

Whitefish Re-chlorination Station Schedule 'B' Municipal Class EA

Introduction

AECOM was retained by the City of Greater Sudbury to undertake a study to examine the efficiency of the Vermilion Water Distribution System. The distribution system has historically seen low chlorine residuals in Whitefish and Whitefish Lake First Nations resulting from low demand and the length of the watermain. In order to maintain acceptable chlorine residuals, the City of Greater Sudbury currently bleeds water at the ends of the distribution system to create an artificially high demand.

Purpose and Objective of the Study

The purpose of the study is to determine the most appropriate method to maintain chlorine residuals at an cost effective value. The solution for the Vermilion distribution system must be consistent with Ministry of the Environment (MOE) policies and procedures, while reducing operational costs for the City of Greater Sudbury as well as reducing the environmental impact to the community of Whitefish.

The principle objective of the study is to ensure the communities of Whitefish and Whitefish Lake First nations both at the extremities of the distribution system are provided with water that meets ministry of environment regulations by maintaining chlorine residual; minimizing water age; encouraging water flow and bleeding water only when necessary.

Study Area / Key Facts

The communities of Naughton and Whitefish, and Whitefish Lake First Nations are serviced with water from Vale's Vermilion Water Treatment Plant (WTP).

While Vale owns and operates the Vermilion WTP, the City owns and operates the water distribution system through Lively and Naughton to Whitefish. The distribution system is characterized as a long trunk main with clusters of residential and commercial demand between the WTP source and the Whitefish community terminus.

Demand at the east end of the system is significantly higher than demand at Whitefish, Naughton and Whitefish Lake First Nations at the west end. The low demand for water and the length of pipe has resulted in low chlorine residual and high Trihalomethane (THM) formation potential. Water leaving the Vermilion WTP meets all drinking water standards.

To maintain acceptable chlorine residuals in Whitefish the City bleeds water at the extremities of the system to create artificially high water demand. This reduces the age of the water, which in turn maintains higher chlorine concentrations. Bleeding is accomplished through a series of blow-offs around the Whitefish area. The most significant blow off is located on Bay Street discharging an estimated 1 to 4 L/sec. The City wants to eliminate this process to conserve water and energy, and reduce the cost of producing and purchasing water.

Class Environmental Assessment Process

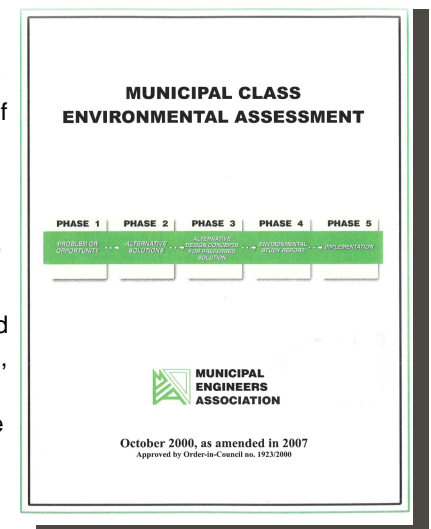
This project is being undertaken in accordance with the Municipal Class EA (2000), as amended in 2007, for a Schedule 'B' undertaking (Phases 1 and 2).

The Municipal Class EA is approved under the *Environmental Assessment Act* and enables the planning of municipal infrastructure projects in accordance with a proven process for protecting the environment.

The Schedule 'B' Class EA process includes public and review agency consultation, an evaluation of alternatives, an assessment of the effects on the environment, and identification of reasonable measures to mitigate any adverse effects.

There is an opportunity at any time during the Class EA process for the public to provide input. The circulation of this Newsletter provides another means to participate.

Upon completion of the Class EA process, the Project File will be available for 30-day public review.



Problem / Opportunity Statement

The problem / opportunity statement for the City of Greater Sudbury Whitefish Rechlorination project is defined as follows:

Problems

- Bleeding Water at an estimated cost to the City of \$75 000 to \$200 000/yr.
- Low Chlorine Residuals in Whitefish and Whitefish Lake first Nations if the bleeders are shut off.
- High THM formation Potential.
- Bleeding chlorinated water may have a negative impact to the environment.
- Energy and resources are used in treating the bleeding water.

