Mayo River Watershed

In 2012, water samples were collected at five different sites in the Mayo River basin. Sampling commenced on June 6, 2012 and a total of 233 samples were collected up until the end of the season on September 10, 2012. A combination of automatic composite sampling and grab sampling methods were used in the basin. In addition, four samples were collected by E.M.R staff during routine mine inspections.

Atmospheric data was collected using two portable weather stations, one located near the mouth of Highet Creek and the other near the mouth of Duncan Creek.

Basin total flow data was provided to us by the Yukon Energy station located at the Mayo Lake Outlet. Flow data for the individual tributaries to the Mayo River was collected at the time of sampling by the Compliance Monitoring and Inspections Branch (CMI) using the methodology outlined in the Yukon Placer Secretariat's Water Quality Objectives Monitoring Protocol.

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

SITE_DESCRIPTION	SITE_CODE	LATITUDE	LONGITUDE
Mayo River at mouth	MA01	63.59297	-135.90965
Mayo River upstream of Highet Creek and Minto Creek	MA02	63.73728	-135.75497
Mayo River upstream of Davidson Creek	MA03	63.76857	-135.44739
Duncan Creek below all mining	MA_DU01	63.78395	-135.50555
Davidson Creek mouth	MA_DA01	63.76793	-135.45035
Highet Creek mouth	MA_HI01	63.72393	-136.07204
Minto Creek mouth	MA_MI01	63.70271	-135.87244

Water Quality Objective monitoring, Mayo River Watershed – Summary

Because of the low number of active operations in the area, the Mayo Lake Watershed was designated a 'minor' watershed for monitoring in 2012. This meant that a limited amount of time and only a small proportion of the monitoring efforts were spent in the basin, and that only four automated water sampling stations and two weather stations were deployed in the area. From the analysis of the data obtained by these instruments and through on site visits and sampling conducted by CMI, the following observations regarding the water quality in the basin can be made:

On average, the water quality in the basin, met the minimum objectives set under the Fish Habitat Management System for Yukon Placer Mining throughout the monitoring season. 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 all cases, rain fall, either as localised events or basin wide occurrences, increased the amount of surface run off 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 rain event or immediately in a period of one or two days after the rain event, as surface water continued draining from the land and ground water infiltrated the water course.

Increases in the volume of sediment laden ground and surface water entering the system add to the amount of sediment in the water course. The ability of the receiving water to dilute these inputs of sediment is negated by the re-suspension of stream bed 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. All of these factors: precipitation leading to increased sediment input and increased flows from these rain events re-suspending and further eroding material, led to an increase in suspended solids concentrations and a decrease in water quality.

The Fish Habitat Management System - Mayo River Watershed (Category B)

Sample Results that Exceed Water Quality Objectives for 2012

Sampling Station	MA01	MA_HI01	MA02	MA_DU01	MA_DA01	MA03
Location Description	Mouth	Mouth	d/s DCN 01	BAM	Mouth	u/s DVN 01
Sample Type	Auto/Grab	Grab	Grab	Auto/Grab	Auto/Grab	Auto/Grab
Lat Y	63.595	63.72393	63.73728	63.78395	63.76793	63.76857
Long X	-135.904	-136.07204	-135.75497	-135.50555	-135.45035	-135.44739
Habitat Classification	High	Low	Low	Low	Low	Low
Water Quality Objective (mg/L)	25	300	300	300	300	300
Date of Sampling						
10-Sep-12					301	
Total Seasonal Average TSS (mg/L by site	4.0		7	15.5	57.2	4.8
Number of days sampled	75		1	23	47	71

Legend	Not continuously monitored
	Water Samples that are: Above / Below the Water Quality Objective