



V3 April 18, 2013

Reference:4419

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Re: Proposed water and sediment quality monitoring programs for the operating temporary coal offloading facility at Fraser Surrey Docks, Surrey BC

1.0 Introduction

This document outlines a proposed operations phase water and sediment quality monitoring program for the temporary coal offloading facility at Fraser Surrey Docks, (FSD) in Surrey, BC.

2.0 Water quality monitoring

Storm water runoff and dust suppression waters will typically be collected, treated and re-used in the system, although some discharge of treated water to sanitary sewer may be required during heavy rain events. The exact discharge volumes will be confirmed through detailed design. A water quality monitoring program will be used to confirm and evaluate the function of the onsite water collection and treatment system. A site-specific treatment system is in the design phase and at a minimum, routine pH adjustment and solids removal are anticipated during operations. In preparation for a discharge permit to sanitary sewer, pre-construction sampling followed by a water treatment system test will be needed; with analytical sampling reflective of Schedule 5 - Restricted Wastes, Greater Vancouver Sewerage and Drainage District (GVS&DD) Sanitary Sewer Use Bylaw 299. Sampling parameters will include:

- Biochemical Oxygen Demand (BOD)
- Oil & grease
- pH (*in situ* and analytical)
- Phenols (chlorinated / non-chlorinated)
- Sulphate
- Total and dissolved metals
- Total suspended solids (TSS)
- Volatile Organic Compounds (VOC)

Routine pH adjustment and solids removal will require some combination of a buffering agent to raise the pH and flocculent injection in association with tank storage to settle the suspended solids. We recommend a combination of field sampling (*in-situ*) and laboratory analyses be conducted on the *treated discharge*, with daily *in-situ* measurements of pH, conductivity and turbidity when the treatment system is running (Table 1). These parameters can be measured in the field with hand held meters, and can be used to quickly identify treatment system malfunction and / or maintenance needs. The monitoring data will be maintained in a spreadsheet to evaluate system performance on an ongoing basis. Monthly confirmatory analytical samples of the treated discharge are also recommended - emphasizing pH, total suspended solids (TSS) and turbidity.

Table 1. Proposed discharge monitoring program - parameters and frequency

Treated discharge sampling program		
Parameter	Frequency (in-situ)	Frequency (Analytical)
conductivity	Daily	Monthly
pH	Daily	Monthly
turbidity	Daily	Monthly
TSS	-	Monthly
<i>Note: Daily meter calibration required for in-situ sampling program</i>		

3.0 Sediment quality monitoring

Given the dust and spill control measures proposed for the facility, coal is not expected to accumulate in abundance in the sediments at or around the FSD during operations. However, FSD is proposing a twice yearly sediment survey to collect samples for particle size analyses, % total organic carbon (TOC) and % coal content. The following program is recommended:

- Samples will be collected twice annually, including once in September at the tail end of freshet and then once in February, the latter timeframe corresponding with some of the lowest average discharge rates at the closest non-tidal Water Survey of Canada station in the Fraser River¹ for which more recent data are available (into the 1990s)
 - Samples collected in September will reflect sediment conditions after peak freshet in the river (June / July) and would provide a yearly, site-specific basis for comparison with the winter samples

¹ Fraser River at Agassiz-08MF035

- The winter timeframe reflects a ≥ 6 month period after peak freshet and would be an optimal time for evaluating the highest potential coal accumulations in local sediments
- Surface sediment grab samples would be collected from 10 evenly distributed locations (following a grid pattern) at Berth 2 where the paired barges will be loaded
 - We recommend collecting a full set of samples prior to operations to describe the pre-project conditions in the barge loading area
 - The first set of operational samples are recommended for the February following the start of operations
 - Samples will be sent to CARO Analytical and the UBC Mining Laboratory for particle size analyses, % coal content and %TOC

These data would be used to track potential coal accumulations in the vicinity of the barge loading area throughout the operations phase of the project. Additional samples may be collected outside of the immediate barge loading areas depending on the results from samples collected at the 10 onsite locations during the operational phases.

4.0 Closing

If you have any questions, comments or concerns about this letter please contact the undersigned at 604-790-6915, 604-279-2093 or kgraf@triton-env.com



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