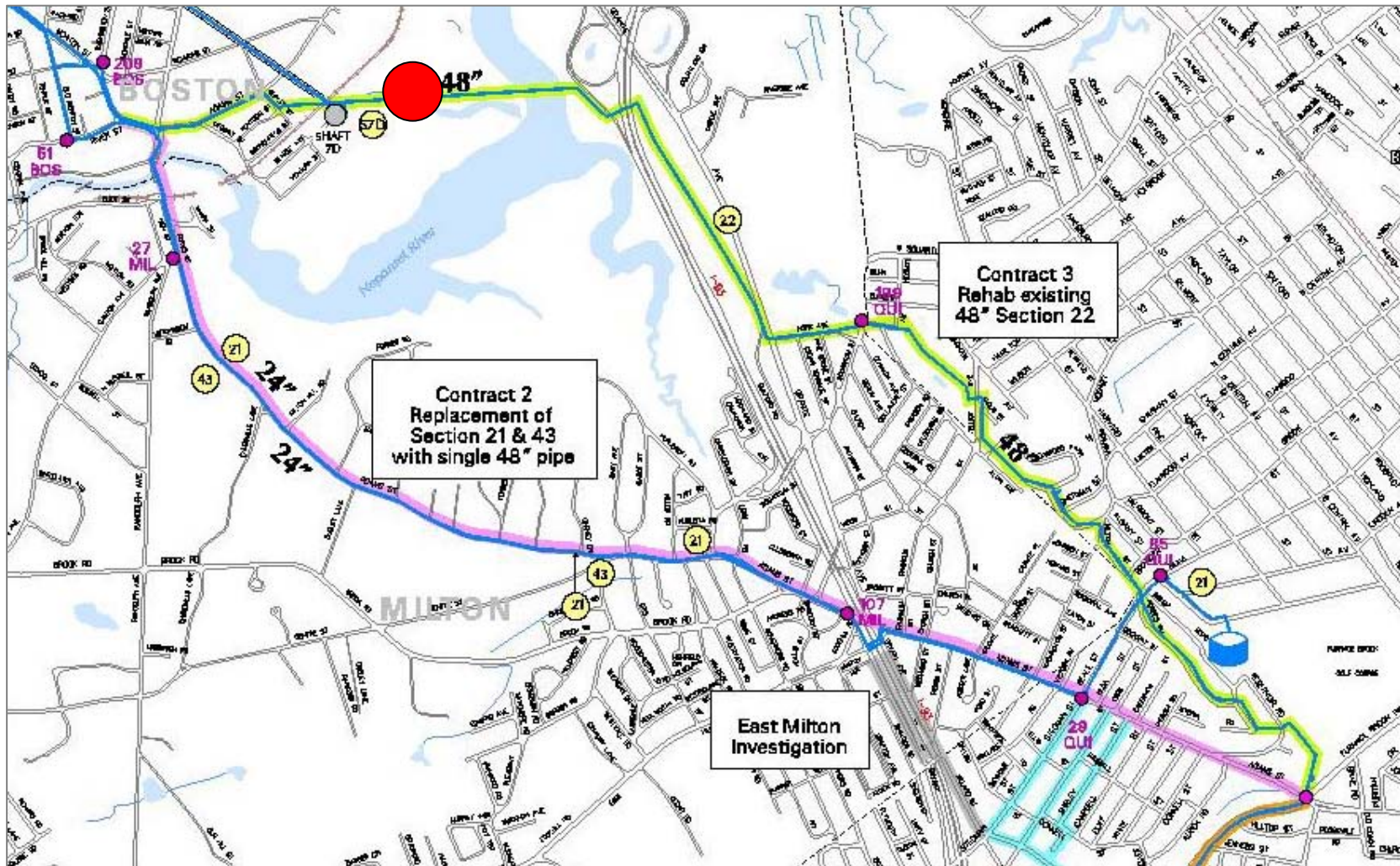


Section 22 Leak – August 2005





Section 22 Leak – February 2006





Section 22 Leak – April 2004



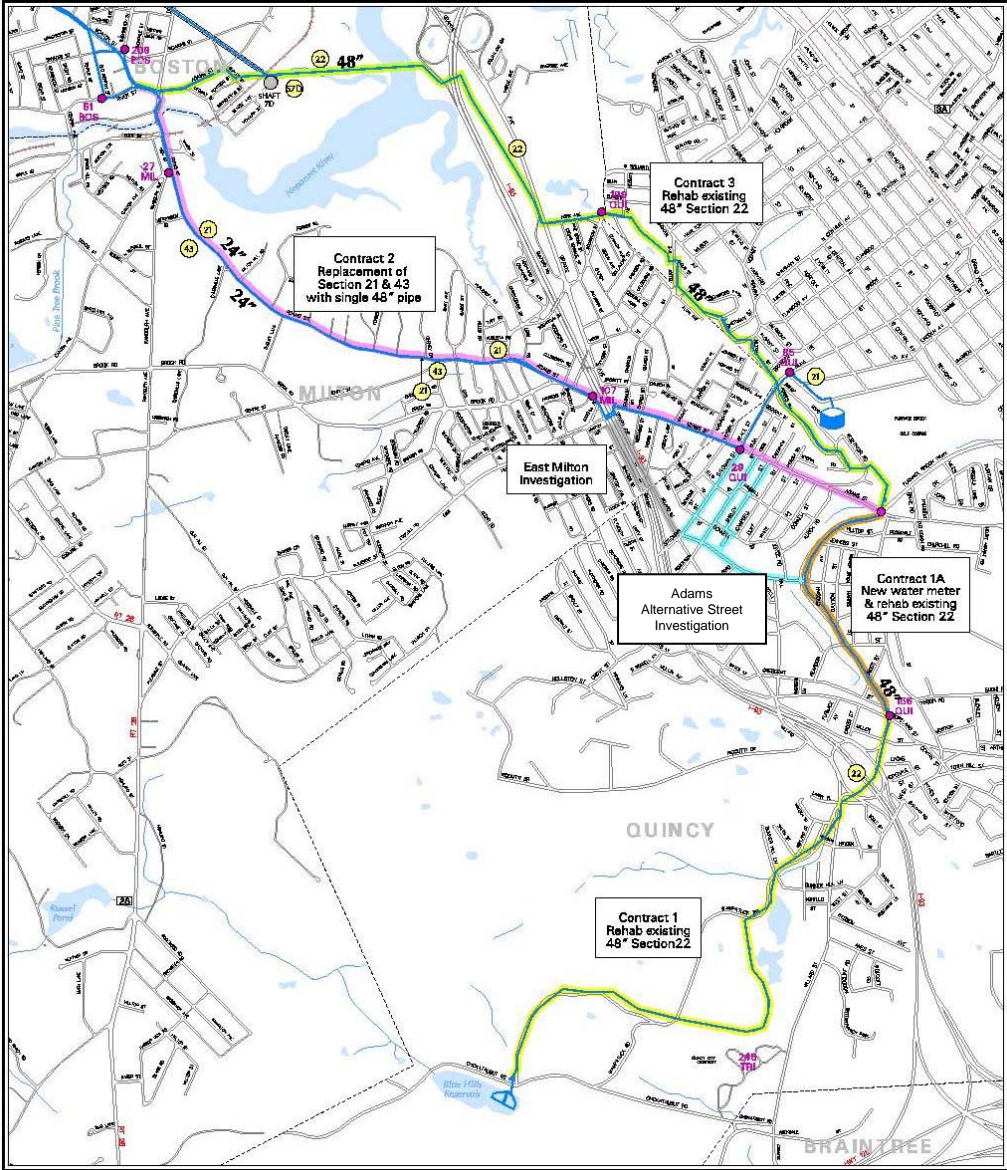


Section 22 Leak – August 2005



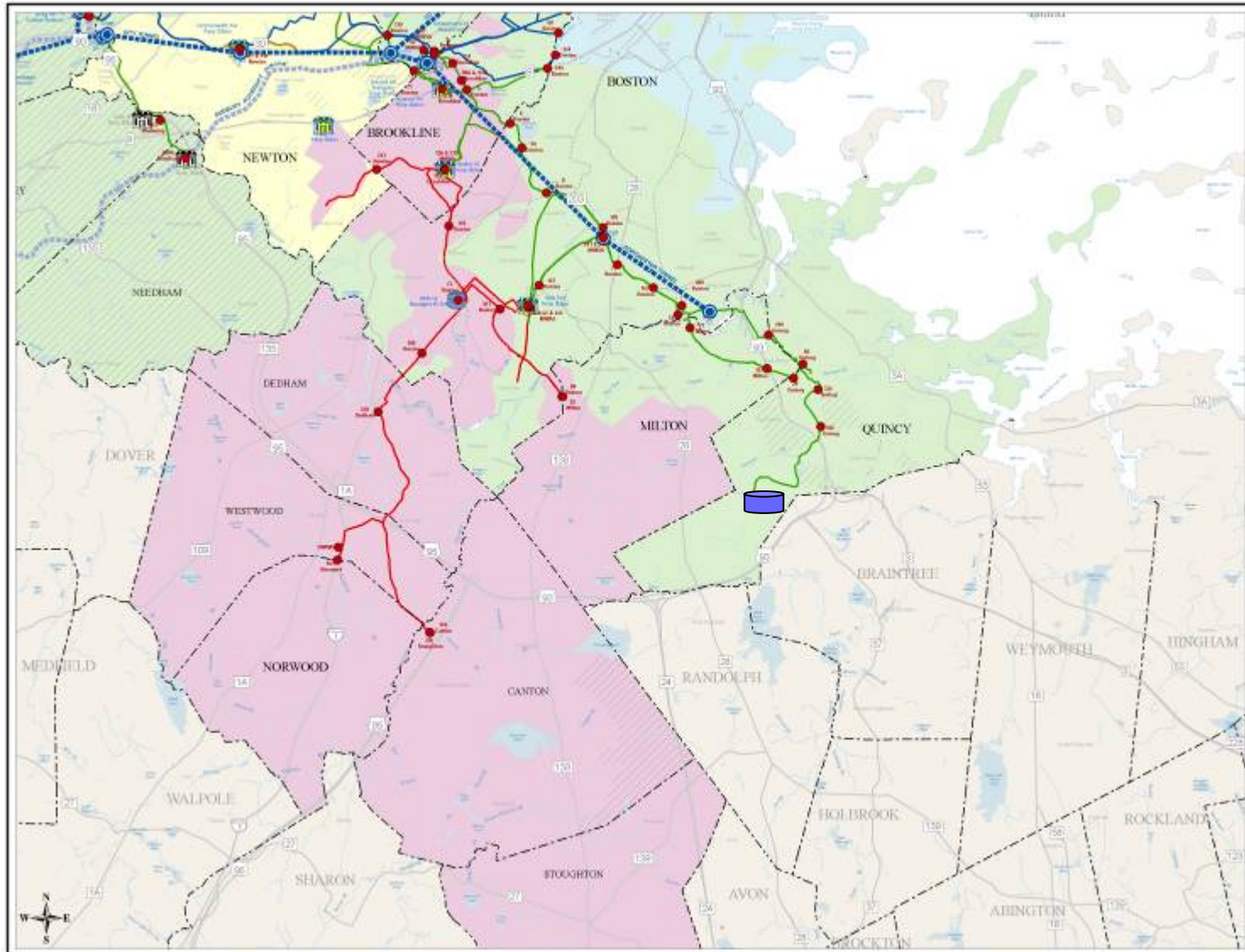


