



Adaptive Management Report

*Fish Habitat Management System for Yukon Placer Mining*

# **Appendix A - Water Quality Objective Monitoring Program 2018 Report**





# Water Quality Objective Monitoring Report-2018

*Klondike River Watershed  
Indian River Watershed  
South Big Salmon Watershed*

**Fish Habitat Management System for Yukon Placer Mining**



# Klondike River Watershed-2018



## Water Quality Objective Monitoring, Klondike River Basin, 2018

### Hydrologic and Geomorphic Characteristics of the Klondike River Drainage Basin

The Klondike River, a major tributary to the Yukon River, drains an area of approximately 7800 square kilometers and has an overall channel length, including the North Klondike River, of approximately 160 Km.

The North Klondike River, a tributary of the Klondike River, drains an area of approximately 1100 square kilometers. From its headwaters in the Ogilvie Mountains, the North Klondike flows in a southerly direction for approximately 75 kilometers until its confluence with the Klondike. It then flows west, down the valley as the Klondike for approximately 42 kilometers until it joins the Yukon River near Dawson. The North Klondike, for its first 58 kilometers, flows through a narrow valley entrenched between high mountains, the remaining length of the Klondike River flows south through relatively flat topography. The banks of the river are stable with relatively little erosion except during flood periods.

Water Survey of Canada's gauging stations are located near the mouth of the North Klondike (09EA004, Km 9.5 Dempster Highway), and at the mouth of the Klondike River (09EA003) near Dawson.

#### North Klondike

Topographical drainage Basin	1100 Sq. Kilometers
Area of Lakes	<2%
Area of Forest	<44%
Channel Length	76.5 Kilometers
Terrain	glaciated

#### Klondike

Topographical drainage Basin	7800 Sq. Kilometers
Area of Lakes	<1%
Area of Forest	<30%
Channel Length	160 Kilometers
Terrain	Left Limit: non-glaciated Right Limit: glaciated

In 2018, water samples were collected at 13 sites in the Klondike River basin. Sampling commenced on June 15, 2018, and 61<sup>1</sup> samples were collected up until the end of the season on September 19, 2018. Grab sampling methods were used exclusively in 2018 as no automatic composite sampling stations were deployed in the watershed.

An additional 65 samples were collected by CMI staff during routine mine inspections.

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<sup>1</sup> As part of a separate study and not the FHMS, water, soil, and sediment samples were collected at each site for heavy metals analysis.

Atmospheric data was collected using three portable weather stations located at Hunker Creek, North Klondike River, and Bonanza Creek. Additional information was provided through the Yukon Government Community Services weather station at the Klondike Fire Center, located at the Dawson City Airport.

Basin total flow data was provided to us by the Water Survey of Canada station located near the mouth of the Klondike River. Flow data for the individual tributaries to the Klondike River was collected at the time of sampling by the staff of E.M.R CMI using the methodology outlined in the Yukon Placer Secretariat's, Water Quality Monitoring Protocol.

**Site Codes and Global Position of Water Quality Sampling Locations in the Klondike River Watershed**

<b>Site Code</b>	<b>Site Description</b>	<b>Latitude</b>	<b>Longitude</b>
KL_AL01	All Gold Creek below all mining	63.94263	-138.61734
KL_BO_AD01	Adams Creek mouth	63.93412	-139.33099
KL_BO_EL_FR01	French Gulch mouth	63.90865	-139.31442
KL_BO_EL01	Eldorado Creek mouth	63.91943	-139.31390
KL_BO_EL02	Eldorado Creek downstream of French Gulch	63.91267	-139.31483
KL_BO_EL03	Eldorado Creek upstream of French Creek	63.90855	-139.31382
KL_BO_EL04	Upper Eldorado Creek background	63.86187	-139.24578
KL_BO_EL05	Eldorado Creek Right Fork	63.86261	-139.24573
KL_BO_EL06	Eldorado Creek Left Fork	63.86261	-139.24573
KL_BO_VI01	Victoria Gulch mouth	63.91261	-139.20930
KL_BO01	Bonanza Creek below all mining	64.04054	-139.40814
KL_BO02	Lower Bonanza Creek	64.01295	-139.37022
KL_BO03	Lower Bonanza Creek downstream of the bridge	63.97027	-139.35472
KL_BO04	Bonanza Creek downstream of Adams Gulch	63.93550	-139.32798
KL_BO05	Bonanza Creek upstream of Adams Gulch	63.93415	-139.32977
KL_BO06	Bonanza Creek downstream of Eldorado Creek	63.92047	-139.31600
KL_BO07	Upper Bonanza Creek upstream of Eldorado Creek	63.91943	-139.31390
KL_BO08	Upper Bonanza Creek upstream of Victoria Gulch	63.91261	-139.20930
KL_BO09	Upper Bonanza Creek		
KL_BO10	Upper Bonanza Creek above all mining	63.88034	-139.08487
KL_FL01	Flat Creek below all mining	63.94308	-138.60225
KL_HU_GO01	Goldbottom Creek mouth	63.96433	-138.96706
KL_HU_LA01	Last Chance Creek mouth	64.01050	-139.09091
KL_HU01	Hunker Creek below all mining	64.02943	-139.17867
KL_HU01A	Hunker Creek mouth behind Fischer's gas station	64.03382	-139.20634
KL_HU01B	Hunker Creek mouth fork with multiple channels - larger creek bed	64.03592	-139.20201
KL_HU01C	Hunker Creek mouth - most upstream fork	64.03619	-139.20204
KL_HU02	Hunker Creek downstream of Henry Gulch	64.02838	-139.17522

KL_HU03	Hunker Creek downstream of Last Chance Creek	64.01345	-139.09187
KL_HU04	Hunker Creek upstream of Last Chance Creek	64.01050	-139.09091
KL_HU05	Hunker Creek downstream of Goldbottom Creek	63.96918	-138.98291
KL_HU06	Hunker Creek upstream of Goldbottom Creek	64.96433	-138.96706
KL_HU07	Hunker Creek above all mining, left fork	63.91105	-138.88522
KL_HU08	Hunker Creek right fork	63.89025	-138.92522
KL_HU09	Hunker Creek above all mining and downstream of the right and left fork	63.91503	-138.88501
KL_NK01	North Klondike River upstream of the confluence with Klondike River	64.00195	-138.59622
KL_TO01	Too Much Gold Creek mouth	63.95132	-138.66708
KL01	Klondike River mouth	64.05348	-139.43961
KL02	Klondike River upstream of Bonanza Creek	64.04311	-139.40936
KL03	Klondike River upstream of Hunker Creek	64.03619	-139.20204
KL04	Klondike River downstream of Goring Creek and upstream of Hunker Creek	64.05810	-139.03092
KL05	Klondike River at Dempster Highway	63.99030	-138.74612
KL06	Klondike River downstream of Too Much Gold Creek and upstream of Dempster highway	63.95778	-138.69030
KL07	Klondike River upstream of Too Much Gold Creek	63.95131	-138.66690
KL08	Klondike River at highway washout downstream of Flat Creek	63.95782	-138.69005



## **Water Quality Objective monitoring, Klondike River Watershed – Summary**

The Klondike River Watershed was once again designated a ‘watershed of interest’ for monitoring in 2018 as it likely will remain for many more years to come.

Grab sampling methods were used exclusively in 2018 as no automatic composite sampling stations were deployed in the watershed. Three portable weather-monitoring stations were set up and maintained from June 15, 2018, until shutdown on September 19, 2018. Water sampling sites in the Klondike received multiple visits during the monitoring season owing to their close proximity to Dawson.

The objective of the monitoring is to answer two key questions:

- (1) Are the WQO established in the new regime being achieved?
- (2) If not, is this due to placer mining activity or to other causes?

From the data obtained by these instruments and through on-site visits and sampling conducted by CMI staff, the following observations regarding the water quality in the basin can be made:

Question #1 - Are the WQO established in the new regime being achieved?

On average, over this monitoring period, the water quality met the minimum objectives set under the Fish Habitat Management System daily 80.3 percent of the time. On those occasions when the WQO were not met, and the Total Suspended Solids levels were greater than the objectives, a direct correlation between environmental conditions and the volume of solids in the water was observed. In most cases, rainfall, as either localized events or basin-wide occurrences, increased the amount of surface runoff and subsequent soil erosion from the land, increasing the input of sediment into the receiving waters.

These increases occurred simultaneously at the time of the rainfall event or in a period of one or two days after a rainfall event, as surface water continued draining from the land and groundwater infiltrated the watercourse. There is also the possibility that additional water was released from upstream catchments in order to increase the available freeboard and avoid ponds breaching.

Increases in the sediment-laden ground and surface water entering the system add to the amount of sediment in the water. The ability of the receiving water to dilute these inputs of sediment is negated by the re-suspension of streambed material and by the further erosion of the streams banks that occurs along with the increased flows that are generated by the aftermath of these rain events.

Question #2 - If not, is this due to placer mining activity or to other causes?

In order to fully understand the root cause of the WQO not being achieved, the following information and data will be required:

- a. The extent of placer mining upstream from monitoring sites.
- b. The distance between monitoring sites and placer activity

- c. The timing, flow volume and duration of effluent discharge from upstream sites.
- d. History of forest fire upstream of the monitoring site.
- e. Recent flood events / high water at the time of sampling.
- f. Natural water quality or background.

Heightened sediment inputs and diminished water quality is thought to be due to rain events in the monitored areas. Surface water runoff and groundwater infiltration into a body of water will intensify the sediment-loading while at the same time increase the rate of flow. The increased flow can scour bank and bed material, compounding the loading. These increases are generally well correlated in the frequency and duration to recorded rainfall events; however, not every time. Spikes in solids concentrations have been observed during periods of no precipitation. Why this occurs is yet to be determined. The additional information requirements listed above would assist in answering this and other related questions.

Knowing exactly from where and when these non-point sources of this additional sediment originate or why they occur is a critical question. Are previously or current mined areas more susceptible to ground and surface erosion than primary, old growth and regenerated areas? Are there non-mitigated sources of input and could there be better control of these areas? If results indicate that point source effluent discharge appears to have little to no effect when discharge standards are maintained, and generally, compliance has been the norm, then what is the effect of multiple non-point sources and effluent exceedances on water quality?

Without the monitoring and evaluation of water quality upstream and downstream of stripped, mined and reclaimed sites and without the collection of additional water quality and flow data of mine effluent discharge in a watershed, most of these questions detailed above will remain unanswered. Any direct causal relationship to mining activity versus other natural environmental occurrences cannot be categorically determined if the additional information and data listed above are not collected, a task which is beyond the scope of this protocol and will have to be addressed through another regime component within the Fish Habitat Management System.



# Klondike River Watershed Water Quality Objective Monitoring Sites 2018 (Category A)

## Monitoring Sites

- Energy, Mines and Resources Weather Station and Sampling Site
- Energy, Mines and Resources Sampling Site
- Water Survey of Canada Station
- Community Services Weather Station

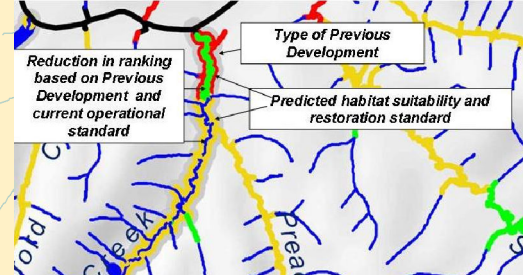
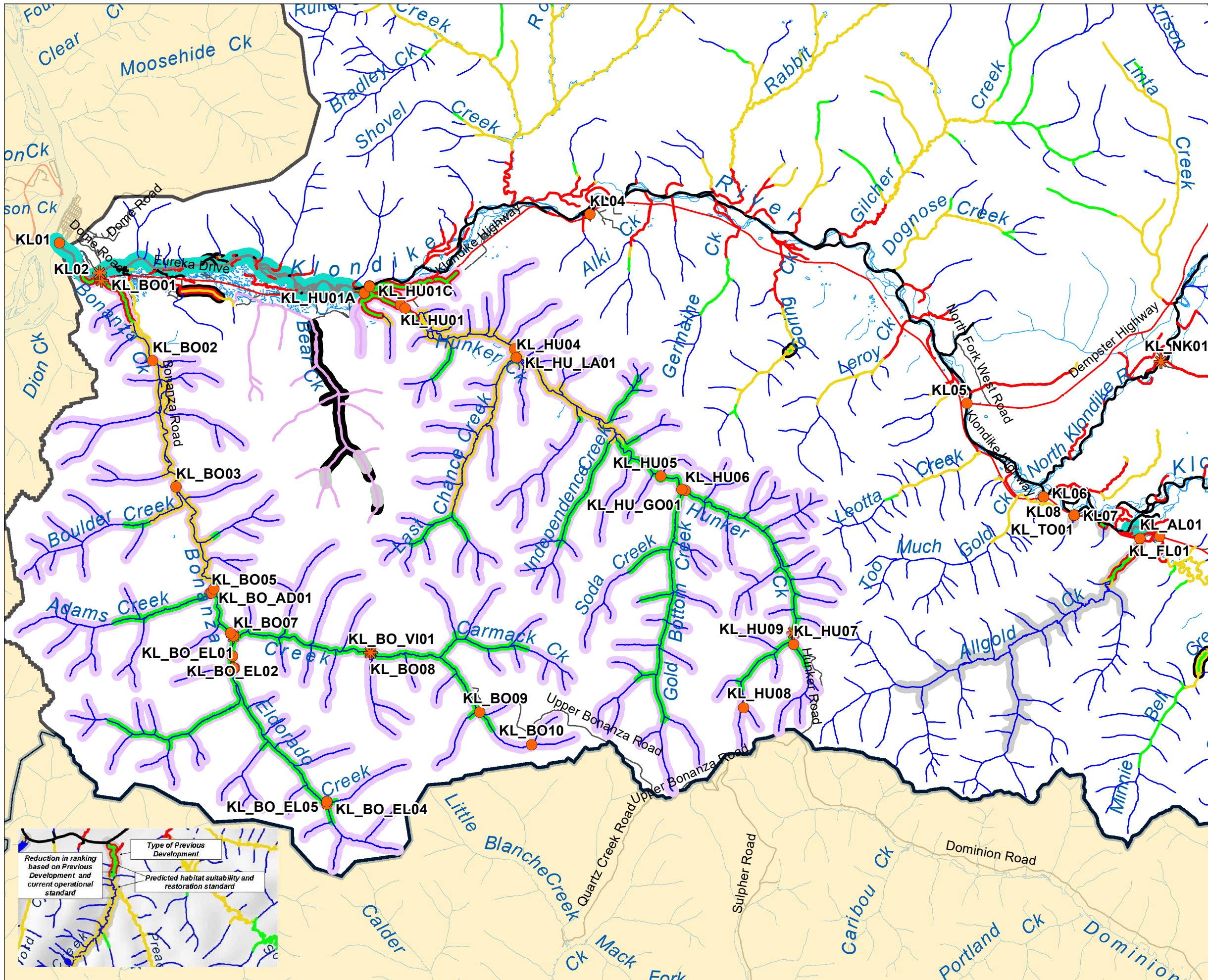
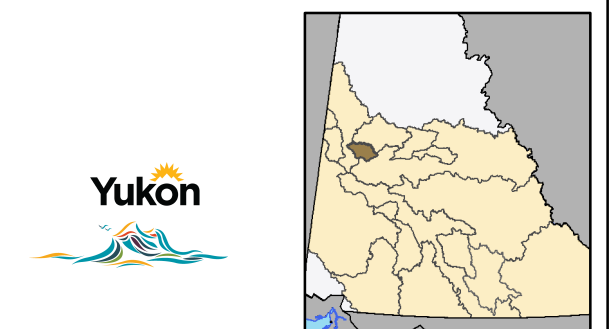
## Stream Reach Classification

- Water Quality
- Low Suitability
- Moderate-Low Suitability
- Moderate-Moderate Suitability
- Moderate-High Suitability
- High Suitability
- Areas of Special Consideration (Ecological)
- Areas of Special Consideration (Cultural)

## Development

- Current
- Historical
- Extensive

This map is provided to depict the location of water quality and weather monitoring sites in relation to streams classified using the Yukon Habitat Suitability Model, and is not intended for any other use. Under no circumstances will the Government of Canada, or Yukon Government be liable to any person or business entity for any direct, indirect, special, incidental, consequential, or other damages based on any use of information contained on this map, including, without limitation, any lost profits, business interruption, or loss of information.



**The Fish Habitat Management System - Klondike River Watershed (Category A)**  
**Sample Results that Exceed Water Quality Objectives for 2018**

Sampling Station	KL01	KL_BO01	KL02	KL_BO_EL01	KL_BO07	KL_BO09	KL_HU01 AT HWY XING
Location Description	Klondike Mouth	Bonanza Ck BAM	u/s KL_BO01	Eldorada Ck Mouth	Bonanza Ck u/s Eldorado	Upper Bonanza Ck	Hunker Ck BAM
Sample Type	Grab	Grab	Grab	Grab	Grab	Grab	Grab
Lat Y	64.05348	64.04054	64.04237	63.91943	63.91943	63.93124	64.02943
Long X	-139.43961	-139.40814	-139.40956	-139.31390	-139.31390	-139.23099	-139.17867
Habitat Classification	Area of special consideration	Moderate-L	Area of special consideration	Low	Low	Low	Moderate-L
Water Quality Objective (mg/L)	25	80	25	200	200	200	80
Date of Sampling							
14-Jun-18		92.4		627.3	587.2	94.8	68.8
15-Jun-18	12.8						
5-Jul-18	4.4	63.6		558.0	20.0	4.0	
6-Jul-18							12.4
1-Aug-18							29.6
2-Aug-18	4.0	16.4		7.6	14.8	3.6	
25-Aug-18		168.4		415.6	139.2	473.2	257.6
26-Aug-18	20.4						
17-Sep-18						45.2	
19-Sep-18	4.4	6.8		28.4	35.2		16.0
Total Seasonal Average TSS (mg/L) by site	9.2	69.5		327.4	159.3	124.2	76.9
Number of days sampled	5	5		5	5	5	5

Legend

Not continuously monitored

Water Samples that are: Above / Below the Water Quality Objective

Sampling Station	KL_HU_LA01	KL_HU04	KL_HU_GO01	KL_HU06	KL_HU09	KL_NK01
Location Description	Last Chance Ck Mouth	Hunker Ck u/s Last Chacne Ck	Goldbottom Ck Mouth	Hukner Ck u/s Goldbottom Ck	Hunker Ck AAM	u/s of Klondike R
Sample Type	Grab	Grab	Grab	Grab	Grab	Grab
Lat Y	64.01050	64.01050	63.96433	64.96433	63.91503	64.00195
Long X	-139.09091	-139.09091	-138.96706	-138.96706	-138.88501	-138.59622
Habitat Classification	Low	Low	Low	Low	Low	High
Water Quality Objective (mg/L)	200	200	200	200	200	25
Date of Sampling						
14-Jun-18	2337.6	56.0	131.6	14.4	21.2	
15-Jun-18						0.8
5-Jul-18						
6-Jul-18	56.8	21.6	101.2	2.4	112.8	24.8
1-Aug-18	60.8	41.2	10.8	42.8	9.2	5.2
2-Aug-18						
25-Aug-18	171.6	208.4	843.2	227.6	9.6	
26-Aug-18						4.4
17-Sep-18						
19-Sep-18	24.0	23.2	88.0	6.0	6.8	3.6
Total Seasonal Average TSS (mg/L) by site	530.2	70.1	235.0	58.6	31.9	7.8
Number of days sampled	5	5	5	5	5	5

Legend

Not continuously monitored

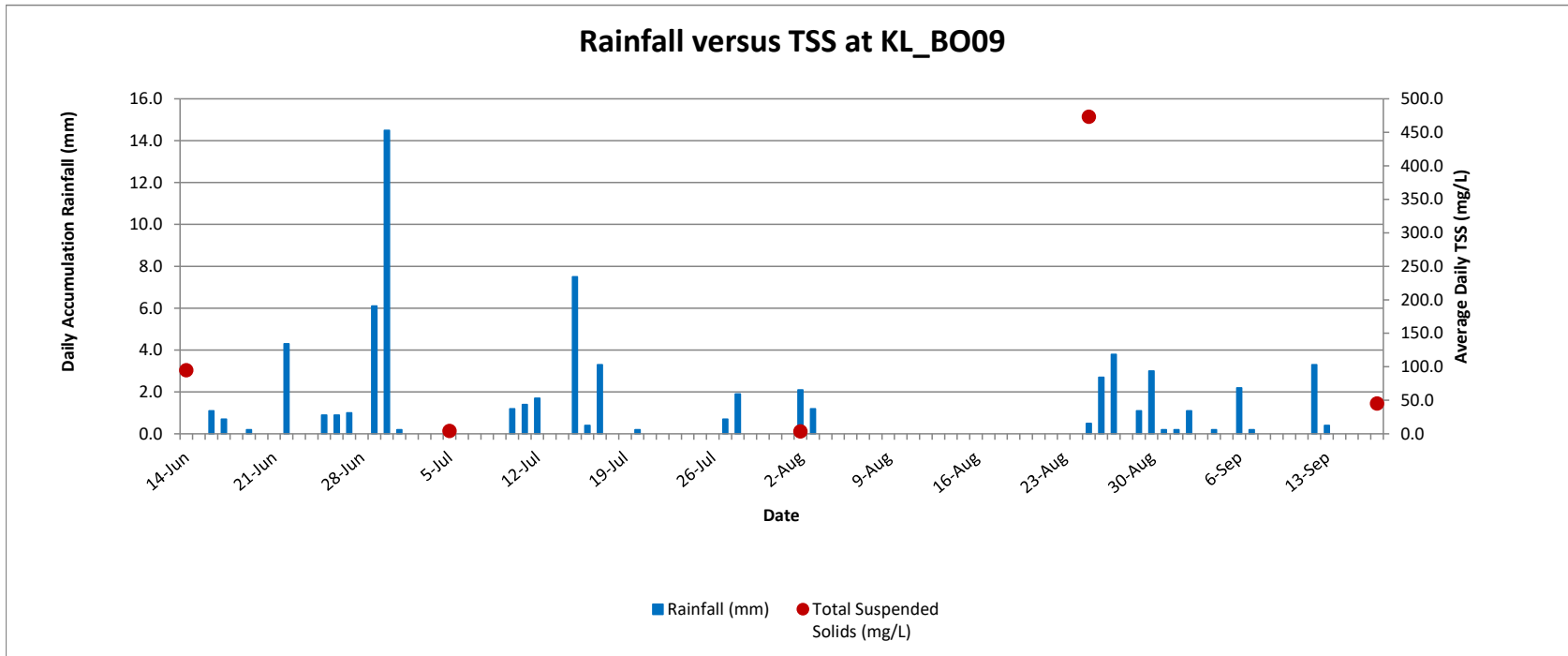
Water Samples that are: Above / Below the Water Quality Objective

**Klondike River Watershed - KL\_BO09**

Date	Average Daily Flow (m3/s) WSC	Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)	Daily Loading (kg/day)	Comments
14-Jun		0.0	2.9	16.3	94.8		
15-Jun		0.0		13.8			
16-Jun		1.1		14.5			
17-Jun		0.7		14.8			
18-Jun		0		16.4			
19-Jun		0.2		16.8			
20-Jun		0		16.9			
21-Jun		0		20.6			
22-Jun		4.3		14.2			
23-Jun		0		14.4			
24-Jun		0		13.5			
25-Jun		0.9		13.4			
26-Jun		0.9		12.4			
27-Jun		1		11.4			
28-Jun		0		13.5			
29-Jun		6.1		11.4			
30-Jun		14.5		11.8			
1-Jul		0.2		14.9			
2-Jul		0		15.1			
3-Jul		0		15.8			
4-Jul		0		17.4			
5-Jul		0	4.3	14.6	4.0		
6-Jul		0		14.4			
7-Jul		0		16.3			
8-Jul		0		18.6			
9-Jul		0		15.2			
10-Jul		1.2		12.8			
11-Jul		1.4		12.1			
12-Jul		1.7		10.2			
13-Jul		0		12.8			
14-Jul		0		13.3			
15-Jul		7.5		11.1			
16-Jul		0.4		12.2			
17-Jul		3.3		10.5			
18-Jul		0		11.2			
19-Jul		0		12.3			
20-Jul		0.2		15.4			
21-Jul		0		16.4			
22-Jul		0		18.9			
23-Jul		0		20.4			
24-Jul		0		19.1			
25-Jul		0		19.3			
26-Jul		0		18.2			

Date	Average Daily Flow (m3/s) WSC	Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)	Daily Loading (kg/day)	Comments
27-Jul		0.7		17.4			
28-Jul		1.9		14.3			
29-Jul		0		17.3			
30-Jul		0		17.9			
31-Jul		0		18.4			
1-Aug		0		18.2			
2-Aug		2.1	4.6	15.9	3.6		
3-Aug		1.2		15.4			
4-Aug		0		13.7			
5-Aug		0		13.4			
6-Aug		0		12.8			
7-Aug		0		12.8			
8-Aug		0		9.9			
9-Aug		0		6.7			
10-Aug		0		7.1			
11-Aug		0		8.8			
12-Aug		0		11.0			
13-Aug		0		14.0			
14-Aug		0		10.4			
15-Aug		0		9.5			
16-Aug		0		8.3			
17-Aug		0		7.6			
18-Aug		0		11.3			
19-Aug		0		8.6			
20-Aug		0		14.1			
21-Aug		0		13.6			
22-Aug		0		8.5			
23-Aug		0		6.1			
24-Aug		0		9.2			
25-Aug		0.5	3.5	8.3	473.2		*arrived to weather station knocked over
26-Aug		2.7		7.2			
27-Aug		3.8		10.3			
28-Aug		0		8.0			
29-Aug		1.1		6.5			
30-Aug		3		3.9			
31-Aug		0.2		4.9			
1-Sep		0.2		3.5			
2-Sep		1.1		7.8			
3-Sep		0		6.2			
4-Sep		0.2		7.8			
5-Sep		0		7.0			
6-Sep		2.2		5.3			
7-Sep		0.2		6.3			
8-Sep		0		3.5			

