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CSO Program Stakeholder Workgroup: Meeting #9
System Master Plan Control Options

City Hall – Council Chambers

October 4, 2012

CH2MHILL

Welcome & Introductions

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- City Representatives
  - Julia Forgue – Director of Utilities
- CH2M HILL
  - Peter von Zweck – Project Manager
  - Becky Weig – Public Involvement
  - Jen Reiners – Water Resources Engineer
  - Keith Bishton – Rates & Affordability
- Stakeholder Workgroup Participants

Schedule of Stakeholder Meetings

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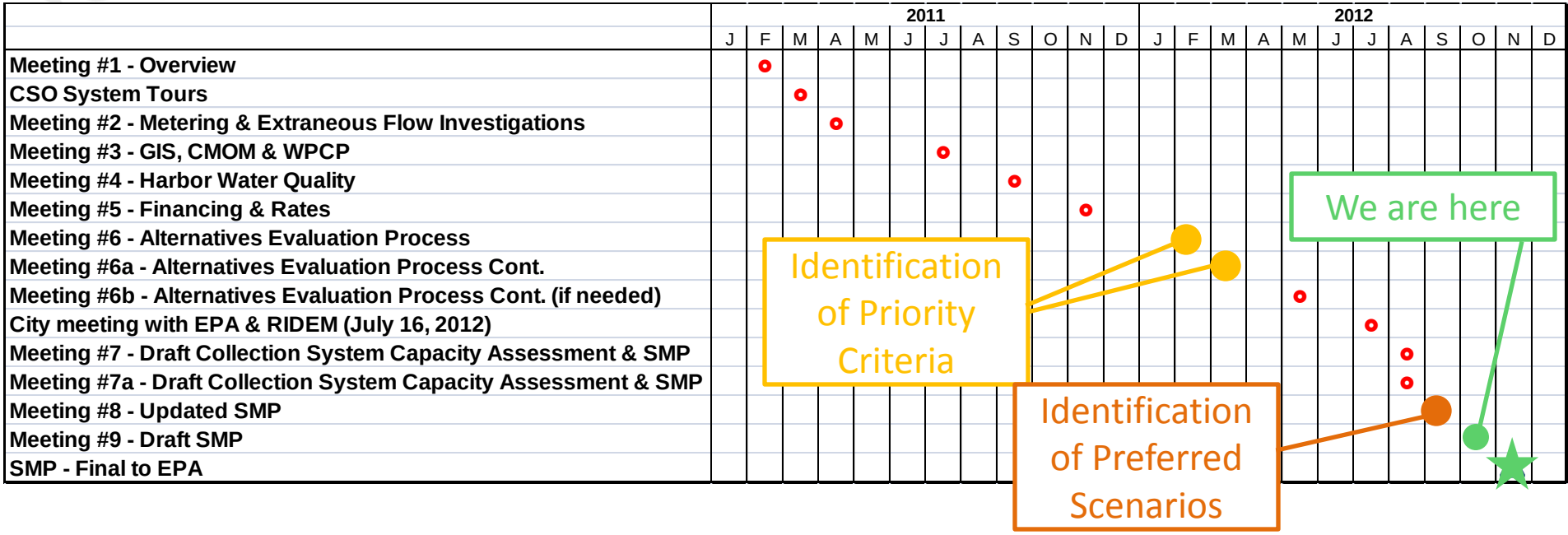

The first 5 meetings focused on existing conditions in the collection system, the harbor and rates.

The last 6 meetings focus on future conditions including: evaluation criteria, technologies, expected benefits, costs and implementation schedules.

Objective for This Meeting

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The objective for this meeting is to discuss how comments from the stakeholders group effected the performance, costs, implementation schedule, and affordability of the previously selected control scenarios.

Meeting Agenda

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- Overview of the Program Schedule
- Approval of Previous Minutes
- Parking Lot Follow-up Items
- SMP Control Scenarios
  - Scenario descriptions
  - Benefits/Costs
  - Implementation schedule/affordability
- Wrap-up & Comments

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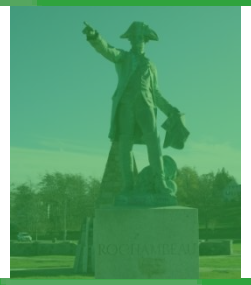


PREVIOUS MEETING'S MINUTES

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PARKING LOT FOLLOW-UP ITEMS

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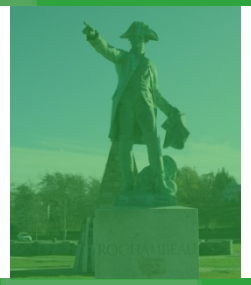
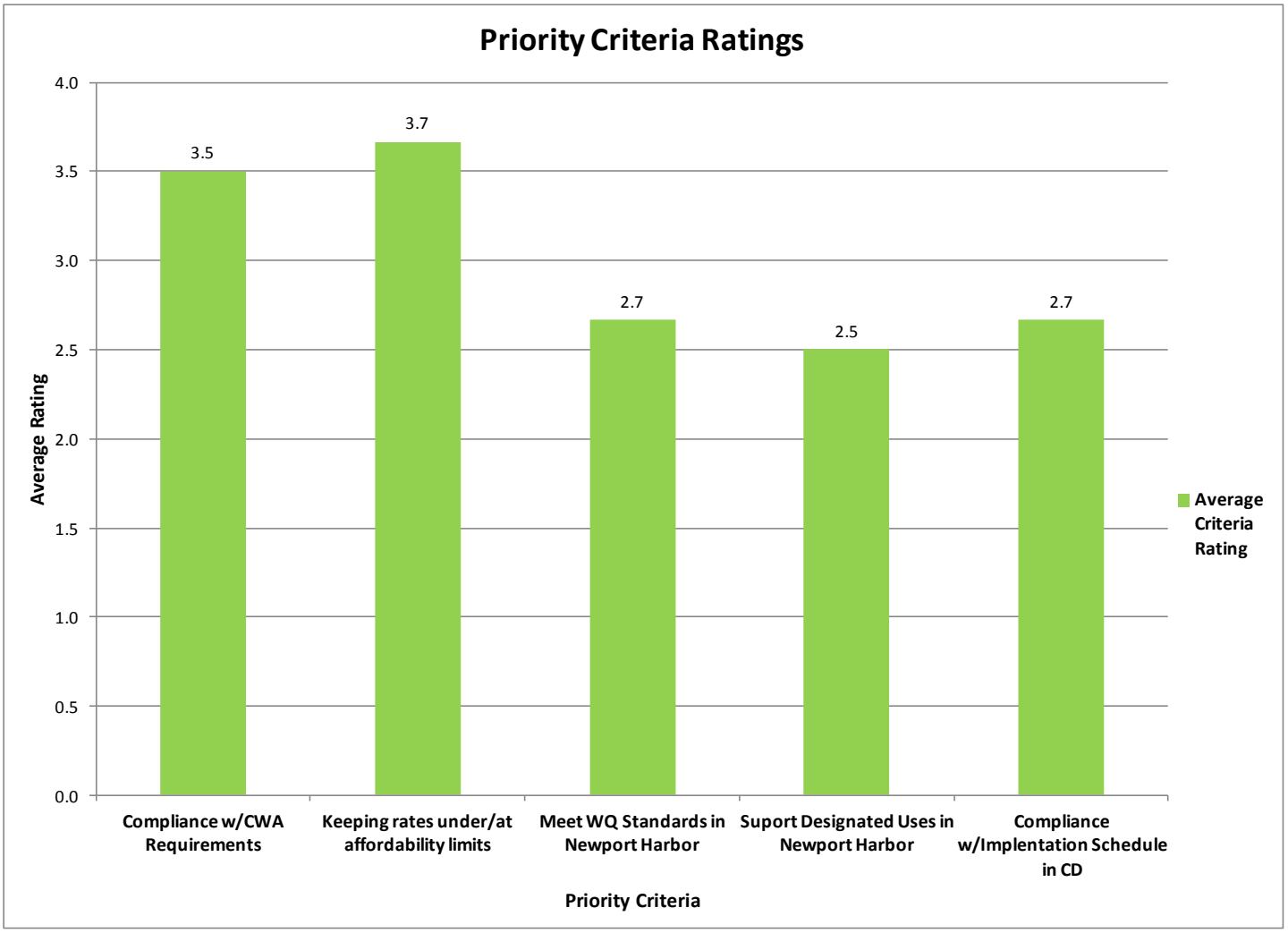



