Massachusetts Water Resources Authority

Briefing to the Wastewater Advisory Committee

MWRA Master Plan
Wastewater Treatment and Sewer System Needs

October 12, 2006

Presentation Outline

- Introduction
- Collection System Facilities and Sewers
- Residuals – Off-Island
- Treatment - Deer Island, Clinton

What the Master Plan Includes

- All projects now in the CIP
- Projects eliminated from the CIP due to budget concerns
- System needs previously identified
- System needs newly-identified

All projects have been prioritized. Projects will receive further scrutiny during the CIP development process.

What the Master Plan Includes

FY07 Approved CIP

CSO Program: $460 million

Other FY07-13 Projects: $192 million

Additional System Needs Identified in Master Plan

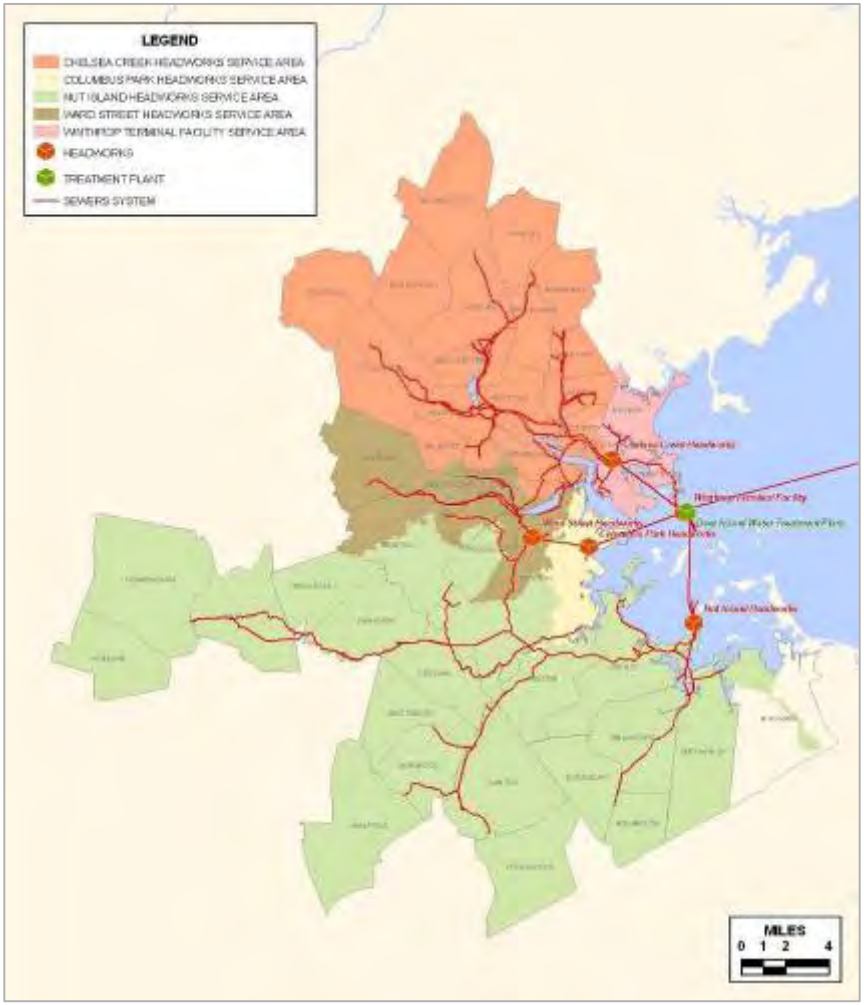
($ in millions)

FY07/08	FY09-13	FY14-18	FY19-48	Total
$4	$114	$391	$ 882	$1,391

Total Wastewater Needs Identified in Master Plan: $2.043 BILLION

MWRA Sewer System Overview

- Deer Island Treatment Plant
  - 360 Million Gal/Day Average
  - 1,270 Million Gal/Day Peak
- Clinton Treatment Plant
- Residuals Plant - produces pellets for Beneficial Reuse
- 4 Remote Headworks
- 20 Pump Stations and CSO Facilities
- 227 miles of Gravity Sewers
- 30 miles of Force Mains, Siphons, and CSO/Emergency Outfalls
- 18 miles of Cross-Harbor Tunnels



Wastewater System Challenges

- Deer Island plant is aging. Maintenance, repair, and rehab/replacement are increasingly costly.
- Residuals facility will need large-scale equipment replacement in FY2015.
- Older Headworks facilities require significant reinvestment.
- Interceptors are aging and some sections require rehabilitation or replacement.
- There will be operational challenges to overcome during capital project construction.

Major Conditions and Assumptions

- Needs assessment extends through FY48 (40 year projection). Today's focus is on FY07-18, including specific 5-year periods FY09-13 and FY14-18.

- No new communities are expected to join the wastewater system. Population growth is expected to be modest.

- No funds are included for additional regulatory requirements.

- Cross-harbor tunnels are assumed to be in good condition. No rehab funds are budgeted.

Project Prioritization

- 201 Wastewater projects evaluated and prioritized

Priority 1 - Critical
Priority 2 - Essential
Priority 3 - Necessary
Priority 4 - Important
Priority 5 - Desirable

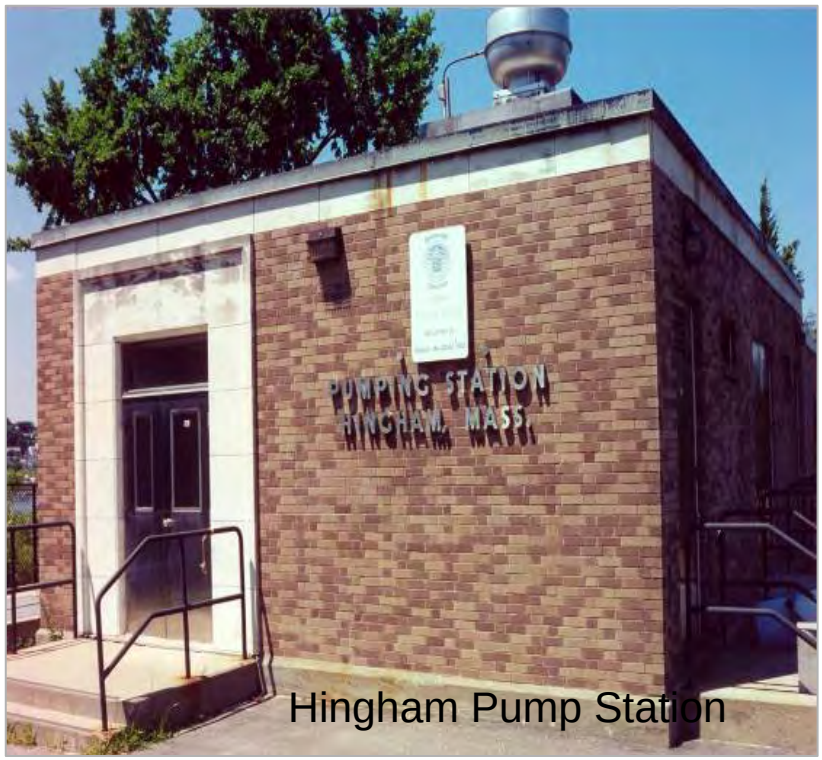
- All projects will receive further scrutiny during FY08 CIP development process

Collection System Facilities

Columbus Park Headworks

4 Remote Headworks

20 Pump Station and CSO Facilities

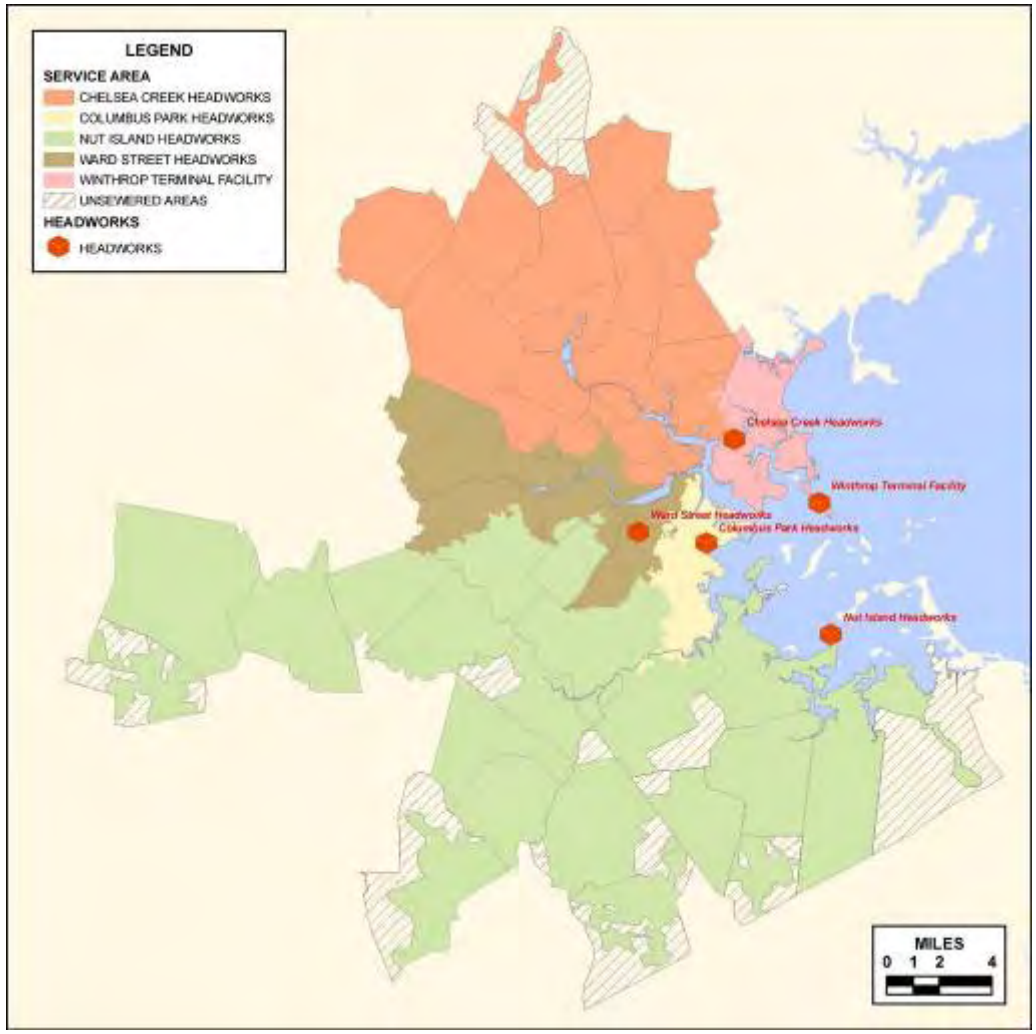


Hingham Pump Station

Key Elements to Minimize Risk of Failure

- Operability of Mechanical Equipment
- Maintenance of Electric/Standby Power

Remote Headworks



- Chelsea Creek 1967
- Columbus Park 1967
- Ward Street 1967
- Nut Island 1998

3 older Headworks remain operational, but are in only fair condition. Significant Investment is required now.