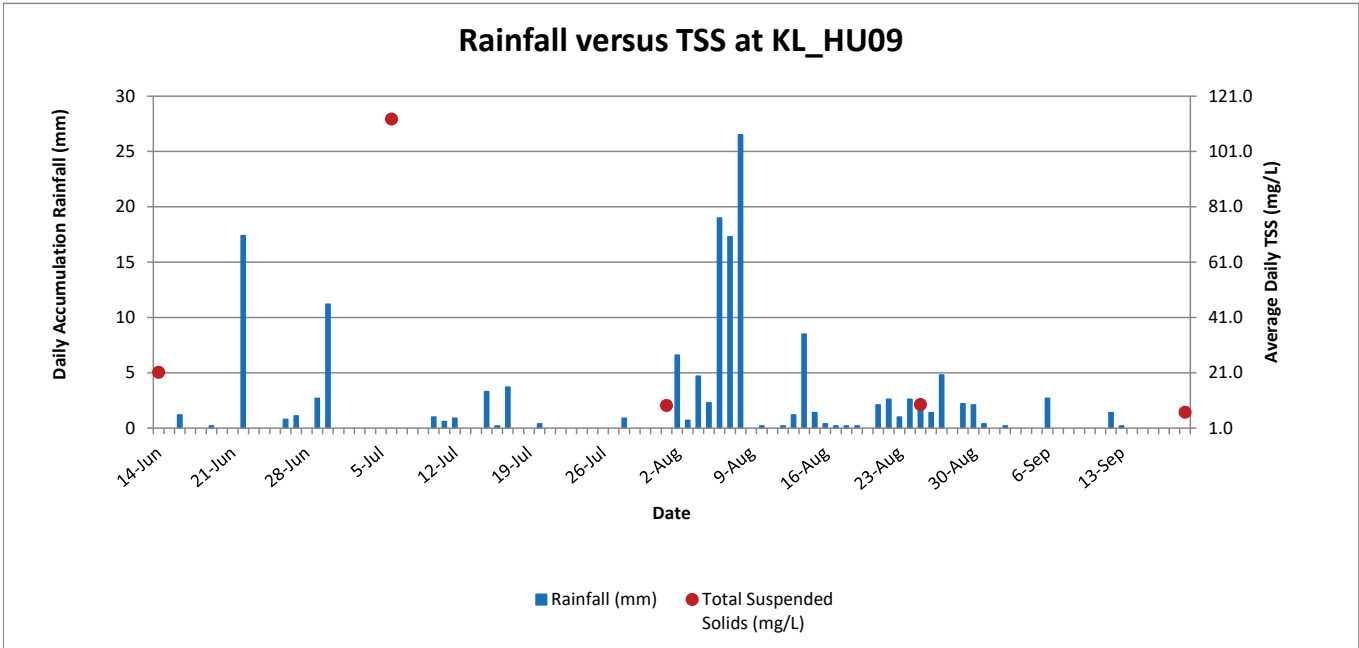
Date	Average Daily Flow (m3/s) WSC	Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)	Daily Loading (kg/day)	Comments
9-Sep		0		3.4			
10-Sep		0		4.5			
11-Sep		0		6.3			
12-Sep		3.3		6.6			
13-Sep		0.4		7.5			
14-Sep		0		0.4			
15-Sep		0		1.8			
16-Sep		0		2.6			
17-Sep		0	0.0	-1.4	45.2		



**Klondike River Watershed - KL\_HU09**

Date	Average Daily Flow (m3/s) WSC	Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)	Daily Loading (kg/day)
14-Jun		0	4.3	18.0	21.2	
15-Jun		0		12.7		
16-Jun		1.2		13.7		
17-Jun		0		13.5		
18-Jun		0		15.3		
19-Jun		0.2		15.7		
20-Jun		0		15.3		
21-Jun		0		19.4		
22-Jun		17.4		12.9		
23-Jun		0		12.8		
24-Jun		0		13.5		
25-Jun		0		13.6		
26-Jun		0.8		13.0		
27-Jun		1.1		11.8		
28-Jun		0		12.9		
29-Jun		2.7		11.4		
30-Jun		11.2		12.1		
1-Jul		0		14.5		
2-Jul		0		14.3		
3-Jul		0		14.3		
4-Jul		0		15.3		
5-Jul		0		13.5		
6-Jul		0	8.7	14.2	112.8	
7-Jul		0		15.7		
8-Jul		0		16.5		
9-Jul		0		13.6		
10-Jul		1		12.5		
11-Jul		0.6		11.4		
12-Jul		0.9		10.0		
13-Jul		0		10.4		
14-Jul		0		11.5		
15-Jul		3.3		10.9		
16-Jul		0.2		12.1		
17-Jul		3.7		9.7		
18-Jul		0		9.0		
19-Jul		0		11.2		
20-Jul		0.4		14.7		
21-Jul		0		14.8		
22-Jul		0		15.4		
23-Jul		0		16.7		
24-Jul		0		17.6		
25-Jul		0		15.8		
26-Jul		0		16.4		
27-Jul		0		15.8		
28-Jul		0.9		13.1		
29-Jul		0		14.3		
30-Jul		0		14.9		
31-Jul		0		15.3		
1-Aug		0	7.3	16.2	9.2	
2-Aug		6.6		14.8		
3-Aug		0.7		14.6		
4-Aug		4.7		14.0		
5-Aug		2.3		13.2		
6-Aug		19		12.7		
7-Aug		17.3		11.7		
8-Aug		26.5		10.1		
9-Aug		0.0		6.2		
10-Aug		0.2		7.1		
11-Aug		0.0		7.7		
12-Aug		0.2		10.5		
13-Aug		1.2		12.4		

Date	Average Daily Flow (m3/s) WSC	Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)	Daily Loading (kg/day)
14-Aug		8.5		10.0		
15-Aug		1.4		9.6		
16-Aug		0.4		8.3		
17-Aug		0.2		7.7		
18-Aug		0.2		10.3		
19-Aug		0.2		8.2		
20-Aug		0.0		13.2		
21-Aug		2.1		13.6		
22-Aug		2.6		8.6		
23-Aug		1.0		5.9		
24-Aug		2.6		8.7		
25-Aug		1.9	4.1	7.8	9.6	
26-Aug		1.4		5.7		
27-Aug		4.8		10.0		
28-Aug		0.0		7.1		
29-Aug		2.2		5.1		
30-Aug		2.1		3.3		
31-Aug		0.4		4.1		
1-Sep		0.0		2.1		
2-Sep		0.2		7.1		
3-Sep		0.0		4.6		
4-Sep		0.0		6.8		
5-Sep		0.0		5.6		
6-Sep		2.7		4.9		
7-Sep		0.0		6.4		
8-Sep		0.0		1.6		
9-Sep		0.0		1.9		
10-Sep		0.0		3.1		
11-Sep		0.0		5.7		
12-Sep		1.4		5.6		
13-Sep		0.2		7.2		
14-Sep		0.0		-1.2		
15-Sep		0.0		-0.5		
16-Sep		0.0		-0.4		
17-Sep		0.0		-0.8		
18-Sep		0.0		-0.5		
19-Sep		0.0	0.0	-4.2	6.8	



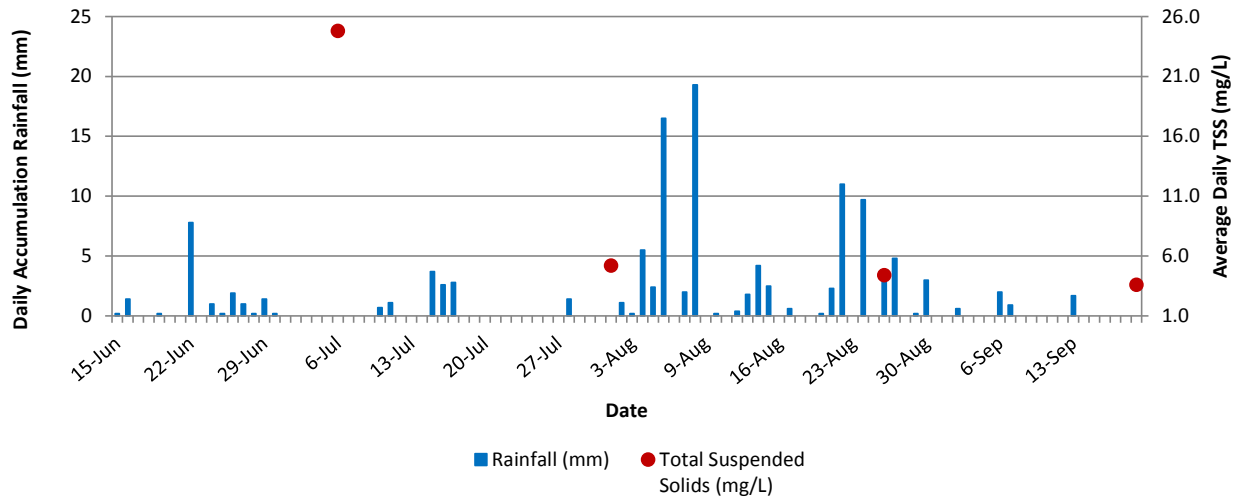


**Klondike River Watershed - KL\_NK01**

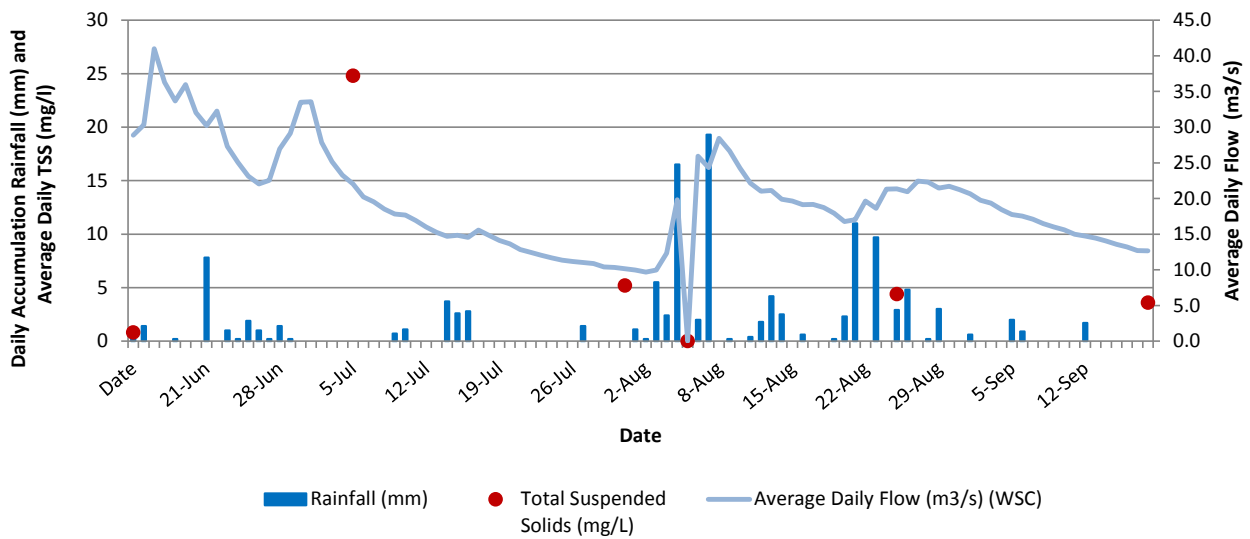
<b>Date</b>	<b>Rainfall (mm)</b>	<b>Average of Water Temperature (°C)</b>	<b>Average of Air Temperature (°C)</b>	<b>Total Suspended Solids (mg/L)</b>	<b>Average Daily Flow (m3/s) (WSC)</b>
15-Jun	0.2	6.5	19.1	0.8	28.9
16-Jun	1.4		14.4		30.3
17-Jun	0		14.7		41.0
18-Jun	0		15.5		36.3
19-Jun	0.2		16.3		33.7
20-Jun	0		16.5		36.0
21-Jun	0		19.7		32.0
22-Jun	7.8		14.0		30.2
23-Jun	0		14.3		32.2
24-Jun	1		14.1		27.3
25-Jun	0.2		14.6		25.0
26-Jun	1.9		13.7		23.1
27-Jun	1		12.0		22.0
28-Jun	0.2		14.3		22.6
29-Jun	1.4		12.6		26.9
30-Jun	0.2		13.1		29.1
1-Jul	0		15.1		33.5
2-Jul	0		15.2		33.6
3-Jul	0		16.9		27.8
4-Jul	0		17.1		25.2
5-Jul	0		14.5		23.3
6-Jul	0	9.8	15.6	24.8	22.0
7-Jul	0		15.6		20.2
8-Jul	0		17.5		19.5
9-Jul	0		14.0		18.5
10-Jul	0.7		14.4		17.8
11-Jul	1.1		12.6		17.7
12-Jul	0		11.9		16.9
13-Jul	0		13.4		16.0
14-Jul	0		13.9		15.2
15-Jul	3.7		12.4		14.7
16-Jul	2.6		12.3		14.8
17-Jul	2.8		10.8		14.6
18-Jul	0		11.8		15.6
19-Jul	0		11.5		14.9
20-Jul	0		15.5		14.1
21-Jul	0		15.9		13.6
22-Jul	0		17.7		12.8
23-Jul	0		18.5		12.5
24-Jul	0		19.2		12.0
25-Jul	0		18.3		11.7
26-Jul	0		17.5		11.4
27-Jul	0		16.9		11.2
28-Jul	1.4		13.9		11.0
29-Jul	0		16.5		10.9
30-Jul	0		16.7		10.4
31-Jul	0		17.4		10.3
1-Aug	0	11	17.5	5.2	10.2
2-Aug	1.1		16.7		10.0
3-Aug	0.2		15.3		9.7
4-Aug	5.5		14.2		10.0
5-Aug	2.4		13.7		12.3
6-Aug	16.5		12.8		19.8

Date	Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)	Average Daily Flow (m3/s) (WSC)
7-Aug	2		12.4		25.9
8-Aug	19.3		10.5		24.3
9-Aug	0		8.4		28.4
10-Aug	0.2		8.6		26.7
11-Aug	0		9.8		24.3
12-Aug	0.4		10.9		22.1
13-Aug	1.8		12.5		21.0
14-Aug	4.2		10.7		21.1
15-Aug	2.5		10.4		19.9
16-Aug	0		9.7		19.6
17-Aug	0.6		7.4		19.1
18-Aug	0		10.7		19.2
19-Aug	0		9.7		18.7
20-Aug	0.2		13.5		17.9
21-Aug	2.3		14.1		16.8
22-Aug	11		9.1		17.0
23-Aug	0		7.3		19.6
24-Aug	9.7		9.1		18.6
25-Aug	0		9.9		21.3
26-Aug	2.9	4.9	7.5	4.4	21.3
27-Aug	4.8		10.6		20.9
28-Aug	0		9.4		22.4
29-Aug	0.2		8.0		22.3
30-Aug	3		3.8		21.5
31-Aug	0		6.0		21.7
1-Sep	0		3.3		21.2
2-Sep	0.6		8.3		20.6
3-Sep	0		4.3		19.7
4-Sep	0		7.4		19.4
5-Sep	0		8.4		18.4
6-Sep	2		5.8		17.8
7-Sep	0.9		6.8		17.5
8-Sep	0		4.3		17.1
9-Sep	0		3.7		16.5
10-Sep	0		4.7		16.0
11-Sep	0		6.4		15.6
12-Sep	0		5.7		15.0
13-Sep	1.7		8.6		14.7
14-Sep	0		1.2		14.4
15-Sep	0		1.6		14.0
16-Sep	0		2.5		13.6
17-Sep	0		1.3		13.2
18-Sep	0		1.7		12.7
19-Sep	0		-4.6	3.6	12.7

### Rainfall versus TSS at KL\_NK01



### Rainfall and TSS versus Average Daily Flow (WSC) at KL\_NK01



**Klondike River Watershed**

LAB_NUMBER	SAMPLE_NUMBER	SAMPLE_DATE	SITE_CODE	TOTAL_SUSPENDED _SOLIDS_MG_L	WATER_QUALITY _OBJECTIVE_MG_L	ABOVE_BELOW _OBJECTIVE	SETTLABLE _SOLIDS_ML_L	CONDUCTIVITY_USM	pH	TURBIDITY_NTU
18-0054	WQG-18-0046	15-Jun-18	KL_NK01	0.8	25	Below	0.0	297.0	7.8	3.0
18-0055	WQG-18-0047	14-Jun-18	KL_HU09	21.2	200	Below	0.0	391.0	7.7	12.0
18-0056	WQG-18-0048	14-Jun-18	KL_HU06	14.4	200	Below	0.0	441.0	7.8	8.0
18-0057	WQG-18-0049	14-Jun-18	KL_HU_GO01	131.6	200	Below	0.2	391.0	7.8	33.0
18-0058	WQG-18-0050	14-Jun-18	KL_HU04	56.0	200	Below	0.1	596.0	7.7	39.0
18-0059	WQG-18-0051	14-Jun-18	KL_HU_LA01	2337.6	200	Above	2.5	708.0	7.7	130.0
18-0060	WQG-18-0052	14-Jun-18	KL_HU01	68.8	80	Below	0.1	644.0	7.8	45.0
18-0061	WQG-18-0053	14-Jun-18	KL_BO09	94.8	200	Below	0.2	152.0	8.1	15.0
18-0062	WQG-18-0054	14-Jun-18	KL_BO_EL01	627.3	200	Above	0.5	383.0	7.9	551.0
18-0063	WQG-18-0055	14-Jun-18	KL_BO07	587.2	200	Above	1.1	290.0	7.9	137.0
18-0064	WQG-18-0056	14-Jun-18	KL_BO01	92.4	80	Above	0.1	427.0	7.9	59.0
18-0065	WQG-18-0057	15-Jun-18	KL01	12.8	25	Below	0.0	275.0	7.9	5.0
18-0294	WQG-18-082	5-Jul-18	KL_BO10	1.2	200	Below	0.0	219.0	7.4	0.3
18-0295	WQG-18-083	5-Jul-18	KL_BO09	4.0	200	Below	0.0	247.0	7.4	3.0
18-0296	WQG-18-084	5-Jul-18	KL_BO07	20.0	200	Below	0.0	440.0	7.3	11.0
18-0297	WQG-18-085	5-Jul-18	KL_BO_EL01	558.0	200	Above	0.0	611.0	7.3	746.0
18-0298	WQG-18-086	5-Jul-18	KL_BO01	63.6	80	Below	0.0	579.0	7.4	50.0
18-0299	WQG-18-087	5-Jul-18	KL01	4.4	25	Below	0.0	312.0	7.5	5.0
18-0301	WQG-18-089	6-Jul-18	KL_HU09	112.8	200	Below	0.0	504.0	7.5	181.0
18-0302	WQG-18-090	6-Jul-18	KL_HU06	2.4	200	Below	0.0	550.0	7.5	10.0
18-0303	WQG-18-091	6-Jul-18	KL_HU_GO01	101.2	200	Below	0.0	572.0	7.6	103.0
18-0304	WQG-18-092	6-Jul-18	KL_HU04	21.6	200	Below	0.0	793.0	7.6	55.0
18-0305	WQG-18-093	6-Jul-18	KL_HU_LA01	56.8	200	Below	0.0	1064.0	7.6	3.0
18-0306	WQG-18-094	6-Jul-18	KL_HU01	12.4	80	Below	0.0	851.0	7.8	25.0
18-0307	WQG-18-095	6-Jul-18	KL_NK01	24.8	25	Below	0.0	355.0	8.0	4.0
18-0557	WQG-18-122	1-Aug-18	KL_HU09	9.2	200	Below	0.0	564.0	8.0	7.0
18-0558	WQG-18-123	1-Aug-18	KL_HU06	42.8	200	Below	0.0	619.0	7.9	32.0
18-0559	WQG-18-124	1-Aug-18	KL_HU_GO01	10.8	200	Below	0.0	695.0	7.9	9.0
18-0560	WQG-18-125	1-Aug-18	KL_HU04	41.2	200	Below	0.0	996.0	7.9	60.0
18-0561	WQG-18-126	1-Aug-18	KL_HU_LA01	60.8	200	Below	0.0	1398.0	7.6	46.0
18-0562	WQG-18-127	1-Aug-18	KL_HU01	29.6	80	Below	0.0	1037.0	8.0	10.0
18-0563	WQG-18-128	1-Aug-18	KL_NK01	5.2	25	Below	0.0	381.0	8.4	6.0
18-0564	WQG-18-129	2-Aug-18	KL_BO09	3.6	200	Below	0.0	311.0	8.4	0.4
18-0565	WQG-18-130	2-Aug-18	KL_BO07	14.8	200	Below	0.0	518.0	8.2	15.0
18-0566	WQG-18-131	2-Aug-18	KL_BO_EL01	7.6	200	Below	0.0	665.0	8.1	4.0
18-0567	WQG-18-132	2-Aug-18	KL_BO01	16.4	80	Below	0.0	737.0	8.0	17.0
18-0568	WQG-18-133	2-Aug-18	KL01	4.0	25	Below	0.0	353.0	8.3	0.3
18-0712	WQG-18-160	25-Aug-18	KL_HU01	257.6	80	Above	0.0	549.0	8.2	176.0
18-0713	WQG-18-161	25-Aug-18	KL_HU04	208.4	200	Above	0.1	498.0	8.3	104.0
18-0714	WQG-18-162	25-Aug-18	KL_HU_LA01	171.6	200	Below	1.0	479.0	8.3	173.0
18-0715	WQG-18-163	25-Aug-18	KL_HU06	227.6	200	Above	1.0	424.0	8.3	403.0
18-0716	WQG-18-164	25-Aug-18	KL_HU_GO01	843.2	200	Above	1.0	271.0	8.4	167.0
18-0717	WQG-18-165	25-Aug-18	KL_HU09	9.6	200	Below	0.0	369.0	8.3	23.0

LAB_NUMBER	SAMPLE_NUMBER	SAMPLE_DATE	SITE_CODE	TOTAL_SUSPENDED _SOLIDS_MG_L	WATER_QUALITY _OBJECTIVE_MG_L	ABOVE_BELOW _OBJECTIVE	SETTLABLE _SOLIDS_ML_L	CONDUCTIVITY_USM	pH	TURBIDITY_NTU
18-0719	WQG-18-167	25-Aug-18	KL_BO09	473.2	200	Above	0.8	114.0	8.5	146.0
18-0720	WQG-18-168	25-Aug-18	KL_BO07	139.2	200	Below	0.0	202.0	8.4	49.0
18-0721	WQG-18-169	25-Aug-18	KL_BO_EL01	415.6	200	Above	0.5	252.0	8.4	80.0
18-0722	WQG-18-170	25-Aug-18	KL_BO01	168.4	80	Above	0.3	309.0	8.3	81.0
18-0723	WQG-18-171	26-Aug-18	KL01	20.4	25	Below	0.0	326.0	8.3	11.0
18-0724	WQG-18-172	26-Aug-18	KL_NK01	4.4	25	Below	0.0	357.0	8.3	2.0
18-1022	WQG-18-187	17-Sep-18	KL_BO09	45.2	200	Below	0.0	232.0	8.2	11.0
18-1035	WQG-18-200	19-Sep-18	KL_NK01	3.6	25	Below	0.0	389.0	8.0	0.2
18-1036	WQG-18-201	19-Sep-18	KL_HU01	16.0	80	Below	0.0	848.0	7.8	25.0
18-1037	WQG-18-202	19-Sep-18	KL_HU09	6.8	200	Below	0.0	511.0	8.0	5.0
18-1038	WQG-18-203	19-Sep-18	KL_HU_GO01	88.0	200	Below	0.0	556.0	7.9	23.0
18-1039	WQG-18-204	19-Sep-18	KL_HU06	6.0	200	Below	0.0	572.0	7.9	6.0
18-1040	WQG-18-205	19-Sep-18	KL_HU_LA01	24.0	200	Below	0.0	1104.0	7.7	24.0
18-1041	WQG-18-206	19-Sep-18	KL_HU04	23.2	200	Below	0.0	798.0	7.9	32.0
18-1042	WQG-18-207	19-Sep-18	KL_BO_EL01	28.4	200	Below	0.0	522.0	8.0	7.0
18-1043	WQG-18-208	19-Sep-18	KL_BO07	35.2	200	Below	0.0	453.0	8.0	8.0
18-1044	WQG-18-209	19-Sep-18	KL_BO01	6.8	80	Below	0.0	596.0	8.0	9.0
18-1045	WQG-18-210	19-Sep-18	KL01	4.4	25	Below	0.0	355.0	8.1	0.2

# Indian River Watershed-2018



# **Water Quality Objective Monitoring, Indian River Watershed, 2018**

## **Hydrologic and Geomorphic Characteristics of the Indian River Drainage Basin**

The Indian River, a major tributary to the Yukon River, drains an area of approximately 2220 square kilometers and has an overall channel length of approximately 120 km. The drainage basin is located 60 km south of Dawson.

Indian River, a gravel bed stream, is a tributary of Yukon River. The Indian River basin lies within the Klondike Plateau, a gently sloping upland south of Tintina Trench consisting of accordant summits (e.g., King Solomon Dome, Australia Mountain). The present flood plain descends about 53 m over a distance of 33 km with an overall gradient of about 1.6 m/km between the confluences of Dominion Creek and Ruby Creek.

The Water Survey of Canada (WSC) gauging station (09EB003) is located 1.5 km from the confluence of the Indian River with the Yukon River.

Topographical drainage Basin	2220 Sq. Kilometers
Area of Lakes	0%
Area of Forest	85%
Channel Length	120 Kilometers
Terrain	non-glaciated

In 2018, water samples were collected at 21 different sites in the Indian River basin. Sampling commenced on May 23<sup>rd</sup>, 2018 and a total of 98<sup>1</sup> samples were collected up until the end of the season on September 18<sup>th</sup>, 2018. Grab sampling methods were used exclusively in 2018 as no automatic composite sampling stations were deployed in the watershed.

Atmospheric data was collected using four portable weather stations; one located near the mouth of the Indian River, the second at a bridge over Eureka Creek, the third at a background site on Dominion Creek and the fourth at a background location on Ruby Creek.

Basin total flow data was provided to us by the Water Survey of Canada station located near the mouth of the Indian River. Flow data for the individual tributaries to the Indian River was collected at the time of sampling by the staff of E.M.R CMI using the methodology outlined in the Yukon Placer Secretariats, Water Quality Monitoring Protocol.

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<sup>1</sup> As part of a separate study and not the FHMS, water, soil, and sediment samples were collected at each site for heavy metals analysis.



