



**PROJECT DESCRIPTION
ABANDONED CLINTON CREEK ASBESTOS MINE**

**STAGE 3 (2004) CLINTON CREEK
CHANNEL STABILIZATION**



**Submitted by:
Government of Yukon
Energy, Mines and Resources
Abandoned Mines Project Office**

January 2004

TABLE OF CONTENTS

- 1.0 INTRODUCTION
 - 1.1 Purpose
 - 1.2 Proponent
 - 1.3 Environmental Assessment
 - 1.4 Authorizations Required

- 2.0 PROJECT DESCRIPTION
 - 2.1 Location
 - 2.2 History
 - 2.3 Channel Stabilization

- 3.0 EXISTING ENVIRONMENT
 - 3.1 Terrestrial
 - 3.2 Aquatic
 - 3.3 Land Use
 - 3.4 Heritage

- 4.0 ENVIRONMENTAL EFFECTS

- 5.0 MONITORING

- 6.0 REFERENCES

APPENDICES

PROJECT DESCRIPTION ABANDONED CLINTON CREEK ASBESTOS MINE STAGE 3 (2004) CHANNEL STABILIZATION

1.0 INTRODUCTION

1.1 Purpose

The former Clinton Creek asbestos mine is an abandoned site and is designated as a Type II mine site under the Canada-Yukon Devolution Transfer Agreement. Type II mines are major mine sites with the potential of unfunded environmental liabilities at the time of closure. The Clinton Creek site has a number of such liabilities that were not satisfactorily addressed by the former site owner.

In 2002, due to concerns with the stability of the Clinton Creek channel and the potential for downstream flooding, the Waste Management Program of the Department of Indian Affairs and Northern Development (DIAND) commenced a channel stabilization project. On April 1, 2003, the management of this Type II site was transferred to the Government of Yukon (GY) as part of the devolution process and the channel stabilization project was continued but not completed in 2003.

The purpose of this document is to outline the channel stabilization work proposed to be completed in 2004 and to initiate an environmental screening of that work under the *Yukon Environmental Assessment Act* (YEAA).

1.2 Proponent

The duties for management of Type II mine sites for the Government of Yukon is with the Assessment and Abandoned Mines Branch of the Oil & Gas and Mineral Resources Division of the Department of Energy, Mines and Resources. This branch as part of the joint DIAND-GY Type II Mines Office provides project management for a number of Type II sites.

During the first two phases of channel stabilization work as will be the case in 2004, the engineering design and construction of the project have been contracted out.

1.3 Authorities and Environmental Assessment

In May 2003, the Abandoned Mines Project Office received an inspector's directive under Section 35(1) of the *Waters Act* from the Water Resources Branch of the Department of Environment. This direction identified that "Work is required to be undertaken at the Hudgeon Lake outlet at the Clinton Creek mine to prevent failure of the outlet control." and to "...conduct such works and

mitigation measures as are required to prevent failure of the outlet control.”

An environmental assessment is triggered under Section 4(1) of the *Environmental Assessment Act*. The Government of Yukon is both the proponent for this project and is providing funding.

2.0 PROJECT DESCRIPTION

2.1 Location

The abandoned Clinton Creek asbestos mine is located about 100 km northwest of Dawson City, Yukon nine kilometres upstream of the confluence of Clinton Creek and the Forty Mile River, (NTS: 116C/07). The mine site is accessible from Dawson City via the Top of the World Highway, the Clinton Creek road, and an access road from the former Clinton Creek town site (see figure 1, Location Map).