Nut Island Headworks is relatively new and in very good condition

Headworks Reinvestment Strategy

For 3 older Headworks (1967)

- Condition Assessment/Facilities Plan
  $2M in Current CIP FY07-08
- Screen Replacement
  $5M in Current CIP FY08-11


Columbus Park


Chelsea Creek

- Additional Upgrades from Facility Plan
  $25M Recommended FY09-18
- Long-Term Annual Asset Protection Budget Included with 20 Other Sewer Facilities ($2-3.5M annually FY11+)

Headworks Screens

Screen Replacement
$5M in FY08-11 CIP

Headworks Equipment

Grit Piping

Grit Pod

Headworks Equipment

Odor Control Media

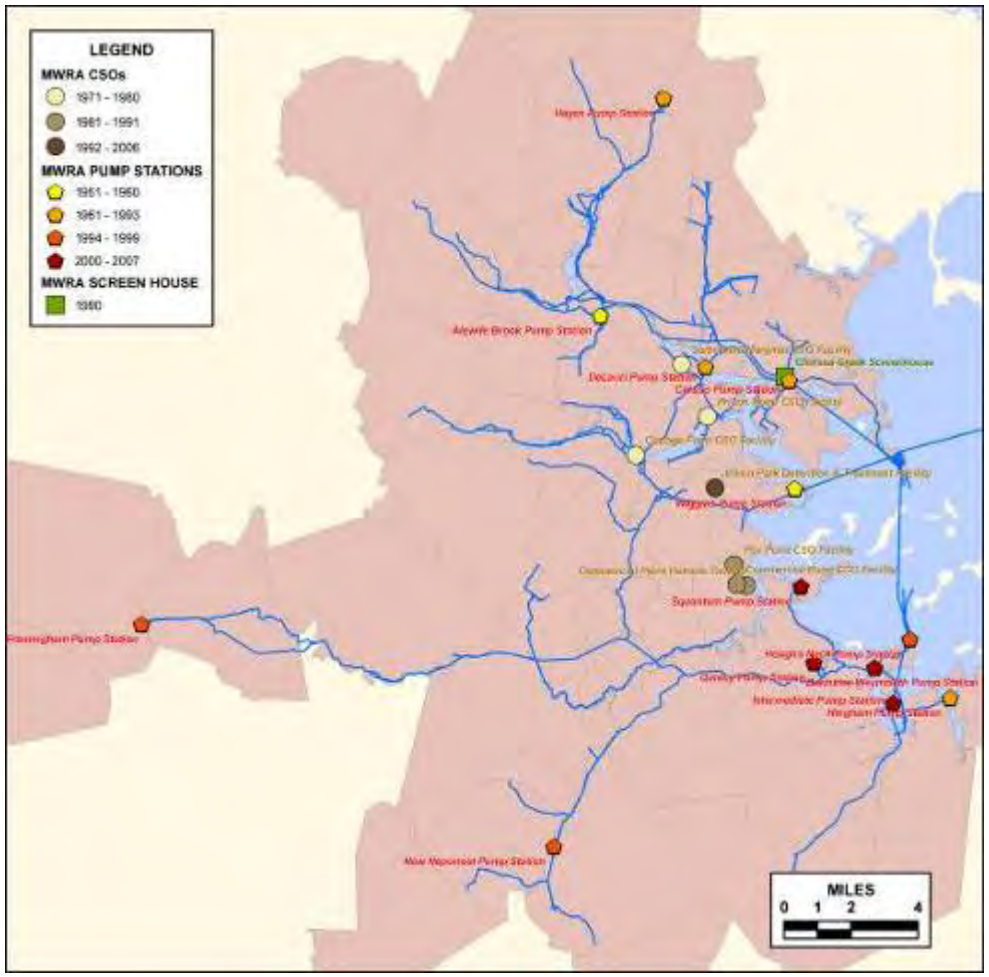
Knife Valve

Nut Island Headworks (1998)

Minor Mechanical Systems, Fire Alarm and Wiring Upgrades, and Pier Rehabilitation/Replacement

$4.5M Recommended for FY09-18

20 Pump Stations and CSO Facilities



- Average Age 17 years - Good to Excellent Condition
- 15 of 20 Facilities Built by MWRA, 1987-2007
- 5 of 20 Facilities Pre-MWRA, 1951-1980
- $3M in Current CIP FY07-13 for Equipment Rehab and Replacement Projects at 5 Facilities (Alewife, Caruso, Hingham, Prison Point, Cottage Farm)

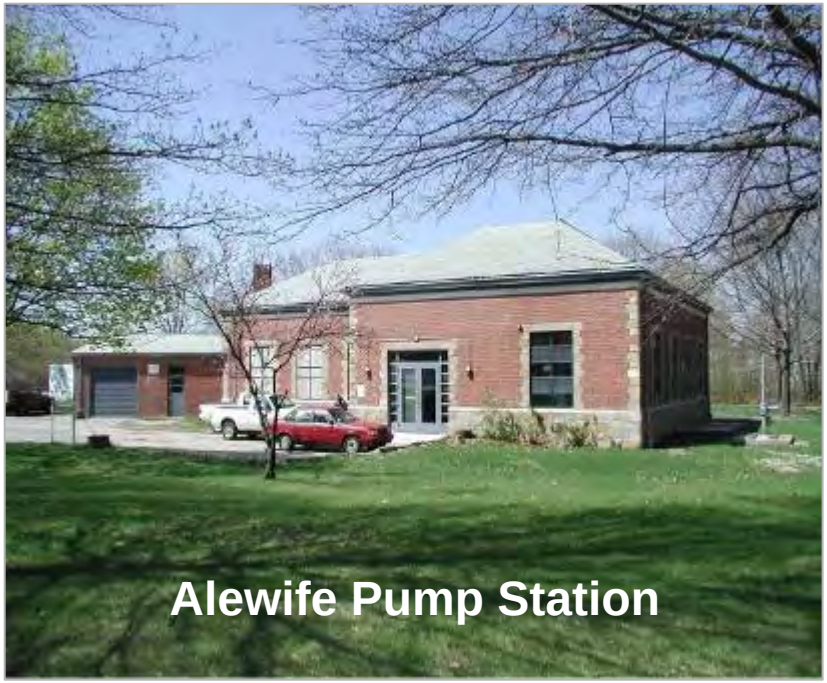
20 Pump Stations and CSO Facilities

- Alewife Brook PS 1951
- Castle Island PS 1960
- Cottage Farm CSO 1971
- Somerville Marg CSO 1971
- Prison Point PS/CSO 1980
- Hayes PS 1987
- Chelsea Screen House 1990
- Caruso PS 1991
- Hingham PS 1992
- DeLauri PS 1993
- New Neponset PS 1995
- Framingham PS 1998
- Hough's Neck PS 1999
- Quincy PS 2002
- Squantum PS 2003
- Intermediate PS 2005
- Union Park CSO 2006
- B/W Replacement PS 2007

To be Decommissioned in 2008

- Fox Point CSO 1989
- Commercial Point CSO 1991

Alewife and Framingham Pump Stations



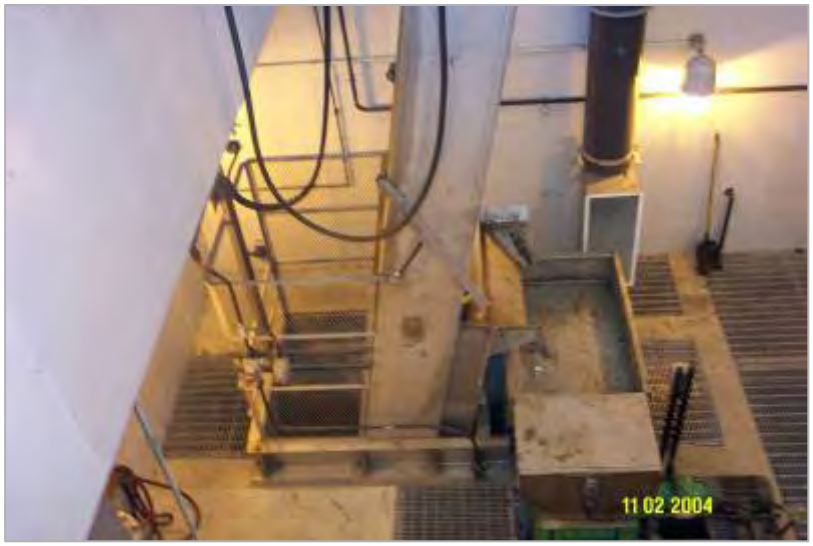
Alewife Pump Station

$4.85M Recommended for FY09-18 for Improvements at Alewife and Framingham Pump Stations and Sluice Gate Replacement at Chelsea Screen House

Framingham Pump Station

Alewife Pump Station

Framingham Pump Station



Sewer Facility Reinvestment Strategy

Hayes Pump Station (1987)

