



Massachusetts Water Resources Authority

MASSACHUSETTS WATER RESOURCES AUTHORITY

Board of Directors Report

on

Key Indicators of MWRA Performance

for

Second Quarter FY2014

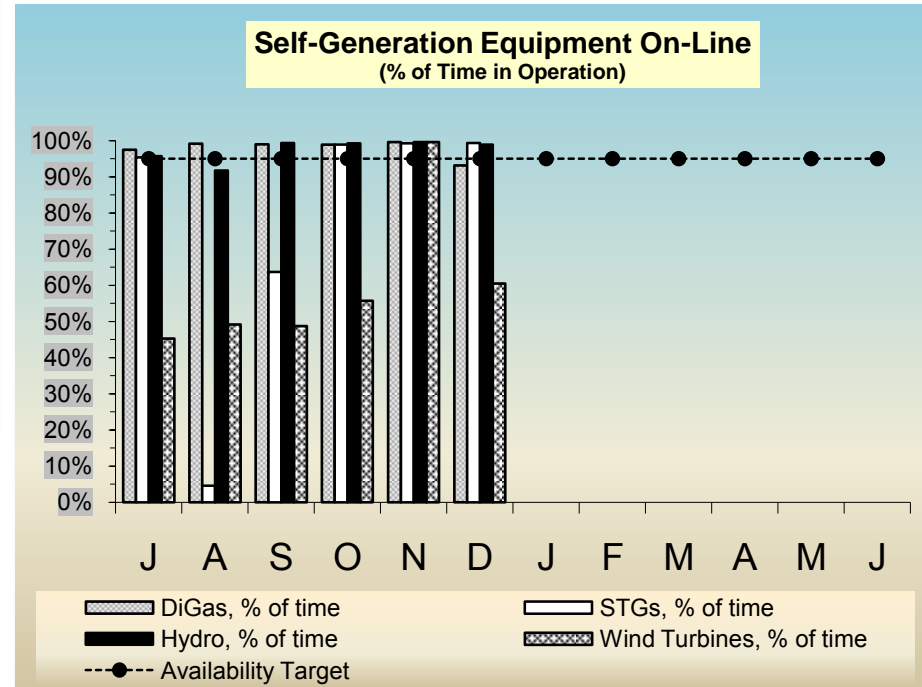
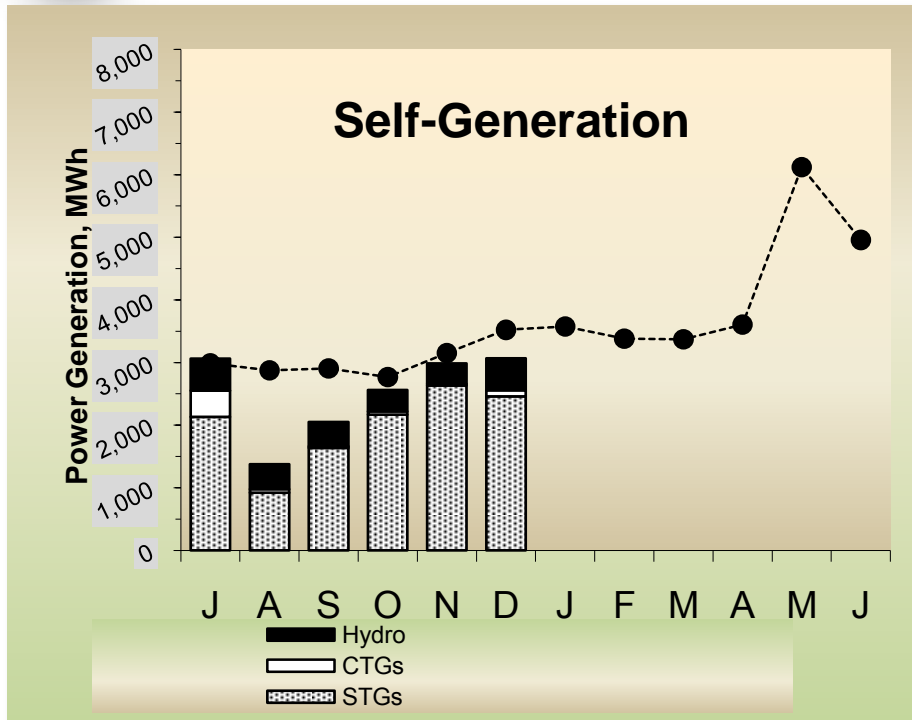
Q1	Q2	Q3	Q4



Frederick A. Laskey, Executive Director
Michael J. Hornbrook, Chief Operating Officer
February 12, 2014



Deer Island Operations: Self-Generation

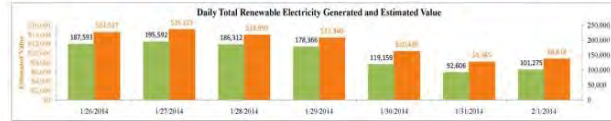




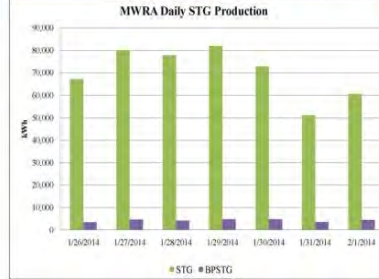
Energy Report



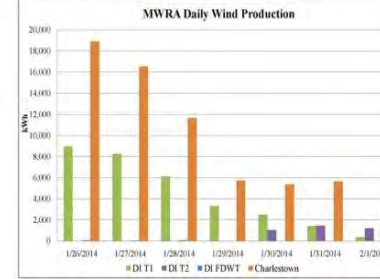
MWRA Renewable Electricity Generation for Week of January 26, 2014



