

Appendix F
TM #3 – Raw Water Quality Sampling Program

Englishman River Water Service Raw Water Quality Sampling Program

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This Technical Memorandum (TM) describes the proposed raw water sampling program to support of the water treatment plant (WTP) design.

1. Introduction

The Englishman River Water Service (ERWS) currently supplies drinking water to customers in Parksville and Nanaimo from multiple groundwater wells and an emergency river source. With peak demand periods expected to exceed the existing well capacity by 2016, there is a need to expand the jointly owned water system.

To meet this need, and the conditions for treatment imposed by the Vancouver Island Health Authority (VIHA), the ERWS is embarking on an industry-leading approach that includes developing a new river water supply and treatment infrastructure coupled with aquifer storage and recharge (ASR).

2. Scope of Work

The scope of work consists of the following 2 tasks:

- 1) Water quality monitoring – This task will be conducted for a minimum of 2 years to develop a full water quality profile of the source water. This version of the TM outlines the water quality sampling protocol for the first month of the testing program. As described in Section 3, the protocol will be adjusted (as required) based on the test results for the duration of the program.
- 2) Treatability testing – This task will be conducted once during the winter of 2013 to determine basic design criteria and costs for candidate treatment alternatives to reduce naturally occurring colour and turbidity in the source water.

This TM outlines the water quality monitoring plan. Treatability testing will be discussed in a separate TM.

3. Water Quality Monitoring

A water quality sampling program will be implemented as part of the process testing plan. The intent is to conduct sampling for a minimum of 2 years. The test results will be reviewed on a monthly basis and revised as required, except for the first month in which results will be reviewed on a weekly basis. It is expected that sampling will be more frequent during the first year as the full water quality profile for the source water is developed and water quality excursions are identified. Sampling frequency will be optimized in the second year primarily to sample more frequently during water quality excursions and less during normal water quality. The sampling plan will be revised as required (frequency and/or type of analysis). Samples, except for treatability, will be collected and analyzed by ERWS. Table 1 shows a summary of analyzes and frequencies for the first month.

TABLE 1
Water Quality Sampling Protocol (October to November 2013)

Parameter	Daily or continuous	Twice per week	Weekly	Water Quality Excursion (colour > 40 or turbidity >20 NTU)
Turbidity, NTU	x			x
TSS, mg/L				
Temperature, ° Celsius	x			x
pH	x			x
UVT, %		x		x
TOC, mg/L		x		x
DOC, mg/L		x		x
True Color, TCU	x			x
Alkalinity, mg/L CaCO ₃			x	x
Hardness, mg/L CaCO ₃			x	x
Conductivity, µS/cm			x	x
TDS, mg/L			x	x
Metals (ICP), mg/L Aluminum, Boron, Barium, Calcium, Copper, Iron, Lead, Magnesium, Manganese, Sodium, Strontium, Potassium, Phosphorus, Silicon			x	x
Anions, mg/L Bromide, chloride, sulfate, nitrate, bromide, fluoride			x	x
Silica, mg/L			x	x
Ammonia, mg/L			x	x
Phosphate, mg/L			x	x