BENEFITS AND COSTS OF CONTROL SCENARIOS

Review of Workgroup Identified Priorities



Other identified priorities:

- Flexibility
- Phased implementation approach

Discussion of Scenarios Selected by EPA and the Stakeholder Group

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BL – Baseline

- Includes projects in the City's existing CIP

E1 – Elimination –> Required by EPA

- Removal of all sources of inflow

Fact sheets were updated for 4 Scenarios….

C1A – Conveyance Upgrades –> C1 modified by Stakeholders

- Upgrade to pumps at Wellington
- Additional Inflow Reduction

S3A – Storage –> S3 Modified by Stakeholders

- WPCP Upgrade includes CEPT
- New Pump Station in Catchment 10
- Roof leader disconnection

BL – Baseline

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Overview & Objective of Scenario

- Replacement of infrastructure that has reached the end of its useful life
- Inflow reduction at manholes and catch basins connected to the sanitary/combined sewer system
- Conveyance improvements to eliminate known bottlenecks
- Improvements to the WPCP's headworks, solids processing and disinfection facilities to improve its effective treatment capacity

Changes Since Previous Meeting

- Updated WPCP capital costs

Key discussion points while reviewing updated fact sheets

- Projects required to maintain system at current level of service
- Significant capital requirements will affect implementation schedule for other scenarios

E1 – Elimination

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Overview & Objective of Scenario

- Removal of all private and public sources of inflow in the City of Newport, Middletown, and the Naval Station Newport
- Conveyance improvements to transport larger volumes of flow from Wellington and Long Wharf PS to the WPCP
- Includes associated improvements to storm drainage system

Changes Since Previous Meeting

- New scenario
- Required by EPA before approval of SMP

Key discussion points while reviewing updated fact sheets

- Requires elimination of all sources of inflow
- Includes inflow reductions by Middletown and Naval Station Newport
- Storm drainage system improvements

C1A – Conveyance Upgrades

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Overview & Objective of Scenario

- Reduction of inflow from the largest known contributor to the system - downspouts
- Conveyance improvements to transport larger volumes of flow from Wellington
- A new pump station to reduce flows to Washington from Catchment 10
- Improvements to the wet weather capacity at the WPCP

Changes Since Previous Meeting

- Upgrade pump size at Wellington PS
- Upgrade force main from Wellington PS to Thames St. interceptor

Key discussion points while reviewing updated fact sheets

- New CSO statistics

S3A – Storage

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Overview & Objective of Scenario

- Conveyance improvements to transport larger volumes of flow from Wellington and reduce volumes to Washington
- Improvements to the wet weather capacity and treatment at the WPCP
- Off-line storage at the Wellington and Washington CSO facilities to capture wet weather flows

Changes Since Previous Meeting

- WPCP Upgrade includes CEPT
- New Pump Station in Catchment 10
- Roof leader disconnection

Key discussion points while reviewing updated fact sheets

- New CSO statistics

Approach to Hydraulic Evaluations

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- Modified the selected scenarios to include improvements recommended by the stakeholders
- Adjusted component sizes and/or configurations to target elimination of a 10-year storm
- Evaluated each scenario for a typical year for number and volumes of CSO discharges
  - 1996 was selected as a typical year which is equal to the median total rainfall depth between 1948 and 2011
- Calculated costs per events and volumes removed for each scenario

Summary of Discharge Volumes for Design Events

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Scenario	2-Year Storm (MG)		5-Year Storm (MG)		10-Year Storm (MG)	
	Wellington	Washington	Wellington	Washington	Wellington	Washington
EC	1.24	4.22	1.83	5.87	2.72	7.53
BL	1.09	2.75	1.78	3.63	2.65	5.7
E1	0	0	0	0	0	0
C1A	0	0	0	0	0	0.19
S3A	0	0	0	0	0	0

Summary of Performance for Average Annual Conditions

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Scenario	Annual Volume (MG)		Annual Events	
	Wellington	Washington	Wellington	Washington
EC	11.03	43.01	12	18
BL	10.6	19	12	10
E1	0	0	0	0
C1A	0	0	0	0
S3A	0	0	0	0

Summary of Program Costs

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Scenario	Capital Cost	O&M Cost (per year)	Equivalent Annual Cost	Cost Per Gallon Removed	Cost Per Event Eliminated
BL	$31,487,000	($8,000)	$1,029,000	N/A	N/A
E1	$202,312,000	$447,000	$7,692,000	$0.26	$350,000
C1A	$91,666,000	$2,000	$3,251,000	$0.11	$148,000
S3A	$114,780,000	$531,000	$4,520,000	$0.15	$206,000

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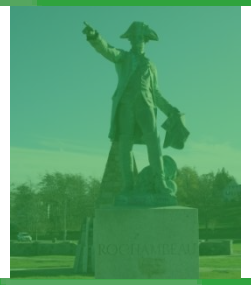


REVIEW & UPDATE ON AFFORDABILITY THRESHOLD

Updated Affordability Threshold Analysis

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Parameter	Preliminary Value (November 2011)	Updated Value (October 2012)
Median Household Income (MHI)	$55,916	$55,916
CPI	216.687	230.379
Adjustment Factor		1.031
Adjusted MHI		$57,656
2% of Adjusted MHI	$1,118	$1,153
Average User Annual Sewer Charge	$676	$541
CSO Fixed Fee	$192	$192
Total Sewer Bill for Typical Residential Customer	$868	$733
Remainder Available Within "Affordability Threshold"	$250	$420

Rate Threshold Assumptions

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- Key assumptions about rate threshold for developing implementation schedule:
  - Cap rates at 1.95% of MHI to allow room for emergencies
  - Phase in rate increases from current 1.27% of MHI to 1.95% of MHI

Fiscal Year	Total Annual Bill	% chg.	Median Household Income	% chg.	Total Annual as % MHI
FY 2013	$733		$58,694		1.25%
FY 2014	$805	10%	$59,750	1.8%	1.35%
FY 2015	$879	9%	$60,826	1.8%	1.45%
FY 2016	$958	9%	$61,921	1.8%	1.55%
FY 2017	$1,038	8%	$63,035	1.8%	1.65%
FY 2018	$1,120	8%	$64,170	1.8%	1.75%
FY 2019	$1,212	8%	$65,325	1.8%	1.86%
FY 2020	$1,261	4%	$66,501	1.8%	1.90%
FY 2021	$1,317	4%	$67,698	1.8%	1.95%

