



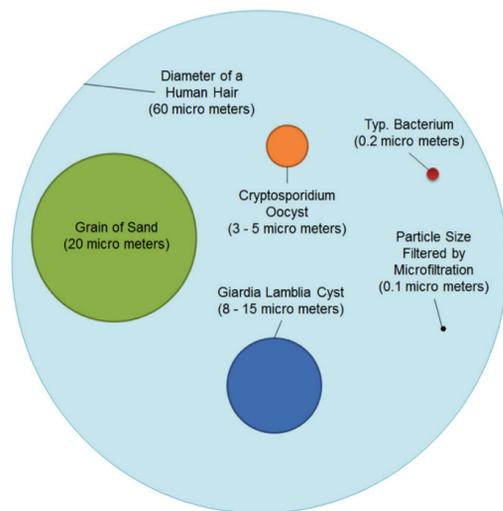
This is the second of two articles intended to provide residents with background to the ERWS project. The first article was published in the PQB News on May 12. This article speaks to treatment options, funding and next steps. We hope you will review both articles and bring your questions to a public information session on May 19 (Parksville) or May 20 (Nanose). Both articles will be available on the ERWS website.

WHY TREAT SURFACE WATER?

There are naturally occurring microbiological pathogens such as E. coli present in our surface water which has typically been removed using chlorine disinfection. There are also organisms such as Cryptosporidium and Giardia which are not removed with the use of chlorine. The most effective means to ensure such organisms do not find their way into the community's potable water supply is by using the multi-barrier approach. The illustration below shows the filtration size required in order to completely remove all biological threats to our drinking water.

A multi-barrier approach to treatment of surface water is required by Island Health to meet their health standards and to be in compliance with Canadian Drinking Water Guidelines. The multi-barrier approach, filtration, ultraviolet light and chlorination works to ensure safe healthy water for residents.

WATER FILTRATION – RELATIVE SIZE OF PARTICLES



HANDLING TURBIDITY (MUDDY WATER)

If water from the Englishman River was relatively free of the silts and sediment (turbidity), treating the water would only require simple direct filtration, disinfection by means of ultraviolet light followed by chlorine disinfection. This is not the case with the Englishman River water source as turbidly events happen on a regular basis through the fall, winter and spring and occasionally during summer months. With turbidity a problem throughout the year, any treatment system must be able to achieve turbidity and microbiological removal at the same time.

Several options have been investigated to remove turbidly and settle it out prior to treatment including constructing raw water reservoirs ahead of the water treatment plant. A few days of raw water storage may reduce turbidly spikes entering the treatment facility during the events allowing a low-turbidity tolerant process such as direct filtration, ultraviolet light disinfection. However, raw water reservoir construction costs, security and algae control related operating issues negate the benefit of a raw water reservoir. Limited site availability and hydraulic considerations would also pose a challenge and therefore, the construction of raw water reservoirs were not considered further for this project.

WATER TREATMENT OPTIONS

A number of water treatment technology processes were reviewed and considered suitable for treating the Englishman River water source:

- » Direct filtration
- » Conventional treatment (sedimentation/media filtration)
- » Dissolved air flotation/media filtration (DAF)
- » Membrane filtration
- » Ballasted flocculation (Actiflo®/media filtration)

Direct filtration technology was ruled out due to the inability to readily handle turbidity spikes. The pilot testing for dissolved air flotation technology showed that organic material was too heavy to allow this technology to perform well under all conditions. Ballasted flocculation technology uses rapid sand filtration and easily handles high turbidity spikes; however, this technology was determined to be too excessive in low turbidity events and results in high operational costs.

Two technologies were selected for small scale water treatment piloting: conventional treatment and pressurized membrane treatment. The piloting project started in fall 2011 and finished in spring 2012 and used water from the Englishman River to flow through the small scale water treatment plants to test the treatment processes under the challenging conditions. The purpose of doing small scale water treatment plant piloting is to prove out such technologies and ensure treatment objectives are met prior to building the full scale water treatment plant. During this period, the pilot water treatment plants experienced typical high turbidity events in the fall resulting from the first initial winter storms and early spring freshet flows.

Conventional treatment did not perform well over the duration of the pilot test period and could not adjust rapidly enough to sudden changes in turbidity levels. The pilot test results for the pressurized membranes performed well and consistently demonstrated the membranes could reliably reduce turbidity to potable water objectives and efficiently remove all biological threats. Pilot testing determined membrane technology water treatment best suits the Englishman River water source.

CAN WATER TREATMENT BE PHASED IN AT A LATER DATE?

Filtration processes and equipment are one of the leading costs for the proposed treatment plant. The province can consider the introduction of filtration at a later date if certain conditions are met. Filtration avoidance criteria were reviewed to determine whether filtration of Englishman River water could be deferred past 2016. Part of the criteria as defined by Health Canada and BC Ministry of Health requires turbidity not exceed 5 NTU for more than two days in a twelve month period and E. coli levels never exceed 20 counts/100mL in the raw water. The Englishman River does not satisfy either of these criteria; therefore, an application for filtration deferral would likely be rejected.