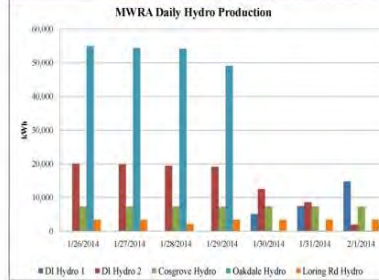
Deer Island Steam Turbine Generator and Backpressure Steam Turbine Generator - Methane



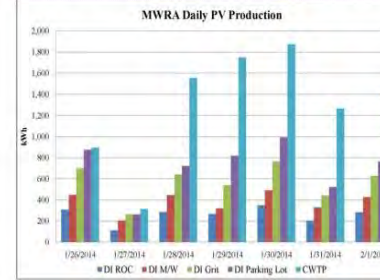
Deer Island Wind T1 and T2, Deer Island FDWT, Charlestown Wind



Deer Island, Oakdale, Cosgrove, Loring Rd - Hydro



Deer Island ROC, Deer Island M/W, DI Grit, DI Parking Lot, CWTP - PV



Weekly Summary	kWh	Estimated Rates (\$/kWh)	Estimated Value (\$)
DI Wind T1	30,943	0.086	\$2,652
DI Wind T2	3,698	0.086	\$317
Charlestown Wind	67,493	0.140	\$9,449
FloDesign Wind	170	0.086	\$15
DI STG	491,710	0.086	\$42,144
DI BPSTG	29,686	0.086	\$2,544
DI Hydro	128,708	0.086	\$11,031
Oakdale Hydro	212,546	0.041	\$8,649
Cosgrove Hydro	51,240	0.037	\$1,907
Loring Rd Hydro*	22,224	0.164	\$3,656
DI PV ROC	1,807	0.086	\$155
DI PV M/W	2,661	0.086	\$228
DI PV Grit	3,975	0.053	\$212
DI PV Parking Lot	4,955	0.053	\$264
CWTP PV	9,086	0.134	\$1,218
Total:	1,060,903		\$84,440

(*Includes electricity off-set due to electricity consumed on-site)

Availability Status Report

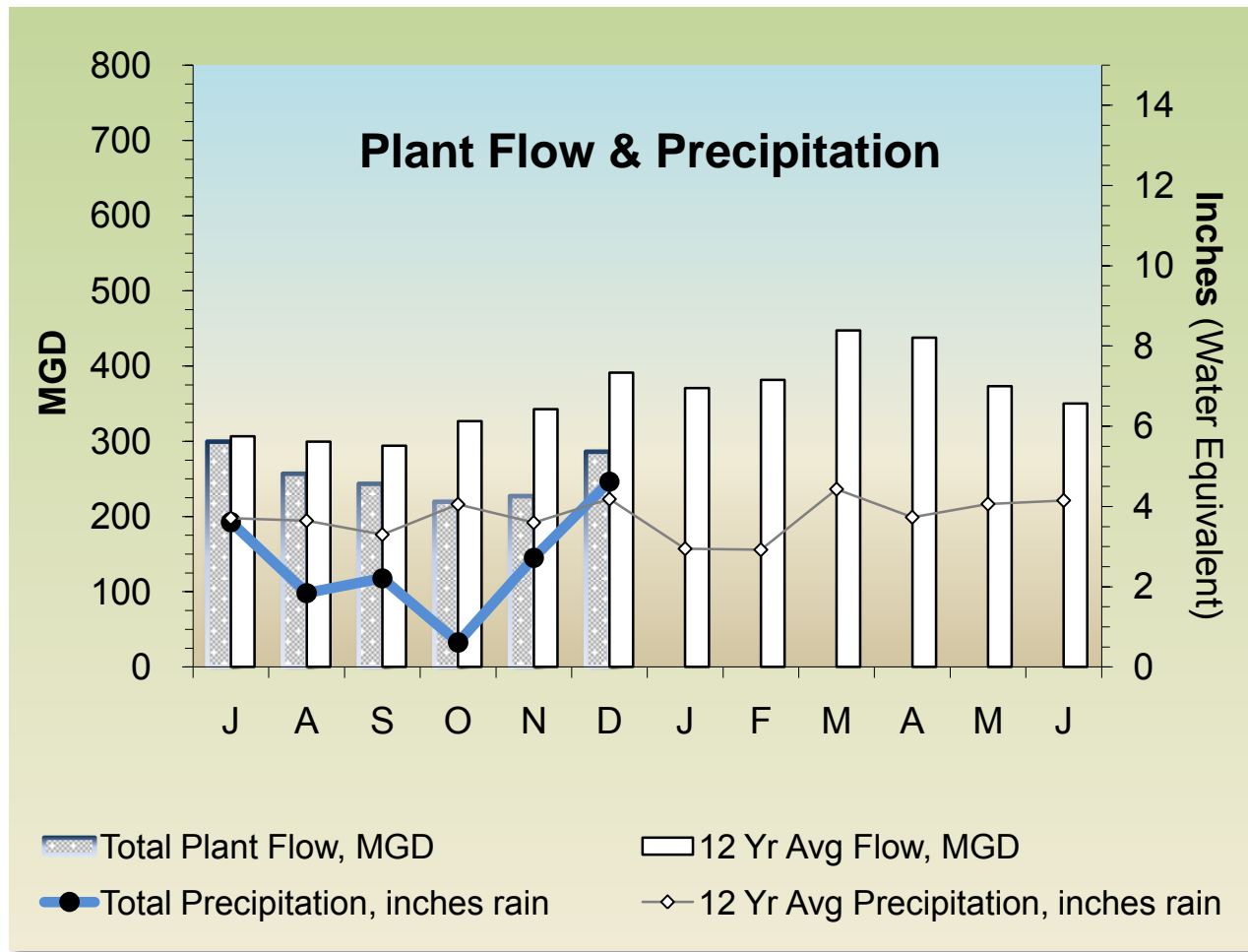
FloDesign Wind Back on-line intermittently. Supervised operation only
 DI Wind T2 Back on-line on 1/30/2014
 Oakdale Hydro Back off-line due to high water elevation at Wachusett Res.