Section 22 Rehabilitation





Southern High and Extra High Systems: Normal Operation



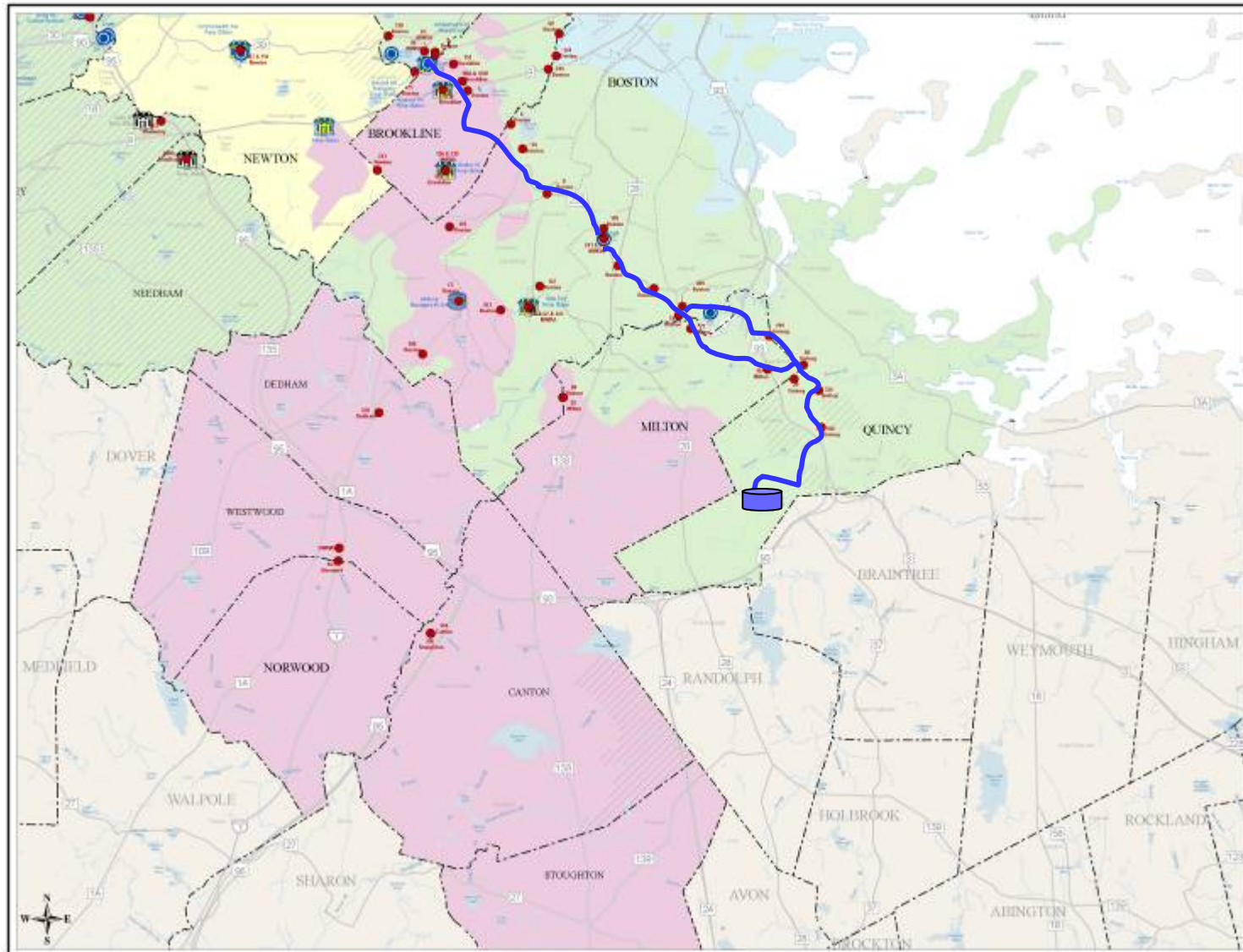


Service Impact During Emergency - Without Blue Hills Covered Tank

- Dorchester Tunnel extends from Shaft 7 to Shaft 7D
- If Tunnel service is lost:
 - Southern High
 - Critical low pressures (<20 psi)/ loss of fire protection at higher elevations
 - Negative pressures in some MWRA transmission pipes and possibly local water systems (cross connection and air in pipes)
 - Southern Extra High
 - Water quality impacts from non-potable water
 - Start-up of Chestnut Hill Emergency Pump Station
 - Activate open reservoir (Waban/Blue Hills) to control pressure
 - Non-potable water
 - Start-up of pump station could take up to a day or more if air entrapment occurs in system

