



Presentation to

WSCAC

Status of MWRA Water System Dams

John J. Gregoire, Program Manager, Reservoir Operations

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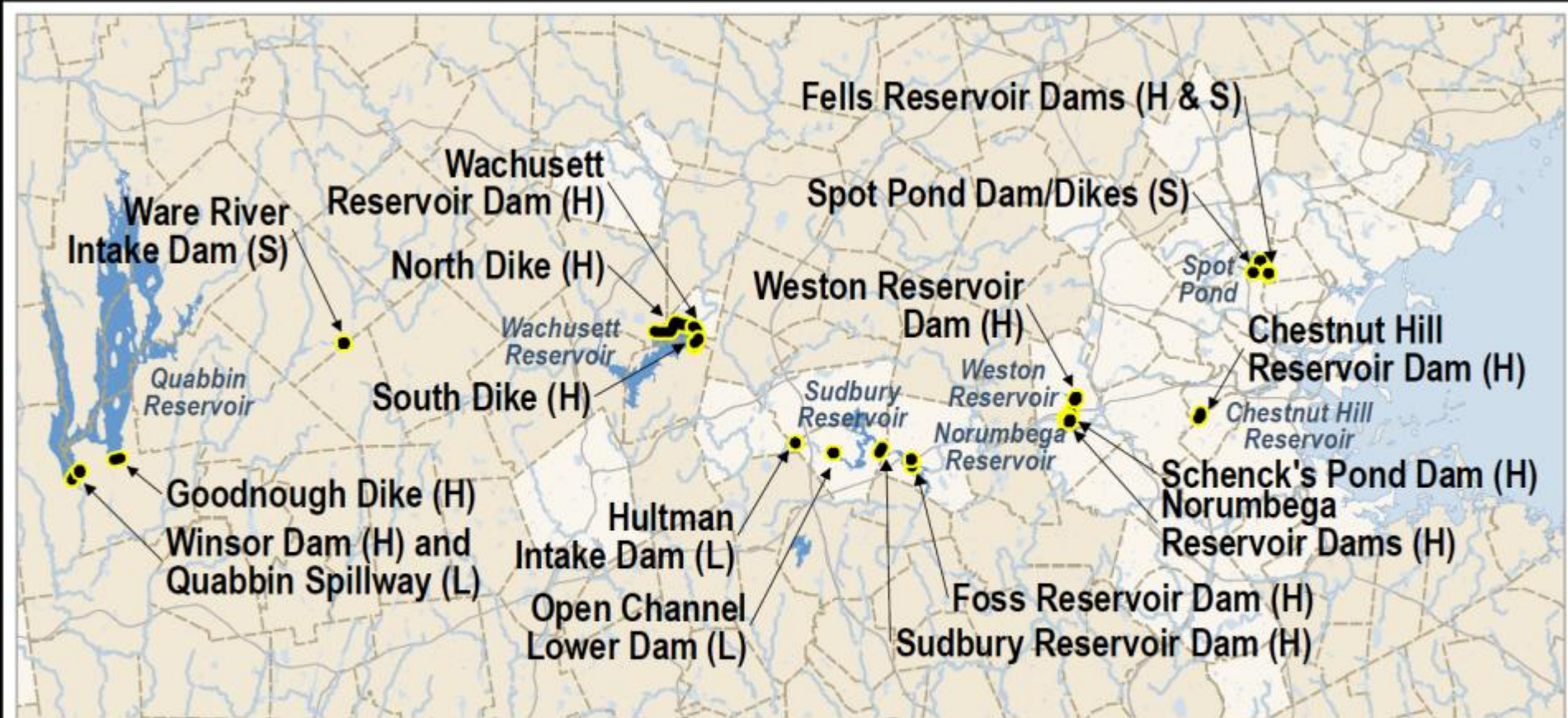


