



Combined Sewer Overflow Setting the Stage in Winnipeg



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Outline

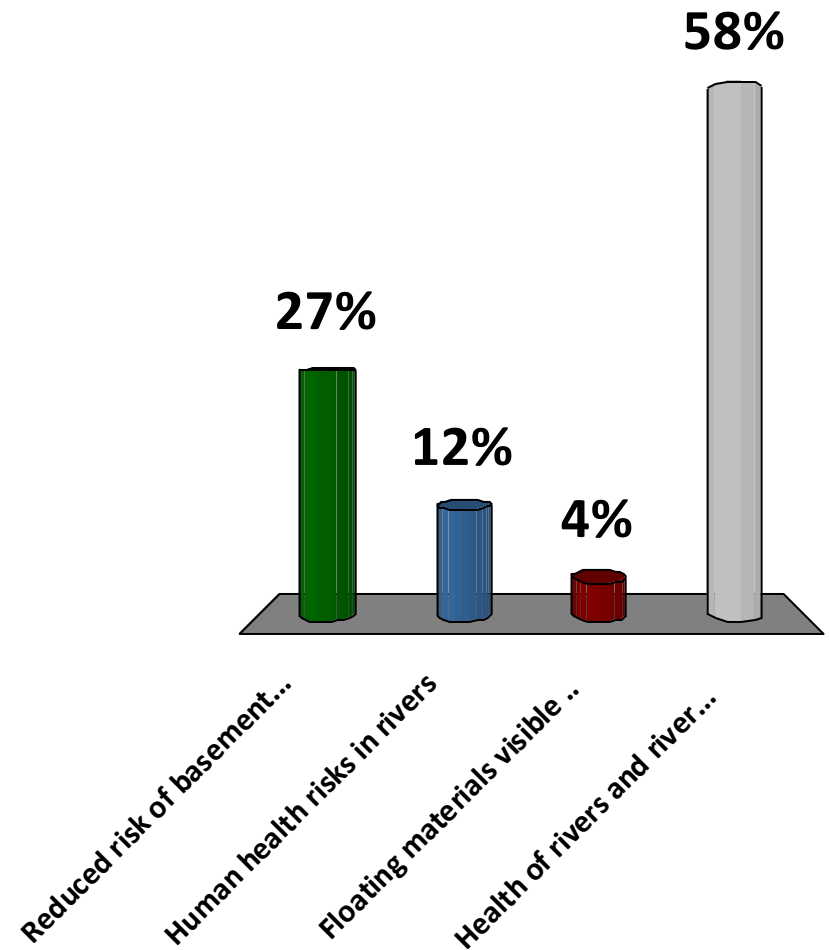
- What are Combined Sewer Overflows (CSOs)
- CSO Impacts in Winnipeg
- CSO Status in Other Cities
- Baseline Winnipeg CSO Conditions
- CSO Regulatory Process
- CSO Control Objectives
- CSO Control Options
- CSO Issues and Challenges
- CSO Master Plan

What Are CSOs?

- <http://wwdengage.winnipeg.ca/cso-mp/>
- [Winnipeg_cso.mp4](#)