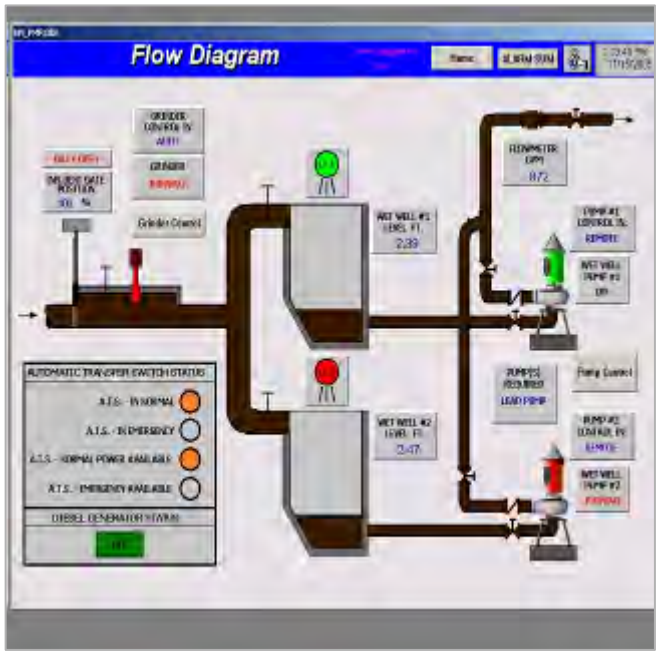
- $3M Recommended for FY10-12 for Facilities Plan for 10 Older Pump Station/CSO Facilities
- $60M Recommended for FY14-18 for Future Upgrades of 10 Older Facilities Based on Facilities Plan

Hingham Pump Station (1992)

- Recommended Long-Term Annual Asset Protection Budget Included with 20 Other Sewer Facilities ($2-3.5M annually FY11+)

SCADA

- Wastewater Central Monitoring Supervisory Control and Data Acquisition (SCADA) for OCC and All Facilities
  - $16M in Current CIP FY07-09
  - $100K Recommended for FY09-18 for SCADA PC Equipment



Facilities - Major Projects in FY07 CIP (through FY13)

CIP Total - $37.8M (FY07-13)

- $11.5M Complete the Braintree/Weymouth Relief Facilities
- $2M Condition Assessment/Facility Plan for Older Headworks
- $5M Replace Headworks Screens
- $3M 8 Equipment Rehabilitation and Replacement Projects
- $16M Upgrade to Wastewater SCADA System

Facilities - Major Projects Recommended for FY08 CIP

Additional Needs Identified for FY08-18 - $121M

- $4.5M Replace Equipment at Nut Island Headworks (FY09-18)
- $4.85M Alewife and Framingham Pump Station Improvements and Chelsea Screen House Sluice Gate Replacement (FY09-18)
- $25M Upgrades to Older Headworks Facilities (FY09-18)
- $3M Pump Station and CSO Facility Condition Assessment - Facilities Plan (FY10-12)
- $60M Design/Construct Upgrades for 10 Older Facilities (FY14-18)
- $23.5M Equipment Replacement Projects (FY11-18)
  - Long-Term Annual Asset Protection Budget for All Sewer Facilities ($2M annually FY11-13, $3.5M annually FY14-18)

Collection System Sewers

- 227 Miles of Gravity Sewers
- 30 Miles of Force Mains, Siphons and Outfalls
- 4,000 Manholes and Structures

Sewer Rehabilitation

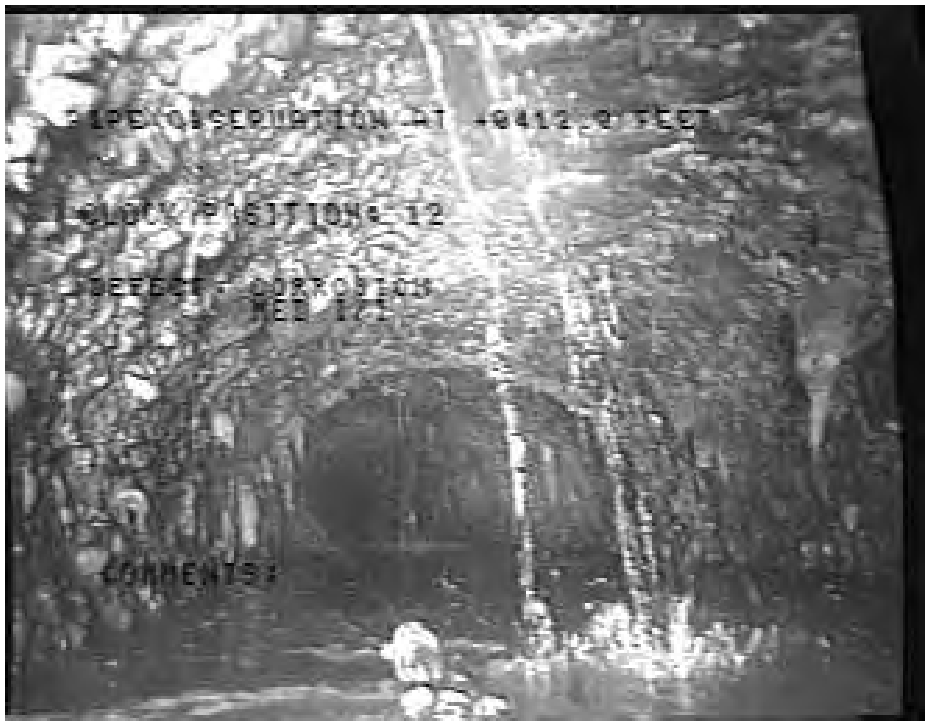
$4M in Current CIP FY07-13 to Complete Rehabilitation of Sections 83 (Arlington) and 160 (Winchester/Medford) using Cured-in-Place Technology

West Roxbury Tunnel Rehabilitation

- Constructed 1963
- 2.5 mile long tunnel, Inspected 1999
- Access shafts at ends and mid-point
- Hydrogen Sulfide Corrosion

- $80M Recommended for FY11-18
- Completed Rehabilitation of Upstream Sewer and New Haven Street Drop Shaft

Section 624 Rehabilitation, North Weymouth



- Constructed 1933
- 2,000 ft - Located Beneath Rte 3A in North Weymouth
- 5 ft Diameter
- Hydrogen Sulfide Corrosion

- $5M Recommended for FY09-11
- Previously a Component of B/W Project

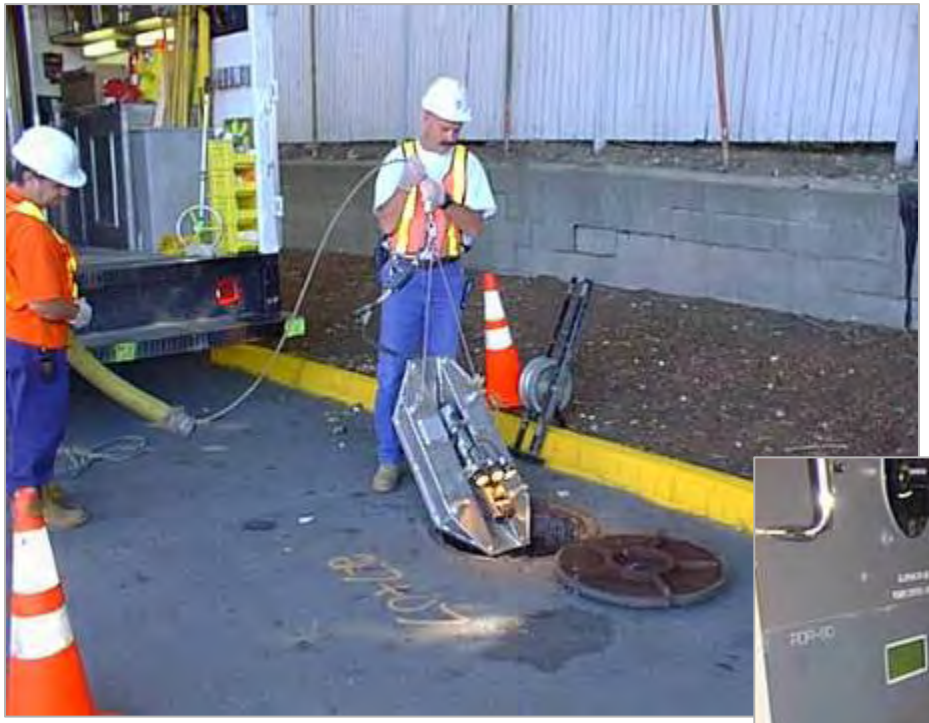
Siphon Headhouse Chambers

$8M Recommended for FY09-18 to Rehabilitate 127 Siphon Headhouse Chambers/Diversion Structures as Previously Identified in 1996 Study