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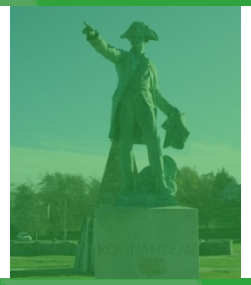


IMPLEMENTATION SCHEDULES AND AFFORDABILITY

E1 – Inflow Elimination
Implementation Schedule

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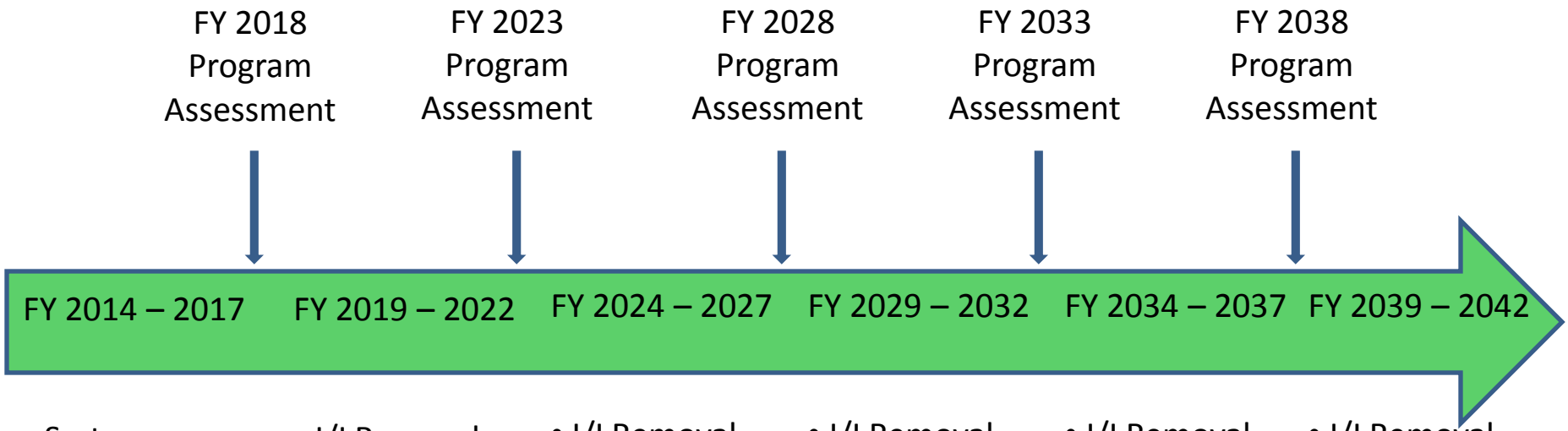

- System Optimization
- I/I Removal – Phase I
- Stormwater Pipe Replacements

- I/I Removal – Phase II
- Stormwater Pipe Replacements

- I/I Removal – Phase III
- Stormwater Pipe Replacements

- I/I Removal – Phase IV
- Stormwater Pipe Replacements

- I/I Removal – Phase V
- Stormwater Pipe Replacements
- WACSO Conversion to SW Treatment

- I/I Removal – Phase VI
- Stormwater Pipe Replacements
- WSCSO Conversion to SW Treatment

FY 2018 Assessment – I/I program effectiveness & system optimization impacts
FY 2023 Assessment – I/I effectiveness
FY 2028 Assessment – I/I effectiveness
FY 2033 Assessment – I/I effectiveness
FY 2038 Assessment – I/I effectiveness

E1 – Inflow Elimination
Affordability

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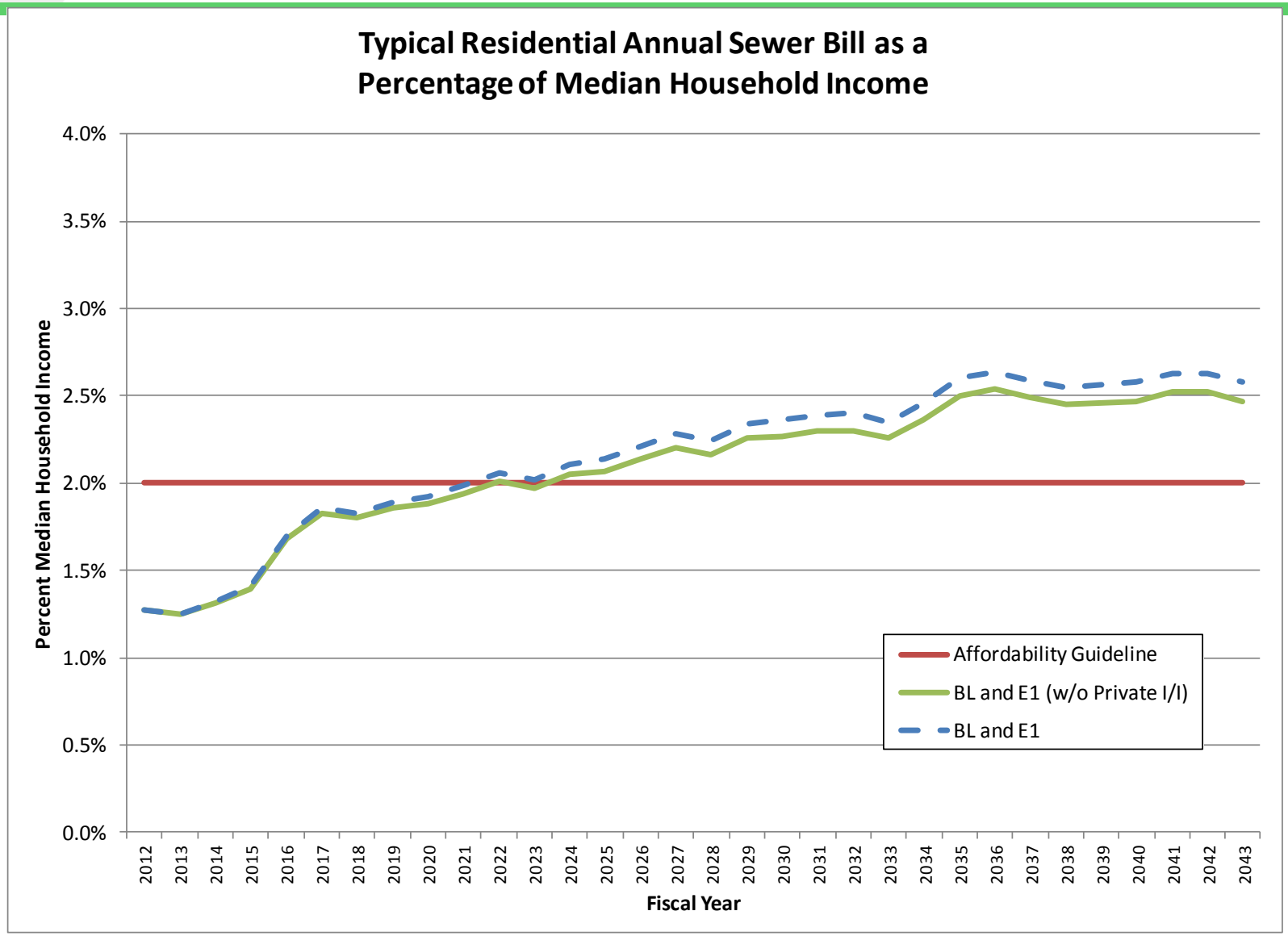

