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Report
on
Biooxidation and Pressure Oxidation Testing -
Sleeper Drill Core Composites
MLI Job No. 3775
May 26, 2015

for

Mr. Glen Van Treek
Paramount Gold Nevada Corp.
665 Anderson Street
Winnemucca, NV 89445

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EXECUTIVE SUMMARY

Preliminary stirred tank biooxidation and pressure oxidation (POX) tests were conducted on three refractory sulfidic drill core composites from the Sleeper project. The purpose for the tests was to evaluate effectiveness of the two oxidative pretreatment methods for improving gold recovery by cyanidation of refractory sulfidic gold bearing material from the Sleeper project. Biooxidation testing consisted of a series of three or four batch stirred tank biooxidation tests, with carbon-in-leach/cyanidation (CIL) of the biooxidized residues, on each composite. POX testing consisted of a single batch POX test followed by CIL of the POX residue.

Following the successful completion of the preliminary testing program, a column biooxidation testing program was conducted to evaluate amenability of the Sleeper refractory sulfidic ore to heap biooxidation treatment, followed by heap leach cyanidation of the biooxidized residues. This testing program included four biooxidation column tests on each of three different drill core composites from the Sleeper project. Each composite was evaluated at two feed sizes (80%-12.5mm and 80%-6.3mm). A "sacrificial" column biooxidation test and a "continuous" column biooxidation test were conducted on each composite at each feed size. The sacrificial columns were emptied periodically to generate samples of partially biooxidized residue for bottle roll (cyanidation) testing and analysis. Results from those tests were used to evaluate the progress of the biooxidation column tests. Residues from the continuous biooxidation column tests were used as feed for column cyanidation tests, after biooxidation pretreatment was terminated.

Results from both testing programs are the subject of this report. Overall, test results showed that the refractory sulfidic composites tested responded well to biooxidation pretreatment, for improvement of gold and silver recoveries by cyanidation. Specifically, simulated heap biooxidation pretreatment, at 12.5mm and 6.3mm feed sizes, resulted in improvement in simulated heap leach cyanidation gold recoveries from about 12% to 20% (without pretreatment) to as high as about 70% to 80%, after 235 days of pretreatment. Silver recoveries were also improved by biooxidation pretreatment, but by a much smaller amount. Stirred tank biooxidation pretreatment, as well as POX pretreatment, of milled feeds were both effective in improving gold recoveries to greater than 90%.

The three composites selected for preliminary stirred tank biooxidation testing were designated WWS-13-1, WWS-13-2 and WOS-13-1. Composite designations indicate West Wood sulfide (WWS) and Wood sulfide (WOS) ore types. Head analyses showed that the composites contained between 1.19 and 3.13 gAu/mt ore, and between 2.8 and 14.7 gAg/mt ore. Sulfide sulfur content the composites ranged from 2.49% to 3.80%. Baseline cyanidation tests, without oxidative pretreatment, showed that all three composites were refractory to whole ore CIL treatment, at an 80%-45µm feed size. Gold recoveries obtained by CIL of the WWS-13-1, WWS-13-2 and WOS-13-1 composites were 38.6%, 30.2% and 51.5%, respectively, in 96 hours of leaching.

Batch stirred tank biooxidation tests were conducted on each composite, with biooxidation times varied from 5 days to 28 days (5 or 6 tests/Comp.). Residues from those tests were used as feed for CIL tests. Summary results from those tests are presented in Table 1. Gold recovery versus oxidation time and gold recovery versus sulfide oxidation are presented in Figures 1 and 2.

Table 1. - Summary Metallurgical Results, Cyanidation (CIL) Tests, Sleeper Drill Core Composites, 80%-45µm Feed Size

					gAu/mt BR			gAu/mt ore			gAg/mt BR			gAg/mt ore		Reagent Req., kg/mt BR	
Composite	Amenability Test No.	Bioox. Time, days	Estimated Oxidation, %	Au Rec., %	Ext'd.	Tail	Calc'd. Head	Calc'd. Head[1)]	Head Assay	Ag Rec., %	Ext'd.	Tail	Calc'd. Head	Calc'd. Head[1)]	Head Assay	NaCN Cons.	Lime Added
WWS-13-1	Baseline	0	0.0	38.6	1.30	2.07	3.37	3.37	3.13	30.6	1.9	4.3	6.2	6.2	10.3	1.56	6.3
WWS 13-1	AM-14	5	1.7	81.3	3.08	0.71	3.79	3.77	3.13	51.4	5.5	5.2	10.7	10.7	10.3	1.12	14.8
WWS-13-1	AM-1	8	53.3	94.3	3.61	0.22	3.83	3.59	3.13	64.6	8.4	4.6	13.0	12.2	10.3	1.39	6.4
WWS-13-1	AM-2	21	79.5	96.0	3.63	0.15	3.78	3.46	3.13	68.1	7.9	3.7	11.6	10.6	10.3	1.36	7.5
WWS-13-2	Baseline	0	0.0	30.2	0.39	0.90	1.29	1.29	1.19	45.2	1.4	1.7	3.1	3.1	2.8	0.75	4.4
WWS 13-2	AM-13	5	2.6	62.1	0.82	0.50	1.32	1.32	1.19	75.0	3.6	1.2	4.8	4.8	2.8	0.89	7.4
WWS-13-2	AM-5	7	60.8	88.7	1.10	0.14	1.24	1.20	1.19	90.6	2.9	0.3	3.2	3.1	2.8	1.27	6.9
WWS-13-2	AM-6	21	78.6	91.1	1.23	0.12	1.35	1.33	1.19	93.4	5.7	0.4	6.1	6.0	2.8	1.19	7.6
WOS-13-1	Baseline	0	0.0	51.5	0.85	0.80	1.65	1.65	1.49	64.3	9.2	5.1	14.3	14.3	14.7	0.82	3.8
WOS-13-1	AM-9	5	5.8	64.0	1.10	0.62	1.72	1.66	1.49	73.8	13.5	4.8	18.3	17.6	14.7	0.59	5.5
WOS-13-1	AM-10	8	24.2	72.5	1.24	0.47	1.71	1.67	1.49	72.2	10.9	4.2	15.1	14.7	14.7	0.85	9.5
WOS-13-1	AM-11	21	60.3	83.4	1.36	0.27	1.63	1.52	1.49	83.1	11.3	2.3	13.6	12.8	14.7	1.00	5.0
WOS-13-1	AM-12	28	85.1	90.6	1.55	0.16	1.71	1.66	1.49	86.6	12.9	2.0	14.9	14.4	14.7	1.16	5.0

1) Adjusted for weight lost during biooxidation.
Note: BR denotes biooxidized residue.

Figure 1. - Gold Recovery vs. Biooxidation Time, Batch Amenability Tests, Sleeper Drill Core Composites

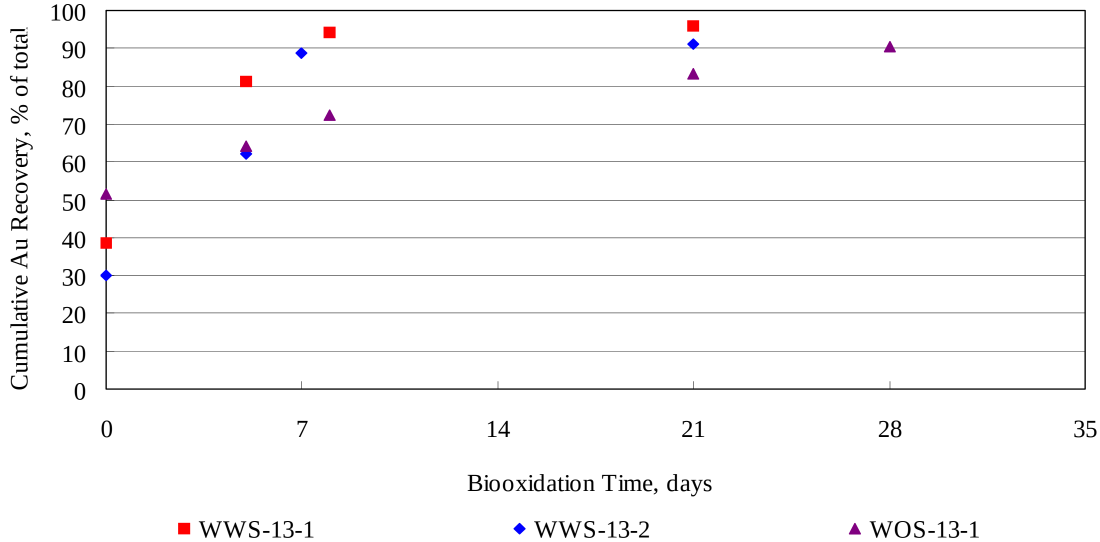
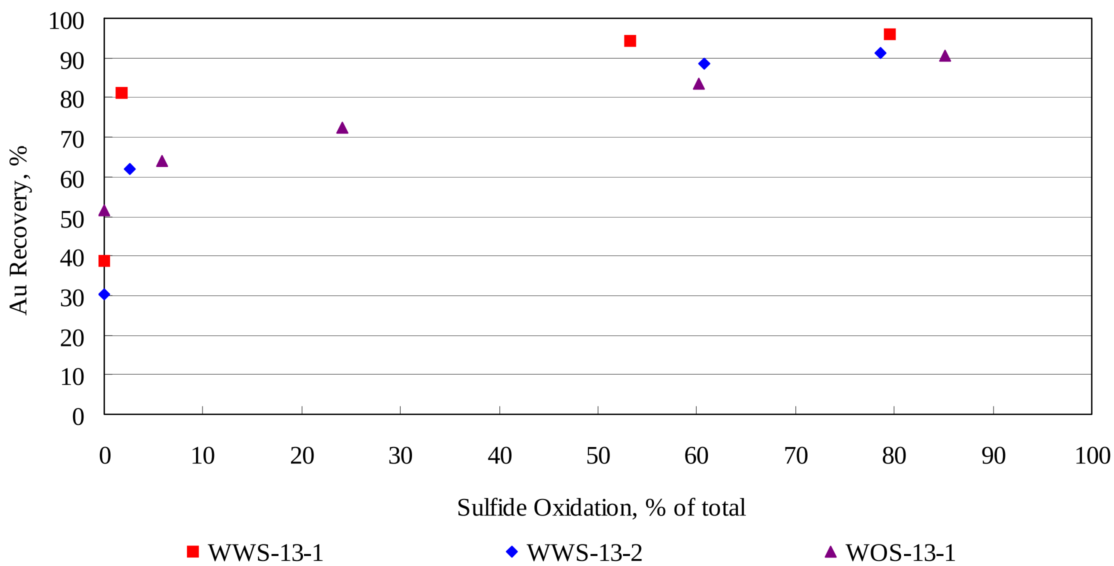


Figure 2. - Gold Recovery vs. Sulfide Oxidation, Batch Amenability Tests, Sleeper Drill Core Composites



All three composites responded very well to batch stirred tank biooxidation treatment. Gold recoveries obtained by CIL were improved to between 90.6% and 96.0%, after 21 to 28 days of biooxidation. Reagent consumptions for the biooxidized residues were moderate.

Biooxidation rates were rapid for the WWS composites. Biooxidation rate was slower for the WOS composite, but not unusually slow for batch stirred tank biooxidation tests. Relatively high levels of sulfide oxidation (>90%) were achieved for all three composites.

A single batch POX test was conducted by Hazen Research (3rd party metallurgical testing laboratory), under the direction of MLI, on each of the three composites. Results showed that all three composites responded well to POX processing. Gold recoveries obtained from the WWS-13-1, WWS-13-2 and WOS-13-1 composites, by CIL of the POX residues, were 92.5%, 90.0% and 85.9%, respectively. Reagent consumptions were higher than for batch Bioox. tests, but not considered unusually high for such preliminary testing. Sulfide sulfur oxidation obtained by POX pretreatment ranged from 77% to 82%. Higher levels of sulfide oxidation and gold recovery can probably be achieved through optimization of the POX processing conditions.

Overall, results showed good technical potential for processing the Sleeper refractory ore types tested, either from the preliminary testing stirred tank biooxidation or POX pretreatment, followed by cyanidation. It is questionable, however, whether the grade range of the composites tested (1.1 - 3.1 gAu/mt ore) is sufficiently high to offset the associated relatively high processing costs. Considering the results presented here and the grade of the material tested, evaluation of heap biooxidation processing of these ore types was recommended. Results from that testing are summarized below.

Because of constraints in the amount of sample available, three different composites were selected for the heap biooxidation testing program. The composites tested were designated WWS-13-MC, WOS-MC and FSU-13-1. WWS, WOS and FSU indicate West Wood sulfide, Wood sulfide and Facilities sulfide, respectively. Head analyses showed that the respective composites contained 2.64, 4.04 and 0.51 gAu/mt ore, and 8.0, 69.4 and 2.8 gAg/mt ore. Sulfide sulfur content the composites ranged from 3.24% to 4.57%. Baseline cyanidation tests, without oxidative pretreatment, showed that all three composites were refractory to whole ore cyanidation treatment, at both the 12.5mm and 6.3mm feed sizes. Column test (cyanidation) gold recoveries from the three composites (without pretreatment) ranged from 11.9% to 20.6%, in 67 to 109 days of leaching and rinsing.

A total of four biooxidation column tests were conducted on each of the three composites, to generate pretreated residues for cyanidation testing. Sacrificial and continuous column biooxidation tests (1/Comp./feed size) were conducted on each composite at 80%-12.5mm and 80%-6.3mm feed sizes. Partially biooxidized residues from the sacrificial columns were emptied from the column periodically to obtain grab samples for bottle roll cyanidation and analyses. These tests were used to gauge the progress of the biooxidation tests with respect to oxidation of sulfide minerals, and the corresponding improvement in response to cyanidation treatment. That information was used to set the biooxidation cycle duration for the corresponding continuous column biooxidation tests. Summary results from bottle roll cyanidation tests on the column biooxidized residues are presented in Figures 3 through 5, where gold recovery is shown as a function of biooxidation pretreatment time.

Figure 3. - Gold Recovery vs. Biooxidation Time, Bottle Roll Tests, Sacrificial Column Bioox. Test Residues, Sleeper Drill Core Composite WWS-13-MC

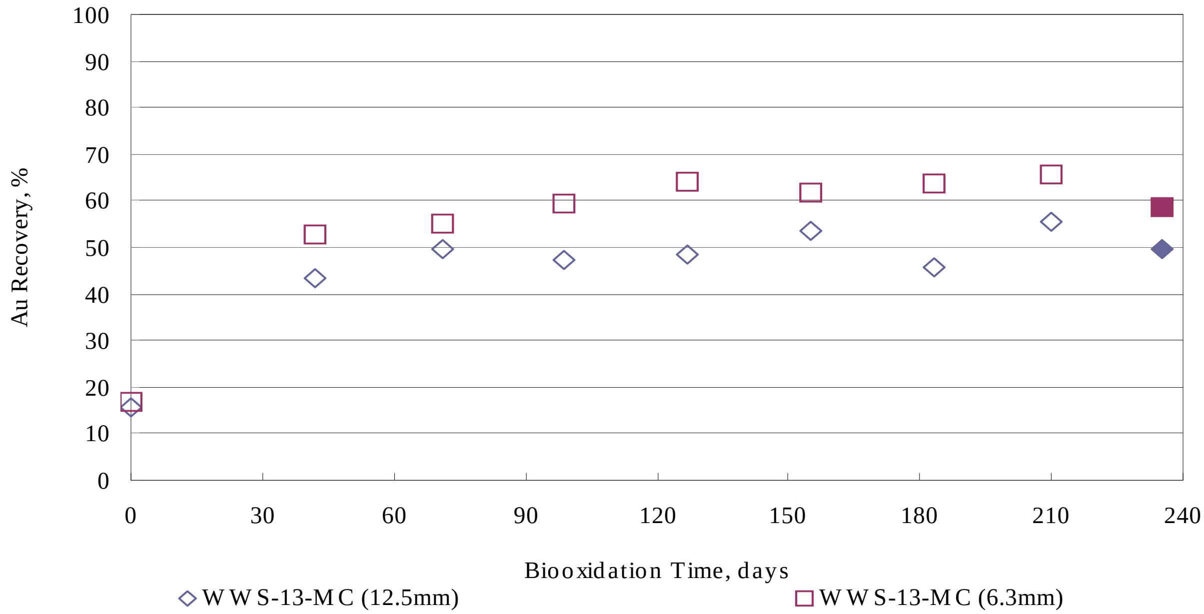


Figure 4. - Gold Recovery vs. Biooxidation Time, Bottle Roll Tests, Sacrificial Column Bioox. Test Residues, Sleeper Drill Core Composite WOS-MC

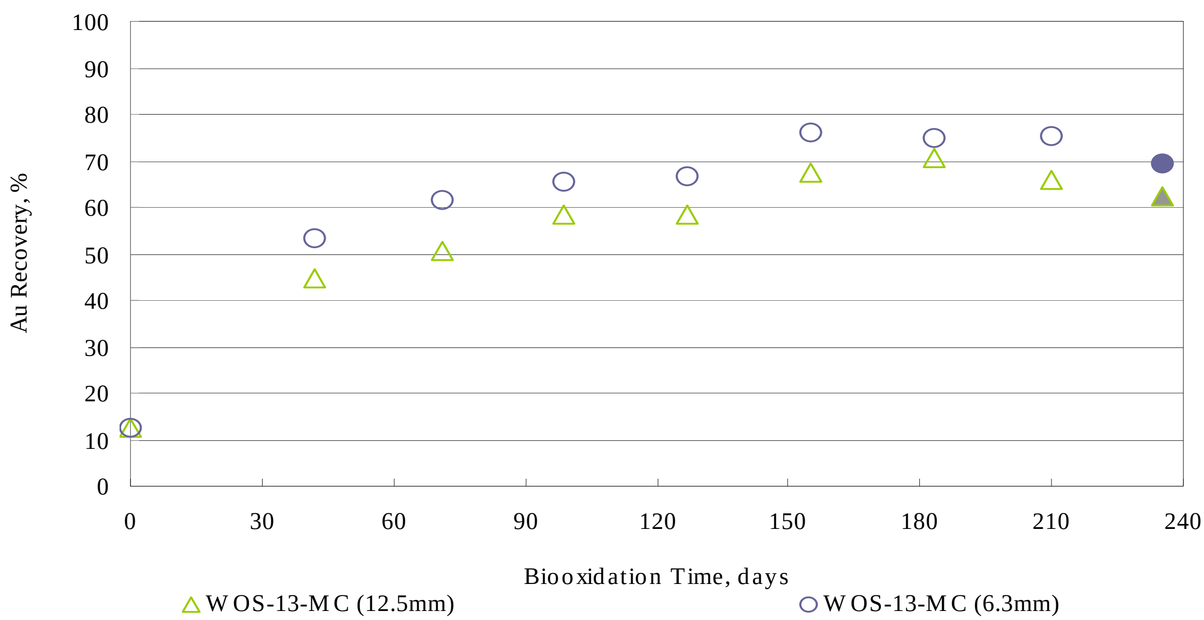
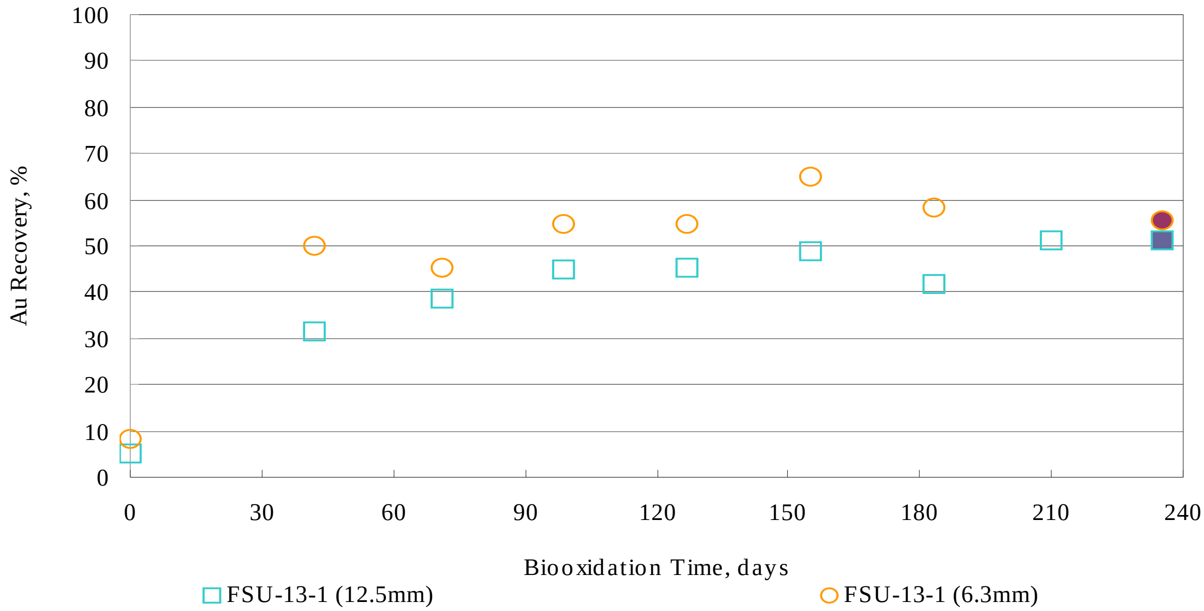


Figure 5. - Gold Recovery vs. Biooxidation Time, Bottle Roll Tests, Sacrificial Column Bioox. Test Residues, Sleeper Drill Core Composite FSU-13-1



Results from bottle roll testing on the sacrificial biooxidation column residues showed that biooxidation pretreatment was effective in significantly improving cyanidation gold recovery from the Sleeper refractory sulfidic core composites. Gold recoveries obtained at the two feed sizes increased from approximately 5% to 17% without pretreatment to between approximately 50% and 80% after biooxidation. In general, gold recoveries were about 5% to 10% higher at the 6.3mm feed size than from the 12.5mm feed size. Near maximum gold recoveries generally were obtained within about 180 days of biooxidation. Based on these results, the continuous biooxidation column tests were ended after 235 days of pretreatment. Comparative bottle roll results from the continuous biooxadation column test residues are shown as solid symbols in Figures 3 through 5.

Column leach cyanidation tests were conducted on each of the three composites, at both the 12.5mm and 6.3mm feed sizes, before and after biooxiation pretreatment. A biooxidation cycle of 235 days was employed for all of the continuous biooxidation column tests, which were used to generate the cyanide column test feeds. Summary results from the cyanidation column tests are presented in Table 2.

Table 2. - Summary Metallurgical Results, Column Leach Tests, Sleeper Drill Core Composites

						gAu/mt ore				gAg/mt ore			Reagent Req., kg/mt ore	
Composite	Feed Size, P_{80}	Test Type	Estimated Sulfide Oxidation, %	Leach/Rinse Time, days	Au Rec., %	Ext'd.	Tail Screen	Calc'd. Head	Ag Rec., %	Ext'd.	Tail Screen	Calc'd. Head	NaCN Cons.	Lime Added
WWS-13-MC	12.5mm	BL	0.0	109	19.5	0.54	2.23	2.77	33.8	2.2	4.3	6.5	2.62	6.6
WWS-13-MC	12.5mm	BR	22.9	92	65.4	1.76	0.93	2.69	44.6	3.3	4.1	7.4	3.55	21.1
WWS-13-MC	6.3mm	BL	0.0	109	20.6	0.56	2.16	2.72	33.3	2.6	5.2	7.8	2.78	6.6
WWS-13-MC	6.3mm	BR	22.0	92	68.7	1.80	0.82	2.62	45.0	3.6	4.4	8.0	3.40	26.1
WOS-MC	12.5mm	BL	0.0	109	14.8	0.57	3.27	3.84	39.9	23.6	35.6	59.2	2.61	6.2
WOS-MC	12.5mm	BR	33.8	92	71.9	2.94	1.15	4.09	41.8	23.7	33.0	56.7	3.37	12.7
WOS-MC	6.3mm	BL	0.0	109	14.4	0.59	3.50	4.09	36.4	23.2	40.5	63.7	2.83	5.4
WOS-MC	6.3mm	BR	23.9	93	77.9	3.07	0.87	3.94	43.9	25.4	32.4	57.8	2.85	13.8
FSU-13-1	12.5mm	BL	0.0	67	14.3	0.05	0.30	0.35	19.0	0.4	1.7	2.1	1.65	3.4
FSU-13-1	12.5mm	BR	44.4	85	70.7	0.29	0.12	0.41	41.7	1.0	1.4	2.4	2.73	30.8
FSU-13-1	6.3mm	BL	0.0	67	11.9	0.05	0.37	0.42	16.7	0.4	2.0	2.4	1.55	5.5
FSU-13-1	6.3mm	BR	54.9	87	81.0	0.34	0.08	0.42	38.5	1.0	1.6	2.6	2.50	37.7

Note: BL denotes baseline. BR denotes cyanidation of a column biooxidized residue.

Simulated heap biooxidation pretreatment was effective in significantly improving gold recovery by cyanidation. Baseline gold recoveries obtained from the three composites at both the 12.5mm and 6.3mm feed sizes, ranged from 11.9% to 20.6%, in 67 to 109 days of leaching and rinsing. Gold recoveries obtained from the biooxidized residues, at the 12.5mm feed size, ranged from 65.4% to 71.9%, in 85 to 92 days of leaching and rinsing. Gold recoveries from the 6.3mm biooxidized residues ranged from 68.7% to 81.0%, in 87 to 93 days of leaching and rinsing.

Cyanidation gold recovery rates were fairly rapid. Because the continuous biooxidation columns were operated without interruption during biooxiation, biooxidation rate data were not available. As discussed above, biooxidation was terminated for these tests after 235 days, based on results from the concurrent sacrificial column biooxidation tests. Sulfide sulfur analysis of the biooxidized residues indicated that levels of sulfide oxidation ranging from 22.0% and 54.9% were obtained during the 235 day biooxdation cycle. Further analysis of the data from the sacrificial column tests indicated that a biooxdation cycle of significantly less time than 235 days may have been sufficient for obtaining the reported gold recoveries by cyanidation. Further testing would be required to confirm that observation.

Cyanide consumptions for the baseline column leach tests were high (1.55 - 2.83 kgNaCN/mt ore). Cyanide consumptions for the biooxidized residues were higher (2.50 - 3.55 kgNaCN/mt ore). Lime requirements for the baseline tests ranged from 3.4 to 6.6 kg/mt ore. Lime required to maintain pH during cyanidation of the biooxidized residues were substantially higher (12.7 - 37.7 kg/mt ore). It is important to note that these lime requirements do not include all of the lime or limestone that will be required for neutralizing the acid generated during biooxidation preatreatment, in a commercial circuit. The global base requirement is probably best estimated based on the sulfide sulfur grade and mineralogy of the feed, and the levels of oxidation required.

Solution percolation problems were observed during biooxidation pretreatment of all three composites, at the 6.3mm feed size. Those problems ranged from minor to fairly severe. In general, no significant solution percolation problems were encountered during biooxidation of the 12.5mm feeds. The notable exception was the FSU-13-1 composite, which displayed moderate solution percolation problems in the 12.5mm continuous column test. All cyanidation column charges (baseline and biooxidized residues) were agglomerated, using the lime required for pH control, before leaching. No solution percolation problems were encountered during cyanide leaching. No geotechnical (load/permeability) testing was conducted on the biooxidized residues or cyanide leached agglomerates, to evaluate permeability expected during commercial heap biooxidation and leaching. It is expected that load/permeability testing will be required, and that testing may lead to additional optimization of crush size and agglomerating conditions.

COMPOSITE PREPARATION AND HEAD ANALYSES

Metallurgical testing was conducted on core composite rejects in-house from an earlier metallurgical testing program. A stirred tank biooxidation amenability testing program was conducted on three refractory sulfidic Sleeper drill core composites tested earlier (WWS-13-1, WWS-13-2 and WOS-13-1). A column biooxidation testing program was conducted on three master composites (WWS-13-MC, WOS-MC and FSU-13-1), which were prepared by combining earlier composite rejects, with drill core interval rejects also stored from the earlier testing program.

Existing rejects from composites WWS-13-1, WWS-13-2 and WOS-13-1 were each blended and split to obtain approximately 12 kg for further preparation, and 3 kg for mineralogical characterization. Each 12 kg sample was stage crushed to just passing 850µm in size. Minus 850µm samples were each blended and split, using a rotary type splitter, to obtain 4 kg for pressure oxidation (POX) testing and multiple 0.5 kg samples for biooxidation testing. The three 4 kg splits were shipped to Hazen Research, for POX testing. Splits (0.5 kg each) from each composite were used to establish a batch grind time to generate an 80%-45µm feed. Remaining 0.5 kg splits were used for batch stirred tank biooxidation tests. Head analyses available for the composites from an earlier testing program, were used, so no additional head analysis splits were required.

Three additional composites were used for the heap biooxidation testing program. Compositing instructions were provided by Paramount Gold Nevada Corp. personnel. Intervals and composite rejects were combined, as required, to produce the three heap biooxidation composites. Composite WWS-13-MC was a composite of rejects from previously prepared composites WWS-13-1 and WWS-13-2. Composite WOS-13-MC was prepared from drill core intervals. Composite FSU-13-1 was the same composite as tested during a preceding MLI Sleeper metallurgical testing program.

Each of the composites, or a split from the composite (FSU-13-1) was stage crushed in entirety to 80%-12.5mm (100%-19mm). Crushed composites were each blended and split to obtain the following:

1 x 18 kg for Baseline Column
2 x 18 kg for Biooxidation Columns
1 x 10 kg for Head Screen
1 x 1 kg for a Bottle Roll

Remaining 12.5mm feed from each composite was stage crushed to 80%-6.3mm (100%-9.5mm) in size, and was blended and split to obtain the same split weights, plus sample for bacterial inoculum scale-up procedures.

Head samples were assayed using conventional fire assay fusion procedures to determine gold and silver content. A multi-element ICP scan and sulfur speciation analyses were also conducted on each composite. The heap biooxidation composites were also subjected to carbon speciation analyses.

Splits (3 kg ea.) from the amenability composites were shipped to SGS Lakefield for mineralogical characterization.

Head assay results and head grade comparisons are presented in Tables 3 through 6. Results from ICP analyses, and carbon and sulfur speciation analysis are presented in Tables 7 and 8. Composite make-up information is presented in Section 1 of the Appendix to this report. A copy of the SGS mineralogy report is provided in Section 2 of the Appendix.

Table 3. - Gold Head Assay Results and Head Grade Comparisons, Sleeper Drill Core Composites

	Head Grade, gAu/mt ore		
Determination Method	WWS-13-1	WWS-13-2	WOS-13-1
Direct Assay, Init.	3.294	1.246	1.525
Direct Assay, Dup.	3.153	1.178	1.543
Direct Assay, Trip.	2.939	1.159	1.399
Calc'd. Bottle Roll, Baseline	3.37	1.29	1.65
Calc'd. Bottle Roll, 5 day Amenability	3.77	1.32	1.66
Calc'd. Bottle Roll, 8 day Amenability	3.59	1.20	1.67
Calc'd. Bottle Roll, 21 day Amenability	3.46	1.33	1.52
Calc'd. Bottle Roll, 28 day Amenability	----	----	1.66
Average	3.37	1.25	1.58
Std. Deviation	0.28	0.07	0.10
Precision, %	91.7	94.4	93.7

Note: WWS-13-2, 8 day Amenability, ran for 7 days.

Table 4. - Silver Head Assay Results and Head Grade Comparisons, Sleeper Drill Core Composites

	Head Grade, gAg/mt ore		
Determination Method	WWS-13-1	WWS-13-2	WOS-13-1
Direct Assay, Init.	10.0	2.9	14.0
Direct Assay, Dup.	11.0	2.7	15.0
Direct Assay, Trip.	10.0	2.8	15.0
Calc'd. Bottle Roll, Baseline	6.2	3.1	14.3
Calc'd. Bottle Roll, 5 day Amenability	10.7	4.8	17.6
Calc'd. Bottle Roll, 8 day Amenability	12.2	3.1	14.7
Calc'd. Bottle Roll, 21 day Amenability	10.6	6.0	12.8
Calc'd. Bottle Roll, 28 day Amenability	----	----	14.4
Average	10.1	3.6	14.7
Std. Deviation	1.9	1.3	1.4
Precision, %	81.2	63.9	90.5

Note: WWS-13-2, 8 day Amenability, ran for 7 days.

Table 5. - Gold Head Assay Results and Head Grade Comparisons, Sleeper Drill Core Composites

	Head Grade, gAu/mt ore		
Determination Method	WWS-13-MC	WOS-MC	FSU-13-1
Direct Assay Initial	2.45	4.15	0.57
Direct Assay Duplicate	2.68	3.95	0.49
Direct Assay Triplicate	2.79	4.01	0.48
Calc'd. Bottle Roll, 12.5mm, Baseline	2.44	4.26	0.39
Calc'd. Bottle Roll, 12.5mm, 42 Days Bioox.	2.40	4.09	0.38
Calc'd. Bottle Roll, 12.5mm, 71 Days Bioox.	2.61	4.09	0.44
Calc'd. Bottle Roll, 12.5mm, 99 Days Bioox.	2.73	3.81	0.40
Calc'd. Bottle Roll, 12.5mm, 127 Days Bioox.	2.78	3.60	0.53
Calc'd. Bottle Roll, 12.5mm, 155 Days Bioox.	2.80	3.67	0.50
Calc'd. Bottle Roll, 12.5mm, 183 Days Bioox.	3.19	4.20	0.65
Calc'd. Bottle Roll, 12.5mm, 210 Days Bioox.	2.53	5.13	0.38
Calc'd. Bottle Roll, 12.5mm, 235 Days Bioox.	3.01	3.58	0.51
Calc'd. Bottle Roll, 6.3mm, Baseline	2.88	4.12	0.49
Calc'd. Bottle Roll, 6.3mm, 42 Days Bioox.	2.89	4.06	0.44
Calc'd. Bottle Roll, 6.3mm, 71 Days Bioox.	2.70	3.91	0.44
Calc'd. Bottle Roll, 6.3mm, 99 Days Bioox.	2.68	4.00	0.44
Calc'd. Bottle Roll, 6.3mm, 127 Days Bioox.	2.68	4.11	0.44
Calc'd. Bottle Roll, 6.3mm, 155 Days Bioox.	2.71	3.58	0.40
Calc'd. Bottle Roll, 6.3mm, 183 Days Bioox.	2.70	4.10	0.47
Calc'd. Bottle Roll, 6.3mm, 210 Days Bioox.	2.80	3.85	N/A
Calc'd. Bottle Roll, 6.3mm, 235 Days Bioox.	2.83	3.90	0.56
Calc'd. Head Screen, 12.5mm	2.65	3.99	0.38
Calc'd. Head Screen, 6.3mm	2.94	3.88	0.55
Calc'd. Column, 12.5mm, Baseline	2.77	3.84	0.35
Calc'd. Column, 12.5mm, Biooxidized	2.69	4.09	0.41
Calc'd. Column, 6.3mm, Baseline	2.72	4.09	0.42
Calc'd. Column, 6.3mm, Biooxidized	2.62	3.94	0.42
Average	2.73	4.00	0.46
Std. Deviation	0.17	0.29	0.07
Precision, %	93.8	92.8	84.8

Table 6. - Silver Head Assay Results and Head Grade Comparisons, Sleeper Drill Core Composites

	Head Grade, gAg/mt ore		
Determination Method	WWS-13-MC	WOS-MC	FSU-13-1
Direct Assay Initial	7.8	68.9	3.2
Direct Assay Duplicate	7.6	65.6	2.7
Direct Assay Triplicate	8.5	73.7	2.4
Calc’d. Bottle Roll, 12.5mm, Baseline	7.3	71.7	2.2
Calc’d. Bottle Roll, 12.5mm, 42 Days Bioox.	6.0	55.5	2.8
Calc’d. Bottle Roll, 12.5mm, 71 Days Bioox.	7.9	77.7	2.7
Calc’d. Bottle Roll, 12.5mm, 99 Days Bioox.	6.0	49.1	2.2
Calc’d. Bottle Roll, 12.5mm, 127 Days Bioox.	7.3	50.1	2.6
Calc’d. Bottle Roll, 12.5mm, 155 Days Bioox.	9.5	52.0	2.0
Calc’d. Bottle Roll, 12.5mm, 183 Days Bioox.	10.1	71.0	2.6
Calc’d. Bottle Roll, 12.5mm, 210 Days Bioox.	7.9	60.6	1.9
Calc’d. Bottle Roll, 12.5mm, 235 Days Bioox.	6.7	47.2	2.3
Calc’d. Bottle Roll, 6.3mm, Baseline	7.0	67.9	2.2
Calc’d. Bottle Roll, 6.3mm, 42 Days Bioox.	7.2	56.8	2.4
Calc’d. Bottle Roll, 6.3mm, 71 Days Bioox.	7.0	55.7	2.8
Calc’d. Bottle Roll, 6.3mm, 99 Days Bioox.	6.9	58.5	2.5
Calc’d. Bottle Roll, 6.3mm, 127 Days Bioox.	7.3	63.4	2.7
Calc’d. Bottle Roll, 6.3mm, 155 Days Bioox.	6.5	51.2	2.1
Calc’d. Bottle Roll, 6.3mm, 183 Days Bioox.	7.4	65.0	2.1
Calc’d. Bottle Roll, 6.3mm, 210 Days Bioox.	7.6	59.8	N/A
Calc’d. Bottle Roll, 6.3mm, 235 Days Bioox.	8.7	68.8	1.9
Calc’d. Head Screen, 12.5mm	8.5	57.9	2.0
Calc’d. Head Screen, 6.3mm	7.2	54.8	3.2
Calc’d. Column, 12.5mm, Baseline	6.5	59.2	2.1
Calc’d. Column, 12.5mm, Biooxidized	7.4	56.7	2.4
Calc’d. Column, 6.3mm, Baseline	7.8	63.7	2.4
Calc’d. Column, 6.3mm, Biooxidized	8.0	57.8	2.6
Average	7.5	60.8	2.4
Std. Deviation	0.9	8.0	0.4
Precision, %	88.0	86.8	83.3

Average gold head grades for the biooxidation amenability testing composites were 3.37 (WWS-13-1), 1.25 (WWS-13-2) and 1.58 (WOS-13-1) gAu/mt ore. Respective average silver head grades were 10.1, 3.6 and 14.7 gAg/mt ore. Average gold head grades for the three heap biooxidation testing composites were 2.73 (WWS-13 MC), 4.00 (WOS-13 MC) and 0.46 (FSU-13-1) gAu/mt ore. Respective average silver head grades were 7.5, 60.8 and 2.4 gAg/mt ore. Gold head grade agreement was good, and head grade precision was greater than 90% for all composites except for FSU-13-1. Composite FSU-13-1 was relatively low in grade, and head grade standard deviation for that composite was only 0.07 gAu/mt ore, which is considered to be reasonably low. Silver head grade agreement was poorer, particularly for the lower silver grade composites. Silver head grade standard deviation generally was low though, and ranged from 0.4 to 0.9 gAg/mt ore, for all composites except for WOS-MC. Composite WOS-MC was higher in grade, and had a higher head grade standard deviation (8.0 gAg/mt ore).

Table 7. - ICP Metals Analysis Results, Sleeper Drill Core Composites

		Composite					
Analysis	Unit	WWS-13-1	WWS-13-2	WOS-13-1	WWS-13-MC	WOS-MC	FSU-13-1
Ag	mg/kg	9.60	3.09	13.10	8.26	69.7	3.14
Al	%	6.09	5.39	6.09	6.18	6.12	6.84
As	mg/kg	1,755	419	779	1,355	2,710	351
Ba	mg/kg	600	810	540	680	720	590
Be	mg/kg	2.38	1.84	1.48	2.66	1.38	2.4
Bi	mg/kg	0.11	0.02	0.02	0.10	0.07	0.08
Ca	%	0.92	0.25	0.12	0.64	0.12	0.69
Cd	mg/kg	0.13	0.12	0.15	0.31	0.21	0.12
Ce	mg/kg	48.0	52.3	55.4	62.5	57.6	52.1
Co	mg/kg	10.9	2.7	5.0	8.3	4.3	26.6
Cr	mg/kg	10	4	4	150	62	129
Cs	mg/kg	10.10	10.35	8.53	11.1	8.31	16.4
Cu	mg/kg	44.3	6.0	14.1	31.9	85.1	53.3
Fe	%	3.60	2.47	3.52	3.16	3.05	5.33
Ga	mg/kg	16.20	13.65	14.55	17.55	14.95	16.7
Ge	mg/kg	0.20	0.22	0.22	0.21	0.29	0.18
Hf	mg/kg	4.8	2.3	3.1	4.0	3.4	3.4
Hg	mg/kg	2.65	2.85	4.84	2.81	3.29	0.503
In	mg/kg	0.048	0.016	0.036	0.053	0.048	0.051
K	%	3.35	3.78	3.48	3.9	4.2	3.23
La	mg/kg	22.0	24.7	27.1	28.2	28	24.6
Li	mg/kg	19.2	19.1	20.7	23.3	30.6	52.4
Mg	%	0.16	0.12	0.14	0.15	0.11	0.66
Mn	mg/kg	62	42	49	48	27	503
Mo	mg/kg	22.5	10.10	70.9	23.7	176.5	4.06
Na	%	0.32	0.57	0.34	0.45	0.46	0.15
Nb	mg/kg	10.2	9.3	10.7	9.2	9.9	11.8
Ni	mg/kg	11.6	2.4	3.1	11.2	2.9	46.9
P	mg/kg	4,010	710	210	2,740	190	1,880
Pb	mg/kg	14.9	16.2	18.0	23.4	20.9	8.1
Rb	mg/kg	165.5	174.5	162.0	194	185	153.5
Re	mg/kg	<0.002	<0.002	<0.002	<0.002	0.002	<0.002
S	%	3.95	2.66	3.88	3.50	3.42	4.53
Sb	mg/kg	733	1,085	297	740	1,825	96.7
Sc	mg/kg	11.0	5.6	6.1	9.1	6	12.8
Se	mg/kg	14	19	10	15	43	10
Sn	mg/kg	2.3	2.2	2.5	2.6	2.8	1.5
Sr	mg/kg	522	144.0	131.5	511	107.5	81.1
Ta	mg/kg	0.71	0.67	0.76	0.76	0.81	0.71
Te	mg/kg	0.08	<0.05	<0.05	0.08	0.37	<0.05
Th	mg/kg	10.1	10.9	12.3	11.1	13.3	4.0
Ti	%	0.479	0.200	0.239	0.400	0.237	0.643
Tl	mg/kg	6.04	3.90	24.0	5.05	15.45	3.24
U	mg/kg	4.4	4.7	6.5	5.2	8.2	1.8
V	mg/kg	82	19	36	63	32	131
W	mg/kg	20.1	6.5	9.4	17.4	9.1	9.3
Y	mg/kg	29.8	25.9	25.2	34.7	25.0	21.1
Zn	mg/kg	177	45	363	120	215	115
Zr	mg/kg	172.5	79.4	103.5	142.0	108.5	128.5

Table 8. - Carbon and Sulfur Speciation Analyses Results, Sleeper Drill Core Composites

	Sulfur, %			Carbon, %		
Composite	Total	Sulfate	Sulfide	Total	Organic	Inorganic
WWS-13-1	4.14	0.11	3.56	<0.01	<0.01	0.08
WWS-13-2	2.78	0.07	2.38	<0.01	<0.01	0.04
WOS-13-1	4.02	0.08	3.69	<0.01	<0.01	0.04
WWS-13-MC	3.76*	0.40*	3.36*	----	----	----
WOS-MC	3.24*	0.31*	2.93*	----	----	----
FSU-13-1	4.81*	0.24*	4.57*	----	----	----

* Average of triplicate results.

Head analysis results showed that the six composites tested contained between 2.38% and 4.57% sulfide sulfur. Sulfate sulfur grades ranged from 0.07% to 0.40%. The amenability composite samples were analyzed by Hazen Research to determine carbon content and speciation. None of those composites contained detectable levels of total carbon. The column test composites were not analyzed to determine carbon content.

Mineralogical characterization, including a gold deportment study, was conducted by SGS on each of composites WWS-13-1, WWS-13-2 and WOS-13-1 (Ref. Sect. 2, App.). The composites were all found to be comprised of major amounts of quartz (27% - 39%) and to be relatively high (26% - 32%) in clay minerals. Those clays included kaolinite, montmorillonite and palygorskite. The major sulfide mineral identified was pyrite.

The SGS gold deportment study revealed that the main gold minerals present were native gold (AuAg alloy, with Ag ≤ 25 wt%) and electrum (AuAg alloy, with 25%≤Ag wt%). Average silver content of the gold minerals was found to be 20% to 27%. Average gold mineral grain sizes for the WWS-13-1, WWS-13-2 and WOS-13-1 composites were 8.6µm, 6.4µm and 5.5µm, respectively. Gold contained in the composites was found to be 26% to 31% liberated and exposed (but attached), and 69% to 74% locked. Host minerals for the exposed and locked gold minerals were predominantly quartz/prite binary particles (WWS-13-1), pyrite/silicate intergrowths, followed by pyrite (WWS-13-2) and quartz (WOS-13-1). It should be noted that the observation that quartz locking was prevalent with composite WOS-13-1 is not consistent with the response of that composite to biooxidation/cyanidation treatment (high gold recoveries with high levels of sulfide oxidation).

BIOOXIDATION AMENABILITY TEST PROCEDURES AND RESULTS

A series of batch stirred tank biooxidation amenability tests were conducted on each of composites WWS-13-1, WWS-13-2 and WOS-13-1 to determine amenability of the three composites to stirred tank biooxidation treatment, and to determine amenability of the biooxidized residue to agitated cyanidation treatment. Residues from each batch biooxidation test were used as feed for a cyanidation test, and for detailed analysis.

An in-house mixed bacteria culture (predominantly T. ferrooxidans) maintained at MLI was adapted to the bulk rougher concentrate over an 8 week period of time. The volume of adapted culture was sequentially scaled up to produce the volume required for amenability testing.

Ore samples (~ 0.5 kg ea.) were stage ground in a laboratory mild steel ball mill to 80%-45µm in size, before biooxidation treatment. Milled ore samples were subjected to stirred tank biooxidation treatment for time periods ranging from 5 to 28 days.

Each milled sample was settled in grinding water to achieve 35% solids, and was placed into a PVC tank. Previously adapted culture was added to achieve 15% solids. Slurry pH was adjusted to between 1.5 and 2.0 by adding sulfuric acid and calcium carbonate, as required.

Biooxidation was conducted by mechanically agitating the concentrate and air sparging the slurry continuously throughout the oxidation cycles of varied times. Slurry pH, Redox., and D.O. were measured daily. A small aliquot of solution was taken daily for iron analysis (total, ferrous and ferric by difference). Slurry pH was maintained between 1.5 and 2.0 by adding sulfuric acid and limestone as required.

After oxidation, biooxidized residues were filtered to separate liquids and solids, and washed with three displacement volumes with fresh water. Washed solids were used as feeds for cyanidation tests. Cyanidation test procedures and results are described in the following section of this report.

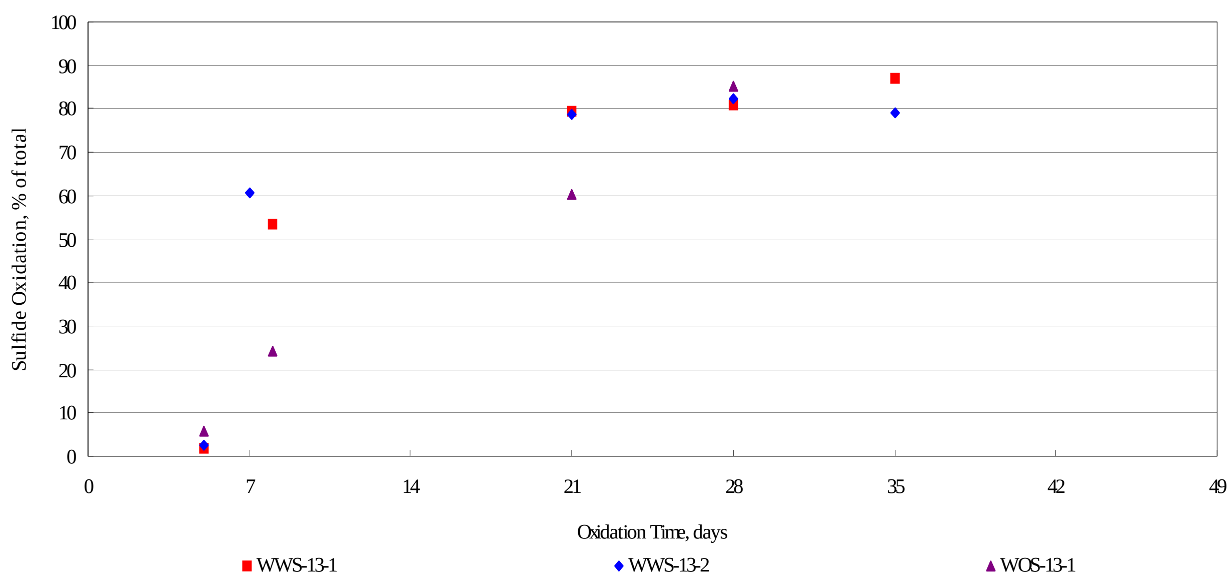
Overall metallurgical results from the batch biooxidation tests are summarized in Table 9. Sulfide oxidation versus biooxidation time is shown graphically in Figure 6. Detailed biooxidation test data are provided in Section 3, of the Appendix to this report. Results from cyanidation tests on the biooxidized residues are presented in the following section of this report.

Table 9. - Summary Metallurgical Results, Biooxidation Amenability Tests, Sleeper Drill Core Composites, 80%-45µm Grind Size

Amenability Test No.	Composite	Biooxidation Time, days	Weight Loss, %[1]	Estimated Oxidation, %	% $S^=$ Init.	% $S^=$ Final	Total Fe Ext'd., % of Total	Total Fe Ext'd., % Fe	Total Fe Head Assay, % Fe
AM-14	WWS-13-1	5	0.7	1.7	3.80	3.76	-10.0	-0.36	3.60
AM-1	WWS-13-1	8	6.5	53.3	3.80	1.90	54.9	1.98	3.60
AM-2	WWS-13-1	21	8.5	79.5	3.80	0.85	76.6	2.76	3.60
AM-3	WWS-13-1	28	7.7	80.8	3.80	0.79	81.6	2.94	3.60
AM-4	WWS-13-1	35	6.1	86.9	3.80	0.53	89.9	3.24	3.60
AM-13	WWS-13-2	5	0.6	2.6	2.49	2.44	0.0	0.00	2.47
AM-5	WWS-13-2	7	3.3	60.8	2.49	1.01	58.8	1.45	2.47
AM-6	WWS-13-2	21	1.4	78.6	2.49	0.54	42.8	1.06	2.47
AM-7	WWS-13-2	28	4.3	82.3	2.49	0.46	79.5	1.96	2.47
AM-8	WWS-13-2	35	3.2	79.0	2.49	0.54	71.6	1.77	2.47
AM-9	WOS-13-1	5	3.4	5.8	3.58	3.49	4.3	0.15	3.52
AM-10	WOS-13-1	8	2.7	24.2	3.58	2.79	20.4	0.72	3.52
AM-11	WOS-13-1	21	6.4	60.3	3.58	1.52	60.1	2.11	3.52
AM-12	WOS-13-1	28	3.0	85.1	3.58	0.55	66.5	2.34	3.52

1) Weight lost during biooxidation pretreatment. A negative weight loss indicates weight gain due to precipitation of reagents added during testing.

Figure 6. - Sulfide Oxidation Rate Data, Batch Stirred Tank Biooxidation Amenability Tests, Sleeper Drill Core Composites



Results showed that the Sleeper drill core composites were readily amenable to batch stirred tank biooxidation treatment. Sulfide oxidation levels of greater than 80% were achieved for all three composites, in 28 days of biooxidation treatment. Results from cyanidation tests on the resulting bioooxidized residues (discussed in next section of report) showed that the sulfide oxidation was effective for substantially improving gold recovery by cyanidation of the three composites.

Sulfide oxidation rate was reasonably rapid for batch stirred tank biooxidation tests. Extending the biooxidation time beyond 35 days might have resulted in marginally higher sulfide oxidation levels, for the WWS-13-1 and WOS-13-1 composites. Batch test kinetics are normally much slower than can be expected in a commercial circuit. Continuous pilot biooxidation testing would be required to evaluate oxidation rates expected in a continuous circuit.

Iron extraction, which provides another measure of sulfide mineral oxidation, ranged from 66.5% to 81.6%, in 28 days of biooxidation. Extending oxidation time to 35 days improved iron extraction from the WWS-13-1 composite. Iron extraction data are considered less reliable than sulfide sulfur data for tracking sulfide mineral oxidation, because of the potential for reprecipitation of iron extracted or added as inoculum, during biooxidation treatment. In the case of test AM-14, reprecipitation of iron added in the inoculum resulted in a negative iron extraction.

CYANIDATION OF AMENABILITY TEST BIOOXIDIZED RESIDUES - PROCEDURES AND RESULTS

The residue from each batch stirred tank biooxidation test was used as feed for a carbon-in-leach (CIL)/cyanidation bottle roll test. A comparative CIL/cyanidation test was conducted on each composite, at an 80%-45µm feed size, to generate baseline cyanidation data for comparison.

Baseline feeds (~ 0.5 kg each) were stage ground using a laboratory mild steel ball mill. Milled feeds and biooxidized residues were settled in grinding water or wash water to achieve 40% solids (by weight). Natural pulp pHs were measured. Hydrated lime was added to adjust the pH of the pulps to 11.0 before adding the cyanide. Sodium cyanide, equivalent to 1.0 gNaCN/L of solution, was added to the alkaline pulps.

Pretreated activated carbon, equivalent to 10 g carbon/L pulp, was added to the slurry with the initial cyanide addition. The carbon used was a PICA G210R, high activity, 6 x 12M coconut shell activated carbon. The activated carbon was pretreated by attritting to remove fines and soaking in barren cyanide solution (1.0 gNaCN/L) for six hours before adding to the test.

Leaching was conducted by rolling the pulps in bottles on the laboratory rolls for 72 hours. The baseline tests were extended to 96 hours. Rolling was suspended briefly after 2, 6, 12, 24, 48, and 72 hours to allow the pulps to settle so samples of barren solution could be taken for gold and silver analysis by A.A. methods. Barren solution volumes were measured and sampled. Cyanide concentration and pH were determined for each barren solution. Make-up water, equivalent to that withdrawn, was added to the pulps. Cyanide concentrations were restored to initial levels. Lime was added, when necessary, to maintain the leaching pH at between 10.8 and 11.2. Rolling was then resumed.

After 72 (or 96) hours, the pulps were screened to recover loaded carbon and filtered to separate liquids and solids. Loaded carbon samples were washed, dried, weighed and assayed, to determine gold and silver recovery. Final barren solution volumes were measured and sampled for gold and silver analysis. Final pH and cyanide concentrations were determined. Leached residues were washed, dried, weighed, and assayed in triplicate to determine residual gold and silver content.

Overall metallurgical results from the CIL tests are provided in Tables 10 through 12. No kinetic (leach rate) data were generated during testing. Detailed CIL test data are provided in Section 4, of the Appendix to this report.

Table 10. - Overall Metallurgical Results, CIL/Cyanidation Bottle Roll Tests, Sleeper Drill Core Composite WWS-13-1, 80%-45µm Feed Size

Bioox. Test:	BL		AM-14		AM-1		AM-2	
Bioox. Time, days:	0		5		8		21	
Est. Oxidation, %:	0.0		1.7		53.3		79.5	
Metallurgical Results	(CY-17)		(CY-22)		(CY-19)		(CY-20)	
Extraction: % of total	Au	Ag	Au	Ag	Au	Ag	Au	Ag
in 72 hours			81.3	51.4	94.3	64.6	96.0	68.1
in 96 hours	38.6	30.6						
Extracted, g/mt BR	1.30	1.9	3.08	5.5	3.61	8.4	3.63	7.9
Tail Assay, g/mt BR[1)]	2.07	4.3	0.71	5.2	0.22	4.6	0.15	3.7
Calc'd. Head, g/mt BR	3.37	6.2	3.79	10.7	3.83	13.0	3.78	11.6
Assayed Head, g/mt ore[1)]	3.13	10.3	3.13	10.3	3.13	10.3	3.13	10.3
NaCN Consumed, kg/mt BR	1.56		1.12		1.39		1.36	
Lime Added, kg/mt BR	6.3		14.8		6.4		7.5	
Final Solution pH	10.7		10.7		11.0		11.1	
Natural pH (40% solids)	5.9		2.8		6.1		5.5	

1) Average of triplicate assays.

Table 11. - Overall Metallurgical Results, CIL/Cyanidation Bottle Roll Tests, Sleeper Drill Core Composite WWS-13-2, 80%-45µm Feed Size

Bioox. Test:	BL		AM-13		AM-5		AM-6	
Bioox. Time, days:	0		5		7		21	
Est. Oxidation, %:	0.0		2.6		60.8		78.6	
Metallurgical Results	(CY-18)		(CY-21)		(CY-23)		(CY-24)	
Extraction: % of total	Au	Ag	Au	Ag	Au	Ag	Au	Ag
in 72 hours			62.1	75.0	88.7	90.6	91.1	93.4
in 96 hours	30.2	45.2						
Extracted, g/mt BR	0.39	1.4	0.82	3.6	1.10	2.9	1.23	5.7
Tail Assay, g/mt BR[1)]	0.90	1.7	0.50	1.2	0.14	0.3	0.12	0.4
Calc'd. Head, g/mt BR	1.29	3.1	1.32	4.8	1.24	3.2	1.35	6.1
Assayed Head, g/mt ore[1)]	1.19	2.8	1.19	2.8	1.19	2.8	1.19	2.8
NaCN Consumed, kg/mt BR	0.75		0.89		1.27		1.19	
Lime Added, kg/mt BR	4.4		7.4		6.9		7.6	
Final Solution pH	11.0		10.9		11.2		10.8	
Natural pH (40% solids)	6.0		3.6		2.6		3.8	

1) Average of triplicate assays.

Table 12. - Overall Metallurgical Results, CIL/Cyanidation Bottle Roll Tests, Sleeper Drill Core Composite WOS-13-1, 80%-45µm Feed Size

Bioox. Test:	BL		AM-9		AM-10		AM-11		AM-12	
Bioox. Time, days:	0		5		8		21		28	
Est. Oxidation, %:	0.0		5.8		24.2		60.3		85.1	
Metallurgical Results	(CY-16)		(CY-27)		(CY-28)		(CY-30)		(CY-29)	
Extraction: % of total	Au	Ag	Au	Ag	Au	Ag	Au	Ag	Au	Ag
in 72 hours			64.0	73.8	72.5	72.2	83.4	83.1	90.6	86.6
in 96 hours	51.5	64.3								
Extracted, g/mt BR	0.85	9.2	1.10	13.5	1.24	10.9	1.36	11.3	1.55	12.9
Tail Assay, g/mt BR[1)]	0.80	5.1	0.62	4.8	0.47	4.2	0.27	2.3	0.16	2.0
Calc'd. Head, g/mt BR	1.65	14.3	1.72	18.3	1.71	15.1	1.63	13.6	1.71	14.9
Assayed Head, g/mt ore[1)]	1.49	14.7	1.49	14.7	1.49	14.7	1.49	14.7	1.49	14.7
NaCN Consumed, kg/mt BR	0.82		0.59		0.85		1.00		1.16	
Lime Added, kg/mt BR	3.8		5.5		9.5		5.0		5.0	
Final Solution pH	10.7		10.9		11.0		11.0		10.8	
Natural pH (40% solids)	6.3		3.3		2.5		2.3		3.3	

1) Average of triplicate assays.

Overall metallurgical results show that stirred tank biooxidation treatment was effective in increasing gold recovery by CIL/cyanidation of the WWS-13-1 composite from 38.6% to as high as 96.0%, after 21 days of biooxidation. The corresponding level of sulfide oxidation was 79.5%. CIL/cyanidation gold recoveries after 5 and 8 days of pretreatment were 81.3% (1.7% $S^{=}$ oxidation) and 94.3% (53.3% $S^{=}$ oxidation), respectively. Biooxidation increased silver recoveries by CIL/cyanidation from 30.6% to as high as 68.1%, after 21 days of pretreatment.

Biooxidation pretreatment was effective in increasing CIL/cyanidation gold recovery from the WWS-13-2 from 30.2% to as high as 91.1%, after 21 days of biooxidation. The corresponding level of sulfide oxidation was 78.6%. CIL/cyanidation gold recoveries after 5 and 7 days of pretreatment were 62.1% (2.6% $S^{=}$ oxidation) and 88.7% (60.8% $S^{=}$ oxidation), respectively. Biooxidation increased silver recoveries by CIL/cyanidation from 45.2% to as high as 93.4%, after 21 days of pretreatment.

Biooxidation pretreatment was effective in increasing CIL/cyanidation gold recovery from the WOS-13-1 from 51.5% to as high as 90.6%, after 28 days of biooxidation. The corresponding level of sulfide oxidation was 85.1%. CIL/cyanidation gold recoveries after 5, 8 and 21 days of pretreatment were 64.0 (5.8% $S^{=}$ oxidation), 72.5 (24.2% $S^{=}$ oxidation) and 83.4% (60.3% $S^{=}$ oxidation), respectively. Biooxidation increased silver recoveries by CIL/cyanidation from 64.3% to as high as 86.6%, after 28 days of pretreatment.

WHOLE ORE PRESSURE OXIDATION TESTS

A single whole ore acidic pressure oxidation (POX) test was conducted on each of composites WWS-13-1, WWS-13-2 and WOS-13-1, to obtain preliminary information concerning amenability of the Sleeper ore types to POX treatment. The resulting POX residues were subjected to CIL/cyanidation treatment, to evaluate the improvement in gold recovery obtained by POX treatment. The testing was subcontracted to Hazen Research, in Golden, CO.

A summary of POX testing conditions used by Hazen are as follows:

Feed Size:	80%-80µm
Temperature:	220°C
Pressure:	424 psig
Pulp Density:	15% solids
Time:	120 minutes

The residue from each POX test was subjected to a bottle roll CIL/cyanidation test. A summary of CIL testing conditions used by Hazen are as follows:

Feed Size:	80%-80µm (no regrind)
Cyanide Concentration:	2.0 gNaCN/L
Activated Carbon Addition:	40 g/kg slurry
pH Range:	10.5 - 11.0
Pulp Density:	30% solids
Time:	24 hours

The Hazen report concerning detailed results from the POX and POX residue CIL testing is provided in Section 5, of the Appendix to this report.

Results from the POX testing showed that all three composites responded well to POX pretreatment. Sulfide sulfur oxidation levels of between 77% and 82% were achieved.

CIL testing on the POX residues showed that gold recovery was increased substantially by POX pretreatment. CIL/cyanidation gold recovery from the WWS-13-1 composite was increased from 36.1% (MLI) to 92.5%. Gold recovery from the WWS-13-2 composite was increased from 30.2% (MLI) to 90.0%. Gold recovery from the WOS-13-1 composite was increased from 51.5% (MLI) to 85.9%.

It was suggested by Hazen that longer POX retention times and finer primary grind might be effective in significantly improving sulfide sulfur oxidation, and thereby further improving gold recovery.

COLUMN BIOOXIDATION TEST PROCEDURES AND RESULTS

A series of column percolation biooxidation tests were conducted on composites WWS-13-MC, WOS-MC and FSU-13-1, to determine amenability of the refractory sulfidic ore types to heap biooxidation pretreatment and the amenability of the heap biooxidized residue to heap leach cyanidation treatment. Column tests were conducted at 80%-12.5mm and 6.3mm feed sizes, to determine crush size sensitivity of the composites. A single test at each feed size was designated a “sacrificial” test. The sacrificial tests were emptied periodically to sample partially oxidized ore for analysis and cyanidation testing. The remaining test at each feed size was designated a “continuous” test. The continuous tests were run uninterrupted until biooxidation pretreatment was terminated.

Ore charges were "agglomerated" (no binder was added) by wetting with adapted bacterial inoculum, while mechanically tumbling. After adding inoculum (bacterial culture), ore charges were placed into 8 cm I.D. x 3 m high columns. Biooxidation pretreatment was conducted initially by applying the adapted culture over the ore charges at a rate of 4.8 Lph/m^2 of column cross-sectional area. Once a sufficient volume of column effluent was obtained for recycle, daily effluent was recycled, with appropriate make-up laboratory culture. Once bacterial activity was established in the biooxidation columns (about day 30 - 50), culture laboratory addition was terminated and ore charges were allowed to "rest" (free drained) for 2 days each week. Fresh water was added to make up for evaporative losses and samples removed for analysis. Ore charges were aerated (bottom up) continuously throughout the biooxidation cycles.

Daily column effluent volume was measured and sampled for analysis. Solution pH, oxidation/reduction (Redox.) potential, dissolved oxygen content, total iron and ferrous iron were determined. Ferric iron content was calculated by difference. After about 2 weeks of testing, sampling and solution recycle frequency was decreased to twice per week. After about 50 days, sampling and recycle frequency were decreased to once per week.

Sacrificial column charges were emptied every 30 to 45 days so that a sample of partially biooxidized residue could be removed for analysis and bottle roll cyanidation testing. Solution application was interrupted, and the column charges were allowed to drain. Columns were emptied by hand in an elongated pile onto a plastic tarp. Grab-samples of the partially biooxidized residue (~ 1 kg/sample) were taken for testing. Each entire grab sample was used for a bottle roll cyanidation test. Bottle roll residues were subjected to detailed analyses, including sulfur speciation analyses. Sulfide sulfur content of the leached residue was used to estimate the degree of sulfide oxidation achieved in the column. After sampling, ore charges were returned to the sacrificial biooxidation columns, and biooxidation pretreatment was resumed.

Biooxidation was continued for 235 days. After biooxidation was terminated, biooxidized residues were allowed to drain. Ore bed heights (apparent bulk density) were measured before and after biooxidation. Biooxidized residues were emptied from the columns, without any fresh water rinsing. Residual moisture content was measured. Biooxidized residues were dried, and the final dry weight was determined.

Summary biooxidation test results are presented in Table 13. Sulfide oxidation rate data are presented graphically in Figures 7 through 9. Results from cyanidation testing conducted on the biooxidized residues are presented later in this report. Detailed column biooxidation data are provided in Section 6 of the Appendix to this report.

Table 13. - Summary Biooxidation Data, Biooxidation Column Tests, Sleeper Drill Core Composites

Composite	Feed Size, P_{80}	Bioox. Time, days	Test No.	Test Type	Estimated $S^=$ Oxidation, %	Weight Loss, %	Sulfide Sulfur, % Init.	Sulfide Sulfur, % Final[1)]	Fe Extraction, % of total	Fe, % Ext'd.	Fe, % Tail[1)]	Fe, % Calc'd. Head	Fe, % Head Assay
WWS-13-MC	12.5mm	235	B-1	Continuous	22.9	0.4	3.36	2.59	20.0	0.71	2.84	3.55	3.16
WWS-13-MC	12.5mm	235	B-3	Sacrificial	26.8	2.9	3.36	2.46	22.8	0.87	2.94	3.81	3.16
WWS-13-MC	6.3mm	235	B-2	Continuous	22.0	0.9	3.36	2.62	19.5	0.73	3.01	3.74	3.16
WWS-13-MC	6.3mm	235	B-4	Sacrificial	22.3	2.9	3.36	2.61	17.5	0.65	3.06	3.71	3.16
WOS-MC	12.5mm	235	B-9	Continuous	33.8	2.3	2.93	1.94	22.9	0.72	2.43	3.15	3.05
WOS-MC	12.5mm	235	B-11	Sacrificial	27.0	3.1	2.93	2.14	27.9	0.87	2.25	3.12	3.05
WOS-MC	6.3mm	235	B-10	Continuous	23.9	2.6	2.93	2.23	17.4	0.49	2.33	2.82	3.05
WOS-MC	6.3mm	235	B-12	Sacrificial	25.6	3.1	2.93	2.18	23.0	0.73	2.45	3.18	3.05
FSU-13-1	12.5mm	235	B-5	Continuous	44.4	0.8	4.57	2.54	7.1	0.31	4.05	4.36	5.33
FSU-13-1	12.5mm	235	B-7	Sacrificial	30.2	2.9	4.57	3.19	12.8	0.73	4.99	5.72	5.33
FSU-13-1	6.3mm	235	B-6	Continuous	54.9	0.7	4.57	2.06	15.3	0.79	4.36	5.15	5.33
FSU-13-1	6.3mm	235	B-8	Sacrificial	38.5	2.9	4.57	2.81	5.9	0.32	5.12	5.44	5.33

1) Adjusted for weight loss during biooxidation.

Figure 7. - Sulfide Oxidation vs. Biooxidation Time, Biooxidation Column Tests, Sleeper Drill Core Composite WWS-13-MC

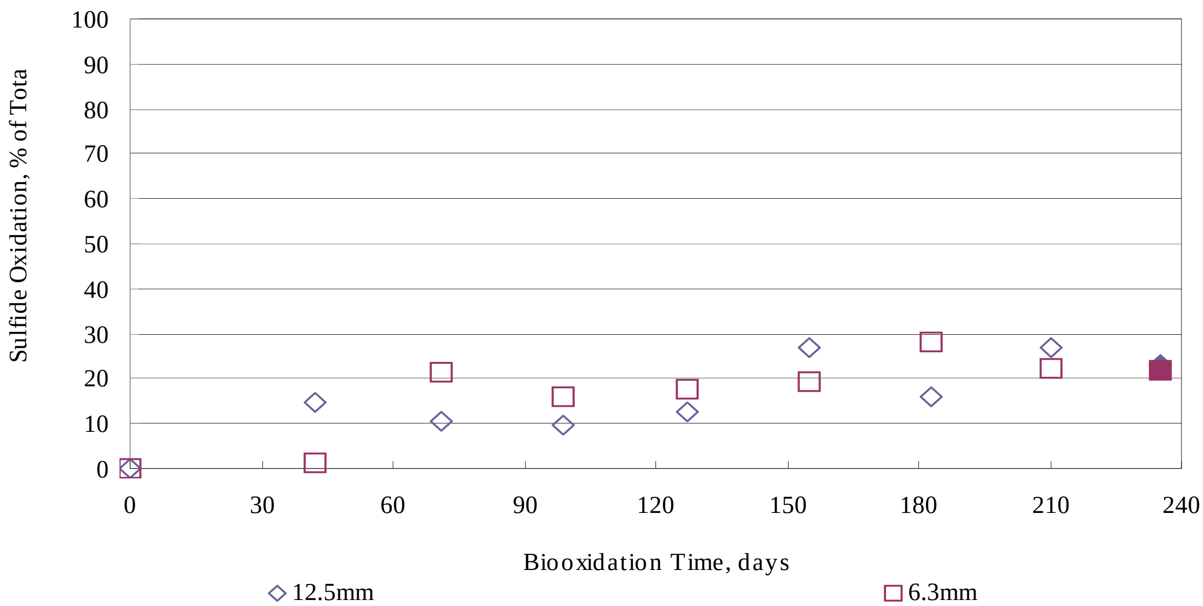


Figure 8. - Sulfide Oxidation vs. Biooxidation Time, Biooxidation Column Tests, Sleeper Drill Core Composite WOS-MC

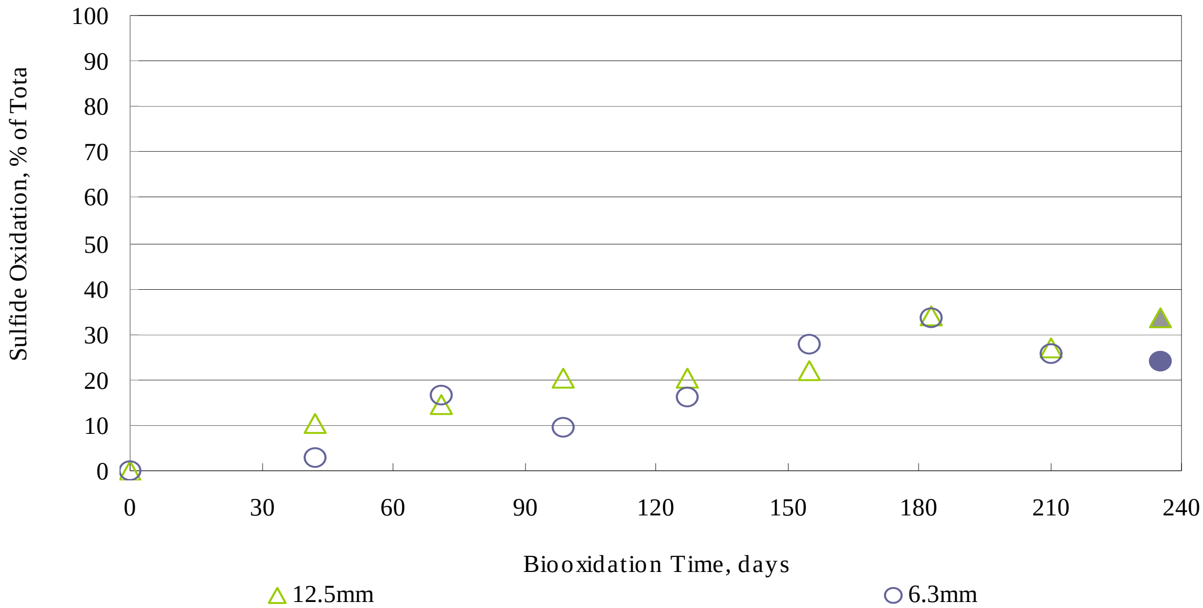
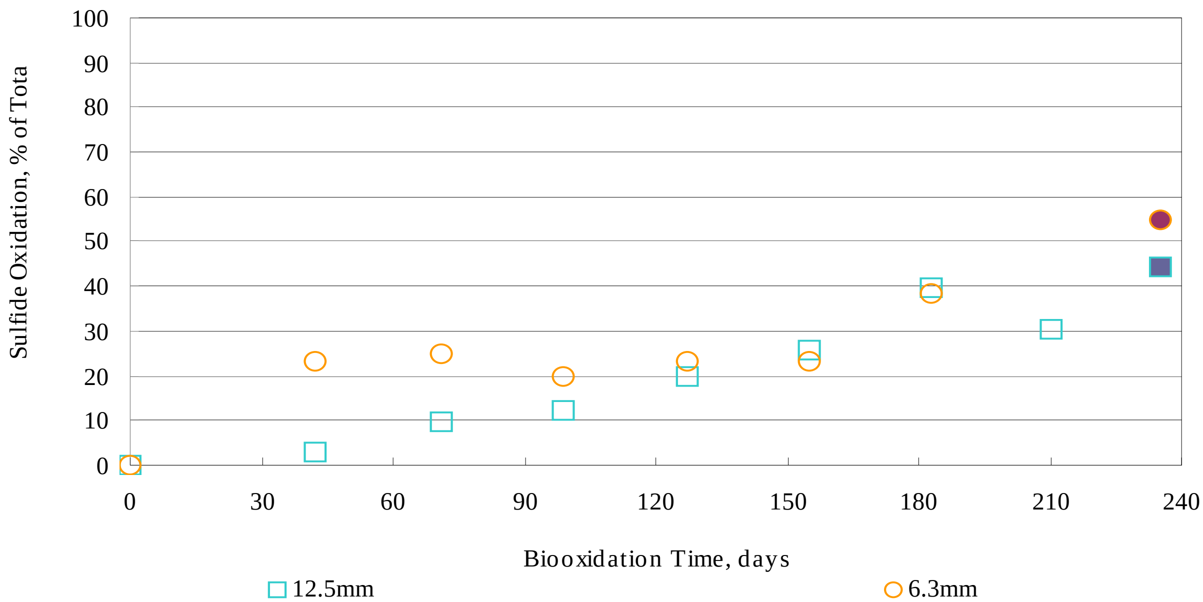


Figure 9. - Sulfide Oxidation vs. Biooxidation Time, Biooxidation Column Tests, Sleeper Drill Core Composite FSU-13-1



Column biooxidation test results showed that simulated heap biooxidation treatment was effective in achieving significant levels of sulfide sulfur oxidation, at both feed sizes evaluated. Estimated oxidation levels are based on initial and final sulfide sulfur grades, along with an adjustment to account for the sample weight loss which occurred during biooxdation (0.4% to 3.1%). Final sulfide oxidation levels for the three continuous 12.5mm feed size column tests, through 235 days of biooxidation pretreatment, were 22.9% (WWS-13-MC), 33.8% (WOS-MC) and 44.4% (FSU-13-1). Respective final oxidation levels for the continuous 6.3mm feed size tests were 22.0%, 23.9% and 54.9%.

Oxidation rate data, as shown in Figures 7 through 9, are based on analysis of the grab samples taken periodically from the sacrificial column tests. The solid data points shown at 235 days are comparative data from the continuous column tests. The oxidation rate data generated from the sacrificial column tests should be considered qualitative, because the samples taken for bottle roll testing and analysis were grab samples, taken from wet column residues. This sampling method resulted in somewhat erratic data.

Biooxidation rate data for the WWS-13-MC composite indicate that the maximum level of sulfide oxidation was achieved in about 155 days of pretreatment at the 12.5mm feed size, and in about 183 days for the 6.3mm feed size. Rate data for the WOS-MC and FSU-13-1 composites indicate that the maximum level of sulfide oxidation was achieved in about 183 days of pretreatment at both feed sizes. Further testing would be required to determine if the improvements in gold recovery observed with the continuous column test residues after 235 days of pretreatment (discussed later in this report) could be achieved with significantly shorter biooxidation preatreatment cycles.

Solution percolation problems were observed during biooxidation pretreatment of all three composites, at the 6.3mm feed size. Those problems ranged from minor to fairly severe, and were detected by visual observation of solution ponding on top of the column charges. In cases where ponding was observed, solution application was interrupted, and the standing solution was allowed to drain. In some cases, it was necessary to temporarily stop aerating the base of the columns, in order to drain the standing solution. After the standing solution was drained, solution application was restarted, but at a slower application rate. In general, it was possible to reestablish solution flow through all of the columns. These problems tended to be worse for the sacrificial columns, which were periodically emptied and reloaded into the biooxidation columns. In the case of test B-8 (sacrificial test on FSU-13-1 at 6.3mm), it was not possible to reestablish solution percolation over the last 50 days or so of the biooxidation cycle. In general, no significant solution percolation problems were encountered during biooxidation of the 12.5mm feeds. The notable exception was the FSU-13-1 composite, which displayed moderate solution percolation problems in the continuous column test (B-5). These results indicate that further optimization of feed size may be required to help ensure adequate ore permeability during commercial heap biooxidation pretreatment. Load/permeability type testing is also recommended for the biooxidized residues.

BOTTLE ROLL CYANIDATION OF BIOOXIDIZED RESIDUES PROCEDURES AND RESULTS

Agitated cyanidation (bottle roll) tests were conducted on composites WWS-13-MC, WOS-MC and FSU-13-1, without biooxidation pretreatment, and on biooxidized residues from the sacrificial and continuous column biooxidation tests. Tests were conducted on each composite at

80%-12.5mm and 80%-6.3mm feed sizes. The tests were conducted in a manner to determine gold and silver recovery, recovery rate and reagent consumptions.

Biooxidized residue samples were not washed with fresh water before leaching. Bottle roll test charges (approx. 1 kg ea.) were mixed with water to achieve 40 weight percent solids. Natural pulp pHs were measured. Lime was added to adjust the pH of the pulps to 11.0 before adding the cyanide. Sodium cyanide, equivalent to 1.0 gNaCN/L solution, was added to the alkaline pulps.

Leaching was conducted by rolling the pulps in bottles on the laboratory rolls for 96 hours. Rolling was suspended briefly after 2, 6, 24, 48, and 72 hours to allow the pulps to settle so samples of pregnant solution could be taken for gold and silver analysis by A.A. methods. Pregnant solution volumes were measured and sampled. Cyanide concentration and pH were determined for each pregnant solution. Make-up water, equivalent to that withdrawn, was added to the pulps. Cyanide concentrations were restored to initial levels. Lime was added, when necessary, to maintain the leaching pH at between 10.8 and 11.2. Rolling was then resumed.

After 96 hours, the pulps were filtered to separate liquids and solids. Final pregnant solution volumes were measured and sampled for gold and silver analysis. Final pH and cyanide concentrations were determined. Leached residues were washed, dried, weighed, and assayed in triplicate to determine residual gold content.

Overall metallurgical results from the bottle roll tests are summarized in Tables 14 through 16, and Figures 10 and 11. More detailed bottle roll results are presented in Tables 17 through 28. Gold leach rate profiles are shown graphically in Figures 12 through 23. Detailed bottle roll test data are provided in Section 7 of the Appendix.

Table 14. - Summary Metallurgical Results, Bottle Roll Tests, Biooxidized Column Residues, Sleeper Drill Core Composite WWS-13-MC

Feed Size, P_{80}	Amenability Test No.	Bioox. Time, days	Estimated Oxidation, %	Au Rec., %	gAu/mt BR			gAu/mt ore		Ag Rec., %	gAg/mt BR			gAg/mt ore		Reagent Req., kg/mt BR	
					Ext'd.	Tail	Calc'd. Head	Calc'd. Head[1)]	Avg. Head		Ext'd.	Tail	Calc'd. Head	Calc'd. Head[1)]	Avg. Head	NaCN Cons.	Lime Added
12.5mm	Baseline	0	0.0	15.6	0.38	2.06	2.44	2.44	2.73	27.4	2.0	5.3	7.3	7.3	7.5	0.41	3.1
12.5mm	B-3	42	14.9	43.4	1.05	1.37	2.42	2.40	2.73	38.3	2.3	3.7	6.0	6.0	7.5	0.88	14.5
12.5mm	B-3	71	10.7	49.4	1.30	1.33	2.63	2.61	2.73	35.4	2.8	5.1	7.9	7.9	7.5	1.21	17.1
12.5mm	B-3	99	9.5	47.3	1.31	1.46	2.77	2.73	2.73	43.3	2.6	3.4	6.0	6.0	7.5	1.66	12.4
12.5mm	B-3	127	12.8	48.6	1.37	1.45	2.82	2.78	2.73	39.2	2.9	4.5	7.4	7.3	7.5	1.41	15.8
12.5mm	B-3	155	26.8	53.5	1.53	1.33	2.86	2.80	2.73	46.4	4.5	5.2	9.7	9.5	7.5	1.66	22.2
12.5mm	B-3	183	16.1	45.7	1.49	1.77	3.26	3.19	2.73	29.8	3.1	7.3	10.4	10.1	7.5	1.32	20.1
12.5mm	B-3	210	26.8	55.4	1.44	1.16	2.60	2.53	2.73	39.5	3.2	4.9	8.1	7.9	7.5	1.28	18.3
12.5mm	B-1	235	22.9	49.5	1.50	1.53	3.03	3.01	2.73	46.3	3.1	3.6	6.7	6.7	7.5	1.35	17.3
6.3mm	Baseline	0	0.0	16.7	0.48	2.40	2.88	2.88	2.73	30.0	2.1	4.9	7.0	7.0	7.5	0.57	3.8
6.3mm	B-4	42	1.2	52.9	1.54	1.37	2.91	2.89	2.73	43.1	3.1	4.1	7.2	7.2	7.5	1.48	19.2
6.3mm	B-4	71	21.4	55.1	1.50	1.22	2.72	2.70	2.73	47.1	3.3	3.7	7.0	7.0	7.5	1.43	17.8
6.3mm	B-4	99	15.8	59.4	1.61	1.10	2.71	2.68	2.73	47.8	3.3	3.6	6.9	6.9	7.5	1.80	14.5
6.3mm	B-4	127	17.6	64.1	1.75	0.98	2.73	2.68	2.73	49.3	3.7	3.8	7.5	7.3	7.5	1.52	19.0
6.3mm	B-4	155	19.3	61.6	1.70	1.06	2.76	2.71	2.73	56.7	3.8	2.9	6.7	6.5	7.5	1.63	24.4
6.3mm	B-4	183	28.3	63.8	1.76	1.00	2.76	2.70	2.73	47.4	3.6	4.0	7.6	7.4	7.5	1.33	21.8
6.3mm	B-4	210	22.3	65.6	1.89	0.99	2.88	2.80	2.73	50.0	3.9	3.9	7.8	7.6	7.5	1.53	20.8
6.3mm	B-2	235	22.0	58.6	1.67	1.18	2.85	2.83	2.73	37.9	3.3	5.4	8.7	8.7	7.5	1.25	21.9

1) Adjusted for weight lost during biooxidation.
Note: BR denotes biooxidized residue.

Table 15. - Summary Metallurgical Results, Bottle Roll Tests, Biooxidized Column Residues, Sleeper Drill Core Composite WOS-MC

Feed Size, P_{80}	Amenability Test No.	Bioox. Time, days	Estimated Oxidation, %	Au Rec., %	gAu/mt BR			gAu/mt ore		Ag Rec., %	gAg/mt BR			gAu/mt ore		Reagent Req., kg/mt BR	
					Ext'd.	Tail	Calc'd. Head	Calc'd. Head[1)]	Avg. Head		Ext'd.	Tail	Calc'd. Head	Calc'd. Head[1)]	Avg. Head	NaCN Cons.	Lime Added
12.5mm	Baseline	0	0.0	12.7	0.54	3.72	4.26	4.26	4.00	47.6	34.1	37.6	71.7	71.7	60.8	0.77	3.3
12.5mm	B-11	42	10.6	44.5	1.83	2.28	4.11	4.09	4.00	44.6	24.9	30.9	55.8	55.5	60.8	1.00	9.5
12.5mm	B-11	71	14.7	50.6	2.09	2.04	4.13	4.09	4.00	51.1	40.1	38.4	78.5	77.7	60.8	1.15	13.4
12.5mm	B-11	99	20.1	58.3	2.25	1.61	3.86	3.81	4.00	51.7	25.7	24.0	49.7	49.1	60.8	1.06	5.1
12.5mm	B-11	127	20.5	58.6	2.15	1.52	3.67	3.60	4.00	45.9	23.4	27.6	51.0	50.1	60.8	0.99	6.2
12.5mm	B-11	155	22.2	67.4	2.52	1.22	3.74	3.67	4.00	57.6	30.6	22.5	53.1	52.0	60.8	1.03	12.2
12.5mm	B-11	183	34.1	70.5	3.03	1.27	4.30	4.20	4.00	52.4	38.1	34.6	72.7	71.0	60.8	1.05	10.3
12.5mm	B-11	210	27.0	65.9	3.48	1.80	5.28	5.13	4.00	52.6	32.8	29.5	62.3	60.6	60.8	1.04	9.2
12.5mm	B-9	235	33.8	62.3	2.28	1.38	3.66	3.58	4.00	41.5	20.1	28.3	48.4	47.2	60.8	0.96	8.4
6.3mm	Baseline	0	0.0	12.6	0.52	3.60	4.12	4.12	4.00	46.4	31.5	36.4	67.9	67.9	60.8	0.74	3.4
6.3mm	B-12	42	3.1	53.4	2.18	1.90	4.08	4.06	4.00	48.1	27.5	29.7	57.2	56.8	60.8	1.06	12.5
6.3mm	B-12	71	16.7	61.7	2.43	1.51	3.94	3.91	4.00	53.9	30.3	25.9	56.2	55.7	60.8	1.08	17.8
6.3mm	B-12	99	9.6	65.4	2.65	1.40	4.05	4.00	4.00	60.2	35.7	23.6	59.3	58.5	60.8	1.55	9.2
6.3mm	B-12	127	16.0	66.5	2.78	1.40	4.18	4.11	4.00	53.8	34.7	29.8	64.5	63.4	60.8	1.19	13.1
6.3mm	B-12	155	27.6	76.2	2.79	0.87	3.66	3.58	4.00	61.4	32.1	20.2	52.3	51.2	60.8	1.18	15.2
6.3mm	B-12	183	33.4	74.8	3.15	1.06	4.21	4.10	4.00	49.2	32.8	33.8	66.6	65.0	60.8	1.26	13.7
6.3mm	B-12	210	25.6	75.3	2.98	0.98	3.96	3.85	4.00	49.8	30.6	30.9	61.5	59.8	60.8	1.02	11.1
6.3mm	B-10	235	23.9	69.3	2.77	1.23	4.00	3.90	4.00	41.0	29.0	41.7	70.7	68.8	60.8	1.13	9.5

1) Adjusted for weight lost during biooxidation.
Note: BR denotes biooxidized residue.

