Stewart River Watershed

The Stewart River, a major tributary to the Yukon River, drains an area of approximately 51,000 square kilometres and has an overall channel length of approximately 533 km. The Stewart River is one of the principal tributaries of the Yukon River, flowing more than 480 kilometres from its headwaters in the Mackenzie Mountains and joining the Yukon River 112 kilometres above Dawson City. The river is navigable for most of its length and is a transportation route for lead ore from its upper reaches. It was explored (1850) by Robert Campbell of the Hudson's Bay Company

In 2008, water samples were collected at 7 different sites in the Stewart River basin. Sampling commenced on June 22nd, 2008 and a total of 231 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 a portable weather station located near the mouth of Clear Creek.

Basin total flow data was provided to us by the Water Survey of Canada station located near the mouth of the Stewart River. Flow data for the individual tributaries to the Stewart 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 Stewart River 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 Stewart, 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 Stewart River Watershed

SITE CODE	LOCATION	LAT_Y	LONG_X
ST 06	Stewart River u/s Clear Creek	63.61183	-137.63992
ST 05	Stewart River u/s Maisy May Creek	63.23539	-138.81273
08-0729	unnamed LL trib for Stewart	63.20464	-138.82657
ST 04	Stewart River u/s Scroggie Creek	63.19949	-138.85118
ST 03	Stewart River u/s Barker Creek	63.18350	-138.90445
ST 02	Stewart River u/s Henderson Creek	63.35333	-139.46181
ST 01	Stewart River mouth	63.29113	-139.41042
ST BAR 01	Barker Ck Below All Mining BAM	63.17785	-138.89928
ST BLAC 01	Black Hills Creek Below All Mining (BAM)	63.32137	-138.76973

ST CLEA 01	Clear Creek	63.62825	-137.60947
ST CLEA 02	Clear CreeK u/s highway bridge	63.62825	-137.60947
ST MAIS 01	Maisy May Creek mouth	63.25449	-138.84766
ST SCR 01	Scroggie Creek mouth	63.18696	-138.83366

Water Quality Objective monitoring, Stewart River Watershed – Summary

The overall 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, there is a direct correlation to environmental conditions influencing the amount of solids concentrations in the water. Many large tributary rivers and streams flow into the catchment area of the Yukon River basin.

In all cases, rain fall, either as localized 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 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 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.