Getting Started with Value Engineering at the City of Toronto

Ashbridges Bay Treatment Plant (ABTP) Odour Control Facilities

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City of Toronto

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Presentation Outline

- ABTP Odour Control
  - Project background
  - Project goals and approach
- Getting started with VE
  - Why VE for ABTP?
  - VE Objectives
  - VE Plan
  - Case study VE 1
- Lessons Learned
- Conclusions

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Ashbridges Bay Treatment Plant

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ABTP Odour Control – Project Background

- Environmental Assessment and Mediation Agreement
  - Driver: Resolution # 9 Good Neighbour Initiative
- Comprehensive odour assessment
  - Objective: 1 Odour Unit at ABTP boundary through biofiltration
- Next steps: Implement recommendations of odour assessment

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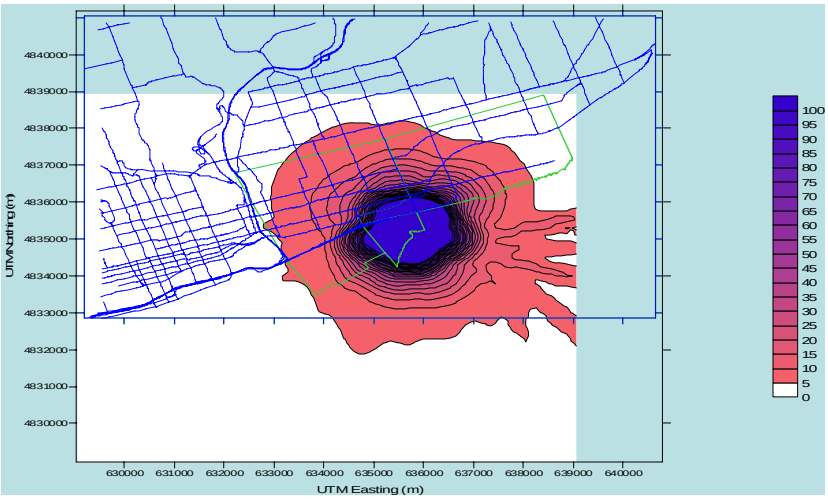
ABTP Odour Impact



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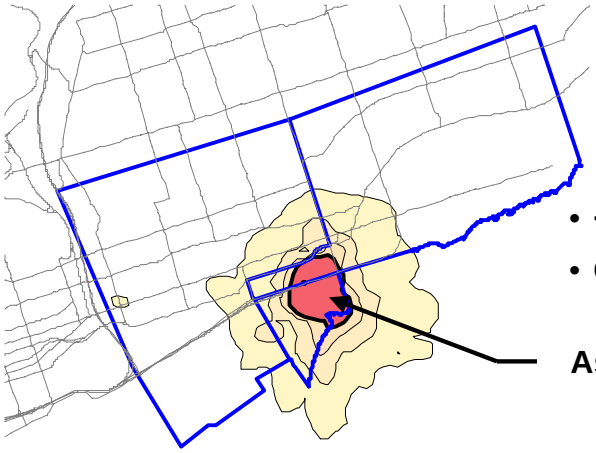
Target Odour Impact



- < 1 OU required
- Central Biofilter

Ashbridges Bay TP

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The Team

- City of Toronto
  - Toronto Water
  - Technical Services
- VE Consultant – National Capital Engineering
- Design Consultants
  - Prime Consultant – Earth Tech
  - Primary Sub-consultant – Stantec

ABTP Odour Control – Project Goals

- Manage within $150M budget
- Develop air management strategy optimizing volume of air to be collected, conveyed, and treated
- Design innovative, economical, and sustainable biofilter
- Meet regulatory requirements

ABTP Odour Control Control Project Approach

- 5 construction contracts:
  - Biofilter
  - D Building
  - Aeration tanks,
  - Pumping Stations
  - odourous air collection