Table 16. - Summary Metallurgical Results, Bottle Roll Tests, Biooxidized Column Residues, Sleeper Drill Core Composite FSU-13-1

Feed Size, P_{80}	Amenability Test No.	Bioox. Time, days	Estimated Oxidation, %	Au Rec., %	gAu/mt BR			gAu/mt ore		Ag Rec., %	gAg/mt BR			gAu/mt ore		Reagent Req., kg/mt BR	
					Ext'd.	Tail	Calc'd. Head	Calc'd. Head[1)]	Avg. Head		Ext'd.	Tail	Calc'd. Head	Calc'd. Head[1)]	Avg. Head	NaCN Cons.	Lime Added
12.5mm	Baseline	0	0.0	5.1	0.02	0.37	0.39	0.39	0.46	13.6	0.3	1.9	2.2	2.2	2.4	0.42	2.9
12.5mm	B-7	42	2.8	31.6	0.12	0.26	0.38	0.38	0.46	21.4	0.6	2.2	2.8	2.8	2.4	1.00	13.0
12.5mm	B-7	71	9.8	38.6	0.17	0.27	0.44	0.44	0.46	22.2	0.6	2.1	2.7	2.7	2.4	1.29	7.6
12.5mm	B-7	99	12.0	45.0	0.18	0.22	0.40	0.40	0.46	27.3	0.6	1.6	2.2	2.2	2.4	0.97	6.4
12.5mm	B-7	127	19.9	45.3	0.24	0.29	0.53	0.53	0.46	23.1	0.6	2.0	2.6	2.6	2.4	1.30	20.1
12.5mm	B-7	155	25.6	49.0	0.25	0.26	0.51	0.50	0.46	30.0	0.6	1.4	2.0	2.0	2.4	0.91	27.1
12.5mm	B-7	183	39.8	41.8	0.28	0.39	0.67	0.65	0.46	19.2	0.5	2.1	2.6	2.6	2.4	1.55	28.0
12.5mm	B-7	210	30.2	51.3	0.20	0.19	0.39	0.38	0.46	26.3	0.5	1.4	1.9	1.9	2.4	1.54	29.7
12.5mm	B-5	235	44.4	51.0	0.26	0.25	0.51	0.51	0.46	21.7	0.5	1.8	2.3	2.3	2.4	1.82	28.1
6.3mm	Baseline	0	0.0	8.2	0.04	0.45	0.49	0.49	0.46	13.6	0.3	1.9	2.2	2.2	2.4	0.22	3.2
6.3mm	B-8	42	23.4	50.0	0.22	0.22	0.44	0.44	0.46	37.5	0.9	1.5	2.4	2.4	2.4	1.39	22.0
6.3mm	B-8	71	24.7	45.5	0.20	0.24	0.44	0.44	0.46	28.6	0.8	2.0	2.8	2.8	2.4	1.52	10.7
6.3mm	B-8	99	19.9	54.5	0.24	0.20	0.44	0.44	0.46	32.0	0.8	1.7	2.5	2.5	2.4	1.71	18.7
6.3mm	B-8	127	23.4	54.5	0.24	0.20	0.44	0.44	0.46	25.9	0.7	2.0	2.7	2.7	2.4	0.75	21.9
6.3mm	B-8	155	23.4	65.0	0.26	0.14	0.40	0.40	0.46	28.6	0.6	1.5	2.1	2.1	2.4	0.67	25.5
6.3mm	B-8	183	38.5	58.3	0.28	0.20	0.48	0.47	0.46	23.8	0.5	1.6	2.1	2.1	2.4	1.20	32.8
6.3mm	B-6	235	54.9	55.4	0.31	0.25	0.56	0.56	0.46	26.3	0.5	1.4	1.9	1.9	2.4	0.79	35.4

1) Adjusted for weight lost during biooxidation.
Note: BR denotes biooxidized residue.

Figure 10. - Gold Recovery vs. Biooxidation Time, Bottle Roll Tests, Sacrificial Column Bioox. Test Residues, Sleeper Drill Core Composites

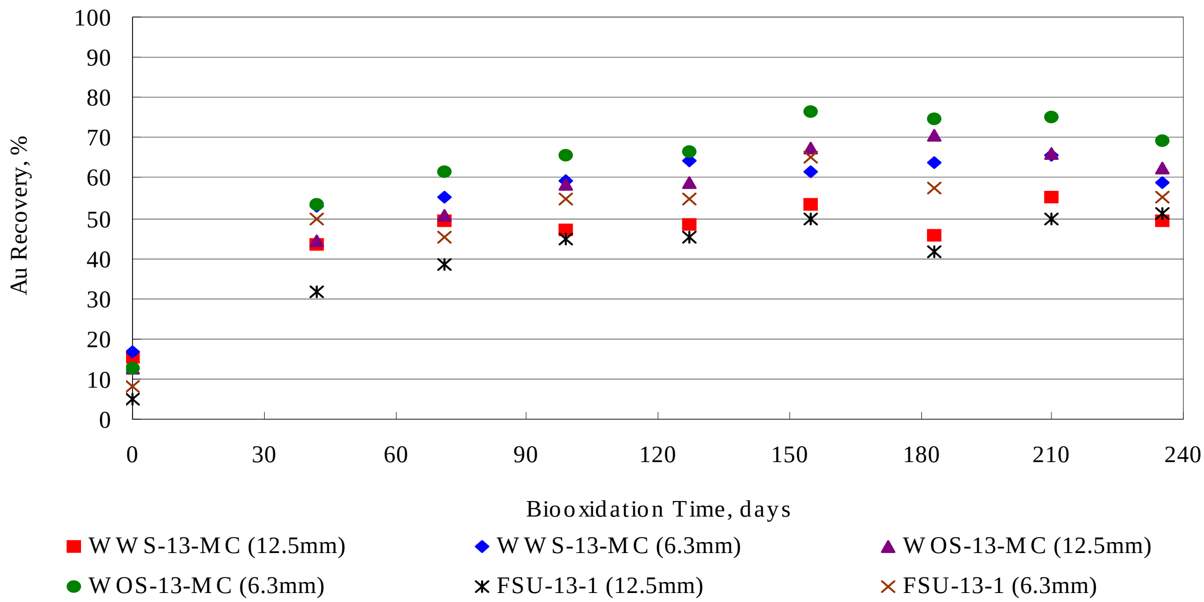


Figure 11. - Gold Recovery vs. Sulfide Oxidation, Bottle Roll Tests, Sacrificial Column Bioox. Test Residues, Sleeper Drill Core Composites

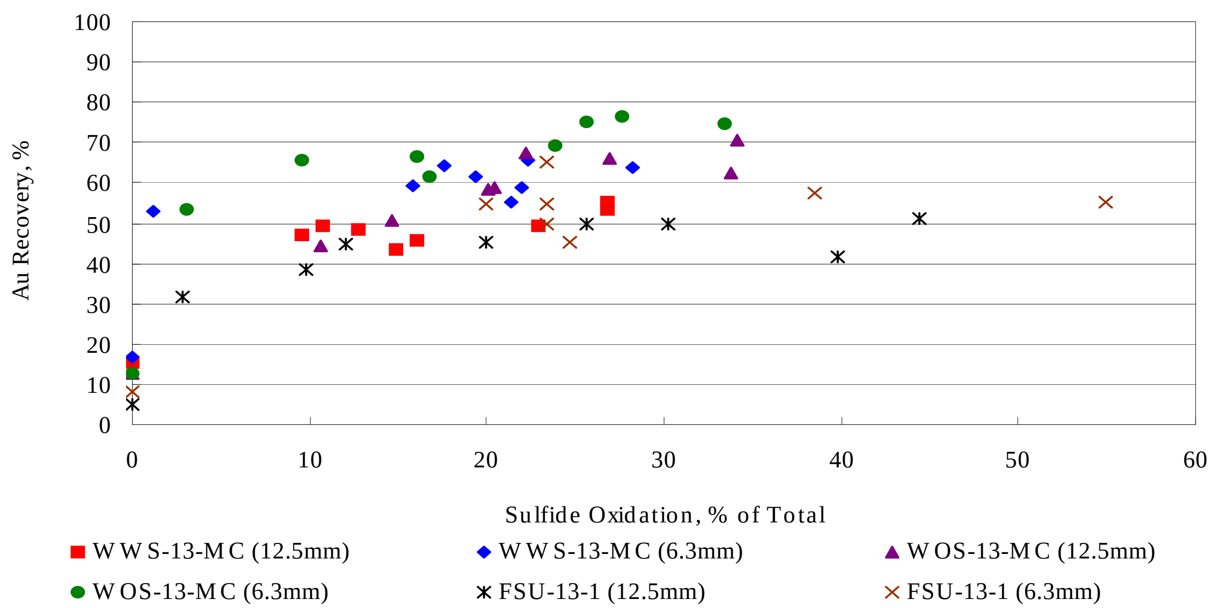


Table 17. - Overall Metallurgical Results, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite WWS-13-MC, 80%-12.5mm Feed Size

Bioox. Test No.:	BL		B-3		B-3		B-3		B-3	
Bioox. Time Days:	0		42		71		99		127	
Est. Oxidation, %:	0.0		14.9		10.7		9.5		12.8	
Metallurgical Results	CY-1		CY-7		CY-13		CY-19		CY-25	
Extraction: % of total	Au	Ag	Au	Ag	Au	Ag	Au	Ag	Au	Ag
in 2 hours	8.0	5.8	22.3	20.3	25.1	17.8	24.9	22.5	26.6	21.9
in 6 hours	9.1	7.4	28.1	22.3	35.2	20.1	32.0	25.6	32.6	24.0
in 24 hours	12.2	12.5	34.8	27.4	42.3	25.4	38.9	31.4	41.6	28.5
in 48 hours	14.1	18.9	39.3	32.8	46.5	30.1	43.9	36.8	44.6	34.0
in 72 hours	15.5	23.7	42.1	35.6	48.3	33.7	45.9	40.6	47.6	36.5
in 96 hours	15.6	27.4	43.4	38.3	49.4	35.4	47.3	43.3	48.6	39.2
Extracted, g/mt BR	0.38	2.0	1.05	2.3	1.30	2.8	1.31	2.6	1.37	2.9
Tail Assay, g/mt BR[1)]	2.06	5.3	1.37	3.7	1.33	5.1	1.46	3.4	1.45	4.5
Calc'd. Head, g/mt BR	2.44	7.3	2.42	6.0	2.63	7.9	2.77	6.0	2.82	7.4
Average Head, g/mt ore[2)]	2.73	7.5	2.73	7.5	2.73	7.5	2.73	7.5	2.73	7.5
NaCN Consumed, kg/mt BR	0.41		0.88		1.21		1.66		1.41	
Lime Added, kg/mt BR	3.1		14.5		17.1		12.4		15.8	
Final Solution pH	11.0		11.4		10.8		10.7		11.2	
Natural pH (40% solids)	2.9		2.4		1.7		1.6		2.3	

1) Average of triplicate assays.
2) Average of all head grade determinations.
Note: BL denotes baseline. BR denotes biooxidized residue.

Table 18. - Overall Metallurgical Results, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite WWS-13-MC, 80%-12.5mm Feed Size

Bioox. Test No.:	B-3		B-3		B-3		B-1	
Bioox. Time, days:	155		183		210		235	
Est. Oxidation, %:	26.8		16.1		26.8		22.9	
Metallurgical Results	CY-31		CY-37		CY-43		CY-48	
Extraction: % of total	Au	Ag	Au	Ag	Au	Ag	Au	Ag
in 2 hours	26.7	14.7	25.3	16.4	31.7	20.6	27.2	26.6
in 6 hours	33.4	16.5	30.6	18.4	37.3	23.8	33.0	28.2
in 24 hours	43.2	21.2	37.7	21.9	46.0	29.3	40.1	33.4
in 48 hours	48.0	29.6	41.5	25.2	51.6	34.3	44.1	37.7
in 72 hours	50.6	41.1	43.1	27.4	53.7	37.5	46.8	42.6
in 96 hours	53.5	46.4	45.7	29.8	55.4	39.5	49.5	46.3
Extracted, g/mt BR	1.53	4.5	1.49	3.1	1.44	3.2	1.50	3.1
Tail Assay, g/mt BR[1)]	1.33	5.2	1.77	7.3	1.16	4.9	1.53	3.6
Calc'd. Head, g/mt BR	2.86	9.7	3.26	10.4	2.60	8.1	3.03	6.7
Average Head, g/mt ore[2)]	2.73	7.5	2.73	7.5	2.73	7.5	2.73	7.5
NaCN Consumed, kg/mt BR	1.66		1.32		1.28		1.35	
Lime Added, kg/mt BR	22.2		20.1		18.3		17.3	
Final Solution pH	11.3		11.3		11.1		10.9	
Natural pH (40% solids)	1.9		2.2		2.2		2.1	

1) Average of triplicate assays.
2) Average of all head grade determinations.
Note: BL denotes baseline. BR denotes biooxidized residue.

Figure 12. - Gold Leach Rate Profiles, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite WWS-13-MC, 80%-12.5mm Feed Size

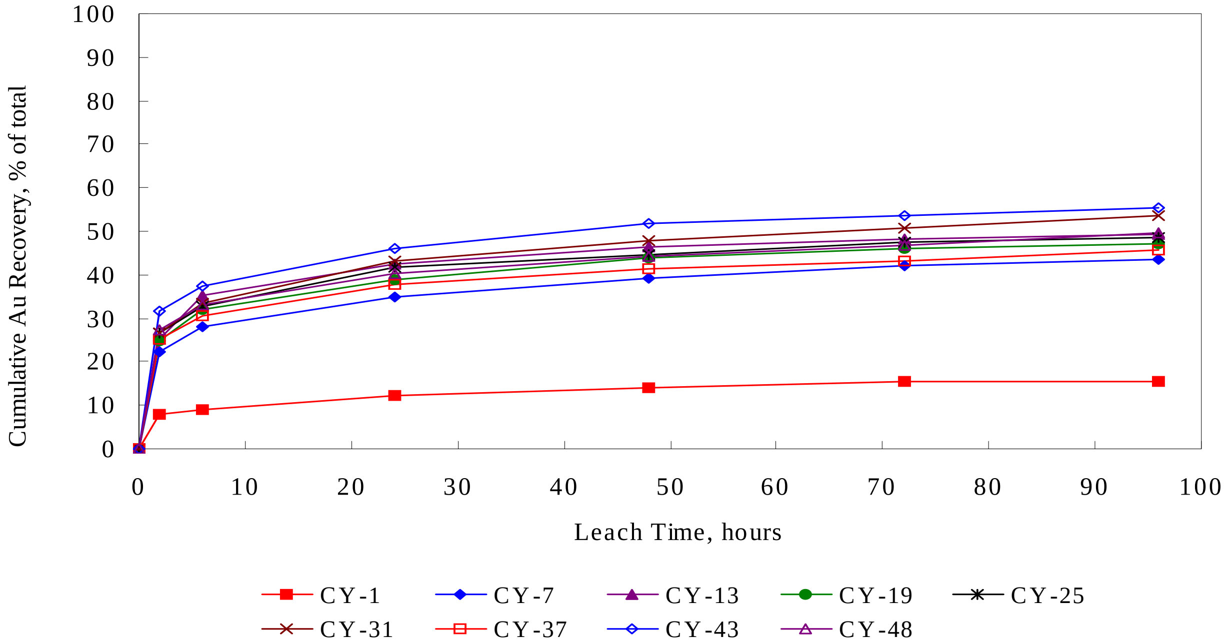


Figure 13. - Silver Leach Rate Profiles, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite WWS-13-MC, 80%-12.5mm Feed Size

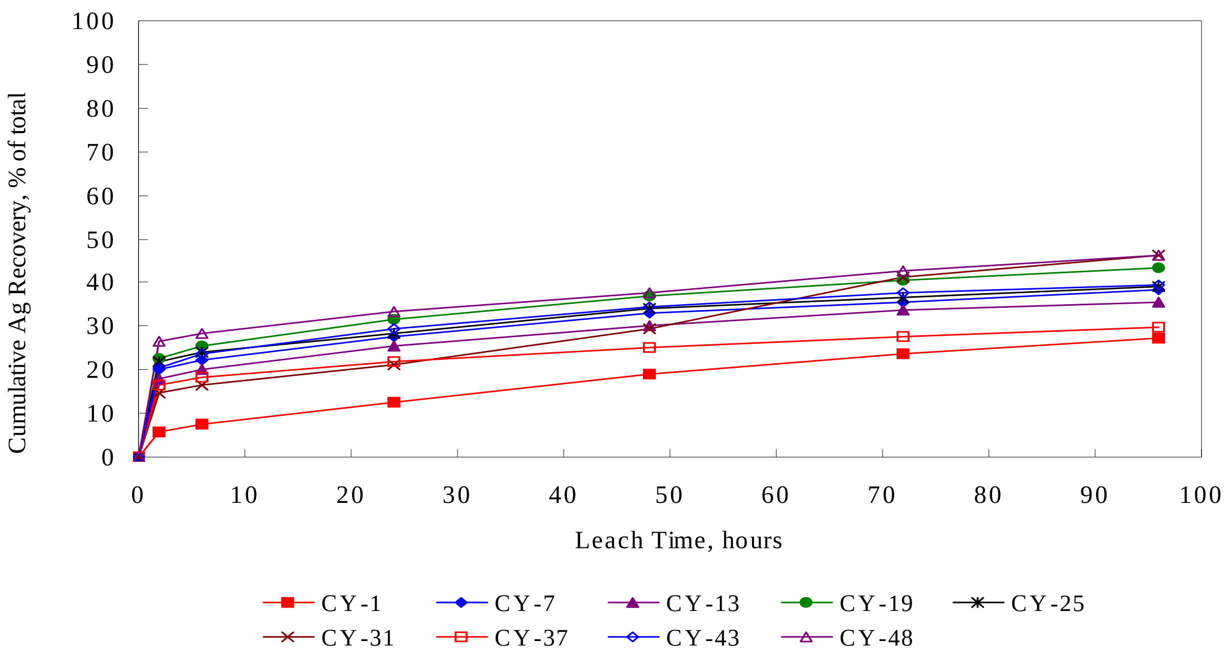


Table 19. - Overall Metallurgical Results, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite WWS-13-MC, 80%-6.3mm Feed Size

Bioox. Test No.:	BL		B-4		B-4		B-4		B-4	
Bioox. Time Days:	0		42		71		99		127	
Est. Oxidation, %:	0.0		1.2		21.4		15.8		17.6	
Metallurgical Results	CY-4		CY-10		CY-14		CY-20		CY-26	
Extraction: % of total	Au	Ag	Au	Ag	Au	Ag	Au	Ag	Au	Ag
in 2 hours	8.3	8.1	28.4	24.2	28.7	27.9	31.5	26.3	35.7	28.6
in 6 hours	9.9	9.8	36.5	27.3	36.6	30.3	40.9	30.5	44.2	31.9
in 24 hours	12.6	15.3	44.9	32.9	44.9	36.2	50.7	36.5	54.2	38.2
in 48 hours	14.4	22.4	48.2	37.6	50.8	40.9	54.4	41.4	59.3	44.0
in 72 hours	15.2	26.8	51.3	41.1	53.2	44.7	57.0	45.1	61.5	47.3
in 96 hours	16.7	30.0	52.9	43.1	55.1	47.1	59.4	47.8	64.1	49.3
Extracted, g/mt BR	0.48	2.1	1.54	3.1	1.50	3.3	1.61	3.3	1.75	3.7
Tail Assay, g/mt BR[1)]	2.40	4.9	1.37	4.1	1.22	3.7	1.10	3.6	0.98	3.8
Calc'd. Head, g/mt BR	2.88	7.0	2.91	7.2	2.72	7.0	2.71	6.9	2.73	7.5
Average Head, g/mt ore[2)]	2.73	7.5	2.73	7.5	2.73	7.5	2.73	7.5	2.73	7.5
NaCN Consumed, kg/mt BR	0.57		1.48		1.43		1.80		1.52	
Lime Added, kg/mt BR	3.8		19.2		17.8		14.5		19.0	
Final Solution pH	10.9		11.4		10.6		10.8		11.2	
Natural pH (40% solids)	3.2		2.3		1.5		1.4		2.1	

1) Average of triplicate assays.
2) Average of all head grade determinations.
Note: BL denotes baseline. BR denotes biooxidized residue.

Table 20. - Overall Metallurgical Results, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite WWS-13-MC, 80%-6.3mm Feed Size

Bioox. Test No.:	B-4		B-4		B-4		B-2	
Bioox. Time, days:	155		183		210		235	
Est. Oxidation, %:	19.3		28.3		22.3		22.0	
Metallurgical Results	CY-32		CY-38		CY-44		CY-49	
Extraction: % of total	Au	Ag	Au	Ag	Au	Ag	Au	Ag
in 2 hours	38.6	33.6	38.0	28.6	34.4	26.9	33.2	21.9
in 6 hours	45.1	37.2	45.0	31.7	42.0	31.1	41.3	24.2
in 24 hours	54.6	44.4	54.9	37.5	53.2	37.6	50.8	29.0
in 48 hours	59.1	48.5	60.2	42.6	59.5	43.4	54.5	33.0
in 72 hours	61.4	53.1	62.3	45.0	63.2	46.6	57.1	35.9
in 96 hours	61.6	56.7	63.8	47.4	65.6	50.0	58.6	37.9
Extracted, g/mt BR	1.70	3.8	1.76	3.6	1.89	3.9	1.67	3.3
Tail Assay, g/mt BR[1)]	1.06	2.9	1.00	4.0	0.99	3.9	1.18	5.4
Calc'd. Head, g/mt BR	2.76	6.7	2.76	7.6	2.88	7.8	2.85	8.7
Average Head, g/mt ore[2)]	2.73	7.5	2.73	7.5	2.73	7.5	2.73	7.5
NaCN Consumed, kg/mt BR	1.63		1.33		1.53		1.25	
Lime Added, kg/mt BR	24.4		21.8		20.8		21.9	
Final Solution pH	11.4		11.2		10.9		11.0	
Natural pH (40% solids)	1.7		2.1		2.2		2.0	

1) Average of triplicate assays.
2) Average of all head grade determinations.
Note: BL denotes baseline. BR denotes biooxidized residue.

Figure 14. - Gold Leach Rate Profiles, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite WWS-13-MC, 80%-6.3mm Feed Size

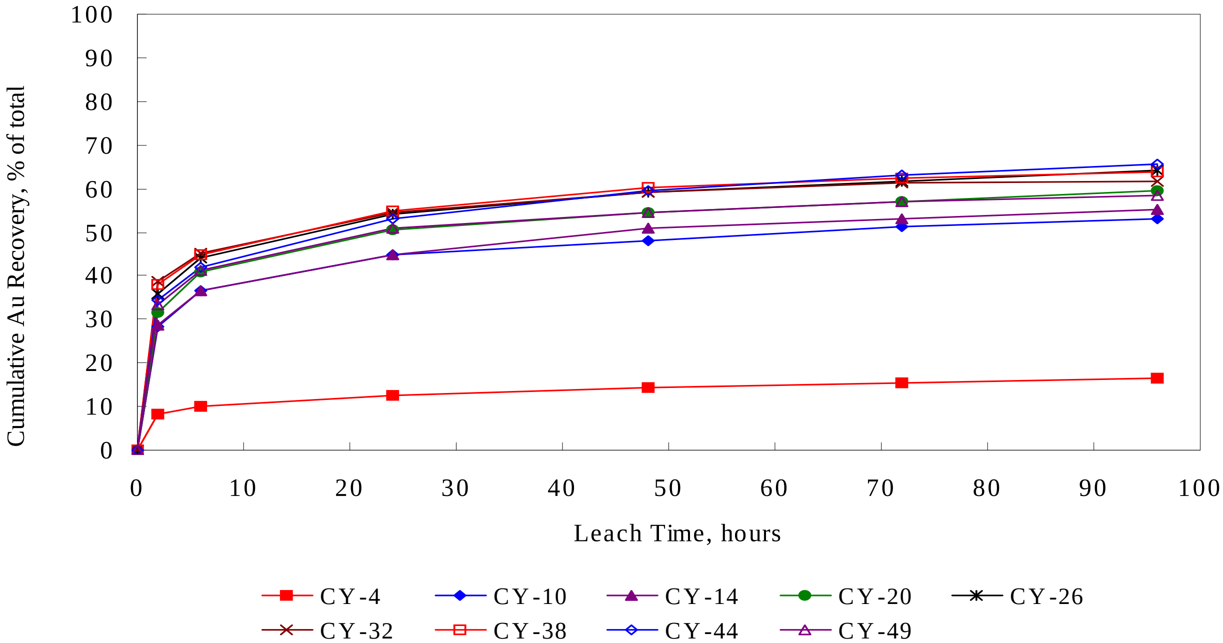


Figure 15. - Silver Leach Rate Profiles, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite WWS-13-MC, 80%-6.3mm Feed Size

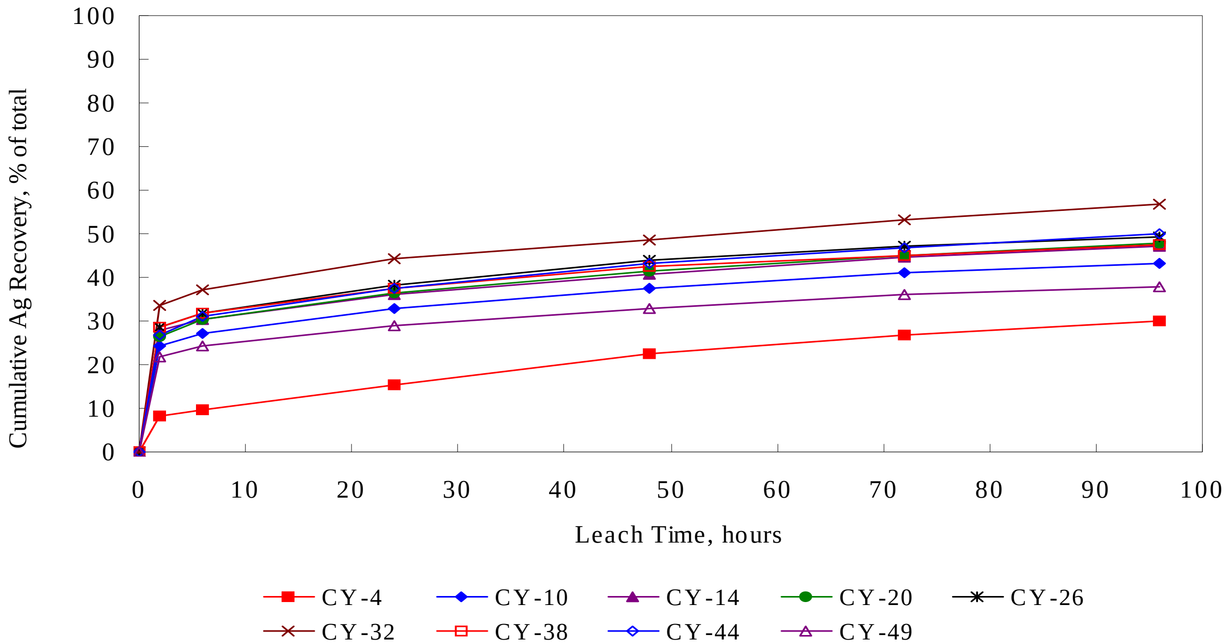


Table 21. - Overall Metallurgical Results, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite WOS-MC, 80%-12.5mm Feed Size

Bioox. Test No.:	BL		B-11		B-11		B-11		B-11	
Bioox. Time Days:	0		42		71		99		127	
Est. Oxidation, %:	0.0		10.6		14.7		20.1		20.5	
Metallurgical Results	CY-2		CY-9		CY-17		CY-23		CY-29	
Extraction: % of total	Au	Ag	Au	Ag	Au	Ag	Au	Ag	Au	Ag
in 2 hours	6.3	5.0	23.0	14.7	25.4	12.2	34.6	19.5	38.4	21.5
in 6 hours	7.8	7.1	30.0	16.0	33.2	16.2	41.8	22.4	44.2	24.5
in 24 hours	9.4	18.1	36.5	25.7	41.0	25.9	48.7	31.2	52.5	35.1
in 48 hours	10.3	34.8	41.2	38.4	46.0	38.3	54.3	43.8	55.9	47.9
in 72 hours	11.3	42.3	43.1	41.4	48.9	44.7	56.0	47.8	57.1	51.1
in 96 hours	12.7	47.6	44.5	44.6	50.6	51.1	58.3	51.7	58.6	45.9
Extracted, g/mt BR	0.54	34.1	1.83	24.9	2.09	40.1	2.25	25.7	2.15	23.4
Tail Assay, g/mt BR[1)]	3.72	37.6	2.28	30.9	2.04	38.4	1.61	24.0	1.52	27.6
Calc'd. Head, g/mt BR	4.26	71.7	4.11	55.8	4.13	78.5	3.86	49.7	3.67	51.0
Average Head, g/mt ore[2)]	4.00	60.8	4.00	60.8	4.00	60.8	4.00	60.8	4.00	60.8
NaCN Consumed, kg/mt BR	0.77		1.00		1.15		1.06		0.99	
Lime Added, kg/mt BR	3.3		9.5		13.4		5.1		6.2	
Final Solution pH	10.9		11.8		10.8		10.9		11.3	
Natural pH (40% solids)	3.4		2.4		2.2		1.7		2.7	

1) Average of triplicate assays.
2) Average of all head grade determinations.
Note: BL denotes baseline. BR denotes biooxidized residue.

Table 22. - Overall Metallurgical Results, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite WOS-MC, 80%-12.5mm Feed Size

Bioox. Test No.:	B-11		B-11		B-11		B-9	
Bioox. Time, days:	155		183		210		235	
Est. Oxidation, %:	22.2		34.1		27.0		33.8	
Metallurgical Results	CY-35		CY-41		CY-46		CY-52	
Extraction: % of total	Au	Ag	Au	Ag	Au	Ag	Au	Ag
in 2 hours	46.1	22.1	44.0	17.2	43.5	22.1	32.4	17.7
in 6 hours	52.6	25.4	54.5	22.4	51.4	27.7	38.7	21.8
in 24 hours	61.4	34.9	66.0	33.7	60.1	37.2	49.9	30.3
in 48 hours	64.3	44.3	67.9	42.4	63.5	44.1	56.3	35.3
in 72 hours	66.2	53.7	67.4	47.1	65.0	49.1	59.4	39.0
in 96 hours	67.4	57.6	70.5	52.4	65.9	52.6	62.3	41.5
Extracted, g/mt BR	2.52	30.6	3.03	38.1	3.48	32.8	2.28	20.1
Tail Assay, g/mt BR[1)]	1.22	22.5	1.27	34.6	1.80	29.5	1.38	28.3
Calc'd. Head, g/mt BR	3.74	53.1	4.30	72.7	5.28	62.3	3.66	48.4
Average Head, g/mt ore[2)]	4.00	60.8	4.00	60.8	4.00	60.8	4.00	60.8
NaCN Consumed, kg/mt BR	1.03		1.05		1.04		0.96	
Lime Added, kg/mt BR	12.2		10.3		9.2		8.4	
Final Solution pH	11.4		11.4		10.8		11.0	
Natural pH (40% solids)	2.4		2.5		2.4		2.2	

1) Average of triplicate assays.
2) Average of all head grade determinations.
Note: BL denotes baseline. BR denotes biooxidized residue.

Figure 16. - Gold Leach Rate Profiles, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite WOS-MC, 80%-12.5mm Feed Size

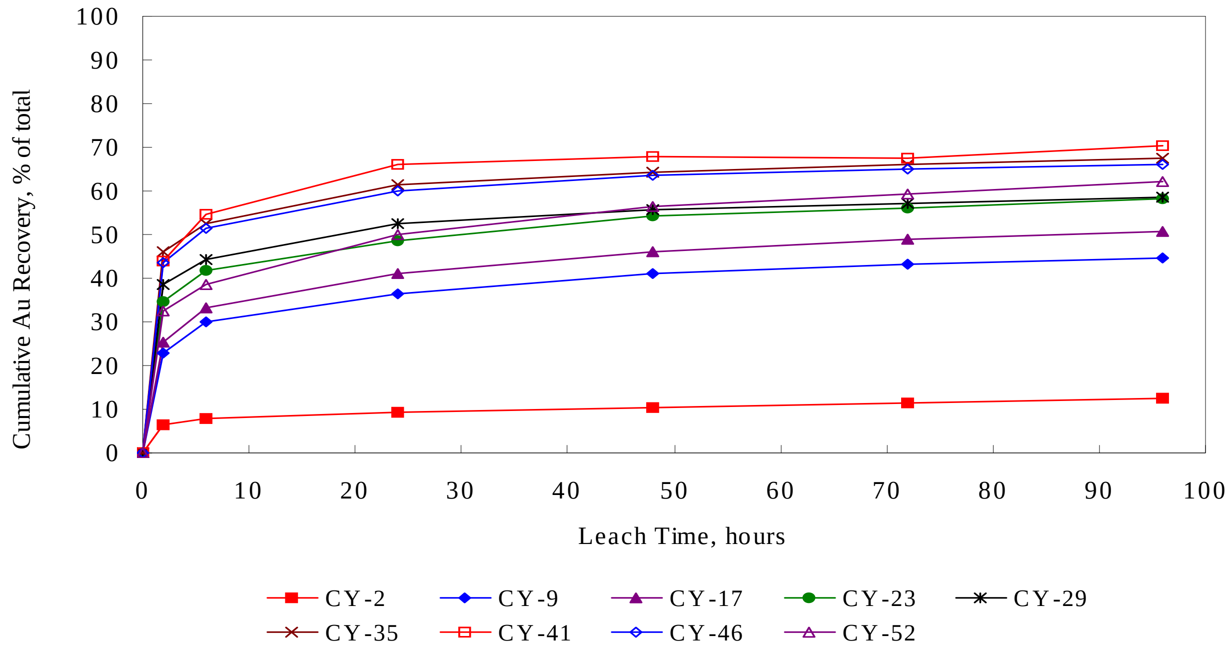


Figure 17. - Silver Leach Rate Profiles, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite WOS-MC, 80%-12.5mm Feed Size

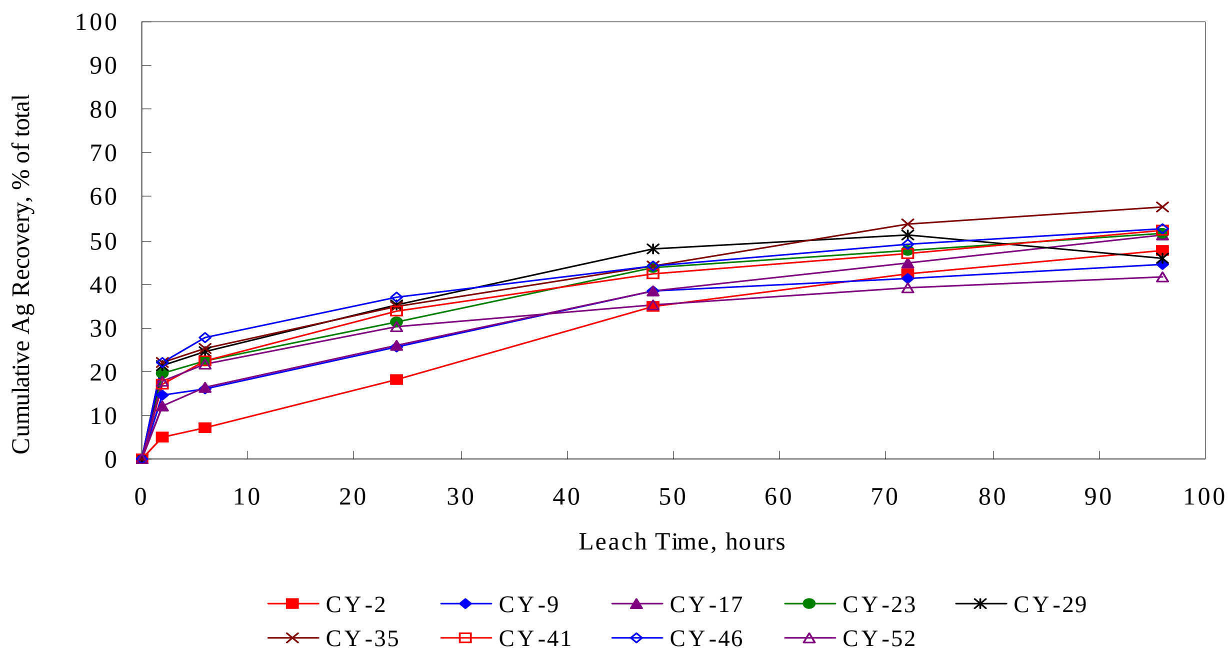


Table 23. - Overall Metallurgical Results, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite WOS-MC, 80%-6.3mm Feed Size

Bioox. Test No.:	BL		B-12		B-12		B-12		B-12	
Bioox. Time Days:	0		42		71		99		127	
Est. Oxidation, %:	0.0		3.1		16.7		9.6		16.0	
Metallurgical Results	CY-5		CY-12		CY-18		CY-24		CY-30	
Extraction: % of total	Au	Ag	Au	Ag	Au	Ag	Au	Ag	Au	Ag
in 2 hours	7.3	5.7	33.5	16.0	37.7	16.7	45.9	21.1	50.6	18.3
in 6 hours	8.5	8.4	38.9	19.3	44.2	22.3	51.5	25.2	55.9	23.4
in 24 hours	10.1	18.9	46.0	30.3	52.3	32.3	57.7	36.8	62.7	34.5
in 48 hours	10.7	33.7	50.9	40.7	56.4	41.8	61.8	47.2	65.6	43.9
in 72 hours	11.7	41.7	52.2	46.4	59.7	47.8	62.7	54.1	65.6	50.0
in 96 hours	12.6	46.4	53.4	48.1	61.7	53.9	65.4	60.2	66.5	53.8
Extracted, g/mt BR	0.52	31.5	2.18	27.5	2.43	30.3	2.65	35.7	2.78	34.7
Tail Assay, g/mt BR[1)]	3.60	36.4	1.90	29.7	1.51	25.9	1.40	23.6	1.40	29.8
Calc'd. Head, g/mt BR	4.12	67.9	4.08	57.2	3.94	56.2	4.05	59.3	4.18	64.5
Average Head, g/mt ore[2)]	4.00	60.8	4.00	60.8	4.00	60.8	4.00	60.8	4.00	60.8
NaCN Consumed, kg/mt BR	0.74		1.06		1.08		1.55		1.19	
Lime Added, kg/mt BR	3.4		12.5		17.8		9.2		13.1	
Final Solution pH	10.9		12.1		10.9		11.0		11.1	
Natural pH (40% solids)	3.6		2.3		2.1		1.4		2.4	

1) Average of triplicate assays.
2) Average of all head grade determinations.
Note: BL denotes baseline. BR denotes biooxidized residue.

Table 24. - Overall Metallurgical Results, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite WOS-MC, 80%-6.3mm Feed Size

Bioox. Test No.:	B-12		B-12		B-12		B-10	
Bioox. Time, days:	155		183		210		235	
Est. Oxidation, %:	27.6		33.4		25.6		23.9	
Metallurgical Results	CY-36		CY-42		CY-47		CY-53	
Extraction: % of total	Au	Ag	Au	Ag	Au	Ag	Au	Ag
in 2 hours	57.8	24.3	56.7	20.9	54.2	20.5	43.1	13.8
in 6 hours	63.3	27.8	61.1	23.8	62.3	26.2	50.5	17.7
in 24 hours	70.6	39.0	70.1	33.6	70.1	34.7	61.8	25.7
in 48 hours	72.6	49.3	72.9	41.0	72.4	41.6	66.7	32.4
in 72 hours	75.4	57.1	74.0	45.8	74.4	45.8	68.4	37.5
in 96 hours	76.2	61.4	74.8	49.2	75.3	49.8	69.3	41.0
Extracted, g/mt BR	2.79	32.1	3.15	32.8	2.98	30.6	2.77	29.0
Tail Assay, g/mt BR[1)]	0.87	20.2	1.06	33.8	0.98	30.9	1.23	41.7
Calc'd. Head, g/mt BR	3.66	52.3	4.21	66.6	3.96	61.5	4.00	70.7
Average Head, g/mt ore[2)]	4.00	60.8	4.00	60.8	4.00	60.8	4.00	60.8
NaCN Consumed, kg/mt BR	1.18		1.26		1.02		1.13	
Lime Added, kg/mt BR	15.2		13.7		11.1		9.5	
Final Solution pH	11.3		11.1		11.2[3)]		11.0	
Natural pH (40% solids)	2.0		2.3		2.3		2.3	

1) Average of triplicate assays.
2) Average of all head grade determinations.
3) Final solution pH was at 72 hours.
Note: BL denotes baseline. BR denotes biooxidized residue.

Figure 18. - Gold Leach Rate Profiles, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite WOS-MC, 80%-6.3mm Feed Size

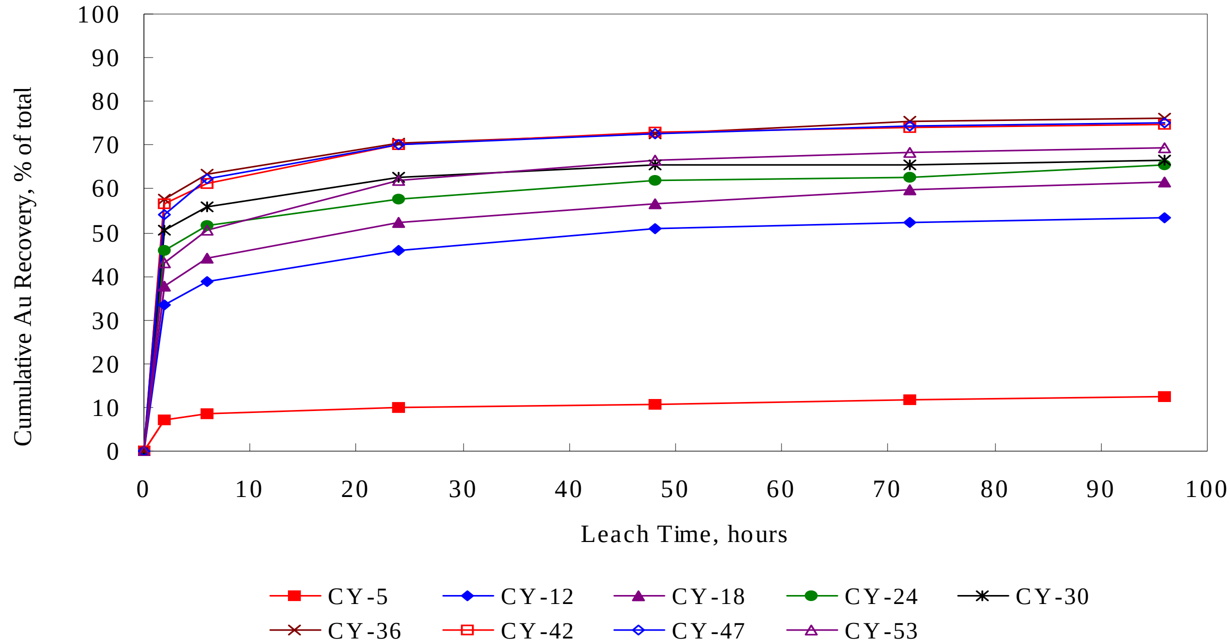


Figure 19. - Silver Leach Rate Profiles, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite WOS-MC, 80%-6.3mm Feed Size

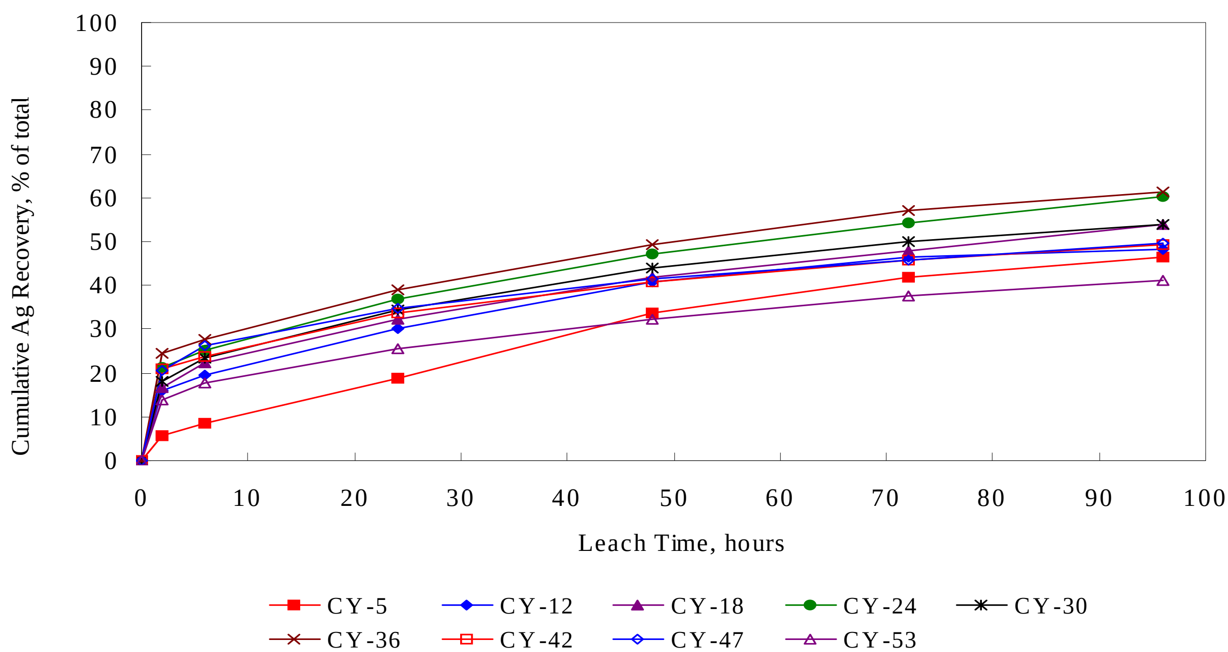


Table 25. - Overall Metallurgical Results, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite FSU-13-1, 80%-12.5mm Feed Size

Bioox. Test No.:	BL		B-7		B-7		B-7		B-7	
Bioox. Time Days:	0		42		71		99		127	
Est. Oxidation, %:	0.0		2.8		9.8		12.0		19.9	
Metallurgical Results	CY-3		CY-8		CY-15		CY-21		CY-27	
Extraction: % of total	Au	Ag	Au	Ag	Au	Ag	Au	Ag	Au	Ag
in 2 hours		4.1	11.8	12.9	17.0	14.4	26.3	15.7	25.5	13.3
in 6 hours		5.7	24.5	15.9	24.8	16.9	31.8	18.1	32.8	15.9
in 24 hours	3.8	8.8	33.9	18.4	29.6	19.5	37.5	22.0	37.8	19.2
in 48 hours	4.1	13.6	32.1	20.6	34.6	21.1	43.6	23.3	45.3	21.5
in 72 hours	4.3	13.6	29.9	21.4	36.4	22.2	42.4	25.3	45.3	22.7
in 96 hours	5.1	13.6	31.6	21.4	38.6	22.2	45.0	27.3	45.3	23.1
Extracted, g/mt BR	0.02	0.3	0.12	0.6	0.17	0.6	0.18	0.6	0.24	0.6
Tail Assay, g/mt BR[1)]	0.37	1.9	0.26	2.2	0.27	2.1	0.22	1.6	0.29	2.0
Calc'd. Head, g/mt BR	0.39	2.2	0.38	2.8	0.44	2.7	0.40	2.2	0.53	2.6
Average Head, g/mt ore[2)]	0.46	2.4	0.46	2.4	0.46	2.4	0.46	2.4	0.46	2.4
NaCN Consumed, kg/mt BR	0.42		1.00		1.29		0.97		1.30	
Lime Added, kg/mt BR	2.9		13.0		7.6		6.4		20.1	
Final Solution pH	11.0		11.6		11.0		10.9		11.2	
Natural pH (40% solids)	5.3		2.8		1.8		1.9		2.5	

1) Average of triplicate assays.
2) Average of all head grade determinations.
Note: BL denotes baseline. BR denotes biooxidized residue.

Table 26. - Overall Metallurgical Results, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite FSU-13-1, 80%-12.5mm Feed Size

Bioox. Test No.:	B-7		B-7		B-7		B-5	
Bioox. Time, days:	155		183		210		235	
Est. Oxidation, %:	25.6		39.8		30.2		44.4	
Metallurgical Results	CY-33		CY-39		CY-45		CY-50	
Extraction: % of total	Au	Ag	Au	Ag	Au	Ag	Au	Ag
in 2 hours	35.3	15.8	20.1	11.0	26.9	14.2	29.4	11.7
in 6 hours	40.7	17.6	26.0	13.4	32.6	16.8	31.5	14.5
in 24 hours	43.2	21.7	34.4	16.0	42.5	21.9	42.4	18.7
in 48 hours	46.2	23.2	38.8	18.2	45.4	23.3	45.0	21.2
in 72 hours	49.0	24.6	41.2	18.7	48.3	24.8	47.7	21.7
in 96 hours	49.0	30.0	41.8	19.2	51.3	26.3	51.0	21.7
Extracted, g/mt BR	0.25	0.6	0.28	0.5	0.20	0.5	0.26	0.5
Tail Assay, g/mt BR[1)]	0.26	1.4	0.39	2.1	0.19	1.4	0.25	1.8
Calc'd. Head, g/mt BR	0.51	2.0	0.67	2.6	0.39	1.9	0.51	2.3
Average Head, g/mt ore[2)]	0.46	2.4	0.46	2.4	0.46	2.4	0.46	2.4
NaCN Consumed, kg/mt BR	0.91		1.55		1.54		1.82	
Lime Added, kg/mt BR	27.1		28.0		29.7		28.1	
Final Solution pH	11.4		11.2		10.9		11.1	
Natural pH (40% solids)	2.2		2.6		2.6		2.5	

1) Average of triplicate assays.
2) Average of all head grade determinations.
Note: BL denotes baseline. BR denotes biooxidized residue.

Figure 20. - Gold Leach Rate Profiles, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite FSU-13-1, 80%-12.5mm Feed Size

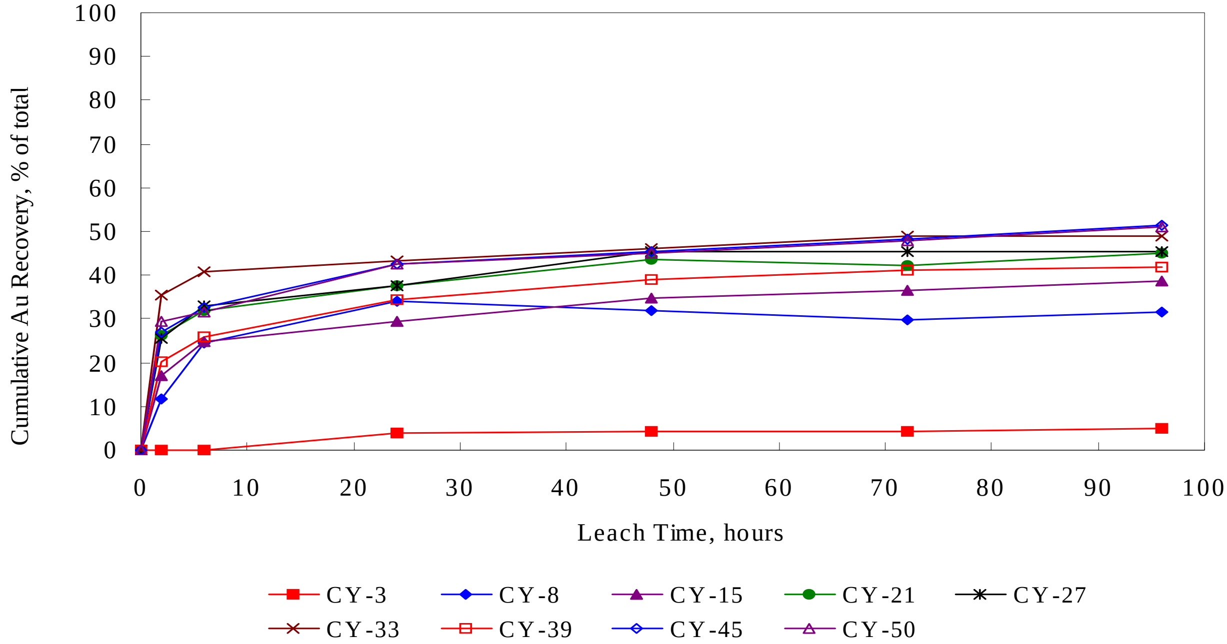


Figure 21. - Silver Leach Rate Profiles, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite FSU-13-1, 80%-12.5mm Feed Size

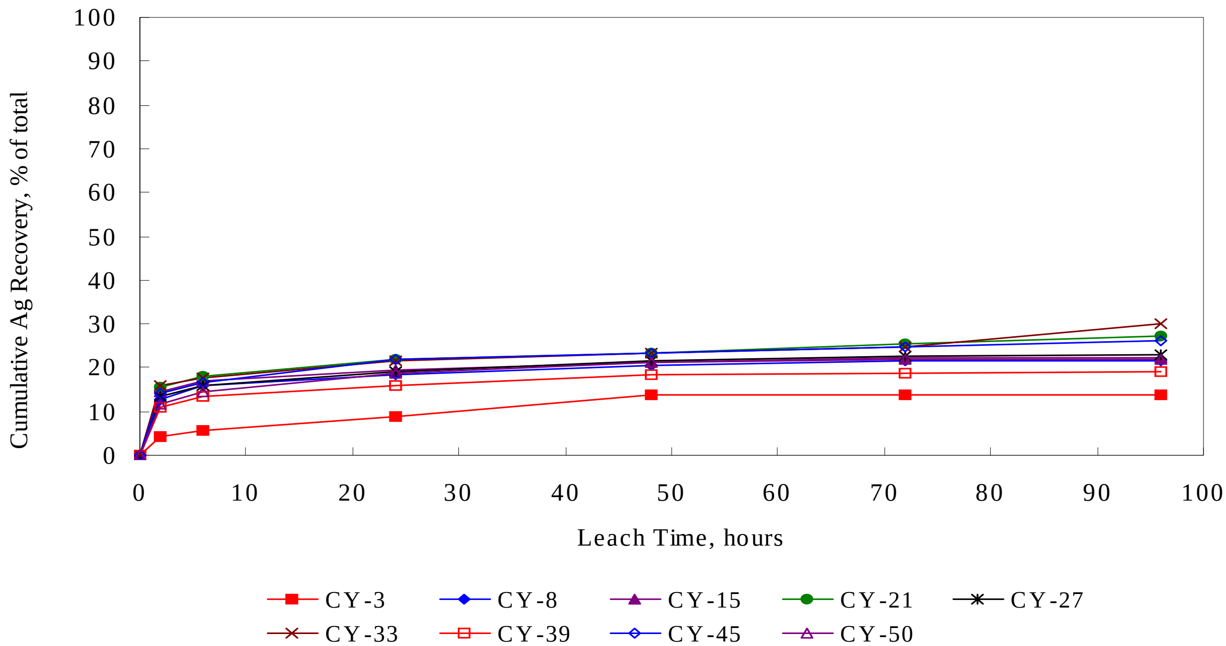


Table 27. - Overall Metallurgical Results, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite FSU-13-1, 80%-6.3mm Feed Size

Bioox. Test No.:	BL		B-8		B-8		B-8		B-8	
Bioox. Time Days:	0		42		71		99		127	
Est. Oxidation, %:	0.0		23.4		24.7		19.9		23.4	
Metallurgical Results	CY-6		CY-11		CY-16		CY-22		CY-28	
Extraction: % of total	Au	Ag	Au	Ag	Au	Ag	Au	Ag	Au	Ag
in 2 hours	3.1	7.5	23.9	25.0	27.3	17.7	34.1	18.6	37.5	15.6
in 6 hours	3.3	9.4	35.8	28.0	35.8	20.4	36.5	21.7	47.1	17.8
in 24 hours	3.5	12.0	45.0	33.0	41.4	24.3	49.1	26.7	53.7	20.7
in 48 hours	6.7	12.7	51.3	36.3	43.8	25.7	52.3	28.4	50.7	22.7
in 72 hours	7.1	13.6	51.0	37.5	42.9	27.2	52.0	29.5	53.6	24.1
in 96 hours	8.2	13.6	50.0	37.5	45.5	28.6	54.5	32.0	54.5	25.9
Extracted, g/mt BR	0.04	0.3	0.22	0.9	0.20	0.8	0.24	0.8	0.24	0.7
Tail Assay, g/mt BR[1)]	0.45	1.9	0.22	1.5	0.24	2.0	0.20	1.7	0.20	2.0
Calc'd. Head, g/mt BR	0.49	2.2	0.44	2.4	0.44	2.8	0.44	2.5	0.44	2.7
Average Head, g/mt ore[2)]	0.46	2.4	0.46	2.4	0.46	2.4	0.46	2.4	0.46	2.4
NaCN Consumed, kg/mt BR	0.22		1.39		1.52		1.71		0.75	
Lime Added, kg/mt BR	3.2		22.0		10.7		18.7		21.9	
Final Solution pH	11.0		11.3		10.9		11.0		11.3	
Natural pH (40% solids)	5.3		2.5		1.6		1.8		2.5	

1) Average of triplicate assays.
2) Average of all head grade determinations.
Note: BL denotes baseline. BR denotes biooxidized residue.

Table 28. - Overall Metallurgical Results, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite FSU-13-1, 80%-6.3mm Feed Size

Bioox. Test No.:	B-8		B-8		B-6	
Bioox. Time, days:	155		183		235	
Est. Oxidation, %:	23.4		38.5		54.9	
Metallurgical Results	CY-34		CY-40		CY-51	
Extraction: % of total	Au	Ag	Au	Ag	Au	Ag
in 2 hours	41.3	15.0	34.4	12.1	37.5	15.0
in 6 hours	51.6	16.8	43.0	15.1	42.9	16.9
in 24 hours	54.9	20.7	52.1	18.3	51.0	21.9
in 48 hours	62.0	23.4	55.7	20.9	51.6	23.3
in 72 hours	61.9	24.8	55.9	21.5	54.6	25.5
in 96 hours	65.0	28.6	58.3	23.8	55.4	26.3
Extracted, g/mt BR	0.26	0.6	0.28	0.5	0.31	0.5
Tail Assay, g/mt BR[1)]	0.14	1.5	0.20	1.6	0.25	1.4
Calc'd. Head, g/mt BR	0.40	2.1	0.48	2.1	0.56	1.9
Average Head, g/mt ore[2)]	0.46	2.4	0.46	2.4	0.46	2.4
NaCN Consumed, kg/mt BR	0.67		1.20		0.79	
Lime Added, kg/mt BR	25.5		32.8		35.4	
Final Solution pH	11.3		11.0		11.1	
Natural pH (40% solids)	2.3		2.6		2.2	

1) Average of triplicate assays.
2) Average of all head grade determinations.
Note: BL denotes baseline. BR denotes biooxidized residue.

Figure 22. - Gold Leach Rate Profiles, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite FSU-13-1, 80%-6.3mm Feed Size

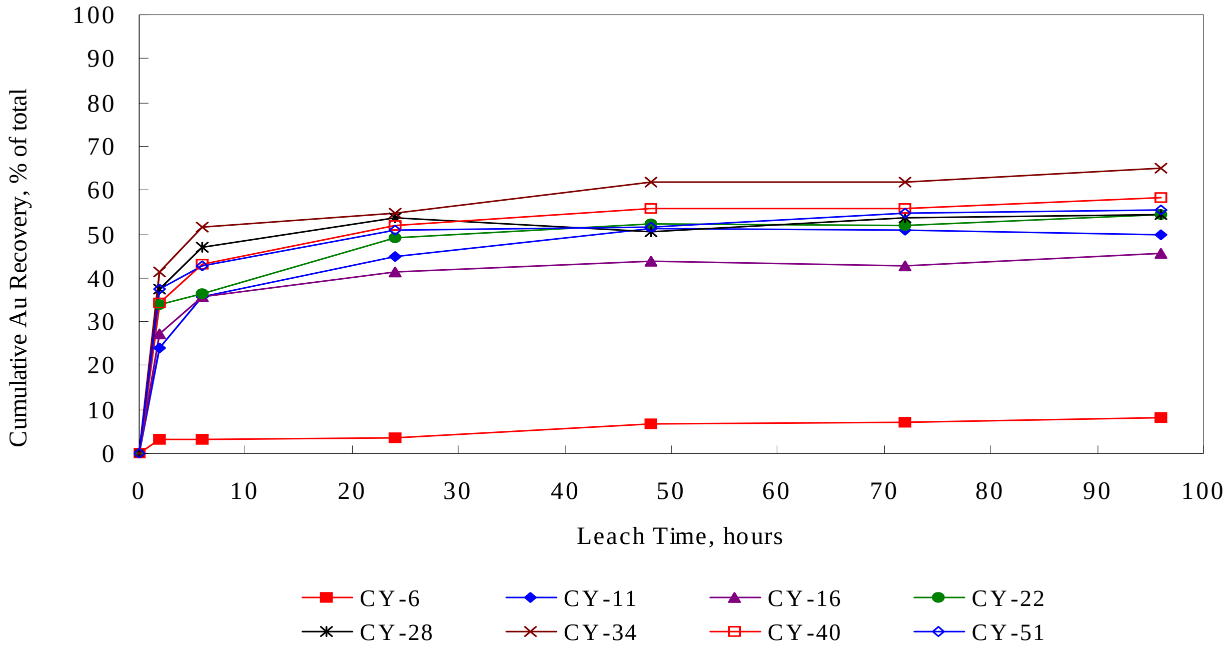
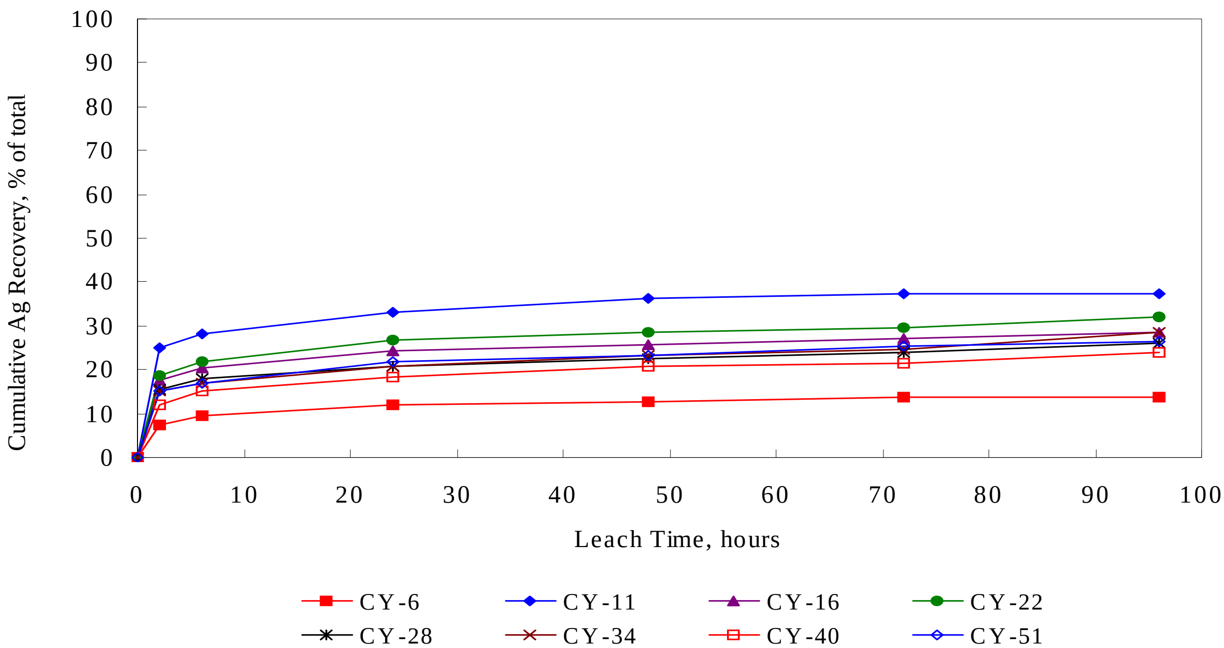


Figure 23. - Silver Leach Rate Profiles, Bottle Roll Tests, Biooxidation Column Test Residues, Sleeper Drill Core Composite FSU-13-1, 80%-6.3mm Feed Size



Results from bottle roll testing on the sacrificial biooxidation column residues showed that biooxidation pretreatment was effective in significantly improving cyanidation gold recovery from the Sleeper refractory sulfidic core composites. Results were somewhat erratic, as the samples taken for cyanidation tests were grab samples taken from wet column residues. Gold recoveries obtained at the two feed sizes increased from approximately 5% to 17% without pretreatment to between approximately 50% and 80% after biooxidation. In general, gold recoveries were about 5% to 10% higher at the 6.3mm feed size than from the 12.5mm feed size. Near maximum gold recoveries generally were obtained within about 180 days of biooxidation.

Gold recoveries from composite WWS-13-MC, at the 80%-12.5mm feed size, increased from 15.6% without pretreatment, to as high as 55.4% after 210 days of pretreatment. A gold recovery of 53.5% was obtained after 155 days of pretreatment. Most of the improvement in gold recovery was observed within the first 71 days of pretreatment. Gold recoveries obtained at the 80%-6.3mm feed size increased from 16.7% without pretreatment, to as high as 65.6% after 210 days of pretreatment. A gold recovery of 64.1% was obtained after 127 days of pretreatment. Gold recoveries for bottle roll tests conducted on the continuous biooxidation column residues (235 days of pretreatment) were somewhat lower than the trend indicated by the sacrificial column residues. Bottle roll test gold recoveries from the 12.5mm and 6.3mm continuous biooxidation column tests were 49.5% and 58.6%, respectively. These recoveries were about 10% to 15% lower than obtained during subsequent column leach cyanidation testing on the same residues.

Gold recoveries from composite WOS-MC, at the 80%-12.5mm feed size, increased from 12.7% without pretreatment, to as high as 70.5% after 183 days of pretreatment. A gold recovery of 67.4% was obtained after 155 days of pretreatment. Most of the improvement in gold recovery was observed within the first 99 days of pretreatment. Gold recoveries obtained at the 80%-6.3mm feed size increased from 12.6% without pretreatment, to as high as 76.2% after 155 days of pretreatment. A gold recovery of 65.4% was obtained after 99 days of pretreatment. Gold recoveries for bottle roll tests conducted on the continuous biooxidation column residues (235 days of pretreatment) were somewhat lower than the trend indicated by the sacrificial column residues. Bottle roll test gold recoveries from the 12.5mm and 6.3mm continuous biooxidation column tests were 62.3% and 69.3%, respectively. These recoveries were about 10% lower than obtained during subsequent column leach cyanidation testing on the same residues.

Gold recoveries from composite FSU-13-1, at the 80%-12.5mm feed size, increased from 5.1% without pretreatment, to as high as 51.3% after 210 days of pretreatment. A gold recovery of 49.0% was obtained after 155 days of pretreatment. Most of the improvement in gold recovery was observed within the first 99 days of pretreatment. Gold recoveries obtained at the 80%-6.3mm feed size increased from 8.2% without pretreatment, to as high as 65.0% after 155 days of pretreatment. A gold recovery of 50.0% was obtained after only 42 days of pretreatment. Gold recoveries for bottle roll tests conducted on the continuous biooxidation column residues (235 days of pretreatment) were comparable to the trend indicated by the sacrificial column residues. Bottle roll test gold recoveries from the 12.5mm and 6.3mm continuous biooxidation column tests were 51.0% and 55.4%, respectively. These recoveries were about 20% to 26% lower than obtained during subsequent column leach cyanidation testing on the same residues.

Gold recovery rates generally were fairly rapid during the first 6 hours of leaching, but slowed substantially after 6 hours. Gold extraction generally was progressing at a slow rate when leaching was terminated after 96 hours. A longer leaching cycle would incrementally increase gold recoveries, but it appears that a very long leach cycle would be required to achieve recoveries approaching those obtained during column leach testing. Gold recovery rates for composite FSU-13-1 tended to be somewhat erratic, because of the low grade nature of the composite.

Improvements in silver recoveries were not as large as the observed improvements in gold recoveries. Maximum silver recoveries obtained from composites WWS-13-MC, WOS-MC and FSU-13-1, at the 12.5mm feed size, were 46.4%, 57.6% and 30.0%, respectively. Corresponding maximum silver recoveries from the 6.3mm feeds were 56.7%, 61.4% and 37.5%. These recoveries were about 10% to 27% higher than obtained without pretreatment.

COLUMN (CYANIDE) LEACH TEST PROCEDURES AND RESULTS

A column percolation leach test was conducted on each of composites WWS-13-MC, WOS-MC and FSU-13-1, at 80%-12.5mm and 80%-6.3mm feed sizes, both without and after biooxidation preatreatment (12 tests total). Principle objective for tests was to determine the effectiveness of heap biooxidation pretreatment for improving gold recovery by heap leach cyanidation from the refractory sulfidic Sleeper ore types. Each test was conducted in a manner to determine gold and silver recovery, recovery rate and reagent consumptions. The continuous biooxidation column residues (tests B-1, 2, 5, 6, 9 and 10) were used as feeds for the tests after biooxidation pretreatment.

The ore charges and biooxidized residues were agglomerated before cyanide leaching by adding the lime required for pH control (determined by bottle roll testing), and wetting with water to optimum moisture content while mechanically tumbling to effect agglomeration. The agglomerates were cured in the 7.6 cm (3") I.D. x 3m (10') high leaching columns before applying leach solution. Agglomerates were placed into the columns in a manner to minimize particle segregation and compaction.

Leaching was conducted by applying cyanide solution (1.0 gNaCN/L solution) over the ore charges at a rate of 12 Lph/m^2 (0.005 gpm/ft^2) of column cross-sectional area. Pregnant effluent solutions were collected each 24 hour period. Pregnant solution volumes were measured by weighing, and samples were taken for gold and silver analysis using conventional A.A. methods. Cyanide concentration and pH were determined for each pregnant solution. Pregnant solutions were pumped through a three stage carbon circuit for adsorption of dissolved gold and silver values. Barren solution, with appropriate make-up reagent, was applied to the ore charges daily. After leaching, water washing was conducted to remove residual cyanide (county requirement) and to recover dissolved gold values. Moisture required to saturate the ore charges (in process solution inventory), for agglomeration and retained moistures were determined. Apparent ore bulk densities were measured before and after leaching.

Drain down tests were conducted after rinsing was complete. Tests were conducted by terminating solution application, and at that time, measuring drain volume. Drain volumes were collected and measured periodically by weighing until drain down was complete.

After leaching, rinsing, and draining, residues were removed from the columns weighed. Residues were then air dried and reweighed, to determine dry residue weight and residual moisture content. Each entire residue was used for a tail screen analysis, conducted using the same procedures and size fractions as for the head screens to determine residual gold and silver content and distribution, and to obtain recovery by size fraction data.

Overall metallurgical results from column tests are shown in Tables 29 through 31. Gold and silver leach rate profiles are shown graphically in Figures 24 through 29. Head and tail screen analysis results, and recovery by size fraction data are provided in Tables 32 through 43. Metallurgical balance data are provided in Tables 44 and 45. Physical ore characteristics data are provided in Table 46. Detailed column leach test data, including results from drain-down tests, are provided in Section 8 of the Appendix to this report.

Table 29. - Overall Metallurgical Results, Column Leach Tests, Sleeper Drill Core Composite WWS-13-MC

Bioox. Test No.:	N/A		B-1		N/A		B-2	
Feed Size:	80%-12.5mm		80%-12.5mm		80%-6.3mm		80%-6.3mm	
Bioox. Time, days:	0		235		0		235	
Est. Oxidation, %:	0.0		22.9		0.0		22.0	
Metallurgical Results	P-1		P-7		P-4		P-10	
Extraction: % of total	Au	Ag	Au	Ag	Au	Ag	Au	Ag
1st Effluent	7.7	4.5	26.8	5.4	7.5	1.3	22.9	0.2
in 5 days	11.2	10.6	42.8	17.7	13.2	9.3	45.0	16.8
in 10 days	13.5	15.2	51.5	27.0	15.6	15.3	54.6	29.2
in 15 days	14.7	18.1	54.8	30.7	16.6	18.1	58.3	32.8
in 20 days	15.6	20.5	56.7	32.9	17.4	20.3	60.2	34.7
in 30 days	16.7	23.8	59.8	36.4	18.5	23.4	63.3	37.8
in 40 days	17.6	26.5	61.7	38.9	19.2	25.5	65.3	40.1
in 50 days	18.2	28.3	63.0	40.8	19.4	27.2	66.7	41.9
in 60 days	18.4	29.9	63.7	42.1	19.6	28.6	67.5	43.1
in 70 days	18.5	30.1	63.7	42.1	19.6	28.7	67.5	43.1
in 80 days	18.9	32.0	65.1	43.8	20.0	30.5	68.6	44.8
in 90 days	18.9	32.3	65.4	44.5	20.0	30.8	68.7	45.0
in 100 days	19.3	33.8			20.3	32.4		
End of Leach/Rinse	19.5	33.8	65.4	44.6	20.6	33.3	68.7	45.0
Extracted, g/mt ore	0.54	2.2	1.76	3.3	0.56	2.6	1.80	3.6
Tail Screen, g/mt	2.23	4.3	0.93	4.1	2.16	5.2	0.82	4.4
Calculated Head, g/mt ore	2.77	6.5	2.69	7.4	2.72	7.8	2.62	8.0
Average Head, g/mt ore[1)]	2.73	7.5	2.73	7.5	2.73	7.5	2.73	7.5
NaCN Consumed, kg/mt ore	2.62		3.55		2.78		3.40	
Lime Added, kg/mt ore	6.6		21.1		6.6		26.1	
Final Solution pH	10.1		9.8		10.2		10.1	
pH After Rinse	10.1		8.7		10.2		8.6	
Leach/Rinse Cycle, Days	109		92		109		92	

1) Average of all head grade determinations.
Note: Results from testing on biooxidized residues are calculated on a whole ore basis, accounting for weight lost during biooxidation.

Figure 24. - Gold Leach Rate Profiles, Column Leach Tests, Sleeper Drill Core Composite WWS-13-MC

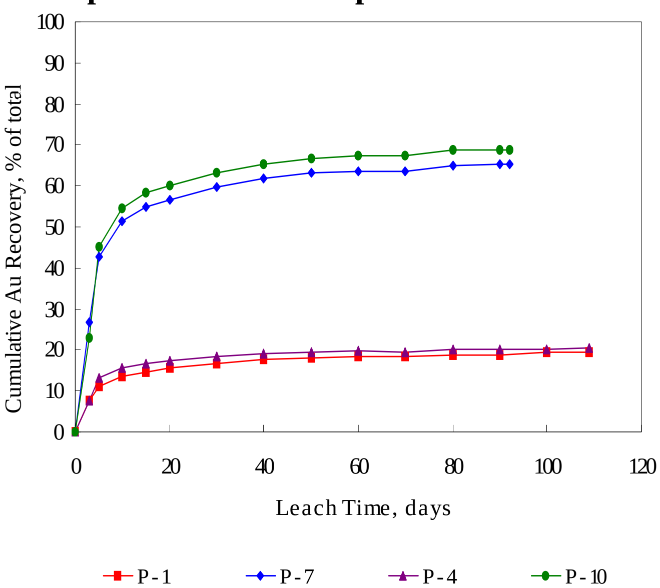
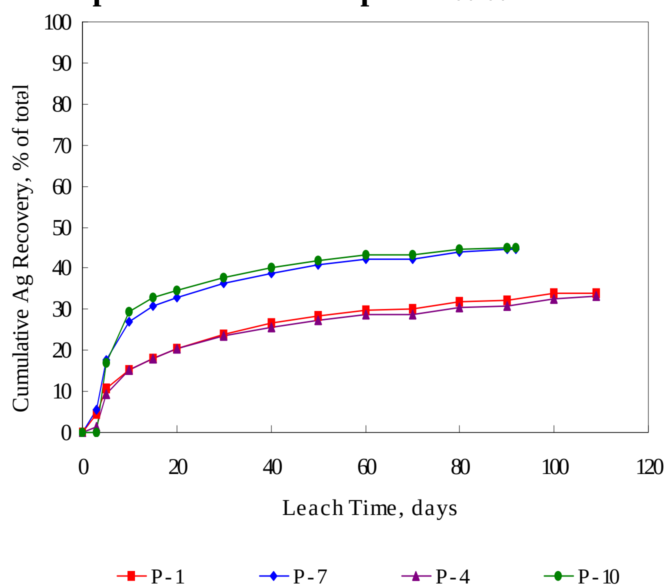


Figure 25. - Silver Leach Rate Profiles, Column Leach Tests, Sleeper Drill Core Composite WWS-13-MC



Column test results showed that gold recoveries obtained from composite WWS-13-MC, without biooxidation pretreatment, were only 19.5% and 20.6%, respectively, in 109 days of leaching and rinsing. Gold recovery rates were fairly rapid initially, and gold extraction was substantially complete in about 20 days of leaching. A longer leach cycle would not significantly improve gold recovery. Silver recoveries, without biooxidation preatreatment, were 33.8% (12.5mm) and 33.3% (6.3mm). Silver recovery rates were slow, and silver extraction was progressing at a slow rate when leaching was terminated. A longer leaching cycle would improve silver recoveries somewhat.

Results from column tests on the biooxidized residues show that simulated heap biooxidation pretreatment was effective in significantly improving gold recovery by simulated heap leach cyanidation. Gold recoveries obtained from the 12.5mm and 6.3mm feeds, after 235 days of pretreatment, were 65.4% and 68.7%, respectively, in 92 days of leaching and rinsing. Those gold recoveries were about 46% to 48% higher than obtained without pretreatment. Gold recovery rates were fairly rapid, and extending the cyanide leaching cycle would only marginally increase gold recoveries. Silver recoveries after biooxdation were 44.6% (12.5mm) and 45.0% (6.3mm). Those silver recoveries were about 11% to 12% higher than obtained without pretreatment. Silver recovery rates were slower, and a longer leaching cycle would improve silver recoveries somewhat.

Cyanide consumptions without pretreatment were 2.62 (12.5mm) and 2.78 (6.3mm) kgNaCN/mt ore. Cyanide consumptions after biooxidation preatreatment were higher (3.55 kgNaCN/mt ore at 12.5mm, and 3.40 kgNaCN/mt ore at 6.3mm). The biooxidized residues were not rinsed with fresh water before agglomeration and cyanide leaching. It may be the case that cyanide consumptions could be decreased with fresh water rinsing between biooxidation and cyanide leaching. The lime required for pH control for the tests without pretreatment was 6.6 kg/mt ore at the 12.5mm feed size and 6.6 kg/mt ore at the 6.3mm feed size. Lime required for pH control during leaching of the biooxized residues was much higher. Lime requirements for the 12.5mm and 6.3mm biooxidized residues were 21.1 and 26.1 kg/mt ore, respectively. These lime requirements include only part of the lime or limestone that will be required in a commercial circuit to neutralize the acid generated during biooxidation pretreatment.

Table 30. - Overall Metallurgical Results, Column Leach Tests, Sleeper Drill Core Composite WOS-MC

Biox. Test No.:	N/A		B-9		N/A		B-10	
Feed Size:	80%-12.5mm		80%-12.5mm		80%-6.3mm		80%-6.3mm	
Biox. Time, days:	0		235		0		235	
Est. Oxidation, %:	0.0		33.8		0.0		23.9	
Metallurgical Results	P-2		P-8		P-5		P-11	
Extraction: % of total	Au	Ag	Au	Ag	Au	Ag	Au	Ag
1st Effluent	5.8	1.0	40.5	7.5	5.4	0.7	47.2	2.7
in 5 days	8.7	3.7	55.2	16.9	8.8	4.7	66.2	17.5
in 10 days	10.3	13.6	62.0	25.5	10.3	13.0	71.3	27.3
in 15 days	11.0	18.3	64.5	29.5	11.0	17.1	73.1	30.9
in 20 days	11.5	21.9	65.9	31.9	11.4	20.2	74.1	33.1
in 30 days	12.2	26.5	68.3	35.2	12.2	23.8	75.7	36.6
in 40 days	12.9	29.6	69.7	37.4	12.5	26.4	76.6	38.9
in 50 days	13.3	32.1	70.6	39.0	12.9	28.8	77.1	40.5
in 60 days	13.6	34.2	70.9	40.0	13.2	30.9	77.3	41.5
in 70 days	13.6	34.4	70.9	40.0	13.2	31.1	77.3	41.5
in 80 days	14.1	36.8	71.6	41.3	13.7	33.5	77.7	43.1
in 90 days	14.2	37.2	71.7	41.8	13.7	33.9	77.9	43.8
in 100 days	14.5	38.7			14.0	35.4		
End of Leach/Rinse	14.8	39.9	71.9	41.8	14.4	36.4	77.9	43.9
Extracted, g/mt ore	0.57	23.6	2.94	23.7	0.59	23.2	3.07	25.4
Tail Screen, g/mt	3.27	35.6	1.15	33.0	3.50	40.5	0.87	32.4
Calculated Head, g/mt ore	3.84	59.2	4.09	56.7	4.09	63.7	3.94	57.8
Average Head, g/mt ore[1)]	4.00	60.8	4.00	60.8	4.00	60.8	4.00	60.8
NaCN Consumed, kg/mt ore	2.61		3.37		2.83		2.85	
Lime Added, kg/mt ore	6.2		12.7		5.4		13.8	
Final Solution pH	10.3		10.2		10.3		9.8	
pH After Rinse	10.6		9.3		10.7		8.2	
Leach/Rinse Cycle, Days	109		92		109		93	

1) Average of all head grade determinations.
Note: Results from testing on biooxidized residues are calculated on a whole ore basis, accounting for weight lost during biooxidation.

Figure 26. - Gold Leach Rate Profiles, Column Leach Tests, Sleeper Drill Core Composite WOS-MC

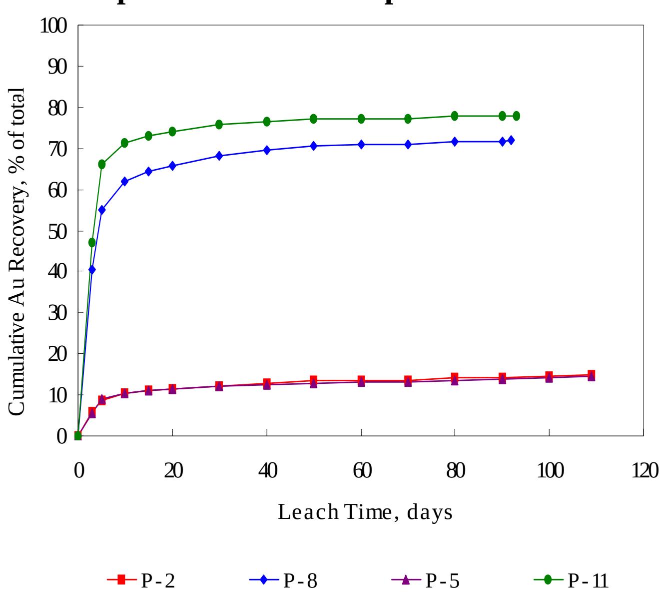
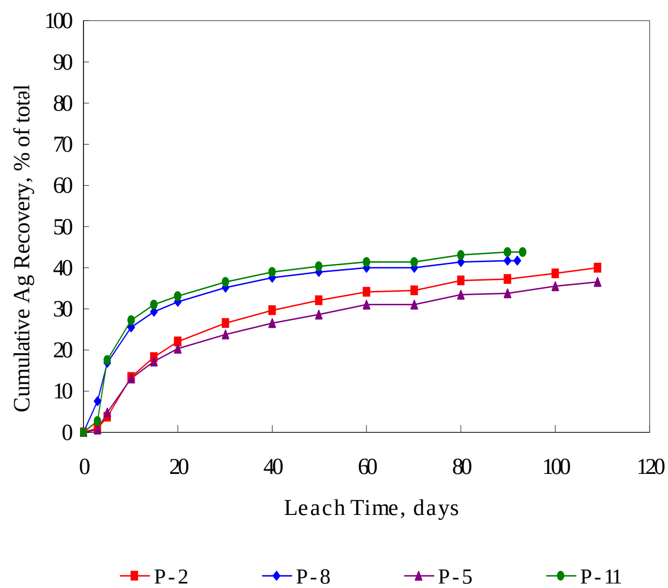


Figure 27. - Silver Leach Rate Profiles, Column Leach Tests, Sleeper Drill Core Composite WOS-MC



Column test results showed that gold recoveries obtained from composite WOS-MC, without biooxidation pretreatment, were only 14.8% and 14.4%, respectively, in 109 days of leaching and rinsing. Gold recovery rates were fairly rapid initially, and gold extraction was substantially complete in about 10 days of leaching. A longer leach cycle would not significantly improve gold recovery. Silver recoveries, without biooxidation preatreatment, were 39.9% (12.5mm) and 36.4% (6.3mm). Silver recovery rates were slow, and silver extraction was progressing at a slow rate when leaching was terminated. A longer leaching cycle would improve silver recoveries somewhat.