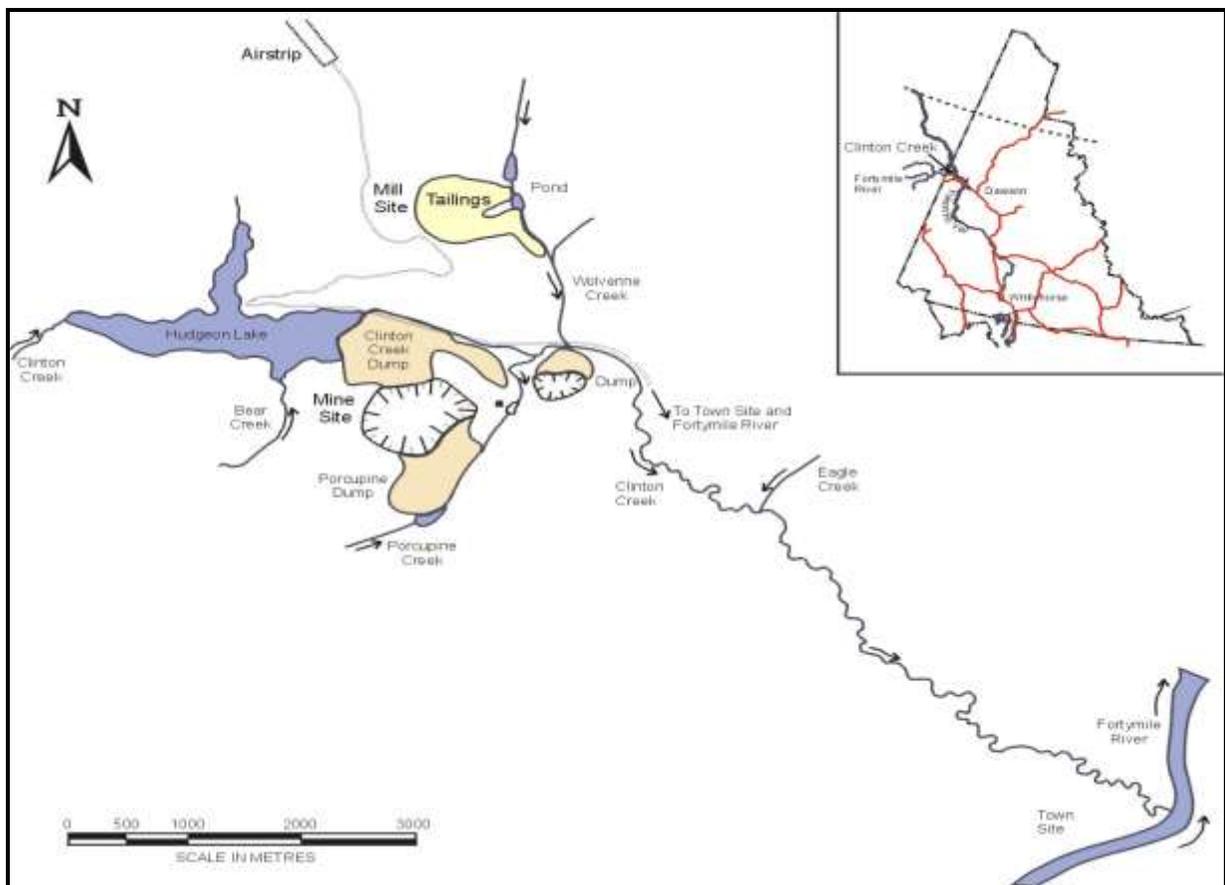


Figure 1: Location Map

2.2 History

2.2.1 Mining

Mining of the Clinton Creek deposit was commenced by Cassiar Asbestos Corporation Ltd. in 1967 and continued until August 1978. Approximately 16 million tonnes of serpentinite ore were extracted over the life of the mine, producing 940,000 tonnes of chrysotile asbestos fibre. Milling rates fluctuated between 3600 and 4100 tonnes per day. Stripping ratios of about four to one resulted in a total of 63,265,400 tonnes of waste rock being extracted. Production came from a series of three adjacent pits, Porcupine pit (77% of production), Snowshoe pit (18%), and Creek pit (3%). The Cassiar Creek pit approximately 40 kilometres east of Clinton Creek accounted for another 2% of ore processed at Clinton Creek.

The water licence for the property expired in September 1982, but the Yukon Territory Water Board, not at the request of the company, extended the licence to September 1987 to deal with property abandonment. In September 1986, Cassiar Mining Corporation submitted an abandonment plan for the site to the Board. This plan was submitted to support an application to the Water Board to abandon the property, terminate the water licence and have the licence security released. The plan failed to address all site liabilities to the satisfaction of government and was never formally accepted. However, DIAND returned the \$400,000 security to the company in 1992.

2.2.2 Clinton Creek Channel Stabilization

Concerns with respect to the physical conditions at the site have existed since the closure of mine operations in 1978 and the site and creek channel had been monitored by DIAND Water Resources on a regular basis. Investigations (Royal Roads University, 1999; UMA, 1999 and 2000) confirmed the observations by DIAND Water Resources that continuing down-cutting of the Clinton Creek channel and erosion of the unstable waste rock may cause the waste rock dam to fail. A sudden breach of the landslide dam and subsequent flooding could expose individuals, property and the downstream environment to various degrees of risk.

In 2001 the physical instability and environmental issues at the Clinton Creek Mine were discussed with the Department of Fisheries and Oceans, Yukon Salmon Committee, Tr'on Dëk Hwëch'in, DIAND Land and Water Resources, and other stakeholders. The consensus of these consultations was that the stabilization of the outflow channel near the reservoir is a priority to reduce the immediate threat of a breach. The plan was to construct several in stream rock gabion structures to remediate 350 metres of the Clinton Creek channel downstream of the outlet and regrading the channel slopes to more stable conditions.