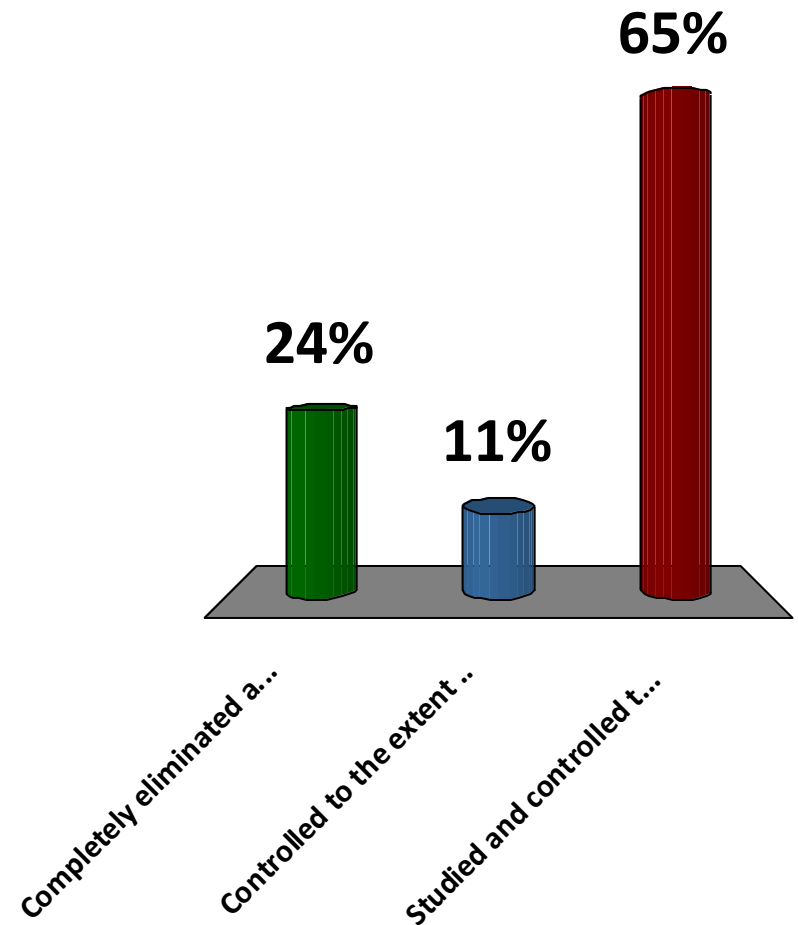
What do you think is the most significant result or impact of CSOs?

- A. Reduced risk of basement flooding
- B. Human health risks in rivers
- C. Floating materials visible in the rivers
- D. Health of rivers and river habitat



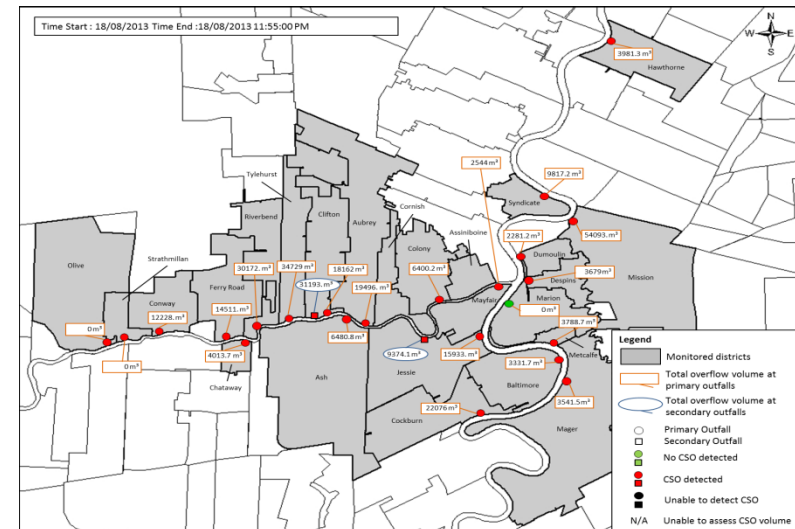
CSOs should be:

- A. Completely eliminated as soon as possible
- B. Controlled to the extent it doesn't require substantial increase in sewage fees
- c. Studied and controlled to the extent their control measurably improves quality in the rivers and Lake Winnipeg



CSO Impacts in Winnipeg

- 79 CSO locations discharge untreated combined sewage
- CSOs occur about 22 times each year
- Discharging mega-litres, untreated



- Contributing pollutants (bacteria, biological chemicals and solid) into the rivers

CSO Status in Other Cities

- All older cities had combined sewers
- Most still have CSOs when it rains
- All are working to reduce CSO impacts



- Medium cities retrofit separate sewers
- Large cities reduce frequency of CSO
 - As practical (Edmonton)
 - Target 4-6 event/year (US)