Results from column tests on the biooxidized residues show that simulated heap biooxidation pretreatment was effective in significantly improving gold recovery by simulated heap leach cyanidation. Gold recoveries obtained from the 12.5mm and 6.3mm feeds, after 235 days of pretreatment, were 71.9% and 77.9%, respectively, in about 92 days of leaching and rinsing. Those gold recoveries were about 57% to 63% higher than obtained without pretreatment. Gold recovery rates were fairly rapid, and extending the cyanide leaching cycle would only marginally increase gold recoveries. Silver recoveries after biooxdation were 41.8% (12.5mm) and 43.9% (6.3mm). Those silver recoveries were only about 2% to 7% higher than obtained without pretreatment. Silver recovery rates were slow, and a longer leaching cycle would improve silver recoveries somewhat.

Cyanide consumptions without pretreatment were 2.61 (12.5mm) and 2.83 (6.3mm) kgNaCN/mt ore. Cyanide consumptions after biooxidation preatreatment were higher for the 12.5mm feed (3.37 kgNaCN/mt ore). Consumption for the 6.3mm feed was about the same as for the baseline test. The biooxidized residues were not rinsed with fresh water before agglomeration and cyanide leaching. It may be the case that cyanide consumption for the 12.5mm feed could be decreased with fresh water rinsing between biooxidation and cyanide leaching. The lime required for pH control for the tests without pretreatment was 6.2 kg/mt ore at the 12.5mm feed size and 5.4 kg/mt ore at the 6.3mm feed size. Lime required for pH control during leaching of the biooxized residues was significantly higher. Lime requirements for the 12.5mm and 6.3mm biooxidized residues were 12.7 and 13.8 kg/mt ore, respectively. These lime requirements include only part of the lime or limestone that will be required in a commercial circuit to neutralize the acid generated during biooxidation pretreatment.

Table 31. - Overall Metallurgical Results, Column Leach Tests, Sleeper Drill Core Composite FSU-13-1

Bioox. Test No.:	N/A		B-5		N/A		B-6	
Feed Size:	80%-12.5mm		80%-12.5mm		80%-6.3mm		80%-6.3mm	
Bioox. Time, days:	0		235		0		235	
Est. Oxidation, %:	0.0		44.4		0.0		54.9	
Metallurgical Results	P-3		P-9		P-6		P-12	
Extraction: % of total	Au	Ag	Au	Ag	Au	Ag	Au	Ag
1st Effluent	4.5	4.1	12.7	3.0	3.1	0.9	12.8	2.4
in 5 days	8.1	7.9	31.4	7.9	7.6	9.5	33.4	6.2
in 10 days	11.2	11.5	57.3	22.5	10.6	12.9	63.8	21.2
in 15 days	11.9	13.1	62.6	28.7	11.3	14.3	72.5	28.9
in 20 days	12.1	14.2	64.1	31.6	11.3	15.2	75.2	31.5
in 30 days	12.1	15.7	67.2	35.4	11.3	16.2	77.5	34.1
in 40 days	12.3	16.2	67.6	36.1	11.9	16.7	77.5	34.5
in 50 days	12.5	16.6	68.4	37.7	11.9	16.7	79.0	35.4
in 60 days	12.5	17.7	69.2	38.4	11.9	16.7	79.7	35.8
in 70 days			69.6	39.2			80.4	36.1
in 80 days			69.6	40.0			81.0	36.5
End of Leach/Rinse	14.3	19.0	70.7	41.7	11.9	16.7	81.0	38.5
Extracted, g/mt ore	0.05	0.4	0.29	1.0	0.05	0.4	0.34	1.0
Tail Screen, g/mt	0.30	1.7	0.12	1.4	0.37	2.0	0.08	1.6
Calculated Head, g/mt ore	0.35	2.1	0.41	2.4	0.42	2.4	0.42	2.6
Average Head, g/mt ore[1)]	0.46	2.4	0.46	2.4	0.46	2.4	0.46	2.4
NaCN Consumed, kg/mt ore	1.65		2.73		1.55		2.50	
Lime Added, kg/mt ore	3.4		30.8		5.5		37.7	
Final Solution pH	10.2		9.9		10.5		9.5	
pH After Rinse	9.4		8.4		9.9		8.8	
Leach/Rinse Cycle, Days	67		85		67		87	

1) Average of all head grade determinations.
Note: Results from testing on biooxidized residues are calculated on a whole ore basis, accounting for weight lost during biooxidation.

Figure 28. - Gold Leach Rate Profiles, Column Leach Tests, Sleeper Drill Core Composite FSU-13-1

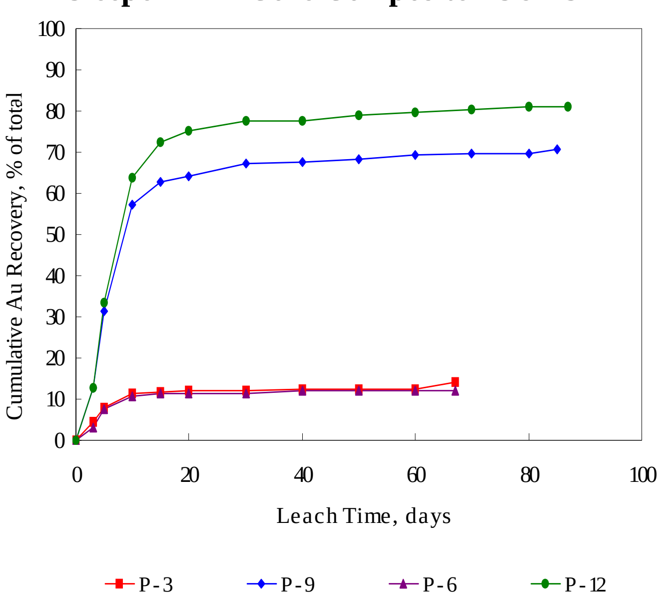
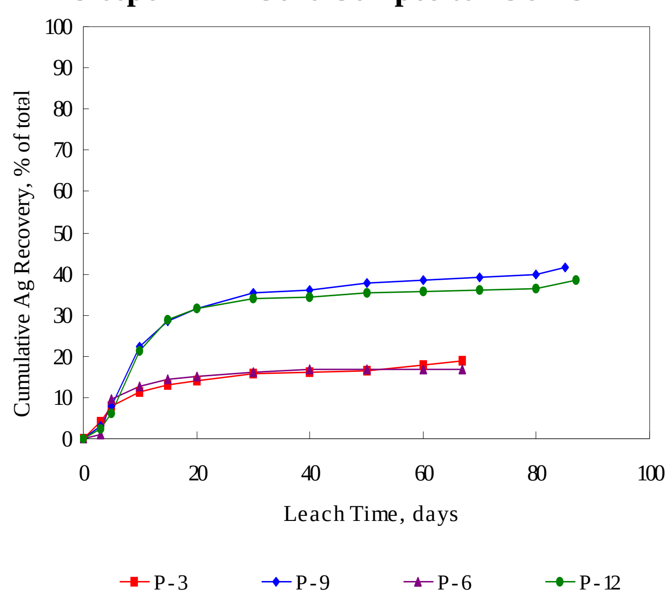


Figure 29. - Silver Leach Rate Profiles, Column Leach Tests, Sleeper Drill Core Composite FSU-13-1



Column test results showed that gold recoveries obtained from composite FSU-13-1, without biooxidation pretreatment, were only 14.3% and 11.9%, respectively, in 67 days of leaching and rinsing. Gold recovery rates were fairly rapid initially, and gold extraction was substantially complete in about 10 days of leaching. A longer leach cycle would not significantly improve gold recovery. Silver recoveries, without biooxidation preatreatment, were 19.0% (12.5mm) and 16.7% (6.3mm). Silver recovery rates were moderate, and silver extraction was progressing at a very slow rate when leaching was terminated. A longer leaching cycle would improve silver recoveries incrementally.

Results from column tests on the biooxidized residues show that simulated heap biooxidation pretreatment was effective in significantly improving gold recovery by simulated heap leach cyanidation. Gold recoveries obtained from the 12.5mm and 6.3mm feeds, after 235 days of pretreatment, were 70.7% and 81.0%, respectively, in about 85 days of leaching and rinsing. Those gold recoveries were about 56% to 69% higher than obtained without pretreatment. Gold recovery rates were fairly rapid, and extending the cyanide leaching cycle would only marginally increase gold recoveries. Silver recoveries after biooxdation were 41.7% (12.5mm) and 38.5% (6.3mm). Those silver recoveries were about 22% higher than obtained without pretreatment. Silver recovery rates were slow, and a longer leaching cycle would improve silver recoveries marginally.

Cyanide consumptions without pretreatment were 1.65 (12.5mm) and 1.55 (6.3mm) kgNaCN/mt ore. Cyanide consumptions after biooxidation preatreatment were higher (2.73 kgNaCN/mt ore at 12.5mm, and 2.50 kgNaCN/mt ore at 6.3mm). The biooxidized residues were not rinsed with fresh water before agglomeration and cyanide leaching. It may be the case that cyanide consumptions could be decreased with fresh water rinsing between biooxidation and cyanide leaching. The lime required for pH control for the tests without pretreatment was 3.4 kg/mt ore at the 12.5mm feed size and 5.5 kg/mt ore at the 6.3mm feed size. Lime required for pH control during leaching of the biooxized residues was much higher. Lime requirements for the 12.5mm and 6.3mm biooxidized residues were 30.8 and 37.7 kg/mt ore, respectively. These lime requirements include only part of the lime or limestone that will be required in a commercial circuit to neutralize the acid generated during biooxidation pretreatment.

Table 32. - Head and Tail Screen Analysis Results, and Recovery by Size Fraction Data, Sleeper Drill Core Composite WWS-13-MC, 80%-12.5mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt Au	Assay, g/mt Ag	Distribution Au %	Distribution Au Cum. %	Distribution Ag %	Distribution Ag Cum. %
HEAD SCREEN ANALYSIS RESULTS								
+12.5mm	17.3	17.3	2.01	6.8	13.1	13.1	13.9	13.9
-12.5+ 9.5mm	19.5	36.8	2.65	6.2	19.5	32.6	14.3	28.2
-9.5 +6.3mm	16.7	53.5	2.24	7.2	14.1	46.7	14.2	42.4
-6.3+1.7mm	24.5	78.0	2.73	9.7	25.2	71.9	28.1	70.5
-420+212µm	9.9	87.9	2.86	8.1	10.7	82.6	9.5	80.0
-212+150µm	3.3	91.2	4.19	15.6	5.2	87.8	6.1	86.1
-150+75µm	1.4	92.6	5.88	29.9	3.1	90.9	5.0	91.1
-75µm	7.4	100.0	3.24	10.2	9.1	100.0	8.9	100.0
Composite	100.0		2.65	8.5	100.0		100.0	
TAIL SCREEN, COLUMN LEACHED RESIDUES (P-1), BASELINE								
+12.5mm	18.4	18.4	1.90	3.7	15.7	15.7	15.7	15.7
-12.5+ 9.5mm	20.8	39.2	2.90	3.6	27.1	42.8	17.3	33.0
-9.5 +6.3mm	16.4	55.6	1.99	3.7	14.7	57.5	14.0	47.0
-6.3+1.7mm	23.4	79.0	1.97	4.4	20.7	78.2	23.8	70.8
-420+212µm	8.9	87.9	2.26	5.8	9.0	87.2	11.9	82.7
-212+150µm	2.8	90.7	3.28	10.7	4.1	91.3	6.9	89.6
-150+75µm	1.2	91.9	4.99	16.5	2.7	94.0	4.6	94.2
-75µm	8.1	100.0	1.65	3.1	6.0	100.0	5.8	100.0
Composite	100.0		2.23	4.3	100.0		100.0	

RECOVERY BY SIZE FRACTION DATA, COLUMN LEACH TEST (P-1), BASELINE

Size Fraction	Weight, % Head	Weight, % Tail	Assay, gAu/mt Head	Assay, gAu/mt Tail	Au Recovery, %
+12.5mm	17.3	18.4	2.01	1.90	5.5
-12.5+ 9.5mm	19.5	20.8	2.65	2.90	<0.1
-9.5 +6.3mm	16.7	16.4	2.24	1.99	11.2
-6.3+1.7mm	24.5	23.4	2.73	1.97	27.8
-420+212µm	9.9	8.9	2.86	2.26	21.0
-212+150µm	3.3	2.8	4.19	3.28	21.7
-150+75µm	1.4	1.2	5.88	4.99	15.1
-75µm	7.4	8.1	3.24	1.65	49.1
Composite	100.0	100.0	2.65	2.23	15.8

Table 33. - Head and Tail Screen Analysis Results, and Recovery by Size Fraction Data, Sleeper Drill Core Composite WWS-13-MC, 80%-12.5mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt		Distribution			
					Au		Ag	
			Au	Ag	%	Cum. %	%	Cum. %
HEAD SCREEN ANALYSIS RESULTS								
+12.5mm	17.3	17.3	2.01	6.8	13.1	13.1	13.9	13.9
-12.5+ 9.5mm	19.5	36.8	2.65	6.2	19.5	32.6	14.3	28.2
-9.5 +6.3mm	16.7	53.5	2.24	7.2	14.1	46.7	14.2	42.4
-6.3+1.7mm	24.5	78.0	2.73	9.7	25.2	71.9	28.1	70.5
-420+212µm	9.9	87.9	2.86	8.1	10.7	82.6	9.5	80.0
-212+150µm	3.3	91.2	4.19	15.6	5.2	87.8	6.1	86.1
-150+75µm	1.4	92.6	5.88	29.9	3.1	90.9	5.0	91.1
-75µm	7.4	100.0	3.24	10.2	9.1	100.0	8.9	100.0
Composite	100.0		2.65	8.5	100.0		100.0	
TAIL SCREEN, COLUMN LEACHED RESIDUES (P-7), BIOOXIDIZED RESIDUE (B-1)								
+12.5mm	17.5	17.5	1.23	3.0	23.0	23.0	12.9	12.9
-12.5+ 9.5mm	20.9	38.4	1.33	2.8	29.8	52.8	14.4	27.3
-9.5 +6.3mm	17.1	55.5	1.25	4.2	22.9	75.7	17.6	44.9
-6.3+1.7mm	21.6	77.1	0.77	5.5	17.8	93.5	29.2	74.1
-420+212µm	8.7	85.8	0.41	5.3	3.8	97.3	11.3	85.4
-212+150µm	3.1	88.9	0.27	6.0	0.9	98.2	4.6	90.0
-150+75µm	1.5	90.4	0.22	12.5	0.4	98.6	4.6	94.6
-75µm	9.6	100.0	0.14	2.3	1.4	100.0	5.4	100.0
Composite	100.0		0.93	4.1	100.0		100.0	

RECOVERY BY SIZE FRACTION DATA, COLUMN LEACH TEST (P-7), BIOOXIDIZED RESIDUE (B-1)

Size Fraction	Weight, %		Assay, gAu/mt		Au Recovery, %
	Head	Tail	Head	Tail	
+12.5mm	17.3	17.5	2.01	1.23	38.8
-12.5+ 9.5mm	19.5	20.9	2.65	1.33	49.8
-9.5 +6.3mm	16.7	17.1	2.24	1.25	44.2
-6.3+1.7mm	24.5	21.6	2.73	0.77	71.8
-420+212µm	9.9	8.7	2.86	0.41	85.7
-212+150µm	3.3	3.1	4.19	0.27	93.6
-150+75µm	1.4	1.5	5.88	0.22	96.3
-75µm	7.4	9.6	3.24	0.14	95.7
Composite	100.0	100.0	2.65	0.93	64.9

Table 34. - Head and Tail Screen Analysis Results, and Recovery by Size Fraction Data, Sleeper Drill Core Composite WWS-13-MC, 80%-6.3mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt Au	Assay, g/mt Ag	Distribution Au %	Distribution Au Cum. %	Distribution Ag %	Distribution Ag Cum. %
HEAD SCREEN ANALYSIS RESULTS								
+6.3mm	20.0	20.0	2.26	6.0	15.4	15.4	16.6	16.6
-6.3+1.7mm	40.7	60.7	2.77	5.4	38.4	53.8	30.4	47.0
-1.7mm+420µm	17.1	77.8	3.04	6.9	17.7	71.5	16.4	63.4
-420+150µm	4.2	82.0	3.30	12.4	4.7	76.2	7.2	70.6
-150+75µm	3.1	85.1	4.09	21.8	4.3	80.5	9.4	80.0
-75µm	14.9	100.0	3.84	9.7	19.5	100.0	20.0	100.0
Composite	100.0		2.94	7.2	100.0		100.0	
TAIL SCREEN, COLUMN LEACHED RESIDUES (P-4), BASELINE								
+6.3mm	17.5	17.5	2.01	6.3	16.3	16.3	21.0	21.0
-6.3+1.7mm	42.5	60.0	2.08	4.7	41.0	57.3	38.1	59.1
-1.7mm+420µm	19.3	79.3	2.24	5.5	20.0	77.3	20.3	79.4
-420+150µm	6.0	85.3	2.49	6.1	6.9	84.2	7.0	86.4
-150+75µm	2.6	87.9	3.80	10.2	4.6	88.8	5.1	91.5
-75µm	12.1	100.0	1.99	3.7	11.2	100.0	8.5	100.0
Composite	100.0		2.16	5.2	100.0		100.0	

RECOVERY BY SIZE FRACTION DATA, COLUMN LEACH TEST (P-4), BASELINE

Size Fraction	Weight, % Head	Weight, % Tail	Assay, gAu/mt Head	Assay, gAu/mt Tail	Au Recovery, %
+6.3mm	20.0	17.5	2.26	2.01	11.1
-6.3+1.7mm	40.7	42.5	2.77	2.08	24.9
-1.7mm+420µm	17.1	19.3	3.04	2.24	26.3
-420+150µm	4.2	6.0	3.30	2.49	24.5
-150+75µm	3.1	2.6	4.09	3.80	7.1
-75µm	14.9	12.1	3.84	1.99	48.2
Composite	100.0	100.0	2.94	2.16	26.5

Table 35. - Head and Tail Screen Analysis Results, and Recovery by Size Fraction Data, Sleeper Drill Core Composite WWS-13-MC, 80%-6.3mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt Au	Assay, g/mt Ag	Distribution Au %	Distribution Au Cum. %	Distribution Ag %	Distribution Ag Cum. %
HEAD SCREEN ANALYSIS RESULTS								
+6.3mm	20.0	20.0	2.26	6.0	15.4	15.4	16.6	16.6
-6.3+1.7mm	40.7	60.7	2.77	5.4	38.4	53.8	30.4	47.0
-1.7mm+420µm	17.1	77.8	3.04	6.9	17.7	71.5	16.4	63.4
-420+150µm	4.2	82.0	3.30	12.4	4.7	76.2	7.2	70.6
-150+75µm	3.1	85.1	4.09	21.8	4.3	80.5	9.4	80.0
-75µm	14.9	100.0	3.84	9.7	19.5	100.0	20.0	100.0
Composite	100.0		2.94	7.2	100.0		100.0	
TAIL SCREEN, COLUMN LEACHED RESIDUES (P-10), BIOOXIDIZED RESIDUE (B-2)								
+6.3mm	19.8	19.8	1.37	5.7	32.9	32.9	25.7	25.7
-6.3+1.7mm	41.6	61.4	1.05	4.6	52.9	85.8	43.6	69.3
-1.7mm+420µm	16.8	78.2	0.44	4.0	9.0	94.8	15.3	84.6
-420+150µm	6.1	84.3	0.28	3.8	2.1	96.9	5.3	89.9
-150+75µm	2.8	87.1	0.24	7.1	0.8	97.7	4.5	94.4
-75µm	12.9	100.0	0.15	1.9	2.3	100.0	5.6	100.0
Composite	100.0		0.83	4.4	100.0		100.0	

RECOVERY BY SIZE FRACTION DATA, COLUMN LEACH TEST (P-10), BIOOXIDIZED RESIDUE (B-2)

Size Fraction	Weight, % Head	Weight, % Tail	Assay, gAu/mt Head	Assay, gAu/mt Tail	Au Recovery, %
+6.3mm	20.0	19.8	2.26	1.37	39.4
-6.3+1.7mm	40.7	41.6	2.77	1.05	62.1
-1.7mm+420µm	17.1	16.8	3.04	0.44	85.5
-420+150µm	4.2	6.1	3.30	0.28	91.5
-150+75µm	3.1	2.8	4.09	0.24	94.1
-75µm	14.9	12.9	3.84	0.15	96.1
Composite	100.0	100.0	2.94	0.83	71.8

Table 36. - Head and Tail Screen Analysis Results, and Recovery by Size Fraction Data, Sleeper Drill Core Composite WOS-MC, 80%-12.5mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt Au	Assay, g/mt Ag	Distribution Au %	Distribution Au Cum. %	Distribution Ag %	Distribution Ag Cum. %
HEAD SCREEN ANALYSIS RESULTS								
+12.5mm	21.7	21.7	3.42	38.5	18.6	18.6	14.4	14.4
-12.5+ 9.5mm	21.5	43.2	3.34	40.7	18.0	36.6	15.1	29.5
-9.5 +6.3mm	17.2	60.4	4.72	41.4	20.3	56.9	12.3	41.8
-6.3+1.7mm	20.0	80.4	4.79	44.7	24.0	80.9	15.5	57.3
-420+212µm	8.0	88.4	4.71	108.4	9.4	90.3	15.0	72.3
-212+150µm	3.2	91.6	4.52	148.0	3.6	93.9	8.2	80.5
-150+75µm	1.6	93.2	3.99	181.4	1.6	95.5	5.0	85.5
-75µm	6.8	100.0	2.63	123.7	4.5	100.0	14.5	100.0
Composite	100.0		3.99	57.9	100.0		100.0	
TAIL SCREEN, COLUMN LEACHED RESIDUES (P-2), BASELINE								
+12.5mm	19.4	19.4	2.92	21.4	17.3	17.3	11.7	11.7
-12.5+ 9.5mm	20.0	39.4	2.79	22.8	17.1	34.4	12.8	24.5
-9.5 +6.3mm	15.8	55.2	4.31	32.8	20.9	55.3	14.5	39.0
-6.3+1.7mm	22.4	77.6	3.71	42.0	25.4	80.7	26.4	65.4
-420+212µm	9.0	86.6	3.42	51.4	9.4	90.1	13.0	78.4
-212+150µm	3.1	89.7	4.46	128	4.2	94.3	11.1	89.5
-150+75µm	1.7	91.4	3.32	59.6	1.7	96.0	2.8	92.3
-75µm	8.6	100.0	1.51	31.7	4.0	100.0	7.7	100.0
Composite	100.0		3.27	35.6	100.0		100.0	

RECOVERY BY SIZE FRACTION DATA, COLUMN LEACH TEST (P-2), BASELINE

Size Fraction	Weight, % Head	Weight, % Tail	Assay, gAu/mt Head	Assay, gAu/mt Tail	Au Recovery, %
+12.5mm	21.7	19.4	3.42	2.92	14.6
-12.5+ 9.5mm	21.5	20.0	3.34	2.79	16.5
-9.5 +6.3mm	17.2	15.8	4.72	4.31	8.7
-6.3+1.7mm	20.0	22.4	4.79	3.71	22.5
-420+212µm	8.0	9.0	4.71	3.42	27.4
-212+150µm	3.2	3.1	4.52	4.46	1.3
-150+75µm	1.6	1.7	3.99	3.32	16.8
-75µm	6.8	8.6	2.63	1.51	42.6
Composite	100.0	100.0	3.99	3.27	18.0

Table 37. - Head and Tail Screen Analysis Results, and Recovery by Size Fraction Data, Sleeper Drill Core Composite WOS-MC, 80%-12.5mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt Au	Assay, g/mt Ag	Distribution Au %	Distribution Au Cum. %	Distribution Ag %	Distribution Ag Cum. %
HEAD SCREEN ANALYSIS RESULTS								
+12.5mm	21.7	21.7	3.42	38.5	18.6	18.6	14.4	14.4
-12.5+ 9.5mm	21.5	43.2	3.34	40.7	18.0	36.6	15.1	29.5
-9.5 +6.3mm	17.2	60.4	4.72	41.4	20.3	56.9	12.3	41.8
-6.3+1.7mm	20.0	80.4	4.79	44.7	24.0	80.9	15.5	57.3
-420+212µm	8.0	88.4	4.71	108.4	9.4	90.3	15.0	72.3
-212+150µm	3.2	91.6	4.52	148.0	3.6	93.9	8.2	80.5
-150+75µm	1.6	93.2	3.99	181.4	1.6	95.5	5.0	85.5
-75µm	6.8	100.0	2.63	123.7	4.5	100.0	14.5	100.0
Composite	100.0		3.99	57.9	100.0		100.0	
TAIL SCREEN, COLUMN LEACHED RESIDUES (P-8), BIOOXIDIZED RESIDUE (B-9)								
+12.5mm	22.8	22.8	2.32	35.0	44.9	44.9	23.7	23.7
-12.5+ 9.5mm	23.7	46.5	0.93	32.0	18.7	63.6	22.5	46.2
-9.5 +6.3mm	17.1	63.6	1.37	28.0	19.9	83.5	14.2	60.4
-6.3+1.7mm	19.8	83.4	0.68	37.4	11.4	94.9	21.9	82.3
-420+212µm	6.1	89.5	0.46	40.0	2.4	97.3	7.2	89.5
-212+150µm	2.4	91.9	0.37	36.3	0.8	98.1	2.6	92.1
-150+75µm	1.6	93.5	0.33	42.6	0.4	98.5	2.0	94.1
-75µm	6.5	100.0	0.28	30.8	1.5	100.0	5.9	100.0
Composite	100.0		1.18	33.8	100.0		100.0	

RECOVERY BY SIZE FRACTION DATA, COLUMN LEACH TEST (P-8), BIOOXIDIZED RESIDUE (B-9)

Size Fraction	Weight, % Head	Weight, % Tail	Assay, gAu/mt Head	Assay, gAu/mt Tail	Au Recovery, %
+12.5mm	21.7	22.8	3.42	2.32	32.2
-12.5+ 9.5mm	21.5	23.7	3.34	0.93	72.2
-9.5 +6.3mm	17.2	17.1	4.72	1.37	71.0
-6.3+1.7mm	20.0	19.8	4.79	0.68	85.8
-420+212µm	8.0	6.1	4.71	0.46	90.2
-212+150µm	3.2	2.4	4.52	0.37	91.8
-150+75µm	1.6	1.6	3.99	0.33	91.7
-75µm	6.8	6.5	2.63	0.28	89.4
Composite	100.0	100.0	3.99	1.18	70.4

Table 38. - Head and Tail Screen Analysis Results, and Recovery by Size Fraction Data, Sleeper Drill Core Composite WOS-MC, 80%-6.3mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt Au	Assay, g/mt Ag	Distribution Au %	Distribution Au Cum. %	Distribution Ag %	Distribution Ag Cum. %
HEAD SCREEN ANALYSIS RESULTS								
+6.3mm	22.1	22.1	4.00	42.6	22.8	22.8	17.2	17.2
-6.3+1.7mm	46.1	68.2	3.90	37.5	46.3	69.1	31.6	48.8
-1.7mm+420µm	13.6	81.8	4.27	75.8	14.9	84.0	18.8	67.6
-420+150µm	4.6	86.4	4.33	91.0	5.1	89.1	7.6	75.2
-150+75µm	2.5	88.9	4.14	102.3	2.7	91.8	4.7	79.9
-75µm	11.1	100.0	2.88	99.4	8.2	100.0	20.1	100.0
Composite	100.0		3.88	54.8	100.0		100.0	
TAIL SCREEN, COLUMN LEACHED RESIDUES (P-5), BASELINE								
+6.3mm	21.0	21.0	3.76	43.7	22.6	22.6	22.7	22.7
-6.3+1.7mm	46.1	67.1	3.96	41.0	52.2	74.8	46.7	69.4
-1.7mm+420µm	15.7	82.8	3.23	36.3	14.5	89.3	14.1	83.5
-420+150µm	5.6	88.4	3.12	51.7	5.0	94.3	7.1	90.6
-150+75µm	2.2	90.6	3.08	61.3	1.9	96.2	3.3	93.9
-75µm	9.4	100.0	1.41	26.5	3.8	100.0	6.1	100.0
Composite	100.0		3.50	40.5	100.0		100.0	

RECOVERY BY SIZE FRACTION DATA, COLUMN LEACH TEST (P-5), BASELINE

Size Fraction	Weight, % Head	Weight, % Tail	Assay, gAu/mt Head	Assay, gAu/mt Tail	Au Recovery, %
+6.3mm	22.1	21.0	4.00	3.76	6.0
-6.3+1.7mm	46.1	46.1	3.90	3.96	<0.1
-1.7mm+420µm	13.6	15.7	4.27	3.23	24.4
-420+150µm	4.6	5.6	4.33	3.12	27.9
-150+75µm	2.5	2.2	4.14	3.08	25.6
-75µm	11.1	9.4	2.88	1.41	51.0
Composite	100.0	100.0	3.88	3.50	9.8

Table 39. - Head and Tail Screen Analysis Results, and Recovery by Size Fraction Data, Sleeper Drill Core Composite WOS-MC, 80%-6.3mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt Au	Assay, g/mt Ag	Distribution Au %	Distribution Au Cum. %	Distribution Ag %	Distribution Ag Cum. %
HEAD SCREEN ANALYSIS RESULTS								
+6.3mm	22.1	22.1	4.00	42.6	22.8	22.8	17.2	17.2
-6.3+1.7mm	46.1	68.2	3.90	37.5	46.3	69.1	31.6	48.8
-1.7mm+420µm	13.6	81.8	4.27	75.8	14.9	84.0	18.8	67.6
-420+150µm	4.6	86.4	4.33	91.0	5.1	89.1	7.6	75.2
-150+75µm	2.5	88.9	4.14	102.3	2.7	91.8	4.7	79.9
-75µm	11.1	100.0	2.88	99.4	8.2	100.0	20.1	100.0
Composite	100.0		3.88	54.8	100.0		100.0	
TAIL SCREEN, COLUMN LEACHED RESIDUES (P-11), BIOOXIDIZED RESIDUE (B-10)								
+6.3mm	20.0	20.0	1.14	10.0	25.6	25.6	6.0	6.0
-6.3+1.7mm	47.8	67.8	1.01	36.7	54.2	79.8	52.6	58.6
-1.7mm+420µm	15.0	82.8	0.72	50.6	12.1	91.9	22.8	81.4
-420+150µm	5.5	88.3	0.59	52.4	3.6	95.5	8.7	90.1
-150+75µm	1.9	90.2	0.48	56.9	1.0	96.5	3.2	93.3
-75µm	9.8	100.0	0.32	22.8	3.5	100.0	6.7	100.0
Composite	100.0		0.89	33.3	100.0		100.0	

RECOVERY BY SIZE FRACTION DATA, COLUMN LEACH TEST (P-11), BIOOXIDIZED RESIDUE (B-10)

Size Fraction	Weight, % Head	Weight, % Tail	Assay, gAu/mt Head	Assay, gAu/mt Tail	Au Recovery, %
+6.3mm	22.1	20.0	4.00	1.14	71.5
-6.3+1.7mm	46.1	47.8	3.90	1.01	74.1
-1.7mm+420µm	13.6	15.0	4.27	0.72	83.1
-420+150µm	4.6	5.5	4.33	0.59	86.4
-150+75µm	2.5	1.9	4.14	0.48	88.4
-75µm	11.1	9.8	2.88	0.32	88.9
Composite	100.0	100.0	3.88	0.89	77.1

Table 40. - Head and Tail Screen Analysis Results, and Recovery by Size Fraction Data, Sleeper Drill Core Composite FSU-13-1, 80%-12.5mm Feed Size

Size	Weight,	Cum. Wt.,	Assay, g/mt		Distribution Au		Distribution Ag	
Fraction	%	%	Au	Ag	%	Cum. %	%	Cum. %
HEAD SCREEN ANALYSIS RESULTS								
+12.5mm	21.9	21.9	0.40	2.1	22.8	22.8	22.6	22.6
-12.5+ 9.5mm	22.2	44.1	0.39	2.0	22.6	45.4	21.8	44.4
-9.5 +6.3mm	14.6	58.7	0.38	2.0	14.5	59.9	14.3	58.7
-6.3+1.7mm	17.5	76.2	0.40	2.4	18.2	78.1	20.6	79.3
-420+212µm	6.6	82.8	0.46	2.2	7.9	86.0	7.1	86.4
-212+150µm	2.6	85.4	0.51	2.7	3.4	89.4	3.5	89.9
-150+75µm	2.1	87.5	0.56	2.6	3.1	92.5	2.7	92.6
-75µm	12.5	100.0	0.23	1.2	7.5	100.0	7.4	100.0
Composite	100.0		0.38	2.0	100.0		100.0	
TAIL SCREEN, COLUMN LEACHED RESIDUES (P-3), BASELINE								
+12.5mm	24.0	24.0	0.35	2.4	28.0	28.0	33.1	33.1
-12.5+ 9.5mm	20.5	44.5	0.28	1.7	19.2	47.2	20.0	53.1
-9.5 +6.3mm	12.4	56.9	0.35	1.6	14.5	61.7	11.4	64.5
-6.3+1.7mm	21.6	78.5	0.28	1.4	20.2	81.9	17.4	81.9
-420+212µm	6.6	85.1	0.42	1.9	9.3	91.2	7.2	89.1
-212+150µm	2.7	87.8	0.46	2.3	4.1	95.3	3.6	92.7
-150+75µm	1.9	89.7	0.21	1.8	1.3	96.6	2.0	94.7
-75µm	10.3	100.0	0.10	0.9	3.4	100.0	5.3	100.0
Composite	100.0		0.30	1.7	100.0		100.0	

RECOVERY BY SIZE FRACTION DATA, COLUMN LEACH TEST (P-3), BASELINE

Size	Weight, %		Assay, gAu/mt		Au Recovery,
Fraction	Head	Tail	Head	Tail	%
+12.5mm	21.9	24.0	0.40	0.35	12.5
-12.5+ 9.5mm	22.2	20.5	0.39	0.28	28.2
-9.5 +6.3mm	14.6	12.4	0.38	0.35	7.9
-6.3+1.7mm	17.5	21.6	0.40	0.28	30.0
-420+212µm	6.6	6.6	0.46	0.42	8.7
-212+150µm	2.6	2.7	0.51	0.46	9.8
-150+75µm	2.1	1.9	0.56	0.21	62.5
-75µm	12.5	10.3	0.23	0.10	56.5
Composite	100.0	100.0	0.38	0.30	21.1

Table 41. - Head and Tail Screen Analysis Results, and Recovery by Size Fraction Data, Sleeper Drill Core Composite FSU-13-1, 80%-12.5mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt Au	Assay, g/mt Ag	Distribution Au %	Distribution Au Cum. %	Distribution Ag %	Distribution Ag Cum. %
HEAD SCREEN ANALYSIS RESULTS								
+12.5mm	21.9	21.9	0.40	2.1	22.8	22.8	22.6	22.6
-12.5+ 9.5mm	22.2	44.1	0.39	2.0	22.6	45.4	21.8	44.4
-9.5 +6.3mm	14.6	58.7	0.38	2.0	14.5	59.9	14.3	58.7
-6.3+1.7mm	17.5	76.2	0.40	2.4	18.2	78.1	20.6	79.3
-420+212µm	6.6	82.8	0.46	2.2	7.9	86.0	7.1	86.4
-212+150µm	2.6	85.4	0.51	2.7	3.4	89.4	3.5	89.9
-150+75µm	2.1	87.5	0.56	2.6	3.1	92.5	2.7	92.6
-75µm	12.5	100.0	0.23	1.2	7.5	100.0	7.4	100.0
Composite	100.0		0.38	2.0	100.0		100.0	
TAIL SCREEN, COLUMN LEACHED RESIDUES (P-9), BIOOXIDIZED RESIDUE (B-5)								
+12.5mm	20.4	20.4	0.24	2.1	39.6	39.6	29.8	29.8
-12.5+ 9.5mm	12.5	32.9	0.17	1.7	17.2	56.8	14.8	44.6
-9.5 +6.3mm	11.2	44.1	0.17	1.2	15.4	72.2	9.4	54.0
-6.3+1.7mm	15.3	59.4	0.11	1.0	13.6	85.8	10.6	64.6
-420+212µm	8.7	68.1	0.05	0.6	3.5	89.3	3.6	68.2
-212+150µm	4.7	72.8	0.08	0.8	3.1	92.4	2.6	70.8
-150+75µm	3.9	76.7	0.06	0.6	1.9	94.3	1.6	72.4
-75µm	23.3	100.0	0.03	1.7	5.7	100.0	27.6	100.0
Composite	100.0		0.12	1.4	100.0		100.0	

RECOVERY BY SIZE FRACTION DATA, COLUMN LEACH TEST (P-9), BIOOZIDIZED RESIDUE (B-5)

Size Fraction	Weight, % Head	Weight, % Tail	Assay, gAu/mt Head	Assay, gAu/mt Tail	Au Recovery, %
+12.5mm	21.9	20.4	0.40	0.24	40.0
-12.5+ 9.5mm	22.2	12.5	0.39	0.17	56.4
-9.5 +6.3mm	14.6	11.2	0.38	0.17	55.3
-6.3+1.7mm	17.5	15.3	0.40	0.11	72.5
-420+212µm	6.6	8.7	0.46	0.05	89.1
-212+150µm	2.6	4.7	0.51	0.08	84.3
-150+75µm	2.1	3.9	0.56	0.06	89.3
-75µm	12.5	23.3	0.23	0.03	87.0
Composite	100.0	100.0	0.38	0.12	68.4

Table 42. - Head and Tail Screen Analysis Results, and Recovery by Size Fraction Data, Sleeper Drill Core Composite FSU-13-1, 80%-6.3mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt Au	Assay, g/mt Ag	Distribution Au %	Distribution Au Cum. %	Distribution Ag %	Distribution Ag Cum. %
HEAD SCREEN ANALYSIS RESULTS								
+6.3mm	17.0	17.0	0.49	3.5	15.2	15.2	18.5	18.5
-6.3+1.7mm	38.2	55.2	0.54	3.2	37.8	53.0	37.9	56.4
-1.7mm+420µm	18.3	73.5	0.72	3.3	24.1	77.1	18.7	75.1
-420+150µm	6.7	80.2	0.45	3.1	5.5	82.6	6.5	81.6
-150+75µm	3.9	84.1	0.52	4.2	3.7	86.3	5.1	86.7
-75µm	15.9	100.0	0.47	2.7	13.7	100.0	13.3	100.0
Composite	100.0		0.55	3.2	100.0		100.0	
TAIL SCREEN, COLUMN LEACHED RESIDUES (P-6), BASELINE								
+6.3mm	16.4	16.4	0.43	2.7	18.9	18.9	22.7	22.7
-6.3+1.7mm	39.4	55.8	0.41	2.0	43.3	62.2	40.3	63.0
-1.7mm+420µm	17.9	73.7	0.44	2.1	21.1	83.3	19.3	82.3
-420+150µm	6.2	79.9	0.38	2.1	6.3	89.6	6.7	89.0
-150+75µm	3.3	83.2	0.41	1.9	3.6	93.2	3.2	92.2
-75µm	16.8	100.0	0.15	0.9	6.8	100.0	7.8	100.0
Composite	100.0		0.37	2.0	100.0		100.0	

RECOVERY BY SIZE FRACTION DATA, COLUMN LEACH TEST (P-6), BASELINE

Size Fraction	Weight, % Head	Weight, % Tail	Assay, gAu/mt Head	Assay, gAu/mt Tail	Au Recovery, %
+6.3mm	17.0	16.4	0.49	0.43	12.2
-6.3+1.7mm	38.2	39.4	0.54	0.41	24.1
-1.7mm+420µm	18.3	17.9	0.72	0.44	38.9
-420+150µm	6.7	6.2	0.45	0.38	15.6
-150+75µm	3.9	3.3	0.52	0.41	21.2
-75µm	15.9	16.8	0.47	0.15	68.1
Composite	100.0	100.0	0.55	0.37	32.7

Table 43. - Head and Tail Screen Analysis Results, and Recovery by Size Fraction Data, Sleeper Drill Core Composite FSU-13-1, 80%-6.3mm Feed Size

Size Fraction	Weight, %	Cum. Wt., %	Assay, g/mt Au	Assay, g/mt Ag	Distribution Au %	Distribution Au Cum. %	Distribution Ag %	Distribution Ag Cum. %
HEAD SCREEN ANALYSIS RESULTS								
+6.3mm	17.0	17.0	0.49	3.5	15.2	15.2	18.5	18.5
-6.3+1.7mm	38.2	55.2	0.54	3.2	37.8	53.0	37.9	56.4
-1.7mm+420µm	18.3	73.5	0.72	3.3	24.1	77.1	18.7	75.1
-420+150µm	6.7	80.2	0.45	3.1	5.5	82.6	6.5	81.6
-150+75µm	3.9	84.1	0.52	4.2	3.7	86.3	5.1	86.7
-75µm	15.9	100.0	0.47	2.7	13.7	100.0	13.3	100.0
Composite	100.0		0.55	3.2	100.0		100.0	
TAIL SCREEN, COLUMN LEACHED RESIDUES (P-12), BIOOXIDIZED RESIDUE (B-6)								
+6.3mm	14.4	14.4	0.17	1.7	30.1	30.1	15.7	15.7
-6.3+1.7mm	31.5	45.9	0.12	1.2	46.4	76.5	24.2	39.9
-1.7mm+420µm	12.5	58.4	0.04	0.8	6.1	82.6	6.4	46.3
-420+150µm	5.2	63.6	0.05	0.7	3.2	85.8	2.3	48.6
-150+75µm	6.3	69.9	0.04	0.8	3.1	88.9	3.2	51.8
-75µm	30.1	100.0	0.03	2.5	11.1	100.0	48.2	100.0
Composite	100.0		0.08	1.6	100.0		100.0	

RECOVERY BY SIZE FRACTION DATA, COLUMN LEACH TEST (P-12), BIOOXIDIZED RESIDUE (B-6)

Size Fraction	Weight, % Head	Weight, % Tail	Assay, gAu/mt Head	Assay, gAu/mt Tail	Au Recovery, %
+6.3mm	17.0	14.4	0.49	0.17	65.3
-6.3+1.7mm	38.2	31.5	0.54	0.12	77.8
-1.7mm+420µm	18.3	12.5	0.72	0.04	94.4
-420+150µm	6.7	5.2	0.45	0.05	88.9
-150+75µm	3.9	6.3	0.52	0.04	92.3
-75µm	15.9	30.1	0.47	0.03	93.6
Composite	100.0	100.0	0.55	0.08	85.5

Head screen analysis results showed that composites WWS-13-MC, WOS-MC and FSU-13-1 contained averages of 2.80, 3.94 and 0.47 gAu/mt ore, and 7.9, 56.4 and 2.6 gAg/mt ore, respectively. Contained gold values were fairly evenly distributed throughout the various size fractions, with a minor enrichment of values in the fines noted for composite WWS-13-MC, and a minor depletion of values in the fines noted for the other two composites. Contained silver values for composites WWS-13-MC, and in particular for composite WOS-MC were not as evenly distributed, and tended to be enriched in the finer size fractions.

Tail screen analysis results showed that the baseline (no pretreatment) column leached residues contained 2.23 to 2.16 gAu/mt (WWS-13-MC), 3.27 to 3.50 gAu/mt (WOS-MC) and 0.30 to 0.37 gAu/mt (FSU-13-1). Residual gold values for the baseline tests were fairly evenly distributed throughout the various size fractions, with a moderate depletion of values generally noted in the fines (-75µm) size fraction. These results, and recovery by size fraction data from the baseline tests indicate that grinding finer than 75µm in size would significantly improve gold recovery by cyanidation, but that recoveries at the -75µm feed size would probably still be too low for economical processing.

Tail screen analysis results showed that the pretreated (biooxidized) column leached residues contained 0.83 to 0.93 gAu/mt (WWS-13-MC), 0.89 to 1.18 gAu/mt (WOS-MC) and

0.08 to 0.12 gAu/mt (FSU-13-1). Residual gold values for the biooxidized residues were not evenly distributed throughout the various size fractions, but were moderately to strongly depleted from the finer size fractions. Those results, and recovery by size fraction data indicate that gold recovery for heap biooxidation/heap cyanidation treatment would probably increase with decreasing feed size. This observation is supported by the high gold recoveries obtained from the three Sleeper amenability test composites, during stirred tank biooxidation testing on milled feed.

Table 44. - Metallurgical Balances, Column Leach Tests, Sleeper Drill Core Composites

	Metallurgical Balance		
	Sol. vs. Tail	Carbon vs. Tail	Head vs. Tail[3)]
WWS-13-MC, 80%-12.5mm Feed Size, P-1 Baseline			
Extracted, gAu/mt ore	0.54	0.65	0.50
Tail Assay, gAu/mt	2.23	2.23	2.23
Calculated, Head, gAu/mt	2.77	2.88	2.73
Recovery, %	19.5	22.6	18.3
Deviation, g/mt[1)]	N/A	0.11	0.04
Precision, %	100.0	96.0	98.6
WWS-13-MC, 80%-12.5mm Feed Size, P-7 Biooxidized Residue (B-1)			
Extracted, gAu/mt ore	1.76	1.60	1.80
Tail Assay, gAu/mt	0.93	0.93	0.93
Calculated, Head, gAu/mt	2.69	2.53	2.73
Recovery, %	65.4	63.2	65.9
Deviation, g/mt[1)]	N/A	0.16	0.04
Precision, %	100.0	94.1	98.5
WWS-13-MC, 80%-6.3mm Feed Size, P-4 Baseline			
Extracted, gAu/mt ore	0.56	0.53	0.57
Tail Assay, gAu/mt	2.16	2.16	2.16
Calculated, Head, gAu/mt	2.72	2.69	2.73
Recovery, %	20.6	19.7	20.9
Deviation, g/mt[1)]	N/A	0.03	0.01
Precision, %	100.0	98.9	99.6
WWS-13-MC, 80%-6.3mm Feed Size, P-10 Biooxidized Residue (B-2)			
Extracted, gAu/mt ore	1.80	1.70	1.91
Tail Assay, gAu/mt	0.82	0.82	0.82
Calculated, Head, gAu/mt	2.62	2.52	2.73
Recovery, %	68.7	67.5	70.0
Deviation, g/mt[1)]	N/A	0.10	0.11
Precision, %	100.0	96.2	95.8
WOS-MC, 80%-12.5mm Feed Size, P-2 Baseline			
Extracted, gAu/mt ore	0.57	0.59	0.73
Tail Assay, gAu/mt	3.27	3.27	3.27
Calculated, Head, gAu/mt	3.84	3.86	4.00
Recovery, %	14.8	15.3	18.3
Deviation, g/mt[1)]	N/A	0.02	0.16
Precision, %	100.0	99.5	95.8
WOS-MC, 80%-12.5mm Feed Size, P-8 Biooxidized Residue (B-9)			
Extracted, gAu/mt ore	2.94	2.95	2.85
Tail Assay, gAu/mt	1.15	1.15	1.15
Calculated, Head, gAu/mt	4.09	4.10	4.00
Recovery, %	71.9	72.0	71.3
Deviation, g/mt[1)]	N/A	0.01	0.09
Precision, %	100.0	99.8	97.8

1) Deviation from solution versus tail balance.
2) Calculated based on average of all head grades and tail screen results.

Table 45. - Metallurgical Balances, Column Leach Tests, Sleeper Drill Core Composites

	Metallurgical Balance		
	Sol. vs. Tail	Carbon vs. Tail	Head vs. Tail[3]
WOS-MC, 80%-6.3mm Feed Size, P-5 Baseline			
Extracted, gAu/mt ore	0.59	0.60	0.50
Tail Assay, gAu/mt	3.50	3.50	3.50
Calculated, Head, gAu/mt	4.09	4.10	4.00
Recovery, %	14.4	14.6	12.5
Deviation, g/mt[1]	N/A	0.01	0.09
Precision, %	100.0	99.8	97.8
WOS-MC, 80%-6.3mm Feed Size, P-11 Biooxidized Residue (B-10)			
Extracted, gAu/mt ore	3.07	2.99	3.13
Tail Assay, gAu/mt	0.87	0.87	0.87
Calculated, Head, gAu/mt	3.94	3.86	4.00
Recovery, %	77.9	77.5	78.3
Deviation, g/mt[1]	N/A	0.08	0.06
Precision, %	100.0	98.0	98.5
FSU-13-1, 80%-12.5mm Feed Size, P-3 Baseline			
Extracted, gAu/mt ore	0.05	0.06	0.16
Tail Assay, gAu/mt	0.30	0.30	0.30
Calculated, Head, gAu/mt	0.35	0.36	0.46
Recovery, %	14.3	16.7	34.8
Deviation, g/mt[1]	N/A	0.01	0.11
Precision, %	100.0	97.1	68.6
FSU-13-1, 80%-12.5mm Feed Size, P-9 Biooxidized Residue (B-5)			
Extracted, gAu/mt ore	0.29	0.33	0.34
Tail Assay, gAu/mt	0.12	0.12	0.12
Calculated, Head, gAu/mt	0.41	0.45	0.46
Recovery, %	70.7	73.3	73.9
Deviation, g/mt[1]	N/A	0.04	0.05
Precision, %	100.0	90.2	87.8
FSU-13-1, 80%-6.3mm Feed Size, P-6 Baseline			
Extracted, gAu/mt ore	0.05	0.06	0.09
Tail Assay, gAu/mt	0.37	0.37	0.37
Calculated, Head, gAu/mt	0.42	0.43	0.46
Recovery, %	11.9	14.0	19.6
Deviation, g/mt[1]	N/A	0.01	0.04
Precision, %	100.0	97.6	90.5
FSU-13-1, 80%-6.3mm Feed Size, P-12 Biooxidized Residue (B-6)			
Extracted, gAu/mt ore	0.34	0.31	0.38
Tail Assay, gAu/mt	0.08	0.08	0.08
Calculated, Head, gAu/mt	0.42	0.39	0.46
Recovery, %	81.0	79.5	82.6
Deviation, g/mt[1]	N/A	0.03	0.04
Precision, %	100.0	92.9	90.5

1) Deviation from solution versus tail balance.
2) Calculated based on average of all head grades and tail screen results.

Solution versus tail, loaded carbon versus tail and head versus tail metallurgical balances all agreed within normally expected precision limits. Solution versus tail balance is normally considered to be the most reliable, because of the number of check analyses performed on column test pregnant solutions. That balance was used for all recovery calculations presented in this report, except as otherwise noted.

Table 46. - Physical Ore Characteristic Data, Column Leach Tests, Sleeper Drill Core Composites

Composite	Test Type	Feed Size	Test No.	Ore Charge, kg	Moisture, wt. % As Received	For Agglom.	To Saturate*	Retained	Apparent Bulk Density, mt ore/m^3 Before	After
WWS-13 MC	Baseline	80%-12.5mm	P-1	16.97	0.9	9.1	15.4	6.7	1.27	1.27
WWS-13 MC	Biooxidized	80%-12.5mm	P-7	15.47	0.9	11.0	18.9	12.1	1.19	1.19
WWS-13 MC	Baseline	80%-6.3mm	P-4	16.92	0.7	12.0	18.6	12.7	1.27	1.28
WWS-13 MC	Biooxidized	80%-6.3mm	P-10	15.48	1.0	12.4	21.1	14.0	1.15	1.16
WOS-13 MC	Baseline	80%-12.5mm	P-2	16.28	0.7	10.1	15.9	10.9	1.27	1.27
WOS-13 MC	Biooxidized	80%-12.5mm	P-8	14.66	0.3	10.3	17.2	11.4	1.32	1.32
WOS-13 MC	Baseline	80%-6.3mm	P-5	15.99	0.3	12.2	18.6	12.7	1.30	1.30
WOS-13 MC	Biooxidized	80%-6.3mm	P-11	14.48	0.3	12.9	20.0	14.1	1.33	1.33
FSU-13-1	Baseline	80%-12.5mm	P-3	16.90	0.9	8.9	15.1	9.8	1.32	1.32
FSU-13-1	Biooxidized	80%-12.5mm	P-9	15.52	1.6	20.0	31.3	17.3	1.08	1.08
FSU-13-1	Baseline	80%-6.3mm	P-6	16.85	1.1	12.6	19.6	16.2	1.32	1.29
FSU-13-1	Biooxidized	80%-6.3mm	P-12	15.85	1.5	17.7	29.8	20.0	1.05	1.05

1) Calculated on a dry ore weight basis. Includes moisture for agglomeration.

Physical ore characteristic data show that very little slumping of the agglomerates occurred during cyanide leaching. Ore apparent bulk densities were essentially the same before and after leaching. Ore apparent bulk densities for composites WWS-13-MC and FSU-13-1 were significantly lower for the biooxidized residues than for the ore without pretreatment. Moisture requirements were higher for the biooxidized residues, than for the ore without pretreatment. No solution percolation, fines migration or solution channeling problems were encountered during cyanide leaching. No load/permeability type testing was conducted as part of this testing program. Further optimization of agglomerating conditions and load/permeability testing is recommended if this processing method is further evaluated.

As noted earlier in this report, some of the ore charges undergoing simulated heap biooxidation pretreatment displayed solution percolation problems (ponding observed on top of the column charges), particularly in the case of the 6.3mm feeds. Those results indicate that further optimization of heap biooxidation feed size, and further evaluation of permeability of the biooxidized ore will be required, if this processing method is further evaluated. That evaluation also should include load/permeability testing.

CONCLUSIONS

- ○ The six Sleeper drill core composites tested were refractory to direct cyanidation treatment, at feed sizes ranging from 80%-12.5mm to 80%-45µm.

- ○ The most likely cause for the low gold recoveries obtained from the refractory Sleeper composites was a locking of gold in sulfide mineral grains.

- ○ All six composites responded very well to biooxidation pretreatment for oxidation of contained sulfide minerals, resulting in an improvement in gold recovery by cyanidation treatment.

- ○ Gold recoveries of 90% or greater were obtained by simulated whole ore stirred tank biooxidation, followed by agitated cyanidation, at an 80%-45µm feed size (3 composites tested).

- ○ Gold recoveries of 86% to 93% were obtained by whole ore POX pretreatment followed by agitated cyanidation, at an 80%-80µm feed size.

- ○ Gold recoveries of 65% to 81% were obtained by simulated heap biooxidation pretreatment, followed by simulated heap leach cyanidation treatment, at 80%-12.5mm and 80%-6.3mm feed sizes.

- ○ Solution percolation/solution ponding problems were encountered during simulated heap biooxidation pretreatment, particularly at the 6.3mm feed size. Further optimization of heap biooxidation feed size and biooxidation cycle time will be required, if this process is to be considered further.

- ○ Reagent requirements were high, under conditions not yet optimized.

RECOMMENDATIONS

We recommend the following testing be considered, if heap biooxidation pretreatment is to be evaluated further:

- Column biooxidation testing should be conducted to optimize biooxidation feed size and cycle time. Special consideration should be given to heap permeability issues. This testing should include load/permeability type testing on biooxidized residues.

- Testing should be conducted to optimize rinsing of the biooxidized residues before cyanidation treatment. This testing should include evaluation of biooxidation solution treatment/neutralization and recycle in the biooxidation circuit and in a rinsing circuit.

- Column cyanidation testing should be conducted to optimize conditions for heap leach cyanidation of the biooxidized residues. This should include optimization of agglomerating conditions and load/permeability type testing on the leached agglomerates.

- If sufficient higher grade material may be processed, evaluation of milling/cyanidation treatment of a simulated heap biooxized residue should be considered.

- Evaluation of flotation treatment should be considered if not already sufficiently tested.

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APPENDIX

Section 1 - Composite Make-Up Information

Section 2 - Gold Deportment Mineralogical Study - SGS Canada Inc. Report

Section 3 - Biooxidation Amenability Test Data

Section 4 - CIL/Cyanidation Data, Biooxidized Amenability Test Residues

Section 5 - POX Testing Results - Hazen Research, Inc. Report

Section 6 - Column Biooxidation Test Data

Section 7 - Bottle Roll Test Data

Section 8 - Column Leach (Cyanide) Test Data

APPENDIX

Section 1 - Composite Make-Up Information

Met Sample ID	HOLE ID	FROM (FT)	TO (FT)	AREA	SAMPLE ID_ALS	Sample Prep Lab	Sample Feed Size (inch)	Sample weigth	Au ppm	Au Wavg	Ag Wavg	Ag ppm
FSU-13-1												
FSU-13-1	PGC-12-028	435	440	FACILITIES	800867	McClelland	1.50	14.63	0.236	3.453	79.00	5.40
FSU-13-1	PGC-12-028	440	445	FACILITIES	800868	McClelland	1.50	15.56	0.262	4.077	76.24	4.90
FSU-13-1	PGC-12-028	445	447	FACILITIES	800869	McClelland	1.50	8.42	0.278	2.341	21.89	2.60
FSU-13-1	PGC-12-028	447	450	FACILITIES	800870	McClelland	1.50	9.05	0.093	0.842	15.39	1.70
FSU-13-1	PGC-12-028	450	455	FACILITIES	800871	McClelland	1.50	15.54	0.827	12.852	21.76	1.40
FSU-13-1	PGC-12-028	455	460	FACILITIES	800872	McClelland	1.50	13.80	0.708	9.770	23.46	1.70
FSU-13-1	PGC-12-028	460	465	FACILITIES	800873	McClelland	1.50	14.71	0.908	13.357	11.77	0.80
FSU-13-1	PGC-12-028	465	470	FACILITIES	800874	McClelland	1.50	16.51	0.386	6.373	21.46	1.30
FSU-13-1	PGC-12-028	470	475	FACILITIES	800875	McClelland	1.50	11.82	0.171	2.021	9.46	0.80
FSU-13-1	PGC-12-028	475	480	FACILITIES	800877	McClelland	1.50	13.95	0.410	5.720	19.53	1.40
FSU-13-1	PGC-12-028	480	485	FACILITIES	800878	McClelland	1.50	15.60	0.113	1.763	7.80	0.50
FSU-13-1	PGC-12-028	520	525	FACILITIES	800886	McClelland	1.50	17.93	0.275	4.931	21.52	1.20
FSU-13-1	PGC-12-028	525	530	FACILITIES	800887	McClelland	1.50	17.38	0.115	1.999	8.69	0.50
FSU-13-1	PGC-12-028	540	545	FACILITIES	800891	McClelland	1.50	18.79	0.113	2.123	16.91	0.90
FSU-13-1	PGC-12-028	545	550	FACILITIES	800892	McClelland	1.50	17.89	0.227	4.061	66.19	3.70
FSU-13-1	PGC-12-028	550	556	FACILITIES	800893	McClelland	1.50	19.80	0.624	12.355	128.70	6.50
FSU-13-1	PGC-12-028	556	562	FACILITIES	800895	McClelland	1.50	22.63	1.070	24.214	244.40	10.80
FSU-13-1	PGC-12-028	562	567	FACILITIES	800896	McClelland	1.50	17.48	0.475	8.303	174.80	10.00
FSU-13-1	PGC-12-028	567	571	FACILITIES	800897	McClelland	1.50	9.85	0.389	3.832	41.37	4.20
FSU-13-1	PGC-12-028	571	575	FACILITIES	800898	McClelland	1.50	9.07	0.189	1.714	19.05	2.10
FSU-13-1	PGC-12-028	575	580	FACILITIES	800899	McClelland	1.50	16.57	0.305	5.054	43.08	2.60
FSU-13-1	PGC-12-028	580	585	FACILITIES	800900	McClelland	1.50	15.08	0.086	1.297	12.06	0.80
FSU-13-1	PGC-12-028	585	590	FACILITIES	800901	McClelland	1.50	14.70	0.269	3.954	29.40	2.00
FSU-13-1	PGC-12-028	590	595	FACILITIES	800902	McClelland	1.50	16.77	0.126	2.113	8.39	0.50
FSU-13-1	PGC-12-028	601	607	FACILITIES	800904	McClelland	1.50	17.05	0.197	3.359	13.64	0.80
FSU-13-1	PGC-12-028	607	610	FACILITIES	800905	McClelland	1.50	8.75	0.138	1.208	10.50	1.20
FSU-13-1	PGC-12-028	610	615	FACILITIES	800906	McClelland	1.50	16.45	0.325	5.346	34.55	2.10
FSU-13-1	PGC-12-028	615	620.5	FACILITIES	800907	McClelland	1.50	17.87	0.586	10.472	41.10	2.30
FSU-13-1	PGC-12-028	620.5	624	FACILITIES	800908	McClelland	1.50	11.24	3.620	40.689	46.08	4.10
FSU-13-1	PGC-12-028	624	630	FACILITIES	800909	McClelland	1.50	16.29	0.415	6.760	21.18	1.30
FSU-13-1	PGC-12-028	630	635	FACILITIES	800910	McClelland	1.50	15.14	0.298	4.512	16.65	1.10
FSU-13-1	PGC-12-028	635	640	FACILITIES	800911	McClelland	1.50	15.61	0.260	4.059	24.98	1.60
FSU-13-1	PGC-12-028	640	645	FACILITIES	800912	McClelland	1.50	11.96	0.242	2.894	14.35	1.20
FSU-13-1	PGC-12-028	725	730	FACILITIES	800930	McClelland	1.50	17.48	0.125	2.185	12.24	0.70
FSU-13-1	PGC-12-028	730	735	FACILITIES	800931	McClelland	1.50	12.79	0.339	4.336	17.91	1.40
FSU-13-1	PGC-12-028	735	740	FACILITIES	800932	McClelland	1.50	14.79	0.119	1.760	7.40	0.50
FSU-13-1	PGC-12-028	740	745	FACILITIES	800933	McClelland	1.50	12.84	0.308	3.955	19.26	1.50
37	**Total**							**552**	**0.422**	**0.417**	**2.54**	**2.4**

Met Sample ID	HOLE ID	FROM (FT)	TO (FT)	AREA	SAMPLE ID_ALS	Sample Prep Lab	Sample Feed Size (inch)	Sample weigth	Au ppm	Au Wavg	Ag Wavg	Ag ppm
WWS-13-1												
WWS-13-1	PGC-13-033	815.0	820.0	WEST WOOD	802125	AAL	0.75	12.50	6.380	79.750	187.50	15.00
WWS-13-1	PGC-13-033	820.0	825.0	WEST WOOD	802126	AAL	0.75	11.90	4.320	51.408	88.06	7.40
WWS-13-1	PGC-13-033	825.0	830.0	WEST WOOD	802128	AAL	0.75	11.74	2.080	24.419	385.07	32.80
WWS-13-1	PGC-13-033	830.0	835.0	WEST WOOD	802129	AAL	0.75	12.05	2.670	32.174	439.83	36.50
WWS-13-1	PGC-13-033	835.0	840.0	WEST WOOD	802130	AAL	0.75	11.18	0.505	5.646	26.83	2.40
WWS-13-1	PGC-13-033	840.0	845.0	WEST WOOD	802131	AAL	0.75	11.60	1.005	11.658	18.56	1.60
WWS-13-1	PGC-13-033	845.0	850.0	WEST WOOD	802132	AAL	0.75	10.88	1.865	20.291	59.84	5.50
WWS-13-1	PGC-13-033	850.0	855.0	WEST WOOD	802133	AAL	0.75	13.67	2.380	32.535	118.93	8.70
WWS-13-1	PGC-13-033	900.0	905.0	WEST WOOD	802145	AAL	0.75	13.47	3.620	48.761	83.51	6.20
WWS-13-1	PGC-13-033	905.0	910.0	WEST WOOD	802146	AAL	0.75	14.69	15.300	224.757	364.31	24.80
WWS-13-1	PGC-13-033	910.0	915.0	WEST WOOD	802147	AAL	0.75	14.17	11.950	169.332	262.15	18.50
WWS-13-1	PGC-13-033	915.0	920.0	WEST WOOD	802148	AAL	0.75	13.51	1.915	25.872	67.55	5.00
WWS-13-1	PGC-13-033	1023.0	1025.0	WEST WOOD	802172	AAL	0.75	6.01	1.860	11.179	40.87	6.80
WWS-13-1	PGC-13-033	1025.0	1030.0	WEST WOOD	802173	AAL	0.75	14.13	1.440	20.347	103.15	7.30
WWS-13-1	PGC-13-033	1030.0	1035.0	WEST WOOD	802174	AAL	0.75	12.09	1.385	16.738	83.39	6.90
WWS-13-1	PGC-13-033	1035.0	1040.0	WEST WOOD	802175	AAL	0.75	13.14	2.920	38.369	85.41	6.50
WWS-13-1	PGC-13-033	1040.0	1045.0	WEST WOOD	802176	AAL	0.75	10.53	1.785	18.796	74.76	7.10
WWS-13-1	PGC-13-033	1045.0	1050.0	WEST WOOD	802177	AAL	0.75	13.76	1.045	14.379	71.55	5.20
WWS-13-1	PGC-13-033	1050.0	1055.0	WEST WOOD	802178	AAL	0.75	13.58	1.230	16.703	59.75	4.40
WWS-13-1	PGC-13-033	1055.0	1060.0	WEST WOOD	802179	AAL	0.75	13.44	1.690	22.714	64.51	4.80
20	**Total**							**248**	**3.367**	**3.571**	**10.83**	**10.7**
WWS-13-2												
WWS-13-2	PGC-13-033	625.0	630.0	WEST WOOD	802074	AAL	0.75	14.83	1.195	17.722	16.31	1.10
WWS-13-2	PGC-13-033	630.0	635.0	WEST WOOD	802075	AAL	0.75	12.66	1.095	13.863	21.52	1.70
WWS-13-2	PGC-13-033	635.0	640.0	WEST WOOD	802076	AAL	0.75	13.32	1.140	15.185	42.62	3.20
WWS-13-2	PGC-13-033	640.0	645.0	WEST WOOD	802077	AAL	0.75	12.96	0.889	11.521	33.70	2.60
WWS-13-2	PGC-13-033	645.0	650.0	WEST WOOD	802078	AAL	0.75	12.77	0.487	6.219	15.32	1.20
WWS-13-2	PGC-13-033	650.0	654.0	WEST WOOD	802079	AAL	0.75	13.24	2.930	38.793	111.22	8.40
WWS-13-2	PGC-13-033	654.0	658.0	WEST WOOD	802080	AAL	0.75	13.83	0.704	9.736	24.89	1.80
WWS-13-2	PGC-13-033	658.0	663.5	WEST WOOD	802082	AAL	0.75	16.15	0.731	11.806	58.14	3.60
WWS-13-2	PGC-13-033	663.5	667.0	WEST WOOD	802083	AAL	0.75	9.74	0.905	8.815	72.08	7.40
WWS-13-2	PGC-13-033	667.0	670.0	WEST WOOD	802084	AAL	0.75	9.28	2.520	23.386	43.62	4.70
WWS-13-2	PGC-13-033	670.0	675.0	WEST WOOD	802085	AAL	0.75	12.53	3.830	47.990	65.16	5.20
WWS-13-2	PGC-13-033	675.0	678.5	WEST WOOD	802086	AAL	0.75	11.72	1.930	22.620	30.47	2.60
WWS-13-2	PGC-13-033	678.5	681.5	WEST WOOD	802087	AAL	0.75	7.96	1.665	13.253	18.31	2.30
13	**Total**							**161**	**1.540**	**1.496**	**3.44**	**3.5**
WOS-13-1												
WOS-13-1	PGC-12-027	640	645	WOOD	801063	McClelland	1.50	15.85	1.140	18.069	60.23	3.80
WOS-13-1	PGC-12-027	645	650	WOOD	801064	McClelland	1.50	14.17	0.935	13.249	59.51	4.20
WOS-13-1	PGC-12-027	650	652.5	WOOD	801065	McClelland	1.50	5.79	1.105	6.398	350.30	60.50
WOS-13-1	PGC-12-027	652.5	657	WOOD	801067	McClelland	1.50	14.30	0.870	12.441	328.90	23.00
WOS-13-1	PGC-12-027	657	665	WOOD	801068	McClelland	1.50	4.68	1.380	6.458	394.06	84.20
WOS-13-1	PGC-12-027	665	670	WOOD	801069	McClelland	1.50	9.35	1.520	14.212	54.23	5.80
WOS-13-1	PGC-12-027	670	675	WOOD	801070	McClelland	1.50	14.70	4.730	69.531	142.59	9.70
WOS-13-1	PGC-12-027	675	680	WOOD	801071	McClelland	1.50	12.72	1.565	19.907	50.88	4.00
WOS-13-1	PGC-12-027	680	686	WOOD	801072	McClelland	1.50	17.98	1.795	32.274	418.93	23.30
WOS-13-1	PGC-12-027	686	690	WOOD	801073	McClelland	1.50	10.78	0.592	6.382	22.64	2.10
10	**Total**							**120**	**1.563**	**1.653**	**15.64**	**22.1**

Table A1-1. - Composite Make-Up Information, Sleeper WWS-13-MC (Master Composite)

Sample	Weight, kg Available	Weight, kg To Comp.	Weight, kg Received	Weight, % To Comp.
WWS-13-1	138	90	90.02	64.3
WWS-13-2	50	50	50.54	35.7
Composite		**140**	**140.56**	**100.0**

Table A1-2. - Composite Make-Up Information, Sleeper WOS-MC (Master Composite)

Sample	Weight, kg Available	Weight, kg To Comp.	Weight, kg Received	Weight, % To Comp.
PGC-12-027 801087	13.90	13.90	13.87	10.6
PGC-12-027 801088	15.56	15.56	15.53	11.9
PGC-12-027 801089	16.72	16.72	16.68	12.8
PGC-12-027 801090	7.17	7.17	7.14	5.5
PGC-12-027 801091	8.69	8.69	8.66	6.6
PGC-12-027 801092	6.15	6.15	6.15	4.7
PGC-12-027 801093	11.61	11.61	11.58	8.9
PGC-12-027 801094	11.17	11.17	11.16	8.5
WOS-13-1	40	40	40.3	30.5
Composite		**130.97**	**131.07**	**100.0**

APPENDIX

Section 2 - Gold Deportment Mineralogical Study - SGS Canada Inc. Report

An Investigation into

GOLD DEPORTMENT MINERALOGICAL STUDY ON THREE SAMPLES

prepared for

PARAMOUNT GOLD AND SILVER CORP

Project 14322-001 – Final Report
February 10, 2014

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Executive Summary

Three ore samples, referred to as 3775-WWS-13-1, 3775-WWS-13-2 and 3775-WOS-13-1, were submitted by the Paramount Gold and Silver Corp. to the AMF at the SGS Lakefield site to conduct a gold deportment study. The test work included chemical assays, bulk and gold mineralogical analysis, and cyanide leaching tests.

The samples referred herein as WWS-13-1, WWS-13-2, and WOS-13-1 for this study.

A total of three kg of each sample was received. Two kilograms of each were riffled out and stage crushed to passing 1.70 mm (10 mesh). The majority of each sample (~1.5 kg) was stage-crushed to a P_{80} of 150 µm for mineralogy study, and the remainder was pulverized for head assays and X-Ray Diffraction (XRD).

Head Assays:

Head analyses were completed on the samples and a summary of the head grades is shown in Table A.

Table A: Head Analysis Summary

Sample ID		WWS-13-1	WWS-13-2	WOS-13-1
SiO_2	%	49.3	55.9	53.3
Al_2O_3	%	13.0	11.2	12.6
Fe_2O_3	%	5.60	3.68	5.08
MgO	%	0.328	0.232	0.269
CaO	%	1.50	0.36	0.19
K_2O	%	4.58	5.09	4.66
TiO_2	%	0.89	0.354	0.416
MnO	%	0.009	0.005	0.006
Cr_2O_3	%	0.012	0.013	0.008
V_2O_5	%	0.016	< 0.008	< 0.008
Na_2O	%	0.48	0.85	0.49
P_2O_5	%	0.98	0.17	0.043
Fe	%	3.84	2.58	3.71
As	%	0.200	0.046	0.084
$S^=$	%	3.88	2.64	3.88
C(t)	%	< 0.01	< 0.01	< 0.01
TCM	%	< 0.05	< 0.05	< 0.05
Au Ave.	g/t	3.68	1.4	1.75
Ag Ave.	g/t	11.0	< 11	14.1

All three samples contain major amounts of SiO_2 (49.3% to 55.9%), moderate amounts of Al_2O_3 (11.2% to 13%), and minor amounts (2 to 10%) of K_2O and Fe_2O_3, along with trace amounts (<2%) of other elements.

The gold head grades for WWS-13-1, WWS-13-2 and WOS-13-1 samples are 3.68 g/t, 1.4 g/t, and 1.75 g/t, respectively. The sulphur occurring as sulphide is 3.88 wt% in both samples WWS-13-1 and WOS-13-1, and 2.64 wt% in the WWS-13-2 sample, showing a positive correlation with iron grade. All three samples also contain trace amount of arsenic (0.05% to 0.2%), along with high sulphide concentrations, which may indicate refractory gold.

Bulk Mineralogy:

A QEMSCAN Rapid Mineral Scan (QEM-RMS), designed to provide simple bulk mineralogy using QEMSCAN and XRD, was conducted on all three as-received samples. In order to determine the clay speciation, the fine fraction (<2 μm) of each sample was separated by centrifuge and prepared for XRD clay mineralogy analysis. The bulk mineralogy modals are presented in Table B; the results from clay speciation analyses are presented in Table C.

Table B: Bulk Mineralogy by QEMRMS

Sample ID		WWS-13-1	WWS-13-2	WOS-13-1
Mineral Mass (wt%)	Pyrite	7.07	4.19	7.15
	Arsenopyrite	0.41	0.03	0.11
	Stibnite	0.04	0.09	0.00
	Quartz	26.6	39.2	38.3
	K-Feldspar	17.2	20.9	13.1
	Plagioclase	0.22	0.15	0.06
	Muscovite	3.46	0.34	9.20
	Kaolinite	8.55	4.78	4.83
	Other Clays	32.2	29.6	26.4
	Ti-Oxides	1.01	0.36	0.60
	Apatite	2.59	0.08	0.00
	Other	0.60	0.35	0.23

Table C: Clay Speciation by XRD

Clay Fraction	Major (>30 wt%)	Moderate (10 - 30 wt%)	Minor (2 - 10 wt%)	Trace (<2% wt%)
WWS-13-1	kaolinite	montmorillonite, I/M	(quartz), (potassium-feldspar)	*illite
WWS-13-2	montmorillonite, I/M	Kaolinite	(quartz), (potassium-feldspar)	*illite
WOS-13-1	kaolinite	palygorskite	I/M, (quartz), (potassium-feldspar)	-

I/M – illite/montmorillonite mixture;

** Tentative identification due to low concentrations, diffraction line overlap or poor crystallinity*

The three samples have a similar mineral assemblage that is comprised of major amounts of quartz (~27% to 39%) and clays (montmorillonite, illite/montmorillonite mixture, illite and palygorskite) (~26% to 32%), moderate amounts of feldspar (13% to 21%), and minor amounts (2-10%) of pyrite (4.2% to 7.2%) and kaolinite (4.8% to 8.6%), %), and minor to trace amounts (<2%) of other minerals (Table C).

<u>Mineralogical Gold Deportment Study</u>

A mineralogical gold deportment study was conducted on each sample; the procedure included pre-concentration by heavy liquid separation (HLS) and superpanning (SP). Optical microscopy and SEM-EDS analysis methods were used for gold mineral scanning, identification, grain size measurement and association characteristics. Chemical assays were also used to determine the distribution of gold by association category in the pre-concentration fractions and weighted to the overall sample. A summary of the results is presented in Table D, and are discussed below:

Table D: Mineralogical Characteristics of the Gold Minerals

Sample ID	Au Grade (g/t)	Au Distribution by Association		Size Range (µm)	Average Size (µm)	Au-Mineral Abundance	Minerals Associated with Exposed and Locked Au-Minerals
WWS-13-1	**3.68**	Liberated	31%	9.7 - 38.1	20.8	Gold (92%), Electrum (8%)	quartz/pyrite 98%, pyrite 1%, other minerals 1%
		Exposed		12.6 - 12.6	12.6		
		Locked	69%	0.6 - 24.7	4.2		
			100%	***0.6 - 38.1***	***8.6***		
WWS-13-2	**1.40**	Liberated	26%	1.1 - 27.1	9.0	Gold (7%), Electrum (93%)	pyrite/silicates 77%, pyrite 23%
		Exposed		1.9 - 1.9	1.9		
		Locked	74%	2.7 - 4.4	3.7		
			100%	***1.1 - 27.1***	***6.4***		
WOS-13-2	**1.75**	Liberated	29%	3.5 - 16.3	9.1	Gold (33%), Electrum (67%)	quartz 99.99%, pyrite 0.01%
		Exposed		2.1 - 6.9	3.9		
		Locked	71%	0.6 - 7.5	2.8		
			100%	0.6 - 16.3	**5.5**		

1) <u>Gold Mineral Type and Relative Abundance:</u>

The main gold minerals identified in all three samples are native gold (AuAg alloy, with Ag ≤25 wt%) and electrum (AuAg alloy, with 25%≤ Ag ≤50 wt%). On average, gold minerals in these three samples contain 71 – 78% Au and 20 – 27% Ag. The high silver content in the gold minerals is noteworthy.

2) <u>Gold Grade Distribution by Gold Mineral Association</u>

In the WWS-13-1 (3.68 g/t Au), exposed gold, including liberated and exposed (attached) grains accounts for 31% and locked gold minerals for 69% of the gold in the sample.

In the WWS-13-2 (1.4 g/t Au), exposed gold grains account for 26% and locked gold minerals for 74%, of the gold in the sample.

In the WOS-13-1 (1.75 g/t Au), by exposed gold grains account for 29% and locked gold minerals for 71%, of the gold in the sample.

Note that these calculations are based on the visible microscopic gold (>0.5 µm) study on the pre-concentration fractions (by HLS and SP) and leaching test results of the float fractions. Submicroscopic gold (or invisible gold, <0.5 µm) and other possible forms of gold are beyond the scope of the current study.

3) Gold Mineral Size

The grain size of the gold minerals varies among the samples. The average gold grain size for WWS-13-1, WWS-13-2, and WOS-13-1 is 8.6 µm, 6.4 µm, and 5.5 µm, respectively. Typically, liberated gold grains are coarser than exposed and locked gold.

4) Host Minerals

The host minerals of exposed and locked gold were also identified and measured. Association results indicate that the major host minerals in sample WWS-13-1 are quartz/pyrite binary particles, in WWS-13-2 are pyrite/silicate intergrowths, followed by pyrite, and quartz in WOS-13-1.

Estimated Gold Recovery

Mineralogical determination to estimate gold recovery is based on the gold distribution through gravity method, gold mineral liberation and association study, and metallurgical leaching tests on the HLS float. The estimated gold recovery based on all testwork is presented in Table E and represented in Figure A, and is discussed below:

Table E: Gold Grade Distribution and Estimated Gold Recovery

Sample ID	Wt (%)	Assays Au g/t	Distribution Au %	Leach-able Au %	Direct Leach[3] %	Gravity Recovery[4] %	Total Au Recovery[5] %
WWS-13-1	**100**	**3.68**	**100**		**31.0**	**43.3**	**52.3**
WWS-13-1 HLS Sink	7.19	21.9	43.3	22.0[1]			
WWS-13-1 HLS Float	92.8	2.25	56.7	8.96[2]			
WWS-13-2	**100**	**1.4**	**100**		**25.9**	**18.6**	**39.5**
WWS-13-2 HLS Sink	5.00	5.2	18.6	5.0[1]			
WWS-13-2 HLS Float	95.0	1.2	81.4	20.9[2]			
WOS-13-1	**100**	**1.75**	**100**		**29.4**	**26.2**	**51.7**
WOS-13-1 HLS Sink	7.1	6.4	26.2	3.9[1]			
WOS-13-1 HLS Float	92.9	1.39	73.8	25.5[2]			

(1) Leach-able gold (including liberated and exposed gold grains) in HLS Sink.
(2) Extracted Au in HLS Float by leach test.
(3) Estimated liberated and exposed gold in HLS Sink plus leached gold in HLS Float.
(4) Gold grade distribution in HLS Sink.
(5) Gravity recovery plus leached gold in HLS Float.

1) Gravity Recoverable Gold

For sample WWS-13-1, through HLS testing at a density split point of 2.9 g/cm^3, a total of 43% of the gold concentrates in the HLS Sink fraction (accounting for 7.2% of the total mass), indicating a moderate amount of potential gravity recoverable gold.

For sample WWS-13-2, through HLS testing at a density split point of 2.9 g/cm^3 , a total of 18.6% of the gold concentrates in the HLS Sink fraction (accounting for 5.0% of the total mass), indicating a low amount of potential gravity recoverable gold.

For sample WOS-13-1, through HLS testing at a density split point of 2.9 g/cm^3, a total of 26.2% of the gold concentrates in the HLS Sink fraction (accounting for 6.4% of the total mass), indicating a low amount of potential gravity recoverable gold.

2) Diagnostic Leach Tests on the HLS Float Products

Only a few gold grains were found in the polished sections scanned from the HLS Float products. In order to complete the gold deportment study and determine recovery of the overall samples, diagnostic leach tests were conducted on a 300 g split aliquot of HLS Float fraction of each sample to determine the cyanide leachable gold content. Low to moderate gold extraction (16 to 34%) was achieved in the HLS Float products of each sample. Based on the gold distribution in the Float products, the overall gold extraction calculated by overall sample was between 9% and 26%.

3) Estimated Direct Leachable Gold Extraction

The estimated direct leachable gold is calculated by adding the percentage of exposed gold (liberated and exposed gold) in the HLS Sink fraction with the percentage of gold extraction by cyanidation of the HLS Float fraction. The estimated direct leachable gold is ~31% for sample WWS-13-1, ~26% for WWS-13-2, and ~29% for sample WOS-13-1.

4) Overall Gold Recovery

Overall estimated gold recovery by sample is calculated by adding the total gravity recoverable gold in the HLS Sink with the leach extraction of gold for the HLS Float, which is estimated at 52.3%, 39.5%, and 51.7% for samples WWS-13-1, WWS-13-2, and WOS-13-1, respectively.

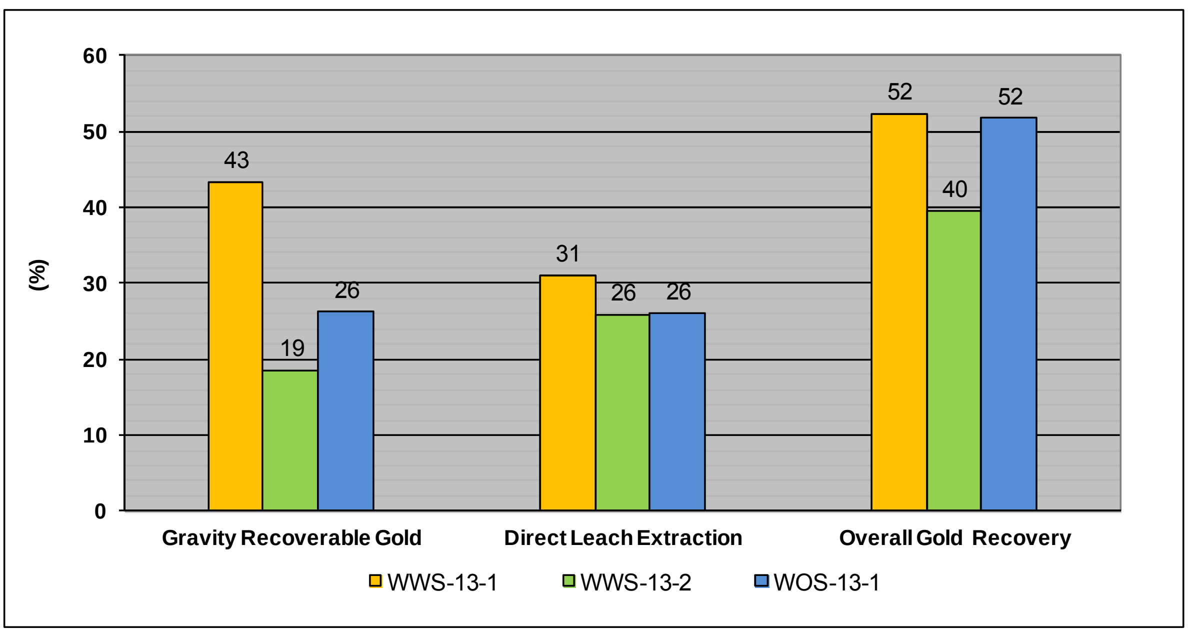

Figure A: Estimated Gold Recovery

Introduction

Three samples, identified as 3775-WWS-13-1, 3775-WWS-13-2, and 3775-WOS-13-1 from Paramount Gold and Silver Corp were received by the SGS Mineralogy Department and prepared for bulk mineralogy and gold deportment studies. This test program was authorized by Ms. Nancy Wolverson and Mr. Glen van Treek, on behalf of Paramount Gold and Silver Corp.

The as-received samples each weighed ~3 kg. The objectives of this investigation were to: 1) determine the bulk modal mineralogy, including clay mineral identification in the fine fraction; 2) identify the gold occurrence in each sample and classify by association criteria; and 3) identify and evaluate any mineralogical factors that could affect gold recovery.

A comprehensive mineralogical and analytical approach, including fire assay, heavy liquid separation (HLS), superpanning (SP), optical microscopy, X-ray diffraction (XRD), Quantitative Evaluation of Materials by Scanning Electron Microscopy (QEMSCAN) and Scanning Electron Microscopy with Energy-Dispersive Spectrometry (SEM-EDS) were used to carry out this gold deportment study. Representative digital photomicrographs were taken to illustrate the occurrence of gold within the samples. The results are presented and discussed in this report.

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Margot Aldis, Kim Gibbs SEM Study
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Reviewed by: Kim Gibbs, Alicia Windsor and Stephanie Downing

Testwork Summary

1. Sample Receipt, Preparation and Characterization

Three samples, identified as 3775-WWS-13-1, 3775-WWS-13-2, and 3775-WOS-13-1 from Paramount Gold and Silver Corp were received by the SGS Mineralogy Department in October 2013 at the SGS Lakefield site. The sample identifications are abbreviated to WWS-13-1, WWS-13-2, and WOS-13-1, respectively in this report.

Approximately 3 kg of each sample was received for both bulk mineralogy and mineralogical gold deportment study. The as-received samples were first crushed to minus -1.70 mm, then stage-ground to 150 µm (P_{80}). Test charges were riffled out for head assays, QEMSCAN RMS, XRD clay mineralogy study, and gold deportment study as required.

2. Head Assays

Head chemical analyses, including Au, Ag, Fe, As and $S^{=}$ assays, total carbon C(t) and carbonaceous material (TCM), and whole rock analysis (WRA) were completed on the as-received samples and the results are summarized in Table 1. The chemical certificates of analysis are presented in Appendix B.

Results indicate that all three samples contain major amounts of SiO_2 (49.3% to 55.9%), moderate amounts of Al_2O_3 (11.2% to 13%) and minor amounts (2 to 10%) of K_2O and Fe_2O_3, along with trace amounts (<2%) of other elements.