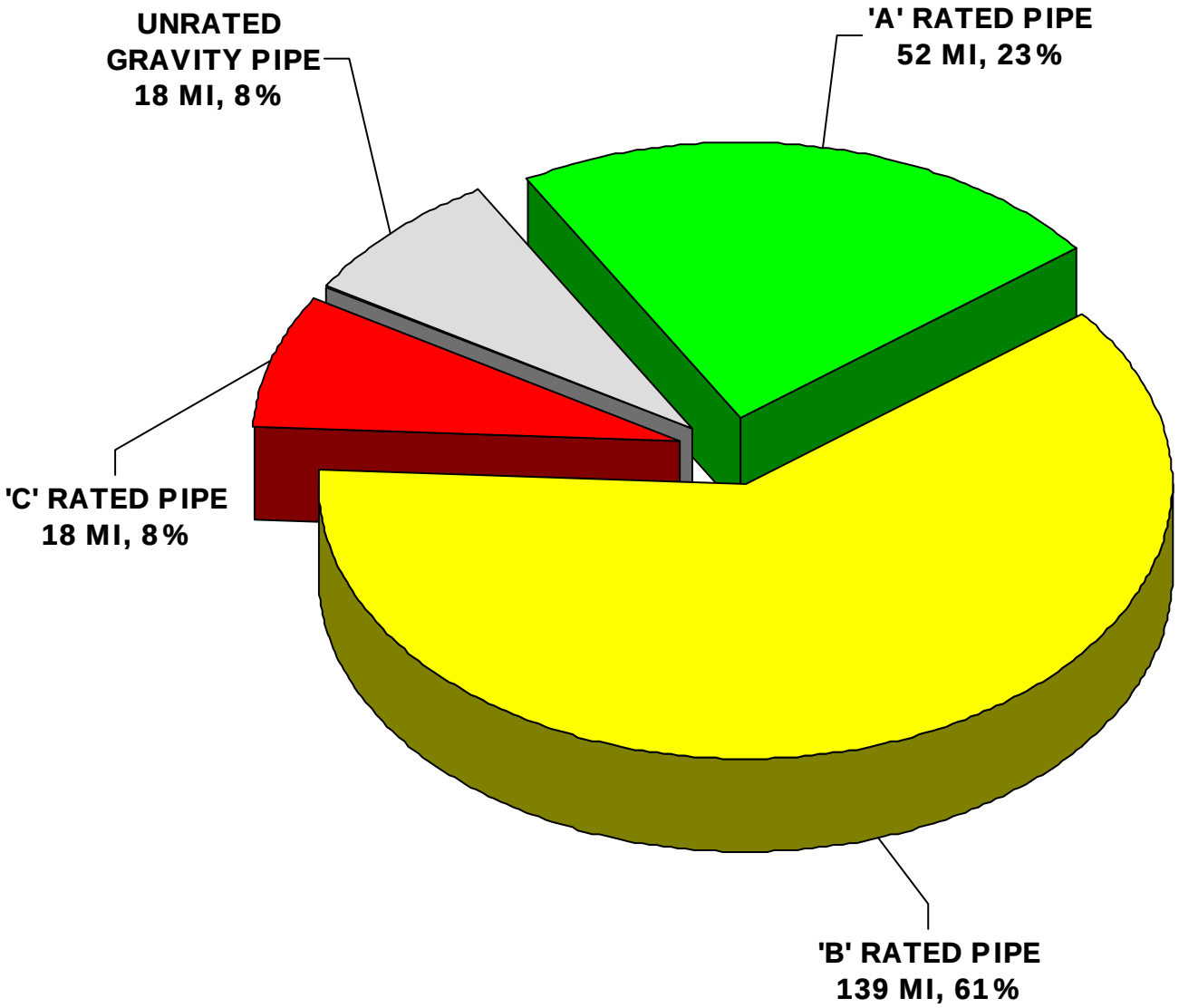
Interceptor Renewal Project Development

- Internal TV Inspection of All Gravity Sewers
- Rate Physical Condition of Sewers: A (very good), B (fair to good), C (poor/severely damaged)
- Use Risk/Consequence of Failure Methodology to Prioritize “C” Rated Pipe
- Group “C” Rated Pipe into Prioritized Projects
- Rehabilitate Manholes/Structures Together with “C” Rated Pipeline Projects