Baseline Winnipeg CSO Conditions

- *2002 Final Report: Combined Sewer Overflow Management Study*
 - Complete documentation of CSO conditions in Winnipeg
- Clean Environment Commission (CEC) recommendations
 - More aggressive targets than planned in 2002
- Canada Wide Strategy for Management of Municipal Wastewater Effluent
 - Avoided the CSO issues
- 2013 Provincial License No. 3042 for CSOs

CSO Regulatory Process

- Province mandated to protect the river water quality
 - Standards exist for discharge from treatment plants
 - Winnipeg is the major Manitoba discharger of CSOs
 - CSOs are one of many sources of pollutants threatening
 - The rivers and potentially Lake Manitoba (remote)
- Province issued CSO license subject to
 - Public information
 - Several study deadlines
- Province and City are working to
 - better understand CSO impacts and evaluate options
 - prior to finalizing requirements

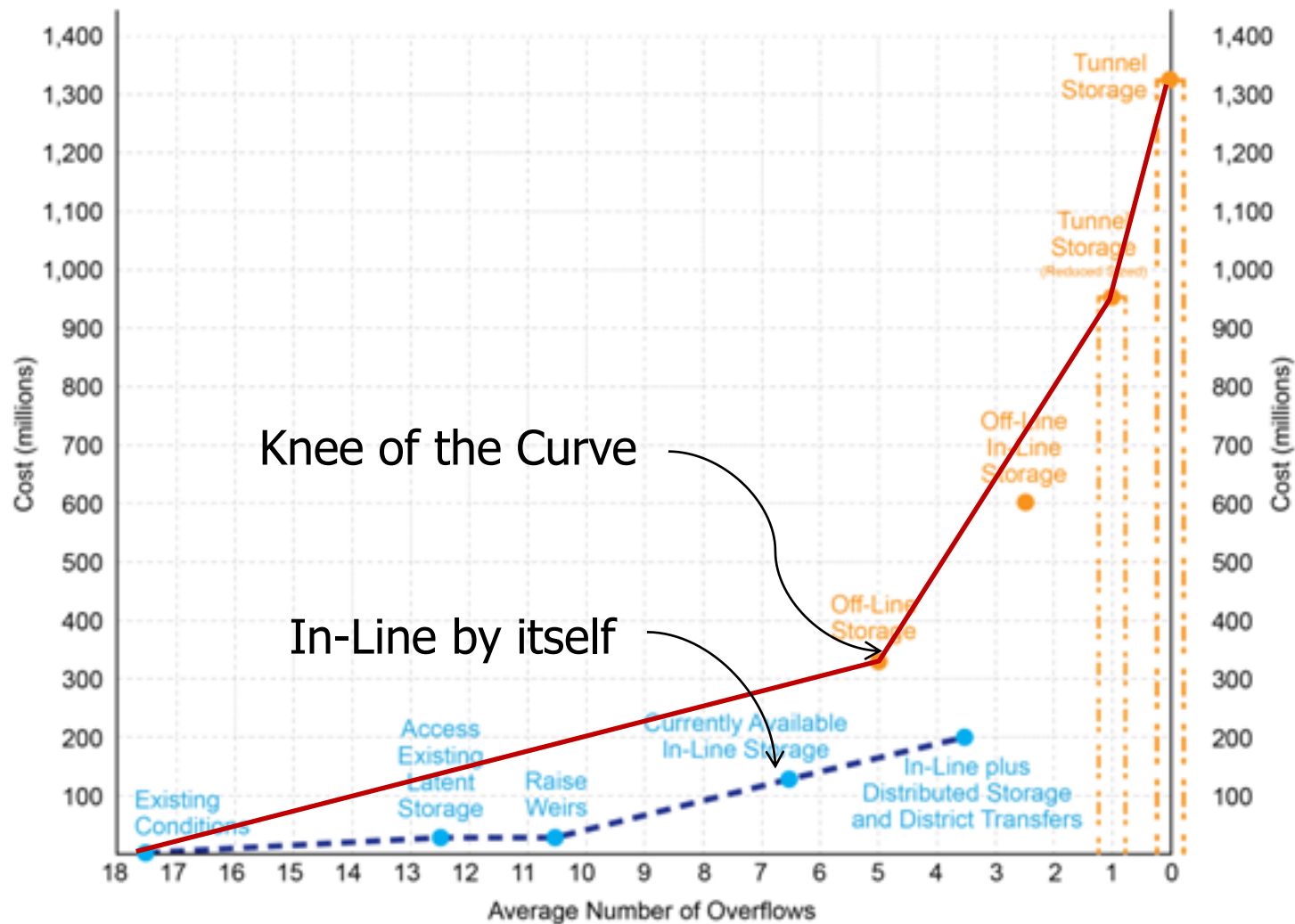
Possible CSO Control Objectives - Regulatory