The head gold grades for samples WWS-13-1, WWS-13-2, and WOS-13-1 are 3.68 g/t, 1.4 g/t, and 1.74 g/t, respectively. Silver grades are 11 g/t and 14 g/t in samples WWS-13-1 and WOS-13-1, but <10 g/t in sample WWS-13-2. Total carbon and total carbonaceous material (TCM) are negligible in all three samples. The sulphur occurring as sulphide is 3.88 wt% in both samples WWS-13-1 and WOS-13-1, and 2.64 wt% in sample WWS-13-2, which shows a positive correlation with the iron grade. All three samples also contain trace amount of arsenic (0.05% to 0.2%), along with high sulphide concentration, which may indicate refractory gold.

Table 1: Head Analysis

Sample ID		WWS-13-1	WWS-13-2	WOS-13-1
SiO_2	%	49.3	55.9	53.3
Al_2O_3	%	13.0	11.2	12.6
Fe_2O_3	%	5.60	3.68	5.08
MgO	%	0.328	0.232	0.269
CaO	%	1.50	0.36	0.19
K_2O	%	4.58	5.09	4.66
TiO_2	%	0.89	0.354	0.416
MnO	%	0.009	0.005	0.006
Cr_2O_3	%	0.012	0.013	0.008
V_2O_5	%	0.016	< 0.008	< 0.008
Na_2O	%	0.48	0.85	0.49
P_2O_5	%	0.98	0.17	0.043
Fe	%	3.84	2.58	3.71
As	%	0.200	0.046	0.084
$S^=$	%	3.88	2.64	3.88
C(t)	%	< 0.01	< 0.01	< 0.01
TCM	%	< 0.05	< 0.05	< 0.05
Au Ave.	g/t	3.68	1.4	1.75
Ag Ave.	g/t	11.0	< 11	14.1

3. Modal Mineralogy, Liberation and Association of Key Sulphide Minerals

Modal mineralogy and liberation/association characteristics of key sulphide minerals for the as-received samples were determined by QEMSCAN analysis. The QEM-RMS or Rapid Mineral Scan is a method designed to provide simple bulk modal mineralogy using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy) and XRD (X-ray Diffraction) analyses. To determine the clay speciation, the fine fraction (<2 μm) of each sample was separated by centrifuge and prepared for XRD clay mineralogy analysis. The semi-quantitative mineral abundance, as well as liberation and grain size analyses of one or two key minerals of interest which occur in significant quantities (>1% mineral mass), are reported and summarized in the sections below, as well as in Appendix C.

3.1. Modal Mineralogy

The modal mineralogy for the three samples is presented in Table 2 and Figure 1. The clay speciation analyses are presented in Table 3.

All three samples contain a similar mineral assemblage, including major amounts of quartz (~27% to 39%) and clays (montmorillonite, illite/montmorillonite mixture, illite and palygorskite (~26% to 32%)), moderate amounts of feldspar (13% to 21%), and minor amounts (2 -10%) of pyrite (4.2% to 7.2%) and kaolinite (4.8% to 8.6%). Minor to trace amounts (<2%) of other minerals, such as mica, apatite, Ti-oxide, arsenopyrite, and stibnite, are also present.

Table 2: Summary of Bulk Mineralogy by QEM-RMS

Sample ID		WWS-13-1	WWS-13-2	WOS-13-1
Mineral Mass (wt%)	Pyrite	7.07	4.19	7.15
	Arsenopyrite	0.41	0.03	0.11
	Stibnite	0.04	0.09	0.00
	Quartz	26.6	39.2	38.3
	K-Feldspar	17.2	20.9	13.1
	Plagioclase	0.22	0.15	0.06
	Muscovite	3.46	0.34	9.20
	Kaolinite	8.55	4.78	4.83
	Other Clays	32.2	29.6	26.4
	Ti-Oxides	1.01	0.36	0.60
	Apatite	2.59	0.08	0.00
	Other	0.60	0.35	0.23

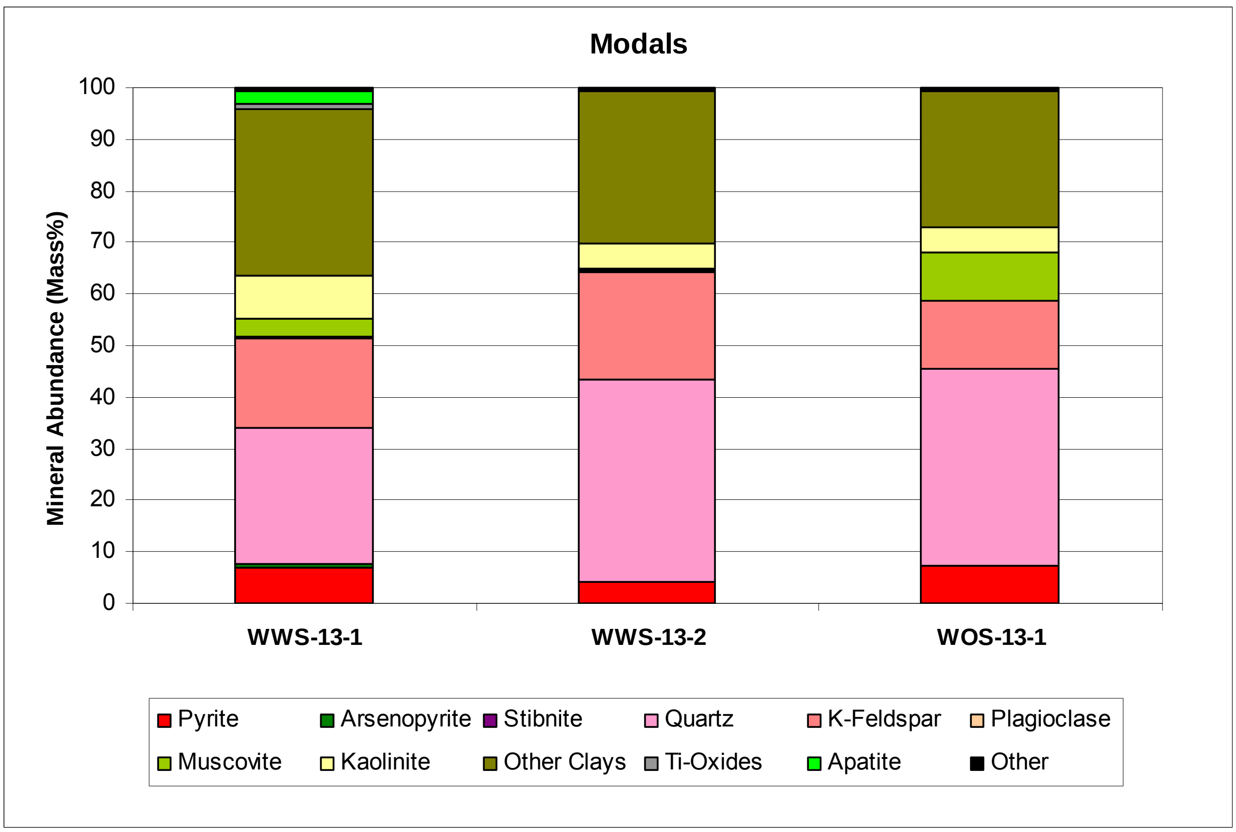


Figure 1: Modal Mineralogy

The total clay content (including all varieties) is over 30% for all three samples. The clay mineral speciation analyses by XRD indicates that the clay mineral components are similar for both WWS-13-1 and WWS-13-2 samples, but with varying abundances. The major clay mineral for WWS-13-1 sample is kaolinite, with moderate montmorillonite and illite/montmorillonite mixture. In the WWS-13-2 sample, the major clay mineral is montmorillonite and illite/montmorillonite mixture, with moderate kaolinite. For sample WOS-13-1, the major clay mineral is kaolinite, with moderate palygorskite and minor illite/montmorillonite mixture.

Table 3: Clay Speciation Analysis

Clay Fraction	Major (>30 wt%)	Moderate (10 - 30 wt%)	Minor (2 - 10 wt%)	Trace (<2% wt%)
WWS-13-1	kaolinite	montmorillonite, I/M	(quartz), (potassium-feldspar)	*illite
WWS-13-2	montmorillonite, I/M	Kaolinite	(quartz), (potassium-feldspar)	*illite
WOS-13-1	kaolinite	palygorskite	I/M, (quartz), (potassium-feldspar)	-

I/M – illite/montmorillonite mixtrure;

** Tentative identification due to low concentrations, diffraction line overlap or poor crystallinity*

Please note that the high abundance of clay minerals, including kaolinite and the typical swelling clays montmorillonite and palygorskite, may cause serious problems during gold extraction processing, from sample preparation through final leaching.

3.2. QEMSCAN Sulphide Mineral Liberation, Association and Grain Size/Mass Distribution Study

In addition to the bulk modal mineralogy analysis, QEMSCAN PMA (Particle Mineral Analysis) was completed to provide the basic liberation, association, and size by mass distribution analysis of target minerals (including pyrite and arsenopyrite in the current study; see the liberation and association category definitions of QEM-RMS and detailed data in Appendix C). A summary of the findings relating to pyrite, the possible major gold carrier mineral, is presented in the following sections.

3.2.1. Liberation and Association of Pyrite

The total abundance of pyrite is 7.1 wt% in sample WWS-13-1, 4.2 wt% in sample WWS-13-2, and 7.2% in sample WOS-13-1. Table 4 and Figure 2 summarize the liberation and association of pyrite in the three samples.

Table 4: Normalized Mass of Pyrite, Categorized by Liberation and Association

Mineral Name	WWS-13-1	WWS-13-2	WOS-13-1
Free Py	30.5	30.9	43.2
Liberated Py	17.9	5.8	10.0
Py:Other Sulphides	0.2	0.0	0.2
Py:Qtz/Feld	9.7	2.8	19.6
Py:Micas/Clays	2.6	0.4	3.9
Py:Oxides	0.4	1.4	0.8
Complex	38.7	58.8	22.4
Total	**100.0**	**100.0**	**100.0**

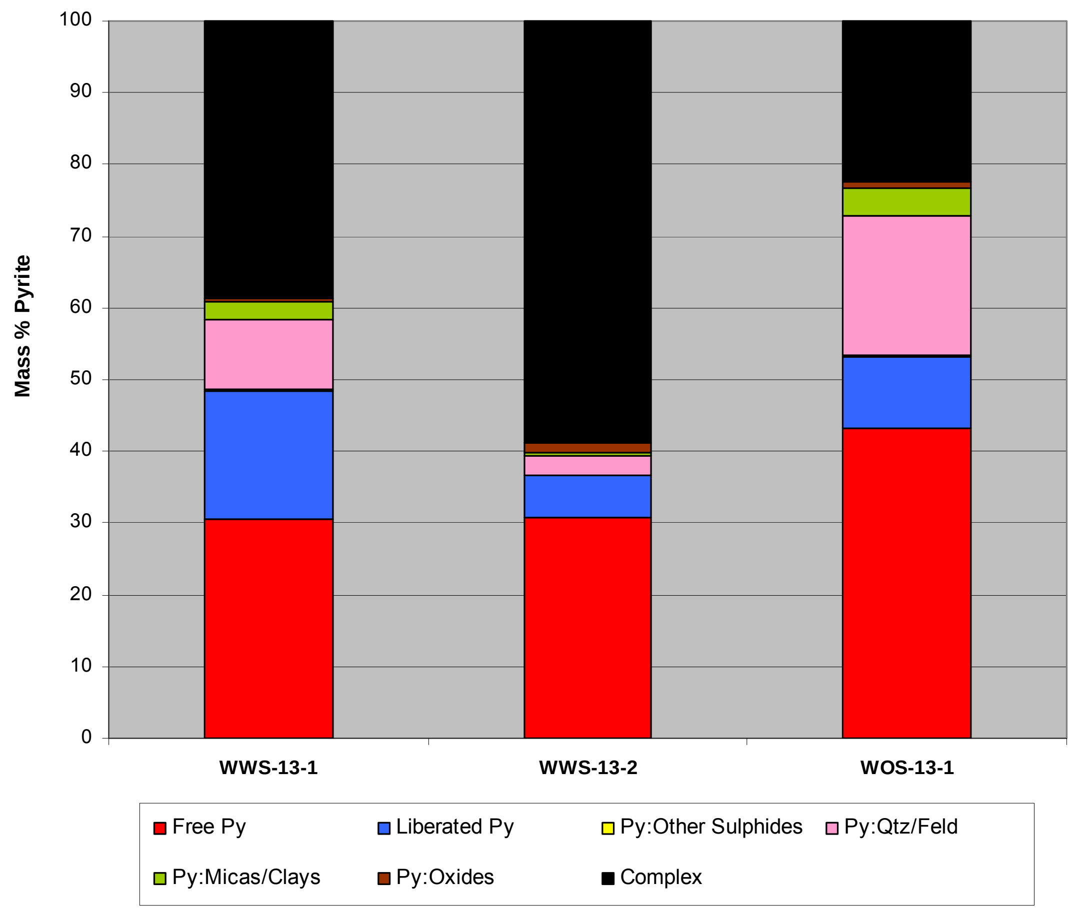


Figure 2: The Liberation and Association of Pyrite

The liberation and association characteristics of pyrite are different in all three samples.

Approximately 48% of the pyrite present in WWS-13-1 sample is free (i.e. >95% of the particle is pyrite) or liberated (i.e. >85% of the particle is pyrite). Approximately 10% of the pyrite occurs in association with feldspar and quartz, ~3% with mica/clay minerals, and ~39% with complex particles. This suggests a low to moderate degree of pyrite liberation at a P_{80} grind of <150 µm for sample WWS-13-1.

Approximately 37% of the pyrite present in sample WWS-13-2 is free or liberated. Approximately 2.8% of the pyrite occurs in association with feldspar and quartz and 1.4% occurs with oxides. The majority (~59%) of the pyrite occurs with complex particles. This suggests a low degree of pyrite liberation at a P_{80} grind of <150 μm for sample WWS-13-2.

Approximately 53% of the pyrite present in WOS-13-1 sample is free or liberated. Approximately 20% of the pyrite occurs in association with feldspar and quartz, ~4% with mica/clay minerals, and ~23% with complex particles. This suggests a low to moderate degree of pyrite liberation at a P_{80} grind of <150 μm, for sample WOS-13-1.

3.2.2. Size Distribution of Pyrite

Figure 3 presents the image grid of pyrite sorted by association criteria for all three samples and Figure 4 shows that the size distribution of pyrite varies across the three samples.

The D_{50} (the diameter at 50% passing) of pyrite particle size for both WWS-13-1 and WOS-13-1 samples is around 25 to 30 μm, whereas for sample WWS-13-2, it is finer at 15 μm.

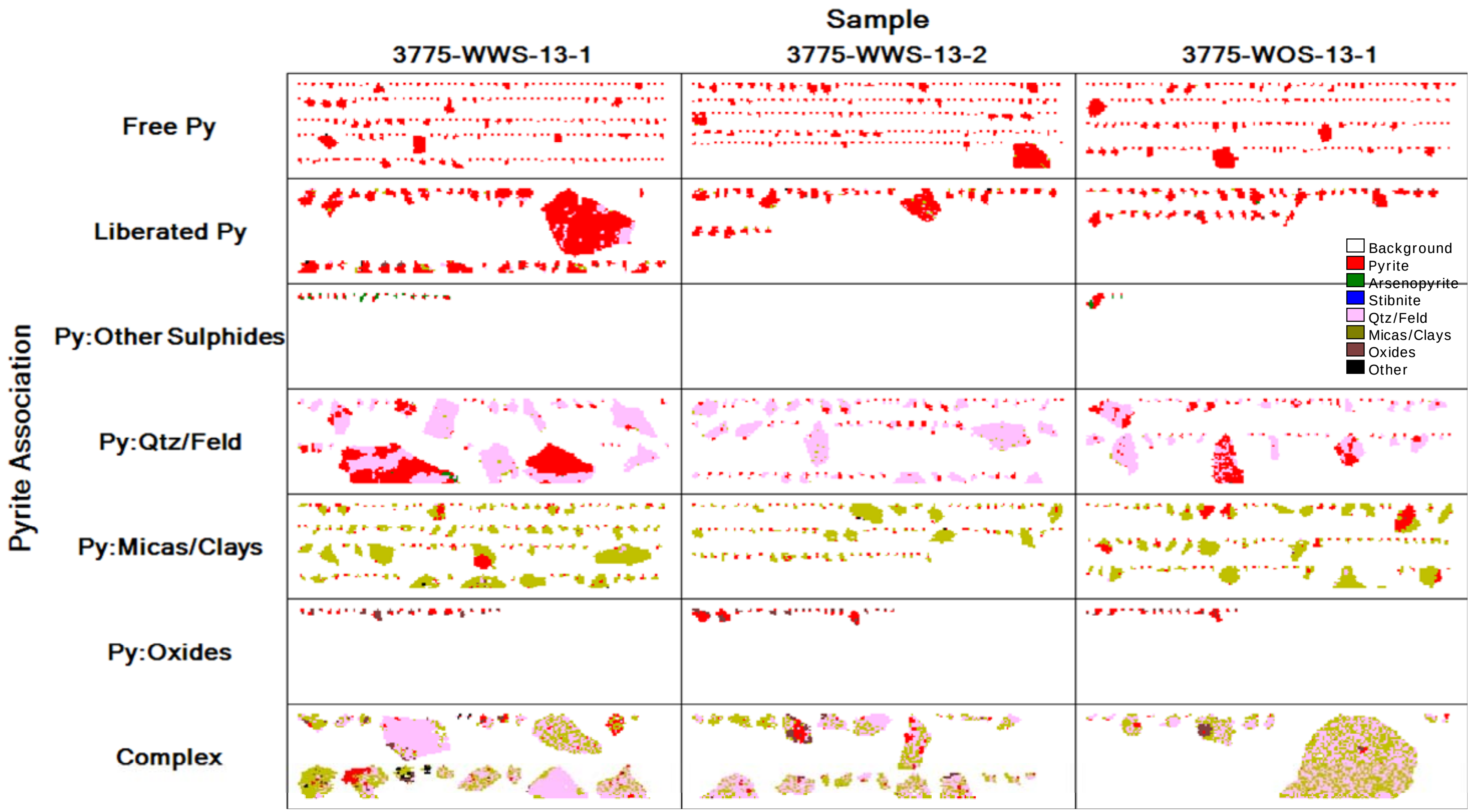
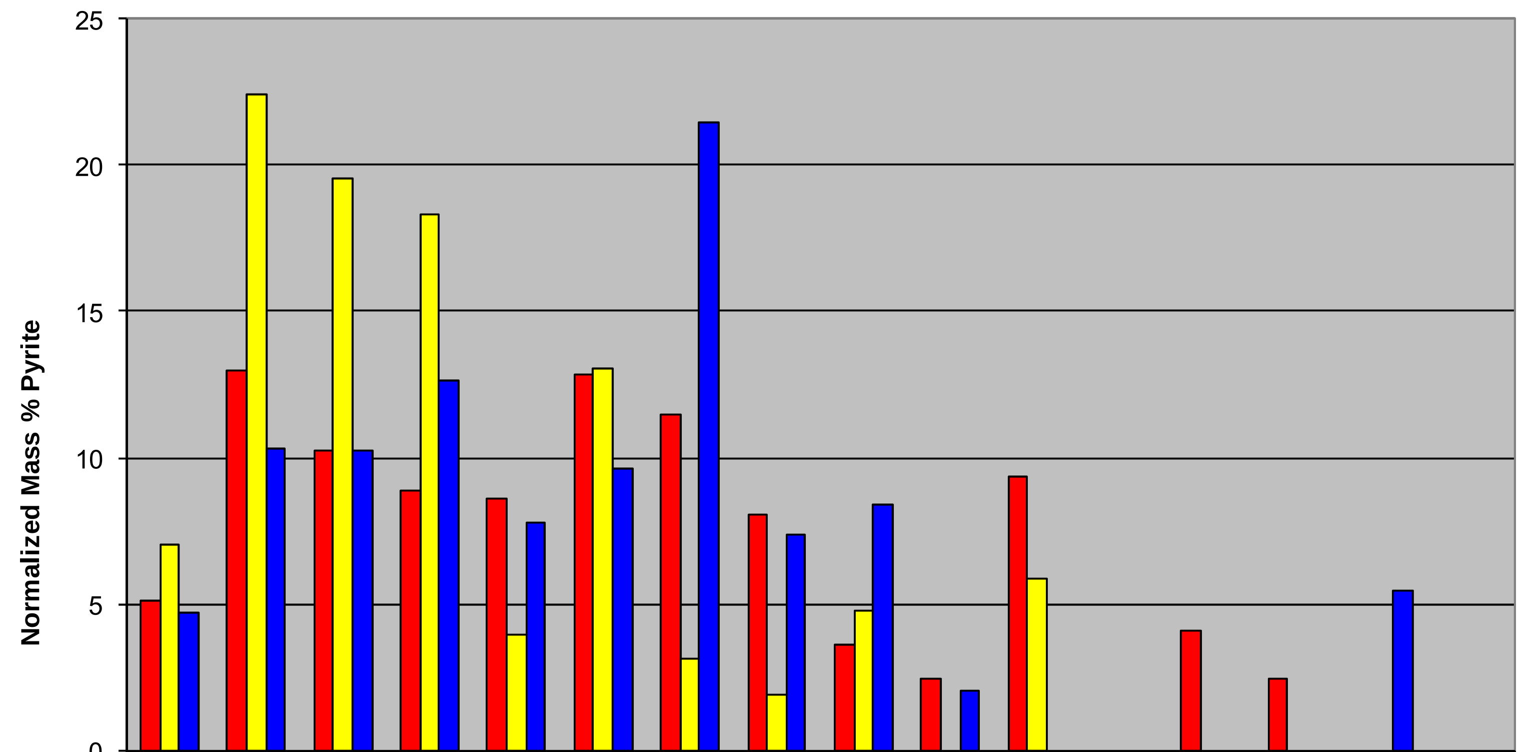


Figure 3: Image Grid of Pyrite For All Three Samples



	+5	+10	+15	+20	+25	+30	+40	+50	+60	+70	+80	+90	+100	+110	+120	+130
WWS-13-1	5.1	13.0	10.2	8.9	8.6	12.8	11.4	8.0	3.6	2.4	9.3	0.0	4.1	2.4	0.0	0.0
WWS-13-2	7.0	22.4	19.6	18.3	3.9	13.1	3.1	1.9	4.8	0.0	5.9	0.0	0.0	0.0	0.0	0.0
WOS-13-1	4.7	10.3	10.3	12.6	7.8	9.7	21.4	7.3	8.4	2.0	0.0	0.0	0.0	0.0	5.5	0.0

Figure 4: Pyrite Grain Size Distribution by Mass

4. Mineralogical Gold Deportment Study

The mineralogical gold deportment study method used by SGS is based on the assay distribution and target mineral (gold) occurrences in the pre-concentration fractions. This method was accredited by the Standards Council of Canada to conform to the requirements of ISO/IEC 17025: The General Requirements for the Competence of Testing and Calibration Laboratories.

4.1. Sample Preparation for the Mineralogical Gold Deportment Study

Each crushed sample (~1.5 kg, 150 µm, P_{80}) was submitted for pre-concentration by HLS for the gold deportment study.

Each of the three samples was pre-concentrated by HLS at a SG of 2.9 to obtain a Sink fraction (consisting mainly of sulphides, oxides and heavy silicate minerals) and a Float fraction (consisting mainly of silicates or silicates with disseminated sulphides or oxides).

The Sink product was then submitted for superpanning (SP) to further upgrade by gravity and then separated into five products: SP Tip, SP Sulphides (Sul), SP Middlings (Mid) and SP Tailing (Tails).

A 60 g sub-sample of the Float fraction was superpanned to produce two products: SP Float 1 (the heavier Float Tip portion) and SP Float 2 (the lighter and greater portion by mass).

A schematic of the pre-concentration procedure is presented in Figure 5 and the weight of each fraction is presented in Table 5.

A total of 21 polished sections were prepared from the various SP products for microscopic (or visible grains, >0.5 µm) gold mineral examination by optical microscopy and SEM-EDS methods (7 PS per sample). Sub-samples of pre-concentration fractions with sufficient amounts were submitted for Au, Ag, Fe, As and $S^{=}$ assays as well.

In addition, to complete the gold deportment characterization, approximately 300 g of each Float fraction was riffled and submitted for CN leach testing.

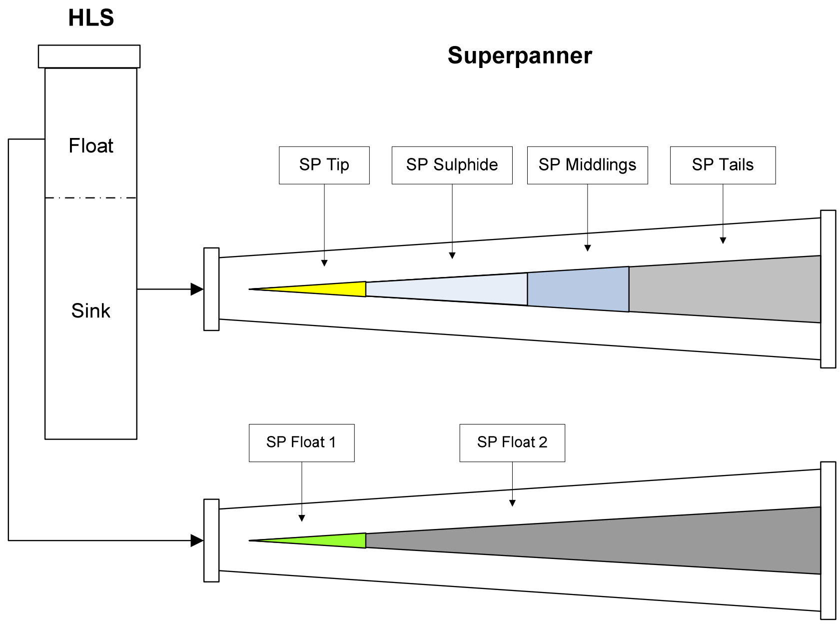


Figure 5: Schematic of the Pre-concentration Procedure

Table 5: Pre-concentration Feed and Product Weights

Sample ID	Initial Weight g	HLS Initial Wt g	HLS Prod. @ SG 2.9 g	Loss Due to HLS %	SP Initial Wt g	SP Prod. g	Loss Due to SP %	Mass %
WWS-13-1	**2996**	**1508**	**1503**	**0.32**	**---**	**---**	**---**	**100**
WWS-13-1 HLS Sink	***---***	***---***	***109.2***	***---***	***109.24***	***105.1***	***3.81***	***7.27***
WWS-13-1 SP Tip	---	---	---	---	---	0.65	---	0.04
WWS-13-1 SP Sul 1	---	---	---	---	---	2.24	---	0.15
WWS-13-1 SP Sul 2	---	---	---	---	---	4.96	---	0.34
WWS-13-1 SP Mid	---	---	---	---	---	55.99	---	3.87
WWS-13-1 SP Tail	---	---	---	---	---	41.24	---	2.85
WWS-13-1 HLS Flt	***---***	***---***	***1394***	***---***	***60.34***	***58.26***	***3.45***	***92.7***
WWS-13-1 SP Flt 1	---	---	---	---	---	1	---	1.59
WWS-13-1 SP Flt 2	---	---	---	---	---	57.26	---	91.1
WWS-13-2	**2994**	**1501**	**1496**	**0.31**	**---**	**---**	**---**	**100**
WWS-13-2 HLS Sink	***---***	***---***	***75.07***	***---***	***75.07***	***68.1***	***9.34***	***5.02***
WWS-13-2 SP Tip	---	---	---	---	---	1.01	---	0.07
WWS-13-2 SP Sul 1	---	---	---	---	---	7.98	---	0.59
WWS-13-2 SP Sul 2	---	---	---	---	---	5.31	---	0.39
WWS-13-2 SP Mid	---	---	---	---	---	37.61	---	2.77
WWS-13-2 SP Tail	---	---	---	---	---	16.15	---	1.19
WWS-13-2 HLS Flt	***---***	***---***	***1421***	***---***	***60***	***56.33***	***6.12***	***95.0***
WWS-13-2 SP Flt 1	---	---	---	---	---	1.02	---	1.72
WWS-13-2 SP Flt 2	---	---	---	---	---	55.31	---	93.3
WOS-13-1	**3002**	**1500**	**1495**	**0.31**	**---**	**---**	**---**	**100**
WOS-13-1 HLS Sink	***---***	***---***	***106.6***	***---***	***106.59***	***104.0***	***2.39***	***7.13***
WOS-13-1 SP Tip	---	---	---	---	---	0.99	---	0.07
WOS-13-1 SP Sul 1	---	---	---	---	---	5.09	---	0.35
WOS-13-1 SP Sul 2	---	---	---	---	---	9.98	---	0.68
WOS-13-1 SP Mid	---	---	---	---	---	48.32	---	3.31
WOS-13-1 SP Tail	---	---	---	---	---	39.66	---	2.72
WOS-13-1 HLS Flt	***---***	***---***	***1389***	***---***	***60.04***	***54.1***	***9.89***	***92.9***
WOS-13-1 SP Flt 1	---	---	---	---	---	1.01	---	1.73
WOS-13-1 SP Flt 2	---	---	---	---	---	53.09	---	91.1

4.2. Assays, Mass Balances and Gold Grade Distribution in Pre-Concentration Fractions

The assays for the head samples (including Au, Fe, As and $S^{=}$) and representative pre-concentration fractions (if sufficient mass was available for assay) are listed in Table 6. The chemical analyses indicate that the arsenic grade is very low in the as-received samples. The concentrations of gold, iron and sulphide show a positive correlation in almost all SP fractions of each sample. There is a significant deviation in gold grade between the HLS Float fraction and the other SP fractions; this suggests an effective concentration by HLS.

Table 6: Chemical Assays for Head Samples and Pre-Concentration Fractions

Sample/Products ID	Au g/t	Fe %	As %	$S^{=}$ %
WWS-13-1	3.68	3.84	0.200	3.88
WWS-13-1 SP Sul 2	16.5	--	--	30.7
WWS-13-1 SP Mid	17.2	22.7	0.840	26.0
WWS-13-1 SP Tail	16.9	32.2	0.810	34.1
WWS-13-1 SP Flt 2	2.25	2.20	0.150	2.19
WWS-13-1 HLS Flt	2.28	2.28	0.150	2.00
WWS-13-2	1.40	2.58	0.046	2.64
WWS-13-2 SP Sul 1	10.3	38.1	0.410	40.0
WWS-13-2 SP Sul 2	9.63	--	--	--
WWS-13-2 SP Mid	4.95	12.1	0.160	13.6
WWS-13-2 SP Tail	4.40	10.0	0.160	11.1
WWS-13-2 SP Flt 2	1.06	2.04	0.037	2.05
WWS-13-2 HLS Flt	1.20	2.01	0.040	1.99
WOS-13-1	1.75	3.71	0.084	3.88
WOS-13-1 SP Sul 1	7.04	--	--	--
WOS-13-1 SP Sul 2	5.29	37.1	0.480	39.4
WOS-13-1 SP Mid	5.47	25.4	0.400	27.4
WOS-13-1 SP Tail	7.70	35.2	0.540	37.3
WOS-13-1 SP Flt 2	1.32	1.82	0.056	1.84
WOS-13-1 HLS Flt	1.39	1.79	0.055	1.52

The gold grade and distribution for the pre-concentration fractions of all three samples are presented in Table 7. Please note that the gold elemental distribution is calculated based on the assays and mass distribution of each fraction.

Table 7: Au Assay, Mass Balance and Distribution

Sample ID	Mass %	Au assay g/t	Au Dist. %
WWS-13-1	**100**	**3.68**	**100**
WWS-13-1 HLS Sink	***7.27***	***21.9***	***43.3***
WWS-13-1 SP Tip	0.04	195	10.6
WWS-13-1 SP Sul 1	0.15		
WWS-13-1 SP Sul 2	0.34	16.5	1.54
WWS-13-1 SP Mid	3.87	17.2	18.1
WWS-13-1 SP Tail	2.85	16.9	13.1
WWS-13-1 HLS Flt	***92.7***	***2.25***	***56.7***
WWS-13-2	**100**	**1.40**	**100**
WWS-13-2 HLS Sink	***5.02***	***5.2***	***18.6***
WWS-13-2 SP Tip	0.07	4.97	2.35
WWS-13-2 SP Sul 1	0.59		
WWS-13-2 SP Sul 2	0.39	9.63	2.69
WWS-13-2 SP Mid	2.77	4.95	9.80
WWS-13-2 SP Tail	1.19	4.40	3.74
WWS-13-2 HLS Flt	***95.0***	***1.20***	***81.4***
WOS-13-1	**100**	**1.75**	**100**
WOS-13-1 HLS Sink	***7.13***	***6.4***	***26.2***
WOS-13-1 SP Tip	0.07	11.9	0.46
WOS-13-1 SP Sul 1	0.35	7.04	1.40
WOS-13-1 SP Sul 2	0.68	5.29	2.07
WOS-13-1 SP Mid	3.31	5.47	10.3
WOS-13-1 SP Tail	2.72	7.70	12.0
WOS-13-1 HLS Flt	***92.9***	***1.39***	***73.8***

Underline - calculated assay

For sample WWS-13-1, ~43% of the gold is distributed in the HLS Sink fraction at SG 2.9, which accounts for ~7% of the total mass, while 57% of the gold remains in the HLS Float, accounting for the remaining mass (~93%); indicating moderate gold recovery by gravity may be achievable. In the HLS Sink, after further superpanning, ~12% of gold concentrates in the SP Tip and SP Sulphide fractions, which accounts for only 0.5% of the total mass. Approximately 66% of the gold grade in the HLS Sink is distributed in the SP Mid and SP Tail fractions, accounting for ~6.6% of the total mass. This indicates poor liberation of gold minerals or middling associations.

For sample WWS-13-2, only ~19% of the gold is distributed in the HLS Sink fraction at SG 2.9, which accounts for ~5% of the total mass, while the majority of gold (~81%) remains in the HLS Float, accounting for the remaining mass (~95%); therefore, poor gold recovery by gravity is indicated. In the HLS Sink, after superpanning, ~5% of gold concentrates in the SP Tip and SP Sulphide fractions, which accounts for only 1% of the total mass, while over 66% of the gold grade in the HLS Sink is distributed in the SP Mid and SP Tail fractions, accounting for ~4% of the total mass, which indicates poor liberation of gold minerals or middling associations.

For sample WOS-13-1, ~26% of the gold is distributed in the HLS Sink fraction at SG 2.9, which accounts for ~7% of the total mass, while 74% of gold remains in the HLS Float, accounting for the remaining mass (~93%); therefore, poor gold recovery by gravity is indicated. In the HLS Sink, after superpanning, ~4%

of gold concentrates in the SP Tip and SP Sulphide fractions, which accounts for only 1% of the total mass. Over 80% of the gold grade in HLS Sink is distributed in the SP Mid and SP Tail fractions, accounting for ~6% of the total mass. This indicates poor liberation of gold minerals or middling associations.

4.3. Gold Mineral Chemical Composition and Relative Abundance

The chemical composition of gold minerals was determined by SEM-EDS standardless semi-quantitative analysis. The average chemistry of major gold minerals is presented in Table 8. Detailed results for all samples are listed in Appendix D.

Table 8: Gold Mineral Chemistry

Sample ID	Gold Minerals		Gold Mineral Chemical Composition (by SEM-EDS analysis, normalized wt%)													
			S	Fe	Ni	Cu	Zn	As	Se	Ag	Sb	Te	I	Au	Pb	Bi
WWS-13-1	Gold	n=10	0.0	2.4	0.0	0.0	0.0	0.0	0.0	19.8	0.0	0.0	0.0	77.9	0.0	0.0
	Electrum	n=6	0.0	2.0	0.0	0.0	0.0	0.0	0.0	26.9	0.0	0.0	0.0	71.1	0.0	0.0
WWS-13-2	Electrum	n=5	0.0	1.2	0.0	0.0	0.0	0.0	0.0	26.8	0.0	0.0	0.0	72.0	0.0	0.0
WOS-13-1	Gold	n=5	0.0	0.1	0.0	0.0	0.0	0.0	0.0	24.4	0.0	0.0	0.0	75.5	0.0	0.0
	Electrum	n=7	0.0	0.4	0.0	0.0	0.0	0.0	0.0	26.1	0.0	0.0	0.0	73.5	0.0	0.0

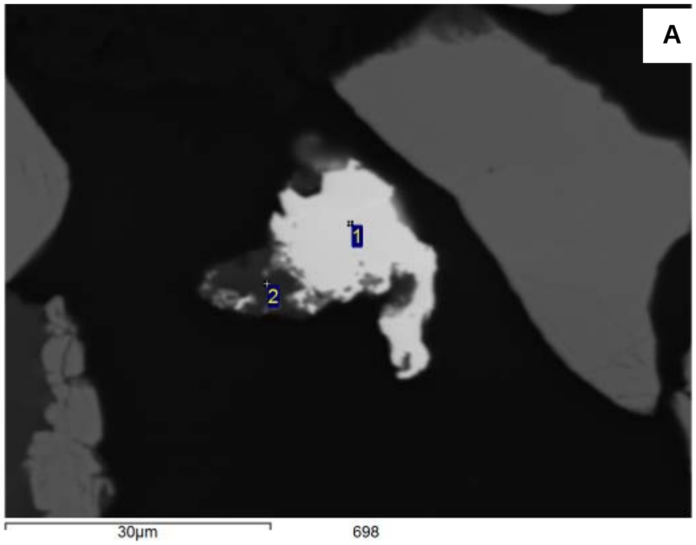
The major gold minerals identified are native gold (Au/Ag alloy, with Ag ≤25 wt%) and electrum (Au/Ag alloy, with 25≤ Ag ≤50 wt%) in all three samples, containing an average of 71.1 to 77.9% of Au and 19.8 to 26.9% of Ag, with minor to trace amounts of iron.

The major sulphide minerals identified are pyrite and arsenopyrite in all three samples (Table 2). The average chemical composition of pyrite and arsenopyrite are presented in Table 9. For all three samples, pyrite contains trace amounts (0.1 to 0.3%) of arsenic and arsenopyrite contains 0.7 to 1.3% of Sb; both are indicative of the possible occurrence of submicroscopic gold in sulphide minerals.

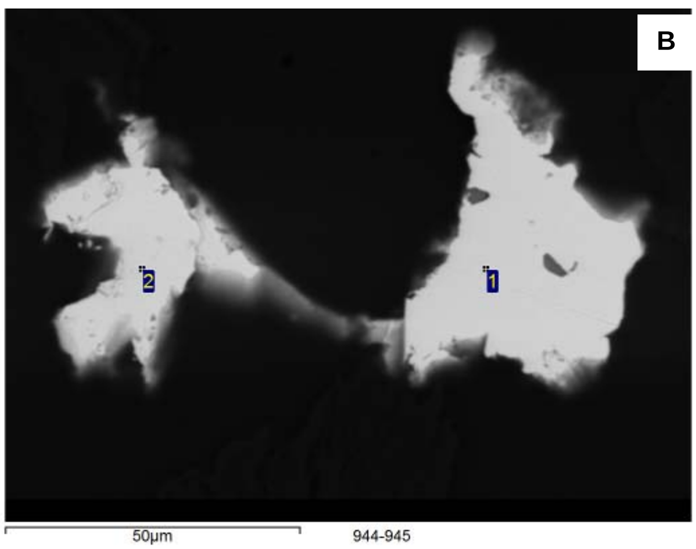
Table 9: Sulphide Mineral Chemistry

Sample ID	Major Suphide Mineral Chemical Composition (by SEM-EDS analysis, normalized wt%)								
	Pyrite				Arsenopyrite				
	Average	S	Fe	As	Average	S	Fe	As	Sb
WWS-13-1	n=60	54.6	45.3	0.1	n=27	21.3	34.7	42.8	1.2
WWS-13-2	n=79	54.6	45.3	0.1	n=21	24.2	35.4	39.1	1.3
WOS-13-1	n=69	54.4	45.2	0.3	n=24	23.3	35.5	40.5	0.7

Representative SEM backscattered electron images (SEM-BSE images), including the chemistry of gold minerals and associated host minerals are presented in Figure 6 to Figure 7 for sample WWS-13-1, Figure 8 to Figure 9 for sample WWS-13-2, and Figure 10 to Figure 11 for sample WWS-13-2. Additional images and data are presented in Appendix E.



Spectrum	O	Al	Si	S	Fe	As	Ag	Au	Total	Mineral ID
1					0.7		31.1	68.2	100.0	Electrum
2	47.8	0.4	46.3	1.4	2.3	1.9			100.0	Quartz

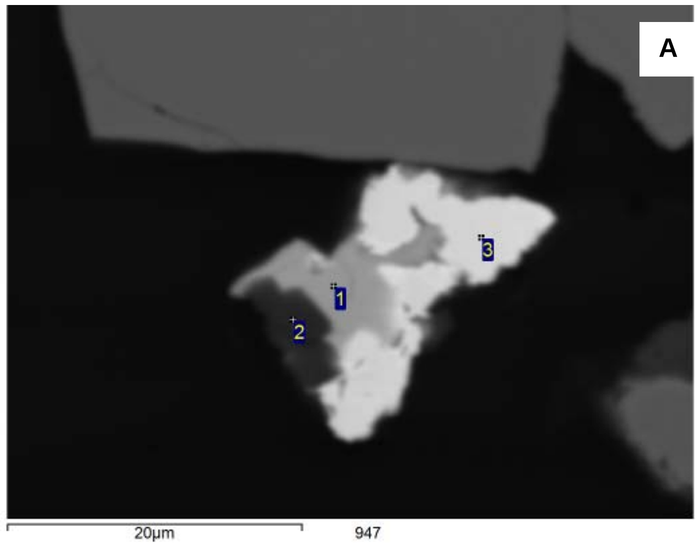


Spectrum	Ag	Au	Total	Mineral ID
1	28.6	71.4	100.0	Electrum
2	28.1	71.9	100.0	Electrum

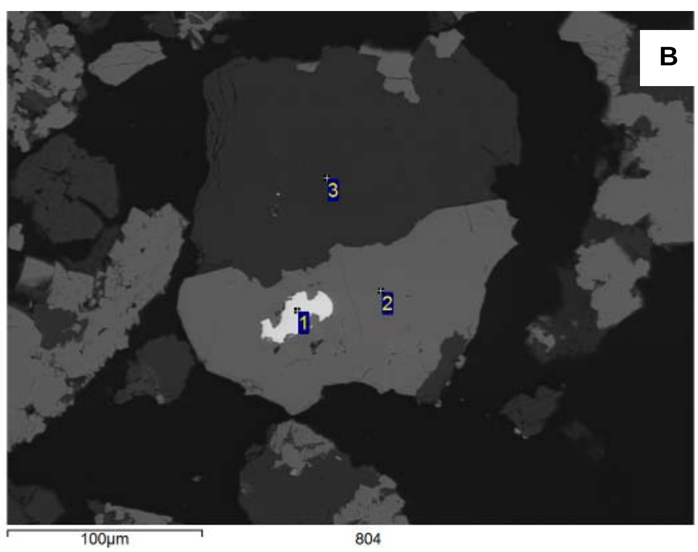
Processing option: All elements analysed (Normalised). All results in weight %

Figure 6: SEM-EDS Images and Analyses of Gold Minerals, Sample WWS-13-1

A and B – Liberated gold.



Spectrum	O	Si	S	Fe	Ag	Sb	Au	Total	Mineral ID
1			21.3		36.2	42.4		100.0	Miargyrite
2	51.7	44.1	1.1		1.7	1.4		100.0	Quartz
3				0.9	19.5		79.6	100.0	Gold

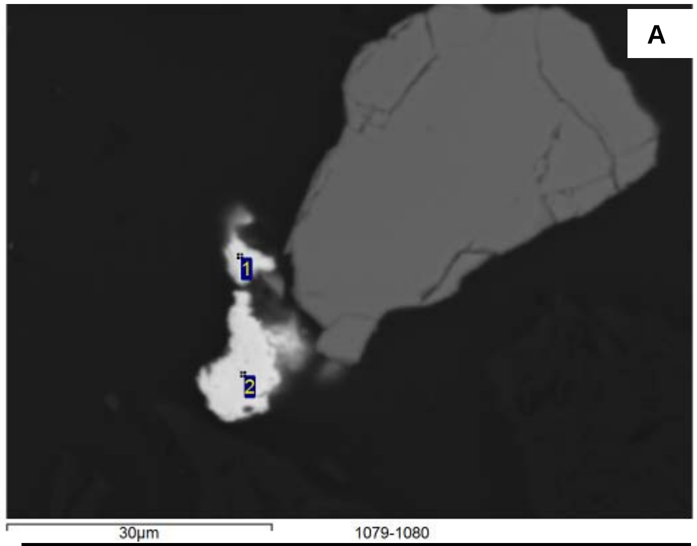


Spectrum	O	Al	Si	S	Fe	Ag	Au	Total	Mineral ID
1						20.2	79.8	100.0	Gold
2				54.3	45.7			100.0	Pyrite
3	50.6	0.5	48.8					100.0	Quartz

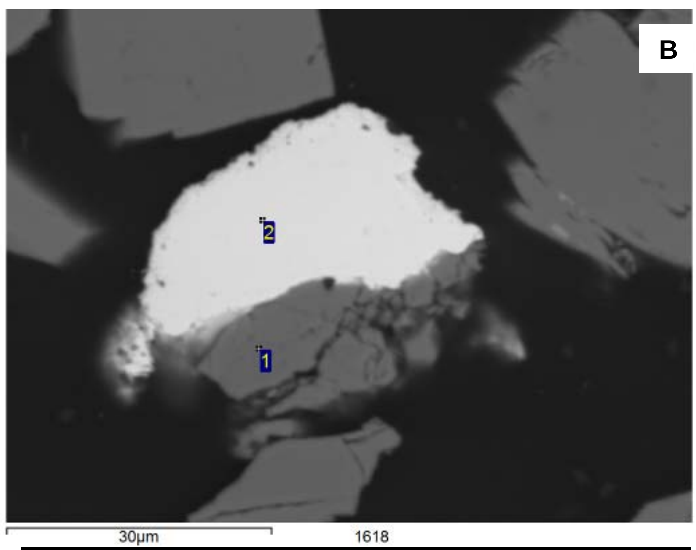
Processing option: All elements analysed (Normalised). All results in weight %

Figure 7: SEM-EDS Images and Analyses of Gold Minerals, Sample WWS-13-1

A – Exposed gold, associated with miargyrite ($AgSbS_2$); B – Gold locked in pyrite/quartz complex particle.



Spectrum	O	Fe	Ag	Au	Total	Mineral ID
1	3.1	1.7	15.3	79.8	100.0	Gold
2			28.5	71.5	100.0	Electrum

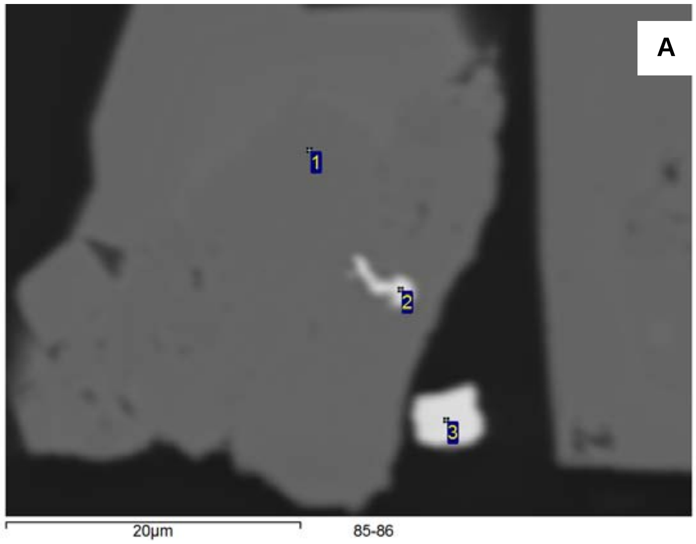


Spectrum	S	Fe	Ag	Au	Total	Mineral ID
1	55.3	44.7			100.0	Pyrite
2			28.8	71.2	100.0	Electrum

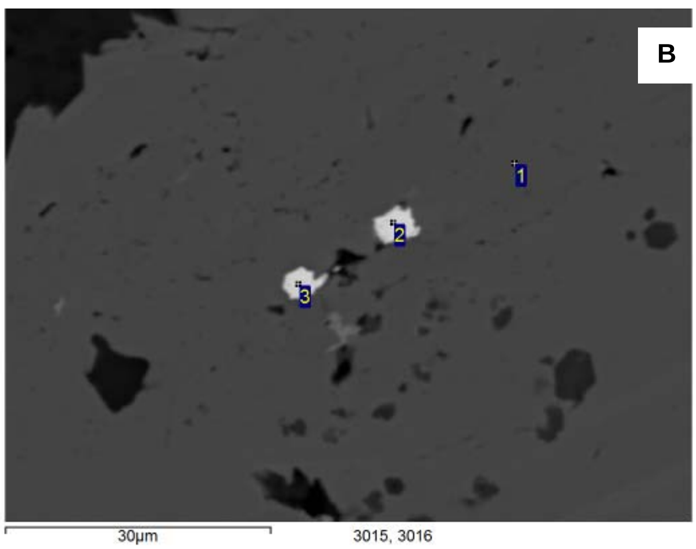
Processing option: All elements analysed (Normalised). All results in weight %.

Figure 8: SEM-EDS Images and Analyses of Gold Minerals, Sample WWS-13-2

A – Liberated electrum; B – Electrum associated with pyrite.



Spectrum	S	Fe	Ag	Au	Total	Mineral ID
1	55.0	45.0			100.0	Pyrite
2		5.5	23.0	71.5	100.0	Electrum
3		1.6	26.6	71.8	100.0	Electrum

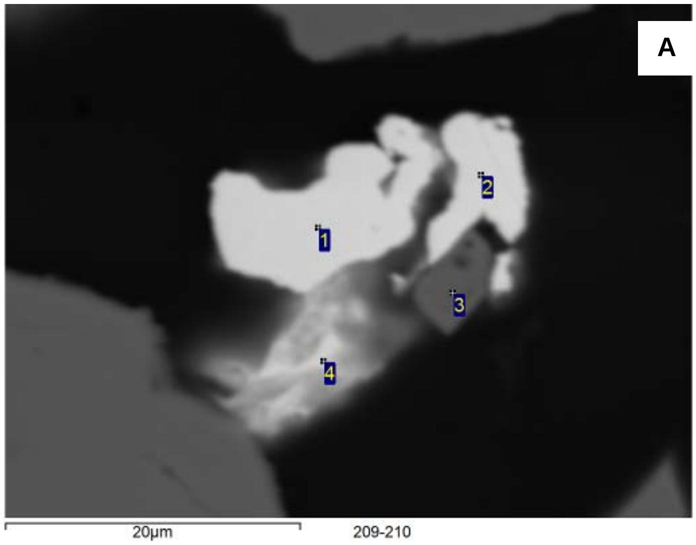


Spectrum	S	Fe	Ag	Au	Total	Mineral ID
1	54.5	45.5			100.0	Pyrite
2		2.4	25.1	72.5	100.0	Electrum
3		2.1	25.0	72.9	100.0	Electrum

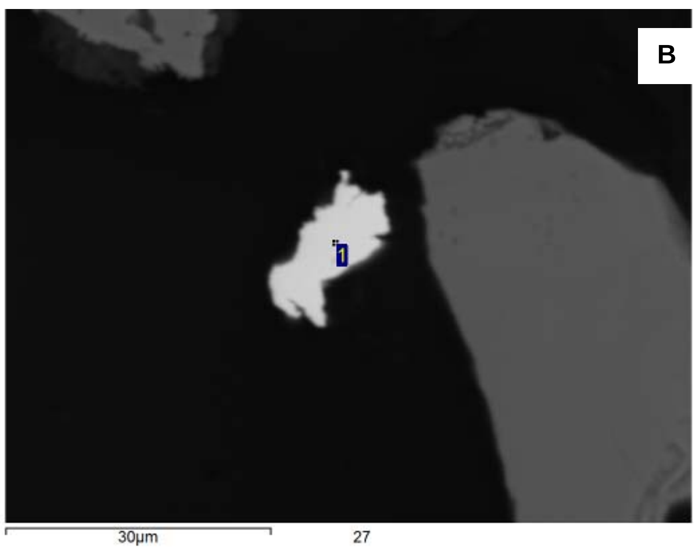
Processing option: All elements analysed (Normalised). All results in weight%

Figure 9: SEM-EDS Images and Analyses of Gold Mineral, Sample WWS-13-2

A – A liberated and a locked gold grain associated with pyrite; B – Electrum grains locked in pyrite.



Spectrum	O	S	Fe	Ag	Au	Total	Mineral ID
1				26.1	73.9	100.0	Electrum
2			0.9	25.5	73.6	100.0	Electrum
3		55.1	44.9			100.0	Pyrite
4	3.7		1.0	25.4	69.9	100.0	Electrum

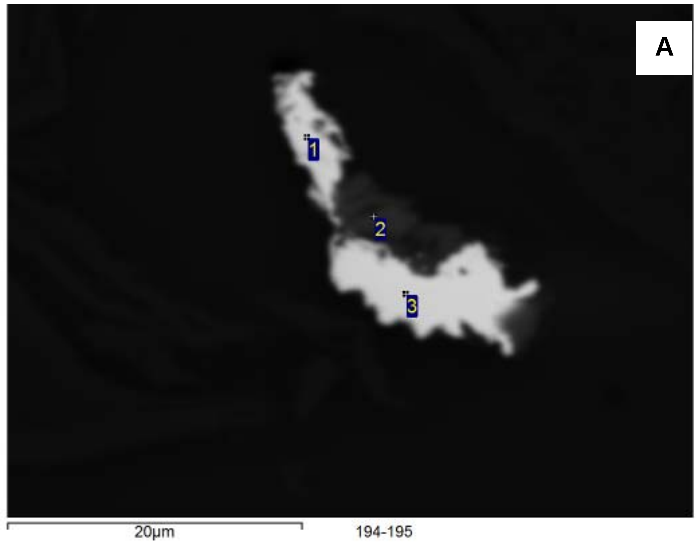


Spectrum	Fe	Ag	Au	Total	Mineral ID
1	0.7	23.7	75.6	100.0	Gold

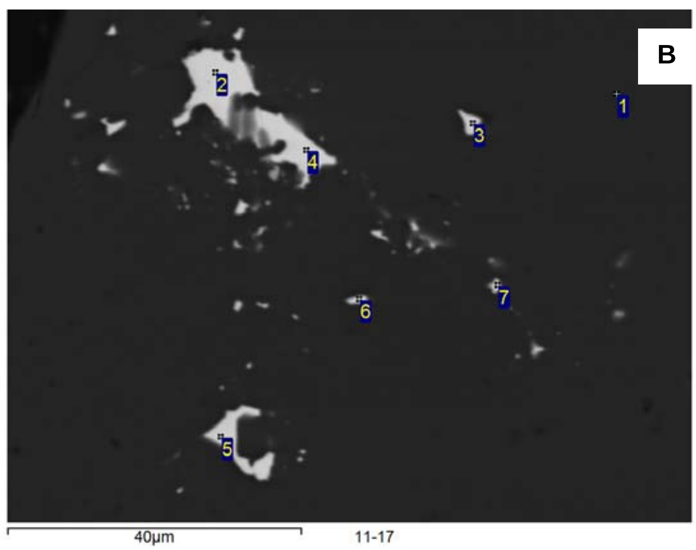
Processing option: All elements analysed (Normalised). All results in weight%

Figure 10: SEM-EDS Images and Analyses of Gold Mineral, Sample WOS-13-1

A – Liberated electrum, associated with pyrite; B – Liberated gold.



Spectrum	O	Al	Si	Fe	Ag	Au	Total	Mineral ID
1				1.2	25.7	73.1	100.0	Electrum
2	52.8	0.4	42.6		0.7	3.6	100.0	Quartz
3					26.3	73.7	100.0	Electrum



Spectrum	O	Si	Ag	Au	Total	Mineral ID
1	51.3	48.7			100.0	Quartz
2			25.2	74.8	100.0	Electrum
3			24.8	75.2	100.0	Gold
4			24.8	75.2	100.0	Gold
5			25.6	74.4	100.0	Electrum
6	11.8	5.7	18.9	63.5	100.0	Gold
7	5.5	1.5	23.1	69.9	100.0	Electrum

Processing option: All elements analysed (Normalised). All results in weight%

Figure 11: SEM-EDS Images and Analyses of Gold Mineral, Sample WOS-13-1

A – Electrum exposed in quartz; B – Gold/electrum grains locked in quartz.

4.4. Gold Mineral Occurrence – Size, Liberation and Association Analysis

All polished sections were scanned and measured using both an optical microscope equipped with reflected light capabilities and a scanning electron microscope equipped with an energy dispersive detector (SEM-EDS) to determine the gold mineral speciation, size, liberation and association characteristics.

4.4.1. Definitions

The gold mineral occurrences are grouped into three association categories: liberated, exposed and locked. A detailed summary of this terminology is provided in Appendix A and definitions are summarized as follows:

(1) Liberated: A gold grain with no other mineral attached and/or a binary particle with ≥80% of gold surface area exposure to the epoxy medium.

(2) Exposed: A gold grain containing <80% of surface area exposure to the epoxy medium and occurs adjacent to another mineral.

(3) Locked: A gold grain totally enclosed in another mineral or particle, with 0% exposure to the epoxy medium in a two-dimensional plane, including:

- Gold as inclusions that are completely encapsulated in a host mineral, e.g. fine gold in a coarse pyrite;
- Gold as inclusions in a porous or framboidal permeable host mineral, e.g. fine gold in a porous pyrite;
- Gold in interstitial spaces between mineral grains and at borders of mineral grains (including same mineral or different minerals)
- Fracture-controlled gold – gold enclosed in fractures and micro-fractures, as veinlets and micro-veinlets in the host minerals.

Representative gold mineral occurrences were presented by SEM-BSE images in the previous section. More examples are documented in Appendix E, along with mineral chemistry data. The optical microscopy results for sample WWS-13-1, WWS-13-2, and WOS-13-1 are presented in Figure 12, Figure 13, and Figure 14, respectively.

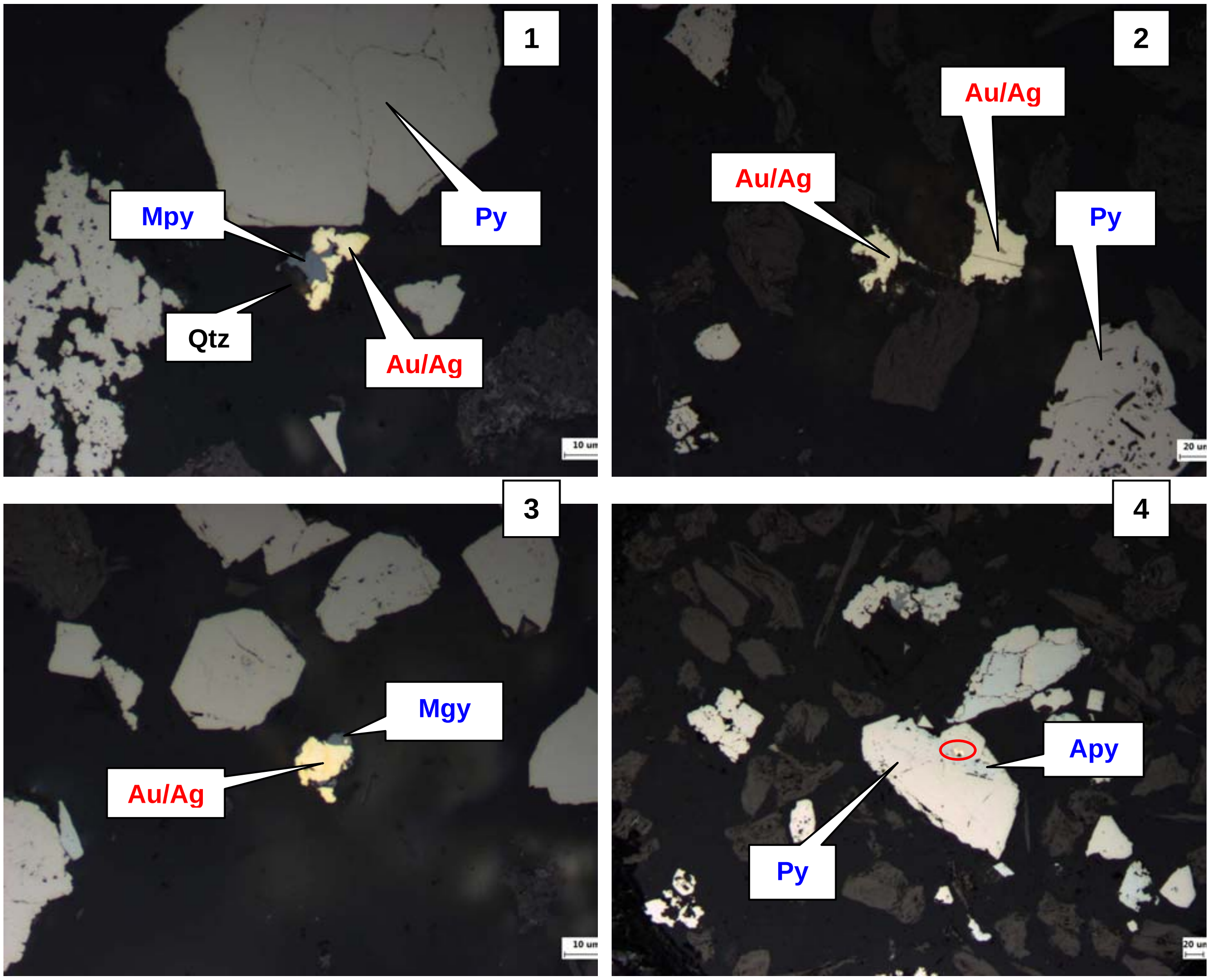


Figure 12: Gold Mineral Occurrences in Sample WWS-13-1

*Photomicrographs taken in PPRL (plane polarized reflected light) showing gold mineral occurrences, indicated by **Au/Ag** (native gold and electrum) or red circle. **Py** – pyrite; **Mgy** – miargyrite ($AgSbS_2$)*

Plate 1 and 3 – Liberated gold grain, associated with miargyrite;
Plate 2 – Liberated gold grains;
Plate 4 – Locked gold grains, associated with arsenopyrite and pyrite.

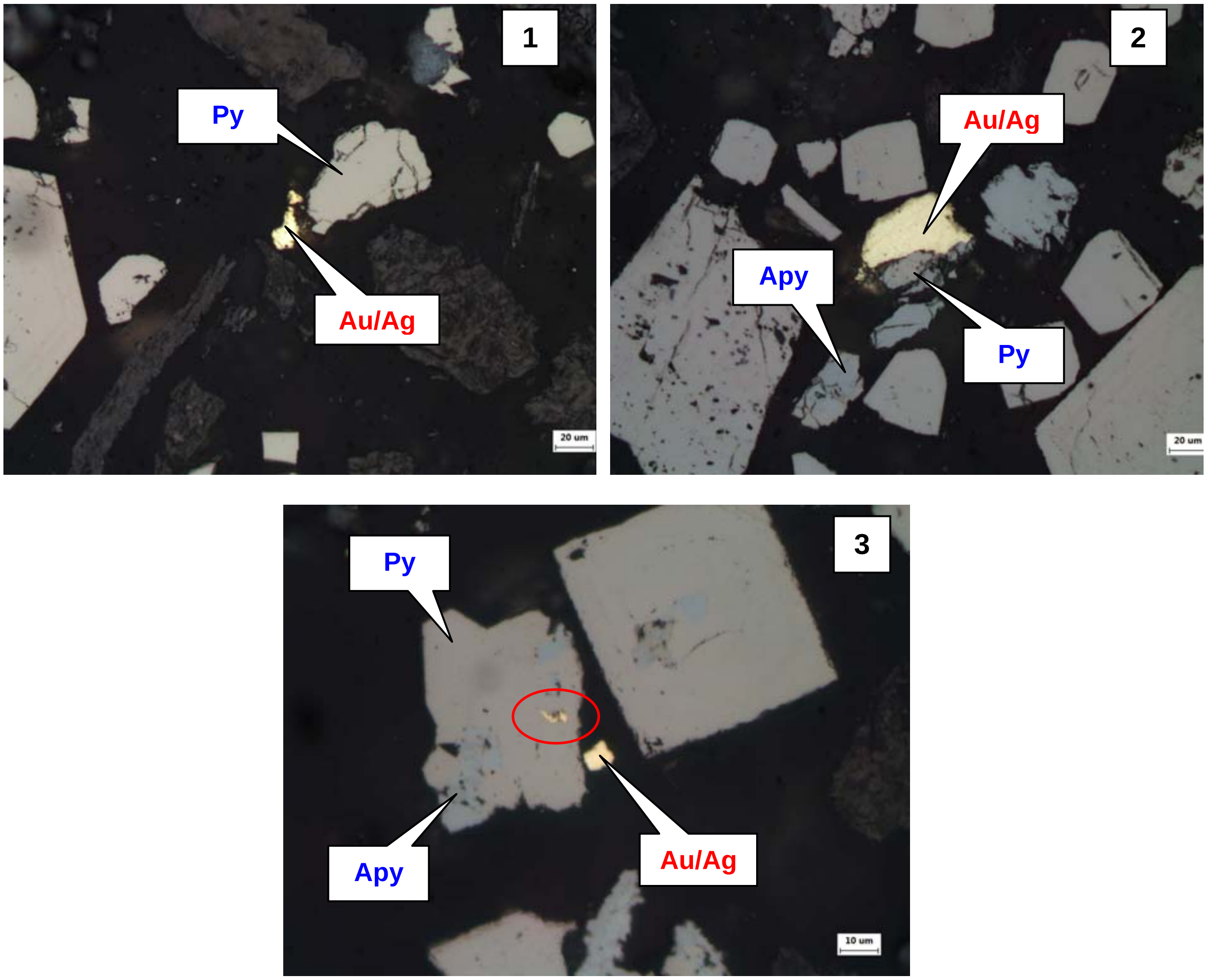


Figure 13: Gold Mineral Occurrences in Sample WWS-13-2

*Photomicrographs taken in PPRL (plane polarized reflected light) showing gold mineral occurrences, indicated by **Au/Ag** (native gold and electrum). **Py** – pyrite; **Apy** – arsenopyrite.*

Plate 1 and 2 – Liberated gold grain;
Plate 3 – Liberated gold and locked gold minerals, associated with pyrite/arsenopyrite.

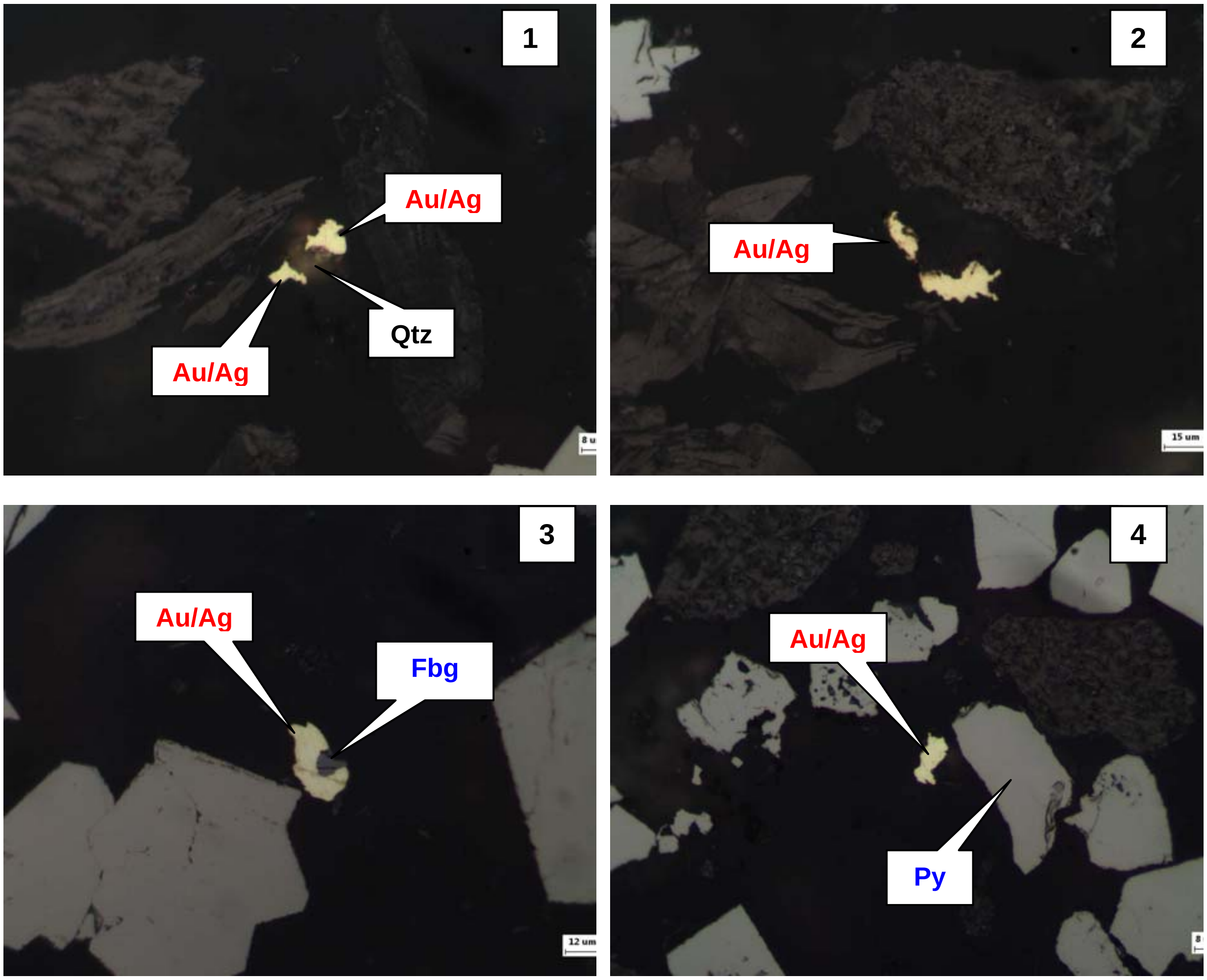


Figure 14: Gold Mineral Occurrences in Sample WOS-13-1

*Photomicrographs taken in PPRL (plane polarized reflected light) showing gold mineral occurrences, indicated by **Au/Ag** (native gold and electrum). **Py** – pyrite; **Fbg** – freibergite ($(Ag,Cu,Fe)_{12}(Sb,As)_4S_{13}$)*

Plate 1– Liberated gold/electrum grains, associated with quartz;
Plate 2 and 4 – Liberated gold;
Plate 3 – Liberated electrum, associated with freibergite.

4.4.2. Gold Grain Size and Distribution

4.4.2.1. Sample WWS-13-1

A total of 21 gold grains were found by optical and SEM gold scanning in sample WWS-13-1, including 5 liberated with an average size of 20.8 µm, 1 exposed with an average size of 12.6 µm, and 15 locked with an average size of 4.2 µm (Table 10). Detailed gold grain sizes, along with association and host mineral information for each grain, are included in Appendix F.

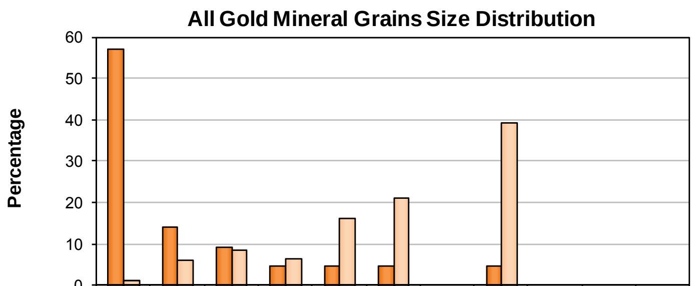
Table 10: Summary of Gold Grain Size Distribution and Association in Sample WWS-13-1

WWS-13-1	Association	No. of Observed Grains	Size Range (um)			Average Size (um)
SP Tip	Liberated	4	12.6	-	38.1	23.6
	Exposed	1	12.6	-	12.6	12.6
	Locked	4	0.8	-	8.7	4.6
	Subtotal	9				13.9
SP Mid	Liberated	0	0.0	-	0.0	0.0
	Exposed	0	0.0	-	0.0	0.0
	Locked	4	2.3	-	24.7	8.3
	Subtotal	4				8.3
SP Tail	Liberated	1	9.7	-	9.7	9.7
	Exposed	0	0.0	-	0.0	0.0
	Locked	7	0.6	-	3.0	1.7
	Subtotal	8				2.7
TOTAL	Liberated	5	9.7	-	38.1	20.8
	Exposed	1	12.6	-	12.6	12.6
	Locked	15	0.6	-	24.7	4.2
	Total	21	0.6	-	38.1	8.6

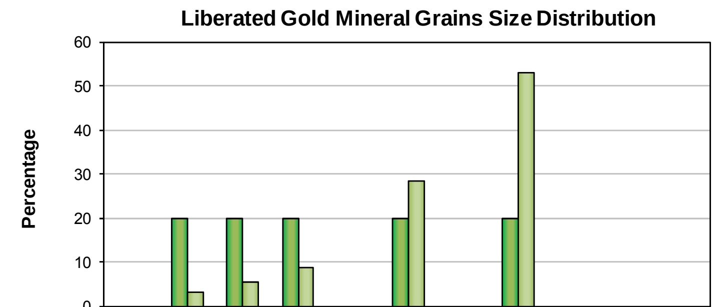
Overall size distributions by frequency and surface area percentage of measured gold mineral grains are presented in Figure 15, along with gold mineral grain size distributions categorized as liberated, exposed and locked.

Overall by frequency, more than 71% of the gold grains are less than 10 µm in size and account for ~8% of the total gold surface area. Approximately 24% of the gold grains are between 10 and 30 µm in size and account for ~52% of the total gold surface area. Less than 5% of the gold grains are greater than 30 µm and account for 40% of the total gold surface area.

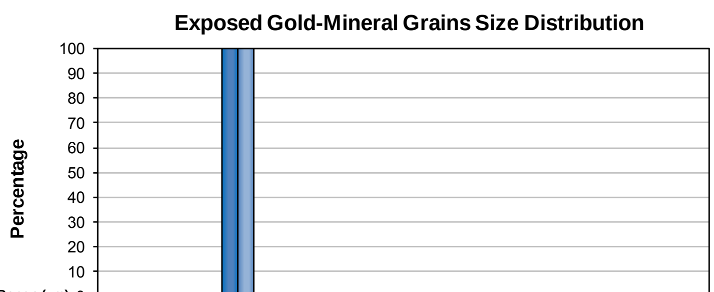
The size distribution trend of liberated and locked gold mineral grains is similar to the overall observed gold, the large liberated gold grains contribute a high surface area percentage. Only a few exposed gold grains were found, so this size distribution may not be representative.



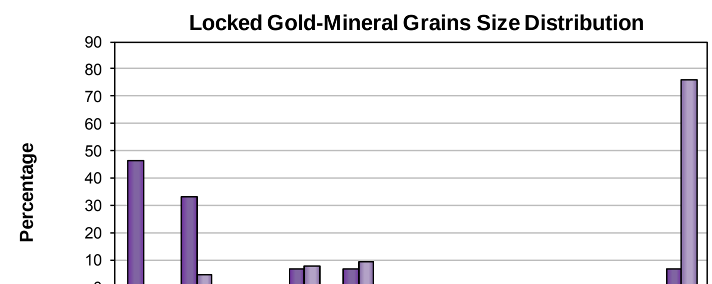
Size Range (µm)	<= 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	> 50
Frequency (%)	57.1	14.3	9.5	4.8	4.8	4.8	0.0	4.8	0.0	0.0	0.0
Surface Area (%)	1.3	6.3	8.6	6.5	16.5	21.3	0.0	39.4	0.0	0.0	0.0



Size Range (µm)	<= 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	> 50
Frequency (%)	0.0	20.0	20.0	20.0	0.0	20.0	0.0	20.0	0.0	0.0	0.0
Surface Area (%)	0.0	3.5	5.8	8.8	0.0	28.7	0.0	53.2	0.0	0.0	0.0



Size Range (µm)	<= 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	> 50
Frequency (%)	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surface Area (%)	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



Size Range (µm)	<= 2	2 - 4	4 - 6	6 - 8	8 - 10	10 - 12	12 - 14	14 - 16	16 - 18	18 - 20	> 20
Frequency (%)	46.7	33.3	0.0	6.7	6.7	0.0	0.0	0.0	0.0	0.0	6.7
Surface Area (%)	1.3	4.9	0.0	7.9	9.6	0.0	0.0	0.0	0.0	0.0	76.4

Figure 15: Size Distribution of Au-Mineral Grains in Sample WWS-13-1

4.4.2.2. Sample WWS-13-2

A total of 9 gold grains were found by optical and SEM gold scanning in sample WWS-13-2, including 5 liberated with an average size of 9 µm, 1 exposed with an average size of 1.9 µm and 3 locked with an average size of 3.7 µm (Table 11). Detailed gold grain sizes, along with association and host mineral information for each grain, are included in Appendix F.

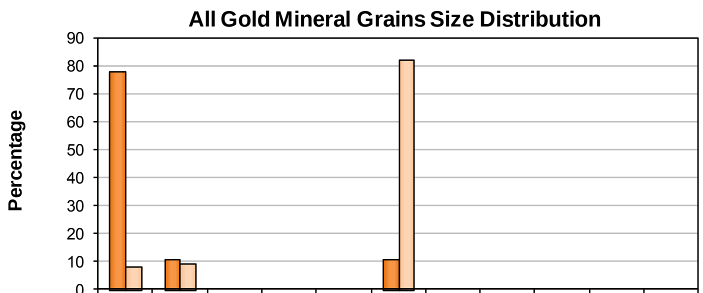
Table 11: Summary of Gold Grain Size Distribution and Association in Sample WWS-13-2

WWS-13-2	Association	No. of Observed Grains	Size Range (um)			Average Size (um)
SP Tip	Liberated	4	1.1	-	27.1	10.3
	Exposed	0	0.0	-	0.0	0.0
	Locked	0	0.0	-	0.0	0.0
	Subtotal	4				10.3
SP Sul 1	Liberated	1	3.7	-	3.7	3.7
	Exposed	0	0.0	-	0.0	0.0
	Locked	1	2.7	-	2.7	2.7
	Subtotal	2				3.2
SP Sul 2	Liberated	0	0.0	-	0.0	0.0
	Exposed	1	1.9	-	1.9	1.9
	Locked	0	0.0	-	0.0	0.0
	Subtotal	1				1.9
SP Mid	Liberated	0	0.0	-	0.0	0.0
	Exposed	0	0.0	-	0.0	0.0
	Locked	0	0.0	-	0.0	0.0
	Subtotal	0				0.0
SP Tail	Liberated	0	0.0	-	0.0	0.0
	Exposed	0	0.0	-	0.0	0.0
	Locked	2	4.0	-	4.4	4.2
	Subtotal	2				4.2
HLS Float	Liberated	0	0.0	-	0.0	0.0
	Exposed	0	0.0	-	0.0	0.0
	Locked	0	0.0	-	0.0	0.0
	Subtotal	0				0.0
TOTAL	Liberated	5	1.1	-	27.1	9.0
	Exposed	1	1.9	-	1.9	1.9
	Locked	3	2.7	-	4.4	3.7
	Total	9	1.1	-	27.1	6.4

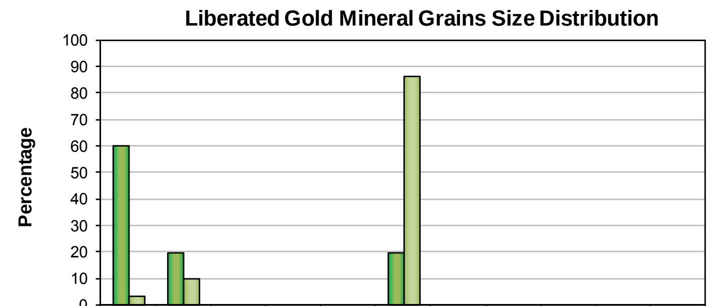
Overall size distributions by frequency and surface area percentage of measured gold mineral grains are presented in Figure 16.

Overall by frequency, more than 89% of the gold grains are less than 10 μm in size and account for ~18% of the total gold surface area. Approximately 11% of the gold grains are between 10 and 30 μm in size and account for ~82% of the total gold surface area.

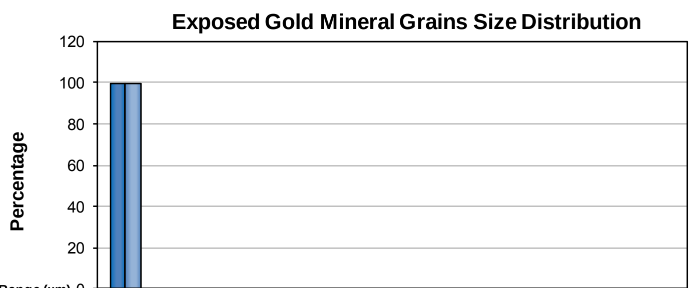
The size distribution trend of liberated gold mineral grains is similar to the overall observed gold. Only a few exposed and locked gold grains were found; their size distribution may not be representative.



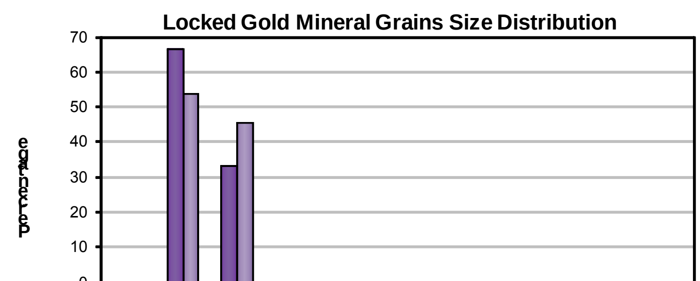
Size Range (µm)	<= 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	> 50
Frequency (%)	77.8	11.1	0.0	0.0	0.0	11.1	0.0	0.0	0.0	0.0	0.0
Surface Area (%)	8.5	9.5	0.0	0.0	0.0	82.0	0.0	0.0	0.0	0.0	0.0



Size Range (µm)	<= 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	> 50
Frequency (%)	60.0	20.0	0.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0
Surface Area (%)	3.5	10.0	0.0	0.0	0.0	86.5	0.0	0.0	0.0	0.0	0.0



Size Range (µm)	<= 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	> 50
Frequency (%)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surface Area (%)	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



Size Range (µm)	<= 2	2 - 4	4 - 6	6 - 8	8 - 10	10 - 12	12 - 14	14 - 16	16 - 18	18 - 20	> 20
Frequency (%)	0.0	66.7	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surface Area (%)	0.0	54.1	45.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Figure 16: Size Distribution of Au-Mineral Grains in Sample WWS-13-2

4.4.2.3. Sample WOS-13-1

A total of 21 gold grains were found by optical and SEM gold scanning in sample WOS-13-1, including 8 liberated with an average size of 9.1 µm, 3 exposed with an average size of 3.9 µm and 9 locked with an average size of 2.8 µm (Table 12). Detailed gold grain sizes, along with association and host mineral information for each grain, are included in Appendix F.

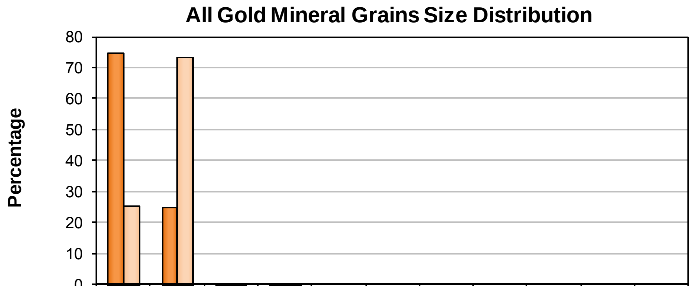
Table 12: Summary of Gold Grain Size Distribution and Association in Sample WWOS-13-1

WOS-13-1	Association	No. of Observed Grains	Size Range (um)			Average Size (um)
SP Tip	Liberated	7	3.5	-	16.3	9.8
	Exposed	3	2.1	-	6.9	3.9
	Locked	2	1.3	-	1.4	1.3
	Subtotal	12				6.9
HLS Float	Liberated	1	3.5	-	3.5	3.5
	Exposed	0	0.0	-	0.0	0.0
	Locked	7	0.6	-	7.5	3.3
	Subtotal	8				3.3
TOTAL	Liberated	8	3.5	-	16.3	9.1
	Exposed	3	2.1	-	6.9	3.9
	Locked	9	0.6	-	7.5	2.8
	Total	20	0.6	-	16.3	5.5

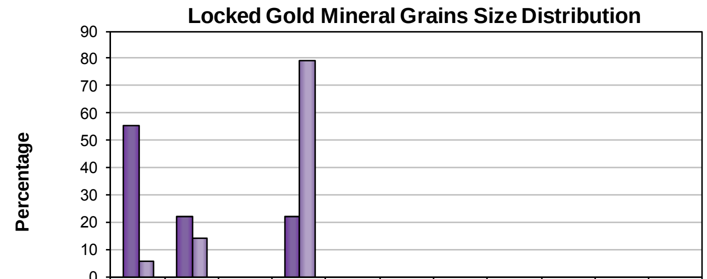
Overall size distributions by frequency and surface area percentage of measured gold mineral grains are presented in Figure 17, along with gold mineral grain size distributions categorized as liberated, exposed and locked.

Overall by frequency, more than 75% of the gold grains are less than 5 µm in size and account for ~26% of the total gold surface area. Approximately 25% of the gold grains are between 5 and 10 µm in size and account for ~74% of the total gold surface area.

The size distribution trend of liberated and locked gold mineral grains is similar to the overall observed gold, the large liberated gold grains contribute to the high surface area percentage. Only a few exposed gold grains were found, so the size distribution may not be representative.

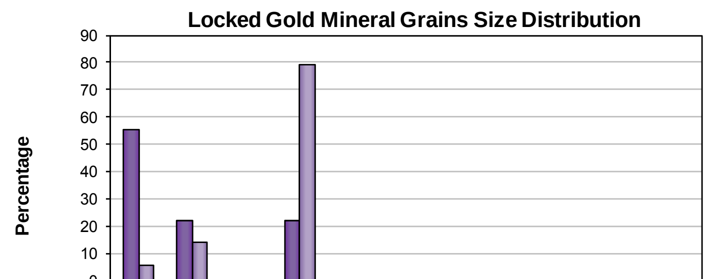


Size Range (µm)	<= 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	> 50
Frequency (%)	74.9	25.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surface Area (%)	25.7	73.4	0.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0



Size Range (µm)	<= 2	2 - 4	4 - 6	6 - 8	8 - 10	10 - 12	12 - 14	14 - 16	16 - 18	18 - 20	> 20
Frequency (%)	55.6	22.2	0.0	22.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surface Area (%)	6.1	14.5	0.0	79.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Size Range (µm)	<= 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	> 50
Frequency (%)	66.7	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surface Area (%)	19.1	80.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



Size Range (µm)	<= 2	2 - 4	4 - 6	6 - 8	8 - 10	10 - 12	12 - 14	14 - 16	16 - 18	18 - 20	> 20
Frequency (%)	55.6	22.2	0.0	22.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surface Area (%)	6.1	14.5	0.0	79.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Figure 17: Size Distribution of Au-Mineral Grains in Sample WOS-13-1

4.4.3. Gold Associated Minerals

For all observed locked and exposed gold grains, their associated minerals or host minerals were also identified and measured through both optical microscopy and SEM-EDS analysis (see detailed data in Appendix F). The distribution of gold is calculated according to the gold grain surface area percentage by association.