**Site Codes and Global Position of Water Quality Sampling Locations in the Indian River Watershed**

<b>Site Code</b>	<b>Location</b>	<b>Latitude</b>	<b>Longitude</b>
IN_AU01	Australia Creek mouth	63.62327	-138.69434
IN_AU04	Australia Creek background	63.59586	-138.39734
IN_DO_AL01	Almeda Pup Creek mouth	63.83905	-138.78414
IN_DO_AR01	Arkansas Creek mouth	63.74499	-138.51467
IN_DO_BU01	Burnham Creek mouth	63.72881	-138.52914
IN_DO_CA01	Caribou Creek mouth	63.84294	-138.80054
IN_DO_CHAM01	Champion Pup Creek mouth	63.82743	-138.68361
IN_DO_CHAP01	Chapman Pup Creek mouth	63.83091	-138.69487
IN_DO_EI01	Eight below Pup Creek mouth	63.83350	-138.71324
IN_DO_GO01	Gold Run Creek mouth	63.69152	-138.59724
IN_DO_GR01	Grant Pup Creek mouth	63.70445	-138.57770
IN_DO_JE01	Jensen Creek mouth	63.77149	-138.53495
IN_DO_KE01	Kentucky Creek mouth	63.75940	-138.51349
IN_DO_LO01	Lombard Pup Creek mouth	63.85677	-138.85347
IN_DO_MU01	Mummie Pup Creek mouth	63.85705	-138.85352
IN_DO_NE01	Nevada Creek mouth	63.80472	-138.60658
IN_DO_TR01	Troublesome Pup Creek mouth	63.83500	-138.74991
IN_DO01	Dominion Creek mouth and upstream of the confluence with Sulphur Creek	63.62363	-138.69377
IN_DO02	Dominion Creek upstream of Gold Run Creek and downstream of Burnham Creek	63.71686	-138.54523
IN_DO03	Dominion Creek upstream of Burnham Creek and downstream of Arkansas Creek	63.73349	-138.52496
IN_DO04	Dominion Creek background	63.85257	-138.89658
IN_EU01	Eureka Creek below all mining	63.60483	-138.83099
IN_EU04	Eureka Creek background	63.54351	-138.91261
IN_MO01	Montana Creek mouth	63.69702	-138.97751
IN_MO03		63.61635	139.00667
IN_MO04	Montana Creek background	63.55976	-139.13676
IN_MO_BI01	Low	63.62104	-139.01450
IN_MO_BI04	Bismark Creek background	63.59500	-139.20073
IN_NI01	Nine Mile Creek mouth	63.79533	-139.40988
IN_QU01	Quartz Creek mouth	63.74262	-139.14003
IN_QU02	Quartz Creek at dredge	63.75333	-139.12445
IN_QU03		63.79744	139.09125
IN_QU04	Quartz Creek background	63.83472	-139.00333
IN_RU01	Ruby Creek mouth	63.76250	-139.24583
IN_RU04	Ruby Creek background	63.66232	-139.24286

IN_SU01	Sulphur Creek mouth upstream of the confluence with Dominion Creek	63.62427	-138.69545
IN_SU02	Sulphur Creek upstream of large culverts	63.65632	-138.67613
IN_SU03	Sulphur Creek at Brimstone Gulch	63.74023	-138.84891
IN_SU04	Sulphur Creek background	63.81999	-138.93423
IN_SU05	Sulphur Creek background	63.82285	-138.92865
IN01	Indian River near the mouth	63.77794	-139.70927
IN02	Indian River upstream of Nine Mile Creek and downstream of Ophir Creek	63.77337	-139.34888
IN03	Indian River downstream of Ruby Creek	63.76852	-139.31589
IN04	Indian River downstream of Quartz Creek	63.74762	-139.16173
IN05	Indian River downstream of Gimlex bridge	63.73735	-139.07439
IN06	Indian River downstream of Montana Creek	63.69683	-138.96550
IN07	Indian River downstream of Eureka Creek	63.69385	-138.93163
IN08	Indian River at bridge over to Eureka Creek	63.61254	-138.71571

### **Water Quality Objective monitoring, Indian River Watershed – Summary**

This basin has been extensively monitored for the past 12 years by many different organizations providing us with an immense amount of information regarding the state of the water quality in a historically mined watershed. The Indian River basin is a heavily diverse watershed, with vast areas of active mining as well as inactive, reclaimed and partially reclaimed sections. Placer activities in this watershed have remained consistent over the last decade. Due to the great interest in the area, and recent changes in mining locations and levels of activity, the Indian River Watershed was designated an important watershed for monitoring in 2018. This meant that a major proportion of our monitoring efforts were spent in the basin and that our monitoring schedule included many repeat visits throughout the season.

Grab sampling methods were used exclusively in 2018 as no automatic composite sampling stations were deployed in the watershed. Four weather stations were set up and maintained from May 25<sup>th</sup>, 2017 until shutdown on September 27<sup>th</sup>, 2017. From the data obtained by these instruments and through on-site visits and sampling conducted by CS&I staff, the following observations regarding the water quality in the basin can be made:

The objective of the monitoring is to answer two key questions:

- (1) Are the WQO established in the new regime being achieved?
- (2) If not, is this due to placer mining activity or to other causes?

From the data obtained by these instruments and through on-site visits and sampling conducted by CMI staff, the following observations regarding the water quality in the basin can be made:

Question #1 - Are the WQO established in the new regime being achieved?

On average, over this monitoring period, the water quality objectives (WQO) were met at all 21 sites in the sub basin. Out of the 98 water samples collected on the Indian River Basin, the water quality met the minimum objectives set under the Fish Habitat Management System daily **96.9** percent of the time.

On those occasions when the WQO were not met, and the Total Suspended Solids levels were greater than the objectives, a direct correlation between environmental conditions and the volume of solids in the water was observed. In most cases, rainfall on May 25<sup>th</sup>, August 24<sup>th</sup> and August 25<sup>th</sup>, as either localized events or basin-wide occurrences, increased the amount of surface runoff and subsequent soil erosion from the land, increasing the input of sediment into the receiving waters.

These increases occurred simultaneously at the time of the rainfall event or in a period of one or two days after a rainfall event, as surface water continued draining from the land and groundwater infiltrated the watercourse. There is also the possibility that additional water was released from upstream catchments in order to increase the available freeboard and avoid ponds breaching.

Increases in the sediment-laden ground and surface water entering the system add to the amount of sediment in the water. The ability of the receiving water to dilute these inputs of sediment is negated by the re-suspension of streambed material and by the further erosion of the streams banks that occurs along with the increased flows that are generated by the aftermath of these rain events.

Question #2 - If not, is this due to placer mining activity or to other causes?

In order to fully understand the root cause of the WQO not being achieved, the following information and data will be required:

- a. The extent of placer mining upstream from monitoring sites.
- b. The distance between monitoring sites and placer activity
- c. The timing, flow volume and duration of effluent discharge from upstream sites.
- d. History of forest fire upstream of the monitoring site.
- e. Recent flood events / high water at the time of sampling.
- f. Natural water quality or background.

Heightened sediment inputs and diminished water quality is thought to be due to rain events in the monitored areas. Surface water runoff and groundwater infiltration into a body of water will

intensify the sediment-loading while at the same time increase the rate of flow. The increased flow can scour bank and bed material, compounding the loading. These increases are generally well correlated in the frequency and duration to recorded rainfall events; however, not every time. Spikes in solids concentrations have been observed during periods of no precipitation. Why this occurs is yet to be determined. The additional information requirements listed above would assist in answering this and other related questions.

Knowing exactly from where and when these non-point sources of this additional sediment originate or why they occur is a critical question. Are previously or current mined areas more susceptible to ground and surface erosion than primary old growth and regenerated areas? Are there non-mitigated sources of input and could there be better control of these areas? If results indicate that point source effluent discharge appears to have little to no effect when discharge standards are maintained, and generally, compliance has been the norm, then what is the effect of multiple non-point sources on water quality?

Without the monitoring and evaluation of water quality upstream and downstream of stripped, mined and reclaimed sites and without the collection of additional water quality and flow data of mine effluent discharge in a watershed, most of these questions detailed above will remain unanswered. Any direct causal relationship to mining activity versus other natural environmental occurrences cannot be categorically determined if the additional information and data listed above is not collected, a task which is beyond the scope of this protocol and will have to be addressed through another regime component within the Fish Habitat Management System.

# Indian River Watershed Water Quality Objective Monitoring Sites 2018 (Category B)

## Monitoring Sites

- Energy, Mines and Resources Weather Station and Sampling Site
- Energy, Mines and Resources Sampling Site
- Water Survey of Canada Station
- Community Services Weather Station

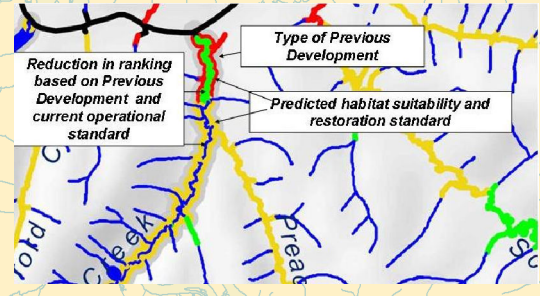
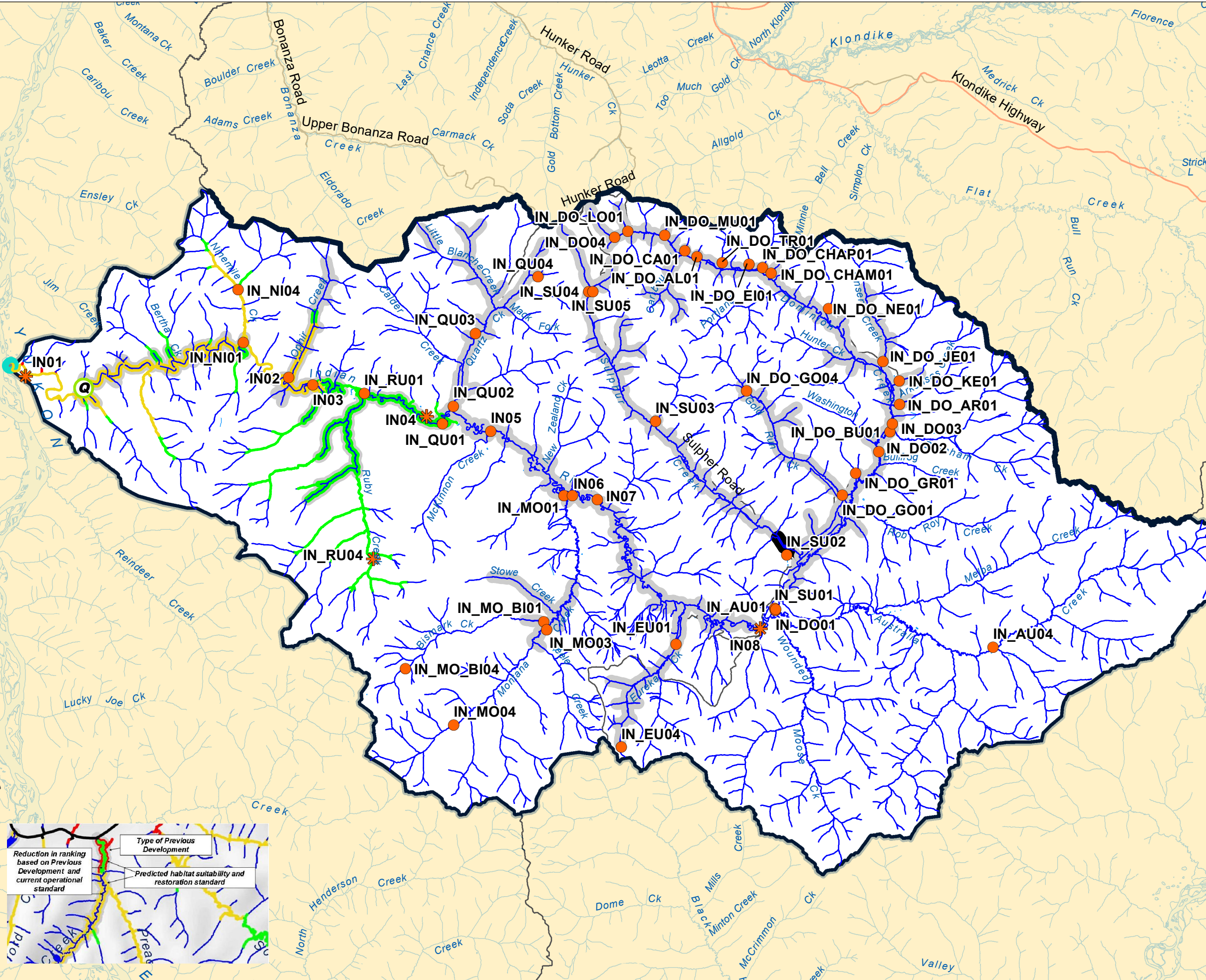
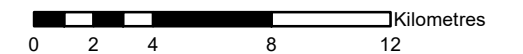
## Stream Reach Classification

- Water Quality
- Low Suitability
- Moderate-Low Suitability
- Moderate-Moderate Suitability
- Moderate-High Suitability
- High Suitability
- Areas of Special Consideration (Ecological)
- Areas of Special Consideration (Cultural)

## Development

- Current
- Historical
- Extensive

This map is provided to depict the location of water quality and weather monitoring sites in relation to streams classified using the Yukon Habitat Suitability Model, and is not intended for any other use. Under no circumstances will the Government of Canada, or Yukon Government be liable to any person or business entity for any direct, indirect, special, incidental, consequential, or other damages based on any use of information contained on this map, including, without limitation, any lost profits, business interruption, or loss of information.





**The Fish Habitat Management System - Indian River Watershed (Category B)**  
**Sample Results that Exceed Water Quality Objectives for 2018**

Sampling Station	IN01	IN_RU01	IN_RU04	IN_QU01	IN_QU03	IN_QU04	IN_MO01	IN_MO BI01
Location Description	Mouth	Ruby Ck Mth	Ruby Ck Backgrd	Quartz CK Mth	Mid Quartz Ck	Quartz Ck Backgrd	Montana Ck Mth	Bismark Ck Mth
Sample Type	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab
Lat Y	63.77794	63.76250	63.66232	63.74262	63.79744	63.83472	63.69702	63.62104
Long X	-139.70927	-139.24583	-139.24286	-139.14003	139.09125	-139.00333	-138.97751	-139.01450
Habitat Classification	Moderate-M	Low	Moderate-L	Low	Low	Low	Low	Low
Water Quality Objective (mg/L)	100	300	80	300	300	300	300	300
Date of Sampling								
23-May-18				20.4		1.2		
24-May-18								
25-May-18	20.8	18.4	1.2				3.6	13.6
11-Jun-18				28.4				
12-Jun-18	26.8	11.6	12.0				34.4	39.6
13-Jun-18					117.5	2.4		
3-Jul-18				28.8	3.6	0.8		
4-Jul-18	34.4	28.0	21.6				12.4	29.6
6-Jul-18								
30-Jul-18				4.4	0.8	12.4		
31-Jul-18	1.6	2.4	4.0				0.8	104.4
1-Aug-18								
23-Aug-18				10.0	4.0	2.8		
24-Aug-18	69.6	63.6	74.4				118.0	142.0
25-Aug-18								
17-Sep-18				5.2	6.8	8.0		
18-Sep-18	45.2	11.6	12.8				4.8	7.2
Average TSS (mg/L) by site	33.1	22.6	21.0	16.2	26.5	4.6	29.0	56.1
Number of days sampled	6	6	6	6	5	6	6	6
Legend	Not continuously monitored Water Samples that are: <b>Above</b> / <b>Below</b> the Water Quality Objective							

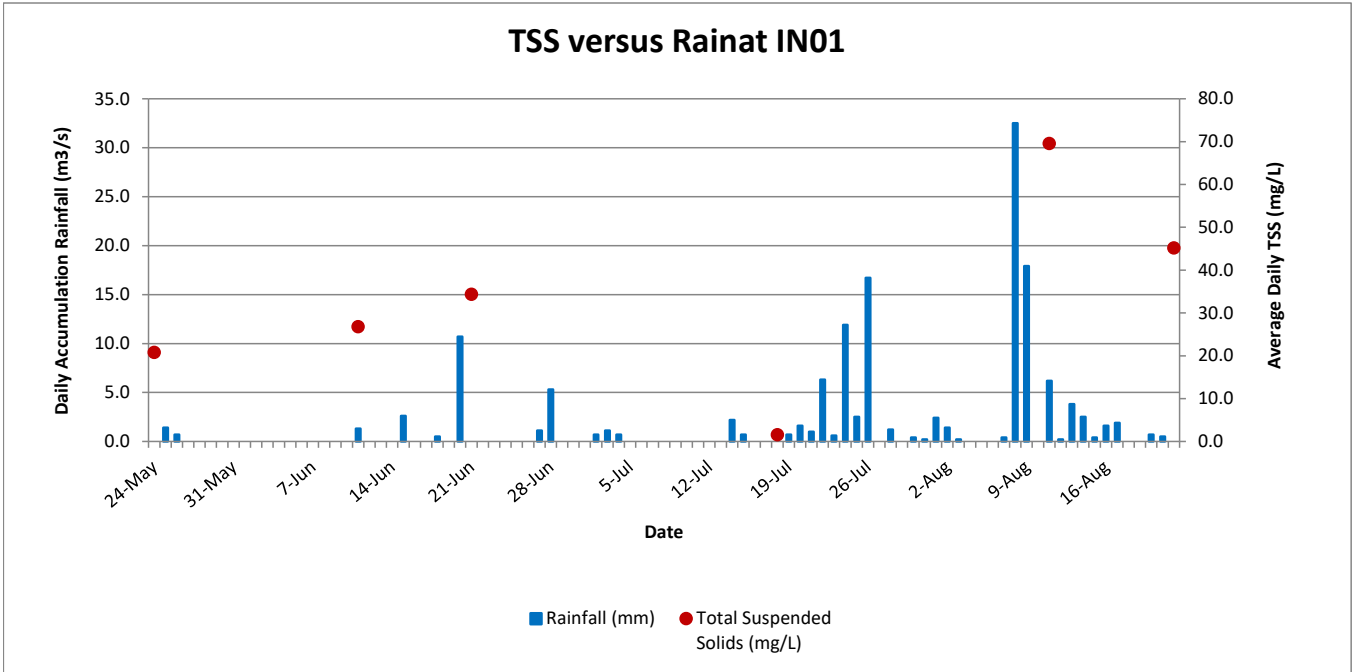
Sampling Station	IN_MO BI04	IN_MO03	IN_MO04	IN08	IN_AU01	IN_AU04	IN_DO01	IN_DO04
Location Description	Bismark Ck Backgrd	Mid Montana Ck	Montana Backgrd	Indian Backgrd	Australia Ck Mouth	Australia Ck Backgrd	Dominion Ck Mth	Dominion Ck Backgrd
Sample Type	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab
Lat Y	63.59500	63.61635	63.55976	63.61241	63.62327	63.59586	63.62363	63.85257
Long X	-139.20073	139.00667	-139.13676	-138.72108	-138.69434	-138.39734	-138.69377	-138.89658
Habitat Classification	Low	Low	Low	Low	Low	Low	Low	Low
Water Quality Objective (mg/L)	300	300	300	300	300	300	300	300
Date of Sampling								
23-May-18								
24-May-18				20.4				
25-May-18	82.0		3.6		29.6	90.4	36.8	34.4
11-Jun-18								
12-Jun-18	20.8	8.4	9.6	21.2	17.6	72.0	24.4	
13-Jun-18								5.6
3-Jul-18								
4-Jul-18	17.6	18.4		14.4	25.6	38.4	34.0	
6-Jul-18								1.6
30-Jul-18								
31-Jul-18	2.0	4.0	2.4	5.6	1.2	1.6	5.2	
1-Aug-18								2.8
23-Aug-18								
24-Aug-18	304	24.8	146.4	16.4	7.2	24.0	29.6	
25-Aug-18								373.6
17-Sep-18								7.2
18-Sep-18	5.6	2.4	8.0	8.8	26.8	4.4	7.6	
Average TSS (mg/L) by site	72	11.6	34	14.5	18	38.5	22.9	70.9
Number of days sampled	6	5	5	6	6	6	6	6
Legend	Not continuously monitored Water Samples that are: <b>Above</b> / <b>Below</b> the Water Quality Objective							

**Indian River Watershed - IN01**

Date	Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)	Comments
25-May	0.0	6.60	14.2	20.8	
26-May	1.4		11.6		
27-May	0.7		12.8		
28-May	0.0		18.1		
29-May	0.0		11.0		
30-May	0.0		13.7		
31-May	0.0		16.2		
1-Jun	0.0		17.1		
2-Jun	0.0		14.9		
3-Jun	0.0		17.7		
4-Jun	0.0		17.1		
5-Jun	0.0		15.5		
6-Jun	0.0		13.4		
7-Jun	0.0		16.1		
8-Jun	0.0		16.1		
9-Jun	0.0		17.4		
10-Jun	0.0		12.8		
11-Jun	0.0		10.9		
12-Jun	1.3	8.30	-3.2	26.8	*arrived to weather station knocked over
13-Jun	0.0		-10.5		
14-Jun	0.0		-8.1		
15-Jun	0.0		-7.4		
16-Jun	2.6		-8.0		
17-Jun	0.0		-7.6		
18-Jun	0.0		-8.8		
19-Jun	0.5		-7.4		
20-Jun	0.0		-5.9		
21-Jun	10.7		-9.4		
4-Jul	0.0	14.50	26.9	34.4	*arrived to weather station knocked over
5-Jul	0.0		15.9		
6-Jul	0.0		17.0		
7-Jul	0.0		18.3		
8-Jul	0.0		20.1		
9-Jul	0.0		16.8		
10-Jul	1.1		14.0		
11-Jul	5.3		14.1		
12-Jul	0.0		12.7		
13-Jul	0.0		17.8		
14-Jul	0.0		15.4		
15-Jul	0.7		15.6		
16-Jul	1.1		14.1		
17-Jul	0.7		13.7		
18-Jul	0.0		15.1		
19-Jul	0.0		13.9		
20-Jul	0.0		17.3		
21-Jul	0.0		19.3		
22-Jul	0.0		21.4		
23-Jul	0.0		21.6		
24-Jul	0.0		21.4		
25-Jul	0.0		21.0		
26-Jul	0.0		19.6		
27-Jul	2.2		18.6		
28-Jul	0.7		16.1		
29-Jul	0.0		20.6		
30-Jul	0.0		19.3		
31-Jul	0.0	17.10	20.3	1.6	
1-Aug	0.7		19.9		
2-Aug	1.6		18.6		
3-Aug	1.0		18.0		



Date	Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)	Comments
4-Aug	6.3		16.1		
5-Aug	0.6		16.1		
6-Aug	11.9		15.1		
7-Aug	2.5		14.9		
8-Aug	16.7		11.5		
9-Aug	0.0		10.4		
10-Aug	1.2		10.7		
11-Aug	0.0		11.7		
12-Aug	0.4		11.9		
13-Aug	0.2		16.0		
14-Aug	2.4		13.7		
15-Aug	1.4		12.7		
16-Aug	0.2		12.5		
17-Aug	0.0		10.8		
18-Aug	0.0		13.1		
19-Aug	0.0		11.4		
20-Aug	0.4		16.0		
21-Aug	32.5		15.4		
22-Aug	17.9		9.6		
23-Aug	0.0		8.0		
24-Aug	6.2	8.8	11.9	69.6	
25-Aug	0.2		11.4		
26-Aug	3.8		7.6		
27-Aug	2.5		11.8		
28-Aug	0.4		11.2		
29-Aug	1.6		9.2		
30-Aug	1.9		5.1		
31-Aug	0.0		7.1		
1-Sep	0.0		5.7		
2-Sep	0.7		9.9		
3-Sep	0.5		1.9		
18-Sep	0.0	1.4	1.9	45.2	*arrived to weather station knocked over

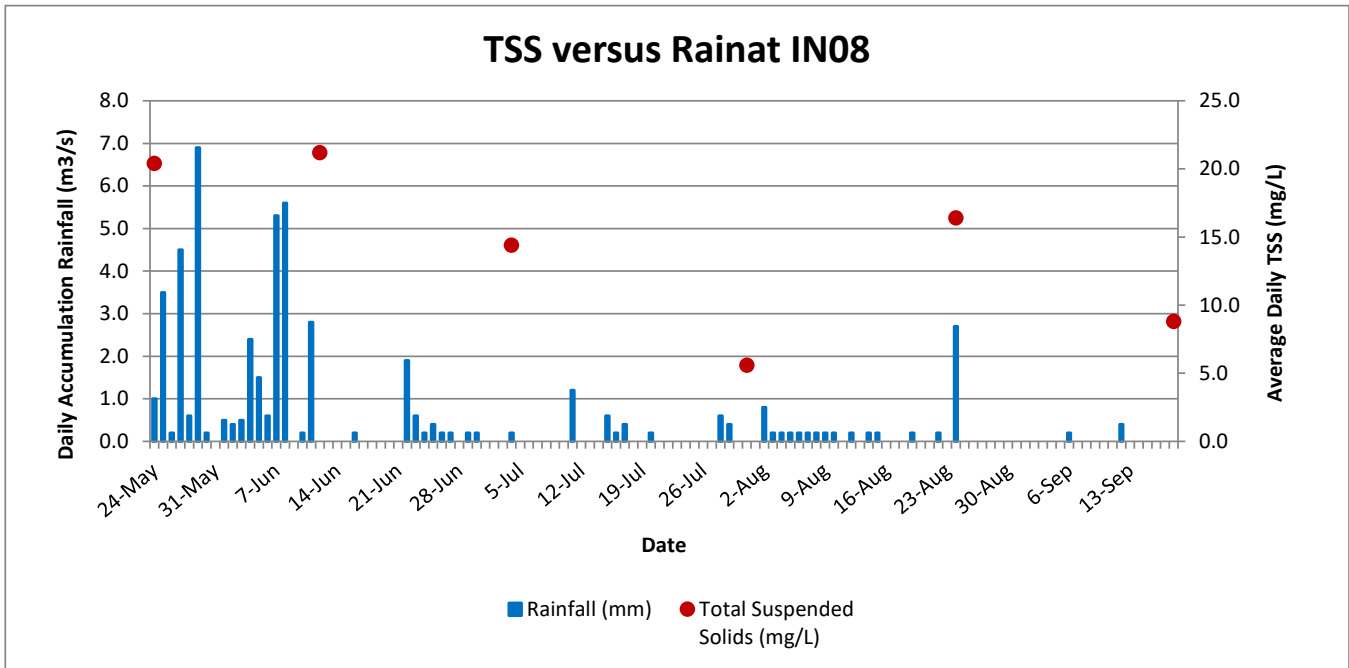


**Indian River Watershed - IN08**

Date	Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)
24-May	1.0	4.2	8.7	20.4
25-May	3.5		8.7	
26-May	0.2		10.1	
27-May	4.5		8.2	
28-May	0.6		12.3	
29-May	6.9		8.8	
30-May	0.2		10.4	
31-May	0		11.4	
1-Jun	0.5		12.6	
2-Jun	0.4		12.5	
3-Jun	0.5		12.8	
4-Jun	2.4		12.8	
5-Jun	1.5		10.8	
6-Jun	0.6		11.2	
7-Jun	5.3		12.5	
8-Jun	5.6		9.9	
9-Jun	0		13.5	
10-Jun	0.2		11.2	
11-Jun	2.8		9.8	
12-Jun	0	7.1	11.5	21.2
13-Jun	0		12.4	
14-Jun	0		14.6	
15-Jun	0		15.9	
16-Jun	0.2		17.1	
17-Jun	0		17.6	
18-Jun	0		17.4	
19-Jun	0		18.8	
20-Jun	0		18.8	
21-Jun	0		22.0	
22-Jun	1.9		16.9	
23-Jun	0.6		15.8	
24-Jun	0.2		14.3	
25-Jun	0.4		15.1	
26-Jun	0.2		12.7	
27-Jun	0.2		13.6	
28-Jun	0		15.7	
29-Jun	0.2		13.9	
30-Jun	0.2		14.3	
1-Jul	0		15.7	
2-Jul	0		16.5	
3-Jul	0		18.2	
4-Jul	0.2	12.7	18.7	14.4
5-Jul	0		15.6	
6-Jul	0		16.1	
7-Jul	0		17.3	
8-Jul	0		19.4	
9-Jul	0		15.4	
10-Jul	0		15.3	
11-Jul	1.2		14.0	
12-Jul	0		12.6	
13-Jul	0		14.9	