C1A – Conveyance Upgrades
Implementation Schedule

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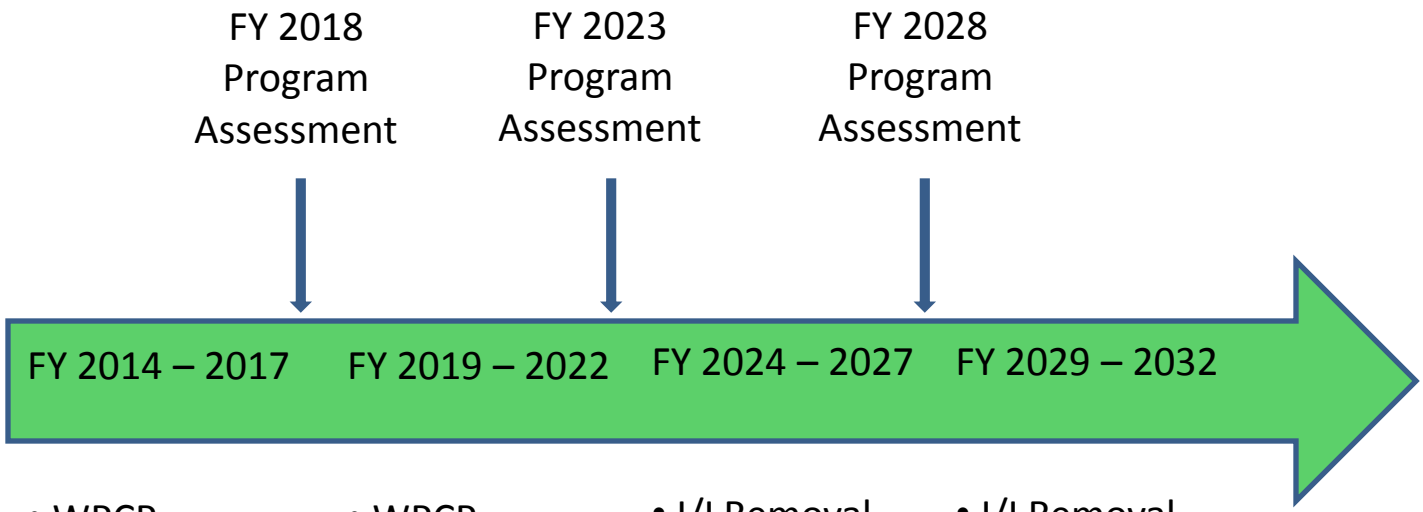

- WPCP Improvements
- Wellington PS Upgrade
- System Optimization
- I/I Removal – Phase I

- WPCP Improvements completed
- Catchment 10 Reroute
- I/I Removal – Phase II

- I/I Removal – Phase III

- I/I Removal – Phase IV

FY 2018 Assessment – I/I effectiveness, system optimization impacts & conveyance upgrade impacts

FY 2023 Assessment – I/I effectiveness , WPCP upgrade impacts & conveyance upgrade impacts

FY 2028 Assessment – I/I effectiveness

C1A – Conveyance Upgrades
Affordability

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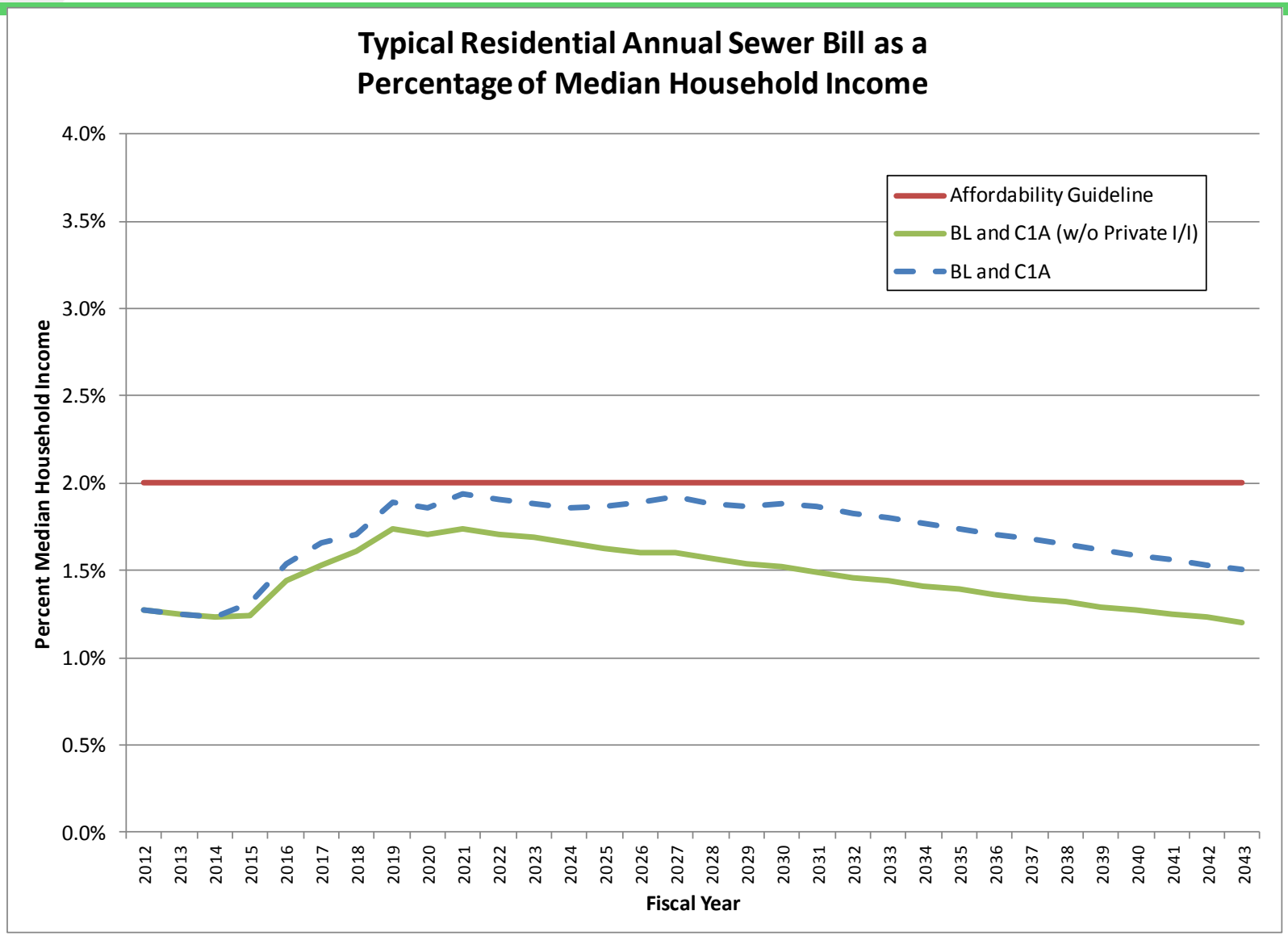