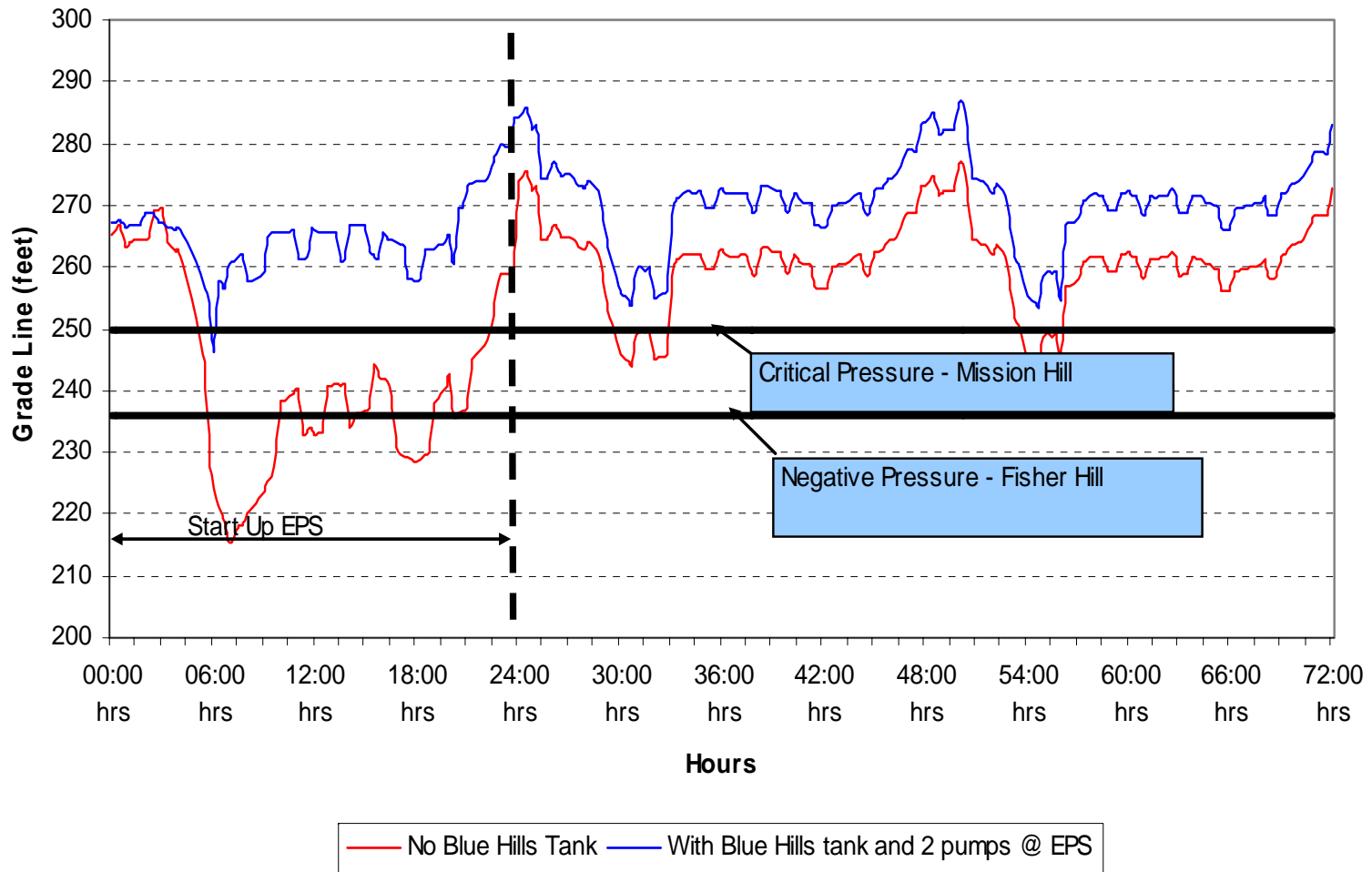


Southern High and Extra High Systems: Emergency Operation





Dorchester Tunnel Shut Down: Boston Meter Average Day





Regional Benefits of Blue Hills Covered Storage During Emergency

- Average Daily Demands:
 - During emergencies and planned shut downs Blue Hills, Chestnut Hill Emergency Pump Station and other ongoing distribution system improvements will provide potable water supply and fire protection
- High Day Demands:
 - Provides time to activate standby facilities Need to institute water use restrictions - potable, positive pressure. Low pressure in high elevations of Quincy



Blue Hills Covered Storage Project: Chronology

- April 1997: MWRA begins planning
- December 2001: Secretary certifies final EIR
- September 2002: Legislation enacted to accelerate project using Design/Build
- November 2003: DEP issues Wetlands Protection Act Variance
- November 2003: Friends of the Blue Hills files appeal
- September 2005: DEP Final Decision



Blue Hills Working Group

- The Blue Hills Working Group was formed in 1997 to review alternatives and met periodically for 3-1/2 years to provide input to MWRA
- The Working Group included representatives from
 - Quincy
 - Milton
 - Braintree
 - Department of Conservation and Recreation
 - Trailside Museum
 - Friends of Blue Hills
 - Water Supply Citizens Advisory Committee
 - MWRA Advisory Board
 - St. Moritz Stables



Why at Blue Hills?

- Is at the proper elevation to supply adequate water pressure
- Minimizes impacts to upland endangered species habitat and park land
- Limits most of the impacts to previously disturbed land within the man-made drinking water reservoir
- Continues the use of the site as water supply
- Provides the opportunity to repair and improve the deteriorating dam, diversify wetland habitat, and expand parks and recreation use into an area that is currently closed to public use



Why at Blue Hills?