Weekly Renewable Electricity Production 1,060,903 kWh
 Equivalent CO₂ Offsets 749 Tons
 Equivalent Weekly electricity usage 4210 homes

DITP Renewable Electricity Generation as % of DITP Total Demand 21%
 (does not include heat value of methane)
 Renewable Electricity Generation as % of MWRA Total Demand 27%
 (MWRA Total Demand based on FY14 budget)

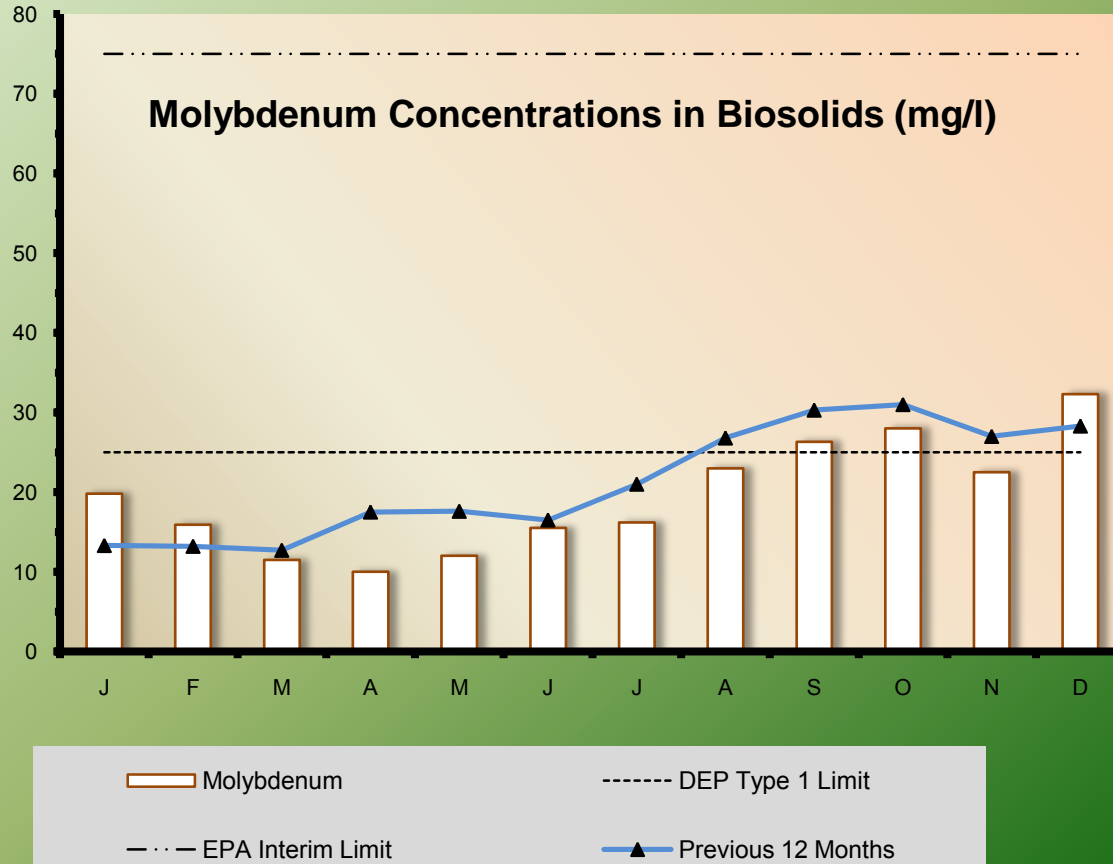


Deer Island: Plant Flow & Precipitation





Toxic Reduction and Control

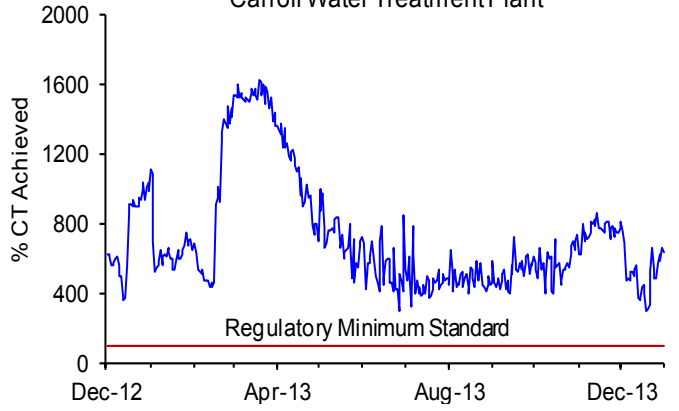




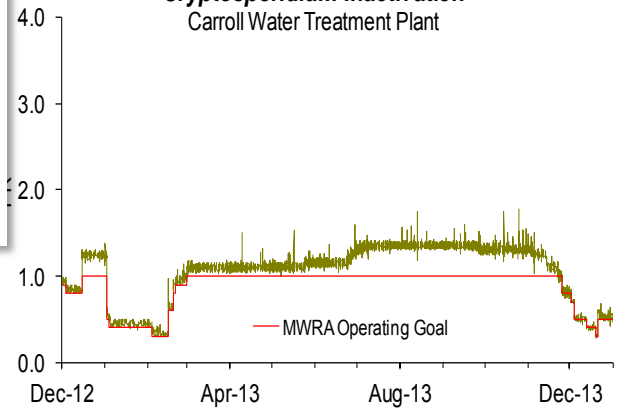
Treated Water: Disinfection Effectiveness