S3A – Storage
Implementation Schedule

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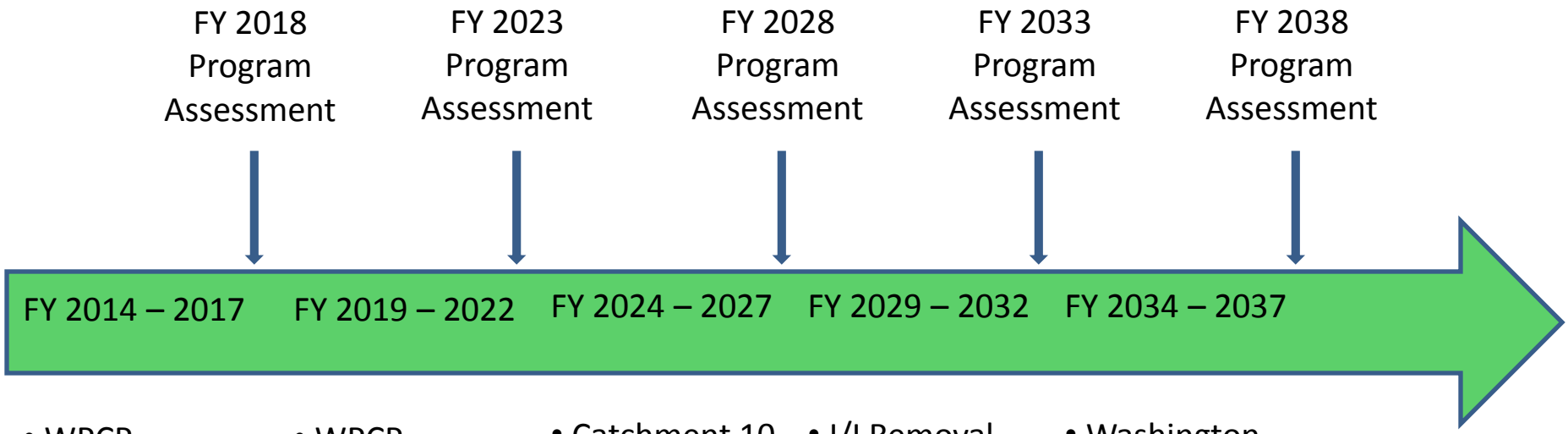

- WPCP Improvements
- Wellington PS Improvements
- System Optimization
- I/I Removal – Phase I

- WPCP Improvements completed
- I/I Removal – Phase II

- Catchment 10 Reroute
- I/I Removal – Phase III

- I/I Removal – Phase IV

- Washington CSO Storage
- Wellington / King Park CSO Storage

FY 2018 Assessment – I/I effectiveness & system optimization impacts
FY 2023 Assessment – I/I effectiveness & WPCP upgrade impacts
FY 2028 Assessment – I/I effectiveness & capacity upgrade impacts
FY 2033 Assessment – I/I effectiveness
FY 2038 Assessment – Washington CSO & Wellington/King Park CSO storage impacts

S3A – Storage
Affordability

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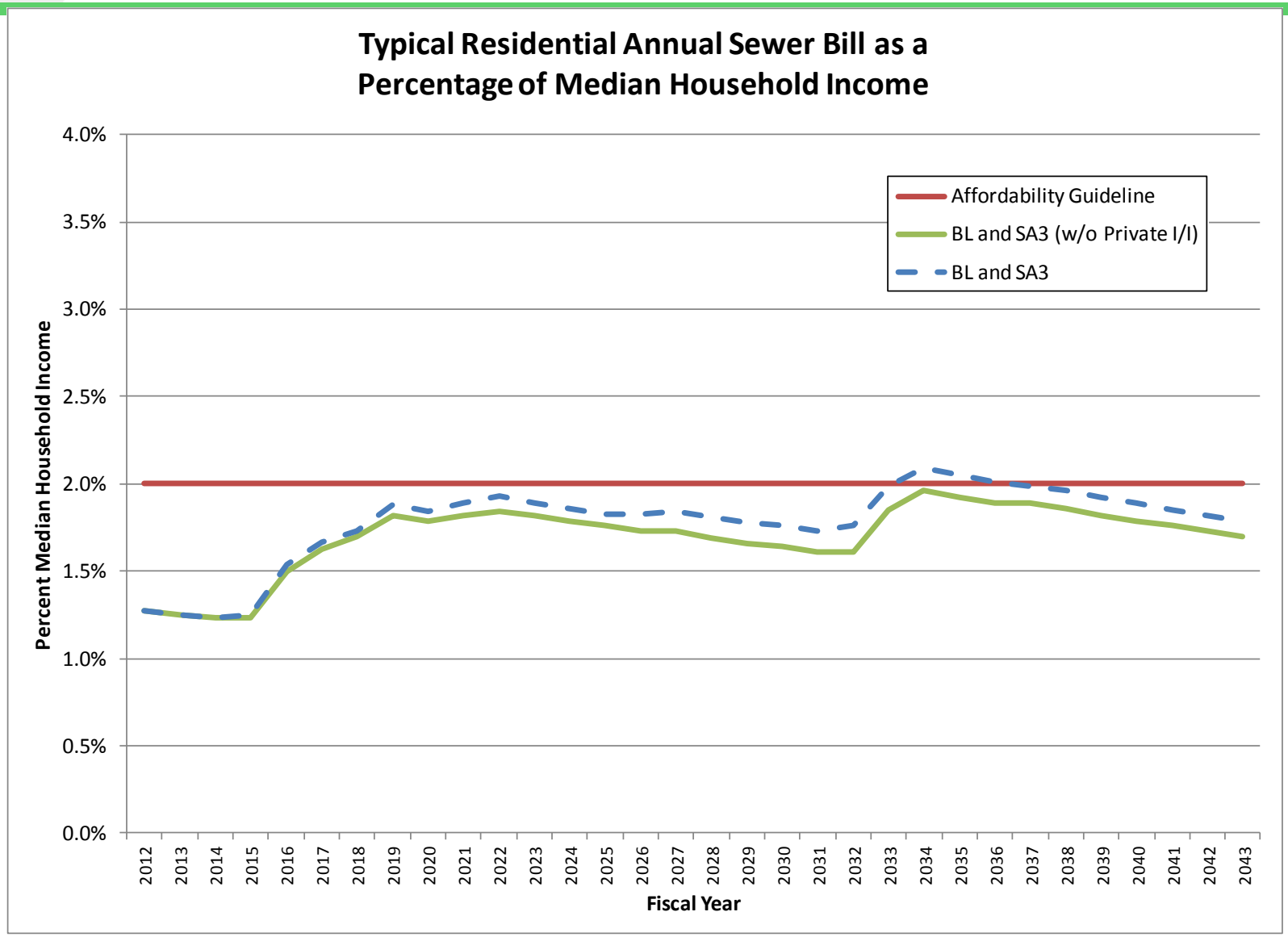

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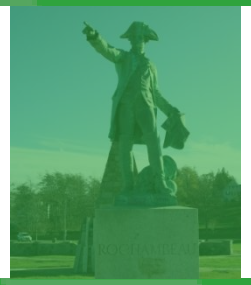


SMP SCENARIO SELECTION

CSO Program Goals

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Continue to identify & implement the most cost-effective solution for reducing the number of CSOs to a level protective of Newport Harbor and acceptable to the community and regulatory agencies.