Date	Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)
14-Jul	0		13.1	
15-Jul	0.6		12.9	
16-Jul	0.2		12.6	
17-Jul	0.4		11.6	
18-Jul	0		13.3	
19-Jul	0		12.5	
20-Jul	0.2		16.1	
21-Jul	0		17.5	
22-Jul	0		20.0	
23-Jul	0		19.3	
24-Jul	0		19.5	
25-Jul	0		20.1	
26-Jul	0		19.6	
27-Jul	0		17.8	
28-Jul	0.6		14.9	
29-Jul	0.4		19.5	
30-Jul	0		18.2	
31-Jul	0	14.2	18.9	5.6
1-Aug	0		19.1	
2-Aug	0.8		16.7	
3-Aug	0.2		16.9	
4-Aug	0.2		15.4	
5-Aug	0.2		14.9	
6-Aug	0.2		14.3	
7-Aug	0.2		13.5	
8-Aug	0.2		11.5	
9-Aug	0.2		8.9	
10-Aug	0.2		10.1	
11-Aug	0		10.6	
12-Aug	0.2		13.0	
13-Aug	0		15.1	
14-Aug	0.2		12.2	
15-Aug	0.2		10.8	
16-Aug	0		9.8	
17-Aug	0		8.5	
18-Aug	0		11.1	
19-Aug	0.2		10.8	
20-Aug	0		15.6	
21-Aug	0		14.9	
22-Aug	0.2		9.6	
23-Aug	0		7.5	
24-Aug	2.7	7.4	10.0	16.4
25-Aug	0		9.7	
26-Aug	0		8.0	
27-Aug	0		11.9	
28-Aug	0		11.0	
29-Aug	0		8.8	
30-Aug	0		4.2	
31-Aug	0		7.1	
1-Sep	0		4.5	
2-Sep	0		9.8	
3-Sep	0		6.9	

Date	Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)
4-Sep	0		8.4	
5-Sep	0		8.0	
6-Sep	0.2		4.7	
7-Sep	0		6.8	
8-Sep	0		5.5	
9-Sep	0		4.9	
10-Sep	0		5.5	
11-Sep	0		7.8	
12-Sep	0.4		7.3	
13-Sep	0		9.8	
14-Sep	0		2.2	
15-Sep	0		2.1	
16-Sep	0		2.7	
17-Sep	0		2.3	
18-Sep	0	1.4	-4.0	8.8

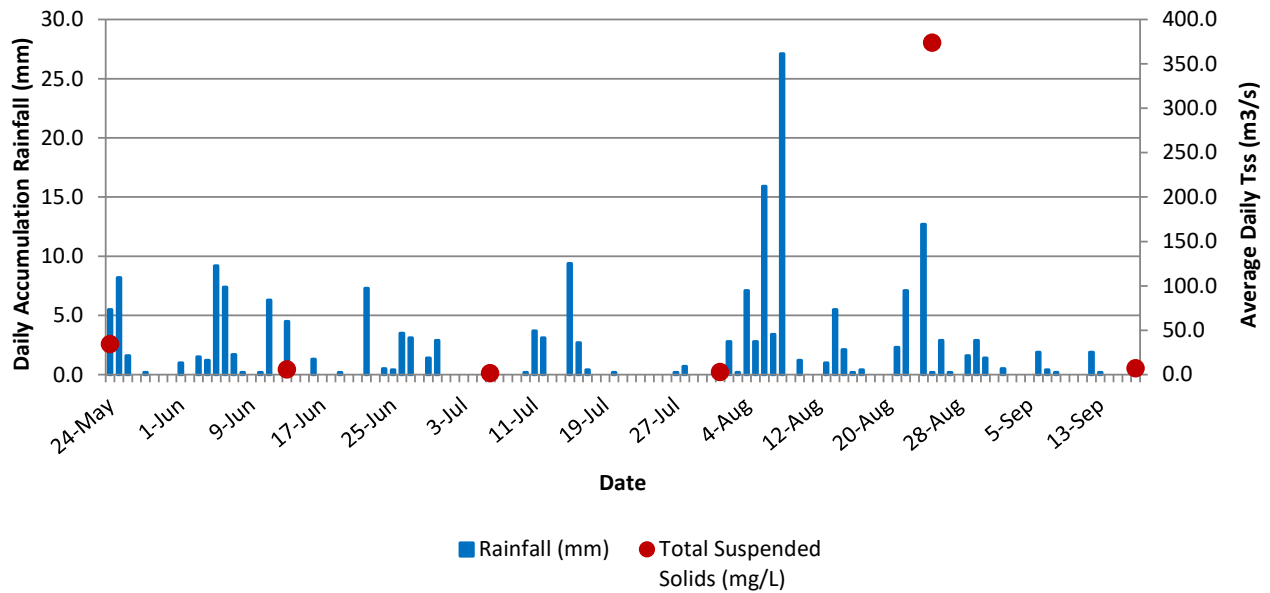


Indian River Watershed - IN_DO04				
Date	Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)
24-May	5.5	0.1	6.6	34.4
25-May	8.2		6.4	
26-May	1.6		6.9	
27-May	0		6.7	
28-May	0.2		9.2	
29-May	0		7.1	
30-May	0		8.9	
31-May	0		9.6	
1-Jun	1		11.2	
2-Jun	0		10.3	
3-Jun	1.5		11.1	
4-Jun	1.2		10.6	
5-Jun	9.2		9.4	
6-Jun	7.4		8.2	
7-Jun	1.7		9.7	
8-Jun	0.2		9.1	
9-Jun	0		12.4	
10-Jun	0.2		9.7	
11-Jun	6.3		7.1	
12-Jun	0		8.9	
13-Jun	4.5	2.7	10.1	5.6
14-Jun	0		12.6	
15-Jun	0		13.9	
16-Jun	1.3		14.6	
17-Jun	0		15.2	
18-Jun	0		16.2	
19-Jun	0.2		17.0	
20-Jun	0		17.9	
21-Jun	0		21.2	
22-Jun	7.3		14.4	
23-Jun	0		15.1	
24-Jun	0.5		13.8	
25-Jun	0.4		12.7	
26-Jun	3.5		11.8	
27-Jun	3.1		11.2	
28-Jun	0		14.7	
29-Jun	1.4		11.9	
30-Jun	2.9		12.1	
1-Jul	0		15.3	
2-Jul	0		16.0	
3-Jul	0		16.8	
4-Jul	0		19.0	
5-Jul	0		15.5	
6-Jul	0	5.7	15.2	1.6
7-Jul	0		16.4	
8-Jul	0		17.6	
9-Jul	0		13.9	
10-Jul	0.2		13.0	
11-Jul	3.7		12.2	

Date	Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)
12-Jul	3.1		10.8	
13-Jul	0		13.8	
14-Jul	0		12.3	
15-Jul	9.4		10.8	
16-Jul	2.7		11.9	
17-Jul	0.4		10.1	
18-Jul	0		12.2	
19-Jul	0		11.9	
20-Jul	0.2		15.4	
21-Jul	0		16.5	
22-Jul	0		18.9	
23-Jul	0		20.3	
24-Jul	0		20.3	
25-Jul	0		20.0	
26-Jul	0		18.4	
27-Jul	0.2		17.7	
28-Jul	0.7		15.1	
29-Jul	0		18.0	
30-Jul	0		19.0	
31-Jul	0		18.6	
1-Aug	0	4.8	19.0	2.8
2-Aug	2.8		16.2	
3-Aug	0.2		15.1	
4-Aug	7.1		13.5	
5-Aug	2.8		12.9	
6-Aug	15.9		12.2	
7-Aug	3.4		12.0	
8-Aug	27.1		9.3	
9-Aug	0		6.5	
10-Aug	1.2		8.1	
11-Aug	0		10.2	
12-Aug	0		11.0	
13-Aug	1		14.1	
14-Aug	5.5		10.5	
15-Aug	2.1		9.3	
16-Aug	0.2		8.9	
17-Aug	0.4		7.9	
18-Aug	0		10.7	
19-Aug	0		9.8	
20-Aug	0		14.5	
21-Aug	2.3		13.7	
22-Aug	7.1		7.9	
23-Aug	0		6.4	
24-Aug	12.7		8.8	
25-Aug	0.2	3.9	8.5	373.6
26-Aug	2.9		7.1	
27-Aug	0.2		10.7	
28-Aug	0		8.7	
29-Aug	1.6		6.9	
30-Aug	2.9		3.2	

Date	Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)
31-Aug	1.4		4.8	
1-Sep	0		3.2	
2-Sep	0.5		7.4	
3-Sep	0		5.6	
4-Sep	0		7.1	
5-Sep	0		6.8	
6-Sep	1.9		4.6	
7-Sep	0.4		5.7	
8-Sep	0.2		4.4	
9-Sep	0		4.1	
10-Sep	0		5.3	
11-Sep	0		6.8	
12-Sep	1.9		6.4	
13-Sep	0.2		8.2	
14-Sep	0		0.7	
15-Sep	0		1.5	
16-Sep	0		1.1	
17-Sep	0	0.0	-3.4	7.2

**TSS versus Rain at IN\_DO04**



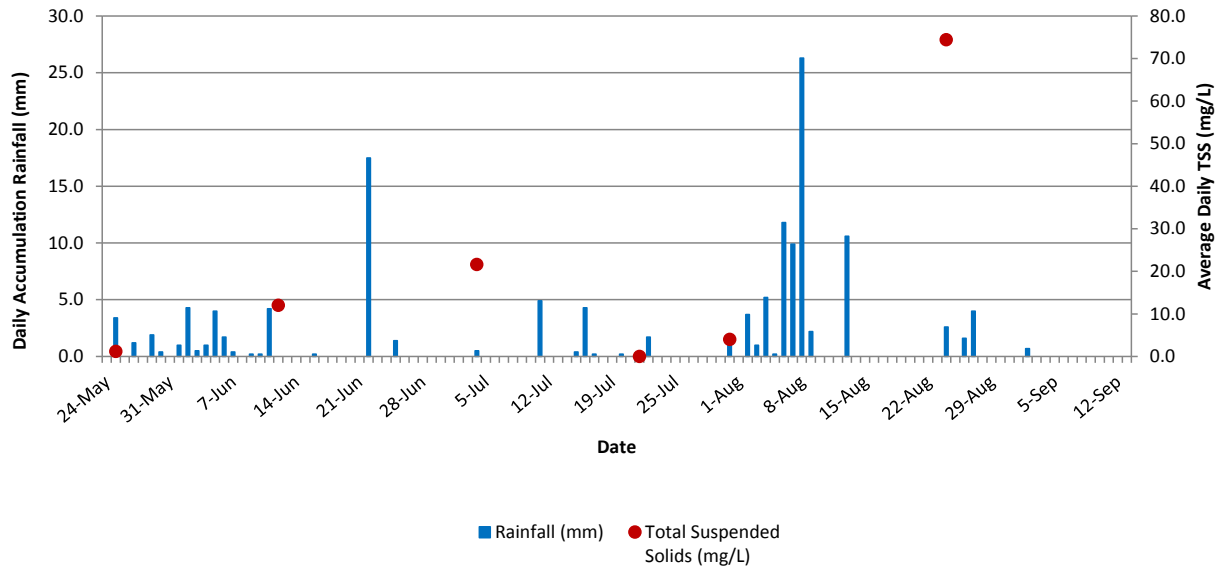


**Indian River Watershed - IN\_RU04**

Date	Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)	Comments
24-May			12.0		
25-May	3.4	1.0	9.1	1.2	
26-May	0		7.5		
27-May	1.2		10.7		
28-May	0		9.0		
29-May	1.9		8.9		
30-May	0.4		11.3		
31-May	0		10.4		
1-Jun	1		10.5		
2-Jun	4.3		11.2		
3-Jun	0.5		13.0		
4-Jun	1		9.7		
5-Jun	4		9.6		
6-Jun	1.7		12.0		
7-Jun	0.4		10.5		
8-Jun	0		12.3		
9-Jun	0.2		10.2		
10-Jun	0.2		8.3		
11-Jun	4.2		10.2		
12-Jun	0	1.7	11.0	12.0	
13-Jun	0		13.8		
14-Jun	0		15.6		
15-Jun	0		15.7		
16-Jun	0.2		16.5		
17-Jun	0		16.3		
18-Jun	0		18.2		
19-Jun	0		18.6		
20-Jun	0		21.0		
21-Jun	0		16.5		
22-Jun	17.5		14.7		
23-Jun	0		14.7		
24-Jun	0		14.3		
25-Jun	1.4		12.8		
26-Jun	0		13.7		
27-Jun	0		14.9		
28-Jun	0		13.0		
29-Jun	0		14.0		
30-Jun	0		16.2		
1-Jul	0		15.7		
2-Jul	0		17.6		
3-Jul	0		18.5		
4-Jul	0.5	5.2	15.1	21.6	*arrived to weather station knocked over
5-Jul	0		15.4		
6-Jul	0		17.9		
7-Jul	0		19.1		
8-Jul	0		15.0		
9-Jul	0		14.7		
10-Jul	0		13.8		
11-Jul	4.9		11.6		
12-Jul	0		14.7		
13-Jul	0		13.0		
14-Jul	0		12.4		
15-Jul	0.4		12.6		
16-Jul	4.3		11.6		
17-Jul	0.2		12.9		
18-Jul	0		12.0		
19-Jul	0		17.0		
20-Jul	0.2		17.4		
21-Jul	0		17.5		

Date	Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)	Comments
22-Jul	1.7		18.6		
23-Jul	0		17.5		
24-Jul	0		16.5		
25-Jul	0		17.0		
26-Jul	0		17.2		
27-Jul	0		14.5		
28-Jul	0		18.1		
29-Jul	0		16.8		
30-Jul	0		17.6		
31-Jul	1.5	6.5	17.8	4.0	
1-Aug	0		16.4		
2-Aug	3.7		15.5		
3-Aug	1		14.9		
4-Aug	5.2		15.2		
5-Aug	0.2		14.7		
6-Aug	11.8		13.7		
7-Aug	9.9		10.6		
8-Aug	26.3		6.8		
9-Aug	2.2		9.4		
10-Aug	0		9.3		
11-Aug	0		12.1		
12-Aug	0		16.4		
13-Aug	10.6		12.6		
14-Aug	0		10.7		
15-Aug	0		10.6		
16-Aug	0		10.2		
17-Aug	0		11.4		
18-Aug	0		9.8		
19-Aug	0		16.3		
20-Aug	0		13.7		
21-Aug	0		9.4		
22-Aug	0		8.2		
23-Aug	0		10.8		
24-Aug	2.6	3.7	9.9	74.4	*arrived to weather station knocked over
25-Aug	0		6.3		
26-Aug	1.6		11.9		
27-Aug	4		9.1		
28-Aug	0		9.8		
29-Aug	0		2.8		
30-Aug	0		8.0		
31-Aug	0		3.2		
1-Sep	0		10.2		
2-Sep	0.7		7.2		
3-Sep	0		7.9		
4-Sep	0		9.5		
5-Sep	0		5.9		
6-Sep	0		8.6		
7-Sep	0		5.8		
8-Sep	0		3.4		
9-Sep	0		4.8		
10-Sep	0		7.4		
11-Sep	0		7.4		
12-Sep	0		11.6		
13-Sep	0		1.7		
14-Sep	0		2.9		
15-Sep	0		1.6		
16-Sep	0		1.9		
17-Sep	0		-10.1		
18-Sep	0	0.0		12.8	

### TSS versus Rain at IN\_RU04



**Indian River Watershed**

LAB_NUMBER	SAMPLE_NUMBER	SAMPLE_DATE	SITE_CODE	TOTAL_SUSPENDED _SOLIDS_MG_L	WATER_QUALITY _OBJECTIVE_MG_L	ABOVE_BELOW _OBJECTIVE	SETTLEABLE_SOLIDS _ML_L	CONDUCTIVITY_USM	pH	TURBIDITY_NTU
18-0001	WQG-18-0001	23-May-18	IN_QU04	1.2	300	Below	0.0	660.0	6.8	24.0
18-0002	WQG-18-0002	23-May-18	IN_QU01	20.4	300	Below	0.0	500.0	7.0	26.0
18-0003	WQG-18-0003	24-May-18	IN_DO04	34.4	300	Below	0.0	335.0	7.2	6.0
18-0004	WQG-18-0004	24-May-18	IN_DO_GO01	56.4	300	Below	0.0	430.0	7.3	51.0
18-0005	WQG-18-0005	24-May-18	IN08	20.4	300	Below	0.0	311.0	7.4	20.0
18-0006	WQG-18-0006	24-May-18	IN_SU05	223.6	300	Below	0.2	287.0	7.4	36.0
18-0007	WQG-18-0007	25-May-18	IN01	20.8	100	Below	0.0	330.0	7.5	24.0
18-0008	WQG-18-0008	25-May-18	IN_RU04	1.2	200	Below	0.0	204.0	7.6	5.0
18-0009	WQG-18-0009	25-May-18	IN_RU01	18.4	300	Below	0.0	267.0	7.6	12.0
18-0010	WQG-18-0010	25-May-18	IN_MO_BI04	82.0	300	Below	0.2	87.0	7.8	21.0
18-0011	WQG-18-0011	25-May-18	IN_MO_BI01	13.6	300	Below	0.0	139.0	7.8	10.0
18-0012	WQG-18-0012	25-May-18	IN_MO04	3.6	300	Below	0.0	146.0	7.7	5.0
18-0013	WQG-18-0013	25-May-18	IN_MO01	3.6	300	Below	0.0	226.0	7.7	7.0
18-0014	WQG-18-0014	25-May-18	IN_EU04	10.8	300	Below	0.0	25.0	8.0	4.0
18-0015	WQG-18-0015	25-May-18	IN_EU01	814.8	300	Above	0.8	492.0	7.4	429.0
18-0016	WQG-18-0016	25-May-18	IN_AU04	90.4	300	Below	0.3	139.0	7.8	55.0
18-0017	WQG-18-0017	25-May-18	IN_AU01	29.6	300	Below	0.0	150.0	7.7	19.0
18-0018	WQG-18-0018	25-May-18	IN_SU01	28.4	300	Below	0.0	535.0	7.4	40.0
18-0019	WQG-18-0019	25-May-18	IN_DO01	36.8	300	Below	0.0	394.0	7.6	23.0
18-0038	WQG-18-0030	11-Jun-18	IN_QU01	28.4	300	Below	0.0	516.0	6.9	69.0
18-0039	WQG-18-0031	12-Jun-18	IN01	26.8	100	Below	0.0	290.0	6.9	30.0
18-0040	WQG-18-0032	12-Jun-18	IN_RU01	11.6	300	Below	0.0	324.0	7.0	11.0
18-0041	WQG-18-0033	12-Jun-18	IN_RU04	12.0	200	Below	0.0	178.0	7.2	8.0
18-0042	WQG-18-0034	12-Jun-18	IN_MO_BI04	20.8	300	Below	0.0	96.0	7.4	10.0
18-0043	WQG-18-0035	12-Jun-18	IN_MO04	9.6	300	Below	0.0	127.0	7.3	4.0
18-0044	WQG-18-0036	12-Jun-18	IN_MO03	8.4	300	Below	0.0	154.0	7.3	6.0
18-0045	WQG-18-0037	12-Jun-18	IN_MO_BI01	39.6	300	Below	0.0	133.0	7.5	23.0
18-0046	WQG-18-0038	12-Jun-18	IN_MO01	34.4	300	Below	0.0	169.0	7.4	30.0
18-0047	WQG-18-0039	12-Jun-18	IN_AU01	17.6	300	Below	0.0	149.0	7.5	10.0
18-0048	WQG-18-0040	12-Jun-18	IN_DO01	24.4	300	Below	0.0	316.0	7.4	25.0
18-0049	WQG-18-0041	12-Jun-18	IN_AU04	72.0	300	Below	0.0	129.0	7.6	17.0
18-0050	WQG-18-0042	12-Jun-18	IN08	21.2	300	Below	0.0	283.0	7.5	18.0
18-0051	WQG-18-0043	13-Jun-18	IN_DO04	5.6	300	Below	0.0	326.0	7.5	3.0
18-0052	WQG-18-0044	13-Jun-18	IN_QU03	117.5	300	Below	0.0	519.0	7.5	240.0
18-0053	WQG-18-0045	13-Jun-18	IN_QU04	2.4	300	Below	0.0	569.0	7.7	6.0
18-0280	WQG-18-068	3-Jul-18	IN_QU01	28.8	300	Below	0.0	529.0	7.0	11.0
18-0281	WQG-18-069	3-Jul-18	IN_QU03	3.6	300	Below	0.0	680.0	6.8	12.0
18-0282	WQG-18-070	3-Jul-18	IN_QU04	0.8	300	Below	0.0	627.0	7.0	0.2
18-0283	WQG-18-071	4-Jul-18	IN01	34.4	100	Below	0.0	299.0	6.9	44.0
18-0284	WQG-18-072	4-Jul-18	IN_RU01	28.0	300	Below	0.0	268.0	7.0	18.0
18-0285	WQG-18-073	4-Jul-18	IN_RU04	21.6	200	Below	0.0	181.0	7.1	10.0
18-0286	WQG-18-074	4-Jul-18	IN_MO_BI04	17.6	300	Below	0.0	101.0	7.3	6.0
18-0287	WQG-18-075	4-Jul-18	IN_MO_BI01	29.6	300	Below	0.0	136.0	7.3	20.0
18-0288	WQG-18-076	4-Jul-18	IN_MO03	18.4	300	Below	0.0	146.0	7.3	6.0
18-0289	WQG-18-077	4-Jul-18	IN_MO01	12.4	300	Below	0.0	161.0	7.3	9.0
18-0290	WQG-18-078	4-Jul-18	IN_AU04	38.4	300	Below	0.0	142.0	7.4	12.0