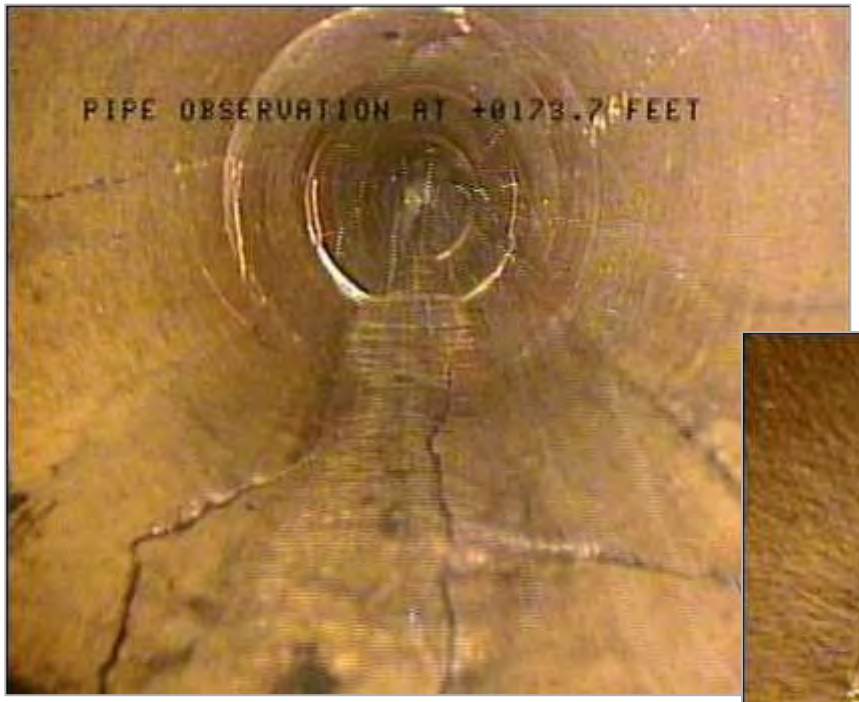
TV Inspect All Gravity Sewers



Pipe Ratings

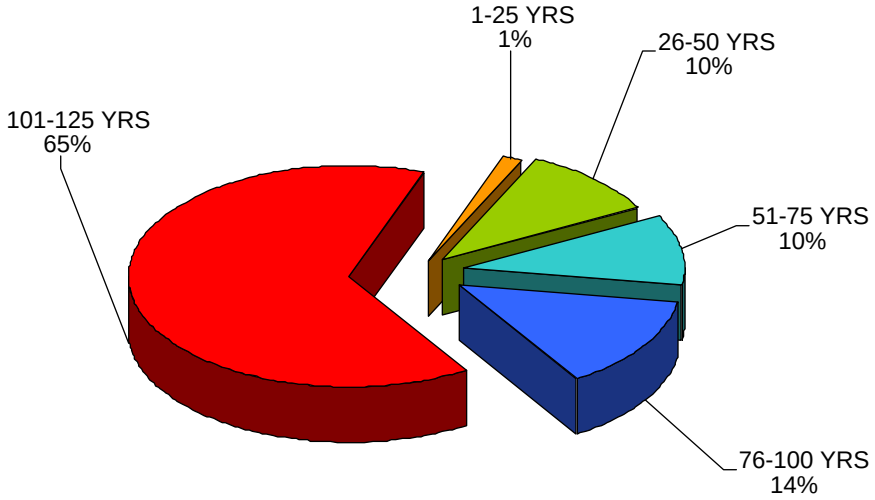


“C” Rated Pipe

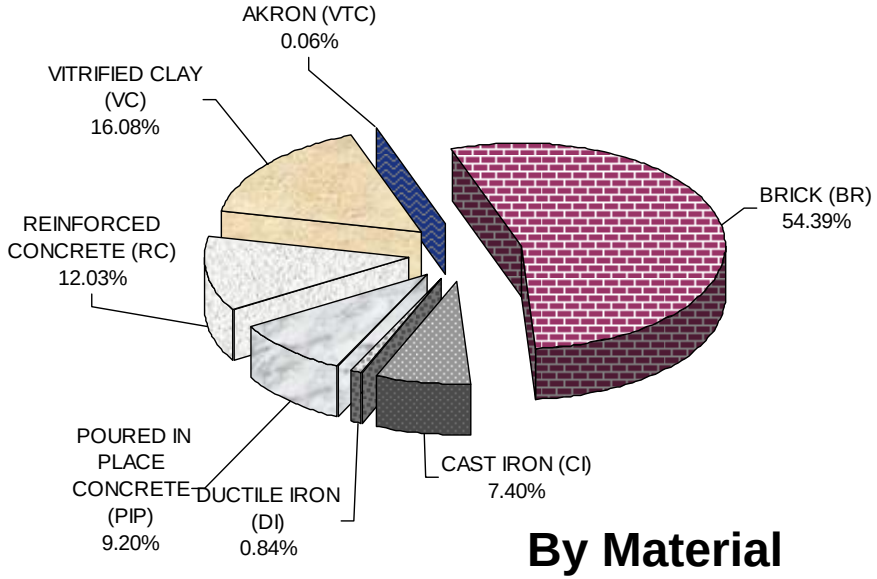

PIPE OBSERVATION AT +0173.7 FEET


MANHOLE FROM: 19+76 TO: 17+98
39BR(208)/ E. BOSTON

“C” Rated Pipe Critical Factors – Age and Material



By Age



By Material

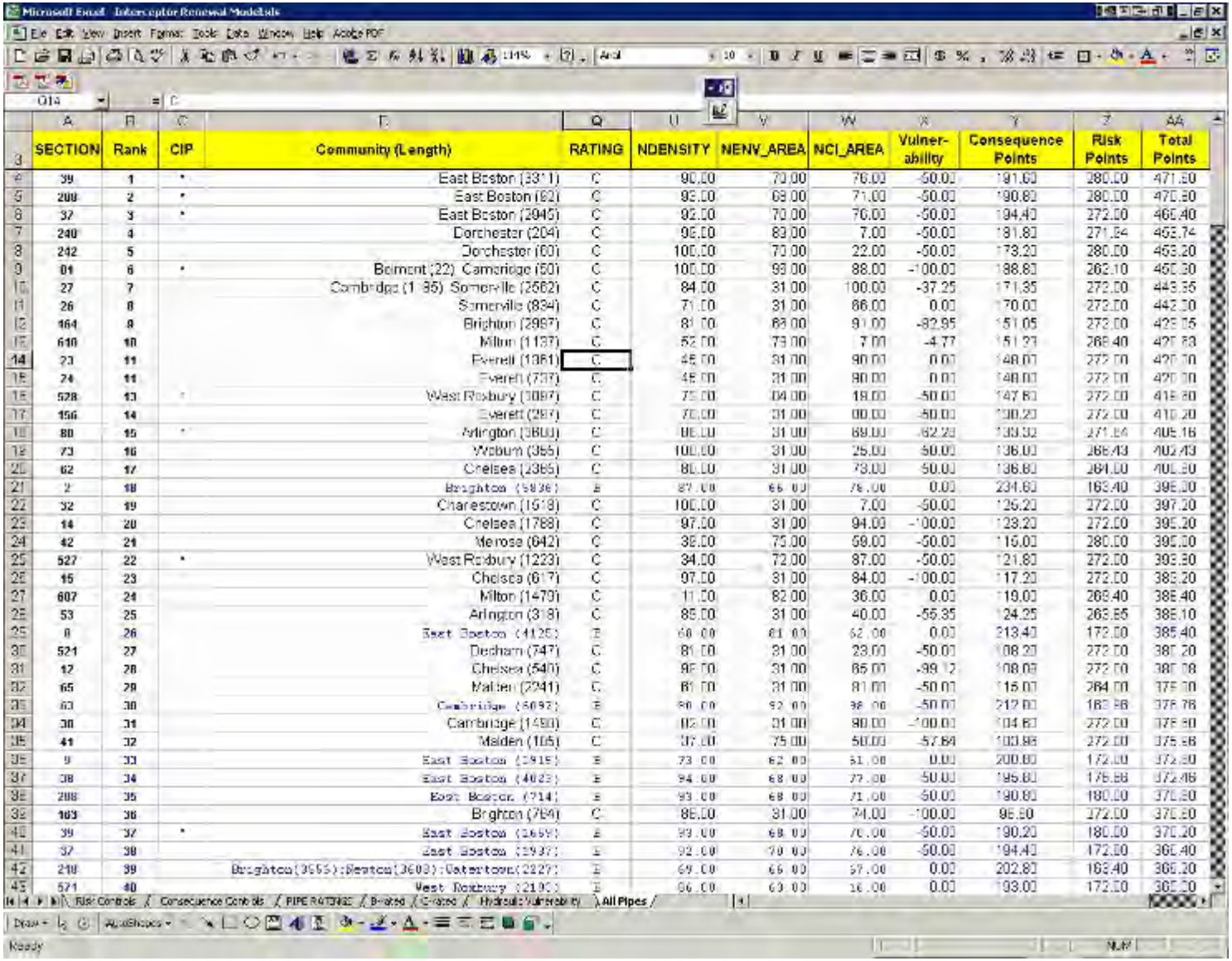
Prioritization of “C” Rated Pipe

- Risk/Consequence of Failure Ranking

- Risk of Failure
  - TV Inspection/Condition Assessment (A,B,C Rating)
  - Age
  - Material

- Consequence of Failure
  - Location/Population Density
  - Land Use Residential/Commercial/Industrial
  - Impact to Public Health/Environmentally Sensitive Areas
  - Ability to Bypass/Divert Flows

Risk/Consequence of Failure Prioritization Results

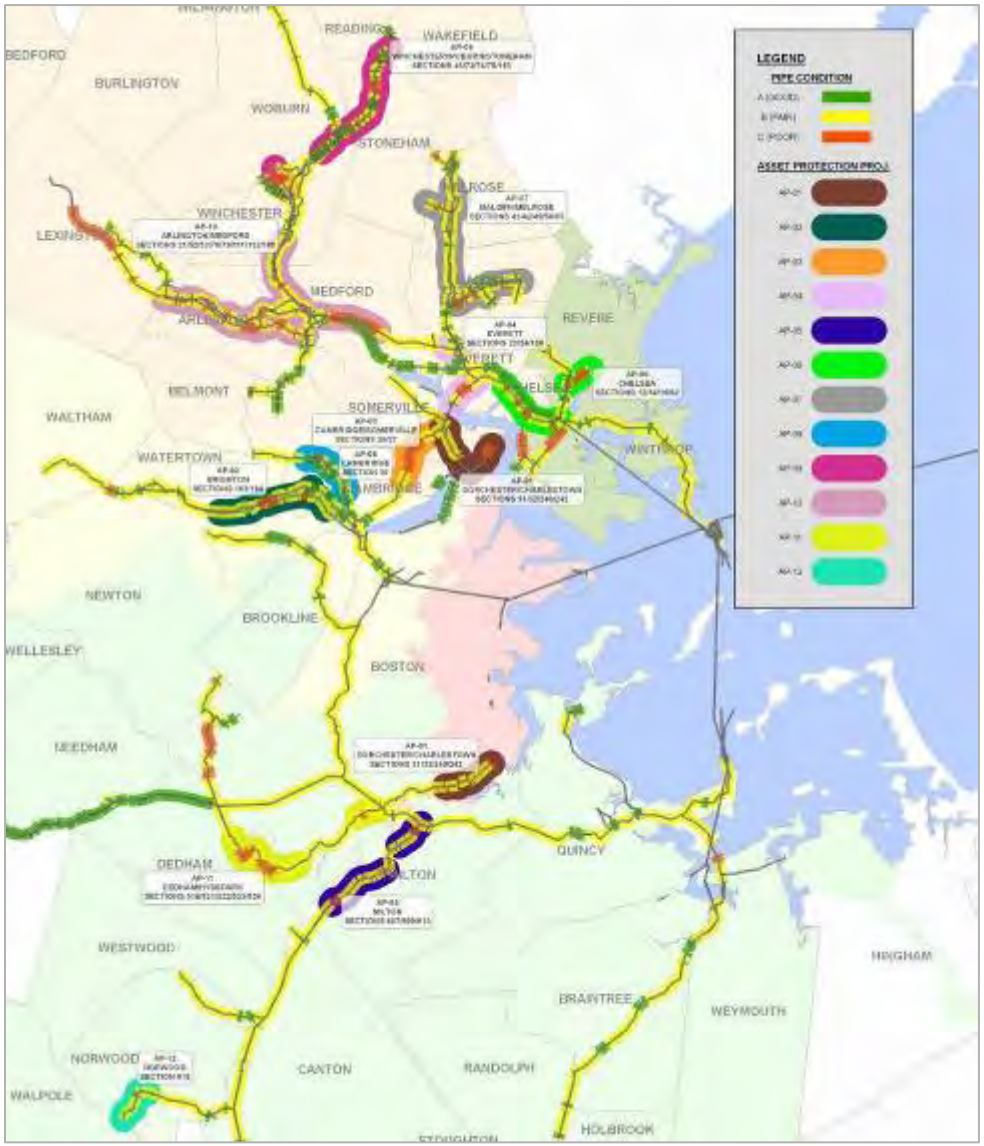


	SECTION	Rank	CIP	Community (Length)	RATING	NDENSITY	NENV_AREA	NCI_AREA	Vulner-ability	Consequence Points	Risk Points	Total Points
4	39	1	*	East Boston (3311)	C	90.00	70.00	76.00	-50.00	191.60	280.00	471.60
5	200	2	*	East Boston (92)	C	93.00	69.00	71.00	-50.00	190.80	280.00	470.80
6	37	3	*	East Boston (2945)	C	92.00	70.00	76.00	-50.00	194.40	272.00	466.40
7	240	4		Dorchester (204)	C	96.00	83.00	7.00	-50.00	181.80	271.84	453.74
8	242	5		Dorchester (60)	C	100.00	70.00	22.00	-50.00	178.20	280.00	458.20
9	01	6	*	Belmont (22) Cambridge (50)	C	100.00	99.00	88.00	-100.00	188.80	262.10	450.90
10	27	7		Cambridge (1 95) Somerville (2662)	C	84.00	31.00	100.00	-37.25	171.35	272.00	443.35
11	26	8		Somerville (834)	C	71.00	31.00	86.00	0.00	170.00	272.00	442.00
12	164	9		Brighton (2997)	C	81.00	69.00	91.00	-82.95	151.05	272.00	423.05
13	610	10		Milton (1137)	C	52.00	73.00	7.00	-4.77	151.23	268.40	419.63
14	23	11		Everett (1361)	C	45.00	31.00	90.00	0.00	148.00	272.00	420.00
15	24	11		Everett (737)	C	45.00	31.00	90.00	0.00	148.00	272.00	420.00
16	528	13	*	West Roxbury (3087)	C	75.00	94.00	19.00	-50.00	147.80	272.00	419.80
17	156	14		Everett (287)	C	70.00	31.00	00.00	-50.00	130.20	272.00	410.20
18	80	15	*	Arlington (3800)	C	96.00	31.00	69.00	-62.28	133.32	271.84	405.16
19	73	16		Woburn (355)	C	100.00	31.00	25.00	50.00	136.00	266.43	402.43
20	62	17		Chelsea (2365)	C	80.00	31.00	73.00	50.00	136.80	264.00	400.80
21	2	18		Brighton (5836)	B	87.00	66.00	76.00	0.00	234.60	163.40	398.00
22	32	19		Charlestown (1618)	C	100.00	31.00	7.00	-50.00	125.20	272.00	397.20
23	14	20		Chelsea (1788)	C	97.00	31.00	94.00	-100.00	123.20	272.00	395.20
24	42	21		Melrose (642)	C	38.00	75.00	58.00	-50.00	115.00	280.00	395.00
25	527	22	*	West Roxbury (1223)	C	34.00	72.00	87.00	-50.00	121.80	272.00	393.80
26	15	23		Chelsea (617)	C	97.00	31.00	84.00	-100.00	117.20	272.00	389.20
27	607	24		Milton (1470)	C	11.00	82.00	36.00	0.00	119.00	269.40	388.40
28	53	25		Arlington (318)	C	85.00	31.00	40.00	-55.35	124.25	263.85	388.10
29	8	26		East Boston (4125)	B	68.00	61.00	62.00	0.00	213.40	172.00	385.40
30	521	27		Dedham (747)	C	81.00	31.00	23.00	-50.00	108.20	272.00	380.20
31	12	28		Chelsea (540)	C	96.00	31.00	85.00	-99.12	108.08	272.00	380.08
32	65	29		Malden (2941)	C	81.00	31.00	81.00	-50.00	115.00	264.00	379.00
33	63	30		Cambridge (5092)	B	90.00	92.00	98.00	-50.00	212.80	163.98	376.78
34	30	31		Cambridge (1490)	C	02.00	31.00	90.00	-100.00	104.80	272.00	376.80
35	41	32		Malden (105)	C	07.00	75.00	50.00	-57.84	100.96	272.00	375.68
36	9	33		East Boston (2915)	B	73.00	62.00	51.00	0.00	200.60	172.00	372.60
37	38	34		East Boston (4023)	B	94.00	68.00	77.00	-50.00	196.80	176.66	372.46
38	208	35		East Boston (714)	B	93.00	68.00	71.00	-50.00	190.80	180.00	370.80
39	163	36		Brighton (764)	C	86.00	31.00	74.00	-100.00	96.80	272.00	370.80
40	39	37	*	East Boston (1669)	B	93.00	68.00	76.00	-50.00	190.20	180.00	370.20
41	37	38		East Boston (2937)	B	92.00	70.00	76.00	-50.00	194.40	172.00	366.40
42	210	39		Brighton(3555);Boston(3603);Watertown(2227)	B	69.00	66.00	57.00	0.00	202.80	163.40	366.20
43	521	40		West Roxbury (2100)	B	96.00	63.00	16.00	0.00	193.00	172.00	365.00