- CSO License options
 - Maximum of 4 overflows events per year
 - Zero combined sewer overflows
 - At least 85% Percent Capture and a maximum of 4 overflow events per year
- CSO standards adopted elsewhere
 - Maximum use of existing infrastructure
 - Nine minimum controls (US CSO Policy)
 - Environmental equivalent of separation (Edmonton)
 - No more than 4 to 6 overflows/year (US CSO Policy)
 - Capture and treat 85% of wet weather flows (US CSO Policy)

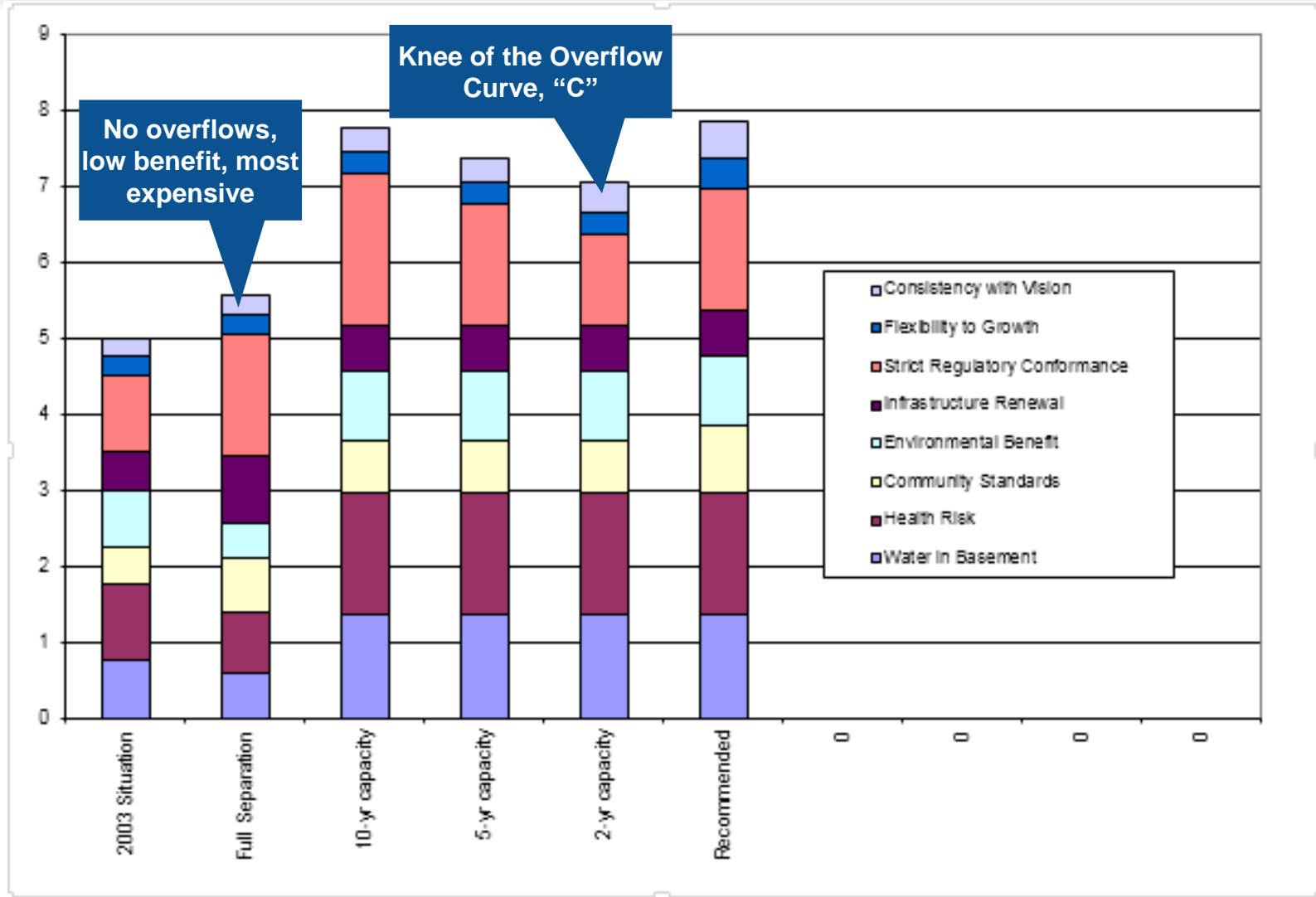
Possible CSO Control Objectives - Other

- Achieve water quality standards
 - Water quality standards are not established for CSOs
 - Standards for constant, not short term, conditions
 - Water quality standards are written for rivers and streams which are impacted by other sources
- Control to point of diminishing returns (knee of the curve)
 - The point where further expenditure gives little benefit

2002 CSO Study Knee-of-the-Curve – Single Benefit



Example Multi-Attribute Perceptible Benefits (Cincinnati)



CSO Control Options

Control Option	Concerns*
Sewer separation	Disruption, residual untreated stormwater
System flow balancing and real time controls	Modest control improvement, risk of basement flood exacerbation
Increase wet weather treatment at plants	Threatens license limits targeted toward dry weather flow
Retention treatment basins	Odours, operational complexity
Conveyance-storage tunnels	Deep maintenance
Green infrastructure	Modest control improvement, drainage retrofit takes decades
Watershed approach	Requires work beyond City authority