Dams by location and type

Dam Name and Location		Year Completed	Construction/Type	Storage (MG)
Quabbin Reservoir	Winsor Dam, Belchertown	1939	Earthen Embankment	412,000
	Goodnough Dike, Ware	1938	Earthen Embankment	
	Quabbin Spillway	1938	Masonry - Gravity	
Ware River	Lonergan Intake Dam, Barre	1931	Masonry - Arch	Run of River
Wachusett Reservoir	Wachusett Reservoir Dam, Clinton	1905	Masonry - Gravity	65,000
	North Dike, Clinton	1905	Earthen Embankment	
	South Dike, Clinton	1905	Earthen Embankment	
Wachusett Aqueduct	Open Channel Lower Dam, Southborough	1880s	Masonry – Gravity & Earthen Embankment	8
Wachusett Aqueduct	Hultman Intake Dam, Marlborough	1940s	Earthen Embankment	8
Sudbury Reservoir	Sudbury Dam, Southborough	1898	Earthen Embankment	7,200
Foss Reservoir	Foss Reservoir Dam, Framingham	1890s	Earthen Embankment	1500
Norumbega Reservoir	Dams 1, 2, 3, 4 and East Dike, Weston	1940s	Earthen Embankment	163
Schenck's Pond	Schenck's Pond Dam, Weston	1940s	Earthen Embankment	43
Weston Reservoir	Weston Reservoir Dam, Weston	1903	Earthen Embankment	360
Spot Pond	Dams 1, 4 and 5, Stoneham	1899	Earthen Embankment	2,500
Fells Reservoir	Dams 2, 3, 6, 7, and 8, Stoneham	1898	Earthen Embankment	63
Chestnut Hill Reservoir	Chestnut Hill Dam, Boston	1870	Earthen Embankment	413



Dams locations geographically



- Dams (MWRA Responsibility)
- Major Roads
- MWRA Water Communities
- MWRA Reservoirs
- (H) - High Hazard Class
- (S) - Significant Hazard Class
- (L) - Low Hazard Class

Oroville Dam and Spillway Crisis



Oroville Dam, CA

- 1 TG volume (>2X Quabbin Reservoir)
- Structural height = 770 ft. (4.5 x Winsor Dam)





Problem began with a primary spillway failure



Spillway bedding undermined and progressive failure



Emergency spillway activates for the first time





Downstream of Emergency Spillway severely eroded





Primary Spillway Damage



MWRA Dams and Spillways



Quabbin Spillways





Quabbin Primary Spillway @ 0.6 BGD on 04.05.10





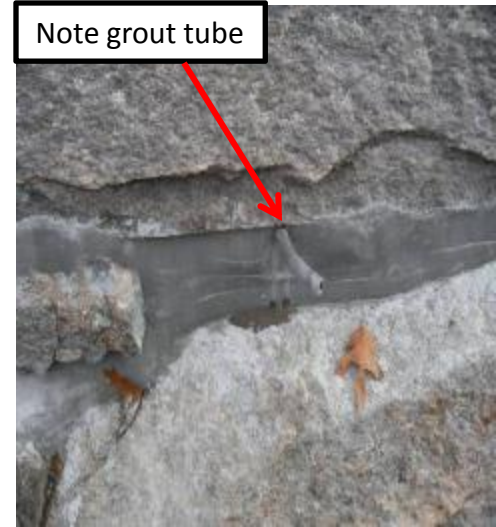
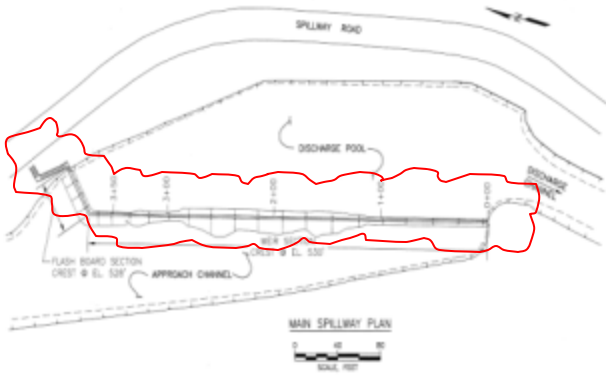
Quabbin Primary Discharge Channel





