Transcript of Virtual Public Consultation Centre #2

Slide 1 – Title slide

Hi everyone, and welcome to the New Dundee Water Supply – Iron and Manganese Treatment Upgrades Virtual Public Consultation Centre, or PCC, #2. This PCC is hosted by the Region of Waterloo as part of a Schedule C Municipal Class Environmental Assessment, or Class EA. My name is Jonathan Rudyk, and I work for R.V. Anderson, a company that will be assisting the Region in conducting the Class EA. I will be narrating the presentation today.

Before we begin, some housekeeping notes. This video is available on the Region of Waterloo website as of May 11, 2021 and has been uploaded to YouTube. On the Region website, there is a transcript of my narration for this presentation, and a PDF copy of the slides, as well as the contact information for Kaoru Yajima and Kirk Worounig of the project team. If you have any questions or comments on the presentation, please send it to them, or fill out a Comments Form provided on the Region website and submit it to the project team. This presentation is the second of three public consultation centres, or PCCs, with the first PCC happening in June of 2020. With that, let's get started with virtual PCC #2!

Slide 2 – Welcome!

The goals of this virtual PCC are as follows: Introduce the project and the reasons why it is being completed, provide the evaluation criteria for iron and manganese treatment and residual management alternatives, evaluate alternatives for iron and manganese treatment, present treatment facility location requirements and potential locations, and answer any questions you may have and provide an opportunity to get involved in the project. Please note that comments received during this study will be used to help identify a recommended approach for the New Dundee water supply iron and manganese treatment.

Slide 3 – New Dundee water supply system iron and manganese treatment upgrades project overview

To better understand the project, we ask the following three questions.

1, what are we doing,

2, why are we doing it, and

3, what does it mean to you?

To answer the first, the Region is planning upgrades to the New Dundee water supply system to provide treatment for iron and manganese. This study will look at the best ways to complete these upgrades.

Why are we doing it? Lower aesthetic drinking water objectives for manganese are expected in the near future. The New Dundee water supply system has been identified as requiring upgrades to meet these future aesthetic objectives. As an aside, aesthetic objectives are targets we meet when treating water for taste, odour, and colour. We are taking steps now to ensure we are ready to meet these objectives.

What does it mean to you? These upgrades will require a new building for the treatment equipment. It is expected additional property at the Region's existing water supply site or a new site will be required. There is no change in the amount of water being taken from the New Dundee water supply wells.

Slide 4 – Evaluation criteria

Iron and manganese treatment processes will be evaluated according to technical, financial, social, and natural environmental criteria, as shown below. Each of these four categories will be considered equally, with the highest overall score signifying the preferred alternative.

The alternatives are evaluated against the technical criteria to determine if they:

- Provides reliable service,
- Meets current and future needs,
- Align with existing and planned infrastructure,
- Align with existing and future land uses,
- Align with approval and permitting processes,
- Manage and minimize construction risks, and
- Their ability to adapt to climate change.

The alternatives are evaluated against the financial criteria to determine if they:

- Provide low lifecycle costs

The alternatives are evaluated against the social criteria to determine if they:

- Protect health and safety,
- Minimize impacts to residents and businesses related to noise, odour, traffic, and aesthetics,
- Minimize impacts to businesses,
- Manages and minimizes construction impacts,
- Protect cultural heritage features,
- Protect archaeological features.

The alternatives are evaluated against the natural environment criteria to determine if they:

- Protect environmental features,
- Protect wildlife and species at risk,

- Protect groundwater, streams, and rivers,
- Minimize climate change impacts.

Slide 5 – Potential treatment alternatives

Potential alternatives were screened to develop a short-list of options for detailed evaluation. Alternatives that were screened out did not meet the project objectives for one reason or another.

The screened out alternatives include: doing nothing, a new watermain from Kitchener-Waterloo, iron and manganese sequestration, in situ removal, ion exchange softening, biological filtration, and lime and soda softening.

The short-listed alternatives that will be taken forward for detailed evaluation are: oxidation and conventional filtration, and membrane filtration. These technologies will be summarized on the next two slides.

Slide 6 – Short listed alternative 1: Conventional filtration and oxidation

A description of this alternative is: Chlorine solution is added to the well water to oxidize the iron and manganese before being removed through filtration.

The advantages of this alternative are:

- This is a reliable process in removing iron and manganese.
- This technology is currently being used at other facilities in the Region.
- No additional chemicals are required since the chlorine solution is already used at the existing facility. Operation of technology will not negatively impact operator health and safety.
- Treatment facility will be resilient to extreme weather events.