* **Cost is a major concern with all CSO controls.**

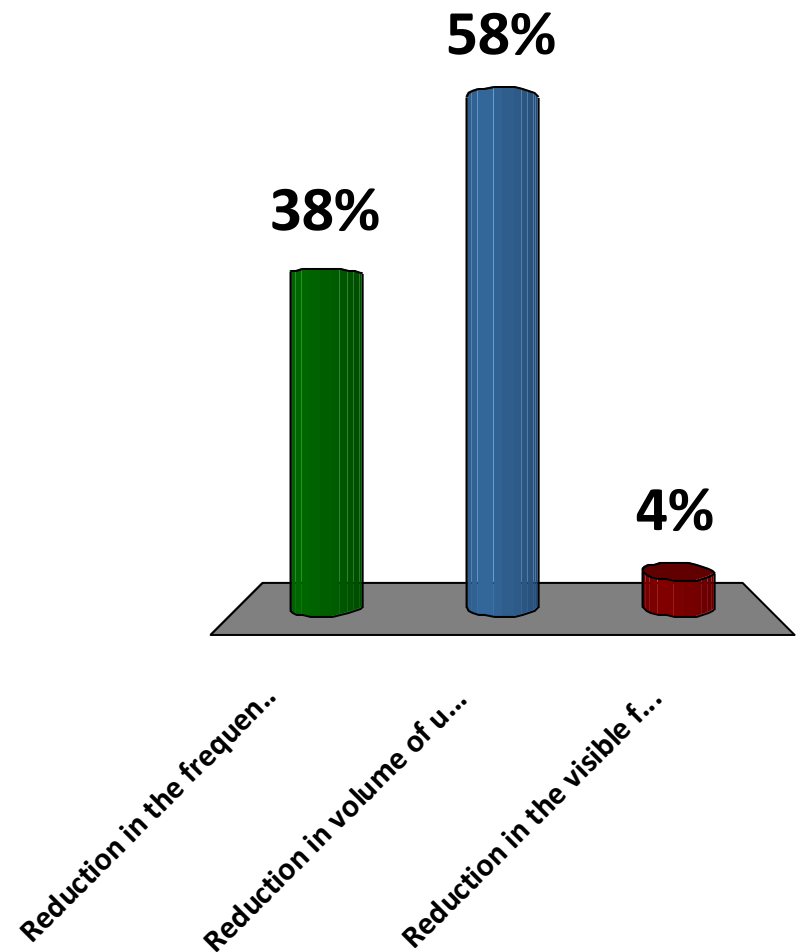
Winnipeg CSO Challenges

- Changing regulatory requirements
- Control Objectives
 - Reduce risk to 0?
 - Reduce frequency everywhere, or where feasible?
 - Capture and treat 85%, or 95%, or ?
- Performance Measures
 - Frequency of overflow
 - Volume of overflow (difficult to measure)
 - River water quality (affected by many other sources)