Giardia CT & *Cryptosporidium* Inactivation

Giardia CT Percent Achievement
Carroll Water Treatment Plant



Cryptosporidium Inactivation
Carroll Water Treatment Plant

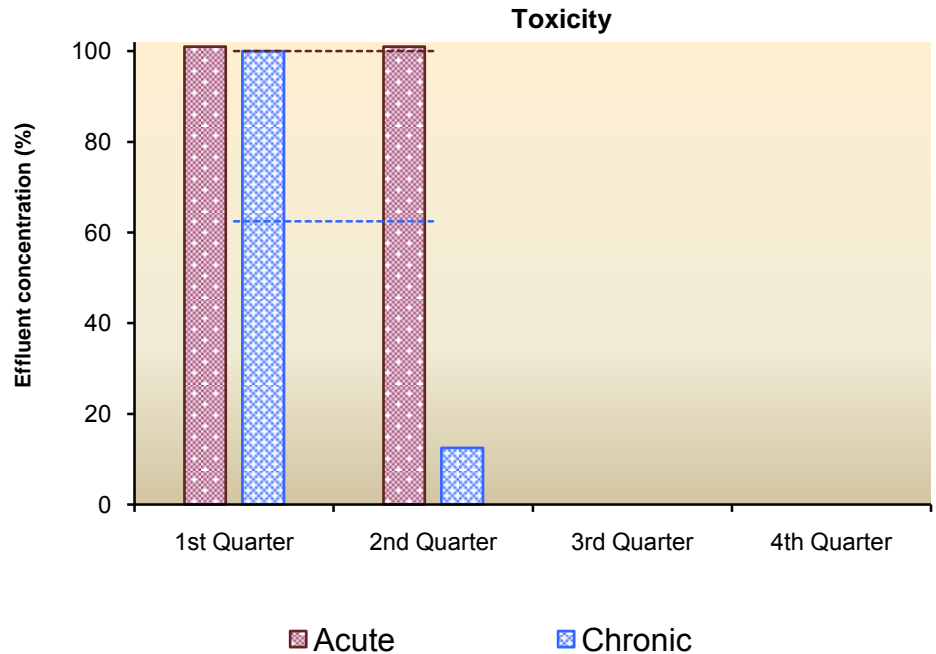
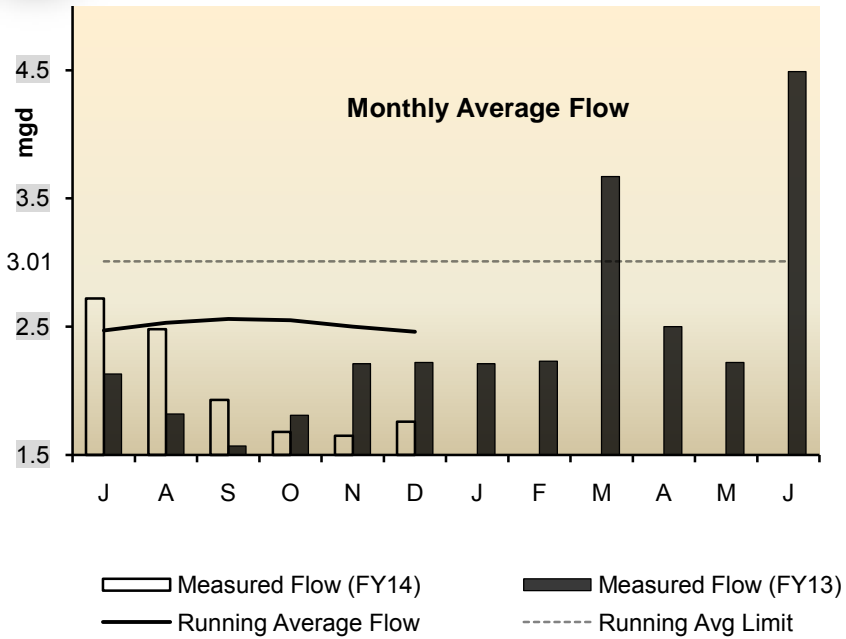


Minimum Hourly Crypto Log Inactivation
CWTPUV Treatment
target >2.0



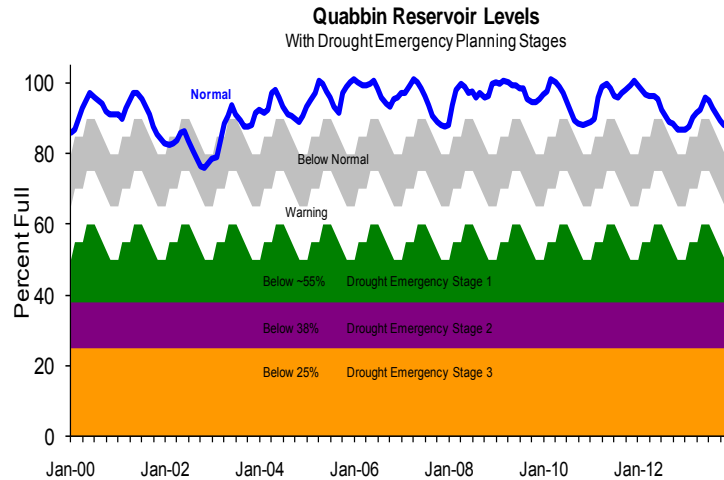
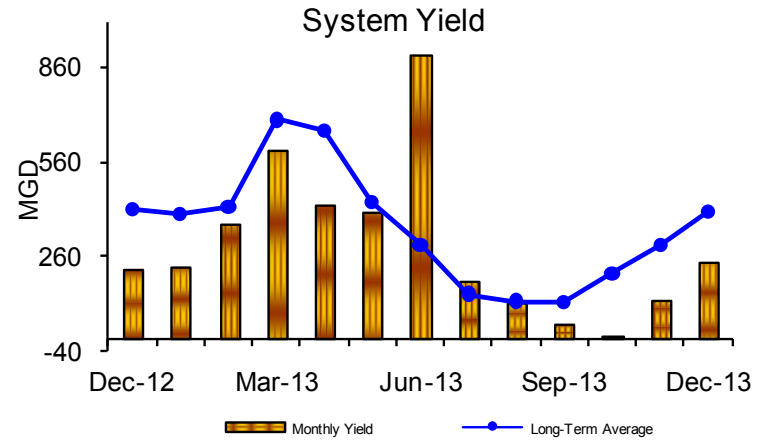
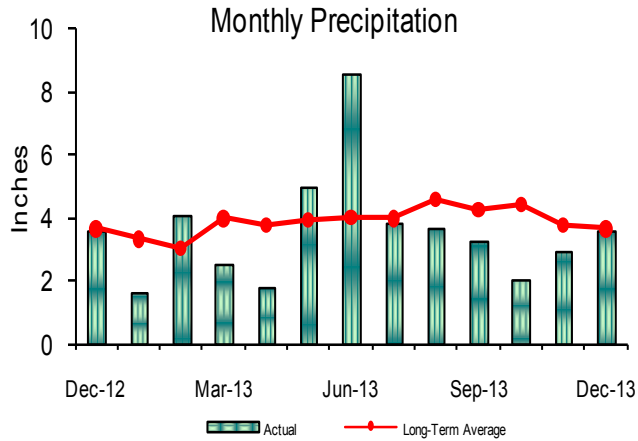