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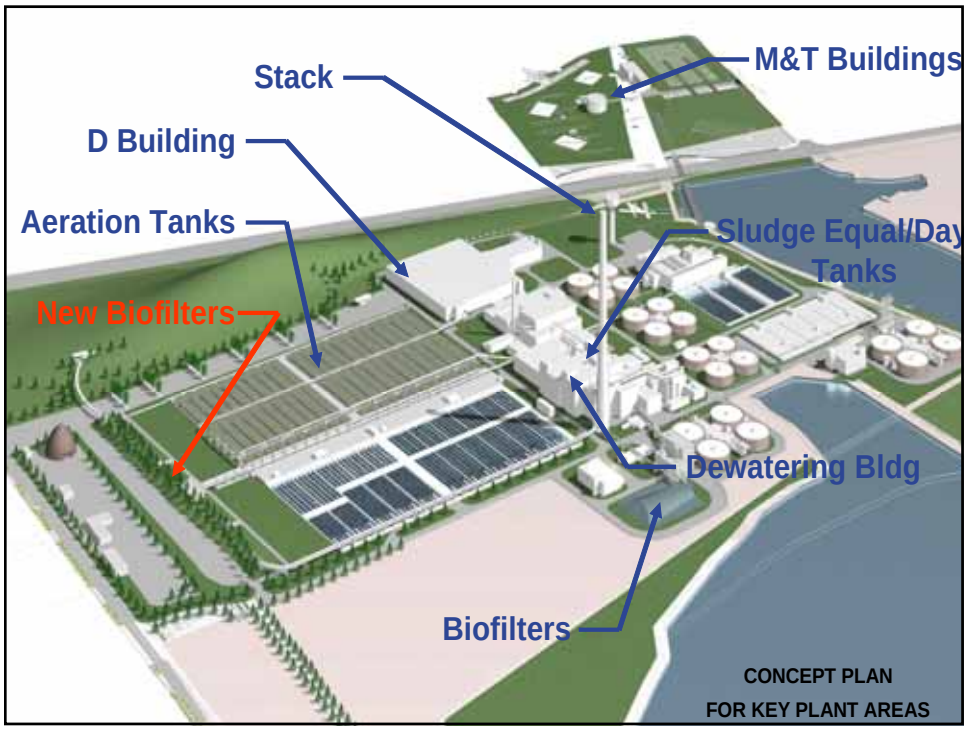

Why VE for the ABTP Odour Control?

- Scale – world's largest biofilter complex at WWTP
- Complexity – technical / contract management
- Budget – current estimate 150M
- Ambitious target - 1 OU at ABTP boundary
- Support from City Council
- Acceptance by external stakeholders
- Partnering opportunities

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VE Objectives

- Confirm design concepts
- Improve performance
- Maintain
  - Safety, reliability, regulatory compliance
- Identify, analyze, and mitigate risks
- Confirm scheduling relationships
  - Sequence of contracts

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Original VE Plan

- Three 5-day VE studies:
  - VE 1 upon completion of air management strategy
  - VE 2 upon completion of biofilter's pre-design
  - VE 3 at 50% completion of biofilter's design
- Timeframe: May/06 – Sept/07

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Revised VE Plan

- How it has turned out:
  - VE 1 scope revised – pre-design for primary treatment, M building, existing biofilter
  - VE 1 completed in July/06
- Next VE sessions:
  - VE 2 – air management strategy (Feb/07)
  - VE 3 – biofilter upon completion of pre-design (fall 07)

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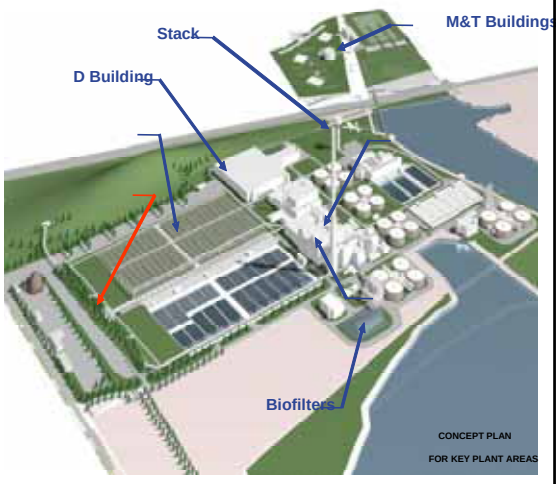
Case Study: VE 1 Process Areas

- Areas included:
  - Primary treatment (D Building)
  - M Building
  - Existing biofilter
- Estimated cost: $58M



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Case Study: VE 1 Ideas

- Generated - 271
- Developed - 38
- Selected for input - 19
- Investigated in-depth - 5

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Case Study: VE 1 D Building

- New building and screens
- Upgrading of grit removal system
- New loading bay for screenings and grit
- Realignment of inlet conduits
- Ventilation upgrades to meet NFPA 820 standard

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Case Study: VE 1 D Building

Selected Objectives

- Mitigate flooding potential in D Building
- Confirm technology selection for new screens
- Confirm technology selection for disposal of screenings and grit

