ABANDONED CLINTON CREEK ASBESTOS MINE

Site Visit May 21, 2002
by

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SUMMARY

The Clinton Creek asbestos mine was operated by the Cassiar Asbestos Corporation Limited from October 1967 until August of 1978. The mine is located 86 kilometres northwest of Dawson City, Yukon and consists of three open pits, located on the south side of Clinton Creek. There are 60 million tonnes of waste rock which have blocked the drainage of Clinton Creek and formed Hudgeon Lake. The mill produced one million tonnes of long fibre asbestos and discharged 10 million tonnes of tailings to the Wolverine Creek valley. The tailings dumps have since failed and formed two lobes, blocking the flow of Wolverine Creek. The creeks have eroded both the tailings piles and waste rock causing intermittent failure of impoundments and the aggradation of both creeks. The fish habitat of upper Clinton Creek and Wolverine Creek has been destroyed through physical deposition of material in the creeks.

The site visit in May found the water level of Hudgeon Lake and the discharge to Clinton Creek quite low. Clinton Creek continues to incise back toward Hudgeon Lake and there has been a visible drop in the elevation of the plug, at the Lake discharge, from that noted last year. The road adjacent to the Lake decant continues to move as evidenced my fresh cracking and deformation in the road base. A slump of material and an increased flow from two springs immediately downstream of outlet was noted. Slumping within the canyon containing the upper reach of Clinton Creek has continued and the erosion of the native rock wall has increased over last year and appears to be preferential to erosion of the waste rock side of the channel.

The tailings have a channel of Wolverine Creek flowing through them and there does not appear to be any blockage of this drainage at present, although new slumps were visible in the upper area of the tails. The main pit area has also exhibited recent slumps since last fall and a significant volume of material is verging on deposit in the pit.

Public safety has been further compromised by the use of the delta of Clinton Creek at the 40 Mile River, as an overnight rest area for at least one local tourism operation, which rents/guides canoes for travel from the Alaska side of the 40 Mile drainage.

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INTRODUCTION

The Clinton Creek asbestos mine (Lat, 64° 22' 23" N Long, 140° 42' 50" W) was operated as an open pit mine by the Cassiar Asbestos Corporation Limited from October, 1967 until August of 1978. The site had been originally staked in 1957 and acquired by Cassiar later that same year. After initial sampling the site was dormant until 1964, when development of the mill and mine site commenced (1). The mill buildings and town site were disposed of at auction in 1978.

The site is in hilly and unglaciated terrain 86 kilometres northwest of Dawson City, Yukon. The mine consists of three open pits, located on the south side of Clinton Creek. The waste rock from these pits was dumped adjacent to the pit sites with the largest volume being located to the south of Clinton Creek. There are approximately 60 million tonnes of waste rock, the movement of which blocked the drainage of Clinton Creek. The body of water formed by this blockage is referred to as Hudgeon Lake, and the waste rock continues to creep down slope. An additional 3 million tonnes of waste rock has formed an impoundment on Porcupine Creek.

The tailings were stacked in two piles, which have since formed two failures known as the north and south lobes. The original tailings pile was the south lobe which failed in 1974 and blocked the flow of Wolverine Creek, creating an unnamed lake. The north site was employed following this failure and tailings were deposited there until closure. The north lobe failed in 1976 and added to the blockage of Wolverine Creek. Since that time the creek has eroded both the tailings pile and the east bank of the valley. This combination of erosion and blockage has caused the intermittent failure of impoundment with often dramatic results downstream on Wolverine Creek. In the spring of 1997, a large flow of water discharged past the Clinton Creek impoundment and resulted in serious erosion of the mine site road access. This access continues to be accessible by four wheel drive vehicles.

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PHYSICAL CONSIDERATIONS

A large number of evaluations of the tailings and waste rock instability have been conducted over the years, during and after mine operations. The majority of these reports have been produced by consultants working for Cassiar Asbestos or DIAND. The evaluations have been contradictory, especially with regard to mine site abandonment by Cassiar. A number of abandonment related actions were employed, especially on the Clinton Creek channel, with an eye toward controlling erosion of the channel. This work on the Clinton Creek channel has not been successful, to date. There has been an equal amount of interest in compensating for the instability of the tailings piles and eliminating any distribution of asbestos dust. The dust has become a limited issue, as a crust has formed on the tailings.

Impoundment and Channel

The level of Hudgeon Lake and the decant was as low as it has ever been, in the author's memory(Photo A and B). Personal observations at this site go back to 1991. The elevation of the downstream end of the decant plug appears to be noticeably lower than last year. The end of laminar flow and the start of the riffle area visible in the photo (Photo C), begins at the location of the crossed trees at the culvert end. This appears to be closer to the Lake than in the previous year.

Immediately downstream of the outlet, on the waste rock side of the channel, there is a new slump in the bank material at the site of two springs (Photo D). The flow rate of the lower of the two springs appears to be higher than in previous years (Photo E) and the location of this spring corresponds to cracks in the road bed above.

Further downstream in the channel, slumping has occurred on the native rock side of the channel, due to undercutting of the native rock (Photos F and G). Several more areas are in the process of sliding in from this same side, as you move downstream. The road bed has become more noticeably deformed through the movement of waste rock toward the Creek and new active lateral cracking of the material was observed.

Tailings Piles

The tailings piles have recent slumps in their upper reaches, but there is a clear channel for the flow of Wolverine Creek, at present. Water levels at the beaver pond between the two lobes of the slumps is low.