LAB_NUMBER	SAMPLE_NUMBER	SAMPLE_DATE	SITE_CODE	TOTAL_SUSPENDED _SOLIDS_MG_L	WATER_QUALITY _OBJECTIVE_MG_L	ABOVE_BELOW _OBJECTIVE	SETTLABLE_SOLIDS _ML_L	CONDUCTIVITY_USM	pH	TURBIDITY_NTU
18-0291	WQG-18-079	4-Jul-18	IN_DO01	34.0	300	Below	0.0	361.0	7.2	58.0
18-0292	WQG-18-080	4-Jul-18	IN_AU01	25.6	300	Below	0.0	147.0	7.4	9.0
18-0293	WQG-18-081	4-Jul-18	IN08	14.4	300	Below	0.0	301.0	7.3	22.0
18-0300	WQG-18-088	6-Jul-18	IN_DO04	1.6	300	Below	0.0	475.0	7.4	0.4
18-0541	WQG-18-106	30-Jul-18	IN_QU01	4.4	300	Below	0.0	864.0	8.0	6.0
18-0542	WQG-18-107	30-Jul-18	IN_QU03	0.8	300	Below	0.0	810.0	8.0	0.4
18-0543	WQG-18-108	30-Jul-18	IN_QU04	12.4	300	Below	0.0	1050.0	7.9	0.2
18-0544	WQG-18-109	31-Jul-18	IN01	1.6	100	Below	0.0	476.0	8.1	6.0
18-0545	WQG-18-110	31-Jul-18	IN_RU01	2.4	300	Below	0.0	512.0	8.1	4.0
18-0546	WQG-18-111	31-Jul-18	IN_RU04	4.0	200	Below	0.0	358.0	8.2	0.5
18-0547	WQG-18-112	31-Jul-18	IN_MO_BI04	2.0	300	Below	0.0	199.0	8.3	3.0
18-0548	WQG-18-113	31-Jul-18	IN_MO04	2.4	300	Below	0.0	257.0	8.2	0.4
18-0549	WQG-18-114	31-Jul-18	IN_MO03	4.0	300	Below	0.0	396.0	8.1	2.0
18-0550	WQG-18-115	31-Jul-18	IN_MO_BI01	104.4	300	Below	0.2	244.0	8.1	93.0
18-0551	WQG-18-116	31-Jul-18	IN_MO01	0.8	300	Below	0.0	335.0	7.9	4.0
18-0552	WQG-18-117	31-Jul-18	IN08	5.6	300	Below	0.0	374.0	7.9	8.0
18-0553	WQG-18-118	31-Jul-18	IN_AU01	1.2	300	Below	0.0	205.0	8.2	0.5
18-0554	WQG-18-119	31-Jul-18	IN_DO01	5.2	300	Below	0.0	533.0	7.9	7.0
18-0555	WQG-18-120	31-Jul-18	IN_AU04	1.6	300	Below	0.0	198.0	8.3	0.5
18-0556	WQG-18-121	1-Aug-18	IN_DO04	2.8	300	Below	0.0	539.0	7.9	0.3
18-0697	WQG-18-145	23-Aug-18	IN_QU01	10.0	300	Below	0.0	587.0	8.3	10.0
18-0698	WQG-18-146	23-Aug-18	IN_QU03	4.0	300	Below	0.0	725.0	8.3	9.0
18-0699	WQG-18-147	23-Aug-18	IN_QU04	2.8	300	Below	0.0	730.0	8.2	3.0
18-0700	WQG-18-148	24-Aug-18	IN01	69.6	100	Below	0.0	280.0	8.4	45.0
18-0701	WQG-18-149	24-Aug-18	IN_RU01	63.6	300	Below	0.0	249.0	8.5	26.0
18-0702	WQG-18-150	24-Aug-18	IN_RU04	74.4	200	Below	0.0	152.0	8.5	27.0
18-0703	WQG-18-151	24-Aug-18	IN_MO_BI04	304.0	300	Above	0.8	103.0	8.6	107.0
18-0704	WQG-18-152	24-Aug-18	IN_MO04	146.4	300	Below	0.4	109.0	8.5	48.0
18-0705	WQG-18-153	24-Aug-18	IN_MO03	24.8	300	Below	0.0	141.0	8.5	23.0
18-0706	WQG-18-154	24-Aug-18	IN_MO_BI01	142.0	300	Below	0.3	146.0	8.4	60.0
18-0707	WQG-18-155	24-Aug-18	IN_MO01	118.0	300	Below	0.2	163.0	8.5	38.0
18-0708	WQG-18-156	24-Aug-18	IN_AU04	24.0	300	Below	0.3	162.0	8.4	11.0
18-0709	WQG-18-157	24-Aug-18	IN_AU01	7.2	300	Below	0.3	163.0	8.4	6.0
18-0710	WQG-18-158	24-Aug-18	IN_DO01	29.6	300	Below	0.0	409.0	8.3	41.0
18-0711	WQG-18-159	24-Aug-18	IN08	16.4	300	Below	0.0	291.0	8.4	17.0
18-0718	WQG-18-166	25-Aug-18	IN_DO04	373.6	300	Above	0.6	228.0	8.4	64.0
18-1018	WQG-18-183	17-Sep-18	IN_DO04	7.2	300	Below	0.0	477.0	7.9	3.0
18-1019	WQG-18-184	17-Sep-18	IN_QU01	5.2	300	Below	0.0	674.0	8.1	11.0
18-1020	WQG-18-185	17-Sep-18	IN_QU03	6.8	300	Below	0.0	684.0	8.0	14.0
18-1021	WQG-18-186	17-Sep-18	IN_QU04	8.0	300	Below	0.0	811.0	7.9	10.0
18-1023	WQG-18-188	18-Sep-18	IN01	45.2	100	Below	0.0	370.0	8.1	47.0
18-1024	WQG-18-189	18-Sep-18	IN_RU01	11.6	300	Below	0.0	365.0	8.1	9.0
18-1025	WQG-18-190	18-Sep-18	IN_RU04	12.8	200	Below	0.0	233.0	8.2	5.0
18-1026	WQG-18-191	18-Sep-18	IN_MO_BI04	5.6	300	Below	0.0	177.0	8.2	3.0
18-1027	WQG-18-192	18-Sep-18	IN_MO04	8.0	300	Below	0.0	172.0	8.2	3.0
18-1028	WQG-18-193	18-Sep-18	IN_MO03	2.4	300	Below	0.0	236.0	8.3	3.0
18-1029	WQG-18-194	18-Sep-18	IN_MO_BI01	7.2	300	Below	0.0	186.0	8.1	7.0
18-1030	WQG-18-195	18-Sep-18	IN_MO01	4.8	300	Below	0.0	257.0	8.0	4.0
18-1031	WQG-18-196	18-Sep-18	IN08	8.8	300	Below	0.0	388.0	8.0	15.0
18-1032	WQG-18-197	18-Sep-18	IN_AU04	4.4	300	Below	0.0	181.0	8.2	6.0
18-1033	WQG-18-198	18-Sep-18	IN_AU01	26.8	300	Below	0.0	185.0	8.1	2.0
18-1034	WQG-18-199	18-Sep-18	IN_DO01	7.6	300	Below	0.0	447.0	7.9	10.0

# South Big Salmon Watershed-2018



## **Water Quality Objective Monitoring, Livingstone/South Big Salmon Watershed, 2018**

### **Hydrologic and Geomorphic Characteristics of the South Big Salmon drainage**

The Big Salmon Range is a remote mountain range in the Yukon, Canada. It has an area of 9001 km<sup>2</sup> and is a subrange of the Pelly Mountains, which in turn form part of the Yukon Ranges. Most of its peaks are unnamed. Northwest-trending valleys, occupied by the Nordenskiöld and Big Salmon rivers, the Frenchman Lakes, and the Yukon River downstream of Minto, coincide with inactive fault zones that separate terrains and truncate rock formations.

The upper reaches of the Liard flow to the southeast from the Cassiar Mountains, while the upper reaches of the intermediate-sized Big Salmon River flow to the west from the Pelly Mountains. Other significant smaller streams include the Meister, Hoole, Smart, and Rose, Lapie and North Big Salmon rivers. The ecoregion has relatively few waterbodies, Little Salmon and Drury lakes are the two most major water bodies in the drainage. The coverage by wetlands in the basin is also relatively small, less than 2%.

There are four representative active and historical continuous hydrometric stations: Rancheria, Big Salmon, and South Big Salmon rivers; and Sidney Creek. Annual streamflow in the basin is characterized by a rapid increase in discharge in May, due to snowmelt at lower elevations, rising to a peak in June.

Because of the mountainous topography, there are a number of streams likely to produce a streamflow response that tends to be rapid and flashy. Because this area is also susceptible to intense summer rainstorms, maximum annual flows are frequently produced by these storm events. Some steep, smaller streams are susceptible to mud flows triggered by these summer rainstorms.

Mean annual runoff is moderate with a range in values of 244 to 366 mm, and an ecosystem mean value of 309 mm. Mean seasonal and summer flows are moderate with values of  $19 \times 10^{-3}$  and  $15 \times 10^{-3}$  m<sup>3</sup>/s/km<sup>2</sup>, respectively. The mean annual flood and mean summer flood are moderately low values of  $70 \times 10^{-3}$  and  $35 \times 10^{-3}$  m<sup>3</sup>/s/km<sup>2</sup>, respectively. The minimum annual and summer flows are high and moderate, with values of  $1.7 \times 10^{-3}$  and  $6.1 \times 10^{-3}$  m<sup>3</sup>/s/km<sup>2</sup>, respectively.

Minimum streamflow generally occurs during April, with the relative magnitude higher than more eastern or northern ecoregions because of higher winter temperatures and subsequently greater groundwater contributions. Only very small streams may experience zero winter flows during cold winters.



## Water Quality Objective Monitoring, Livingstone/South Big Salmon Watershed, 2018

### Livingstone/South Big Salmon Basin

Topographical drainage Basin	515 Sq. Kilometers
Area of Lakes	5%
Approximate land cover:	Boreal/subalpine coniferous forest, 50%
	Alpine tundra, 35%
	Alpine Rockland, 10%
ELEVATION RANGE:	600–2,400 m ASL
	Mean elevation 1,350 m ASL
Channel Length (approx.)	102.7 Kilometers
Terrain	75% non-glaciated / 25% glaciated

The Water Survey of Canada gauging station (09AG003) was located just below the confluence of Livingstone Creek with the South Big Salmon River and operated continuously from 1982 until 1998.

Placer deposits in the Livingstone / South Big salmon lie well within the McConnell glacial limit, the most recent glacial advance. Auriferous interglacial gravels formed between the Reid and the McConnell glaciations occupy east-west trending valleys, which are transverse to the direction of ice movement. These placers were buried by several metres of glacial drift, which protected them from the erosive action of the ice, which later scoured the ridges as the ice sheet moved northwestward. The gravels were later re-exposed by a large amount of fluvial down cutting at the end of the glaciation and during a period of post-glacial fluvial reworking. The six major creeks in the area that have received most of the exploration and mining are Martin, Livingstone, Summit, Lake, Cottoneva, and Little Violet. Livingstone and Cottoneva Creeks have the longest drainages and are the most mined, past and present.

In 2018, water samples were collected at nine different sites in the South Big Salmon Watershed. Sampling commenced on June 6<sup>th</sup>, 2018 and 392 ISCO and grab samples were collected up until the end of the season on September 11<sup>th</sup>, 2018<sup>1</sup>. A combination of automatic composite sampling and grab sampling methods were used in the basin.

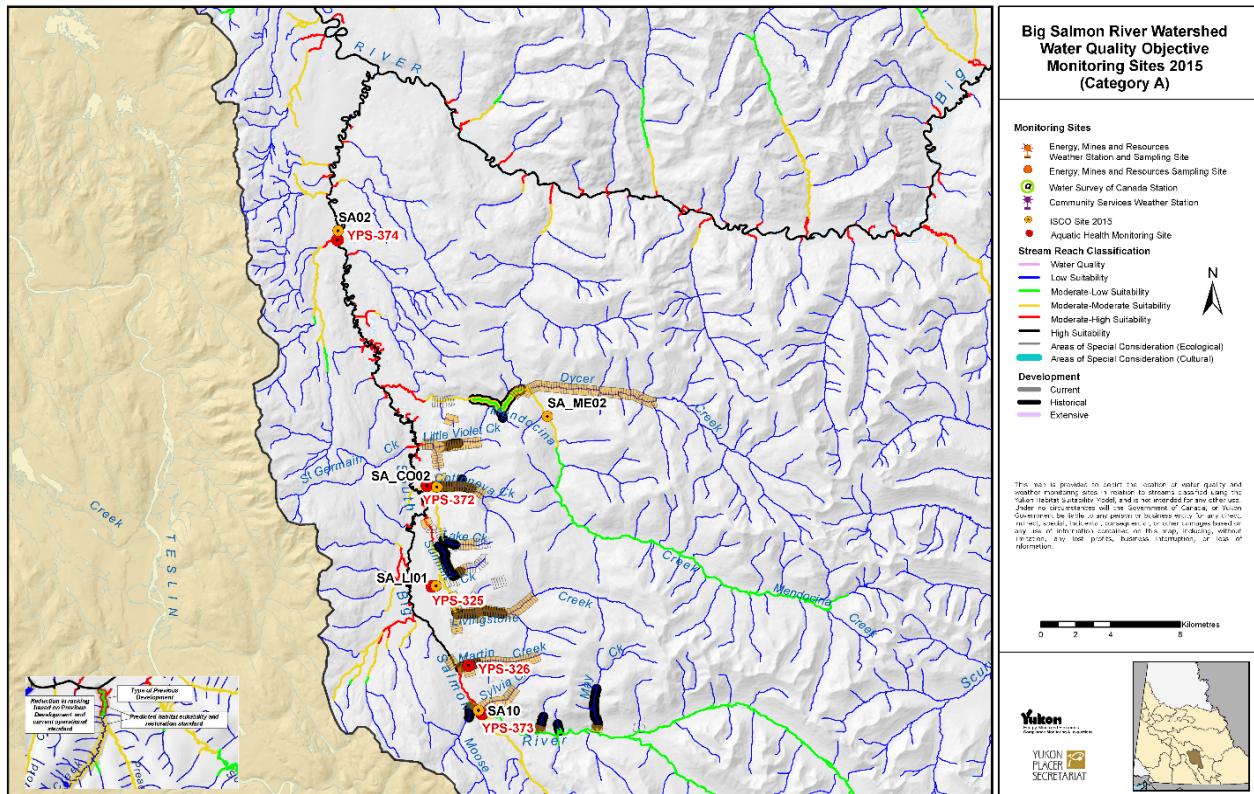
Atmospheric data was collected using two portable weather stations; one located on the South Big Salmon River, downstream Sylvia Creek, the second on the South Big Salmon River, downstream 'Unnamed Creek.'

Total basin flow data is available from the Water Survey of Canada station located near the mouth of the South Big Salmon, but only for the period between 1982 until 1998. Flow data for the individual tributaries to South Big Salmon was collected at the time of sampling by the staff of E.M.R CMI using the methodology outlined in the Yukon Placer Secretariats, Water Quality Monitoring Protocol.

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<sup>1</sup> As part of a separate study and not the FHMS, water, soil, and sediment samples were collected at each site for heavy metals analysis.

# Water Quality Objective Monitoring, Livingstone/South Big Salmon Watershed, 2018



## Site Codes and Global Position of Water Quality Sampling Locations in the South Big Salmon Watershed

SITE_CODE	WATERCOURSE	SITE_DESCRIPTION	LATITUDE_DD	LONGITUDE_DD	WQ_OBJECTIVE (mg/L)
SA_CO01	Cottoneva Creek	Cottoneva Creek mouth			50
SA_CO02	Cottoneva Creek	Cottoneva Creek upstream tributary	61.39361	-134.37056	50
SA_LI01	Livingstone Creek	Livingstone Creek mouth	61.34224	-134.37056	50
SA_LI04	Livingstone Creek		61.33620	134.17120	200
SA_ME_DY01	Mendocina Creek	Dycer Creek mouth			50
SA_ME_DY04	Dycer Creek		61.44623	134.19487	200
SA_ME01	Mendocina Creek	Mendocina mouth			25
SA_ME02	Mendocina Creek	Mendocina upstream Dycer Creek	61.43176	-134.24377	50
SA_ME04	Mendocina Creek		61.32335	133.90634	80
SA01	South Big Salmon	South Big Salmon River mouth			25
SA02	South Big Salmon	South Big Salmon River downstream Unnamed Creek - YPS-374	61.52524	-134.47385	25
SA03	South Big Salmon	South Big Salmon River downstream Mendocina Creek			25
SA04	South Big Salmon	South Big Salmon River downstream Little Violet Creek			25
SA05	South Big Salmon	South Big Salmon River downstream Cottoneva Creek			25
SA06	South Big Salmon	South Big Salmon River downstream Summit Creek			25
SA07	South Big Salmon	South Big Salmon River downstream Livingstone Creek			25
SA08	South Big Salmon	South Big Salmon River downstream Martin Creek			25
SA09	South Big Salmon	South Big Salmon River downstream Moose Creek			25
SA10	South Big Salmon	South Big Salmon River downstream Sylvia Creek	61.27718	-134.30847	25
SA11	South Big Salmon	South Big Salmon River downstream Discovery Claim Pup			80
SA12	South Big Salmon	South Big Salmon River downstream May Creek			80
SA13	South Big Salmon	Upper South Big Salmon River			80

## **Water Quality Objective monitoring, South Big Salmon Watershed – Summary**

Four automatic water-sampling stations were set up and operated from June 6<sup>th</sup> until shutdown on September 11<sup>th</sup> as well as three portable weather-monitoring stations.

On average, over this monitoring period, the water quality met the minimum objectives set under the Fish Habitat Management System daily 97% of the time. On those occasions when the WQO were not met, and the Total Suspended Solids levels were greater than the objectives, a direct correlation between environmental conditions and the volume of solids in the water was observed. In most cases, rainfall, as either localized events or basin-wide occurrences, increased the amount of surface runoff and subsequent soil erosion from the land, increasing the input of sediment into the receiving waters.

On those occasions when the WQO was not met, and the Total Suspended Solids levels were greater than the objectives, a direct correlation between environmental conditions and the volume of solids in the water was observed.

In most cases, rainfall, as either localized events or basin-wide occurrences, increased the amount of surface runoff and subsequent soil erosion from the land, increasing the input of sediment into the receiving waters. Another factor that had a large influence on the watershed was the late snow melt and resulting freshet in mid-June of 2018. A rapid increase in sunshine and the resulting air temperatures instigated an intense surface thaw and meltwater runoff.

These increases occurred simultaneously at the time of a rainfall event or in a period of one or two days after a rainfall event, as surface water continued draining from the land and groundwater infiltrated the watercourse.

Increases in the sediment-laden ground and surface water entering the system add to the amount of sediment in the water. The ability of the receiving water to dilute these inputs of sediment is negated by the re-suspension of streambed material and by the further erosion of the stream banks that occurs along with the increased flows that are generated by the aftermath of these rain events.

Question #2 - If not, is this due to placer mining activity or to other causes?

To fully understand the root cause of the WQO not being achieved, the following information and data will be required:

- a. The extent of placer mining upstream from monitoring sites.
- b. The distance between monitoring sites and placer activity
- c. The timing, flow volume and duration of effluent discharge from upstream sites.
- d. History of forest fire upstream of the monitoring site.
- e. Recent flood events / high water at the time of sampling.
- f. Natural water quality or background.

Heightened sediment inputs and diminished water quality is thought to be due to rain events in the monitored areas. Surface water runoff and groundwater infiltration into a body of water will intensify the sediment-loading while at the same time increase the rate of flow. The increased

flow can scour bank and bed material, compounding the loading. These increases are generally well correlated in the frequency and duration to recorded rainfall events; however, not every time. Spikes in solids concentrations have been observed during periods of no precipitation. Why this occurs is yet to be determined. The additional information requirements listed above would assist in answering this and other related questions.

Knowing exactly from where and when these non-point sources of this additional sediment originate or why they occur is a critical question. Are previously or current mined areas more susceptible to ground and surface erosion than primary, old growth and regenerated areas? Are there non-mitigated sources of input and could there be better control of these areas? If results indicate that point source effluent discharge appears to have little to no effect when discharge standards are maintained, and generally, compliance has been the norm, then what is the effect of multiple non-point sources and effluent exceedances on water quality?

Without the monitoring and evaluation of water quality upstream and downstream of stripped, mined and reclaimed sites and without the collection of additional water quality and flow data of mine effluent discharge in a watershed, most of these questions detailed above will remain unanswered. Any direct causal relationship to mining activity versus other natural environmental occurrences cannot be categorically determined if the additional information and data listed above are not collected, a task which is beyond the scope of this protocol and will have to be addressed through another regime component within the Fish Habitat Management System.

The Fish Habitat Management System - South Big Salmon Watershed (Category A)  
Sample Results that Exceed Water Quality Objectives for 2018

Sampling Station	SA02	SA_ME01	SA_ME04	SA_ME_DY01	SA_ME_DY04	SA_CO02	SA_LI01	SA_LI04	SA10
Location Description	d/s Unnamed Creek - YPS-374	Mendocina Ck mouth	Mendocina Ck AAM	Dycer Ck Mouth	Dycer Ck AAM	Cottoneva Ck u/s tributary	Livingstone Ck Mouth	Livingstone Ck AAM	d/s Sylvia Creek
Type of sampling	Auto/Grab	Auto/Grab	Grab	Auto/Grab	Grab	Auto/Grab	Grab	Grab	Auto/Grab
Lat Y	61.52524	61.44386	61.32335	61.44543	61.44623	61.39361	61.34224	61.33620	61.27718
Long X	-134.47385	-134.42397	133.90634	-134.26137	-134.19487	-134.37056	-134.37056	-134.17120	-134.30847
Habitat Classification	High	Moderate-H	Moderate -L	Moderate-M	Low	Moderate-M	Moderate-M	Low	Moderate-H
Water Quality Objective (mg/L)	25	25	80	50	200	50	50	200	25
Date of Sampling									
6-Jun-18						20.0	8.8	7.2	4.8
7-Jun-18	16.8	8.8	2.8	8.4	5.2	8.8			4.4
8-Jun-18	9.6	0.4				5.6			5.2
9-Jun-18	6.4	5.2				6.8			3.6
10-Jun-18	6.8	6.0				14.0			7.2
11-Jun-18	5.2	5.2				2.4			3.2
12-Jun-18	8.8	7.6				4.0			2.8
13-Jun-18	7.6	6.0				3.6			2.8
14-Jun-18	10.0	2.0				2.0			26.4
15-Jun-18	50.4	46.0				2.4			7.2
16-Jun-18	41.2	7.6				2.4			18.8
17-Jun-18	47.6	10.4				2.0			10.4
18-Jun-18	40.8	8.4				1.6			16.0
19-Jun-18	54.0	18.0				0.8			7.2
20-Jun-18	65.2	22.4				1.2			7.2
21-Jun-18	50.4	3.6				1.6			4.8
22-Jun-18	40.4	6.8				2.8			2.8
23-Jun-18	16.4	10.4				1.6			1.2
24-Jun-18	12.8	8.0				4.8			0.8
25-Jun-18	24.0	5.2				2.4			1.2
26-Jun-18	20.8	3.2	1.2	2.4	2.8	4.0	2.0	2.8	2.4
27-Jun-18	7.6	7.6				9.2			1.6
28-Jun-18	5.2	3.6				2.0			4.4
29-Jun-18	8.4	6.0				9.2			4.4
30-Jun-18	7.6	4.0				3.2			1.6
1-Jul-18	6.8	8.0				8.4			0.4
2-Jul-18	5.6	4.8				2.8			0.8
3-Jul-18	7.6	3.6				7.6			2.0
4-Jul-18	5.6	2.4				4.4			0.8
5-Jul-18	5.2	4.8				78.4			0.8

Type of sampling	Auto/Grab	Auto/Grab	Grab	Auto/Grab	Grab	Auto/Grab	Grab	Grab	Auto/Grab
Lat Y	61.52524	61.44386	61.32335	61.44543	61.44623	61.39361	61.34224	61.33620	61.27718
Long X	-134.47385	-134.42397	133.90634	-134.26137	-134.19487	-134.37056	-134.37056	-134.17120	-134.30847
Habitat Classification	High	Moderate-H	Moderate -L	Moderate-M	Low	Moderate-M	Moderate-M	Low	Moderate-H
Water Quality Objective (mg/L)	25	25	80	50	200	50	50	200	25
6-Jul-18	6.4	4.4				4.0			0.8
7-Jul-18	1.6	2.8							0.8
8-Jul-18	4.8	2.0							2.8
9-Jul-18	6.8	3.6							72.8
10-Jul-18	3.6	1.2							2.0
11-Jul-18	2.8	5.6							2.8
12-Jul-18	0.4	2.0							1.6
13-Jul-18	2.8	7.2							2.0
14-Jul-18	1.2	3.6							4.4
15-Jul-18	2.4	6.4							2.4
16-Jul-18	2.4	2.4							1.6
17-Jul-18	2.0	6.0							0.8
18-Jul-18	2.8	1.6							2.4
19-Jul-18	3.6	7.2	0.8	2.0	2.0	10.4	2.8	2.8	1.6
20-Jul-18	5.2	4.8				3.2			3.2
21-Jul-18	3.6	3.2				2.8			1.2
22-Jul-18	3.6	2.8				1.6			1.6
23-Jul-18	2.8	0.4				5.2			3.2
24-Jul-18	4.0	0.8				3.2			0.8
25-Jul-18	0.8	1.2				3.2			2.8
26-Jul-18	2.0	0.4				3.2			2.4
27-Jul-18	1.2	0.8				3.6			2.8
28-Jul-18	4.8	3.2				2.8			3.2
29-Jul-18	1.2	2.8				4.4			2.0
30-Jul-18	3.6	2.0				2.8			1.2
31-Jul-18	0.8	0.4				2.8			2.8
1-Aug-18	2.8	2.0				3.6			0.8
2-Aug-18	1.6	1.2				3.6			1.6
3-Aug-18	1.2	0.8				3.2			1.2
4-Aug-18	0.8	1.6				6.4			0.8
5-Aug-18	2.4	2.4				5.2			2.4
6-Aug-18	1.6	0.4				4.4			1.6
7-Aug-18	2.4	2.4				4.8			2.8
8-Aug-18	1.2	0.8				8.4			5.2
9-Aug-18	11.6	1.2				17.2			18.8

Type of sampling	Auto/Grab	Auto/Grab	Grab	Auto/Grab	Grab	Auto/Grab	Grab	Grab	Auto/Grab
Lat Y	61.52524	61.44386	61.32335	61.44543	61.44623	61.39361	61.34224	61.33620	61.27718
Long X	-134.47385	-134.42397	133.90634	-134.26137	-134.19487	-134.37056	-134.37056	-134.17120	-134.30847
Habitat Classification	High	Moderate-H	Moderate -L	Moderate-M	Low	Moderate-M	Moderate-M	Low	Moderate-H
Water Quality Objective (mg/L)	25	25	80	50	200	50	50	200	25
10-Aug-18	20.4	3.2				60.8			17.6
11-Aug-18	18.4	14.0				13.2			11.6
12-Aug-18	6.0	14.4				11.2			4.4
13-Aug-18		6.4							
14-Aug-18		2.0							
15-Aug-18	0.4	0.8	0.4	0.8	0.8	0.8	0.8	1.2	1.2
16-Aug-18		2.0				2.0			3.2
17-Aug-18		7.2				1.2			6.4
18-Aug-18	4.0	1.6				1.6			0.4
19-Aug-18	12.0	6.4				1.6			1.6
20-Aug-18	6.8	1.6				1.6			2.8
21-Aug-18	4.0	4.0				1.6			0.8
22-Aug-18	1.6	2.4				1.2			0.4
23-Aug-18	0.4	5.2				3.2			3.6
24-Aug-18	5.2	2.4				1.6			0.8
25-Aug-18	1.2	4.8				0.8			3.6
26-Aug-18	2.8	3.2				1.6			0.8
27-Aug-18	13.2	6.0				4.0			6.0
28-Aug-18	0.8	1.6				0.8			0.8
29-Aug-18	2.0	4.4				2.8			6.4
30-Aug-18	0.8	1.2				0.8			0.4
31-Aug-18	1.2	4.4				4.0			4.8
1-Sep-18	0.8	4.0				22.8			3.2
2-Sep-18	1.2	7.6				12.8			5.2
3-Sep-18	0.8	2.4				4.0			0.4
4-Sep-18	3.2	8.0				7.2			6.4
5-Sep-18	1.2	3.6				1.6			2.0
6-Sep-18	1.6	4.0				4.0			5.6
7-Sep-18	2.0	2.8				3.2			1.2
8-Sep-18	0.8	2.0				6.4			8.4
11-Sep-18	7.2	1.6	2.8	3.2	0.4	1.6	0.8	0.8	2.8
Total Seasonal Average TSS (mg/L) by site	8.9	4.9	2.5	3.4	2.2	6.2	3.0	3.0	4.5
Number of days sampled	91	93	5	5	5	82	5	5	94
Legend	Not continuously monitored Water Samples that are: Above / Below the Water Quality Objective								