4.4.3.1. Sample WWS-13-1

The distribution of the locked and exposed gold grains in sample WWS-13-1, as a function of associated/host mineral, is illustrated in Figure 18. The majority of exposed and locked gold grains (~98.4%, by gold mineral surface area) are associated with pyrite/quartz complexes; only a few grains occur with pyrite (1.1%) and miargyrite ($AgSbS_2$) (<1%).

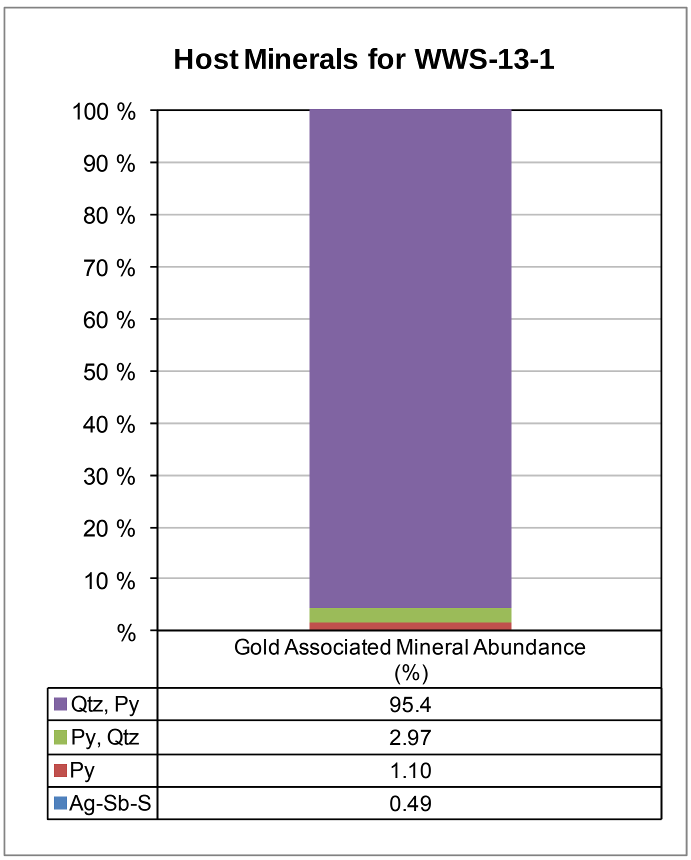


Figure 18: Gold Associated Mineral in Sample WWS-13-1

Qtz – quartz; Py – pyrite; Ag-Ab-S – mainly as miargyrite ($AgSbS_2$)

4.4.3.2. Sample WWS-13-2

The distribution of the locked and exposed gold grains in sample WWS-13-2, as a function of associated/host mineral, is illustrated in Figure 19. The majority of exposed and locked gold grains (~77%, by gold mineral surface area) are associated with pyrite/silicate complexes; a moderate amount of gold grains (23%) occur with pyrite.

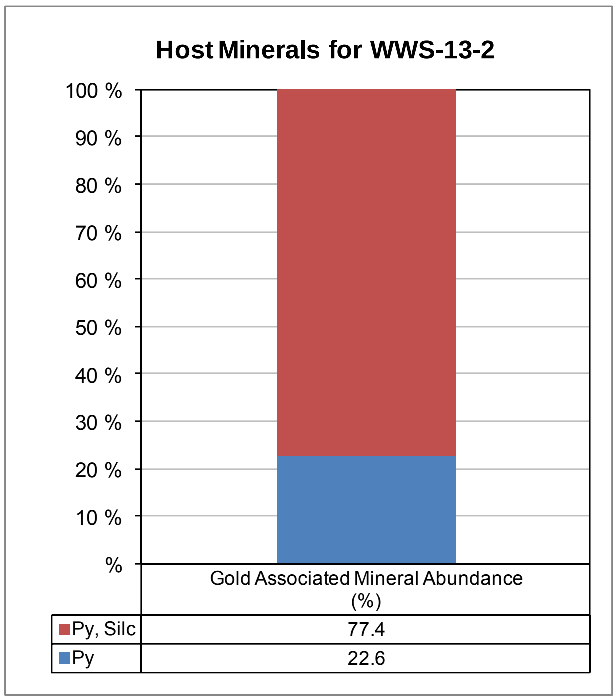


Figure 19: Gold Associated Mineral in Sample WWS-13-2

Qtz – quartz; Py – pyrite; Ag-Ab-S – mainly as miargyrite ($AgSbS_2$)

4.4.3.3. Sample WOS-13-1

The distribution of the locked and exposed gold grains in sample WOS-13-1, as a function of associated/host mineral, is illustrated in Figure 20. The majority of exposed and locked gold grains (>99%, by gold mineral surface area) are associated with quartz complexes; only a very few grains occur with pyrite (<0.1%).

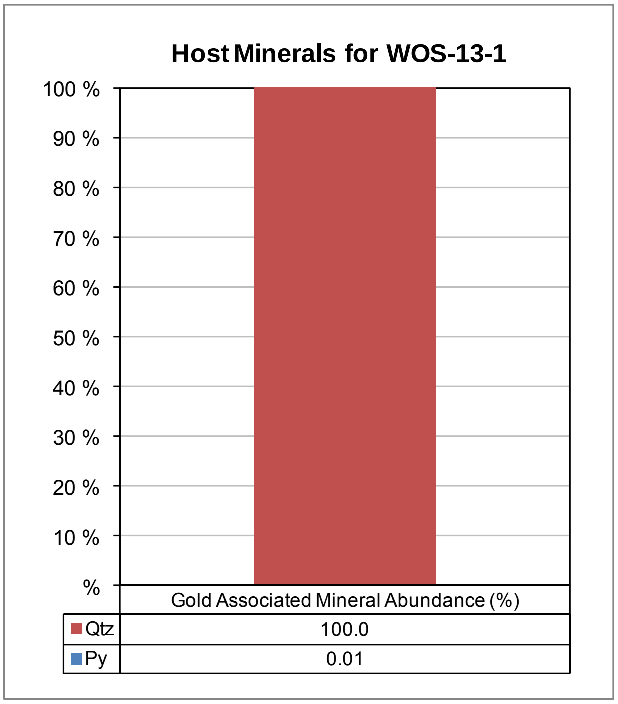


Figure 20: Gold Associated Mineral in Sample WWS-13-1

Py – pyrite; Qtz - quartz

4.5. Overall Gold Mineral Association and Distribution

A modified quantitative estimation of the overall microscopic gold mineral distribution and association is based on the results of the gold mineralogy study on the HLS Sink and gravity products and cyanidation leaching test results on the HLS Float fraction.

4.5.1. Gold Mineral Association and Distribution in HLS Sink Fraction

A quantitative estimation of the microscopic gold mineral distribution and association is based on the percentage of microscopic gold characterized by its association (e.g. liberated, exposed and locked), expressed as a percentage of adjusted total observed gold grain surface area measured in that fraction.

Please note that in this calculation, the head grade of gold is assumed to be from the contribution of microscopic gold. Submicroscopic gold analysis, possible carbon-related surface gold and other possible forms of gold are not part of this project scope, therefore their contribution to the head assay is unknown.

4.5.1.1. Sample WWS-13-1

The gold mineral distribution and association was calculated for the HLS Sink fraction of sample WWS-13-1 and is summarized in Table 13. The results indicate that liberated, exposed and locked gold minerals account for 21.3%, 0.7% and 21.3% of the overall gold grade in the sample, respectively. The total gold distribution by grade in the HLS Sink fraction is 43.3%.

Table 13: Overall Gold Mineral Association and Distribution in Sample WWS-13-1

WWS-13-1 HLS Sink	Association	No. of Observed Grains	Total Observed Surface Area (um2)	% Observed Surface Area Fraction	Overall Gold Distribution
SP Tip/Sul1/Sul2	Liberated	4	2,072	89.8	10.9
	Exposed	1	125	5.4	0.7
	Locked	4	110	4.8	0.6
	Subtotal	*9*	*2,307*	*100*	***12.1***
SP Mid	Liberated	0	0	0.0	0.0
	Exposed	0	0	0.0	0.0
	Locked	4	498	100.0	18.1
	Subtotal	*4*	*498*	*100*	***18.1***
SP Tail	Liberated	1	75	79.9	10.5
	Exposed	0	0	0.0	0.0
	Locked	7	19	20.1	2.6
	Subtotal	*8*	*93*	*100*	***13.1***
TOTAL	Liberated				21.3
	Exposed				0.7
	Locked				21.3
	Total				***43.3***

4.5.1.2. Sample WWS-13-2

The gold mineral distribution and association was calculated for the HLS Sink fraction of sample WWS-13-2 and is summarized in Table 14. The results indicate that liberated, exposed and locked gold minerals account for 5.0%, 0.0% and 13.6% of the overall gold grade in the sample, respectively. The total gold distribution by grade in the HLS Sink fraction is 18.6%.

Table 14: Overall Gold Mineral Association and Distribution in Sample WWS-13-2

WWS-13-2 HLS Sink	Association	No. of Observed Grains	Total Observed Surface Area (um2)	%Observed Surface Area Fraction	Overall Gold Distribution
SP Tip/Sp Sul 1/SP Su	Liberated	5	666	98.7	5.0
	Exposed	1	3	0.41	0.0
	Locked	1	6	0.85	0.0
	Subtotal	*7*	675	*100*	***5.0***
SP Mid /SP Tail	Liberated	0	0	0	0
	Exposed	0	0	0	0
	Locked	2	28	100.0	13.5
	Subtotal	*2*	*28*	*100*	***13.5***
Total	Liberated				5.0
	Exposed				0.0
	Locked				13.6
	Subtotal				18.6

4.5.1.3. Sample WOS-13-1

The gold mineral distribution and association was calculated for the HLS Sink fraction of sample WOS-13-1 and is summarized in Table 15. The results indicate that liberated, exposed and locked gold minerals account for 3.6%, 0.3% and 22.3% of the overall gold grade in the sample, respectively. The total gold distribution by grade in the HLS Sink fraction is 26.2%.

Table 15: Overall Gold Mineral Association and Distribution in Sample WOS-13-1

WOS-13-1, HLS Sink	Association	No. of Observed Grains	Total Observed Surface Area (um2)	%Observed Surface Area Fraction	Overall Gold Distribution
SP Tip/Sul 1/Sul 2	Liberated	7	619	93	3.6
	Exposed	3	47	7	0.3
	Locked	2	3	0.4	0.0
	Subtotal	*12*	*669*	*100*	***3.9***
SP Mid/SP Tail	Liberated	0	0	0	0
	Exposed	0	0	0	0
	Locked	0	0	100.0	22.3
	Subtotal	*0*	*0*	*100*	***22.3***
TOTAL	Liberated				3.6
	Exposed				0.3
	Locked				22.3
	Total				***26.2***

4.5.2. Gold Characteristics of the HLS Float Fraction - Metallurgical Testing

In order to aid the mineralogy deportment characterisation of gold ("free/exposed" & "locked") in the HLS Float products and to determine the cyanide leachable gold content of each sample, a 300 g sub-sample of the HLS Float fraction was submitted for direct cyanidation testing.

The sample was placed in a bottle and pulped with water to 33% solids (W/W). The pH of the pulp was adjusted at 10.7 – 11 with lime as described in Appendix G. Pre-treated carbon and sodium cyanide was added to the bottle and the bottle was placed on the rolls for 48 h. Dissolved oxygen and pH were maintained for the duration of the test. At the end of the leach, the carbon was screened, the pulp was filtered, and the residue was washed with three displacements of water. The final products were submitted for the required assays.

The leach test results are presented for each sample in Table 16 to Table 18. Complete diagnostic leach test details and results are summarized in Appendix G.

Table 16: Cyanidation Results – WWS-13-1

Product	Amount g, mL	Assays, mg/L, g/t Au	% Distribution Au
Carbon	6.41	15.7 *	14.8
Barren Solution 24 h	666	0.01	1.0
Final Residue	296	1.94	84.2
Head (calc.)	299	2.28	100.0
Head (dir.)		2.28	
		Extraction,	**15.8**

* The carbon assay failed. The value is back calculated.

Pulp Density 0h,% 33.0

Pulp Density 24h,% 30.8

Duplicate residue assays, Au, g/t = 1.93
1.95
Average: 1.94 g/t

Table 17: Cyanidation Results – WWS-13-2

Product	Amount g, mL	Assays, mg/L, g/t Au	% Distribution Au
Carbon	6.71	11.7	23.7
Barren Solution 24 h	661	0.01	2.0
Final Residue	302	0.81	74.3
Head (calc.)	303	1.09	100.0
Head (dir.)		1.20	
		Extraction,	**25.7**

Pulp Density 0h,% 33.0

Pulp Density 24h,% 31.4

Duplicate residue assays, Au, g/t = 0.814
0.814
Average: 0.814 g/t

Table 18: Cyanidation Results – WOS-13-1

Product	Amount	Assays, mg/L, g/t	% Distribution
	g, mL	Au	Au
Carbon	6.63	18.7	32.8
Barren Solution 24 h	661	<0.01	1.7
Final Residue	297	0.83	65.5
Head (calc.)	300	1.26	100.0
Head (dir.)		1.39	
		Extraction,	**34.5**

Pulp Density 0h,% 33.0

Pulp Density 24h,% 31.0

Duplicate residue assays, Au, g/t = 0.823
0.843
Average: 0.833 g/t

The overall gold extraction of the HLS Float fractions is summarized in Table 19 for all three samples. It is shown that gold grade distribution in HLS Float is 56.7%, 81.4%, and 73.8% for samples WWS-13-1, WWS-13-2, and WOS-13-1, respectively. Overall, this gold extraction data represents between 10 and 26% of the total gold in the three samples. The gold that remained in the final cyanidation residues was assumed to be locked in silicates, or associated with fine sulphides locked in silicates.

Table 19: Gold Extraction from Heavy Liquid Float Fractions by Cyanide Leaching

Test No.	Au Assay	Au Grade in Residue	% Extraction Au of HLS Float	Au Dist. In HLS Float	% Extraction Au of Overall	% Unleachable Au of overall Sample
	g/t	g/t	%	%	%	%
WWS-13-1 HLS Float	2.28	1.940	15.8	56.7	8.96	47.7
WWS-13-2 HLS Float	1.20	0.814	25.7	81.4	20.9	60.5
WOS-13-1 HLS Float	1.39	0.833	34.5	73.8	25.5	48.3

4.5.3. Mineralogical Gold Deportment and Estimated Gold Recovery of Each Sample

4.5.3.1. Sample WWS-13-1

In sample WWS-13-1, the total Au grade is 3.68 g/t. Of this, 43% is distributed in the HLS (SG 2.9) Sink fraction and 57% is in the HLS Float fraction. Through mineralogical gold deportment study, gold recovery can be estimated by combining test results from the different analyses, as presented in Table 20.

1. Gravity recoverable gold through heavy liquid separation at SG 2.9 is 44.6% and represents ~7% of the total sample mass.

2. Estimated leachable gold of the overall sample equals exposed gold (liberated and exposed) in the HLS Sink fraction plus gold extracted by cyanide leaching in the HLS Float fraction. An estimated low limit for direct leachable gold is approximately 31%. Locked and possible sub-microscopic gold may be partly leachable during actual processing, so the exact recovery may be higher than 31%. Also, fine grinding may gradually improve the exposure of gold.

3. The total gold recovery, combining the gravity recoverable gold in the HLS Sink and leaching recovery in HLS Float, is 52.3%.

Table 20: Overall Gold Distribution of Sample WWS-13-1

Sample ID	Wt (%)	Assays Au g/t	Distribution Au %	Leach-able Au %	Direct Leach[3)] %	Gravity Recovery[4)] %	Total Au Recovery[5)] %
WWS-13-1	**100**	**3.68**	**100**		**31.0**	**43.3**	**52.3**
WWS-13-1 HLS Sink	7.19	21.9	43.3	22.0[1)]			
WWS-13-1 HLS Float	92.8	2.25	56.7	8.96[2)]			

(1) Leach-able gold (including liberated and exposed gold grains) in HLS Sink.
(2) Extracted Au in HLS Float by leach test.
(3) Estimated liberated and exposed gold in HLS Sink plus leached gold in HLS Float.
(4) Gold grade distribution in HLS Sink.
(5) Gravity recovery plus leached gold in HLS Float.

Figure 21 illustrates the overall gold deportment of sample WWS-13-1. Liberated and exposed gold, which may be extracted through leaching, account for 31% of the grade, and locked gold, which may be recovered with finer sample grinding, accounts for 69% of the total gold in the sample.

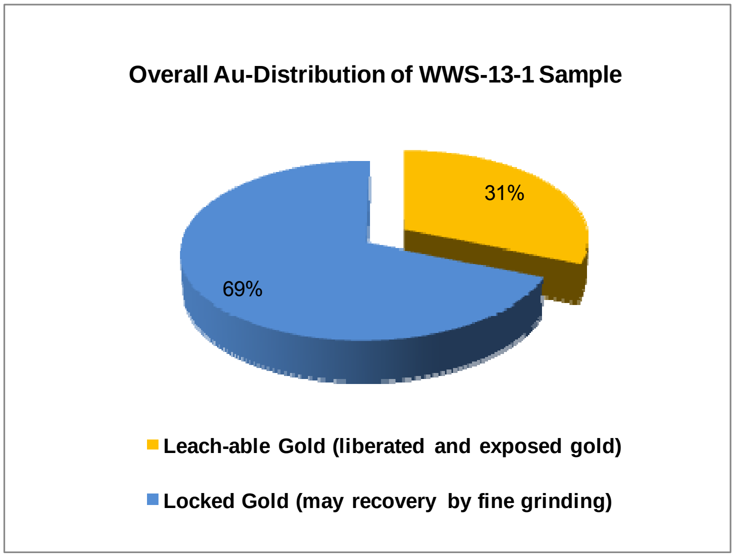


Figure 21: Overall Gold Distribution for Sample WWS-13-1

4.5.3.2. Sample WWS-13-2

In sample WWS-13-2, the total Au grade is 1.4 g/t. Of this, 18.6% is distributed in the HLS Sink fraction (SG 2.9) and 81.4% is in the HLS Float fraction. Through mineralogical gold deportment study, gold recovery can be estimated by combining test results from the different analyses, as presented in Table 21.

1. Gravity recoverable gold through heavy liquid separation at SG 2.9 is 18.6% and represents ~5% of the total sample mass.

2. An estimated low limit for direct leachable gold is approximately 26%. Locked and possible sub-microscopic gold may be partly leachable during actual processing, so the exact recovery may be higher than 26%. Also, fine grinding may gradually improve the exposure of gold.

3. The total gold recovery, combining the gravity recoverable gold in the HLS Sink and the leaching recovery in HLS Float, is 39.5% for sample WWS-13-2.

Table 21: Overall Gold Distribution of Sample WWS-13-2

Sample ID	Wt (%)	Assays Au g/t	Distribution Au %	Leach-able Au %	Direct Leach[3] %	Gravity Recovery[4] %	Total Au Recovery[5] %
WWS-13-2	**100**	**1.4**	**100**		**25.9**	**18.6**	**39.5**
WWS-13-2 HLS Sink	5.00	5.2	18.6	5.0[1)]			
WWS-13-2 HLS Float	95.0	1.2	81.4	20.9[2)]			

(1) Leach-able gold (including liberated and exposed gold grains) in HLS Sink.
(2) Extracted Au in HLS Float by leach test.
(3) Estimated liberated and exposed gold in HLS Sink plus leached gold in HLS Float.
(4) Gold grade distribution in HLS Sink.
(5) Gravity recovery plus leached gold in HLS Float.

Figure 22 illustrates the overall gold deportment of sample WWS-13-2. Liberated and exposed gold, which may be extracted through leaching, accounts for 26% of the gold grade and locked gold, which may be recovered with finer sample grinding, accounts for 74% of the total gold in the sample.

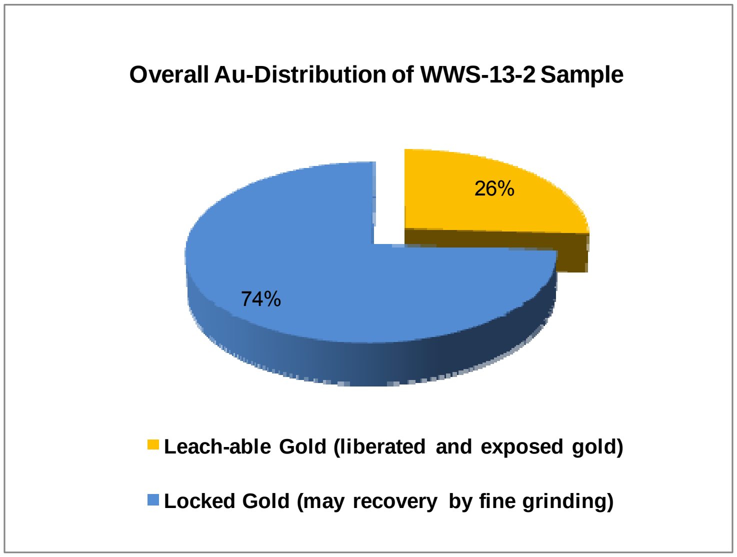


Figure 22: Overall Gold Distribution for Sample WWS-13-2

4.5.3.3. Sample WOS-13-1

In sample WOS-13-1, the total Au grade is 1.75 g/t. Of this, 26.2% is distributed in the HLS (SG 2.9) Sink fraction and 73.8% is in the HLS Float fraction. Through mineralogical gold deportment study, gold recovery can be estimated by combining test results from the different analyses, as presented in Table 22.

1. Gravity recoverable gold through heavy liquid separation at SG 2.9 is 26.2% and represents ~7% of the total sample mass.

2. An estimated low limit for direct leachable gold is approximately 29%. Locked and possible sub-microscopic gold may be partly leachable during actual processing, so the exact recovery may be higher than 29%. Also, fine grinding may gradually improve the exposure of gold.

3. The total gold recovery, combining gravity recoverable gold in the HLS Sink and leaching recovery in the HLS Float, is 51.7% for sample WOS-13-1.

Table 22: Overall Gold Distribution of Sample WOS-13-1

Sample ID	Wt (%)	Assays Au g/t	Distribution Au %	Leach-able Au %	Direct Leach[3] %	Gravity Recovery[4] %	Total Au Recovery[5] %
WOS-13-1	**100**	**1.75**	**100**		**29.4**	**26.2**	**51.7**
WOS-13-1 HLS Sink	7.1	6.4	26.2	3.9[1]			
WOS-13-1 HLS Float	92.9	1.39	73.8	25.5[2]			

(1) Leach-able gold (including liberated and exposed gold grains) in HLS Sink.
(2) Extracted Au in HLS Float by leach test.
(3) Estimated liberated and exposed gold in HLS Sink plus leached gold in HLS Float.
(4) Gold grade distribution in HLS Sink.
(5) Gravity recovery plus leached gold in HLS Float.

Figure 23 illustrates the overall gold deportment of sample WOS-13-1. Liberated and exposed gold, which may be extracted through leaching, account for 29% of the gold grade and locked gold, which may be recovered with finer sample grinding, accounts for 71% of the total gold in the sample.

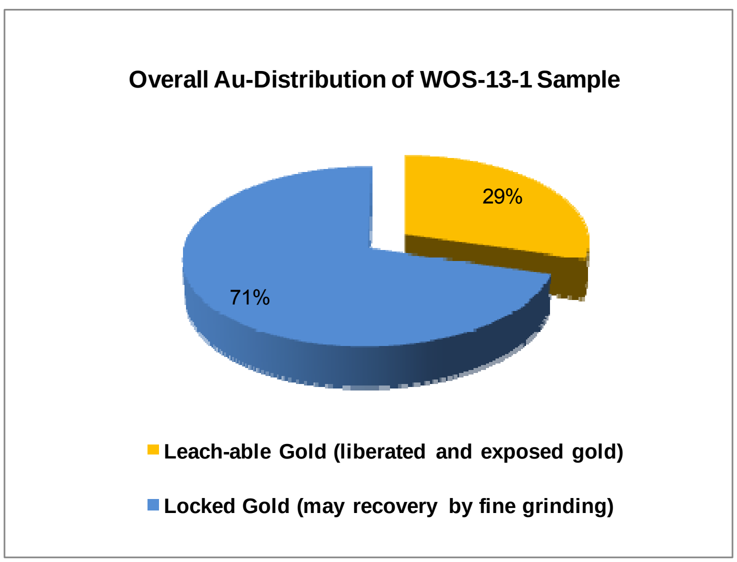


Figure 23: Overall Gold Distribution for Sample MV North F-Med

5. Summary and Main Conclusions

5.1. Mineralogical Gold Deportment

A summary of the results is presented in Figure 23.

Table 23: Mineralogical Characteristics of the Gold Minerals

Sample ID	Au Grade (g/t)	Au Distribution by Association		Size Range (µm)	Average Size (µm)	Au-Mineral Abundance	Minerals Associated with Exposed and Locked Au-Minerals
WWS-13-1	**3.68**	Liberated Exposed	31%	9.7 - 38.1 12.6 - 12.6	20.8 12.6	Gold (92%), Electrum (8%)	quartz/pyrite 98%, pyrite 1%, other minerals 1%
		Locked	69%	0.6 - 24.7	4.2		
			100%	***0.6 - 38.1***	***8.6***		
WWS-13-2	**1.40**	Liberated Exposed	26%	1.1 - 27.1 1.9 - 1.9	9.0 1.9	Gold (7%), Electrum (93%)	pyrite/silicates 77%, pyrite 23%
		Locked	74%	2.7 - 4.4	3.7		
			100%	***1.1 - 27.1***	***6.4***		
WOS-13-2	**1.75**	Liberated Exposed	29%	3.5 - 16.3 2.1 - 6.9	9.1 3.9	Gold (33%), Electrum (67%)	quartz 99.99%, pyrite 0.01%
		Locked	71%	0.6 - 7.5	2.8		
			100%	0.6 - 16.3	**5.5**		

1) <u>Gold Mineral Type and Relative Abundance:</u>

The main gold minerals identified in all three samples are native gold (AuAg alloy, with Ag ≤25 wt%) and electrum (AuAg alloy, with 25%≤ Ag ≤50 wt%). On average, gold minerals in these three samples contain about 71 – 78% Au and 20 – 27% Ag. The high silver content in the gold minerals is noteworthy.

2) <u>Gold Grade Distribution by Gold Mineral Association</u>

In the WWS-13-1 (3.68 g/t Au), exposed gold, including liberated and exposed (attached) grains accounts for 31% and locked gold minerals for 69% of the gold in the sample.

In the WWS-13-2 (1.4 g/t Au), exposed gold grains account for 26% and locked gold minerals for 74%, of the gold in the sample.

In the WOS-13-1 (1.75 g/t Au), by exposed gold grains account for 29% and locked gold minerals for 71%, of the gold in the sample.

Note that these calculations are based on the visible microscopic gold (>0.5 µm) study on the pre-concentration fractions (by HLS and SP) and leaching test results of the float fractions. Submicroscopic gold (or invisible gold, <0.5 µm) and other possible forms of gold are beyond the scope of the current study.

3) <u>Gold Mineral Size</u>

The grain size of the gold minerals varies among the samples. The average gold grain size for WWS-13-1, WWS-13-2, and WOS-13-1 is 8.6 µm, 6.4 µm, and 5.5 µm, respectively. Typically, liberated gold grains are coarser than exposed and locked gold.

4) Host Minerals

The host minerals of exposed and locked gold were also identified and measured. Association results indicate that the major host minerals in sample WWS-13-1 are quartz/pyrite binary particles, in WWS-13-2 are pyrite/silicate intergrowths, followed by pyrite, and quartz in WOS-13-1.

5.2. Estimated Gold Recovery

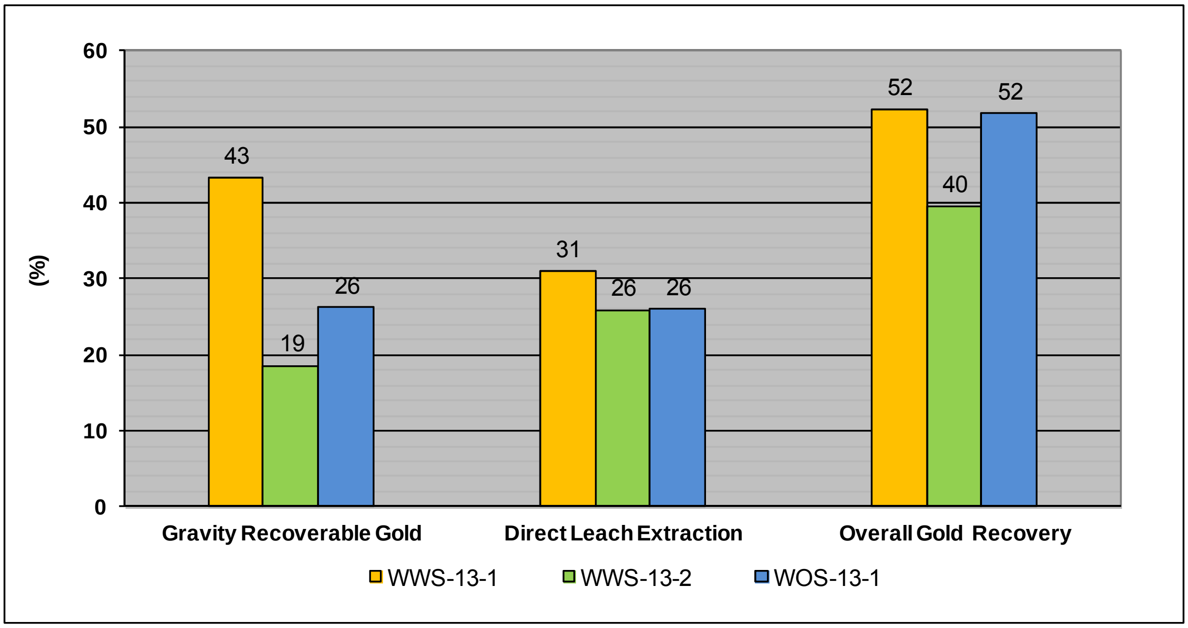
The estimated gold recovery based on all gold deportment data and leach results is presented in Table 24 and Figure 24.

Table 24: Gold Grade Distribution for HLS Products and Estimated Gold Recovery

Sample ID	Wt (%)	Assays Au g/t	Distribution Au %	Leach-able Au %	Direct Leach[3)] %	Gravity Recovery[4)] %	Total Au Recovery[5)] %
WWS-13-1	**100**	**3.68**	**100**		**31.0**	**43.3**	**52.3**
WWS-13-1 HLS Sink	7.19	21.9	43.3	22.0[1)]			
WWS-13-1 HLS Float	92.8	2.25	56.7	8.96[2)]			
WWS-13-2	**100**	**1.4**	**100**		**25.9**	**18.6**	**39.5**
WWS-13-2 HLS Sink	5.00	5.2	18.6	5.0[1)]			
WWS-13-2 HLS Float	95.0	1.2	81.4	20.9[2)]			
WOS-13-1	**100**	**1.75**	**100**		**29.4**	**26.2**	**51.7**
WOS-13-1 HLS Sink	7.1	6.4	26.2	3.9[1)]			
WOS-13-1 HLS Float	92.9	1.39	73.8	25.5[2)]			

(1) Leach-able gold (including liberated and exposed gold grains) in HLS Sink.
(2) Extracted Au in HLS Float by leach test.
(3) Estimated liberated and exposed gold in HLS Sink plus leached gold in HLS Float.
(4) Gold grade distribution in HLS Sink.
(5) Gravity recovery plus leached gold in HLS Float.

Figure 24: Estimated Gold Recovery



1) *Gravity Recoverable Gold*

The gravity recoverable gold is based on the distribution of gold recovered to the HLS Sink fraction. For sample WWS-13-1, through HLS testing at a density split point of 2.9 g/cm^3, a total of 43% of the gold concentrates in the HLS Sink fraction (accounting for 7.2% of the total mass), indicating a moderate amount of potential gravity recoverable gold.

For sample WWS-13-2, through HLS testing at a density split point of 2.9 g/cm^3 , a total of 18.6% of the gold concentrates in the HLS Sink fraction (accounting for 5.0% of the total mass), indicating a low amount of potential gravity recoverable gold.

For sample WOS-13-1, through HLS testing at a density split point of 2.9 g/cm^3, a total of 26.2% of the gold concentrates in the HLS Sink fraction (accounting for 6.4% of the total mass), indicating a low amount of potential gravity recoverable gold.

2) *Diagnostic Leach Tests on the HLS Float Products*

Leachable gold is estimated by direct leaching of the HLS Float fraction. Only a few gold grains were found in the polished sections scanned from the HLS Float products. In order to complete the gold deportment study and determine recovery of the overall samples, diagnostic leach tests were conducted on a 300 g split aliquot of HLS Float fraction of each sample to determine the cyanide leachable gold content. Low to moderate gold extraction (16 to 34%) was achieved in the HLS Float products of each sample. Based on the gold distribution in the Float products, the overall gold extraction calculated by overall sample was between 9% and 26%.

Estimated Direct Leachable Gold Extraction

Direct leachable gold is estimated by the amount of leachable gold in the HLS Sink and recovery by direct leaching in the HLS Float. Generally, only liberated and exposed gold may directly exposed to the cyanide solutions. The estimated direct leachable gold is calculated by adding the percentage of exposed gold (liberated and exposed gold) in the HLS Sink fraction with the percentage of gold extraction by cyanidation of the HLS Float fraction. The estimated direct leachable gold is ~31% for sample WWS-13-1, ~26% for WWS-13-2, and ~29% for sample WOS-13-1. Please note that because sub-microscopic gold is not investigated in this study, the total liberated and exposed gold amount may be over-estimated, along with the estimated direct leachable gold.

3) Overall Gold Recovery

The total overall estimated gold recovery by sample is calculated by adding the total gravity recoverable gold in the HLS Sink and the leach extraction recovery of gold in the HLS Float. The total gold recovery is estimated at 52.3%, 39.5%, and 51.7% for samples WWS-13-1, WWS-13-2, and WOS-13-1, respectively.

5.3. Other Factors May Affecting Gold Extractive Metallurgy

In addition to the predictive gold recovery based on the gold mineralogy and diagnostic leach testwork results, the bulk mineralogy of the samples (determined by QEMSCAN and XRD) may also influence the gold extractive metallurgy processing. For all three samples, the high abundance of clay minerals, including kaolinite and the typical swelling clays montmorillonite and palygorskite, may cause serious problems during gold extraction processing, from sample preparation through final leaching affecting overall recovery. A detailed study of the clay mineral speciation and its variation during future processing is recommended.

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Appendix A – Glossary and Terminology for Gold Deportment Study

Glossary and Terminology for Gold Deportment Study

Mineralogical Instrumentation and Optical Terminology:

- XRD: *X-ray diffraction*
- SEM-EDS: *Scanning electron microscope with energy-dispersive spectrometer*
- Feature Analysis*: A function on the Oxford SEM system*
- BSE*: Backscattered electron images*
- QEMSCAN: *Quantitative Evaluation of Materials by Scanning Electron Microscopy*
- BMA: *Bulk Mineral Analysis (part of the QEMSCAN analysis modes) is performed using a linear intercept method, and is used to provide statistically abundant data for speciation and mineral distribution.*
- PMA: *Particle Mineral Analysis (part of the QEMSCAN analysis modes) is a two-dimensional mapping analysis aimed at providing mineral speciation, distribution and resolving liberation and locking characteristics of a generic set of particles (dependant on the grade).*
- SMS: *Specific Mineral Search (part of the QEMSCAN analysis modes), used if a phase reports as a low-grade constituent and can be located by thresholding of the back-scattered electron intensity, to provide liberation and locking characteristics.*
- TMS: *Trace Mineral Search (part of the QEMSCAN analysis modes), where a phase reports as a trace constituent and can be located by thresholding of the back-scattered electron intensity, to provide to provide liberation and locking characteristics; usually for Au/Ag and PGE ore types..*
- QEM-ARMS: *or Automated Rapid Mineral Scan by QEMSCAN, is a semi-quantitative method designed to provide simple bulk mineralogical deportment as well as basic liberation analysis of one or two minerals of interest which occur in significant quantities (>1% mineral mass).*
- EMPA: *Electron probe micro-analyzer*
- PPRL: *Plane polarized reflected light*
- D-SIMS: *Dynamic secondary ion mass spectrometry*

Chemical Analysis:

- Routine Pulp: *Routine analytical techniques such as pyrosulfate XRF, routine Pb fire assay etc.*
- XRF*: X-Ray Fluorescence analysis method*
- WRA by XRF*: Borate fusion Whole Rock Analysis, pulp-major oxides and LOI*

- WRA by ICP: *Sodium peroxide fusion for highly base metal mineralized sample types and/or high grade sulphide ores.*

- ICP-*OES: Inductively coupled plasma-optical emission spectroscopy analysis, including different packages of multi-element analysis for mineralized sample, e.g. strong acid digest for low mineralized sample types.*

- Au and Ag assay: *Routine Pulp by fire assay*

- $S^{=}$: *Pulp-sulphur as sulphide*

- As and Fe: *Routine pulp XRF*

Sample Preparation and Pre-concentration

Heavy Liquid Separation

- HLS: *Heavy liquid separation*

- M.I.: *Methylene iodide. A liquid compound (SG 3.32) that is used as a heavy liquid to separate minerals.*

- Density: *The mass of a substance per unit volume, usually expressed in grams per cubic centimeter (g/cc)*

- SG: *Specific gravity; the ratio between the weight of a substance and the weight of an equal volume of water at 4°C*

- HLS Float: *The portion of the sample that is lighter than the SG of the heavy liquid*

- HLS Sink: *The portion of the sample that is heavier than the SG of the heavy liquid*

Wilfley Tabling Gravity Concentration

- W.T. or WT: *Wilfley Table method of gravity concentration*

- WT Tip: *Wilfley tabling Tip or concentrate fraction*

- WT Mid: *Wilfley tabling middling fraction*

- WT *Tail: Wilfley tabling tails fraction*

Superpanning

- Superpanner: *The mechanical device that concentrates the sample based on the minerals specific gravity*

- Superpanning: *The gravity separation method with Superpanner.*

- SP: *Superpanning methods or products*
- SP Tip: *Superpanning tip or concentrate fraction, the separated sample at the front end of the pan that contains minerals with the highest specific gravity. It is generally composed of sulphides & Au-PGM-grains and varies based on ore type and mill product*
- SP Sulphides (or SP Oxides) and SP Mids: *The separated sample that lies between the Tip and the Pan tail. It is generally composed of liberated sulphides, oxides and sulphide/silicate binary particles.*
- SP Tail: *The sample that is closest to the back of the pan. It is dominantly composed of silicates and/or carbonates of various grain sizes. The Pan Tails often makes up the greatest proportion by volume for the sample*
- P.S. or PS: *Polished Section, a 25 mm polished epoxy grain mount or a 30mm block with a 25mm centre for the sample - using the Bakelite rings.*

Gold Mineralogy Related Terminology

- Gold Mineral*: A mineral in which Au occurs as a major component, such as native gold, electrum, and gold tellurides, antimonides and bismuthides*
- Native Gold: *Gold-Silver alloy with a minimum Au content of 75%*
- Electrum: *Gold-Silver alloy with 50 – 75 wt% Au;*
- *Kustelite: Silver-Gold alloy with 50 – 75 wt% Ag;*
- *Native Silver: Silver-Gold alloy with a minimum Ag content of 75%*
- Sulphides: *Sulphide Minerals*
- FeOx: *Iron oxide minerals*
- Nop: *Non-opaque minerals*
- *Sil: Silicate minerals*
- Grain: *A mineral grain that consists of a single mineral type. Several grains can make up a particle. In the case of a liberated grain, the terms grain and particle are equivalent.*
- Measurement Parameters of Gold Grain from SEM Feature Analysis:

  (1) Length – Max feret in microns

  (2) Breath – Min feret in microns

  (3) Area – Area of whole feature in square microns

(4) *ECD – Equivalent circle diameter in microns, equals the grain size (Square root of (4 x Area)/Pi)*

- Measurement Parameters of Gold Grain from Optical Microscopy Measurement (two-dimensional cross-sections):

(1) *Length – Max grain boundary in microns*

(2) *Breath – Min grain boundary in microns*

(3) *Area – Area of whole grain in square microns, equals Length x Breath*

(4) *Size – Equals Square root of (4 x Area)/Pi*

- Gold Mineral Association: *refers to the nature of the gold and how it occurs in the sample with respect to adjacent minerals, e.g. liberated, exposed and locked.*

(4) *Liberated: A gold grain with no other mineral attached and/or a binary particle with ≥80% of gold surface area exposure to the epoxy medium*

(5) *Exposed: A gold grain containing <80% of surface area exposure to the epoxy medium and occurs adjacent to another mineral.*

(6) *Locked: A gold grain totally enclosed in other mineral or minerals, with 0% exposure to the epoxy medium in a two-dimensional plane, including:*

- *Gold as inclusions that is completely encapsulated in a host mineral, e.g. fine gold in a coarse pyrite;*
- *Gold as inclusions in a porous or framboidal permeable host minerals, e.g. fine gold in a porous pyrite;*
- *Gold in interstitial spaces between mineral grains and at borders of minerals grains (including same mineral or different minerals)*
- *Fracture-controlled gold – gold enclosed in fractures and micro-fractures, as veinlets and micro-veinlets in the host minerals;*

It must be noted that Locked gold in this report includes gold which occurs along micro-fractures and cracks or pits along mineral grain cleavages and boundaries, as well as gold inclusions in sulphides or other minerals, and therefore may be leachable, especially at finer grind sizes. In another side, gold occurring as "locked" may in fact be exposed and leachable if viewing in three-dimensional profile. Therefore the estimated amount of locked gold does not reflect the amount of non-leachable or non-recoverable gold. The recovery of locked gold will also be dependent on 1) the nature of the carrier mineral(s), which may be leachable; 2) micro-textures such as micro-fractures, cleavage and porosity of the host minerals; and 3) the grind size of the leach work, which may be significantly finer than the grind size of the mineralogy study and thus the locked grains may actually be exposed at finer grinds.

- Coated gold: *Gold with a coating (e.g. Fe-oxide, gypsum, jarosite) usually formed by precipitation during weathering, autoclaving or cyanidation.*

- *Microscopic Gold or Visible Gold: Gold mineral grain with a size greater than 0.5 µm, therefore visible under the optical and scanning electron microscope;*

- *Submicroscopic Gold or invisible gold: Solid solution and/or colloidal size particulate gold dispersed in the crystal structure of sulphide minerals such as pyrite and arsenopyrite.*

Appendix B – Chemical Certificates of Analysis

SGS Canada Inc.
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Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

LR Internal Dept 14
Attn : Huyun Zhou / Elaine Glover

---, ---

Phone: ---
Fax:---

06-December-2013

Date Rec. : 29 October 2013
LR Report : **CA03206-OCT13**
Project : CALR-14322-001
Client Ref : MI5030-OCT13

CERTIFICATE OF ANALYSIS

Sample ID	Al2O3 %	Fe2O3 %	MgO %	CaO %	K2O %	TiO2 %	MnO %	Cr2O3 %	V2O5 %	Na2O %	P2O5 %	Si %
1: 3775-WWS-13-1	13.0	5.60	0.328	1.50	4.58	0.890	0.009	0.012	0.016	0.48	0.98	29.6
2: 3775-WWS-13-2	11.2	3.68	0.232	0.36	5.09	0.354	0.005	0.013	< 0.008	0.85	0.17	33.6
3: 3775-WOS-13-1	12.6	5.08	0.269	0.19	4.66	0.416	0.006	0.008	< 0.008	0.49	0.043	32.0

Control Quality Assay
Not Suitable for Commercial Exchange

Tom Watt
Project Coordinator

OnLine LIMS

0000072417

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---, ---

Phone: ---
Fax:---

06-December-2013

Date Rec. : 29 October 2013
LR Report : **CA03207-OCT13**
Project : CALR-14322-001
Client Ref : MI5030-OCT13

CERTIFICATE OF ANALYSIS

Sample ID	Au g/t	Ag g/t
1: 3775-WWS-13-1	3.69	11.8
2: 3775-WWS-13-1 Cut 2	3.67	10.2
3: 3775-WWS-13-2	1.40	< 10
4: 3775-WWS-13-2 Cut 2	1.40	< 10
5: 3775-WOS-13-1	1.74	13.9
6: 3775-WOS-13-1 Cut 2	1.76	14.3

Control Quality Assay
Not Suitable for Commercial Exchange

Tom Watt
Project Coordinator

OnLine LIMS

0000072418

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

LR Internal Dept 14
Attn : Huyun Zhou / Elaine Glover

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Phone: ---, Fax:---

06-December-2013

Date Rec. : 29 October 2013
LR Report : **CA03208-OCT13**
Project : CALR-14322-001
Client Ref : MI5030-OCT13

CERTIFICATE OF ANALYSIS

Sample ID	Fe %	As %	S= %
1: 3775-WWS-13-1	3.84	0.20	3.88
2: 3775-WWS-13-2	2.58	0.046	2.64
3: 3775-WOS-13-1	3.71	0.084	3.88

Control Quality Assay
Not Suitable for Commercial Exchange

Tom Watt
Project Coordinator

OnLine LIMS

0000072419

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LR Internal Dept 14
Attn : Huyun Zhou / Elaine Glover

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06-December-2013

Date Rec. : 29 October 2013
LR Report : **CA03209-OCT13**
Project : CALR-14322-001
Client Ref : MI5030-OCT13

CERTIFICATE OF ANALYSIS

Sample ID	C(t) %	TCM %
1: 3775-WWS-13-1	< 0.01	< 0.05
2: 3775-WWS-13-2	< 0.01	< 0.05
3: 3775-WOS-13-1	< 0.01	< 0.05

Tom Watt
Project Coordinator

OnLine LIMS

0000072420

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LR Internal Dept 14
Attn : Huyun Zhou / Elaine Glover

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Phone: ---, Fax:---

06-December-2013

Date Rec. : 13 November 2013
LR Report : **CA02501-NOV13**
Project : CALR-14322-001
Client Ref : MI5030-OCT13

CERTIFICATE OF ANALYSIS

Sample ID	Au g/t
1: 3775-WWS-13-1 SP Sul 2	16.5
2: 3775-WWS-13-1 SP Mid	17.2
3: 3775-WWS-13-1 SP Tail	16.9
4: 3775-WWS-13-1 SP Flt 2	2.25
5: 3775-WWS-13-1 HLS Flt	2.28
6: 3775-WWS-13-2 SP Sul 1	10.3
7: 3775-WWS-13-2 SP Sul 2	9.63
8: 3775-WWS-13-2 SP Mid	4.95
9: 3775-WWS-13-2 SP Tail	4.40
10: 3775-WWS-13-2 SP Flt 2	1.06
11: 3775-WWS-13-2 HLS Flt	1.20
12: 3775-WOS-13-1 SP Sul 1	7.04
13: 3775-WOS-13-1 SP Sul 2	5.29
14: 3775-WOS-13-1 SP Mid	5.47
15: 3775-WOS-13-1 SP Tail	7.70
16: 3775-WOS-13-1 SP Flt 2	1.32
17: 3775-WOS-13-1 HLS Flt	1.39

Control Quality Assay
Not Suitable for Commercial Exchange

Tom Watt
Project Coordinator

OnLine LIMS

0000072416

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LR Internal Dept 14
Attn : Huyun Zhou / Elaine Glover

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Phone: ---
Fax:---

06-December-2013

Date Rec. : 13 November 2013
LR Report : **CA02498-NOV13**
Project : CALR-14322-001
Client Ref : MI5030-OCT13

CERTIFICATE OF ANALYSIS

Sample ID	Fe %	As %	S= %
1: 3775-WWS-13-1 SP Mid	22.7	0.84	26.0
2: 3775-WWS-13-1 SP Tail	32.2	0.81	34.1
3: 3775-WWS-13-1 SP Flt 2	2.20	0.15	2.19
4: 3775-WWS-13-1 HLS Flt	2.28	0.15	2.00
5: 3775-WWS-13-2 SP Sul 1	38.1	0.41	40.0
6: 3775-WWS-13-2 SP Mid	12.1	0.16	13.6
7: 3775-WWS-13-2 SP Tail	10.0	0.16	11.1
8: 3775-WWS-13-2 SP Flt 2	2.04	0.037	2.05
9: 3775-WWS-13-2 HLS Flt	2.01	0.040	1.99
10: 3775-WOS-13-1 SP Sul 2	37.1	0.48	39.4
11: 3775-WOS-13-1 SP Mid	25.4	0.40	27.4
12: 3775-WOS-13-1 SP Tail	35.2	0.54	37.3
13: 3775-WOS-13-1 SP Flt 2	1.82	0.056	1.84
14: 3775-WOS-13-1 HLS Flt	1.79	0.055	1.52

```
Control Quality Assay
Not Suitable for Commercial Exchange
```

Tom Watt
Project Coordinator

OnLine LIMS

0000072414

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LR Internal Dept 14
Attn : Huyun Zhou / Elaine Glover

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---, ---
Phone: ---, Fax:---

06-December-2013

Date Rec. : 13 November 2013
LR Report : **CA02500-NOV13**
Project : CALR-14322-001
Client Ref : MI5030-OCT13

CERTIFICATE OF ANALYSIS

Sample ID	**S= %**
1: 3775-WWS-13-1 SP Sul 2	30.7

```
Control Quality Assay
Not Suitable for Commercial Exchange
```

Tom Watt
Project Coordinator

Appendix C – QEM-RMS Bulk Mineralogy Study

SGS

QEM AUTOMATED RAPID MINERAL SCAN

Project Samples

prepared for

New Sleeper Gold

Project 14322-001 - MI6005-OCT13

November 29, 2013

Kathryn Sheridan, P.Geo.
Mineralogist

Chris Gunning, B.Sc. Hons.
Senior Mineralogist

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a division of SGS Canada Inc. | Tel: (705) 652-2000 Fax: (705) 652-6365 www.sgs.com www.sgs.com/met
Member of the SGS Group (SGS SA)

QEMSCAN Method Summary

Mineral Identification and Interpretation:

The QEM-ARMS, or Automated Rapid Mineral Scan is a method designed to provide simple bulk mineralogy using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy) (METH# 8.11.1) and XRD (X-ray Diffraction, BRUKER AXS D8 Advance Diffractometer). Semi-quantitative mineral abundance, as well as liberation and grain size analyses of one or two key minerals of interest which occur in significant quantities (>1% mineral mass) are presented.

Test Limitations:

The reader should note that this is a semi-quantative study. Any data should be treated as approximations. The study is subject to the representativity of the sample selected, and its accuracy limited by the particle statistics.

XRD Method Summary

Mineral Identification and Interpretation:

Mineral identification and interpretation involve matching the diffraction pattern of an unknown material to patterns of single-phase reference materials. The reference patterns are compiled by the Joint Committee on Powder Diffraction Standards - International Center for Diffraction Data (JCPDS-ICDD) database and released on software as Powder Diffraction Files (PDF).

Interpretations do not reflect the presence of non-crystalline and/or amorphous compounds. Mineral proportions are based on relative peak heights and may be strongly influenced by crystallinity, structural group or preferred orientations. Interpretations and relative proportions should be accompanied by supporting petrographic and geochemical data (Whole Rock Analysis, Inductively Coupled Plasma - Optical Emission Spectroscopy, etc.).

The Qualitative XRD method (METH # 8-8-1) used by SGS Minerals Services,
P.O. Box 4300, 185 Concession Street, Lakefield, Ontario, Canada K0L 2H0.
Tel: (705) 652-2000 Fax: (705) 652-6365 Mini-method available upon request.

Terminology for Association data

Association classes were defined as the following;

- **Free Pyrite** - A particle that has >=95% of Pyrite

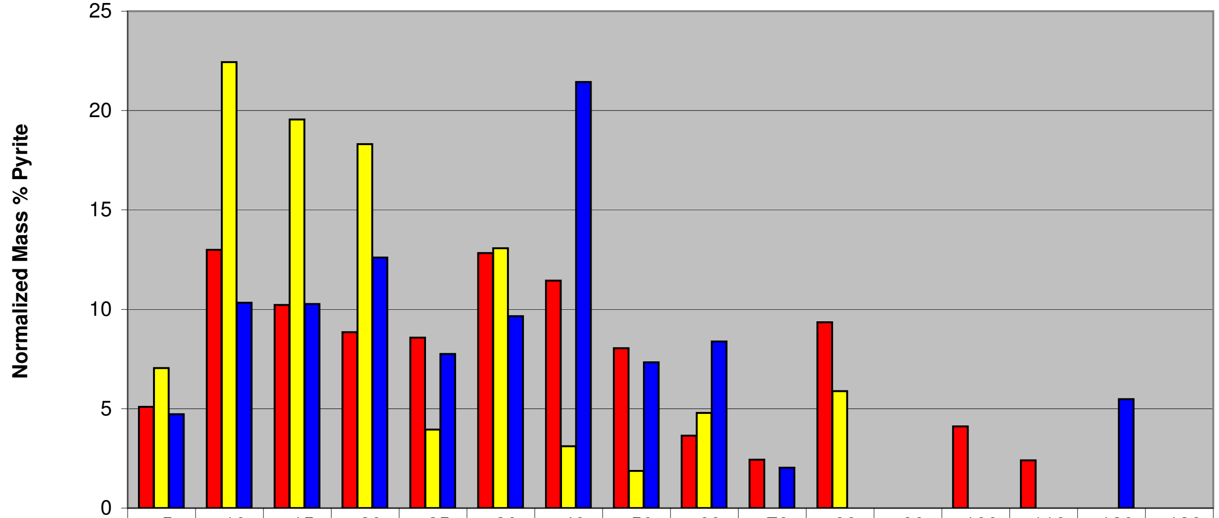
- **Liberated Pyrite**: A particle that has ≥80 but <95 area% of Pyrite

- **Pyrite: Quartz** - A particle that has ≥95 area% of Pyrite + Quartz
- **Pyrite: Carbonates** - A particle that has ≥95 area% of Pyrite + Carbonates
- **Pyrite: Hard Silicates** - A particle that has ≥95 area% of Pyrite + Carbonates
- **Pyrite**: **Other Sulphides** - A particle that has ≥95 area% of Pyrite + Other Sulphides
- **Pyrite**: **Other** - A particle that has ≥95 area% of Pyrite + Any Other Minerals
- **Complex**: Any combination of the above definitions has been defined as a complex particle.

QEMSCAN Modals

Survey		New Sleeper Gold		
Project/LIMS		14322-001 - MI6005-OCT13		
Sample		3775-WWS-13-1	3775-WWS-13-2	3775-WOS-13-1
Mineral Mass (%)	Pyrite	7.07	4.19	7.15
	Arsenopyrite	0.41	0.03	0.11
	Stibnite	0.04	0.09	0.00
	Quartz	26.6	39.2	38.3
	K-Feldspar	17.2	20.9	13.1
	Plagioclase	0.22	0.15	0.06
	Muscovite	3.46	0.34	9.20
	Kaolinite	8.55	4.78	4.83
	Other Clays	32.2	29.6	26.4
	Ti-Oxides	1.01	0.36	0.60
	Apatite	2.59	0.08	0.00
	Other	0.60	0.35	0.23

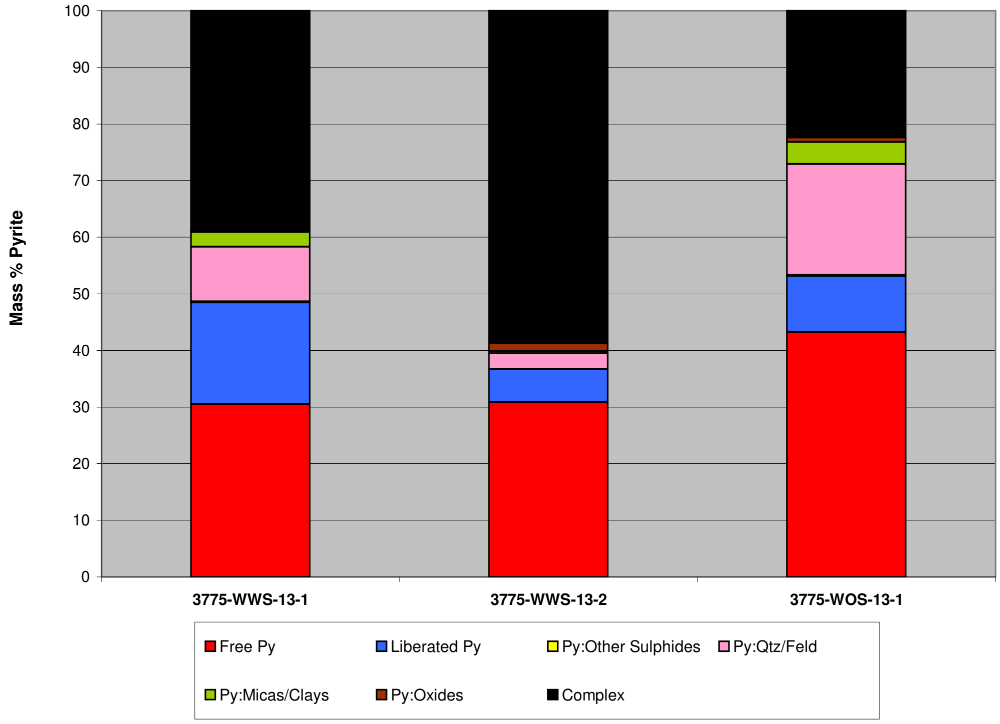
Histograms - Pyrite Size by Mass



	+5	+10	+15	+20	+25	+30	+40	+50	+60	+70	+80	+90	+100	+110	+120	+130
3775-WWS-13-1	5.09	12.99	10.22	8.85	8.58	12.83	11.45	8.04	3.64	2.43	9.35	0.00	4.12	2.41	0.00	0.00
3775-WWS-13-2	7.04	22.44	19.55	18.30	3.95	13.06	3.11	1.87	4.79	0.00	5.88	0.00	0.00	0.00	0.00	0.00
3775-WOS-13-1	4.73	10.34	10.26	12.60	7.75	9.65	21.44	7.33	8.38	2.03	0.00	0.00	0.00	0.00	5.48	0.00

Size (µm)

Pyrite Association



Normalized Mass of Pyrite Across Sample

Mineral Name	3775-WWS-13-1	3775-WWS-13-2	3775-WOS-13-1
Free Py	30.5	30.9	43.2
Liberated Py	17.9	5.8	10.0
Py:Other Sulphides	0.2	0.0	0.2
Py:Qtz/Feld	9.7	2.8	19.6
Py:Micas/Clays	2.6	0.4	3.9
Py:Oxides	0.4	1.4	0.8
Complex	38.7	58.8	22.4
Total	**100.0**	**100.0**	**100.0**

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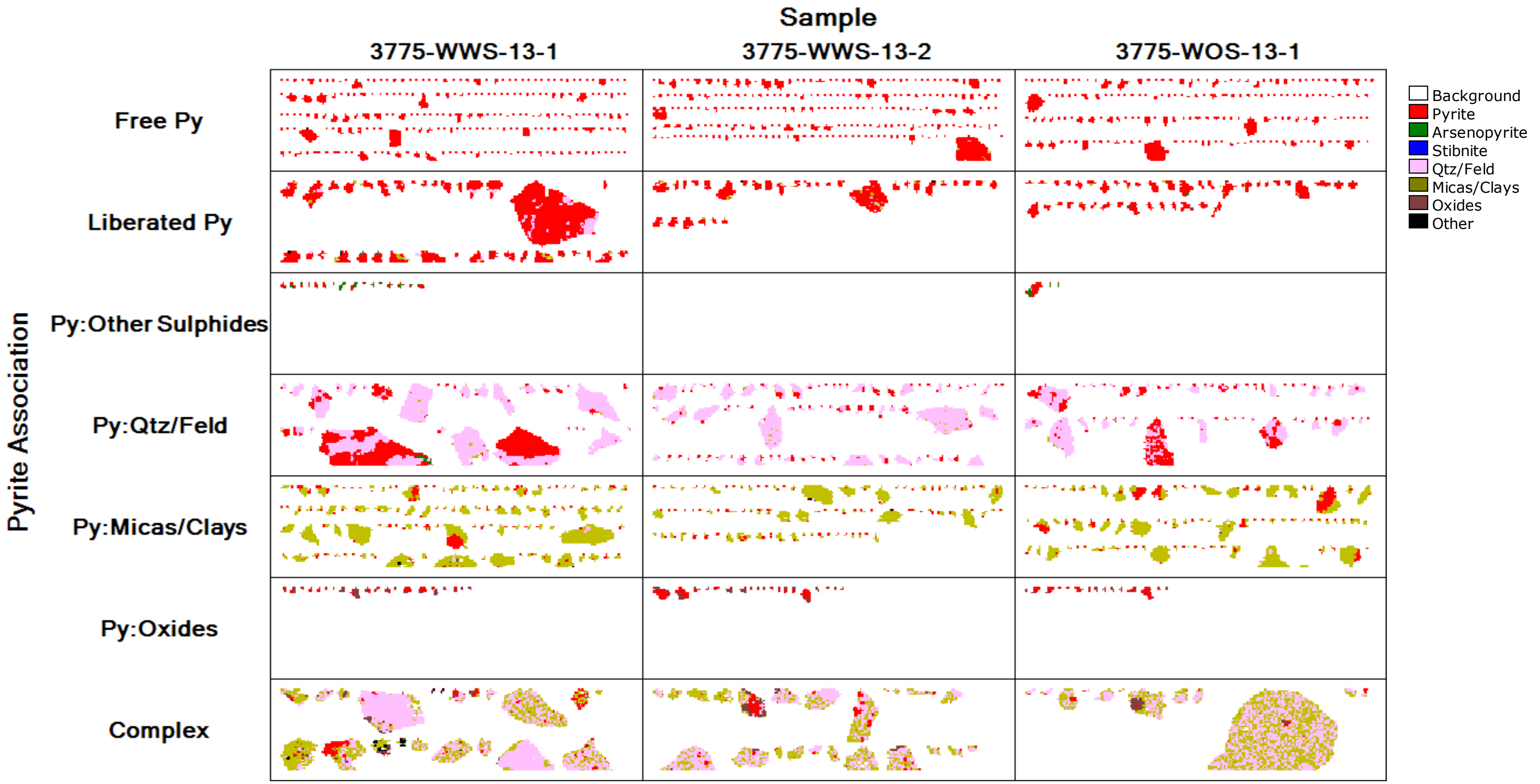
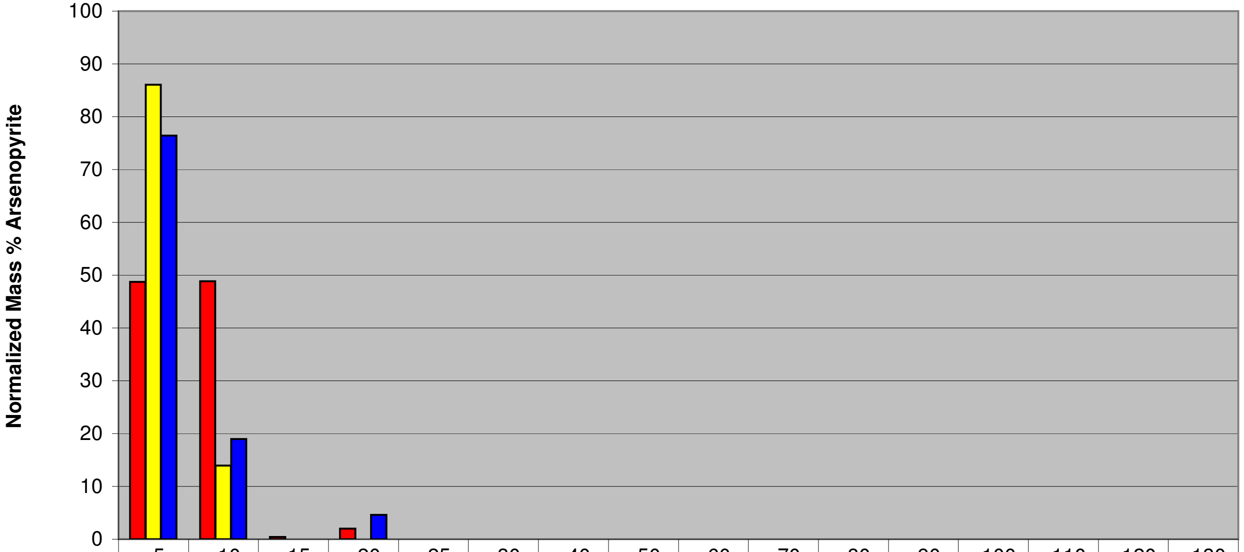
QEM AUTOMATED RAPID MINERAL SCAN
Data Report

New Sleeper Gold
14322-001 - MI6005-OCT13
11/29/2013

Image Grid - Pyrite Association



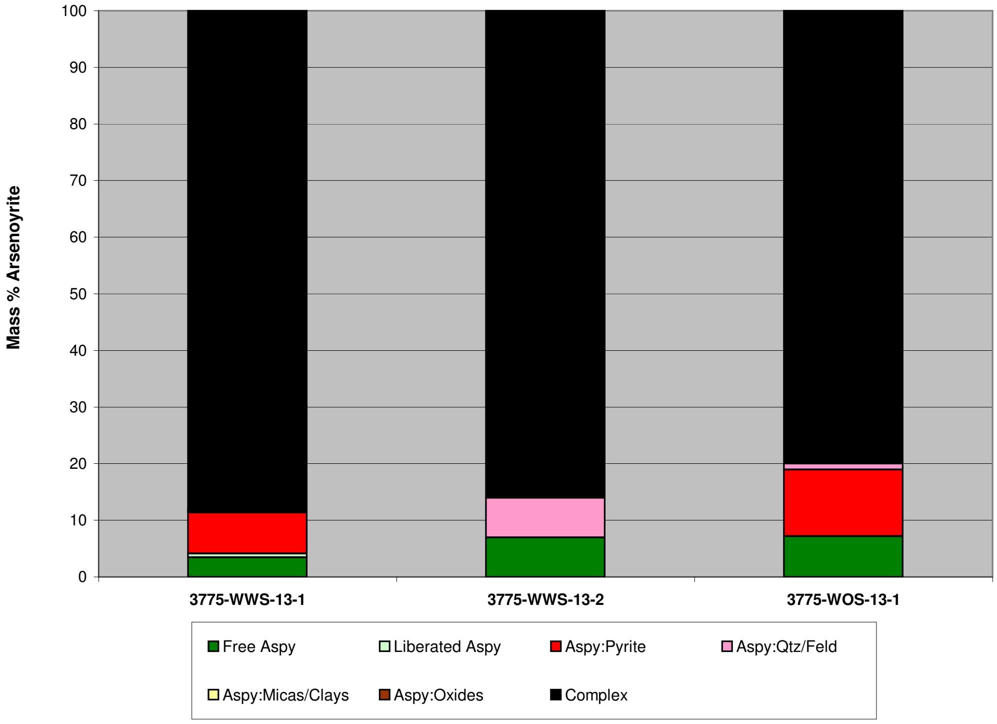
Histograms - Arsenopyrite Size by Mass



	+5	+10	+15	+20	+25	+30	+40	+50	+60	+70	+80	+90	+100	+110	+120	+130
3775-WWS-13-1	48.74	48.83	0.45	1.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3775-WWS-13-2	86.05	13.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3775-WOS-13-1	76.41	18.97	0.00	4.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Size (µm)

Arsenopyrite Association



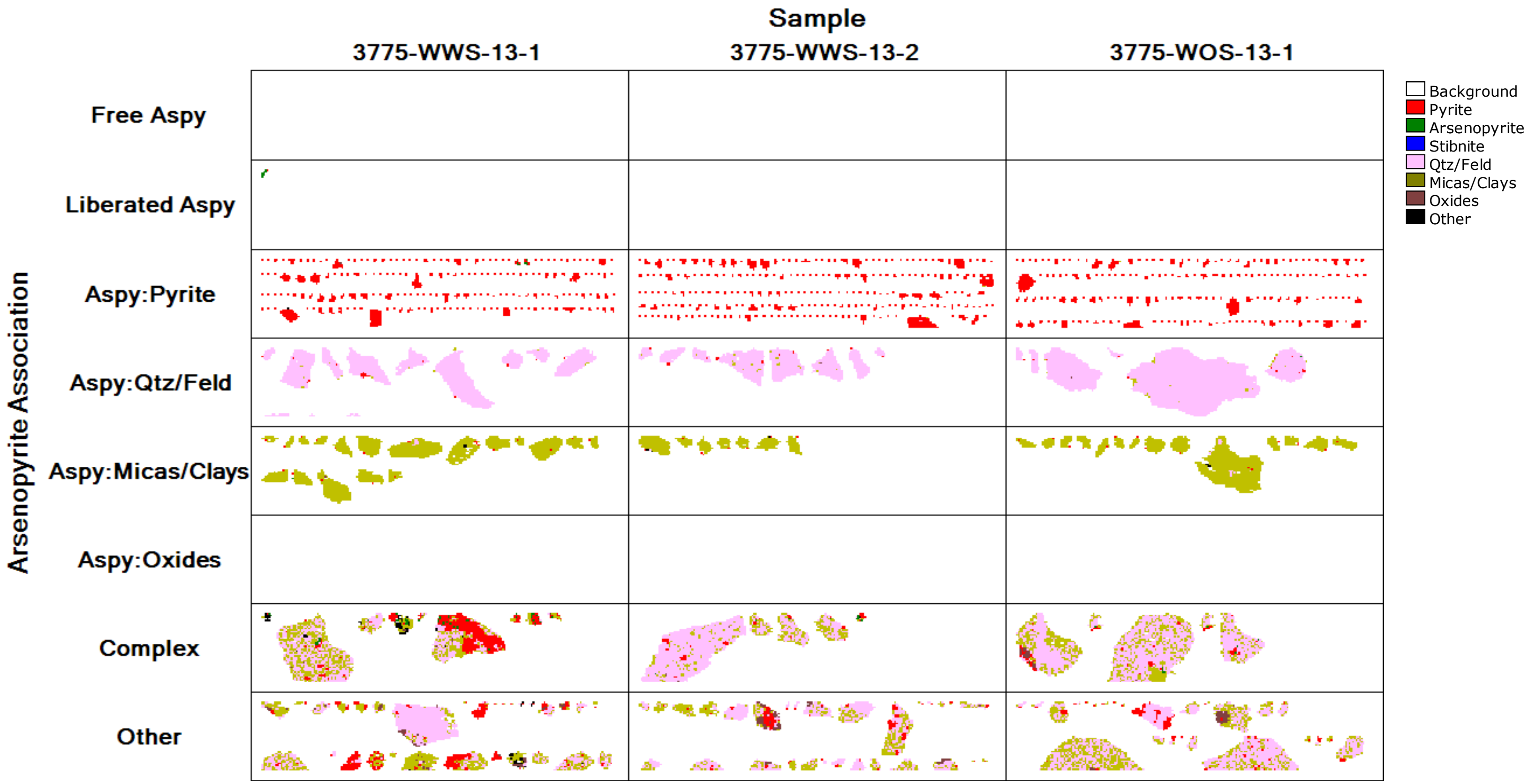
Normalized Mass of Arsenoyrite Across Sample

Mineral Name	3775-WWS-13-1	3775-WWS-13-2	3775-WOS-13-1
Free Aspy	3.4	7.0	7.2
Liberated Aspy	0.7	0.0	0.0
Aspy:Pyrite	7.2	0.0	11.8
Aspy:Qtz/Feld	0.2	7.0	1.0
Aspy:Micas/Clays	0.2	0.0	0.0
Aspy:Oxides	0.2	0.0	0.0
Complex	88.1	86.0	80.0
Total	**100.0**	**100.0**	**100.0**

QEM AUTOMATED RAPID MINERAL SCAN
Data Report

New Sleeper Gold
14322-001 - MI6005-OCT13
11/29/2013

Image Grid - Arsenopyrite Association



QEM AUTOMATED RAPID MINERAL SCAN
Data Report

New Sleeper Gold
14322-001 - MI6005-OCT13
11/29/2013

Summary of Qualitative X-ray Diffraction Results

Crystalline Mineral Assemblage (relative proportions based on peak height)

Sample ID	Major	Moderate	Minor	Trace
3775-WWS-13-1				
Bulk	quartz	potassium-feldspar	kaolinite, pyrite, apatite, mica, illite	*I/M1, *montmorillonite, *anatase, *rutile
Clay Fraction	kaolinite	montmorillonite, I/M1	(quartz), (potassium-feldspar)	*illite
3775-WWS-13-2				
Bulk	quartz, potassium-feldspar	-	mica, pyrite, kaolinite, I/M1	*illite, *montmorillonite
Clay Fraction	montmorillonite, I/M1	kaolinite	(quartz), (potassium-feldspar)	*illite
3775-WOS-13-1				
Bulk	quartz	potassium-feldspar	kaolinite, pyrite, mica, I/M1	*palygorskite, *hematite, *anatase
Clay Fraction	kaolinite	palygorskite	I/M1, (quartz), (potassium-feldspar)	-

** tentative identification due to low concentrations, diffraction line overlap or poor crystallinity*

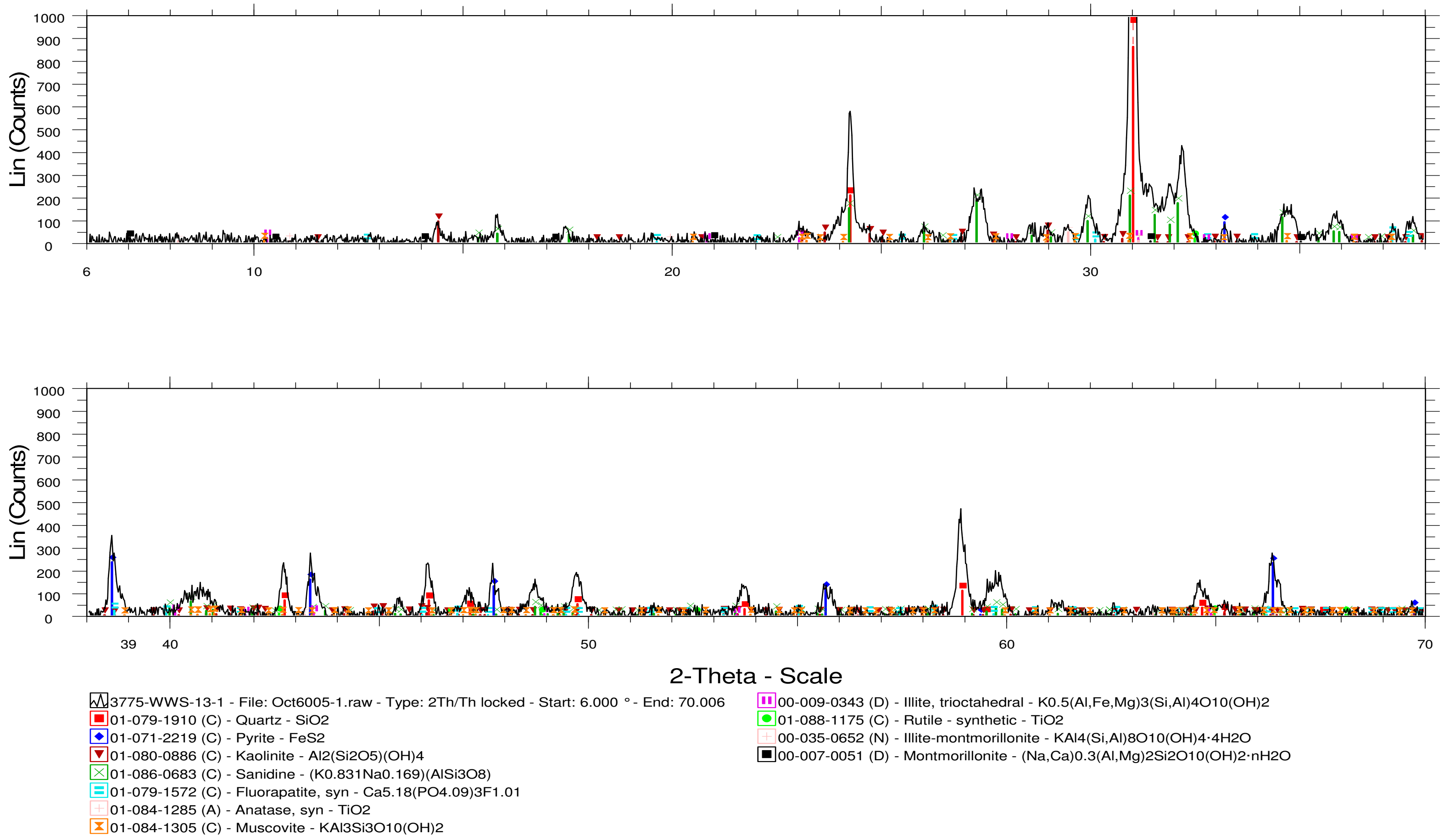
brackets indicate non-clay minerals present in the clay fraction.

I/M[1] indicates Illite, Montmorillonite clay mixture

Mineral	Composition
Quartz	SiO_2
Potassium-Feldspar	$KAlSi_3O_8$
Pyrite	FeS_2
Kaolinite	$Al_2Si_2O_5(OH)_4$
Mica	$K(Mg,Fe)Al_2Si_3AlO_{10}(OH)_2$
Illite	$(K,H_3O)(Al,Mg,Fe)_2(Si,Al)_4O_{10}[(OH)_2,(H_2O)]$
Apatite	$Ca_5(PO_4)_3(F,Cl,OH)$
Montmorillonite	$(Na,Ca)_{0.3}(Al,Mg)_2Si_4O_{10}(OH)_2\cdot 10(H_2O)$
Anatase	TiO_2
Palygorskite	$(Mg,Al)_2Si_4O_{10}(OH)*4H_2O$
Hematite	Fe_2O_3
Rutile	TiO_2

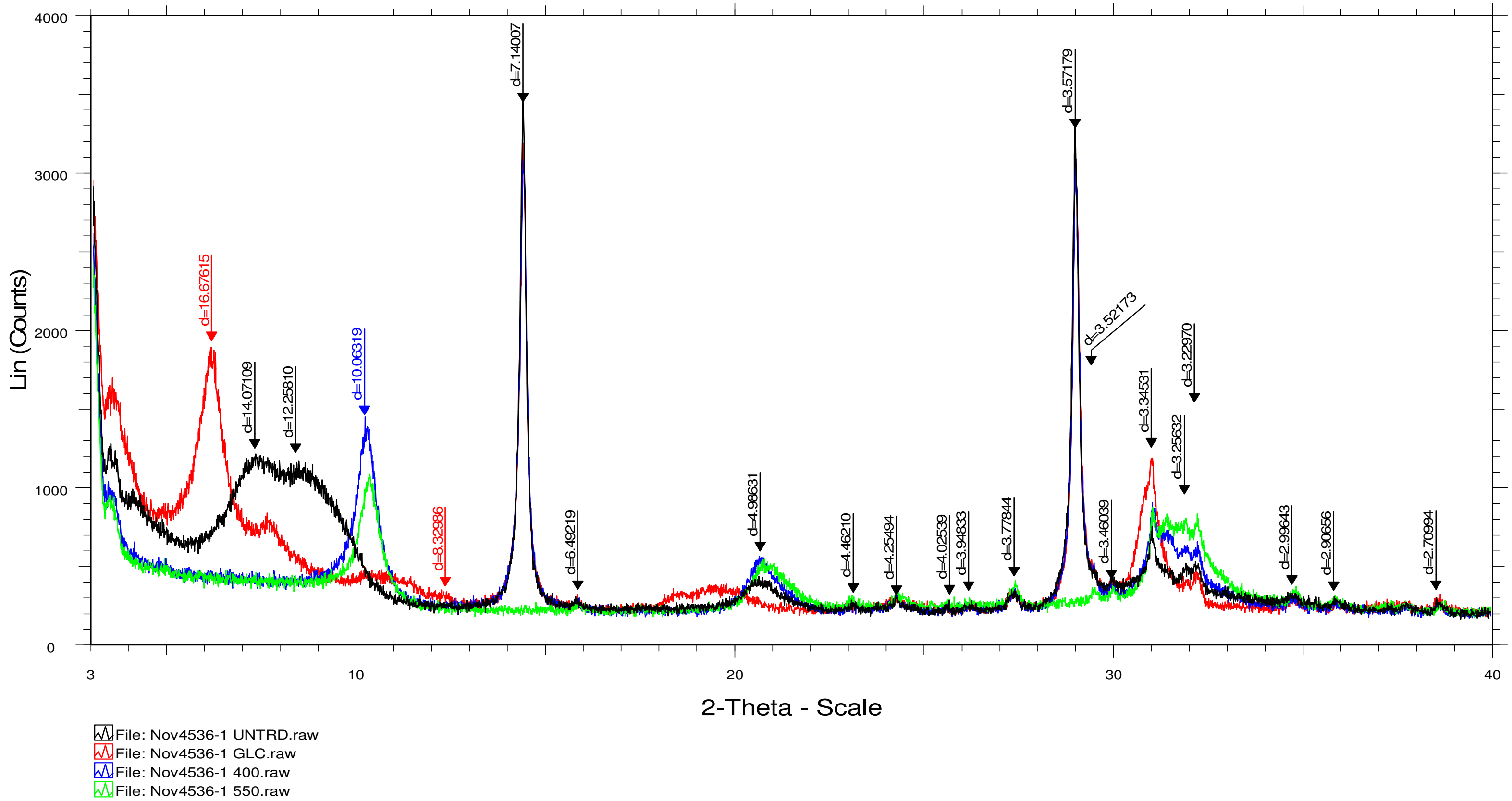
QEM AUTOMATED RAPID MINERAL SCAN
Data Report

3775-WWS-13-1



QEM AUTOMATED RAPID MINERAL SCAN
Data Report

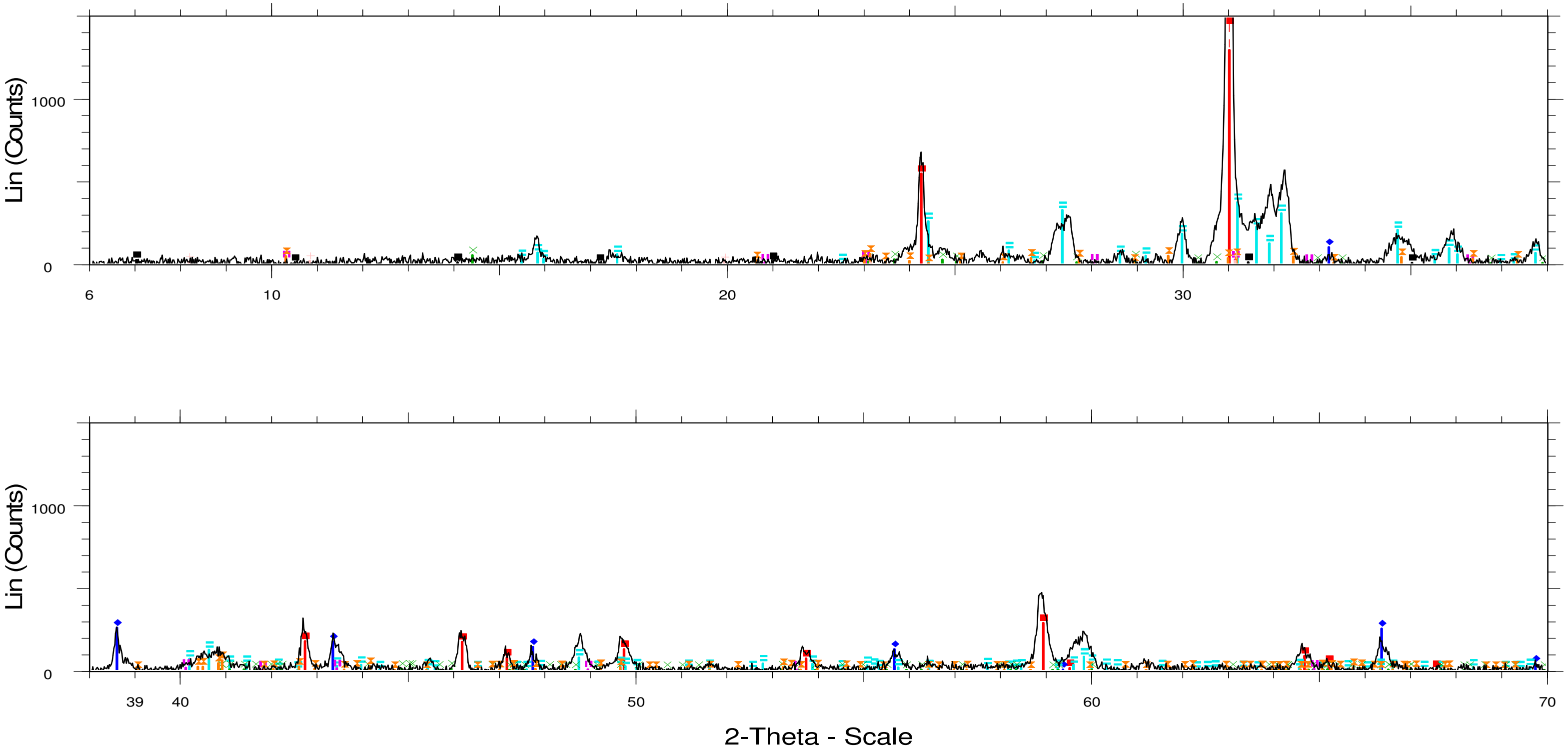
3775-WWS-13-1



The Qualitative XRD method (METH # 8-8-1) used by SGS Minerals Services, P.O. Box 4300, 185 Concession Street, Lakefield, Ontario, Canada K0L 2H0.
Tel: (705) 652-2000 Fax: (705) 652-6365 Mini-method available upon request.

