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Client: Slocan River Streamkeepers, RDCK, City of Slocan

Re: Water and Sediment Testing in Springer Creek

Date: December 12, 2017

Samples of water were collected from Springer Creek on June 6, August 7th and October 24th and tested for metals. One sediment sample was collected on October 24th. The test results are reported below.

Sample Collection and Methods of Testing:

The samples were collected in the Springer Creek channel just above the Main Street bridge in Slocan City. Water samples were collected in bottles containing preservative. The samples were sent to CARO Analytical Services, Kelowna where they were tested in accordance with methods for the Examination of Water and Wastewater", 22st Edition. American Public Health Association. Metals were tested by ICPMS in water

Results of Testing:

A review of selected metals levels in mg/liter in the water samples are given:

Metal	June 2, 2017	August 8, 2017	October 24, 2017	Guideline
Aluminum	0.552	0.0211	0.0085	<0.1 (OG)
Arsenic	0.00055	<0.00050	<0.00050	0.01 (MAC)
Cadmium	0.000142	0.000090	0.000073	0.005(MAC)
Copper	0.00073	0.00036	<0.00040	< 1 (MAC)
Iron	0.734	0.013	<0.010	<0.3 (AO)
Lead	0.00233	<0.00010	<0.00020	0.01 (MAC)
Nickel	0.00056	<0.00020	<0.00040	N/A (MAC)
Zinc	0.0153	<0.0132	0.0137	<5 (AO)

MAC = Maximum allowable concentration (health concerns)

AO = Aesthetic objectives

OG = Operational objectives

< = less than

The review indicates two exceedances (Aluminum, June 2nd and Iron, June 2nd) Neither exceedance would be considered a health hazard. It is interesting to note that generally, we see measurable levels of metals in the Spring rather than Fall. This may be due to sediment released during freshet.

Water and Sediment Testing in Springer Creek cont.

Results of Testing:

One sample of sediment was taken in the Springer Creek channel (above the bridge) on October 24th.

It is useful to look at metals in sediment because they represent a historic view of levels and indicate possible impacts to aquatic life. The guidelines are taken from BC MOE Working Guidelines for Sediments and cited as LEL (lowest effect level).

A review of selected metals (mg/kg dry) in sediment:

Metal	October 24, 2017	Guideline
Aluminum	4,540	N/A
Arsenic	2.19	5.9
Cadmium	0.591	0.6
Copper	5.08	35.7
Iron	11,600	21,200
Lead	10.9	35
Manganese	215	460
Silver	0.21	0.5
Selenium	0.21	5
Nickel	4.39	16
Zinc	117	123

While Cadmium is close to the guidelines, all other metals are below the lowest effect level. In summary, it is likely no harmful effects to aquatic life from metals in the sediment will be observed in Springer Creek.

Respectfully Submitted

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