2002

Under the management of DIAND Waste Management Program, the construction of the first gabion structure and re-shaping of the lake outlet took place between August 28 and October 4, 2002. Construction was undertaken by Hän Construction Ltd., which is owned by Chief Issac Inc., a business unit of the Tr'ondëk Hwëch'in First Nation. Engineering design and management was provided by UMA Engineering Ltd.. The general construction events required to complete the work are listed below, complete details of 2002 construction can be found in the "Indian and Northern Affairs Canada, Clinton Creek Channel Stabilization (Stage 1) Construction Report" (UMA 2003).

- improve road (site access) from the bridge over the Fortymile River to the mine site;
- production of gabion fill material;
- construction of a diversion pipe to route the flow from Hudgeon Lake around the work area;
- construction of a cofferdam across the outlet at Hudgeon Lake;
- fish salvage from remaining ponds in the creek channel;
- creek channel preparation which included removal of the two culverts from the lake outlet, removal of debris and vegetation from the channel and moving some boulders to facilitate construction of the gabion drop structure(s);
- backfilling, compacting and shaping the creek channel to the design grades;
- construction of gabion drop structures;
- re-grading of the outlet from Hudgeon Lake and installing a gabion mat and ford crossing;
- restoring flow over the lake outlet and into Clinton Creek and removal of diversion pipe.

2003

In 2003, under the management of the Government of Yukon the channel stabilization program was continued and the second drop structure was completed. As in 2002, Hän Construction Ltd. and UMA Engineering Ltd. provided construction and technical expertise. Camp mobilization, rip rap production, and gabion basket assembly commenced in early July. Instream work was commenced on August 1 and continued until August 16.

Following consultation with the Department of Fisheries and Oceans (DFO) it was determined that a diversion to ensure minimal water flows in the channel immediately below the construction was not necessary, as long as all fish were salvaged on Clinton Creek between Hudgeon Lake and Wolverine Creek during cofferdam installation. Adequate flows in Clinton Creek could be maintained for fish, even with a cofferdam in place at the Hudgeon Lake outlet, below the point

where Wolverine Creek enters Clinton Creek (see figure 1.). A Letter of Advice (see appendix **XX**) was issued by DFO for the project on May 31, 2003. A fish salvage program netted approximately 1500 Arctic grayling, Slimy sculpins, Longnose suckers, and three Chinook salmon fry (Roach 2003, see appendix **XX**).

Relatively dry weather during the 12 days the cofferdam was in place resulted in Hudgeon Lake rising only approximately 25 centimetres behind the dam. As a result sediment load upon removal of the dam was minimal and the water was visibly clear within 20-30 minutes of dam removal (UMA 2003a).

The second drop structure was located approximately 50 metres downstream of structure #1 (see figure 2, Plan and Profile, next page). This structure has a vertical drop of 2.5 metres compared to 1.5 metres for the first. Drop structure construction was essentially the same as that in 2002 with the exception of an additional row of baskets at the downstream end to help prevent erosion at the downstream end of the structure (see figure 3, Drop Structure #2 Details). This additional row was also added to the first structure, as some accelerated erosion was noted at its bottom end after the 2003 spring freshet. Complete details of the 2003 construction can be found in the Clinton Creek Channel Stabilization (Stage II) – Construction Report (UMA 2003a).

It was planned that the remaining two drop structures would also be installed in 2003. Four days of heavy rainfall beginning on August 30 caused Hudgeon Lake to rise and the Clinton Creek flow approached spring freshet levels (see figure 3, High Flows)

Lake levels failed to drop fast enough to the minimum level where cofferdam installation would be feasible before the end of September. Due to an early onset of snow and cold weather in the third week of September construction of the remaining two structures was deferred until 2004 (see figure 4, Normal Flows).



Figure 3: Clinton Creek Drop Structures 1&2 - High Flows September 2, 2003



Figure 4: Clinton Creek Drop Structures 1&2 - Normal Flows September 22, 2003

2.3 2004 Channel Stabilization

2.3.1 Location

The remaining two drop structures will be located 25 and 70 metres respectively, downstream of structure #2 (see figure 2). The original channel stabilization plan called for a total of six drop structures. During a re-evaluation of the creek profile in 2003 it was determined that with some modifications of the original design, only two more structures would be required. Drop structure 3 will have a vertical drop of 1.5 metres and structure 4 would have a drop of 3.5 metres.

The Clinton Creek channel immediately downstream of the last proposed drop structure is underlain by bedrock (see figure 5, Clinton Ck. canyon). This contrasts with the very soft and erodible waste dump argillite underlaying the upper section of the creek below Hudgeon Lake where the drop structures are being installed. The final drop structure will tie into the bedrock, eliminating any sections of easily erodible material within Clinton Creek at the mine area.



Figure 5: Clinton Creek Canyon, looking downstream