QEM AUTOMATED RAPID MINERAL SCAN
Data Report

3775-WWS-13-2

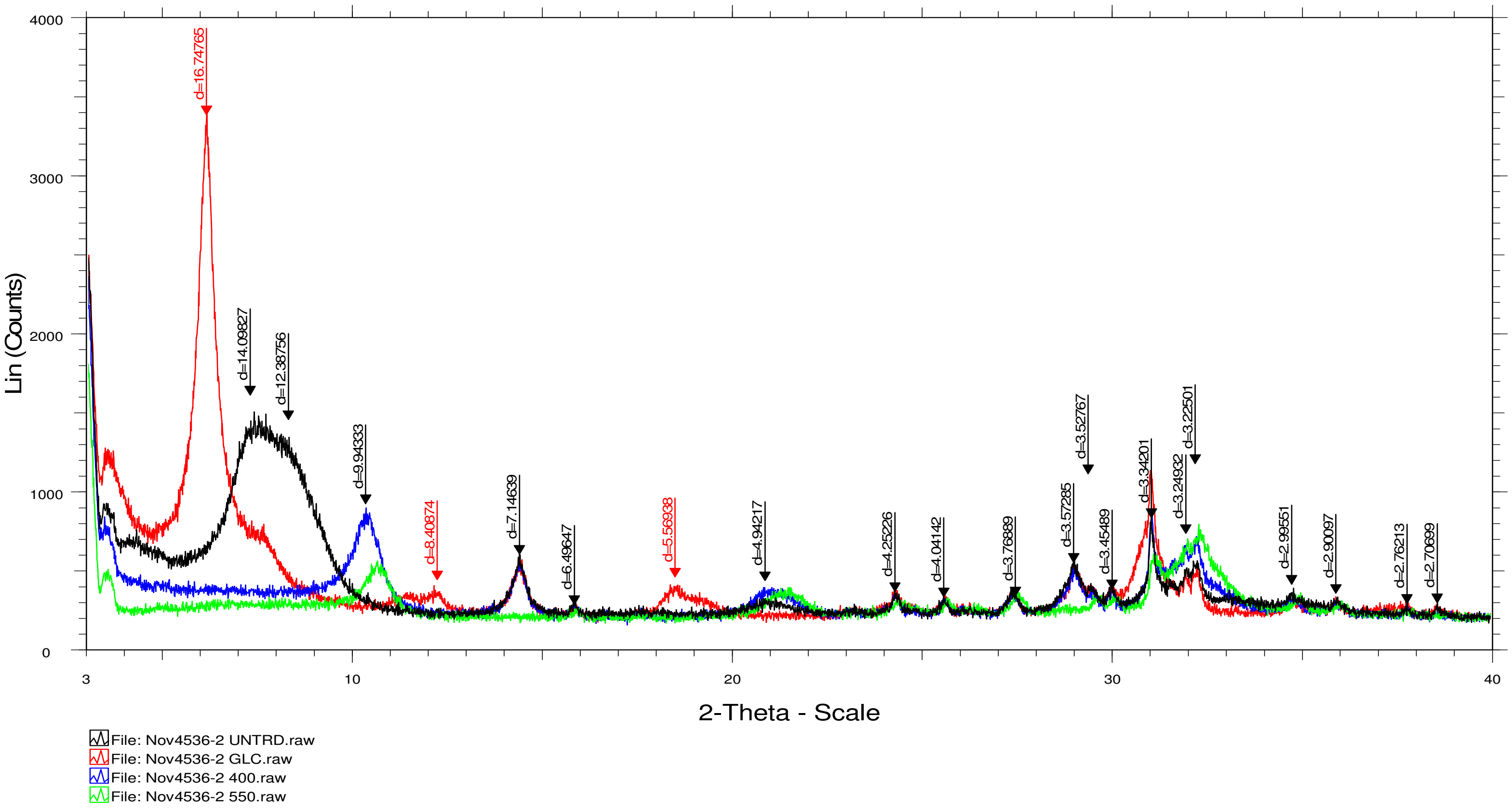


3775-WWS-13-2 - File: Oct6005-2.raw - Type: 2Th/Th locked - Start: 6.000 ° - End: 70.006
00-007-0051 (D) - Montmorillonite - (Na,Ca)0.3(Al,Mg)2Si2O10(OH)2·nH2O
01-079-1910 (C) - Quartz - SiO2
01-071-2219 (C) - Pyrite - FeS2
01-071-0993 (C) - Sanidine - Na.56K3.44Al4Si12O32
01-078-1996 (C) - Kaolinite - Al2(Si2O5)(OH)4
00-009-0343 (D) - Illite, trioctahedral - K0.5(Al,Fe,Mg)3(Si,Al)4O10(OH)2
01-084-1302 (C) - Muscovite - KAl3Si3O10(OH)2
00-035-0652 (N) - Illite-montmorillonite - KAl4(Si,Al)8O10(OH)4·4H2O

SGS

QEM AUTOMATED RAPID MINERAL SCAN
Data Report

3775-WWS-13-2



The Qualitative XRD method (METH # 8-8-1) used by SGS Minerals Services, P.O. Box 4300, 185 Concession Street, Lakefield, Ontario, Canada K0L 2H0.
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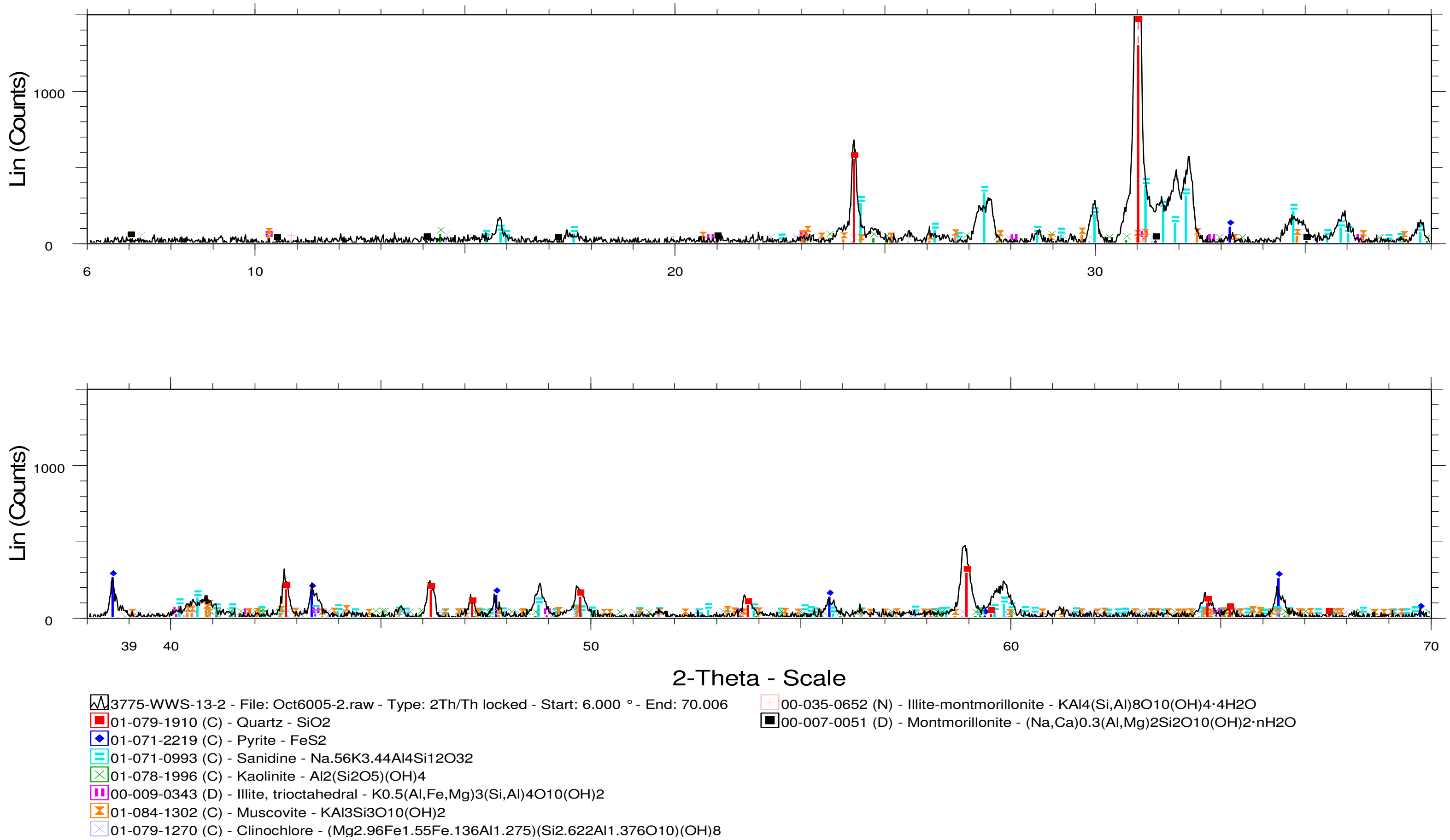
QEM AUTOMATED RAPID MINERAL SCAN
Data Report

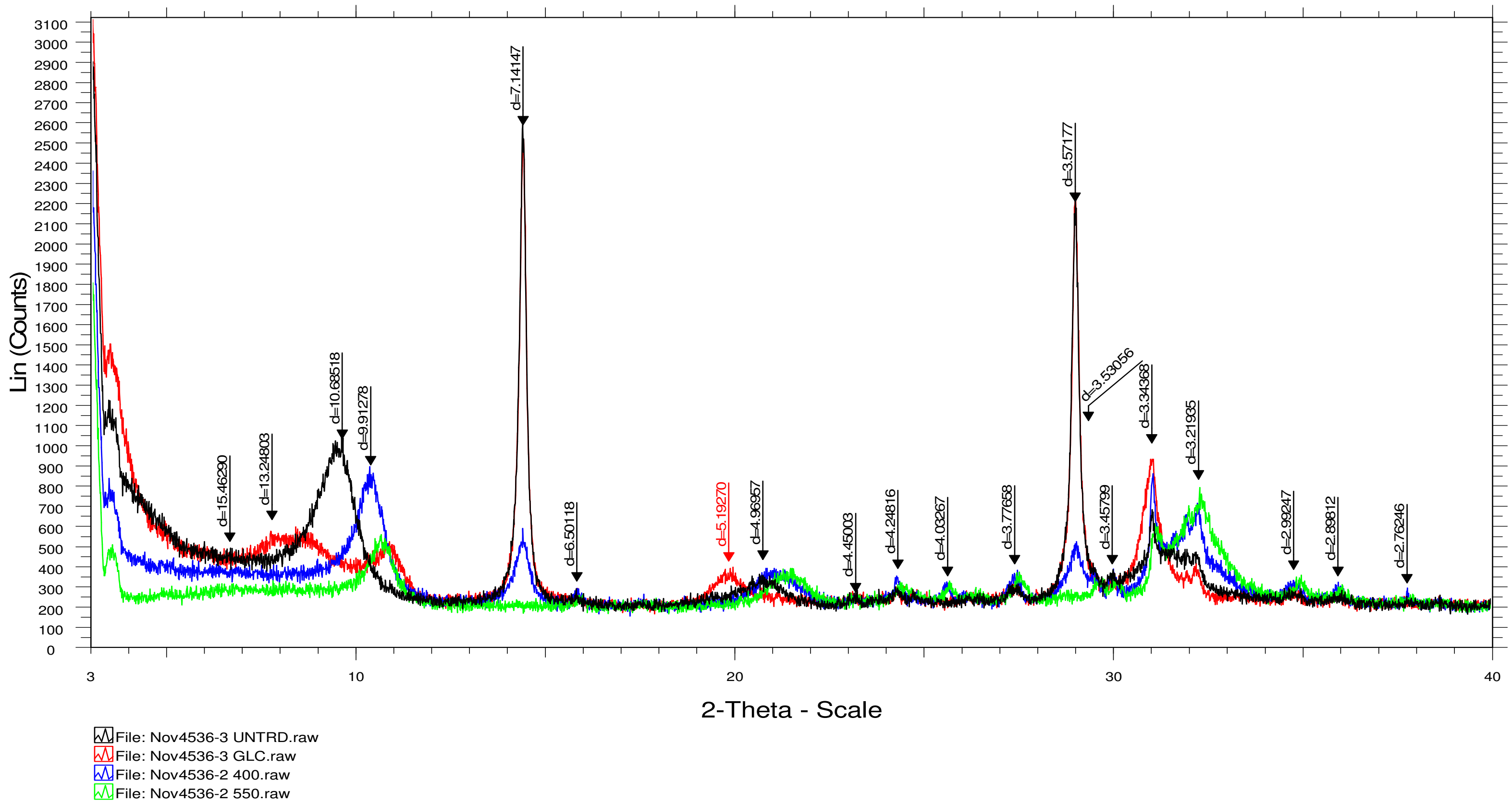
3775-WWS-13-2



The Qualitative XRD method (METH # 8-8-1) used by SGS Minerals Services, P.O. Box 4300, 185 Concession Street, Lakefield, Ontario, Canada K0L 2H0.
Tel: (705) 652-2000 Fax: (705) 652-6365 Mini-method available upon request.

QEM AUTOMATED RAPID MINERAL SCAN
Data Report

3775-WOS-13-1



Appendix D – Gold Mineral Chemistry

Project: 14322-001 MI5030-OCT13
Sample: WWS 13-1 SP Mid

Gold

Sptr.	S	Fe	Ni	Cu	Zn	As	Se	Ag	Sb	Te	I	Au	Pb	Bi	Total
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.2	0.0	0.0	0.0	79.8	0.0	0.0	100
2	0.0	0.9	0.0	0.0	0.0	0.0	0.0	19.5	0.0	0.0	0.0	79.6	0.0	0.0	100
3	0.0	4.6	0.0	0.0	0.0	0.0	0.0	15.9	0.0	0.0	0.0	79.5	0.0	0.0	100
4	0.0	0.9	0.0	0.0	0.0	0.0	0.0	20.7	0.0	0.0	0.0	78.4	0.0	0.0	100
5	0.0	0.8	0.0	0.0	0.0	0.0	0.0	21.0	0.0	0.0	0.0	78.2	0.0	0.0	100
6	0.0	1.8	0.0	0.0	0.0	0.0	0.0	20.5	0.0	0.0	0.0	77.7	0.0	0.0	100
7	0.0	2.6	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0	0.0	77.4	0.0	0.0	100
8	0.0	2.2	0.0	0.0	0.0	0.0	0.0	20.6	0.0	0.0	0.0	77.2	0.0	0.0	100
9	0.0	6.2	0.0	0.0	0.0	0.0	0.0	17.8	0.0	0.0	0.0	76.0	0.0	0.0	100
10	0.0	3.5	0.0	0.0	0.0	0.0	0.0	21.3	0.0	0.0	0.0	75.1	0.0	0.0	100

n=10	S	Fe	Ni	Cu	Zn	As	Se	Ag	Sb	Te	I	Au	Pb	Bi
Average	0.0	2.4	0.0	0.0	0.0	0.0	0.0	19.8	0.0	0.0	0.0	77.9	0.0	0.0
Max	0.0	6.2	0.0	0.0	0.0	0.0	0.0	21.3	0.0	0.0	0.0	79.8	0.0	0.0
Min	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.9	0.0	0.0	0.0	75.1	0.0	0.0
Std Dev	0.0	1.9	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	1.6	0.0	0.0

Electrum

Sptr.	S	Fe	Ni	Cu	Zn	As	Se	Ag	Sb	Te	I	Au	Pb	Bi	Total
1	0.0	3.7	0.0	0.0	0.0	0.0	0.0	21.4	0.0	0.0	0.0	74.8	0.0	0.0	100
2	0.0	4.6	0.0	0.0	0.0	0.0	0.0	21.7	0.0	0.0	0.0	73.7	0.0	0.0	100
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.1	0.0	0.0	0.0	71.9	0.0	0.0	100
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.6	0.0	0.0	0.0	71.4	0.0	0.0	100
5	0.0	0.7	0.0	0.0	0.0	0.0	0.0	31.1	0.0	0.0	0.0	68.2	0.0	0.0	100
6	0.0	2.8	0.0	0.0	0.0	0.0	0.0	30.5	0.0	0.0	0.0	66.7	0.0	0.0	100

n=6	S	Fe	Ni	Cu	Zn	As	Se	Ag	Sb	Te	I	Au	Pb	Bi
Average	0.0	2.0	0.0	0.0	0.0	0.0	0.0	26.9	0.0	0.0	0.0	71.1	0.0	0.0
Max	0.0	4.6	0.0	0.0	0.0	0.0	0.0	31.1	0.0	0.0	0.0	74.8	0.0	0.0
Min	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.4	0.0	0.0	0.0	66.7	0.0	0.0
Std Dev	0.0	2.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	0.0	0.0	3.1	0.0	0.0

Project: 14322-001 MI5030-OCT13
Sample: WWS 13-2

Electrum

Sptr.	S	Fe	Ni	Cu	Zn	As	Se	Ag	Sb	Te	I	Au	Pb	Bi	Total
1	0.0	2.1	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	72.9	0.0	0.0	100
2	0.0	2.4	0.0	0.0	0.0	0.0	0.0	25.1	0.0	0.0	0.0	72.5	0.0	0.0	100
3	0.0	1.6	0.0	0.0	0.0	0.0	0.0	26.6	0.0	0.0	0.0	71.8	0.0	0.0	100
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.5	0.0	0.0	0.0	71.5	0.0	0.0	100
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.8	0.0	0.0	0.0	71.2	0.0	0.0	100

n=5	S	Fe	Ni	Cu	Zn	As	Se	Ag	Sb	Te	I	Au	Pb	Bi
Average	0.0	1.2	0.0	0.0	0.0	0.0	0.0	26.8	0.0	0.0	0.0	72.0	0.0	0.0
Max	0.0	2.4	0.0	0.0	0.0	0.0	0.0	28.8	0.0	0.0	0.0	72.9	0.0	0.0
Min	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	71.2	0.0	0.0
Std Dev	0.0	1.1	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.7	0.0	0.0

Project: 14322-001 MI5030-OCT13
Sample: WOS-13-1

Gold

Sptr.	S	Fe	Ni	Cu	Zn	As	Se	Ag	Sb	Te	I	Au	Pb	Bi	Total
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.3	0.0	0.0	0.0	76.7	0.0	0.0	100
2	0.0	0.7	0.0	0.0	0.0	0.0	0.0	23.7	0.0	0.0	0.0	75.6	0.0	0.0	100
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.8	0.0	0.0	0.0	75.2	0.0	0.0	100
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.8	0.0	0.0	0.0	75.2	0.0	0.0	100
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.2	0.0	0.0	0.0	74.8	0.0	0.0	100

n=5	S	Fe	Ni	Cu	Zn	As	Se	Ag	Sb	Te	I	Au	Pb	Bi
Average	0.0	0.1	0.0	0.0	0.0	0.0	0.0	24.4	0.0	0.0	0.0	75.5	0.0	0.0
Max	0.0	0.7	0.0	0.0	0.0	0.0	0.0	25.2	0.0	0.0	0.0	76.7	0.0	0.0
Min	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.3	0.0	0.0	0.0	74.8	0.0	0.0
Std Dev	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.7	0.0	0.0

Electrum

Sptr.	S	Fe	Ni	Cu	Zn	As	Se	Ag	Sb	Te	I	Au	Pb	Bi	Total
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.6	0.0	0.0	0.0	74.4	0.0	0.0	100
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.1	0.0	0.0	0.0	73.9	0.0	0.0	100
3	0.0	0.7	0.0	0.0	0.0	0.0	0.0	25.6	0.0	0.0	0.0	73.7	0.0	0.0	100
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.3	0.0	0.0	0.0	73.7	0.0	0.0	100
5	0.0	0.9	0.0	0.0	0.0	0.0	0.0	25.5	0.0	0.0	0.0	73.6	0.0	0.0	100
6	0.0	1.2	0.0	0.0	0.0	0.0	0.0	25.7	0.0	0.0	0.0	73.1	0.0	0.0	100
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.0	0.0	0.0	0.0	72.0	0.0	0.0	100

n=7	S	Fe	Ni	Cu	Zn	As	Se	Ag	Sb	Te	I	Au	Pb	Bi
Average	0.0	0.4	0.0	0.0	0.0	0.0	0.0	26.1	0.0	0.0	0.0	73.5	0.0	0.0
Max	0.0	1.2	0.0	0.0	0.0	0.0	0.0	28.0	0.0	0.0	0.0	74.4	0.0	0.0
Min	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.5	0.0	0.0	0.0	72.0	0.0	0.0
Std Dev	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.8	0.0	0.0

Project: 14322-001 MI5030-OCT13
Sample: WWS-13-1

Arsenopyrite

Spr.	S	Fe	Sb	As	Total
1	18.9	34.0	0.0	47.1	100
2	19.2	33.8	0.0	47.0	100
3	19.8	34.1	0.0	46.1	100
4	19.1	33.8	1.4	45.7	100
5	19.9	34.5	0.0	45.5	100
6	19.3	34.1	1.2	45.4	100
7	19.9	34.3	1.3	44.5	100
8	20.2	34.5	1.1	44.2	100
9	19.8	34.3	1.8	44.1	100
10	20.7	34.4	1.3	43.6	100
11	20.6	34.2	1.7	43.5	100
12	20.7	34.8	1.2	43.2	100
13	21.4	34.6	1.3	42.7	100
14	22.0	35.3	0.0	42.7	100
15	21.4	34.5	1.8	42.3	100
16	20.9	34.3	2.6	42.1	100
17	22.2	34.2	2.1	41.5	100
18	22.2	35.1	1.3	41.3	100
19	23.0	34.4	1.7	40.9	100
20	22.5	35.1	1.6	40.8	100
21	22.6	35.4	1.2	40.8	100
22	23.6	35.7	0.0	40.8	100
23	22.9	35.3	1.2	40.5	100
24	21.0	33.8	4.9	40.4	100
25	23.0	36.8	0.0	40.2	100
26	24.5	35.3	1.2	39.1	100
27	24.2	35.2	1.6	39.0	100

n=27	S	Fe	Sb	As
Average	21.3	34.7	1.2	42.8
Max	24.5	36.8	4.9	47.1
Min	18.9	33.8	0.0	39.0
Std Dev	1.6	0.7	1.0	2.3

Pyrite

Spr.	S	Fe	Sb	As	Total
1	53.6	45.0	0.0	1.4	100
2	53.7	44.3	0.9	1.1	100
3	53.2	44.2	1.7	0.9	100
4	53.8	45.3	0.0	0.9	100
5	54.2	45.0	0.0	0.8	100
6	54.4	44.9	0.0	0.7	100
7	54.8	45.2	0.0	0.0	100
8	54.8	45.2	0.0	0.0	100
9	54.7	45.3	0.0	0.0	100
10	54.7	45.3	0.0	0.0	100
11	55.0	45.0	0.0	0.0	100
12	54.3	45.7	0.0	0.0	100
13	54.5	45.5	0.0	0.0	100
14	54.8	45.2	0.0	0.0	100
15	54.9	45.1	0.0	0.0	100
16	54.7	45.3	0.0	0.0	100
17	54.7	45.3	0.0	0.0	100
18	54.7	45.3	0.0	0.0	100
19	54.3	45.7	0.0	0.0	100
20	54.9	45.1	0.0	0.0	100
21	55.0	45.0	0.0	0.0	100
22	54.4	45.6	0.0	0.0	100
23	54.7	45.3	0.0	0.0	100
24	54.7	45.3	0.0	0.0	100
25	54.9	45.1	0.0	0.0	100
26	54.2	45.8	0.0	0.0	100
27	54.8	45.2	0.0	0.0	100

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Arsenopyrite

Spr.	S	Fe	As	Sb	Total
1	22.7	35.5	38.4	3.3	100
2	22.5	34.9	39.5	3.1	100
3	22.2	34.7	40.3	2.8	100
4	23.3	35.0	39.1	2.6	100
5	21.5	34.2	41.7	2.6	100
6	21.8	34.7	41.2	2.2	100
7	22.1	35.6	40.3	2.0	100
8	22.6	35.1	40.4	1.9	100
9	25.2	36.1	37.1	1.7	100
10	24.7	36.0	37.7	1.5	100
11	26.2	35.8	36.6	1.5	100
12	23.5	34.7	40.6	1.2	100
13	26.9	34.5	38.6	0.0	100
14	26.9	34.5	38.6	0.0	100
15	24.0	35.9	40.0	0.0	100
16	24.0	35.9	40.0	0.0	100
17	24.7	35.9	39.4	0.0	100
18	24.4	36.5	39.2	0.0	100
19	26.9	34.5	38.6	0.0	100
20	28.3	37.4	34.3	0.0	100

n=20	S	Fe	As	Sb
Average	24.2	35.4	39.1	1.3
Max	28.3	37.4	41.7	3.3
Min	21.5	34.2	34.3	0.0
Std Dev	2.0	0.8	1.7	1.2

Pyrite

Spr.	S	Fe	As	Sb	Total
1	53.0	45.1	1.8	0.0	100
2	52.9	45.4	1.7	0.0	100
3	53.5	45.0	1.4	0.0	100
4	53.6	45.0	1.4	0.0	100
5	54.1	44.7	1.1	0.0	100
6	53.7	45.2	1.1	0.0	100
7	53.7	45.4	0.8	0.0	100
8	54.8	45.2	0.0	0.0	100
9	54.9	45.1	0.0	0.0	100
10	54.6	45.4	0.0	0.0	100
11	54.4	45.6	0.0	0.0	100
12	54.5	45.5	0.0	0.0	100
13	54.6	45.4	0.0	0.0	100
14	54.5	45.5	0.0	0.0	100
15	54.7	45.3	0.0	0.0	100
16	54.4	45.6	0.0	0.0	100
17	54.5	45.5	0.0	0.0	100
18	54.7	45.3	0.0	0.0	100
19	54.9	45.1	0.0	0.0	100
20	54.4	45.6	0.0	0.0	100
21	54.5	45.5	0.0	0.0	100
22	54.8	45.2	0.0	0.0	100
23	54.8	45.2	0.0	0.0	100
24	54.8	45.2	0.0	0.0	100
25	54.4	45.6	0.0	0.0	100
26	55.2	44.8	0.0	0.0	100
27	54.8	45.2	0.0	0.0	100

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Sample: WOS-13-1

Arsenopyrite

Spr.	S	Fe	As	Sb	Total
1	21.3	35.1	43.6	0.0	100
2	21.0	34.4	43.5	1.1	100
3	21.3	35.4	43.3	0.0	100
4	20.0	34.2	43.2	2.6	100
5	21.6	35.2	43.2	0.0	100
6	21.6	35.3	43.1	0.0	100
7	22.2	35.2	42.6	0.0	100
8	22.5	35.7	41.8	0.0	100
9	20.8	34.8	41.7	2.7	100
10	23.2	35.5	41.3	0.0	100
11	21.8	35.4	41.2	1.6	100
12	23.1	35.9	41.0	0.0	100
13	22.8	35.2	40.7	1.2	100
14	23.7	35.9	40.4	0.0	100
15	23.6	36.0	40.4	0.0	100
16	22.6	35.2	40.2	2.0	100
17	24.1	35.8	40.1	0.0	100
18	23.1	35.6	40.0	1.3	100
19	23.9	35.5	39.2	1.4	100
20	24.4	36.4	39.2	0.0	100
21	25.8	36.9	37.4	0.0	100
22	24.9	36.3	37.3	1.6	100
23	25.6	36.2	37.1	1.1	100
24	33.2	35.7	30.1	1.0	100

n=24	S	Fe	As	Sb
Average	23.3	35.5	40.5	0.7
Max	33.2	36.9	43.6	2.7
Min	20.0	34.2	30.1	0.0
Std Dev	2.6	0.6	3.0	0.9

Pyrite

Spr.	S	Fe	As	Sb	Total
1	52.3	42.1	5.6	0.0	100
2	52.3	45.0	2.7	0.0	100
3	52.7	44.9	2.4	0.0	100
4	53.5	44.6	2.0	0.0	100
5	52.9	45.9	1.2	0.0	100
6	53.8	45.1	1.1	0.0	100
7	54.0	44.9	1.1	0.0	100
8	53.9	45.0	1.1	0.0	100
9	54.2	44.7	1.0	0.0	100
10	53.9	45.1	1.0	0.0	100
11	54.0	45.1	0.8	0.0	100
12	54.0	45.3	0.8	0.0	100
13	53.8	45.5	0.7	0.0	100
14	54.1	45.2	0.7	0.0	100
15	53.8	45.0	0.0	1.2	100
16	54.3	44.8	0.0	0.9	100
17	54.2	45.8	0.0	0.0	100
18	54.6	45.4	0.0	0.0	100
19	54.8	45.2	0.0	0.0	100
20	54.8	45.2	0.0	0.0	100
21	54.6	45.4	0.0	0.0	100
22	55.2	44.8	0.0	0.0	100
23	54.9	45.1	0.0	0.0	100
24	54.7	45.3	0.0	0.0	100
25	54.7	45.3	0.0	0.0	100
26	54.8	45.2	0.0	0.0	100
27	54.5	45.5	0.0	0.0	100

Spr.	S	Fe	Sb	As	Total
28	54.6	45.4	0.0	0.0	100
29	54.6	45.4	0.0	0.0	100
30	54.4	45.6	0.0	0.0	100
31	54.5	45.5	0.0	0.0	100
32	54.9	45.1	0.0	0.0	100
33	54.7	45.3	0.0	0.0	100
34	53.9	46.1	0.0	0.0	100
35	54.3	45.7	0.0	0.0	100
36	55.1	44.9	0.0	0.0	100
37	54.8	45.2	0.0	0.0	100
38	54.8	45.2	0.0	0.0	100
39	54.5	45.5	0.0	0.0	100
40	54.7	45.3	0.0	0.0	100
41	54.7	45.3	0.0	0.0	100
42	54.7	45.3	0.0	0.0	100
43	54.4	45.6	0.0	0.0	100
44	54.4	45.6	0.0	0.0	100
45	55.0	45.0	0.0	0.0	100
46	55.1	44.9	0.0	0.0	100
47	54.9	45.1	0.0	0.0	100
48	54.7	45.3	0.0	0.0	100
49	54.9	45.1	0.0	0.0	100
50	54.3	45.7	0.0	0.0	100
51	54.7	45.3	0.0	0.0	100
52	54.5	45.5	0.0	0.0	100
53	54.7	45.3	0.0	0.0	100
54	54.7	45.3	0.0	0.0	100
55	54.9	45.1	0.0	0.0	100
56	55.1	44.9	0.0	0.0	100
57	55.3	44.7	0.0	0.0	100
58	54.5	45.5	0.0	0.0	100
59	54.6	45.4	0.0	0.0	100

n=59	S	Fe	Sb	As
Average	54.6	45.3	0.0	0.1
Max	55.3	46.1	1.7	1.4
Min	53.2	44.2	0.0	0.0
Std Dev	0.4	0.3	0.2	0.3

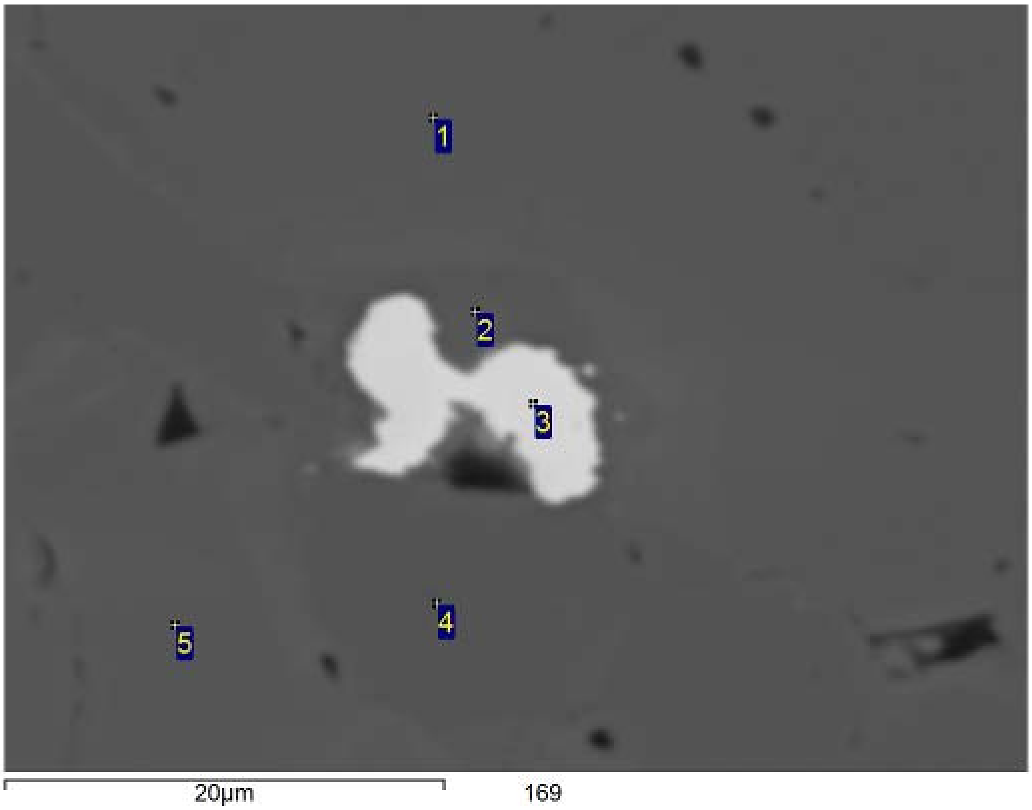
Spr.	S	Fe	As	Sb	Total
28	54.5	45.5	0.0	0.0	100
29	54.3	45.7	0.0	0.0	100
30	54.4	45.6	0.0	0.0	100
31	54.4	45.6	0.0	0.0	100
32	54.4	45.6	0.0	0.0	100
33	55.1	44.9	0.0	0.0	100
34	54.9	45.1	0.0	0.0	100
35	54.2	45.8	0.0	0.0	100
36	55.1	44.9	0.0	0.0	100
37	54.8	45.2	0.0	0.0	100
38	55.0	45.0	0.0	0.0	100
39	55.0	45.0	0.0	0.0	100
40	55.0	45.0	0.0	0.0	100
41	54.7	45.3	0.0	0.0	100
42	54.5	45.5	0.0	0.0	100
43	54.5	45.5	0.0	0.0	100
44	54.8	45.2	0.0	0.0	100
45	54.9	45.1	0.0	0.0	100
46	54.1	45.9	0.0	0.0	100
47	54.5	45.5	0.0	0.0	100
48	55.0	45.0	0.0	0.0	100
49	54.9	45.1	0.0	0.0	100
50	55.2	44.8	0.0	0.0	100
51	54.7	45.3	0.0	0.0	100
52	54.4	45.6	0.0	0.0	100
53	54.4	45.6	0.0	0.0	100
54	54.8	45.2	0.0	0.0	100
55	54.8	45.2	0.0	0.0	100
56	54.6	45.4	0.0	0.0	100
57	54.7	45.3	0.0	0.0	100
58	55.0	45.0	0.0	0.0	100
59	55.0	45.0	0.0	0.0	100
60	54.9	45.1	0.0	0.0	100
61	55.0	45.0	0.0	0.0	100
62	55.1	44.9	0.0	0.0	100
63	55.0	45.0	0.0	0.0	100
64	54.4	45.6	0.0	0.0	100
65	54.9	45.1	0.0	0.0	100
66	54.6	45.4	0.0	0.0	100
67	54.3	45.7	0.0	0.0	100
68	54.5	45.5	0.0	0.0	100
69	54.8	45.2	0.0	0.0	100
70	55.1	44.9	0.0	0.0	100
71	54.5	45.5	0.0	0.0	100
72	54.6	45.4	0.0	0.0	100
73	54.8	45.2	0.0	0.0	100
74	54.8	45.2	0.0	0.0	100
75	54.3	45.7	0.0	0.0	100
76	54.9	45.1	0.0	0.0	100
77	54.8	45.2	0.0	0.0	100
78	54.7	45.3	0.0	0.0	100

n=78	S	Fe	As	Sb
Average	54.6	45.3	0.1	0.0
Max	55.2	45.9	1.8	0.0
Min	52.9	44.7	0.0	0.0
Std Dev	0.4	0.3	0.4	0.0

Spr.	S	Fe	As	Sb	Total
28	54.5	45.5	0.0	0.0	100
29	55.0	45.0	0.0	0.0	100
30	55.0	45.0	0.0	0.0	100
31	54.7	45.3	0.0	0.0	100
32	54.6	45.4	0.0	0.0	100
33	54.5	45.5	0.0	0.0	100
34	54.8	45.2	0.0	0.0	100
35	54.2	45.8	0.0	0.0	100
36	54.4	45.6	0.0	0.0	100
37	54.7	45.3	0.0	0.0	100
38	54.5	45.5	0.0	0.0	100
39	54.7	45.3	0.0	0.0	100
40	54.4	45.6	0.0	0.0	100
41	54.6	45.4	0.0	0.0	100
42	55.0	45.0	0.0	0.0	100
43	54.5	45.5	0.0	0.0	100
44	54.5	45.5	0.0	0.0	100
45	55.0	45.0	0.0	0.0	100
46	54.1	45.9	0.0	0.0	100
47	54.6	45.4	0.0	0.0	100
48	54.6	45.4	0.0	0.0	100
49	54.5	45.5	0.0	0.0	100
50	54.5	45.5	0.0	0.0	100
51	54.6	45.4	0.0	0.0	100
52	54.8	45.2	0.0	0.0	100
53	54.8	45.2	0.0	0.0	100
54	54.8	45.2	0.0	0.0	100
55	54.7	45.3	0.0	0.0	100
56	54.7	45.3	0.0	0.0	100
57	55.0	45.0	0.0	0.0	100
58	54.7	45.3	0.0	0.0	100
59	55.0	45.0	0.0	0.0	100
60	54.8	45.2	0.0	0.0	100
61	54.4	45.6	0.0	0.0	100
62	54.8	45.2	0.0	0.0	100
63	54.6	45.4	0.0	0.0	100
64	54.9	45.1	0.0	0.0	100
65	54.9	45.1	0.0	0.0	100
66	54.6	45.4	0.0	0.0	100
67	54.8	45.2	0.0	0.0	100
68	54.5	45.5	0.0	0.0	100

n=68	S	Fe	As	Sb
Average	54.4	45.2	0.3	0.0
Max	55.2	45.9	5.6	1.2
Min	52.3	42.1	0.0	0.0
Std Dev	0.6	0.5	0.9	0.2

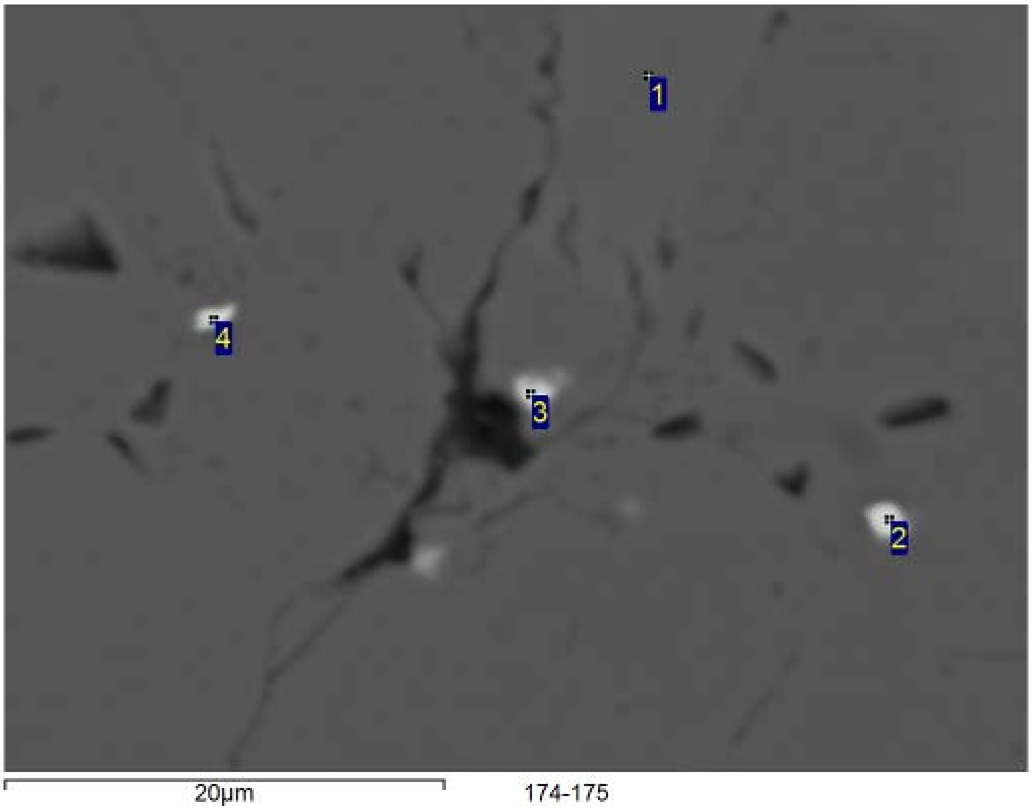
Appendix E – SEM-EDS Images and Analysis of Gold and Associated Minerals



Processing option : All elements analysed (Normalised)

Spectrum	S	Fe	As	Ag	Au	Total	Mineral ID
1	54.3	44.5	1.2			100.0	Pyrite
2	53.6	45.1	1.3			100.0	Pyrite
3		1.8		20.5	77.7	100.0	Gold
4	55.2	44.8				100.0	Pyrite
5	53.2	44.7	2.0			100.0	Pyrite

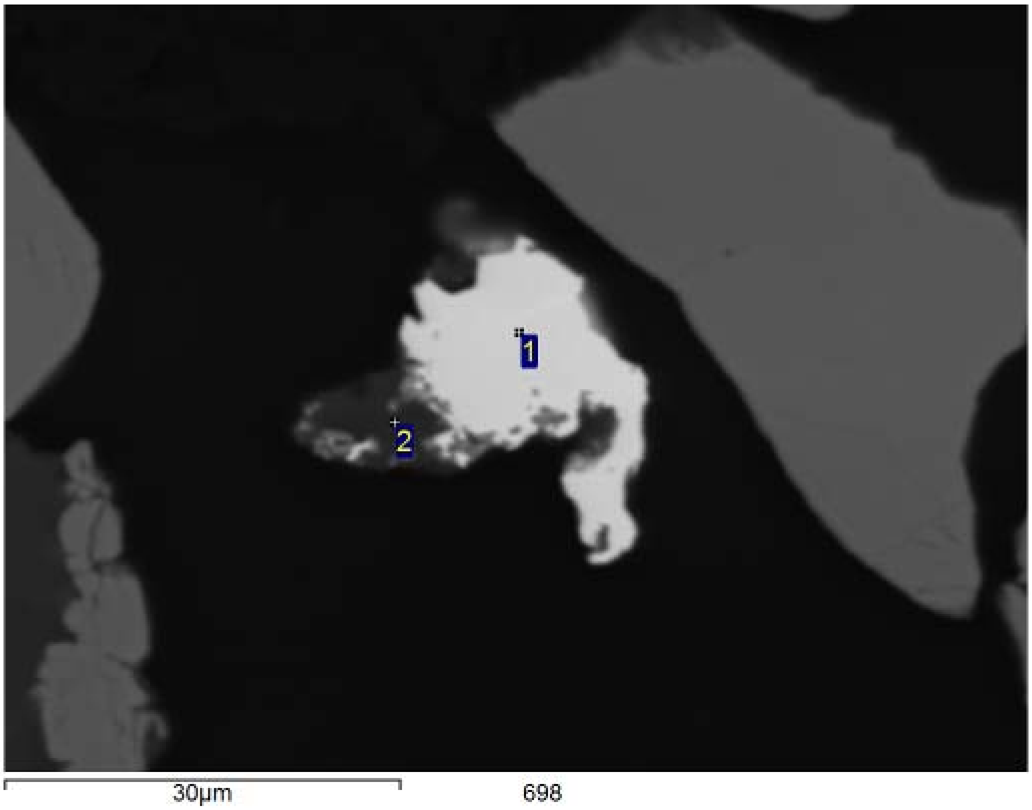
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	O	Mg	S	Fe	As	Ag	Au	Total	Mineral ID
1			50.8	44.2	5.0			100.0	Pyrite
2				4.6		21.7	73.7	100.0	Gold
3	5.6	0.4	13.9	9.1		12.1	58.9	100.0	Gold
4				7.8		19.0	73.2	100.0	Gold

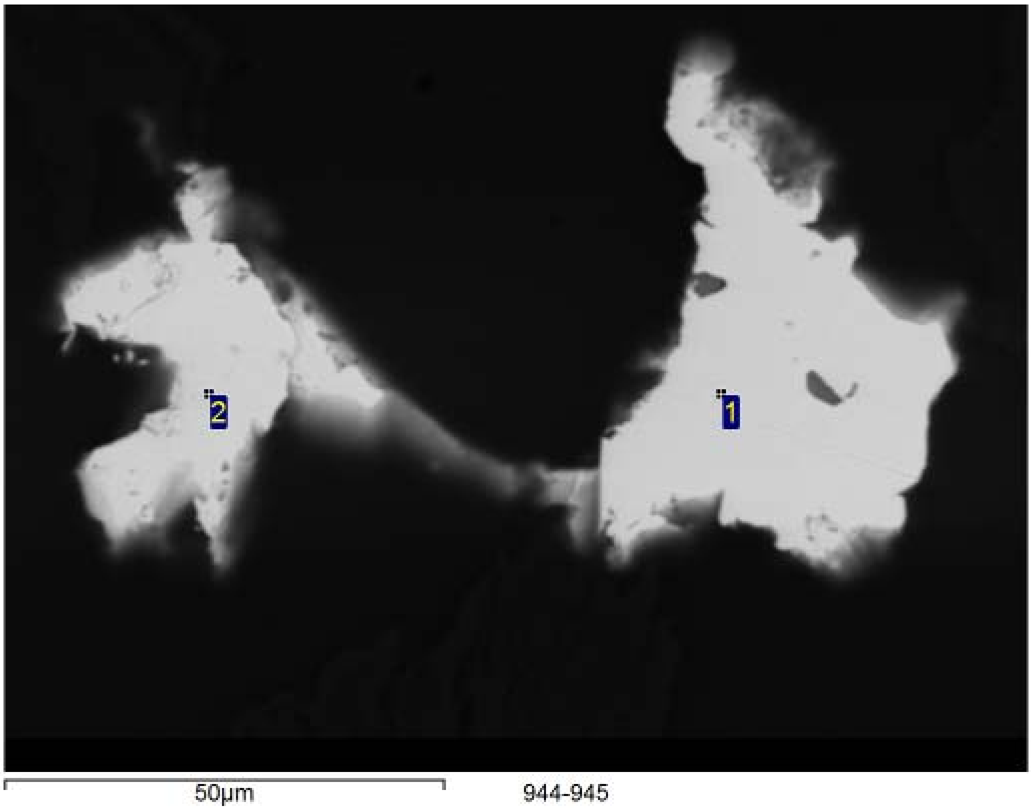
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	O	Al	Si	S	Fe	As	Ag	Au	Total	Mineral ID
1					0.7		31.1	68.2	100.0	Electrum
2	47.8	0.4	46.3	1.4	2.3	1.9			100.0	Quartz

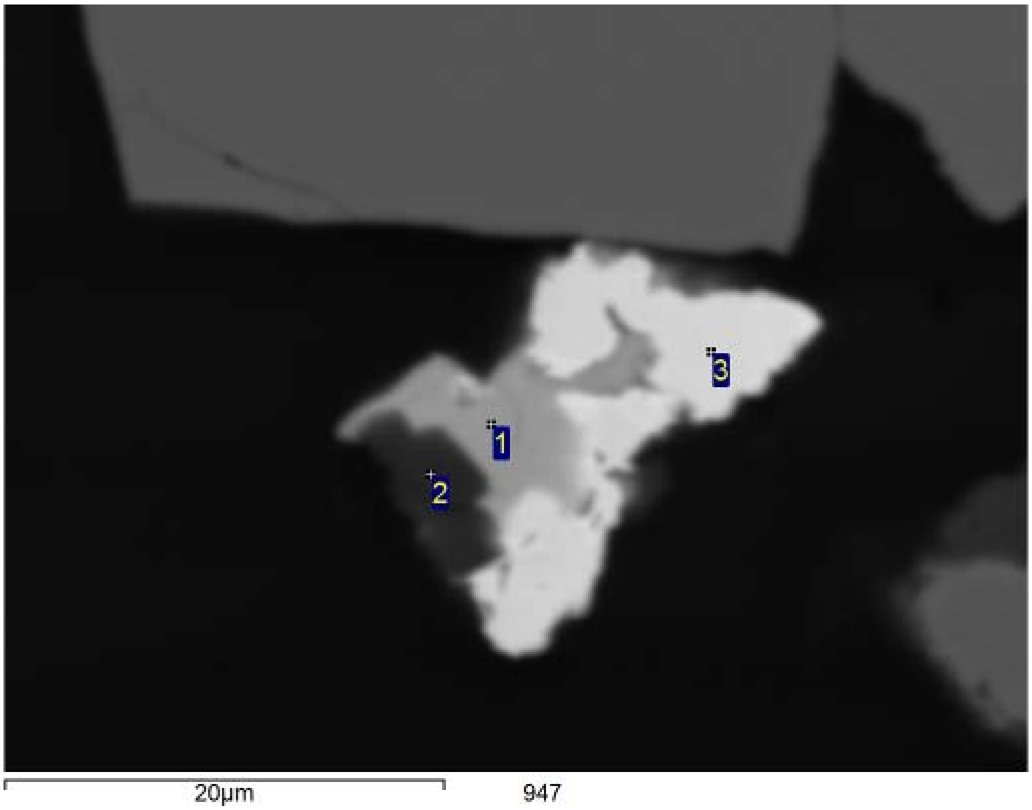
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	Ag	Au	Total	Mineral ID
1	28.6	71.4	100.0	Electrum
2	28.1	71.9	100.0	Electrum

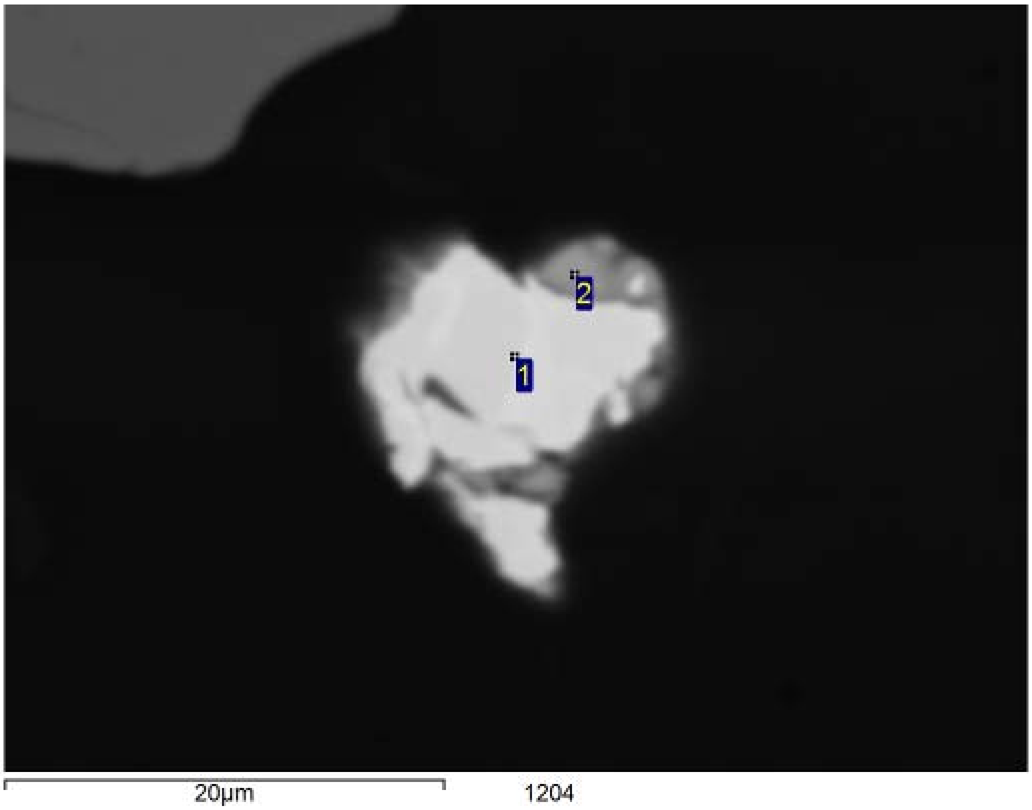
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	O	Si	S	Fe	Ag	Sb	Au	Total	Mineral ID
1			21.3		36.2	42.4		100.0	Miargyrite
2	51.7	44.1	1.1		1.7	1.4		100.0	Quartz
3				0.9	19.5		79.6	100.0	Gold

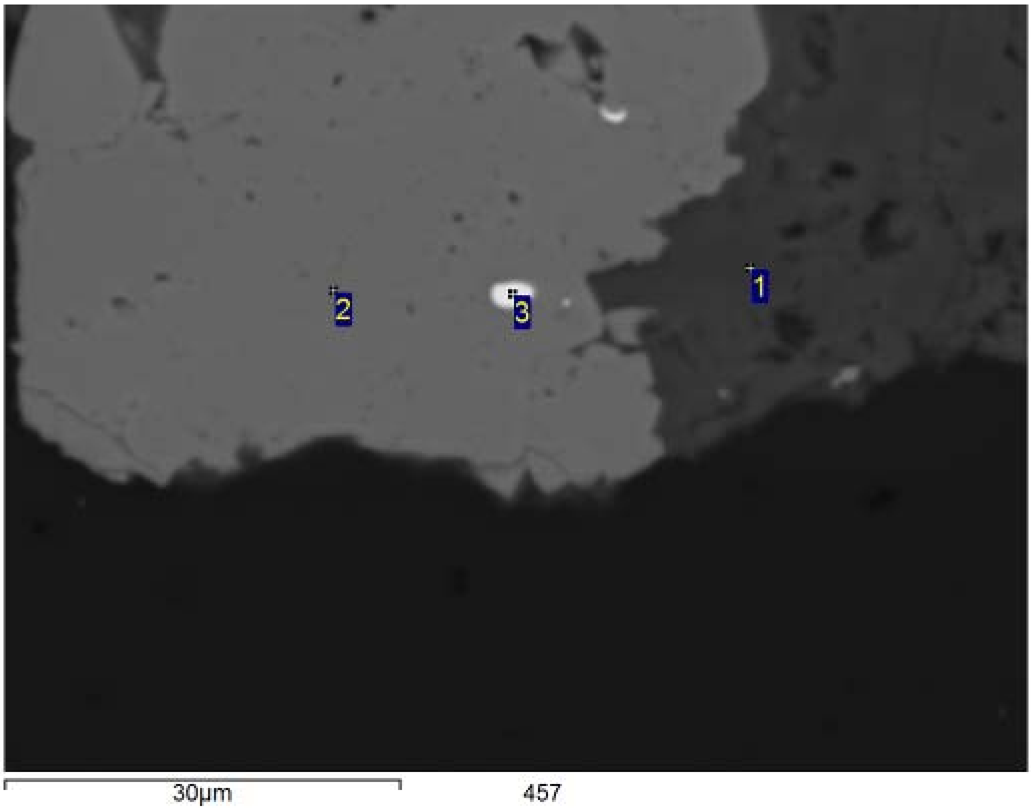
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	O	S	Fe	Ag	Sb	Au	Total	Mineral ID
1	9.2			17.9	1.6	71.4	100.0	Gold
2	5.9	19.1	0.8	29.7	37.1	7.4	100.0	Miargyrite

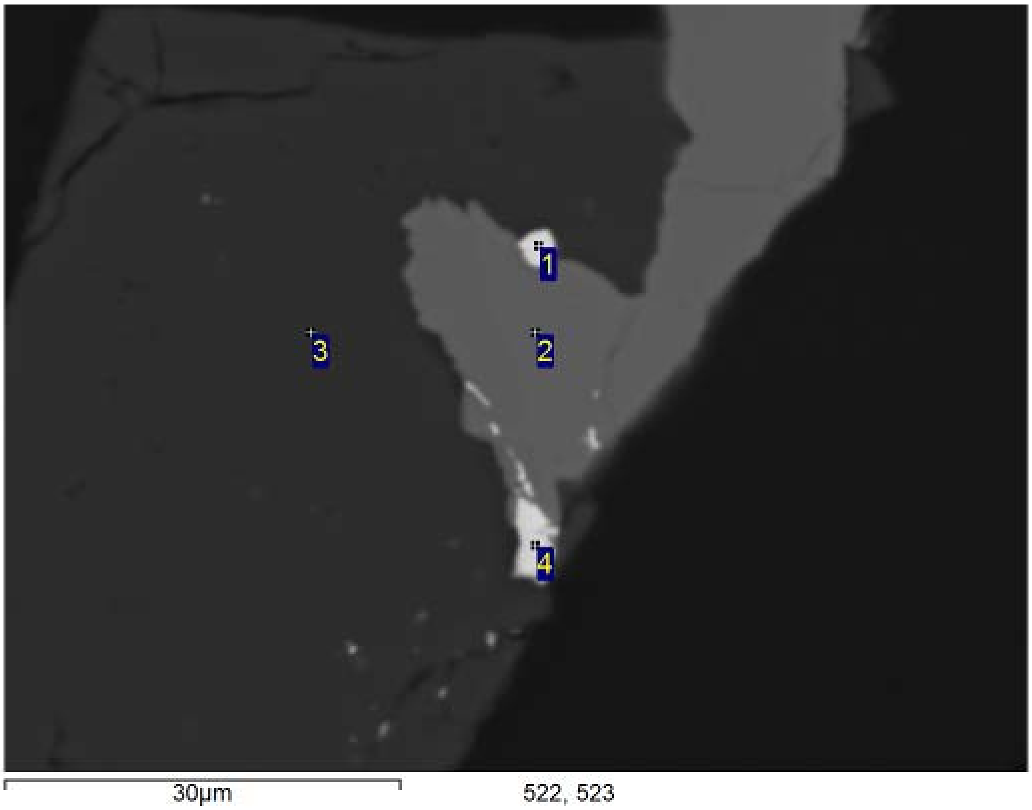
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	O	Al	Si	S	K	Fe	Ag	Au	Total	Mineral ID
1	49.8	1.7	47.1		1.5				100.0	Quartz
2				54.8		45.2			100.0	Pyrite
3						2.8	30.5	66.7	100.0	Electrum

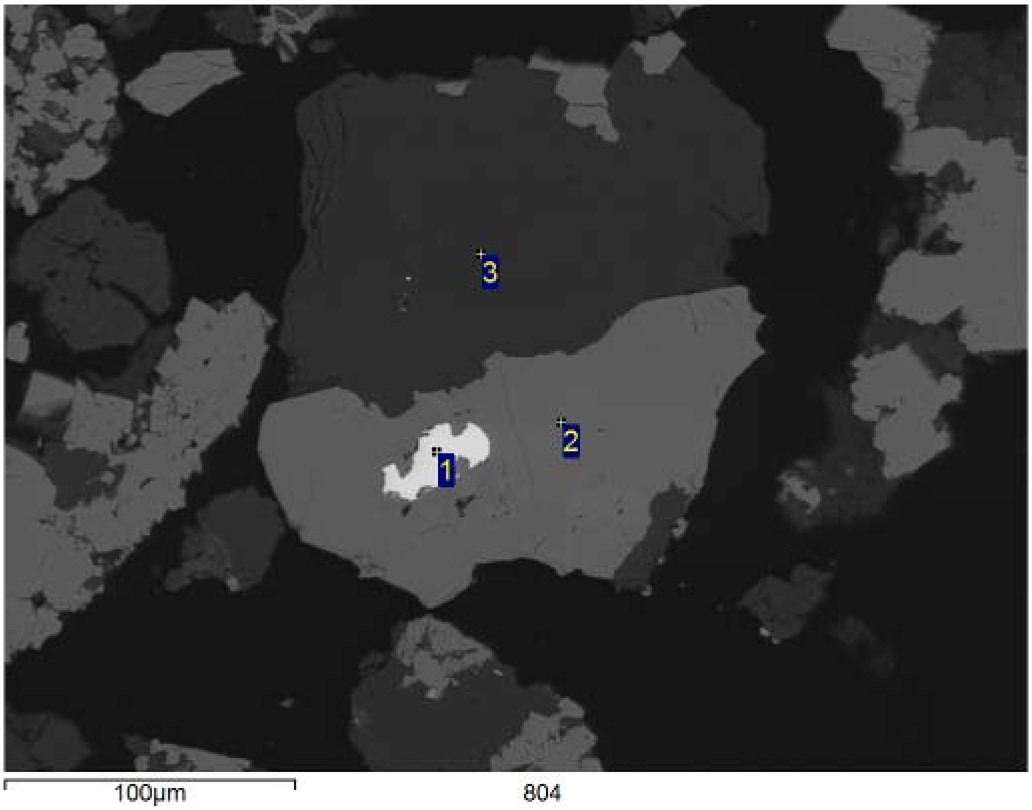
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	O	Si	S	Fe	Ag	Au	Total	Mineral ID
1				2.2	20.7	77.2	100.0	Gold
2			54.6	45.4			100.0	Pyrite
3	50.5	49.1		0.4			100.0	Quartz
4				0.9	20.7	78.4	100.0	Gold

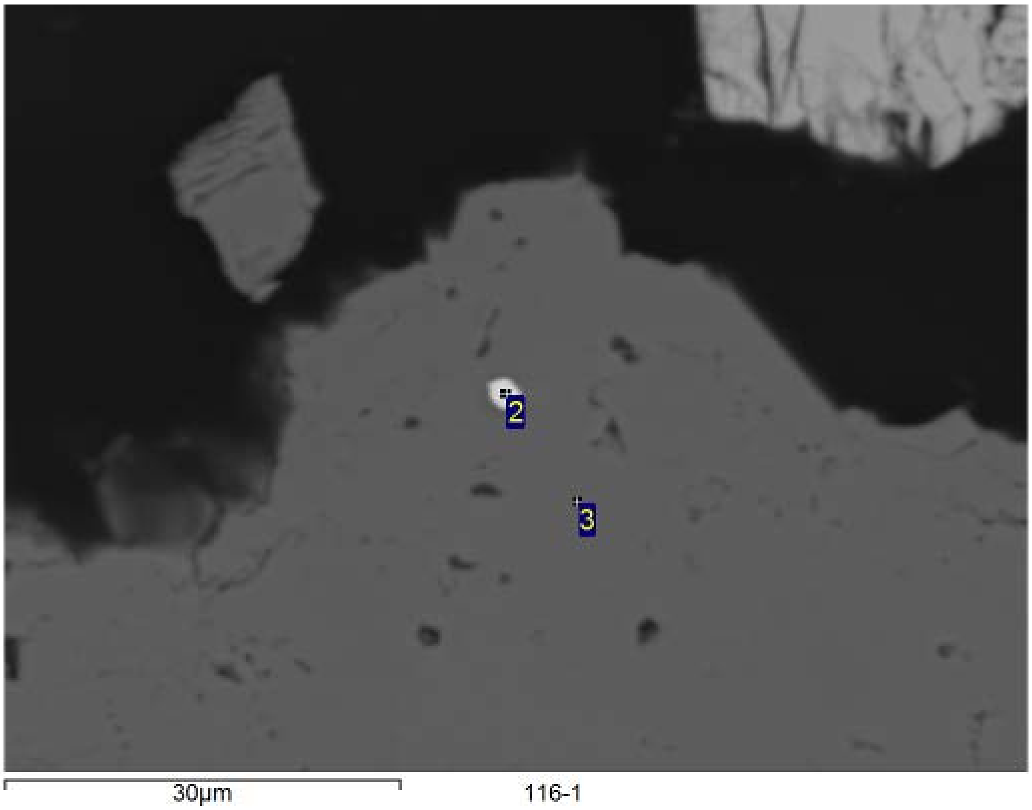
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	O	Al	Si	S	Fe	Ag	Au	Total	Mineral ID
1						20.2	79.8	100.0	Gold
2				54.3	45.7			100.0	Pyrite
3	50.6	0.5	48.8					100.0	Quartz

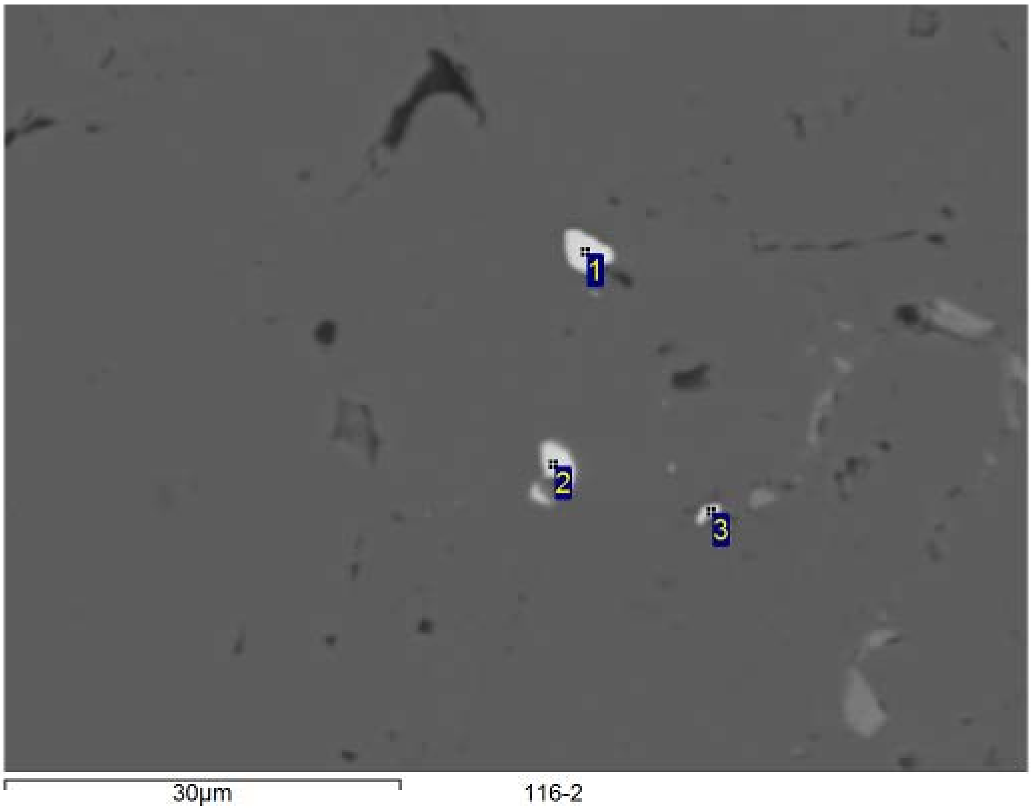
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	S	Fe	Ag	Au	Total	Mineral ID
1		3.7	21.4	74.8	100.0	Gold
2		3.5	21.3	75.1	100.0	Gold
3	54.3	45.7			100.0	Pyrite

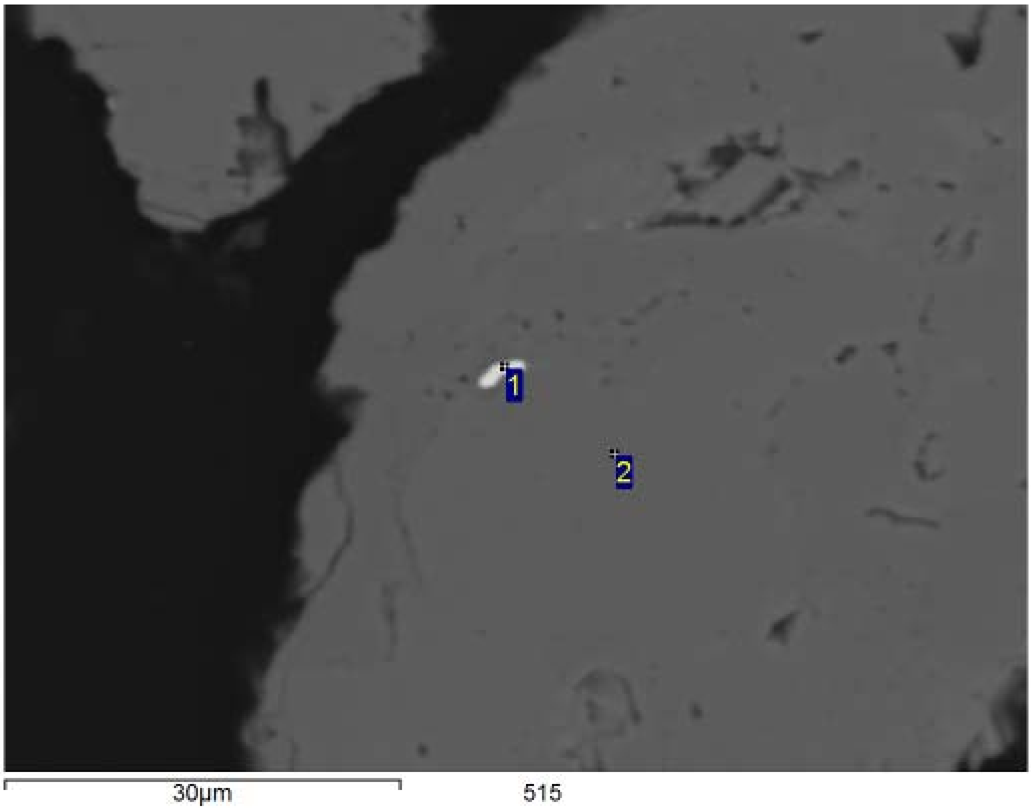
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	S	Fe	Ag	Au	Total	Mineral ID
1		2.6	20.0	77.4	100.0	Gold
2		6.3	20.1	73.6	100.0	Gold
3	17.9	11.2	14.1	56.8	100.0	Gold

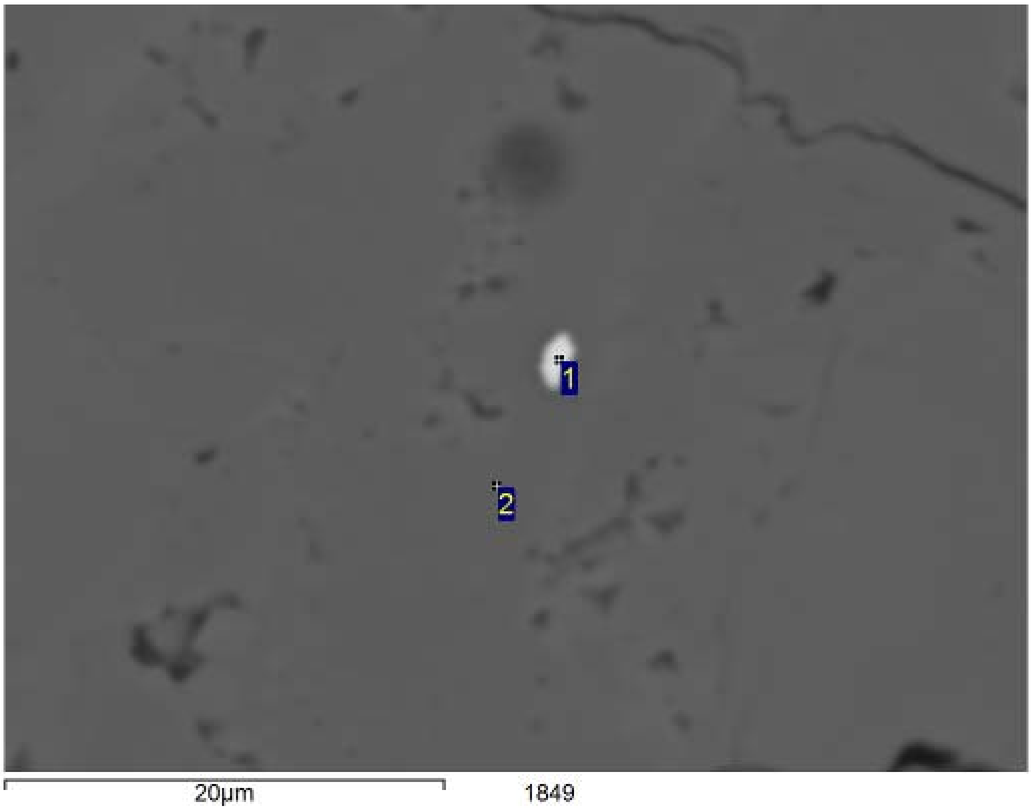
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	S	Fe	Ag	Au	Total	Mineral ID
1	14.6	8.5	11.5	65.4	100.0	Gold
2	54.6	45.4			100.0	Pyrite

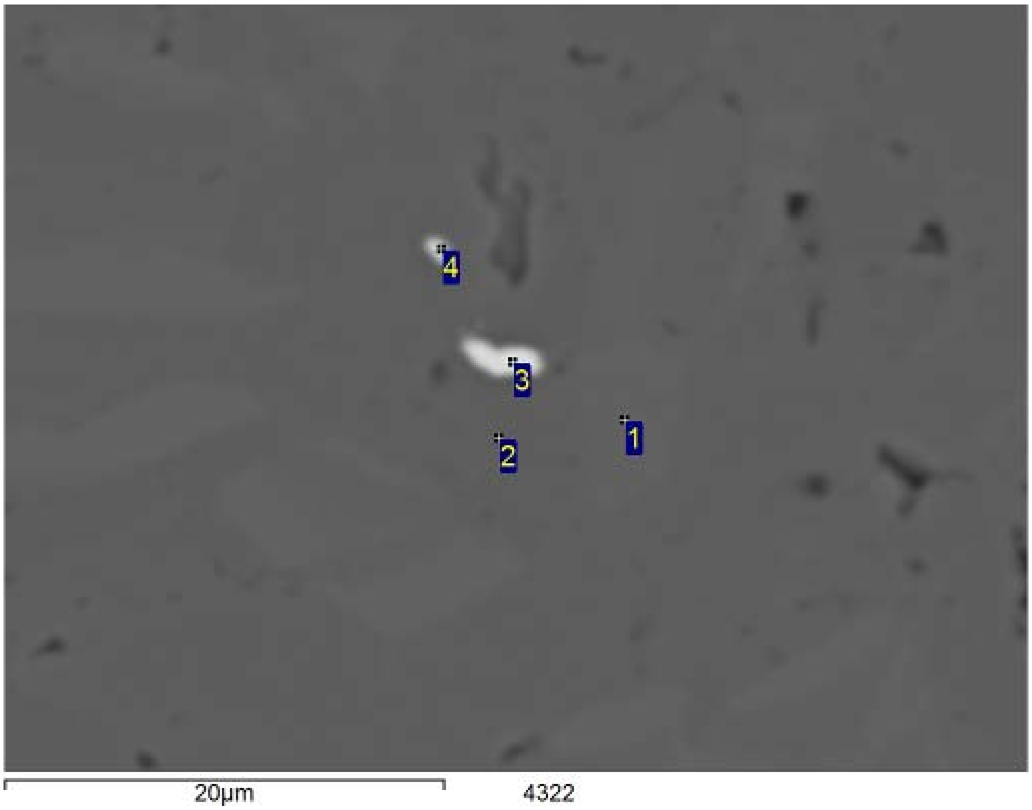
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	S	Fe	Ag	Au	Total	Mineral ID
1		4.6	15.9	79.5	100.0	Gold
2	54.7	45.3			100.0	Pyrite

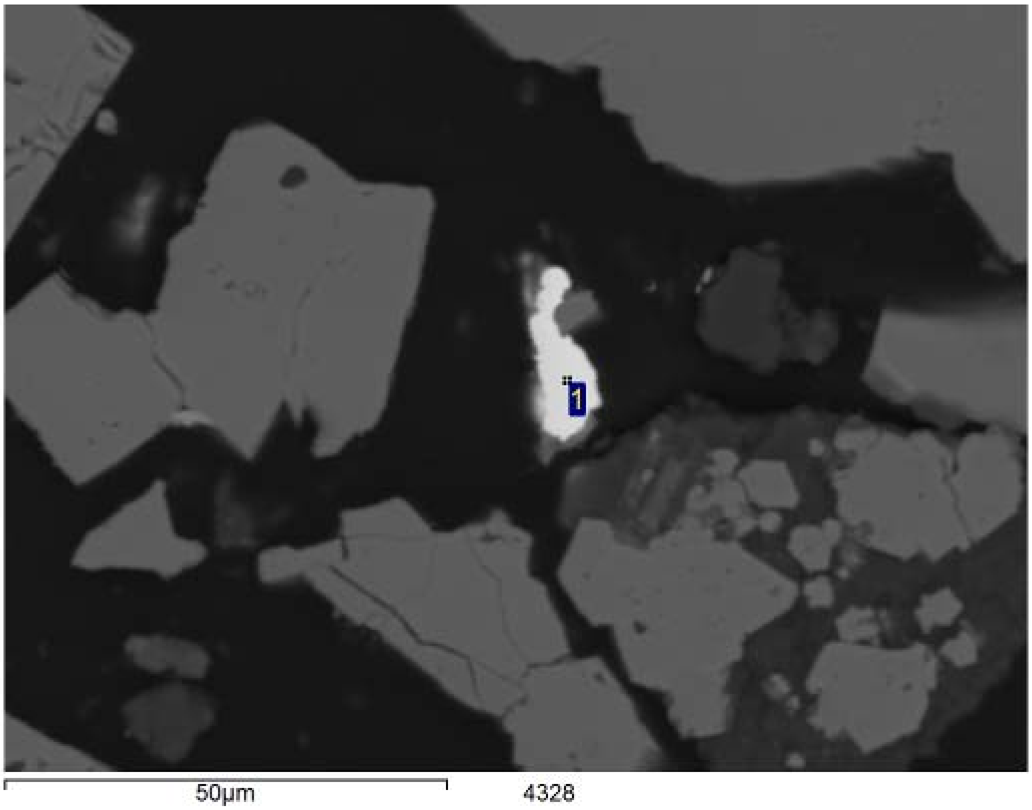
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	S	Fe	As	Ag	Au	Total	Mineral ID
1	51.6	43.9	4.5			100.0	Pyrite
2	54.3	45.7				100.0	Pyrite
3		6.2		17.8	76.0	100.0	Gold
4	18.7	11.6		14.9	54.7	100.0	Gold

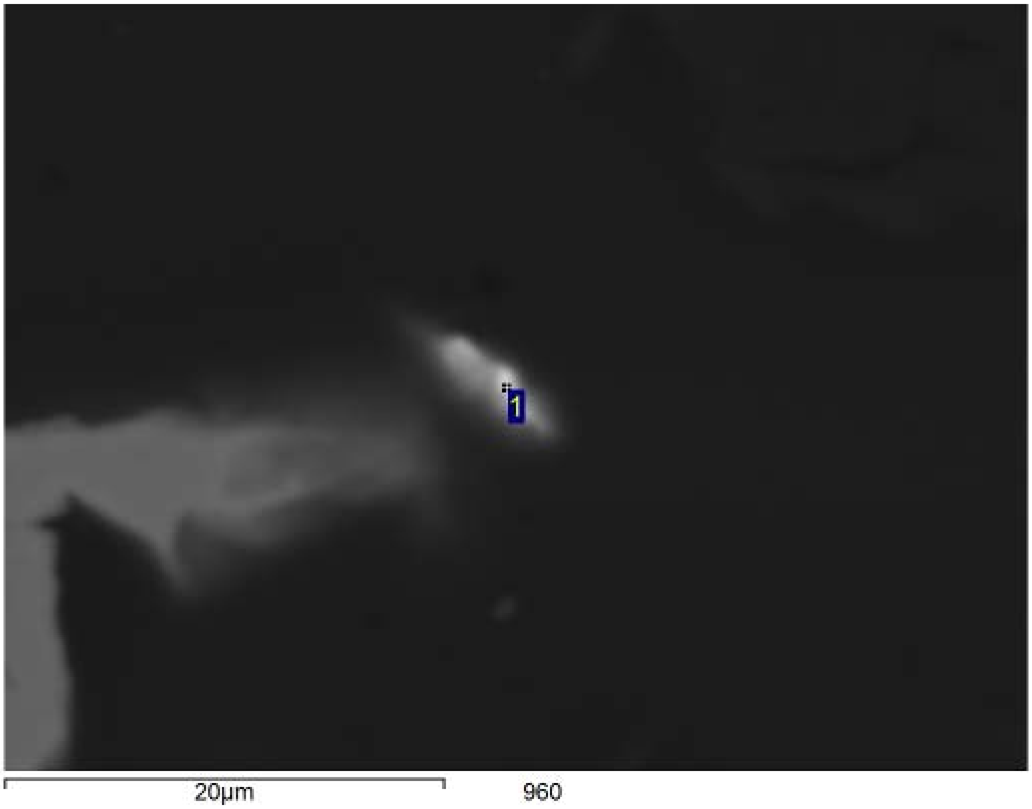
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	Fe	Ag	Au	Total	Mineral ID
1	0.8	21.0	78.2	100.0	Gold

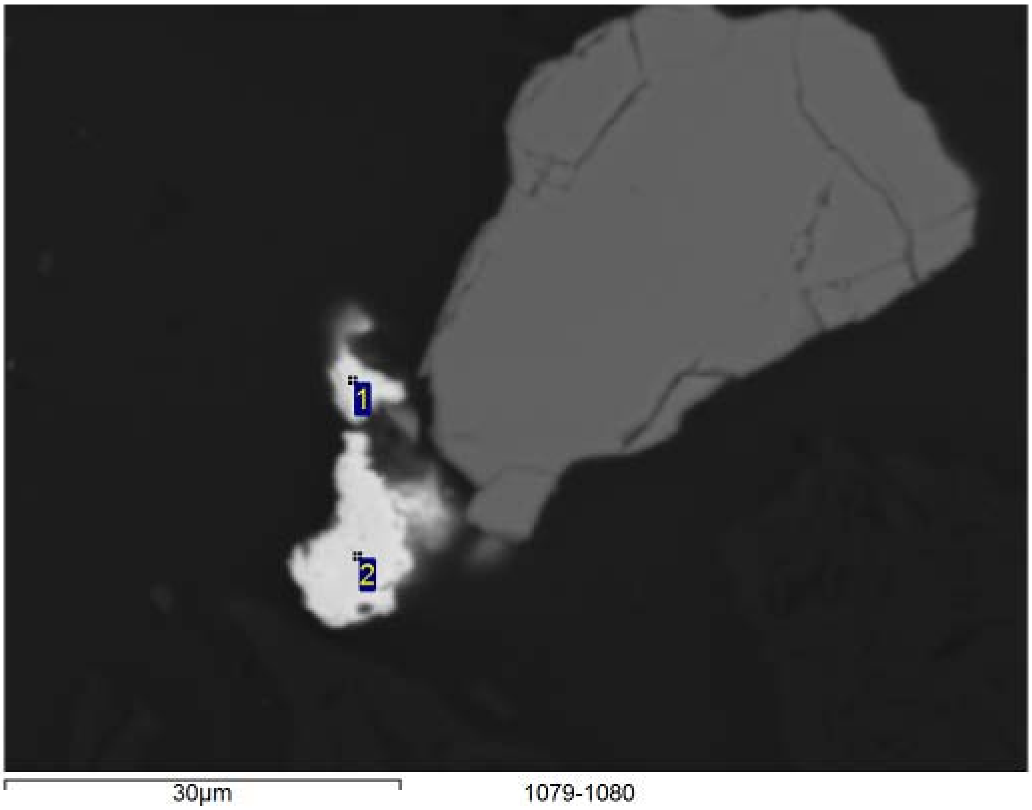
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	O	Fe	Ag	Au	Total	Mineral ID
1	16.0	2.3	14.1	67.6	100.0	Gold

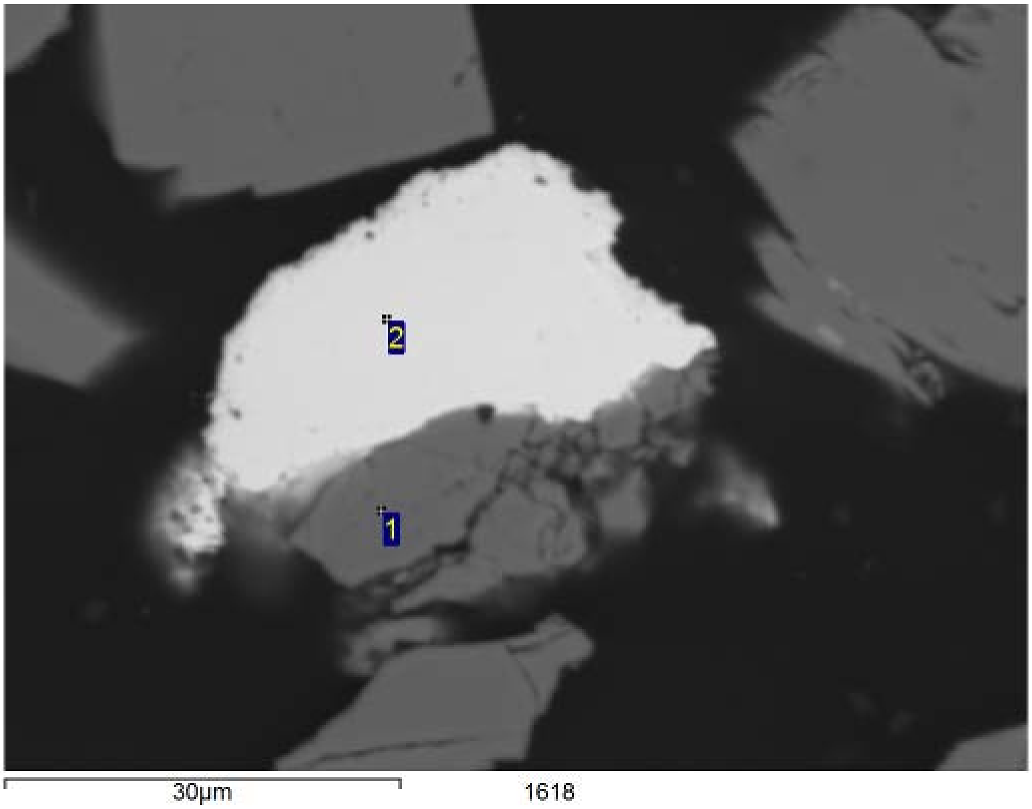
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	O	Fe	Ag	Au	Total	Mineral ID
1	3.1	1.7	15.3	79.8	100.0	Gold
2			28.5	71.5	100.0	Electrum