The disadvantages of this alternative are:

- A medium sized footprint is required for this alternative, to account for the new filters, backwash systems and residual management.

The estimated comparative lifecycle cost of this alternative is four million dollars.

Slide 7 – Short listed alternative 2: Membrane filtration

A description of this alternative is: An oxidant is added to oxidize the iron and manganese, before being pumped under pressure through a membrane filtration system.

The advantages of this alternative are:

- This is a reliable process in removing iron and manganese.
- This alternative has the smaller footprint of the two alternatives.
- The treatment facility will be resilient to extreme weather events.

The disadvantages of this alternative are:

- Additional chemicals are required for maintenance, which increases cost, operational complexity, risk of spills and operator health and safety hazards.
- Disposal of large volumes of residuals is difficult with no sanitary sewer connection in the study area.

The estimated comparative lifecycle cost of this alternative is nine million dollars.

Slide 8 – Evaluation of treatment alternatives

The treatment alternatives were scored, and a summary of the scoring is given on this slide.

For technical criteria, alternative 1, oxidation and conventional filtration, is well aligned with criteria, and alternative 2, membrane filtration, is somewhat aligned with criteria.

For financial, or lifecycle, criteria, alternative 1 is well aligned with criteria, and alternative 2 is not well aligned with criteria.

For social slash cultural criteria, alternative 1 is somewhat aligned with criteria, and alternative 2 is not well aligned with criteria.

For natural environment criteria, alternative 1 is well aligned with criteria, and alternative 2 is somewhat aligned with criteria.

Overall, alternative 1 is well aligned with the evaluation criteria, while alternative 2 is not well aligned with the evaluation criteria.

Slide 9 – Preferred treatment approach.

Oxidation and conventional filtration had the best score in each of the four evaluation categories and is the preliminary preferred treatment alternative. This option has the lowest lifecycle cost and this treatment approach is successfully used for iron and manganese treatment at other facilities in the Region.

The graphic shows how the treatment process would operate. Chlorine solution is injected into water pumped from the wells, and the chlorinated water is pumped into the filter. The filter removes the iron and manganese, and the water is discharged to the distribution system.

Slide 10 – Residual waste produced by the preferred alternative

The next step in the process is to develop residual management systems for the wastewater produced.

The backwash water volumes produced are expected to contain small concentrations of iron and manganese. After adequate settling time, most of the remaining water could separate as “supernatant”. The solids would gradually thicken to a liquid “settled solids” suspension.

Note that backwash water is the water used to clean a filter by flowing the water in reverse of the typical direction of flow.

Supernatant is the clear liquid that lies above the settled solids after settling. Backwash water separates into supernatant and settled solids.

The graphic below shows iron and manganese particles in suspension in the backwash volume and settling to the bottom of the tank after a period of time has elapsed.

Slide 11 – How to manage residuals under the preferred alternative

As with the potential treatment alternatives, potential residual management alternatives were considered for the preferred treatment approach. Residual management alternatives that were screened out did not meet the project objectives.

The screened out alternatives include: Lagoons with supernatant discharged to the storm sewer system, and storage tanks with supernatant discharged to the storm sewer.

Short listed alternatives include: a backwash equalization tank with recycling of supernatant back to the treatment plant and settled solids haulage, and a backwash equalization tank with pumping to a sanitary collection system 9 km away.

Slide 12 – Short-listed residual management alternative 1: Backwash equalization tank with recycling of supernatant and settled solids haulage

A description of this alternative is: A backwash equalization tank (or BET) is used to hold the backwash water while is settles to supernatant and the settled solids. The supernatant would be recycled back to the start of the treatment process and the settled solids would be hauled by truck to a septage receiving station.

The advantages of this alternative are:

- This alternative has been used for other plants within the Region and aligns with infrastructure.
- Treatment facility will be resilient to extreme weather events.

The disadvantages of this alternative are:

- This process would require a truck to haul the settled solids once every month.

The estimated comparative lifecycle cost is one point three million dollars.

Slide 13 – Short-listed residual management alternative 2: BET with pumping to a sanitary collection system

A description of this alternative is: A BET is used to hold the backwash water before pumping the residuals to a sanitary collection system.

The advantages of this alternative are:

- There is not truck haulage required for this alternative.
- Could be expanded to bring sanitary service to the community.