- Selection of implementable control measures

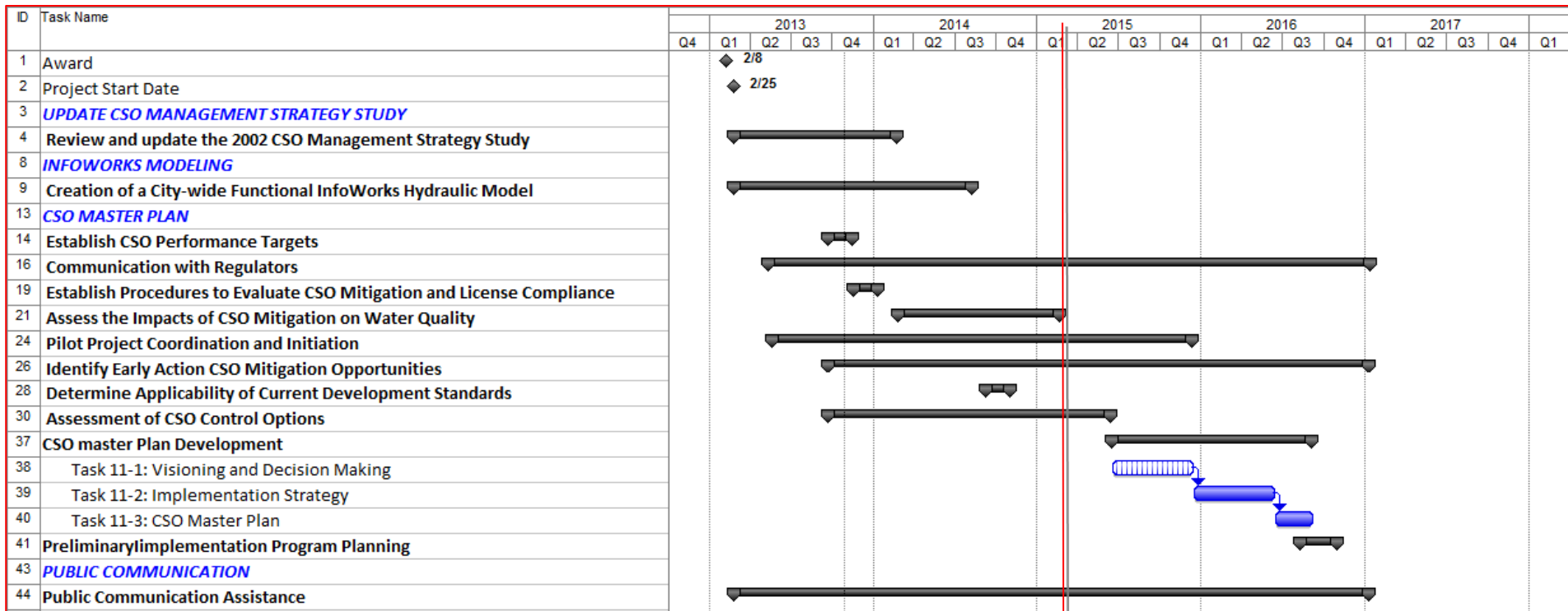


CSOs control benefit should be measured by:

- A. Reduction in the frequency of untreated CSOs
- B. Reduction in volume of untreated sewage discharge
- C. Reduction in the visible floating waste in the rivers



CSO Master Plan Schedule



CSO Master Plan Information

- <http://wwdengage.winnipeg.ca/cso-mp/>