

Value Engineering Experiences in Water and Wastewater

Presented to CSVA 2006
October 23, 2006



Recent Application of VE

- Projects greater than \$10.0 million
- Project Scoping
- New Regional Facilities
- Transportation
- Design/Build Projects



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Water and Wastewater Applications

- **Mid-Halton WWTP**
- Oakville South WWTP
- **Burloak Water Purification Plant**
- Burloak Intake Tunnel



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Why do Value Engineering?

To Ensure:

- Project team “Buy in” at each stage
- Design standards are “Challenged”
- Design is flexible
- Comprehensive design review
- “Unique” opportunities are identified.
- Project cost is validated



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When do we do VEs

Region has traditionally completed VEs:

- Prior to Pre-design (Project Scoping)
- During detailed design
- At design completion (Constructability review)



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Mid-Halton WWTP



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Mid-Halton WWTP Project Background

- Constructed in 1991
- Located north of QEW between Third Line and Bronte Road, abutting the Deerfield Golf Course and Fourteen Mile Creek lands
- Expansion from 50,000 m³/ day to 75,000m³/d to meet future growth needs approved by Council in March, 2003.
- Construction commence early 2007



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Mid Halton WPP Expansion Components

- New pumps in North Pumping Station
- New screen equipment in existing channel
- New grit removal tank
- Elimination of co-thickening in the primary clarifiers with provision for separate sludge thickening



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Mid-Halton WPP Expansion Components

- Chemical system enhancements, scum removal and hydraulic improvements
- Secondary treatment provided using a conventional activated sludge process
- New sludge dewatering building:
 - Secondary sludge thickening
 - Dewatering of liquid biosolids
 - Truck loading facility for cake haulage
- Odour management



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Timing of Mid-Halton VE Reviews

- Class EA Design Concept
- Preliminary design
- Detailed design/construction issues



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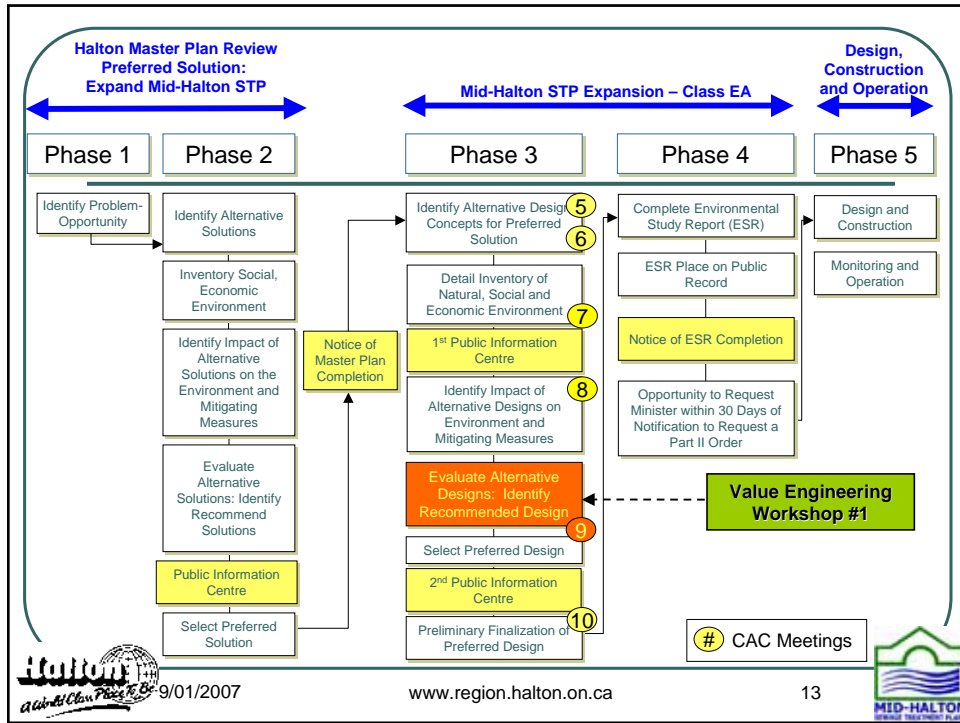
Objective of Mid Halton VE (As presented to Council)

- Ensure project meets current expansion requirements and will integrate with long term plans for the Region
- Ensure that the project effectively considers environmental, operational and maintenance impacts
- Ensure that the Region receives optimum benefit from the funds committed to expanding the plant



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Mid Halton Dewatering Building

VE completed using criteria from public input such as:

- Visual impact to the community
- Impact on future expansion
- Impact of noise and odour
- As well as plant impacts such as:
 - Impact on plant operations – travel distance
 - Potential to block plant roads due to truck waiting
 - Ease of pumping centrate to north facility



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Mid-Halton WWTP VE Results

- 11 major VE alternatives implemented
- 8 major design suggestions implemented
- Savings of over \$2.8 million
- Review allowed for improvements related to:
 - Process alternatives; both capital and conversion of facility
 - Dewatering technology
 - Biosolids Building location



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Burloak WPP



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Burloak WPP

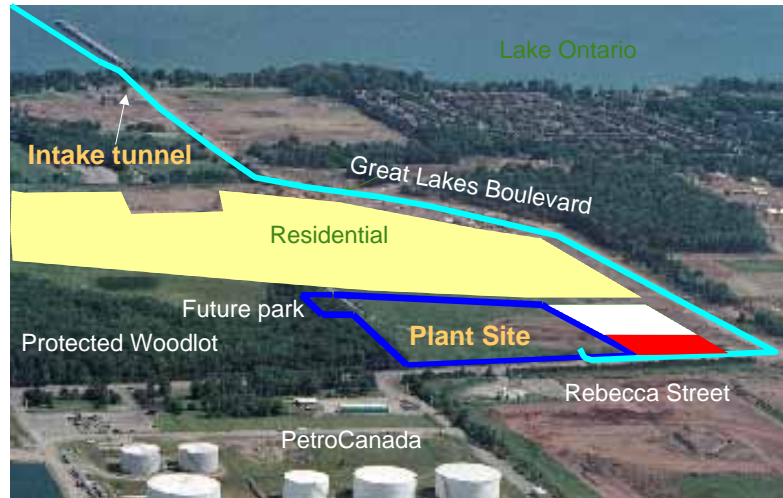
- New 55 ML/d water plant which future expansion to 220 ML/d
- Located at Rebecca Street and Great Lakes Boulevard in Oakville. Adjacent to major new residential development
- Construction of Plant Commenced 2006 completion 2008



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Burloak WPP Site



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Timing of Burloak VE Reviews

- 2 workshops;
- Review of pre-design report
- 50% detailed design



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Burloak VE Reviews

- Challenge “off limit” topics
- Challenge “beyond scope” topics
- Savings delineated by divisions; architectural, mechanical, electrical, construction management



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Burloak VE Reviews (cont'd)

- Major items identified:
 - relocated sequencing of unit processes - \$1.5 million
 - Modified Low Lift PS layout \$380,000
 - Delete Chlorine contactors - \$950,000
 - Delete 1 clearwell - \$550,000
 - Derate membranes for cold water - \$150,000
 - Delete flocculation tank mixers - \$370,000



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Burloak VE Reviews (cont'd)



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Burloak WPP

- 32 major VE proposals
- 20 design suggestions
- Estimated savings of \$4,569,000



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Benefit of Halton Water and Wastewater VEs

- Optimization of Design with respect to Operation and Maintenance needs
- Consideration and Incorporation of Community values.
- Promote project “Buy-in” at all levels
- Payback on investment 10 – 15 times



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