The disadvantages of this alternative are:

- The closest sanitary collection system with potential capacity is in Kitchener, located approximately 9 km away from the New Dundee Water Supply Facility.
- Construction of the piping is expensive and would have a greater impact on the community.
- Length of piping and potential pumping station requirements increases operation and maintenance complexity.

The estimated comparative lifecycle cost is fifteen point five million dollars.

Slide 14 – Evaluation of residual management alternatives

The residual management alternatives were scored, and a summary of the scoring is given on this slide.

For technical criteria, alternative 1, the BET with supernatant recycle and settled solids hauling, is well aligned with criteria, and alternative 2, the BET with pumping to an existing sanitary collection system, has very low alignment with criteria.

For financial, or lifecycle, criteria, alternative 1 is well aligned with criteria, and alternative 2 has very low alignment with criteria.

For social slash cultural criteria, alternative 1 is well aligned with criteria, and alternative 2 is not well aligned with criteria.

For natural environment criteria, alternative 1 is very well aligned with criteria, and alternative 2 is not well aligned with criteria.

Overall, alternative 1 is well aligned with the evaluation criteria, while alternative 2 has very low alignment with the evaluation criteria.

Slide 15 – Preferred residual management approach.

The backwash equalization tank with supernatant recycling and haulage of settled solids had the best score in each of the four evaluation categories and is the preliminary preferred residual management approach. This option has the lowest lifecycle cost, is currently in use by the Region at other facilities and is water efficient.

The below schematic provides a representation of the residual management strategy process.

The settled solids would be hauled off site on a monthly or bi-monthly basis, depending on how much is produced.

Slide 16 – Requirements for potential treatment site location

There is not enough space on the existing site for a new treatment facility. Potential options for a new site were identified based on:

- Land size for new building and driveway,
- Vehicle access to the new site,
- Distance to the existing New Dundee Water Supply facility and watermains,
- Environmental features, cultural heritage features, and areas of archaeological potential, and
- Current and potential future land uses.

Slide 17 – Short-list of potential locations

The below map shows five potential locations for the new facility. Three of the potential locations are adjacent to the existing facility, with two potential locations not adjacent to the existing facility, at the end of Alderview Dr. These short- listed facility locations will be evaluated in detail. The evaluation results will be presented at the next Public Consultation Centre #3 where there will be an opportunity review and provide comments.

Slide 18 – Overview of the Municipal Class Environmental planning process

This study is being completed as a Schedule C Municipal Class Environmental Assessment. A Class Environmental Assessment, or Class EA, is a decision-making process that all municipalities in Ontario follow for building new infrastructure. The process will allow you as the public to follow what is planned and provide opportunities for you to ask questions and provide input. The above diagram gives a step by step process of the Class EA.

Phase 1 is to identify the problem and/or opportunity. After Phase 1 is complete, the first Virtual Public Consultation Centre, or virtual PCC, is held. This PCC was completed in June 2020.

Phase 2 is to develop and evaluate solutions and identify the preferred solution. A second PCC is scheduled after this phase is completed. This is where we are in the process currently.

Phase 3 is to develop and evaluate design concepts for the preferred solution and identify the preferred design. A third PCC is scheduled after this phase.

Phase 4 is the submission of the Environmental Study Report (ESR) and a 30-day public review period. Phase 4 is the final step of the Class EA.

Phase 5 is the implementation of the Class EA findings, in this case design and construction of the facility.

Slide 19 – Next steps

The next steps for the project are as follows. The project team has completed a background review of the existing facility and distribution system, identified a preferred treatment and residual management alternative, and presented the findings to the public for their input. After this, the project team can develop and evaluate alternative design concepts including the facility location and site considerations. A third PCC will be held after this for input on the facility location and size, followed by the final step, which is the filing of the Environmental Study Report, or ESR, to document the project information and the decision-making process. As part of the reporting, there is a thirty-day period for public review of the ESR.

Slide 20 – Thank you for your participation!

Finally, we would like to ask you all to get engaged! We are in the middle of the New Dundee water supply system iron and manganese treatment upgrades EA. Do you have any questions, comments, or want to stay up to date? Please contact or fill out a Comment form for either Kaoru Yajima from the Region of Waterloo or Kirk Worounig from R.V. Anderson. Again, the contact information is available on this slide and on the Region website, and more information, including copies of project notices and PCC materials like a transcript of this virtual presentation can be found at the Region of Waterloo's website. Thank you very much for your participation in the virtual PCC, the project team really appreciates it.

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