- At end of the main transmission system
- At appropriate elevation:
 - Tank will fill by gravity from Norumbega
 - Operation range between elevation 263 and 273
 - Only sites within this range are at Blue Hills Reservation
 - Land already used for water supply purpose



Blue Hills Reservoir

- Prior to the Blue Hills Reservoir, distribution storage was provided by Waban Hill Reservoir in Newton and Fisher Hill Reservoir in Brookline.
- The Blue Hills Reservoir and the Section 22 pipeline were constructed in the early 1950s to provide improved flow and pressure to the Southern High service area from the Chestnut Hill Chestnut Hill Reservoir
- In 1978 the Dorchester Tunnel was put into service enabling the Southern High service area to be served by gravity
- The Southern High service area was served by the Dorchester Tunnel and Blue Hills Reservoir until 1981, when the reservoir was taken off line due to poor water quality
- Since 1981 the Dorchester Tunnel has been serving the Southern High Service area with virtually no distribution storage



Blue Hills Reservoir





Blue Hills Reservoir



Looking W'ly from Highway Sta. 10+50 showing excavation for core wall footing
Blue Hills Reservoir - Cont. 187 - 5/12/50 - Photo Maley 187 - 53



Blue Hills Reservoir





Blue Hills Reservoir





Blue Hills Reservoir





Nash Hill Covered Storage Tanks, Ludlow





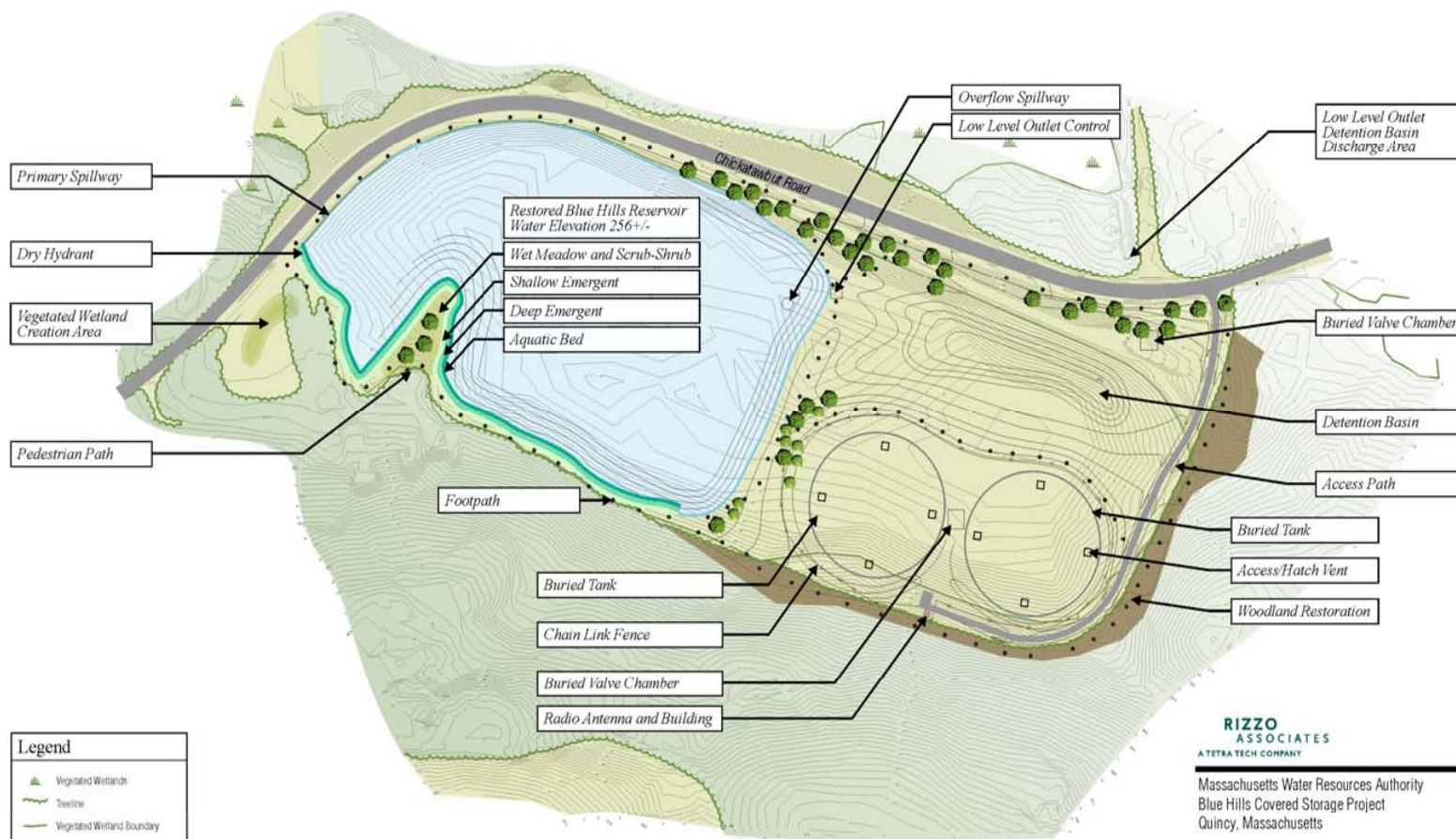
Bear Hill Tank, Stoneham





Blue Hills Covered Storage

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Proposed Conditions



Fells Covered Storage, Stoneham





Norumbega Covered Storage, Weston





Mitigation Measures

- The tanks will be buried and a meadow will be planted on top
- Much of the existing deteriorating dam will be removed and replaced with a new dam with grassed slopes
- The remaining half of the reservoir will be restored and wetlands will be created and enhanced to support wildlife habitat
- Hiking trails will be constructed around and through the site
- Public access will be expanded to areas that are presently restricted



Mitigation Measures

- The proposed mitigation measures have increased the project cost by 30% making this project the most costly covered storage project per gallon of water undertaken by the MWRA



Blue Hills Covered Storage Project: Construction Cost Escalation

Project Component	Year of Contract Award	
	2003	2006
Above Ground Tanks and Site Work	\$20.9	\$24.7
Bury Tanks	\$4.8	\$5.6
Build Dam and Restore Reservoir	\$1.7	\$2.0
Enhance Wetlands On Site	\$0.5	\$0.6
Landscaping, Forest Restoration, Public Access	\$0.3	\$0.4
Total	\$28.2 M	\$33.3 M

Cost to design and construct an 8 acre pond is estimated to be \$4 - \$6 million.