Clinton Wastewater Treatment Plant



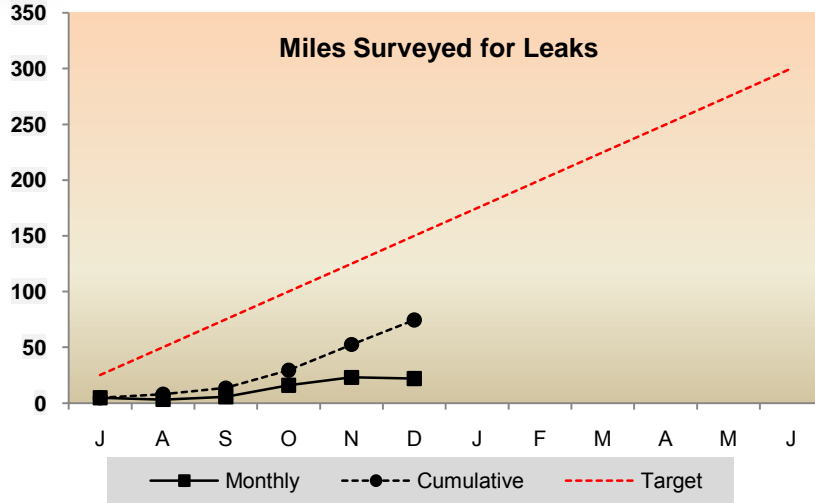


Water Supply and Source Water Management





Water Distribution System Pipelines



<u>Water Distribution System</u>						
Month	J	A	S	O	N	D
Leaks Detected	2	1	0	8	5	6
Leaks Repaired	0	1	2	5	4	5
Backlog	2	2	0	3	4	5
Avg. Lag Time	1.0	20.0	27.3	13.7	15.3	16.4





Massachusetts Water Resources Authority

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Combined Sewer Overflow Control Plan



Alewife Brook Wetland, Cambridge

DRAFT
Annual Progress Report 2013

February 2014



2013 CSO Progress Highlights

- Three CSO projects completed:
 - ✓ Brookline Sewer Separation
 - ✓ CAM004 Stormwater Outfall and Wetland (“Alewife Brook Wetland”)
 - ✓ SOM01A Interceptor Connection Upgrade and Floatables Control

Total completed projects: 32 of 35 in the Long-Term Control Plan

- CAM004 Sewer Separation (Cambridge)
 - ✓ All three major contracts are now in construction.
 - ✓ On schedule for completion by Dec 2015 court milestone.
- Reserved Channel Sewer Separation (BWSC)
 - ✓ All major contracts are complete or >75% complete.
 - ✓ Two smaller contracts to be awarded soon.
 - ✓ On schedule for completion by Dec 2015 court milestone.



2013 CSO Progress Highlights

- MWR003 Gate/Floatables Control and Rindge Ave. Siphon Relief (MWRA)
 - ✓ 100% design; Construction NTP by the August 2014 court milestone

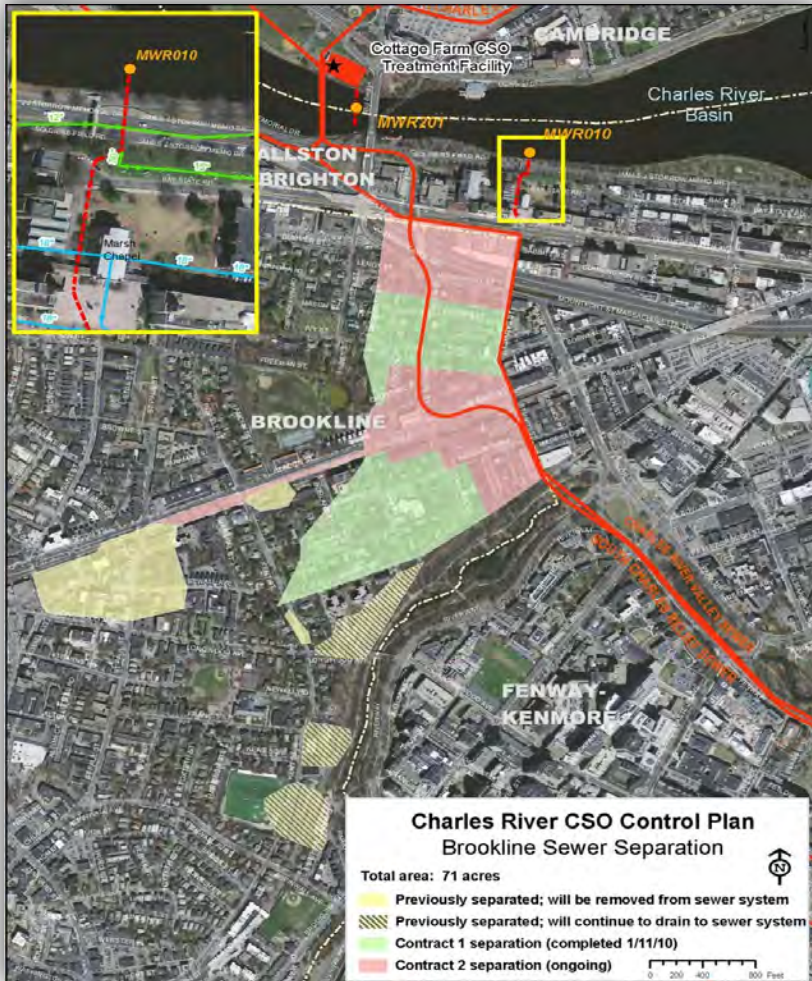
In 2013: 21,172 linear feet (4.0 miles) of storm drain and sanitary sewer were installed in Boston, Brookline and Cambridge