Quabbin Spillway Repointing and Grouting 2010

Limits of work





Quabbin Spillway Repointing and Grouting 2010

Downstream crest stone before

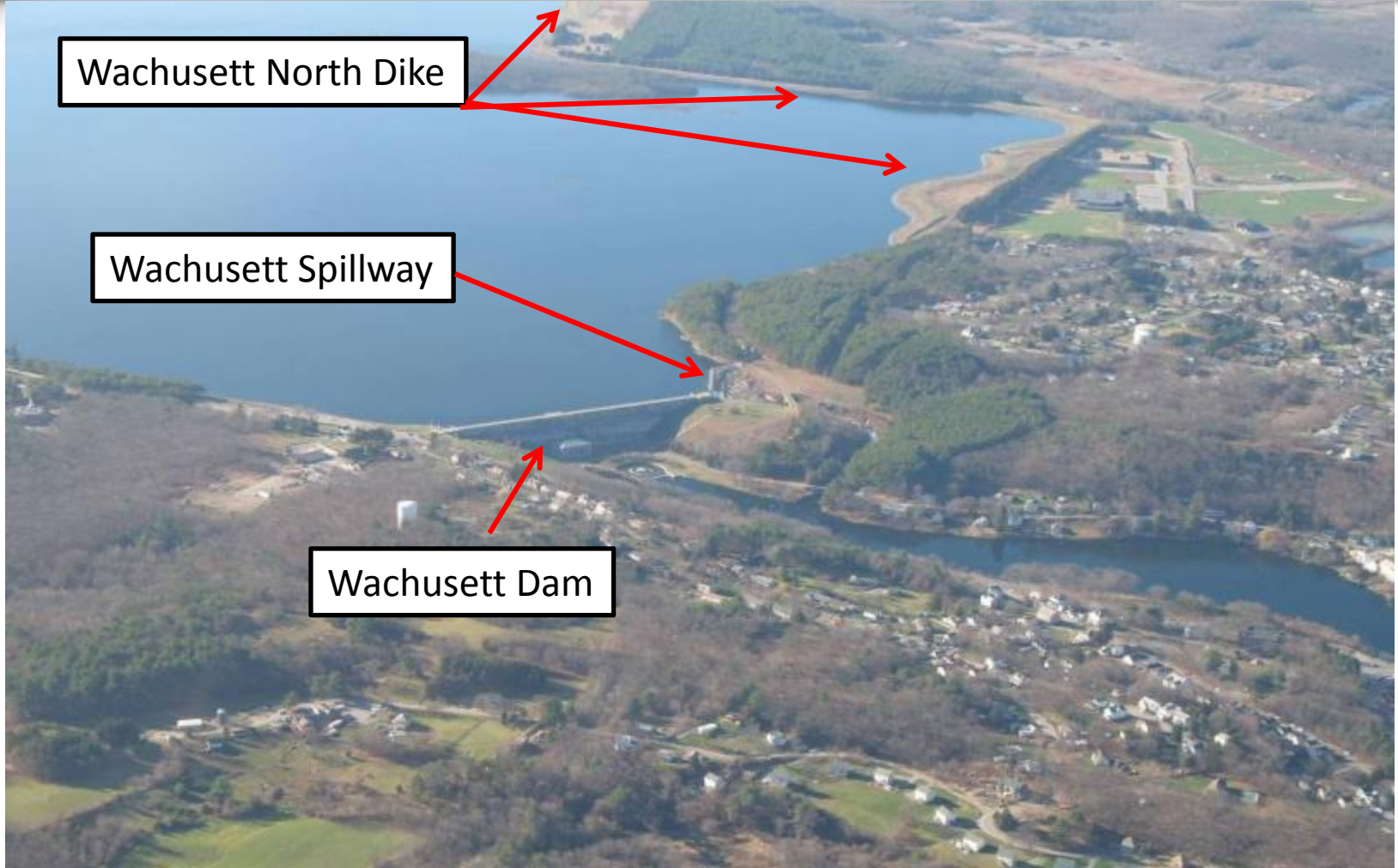


Downstream crest stone after





Wachusett Reservoir, Dam and Spillway





Wachusett Dam 1908



WACHUSETT DAM, CLINTON, FROM THE WEST. MAY 27, '08.



Wachusett Spillway Dismantling and New Sill 2008





Wachusett Spillway Crest Gate Installed 2008



**Original:
before**



**Upgrade:
after**





Wachusett el. 396.07' on 04.01.10 @ 2 BGD



Spillway discharge
Through historic
arch RR Bridge



Wachusett Auxiliary spillway adds discharge capacity 2009

Before



After



Wachusett spillway east berm construction



Wachusett Dam Improvements 2009



Dam face cleaned and repointed





Spot Pond Dam Armoring to protect against erosion 2012



Before



After



Chestnut Hill Dam Improvements 2012

Remove old catch basins, fill depressions...



...re-grade dam toe and hydroseeded.





Chestnut Hill Dam Riprap Improvements 2012



Missing riprap



Resetting riprap





Foss Reservoir Spillway 2012

Spillway masonry repairs



Spillway in flood flow @ 250 MGD





Weston Reservoir Dam Parapet Wall 2011





Sudbury Dam/Spillway Masonry Repointing 2012





Pending work – underway or in development

- Sudbury spillway masonry repairs on downstream spillway and underwater inspection of upstream area and gatehouse
- Internal stabilization of Chestnut Hill Dam GH #1
- Reconnection of North Dike around Leominster P.S.
- Installation of instrumentation (piezometers) at 8 earthen dam locations
- Foss Dam armoring and turf enhancement to protect against overtopping erosion



Conclusion

- All water supply dams are well-maintained, regularly inspected, and in compliance with Massachusetts Office of Dam Safety Regulations.
- MWRA has invested over \$20M since 2004 MOU with DCR for Capital and major maintenance responsibilities. Goal is to extend the life of each dam through good dam safety practices and attention.
- Continuous maintenance is performed on all dams



Thank you.



Chimera watching over Sudbury Dam