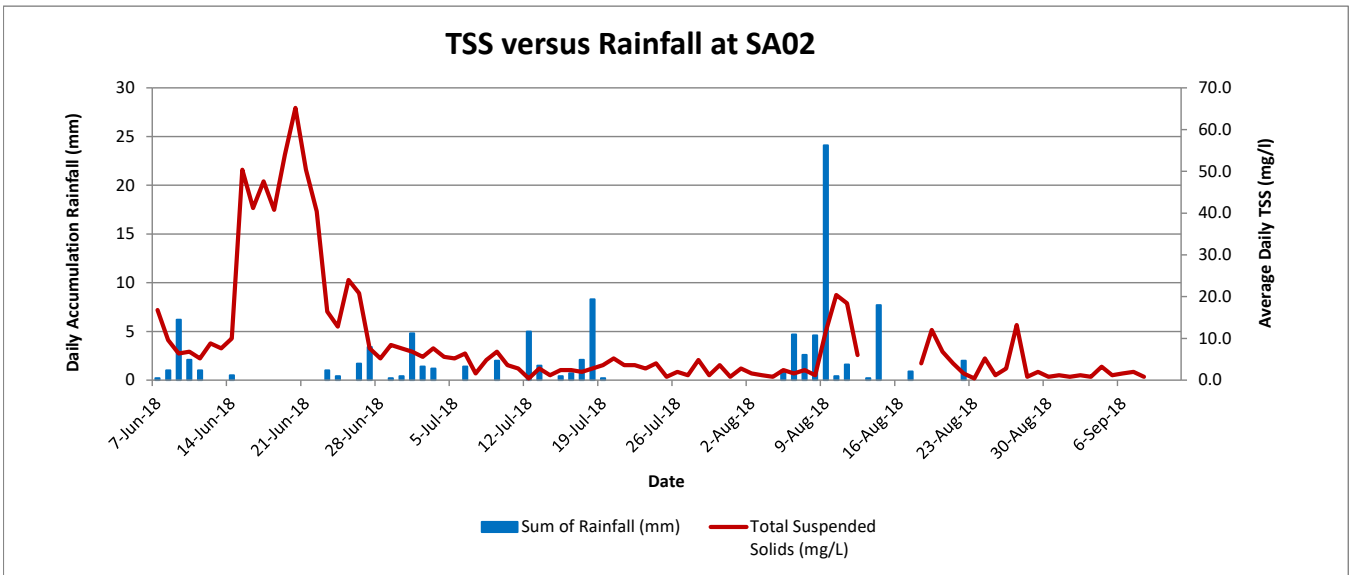
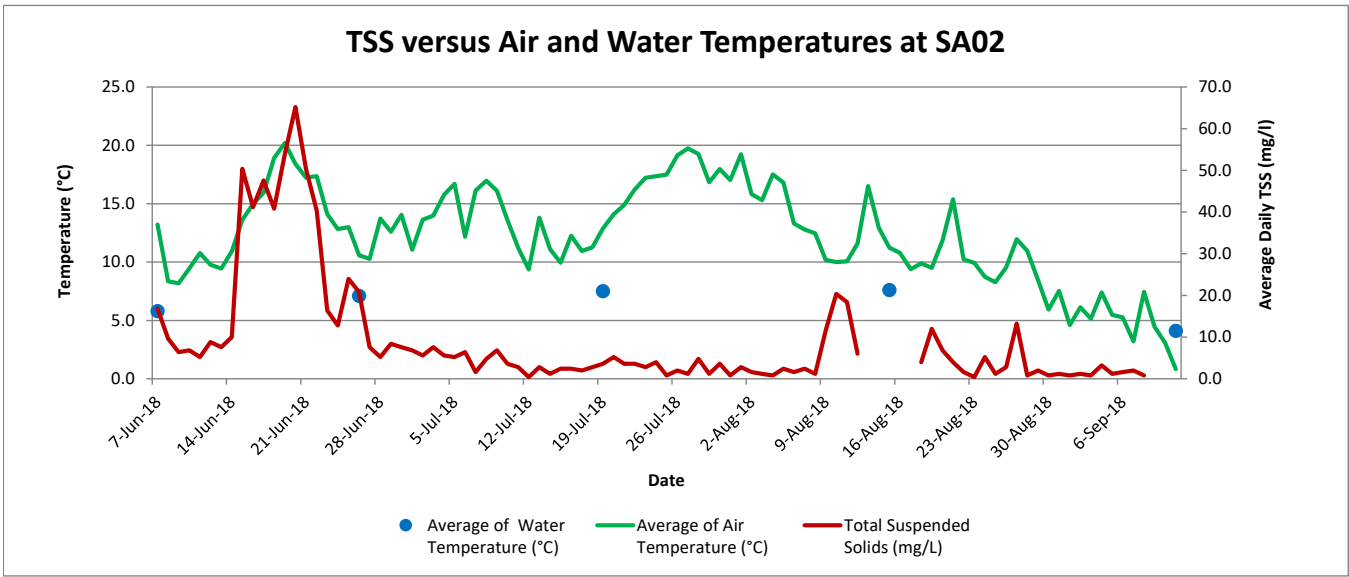
**South Big Salmon Watershed - SA02**

Date	Sum of Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)	Comments
7-Jun-18	0.2	5.8	13.2	16.8	
8-Jun-18	1		8.3	9.6	
9-Jun-18	6.2		8.2	6.4	
10-Jun-18	2.1		9.5	6.8	
11-Jun-18	1		10.8	5.2	
12-Jun-18	0		9.8	8.8	
13-Jun-18	0		9.5	7.6	
14-Jun-18	0.5		10.9	10.0	
15-Jun-18	0		13.6	50.4	
16-Jun-18	0		15.0	41.2	
17-Jun-18	0		16.0	47.6	
18-Jun-18	0		18.9	40.8	
19-Jun-18	0		20.2	54.0	
20-Jun-18	0		18.4	65.2	
21-Jun-18	0		17.2	50.4	
22-Jun-18	0		17.4	40.4	
23-Jun-18	1		14.1	16.4	
24-Jun-18	0.4		12.8	12.8	
25-Jun-18	0		13.0	24.0	
26-Jun-18	1.7	7.1	10.6	20.8	
27-Jun-18	3.4		10.3	7.6	
28-Jun-18	0		13.7	5.2	
29-Jun-18	0.2		12.6	8.4	
30-Jun-18	0.4		14.1	7.6	
1-Jul-18	4.8		11.1	6.8	
2-Jul-18	1.4		13.6	5.6	
3-Jul-18	1.2		14.0	7.6	
4-Jul-18	0		15.8	5.6	
5-Jul-18	0		16.7	5.2	
6-Jul-18	1.4		12.2	6.4	
7-Jul-18	0		16.1	1.6	
8-Jul-18	0		17.0	4.8	
9-Jul-18	2		16.1	6.8	
10-Jul-18	0		13.6	3.6	
11-Jul-18	0		11.2	2.8	
12-Jul-18	5		9.4	0.4	
13-Jul-18	1.5		13.8	2.8	
14-Jul-18	0		11.1	1.2	
15-Jul-18	0.4		10.0	2.4	
16-Jul-18	0.7		12.3	2.4	
17-Jul-18	2.1		11.0	2.0	
18-Jul-18	8.3		11.3	2.8	
19-Jul-18	0.2	7.5	12.9	3.6	
20-Jul-18	0		14.1	5.2	
21-Jul-18	0		14.9	3.6	
22-Jul-18	0		16.2	3.6	
23-Jul-18	0		17.2	2.8	
24-Jul-18	0		17.4	4.0	
25-Jul-18	0		17.5	0.8	
26-Jul-18	0		19.2	2.0	
27-Jul-18	0		19.7	1.2	
28-Jul-18	0		19.3	4.8	
29-Jul-18	0		16.8	1.2	
30-Jul-18	0		18.0	3.6	
31-Jul-18	0		17.0	0.8	
1-Aug-18	0		19.2	2.8	
2-Aug-18	0		15.8	1.6	
3-Aug-18	0		15.3	1.2	
4-Aug-18	0		17.5	0.8	
5-Aug-18	1		16.8	2.4	
6-Aug-18	4.7		13.3	1.6	
7-Aug-18	2.6		12.8	2.4	



Date	Sum of Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)	Comments
8-Aug-18	4.6		12.5	1.2	
9-Aug-18	24.1		10.2	11.6	
10-Aug-18	0.4		10.0	20.4	
11-Aug-18	1.6		10.1	18.4	
12-Aug-18	0		11.6	6.0	
13-Aug-18	0.2		16.5		
14-Aug-18	7.7		12.9		
15-Aug-18	0	7.6	11.2	0.4	
16-Aug-18	0		10.8		
17-Aug-18	0.9		9.4		
18-Aug-18	0		9.9	4.0	
19-Aug-18	0		9.5	12.0	
20-Aug-18	0		11.9	6.8	
21-Aug-18	0		15.4	4.0	
22-Aug-18	2		10.2	1.6	
23-Aug-18	0		9.9	0.4	
24-Aug-18	0		8.7	5.2	
25-Aug-18	0		8.3	1.2	
26-Aug-18	0		9.5	2.8	
27-Aug-18	0		12.0	13.2	
28-Aug-18	0		11.0	0.8	
29-Aug-18	0		8.5	2.0	
30-Aug-18	0		5.9	0.8	
31-Aug-18	0		7.5	1.2	
1-Sep-18	0		4.6	0.8	
2-Sep-18	0		6.1	1.2	
3-Sep-18	0		5.2	0.8	
4-Sep-18	0		7.4	3.2	
5-Sep-18	0		5.5	1.2	
6-Sep-18	0		5.3	1.6	
7-Sep-18	0		3.2	2.0	
8-Sep-18	0		7.5	0.8	
9-Sep-18	0		4.5		
10-Sep-18	0		3.1		
11-Sep-18	0	4.1	0.8	7.2	*arrived to weather station knocked over

Date	Sum of Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)	Comments
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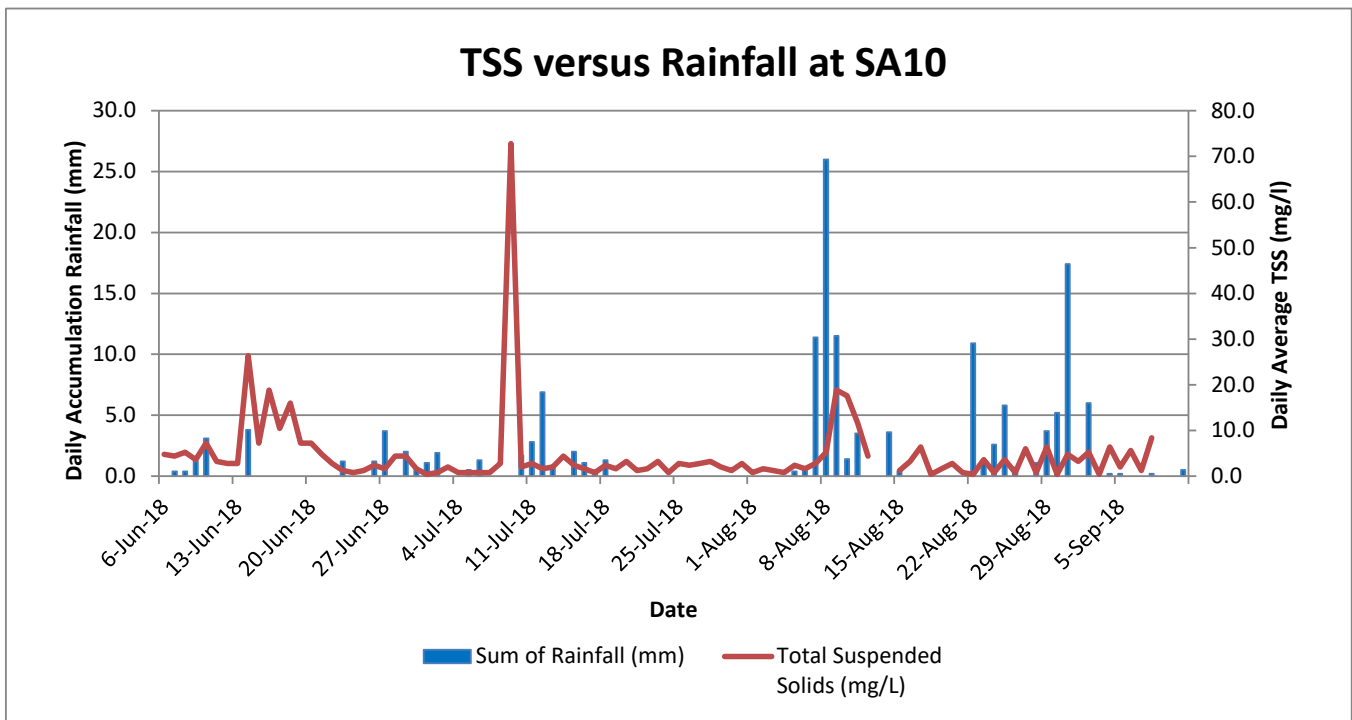
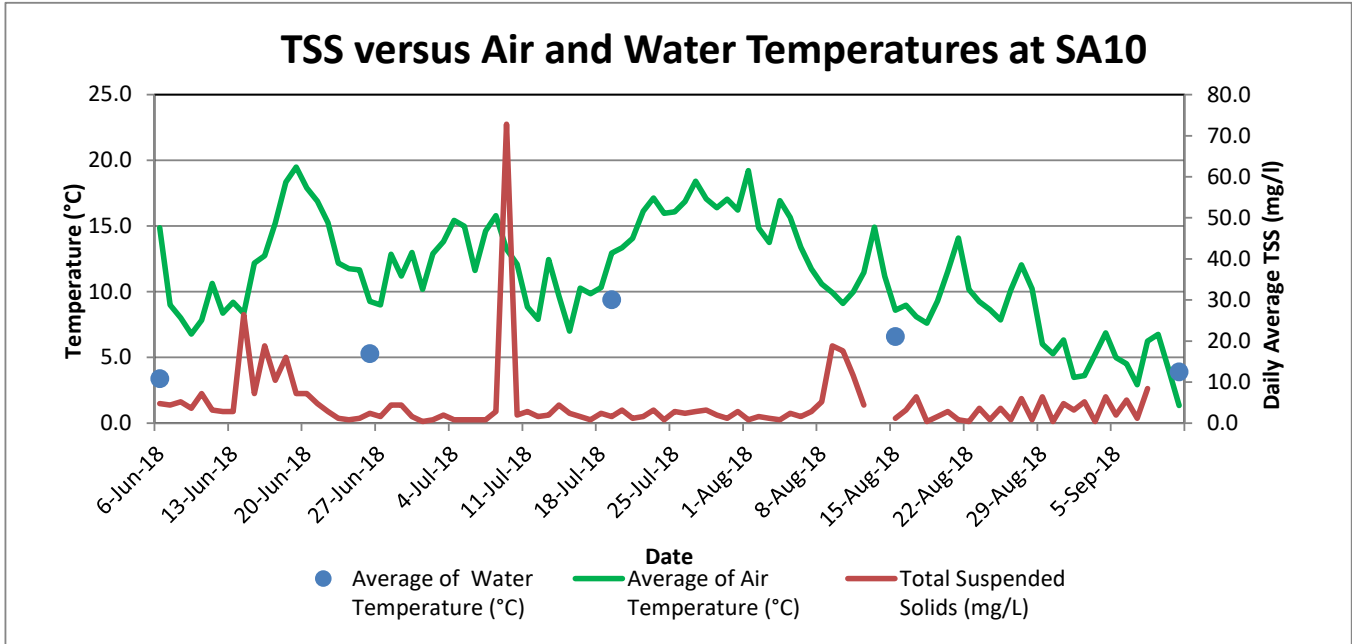


**South Big Salmon Watershed - SA10**

<b>Date</b>	<b>Sum of Rainfall (mm)</b>	<b>Average of Water Temperature (°C)</b>	<b>Average of Air Temperature (°C)</b>	<b>Total Suspended Solids (mg/L)</b>
6-Jun-18	0.0	3.4	14.9	4.8
7-Jun-18	0.4		9.0	4.4
8-Jun-18	0.4		8.0	5.2
9-Jun-18	1.2		6.8	3.6
10-Jun-18	3.1		7.8	7.2
11-Jun-18	0.0		10.6	3.2
12-Jun-18	0.0		8.4	2.8
13-Jun-18	0.0		9.2	2.8
14-Jun-18	3.8		8.3	26.4
15-Jun-18	0.0		12.2	7.2
16-Jun-18	0.0		12.8	18.8
17-Jun-18	0.0		15.2	10.4
18-Jun-18	0.0		18.3	16.0
19-Jun-18	0.0		19.5	7.2
20-Jun-18	0.0		17.9	7.2
21-Jun-18	0.0		16.9	4.8
22-Jun-18	0.0		15.2	2.8
23-Jun-18	1.2		12.2	1.2
24-Jun-18	0.0		11.8	0.8
25-Jun-18	0.0		11.7	1.2
26-Jun-18	1.2	5.3	9.3	2.4
27-Jun-18	3.7		9.0	1.6
28-Jun-18	0.0		12.9	4.4
29-Jun-18	2.0		11.2	4.4
30-Jun-18	0.5		13.0	1.6
1-Jul-18	1.1		10.2	0.4
2-Jul-18	1.9		12.9	0.8
3-Jul-18	0.0		13.8	2.0
4-Jul-18	0.0		15.4	0.8
5-Jul-18	0.5		15.0	0.8
6-Jul-18	1.3		11.6	0.8
7-Jul-18	0.0		14.6	0.8
8-Jul-18	0.0		15.8	2.8
9-Jul-18	0.0		13.2	72.8
10-Jul-18	1.7		12.1	2.0
11-Jul-18	2.8		8.8	2.8
12-Jul-18	6.9		7.9	1.6
13-Jul-18	0.7		12.4	2.0
14-Jul-18	0.0		9.7	4.4
15-Jul-18	2.0		7.0	2.4
16-Jul-18	1.1		10.3	1.6
17-Jul-18	0.2		9.8	0.8
18-Jul-18	1.3		10.3	2.4
19-Jul-18	0.0	9.4	12.9	1.6
20-Jul-18	0.0		13.3	3.2
21-Jul-18	0.0		14.1	1.2
22-Jul-18	0.0		16.1	1.6

Date	Sum of Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)
23-Jul-18	0.0		17.1	3.2
24-Jul-18	0.0		16.0	0.8
25-Jul-18	0.0		16.1	2.8
26-Jul-18	0.0		16.9	2.4
27-Jul-18	0.0		18.4	2.8
28-Jul-18	0.0		17.1	3.2
29-Jul-18	0.0		16.4	2.0
30-Jul-18	0.0		17.0	1.2
31-Jul-18	0.0		16.2	2.8
1-Aug-18	0.0		19.2	0.8
2-Aug-18	0.0		14.8	1.6
3-Aug-18	0.0		13.7	1.2
4-Aug-18	0.0		16.9	0.8
5-Aug-18	0.4		15.7	2.4
6-Aug-18	0.7		13.4	1.6
7-Aug-18	11.4		11.7	2.8
8-Aug-18	26.0		10.6	5.2
9-Aug-18	11.5		10.0	18.8
10-Aug-18	1.4		9.1	17.6
11-Aug-18	3.5		10.0	11.6
12-Aug-18	0.0		11.5	4.4
13-Aug-18	0.0		14.9	
14-Aug-18	3.6		11.2	
15-Aug-18	0.4	6.6	8.6	1.2
16-Aug-18	0.0		9.0	3.2
17-Aug-18	0.0		8.1	6.4
18-Aug-18	0.0		7.6	0.4
19-Aug-18	0.0		9.3	1.6
20-Aug-18	0.0		11.6	2.8
21-Aug-18	0.0		14.1	0.8
22-Aug-18	10.9		10.2	0.4
23-Aug-18	1.2		9.2	3.6
24-Aug-18	2.6		8.6	0.8
25-Aug-18	5.8		7.8	3.6
26-Aug-18	0.7		10.1	0.8
27-Aug-18	0.0		12.1	6.0
28-Aug-18	1.1		10.2	0.8
29-Aug-18	3.7		6.0	6.4
30-Aug-18	5.2		5.3	0.4
31-Aug-18	17.4		6.3	4.8
1-Sep-18	0.0		3.5	3.2
2-Sep-18	6.0		3.6	5.2
3-Sep-18	0.0		5.2	0.4
4-Sep-18	0.2		6.9	6.4
5-Sep-18	0.2		5.0	2.0
6-Sep-18	0.0		4.5	5.6
7-Sep-18	0.0		2.9	1.2
8-Sep-18	0.2		6.2	8.4

Date	Sum of Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)
9-Sep-18	0.0		6.8	
10-Sep-18	0.0		4.1	
11-Sep-18	0.5	3.9	1.3	2.8



Date	Sum of Rainfall (mm)	Average of Water Temperature (°C)	Average of Air Temperature (°C)	Total Suspended Solids (mg/L)
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**South Big Salmon Watershed**

LAB_NUMBER	SAMPLE_NUMBER	SAMPLE_DATE	SITE_CODE	TOTAL_SUSPENDED _SOLIDS_MG_L	WATER_QUALITY _OBJECTIVE_MG_L	ABOVE_BELOW _OBJECTIVE	SETTLABLE _SOLIDS_ML_L	CONDUCTIVITY _USM	pH	TURBIDITY _NTU
18-0028	WQG-18-0021	6-Jun-18	SA10	2.0	25	Below	0.0	56.0	7.5	0.4
18-0029	WQG-18-0022	6-Jun-18	SA_LI01	8.8	50	Below	0.0	128.0	7.5	5.0
18-0030	WQG-18-0023	6-Jun-18	SA_CO02	20.0	50	Below	0.0	213.0	7.4	12.0
18-0031	WQG-18-0024	6-Jun-18	SA_LI04	7.2	300	Below	0.0	91.0	7.6	0.4
18-0032	WQG-18-0025	7-Jun-18	SA02	16.8	25	Below	0.0	187.0	7.6	6.0
18-0033	WQG-18-0026	7-Jun-18	SA_ME01	8.8	25	Below	0.0	203.0	7.6	2.0
18-0034	WQG-18-0027	7-Jun-18	SA_ME_DY01	8.4	50	Below	0.0	226.0	7.6	2.0
18-0035	WQG-18-0028	7-Jun-18	SA_ME_DY04	5.2	200	Below	0.0	222.0	7.6	0.4
18-0036	WQG-18-0029	7-Jun-18	SA_ME04	7.2	80	Below	0.0	259.0	7.7	0.2
18-0155	WQI-18-0145	8-Jun-18	SA02	9.6	25	Below	0.0	185.0	8.5	2.0
18-0123	WQG-18-060	26-Jun-18	SA_ME01	3.2	25	Below	0.0	242.0	7.0	0.4
18-0124	WQG-18-061	26-Jun-18	SA_ME_DY01	2.4	50	Below	0.0	254.0	7.0	0.2
18-0125	WQG-18-062	26-Jun-18	SA_ME_DY04	2.8	200	Below	0.0	249.0	7.2	0.3
18-0126	WQG-18-063	26-Jun-18	SA_ME04	1.2	80	Below	0.0	316.0	7.2	0.3
18-0127	WQG-18-064	26-Jun-18	SA_LI04	2.8	300	Below	0.0	115.0	7.4	0.2
18-0218	WQI-18-0169	6-Jun-18	SA10	4.8	25	Below	0.0	60.0	8.5	0.2
18-0129	WQG-18-066	26-Jun-18	SA_LI01	2.0	50	Below	0.0	156.0	7.5	0.2
18-0130	WQG-18-067	26-Jun-18	SA_CO02	1.6	50	Below	0.0	309.0	7.4	0.3
18-0131	WQI-18-0073	7-Jun-18	SA_CO02	8.8	50	Below	0.0	234.0	8.5	7.0
18-0132	WQI-18-0074	8-Jun-18	SA_CO02	5.6	50	Below	0.0	244.0	8.4	5.0
18-0133	WQI-18-0075	9-Jun-18	SA_CO02	6.8	50	Below	0.0	254.0	8.4	6.0
18-0134	WQI-18-0076	10-Jun-18	SA_CO02	14.0	50	Below	0.0	246.0	8.4	7.0
18-0135	WQI-18-0077	11-Jun-18	SA_CO02	2.4	50	Below	0.0	245.0	8.5	0.4
18-0136	WQI-18-0078	12-Jun-18	SA_CO02	4.0	50	Below	0.0	251.0	8.4	0.4
18-0137	WQI-18-0079	13-Jun-18	SA_CO02	3.6	50	Below	0.0	259.0	8.4	0.4
18-0138	WQI-18-0080	14-Jun-18	SA_CO02	2.0	50	Below	0.0	265.0	8.4	0.5
18-0139	WQI-18-0081	15-Jun-18	SA_CO02	2.4	50	Below	0.0	269.0	8.4	0.4
18-0140	WQI-18-0082	16-Jun-18	SA_CO02	2.4	50	Below	0.0	275.0	8.4	0.3
18-0141	WQI-18-0083	17-Jun-18	SA_CO02	2.0	50	Below	0.0	279.0	8.4	0.5
18-0142	WQI-18-0084	18-Jun-18	SA_CO02	1.6	50	Below	0.0	288.0	8.4	0.4
18-0143	WQI-18-0085	19-Jun-18	SA_CO02	0.8	50	Below	0.0	290.0	8.4	0.4
18-0144	WQI-18-0086	20-Jun-18	SA_CO02	1.2	50	Below	0.0	295.0	8.4	0.4
18-0145	WQI-18-0087	21-Jun-18	SA_CO02	1.6	50	Below	0.0	300.0	8.5	0.3
18-0146	WQI-18-0088	22-Jun-18	SA_CO02	2.8	50	Below	0.0	304.0	8.4	0.3
18-0147	WQI-18-0089	23-Jun-18	SA_CO02	1.6	50	Below	0.0	305.0	8.4	0.3
18-0148	WQI-18-0090	24-Jun-18	SA_CO02	4.8	50	Below	0.0	302.0	8.4	0.4
18-0149	WQI-18-0091	25-Jun-18	SA_CO02	2.4	50	Below	0.0	305.0	8.4	0.3
18-0150	WQI-18-0092	26-Jun-18	SA_CO02	4.0	50	Below	0.0	308.0	8.4	2.0
18-0151	WQI-18-0093	27-Jun-18	SA_CO02		50	Below	Sample empty due to early pick-up			