Since 1996: 450,000 linear feet (85 miles) of storm drain and sanitary sewer have been installed under the CSO Control Plan





Completion of Brookline Sewer Separation – April 2013



Schedule Seven Milestone: July 2014

- 71 acres separated
- 9,450 ft (1.8 miles) of new storm drain
- 5,840 ft (1.1 miles) of new sewer

Removed stormwater from MWRA system to lower CSO discharges to the Charles River Basin, primarily at MWRA’s Cottage Farm facility

Brookline contracts: \$23.9 M

MWRA outfall contract: \$ 1.1 M

Total cost: \$25.0 M



Completion of Brookline Sewer Separation - April 2013



September 2012:
MWRA completes the
cleaning of Outfall
MWR010



April 2013:
Brookline removes steel
overflow plate in Outfall
MWR010



December 2013: Brookline
completes surface
restoration



Alewife Brook Stormwater Outfall and Wetland Basin



Wetland Dedication Ceremony October 15, 2013



Alewife Stormwater Outfall and Wetland Basin

Construction Cost \$17.8M MWRA Share \$5.3M

Construction start: April 2011

Construction complete: April 2013





Alewife Brook Stormwater Outfall and Wetland Basin



4-ft by 8-ft Stormwater Conduit Outfall



Stormwater Outfall to the Forebay



Installation of 42-inch drain on East Second Street

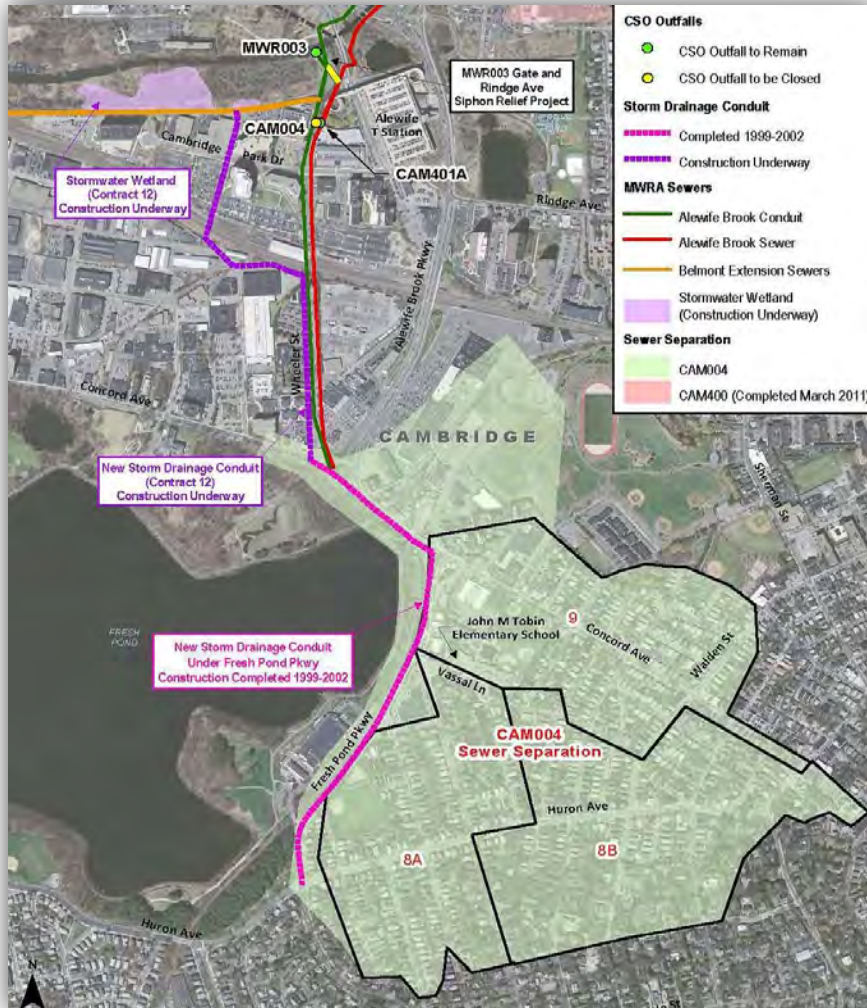


Oxbow extension of the Little River



Alewife Brook CSO Control Plan

\$97.2 million MWRA share (Cambridge's share \$20.5 million)



City of Cambridge

Interceptor Connection(s) Relief and Floatables Controls (2010)

CAM400 Common Manhole Separation (2011)

CAM004 Stormwater Outfall and Wetland (2013)

CAM004 Sewer Separation (2015)