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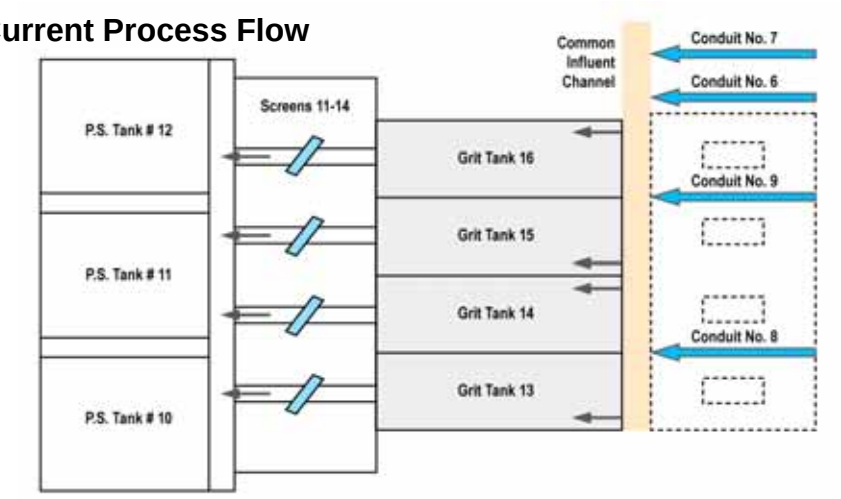
Case Study: VE 1 D Building

Current Process Flow



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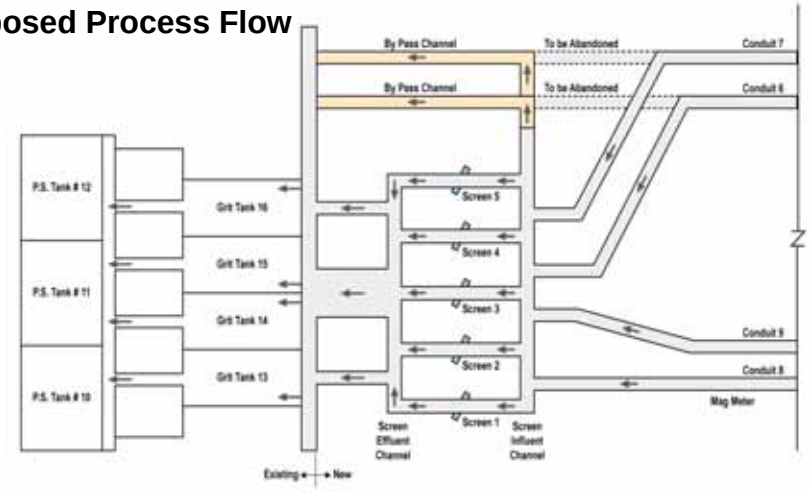
Case Study: VE 1 D Building

Proposed Process Flow



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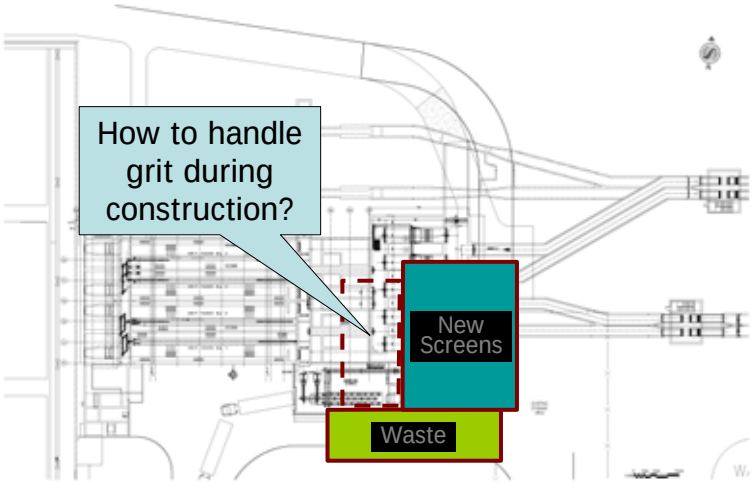
Case Study: VE 1 Clarification of Ideas

- Range of Ideas
  - From ready-to-implement to one-of-kind
  - Some ideas needed further clarification
- How did we clarify some ideas?
  - Conference calls
  - Additional details provided
  - Examples of similar applications

Case Study: VE 1 Selected Idea

- Original concept – construct Screen Building after Loading Bay
- Revised concept – install temporary grit removal facility and construct Screen Building/Loading Bay simultaneously
- Advantages – shorten construction schedule by 2 years
- Potential cost reduction $1.8M