Cause

- Relatively low demand requires CGS to bleed water to create artificially high demand. Without the artificially high demands low chlorine would occur.

Opportunity

- Bleeding of water could be used for recreational use.
- Bleeding water could be used for bulk commercial and or residential filling station.

Class EA Question

Can the municipality maintain acceptable chlorine residual levels in Whitefish without a harmful discharge to the environment and at a reduced cost from the current system?

Screening Criteria

Taking the various social and natural environmental aspects of the project into consideration, the six (6) alternative solutions were comparatively evaluated. The evaluation of alternatives was undertaken based on criteria developed within the following categories of consideration representing the broad definition of the environment described in the EA Act:

Technical:

Ability to meet regulatory requirements, ease of implementation, compatibility with existing operations, performance, flexibility, and energy consumption.

Social:

Ability to minimize impact on visual impact, health and safety; ability to address community growth, the protection of social and recreational resources.

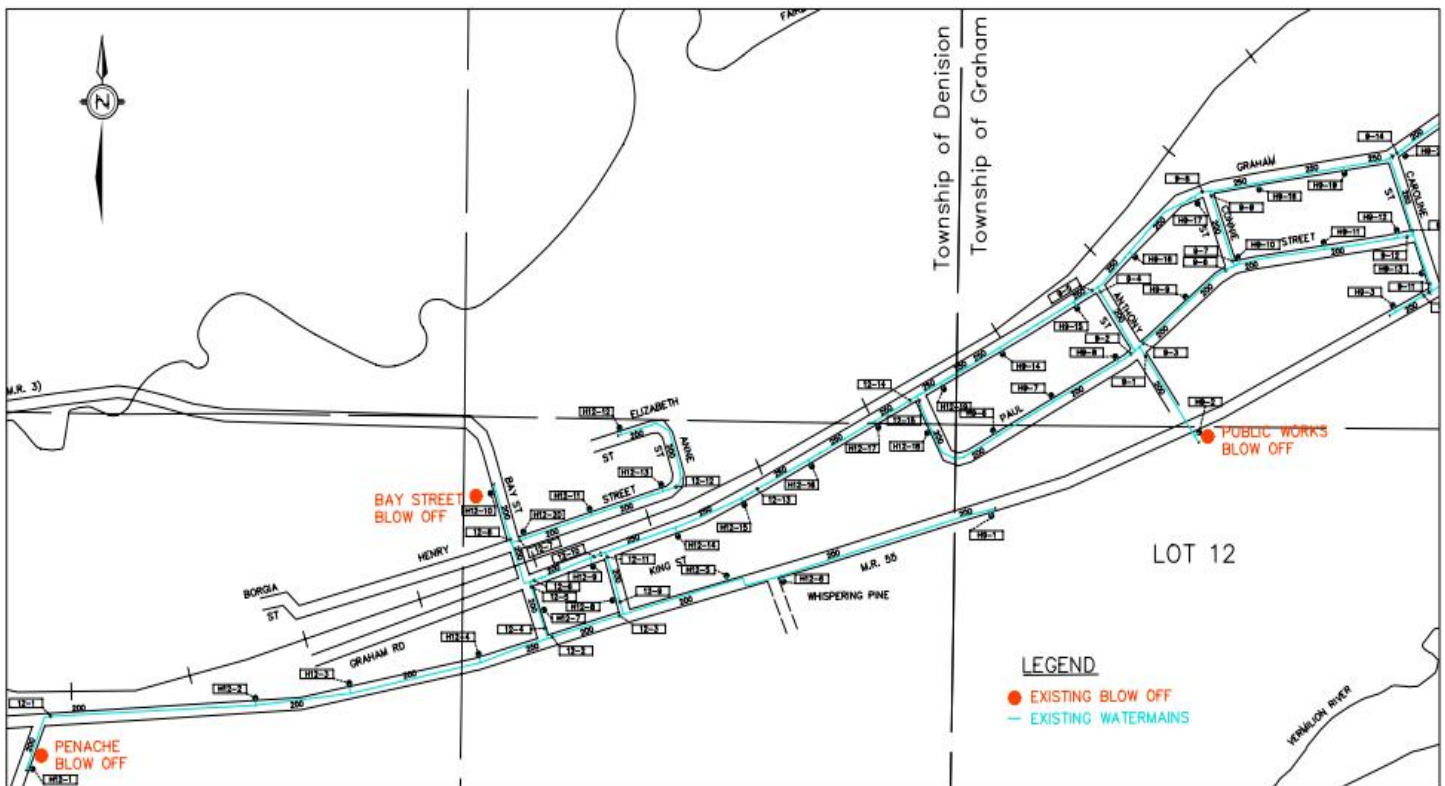
Economic:

Cost effectiveness of capital improvements, and operation and maintenance costs.

Environmental:

Ability to minimize impacts to surface and groundwater, air quality, and aquatic and terrestrial habitat.

The recommended solution should address the Problem / Opportunity Statement by using these screening criteria to evaluate the options listed on the previous page. The preferred solution will be identified after public input has been made. The combination of two or more alternatives may be the proper solution. The evaluation for the combination can be drawn from individual evaluations



Alternatives Considered

Option A– Do Nothing

Assumes that the City of Greater Sudbury will continue to bleed water from the three bleeders.

Advantages:

Continue to operate in same manner; adequate volume for future growth needs; Meets MOE Drinking Water Regulations.

Disadvantages:

Will not meet MOE discharge standards; Uses potable water at a cost to City; Discharge of chlorinated water may have affect on water bodies; High operational costs.

Recommendation: Not recommended .

Option C - Rechlorination/Rechloramination Station

Assumes that water quality problems can be eliminated by adding additional chlorine or a chlorine ammonia combination at a midpoint in the system.

Advantages:

Meets MOE Drinking water regulations; will decrease volume of water bled; Estimated 5 year simple payback when used in combination with some water bleeding.

Disadvantages:

Requires City to maintain facility; Rechlorination has possible THM increase; Rechloramination is difficult to balance with existing system, and requires additional training.

Recommendation: Rechlorination Recommended for further study in combination with other alternatives. Chloramination not recommended for further Study

Option E– Chloramination at Vermilion WTP

Assumes that using a chlorine ammonia combination at the Vermilion WTP will improve chlorine residuals in Whitefish and WFLFN.

Advantages:

Meets Drinking Water regulations; slower chlorine decay rate; Lower risk of THM formation.

Disadvantages:

High capital cost; Additional maintenance and training required; ; public campaign to inform users of changes and possible impacts; Other communities do not require; No Payback.

Recommendation: Not recommended for further study.

Option G– Combination

Assumes that using a combination of alternatives will solve the low chlorine residual problems in Whitefish and Whitefish Lake First Nations.

Advantages:

Meets Drinking Water regulations; solves problem statement; Estimated 6 to 8 year simple payback depending on extent of looping. Extend of automation will improve reliability and reduce operational intervention to maintain minimum acceptable standard making this most effective system.

Disadvantages:

Higher capital cost than using one alternative.

Recommendation: Recommended for Further Study

Option B - Limit Demand– Turn off bleeders

Assumes that water quality problems are a result of use that exceeds the capacity of the existing infrastructure or can be mitigated by reducing the demand on the existing infrastructure.

Advantages:

None

Disadvantages:

Will not meet MOE Drinking water regulations; Unacceptable health risk; High risk of non compliance resulting in additional costs.

Recommendation: Not recommended for further study.

Option D—Looping and/or Recirculation

Assumes that the water quality problems are a result of dead ends, and can be solved by looping those ends.

Advantages:

Eliminates dead ends and moves water through distribution system; Low yearly operating costs as minimal maintenance is required.

Disadvantages:

Will not meet MOE Drinking water standards on its own; possible impacts to traffic, terrestrial habitats and water sources during constructions; No Payback.