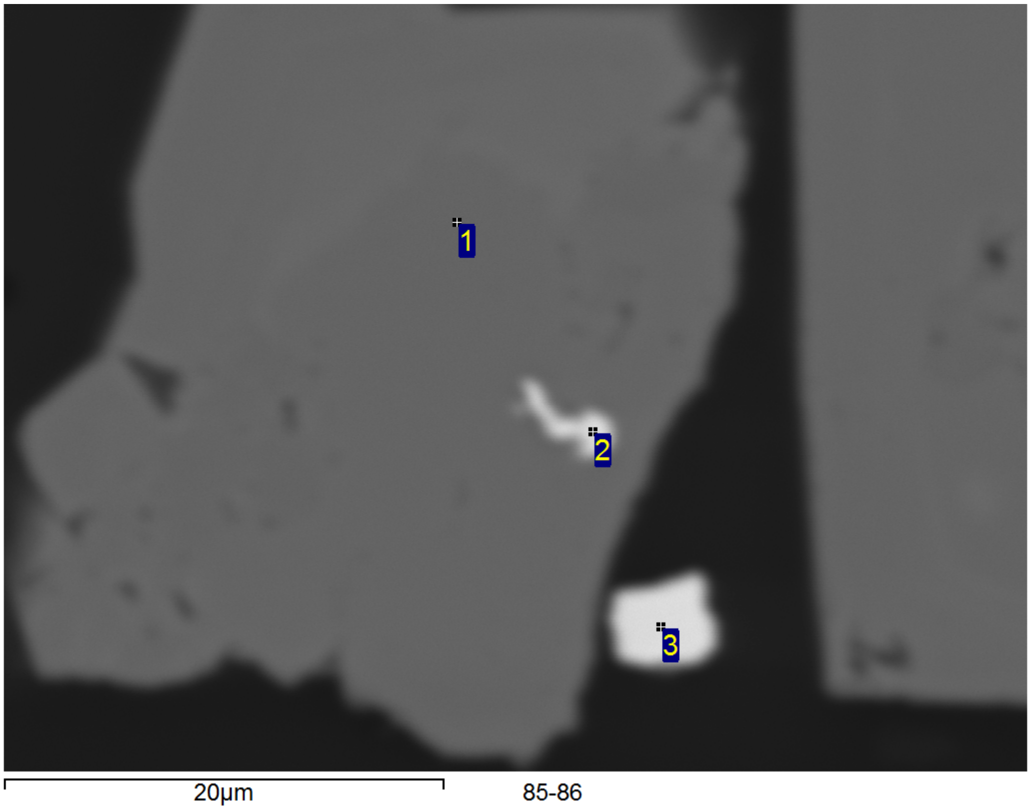
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	S	Fe	Ag	Au	Total	Mineral ID
1	55.3	44.7			100.0	Pyrite
2			28.8	71.2	100.0	Electrum

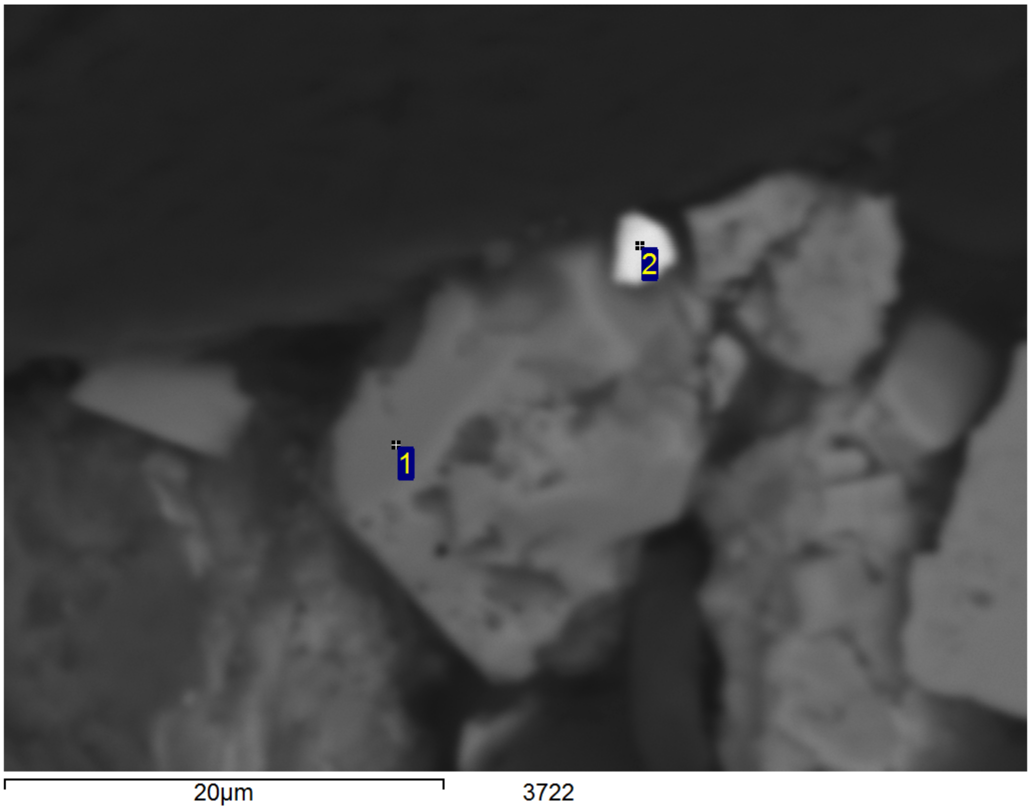
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	S	Fe	Ag	Au	Total	Mineral ID
1	55.0	45.0			100.0	Pyrite
2		5.5	23.0	71.5	100.0	Electrum
3		1.6	26.6	71.8	100.0	Electrum

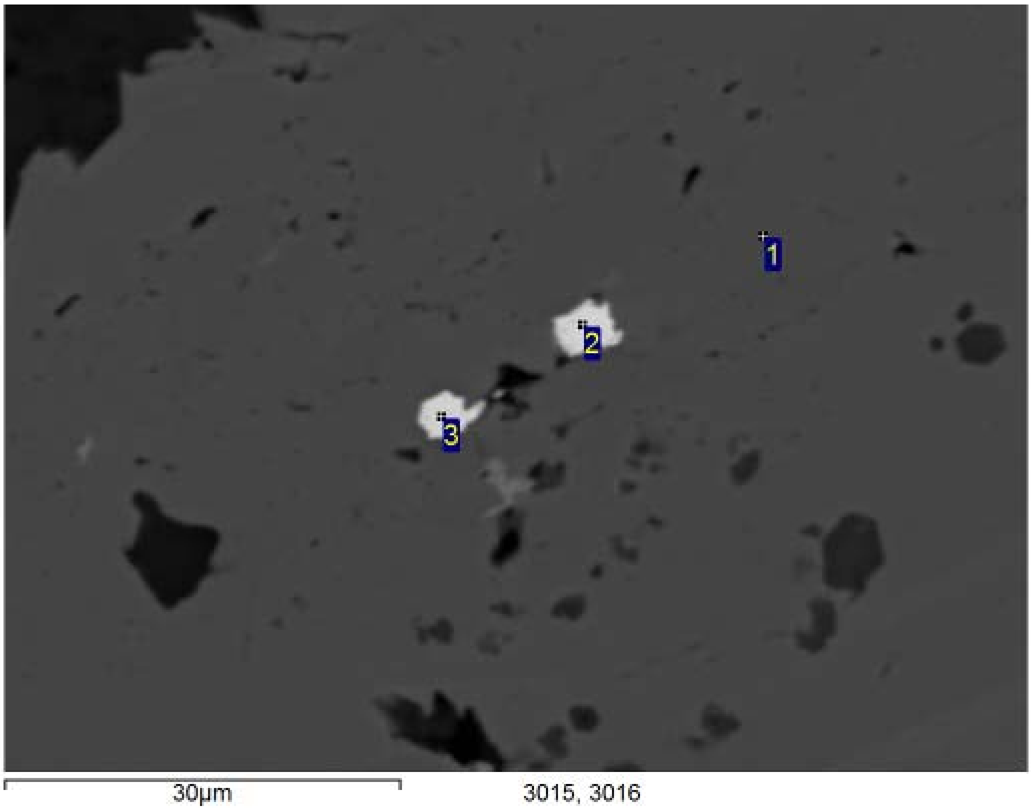
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	Si	S	Fe	Cu	Ag	Au	Total	Mineral ID
1	0.7	51.8	47.5				100.0	Pyrite
2		15.5	9.9	14.8	5.2	54.6	100.0	Gold

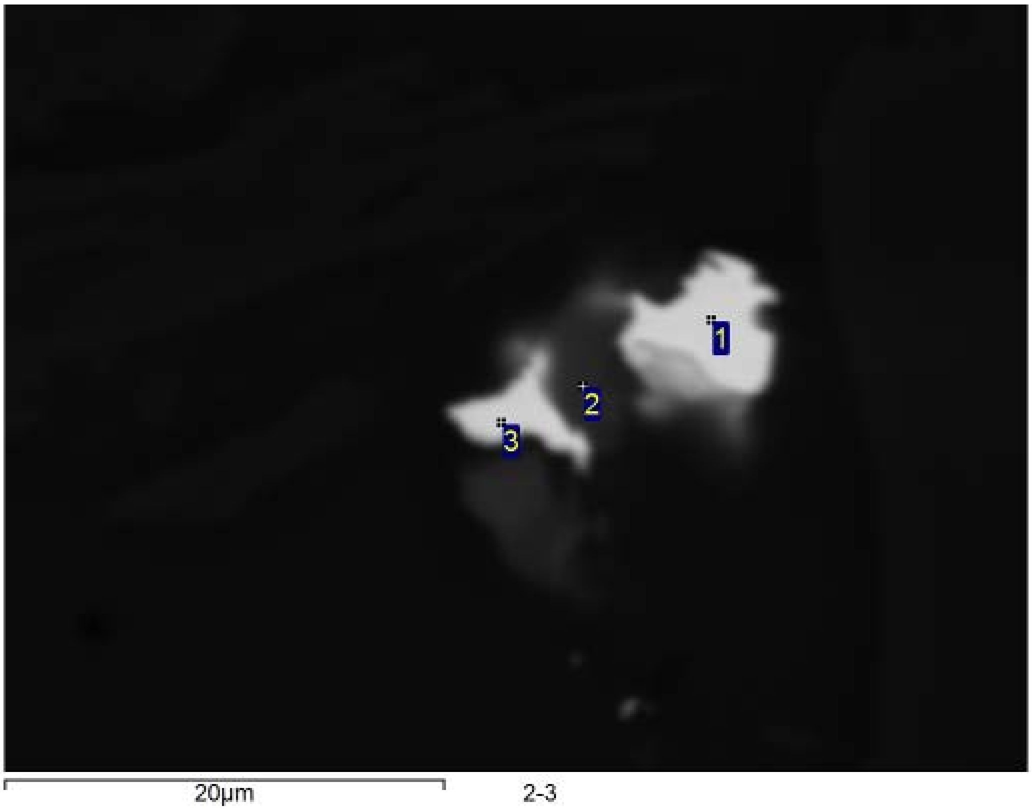
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	S	Fe	Ag	Au	Total	Mineral ID
1	54.5	45.5			100.0	Pyrite
2		2.4	25.1	72.5	100.0	Electrum
3		2.1	25.0	72.9	100.0	Electrum

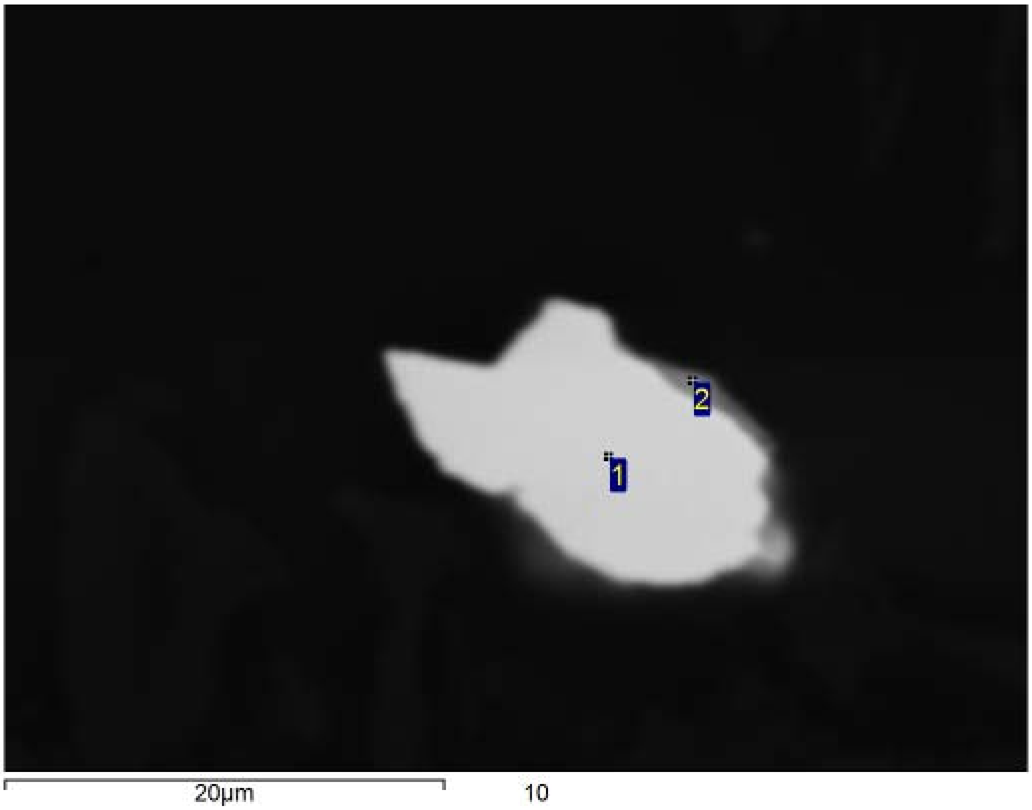
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	O	Si	Fe	Ag	Au	Total	Mineral ID
1			0.7	25.6	73.7	100.0	Electrum
2	50.6	43.9	0.4	0.8	4.4	100.0	Quartz
3	5.9	1.3	1.3	23.3	68.2	100.0	Electrum

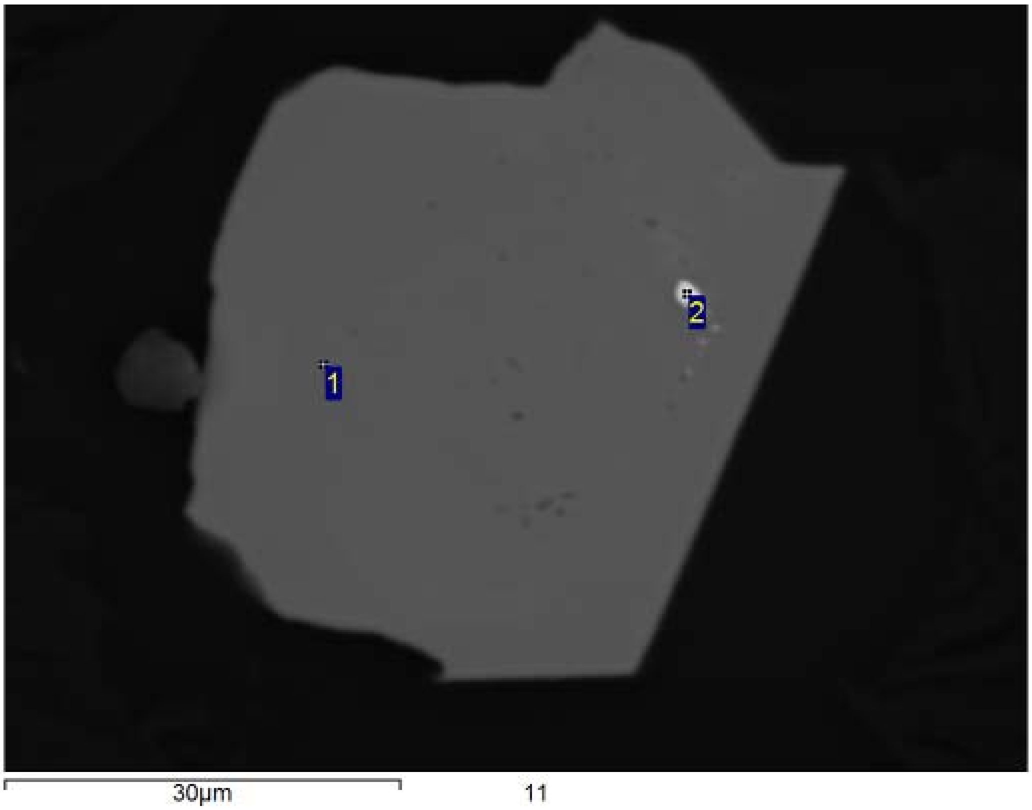
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	O	S	Fe	Cu	Zn	Ag	Sb	Au	Total	Mineral ID
1						28.0		72.0	100.0	Electrum
2	5.9	19.6	3.9	19.8	2.3	14.9	20.7	13.0	100.0	Freibergite

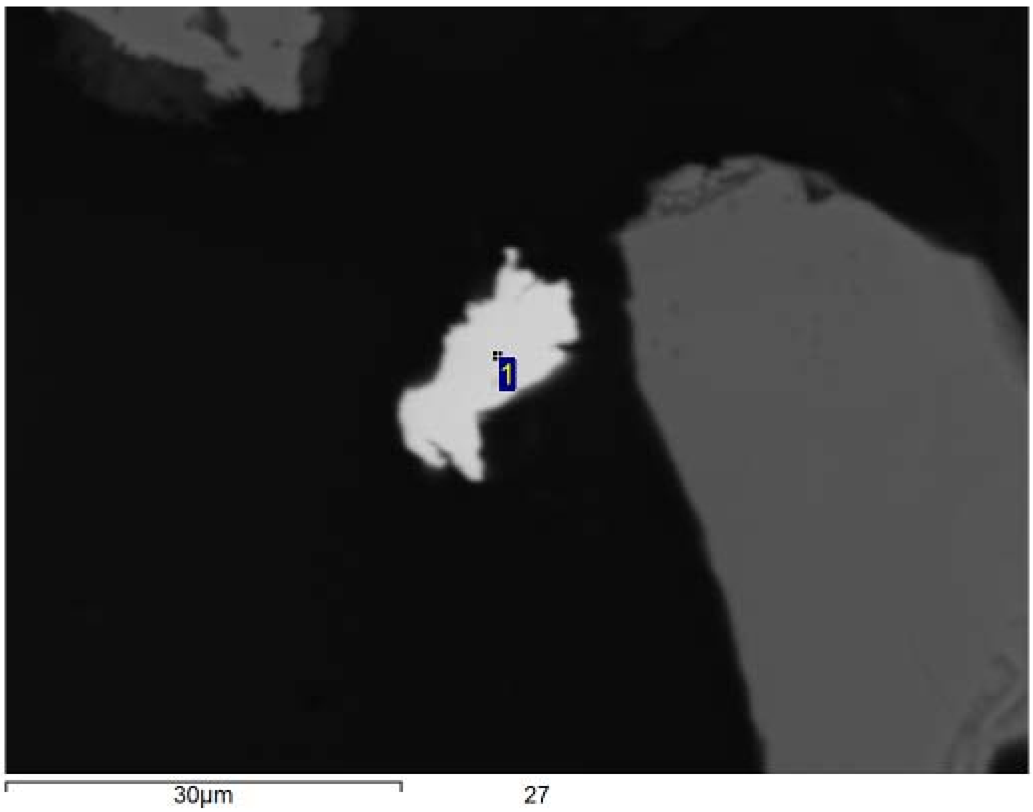
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	S	Fe	As	Ag	Au	Total	Mineral ID
1	54.1	44.7	1.2			100.0	Pyrite
2		5.7		18.5	75.8	100.0	Gold

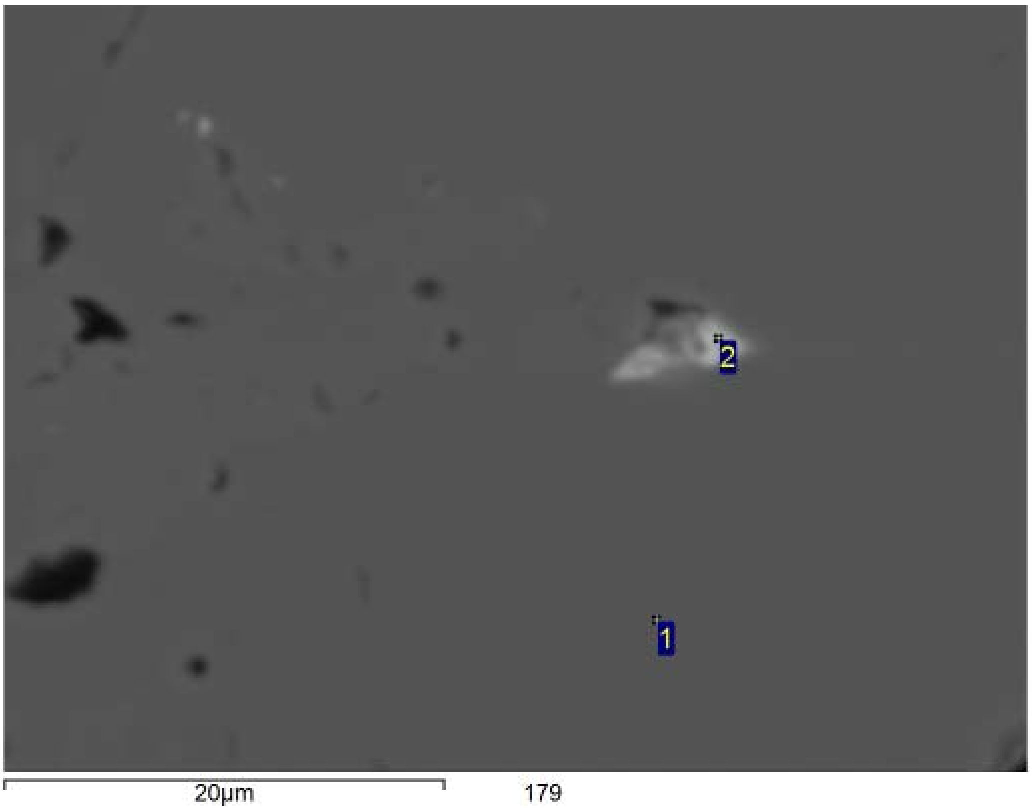
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	Fe	Ag	Au	Total	Mineral ID
1	0.7	23.7	75.6	100.0	Gold

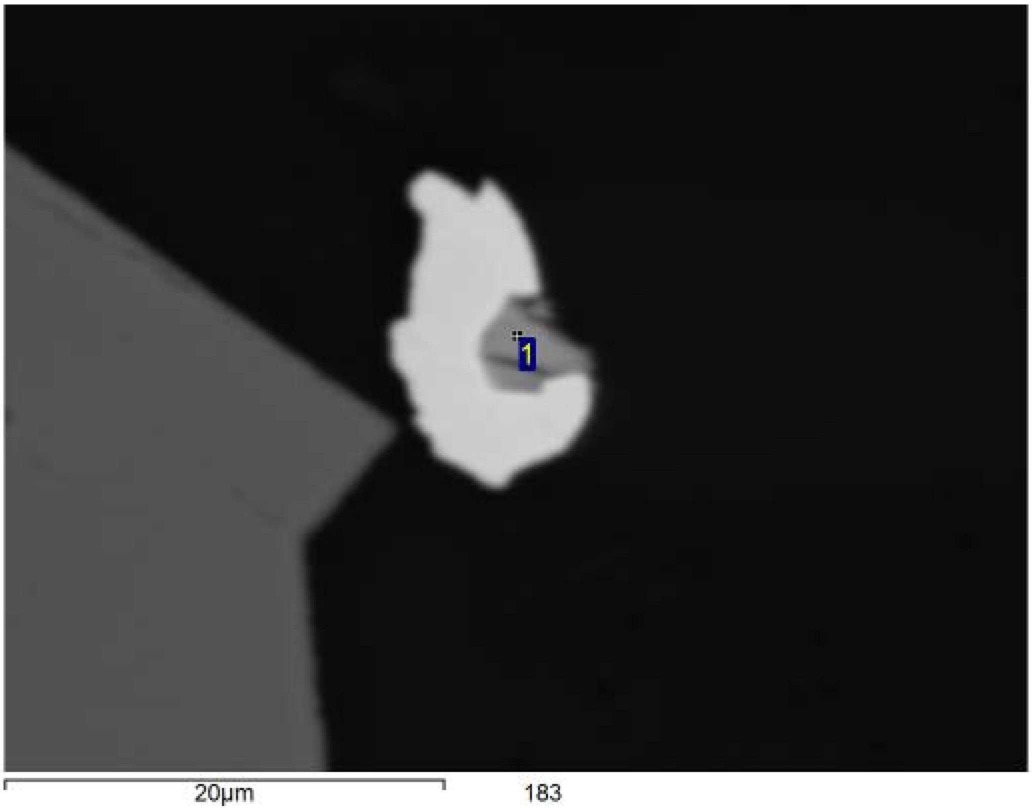
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	S	Fe	Ag	Au	Total	Mineral ID
1	54.3	45.7			100.0	Pyrite
2	11.7	3.3	73.5	11.5	100.0	Kustelite

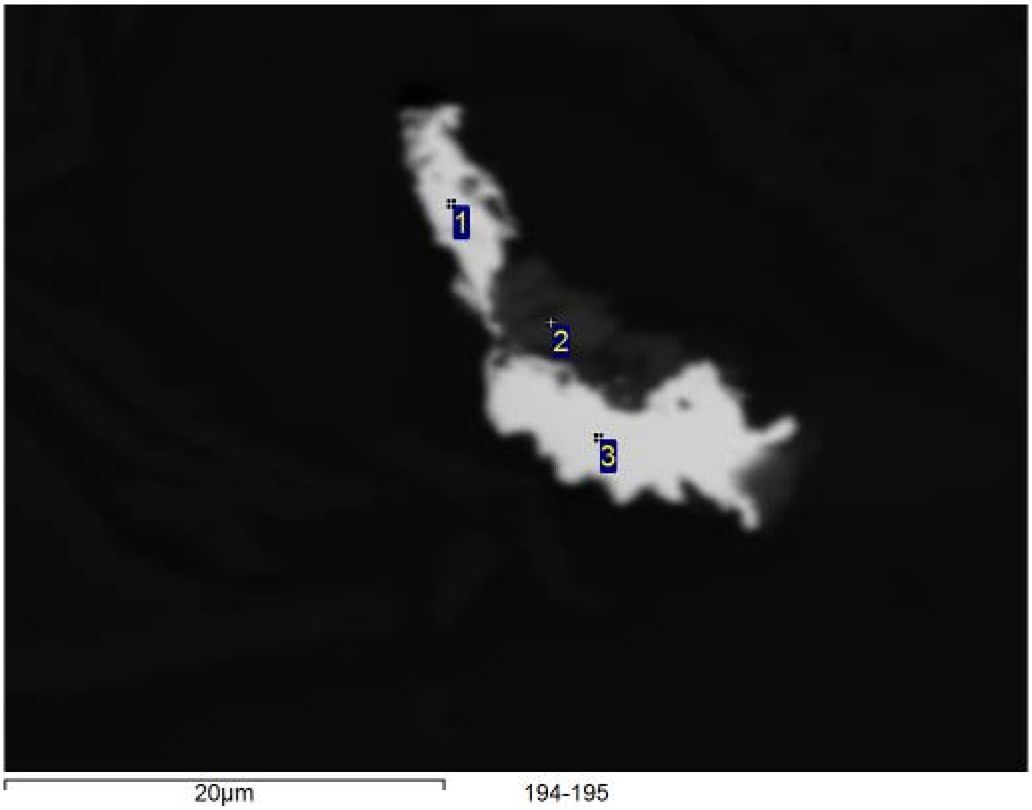
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	S	Fe	Cu	Zn	Ag	Sb	Total	Mineral ID
1	23.3	5.0	26.7	2.3	16.3	26.4	100.0	Freibergite

All results in weight%



Processing option : All elements analysed (Normalised)

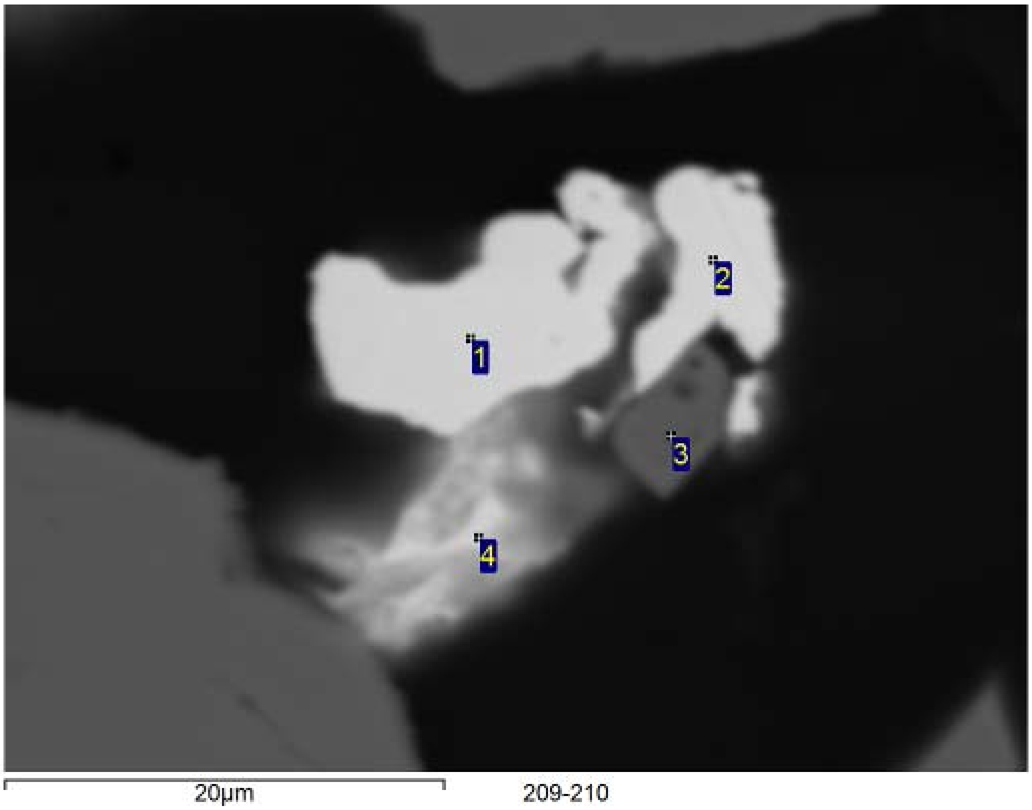
Spectrum	O	Al	Si	Fe	Ag	Au	Total	Mineral ID
1				1.2	25.7	73.1	100.0	Electrum
2	52.8	0.4	42.6		0.7	3.6	100.0	Quartz
3					26.3	73.7	100.0	Electrum

All results in weight%

Processing option : All elements analysed (Normalised)

Spectrum	Ag	Au	Total	Mineral ID
1	23.3	76.7	100.0	Gold

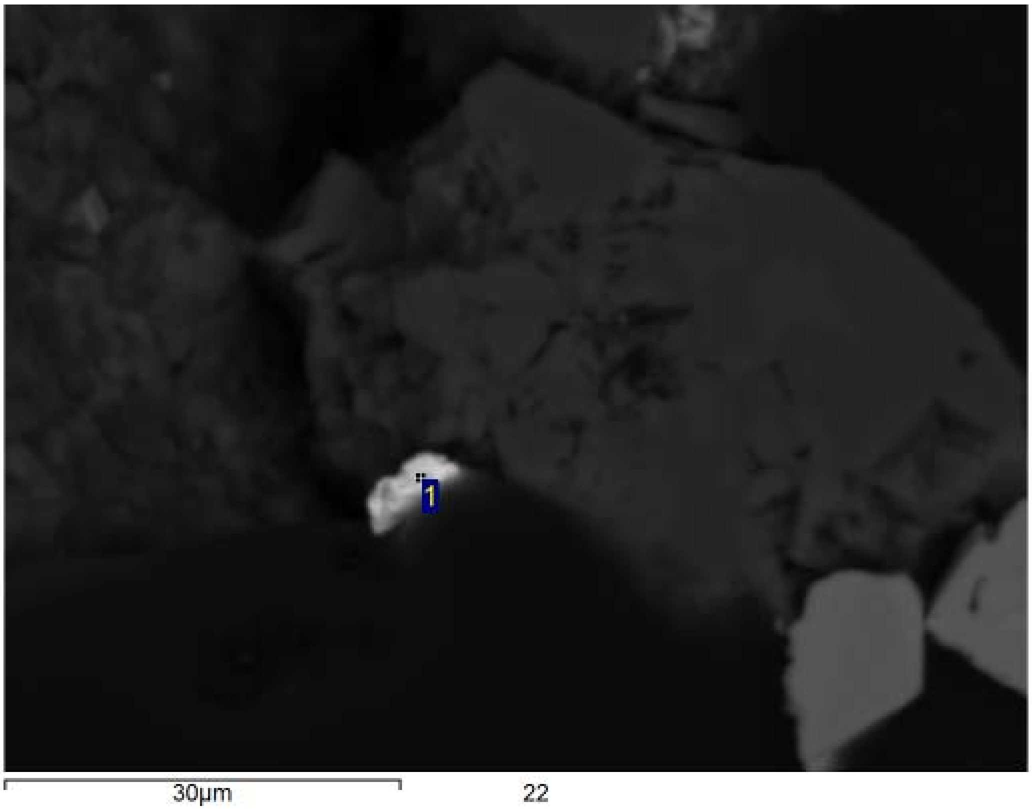
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	O	S	Fe	Ag	Au	Total	Mineral ID
1				26.1	73.9	100.0	Electrum
2			0.9	25.5	73.6	100.0	Electrum
3		55.1	44.9			100.0	Pyrite
4	3.7		1.0	25.4	69.9	100.0	Electrum

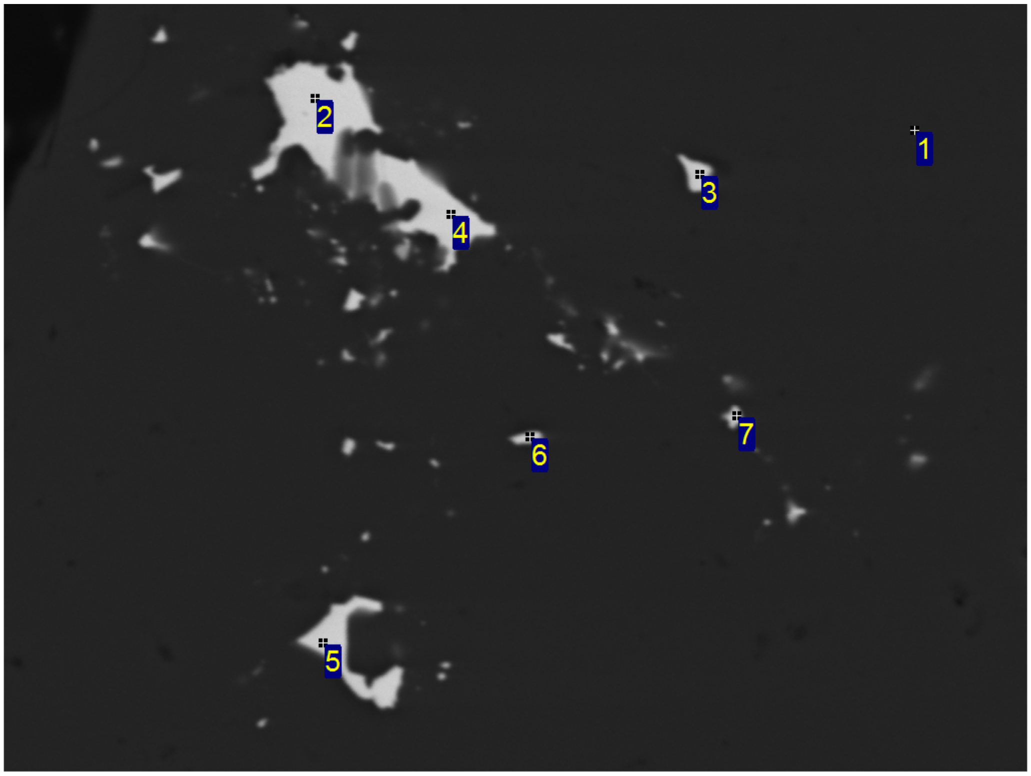
All results in weight%



Processing option : All elements analysed (Normalised)

Spectrum	O	Ag	Au	Total	Mineral ID
1	9.8	27.5	62.7	100.0	Electrum

All results in weight%



40µm 11-17

Processing option : All elements analysed (Normalised)

Spectrum	O	Si	Ag	Au	Total	Mineral ID
1	51.3	48.7			100.0	Quartz
2			25.2	74.8	100.0	Electrum
3			24.8	75.2	100.0	Gold
4			24.8	75.2	100.0	Gold
5			25.6	74.4	100.0	Electrum
6	11.8	5.7	18.9	63.5	100.0	Gold
7	5.5	1.5	23.1	69.9	100.0	Electrum

All results in weight%

Appendix F – Size and Association of Gold and Associated Minerals

Sample ID	Serial (#)	Mineral	Length (µm)	Breadth (µm)	Area (sq. µm)	ECD (µm)	Association	Host Mineral	Length (µm)	Breadth (µm)	Area (sq. µm)	Size (µm)
WWS 13-1 SP Tip	169	Gold	13.1	8.0	49.3	7.9	Locked	Py	203	105	21315.0	164.8
WWS 13-1 SP Tip	174-1	Gold	1.1	0.5	0.5	0.8	Locked	Py	186	206	38316.0	220.9
WWS 13-1 SP Tip	174-2	Gold	1.1	0.5	0.5	0.8	Locked	Py				
WWS 13-1 SP Tip	698	Electrum	26.5	15.4	189.0	15.5	Liberated					
WWS 13-1 SP Tip	944	Electrum	58.3	39.6	1141.8	38.1	Liberated					
WWS 13-1 SP Tip	945	Electrum	42.0	33.7	616.8	28.0	Liberated					
WWS 13-1 SP Tip	947	Gold	20.2	12.3	124.9	12.6	Exposed	Ag-Sb-S	13.1	7.31	95.8	11.0
WWS 13-1 SP Tip	1204	Gold	16.6	12.7	123.9	12.6	Liberated					
WWS-13-1 SP Tip	2	Gold	12.0	5.0	60.0	8.7	Locked	Py	200.0	100.0	20000.0	159.6
Summary	***9***		***21.2***	***14.2***	***2306.8***	***13.9***						

Sample ID	Serial (#)	Mineral	Length (µm)	Breadth (µm)	Area (sq. µm)	ECD (µm)	Association	Host Mineral	Length (µm)	Breadth (µm)	Area (sq. µm)	Size (µm)
WWS 13-1 SP Mid	457	Electrum	2.9	2.0	4.0	2.3	Locked	Qtz, Py	158.0	81.0	12798.0	127.7
WWS 13-1 SP Mid	522-1	Gold	3.9	2.1	4.8	2.5	Locked	Py, Qtz	291.0	40.1	11669.1	121.9
WWS 13-1 SP Mid	522-2	Gold	6.2	2.5	10.3	3.6	Locked	Py, Qtz				
WWS 13-1 SP Mid	804	Gold	40.5	19.5	478.7	24.7	Locked	Qtz, Py	174.0	153.0	26622.0	184.2
Summary	***4***		***13.4***	***6.5***	***497.7***	***8.3***						

Sample ID	Serial (#)	Mineral	Length (µm)	Breadth (µm)	Area (sq. µm)	ECD (µm)	Association	Host Mineral	Length (µm)	Breadth (µm)	Area (sq. µm)	Size (µm)
WWS 13-1 SP Tail 1	116-1	Gold	2.1	1.5	2.3	1.7	Locked	Py	169.0	169.0	28561.0	190.7
WWS 13-1 SP Tail 1	116-2	Gold	3.9	2.8	7.0	3.0	Locked	Py				
WWS 13-1 SP Tail 1	116-3	Gold	3.4	2.2	4.5	2.4	Locked	Py				
WWS 13-1 SP Tail 1	116-4	Gold	0.7	0.5	0.3	0.6	Locked	Py				
WWS 13-1 SP Tail 1	515	Gold	2.1	1.5	2.0	1.6	Locked	Py	102.0	46.2	4712.4	77.5
WWS 13-1 SP Tail 1	1849	Gold	1.8	1.0	1.0	1.1	Locked	Py	195.0	158.0	30810.0	198.1
WWS 13-1 SP Tail 1	4322	Gold	2.6	1.0	1.8	1.5	Locked	Py	215.0	157.0	33755.0	207.4
WWS 13-1 SP Tail 1	4328	Gold	20.3	6.7	74.6	9.7	Liberated					
Summary	***8***		***4.6***	***2.2***	***93.4***	***2.7***						

Sample ID	Serial (#)	Mineral	Length (µm)	Breadth (µm)	Area (sq. µm)	ECD (µm)	Association	Host Mineral	Length (µm)	Breadth (µm)	Area (sq. µm)	Size (µm)
WWS-13-2 SP Tip	960	Gold	1.8	1.0	1.0	1.1	Liberated					
WWS-13-2 SP Tip	1079	Gold	5.3	3.9	12.0	3.9	Liberated					
WWS-13-2 SP Tip	1080	Electrum	13.8	8.6	66.6	9.2	Liberated					
WWS-13-2 SP Tip	1618	Electrum	43.4	23.0	576.3	27.1	Liberated					
Summary	***4***		***16.1***	***9.1***	***655.9***	***10.3***						

Sample ID	Serial (#)	Mineral	Length (µm)	Breadth (µm)	Area (sq. µm)	ECD (µm)	Association	Host Mineral	Length (µm)	Breadth (µm)	Area (sq. µm)	Size (µm)
WWS-13-2 SP Sul 1	85	Gold	5.7	2.1	5.8	2.7	Locked	Py	31.8	24.9	791.8	31.8
WWS-13-2 SP Sul 1	86	Electrum	4.5	3.5	10.5	3.7	Liberated					
Summary	***2***		***5.1***	***2.8***	***16.3***	***3.2***						

Sample ID	Serial (#)	Mineral	Length (µm)	Breadth (µm)	Area (sq. µm)	ECD (µm)	Association	Host Mineral	Length (µm)	Breadth (µm)	Area (sq. µm)	Size (µm)
WWS-13-2 SP Sul 2	3722	Gold	2.5	1.5	2.8	1.9	Exposed	Py	26.8	14.2	380.6	22.0

Sample ID	Serial (#)	Mineral	Length (µm)	Breadth (µm)	Area (sq. µm)	ECD (µm)	Association	Host Mineral	Length (µm)	Breadth (µm)	Area (sq. µm)	Size (µm)
WWS 13-2 SP Tail 1	3015	Electrum	5.4	4.0	15.3	4.4	Locked	Py, Silc	169	134	22646.0	169.8
WWS 13-2 SP Tail 1	3016	Electrum	4.9	3.5	12.3	4.0	Locked	Py, Silc				
Summary	***2***		***5.2***	***3.8***	***27.5***	***4.2***						

Sample ID	Serial (#)	Mineral	Length (µm)	Breadth (µm)	Area (sq. µm)	ECD (µm)	Association	Host Mineral	Length (µm)	Breadth (µm)	Area (sq. µm)	Size (µm)
WOS 13-1 SP Tip	2	Electrum	8.3	5.9	27.5	5.9	Liberated					
WOS 13-1 SP Tip	3	Electrum	4.1	2.5	5.5	2.6	Exposed	Qtz	5.22	3.86	20.1	5.1
WOS 13-1 SP Tip	10	Electrum	18.4	9.1	105.4	11.6	Liberated					
WOS 13-1 SP Tip	11	Gold	1.8	1.0	1.3	1.3	Locked	Py	41.7	48.5	2022.5	50.8
WOS 13-1 SP Tip	27	Gold	16.4	7.6	84.9	10.4	Liberated					
WOS 13-1 SP Tip	179	Kustelite	2.1	1.3	1.5	1.4	Locked	Py	265	119	31535.0	200.4
WOS 13-1 SP Tip	183	Electrum	14.1	7.2	59.1	8.7	Liberated					
WOS 13-1 SP Tip	194	Electrum	8.3	2.2	9.5	3.5	Liberated					
WOS 13-1 SP Tip	195	Electrum	12.5	5.4	37.8	6.9	Exposed	Qtz	8.95	3.41	30.5	6.2
WOS 13-1 SP Tip	203	Gold	18.3	10.9	123.4	12.5	Liberated					
WOS 13-1 SP Tip	209	Electrum	27.3	16.7	209.3	16.3	Liberated					
WOS 13-1 SP Tip	210	Electrum	3.1	1.6	3.4	2.1	Exposed	Py	6.23	3.69	23.0	5.4
Summary	***12***		***11.2***	***5.9***	***668.6***	***6.9***						

Sample ID	Serial (#)	Mineral	Length (µm)	Breadth (µm)	Area (sq. µm)	ECD (µm)	Association	Host Mineral	Length (µm)	Breadth (µm)	Area (sq. µm)	Size (µm)
WOS 13-1 SP Flt 1	22	Electrum	6.3	3.1	9.8	3.5	Liberated					

Sample ID	Serial (#)	Mineral	Length (µm)	Breadth (µm)	Area (sq. µm)	ECD (µm)	Association	Host Mineral	Length (µm)	Breadth (µm)	Area (sq. µm)	Size (µm)
WOS 13-1 SP Flt 2	11-1	Electrum	10.1	7.9	44.6	7.5	Locked	Qtz	237	176	41712.0	230.5
WOS 13-1 SP Flt 2	11-2	Gold	12.4	4.7	31.0	6.3	Locked	Qtz				
WOS 13-1 SP Flt 2	11-3	Gold	0.7	0.5	0.3	0.6	Locked	Qtz				
WOS 13-1 SP Flt 2	11-4	Gold	2.2	1.5	2.0	1.6	Locked	Qtz				
WOS 13-1 SP Flt 2	11-5	Gold	1.6	0.5	0.8	1.0	Locked	Qtz				
WOS 13-1 SP Flt 2	11-6	Electrum	5.3	3.5	9.3	3.4	Locked	Qtz				
WOS 13-1 SP Flt 2	11-7	Electrum	4.3	2.5	4.5	2.4	Locked	Qtz				
Summary	***7***		***5.2***	***3.0***	***92.4***	***3.3***						

Appendix G – Metallurgical Testwork

14322-001 Paramount Gold - New Sleeper Project **06-Dec-13**

Heavy Liquid Float Samples from Mineralogy

Objective: - determine deportment ("free/exposed" & "locked") of gold in Heavy Liquid Float products, in aid of mineralogies gold deportment study

Samples: as listed below

Test No.	Number	Sample	Au (g/t)	Fe (%)	As (%)	S= (%)
CN-Min 1	MI5030-Oct13 5 of 17	3775-WWS-13-1 HLS Float	2.28	2.28	0.150	2.00
CN-Min 2	MI5030-Oct13 11 of 17	3775-WWS-13-2 HLS Float	1.20	2.01	0.040	1.99
CN-Min 3	MI5030-Oct13 17 of 17	3775-WOS-13-1 HLS Float	1.39	1.79	0.055	1.52

Procedure:

- samples are ? 350 grams each
- weight accurately & record weight
- pulp to 33% solids in a bottle
- adjust pH to 11.0 with Ca(OH)2
- add 10 g/L activated carbon
- and 10 g/L NaCN
- place on rolls
- check and record pH & d.o. after 1 hour

(no checking of intermediate CN is required)
- allow to roll for 48 hours (no intermediate checks required)
- check and record pH & d.o. before leaving for the day
- check and record pH & d.o. At ~ 24 hours
- check and record pH & d.o. at 48 hours
- after 48 hours, screeen to remove carbon, and filter
- measure residual NaCN and CaO

  and calculate NaCN & lime consumption
- wash solids
- submit carbon for **accurate** dry weight and Au assay
- submit barren for Au assay
- ask bucking room to do the following for each residue
  - record total dry weight
  - cut out four **30-gram cuts**, name them

    "Cut A", "Cut B", "Cut C", "Cut D"
  - lable samples "low gold"
  - store remaining leach residue
  - ask Fire Assay to:

    "Fuse Cut A & Cut B and combine beads for a single assay"

    "Fuse Cut C & Cut D and combine beads for a single assay"

- prepare CN leach test reports with gold balances.

14322-001 Paramount Gold - New Sleeper Project Last update - Dec 18, 2013

Cyanidation of HLS products

Test No.	Reagent, kg/t of CN Feed Addition		Consumption		% Extraction	Residue, g/t	Head, g/t	
	NaCN	CaO	NaCN	CaO	Au	Au	Calc. Au	Direct Au
3775-WWS-13-1 HLS Float								
CN-MIN1	21.4	2.37	3.08	2.30	15.8 *	1.94	-	2.28
3775-WWS-13-2 HLS Float								
CN-MIN2	20.3	2.05	1.80	1.89	25.7	0.814	1.09	1.20
3775-WOS-13-1 HLS Float								
CN-MIN3	20.3	1.75	2.97	1.64	34.5	0.833	1.26	1.39

* - Carbon Assay failed. The value is back calculated.

Notes: ***Detection Limit: Au-0.05 g/t, Ag-0.2 g/t***

CN Test Conditions Applied Were As Follows:

Primary Grind	=	na
pH	=	> 11 (maintained with lime)
Cyanide Concentration	=	10 g/L
Lead Nitrate	=	na
% Solids	=	33%
Retention Time	=	48 h
Pre-aeration	=	na
Dissolved Oxygen	=	na
Size Target	=	na
Carbon	=	10 g/L
Temperature	=	na
DO target	=	na

Grade (MVNF-Med), 5 Year Composite Cyanidation Au Residue Analysis

Test No.	Residue, Au, g/t A	B	Final Avg.
3775-WWS-13-1 HLS Float			
CN-MIN1	1.93	1.95	1.94
3775-WWS-13-2 HLS Float			
CN-MIN2	0.814	0.814	0.814
3775-WOS-13-1 HLS Float			
CN-MIN3	0.823	0.843	0.833

Test: CN-MIN 1 | **Project:** 14322-001 | **Operator:** NP | **Date:** **December 9, 2013**

Purpose: **Determine deportment ("free/exposed" & "locked") of gold in Heavy Liquid Float products, in aid of mineralogy's gold deportment study**

Procedure: The sample was placed into a bottle and pulped with water to the proper percent solids. The pH of the pulp was adjusted with lime as described below. Pre-treated carbon and sodium cyanidewas added into the bottle and the bottle was placed on the rolls for 48 h. Dissolved oxygen and pH were maintained for duration of the test as described below. At the end of the leach, the carbon was screened, the pulp was filtered and the residue was washed with three displacements of water. The wash water was discarded. The final products were submitted for the required assays.

Feed: ~299 g **3775-WWS-13-1 HLS Float** (MI5030-Oct13 5 of 17)
Leach Duration: 24 **h**
Dissolved Oxygen: na
Solution Volume: ~607 mL
pH Range: 11 maintained with lime as required
DO target: na
Pulp Density: **33 % solids**
Final Residue Size (P_{80}): na
NaCN Concentration: 10.0 g/L NaCN
$Pb(NO_3)_2$: na
Grind: as recieved
Carbon: 10 g/L 6.1 g

Temperature: na
Reagent Addition (kg/t of cyanide feed) NaCN: 21.4 CaO: 2.37
Reagent Consumption (kg/t of cyanide feed) NaCN: 3.06 CaO: 2.30

Time	Added, Grams				Residual		Consumed		pH	DO mg/L	Notes
	Actual		Equivalent		Grams		Grams				
hours	NaCN	$Ca(OH)_2$	NaCN	CaO	NaCN	CaO	NaCN	CaO			
Preconditioning:											
Cyanidation:									4.0		
0-1	6.530	0.780	6.40	0.59	-		-		11.0-10.7	10.7	
1-8	0.000	0.130	0.00	0.10	-		-		11.0-10.9	5.9	
8-24	0.000	0.023	0.00	0.02	-		-		11.0-11.0	5.8	
24-48	0.000	0.000	0.00	0.00	5.485	0.021	0.91	0.69	11.0-10.9	6.1	
Total	6.53	0.93	6.40	0.71	5.48	0.02	0.91	0.69			

Cyanidation Results:

Product	**Amount**	**Assays, mg/L, g/t**	**% Distribution**
	g, mL	**Au**	**Au**
Carbon	6.41	15.7 *	14.8
Barren Solution 24 h	666	0.01	1.0
Final Residue	296	1.94	84.2
Head (calc.)	299	2.28	100.0
Head (dir.)		2.28	

* The carbon assay failed. The value is back calculated.

Extraction, %: **15.8**

Pulp Density 0h,% 33.0
Pulp Density 24h,% 30.8
Duplicate residue assays, Au, g/t = 1.93
1.95

Average: 1.94 g/t

Test: CN-MIN 1 **Project:** 14322-001 **Operator:** NP **Date:** **December 9, 2013**

Purpose: **Determine deportment ("free/exposed" & "locked") of gold in Heavy Liquid Float products, in aid of mineralogy's gold deportment study**

Procedure: The sample was placed into a bottle and pulped with water to the proper percent solids. The pH of the pulp was adjusted with lime as described below. Pre-treated carbon and sodium cyanidewas added into the bottle and the bottle was placed on the rolls for 48 h. Dissolved oxygen and pH were maintained for duration of the test as described below. At the end of the leach, the carbon was screened, the pulp was filtered and the residue was washed with three displacements of water. The wash water was discarded. The final products were submitted for the required assays.

Feed: ~303 g **3775-WWS-13-2 HLS Float** (MI5030-Oct13 11 of 17)
Leach Duration: 24 **h**
Dissolved Oxygen: na
Solution Volume: ~615 mL
pH Range: 11 maintained with lime as required
DO target: na
Pulp Density: **33 % solids**
Final Residue Size (P_{80}): na
NaCN Concentration: 10.0 g/L NaCN
$Pb(NO_3)_2$: na
Grind: as recieved
Carbon: 10 g/L 6.2 g

Temperature: na
Reagent Addition (kg/t of cyanide feed) NaCN: 20.3 CaO: 2.05
Reagent Consumption (kg/t of cyanide feed) **NaCN:** **1.80** **CaO:** **1.89**

Time	Added, Grams				Residual		Consumed		pH	DO	Notes
	Actual		Equivalent		Grams		Grams			mg/L	
hours	NaCN	$Ca(OH)_2$	NaCN	CaO	NaCN	CaO	NaCN	CaO			
Preconditioning:											
Cyanidation:									4.3		
0-1	6.275	0.816	6.15	0.62	-		-		11.8-11.3	9.8	
1-8	0.000	0.000	0.00	0.00	-		-		11.3-11.1	5.7	
8-24	0.000	0.000	0.00	0.00	-		-		11.1-11.1	6.1	
24-48	0.000	0.000	0.00	0.00	5.605	0.046	0.54	0.57	11.1-11.0	6.2	
Total	6.28	0.82	6.15	0.62	5.61	0.05	0.54	0.57			

Cyanidation Results:

Product	**Amount**	**Assays, mg/L, g/t**	**% Distribution**
	g, mL	**Au**	**Au**
Carbon	6.71	11.7	23.7
Barren Solution 24 h	661	0.01	2.0
Final Residue	302	0.81	74.3
Head (calc.)	303	1.09	100.0
Head (dir.)		1.20	
		Extraction, %:	**25.7**

Pulp Density 0h,% 33.0
Pulp Density 24h,% 31.4
Duplicate residue assays, Au, g/t = 0.814
0.814

Average: 0.814 g/t

Test: CN-MIN 3 | **Project:** 14322-001 | **Operator:** NP | **Date:** **December 9, 2013**

Purpose: **Determine deportment ("free/exposed" & "locked") of gold in Heavy Liquid Float products, in aid of mineralogy's gold deportment study**

Procedure: The sample was placed into a bottle and pulped with water to the proper percent solids. The pH of the pulp was adjusted with lime as described below. Pre-treated carbon and sodium cyanidewas added into the bottle and the bottle was placed on the rolls for 48 h. Dissolved oxygen and pH were maintained for duration of the test as described below. At the end of the leach, the carbon was screened, the pulp was filtered and the residue was washed with three displacements of water. The wash water was discarded. The final products were submitted for the required assays.

Feed: ~300 g **3775-WOS-13-1 HLS Float** (MI5030-Oct13 17 of 17)
Leach Duration: 24 **h**
Dissolved Oxygen: na
Solution Volume: ~609 mL
pH Range: 11 maintained with lime as required
DO target: na
Pulp Density: **33 % solids**
Final Residue Size (P_{80}): na
NaCN Concentration: 10.0 g/L NaCN
$Pb(NO_3)_2$: na
Grind: as recieved
Carbon: 10 g/L 6.1 g

Temperature: na
Reagent Addition (kg/t of cyanide feed) NaCN: 20.3 CaO: 1.75
Reagent Consumption (kg/t of cyanide feed) NaCN: 2.97 CaO: 1.64

Time	Added, Grams				Residual		Consumed		pH	DO	Notes
	Actual		Equivalent		Grams		Grams			mg/L	
hours	NaCN	$Ca(OH)_2$	NaCN	CaO	NaCN	CaO	NaCN	CaO			
Preconditioning:											
Cyanidation:									3.8		
0-1	6.214	0.691	6.09	0.53	-		-		11.1-11.0	10.2	
1-8	0.000	0.000	0.00	0.00	-		-		11.0-11.0	5.7	
8-24	0.000	0.000	0.00	0.00	-		-		11.0-11.0	5.8	
24-48	0.000	0.000	0.00	0.00	5.197	0.033	0.892	0.49	11.0-11.0	5.9	
Total	6.21	0.69	6.09	0.53	5.20	0.03	0.89	0.49			

Cyanidation Results:

Product	**Amount**	**Assays, mg/L, g/t**	**% Distribution**
	g, mL	**Au**	**Au**
Carbon	6.63	18.7	32.8
Barren Solution 24 h	661	<0.01	1.7
Final Residue	297	0.83	65.5
Head (calc.)	300	1.26	100.0
Head (dir.)		1.39	
		Extraction, %:	**34.5**

Pulp Density 0h,% 33.0
Pulp Density 24h,% 31.0
Duplicate residue assays, Au, g/t = 0.823
0.843

Average: 0.833 g/t

APPENDIX

Section 3 - Biooxidation Amenability Test Data

Mr. Glen Van Treek / **Paramount Gold and Silver Corp.**
MLI Job No. 3775

Amenability Test Data Sheet

$NaCO_3$ added **20.5** kg/mt ore

MLI Job #: ***3775*** Test Cell #: ***AM-1*** Test Start Date: ***9/12/2013***

Sample ID #: **WWS-13-1** Starting Time: ***3PM*** Technician:

Bacterial ID: ***Culture # 2*** Natural pH:

Special Instructions: Ore Charge, g ***501.6***

Solution Vol., L ***2.8424***

Test Duration, days

												Removed			Additions				
Days	Date	Time	Redox (mV)	Fe^T mg/L	Fe^{2+} mg/L	Fe^{3+} mg/L	Fe^{3+}% of T Fe	Temp. °C	DO_2 (ppm)	pH Initial	Final	Slurry (Mls vol.)	Solution (ml)	Solids (g)	H_2O (ml)	200g/L $NaCO_3$ Slurry (ml)	H_2SO_4 (g)	Fe mg/L	Inoculum (ml)
0			475					23.5	8.76	2.01	1.96						0.7	2893	1910.9
1	9/12/2013	2:45 PM	476	1607	20	1587	98.8	27.7	4.19	1.97	1.96		30		30		0.6		
2	9/13/2013	6:00 PM	491	1824	11	1813	99.4	28.2	4.32	1.83			30		30				
3	9/14/2013	6:00 PM	504	2637	2	2635	99.9	30.7	5.02	1.58	1.59		30		30				
4	9/15/2013	2:30 PM	559	3660	21	3639	99.4	30.8	2.45	1.68			30		30				
5	9/16/2013	5:30 PM	573	4880	10	4870	99.8	29.5	3.89	1.77			30		30				
6	9/17/2013	12:00 PM	593	5040	15	5025	99.7	28.3	6.26	1.58	1.56		30		30				
7	9/18/2013	12:00 PM	584	5170	7.9	5162.1	99.8	29.2	2.65	1.56			30		30				
8	9/19/2013	9:00 AM	525	5170	34	5136	99.3	24.4	2.16	1.52			2737			51.5			
	Rinse		543	125.45	34	91.45	72.9	20.3		2.49			8790.0						

Amenability Test Data Sheet

$NaCO_3$ added **48.7** kg/mt ore

MLI Job #: ***3775*** Test Cell #: ***AM-2*** Test Start Date: ***9/12/2013***

Sample ID #: **WWS-13-1** Starting Time: ***3PM*** Technician:

Bacterial ID: ***Culture # 2*** Natural pH:

Special Instructions: Ore Charge, g ***496.0***

Solution Vol., L ***2.8107***

Test Duration, days

Days	Date	Time	Redox (mV)	Fe^{T} mg/L	Fe^{2+} mg/L	Fe^{3+} mg/L	Fe^{3+}% of T Fe	Temp. °C	DO_2 (ppm)	pH Initial	pH Final	Removed: Slurry (Mls vol.)	Removed: Solution (ml)	Removed: Solids (g)	Additions: H_2O (ml)	Additions: 200g/L $NaCO_3$ Slurry (ml)	Additions: H_2SO_4 (g)	Additions: Fe mg/L	Additions: Inoculum (ml)
0			472					23.7	9.52	2.04	1.96						0.8	**2893**	1889.5
1	9/12/2013	2:45 PM	462	1501	71	1430	95.3	27.9	3.35	2.00	1.98		30		30		0.5		
2	9/13/2013	6:00 PM	488	1469	11	1458	99.3	28.2	3.41	1.82			30		30				
3	9/14/2013	6:00 PM	498	2397	10	2387	99.6	30.6	3.99	1.54	1.54		30		30				
4	9/15/2013	2:30 PM	553	3037	21	3016	99.3	30.1	7.11	1.61			30		30				
5	9/16/2013	5:30 PM	559	4030	11	4019	99.7	29.5	0.83	1.77			30		30				
6	9/17/2013	12:00 PM	594	4680	16	4664	99.7	28.3	6.98	1.54	1.50		30		30				
7	9/18/2013	12:00 PM	583	5490	5.5	5484.5	99.9	29.3	4.87	1.55			30		30				
8	9/19/2013	9:00 AM	582	6620	36	6584	99.5	28.9	3.87	1.46	1.62		30			53.1			
9	9/20/2013																		
10	9/21/2013																		
11	9/22/2013																		
12	9/23/2013																		
13	9/24/2013																		
14	9/25/2013																		
15	9/26/2013	9.15 AM	609	6525	22	6503	99.7	28.9	5.43	1.40	1.53		30			67.6			
16	9/27/2013																		
17	9/28/2013																		
18	9/29/2013																		
19	9/30/2013																		
20	10/1/2013																		
21	10/2/2013	1:00 PM	511	6430	64	6366	99.0			1.65			2638						
	Rinse		535	150	1.5	148.5	99.0			2.57			9473.2						

Mr. Glen Van Treek / **Paramount Gold and Silver Corp.**
MLI Job No. 3775

Amenability Test Data Sheet

$NaCO_3$ added **50.7** kg/mt ore

MLI Job #: ***3775*** Test Cell #: ***AM-3*** Test Start Date: ***9/12/2013***
Sample ID #: **WWS-13-1** Starting Time: ***3PM*** Technician:
Bacterial ID: ***Culture # 2*** Natural pH:
Special Instructions: Ore Charge, g ***501.4***
Solution Vol., L ***2.8107***
Test Duration, days

												Removed			Additions				
Days	Date	Time	Redox (mV)	Fe^T mg/L	Fe^{2+} mg/L	Fe^{3+} mg/L	Fe^{3+}% of T Fe	Temp. °C	DO_2 (ppm)	pH Initial	Final	Slurry (Mls vol.)	Solution (ml)	Solids (g)	H_2O (ml)	200g/L $NaCO_3$ Slurry (ml)	H_2SO_4 (g)	Fe mg/L	Inoculum (ml)
0			469					23.7	9.49	2.05	1.97						1.0	**2893**	1910.1
1	9/12/2013	2:45 PM	465	1767	93	1674	94.7	27.9	2.70	2.01	1.99		30		30		0.5		
2	9/13/2013	6:00 PM	480	1828	62	1766	96.6	28.4	5.18	1.79			30		30				
3	9/14/2013	6:00 PM	500	2137	22	2115	99.0	30.7	4.41	1.53	1.54		30		30				
4	9/15/2013	2:30 PM	559	3292	19	3273	99.4	30.6	6.49	1.60			30		30				
5	9/16/2013	5:30 PM	583	3960	10	3950	99.7	29.1	2.81	1.78			30		30				
6	9/17/2013	12:00 PM	601	4290	14	4276	99.7	28.1	7.12	1.54	1.53		30		30				
7	9/18/2013	12:00 PM	589	4530	5.6	4524.4	99.9	29.7	2.91	1.58			30		30				
8	9/19/2013	9:00 AM	584	5978	34	5944	99.4	28.9	3.54	1.47			30			56.8			
9	9/20/2013																		
10	9/21/2013																		
11	9/22/2013																		
12	9/23/2013																		
13	9/24/2013																		
14	9/25/2013																		
15	9/26/2013	9.15 AM	642	6249	22	6227	99.6	29.0	4.49	1.44	1.59		30			70.2			
16	9/27/2013																		
17	9/28/2013																		
18	9/29/2013																		
19	9/30/2013																		
20	10/1/2013																		
21	10/2/2013																		
22	10/3/2013	10:00 AM	665	6520	13	6507	99.8	29.1	7.42	1.74			30		30				
23	10/4/2013	3:00 PM	690	6800	37	6763	99.5	29.6	1.24	1.67			30		30				
24	10/5/2013																		
25	10/6/2013																		
26	10/7/2013																		
27	10/8/2013																		
28	10/9/2013	1:00 PM	541	6700	36	6664	99.5	19.4	2.03	1.61			2715.2						
	Rinse		542	259.58	1.5	258.08	99.4			2.49			7935.1						

Amenability Test Data Sheet

$NaCO_3$ added **60.2** kg/mt ore

MLI Job #: ***3775*** Test Cell #: ***AM-4*** Test Start Date: ***9/12/2013***

Sample ID #: **WWS-13-1** Starting Time: ***3PM*** Technician:

Bacterial ID: ***Culture # 2*** Natural pH:

Special Instructions: Ore Charge, g ***493.3***

Solution Vol., L ***2.7954***

Test Duration, days

												Removed			Additions				
Days	Date	Time	Redox (mV)	Fe^T mg/L	Fe^{2+} mg/L	Fe^{3+} mg/L	Fe^{3+}% of T Fe	Temp. °C	DO_2 (ppm)	pH Initial	Final	Slurry (Mls vol.)	Solution (ml)	Solids (g)	H_2O (ml)	200g/L $NaCO_3$ Slurry (ml)	H_2SO_4 (g)	Fe mg/L	Inoculum (ml)
0			470					23.6	9.56	2.05	1.99						0.8	2893	1879.2
1	9/12/2013	2:45 PM	468	1674	85	1589	94.9	27.8	2.18	2.00	1.99		30		30		0.3		
2	9/13/2013	6:00 PM	484	1840	29	1811	98.4	28.1	4.71	1.83			30		30				
3	9/14/2013	6:00 PM	503	2265	10	2255	99.6	30.9	4.32	1.51	1.51		30		30				
4	9/15/2013	2:30 PM	555	3584	27	3557	99.2	30.7	2.76	1.59			30		30				
5	9/16/2013	5:30 PM	581	5010	12	4998	99.8	29.5	2.17	1.72			30		30				
6	9/17/2013	12:00 PM	600	5710	15	5695	99.7	27.9	6.56	1.53	1.51		30		30				
7	9/18/2013	12:00 PM	589	6170	6.2	6163.8	99.9	29.6	3.27	1.56			30		30				
8	9/19/2013	9:00 AM	583	6170	33	6137	99.5	29.0	3.79	1.46			30			78.2			
9	9/20/2013																		
10	9/21/2013																		
11	9/22/2013																		
12	9/23/2013																		
13	9/24/2013																		
14	9/25/2013																		
15	9/26/2013	9.15 AM	540	7100	27	7073	99.6	28.9	5.00	1.43	1.57		30			70.2			
16	9/27/2013																		
17	9/28/2013																		
18	9/29/2013																		
19	9/30/2013																		
20	10/1/2013																		
21	10/2/2013																		
22	10/3/2013	10:00 AM	563	7100	15	7085	99.8	29.0	5.46	1.75			30		30				
23	10/4/2013	3:00 PM	564	6700	39	6661	99.4	29.3	1.56	1.71			30		30				
24	10/5/2013																		
25	10/6/2013																		
26	10/7/2013																		
27	10/8/2013																		
28	10/9/2013																		
29	10/10/2013	8:00 AM	630	7010	19	6991	99.7	29.5	4.89	1.63			30		30				
30	10/11/2013																		
31	10/12/2013																		
32	10/13/2013																		
33	10/14/2013																		
34	10/15/2013																		
35	10/16/2013	4:30 PM	567	7010	37	6973	99.5	21.3	3.42	1.77			2594.6						
	Rinse		577	47.4	1.3	46.1	97.3						8023.8						

Amenability Test Data Sheet

$NaCO_3$ added **0.0** kg/mt ore

MLI Job #: ***3775*** Test Cell #: ***AM-5*** Test Start Date: ***9/13/2013***

Sample ID #: **WWS-13-2** Starting Time: ***8AM*** Technician:

Bacterial ID: ***Culture # 3*** Natural pH: ***5.01***

Special Instructions: Ore Charge, g ***507.3***

Solution Vol., L ***2.8747***

Test Duration, days

												Removed			Additions				
Days	Date	Time	Redox (mV)	Fe^T mg/L	Fe^{2+} mg/L	Fe^{3+} mg/L	Fe^{3+}% of T Fe	Temp. °C	DO_2 (ppm)	pH Initial	Final	Slurry (Mls vol.)	Solution (ml)	Solids (g)	H_2O (ml)	200g/L $NaCO_3$ Slurry (ml)	H_2SO_4 (g)	Fe mg/L	Inoculum (ml)
0			500					23.2	6.74	1.87								1719	1932.6
1	9/13/2013	8:00AM	472	886	97	789	89.1	26.7	5.27	1.98			30		30		2.0		
2	9/14/2013	12:00 PM	454	1120	142	978	87.3	29.7	7.08	1.64	1.65		30		30				
3	9/15/2013	10:00AM	482	1273	79	1194	93.8	30.1	3.54	1.66			30		30				
4	9/16/2013	5:30 PM	543	1490	10	1480	99.3	31.5	3.20	1.85			30		30				
5	9/17/2013	12:00 PM	586	2150	9	2141	99.6	27.9	5.98	1.65	1.70		30		30				
6	9/18/2013	12:00 PM	586	3150	4.5	3145.5	99.9	29.6	3.04	1.63			30		30				
7	9/19/2013	9:00 AM	599	3614	29	3585	99.2	29.1	5.95	1.48			2699		30				
	Rinse		592	67.17	5.8	61.37	91.4	20.4		2.49			7452.7						

Amenability Test Data Sheet

$NaCO_3$ added **2.9** kg/mt ore

MLI Job #: ***3775*** Test Cell #: ***AM-6*** Test Start Date: ***9/13/2013***

Sample ID #: ***WWS-13-2*** Starting Time: ***8AM*** Technician:

Bacterial ID: ***Culture # 3*** Natural pH: ***5.06***

Special Instructions: Ore Charge, g ***494.1***

Solution Vol., L ***2.7999***

Test Duration, days

												Removed			Additions				
Days	Date	Time	Redox (mV)	Fe^T mg/L	Fe^{2+} mg/L	Fe^{3+} mg/L	Fe^{3+}% of T Fe	Temp. °C	DO_2 (ppm)	pH Initial	Final	Slurry (Mls vol.)	Solution (ml)	Solids (g)	H_2O (ml)	200g/L $NaCO_3$ Slurry (ml)	H_2SO_4 (g)	Fe mg/L	Inoculum (ml)
0			501					23.4	6.37	1.84								**1719**	1882.3
1	9/13/2013	8:00 AM	473	1085	72	1013	93.4	27.3	4.22	1.91			30		30		2.1		
2	9/14/2013	12:00 AM	446	938	141	797	85.0	29.8	6.46	1.56	1.58		30		30				
3	9/15/2013	10:00AM	465	1359	133	1226	90.2	30.1	3.80	1.60			30		30				
4	9/16/2013	5:30 PM	532	1300	13	1287	99.0	31.7	3.32	1.88			30		30				
5	9/17/2013	12:00 PM	579	1750	11	1739	99.4	28.3	6.46	1.67	1.68		30		30				
6	9/18/2013	12:00 PM	586	2210	3.7	2206.3	99.8	29.6	2.34	1.69			30		30				
7	9/19/2013	9:00 AM	602	2432	32	2400	98.7	29.2	3.20	1.58			30		30				
8	9/20/2013	5:00 PM	609	2975	35	2940	98.8	29.1	5.26	1.50	1.53		30		30				
9	9/21/2013																		
10	9/22/2013																		
11	9/23/2013																		
12	9/24/2013																		
13	9/25/2013																		
14	9/26/2013																		
15	9/27/2013	6:00 PM	567	2907.5	21	2886.5	99.3	29.3	4.46	1.48	1.76		30		23	7.25			
16	9/28/2013																		
17	9/29/2013																		
18	9/30/2013																		
19	10/1/2013																		
20	10/2/2013																		
21	10/3/2013	7:00 AM	564	2840	7	2833	99.8			1.91			**2684**						
	Rinse		555	56	3	53	94.6			2.80			8273.1						

Amenability Test Data Sheet

$NaCO_3$ added **12.5** kg/mt ore

MLI Job #: ***3775*** Test Cell #: ***AM-7*** Test Start Date: ***9/13/2013***

Sample ID #: ***WWS-13-2*** Starting Time: ***8AM*** Technician:

Bacterial ID: ***Culture # 3*** Natural pH: ***4.98***

Special Instructions: Ore Charge, g ***496.7***

Solution Vol., L ***2.8146***

Test Duration, days

												Removed			Additions				
Days	Date	Time	Redox (mV)	Fe^T mg/L	Fe^{2+} mg/L	Fe^{3+} mg/L	Fe^{3+}% of T Fe	Temp. °C	DO_2 (ppm)	pH Initial	Final	Slurry (Mls vol.)	Solution (ml)	Solids (g)	H_2O (ml)	200g/L $NaCO_3$ Slurry (ml)	H_2SO_4 (g)	Fe mg/L	Inoculum (ml)
0			504					23.4	6.38	1.83								1719	1892.2
1	9/13/2013	8:00AM	478	1064	74	990	93.0	27.3	4.07	1.90			30		30		2.2		
2	9/14/2013	12:00 PM	448	1267	147	1120	88.4	29.5	6.87	1.59			30		30				
3	9/15/2013	10:00AM	461	1330	143	1187	89.2	30.2	4.60	1.60			30		30				
4	9/16/2013	5:30 PM	503	1350	25	1325	98.1	31.2	2.59	1.86			30		30				
5	9/17/2013	12:00 PM	583	1600	10	1590	99.4	28.0	5.19	1.67	1.71		30		30				
6	9/18/2013	12:00 PM	589	2460	4	2456	99.8	29.1	3.23	1.71			30		30				
7	9/19/2013	9:00 AM	606	2283	28	2255	98.8	29.1	3.75	1.59			30		30				
8	9/20/2013	5:00 PM	613	2565	37	2528	98.6	29.0	5.40	1.54	1.54		30		30				
9	9/21/2013																		
10	9/22/2013																		
11	9/23/2013																		
12	9/24/2013																		
13	9/25/2013																		
14	9/26/2013																		
15	9/27/2013	6:00 PM	584	3885	29	3856	99.3	29.6	4.93	1.53			30		30				
16	9/28/2013																		
17	9/29/2013																		
18	9/30/2013																		
19	10/1/2013																		
20	10/2/2013																		
21	10/3/2013																		
22	10/4/2013	3:00 PM	636	4670	36	4634	99.2	29.4	2.45	1.49	1.52		30			31.0			
23	10/5/2013																		
24	10/6/2013																		
25	10/7/2013																		
26	10/8/2013																		
27	10/9/2013																		
28	10/10/2013	8:00 AM	569	4380	35	4345	99.2	19.7	2.13	1.53			2677.1						
	Rinse		598	133.47	0.8	132.67	99.4	20.0	2.53	2.52			8287.9						

Amenability Test Data Sheet

$NaCO_3$ added **36.9** kg/mt ore

MLI Job #: ***3775*** Test Cell #: ***AM-8*** Test Start Date: ***9/13/2013***

Sample ID #: **WWS-13-2** Starting Time: ***8AM*** Technician:

Bacterial ID: ***Culture # 3*** Natural pH: ***5.03***

Special Instructions: Ore Charge, g ***494.3***

Solution Vol., L ***2.801***

Test Duration, days

												Removed			Additions				
Days	Date	Time	Redox (mV)	Fe^{T} mg/L	Fe^{2+} mg/L	Fe^{3+} mg/L	Fe^{3+}% of T Fe	Temp. °C	DO_2 (ppm)	pH Initial	Final	Slurry (Mls vol.)	Solution (ml)	Solids (g)	H_2O (ml)	200g/L $NaCO_3$ Slurry (ml)	H_2SO_4 (g)	Fe mg/L	Inoculum (ml)
0			505					23.0	7.27	1.81								1719	1883
1	9/13/2013	8:00AM	475	927	75	852	91.9	27.2	4.49	1.88			30		30				
2	9/14/2013	12:00 PM	461	1164	140	1024	88.0	29.8	6.01	1.68			30		30				
3	9/15/2013	10:00AM	475	1249	114	1135	90.9	30.4	4.28	1.71			30		30				
4	9/16/2013	5:30 PM	531	1400	18	1382	98.7	31.5	2.73	1.90			30		30				
5	9/17/2013	12:00 PM	595	2090	80	2010	96.2	28.2	5.83	1.63	1.69		30		30				
6	9/18/2013	12:00 PM	589	2280	3.7	2276.3	99.8	28.9	2.38	1.74			30		30				
7	9/19/2013	9:00 AM	607	2784	29	2755	99.0	28.9	3.30	1.62			30		30				
8	9/20/2013	5:00 PM	618	3128	30	3098	99.0	28.8	5.19	1.55	1.65		30		30				
9	9/21/2013																		
10	9/22/2013																		
11	9/23/2013																		
12	9/24/2013																		
13	9/25/2013																		
14	9/26/2013																		
15	9/27/2013	6:00 PM	571	3968	20	3948	99.5	29.5	5.44	1.52			30		30				
16	9/28/2013																		
17	9/29/2013																		
18	9/30/2013																		
19	10/1/2013																		
20	10/2/2013																		
21	10/3/2013																		
22	10/4/2013	3:00 PM	676	4510	33	4477	99.3	29.0	2.53	1.53	1.58		30		5	25.0			
23	10/5/2013																		
24	10/6/2013																		
25	10/7/2013																		
26	10/8/2013																		
27	10/9/2013																		
28	10/10/2013	8:00 AM								1.43	1.58					66.1			
29	10/11/2013	7:00 AM	649	4245	10	4235	99.8	29.3	5.49	1.71			30		30				
30	10/12/2013																		
31	10/13/2013																		
32	10/14/2013																		
33	10/15/2013																		
34	10/16/2013																		
35	10/17/2013	10:00AM	625	3980	21	3959	99.5	20.7	2.89	1.86			2693.1						
	Rinse		603	24.4	0.5	23.9	98.0			2.47			8399.5						

Amenability Test Data Sheet

$NaCO_3$ added **0.0** kg/mt ore

MLI Job #: ***3775*** Test Cell #: ***AM-9*** Test Start Date: ***10/3/2013***
Sample ID #: **WOS-13-1** Starting Time: ***12PM*** Technician:
Bacterial ID: ***Culture # 1*** Natural pH: ***2.60***
Special Instructions: Ore Charge, g ***503.5***
Solution Vol., L ***2.8785***
Test Duration, days

												Removed			Additions				
Days	Date	Time	Redox (mV)	Fe^T mg/L	Fe^{2+} mg/L	Fe^{3+} mg/L	Fe^{3+}% of T Fe	Temp. °C	DO_2 (ppm)	pH Initial	Final	Slurry (Mls vol.)	Solution (ml)	Solids (g)	H_2O (ml)	200g/L $NaCO_3$ Slurry (ml)	H_2SO_4 (g)	Fe mg/L	Inoculum (ml)
0																		2320	1918.1
1	10/3/2013	12:00 PM	488	1430	90	1340	93.7	26.1	5.37	1.74			30		30				
2	10/4/2013	3:00 PM	438	1750	114	1636	93.5	28.7	1.02	1.71			30		30				
3	10/5/2013	1:00 PM	428	1750	103	1647	94.1	27.3	5.54	1.62			30		30				
4	10/6/2013	9:00 AM	453	1770	110	1660	93.8	29.2	4.20	1.73			30		30				
5	10/7/2013		473	1740	101	1639	94.2	23.1	4.07	1.52			2719.1						
	Rinse		459	46.15	6.5	39.65	85.9	21.1	3.43	2.70			7582.0						

Amenability Test Data Sheet

$NaCO_3$ added **0.0** kg/mt ore

MLI Job #: ***3775*** Test Cell #: ***AM-10*** Test Start Date: ***10/3/2013***

Sample ID #: ***WOS-13-1*** Starting Time: ***12PM*** Technician:

Bacterial ID: ***Culture # 1*** Natural pH: ***4.37***

Special Instructions: Ore Charge, g ***521.8***

Solution Vol., L ***2.9569***

Test Duration, days

												Removed			Additions				
Days	Date	Time	Redox (mV)	Fe^{T} mg/L	Fe^{2+} mg/L	Fe^{3+} mg/L	Fe^{3+}% of T Fe	Temp. °C	DO_2 (ppm)	pH Initial	Final	Slurry (Mls vol.)	Solution (ml)	Solids (g)	H_2O (ml)	200g/L $NaCO_3$ Slurry (ml)	H_2SO_4 (g)	Fe mg/L	Inoculum (ml)
0																		2320	1987.8
1	10/3/2013	12:00 PM	484	1420	125	1295	91.2	26.1	5.60	1.77			30		30				
2	10/4/2013	3:00 PM	433	1840	79	1761	95.7	29.1	1.21	1.71			30		30				
3	10/5/2013	1:00 PM	429	1720	52	1668	97.0	27.6	4.99	1.66			30		30				
4	10/6/2013	9:00 AM	464	1940	23	1917	98.8	29.3	3.45	1.73			30		30				
5	10/7/2013	9:00 AM	535	2956	31	2925	99.0	30.4	2.96	1.70			30		30				
6	10/8/2013																		
7	10/9/2013	10:00 AM	567	2883	27	2856	99.1	29.3	5.50	1.73			30		30				
8	10/10/2013	9:00 AM	495	2700	94	2606	96.5	18.9	2.21	1.58			2801.0						
	Rinse		513	100.4	4.2	96.2	95.8			2.40			8555.0						

Amenability Test Data Sheet

$NaCO_3$ added **0.0** kg/mt ore

MLI Job #: ***3775*** Test Cell #: ***AM-11*** Test Start Date: ***10/3/2013***

Sample ID #: ***WOS-13-1*** Starting Time: ***12PM*** Technician:

Bacterial ID: ***Culture # 1*** Natural pH: ***2.14***

Special Instructions: Ore Charge, g ***510.4***

Solution Vol., L ***2.8923***

Test Duration, days

												Removed			Additions				
Days	Date	Time	Redox (mV)	Fe^{T} mg/L	Fe^{2+} mg/L	Fe^{3+} mg/L	Fe^{3+}% of T Fe	Temp. °C	DO_2 (ppm)	pH Initial	Final	Slurry (Mls vol.)	Solution (ml)	Solids (g)	H_2O (ml)	200g/L $NaCO_3$ Slurry (ml)	H_2SO_4 (g)	Fe mg/L	Inoculum (ml)
0																		2320	1944.4
1	10/3/2013	12:00 PM	494	1500	131	1369	91.3	26.1	6.05	1.77			30		30				
2	10/4/2013	3:00 PM	428	1750	29	1721	98.3	28.9	1.75	1.70			30		30				
3	10/5/2013	1:00 PM	422	1700	42	1658	97.5	27.8	5.45	1.65			30		30				
4	10/6/2013	9:00 AM	429	1880	126	1754	93.3	29.1	4.97	1.71			30		30				
5	10/7/2013	9:00 AM	489	2328	40	2288	98.3	30.5	3.25	1.71			30		30				
6	10/8/2013																		
7	10/9/2013	10:00 AM	544	2794	37	2757	98.7	29.1	2.70	1.67			30		30				
8	10/10/2013	8:00 AM	551	2620	27	2593	99.0	29.4	3.29	1.57			30		30				
9	10/11/2013																		
10	10/12/2013																		
11	10/13/2013																		
12	10/14/2013																		
13	10/15/2013																		
14	10/16/2013																		
15	10/17/2013	10:00 AM	574	2840	16	2824	99.4	29.3	5.50	1.59			30		30				
16	10/18/2013																		
17	10/19/2013																		
18	10/20/2013																		
19	10/21/2013																		
20	10/22/2013																		
21	10/23/2013	7:00 PM	524	5110	67	5043	98.7	23.4	2.94	1.50			2674.3						
	Rinse		530	155.2	5.7	149.5	96.3			2.18			7935.6						

Amenability Test Data Sheet

$NaCO_3$ added **0.0** kg/mt ore

MLI Job #: ***3775*** Test Cell #: ***AM-12*** Test Start Date: ***10/3/2013***

Sample ID #: ***WOS-13-1*** Starting Time: ***12PM*** Technician:

Bacterial ID: ***Culture # 1*** Natural pH: ***2.15***

Special Instructions: Ore Charge, g ***497.3***

Solution Vol., L ***2.818***

Test Duration, days

												Removed			Additions				
Days	Date	Time	Redox (mV)	Fe^T mg/L	Fe^{2+} mg/L	Fe^{3+} mg/L	Fe^{3+}% of T Fe	Temp. °C	DO_2 (ppm)	pH Initial	Final	Slurry (Mls vol.)	Solution (ml)	Solids (g)	H_2O (ml)	200g/L $NaCO_3$ Slurry (ml)	H_2SO_4 (g)	Fe mg/L	Inoculum (ml)
0																		2320	1894.5
1	10/3/2013	12:00 PM	484	1410	79	1331	94.4	26.1	4.98	1.77			30		30				
2	10/4/2013	3:00 PM	438	1560	71	1489	95.4	29.0	1.14	1.67			30		30				
3	10/5/2013	1:00 PM	444	1660	88	1572	94.7	27.2	4.02	1.67			30		30				
4	10/6/2013	9:00 AM	483	1750	22	1728	98.7	29.3	4.55	1.70			30		30				
5	10/7/2013	9:00 AM	534	2626	36	2590	98.6	30.8	2.55	1.64			30		30				
6	10/8/2013																		
7	10/9/2013	10:00 AM	582	3498	23	3475	99.3	29.4	4.04	1.67			30		30				
8	10/10/2013	8:00 AM	597	3890	18	3872	99.5	29.7	3.46	1.56			30		30				
9	10/11/2013																		
10	10/12/2013																		
11	10/13/2013																		
12	10/14/2013																		
13	10/15/2013																		
14	10/16/2013																		
15	10/17/2013	10:00 AM	627	3140	9	3131	99.7	29.5	5.35	1.54			30		30				
16	10/18/2013																		
17	10/19/2013																		
18	10/20/2013																		
19	10/21/2013																		
20	10/22/2013																		
21	10/23/2013																		
22	10/24/2013																		
23	10/25/2013	5:20 PM	644	4290	27	4263	99.4	25.7	3.80	1.57			30		30				
24	10/26/2013																		
25	10/27/2013																		
26	10/28/2013																		
27	10/29/2013																		
28	10/30/2013	4:00 PM	584	5440	23	5417	99.6	21.7	2.32	1.57			2728.6						
	Rinse		539	91.8	2.8	89	96.9			2.11			8163.2						

Amenability Test Data Sheet

$NaCO_3$ added **0.0** kg/mt ore

MLI Job #: ***3775*** Test Cell #: ***AM-13*** Test Start Date: ***10/16/2013***

Sample ID #: **WWS-13-2** Starting Time: ***4:30PM*** Technician:

Bacterial ID: ***Culture # 3*** Natural pH: ***5.23***

Special Instructions: Ore Charge, g ***496.0***

Solution Vol., L ***2.8107***

Test Duration, days

Days	Date	Time	Redox (mV)	Fe^T mg/L	Fe^{2+} mg/L	Fe^{3+} mg/L	Fe^{3+}% of T Fe	Temp. °C	DO_2 (ppm)	pH Initial	Final	Removed: Slurry (Mls vol.)	Removed: Solution (ml)	Removed: Solids (g)	Additions: H_2O (ml)	Additions: 200g/L $NaCO_3$ Slurry (ml)	Additions: H_2SO_4 (g)	Additions: Fe mg/L	Additions: Inoculum (ml)
0																		930	1889.5
1	10/16/2013	4:30 PM	442	470	119	351	74.7	27.0	5.46	1.86			30		30				
2	10/17/2013	10:00 AM	445	630	143	487	77.3	29.1	5.95	1.79			30		30				
3	10/18/2013	2:00 PM	436	680	8	672	98.8	22.1	6.92	1.77			30		30				
4	10/19/2013	2:00 PM	441	760	77	683	89.9	17.0	6.74	1.78			30		30				
5	10/20/2013	7:30 AM	434	600	138	462	77.0	22.3	2.69	1.90			2544.7						
	Rinse		423	10.4	4.2	6.2	59.6			2.76			7949.6						

Amenability Test Data Sheet

$NaCO_3$ added **0.0** kg/mt ore

MLI Job #: ***3775*** Test Cell #: ***AM-14*** Test Start Date: ***10/16/2013***
Sample ID #: **WWS-13-1** Starting Time: ***4:30PM*** Technician:
Bacterial ID: ***Culture # 2*** Natural pH: ***4.79***
Special Instructions: Ore Charge, g ***482.3***
Solution Vol., L ***2.733***
Test Duration, days

											Removed			Additions				
Days	Date	Time	Redox (mV)	Fe^T mg/L	Fe^{2+} mg/L	Fe^{3+} mg/L	Fe^{3+}% of T Fe	Temp. °C	DO_2 (ppm)	pH Initial	Final	Slurry (Mls vol.)	Solution (ml)	Solids (g)	H_2O (ml)	200g/L $NaCO_3$ Slurry (ml)	H_2SO_4 (g)	Fe mg/L	Inoculum (ml)
0																		1740	1837.3
1	10/16/2013	4:30 PM	423	630	146	484	76.8	26.8	4.24	1.90			30		30				
2	10/17/2013	10:00 AM	436	650	141	509	78.3	29.2	4.21	1.88			30		30				
3	10/18/2013	2:00 PM	445	800	19	781	97.6	22.1	6.36	1.81			30		30				
4	10/19/2013	2:00 PM	442	800	11	789	98.6	17.0	6.81	1.82			30		30				
5	10/20/2013	7:30 AM	459	500	10	490	98.0	21.3	2.13	1.89			2250.2						
	Rinse		442	18.1	5.4	12.7	70.2			2.79			6921.6						

APPENDIX

Section 4 - CIL/Cyanidation Data, Biooxidized Amenability Test Residues

Bottle Roll Test - CIL/Cyanidation

Project No.	**3775**	
Test No.	**CY-17**	
Composite	**WWS-13-1**	
Feed Size	**80%-45µm**	
Biooxidation Test	**Baseline**	
Biooxidation Time	**0**	days
Estimated Oxidation	**0.0**	%
Bio Ox Feed		g
Ore Charge	495.6	g
Solution Vol.	0.7434	L
Natural pH	5.9	
Solid Density (Wt. %)	40.0	

Wt. Loss	
N/A	g
N/A	%

Final Residue Wt: 490.5 g

Cyanide Conc. Maintained at: 1.0 g/L

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	3.294	10	3.80
Duplicate	3.153	11	
Triplicate	2.939	10	
Average	3.13	10.3	3.80

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	2.04	4.7	3.80
Duplicate	2.10	4.4	
Triplicate	2.06	3.7	
Average	2.07	4.3	3.80

Raw Data

Leach Time	Solution Withdrawn				Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	D.O.	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	-----	0.74	2.00	-----	-----	-----	-----	-----
2	100	0.80	10.6	4.59	0.21	0.30	0.02	0.14	0.002	0.014	0.08
6	102	0.80	10.4	5.63	0.23	0.50	0.03	0.08	0.00306	0.00816	0.0816
12	105	0.90	11.1	5.80	0.17	0.00	0.01	0.07	0.00105	0.00735	0.0945
24	101	0.85	10.8	6.05	0.19	0.10	0.01	0.05	0.00101	0.00505	0.08585
48	100	0.85	10.8	7.32	0.19	0.20	0.00	0.04	0	0.004	0.085
72	101	0.85	11.1	5.90	0.19	0.00	0.00	0.05	0	0.00505	0.08585
96	-----	0.85	10.7	6.03	-----	-----	0.00	0.05	-----	-----	-----

Activated Carbon

	Weight, g	Assay gAu/mt	Assay gAg/mt	mgAu	mgAg
Initial	18.7				
Final	19.0	33.6	46	0.6384	0.874

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction mg	Au g/mt ore	Au % of total	Cumulative Ag Extraction mg	Ag g/mt ore	Ag % of total	Reagent Requirements Cumulative kg/mt ore: Cyanide Consumed	Lime Added
0								4.0
2							0.29	4.6
6							0.56	5.6
12							0.70	5.6
24							0.93	5.9
48							1.14	6.3
72							1.35	6.3
96	0.646	1.30	38.6	0.955	1.9	30.6	1.56	6.3

	Au	% of Total	Ag	% of Total
Extracted g/mt ore	**1.30**	**38.6**	**1.9**	**30.6**
Tail assay, g/mt	**2.07**		**4.3**	
Calculated Head g/mt ore	**3.37**		**6.2**	
NaCN Consumed, kg/mt ore	**1.56**			
Lime Added, kg/mt ore	**6.3**			

Bottle Roll Test - CIL/Cyanidation

Project No.	**3775**	
Test No.	**CY-19**	
Composite	**WWS-13-1**	
Feed Size	**80%-45µm**	
Biooxidation Test	**AM-1**	
Biooxidation Time	**8**	days
Estimated Oxidation	**53.3**	%
Bio Ox Feed	501.60	g
Cyanidation Feed	469.1	g
Solution Vol.	0.7037	L
Natural pH	6.1	
Solid Density	Wt. % 40.0	

Wt. Loss	
32.50	g
6.5	%

Final Residue Wt: 464.9 g

Cyanide Conc. Maintained at: 1.0 g/L

Head Assay	g Au/mt	g Ag/mt	%, S=
Predicted			
Initial	3.294	10	3.80
Duplicate	3.153	11	
Triplicate	2.939	10	
Average	3.13	10.3	3.80

Tail Assay	g Au/mt	g Ag/mt	%, S=
Initial	0.225	4.6	1.90
Duplicate	0.229	4.7	
Triplicate	0.217	4.6	
Average	0.22	4.6	1.90

Raw Data

Leach Time	Solution Withdrawn				Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	D.O.	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	0.99	-----	-----	0.70	2.00	-----	-----	-----	-----	-----
2	100	0.80	10.4	7.18	0.22	0.30	0.26	0.58	0.026	0.058	0.08
6	103	0.80	10.7	6.71	0.22	0.20	0.08	0.23	0.00824	0.02369	0.0824
12	103	0.85	10.7	6.51	0.19	0.30	0.01	0.15	0.00103	0.01545	0.08755
24	100	0.90	11.1	6.55	0.16	0.10	0.01	0.11	0.001	0.011	0.09
48	105	0.85	10.9	6.66	0.19	0.10	0.01	0.09	0.00105	0.00945	0.08925
72	-----	0.85	11.0	6.62	-----	-----	<0.01	0.08	-----	-----	-----

Activated Carbon

	Weight, g	Assay gAu/mt	Assay gAg/mt	mgAu	mgAg
Initial	8.8				
Final	8.6	192	436	1.6512	3.7496

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction mg	g/mt BR	% of total	Cumulative Ag Extraction mg	g/mt BR	% of total	Reagent Requirements Cumulative kg/mt BR Cyanide Consumed	Lime Added
0								4.3
2							0.29	4.9
6							0.59	5.3
12							0.81	6.0
24							0.95	6.2
48							1.18	6.4
72	1.696	3.61	94.3	3.923	8.4	64.6	1.39	6.4

	Au	% of Total	Ag	% of Total
Extracted g/mt BR	**3.61**	**94.3**	**8.4**	**64.6**
Tail assay, g/mt	**0.22**		**4.6**	
Calculated Head g/mt BR	**3.83**		**13.0**	
NaCN Consumed, kg/mt BR	**1.39**			
Lime Added, kg/mt BR	**6.4**			

Note: BR denotes biooxidized residue.