MWRA

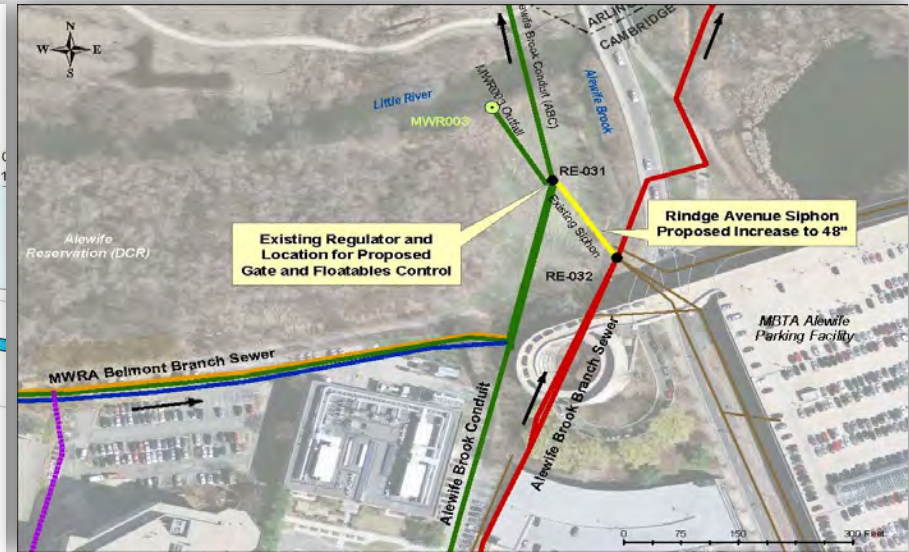
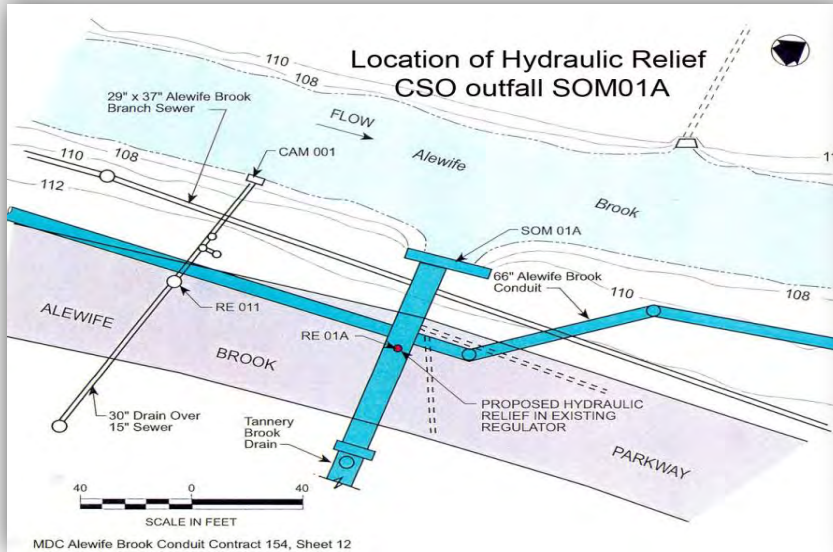
SOM01A Interceptor Connection Upgrade and Floatables Control (2013)

MWR003 Gate/Floatables Control and Rindge Ave. Siphon Relief (2015)



MWRA Alewife Brook CSO Improvements

\$3.8M Design and Construction



Project	Commence Design	Commence Construction	Complete Construction
Outfall SOM01A Interceptor Connection and Floatables Control	Apr 12	Sep 13	Dec 13
Outfall MWR003 Gate and Floatables Control and Rindge Ave. Siphon Relief	Apr 12	Aug 14	Oct 15



SOM01A Interceptor Connection and Floatables Control



**Underflow baffle (floatables control)
Behind existing overflow weir**



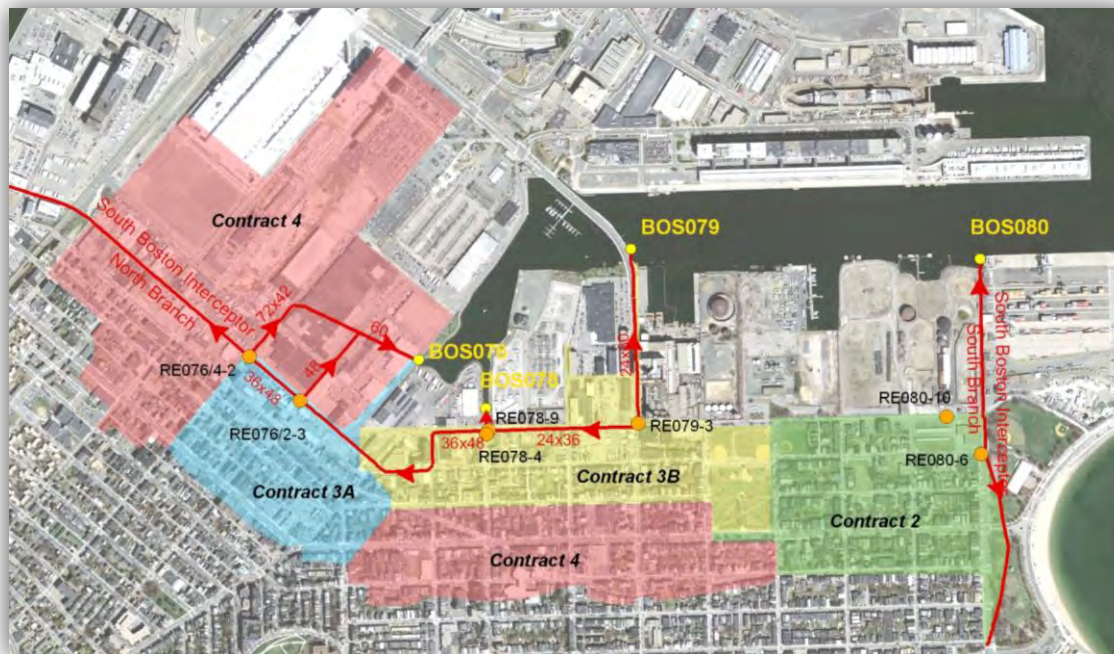
Modified connection to MWRA interceptor



Reserved Channel Sewer Separation Progress

Total Projected MWRA Cost: \$68.6 million

- Contracts 1, 2, 3A and 7 are complete
- Contracts 3B and 4 (sewer separation) are well underway
- Contract 8 (final paving) is ongoing
- Contracts 5 (sewer lining) and 6 (downspouts) to be awarded soon