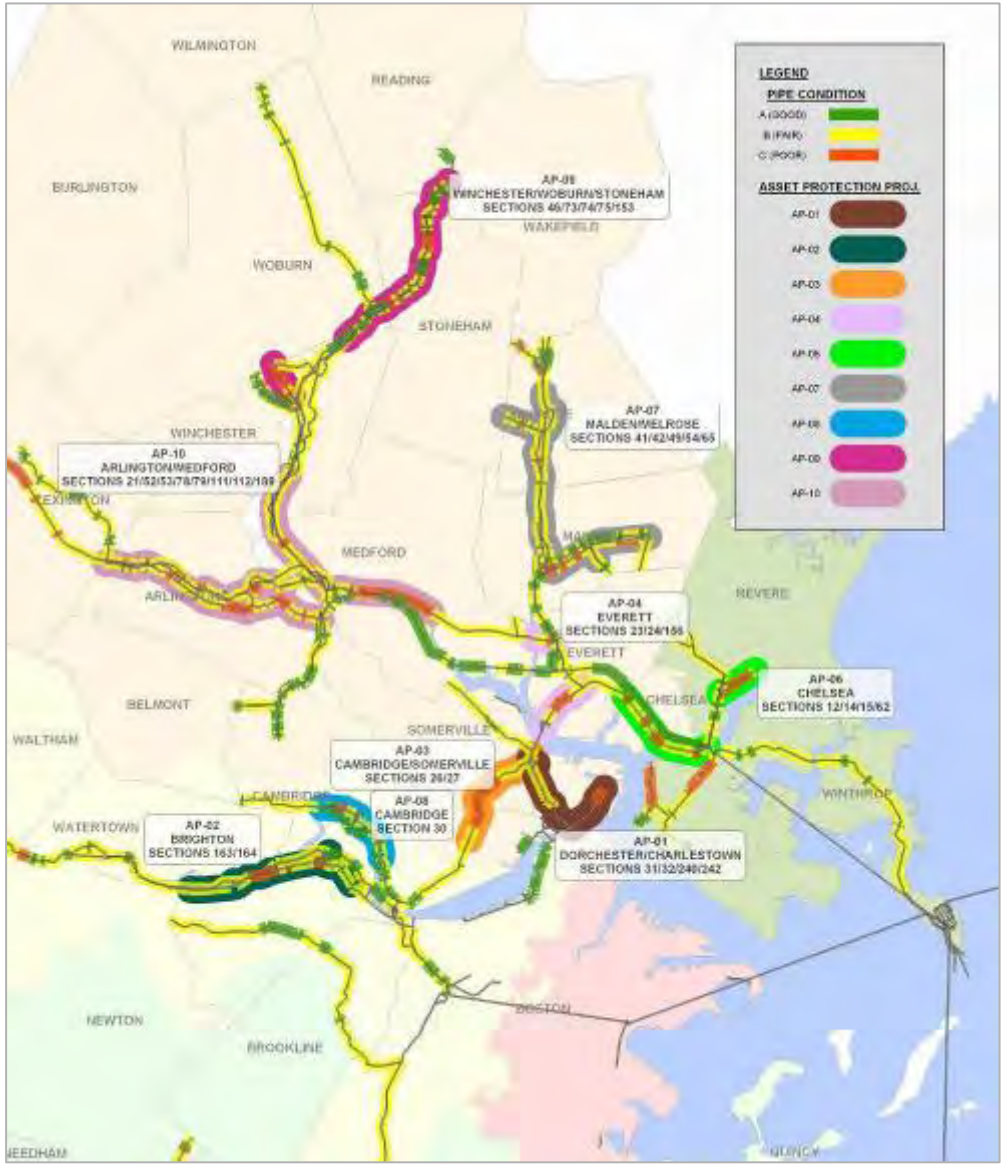
“C” Rated Pipe Grouped into Prioritized Projects

Section	Rank	CIP	Future Projects	Community	Lengths	RATINGS	Consequence points	Risk Points	Total Points
240	**4**		1	Dorchester	204	C	181.8	271.9	453.7
242	**5**		1	Dorchester	60	C	173.2	280.0	453.2
32	**19**		1	Charlestown	1518	C	125.2	272.0	397.2
31	**205**		1	Charlestown	94	C	0.0	256.0	256.0
164	**9**		2	Brighton	2997	C	151.0	272.0	423.0
163	**36**		2	Brighton	764	C	98.6	272.0	370.6
27	**7**		3	Cambridge, Somerville	1185, 2562	C	171.4	272.0	443.4
26	**8**		3	Somerville	834	C	170.0	272.0	442.0
23	**11**		4	Everett	1361	C	148.0	272.0	420.0
24	**11**		4	Everett	737	C	148.0	272.0	420.0
156	**14**		4	Everett	297	C	138.2	272.0	410.2
610	**10**		5	Milton	1137	C	151.2	269.4	420.6
607	**24**		5	Milton	1479	C	119.0	269.4	388.4
609	**68**		5	Milton	331	C	73.8	269.4	343.2
62	**17**		6	Chelsea	2365	C	136.8	264.0	400.8
14	**20**		6	Chelsea	1788	C	123.2	272.0	395.2
15	**23**		6	Chelsea	617	C	117.2	272.0	389.2
12	**28**		6	Chelsea	540	C	108.1	272.0	380.1

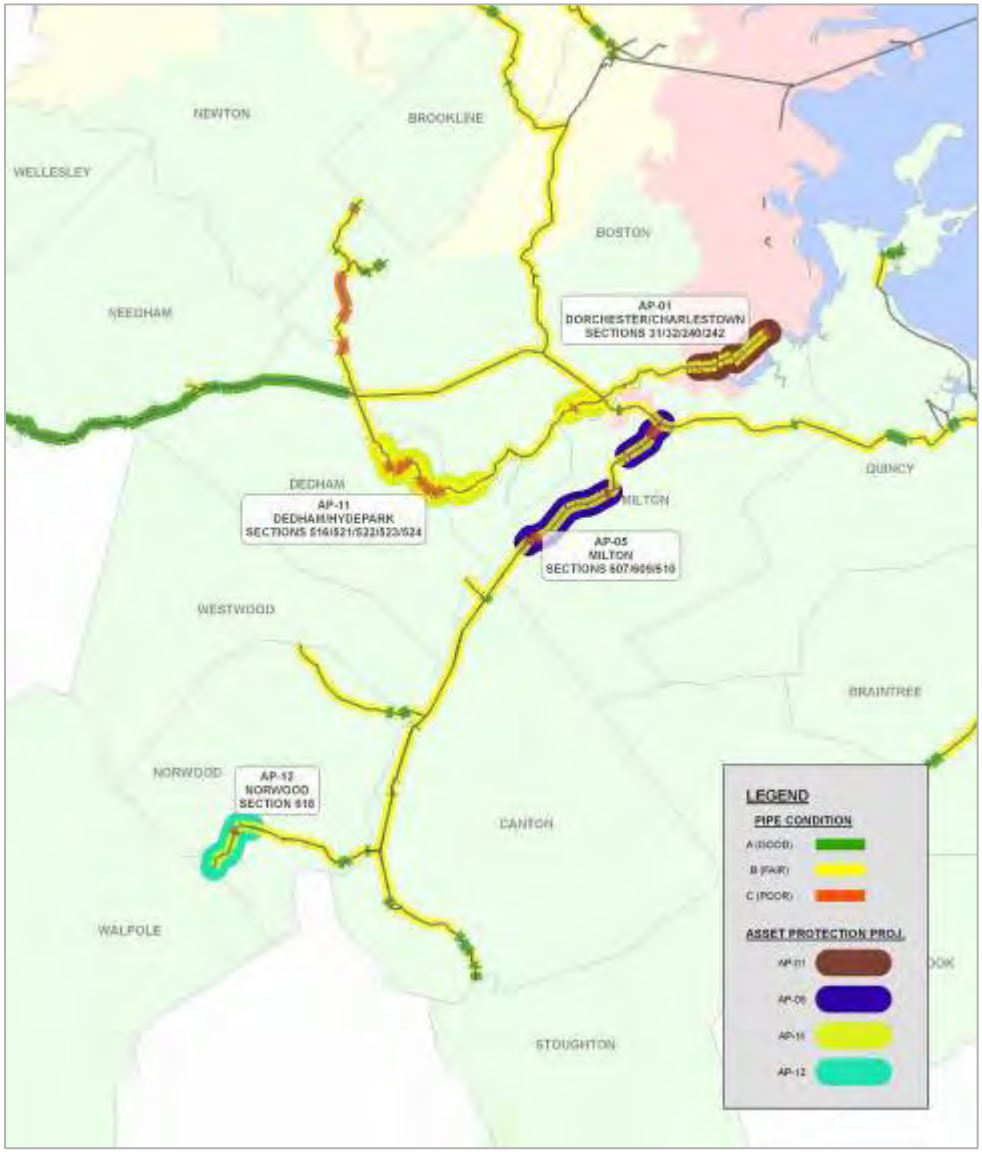
Interceptor Renewal Projects



Interceptor Renewal Projects North



Interceptor Renewal Projects South



Interceptor Renewal

- **$36M Recommended for First 7 of 12 Interceptor Renewal Projects to Address “C” Rated Pipe**
  - $2M Sections 31/32/240/242 Dorchester/Charlestown (FY09-13)
  - $5M Sections 163/164 Brighton (FY09-13)
  - $5M Sections 26/27 Cambridge/Somerville (FY09-13)
  - $3M Sections 23/24/156 Everett (FY14-18)
  - $4M Sections 607/609/610 Milton (FY14-18)
  - $7M Sections 12/14/15/62 Chelsea (FY14-18)
  - $10M Sections 41/42/49/54/65 Malden/Melrose (FY14-18)
- **$43M Recommended for Remaining 5 of 12 Interceptor Renewal Projects to Address “C” Rated Pipe in Later Years (FY19-28)**