Public Safety

The concern for public safety, due to the instability of the waste rock plug, is the one potential effect of the Clinton Creek site that is not mitigable through post-failure action. Recent use of the Clinton Creek delta as an overnight campsite for canoeists (Photo H) entering the 40 Mile River from the Alaska side has increased the potential for risk to human health.

Habitat

The aquatic environment of Clinton Creek has continued to deteriorate through the bed loading of erodible material. Fishery studies have been carried out in Creek in recent years and additional sampling is planned. Past studies indicated the Creek contains, sculpin, juvenile chinook salmon, and grayling. The present condition of Clinton Creek appears to prevents fish from reaching Hudgeon Lake.

CONCLUSIONS

The progressive deterioration of the waste rock plug at the outlet of Hudgeon Lake to Clinton Creek site has continued. Collapses and erosion on both sides of the channel in the upper reaches of Clinton Creek demonstrate the effects of waste rock movement and native rock erosion. The tails appear stable for the moment.

It appears inevitable that Clinton Creek will continue to erode the bed of it's channel, until the integrity of Hudgeon Lake is compromised. The difference in elevation from the outlet to the 40 Mile River is almost 60 meters. This could produce a significant failure event on the Clinton Creek drainage which would likely continue through the 40 Mile to the Yukon River and the 40 Mile townsite. .

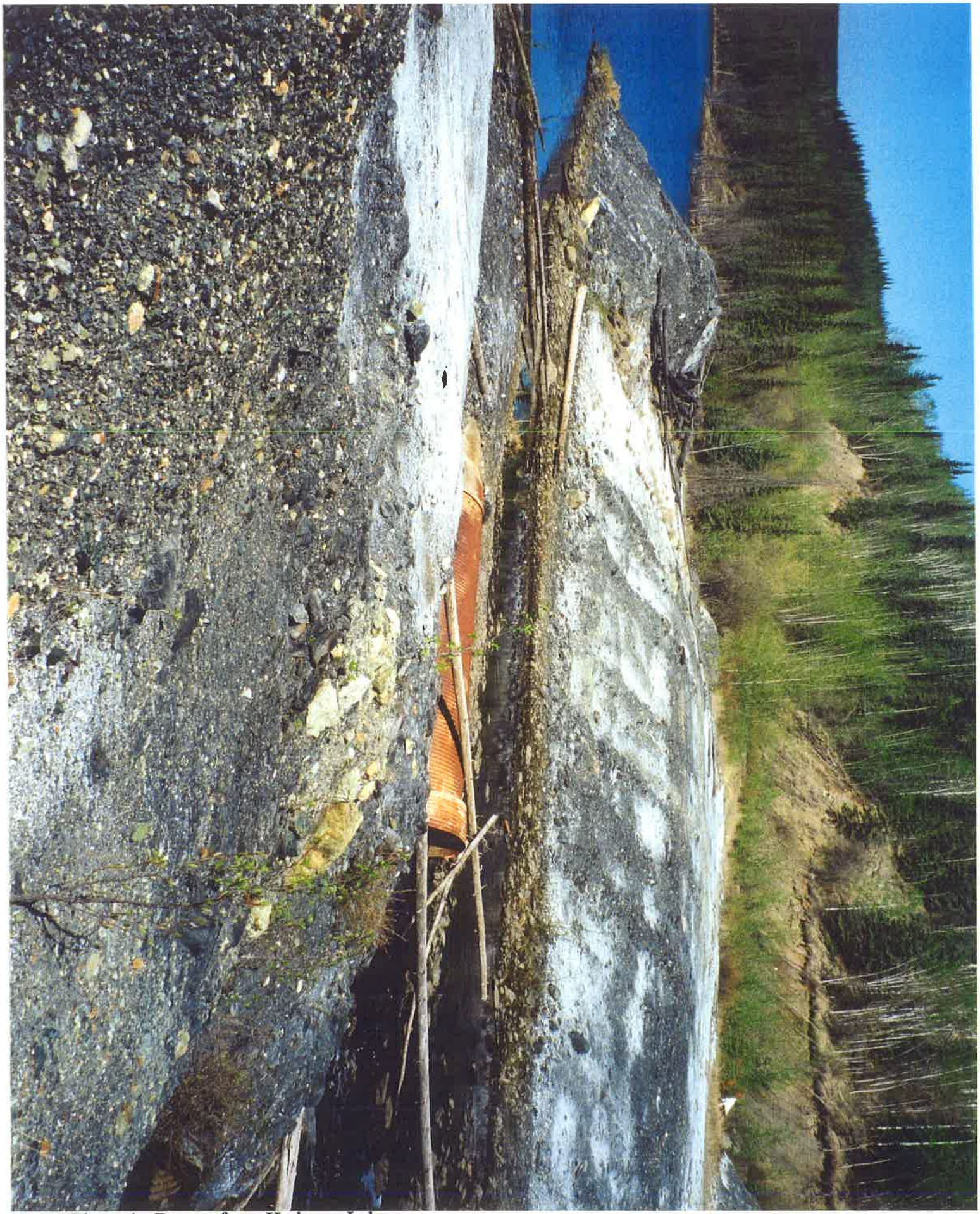

Photo A: Decant from Hudgeon Lake

Photo B: Decant crossing

Photo C: Riffle movement

Photo D: Spring and slump

Photo E: Spring flow

Photo F: Clinton Creek channel slump - native rock side of channel

Photo G: Clinton Creek slump - looking upstream

Photo H: Clinton Creek delta - with tents and canoes