- Voted to reaffirm support for current project as designed
- No additional funds would be provided for additional wetlands mitigation



Superior Court Judge Hely's Opinion

“There is no likelihood of success in the plaintiffs’ argument that the Commissioner has abused his discretion or erred as a matter of law in not requiring the creation of mitigating wetlands at some other site.”


“The Commissioner’s Final Decision complies with the statutory requirements of the Wetlands Protection Act.”

“The variance is necessary to accommodate the overriding public interest in maintaining and supplementing the public water supply for Quincy and parts of Boston and Milton.”



Representative Ayers' Bill

REFILE OF PREVIOUS MATTER: BILL #: OF YEAR:



The Commonwealth of Massachusetts

IN THE YEAR TWO THOUSAND FIVE

AN ACT RELATIVE TO THE PROTECTION OF CERTAIN WETLANDS IN
THE BLUE HILLS RESERVATION

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

SECTION 1. Notwithstanding any general or special law or rule or regulation to the contrary, the variance granted by the commissioner of the department of environmental protection to the Massachusetts Water Resources Authority, dated September 20, 2005, pursuant to the Massachusetts Water Resources Authority, dated September 20, 2005, referred to Docket No. DEP-04-734, DEP File No. 059-0854 for the construction of water tanks in the Blue Hills Reservoir in the city of Quincy is hereby suspended and the work in the wetland resource areas approved by the variance shall not go forward and the time as the project is modified to produce no net loss of wetlands in or near the Blue Hills Reservation. Such modification shall provide that the Authority produce in-kind replacement of any wetlands to be lost. The department shall review the proposed modification. If the department finds the proposed modification includes such in-kind replacement, that a site is identified and a schedule prepared that will ensure that the replacement shall be performed as a part of the construction of the tanks, the department may reissue the variance, provided the replacement of the wetlands shall be a condition of the reissuance.

SECTION 2. This act shall take effect upon its passage.



Summary

- The site is a public water supply reservoir
 - Currently no public access
- Project will provide needed storage for safe water at reliable pressure
- 24% (\$8 million) of the project cost is for mitigation
 - 8-acre public recreation pond will be created
 - allowing public access
 - fishing
- Project complies with Wetlands Protection Act
- “Win-Win”
 - Safe drinking water
 - New recreational resource