Cross-Harbor Tunnels

- 16 miles – 10/11.5 foot diameter
- 100-120 foot deep shafts
- No Current CIP Funds
- 2 Older Tunnels – 1953
  - Midway through 100+ year useful life
  - Inspection is high priority ($3 million Proposed for FY09-13)
  - Shaft Repairs Needed ($5 million Proposed for FY14-18)
- Inter-Island Tunnel – 1998
  - Inspect with other tunnels to provide baseline
- No Funds Recommended for Future Rehabilitation/Repair of Tunnels

Tunnel Shaft Entry at Headworks

H_2S Corrosion in Tunnel Shafts

Shaft Repairs Needed
($5 million Recommended
for FY14-18)

Sewers – Major Projects in FY07 CIP (through FY13)

CIP Total - $45M (FY07-13)

- $36.4M Complete the Upper Neponset Valley Relief Sewer Project
- $2M Complete the Cummingsville Replacement Sewer Project
- $4M Complete the Rehabilitation of Sections 83 (Arlington) and 160 (Winchester/Medford)

Sewers – Major Projects Recommended for FY08 CIP

Additional Needs Identified for FY08-18 - $172M

- **$80M Complete the West Roxbury Tunnel Rehabilitation (FY11-18)**
- **$5M Rehabilitate Section 624 (FY09-11)**
- **$38.5M Hydrogen Sulfide Program**
  - $24M to Reline the Wellesley Extension Replacement Sewer (FY14-22)
  - $8.5M to Rehabilitate the Framingham Ext. Sewer Tunnel (FY14-18)
  - $5M to Construct 3 Biofilter Treatment Systems (FY09-13)
  - $1M for a System-Wide Odor/Hydrogen Sulfide Study (FY09-13)
- **$8M Rehabilitate Siphon Headhouse Chambers (FY09-18)**
- **$36M 7 Interceptor Renewal Projects to Address "C" Rated Pipe**
  - $2M sections 31/32/240/242 (FY09-13)
  - $5M Sections 163/164 (FY09-13)
  - $5M Sections 26/27 (FY09-13)
  - $3M Sections 23/24/156 (FY14-18)
  - $4M Sections 607/609/610 (FY14-18)
  - $7M Sections 12/14/15/62 (FY14-18)
  - $10M Sections 41/42/49/54/65 (FY14-18)

CSO Control Program

- $460M Total Projects FY07-18 in Current CIP
  - $439M FY07-13
  - $21M FY14-18
- No Additional CSO Control Program funds recommended for FY08 CIP
- Future CSO Facility Equipment replacement will be funded from $23.5M for all sewer facilities

Community I/I Financial Assistance

Groundwater INFILTRATION

Manhole INFLOW

Community I/I Financial Assistance

Sump Pump Inflow

Downspout Inflow

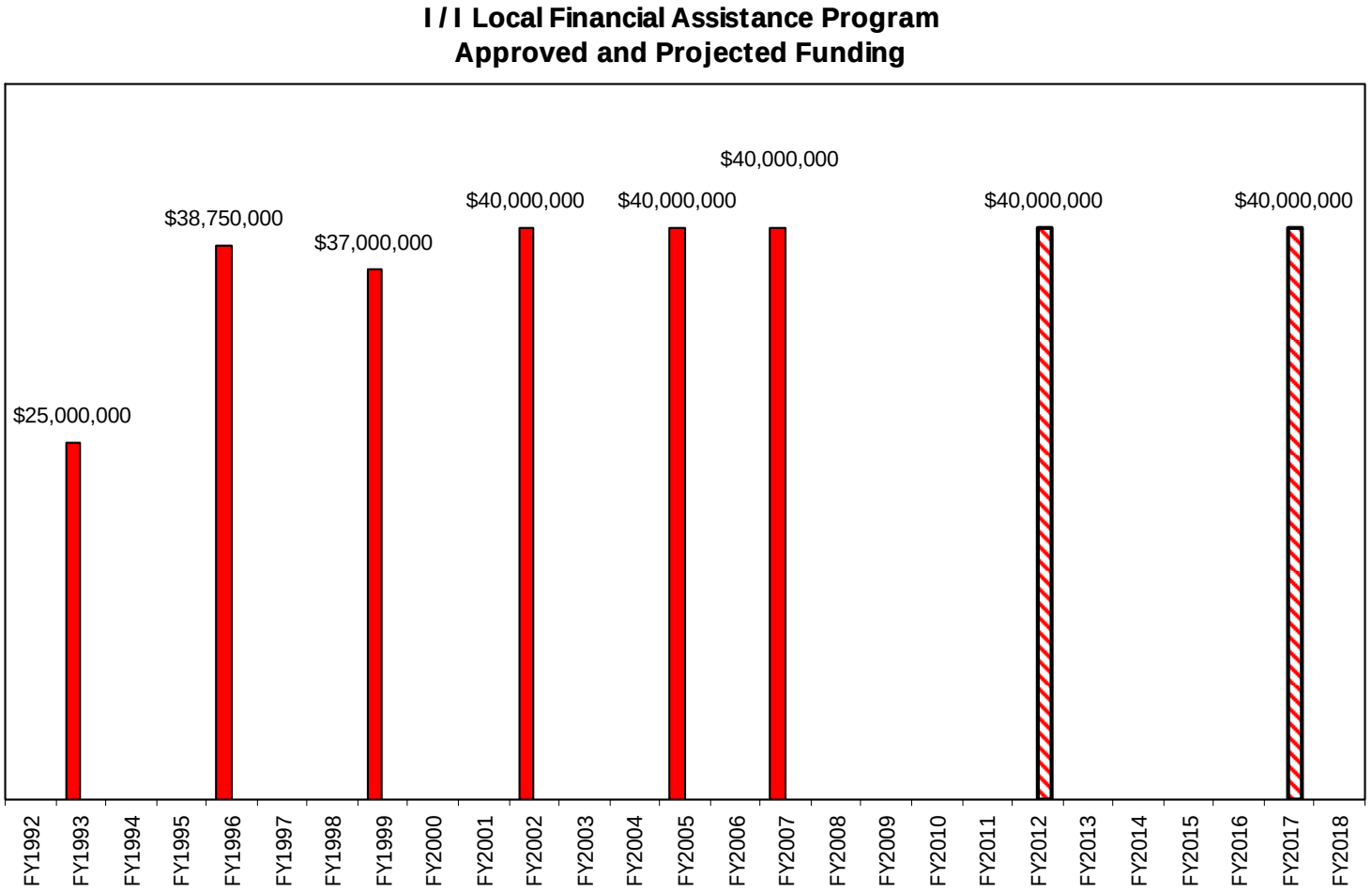
Community I/I Financial Assistance Program

- $240M budgeted through FY15
- $134M distributed through June 2006
- 45% grant / 55% interest-free loan
- Loan repayment over 5 years
- 43 communities – 305 projects funded

- $14M Net Cost of Program in Current CIP

- Master Plan Includes 2 Additional $40M Funding Rounds Recommended for FY12 and FY17

Community I/I Financial Assistance Program



Residuals Processing Facility

- Privatized Operation – NEFCo
- 15-Year Contract (through 12/2015)
- Full responsibility for O&M ($12M annually)
- Capital Replacement Program

Residuals Projects

- **Projects under NEFCo Contract**
  - Cooling Tower Replacement
  - New Polymer Makeup System
  - Sludge Pump Overhaul
  - New Landfill Operator

- **MWRA Representative Projects**
  - B/W Sludge Pumping (FY05)
  - New Security/Access System (FY06)
  - Reliability/Utility Study (FY07)
  - Facility Condition Assessment (FY08)

Residuals Projects Recommended for FY08 CIP

- FY08 - Technology/Regulatory Assessment
- FY09 - Decision Point
- FY10 - Facilities Plan/EIR
- FY11 - Concept Design
- FY12 - Detailed Design
- FY13 - Construction Begins
- FY16 - New Facility/Equipment Replacement

- **Additional Needs Identified FY08-13 - $6.3M Total**
  - Facility Condition Assessment $1M
  - Facility Upgrades Design/Construct $4M
  - Plant Electric System Reliability $620K
  - Pier Rehabilitation $700K

- **Additional Needs Identified FY14-18 - $69M Total**
  - Facility Upgrades Design/Construct $4M
  - New Facility/Equipment Replacement $65M

Deer Island Wastewater Treatment Plant

- $2.4 Billion Replacement Asset Value
- 2nd Largest Wastewater Treatment Plant in the United States
- Built on 120 Acres
- Treatment Capacity
  - Maximum
    - 1.27 Billion Gal/Day
  - Average Daily Flow
    - 360 Million Gal/Day

DITP Asset Value - $2.4 Billion

- **72,000 pieces of equipment - $1.22 Billion**
  - 46,214 Instruments – $131M
  - 7,845 Electrical (motors, VFDs, switchgear) - $304M
  - 6,646 Mechanical (pumps, gearboxes, drives) - $785M
  - 8,334 Valves
  - 2,945 HVAC

- **Non Equipment - $1.26 Billion**
  - Buried Piping (fuel oil, hot water, potable water)
  - Seawall
  - Roads
  - Buildings

Rationale for Investment

- Maintain Facility Permit
- Design, Construction and Maintenance Experience Operating Plant
- Project Identification and Prioritization Process
- Maintenance Practices Established by FAMP/RCM Programs
- Condition Monitoring
- Replace Obsolete Assets with New Technology

Regulatory Impacts

- **New NPDES Permit ~ Possibly by January 2007**
  - **Likely Impacts**
    - Enterococcus in addition to Fecal Coliform
    - CEB increase of $1.2M for hypochlorite and bisulfite annually
    - Increase of secondary flow limit

- **New Air Permit – December 2004**
  - Increased reporting on Odor Control Equipment
  - CEMS system upgraded ($ 100K)

- **Possible Future Regulatory Requirements**
  - Advanced Treatment for Nitrogen Removal
  - Secondary Battery D