WHERE IS THE PROJECT AT?

We have retained professional experts in water treatment, supply, distribution, geology, hydrogeology and environmental engineering to establish an efficient, reliable and cost-effective treatment and distribution system to meet needs now and into the future. Project components include:

- » New river water supply intake to withdraw water from the Englishman River carefully designed and located to consider the needs of river users and protect aquatic habitat.
- » New water treatment plant and distribution system to meet Island Health's drinking water quality standards.
- » Phased design and construction to meet community growth and ensure affordability.

The project has been completed to the predesign stage in an effort to further refine capital and operating costs, proceed with required senior government approvals and apply for grants.

There are a number of critical dates and factors which need to be addressed before proceeding with detailed design, tendering and construction:

- » Department of Fisheries and Oceans Canada construction approval
- » Federal/provincial grant funding
- » Assent of the electorate (referendum) for borrowing

PLAN A AND PLAN B

Two plan options have been prepared to date:

- » **Plan A** will provide the community with 24 million litres per day of membrane filtration, UV and chlorine disinfection, new intake and transmission mains to connect to each jurisdiction capable of supplying the community for over 20 years without further upgrades or phasing. This option is estimated to cost \$37 million. Grant applications in support of these costs have been made to the provincial and federal governments.
- » **Plan B** is a two-phased approach which will reduce initial costs. This option includes reduced water treatment of 8 million litres per day of membrane filtration, UV and chlorine disinfection, a new intake and transmission mains to connect to each jurisdiction. This option is capable of supplying the community's needs for the next eight to ten years until further water treatment capacity is added. The initial cost for Phase 1 is \$24.3 million. Phase 2 is estimated to be \$16.4 million in year 2024 and includes water filtration expansion to meet anticipated water demand.

GRANT FUNDING

A grant application for the New Building Canada Fund (federal/provincial) was submitted in fall 2014 for \$24 million. Initial indications were these grants would be announced in spring 2015 with a reasonable expectation of between \$15 million and the full \$24 million applied for being awarded. Current indications are the announcements will not be made until at least October 2015 and the amounts will likely be 25% of (or even less) than what was applied for. This would indicate Plan A is financially unachievable and all efforts should be directed to Plan B, a multi-phased approach with reduced water treatment plant capacity as the recommended option.

Annual water rate increases for the City of Parksville required to fund the project would be in the 2.25 % range for 2016 through 2024 based on receiving provincial/federal funds in the order of \$6 million. The RDN funds the Nanose Bay Peninsula Water Service through parcel taxes and has projected a 10% per year increase (based on no grants) in the years 2015 through 2018 in order to transfer funds to reserve for these projects and to ensure adequate funding for debt servicing.

Description of Works	Plan A - Original Predesign Report	Plan B - Multi Phased Approach with Reduced Treatment Capacity
Phase I – Firm Water Treatment Membrane Filtration Capacity	24 ML/d	8 ML/d
Water Intake / Raw Water Main	48 ML/d	48 ML/d
Transmission Mains	OCP Build Out	OCP Build Out
Total - Phase I Cost:	37 Million	24.3 Million
Year 2024 Phase II Water Treatment Plant Upgrade to 24 ML/d Cost:	Not Required	16.4 Million
Total - (Phase I and Phase II) Cost:	37 Million	40.7 Million

NEXT STEPS

- » DFO approval is expected before yearend.
- » Referendum on borrowing in early 2016 as required.
- » River intake construction in summer 2016 or 2017, depending upon DFO approval and construction windows.
- » Treatment plant construction is subject to funding Phase 1 of Plan B, including treatment plant commissioning This could potentially be completed by June 2018, in time to meet 2018 peak summer requirements.

This timeline will not meet Island Health's December 2016 requirement and an extension will be required. ERWS has been working closely with Island Health since summer 2014 when the uncertainty of the grant amounts brought into question the overall fiscal risks and community impacts of proceeding with or without senior government support.

In order to bridge the water demand deficit from the summer of 2016 to 2018, both jurisdictions need to consider redeveloping and developing additional wells as an interim redundancy measure. If Island Health should be unwilling to change the operating conditions, stringent watering restrictions would be necessary in 2017 if the river intake is not used. If the river intake is used, a boil water advisory will be required.

MARK YOUR CALENDAR!

Bring your questions about the project to one of next week's public info sessions; staff and consultants will be available to answer questions and respond to concerns.

ERWS Hosted Public Info Sessions

- » **May 19, 3-7 pm** (City of Parksville)
Parksville Community and Conference Centre
- » **May 20, 7 pm** (Regional District of Nanaimo)
Nanose Place

Parksville Council Hosted Town Hall Meeting (Comments only please)

- » **May 28, 7 pm**
Knox United Church, 345 Pym Street

We welcome questions and comments:

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