Reserved Channel Sewer Separation Construction

Contract 3B: 90% Complete



Installation of 42-inch drain on East Second Street



Construction of drain manhole at K and E. 2nd streets

Contract 4: 75% Complete



Installation of 30-inch drain on I Street



Installation of 36-inch drain on E Street



CSO Control Plan Budget and Spending

Proposed FY15 CIP:	\$893.9 M
Projected Cost:	\$896.4 M
Spent in 2013:	\$ 26.3 M
Spent through 2013:	\$844.3 M
Remaining to be spent: (2014-2020)	\$ 52.1 M



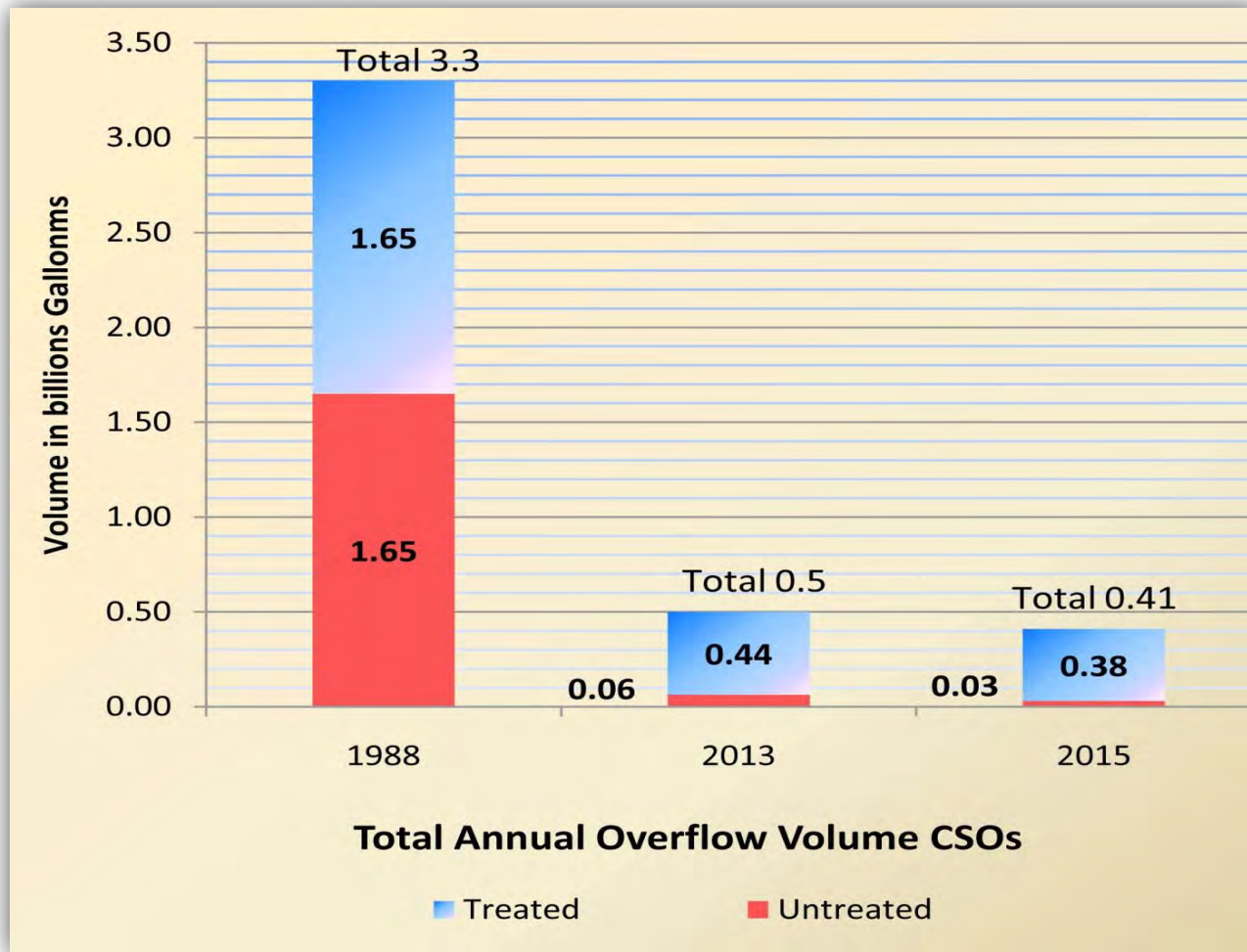
Long-Term Control Plan Achievements To Date

- ✓ 32 of 35 projects in the CSO plan are complete
- ✓ 2 projects are in construction
- ✓ Last project moves to construction in August 2014
- ✓ 37 of 84 CSO outfalls are closed or 25-year control (5 NDB)
- ✓ Average annual CSO volume reduced 85%
(3.3 BG in 1988 to 0.50 BG today)
- ✓ 88% of the remaining volume is treated at MWRA's four CSO facilities

Goal is 0.40 B gallons with 93% treated



Long-Term Control Plan Achievements To Date







***Oxygen Generation Facility Services,
Deer Island Treatment Plant***





Cryogenic Oxygen Production is Critical to DITP Permit Compliance

- **“Cryo” Generates 130 dtpd 97% Pure Oxygen from 1 of 2 process trains**
- **Oxygen is Used in Secondary Activated Sludge Process**
- **“Cryo” is a significant Energy User with hundreds of instruments**
 - 17.6 M kWh annually (11.4% of DITP’s total Energy Demand)