LAB_NUMBER	SAMPLE_NUMBER	SAMPLE_DATE	SITE_CODE	TOTAL_SUSPENDED _SOLIDS_MG_L	WATER_QUALITY _OBJECTIVE_MG_L	ABOVE_BELOW _OBJECTIVE	SETTLABLE _SOLIDS_ML_L	CONDUCTIVITY _USM	pH	TURBIDITY _NTU
18-0152	WQI-18-0094	28-Jun-18	SA_CO02		50	Below	Sample empty due to early pick-up			
18-0153	WQI-18-0095	29-Jun-18	SA_CO02		50	Below	Sample empty due to early pick-up			
18-0154	WQI-18-0096	30-Jun-18	SA_CO02		50	Below	Sample empty due to early pick-up			
18-0156	WQI-18-0146	9-Jun-18	SA02	6.4	25	Below	0.0	191.0	8.5	2.0
18-0157	WQI-18-0147	10-Jun-18	SA02	6.8	25	Below	0.0	193.0	8.4	5.0
18-0158	WQI-18-0148	11-Jun-18	SA02	5.2	25	Below	0.0	192.0	8.5	4.0
18-0159	WQI-18-0149	12-Jun-18	SA02	8.8	25	Below	0.0	180.0	8.5	2.0
18-0160	WQI-18-0150	13-Jun-18	SA02	7.6	25	Below	0.0	188.0	8.4	2.0
18-0161	WQI-18-0151	14-Jun-18	SA02	10.0	25	Below	0.0	188.0	8.4	3.0
18-0162	WQI-18-0152	15-Jun-18	SA02	50.4	25	Above	0.0	164.0	8.4	12.0
18-0163	WQI-18-0153	16-Jun-18	SA02	41.2	25	Above	0.0	157.0	8.5	10.0
18-0164	WQI-18-0154	17-Jun-18	SA02	47.6	25	Above	0.0	147.0	8.5	11.0
18-0165	WQI-18-0155	18-Jun-18	SA02	40.8	25	Above	0.0	145.0	8.5	8.0
18-0166	WQI-18-0156	19-Jun-18	SA02	54.0	25	Above	0.0	138.0	8.5	9.0
18-0167	WQI-18-0157	20-Jun-18	SA02	65.2	25	Above	0.0	149.0	8.5	5.0
18-0168	WQI-18-0158	21-Jun-18	SA02	50.4	25	Above	0.0	160.0	8.5	5.0
18-0169	WQI-18-0159	22-Jun-18	SA02	40.4	25	Above	0.0	165.0	8.4	5.0
18-0170	WQI-18-0160	23-Jun-18	SA02	16.4	25	Below	0.0	177.0	8.4	4.0
18-0171	WQI-18-0161	24-Jun-18	SA02	12.8	25	Below	0.0	189.0	8.4	4.0
18-0172	WQI-18-0162	25-Jun-18	SA02	24.0	25	Below	0.0	201.0	8.4	4.0
18-0122	WQG-18-059	26-Jun-18	SA02	11.2	25	Below	0.0	213.0	7.2	0.3
18-0173	WQI-18-0163	26-Jun-18	SA02	20.8	25	Below	0.0	208.0	8.4	5.0
18-0174	WQI-18-0164	27-Jun-18	SA02		25	Below	Sample empty due to early pick-up			
18-0434	WQI-18-0241	27-Jun-18	SA02	7.6	25	Below	0.0	218.0	8.0	4.0
18-0175	WQI-18-0165	28-Jun-18	SA02		25	Below	Sample empty due to early pick-up			
18-0435	WQI-18-0242	28-Jun-18	SA02	5.2	25	Below	0.0	206.0	8.1	4.0
18-0176	WQI-18-0166	29-Jun-18	SA02		25	Below	Sample empty due to early pick-up			
18-0194	WQI-18-0121	8-Jun-18	SA_ME01	0.4	25	Below	0.0	216.0	8.3	2.0
18-0195	WQI-18-0122	9-Jun-18	SA_ME01	5.2	25	Below	0.0	223.0	8.3	0.3
18-0196	WQI-18-0123	10-Jun-18	SA_ME01	6.0	25	Below	0.0	225.0	8.3	0.4
18-0197	WQI-18-0124	11-Jun-18	SA_ME01	5.2	25	Below	0.0	216.0	8.3	0.4
18-0198	WQI-18-0125	12-Jun-18	SA_ME01	7.6	25	Below	0.0	208.0	8.3	0.4
18-0199	WQI-18-0126	13-Jun-18	SA_ME01	6.0	25	Below	0.0	222.0	8.3	0.3
18-0200	WQI-18-0127	14-Jun-18	SA_ME01	2.0	25	Below	0.0	224.0	8.3	0.3
18-0201	WQI-18-0128	15-Jun-18	SA_ME01	46.0	25	Above	0.0	177.0	8.3	9.0
18-0202	WQI-18-0129	16-Jun-18	SA_ME01	7.6	25	Below	0.0	186.0	8.3	3.0
18-0203	WQI-18-0130	17-Jun-18	SA_ME01	10.4	25	Below	0.0	166.0	8.3	3.0
18-0204	WQI-18-0131	18-Jun-18	SA_ME01	8.4	25	Below	0.0	176.0	8.3	3.0
18-0205	WQI-18-0132	19-Jun-18	SA_ME01	18.0	25	Below	0.0	166.0	8.3	0.3
18-0206	WQI-18-0133	20-Jun-18	SA_ME01	22.4	25	Below	0.0	175.0	8.3	0.4



LAB_NUMBER	SAMPLE_NUMBER	SAMPLE_DATE	SITE_CODE	TOTAL_SUSPENDED _SOLIDS_MG_L	WATER_QUALITY _OBJECTIVE_MG_L	ABOVE_BELOW _OBJECTIVE	SETTLABLE _SOLIDS_ML_L	CONDUCTIVITY _USM	pH	TURBIDITY _NTU
18-0207	WQI-18-0134	21-Jun-18	SA_ME01	3.6	25	Below	0.0	196.0	8.3	0.3
18-0208	WQI-18-0135	22-Jun-18	SA_ME01	6.8	25	Below	0.0	202.0	8.2	0.4
18-0209	WQI-18-0136	23-Jun-18	SA_ME01	10.4	25	Below	0.0	218.0	8.1	2.0
18-0210	WQI-18-0137	24-Jun-18	SA_ME01	8.0	25	Below	0.0	227.0	8.2	3.0
18-0211	WQI-18-0138	25-Jun-18	SA_ME01	5.2	25	Below	0.0	241.0	8.1	2.0
18-0212	WQI-18-0139	26-Jun-18	SA_ME01	7.6	25	Below	0.0	245.0	8.2	2.0
18-0213	WQI-18-0140	27-Jun-18	SA_ME01		25	Below	Sample empty due to early pick-up			
18-0214	WQI-18-0141	28-Jun-18	SA_ME01		25	Below	Sample empty due to early pick-up			
18-0215	WQI-18-0142	29-Jun-18	SA_ME01		25	Below	Sample empty due to early pick-up			
18-0216	WQI-18-0143	30-Jun-18	SA_ME01		25	Below	Sample empty due to early pick-up			
18-0217	WQI-18-0144	1-Jul-18	SA_ME01		25	Below	Sample empty due to early pick-up			
18-0219	WQI-18-0170	7-Jun-18	SA10	4.4	25	Below		61.0	8.6	0.2
18-0220	WQI-18-0171	8-Jun-18	SA10	5.2	25	Below	0.0	63.0	8.5	0.3
18-0221	WQI-18-0172	9-Jun-18	SA10	3.6	25	Below	0.0	70.0	8.5	0.2
18-0222	WQI-18-0173	10-Jun-18	SA10	7.2	25	Below	0.0	60.0	8.5	3.0
18-0223	WQI-18-0174	11-Jun-18	SA10	3.2	25	Below		59.0	8.5	0.2
18-0224	WQI-18-0175	12-Jun-18	SA10	2.8	25	Below		60.0	8.5	0.3
18-0225	WQI-18-0176	13-Jun-18	SA10	2.8	25	Below	0.0	60.0	8.4	0.2
18-0226	WQI-18-0177	14-Jun-18	SA10	26.4	25	Above	0.0	48.0	8.3	10.0
18-0227	WQI-18-0178	15-Jun-18	SA10	7.2	25	Below	0.0	52.0	8.5	3.0
18-0228	WQI-18-0179	16-Jun-18	SA10	18.8	25	Below	0.0	46.0	8.4	4.0
18-0229	WQI-18-0180	17-Jun-18	SA10	10.4	25	Below	0.0	51.0	8.4	3.0
18-0230	WQI-18-0181	18-Jun-18	SA10	16.0	25	Below	0.0	48.0	8.4	3.0
18-0231	WQI-18-0182	19-Jun-18	SA10	7.2	25	Below	0.0	53.0	8.5	3.0
18-0232	WQI-18-0183	20-Jun-18	SA10	7.2	25	Below	0.0	55.0	8.3	2.0
18-0233	WQI-18-0184	21-Jun-18	SA10	4.8	25	Below	0.0	56.0	8.4	0.2
18-0234	WQI-18-0185	22-Jun-18	SA10	2.8	25	Below	0.0	62.0	8.4	0.2
18-0235	WQI-18-0186	23-Jun-18	SA10	1.2	25	Below	0.0	70.0	8.4	0.2
18-0236	WQI-18-0187	24-Jun-18	SA10	0.8	25	Below	0.0	69.0	8.3	0.2
18-0237	WQI-18-0188	25-Jun-18	SA10	1.2	25	Below		73.0	8.4	0.2
18-0128	WQG-18-065	26-Jun-18	SA10	2.4	25	Below	0.0	70.0	7.6	0.2
18-0238	WQI-18-0189	26-Jun-18	SA10		25	Below	Sample empty due to early pick-up			
18-0239	WQI-18-0190	27-Jun-18	SA10		25	Below	Sample empty due to early pick-up			
18-0410	WQI-18-0265	27-Jun-18	SA10	1.6	25	Below	0.0	74.0	8.3	0.3
18-0240	WQI-18-0191	28-Jun-18	SA10		25	Below	Sample empty due to early pick-up			
18-0436	WQI-18-0243	29-Jun-18	SA02	8.4	25	Below	0.0	218.0	8.0	2.0
18-0345	WQG-18-098	19-Jul-18	SA_ME01	4.8	25	Below	0.0	247.0	8.0	0.2
18-0346	WQG-18-099	19-Jul-18	SA_ME_DY01	2.0	50	Below	0.0	285.0	7.9	0.3
18-0347	WQG-18-100	19-Jul-18	SA_ME_DY04	2.0	200	Below	0.0	276.0	8.0	0.2
18-0348	WQG-18-101	19-Jul-18	SA_ME04	0.8	80	Below	0.0	349.0	7.9	0.2

LAB_NUMBER	SAMPLE_NUMBER	SAMPLE_DATE	SITE_CODE	TOTAL_SUSPENDED _SOLIDS_MG_L	WATER_QUALITY _OBJECTIVE_MG_L	ABOVE_BELOW _OBJECTIVE	SETTLEABLE _SOLIDS_ML_L	CONDUCTIVITY _USM	pH	TURBIDITY _NTU
18-0349	WQG-18-102	19-Jul-18	SA_LI04	2.8	300	Below	0.0	144.0	8.1	0.3
18-0411	WQI-18-0266	28-Jun-18	SA10	4.4	25	Below	0.0	71.0	8.2	0.2
18-0351	WQG-18-104	19-Jul-18	SA_LI01	2.8	50	Below	0.0	176.0	8.1	0.2
18-0352	WQG-18-105	19-Jul-18	SA_CO02	10.4	50	Below	0.0	304.0	7.9	0.3
18-0241	WQI-18-0192	29-Jun-18	SA10		25	Below	Sample empty due to early pick-up			
18-0412	WQI-18-0267	29-Jun-18	SA10	4.4	25	Below	0.0	79.0	8.2	0.2
18-0413	WQI-18-0268	30-Jun-18	SA10	1.6	25	Below	0.0	77.0	8.3	0.2
18-0414	WQI-18-0269	1-Jul-18	SA10	0.4	25	Below	0.0	79.0	8.2	0.2
18-0415	WQI-18-0270	2-Jul-18	SA10	0.8	25	Below	0.0	79.0	8.2	0.2
18-0416	WQI-18-0271	3-Jul-18	SA10	2.0	25	Below	0.0	78.0	8.3	0.2
18-0417	WQI-18-0272	4-Jul-18	SA10	0.8	25	Below	0.0	80.0	8.1	0.2
18-0418	WQI-18-0273	5-Jul-18	SA10	0.8	25	Below	0.0	84.0	8.2	0.2
18-0419	WQI-18-0274	6-Jul-18	SA10	0.8	25	Below	0.0	91.0	8.1	0.2
18-0420	WQI-18-0275	7-Jul-18	SA10	0.8	25	Below	0.0	84.0	8.2	0.2
18-0421	WQI-18-0276	8-Jul-18	SA10	2.8	25	Below	0.0	85.0	8.2	0.2
18-0422	WQI-18-0277	9-Jul-18	SA10	72.8	25	Above	0.0	86.0	8.1	0.2
18-0423	WQI-18-0278	10-Jul-18	SA10	2.0	25	Below	0.0	90.0	8.1	0.2
18-0424	WQI-18-0279	11-Jul-18	SA10	2.8	25	Below	0.0	91.0	8.1	0.2
18-0425	WQI-18-0280	12-Jul-18	SA10	1.6	25	Below	0.0	94.0	8.1	0.2
18-0426	WQI-18-0281	13-Jul-18	SA10	2.0	25	Below	0.0	89.0	8.2	0.1
18-0427	WQI-18-0282	14-Jul-18	SA10	4.4	25	Below	0.0	90.0	8.1	0.1
18-0428	WQI-18-0283	15-Jul-18	SA10	2.4	25	Below	0.0	94.0	8.2	0.2
18-0429	WQI-18-0284	16-Jul-18	SA10	1.6	25	Below	0.0	97.0	8.2	0.2
18-0430	WQI-18-0285	17-Jul-18	SA10	0.8	25	Below	0.0	95.0	8.2	0.2
18-0431	WQI-18-0286	18-Jul-18	SA10	2.4	25	Below	0.0	92.0	8.1	0.2
18-0350	WQG-18-103	19-Jul-18	SA10	0.8	25	Below	0.0	93.0	8.2	0.2
18-0432	WQI-18-0287	19-Jul-18	SA10	1.6	25	Below		93.0	8.2	0.2
18-0433	WQI-18-0288	20-Jul-18	SA10		25	Below	Sample empty due to early pick-up			
18-0177	WQI-18-0167	30-Jun-18	SA02		25	Below	Sample empty due to early pick-up			
18-0437	WQI-18-0244	30-Jun-18	SA02	7.6	25	Below		223.0	8.1	0.2
18-0178	WQI-18-0168	1-Jul-18	SA02		25	Below	Sample empty due to early pick-up			
18-0438	WQI-18-0245	1-Jul-18	SA02	6.8	25	Below	0.0	221.0	8.1	2.0
18-0439	WQI-18-0246	2-Jul-18	SA02	5.6	25	Below	0.0	220.0	8.1	2.0
18-0440	WQI-18-0247	3-Jul-18	SA02	7.6	25	Below	0.0	227.0	8.1	2.0
18-0441	WQI-18-0248	4-Jul-18	SA02	5.6	25	Below	0.0	222.0	8.1	0.3
18-0442	WQI-18-0249	5-Jul-18	SA02	5.2	25	Below	0.0	228.0	8.1	0.2
18-0443	WQI-18-0250	6-Jul-18	SA02	6.4	25	Below	0.0	236.0	8.1	0.1
18-0444	WQI-18-0251	7-Jul-18	SA02	1.6	25	Below	0.0	234.0	8.1	0.2
18-0445	WQI-18-0252	8-Jul-18	SA02	4.8	25	Below	0.0	234.0	8.1	1.0
18-0446	WQI-18-0253	9-Jul-18	SA02	6.8	25	Below	0.0	240.0	8.1	1.0

LAB_NUMBER	SAMPLE_NUMBER	SAMPLE_DATE	SITE_CODE	TOTAL_SUSPENDED _SOLIDS_MG_L	WATER_QUALITY _OBJECTIVE_MG_L	ABOVE_BELOW _OBJECTIVE	SETTLABLE _SOLIDS_ML_L	CONDUCTIVITY _USM	pH	TURBIDITY _NTU
18-0447	WQI-18-0254	10-Jul-18	SA02	3.6	25	Below	0.0	246.0	8.1	0.2
18-0448	WQI-18-0255	11-Jul-18	SA02	2.8	25	Below	0.0	249.0	8.1	0.2
18-0449	WQI-18-0256	12-Jul-18	SA02	0.4	25	Below	0.0	249.0	8.1	0.2
18-0450	WQI-18-0257	13-Jul-18	SA02	2.8	25	Below	0.0	249.0	8.1	2.0
18-0451	WQI-18-0258	14-Jul-18	SA02	1.2	25	Below	0.0	230.0	8.1	0.2
18-0452	WQI-18-0259	15-Jul-18	SA02	2.4	25	Below	0.0	247.0	8.1	2.0
18-0453	WQI-18-0260	16-Jul-18	SA02	2.4	25	Below	0.0	250.0	8.1	0.2
18-0454	WQI-18-0261	17-Jul-18	SA02	2.0	25	Below	0.0	254.0	8.1	0.2
18-0455	WQI-18-0262	18-Jul-18	SA02	2.8	25	Below	0.0	251.0	8.1	0.2
18-0344	WQG-18-097	19-Jul-18	SA02	2.0	25	Below	0.0	247.0	7.8	0.2
18-0456	WQI-18-0263	19-Jul-18	SA02	3.6	25	Below		245.0	8.1	3.0
18-0457	WQI-18-0264	20-Jul-18	SA02		25	Below	Sample empty due to early pick-up			
18-0458	WQI-18-0289	27-Jun-18	SA_ME01	3.6	25	Below	0.0	240.0	8.2	0.2
18-0459	WQI-18-0290	28-Jun-18	SA_ME01	6.0	25	Below	0.0	230.0	8.2	0.3
18-0460	WQI-18-0291	29-Jun-18	SA_ME01	4.0	25	Below	0.0	245.0	8.2	0.2
18-0461	WQI-18-0292	30-Jun-18	SA_ME01	8.0	25	Below	0.0	252.0	8.2	0.2
18-0462	WQI-18-0293	1-Jul-18	SA_ME01	4.8	25	Below	0.0	250.0	8.2	0.2
18-0463	WQI-18-0294	2-Jul-18	SA_ME01	3.6	25	Below	0.0	247.0	8.1	0.2
18-0464	WQI-18-0295	3-Jul-18	SA_ME01	2.4	25	Below	0.0	245.0	8.2	0.2
18-0465	WQI-18-0296	4-Jul-18	SA_ME01	4.8	25	Below	0.0	245.0	8.2	0.2
18-0466	WQI-18-0297	5-Jul-18	SA_ME01	4.4	25	Below	0.0	255.0	8.2	0.2
18-0467	WQI-18-0298	6-Jul-18	SA_ME01	2.8	25	Below	0.0	259.0	8.2	0.2
18-0468	WQI-18-0299	7-Jul-18	SA_ME01	2.0	25	Below	0.0	259.0	8.2	0.2
18-0469	WQI-18-0300	8-Jul-18	SA_ME01	3.6	25	Below	0.0	262.0	8.2	0.2
18-0470	WQI-18-0301	9-Jul-18	SA_ME01	1.2	25	Below	0.0	266.0	8.1	0.2
18-0471	WQI-18-0302	10-Jul-18	SA_ME01	5.6	25	Below	0.0	271.0	8.2	0.2
18-0472	WQI-18-0303	11-Jul-18	SA_ME01	2.0	25	Below	0.0	276.0	8.2	0.2
18-0473	WQI-18-0304	12-Jul-18	SA_ME01	7.2	25	Below	0.0	274.0	8.2	0.2
18-0474	WQI-18-0305	13-Jul-18	SA_ME01	3.6	25	Below	0.0	256.0	8.2	0.2
18-0475	WQI-18-0306	14-Jul-18	SA_ME01	6.4	25	Below	0.0	256.0	8.2	0.2
18-0476	WQI-18-0307	15-Jul-18	SA_ME01	2.4	25	Below	0.0	271.0	8.2	0.2
18-0477	WQI-18-0308	16-Jul-18	SA_ME01	6.0	25	Below	0.0	275.0	8.1	0.2
18-0478	WQI-18-0309	17-Jul-18	SA_ME01	1.6	25	Below	0.0	275.0	8.2	0.2
18-0479	WQI-18-0310	18-Jul-18	SA_ME01	7.2	25	Below	0.0	271.0	8.2	0.2
18-0480	WQI-18-0311	19-Jul-18	SA_ME01	3.2	25	Below		272.0	8.2	0.2
18-0481	WQI-18-0312	20-Jul-18	SA_ME01		25	Below	Sample empty due to early pick-up			
18-0482	WQI-18-0313	27-Jun-18	SA_CO02	9.2	50	Below	0.0	303.0	8.1	0.2
18-0483	WQI-18-0314	28-Jun-18	SA_CO02	2.0	50	Below	0.0	292.0	8.2	0.1
18-0484	WQI-18-0315	29-Jun-18	SA_CO02	9.2	50	Below	0.0	298.0	8.2	0.2
18-0485	WQI-18-0316	30-Jun-18	SA_CO02	3.2	50	Below	0.0	301.0	8.2	0.2

LAB_NUMBER	SAMPLE_NUMBER	SAMPLE_DATE	SITE_CODE	TOTAL_SUSPENDED _SOLIDS_MG_L	WATER_QUALITY _OBJECTIVE_MG_L	ABOVE_BELOW _OBJECTIVE	SETTLABLE _SOLIDS_ML_L	CONDUCTIVITY _USM	pH	TURBIDITY _NTU
18-0486	WQI-18-0317	1-Jul-18	SA_CO02	8.4	50	Below	0.0	303.0	8.2	0.2
18-0487	WQI-18-0318	2-Jul-18	SA_CO02	2.8	50	Below	0.0	297.0	8.2	0.2
18-0488	WQI-18-0319	3-Jul-18	SA_CO02	7.6	50	Below	0.0	299.0	8.2	0.2
18-0489	WQI-18-0320	4-Jul-18	SA_CO02	4.4	50	Below	0.0	312.0	8.2	0.2
18-0490	WQI-18-0321	5-Jul-18	SA_CO02	78.4	50	Above	0.0	318.0	8.1	16.0
18-0491	WQI-18-0322	6-Jul-18	SA_CO02	4.0	50	Below	0.0	312.0	8.2	4.0
18-0492	WQI-18-0323	7-Jul-18	SA_CO02		50	Below	Sample empty due to equipment failure			
18-0493	WQI-18-0324	8-Jul-18	SA_CO02		50	Below	Sample empty due to equipment failure			
18-0494	WQI-18-0325	9-Jul-18	SA_CO02		50	Below	Sample empty due to equipment failure			
18-0495	WQI-18-0326	10-Jul-18	SA_CO02		50	Below	Sample empty due to equipment failure			
18-0496	WQI-18-0327	11-Jul-18	SA_CO02		50	Below	Sample empty due to equipment failure			
18-0497	WQI-18-0328	12-Jul-18	SA_CO02		50	Below	Sample empty due to equipment failure			
18-0498	WQI-18-0329	13-Jul-18	SA_CO02		50	Below	Sample empty due to equipment failure			
18-0499	WQI-18-0330	14-Jul-18	SA_CO02		50	Below	Sample empty due to equipment failure			
18-0500	WQI-18-0331	15-Jul-18	SA_CO02		50	Below	Sample empty due to equipment failure			
18-0501	WQI-18-0332	16-Jul-18	SA_CO02		50	Below	Sample empty due to equipment failure			
18-0502	WQI-18-0333	17-Jul-18	SA_CO02		50	Below	Sample empty due to equipment failure			
18-0503	WQI-18-0334	18-Jul-18	SA_CO02		50	Below	Sample empty due to equipment failure			
18-0504	WQI-18-0335	19-Jul-18	SA_CO02		50	Below	Sample empty due to equipment failure			
18-0505	WQI-18-0336	20-Jul-18	SA_CO02		50	Below	Sample empty due to equipment failure			
18-0797	WQI-18-0361	20-Jul-18	SA02	5.2	25	Below	0.0	264.0	8.4	0.3
18-0570	WQG-18-136	15-Aug-18	SA_ME01	0.8	25	Below	0.0	261.0	7.8	0.4
18-0571	WQG-18-137	15-Aug-18	SA_ME_DY01	0.8	50	Below	0.0	278.0	8.4	0.2
18-0572	WQG-18-138	15-Aug-18	SA_ME_DY04	0.8	200	Below	0.0	268.0	8.4	0.2
18-0573	WQG-18-139	15-Aug-18	SA_ME04	0.4	80	Below	0.0	293.0	8.4	0.2
18-0574	WQG-18-140	15-Aug-18	SA_LI04	1.2	300	Below	0.0	159.0	8.5	0.2
18-0645	WQI-18-0385	20-Jul-18	SA10	3.2	25	Below	0.0	105.0	8.5	0.2
18-0576	WQG-18-142	15-Aug-18	SA_LI01	0.8	50	Below	0.0	185.0	8.4	0.2
18-0577	WQG-18-143	15-Aug-18	SA_CO02	0.8	50	Below	0.0	311.0	8.2	0.3
18-0646	WQI-18-0386	21-Jul-18	SA10	1.2	25	Below	0.0	99.0	8.5	0.9
18-0647	WQI-18-0387	22-Jul-18	SA10	1.6	25	Below	0.0	106.0	8.4	0.2
18-0648	WQI-18-0388	23-Jul-18	SA10	3.2	25	Below	0.0	116.0	8.3	0.2
18-0649	WQI-18-0389	24-Jul-18	SA10	0.8	25	Below	0.0	112.0	8.4	0.2
18-0650	WQI-18-0390	25-Jul-18	SA10	2.8	25	Below	0.0	116.0	8.4	0.2
18-0651	WQI-18-0391	26-Jul-18	SA10	2.4	25	Below	0.0	123.0	8.4	0.1
18-0652	WQI-18-0392	27-Jul-18	SA10	2.8	25	Below	0.0	118.0	8.3	0.1
18-0653	WQI-18-0393	28-Jul-18	SA10	3.2	25	Below	0.0	113.0	8.4	0.2
18-0654	WQI-18-0394	29-Jul-18	SA10	2.0	25	Below	0.0	116.0	8.4	0.1
18-0655	WQI-18-0395	30-Jul-18	SA10	1.2	25	Below	0.0	127.0	8.3	0.2
18-0656	WQI-18-0396	31-Jul-18	SA10	2.8	25	Below	0.0	121.0	8.4	0.2