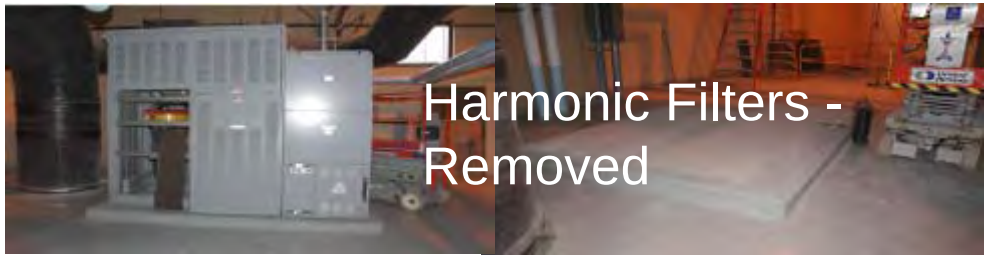
Electrical Equipment Upgrades

$23.2M in Current CIP FY07-13 to Upgrade/Replace Electrical Components

$9.9M in Current CIP FY07-13 for Electrical System Modifications

$15.6M Recommended for FY11-18 to Upgrade/Replace Electrical Components

Electrical Components - VFD Replacement



VFD Replacement Part of Electrical Equipment Upgrades

$11M in Current CIP FY07-10

$9.3M Recommended for FY14-18

Primary and Secondary Clarifier Rehabilitation

$7.2M in Current CIP FY07-13 to Rehabilitate Primary Clarifiers

$4M Recommended for FY14-15 to Rehabilitate Secondary Clarifiers

Sludge Pump Replacements

$5.8M in Current CIP FY07-13 to Replace Thickened Primary Sludge Pumps

Seawall and Public Access

CEB - $95K/yr maintenance contract ($950K for FY08-18)

CIP – Recommended FY09-18 ($1.5-3.5M)

Digester Storage Tank Membrane Replacements

CIP $640K FY04/5

$750K Recommended for FY15 CIP

Pump Station Motor Control and Shaft/Pump Replacement

$3.7M in Current CIP FY07-13 to Replace Motor Control Center

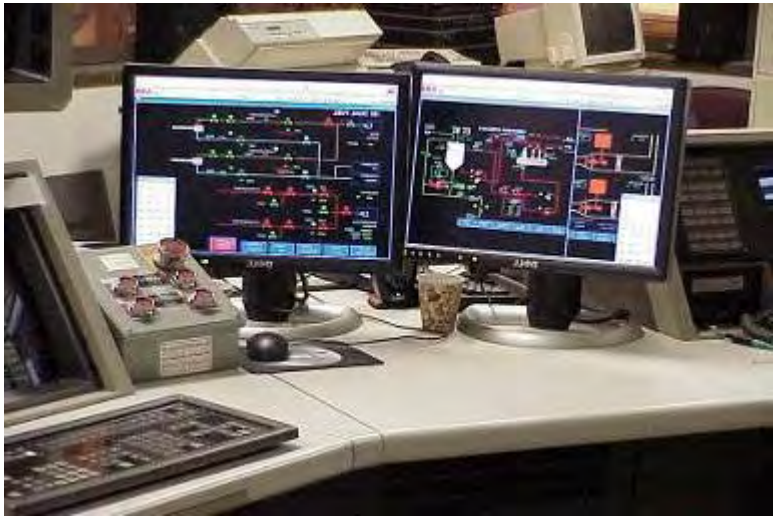
$4.5M Recommended for FY14-16 to Replace Shafts/Pumps

$100K/year in CEB for two motor rebuilds/yr – Total $1M for FY08-18

Process Instrumentation Control System (PICS) Upgrade

Primary Operations

Thermal Operations



$1.6M in Current CIP FY10

$5.8M Recommended for FY15

Centrifuge Replacement

$2.2M in Current CIP FY07-09 for Centrifuge Back-Drive Replacement

$5.2M Recommended for FY14 to Replace 4 Centrifuges @ $1.3M

CEB Equipment Rehabilitation - $275K/yr – Total $2.8M for FY08-18

Sodium Hypochlorite Pipeline/Tank

$3.5M in Current CIP FY07-13 to Replace Sodium Hypochlorite Pipeline

$4.4M Recommended for FY07-09 and FY17 to Rehabilitate Sodium Hypochlorite Tanks

Cryogenics Facility

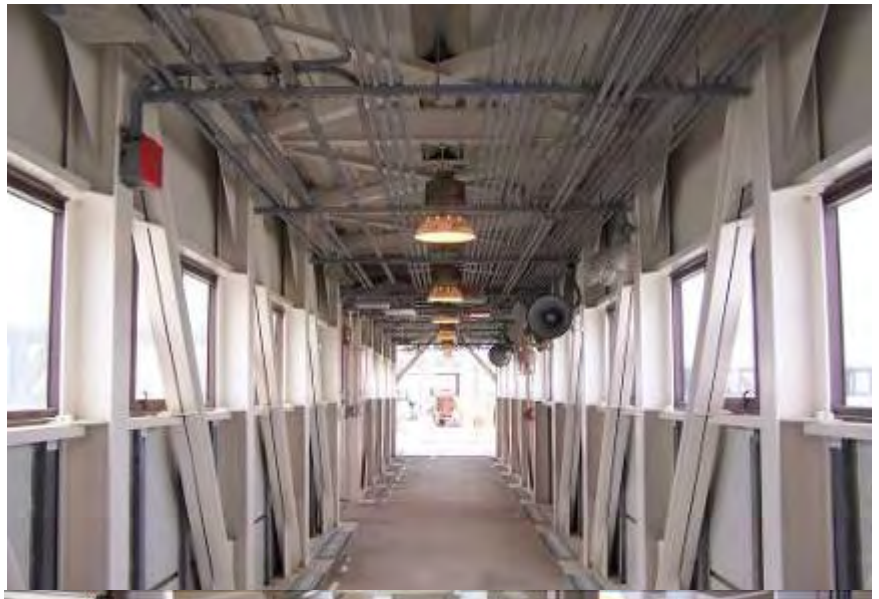
$2M Recommended for FY14 to Replace Equipment at Cryogenics Plant

CEB Equipment Rehabilitation - $ 300K/yr - $3M total (FY08-18)

Roof Repairs – Residuals

$200-400K/year for a total of $2M-$4M (FY08-18) in replacement spending – CEB (10 yr life)

Painting/Coatings



CEB Painting Phases - $500k to $1M/yr

$5M-$10M total – FY08-18

Gravity Thickening Overflow Wetwell Coating Project

1) GTO Wet Well #1 Ceiling

2) GTO WET WELL #3 Wall

3) GTO Wet Well #4 Upper Walls and Ceiling

4) GTO Wet Well #4 Wall

Clinton Advanced Wastewater Treatment Plant

- 3 Million Gal/Day
- 1985 MWRA took over operation
- 1992 plant upgraded with advanced treatment capability
- Discharges into South Branch of Nashua River

$550K for Clinton Projects in Current CIP

Projects in Current CIP

- Soda Ash System Replacement ($288K – FY07-08)
- Permanent Standby Generator ($259K – FY07)

Recommended Funding for FY09-13 CIP

Additional Needs Identified for FY09-13 - $1.1M

- Electrical Backup Modifications ($150K)
- Landfill Cell #1 Closure Plan and Implementation ($200K)
- Roof Rehabilitation of All Buildings ($150K)
- Digester (2) Internal Inspection, Clean Out and Rehabilitation ($350K)
- Replace Process Water Pumps (4) ($175K)
- Security Upgrades for Plant Access and Landfill Access ($100K)

Recommended Funding FY14-18

Additional Needs Identified for FY14-18 - $9.5M

- Long-Term Asset Protection ($300K annually)
- Technology Improvements for Plant Processes (Sludge Pressing, Phosphorous, UV Disinfection, Equipment Replacement) ($3M)
- Placeholder for Upgrade to Meet Future Regulatory Requirements ($2M)
- Influent and Intermediate Lift Pump Replacements ($750K)
- Grit Removal Facility Rehabilitation/Replacement ($700K)
- Belt Filter Press Replacement ($1.5M)

Treatment – Major Projects in FY07 CIP (through FY13)

CIP Total - $90M (FY07-13)

- **$10.9M Ancillary Modifications and As-Needed Design**

- **$40.4M Upgrade/Replace Electrical Components**
  - $14.6M for VFDs at Pump Stations
  - $7.8M for Substation Upgrades
  - $4.4M to Replace Switchgear
  - $3.7M to Replace Motor Control Center at NMPS
  - $9.9M for Power System Improvement Design/Construct
- **$7.2M Rehabilitate Primary Clarifiers**
- **$5.8M Replace Thickened Primary Sludge Pumps**
- **$3.0M Replace LOCAT Scrubbers**
- **$3.5M Replace Sodium Hypochlorite Pipeline**
- **$4.9M Future Equipment Replacement Projects**

CEB Total – Approximately $35M ($5M/year) - Equipment Replacement

Treatment – Projects Recommended for FY08 CIP

Additional Needs Identified for FY08-18 - $105M

- **$15.6M Upgrade/Replace Electrical Components**
  - $9.3M for VFDs (3 projects, FY14-18)
  - $5M for Electrical Equipment Upgrades ($2M FY11-12 and $500k/yr through FY18)
  - $1.3M to Complete Switchgear Replacement (FY18)
- **$2M Replace Digester Sludge Pumps (FY10)**
- **$5.8M PICS Replacements (FY15)**
- **$4.4M Rehabilitate Sodium Hypochlorite Tanks (FY07-09, and FY17)**
- **$2M Rebuild CTGs (FY15)**
- **$5.2M Replace Centrifuges (4@$1.3M – FY14)**

Treatment – Projects Recommended for FY08 CIP

Additional Needs Identified for FY08-18 - $105M (continued)

- $2M Replace Equipment at Cryogenics Plant (FY14)
- $10M Future Equipment Replacement Projects ($2M annually FY11-12 and FY16-18)
- $4.5M Replace Shafts/Motors at SSPS, NPSP, and WTF (FY14-16)
- $4M Rehabilitate Secondary Clarifiers (FY14)
- $10M Clinton Projects (FY09-18)

Future CEB Total - $5M/year ($25M - FY14-18)

Looking to the Future

- Although the focus of today's presentation is FY07 to FY18, the Master Plan includes projects from FY07 to FY48

- In the FY19 to FY48 timeframe, staff has identified $882 million in wastewater project needs