

Alan Ehrlich

From: Oscar Alvarado <oalvarado@bactechgreen.com>
Sent: August-30-12 1:10 PM
To: Alan Ehrlich
Subject: Submitting Documents to Public Registry
Attachments: Memo-Guo - Giant Mine Tailings-1.doc

Dear Mr. Ehrlich,

I am inquiring as to how our company, BacTech Environmental, can submit a document to the Mackenzie Valley Review Board Public Registry for the Giant Mine Project. On August 14, SRK published a memo to the registry assessing our bioleaching technology for the remediation of Giant Mine. We would like an opportunity to counter some of their claims and describe our technology in greater detail for the public record. Is there any way that we can submit our response, which is attached, for publication?

Please let me know what the appropriate procedures are and I'd be happy to follow them.

Thank you for your help.

Best regards,

Oscar Alvarado (BASc, MA, EPT)
Project Research Analyst
BacTech Environmental
416-813-0303 ext 227
www.bactechgreen.com

BACTECH ENVIRONMENTAL CORPORATION

50 Richmond Street East, Suite 300, Toronto, Ontario M5C 1N7 Canada
Tel: 416.813.0303 **Fax:** 416.596.9840 www.bactechgreen.com

Memorandum

From: Junxiang Guo
To: Ross Orr, David Salari, Paul Miller, Lou Nagy
Date: July 17, 2012
Subject: Preliminary assessment on the Giant Mine tailings

In late 1980's the previous Giant Yellowknife Mines built a 10,000 tpd Tailings Retreatment Plant ("TRP") for the recovery of gold from the old tailings. The flowsheet dated February 1989 (Bartlett, 1989) shows that in addition to a carbon-in-column circuit and a carbon-in-leach circuit, there was a magnetic separation/roasting circuit in which the CIL tails would go through magnetic separators at the very end of the flowsheet. The magnetic concentrate would then be roasted and the calcine would be recirculated to the CIL circuit. However in a detailed metallurgical audit of TRP performance from 31 Jan to 11 Feb 1990 nothing was mentioned about this magnetic separation/roasting circuit (Suddaby, 1990). Therefore it is likely that this magnetic separation/roasting circuit was either conceptual or was not implemented, thus the TRP was only capable of recovering free milling gold from the old tailings.

In 1989 the TRP treated in total 1,094,206.3 tons of the old tailings with an averaged feed grade of 0.066 oz/t (or 2.26 g/t). At 10,000 tpd throughput, the TRP would have operated for 109 days in 1989. Gold production attributable to 1989 operations at the TRP was estimated to be 20,570 ounces. This corresponds to a gold percentage recovery of 28.5% based on ounces produced. The newly generated tails contained 0.046 oz/t (or 1.58 g/t) gold (Suddaby, 1990).

The plant recovery is lower than bottle roll extractions of around 34% on samples described as 1989 mining area composites, but is generally in line with diagnostic leach test results:

Diagnostic Leach	Mineral Association	Gold Distribution wt%
Pond Water	Gold cyanide salt	11.5
Cyanide	<u>Free gold grains</u>	<u>9.3</u>
	<i>Liberated Sub-Total</i>	<i>20.8%</i>
NaOH	Ferric arsenates	15.2
HCl	Geothite/pyrrhotite	33.0
Aqua Regia	<u>Arsenopyrite/pyrite</u>	<u>28.2</u>
	<i>Refractory Sub-Total</i>	<i>79.2%</i>

If the diagnostic leach procedure used a hot NaOH digestion, the mineral that would get dissolved should be arsenopyrite, not “ferric arsenates”.

Probably due to the economic reasons, flotation of the gold-bearing sulphides in the old tailings was not incorporated into the flowsheet in Phase I and the TRP was designed only to recover the non-refractory portion of the gold in the old tailings. Concentration of the old tailings appears to be a priority in Phase II. As of 10 April 1989, Lakefield Research achieved cleaner recovery of 29% in 6.5 wt% mass pull from TRP feed (Bartlett, 1989):

Reagents	Product	Wt	Assays, (g/t, %)			% Distribution		
		%	Au	S	As	Au	S	As
H ₃ PO ₄	Cleaner Conc	6.5	12.5	3.45	0.75	28.9	42.6	14.2
Silicate O	Rougher Conc	22.8	5.43	1.35	0.52	44.2	58.7	34.6
A350/AQ50	Rougher Tail	77.2	2.02	0.28	0.29	55.8	41.3	65.4
3477	Head		2.80	0.52	0.34			

It is believed that these results were preliminary at the time Bartlett prepared his report in April 1989. There are three reports by Lakefield Research that may provide us with more insight into the floatability of the old tailings:

- Lakefield Research - Project No.L.R.3672 - Phase II Report, 28 June 1989
- Lakefield Research - Project No.L.R.3674, Progress Report No.1, Oct 6, 1989
- Lakefield Research - Project No.L.R.3718, Phase III Report, 23 Nov 1989

On 16 July 2012 we have requested Aboriginal Affairs and Northern Development Canada (“AANDC”) to help us get these reports.

Also unknown at this point is that how long the TRP had operated since 1989.

It is clear that there is a significant amount of refractory gold locked in sulphide minerals in the old tailings. Fine grinding tests had confirmed no liberation at 10 micron (Bartlett, 1989) therefore destructive sulphide oxidation method like bioleaching would be required to liberate the gold.

References:

1. Progress Review - Technical Improvement Program - Tailings Retreatment Plant, Yellowknife Division, Giant Yellowknife Mines Limited – D.R. Bartlett (Senior Project Metallurgist), 10 April 1989.
2. Metallurgical Audit for Giant Yellowknife Mines - 1989 TRP Performance from 31 Jan to 11 Feb 1990 – Mark K. Suddaby, 13 Nov 1990.