Case Study: VE 1 Selected Idea



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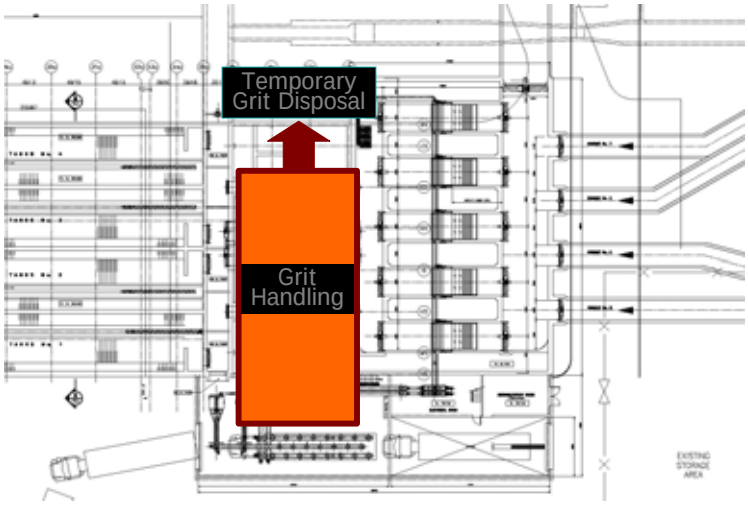
Case Study: VE 1 Selected Idea



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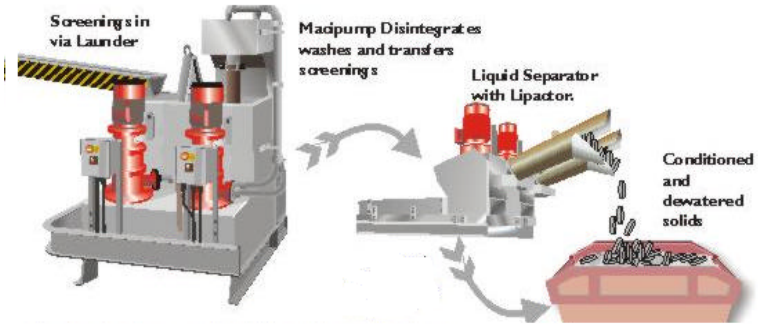
Case Study: VE 1 Clarification Item

- Original Concept – hydraulic sluicing, dewatering and screw conveyors

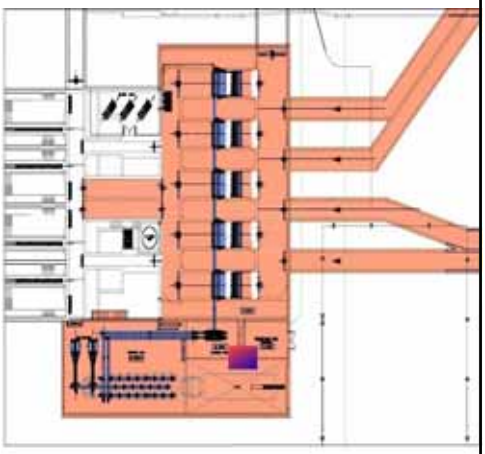
Case Study: VE 1 Clarification Item

- Revised Idea – hydraulic sluicing, maceration, pumping to dewatering



Case Study: VE 1 Clarification Item

- Advantages
  - Reduction in size of loading bay
  - Elimination of screw conveyors
  - Shortened conveyance of dry screenings



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Case Study: VE 1 Risk Assessment

- Risk specialist part of VE team
- Existing risk register/mitigation plan available
- New risk register developed
- Snapshot of risk perception

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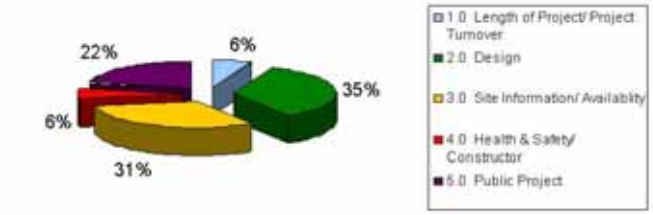
Case Study: VE 1 Risk Assessment

Design Team Risk Perception



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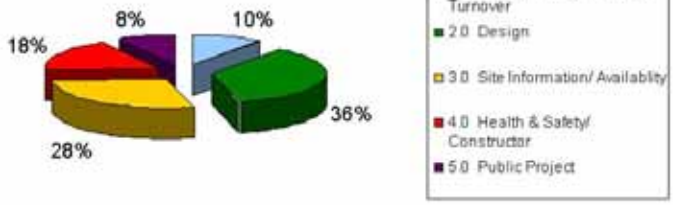
Case Study: VE 1 Risk Assessment

VE Team Risk Perception



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Lessons Learned

- Number of VE studies
  - Provide for extra study
- Order of VE studies
  - Allow for flexibility
- Risk assessment
  - A complementary process to VE study
- Timing of VE studies for multifaceted projects
  - Start early at concept phase
  - Pre-design, 50% completion of detailed design

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Conclusions

- VE for ABTP Odour Control established path for future VE studies in City
- VE 1 outlined several opportunities for further consideration
- VE 1 provided excellent partnering opportunities

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Acknowledgements

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questions and answers

Thank you!