Option F–Automated Bleeder

Assumes that bleeding water when the chlorine residual drops below a regulated value will be a more cost effective method.

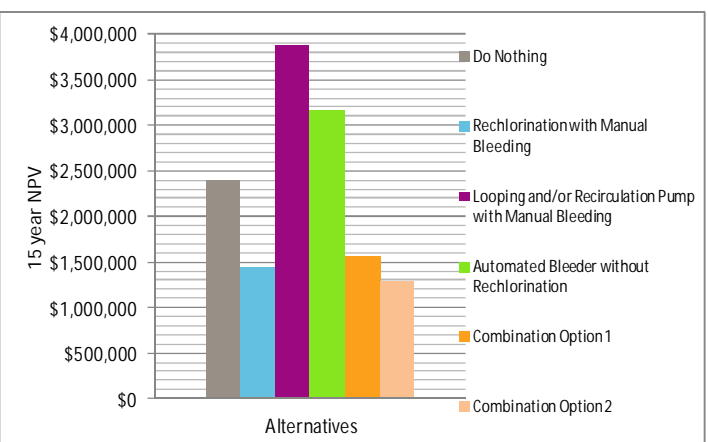
Advantages:

Will meet MOE Drinking water regulations; will reduce the volume of water bled; ensures that only necessary water is bled.

Disadvantages:

Will not meet MOE discharge standards without dechlorination; Uses potable water at a cost to the municipality; No payback.

Recommendation: Recommended for further study in combination with other alternatives.



Residential Filling Station

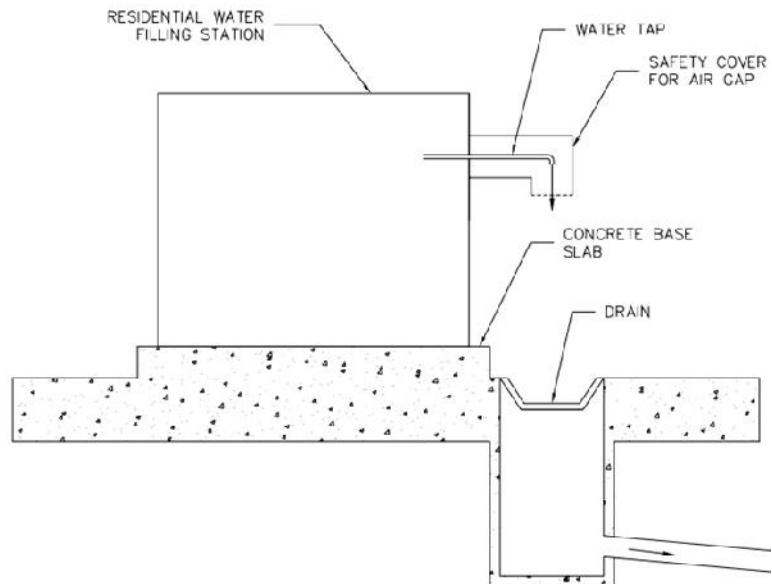
Through preliminary investigation the option of a residential filling station as a method to solve the low chlorine residual in Whitefish was proven not effective. But the need for a residential filling station was demonstrated through observed use at Bay Street.

The City of Greater Sudbury will be replacing the Bay Street bleeder with a residential filling station as a source of public water. The benefits of this include:

- Ensured Safe Drinking Water – No cross contamination between users
- Controlled volumes of water with minimal splashing
- Provide City with valuable data regarding use

Key Features

- Safety Cover to ensure no cross contamination
- Push Button to turn on and off water flow
- Drain to reduce ice build up and puddle formation
- Heat traced watermain to prevent freezing of water line



Next Steps

1. Draft Class EA documentation
2. Final Class EA document filed for 30-day public review
3. Detailed design and Tender
4. Permanent Municipal construction

Feedback

Your feedback is important. Please use the comment sheet provided or send your comments to one of the team members listed below by December 1st, 2011.

Please contact one of the following for additional information:



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