- From Presentation to Newport City Council by CH2M HILL on March 2011

Strategy to Achieve the Goals of the CSO Program

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1. Comply with EPA and RIDEM negotiated CAP requirements
2. Achieve reasonable application of water quality standards
   - Protect King Park Beach
   - Determine the best use of the Washington St. CSO Facility
3. Maximize use of existing facilities
4. Prioritize capital repair & replacement projects
   - Invest in sewerage system for next generations
5. Control Operations & Maintenance (O&M) requirements - (minimize need for new capital facilities)
6. Identify a program & an implementation schedule that is affordable to Newport customers

Recommended SMP Scenario
C1A – Conveyance Upgrades

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- C1A Scenario best achieves the goals of the CSO Program:
  - Maximizes the use of existing facilities
  - Minimizes O&M costs
  - Program & implementation schedule are affordable & achievable in a reasonable timeframe
- C1A Scenario best achieves the goals of the Stakeholder Workgroup:
  - Maintains rates below 2% MHI
  - Meets the requirements of the CWA
  - Phased implementation approach provides flexibility for re-evaluation and change
- C1A Scenario best achieves the goals of EPA:
  - Focus on I/I reduction

Next Steps for the SMP

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- Prepare Draft SMP for City Review
  - Hydraulic analysis
  - Affordability analysis
  - Implementation schedule
  - Summary of stakeholder process
- Present SMP to City Council at Public Workshop
- Submit Final SMP to EPA by November 30, 2012

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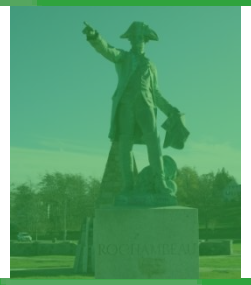


WRAP-UP & COMMENTS

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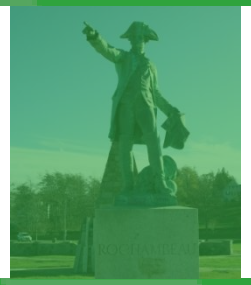


PARKING LOT FOLLOW-UP ITEMS

Parking Lot Item #1

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- Provide an overview of other I/I removal programs
  - Benefits provided
  - Costs
  - Implementation methods

I/I Programs Reviewed in this Document

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Some details…

- Portland, OR
- Hartford, CT
- Johnson County, KS
- Duluth, MN
- Knoxville, TN

Just the basics…

- Lowell, MA
- Newton, MA
- Burlington, MA
- Greenwich

Downspout Disconnection Program
Portland, OR

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Purpose: To reduce CSOs to the Columbia Slough and Willamette River.

Program type: Incentive based.

- Homeowner reimbursement of $53.00/downspout (typical)
- If City determines disconnections to be complex, larger reimbursements could be made
- Free disconnection services by City approved non-profit organizations

Benefit:

- Disconnected 56,000 downspouts
- Removed 1.2 billion gallons of water per year from combined sewers

Program Cost: Total costs not known

Implementation Schedule:

- Program began in 1995 and concluded in 2011

Hartford Area Separation Projects

Hartford, CT

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Purpose: Reduce CSOs in 3 catchment areas

Program type: Incentive based

Technical Approach:

- Program was managed and funded by Hartford MDC via rates – no homeowner costs
- Program required extensive outreach & homeowner satisfaction
- Program provided homeowners with property improvements along with stormwater disconnection.

Benefit:

- Disconnected downspouts from 277 homes – average of 5 downspouts per property
- Rain gardens were more cost effective than hard piping for 3 or more downspouts at one property

Cost: $20,000 - $27,000/property

Johnson County Wastewater

Johnson County, KS

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Technical Approach

- Program initiated to address widespread SSO events in the early 80's
- Passed a county ordinance making it illegal for residents to have connections from surface or ground water sources to the sanitary sewer system
- Within a year, most of the 55,000 property owners had readily complied with the request for access to their homes and buildings.
- Property owners were reimbursed for direct costs associated with removal of foundation drains, storm sump pumps or pits, area drains (driveway, patio, yard, window well, and basement entry), downspouts, and defective service line cleanouts. Maximum payments were published for each type of connection.
- JCW established informal fixed-price contracts with local contractors. These contracts were based on standard specifications and set costs for different types of disconnections.
- Property owners could either have JCW assign the contractor, or be provided with a list of pre-approved contractors and make their selection through a two-bid process
- The standard contracts worked extremely well and relieved a serious project backlog in the first year of the program, tripling the disconnection rate to 4,000 per year.

Johnson County Wastewater
Johnson County, KS

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Benefit
- Disconnected more than 15,600 unpermitted sources of storm water inflow on private property
- Reduced capacity-related SSOs by reducing wet-weather flow rates in the system by an average 280 mgd during the 10-year storm
- Reduction in the number of complaints for smaller storm events

Cost
- I/I reduction program cost a total of $60 million
  - private connection program was the least expensive at just under $10.3 million
  - $30 million for collection system improvements
  - $19.7 million for program-specific engineering and administrative expenses
- JCW was able to obtain $12 million in grant funds and $18 million in low-interest state revolving loans, but the private connection work was not eligible for public funds. JCW covered the costs with obligation bonds that are being paid for through a tax increase.

Incentive/Penalty
- Reimbursed property owners for disconnection up to a max payment for each type of connection
- No enforcement action taken unless homeowner refused to comply with the ordinance

Implementation Schedule
- Initiated surveys in 1985 and completed this phase of the I/I reduction program in 1994.

City of Duluth Sump Program
Duluth, MN

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Technical Approach

- Initiated I/I reduction programs as a result of an Administrative Action from the USEPA due to SSOs
- In 2000, initiated inspection/disconnection of foundation drains in homes
- Voluntary programs until 2004 when a new ordinance was adopted making participation in the program mandatory
- Collection system divided into 30 basins containing approximately 1000 homes each, inspections performed in targeted basins based on priority
- Inspections determine if home is a contributor or non-contributor of inflow from foundation drains. If a contributor then the homeowner must install a sump pump and house traps must be removed.
- Following inspection the home owner has 90 days to install the sump pump
- Ordinance requires point of sale inspection, disconnection of drains and removal of house trap
- All new homes are inspected to make sure there are no connections to the SS

City of Duluth Sump Program
Duluth, MN

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Benefit
- 5000+ homes inspected, 70 refused to be inspected (2005)
- Roof drain disconnection reduced peak flows by about 10% and the sump pump program reduced peak flows by about 75%
- Reduced capacity requirements for storage facilities

Cost
- Paid approximately $6 million in I/I reduction with about $1.5 million going to sump pump grants. City paid 100% for roof drain disconnections in downtown. (2005)
- Passed on as increased sewer rates; which increased by about 20%

Incentive/Penalty
- Grant money available up to a set amount of $2,150 for specified allowances
- Property owners making less than 50% of the median City income get 100% reimbursement
- If inspections are not allowed the City will issue administrative search warrants
- A $250 surcharge will be added to utility bill if disconnection not performed within 90 days

Implementation Schedule
- Inspection of foundation drains were initiated in 2000 and are ongoing for targeted basins

Lessons Learned
- City of Duluth found that the program had to have an enforcement component with teeth to be effective
- Up front outreach and education of City Council members to achieve buy-in for ordinances and administrative actions

KUB Private Lateral Program
Knoxville Utilities Board

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Technical Approach

- Consent Decree requires implementation of a program to reduce extraneous flows entering the wastewater collection system through defective residential private laterals and illicit connections.
- Defective laterals and illicit connections were identified during previous assessment and continue to be identified through the Continuing Sewer System Assessment Program.
- Prioritize areas where collection system improvements were underway. KUB replace lower laterals during such projects, property owner responsible for upper.
- Contracted with a third party (non-profit entity) to administer the PLP and provide financial assistance, which included a grant program for low to moderate income owners and also a interest free loan program. Financial assistance not just based on income.
- Implemented a 120 day enforcement deadline for property owners to perform repairs or replacement.
- Communication to property owners and public was essential

KUB Private Lateral Program
Knoxville Utilities Board

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Benefit
- Met conditions of the Consent Decree
- Identified 3,365 laterals needing repair/replacement, 3,230 were done
- Provided 981 grants and 36 loans (loans discontinued for low use)
- 59% reduction of wet weather overflows since implementation of 10 year program to improve collection system (not just the PLP)

Cost
- Provided $2+ million in grants

Incentive/Penalty
- 120 day enforcement deadline, at which time water service was shut off
- 241 water service disconnections were implemented, 139 reinstated.
- Disconnection was continued during sale of property
- 33 active properties still under enforcement

Implementation Schedule
- Consent Decree entered in February 2005, PLP program initiated later that year and completed in 2012.