LAB_NUMBER	SAMPLE_NUMBER	SAMPLE_DATE	SITE_CODE	TOTAL_SUSPENDED _SOLIDS_MG_L	WATER_QUALITY _OBJECTIVE_MG_L	ABOVE_BELOW _OBJECTIVE	SETTLABLE _SOLIDS_ML_L	CONDUCTIVITY _USM	pH	TURBIDITY _NTU
18-0657	WQI-18-0397	1-Aug-18	SA10	0.8	25	Below	0.0	114.0	8.4	0.2
18-0658	WQI-18-0398	2-Aug-18	SA10	1.6	25	Below	0.0	114.0	8.4	0.1
18-0659	WQI-18-0399	3-Aug-18	SA10	1.2	25	Below	0.0	120.0	8.4	0.2
18-0660	WQI-18-0400	4-Aug-18	SA10	0.8	25	Below	0.0	117.0	8.4	0.1
18-0661	WQI-18-0401	5-Aug-18	SA10	2.4	25	Below	0.0	123.0	8.3	0.2
18-0662	WQI-18-0402	6-Aug-18	SA10	1.6	25	Below	0.0	135.0	8.4	0.2
18-0663	WQI-18-0403	7-Aug-18	SA10	2.8	25	Below	0.0	120.0	8.4	0.2
18-0664	WQI-18-0404	8-Aug-18	SA10	5.2	25	Below	0.0	104.0	8.4	0.2
18-0665	WQI-18-0405	9-Aug-18	SA10	18.8	25	Below	0.0	90.0	8.5	3.0
18-0666	WQI-18-0406	10-Aug-18	SA10	17.6	25	Below	0.0	71.0	8.5	3.0
18-0667	WQI-18-0407	11-Aug-18	SA10	11.6	25	Below	0.0	85.0	8.4	0.2
18-0668	WQI-18-0408	12-Aug-18	SA10	4.4	25	Below	0.0	78.0	8.5	0.3
18-0575	WQG-18-141	15-Aug-18	SA10	1.2	25	Below	0.0	76.0	8.6	0.2
18-0749	WQI-18-0433	20-Jul-18	SA_CO02	3.2	50	Below	0.0	321.0	8.1	0.1
18-0750	WQI-18-0434	21-Jul-18	SA_CO02	2.8	50	Below	0.0	324.0	8.1	0.2
18-0751	WQI-18-0435	22-Jul-18	SA_CO02	1.6	50	Below	0.0	342.0	8.1	0.2
18-0752	WQI-18-0436	23-Jul-18	SA_CO02	5.2	50	Below	0.0	330.0	8.1	0.2
18-0753	WQI-18-0437	24-Jul-18	SA_CO02	3.2	50	Below	0.0	334.0	8.1	0.2
18-0754	WQI-18-0438	25-Jul-18	SA_CO02	3.2	50	Below	0.0	336.0	8.2	0.2
18-0755	WQI-18-0439	26-Jul-18	SA_CO02	3.2	50	Below	0.0	341.0	8.2	0.2
18-0756	WQI-18-0440	27-Jul-18	SA_CO02	3.6	50	Below	0.0	355.0	8.2	0.2
18-0757	WQI-18-0441	28-Jul-18	SA_CO02	2.8	50	Below	0.0	344.0	8.2	0.1
18-0758	WQI-18-0442	29-Jul-18	SA_CO02	4.4	50	Below	0.0	344.0	8.2	0.2
18-0759	WQI-18-0443	30-Jul-18	SA_CO02	2.8	50	Below	0.0	347.0	8.3	0.2
18-0760	WQI-18-0444	31-Jul-18	SA_CO02	2.8	50	Below	0.0	351.0	8.3	0.2
18-0761	WQI-18-0445	1-Aug-18	SA_CO02	3.6	50	Below	0.0	349.0	8.3	0.2
18-0762	WQI-18-0446	2-Aug-18	SA_CO02	3.6	50	Below	0.0	353.0	8.2	0.2
18-0763	WQI-18-0447	3-Aug-18	SA_CO02	3.2	50	Below	0.0	361.0	8.3	0.2
18-0764	WQI-18-0448	4-Aug-18	SA_CO02	6.4	50	Below	0.0	355.0	8.3	0.2
18-0765	WQI-18-0449	5-Aug-18	SA_CO02	5.2	50	Below	0.0	361.0	8.3	0.2
18-0766	WQI-18-0450	6-Aug-18	SA_CO02	4.4	50	Below	0.0	361.0	8.3	0.2
18-0767	WQI-18-0451	7-Aug-18	SA_CO02	4.8	50	Below	0.0	351.0	8.3	0.2
18-0768	WQI-18-0452	8-Aug-18	SA_CO02	8.4	50	Below	0.0	353.0	8.3	0.2
18-0769	WQI-18-0453	9-Aug-18	SA_CO02	17.2	50	Below	0.0	320.0	8.2	3.0
18-0770	WQI-18-0454	10-Aug-18	SA_CO02	60.8	50	Above	0.0	271.0	8.3	16.0
18-0771	WQI-18-0455	11-Aug-18	SA_CO02	13.2	50	Below	0.0	260.0	8.3	2.0
18-0772	WQI-18-0456	12-Aug-18	SA_CO02	11.2	50	Below	0.0	273.0	8.4	0.3
18-0773	WQI-18-0409	20-Jul-18	SA_ME01	2.8	25	Below	0.0	286.0	8.4	0.3
18-0774	WQI-18-0410	21-Jul-18	SA_ME01	0.4	25	Below	0.0	290.0	8.4	0.2
18-0775	WQI-18-0411	22-Jul-18	SA_ME01	0.8	25	Below	0.0	293.0	8.4	0.2

LAB_NUMBER	SAMPLE_NUMBER	SAMPLE_DATE	SITE_CODE	TOTAL_SUSPENDED _SOLIDS_MG_L	WATER_QUALITY _OBJECTIVE_MG_L	ABOVE_BELOW _OBJECTIVE	SETTLABLE _SOLIDS_ML_L	CONDUCTIVITY _USM	pH	TURBIDITY _NTU
18-0776	WQI-18-0412	23-Jul-18	SA_ME01	1.2	25	Below	0.0	299.0	8.3	0.2
18-0777	WQI-18-0413	24-Jul-18	SA_ME01	0.4	25	Below	0.0	299.0	8.3	0.2
18-0778	WQI-18-0414	25-Jul-18	SA_ME01	0.8	25	Below	0.0	306.0	8.3	0.2
18-0779	WQI-18-0415	26-Jul-18	SA_ME01	3.2	25	Below	0.0	306.0	8.3	0.2
18-0780	WQI-18-0416	27-Jul-18	SA_ME01	2.8	25	Below	0.0	307.0	8.3	0.2
18-0781	WQI-18-0417	28-Jul-18	SA_ME01	2.0	25	Below	0.0	310.0	8.3	0.2
18-0782	WQI-18-0418	29-Jul-18	SA_ME01	0.4	25	Below	0.0	316.0	8.3	0.2
18-0783	WQI-18-0419	30-Jul-18	SA_ME01	2.0	25	Below	0.0	317.0	8.3	0.2
18-0784	WQI-18-0420	31-Jul-18	SA_ME01	1.2	25	Below	0.0	318.0	8.3	0.2
18-0785	WQI-18-0421	1-Aug-18	SA_ME01	0.8	25	Below	0.0	314.0	8.3	0.3
18-0786	WQI-18-0422	2-Aug-18	SA_ME01	1.6	25	Below	0.0	317.0	8.3	0.2
18-0787	WQI-18-0423	3-Aug-18	SA_ME01	2.4	25	Below	0.0	323.0	8.3	0.2
18-0788	WQI-18-0424	4-Aug-18	SA_ME01	0.4	25	Below	0.0	326.0	8.3	0.2
18-0789	WQI-18-0425	5-Aug-18	SA_ME01	2.4	25	Below	0.0	331.0	8.3	0.2
18-0790	WQI-18-0426	6-Aug-18	SA_ME01	0.8	25	Below	0.0	328.0	8.3	0.2
18-0791	WQI-18-0427	7-Aug-18	SA_ME01	1.2	25	Below	0.0	317.0	8.3	0.2
18-0792	WQI-18-0428	8-Aug-18	SA_ME01	3.2	25	Below	0.0	308.0	8.3	0.2
18-0793	WQI-18-0429	9-Aug-18	SA_ME01	14.0	25	Below	0.0	232.0	8.4	0.2
18-0794	WQI-18-0430	10-Aug-18	SA_ME01	14.4	25	Below	0.0	223.0	8.3	0.4
18-0795	WQI-18-0431	11-Aug-18	SA_ME01	6.4	25	Below	0.0	237.0	8.3	0.3
18-0796	WQI-18-0432	12-Aug-18	SA_ME01	2.0	25	Below	0.0	250.0	8.3	0.2
18-0798	WQI-18-0362	21-Jul-18	SA02	3.6	25	Below	0.0	273.0	8.4	0.4
18-0799	WQI-18-0363	22-Jul-18	SA02	3.6	25	Below	0.0	265.0	8.3	0.3
18-0800	WQI-18-0364	23-Jul-18	SA02	2.8	25	Below	0.0	275.0	8.3	0.3
18-0801	WQI-18-0365	24-Jul-18	SA02	4.0	25	Below	0.0	275.0	8.3	0.3
18-0802	WQI-18-0366	25-Jul-18	SA02	0.8	25	Below	0.0	274.0	8.3	0.3
18-0803	WQI-18-0367	26-Jul-18	SA02	2.0	25	Below	0.0	293.0	8.3	0.3
18-0804	WQI-18-0368	27-Jul-18	SA02	1.2	25	Below	0.0	292.0	8.2	0.2
18-0805	WQI-18-0369	28-Jul-18	SA02	4.8	25	Below	0.0	290.0	8.1	0.2
18-0806	WQI-18-0370	29-Jul-18	SA02	1.2	25	Below	0.0	290.0	8.2	0.2
18-0807	WQI-18-0371	30-Jul-18	SA02	3.6	25	Below	0.0	288.0	8.2	0.2
18-0808	WQI-18-0372	31-Jul-18	SA02	0.8	25	Below	0.0	286.0	8.2	0.2
18-0809	WQI-18-0373	1-Aug-18	SA02	2.8	25	Below	0.0	289.0	8.2	0.2
18-0810	WQI-18-0374	2-Aug-18	SA02	1.6	25	Below	0.0	303.0	8.3	0.2
18-0811	WQI-18-0375	3-Aug-18	SA02	1.2	25	Below	0.0	293.0	8.3	0.2
18-0812	WQI-18-0376	4-Aug-18	SA02	0.8	25	Below	0.0	297.0	8.3	0.2
18-0813	WQI-18-0377	5-Aug-18	SA02	2.4	25	Below	0.0	294.0	8.3	0.2
18-0814	WQI-18-0378	6-Aug-18	SA02	1.6	25	Below	0.0	295.0	8.3	0.3
18-0815	WQI-18-0379	7-Aug-18	SA02	2.4	25	Below	0.0	299.0	8.3	0.2
18-0816	WQI-18-0380	8-Aug-18	SA02	1.2	25	Below	0.0	293.0	8.3	0.2

LAB_NUMBER	SAMPLE_NUMBER	SAMPLE_DATE	SITE_CODE	TOTAL_SUSPENDED _SOLIDS_MG_L	WATER_QUALITY _OBJECTIVE_MG_L	ABOVE_BELOW _OBJECTIVE	SETTLEABLE _SOLIDS_ML_L	CONDUCTIVITY _USM	pH	TURBIDITY _NTU
18-0817	WQI-18-0381	9-Aug-18	SA02	11.6	25	Below	0.0	239.0	8.3	0.3
18-0818	WQI-18-0382	10-Aug-18	SA02	20.4	25	Below	0.0	196.0	8.4	4.0
18-0819	WQI-18-0383	11-Aug-18	SA02	18.4	25	Below	0.0	221.0	8.3	2.0
18-0820	WQI-18-0384	12-Aug-18	SA02	6.0	25	Below	0.0	219.0	8.3	0.3
18-0569	WQG-18-135	15-Aug-18	SA02	0.4	25	Below	0.0	209.0	7.9	0.2
18-0862	WQI-18-0529	16-Aug-18	SA02		25	Below	Sample empty due to equipment failure			
18-0863	WQI-18-0530	17-Aug-18	SA02		25	Below	Sample empty due to equipment failure			
18-0864	WQI-18-0531	18-Aug-18	SA02	4.0	25	Below		242.0	8.3	5.0
18-0865	WQI-18-0532	19-Aug-18	SA02	12.0	25	Below	0.0	247.0	8.2	0.2
18-0866	WQI-18-0533	20-Aug-18	SA02	6.8	25	Below	0.0	251.0	8.2	0.2
18-0867	WQI-18-0534	21-Aug-18	SA02	4.0	25	Below	0.0	257.0	8.2	0.2
18-0868	WQI-18-0535	22-Aug-18	SA02	1.6	25	Below	0.0	257.0	8.2	0.2
18-0869	WQI-18-0536	23-Aug-18	SA02	0.4	25	Below	0.0	259.0	8.2	0.2
18-0870	WQI-18-0537	24-Aug-18	SA02	5.2	25	Below	0.0	248.0	8.2	0.2
18-0871	WQI-18-0538	25-Aug-18	SA02	1.2	25	Below	0.0	254.0	8.2	0.2
18-0872	WQI-18-0539	26-Aug-18	SA02	2.8	25	Below	0.0	241.0	8.2	0.2
18-0873	WQI-18-0540	27-Aug-18	SA02	13.2	25	Below	0.0	244.0	8.2	0.2
18-0874	WQI-18-0541	28-Aug-18	SA02	0.8	25	Below	0.0	253.0	8.2	0.2
18-0875	WQI-18-0542	29-Aug-18	SA02	2.0	25	Below	0.0	254.0	8.2	0.2
18-0876	WQI-18-0543	30-Aug-18	SA02	0.8	25	Below	0.0	255.0	8.2	0.2
18-0877	WQI-18-0544	31-Aug-18	SA02	1.2	25	Below	0.0	245.0	8.2	0.2
18-0878	WQI-18-0545	1-Sep-18	SA02	0.8	25	Below	0.0	216.0	8.3	0.3
18-0879	WQI-18-0546	2-Sep-18	SA02	1.2	25	Below	0.0	228.0	8.2	0.2
18-0880	WQI-18-0547	3-Sep-18	SA02	0.8	25	Below	0.0	230.0	8.3	0.2
18-0881	WQI-18-0548	4-Sep-18	SA02	3.2	25	Below	0.0	234.0	8.3	0.2
18-0882	WQI-18-0549	5-Sep-18	SA02	1.2	25	Below	0.0	239.0	8.3	0.2
18-0883	WQI-18-0550	6-Sep-18	SA02	1.6	25	Below	0.0	240.0	8.2	0.3
18-0884	WQI-18-0551	7-Sep-18	SA02	2.0	25	Below	0.0	246.0	8.1	1.0
18-0885	WQI-18-0552	8-Sep-18	SA02	0.8	25	Below	0.0	247.0	8.1	0.3
18-0886	WQI-18-0481	16-Aug-18	SA_CO02	2.0	50	Below	0.0	318.0	8.2	0.2
18-0887	WQI-18-0482	17-Aug-18	SA_CO02	1.2	50	Below	0.0	319.0	8.2	0.2
18-0888	WQI-18-0483	18-Aug-18	SA_CO02	1.6	50	Below	0.0	327.0	8.2	0.2
18-0889	WQI-18-0484	19-Aug-18	SA_CO02	1.6	50	Below	0.0	323.0	8.2	0.2
18-0890	WQI-18-0485	20-Aug-18	SA_CO02	1.6	50	Below	0.0	333.0	8.2	0.3
18-0891	WQI-18-0486	21-Aug-18	SA_CO02	1.6	50	Below	0.0	333.0	8.3	0.3
18-0892	WQI-18-0487	22-Aug-18	SA_CO02	1.2	50	Below	0.0	335.0	8.2	0.2
18-0893	WQI-18-0488	23-Aug-18	SA_CO02	3.2	50	Below	0.0	326.0	8.2	0.4
18-0894	WQI-18-0489	24-Aug-18	SA_CO02	1.6	50	Below	0.0	322.0	8.2	0.3
18-0895	WQI-18-0490	25-Aug-18	SA_CO02	0.8	50	Below	0.0	318.0	8.2	0.3
18-0896	WQI-18-0491	26-Aug-18	SA_CO02	1.6	50	Below	0.0	303.0	8.3	0.4



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18-0897	WQI-18-0492	27-Aug-18	SA_CO02	4.0	50	Below	0.0	306.0	8.2	0.2
18-0898	WQI-18-0493	28-Aug-18	SA_CO02	0.8	50	Below	0.0	315.0	8.2	0.3
18-0899	WQI-18-0494	29-Aug-18	SA_CO02	2.8	50	Below	0.0	319.0	8.2	0.3
18-0900	WQI-18-0495	30-Aug-18	SA_CO02	0.8	50	Below	0.0	316.0	8.2	0.3
18-0901	WQI-18-0496	31-Aug-18	SA_CO02	4.0	50	Below	0.0	278.0	8.3	4.0
18-0902	WQI-18-0497	1-Sep-18	SA_CO02	22.8	50	Below	0.0	261.0	8.3	2.0
18-0903	WQI-18-0498	2-Sep-18	SA_CO02	12.8	50	Below	0.0	269.0	8.2	2.0
18-0904	WQI-18-0499	3-Sep-18	SA_CO02	4.0	50	Below	0.0	265.0	8.3	0.2
18-0905	WQI-18-0500	4-Sep-18	SA_CO02	7.2	50	Below	0.0	278.0	8.3	0.2
18-0906	WQI-18-0501	5-Sep-18	SA_CO02	1.6	50	Below	0.0	287.0	8.3	0.2
18-0907	WQI-18-0502	6-Sep-18	SA_CO02	4.0	50	Below	0.0	287.0	8.3	0.2
18-0908	WQI-18-0503	7-Sep-18	SA_CO02	3.2	50	Below	0.0	290.0	8.2	0.2
18-0909	WQI-18-0504	8-Sep-18	SA_CO02	6.4	50	Below	0.0	292.0	8.2	0.4
18-0910	WQI-18-0505	16-Aug-18	SA10	3.2	25	Below	0.0	84.0	8.5	0.1
18-0911	WQI-18-0506	17-Aug-18	SA10	6.4	25	Below	0.0	86.0	8.4	0.1
18-0912	WQI-18-0507	18-Aug-18	SA10	0.4	25	Below	0.0	89.0	8.4	0.2
18-0913	WQI-18-0508	19-Aug-18	SA10	1.6	25	Below	0.0	90.0	8.4	0.1
18-0914	WQI-18-0509	20-Aug-18	SA10	2.8	25	Below	0.0	90.0	8.4	0.1
18-0915	WQI-18-0510	21-Aug-18	SA10	0.8	25	Below	0.0	94.0	8.3	0.1
18-0916	WQI-18-0511	22-Aug-18	SA10	0.4	25	Below	0.0	93.0	8.4	0.1
18-0917	WQI-18-0512	23-Aug-18	SA10	3.6	25	Below	0.0	95.0	8.4	0.2
18-0918	WQI-18-0513	24-Aug-18	SA10	0.8	25	Below	0.0	96.0	8.4	0.2
18-0919	WQI-18-0514	25-Aug-18	SA10	3.6	25	Below	0.0	97.0	8.3	0.2
18-0920	WQI-18-0515	26-Aug-18	SA10	0.8	25	Below	0.0	92.0	8.3	0.2
18-0921	WQI-18-0516	27-Aug-18	SA10	6.0	25	Below	0.0	97.0	8.2	0.2
18-0922	WQI-18-0517	28-Aug-18	SA10	0.8	25	Below	0.0	98.0	8.3	0.2
18-0923	WQI-18-0518	29-Aug-18	SA10	6.4	25	Below	0.0	98.0	8.3	0.2
18-0924	WQI-18-0519	30-Aug-18	SA10	0.4	25	Below	0.0	100.0	8.3	0.2
18-0925	WQI-18-0520	31-Aug-18	SA10	4.8	25	Below	0.0	93.0	8.3	0.2
18-0926	WQI-18-0521	1-Sep-18	SA10	3.2	25	Below	0.0	89.0	8.4	0.2
18-0927	WQI-18-0522	2-Sep-18	SA10	5.2	25	Below	0.0	95.0	8.3	0.1
18-0928	WQI-18-0523	3-Sep-18	SA10	0.4	25	Below	0.0	91.0	8.4	0.2
18-0929	WQI-18-0524	4-Sep-18	SA10	6.4	25	Below	0.0	92.0	8.2	0.3
18-0930	WQI-18-0525	5-Sep-18	SA10	2.0	25	Below	0.0	94.0	8.2	0.2
18-0931	WQI-18-0526	6-Sep-18	SA10	5.6	25	Below	0.0	98.0	8.1	0.3
18-0932	WQI-18-0527	7-Sep-18	SA10	1.2	25	Below		95.0	8.2	2.0
18-0933	WQI-18-0528	8-Sep-18	SA10	8.4	25	Below	0.0	98.0	8.2	0.2
18-0934	WQI-18-0553	16-Aug-18	SA_ME01	2.0	25	Below	0.0	270.0	8.2	0.2
18-0935	WQI-18-0554	17-Aug-18	SA_ME01	7.2	25	Below	0.0	279.0	8.1	0.2
18-0936	WQI-18-0555	18-Aug-18	SA_ME01	1.6	25	Below	0.0	286.0	8.1	0.2



LAB_NUMBER	SAMPLE_NUMBER	SAMPLE_DATE	SITE_CODE	TOTAL_SUSPENDED _SOLIDS_MG_L	WATER_QUALITY _OBJECTIVE_MG_L	ABOVE_BELOW _OBJECTIVE	SETTLABLE _SOLIDS_ML_L	CONDUCTIVITY _USM	pH	TURBIDITY _NTU
18-0937	WQI-18-0556	19-Aug-18	SA_ME01	6.4	25	Below	0.0	291.0	8.2	0.1
18-0938	WQI-18-0557	20-Aug-18	SA_ME01	1.6	25	Below	0.0	294.0	8.2	0.2
18-0939	WQI-18-0558	21-Aug-18	SA_ME01	4.0	25	Below	0.0	297.0	8.2	0.2
18-0940	WQI-18-0559	22-Aug-18	SA_ME01	2.4	25	Below	0.0	304.0	8.2	0.2
18-0941	WQI-18-0560	23-Aug-18	SA_ME01	5.2	25	Below	0.0	290.0	8.2	0.2
18-0942	WQI-18-0561	24-Aug-18	SA_ME01	2.4	25	Below	0.0	293.0	8.2	0.2
18-0943	WQI-18-0562	25-Aug-18	SA_ME01	4.8	25	Below	0.0	291.0	8.2	0.2
18-0944	WQI-18-0563	26-Aug-18	SA_ME01	3.2	25	Below	0.0	273.0	8.2	0.2
18-0945	WQI-18-0564	27-Aug-18	SA_ME01	6.0	25	Below	0.0	278.0	8.2	0.2
18-0946	WQI-18-0565	28-Aug-18	SA_ME01	1.6	25	Below	0.0	283.0	7.9	0.2
18-0947	WQI-18-0566	29-Aug-18	SA_ME01	4.4	25	Below	0.0	293.0	8.0	0.2
18-0948	WQI-18-0567	30-Aug-18	SA_ME01	1.2	25	Below	0.0	287.0	8.1	0.2
18-0949	WQI-18-0568	31-Aug-18	SA_ME01	4.4	25	Below	0.0	261.0	8.1	2.0
18-0950	WQI-18-0569	1-Sep-18	SA_ME01	4.0	25	Below	0.0	248.0	8.2	0.3
18-0951	WQI-18-0570	2-Sep-18	SA_ME01	7.6	25	Below	0.0	263.0	8.1	0.2
18-0952	WQI-18-0571	3-Sep-18	SA_ME01	2.4	25	Below	0.0	265.0	8.1	0.2
18-0953	WQI-18-0572	4-Sep-18	SA_ME01	8.0	25	Below	0.0	270.0	8.1	0.2
18-0954	WQI-18-0573	5-Sep-18	SA_ME01	3.6	25	Below	0.0	278.0	8.1	0.2
18-0955	WQI-18-0574	6-Sep-18	SA_ME01	4.0	25	Below	0.0	280.0	8.1	0.2
18-0956	WQI-18-0575	7-Sep-18	SA_ME01	2.8	25	Below	0.0	282.0	8.1	0.2
18-0957	WQI-18-0576	8-Sep-18	SA_ME01	2.0	25	Below	0.0	283.0	8.1	0.2
18-0958	WQG-18-173	11-Sep-18	SA02	7.2	25	Below	0.0	253.0	8.2	0.1
18-0959	WQG-18-174	11-Sep-18	SA_ME01	1.6	25	Below	0.0	253.0	8.2	0.2
18-0960	WQG-18-175	11-Sep-18	SA_ME_DY01	3.2	50	Below	0.0	295.0	8.2	0.2
18-0961	WQG-18-176	11-Sep-18	SA_ME_DY04	0.4	200	Below	0.0	287.0	8.2	0.1
18-0962	WQG-18-177	11-Sep-18	SA_ME04	2.8	80	Below	0.0	404.0	8.1	0.2
18-0963	WQG-18-178	11-Sep-18	SA_LI04	0.8	300	Below	0.0	177.0	8.3	0.2
18-0964	WQG-18-179	11-Sep-18	SA10	2.8	25	Below	0.0	100.0	8.4	0.2
18-0965	WQG-18-180	11-Sep-18	SA_LI01	0.8	50	Below	0.0	184.0	8.3	0.2
18-0966	WQG-18-181	11-Sep-18	SA_CO02	1.6	50	Below	0.0	302.0	8.1	0.3