## Mayo Lake Watershed

In 2008, water samples were collected at 6 different sites in the Mayo Lake basin. Sampling commenced on May 22nd, 2008 and a total of 96 samples were collected up until the end of the season on August 28th, 2008. 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 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 staff of E.M.R CS&I using the methodology outlined in the Yukon Placer Secretariats, Water Quality Monitoring Protocol.

In 2008, the effluent discharge standards for the Mayo Lake Basin were those set under the existing *Yukon Placer Authorization*. Beginning in 2009, the effluent standards for all 19 separate watersheds in the Yukon, including the Mayo, will be set under the *Fish Habitat Management System*. The *Fish Habitat Management System* replaces the YPA with approximately 19 separate watershed authorizations, each of which are class authorizations under Section 35(2), governing placer mining in specific drainage basins.

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

| SITE CODE | LOCATION | LAT_Y | LONG_X |
|---|---|---|---|
| M 01 | Mayo River mouth | 63.59297 | -135.90965 |
| M 04 | Mayo River u/s Highet Creek | 63.73728 | -135.75497 |
| M 06 | Mayo River d/s bridge u/s Davidson | 63.76857 | -135.44739 |
| M DCN 01 | Duncan Creek Below All Mining (BAM) | 63.78395 | -135.50555 |
| M DVN 01 | Davidson Creek mouth | 63.76793 | -135.45035 |
| M HIGH 01 | Highet Creek mouth | 63.72393 | -136.07204 |
| M MIN 01 | Minto Creek mouth | 63.70271 | -135.87244 |

**Water Quality Objective monitoring, Mayo Lake 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 2008. This meant that a limited amount of time and only a small proportion of our monitoring efforts were spent in the basin, and that only one automated water sampling station and one weather station from our available inventory was deployed in the area. From the analysis of 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:

On average, the water quality in the basin, met the minimum objectives set under the *Fish Habitat Management System* 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, lead to an increase in suspended solids concentrations and a decrease in water quality.