Lessons Learned
- Customer hardship and dissatisfaction were expected so they implemented a public relations program from the start
- Using CCTV allowed pinpointing problems and could reduce repair costs for customers

City of Lowell, MA
Regional Wastewater Utility

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- Co-permittees with Dracut, Chelmsford, Tewksbury and Tyngsborough
- Permit issued in 2005 requiring the development of an I/I Control Plan that includes a program for disconnecting sump pumps and roof downspouts
- Dracut initiating a public awareness program that focuses on private property I/I

City of Newton, MA

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- MWRA Assessment driven
- Private Inflow Removal Program
- Focusing on two areas with wet weather overflows
- Performed inspections and smoke testing, identified 58 driveway drains and 136 sump pumps connected
- Notifying property owners
- 22 sump pumps disconnected

City of Burlington, MA

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- Mass DEP moratorium on sewer allocations
- Just began performing inspections this year
- Amnesty program that is cost free to property owner where developer performs work in order to receive allocation to connect

City of Greenwich, CT

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- Under orders from US Dept of Justice and CT DEP
- Performing investigations in phases based on priority
- Notifies property owners if they have an illegal connection, a flexible connection or a suspected connection
- Notification includes packet that provides instructions on how the property owner can go about performing the disconnections
- Requires property owners to get permits for performing the work

Parking Lot Item #2

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- Provide an update on CSO system performance
  - Trends for system performance for 2001 - 2012

Improvements Implemented Between 2001 and 2011 Effecting CSOs

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- Inflow Reduction Projects
  - Mainly focused on Wellington area
  - Public defect remediation – 41 catch basins separated
  - Private defect remediation – roof leader and sump pump disconnection
- Conveyance Projects
  - Thames Street Rehabilitation Project
  - Removed 35 utilities and 3 weirs that were obstructing flow
  - Relined the interceptor
  - Increase conveyance of flow from Wellington to Washington
- System Operations
  - Adjusted operations to limit flows to the WPCP to not exceed RIPDES permit flow limits

Wellington Avenue Treatment Facility
Cumulative Flow vs. Rainfall

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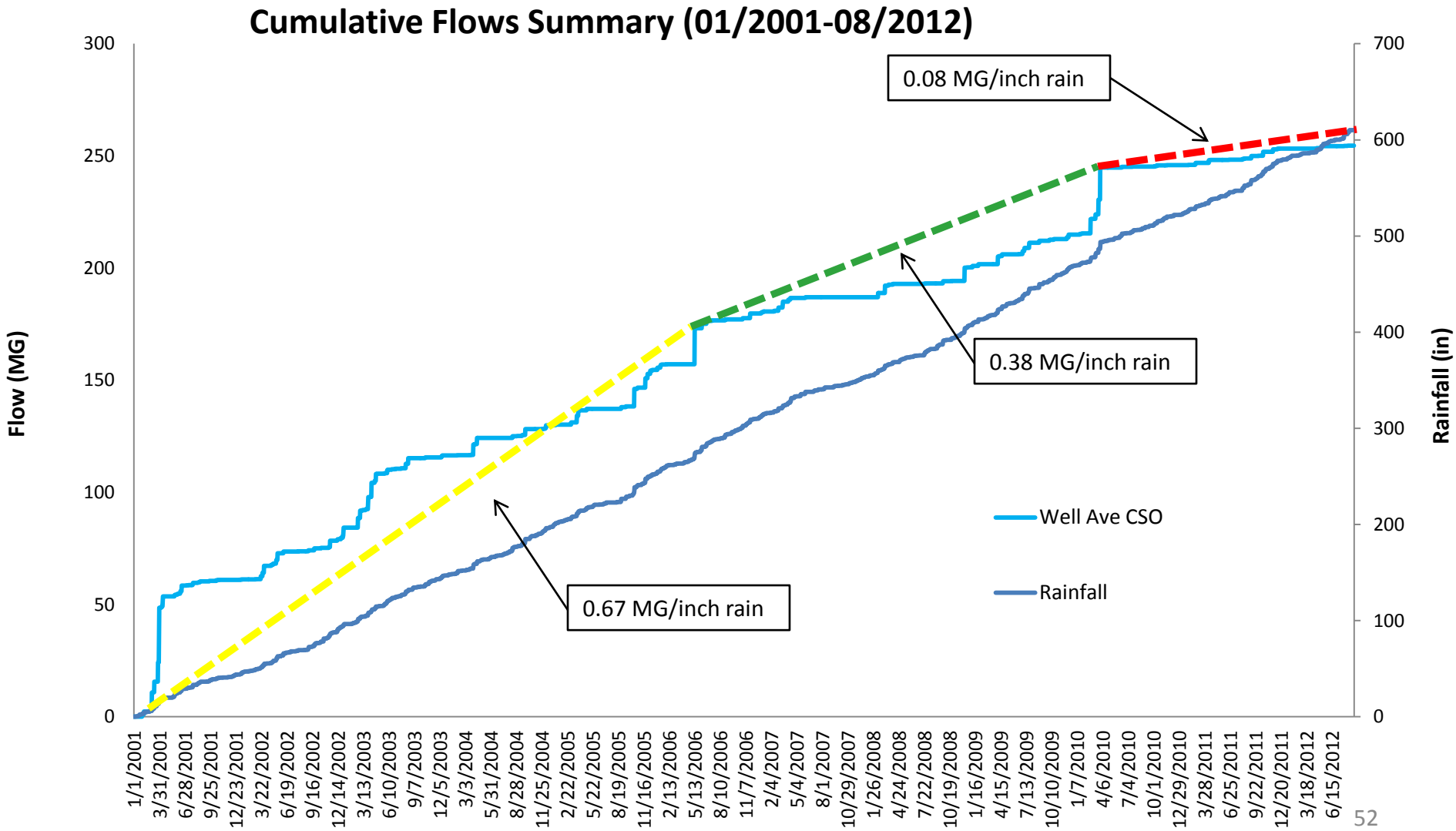

