



Ministry of Environment

Information Sheet

on

Cobble Hill Holdings/ South Island Aggregates

South Shawnigan Creek Receiving Environment Monitoring

This Information Sheet provides a summary of receiving environment monitoring conducted in South Shawnigan Creek, near properties that are owned and operated by Cobble Hill Holdings Ltd. (Lot 23) and South Island Aggregates Ltd. (Lot 21). The sampling was done by the Ministry of Environment (MOE) in conjunction with a compliance inspection which took place on May 13, 2015 for Permit 105809 at Lot 23 and a soil sampling program that took place on the same day at the adjacent Lot 21.

What was assessed?

- Surface water samples were collected for the purpose of:
 1. Auditing a subset of the permitted monitoring sites that are required to be sampled in CHH's quarterly monitoring program
 2. Determining receiving environment conditions near Lot 21
 3. Assessing water quality at two sites where previous MOE (2013) receiving environment monitoring has occurred
- Sediment samples were collected to augment datasets from previous receiving environment monitoring conducted by MOE and the Cowichan Valley Regional District (CVRD) as part of the Shawnigan Lake Water Quality Objectives update and attainment monitoring.
- Groundwater samples were collected by Ministry of Forest, Lands and Natural Resources Operations (FLNRO) on Lot 23 at three of the seven wells located on site (MW-1S, MW-2, and MW-5S).

How was it assessed?

- Samples were collected by MOE Environmental Impact Assessment Biologists at 4 locations:
 - Site 1 - **South Shawnigan Creek downstream (d/s) Elkington Forest** - upstream of SIA/CHH properties
 - Site 2 - **Rip Rap Tributary d/s Settling Pond** - downstream from permitted discharge site on Lot 23
 - Site 3 - **SIA Lot 21** - in the outflow from Lot 21 before it reaches Shawnigan Creek
 - Site 4 - **South Shawnigan Creek d/s of Lot 21** - upstream of the confluence of Shawnigan Creek and the ephemeral creek that receives discharges from the permitted site (Lot 23)
- All samples were collected following standard MOE sampling protocols and analyzed by Maxxam Analytics in Burnaby, B.C. Parameters analyzed included chloride, total and dissolved metals as well as field measurements of dissolved oxygen, temperature, specific conductivity and pH. In situ sediment sampling was also conducted at the Shawnigan Creek sites and analyzed for grain size, total metals, total organic carbon (TOC) and polycyclic aromatic hydrocarbons (PAHs).

What are the guidelines?

- All surface water results were compared to the B.C. Water Quality Guidelines and sediment results were compared to the B.C. Sediment Quality Guidelines for the purposes of the protection of aquatic life and drinking water. These guidelines can be found at:

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- Currently MOE has Water Quality Objectives (WQOs) which apply specifically to Shawnigan Lake. These are in the process of being updated to include the surrounding tributaries. The results collected on May 13 were also compared to the draft updated WQOs for the Shawnigan Lake watershed.

What were the findings?

Water Quality

- **All water quality results for all sample locations meet the B.C. water quality guidelines and the draft updated Water Quality Objectives.**
- For auditing purposes, MOE water quality results were very similar to the CHH results. There were minor differences related to detection limits used, and individual copper concentrations seen above the average guideline values. However, this copper guideline was developed for comparison of the average of 5 weekly samples conducted within 30 consecutive days, not a single sample as collected here. Similar individual copper values were also seen in the 2013 summer/fall sampling conducted by the MOE and CVRD, as part of the WQOs development program for Shawnigan Lake watershed.
- FLNRO groundwater results indicated that dissolved arsenic in MW-1S was the only parameter that exceeded the CSR Aquatic Life and Drinking Water (DW) standards. Other parameters (including many that are known to be naturally elevated) exceeded DW standards for total metals but not dissolved metals, suggesting possible disturbance of the well during sampling.
- Overall the current water quality in and around the CHH/SIA properties compares to background conditions in South Shawnigan Creek and at this time MOE does not have any concerns with respect to receiving environment conditions.

Sediment Quality

- Sediment sampling results were similar between the upstream (u/s) site on Shawnigan Creek (Site 1) and the tributary site d/s of the CHH discharge (Site 2); both sites had a few minor aquatic life exceedances for chromium, iron and nickel, suggesting that background levels in the watershed are naturally slightly elevated. PAH results at these two sites were within applicable sediment quality guidelines.
- Results from lower South Shawnigan Creek (Site 4), had minor exceedances of a few metals and PAHs, likely associated with stormwater run-off from Stebbings Road which runs adjacent to the west side of the creek at this location.
- Sediment composition between the u/s and d/s sites differs, with the d/s site being comprised of very fine/diatomaceous sediment whereas the u/s sites were composed largely of gravel and pebbles. Both metals and PAHs are known to adhere to fine sediments that occur in low velocity flow conditions with greater areas of depositional area, as opposed to faster moving water with larger particles.
- Some of the metals observed in the d/s section could be a groundwater precipitate, such as iron and manganese. This precipitate is a result of groundwater which surfaces, becomes oxidized and deposits a fine covering on the stream bottom. If iron is present, this precipitate can be orange in color. This orange precipitate was noted at some of the sample locations.



What are the next steps?

- Ongoing annual review of permittee receiving environment monitoring data will occur by MOE staff
- Initiate discussions with CVRD regarding Shawnigan Creek water quality results and potential options for source identification.
- Completion of Shawnigan Watershed updated Water Quality Objectives

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