Washington Street Treatment Facility
Cumulative Flow vs. Rainfall

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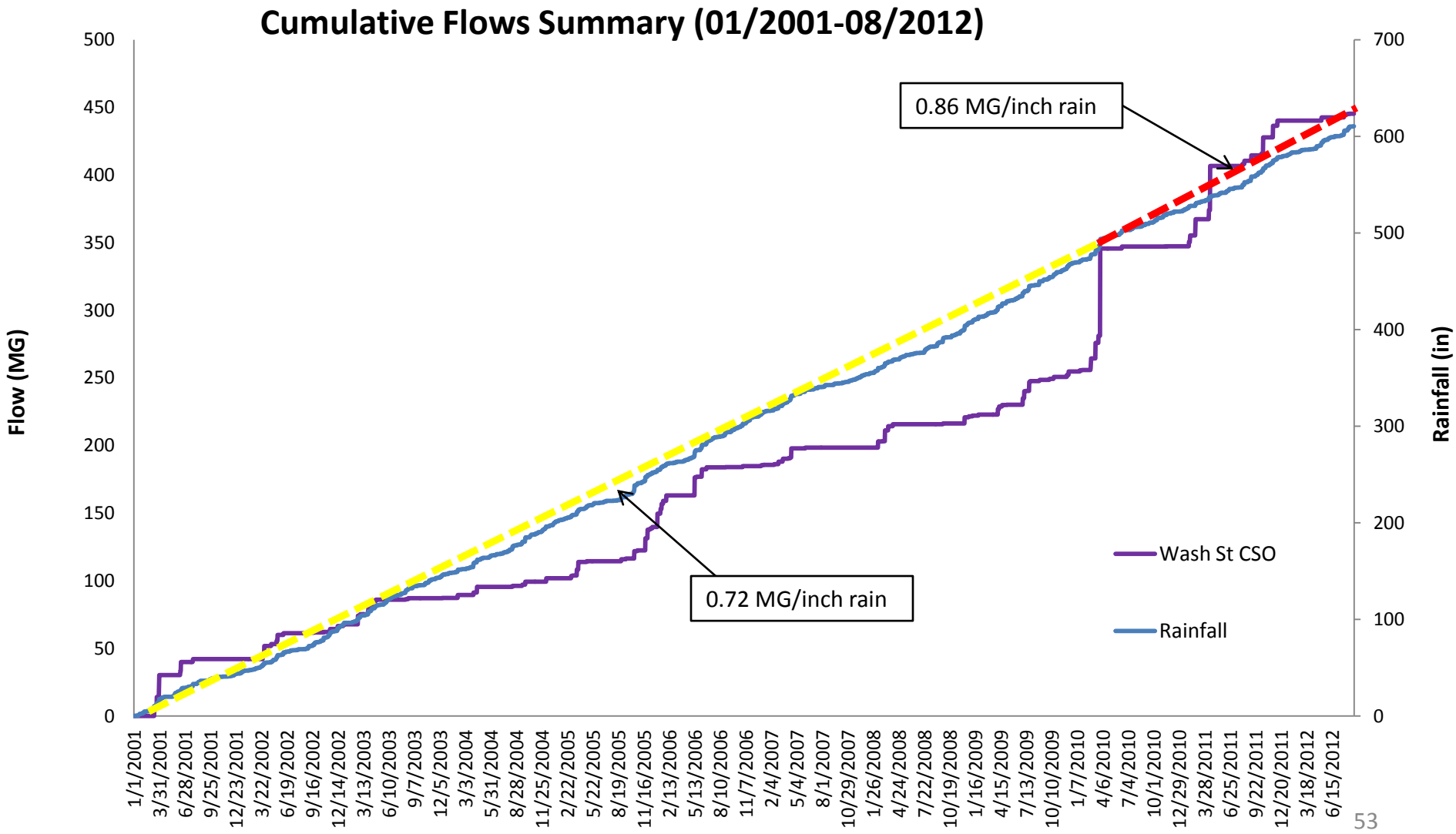
1639



Cumulative Flow vs. Rainfall

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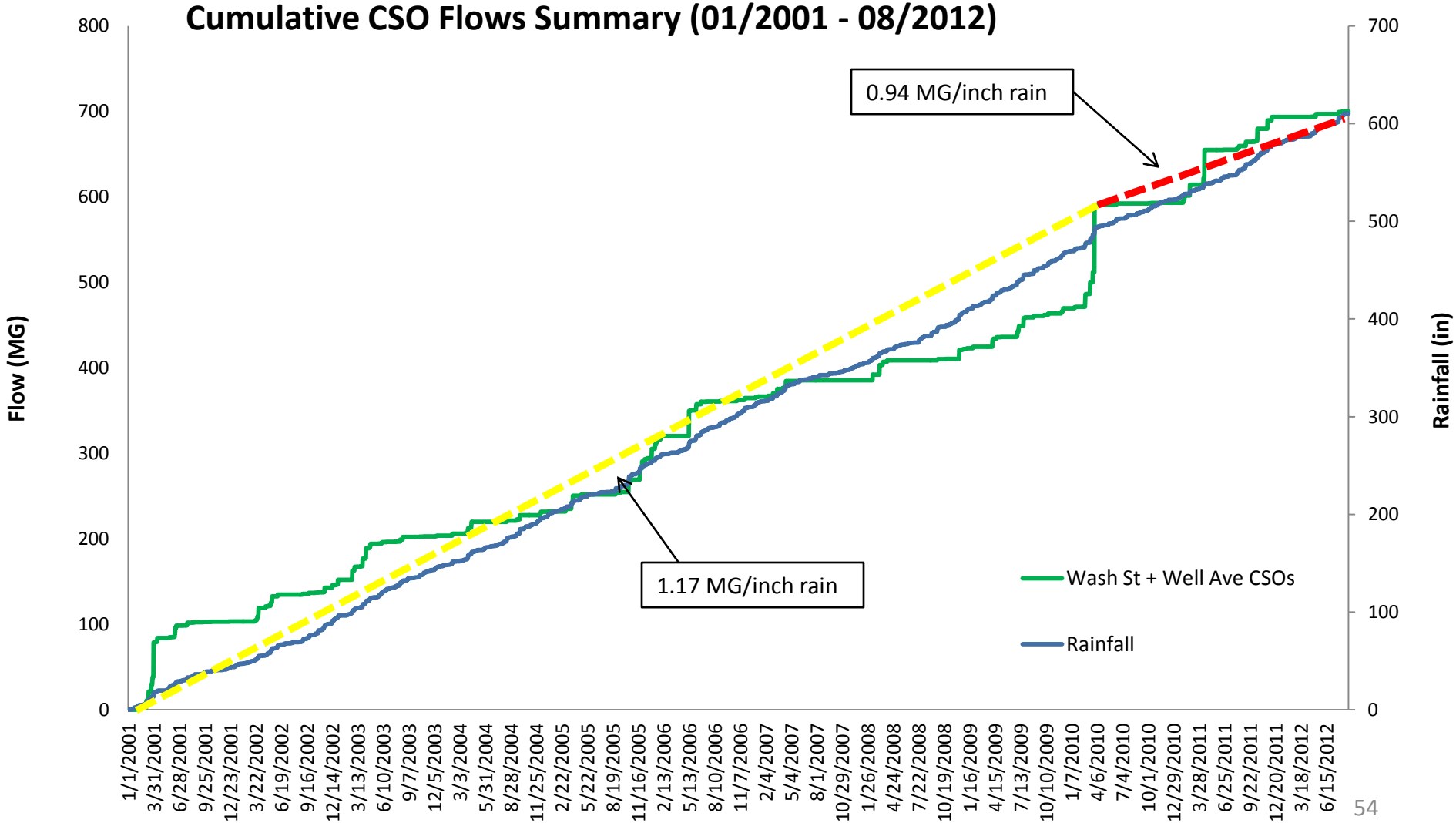

Recent CSO Performance Conclusions

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- Trends in CSO Discharges
  - Wellington shows a significant decrease in CSO volumes
    - From 0.67 to 0.08 MG per inch of rain
  - Washington shows a small increase in CSO volumes
    - From 0.72 to 0.86 MG per inch of rain
  - Citywide CSOs volumes show a small decreased
    - From 1.17 to 0.94 MG per inch of rain
- Effects of Recent Improvement Projects
  - Recent projects have increased conveyance of flow from the Wellington to Washington CSO treatment facilities
- System Operations
  - The system has the capacity to convey more flow to the plant – but -
  - The plant's discharge permit limits flows that can be treated during wet weather