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**3.38**	**94.2**	**7.9**	**64.8**
Tail assay, g/mt ore [1)]	**0.21**		**4.3**	
Calculated Head g/mt ore [1)]	**3.59**		**12.2**	
NaCN Consumed, kg/mt ore [1)]	**1.30**			
Lime Added, kg/mt ore [1)]	**6.0**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test - CIL/Cyanidation

Project No.	**3775**			
Test No.	**CY-20**			
Composite	**WWS-13-1**			
Feed Size	**80%-45µm**		Wt. Loss	
Biooxidation Test	**AM-2**		42.20	g
Biooxidation Time	**21**	days	8.5	%
Estimated Oxidation	**79.5**	%		

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	3.294	10	3.80
Duplicate	3.153	11	
Triplicate	2.939	10	
Average	3.13	10.3	3.80

Bio Ox Feed 496.00 g
Cyanidation Feed 453.8 g

Solution Vol. 0.6807 L

Final Residue Wt: 448.5 g

Natural pH 5.5

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.16	3.7	0.85
Duplicate	0.15	3.6	
Triplicate	0.14	3.7	
Average	0.15	3.7	0.85

Solid Density: Wt. % 40.0

Cyanide Conc. Maintained at: 1.0 g/L

Raw Data

Leach Time	Solution Withdrawn				Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	D.O.	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	-----	0.68	2.50	-----	-----	-----	-----	-----
2	100	0.85	10.5	6.80	0.18	0.30	0.16	0.47	0.016	0.047	0.085
6	102	0.80	10.9	7.34	0.22	0.00	0.05	0.19	0.0051	0.01938	0.0816
12	107	0.85	10.5	7.11	0.17	0.30	0.02	0.13	0.00214	0.01391	0.09095
24	105	0.80	10.8	6.96	0.22	0.10	0.00	0.09	0	0.00945	0.084
48	102	0.90	10.8	6.59	0.16	0.20	0.00	0.08	0	0.00816	0.0918
72	-----	0.85	11.1	7.00	-----	-----	0.00	0.08	-----	-----	-----

Activated Carbon

	Weight, g	Assay gAu/mt	Assay gAg/mt	mgAu	mgAg
Initial	8.55				
Final	8.93	182	386	1.62526	3.44698

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt BR	
Hours	mg	g/mt BR	% of total	mg	g/mt BR	% of total	Cyanide Consumed	Lime Added
0								5.5
2							0.22	6.2
6							0.51	6.2
12							0.74	6.8
24							0.99	7.1
48							1.14	7.5
72	1.649	3.63	96.0	3.599	7.9	68.1	1.36	7.5

	Au	% of Total	Ag	% of Total
Extracted g/mt BR	**3.63**	**96.0**	**7.9**	**68.1**
Tail assay, g/mt	**0.15**		**3.7**	
Calculated Head g/mt BR	**3.78**		**11.6**	
NaCN Consumed, kg/mt BR	**1.36**			
Lime Added, kg/mt BR	**7.5**			

Note: BR denotes biooxidized residue.

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**3.32**	**96.0**	**7.2**	**67.9**
Tail assay, g/mt ore [1)]	**0.14**		**3.4**	
Calculated Head g/mt ore [1)]	**3.46**		**10.6**	
NaCN Consumed, kg/mt ore [1)]	**1.25**			
Lime Added, kg/mt ore [1)]	**6.9**			

Bottle Roll Test - CIL/Cyanidation

Project No.	**3775**			
Test No.	**CY-22**			
Composite	**WWS 13-1**			
Feed Size	**80%-45µm**		Wt. Loss	
Biooxidation Test	**AM-14**		3.50	g
Biooxidation Time	**5**	days	0.7	%
Estimated Oxidation	**1.745263158**	%		

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	3.294	10	3.80
Duplicate	3.153	11	
Triplicate	2.939	10	
Average	3.13	10.3	3.80

Bio Ox Feed	482.3	g
Cyanidation Feed	478.8	g
Solution Vol.	0.7182	L
Natural pH	2.8	

Final Residue Wt: 477.2 g

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.69	5.2	3.76
Duplicate	0.72	5.2	
Triplicate	0.70	5.2	
Average	0.71	5.2	3.76

Solid Density: Wt. % 40.0

Cyanide Conc. Maintained at: 1.0 g/L

Raw Data

Leach Time	Solution Withdrawn				Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	D.O.	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	-----	0.72	5.40	-----	-----	-----	-----	-----
2	100	0.80	10.7	3.43	0.22	0.30	0.18	0.35	0.018	0.035	0.08
6	100	0.90	10.4	3.08	0.16	0.70	0.05	0.17	0.005	0.017	0.09
12	104	0.95	10.9	2.71	0.14	0.00	0.03	0.14	0.00312	0.01456	0.0988
24	109	0.80	10.8	2.96	0.23	0.20	0.03	0.13	0.00327	0.01417	0.0872
48	100	0.90	10.6	3.36	0.16	0.50	0.02	0.10	0.002	0.01	0.09
72	-----	0.90	10.7	4.08	-----	-----	0.01	0.09	-----	-----	-----

Activated Carbon

	Weight, g	Assay gAu/mt	Assay gAg/mt	mgAu	mgAg
Initial	9.0				
Final	8.7	165	285	1.4355	2.4795

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt BR	
Hours	mg	g/mt BR	% of total	mg	g/mt BR	% of total	Cyanide Consumed	Lime Added
0								11.3
2							0.30	11.9
6							0.45	13.4
12							0.52	13.4
24							0.83	13.8
48							0.98	14.8
72	1.474	3.08	81.3	2.635	5.5	51.4	1.12	14.8

	Au	% of Total	Ag	% of Total
Extracted g/mt BR	**3.08**	**81.3**	**5.5**	**51.4**
Tail assay, g/mt	**0.71**		**5.2**	
Calculated Head g/mt BR	**3.79**		**10.7**	
NaCN Consumed, kg/mt BR	**1.12**			
Lime Added, kg/mt BR	**14.8**			

Note: BR denotes biooxidized residue.

	Au	% of Total	Ag	% of Total
Extracted g/mt ore 1)	**3.06**	**81.2**	**5.5**	**51.4**
Tail assay, g/mt ore 1)	**0.71**		**5.2**	
Calculated Head g/mt ore 1)	**3.77**		**10.7**	
NaCN Consumed, kg/mt ore 1)	**1.11**			
Lime Added, kg/mt ore 1)	**14.7**			

Bottle Roll Test - CIL/Cyanidation

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	1.246	2.9	2.49
Duplicate	1.178	2.7	
Triplicate	1.159	2.8	
Average	1.19	2.8	2.49

Project No.	**3775**				
Test No.	**CY-18**				
Composite	**WWS-13-2**				
Feed Size	**80%-45µm**		Wt. Loss		
Biooxidation Test	**Baseline**		N/A	g	
Biooxidation Time	**0**	days	N/A	%	
Estimated Oxidation	**0.0**	%			
Bio Ox Feed	0.00	g			
Ore Charge	500.8	g			
			Final Residue Wt:	498.0	g
Solution Vol.	0.7512	L			
Natural pH	6.0				

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.909	1.6	2.49
Duplicate	0.893	1.7	
Triplicate	0.895	1.7	
Average	0.90	1.7	2.49

	Wt. %		g/L
Solid Density	40.0	Cyanide Conc. Maintained at:	1.0

Raw Data

Leach Time	Solution Withdrawn				Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	D.O.	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	0.97	-----	-----	0.73	1.50	-----	-----	-----	-----	-----
2	100	0.90	10.9	4.56	0.16	0.00	0.02	0.17	0.002	0.017	0.09
6	109	0.95	10.5	5.08	0.14	0.50	0.02	0.06	0.00218	0.00654	0.10355
12	104	1.00	11.3	5.55	0.10	0.00	0.01	0.04	0.00104	0.00416	0.104
24	101	0.95	11.0	6.40	0.13	0.00	0.00	0.03	0	0.00303	0.09595
48	116	0.85	11.0	5.70	0.21	0.00	0.00	0.02	0	0.00232	0.0986
72	112	0.80	10.7	6.27	0.24	0.20	0.00	0.02	0	0.00224	0.0896
96	-----	1.00	11.0	6.40	-----	-----	0.00	0.01	-----	-----	-----

Activated Carbon

	Weight, g	Assay gAu/mt	Assay gAg/mt	mgAu	mgAg
Initial	9.44				
Final	9.8	19.5	66	0.1911	0.6468

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction mg	Cumulative Au Extraction g/mt ore	Cumulative Au Extraction % of total	Cumulative Ag Extraction mg	Cumulative Ag Extraction g/mt ore	Cumulative Ag Extraction % of total	Reagent Requirements Cumulative kg/mt ore Cyanide Consumed	Reagent Requirements Cumulative kg/mt ore Lime Added
0								3.0
2							0.11	3.0
6							0.17	4.0
12							0.17	4.0
24							0.24	4.0
48							0.46	4.0
72							0.75	4.4
96	0.196	0.39	30.2	0.690	1.4	45.2	0.75	4.4

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore	**0.39**	**30.2**	**1.4**	**45.2**
Tail assay, g/mt	**0.90**		**1.7**	
Calculated Head g/mt ore	**1.29**		**3.1**	
NaCN Consumed, kg/mt ore	**0.75**			
Lime Added, kg/mt ore	**4.4**			

Bottle Roll Test - CIL/Cyanidation

Project No.	**3775**	
Test No.	**CY-23**	
Composite	**WWS-13-2**	
Feed Size	**80%-45µm**	
Biooxidation Test	**AM-5**	
Biooxidation Time	**7**	days
Estimated Oxidation	**60.8**	%
Bio Ox Feed	507.30	g
Cyanidation Feed	490.7	g
Solution Vol.	0.7361	L
Natural pH	2.6	
Solid Density (Wt. %)	40.0	

Wt. Loss: 16.60 g, 3.3 %

Final Residue Wt: 488.3 g

Cyanide Conc. Maintained at: 1.0 g/L

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	1.246	2.9	2.49
Duplicate	1.178	2.7	
Triplicate	1.159	2.8	
Average	1.19	2.8	2.49

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.145	0.3	1.01
Duplicate	0.137	0.3	
Triplicate	0.137	0.3	
Average	0.14	0.3	1.01

Raw Data

Leach Time	Solution Withdrawn				Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	D.O.	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.01	-----	-----	0.74	2.70	-----	-----	-----	-----	-----
2	100	0.85	10.5	6.77	0.18	0.30	0.04	0.23	0.004	0.023	0.085
6	104	0.90	10.8	7.47	0.17	0.10	0.01	0.09	0.00104	0.00936	0.0936
12	105	0.85	10.8	7.12	0.20	0.10	0.02	0.05	0.0021	0.00525	0.08925
24	110	0.85	10.9	6.35	0.21	0.10	0.01	0.02	0.0011	0.0022	0.0935
48	105	0.85	10.9	6.96	0.20	0.10	0.01	0.02	0.00105	0.0021	0.08925
72	-----	0.85	11.2	6.83	-----	-----	0.01	0.01	-----	-----	-----

Activated Carbon

	Weight, g	Assay gAu/mt	Assay gAg/mt	mgAu	mgAg
Initial	9.2				
Final	9.2	57	150	0.5244	1.38

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction mg	Au g/mt BR	Au % of total	Cumulative Ag Extraction mg	Ag g/mt BR	Ag % of total	Reagent Requirements Cumulative kg/mt BR Cyanide Consumed	Lime Added
0								5.5
2							0.23	6.1
6							0.35	6.3
12							0.58	6.5
24							0.81	6.7
48							1.05	6.9
72	0.541	1.10	88.7	1.429	2.9	90.6	1.27	6.9

	Au	% of Total	Ag	% of Total
Extracted g/mt BR	**1.10**	**88.7**	**2.9**	**90.6**
Tail assay, g/mt	**0.14**		**0.3**	
Calculated Head g/mt BR	**1.24**		**3.2**	
NaCN Consumed, kg/mt BR	**1.27**			
Lime Added, kg/mt BR	**6.9**			

Note: BR denotes biooxidized residue.

	Au	% of Total	Ag	% of Total
Extracted g/mt ore 1)	**1.06**	**88.3**	**2.8**	**90.3**
Tail assay, g/mt ore 1)	**0.14**		**0.3**	
Calculated Head g/mt ore 1)	**1.20**		**3.1**	
NaCN Consumed, kg/mt ore 1)	**1.23**			
Lime Added, kg/mt ore 1)	**6.7**			

Bottle Roll Test - CIL/Cyanidation

Project No.	3775			
Test No.	CY-24			
Composite	WWS-13-2			
Feed Size	80%-45µm		Wt. Loss	
Biooxidation Test	AM-6		7.00	g
Biooxidation Time	21	days	1.4	%
Estimated Oxidation	78.6	%		
Bio Ox Feed	494.10	g		
Cyanidation Feed	487.1	g		
			Final Residue Wt:	476.3 g
Solution Vol.	0.7306	L		
Natural pH	3.8			
Solid Density	40.0	Wt. %	Cyanide Conc. Maintained at:	1.0 g/L

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	1.246	2.9	2.49
Duplicate	1.178	2.7	
Triplicate	1.159	2.8	
Average	1.19	2.8	2.49

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.13	0.3	0.54
Duplicate	0.12	0.4	
Triplicate	0.11	0.4	
Average	0.12	0.4	0.54

Raw Data

Leach Time	Solution Withdrawn				Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	D.O.	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	-----	0.73	2.40	-----	-----	-----	-----	-----
2	100	0.85	10.4	6.88	0.19	0.30	0.04	0.13	0.004	0.013	0.085
6	109	0.95	10.5	7.60	0.14	0.50	0.01	0.05	0.00109	0.00545	0.10355
12	108	0.85	10.9	7.28	0.20	0.20	0.00	0.04	0	0.00432	0.0918
24	108	0.85	10.9	7.02	0.20	0.10	0.00	0.02	0	0.00216	0.0918
48	105	0.85	10.9	7.07	0.20	0.20	0.00	0.02	0	0.0021	0.08925
72	-----	0.85	10.8	7.13	-----	-----	0.00	0.02	-----	-----	-----

Activated Carbon

	Weight, g	Assay gAu/mt	Assay gAg/mt	mgAu	mgAg
Initial	9.18				
Final	9.26	63.9	295	0.591714	2.7317

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt BR	
Hours	mg	g/mt BR	% of total	mg	g/mt BR	% of total	Cyanide Consumed	Lime Added
0								4.9
2							0.22	5.5
6							0.29	6.6
12							0.51	7.0
24							0.74	7.2
48							0.96	7.6
72	0.597	1.23	91.1	2.773	5.7	93.4	1.19	7.6

	Au	% of Total	Ag	% of Total
Extracted g/mt BR	**1.23**	**91.1**	**5.7**	**93.4**
Tail assay, g/mt	**0.12**		**0.4**	
Calculated Head g/mt BR	**1.35**		**6.1**	
NaCN Consumed, kg/mt BR	**1.19**			
Lime Added, kg/mt BR	**7.6**			

Note: BR denotes biooxidized residue.

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**1.21**	**91.0**	**5.6**	**93.3**
Tail assay, g/mt ore [1)]	**0.12**		**0.4**	
Calculated Head g/mt ore [1)]	**1.33**		**6.0**	
NaCN Consumed, kg/mt ore [1)]	**1.17**			
Lime Added, kg/mt ore [1)]	**7.5**			

Bottle Roll Test - CIL/Cyanidation

Project No.	**3775**
Test No.	**CY-21**
Composite	**WWS 13-2**
Feed Size	**80%-45µm**
Biooxidation Test	**AM-13**
Biooxidation Time	**5** days
Estimated Oxidation	**2.595983936** %

Wt. Loss	
3.20	g
0.6	%

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	1.246	2.9	2.49
Duplicate	1.178	2.7	
Triplicate	1.159	2.8	
Average	1.19	2.8	2.49

Bio Ox Feed 496.0 g
Cyanidation Feed 492.8 g

Final Residue Wt: 487.1 g

Solution Vol. 0.7392 L

Natural pH 3.6

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.49	1.2	2.44
Duplicate	0.51	1.2	
Triplicate	0.49	1.3	
Average	0.50	1.2	2.44

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.0 g/L

Raw Data

Leach Time	Solution Withdrawn				Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	D.O.	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	-----	0.74	3.00	-----	-----	-----	-----	-----
2	100	1.05	11.0	2.06	0.06	0.00	0.03	0.19	0.003	0.019	0.105
6	101	0.85	10.8	2.77	0.20	0.20	0.00	0.06	0	0.00606	0.08585
12	104	0.85	10.8	3.49	0.20	0.30	0.00	0.04	0	0.00416	0.0884
24	104	0.85	11.0	3.05	0.20	0.00	0.00	0.03	0	0.00312	0.0884
48	107	0.85	10.9	3.55	0.20	0.15	0.00	0.02	0	0.00214	0.09095
72	-----	0.95	10.9	3.39	-----	-----	0.00	0.02	-----	-----	-----

Activated Carbon

	Weight, g	Assay gAu/mt	Assay gAg/mt	mgAu	mgAg
Initial	9.29				
Final	9.1	44	190	0.4004	1.729

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction mg	g/mt BR	% of total	Cumulative Ag Extraction mg	g/mt BR	% of total	Reagent Requirements Cumulative kg/mt BR Cyanide Consumed	Lime Added
0								6.1
2							-0.07	6.1
6							0.14	6.5
12							0.37	7.1
24							0.59	7.1
48							0.82	7.4
72	0.403	0.82	62.1	1.778	3.6	75.0	0.89	7.4

	Au	% of Total	Ag	% of Total
Extracted g/mt BR	**0.82**	**62.1**	**3.6**	**75.0**
Tail assay, g/mt	**0.50**		**1.2**	
Calculated Head g/mt BR	**1.32**		**4.8**	
NaCN Consumed, kg/mt BR	**0.89**			
Lime Added, kg/mt BR	**7.4**			

Note: BR denotes biooxidized residue.

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**0.82**	**62.1**	**3.6**	**75.0**
Tail assay, g/mt ore [1)]	**0.50**		**1.2**	
Calculated Head g/mt ore [1)]	**1.32**		**4.8**	
NaCN Consumed, kg/mt ore [1)]	**0.89**			
Lime Added, kg/mt ore [1)]	**7.4**			

Bottle Roll Test - CIL/Cyanidation

Project No.	**3775**				
Test No.	**CY-16**				
Composite	**WOS-13-1**				
Feed Size	**80%-45µm**		Wt. Loss		
Biooxidation Test	**Baseline**		N/A	g	
Biooxidation Time	**0**	days	N/A	%	
Estimated Oxidation	**0.0**	%			
Bio Ox Feed	0.00	g			
Ore Charge	504.1	g			
			Final Residue Wt:	493.4	g
Solution Vol.	0.7562	L			
Natural pH	6.3				
	Wt. %				g/L
Solid Density	40.0		Cyanide Conc. Maintained at:		1.0

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	1.525	14	3.58
Duplicate	1.543	15	
Triplicate	1.399	15	
Average	1.49	14.7	3.58

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.821	4.9	3.58
Duplicate	0.804	4.7	
Triplicate	0.788	5.8	
Average	0.80	5.1	3.58

Raw Data

Leach Time	Solution Withdrawn				Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	D.O.	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.01	-----	-----	0.76	1.50	-----	-----	-----	-----	-----
2	100	0.95	10.8	5.79	0.12	0.00	0.09	0.86	0.009	0.086	0.095
6	104	0.95	10.6	5.75	0.14	0.30	0.00	0.33	0	0.03432	0.0988
12	105	0.90	11.1	6.38	0.17	0.00	0.00	0.24	0	0.0252	0.0945
24	100	0.90	10.8	6.55	0.17	0.10	0.00	0.13	0	0.013	0.09
48	105	0.90	11.1	5.73	0.17	0.00	0.00	0.12	0	0.0126	0.0945
72	105	0.90	11.0	6.46	0.17	0.00	0.00	0.11	0	0.01155	0.0945
96	-----	0.95	10.7	6.52	-----	-----	0.00	0.08	-----	-----	-----

Activated Carbon

	Weight, g	Assay gAu/mt	Assay gAg/mt	mgAu	mgAg
Initial	9.5				
Final	9.8	42.6	450	0.41748	4.41

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction mg	Au g/mt ore	Au % of total	Cumulative Ag Extraction mg	Ag g/mt ore	Ag % of total	Reagent Requirements Cumulative kg/mt ore: Cyanide Consumed	Lime Added
0								3.0
2							0.08	3.0
6							0.13	3.6
12							0.29	3.6
24							0.44	3.8
48							0.60	3.8
72							0.75	3.8
96	0.426	0.85	51.5	4.653	9.2	64.3	0.82	3.8

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore	**0.85**	**51.5**	**9.2**	**64.3**
Tail assay, g/mt	**0.80**		**5.1**	
Calculated Head g/mt ore	**1.65**		**14.3**	
NaCN Consumed, kg/mt ore	**0.82**			
Lime Added, kg/mt ore	**3.8**			

Bottle Roll Test - CIL/Cyanidation

Project No.	**3775**	
Test No.	**CY-27**	
Composite	**WOS-13-1**	
Feed Size	**80%-45µm**	
Biooxidation Test	**AM-9**	
Biooxidation Time	**5**	days
Estimated Oxidation	**5.8**	%
Bio Ox Feed	503.50	g
Cyanidation Feed	486.5	g
Solution Vol.	0.7298	L
Natural pH	3.3	
Solid Density	40.0	Wt. %

Wt. Loss	
17.00	g
3.4	%

Final Residue Wt: 477.2 g

Head Assay	g Au/mt	g Ag/mt	%, $S^{=}$
Predicted			
Initial	1.525	14	3.58
Duplicate	1.543	15	
Triplicate	1.399	15	
Average	1.49	14.7	3.58

Tail Assay	g Au/mt	g Ag/mt	%, $S^{=}$
Initial	0.627	4.7	3.49
Duplicate	0.625	4.9	
Triplicate	0.609	4.7	
Average	0.62	4.8	3.49

Cyanide Conc. Maintained at: 1.0 g/L

Raw Data

Leach Time	Solution Withdrawn				Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	D.O.	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	-----	0.73	2.20	-----	-----	-----	-----	-----
2	100	0.95	10.7	6.52	0.12	0.20	0.16	1.13	0.016	0.113	0.095
6	107	0.90	11.2	6.43	0.17	0.00	0.03	0.42	0.00321	0.04494	0.0963
12	108	1.00	11.2	6.65	0.11	0.00	0.00	0.21	0	0.02268	0.108
24	104	0.90	10.5	6.62	0.17	0.30	0.00	0.14	0	0.01456	0.0936
48	105	0.90	11.0	5.03	0.17	0.00	0.00	0.14	0	0.0147	0.0945
72	-----	0.95	10.9	4.10	-----	-----	0.00	0.12	-----	-----	-----

Activated Carbon

	Weight, g	Assay gAu/mt	Assay gAg/mt	mgAu	mgAg
Initial	9.17				
Final	9.11	56.6	686	0.515626	6.24946

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt BR	
Hours	mg	g/mt BR	% of total	mg	g/mt BR	% of total	Cyanide Consumed	Lime Added
0								4.5
2							0.08	4.9
6							0.20	4.9
12							0.20	4.9
24							0.36	5.5
48							0.51	5.5
72	0.535	1.10	64.0	6.547	13.5	73.8	0.59	5.5

	Au	% of Total	Ag	% of Total
Extracted g/mt BR	**1.10**	**64.0**	**13.5**	**73.8**
Tail assay, g/mt	**0.62**		**4.8**	
Calculated Head g/mt BR	**1.72**		**18.3**	
NaCN Consumed, kg/mt BR	**0.59**			
Lime Added, kg/mt BR	**5.5**			

Note: BR denotes biooxidized residue.

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**1.06**	**63.9**	**13.0**	**73.9**
Tail assay, g/mt ore [1)]	**0.60**		**4.6**	
Calculated Head g/mt ore [1)]	**1.66**		**17.6**	
NaCN Consumed, kg/mt ore [1)]	**0.57**			
Lime Added, kg/mt ore [1)]	**5.4**			

Bottle Roll Test - CIL/Cyanidation

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	1.525	14	3.58
Duplicate	1.543	15	
Triplicate	1.399	15	
Average	1.49	14.7	3.58

Project No.	**3775**		
Test No.	**CY-28**		
Composite	**WOS-13-1**		
Feed Size	**80%-45µm**		
Biooxidation Test	**AM-10**		
Biooxidation Time	**8**	days	
Estimated Oxidation	**24.2**	%	

Wt. Loss	
13.90	g
2.7	%

Bio Ox Feed	521.80	g
Cyanidation Feed	507.9	g
Solution Vol.	0.7619	L
Natural pH	2.5	

Final Residue Wt: 498.6 g

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.472	4.3	2.79
Duplicate	0.457	4.1	
Triplicate	0.467	4.3	
Average	0.47	4.2	2.79

Solid Density: Wt. % 40.0

Cyanide Conc. Maintained at: 1.0 g/L

Raw Data

Leach Time	Solution Withdrawn				Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	D.O.	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	-----	0.76	4.80	-----	-----	-----	-----	-----
2	100	0.85	11.6	3.42	0.19	0.00	0.14	1.43	0.014	0.143	0.085
6	109	0.95	11.5	4.06	0.14	0.00	0.08	0.63	0.00872	0.06867	0.10355
12	109	0.90	11.4	3.61	0.17	0.00	0.03	0.27	0.00327	0.02943	0.0981
24	108	0.90	11.2	3.08	0.17	0.00	0.02	0.15	0.00216	0.0162	0.0972
48	109	0.90	11.1	3.13	0.17	0.00	0.00	0.10	0	0.0109	0.0981
72	-----	0.90	11.0	2.85	-----	-----	0.00	0.10	-----	-----	-----

Activated Carbon

	Weight, g	Assay gAu/mt	Assay gAg/mt	mgAu	mgAg
Initial	9.57				
Final	9.50	63.4	544	0.6023	5.168

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction mg	Au g/mt BR	Au % of total	Cumulative Ag Extraction mg	Ag g/mt BR	Ag % of total	Reagent Requirements Cumulative kg/mt BR Cyanide Consumed	Lime Added
0								9.5
2							0.22	9.5
6							0.28	9.5
12							0.42	9.5
24							0.57	9.5
48							0.71	9.5
72	0.630	1.24	72.5	5.512	10.9	72.2	0.85	9.5

	Au	% of Total	Ag	% of Total
Extracted g/mt BR	**1.24**	**72.5**	**10.9**	**72.2**
Tail assay, g/mt	**0.47**		**4.2**	
Calculated Head g/mt BR	**1.71**		**15.1**	
NaCN Consumed, kg/mt BR	**0.85**			
Lime Added, kg/mt BR	**9.5**			

Note: BR denotes biooxidized residue.

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**1.21**	**72.5**	**10.6**	**72.1**
Tail assay, g/mt ore [1)]	**0.46**		**4.1**	
Calculated Head g/mt ore [1)]	**1.67**		**14.7**	
NaCN Consumed, kg/mt ore [1)]	**0.83**			
Lime Added, kg/mt ore [1)]	**9.2**			

Bottle Roll Test - CIL/Cyanidation

Project No.	**3775**			
Test No.	**CY-30**			
Composite	**WOS-13-1**			
Feed Size	**80%-45µm**		Wt. Loss	
Biooxidation Test	**AM-11**		32.70	g
Biooxidation Time	**21**	days	6.4	%
Estimated Oxidation	**60.3**	%		

Head Assay	g Au/mt	g Ag/mt	%, S=
Predicted			
Initial	1.525	14	3.58
Duplicate	1.543	15	
Triplicate	1.399	15	
Average	1.49	14.7	3.58

Bio Ox Feed 510.40 g
Cyanidation Feed 477.7 g

Solution Vol. 0.7166 L

Final Residue Wt: 469.3 g

Tail Assay	g Au/mt	g Ag/mt	%, S=
Initial	0.267	2.4	1.52
Duplicate	0.264	2.2	
Triplicate	0.284	2.4	
Average	0.27	2.3	1.52

Natural pH 2.3

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.0 g/L

Raw Data

Leach Time	Solution Withdrawn				Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	D.O.	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	-----	0.72	2.00	-----	-----	-----	-----	-----
2	50	0.85	11.2	3.50	0.15	0.00	0.20	1.94	0.01	0.097	0.0425
6	56	0.85	11.3	4.91	0.16	0.00	0.05	0.74	0.0028	0.04144	0.0476
12	59	0.85	11.1	3.56	0.16	0.00	0.02	0.38	0.00118	0.02242	0.05015
24	60	1.00	11.0	3.44	0.06	0.00	0.00	0.23	0	0.0138	0.06
48	65	0.90	10.3	3.14	0.13	0.40	0.00	0.18	0	0.0117	0.0585
72	-----	0.90	11.0	3.65	-----	-----	0.00	0.21	-----	-----	-----

Activated Carbon

	Weight, g	Assay gAu/mt	Assay gAg/mt	mgAu	mgAg
Initial	9.00				
Final	8.92	71.2	566	0.635104	5.04872

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction mg	g/mt BR	% of total	Cumulative Ag Extraction mg	g/mt BR	% of total	Reagent Requirements Cumulative kg/mt BR Cyanide Consumed	Lime Added
0								4.2
2							0.23	4.2
6							0.46	4.2
12							0.69	4.2
24							0.70	4.2
48							0.85	5.0
72	0.649	1.36	83.4	5.386	11.3	83.1	1.00	5.0

	Au	% of Total	Ag	% of Total
Extracted g/mt BR	**1.36**	**83.4**	**11.3**	**83.1**
Tail assay, g/mt	**0.27**		**2.3**	
Calculated Head g/mt BR	**1.63**		**13.6**	
NaCN Consumed, kg/mt BR	**1.00**			
Lime Added, kg/mt BR	**5.0**			

Note: BR denotes biooxidized residue.

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**1.27**	**83.6**	**10.6**	**82.8**
Tail assay, g/mt ore [1)]	**0.25**		**2.2**	
Calculated Head g/mt ore [1)]	**1.52**		**12.8**	
NaCN Consumed, kg/mt ore [1)]	**0.93**			
Lime Added, kg/mt ore [1)]	**4.7**			

Bottle Roll Test - CIL/Cyanidation

Project No.	**3775**			
Test No.	**CY-29**			
Composite	**WOS-13-1**			
Feed Size	**80%-45µm**		Wt. Loss	
Biooxidation Test	**AM-12**		14.90	g
Biooxidation Time	**28**	days	3.0	%
Estimated Oxidation	**85.1**	%		

Head Assay	g Au/mt	g Ag/mt	%, $S^{=}$
Predicted			
Initial	1.525	14	3.58
Duplicate	1.543	15	
Triplicate	1.399	15	
Average	1.49	14.7	3.58

Bio Ox Feed	497.30	g
Cyanidation Feed	482.4	g
Solution Vol.	0.7236	L
Natural pH	3.3	

Final Residue Wt: 467.1 g

Tail Assay	g Au/mt	g Ag/mt	%, $S^{=}$
Initial	0.170	2.1	0.55
Duplicate	0.158	2.0	
Triplicate	0.165	1.9	
Average	0.16	2.0	0.55

Solid Density: Wt. % 40.0

Cyanide Conc. Maintained at: 1.0 g/L

Raw Data

Leach Time	Solution Withdrawn				Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	D.O.	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	-----	0.72	2.00	-----	-----	-----	-----	-----
2	50	0.85	11.5	3.66	0.14	0.00	0.17	2.44	0.0085	0.122	0.0425
6	54	0.90	11.3	4.93	0.12	0.00	0.09	0.86	0.00486	0.04644	0.0486
12	59	0.85	11.2	3.86	0.15	0.00	0.03	0.42	0.00177	0.02478	0.05015
24	59	0.85	10.9	3.54	0.16	0.10	0.00	0.25	0	0.01475	0.05015
48	59	0.85	10.4	3.30	0.16	0.30	0.00	0.21	0	0.01239	0.05015
72	-----	0.90	10.8	3.67	-----	-----	0.00	0.22	-----	-----	-----

Activated Carbon

	Weight, g	Assay gAu/mt	Assay gAg/mt	mgAu	mgAg
Initial	9.09				
Final	9.18	79.9	638	0.733482	5.85684

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt BR	
Hours	mg	g/mt BR	% of total	mg	g/mt BR	% of total	Cyanide Consumed	Lime Added
0								4.1
2							0.22	4.1
6							0.34	4.1
12							0.57	4.1
24							0.77	4.4
48							1.00	5.0
72	0.749	1.55	90.6	6.236	12.9	86.6	1.16	5.0

	Au	% of Total	Ag	% of Total
Extracted g/mt BR	**1.55**	**90.6**	**12.9**	**86.6**
Tail assay, g/mt	**0.16**		**2.0**	
Calculated Head g/mt BR	**1.71**		**14.9**	
NaCN Consumed, kg/mt BR	**1.16**			
Lime Added, kg/mt BR	**5.0**			

Note: BR denotes biooxidized residue.

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**1.50**	**90.4**	**12.5**	**86.8**
Tail assay, g/mt ore [1)]	**0.16**		**1.9**	
Calculated Head g/mt ore [1)]	**1.66**		**14.4**	
NaCN Consumed, kg/mt ore [1)]	**1.12**			
Lime Added, kg/mt ore [1)]	**4.8**			

APPENDIX

Section 5 - POX Testing Results - Hazen Research, Inc. Report

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November 22, 2013

E-mail Delivery

Mr. Jack McPartland
McClelland Laboratories, Inc
1016 Greg St
Sparks, NV 89431

Subject: Pressure Oxidation Pretreatment and Cyanide Leaching of Sleeper Mine Samples
Hazen Project 11814
Report and Appendices A and B

Dear Mr. McPartland:

At the request of McClelland Laboratories, Inc., Hazen Research, Inc. performed three batch 2 L autoclave pressure oxidation (POX) pretreatment and three cyanide leaching experiments on samples provided from the Sleeper Mine in Nevada. The purpose of the work was to determine gold and silver extractions from the samples and to determine reagent consumptions during cyanide leaching.

SAMPLE DESCRIPTION AND PREPARATION

Three 4 kg dry samples of minus 20-mesh material were received. Each sample was blended and riffle-split to produce test charges and assay heads. Samples were stage-crushed to an approximate 80% passing (P_{80}) 80 µm particle size. A summary of the samples received with head assays and grind particle sizes is shown in Table 1.

Table 1. Sample Identification, Particle Sizes, and Head Assays

HRI	Experiment No.	Client Identification	Approximate Weight, kg	P_{80}, µm	Au, g/t	Ag, g/t
53701-1	POX-1, CIL-1	Sleeper Mine WWS-13-1	4.0	83	3.53	12
53701-2	POX-2, CIL-2	Sleeper Mine WWS-13-2	4.0	83	1.37	4
53701-3	POX-3, CIL-3	Sleeper Mine WOS-13-1	4.1	88	1.70	16

POX PROCEDURE

The POX experiments were conducted in a Parr Instrument 2 gal titanium autoclave. Dry solids were slurried with deionized (DI) water at a pulp density of 15% and transferred to the autoclave. The autoclave was sealed and prepressurized to 100 psi to ensure oxidizing conditions were maintained during the heatup process. The POX operating conditions are summarized in Table 2.

Table 2. POX Operating Conditions

Condition	Target
Temperature, °C	220
Targeted total pressure, psig	424
Pulp density, % solids	15
Feed sample, g	195
Feed particle size, P_{80} µm	80
Offgas bleed, mL/min	100–300
Time, min	120

POX RESULTS

A key indicator of the effectiveness of the POX pretreatment is the conversion of sulfide to sulfate and the resultant free acid produced during the POX. In all three experiments, sulfide conversion was incomplete, suggesting that additional gold and silver liberation could occur with either a longer retention time and/or a smaller particle size. Sulfide oxidation and free acid results are shown in Table 3.

Table 3. POX Sulfide Oxidation and Free Acid Results

Experiment	Sample	Sulfide Oxidation, %	Free Acid, g/L
POX-1	WWS 13-1	82	11.5
POX-2	WWS 13-1	79	9.4
POX-3	WOS 13-1	77	14.7

Complete POX operating data, analytical data, and material balances are shown in the worksheets in Appendix A.

CARBON-IN-LEACH CYANIDE LEACHING

Bottle roll cyanide leaching with carbon-in-leach (CIL) was performed on wet cakes from the filtered POX discharge. The CIL conditions are summarized in Table 4.

Table 4. Cyanide Leaching Conditions

Condition	Target
Temperature, °C	Ambient, 20–22
NaCN concentration, g/L	2 g/L maintained
Activated carbon, g/kg slurry	40
pH, maintained with milk of lime	10.5–11.0
Dissolved O_2, ppm	Greater than 5
Time, h	24
Pulp density, % solids	30
Method	Bottle roll leach, CIL

CYANIDE LEACHING RESULTS

The CIL leaching results and reagent requirements are summarized in Table 5. The CIL worksheets with complete test data and material balances are located in Appendix B.

Table 5. CIL Leaching Results

Client ID	Notebook Reference	Feed ID	P_{80}, µm	CIL Extraction, %				Reagent Requirement, kg/t	
				Au[a]	Au[b]	Ag[a]	Ag[b]	CaO	NaCN
WWS 13-1	3673-63	POX 1 Residue	83	92.5	92.7	38.9	22.9	4.0	2.6
WWS 13-2	3673-65	POX 2 Residue	83	90.0	90.5	33.4	22.7	2.7	3.1
WOS 13-1	3673-67	POX 3 Residue	88	85.9	85.6	49.8	12.8	2.2	2.3

[a]Extraction is based on head and tails analyses.
[b]Extraction is based on a calculated head and products basis.

This report concludes the planned experiments for the three Sleeper Mine samples. Hazen appreciates the opportunity to conduct these experiments for McClelland Labs. Please let us know if you would like your samples returned or held for possible additional work.

Regards,

Maxine Green

Maxine S. Green
Hydromet Lab Manager

MSG/gmr

xc: Lily Giddings, Hazen Research, Inc.
Dennis Gertenbach, Hazen Research, Inc.
David Martin, Hazen Research, Inc.

APPENDIX A

POX Data Sheets

Gold and Silver POX Pretreatment
Hazen Project 11814

Test No.: POX-1
Notebook: 3673-62

Purpose: Pressure oxidation of a gold- and silver-bearing sample as a pretreatment for cyanide leaching.
Samples were ground to approximately P_{80} of 80 µm particle size.

Date: 10/7/13
By: Aaron DeWitt

Feed Solids: HRI 53701-1 WWS-13-1 P_{80} = 83.2 µm
Feed Solution: DI water

Sample weight, g: 195.00 dry
Total water, g: 1,105
Total slurry , g: 1,300
Target % solids: 15

Autoclave Conditions (titanium high-pressure 2 L autoclave)

Operating Notes
1. Slight plug in O_2 dip tube @ 65 min, 410 psig, increased flow to maintain psig at 424.
2. Looked like a small amount of unreacted material in the autoclave.

Heat on clock time: 08:40
To temp clock time: 09:40
End test clock time: 11:40

Total slurry wt, g: 1,301
Shell tare wt, g: 4,745
Final slurry total, g: 1,306

Temperature, °C: 220
O_2 overpressure, psi: 100 (start heatup with 100 psi O_2)
Total press at temp, psig: 424 (Note: O_2 may need to be increased to maintain conditions)

Start O_2 at, °C: 220

Condensate, g: 0

Time, min: 120
Offgas bleed, cm^3/min: 100 to 300
Heatup time, min: 60
Impeller speed rpm: 830.0 Tip speed of 8.15 ft/s

Products and Assays

Sample ID	Product	Wt, g	Vol, mL	pH	emf, mV	Density, g/mL	Free Acid H_2SO_4, g/L	Assay, g/t or ppm Au	Ag	Assay, % or g/L as S S^{tot}	SO_4^{2-}	S^{2-}, (Calc)	Assay, % C^{tot}	CO_3^{2-}	C^{org}			
	Inputs																	
HRI 53701-1	WWS-13-1	195.00						3.53	12	4.31	0.21	4.10	<.01	0.08	<.01			
	DI water	1,105.00																
	Starting slurry	1,300.00		0.25	510													
	Products																	
3673-62-1	120 min final primary filtrate	1,021.55	1,015	0.36	502	1.0126	11.5		<0.2	5.20	5.34							
3673-62-2	120 min final wash	724.14	725	1.21	488	1.0033			<0.2		1.18							
3673-62-3	Residue	195.18						3.64	13	1.42	0.67	0.75	0.04					

Solids weight loss, % 0

Note: emf measured with a Pt–Ag/AgCl electrode in saturated KCl: Eh = emf + 199 mV at 25°C

Total wet cake: 253.45 g, wet
Assay, moisture split: 75.1 g, wet
57.84 g, dry
77.01 % solids

Filtration, min:
PF, min: 31
Wash, min: 85

Residue color: Orange
PF color: Clear
18.5 cm 934-AH Filter

	Mass, mg contained Au	Ag	S^{2-}
Input			
Feed solids	0.69	2.34	8,002
POX feed solution			
Products			
120 min PF	0.00	0.00	
120 min wash	0.00	0.00	
Residue	0.71	2.54	1,464
Dissolution (1 - residue/feed), %:	<0.01	<0.01	81.7
Products/feed balance, %:	103	108	na
S^{2-} oxidation, %:			81.7

na = not available

Gold and Silver POX Pretreatment
Hazen Project 11814

Test No.: POX-2
Notebook: 3673-64

Purpose: Pressure oxidation of a gold- and silver-bearing sample as a pretreatment for cyanide leaching.
Samples were ground to approximately P_{80} of 80 µm particle size.

Date: 10/8/13
By: Aaron DeWitt

Feed Solids: HRI 53701-2 WWS-13-2 P_{80} = 83.4 µm
Feed Solution: DI water

Operating Notes
1. Slight plug in O_2 dip tube @ 65 min, 410 psig, increased flow to maintain psig at 424.

Sample weight, g: 195.00 dry
Total water, g: 1,105
Total slurry , g: 1,300
Target % solids: 15

Autoclave Conditions (titanium high-pressure 2 L autoclave)

Heat on clock time:
To temp clock time: 06:30
End test clock time: 07:28
End test time: 09:28

Total slurry wt, g: 1,300
Shell tare wt, g: 4,745
Final slurry total, g: 1,280

Temperature, °C: 220
O_2 overpressure, psi: 100 (start heatup with 100 psi O_2)
Total press at temp, psig: 424 (Note: O_2 may need to be increased to maintain conditions)

Start O_2 at, °C: 220

Condensate, g: 2

Time, min: 120
Offgas bleed, cm^3/min: 100 to 300
Heatup time, min: 58
Impeller speed rpm: 830.0 Tip speed of 8.15 ft/s

Products and Assays

Sample ID	Product	Wt, g	Vol, mL	pH	emf, mV	Density, g/mL	Free Acid H_2SO_4, g/L	Assay, g/t or ppm Au	Ag	Assay, % or g/L as S S^{tot}	SO_4^{2-}	S^{2-}, (Calc)	Assay, % C^{tot}	CO_3^{2-}	C^{org}			
	Inputs																	
HRI 53701-2	WWS-13-2	195.00						1.37	4	2.93	0.24	2.69	<.01	0.04	<.01			
	DI water	1,105.00																
	Starting slurry	1,300.00		0.74	478.50													
	Products																	
3673-64-1	120 min final primary filtrate	987.70	980	0.91	452.60	1.0070	9.42		<0.2	3.80	3.83							
3673-64-2	120 min final wash	686.47	690	1.73	387.00	1.0003			<0.2		0.59							
3673-64-3	Residue	195.74						1.37	6	0.85	0.28	0.57	<.01					

Solids weight loss, % 0

Note: emf measured with a Pt–Ag/AgCl electrode in saturated KCl: Eh = emf + 199 mV at 25°C

Total wet cake: 269.20 g, wet
Assay, moisture split: 75.34 g, wet
54.78 g, dry
72.71 % solids

Filtration, min:
PF, min: 21
Wash, min: 35

Residue color: Red–orange
PF color: Clear
18.5 cm 934-AH Filter

	Mass, mg contained Au	Ag	S^{2-}
Input			
Feed solids	0.27	0.78	5,246
POX feed solution			
Products			
120 min PF	0.00	0.00	
120 min wash	0.00	0.00	
Residue	0.27	1.17	1,116
Dissolution (1 - residue/feed), %:	<0.01	ABDL	78.7
Products/feed balance, %:	100	ABDL	na
S^{2-} oxidation, %:			78.7

ABDL = at or below detection limit
na = not available

Gold and Silver POX Pretreatment
Hazen Project 11814

Test No.: POX-3
Notebook: 3673-66

Purpose: Pressure oxidation of a gold- and silver-bearing sample as a pretreatment for cyanide leaching.
Samples were ground to approximately P_{80} of 80 µm particle size.

Date: 10/8/13
By: Aaron DeWitt

Feed Solids: HRI 53701-3 WOS-13-1 P_{80} = 87.9 µm
Feed Solution: DI water

Operating Notes
1. Slight plug in O_2 dip tube @ 65 min, 410 psig, increased flow to maintain psig at 424.

Sample weight, g: 195.00 dry
Total water, g: 1,105
Total slurry , g: 1,300
Target % solids: 15

Autoclave Conditions (titanium high-pressure 2 L autoclave)

Heat on clock time:
To temp clock time: 10:08
End test clock time: 11:01
End test time: 13:01

Total slurry wt, g: 1,300
Shell tare wt, g: 4,745
Final slurry total, g: 1,300

Temperature, °C: 220
O_2 overpressure, psi: 100 (start heatup with 100 psi O_2)
Total press at temp, psig: 424 (Note: O_2 may need to be increased to maintain conditions)

Start O_2 at, °C: 220

Condensate, g: 0

Time, min: 120
Offgas bleed, cm^3/min: 100 to 300
Heatup time, min: 53
Impeller speed rpm: 830.0 Tip speed of 8.15 ft/s

Products and Assays

Sample ID	Product	Wt, g	Vol, mL	pH	emf, mV	Density, g/mL	Free Acid H_2SO_4, g/L	Assay, g/t or ppm		Assay, % or g/L as S			Assay, %					
								Au	Ag	S^{tot}	SO_4^{2-}	S^{2-}, (Calc)	C^{tot}	CO_3^{2-}	C^{org}			
	Inputs																	
HRI 53701-3	WOS-13-1	195.00						1.70	16	4.23	0.23	4.00	<.01	0.04	<.01			
	DI water	1,105.00																
	Starting slurry	1,300.00		0.85	490.80													
	Products																	
3673-66-1	120 min final primary filtrate	1,023.00	1,015	0.89	490.50	1.0116	14.7		<0.2	6.00	6.24							
3673-66-2	120 min final wash	768.65	770	1.52	436.40	1.0008			<0.2		0.73							
3673-66-3	Residue	192.09						1.71	16	1.42	0.50	0.92	<.01					

Solids weight loss, % 1.53

Note: emf measured with a Pt–Ag/AgCl electrode in saturated KCl: Eh = emf + 199 mV at 25°C

Total wet cake: 264.12 g, wet
Assay, moisture split: 75.77 g, wet
55.11 g, dry
72.73 % solids

Filtration, min:
PF, min: 14
Wash, min: 48

Residue color: Red–orange
PF color: Clear
18.5 cm 934-AH Filter

	Mass, mg contained		
	Au	Ag	S^{2-}
Input			
Feed solids	0.33	3.12	7,807
POX feed solution			
Products			
120 min PF	0.00	0.00	
120 min wash	0.00	0.00	
Residue	0.33	3.07	1,767
Dissolution (1 - residue/feed), %:	0.91	1.49	77.4
Products/feed balance, %:	99.1	98.5	
S^{2-} oxidation, %:			77.4

APPENDIX B

CIL Data Sheets

Cyanidation Report
Hazen Project

Notebook: 3673-63
Test: CIL-1

Date: 10/10/2013
Operator(s): J Suter

Sample: 3673-62-3 POX-1 Residue

Purpose: Investigate gold and silver extractions and reagent consumptions in pressure oxidation (POX) residues.

Conditions

Feed solids to CIL, g:	85.0	dry	110.38 wet cake, g	pH maintained with $Ca(OH)_2$:	10.5–11.5
Slurry DI water, g:	198		77.01 % solids	Leach time, h:	24
Slurry weight, g:	283			Aeration:	Open bottle
Target slurry density, %:	30			Monitor DO:	Beginning and end
NaCN addition, g/L:	2.0	(maintained)			
Carbon addition, g/kg slurry:	40				

A. Cyanidation Conditions

Time, h	Net Pulp Wt, g	Net Sol'n Vol, mL	Reagent Added, g			NaCN, g/L	pH		DO, ppm
			$Ca(OH)_2$	NaCN	Carbon		Init.	Adj.	
Conditioning									
0			0.4				3.14	12.6	
0.5							11.2		8.13
Cyanidation									
0	283	198		0.44	11.33	2.20	11.2		8.13
2	323	227	0.05	0.05		1.79	10.8	11.8	
6	326	230		0.04		1.82	11.2		
19	328	232		0.09		1.61	11.0		
24	342	258				1.55	10.9		7.99
Total added, g:			0.45	0.62					
(CaO equivalent, g):			0.34						
CaO requirement, kg/t:			4.01						
NaCN consumption, kg/t:				2.55					

B. Products, Assays, and Results

Sample ID	Products	Wt or Vol, g or mL	Assay, g/t or mg/L	
			Au	Ag
3673-62-3	CIL feed solids	85.0	3.63	13
3725-63-1	Final PF and wash	530	<0.05	<0.2
3725-63-2	Loaded carbon	11.43	0.29	0.2
3725-63-3	Dry residue	84.40	0.27	8

Note:
Carbon units are mg contained

Sample ID	Products	Mass, mg	
		Au	Ag
3673-62-3	CIL feed solids	0.31	1.11
3725-63-1	Final PF and wash	0	0
3725-63-2	Loaded carbon	0.29	0.20
3725-63-3	Dry residue	0.02	0.68

	Au	Ag
Balance (out/in), %:	102.8	79.2
Calculated head, g/t:	3.73	10.3
Extraction based on calculated head and products, %:	92.7	22.9
Extraction based on head and tails, %:	92.5	38.9

Cyanidation Report
Hazen Project

Notebook: 3673-65 | Date: 10/10/2013
Test: CIL-2 | Operator(s): J Suter

Sample: 3673-64-3 POX-2 Residue

Purpose: Investigate gold and silver extractions and reagent consumptions in pressure oxidation (POX) residues.

Conditions

Feed solids to CIL, g: 85.0 dry 116.9 wet cake, g
Slurry DI water, g: 198 72.71 % solids
Slurry weight, g: 283
Target slurry density, %: 30
NaCN addition, g/L: 2.0 (maintained)
Carbon addition, g/kg slurry: 40

pH maintained with $Ca(OH)_2$: 10.5–11.5
Leach time, h: 24
Aeration: Open bottle
Monitor DO: Beginning and end

A. Cyanidation Conditions

Time, h	Net Pulp Wt, g	Net Sol'n Vol, mL	Reagent Added, g			NaCN, g/L	pH		DO, ppm
			$Ca(OH)_2$	NaCN	Carbon		Init.	Adj.	
Conditioning									
0			0.25				2.88	12.2	
0.5							11.1		7.98
Cyanidation									
0	283	198		0.44	11.33	2.20	11.1		7.98
2	327	231	0.05	0.06		1.73	10.7	11.8	
6	331	235		0.04		1.85	11.3		
19	336	240		0.09		1.63	11.2		
24	355	270				1.35	11.1		7.77
Total added, g:			0.30	0.63					
(CaO equivalent, g):			0.23						
CaO requirement, kg/t:			2.67						
NaCN consumption, kg/t:				3.08					

B. Products, Assays, and Results

Sample ID	Products	Wt or Vol, g or mL	Assay, g/t or mg/L	
			Au	Ag
3673-64-3	CIL feed solids	85.0	1.37	6
3725-65-1	Final PF and wash	480	<0.05	<0.2
3725-65-2	Loaded carbon	11.43	0.11	<0.1
3725-65-3	Dry residue	84.96	0.14	<4

Note:
Carbon units are mg contained

Sample ID	Products	Mass, mg	
		Au	Ag
3673-64-3	CIL feed solids	0.12	0.51
3725-65-1	Final PF and wash	0	0.000
3725-65-2	Loaded carbon	0.11	0.10
3725-65-3	Dry residue	0.012	0.34

	Au	Ag
Balance (out/in), %:	105.3	86.2
Calculated head, g/t:	1.44	5.17
Extraction based on calculated head and products, %:	90.5	22.7
Extraction based on head and tails, %:	90.0	33.4

Cyanidation Report
Hazen Project

Notebook: 3673-67 | Date: 10/10/2013
Test: CIL-3 | Operator(s): J Suter

Sample: 3673-66-3 POX-3 Residue

Purpose: Investigate gold and silver extractions and reagent consumptions in pressure oxidation (POX) residues.

Conditions

Feed solids to CIL, g: 85.0 dry 116.87 wet cake, g
Slurry DI water, g: 198 72.73 % solids
Slurry weight, g: 283
Target slurry density, %: 30
NaCN addition, g/L: 2.0 (maintained)
Carbon addition, g/kg slurry: 40

pH maintained with $Ca(OH)_2$: 10.5–11.5
Leach time, h: 24
Aeration: Open bottle
Monitor DO: Beginning and end

A. Cyanidation Conditions

Time, h	Net Pulp Wt, g	Net Sol'n Vol, mL	Reagent Added, g			NaCN, g/L	pH		DO, ppm
			$Ca(OH)_2$	NaCN	Carbon		Init.	Adj.	
Conditioning									
0			0.25				3.1	12.2	
0.5							12.0		8.25
Cyanidation									
0	283	198		0.44	11.33	2.20	12.0		8.25
2	310	214				2.03	11.2		
6	313	217		0.06		1.73	11.2		
19	321	225		0.08		1.66	11.1		
24	341	256				1.49	11.0		
Total added, g:			0.25	0.58					
(CaO equivalent, g):			0.19						
CaO requirement, kg/t:			2.23						
NaCN consumption, kg/t:				2.30					

B. Products, Assays, and Results

Sample ID	Products	Wt or Vol, g or mL	Assay, g/t or mg/L	
			Au	Ag
3673-66-3	CIL feed solids	85.0	1.71	16
3725-67-1	Final PF and wash	575	<0.05	<0.2
3725-67-2	Loaded carbon	11.45	0.12	<0.1
3725-67-3	Dry residue	85.41	0.24	8

Note:
Carbon units are mg contained

Sample ID	Products	Mass, mg	
		Au	Ag
3673-66-3	CIL feed solids	0.15	1.36
3725-67-1	Final PF and wash	0	0.000
3725-67-2	Loaded carbon	0.12	0.10
3725-67-3	Dry residue	0.020	0.68

	Au	Ag
Balance (out/in), %:	98.0	57.6
Calculated head, g/t:	1.68	9.22
Extraction based on calculated head and products, %:	85.6	12.8
Extraction based on head and tails, %:	85.9	49.8

APPENDIX

Section 6 - Column Biooxidation Test Data

Job No.	**3775-01**
Test No.	**B-1**
Sample	**WWS-13-MC**
Feed Size	**80%-12.5mm**
Agglomeration	**Yes**

Ore Charge, kgs	
Initial (Wet)	17.00
Initial (Dry)	16.83
Finalwt, kg	16.77
Weight loss, kg	0.06
Weight Loss %	0.36

Head Analyses	
Au, g/mt	2.64
Ag, g/mt	8.0
Fe, %	3.16
S=, %	3.36
As, ppm	1355
Cu, ppm	31.9
Zn, ppm	120

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	2.98 [1)]	2.96	%
S=, %	2.60 [1)]	2.59	%
As, ppm	5*		ppm
Cu, ppm	19.4*		ppm
Zn, ppm	48*		ppm

* BRT Residue analysis, [1)] Used average of Bottle Roll & Column Leach Tails

Daily Column Biooxidation Data,WWS-13-MC, 80%-12.5mm

		Solution Applied												Recycle	Effluent Solution													Fe Extraction			
			D.I.		Inoculum															Redox											
		Total Vol.	Water	H_2SO_4	Culture	Volume	Free	Redox		Specific	Fe, mg/l			Effluent,	Volume	Weight	Specific		Free	mV	D.O.	Temp	Fe, mg/l			Cu	As		Cum.	Cum.	Est. Pct.
Date	Days	liters	liters	grams	No.	liters	Acid, g/L	mv (Ag/AgCl)	pH	Gravity	total	2+	3+	liters	liters	kg	Gravity	pH	Acid, g/L	(Ag/AgCl)	mg/l	°C	total	2+	3+	mg/L	mg/L	mg	mg	pct.	of Total
3/10/2014	0					1.06		669	1.81		4299.4	6.4	4293																		
3/11/2014	1	0.53			4	0.53	0.54	610	1.95	1.008	1819.6	3.6	1816															-4556.5	-4556.5	-0.027	-0.8
3/12/2014	2	0.53			4	0.53	0.29	613	1.95	1.004	1224.6	3.5	1221															-964.388	-5520.89	-0.032	-1.0
3/13/2014	3	0.53			4	0.53	0.25	575	1.95	1.003	810.4	2.9	808															-649.038	-6169.93	-0.036	-1.1
3/14/2014	4	0.59			4	0.00					587.8	2.2	586	0.589	0.71	0.72	1.019	1.56		377	7.0		3571	3	3568			2093.668	-4076.26	-0.024	-0.8
3/15/2014	5	0.53		0.8	4	0.207					604.6	2.2	602	0.322	0.44	0.45	1.016	2.19		399	7.1		2912	4	2908			1289.764	-2786.5	-0.016	-0.5
3/16/2014	6	Rest																										-125.152	-2911.65		
3/17/2014	7	Rest																										0	-2911.65		
3/18/2014	8	0.53		0.1	4	0.034					1210	8	1203	0.497	0.62	0.625	1.011	2.15		395	8.8		2080	294	1786			1285.856	-1625.8	-0.010	-0.3
3/19/2014	9	0.53			4	0.274					1200	2	1198	0.257	0.38	0.380	1.013	2.15		393	7.6		1930	260	1670			-101.312	-1727.11	-0.010	-0.3
3/20/2014	10	0.53		0.1	4	0.154					1160	2	1158	0.377	0.50	0.505	1.013	2.13		408	7.7		2490	380	2110			271.7529	-1455.35	-0.009	-0.3
3/21/2014	11	0.53			4	0.199					2710	6	2704	0.332	0.46	0.470	1.014	1.82		409	7.3		3360	520	2840			591.9164	-863.438	-0.005	-0.2
3/22/2014	12	0.53			4	0.215					4330	3	4327	0.316	0.45	0.455	1.013	1.73		412	7.7		4660	470	4190			1553.8	690.362	0.004	0.1
3/23/2014	13	Rest																										-930.95	-240.588		
3/24/2014	14	Rest																										0	-240.588		
3/25/2014	15	1.06			4	0.456					3182	3	3180	0.608	0.73	0.74	1.017	1.69		433	6.9		3800	460	3340			2764.995	2524.407	0.015	0.5
3/27/2014	17	1.59			4	0.817					3061	2	3059	0.776	0.89	0.90	1.015	1.63		388	5.4		3270	440	2830			1448.515	3972.922	0.023	0.7
3/30/2014	20	Rest																										-2500.84	1472.085		
3/31/2014	21	Rest																										0	1472.085		
4/1/2014	22	1.59			4	0.087					1469	2	1467	1.503	1.63	1.654	1.014	1.64		399	3.2		4060	590	3470			6622.525	8094.61	0.048	1.5
4/4/2014	25	1.59			4	0.470					1457	2	1455	1.120	1.22	1.235	1.009	1.68		454	2.0		1080	150	930			1194.091	9288.701	0.055	1.7
4/7/2014	28	Rest																										-2401.99	6886.711		
4/8/2014	29	1.59			4									1.590	1.80	1.830	1.017	1.58		483	2.2		3263	70	3193			5871.835	12758.55	0.075	2.4
4/11/2014	32	1.59			4	0.315					709	2	707	1.275	1.40	1.420	1.012	1.58		426	3.3		3658	460	3198			5132.767	17891.31	0.105	3.3
4/14/2014	35	Rest																										-6002.98	11888.34		
4/15/2014	36	1.59			4	0.010					1552	2	1550	1.580	1.70	1.730	1.019	1.56		427	6.6		3919	76	3843			6653.454	18541.79	0.109	3.5
4/18/2014	39	1.59			4	0.373					1601	2	1599	1.217	1.34	1.360	1.014	1.53		416	2.4		3289	77	3212			4395.762	22937.55	0.135	4.3
4/21/2014	42	Rest																										-5704.99	17232.56		
4/22/2014	43	1.59			4	0.037					901	8	893	1.553	1.72	1.750	1.017	1.55		423	2.0		3131	460	2671			5387.66	22620.22	0.133	4.2
4/25/2014	46	1.59			4	0.290					2398	20		1.300	1.42	1.445	1.015	1.25		425	1.3		3698	204	3494			5231.303	27851.53	0.164	5.2
4/28/2014	49	Rest																										-6112.99	21738.54		
4/29/2014	50	1.59			4	0.125					2549	3	2546	1.465	1.59	1.620	1.017	1.54		424	2.0		4371	270	4101			6962.655	28701.19	0.169	5.3
5/2/2014	53	1.59			4	1.590					2392	3	2389															-318.625	28382.57		
5/5/2014	56	Rest																										-3803.28	24579.29		
5/6/2014	57	3.18	0.216											2.964	3.09	3.150	1.019	1.58		424	5.2		3874	760	3114			11975.56	36554.85	0.215	6.8
5/12/2014	63	Rest																										-11494.2	25060.69		
5/13/2014	64	3.18	0.213											2.967	3.09	3.140	1.015	1.67		426	3.5		3422	313	3109			10584.83	35645.53	0.210	6.6
5/19/2014	70	Rest																										-10025.1	25620.44		
5/20/2014	71	3.18	0.250											2.930	3.08	3.140	1.019	1.69		402	2.6		3194	535	2659			9842.159	35462.6	0.209	6.6
5/26/2014	77	Rest																										-9550.06	25912.54		
5/27/2014	78	3.18	0.190											2.990	3.11	3.160	1.016	1.61		415	2.1		2719	480	2239			8456.732	34369.27	0.202	6.4
6/2/2014	84	Rest																										-7776.34	26592.93		
6/3/2014	85	3.18	0.320											2.860	2.99	3.040	1.018	1.69		415	1.6		4340	419	3921			12960.31	39553.25	0.233	7.4
6/9/2014	91	Rest																										-10459.4	29093.85		
6/10/2014	92	3.18	0.770											2.410	2.54	2.600	1.024	1.62		446	5.8		4660	204	4456			11832.03	40925.88	0.241	7.6
6/16/2014	98	Rest																										-13667.8	27258.1		
6/17/2014	99	3.18	0.246											2.933	3.07	3.170	1.033	1.57		449	1.6		7230	170	7060			22186.93	49445.03	0.291	9.2
6/23/2014	105	Rest																										-21473.1	27971.93		
6/24/2014	106	3.18	0.210											2.970	2.94	3.015	1.026	1.58		464	3.0		6560	120	6440			19277.19	47249.12	0.278	8.8
6/30/2014	112	Rest																										-18938.7	28310.4		
7/1/2014	113	3.18	0.293											2.887	2.82	2.920	1.037	1.43		449	3.4		9210	282	8928			25933.65	54244.06	0.319	10.1
7/7/2014	119	Rest																										-23338.1	30905.92		
7/8/2014	120	3.18	0.646											2.534	2.46	2.570	1.043	1.51		453	3.9		10900	232	10668			26858.1	57764.02	0.340	10.8
7/14/2014	126	Rest																										-29831.6	27932.44		
7/15/2014	127	3.07	0.329											2.737	2.74	2.860	1.045	1.46		460	1.1		10300	34	10266			28189.47	56121.92	0.330	10.4
7/21/2014	133	Rest																										-24617	31504.92		
7/22/2014	134	3.18	0.790											2.390	2.53	2.640	1.045	1.53		453	1.6		10800	305	10495			27284.21	58789.13	0.346	10.9
7/28/2014	140	Rest																										-28155.6	30633.53		
7/29/2014	141	3.18	0.573											2.607	2.78	2.905	1.044	1.53		459	2.9		10100	320	9780			28103.93	58737.45	0.346	10.9
8/4/2014	147	Rest																										-25320.7	33416.75		
8/5/2014	148	3.18	0.673											2.507	2.64	2.760	1.047	1.52		464	3.2		9780	230	9550			25781.09	59197.84	0.348	11.0
8/11/2014	154	Rest																										-23325.3	35872.54		
8/12/2014	155	3.18			4	0.795					2820	4	2816	2.385	2.90	3.028	1.043	1.59		453	3.0		10300	390	9910			29902.59	65775.13	0.387	12.2
8/18/2014	161	Rest																										-34995.9	30779.23		
8/19/2014	162	3.18												3.180	3.48	3.615	1.040	1.53		448	5.6		9950	270	9680			34585.82	65365.05	0.385	12.2
8/25/2014	168	Rest																										-29591.3	35773.75		
8/26/2014	169	3.18	0.206											2.974	3.10	3.225	1.039	1.52		441	3.5		10600	430	10170			32901.83	68675.58	0.404	12.8

Job No.	**3775-01**
Test No.	**B-1**
Sample	**WWS-13-MC**
Feed Size	**80%-12.5mm**
Agglomeration	**Yes**

Ore Charge, kgs	
Initial (Wet)	17.00
Initial (Dry)	16.83
Finalwt, kg	16.77
Weight loss, kg	0.06
Weight Loss %	0.36

Head Analyses	
Au, g/mt	2.64
Ag, g/mt	8.0
Fe, %	3.16
S=, %	3.36
As, ppm	1355
Cu, ppm	31.9
Zn, ppm	120

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	2.98 [1)]	2.96	%
S=, %	2.60 [1)]	2.59	%
As, ppm	5*		ppm
Cu, ppm	19.4*		ppm
Zn, ppm	48*		ppm

* BRT Residue analysis, [1)] Used average of Bottle Roll & Column Leach Tails

Daily Column Biooxidation Data,WWS-13-MC, 80%-12.5mm

		Solution Applied													Effluent Solution													Fe Extraction			
			D.I.		Inoculum									Recycle						Redox											
		Total Vol.	Water	H_2SO_4	Culture	Volume	Free	Redox		Specific	Fe, mg/l			Effluent,	Volume	Weight	Specific		Free	mV	D.O.	Temp	Fe, mg/l			Cu	As		Cum.	Cum.	Est. Pct.
Date	Days	liters	liters	grams	No.	liters	Acid, g/L	mv (Ag/AgCl)	pH	Gravity	total	2+	3+	liters	liters	kg	Gravity	pH	Acid, g/L	(Ag/AgCl)	mg/l	°C	total	2+	3+	mg/L	mg/L	mg	mg	pct.	of Total
9/1/2014	175	Rest																										-27920.4	40755.18		
9/2/2014	176	3.18	0.546											2.634	2.76	2.870	1.041	1.55		438	2.2		10500	220	10280			28948.13	69703.3	0.410	13.0
9/8/2014	182	Rest																										-21840	47863.3		
9/9/2014	183	3.18	1.100											2.080	2.20	2.298	1.043	1.48		464	3.1		10800	210	10590			23795.21	71658.51	0.422	13.3
9/15/2014	189	Rest																										-34344	37314.51		
9/16/2014	190	3.18												3.180	3.95	4.088	1.034	1.60		468	3.4		10400	50	10350			41117.21	78431.72	0.461	14.6
9/22/2014	196	Rest																										-28891.2	49540.52		
9/23/2014	197	3.18	0.402											2.778	2.91	3.020	1.039	1.58		473	1.9		10700	20	10680			31101.06	80641.58	0.474	15.0
9/29/2014	203	Rest																										-31436.6	49204.98		
9/30/2014	204	3.18	0.242											2.938	3.05	3.170	1.040	1.57		467	3.0		10300	190	10110			31395.19	80600.18	0.474	15.0
10/6/2014	210	Rest																										-31198.7	49401.48		
10/7/2014	211	3.18	0.151											3.029	3.14	3.270	1.042	1.62		483	2.3		9290	110	9180			29153.84	78555.31	0.462	14.6
10/13/2014	217	Rest																										-26569.4	51985.91		
10/14/2014	218	3.18	0.320											2.860	2.98	3.104	1.042	1.60		500	5.3		11200	80	11120			33363.53	85349.45	0.502	15.9
10/20/2014	224	Rest																										-33264	52085.45		
10/21/2014	225	3.18	0.210											2.970	3.11	3.230	1.040	1.58		501	1.7		10800	30	10770			33542.31	85627.75	0.504	15.9
10/27/2014	231	Rest																										0	85627.75		
10/28/2014	232														2.97	3.090	1.041	1.57		485	2.2		11500	75	11425			34135.45	119763.2	0.70	22.2
10/30/2014	234	Drain Down																										0	119763.2		
10/31/2014	235														0.10	0.105	1.041	1.55		511	5.8		11400	30	11370			1149.856	120913.1	0.71	22.5

Extracted, %, Fe	**0.71**	**19.3**
Tail Analysis, % Fe	**2.96**	
Calculated head, % Fe	**3.67**	

Mr. Glen Van Treek / **Paramount Gold and Silver Corp.**
MLI Job No. 3775

Job No.	**3775-01**
Test No.	**B-2**
Sample	**WWS-13-MC**
Feed Size	**80%-6.3mm**
Agglomeration	**Yes**

Ore Charge, kgs	
Initial (Wet)	17.02
Initial (Dry)	16.88
Finalwt, kg	16.73
Weight loss, kg	0.15
Weight Loss %	0.89

Head Analyses	
Au, g/mt	2.64
Ag, g/mt	8.0
Fe, %	3.16
S=, %	3.36
As, ppm	1355
Cu, ppm	31.9
Zn, ppm	120

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	3.16	3.13	%
S=, %	2.64 [1]	2.62	%
As, ppm	1180*		ppm
Cu, ppm	16.9*		ppm
Zn, ppm	44*		ppm

* BRT Residue analysis, [1] Used average of Bottle Roll & Column Leach Tails

Daily Column Biooxidation Data,WWS-13-MC, 80%-6.3mm

		Solution Applied												Recycle	Effluent Solution													Fe Extraction			
			D.I.		Inoculum															Redox											
		Total Vol.	Water	H_2SO_4	Culture	Volume	Free	Redox		Specific	Fe, mg/l			Effluent,	Volume	Weight	Specific		Free	mV	D.O.	Temp	Fe, mg/l			Cu	As		Cum.	Cum.	Est. Pct.
Date	Days	liters	liters	grams	No.	liters	Acid, g/L	mv (Ag/AgCl)	pH	Gravity	total	2+	3+	liters	liters	kg	Gravity	pH	Acid, g/L	(Ag/AgCl)	mg/l	°C	total	2+	3+	mg/L	mg/L	mg	mg	pct.	of Total
3/10/2014	0					1.07		669	1.81		4299.4	6.4	4293																		
3/11/2014	1	0.53			4	0.53	0.54	610	1.95	1.008	1819.6	3.6	1816															-4620.57	-4620.57	-0.027	-0.9
3/12/2014	2	0.53			4	0.53	0.29	613	1.95	1.004	1224.6	3.5	1221															-964.388	-5584.95	-0.033	-1.0
3/13/2014	3	0.53			4	0.53	0.25	575	1.95	1.003	810.4	2.9	808															-649.038	-6233.99	-0.037	-1.2
3/14/2014	4	0.53		0.2	4	0.425					587.8	2.2	586	0.104	0.22	0.225	1.013	2.27		392	6.0		2982	3	2979			232.8276	-6001.16	-0.035	-1.1
3/15/2014	5	0.53		0.4	4	0.500					604.6	2.2	602	0.030	0.15	0.155	1.015	2.16		390	6.4		2468	4	2464			127.0717	-5874.09	-0.035	-1.1
3/16/2014	6	Rest																										-302.3	-6176.39		
3/17/2014	7	Rest																										0	-6176.39		
3/18/2014	8	0.53		0.2	4	0.246					1210	8	1203	0.285	0.40	0.405	1.012	2.35		382	7.1		1950	296	1654			780.3854	-5396.01	-0.032	-1.0
3/19/2014	9	0.53			4	0.488					1200	2	1198	0.043	0.16	0.160	1.014	2.38		376	7.9		1690	470	1220			-717.393	-6113.4	-0.036	-1.1
3/20/2014	10	0.53		0.2	4	0.179					1160	2	1158	0.352	0.47	0.475	1.010	2.41		384	8.4		1990	370	1620			-416.969	-6530.37	-0.038	-1.2
3/21/2014	11	0.53		0.2	4	0.080					2710	6	2704	0.454	0.58	0.585	1.004	2.24		374	8.1		1870	320	1550			-27.4784	-6557.85	-0.039	-1.2
3/22/2014	12	0.53			4	0.073					4330	3	4327	0.457	0.59	0.595	1.006	2.11		387	8.2		2170	390	1780			1066.649	-5491.2	-0.032	-1.0
3/23/2014	13	Rest																										-316.09	-5807.29		
3/24/2014	14	Rest																										0	-5807.29		
3/25/2014	15	1.06			4	0.572					3182	3	3180	0.492	0.61	0.615	1.013	2.00		422	6.5		2570	370	2200			1560.267	-4247.02	-0.025	-0.8
3/27/2014	17	1.59			4	0.836					3061	2	3059	0.757	0.87	0.880	1.014	1.73		409	5.0		2770	350	2420			583.8408	-3663.18	-0.022	-0.7
3/30/2014	20	Rest																										-2559	-6222.18		
3/31/2014	21	Rest																										0	-6222.18		
4/1/2014	22	1.59			4	0.051					1469	2	1467	1.539	1.67	1.694	1.015	1.65		409	3.4		3270	480	2790			5457.517	-764.659	-0.004	-0.1
4/4/2014	25	1.59			4	0.922					1457	2	1455	0.668	0.79	0.795	1.009	1.70		428	1.7		2120	260	1860			1595.443	830.783	0.005	0.2
4/7/2014	28	Rest																										-4616.63	-3785.85		
4/8/2014	29	1.59			4	0.045					1288	27	1261	1.544	1.66	1.680	1.014	1.61		390	2.7		2907	76	2831			4816.331	1030.481	0.006	0.2
4/11/2014	32	1.59			4	0.378					709	2	707	1.212	1.34	1.350	1.010	1.60		444	2.1		2447	190	2257			3212.783	4243.263	0.025	0.8
4/14/2014	35	Rest																										-4119.58	123.683		
4/15/2014	36	1.59			4	0.016					1552	2	1550	1.574	1.69	1.715	1.015	1.64		493	4.5		2697	11	2686			4557	4680.683	0.028	0.9
4/18/2014	39	1.59			4	0.393					1601	2	1599	1.197	1.33	1.350	1.014	1.53		433	1.2		3039	78	2961			4021.174	8701.857	0.051	1.6
4/21/2014	42	Rest																										-5461.2	3240.654		
4/22/2014	43	1.59			4									1.590	1.82	1.835	1.011	1.64		469	1.6		2394	121	2273			4345.193	7585.847	0.045	1.4
4/25/2014	46	1.59			4	0.230					2398	20	2378	1.360	1.50	1.515	1.013	1.59		419	1.2		2992	152	2840			4474.709	12060.56	0.071	2.2
4/28/2014	49	Rest																										-4866	7194.552		
4/29/2014	50	1.59			4	0.148					2549	3	2546	1.442	1.57	1.590	1.014	1.56		402	1.8		3447	294	3153			5405.059	12599.61	0.074	2.3
5/2/2014	53	1.59			4	1.590					2392	3	2389															-377.252	12222.36		
5/5/2014	56	Rest																										-3803.28	8419.079		
5/6/2014	57	3.18	0.213											2.967	3.09	3.140	1.015	1.58		404	2.4		3282	313	2969			10153.18	18572.26	0.109	3.5
5/12/2014	63	Rest																										-10003.5	8568.725		
5/13/2014	64	3.18	0.132											3.048	3.18	3.225	1.015	1.63		406	1.1		3056	304	2752			9708.934	18277.66	0.107	3.4
5/19/2014	70	Rest																										-8888.97	9388.686		
5/20/2014	71	3.18	0.271											2.909	3.03	3.080	1.017	1.59		386	1.4		2478	429	2049			7504.661	16893.35	0.099	3.1
5/26/2014	77	Rest																										-7414.18	9479.171		
5/27/2014	78	3.18	0.188											2.992	3.12	3.160	1.014	1.55		428	0.6		2207	290	1917			6877.83	16357	0.096	3.0
6/2/2014	84	Rest																										-6025.11	10331.89		
6/3/2014	85	3.18	0.450											2.730	3.04	3.090	1.017	1.72		427	2.1		4230	210	4020			12852.21	23184.1	0.136	4.3
6/9/2014	91	Rest																										-9348.3	13835.8		
6/10/2014	92	3.18	0.970											2.210	2.34	2.390	1.022	1.60		449	7.5		4000	134	3866			9354.207	23190.01	0.136	4.3
6/16/2014	98	Rest																										-11428	11762.01		
6/17/2014	99	3.18	0.323											2.857	3.00	3.110	1.036	1.54		441	1.8		8210	210	8000			24645.85	36407.86	0.214	6.8
6/23/2014	105	Rest																										-17897.8	18510.06		
6/24/2014	106	3.18	1.000											2.180	2.21	2.260	1.024	1.56		460	3.0		5490	210	5280			12116.6	30626.66	0.180	5.7
6/30/2014	112	Rest																										-16014.3	14612.33		
7/1/2014	113	3.18	0.263											2.917	2.90	2.975	1.027	1.46		444	2.6		6380	305	6075			18481.5	33093.83	0.194	6.2
7/7/2014	119	Rest																										-16466.8	16627.05		
7/8/2014	120	3.18	0.599											2.581	2.57	2.640	1.029	1.49		432	2.5		6700	400	6300			17189.5	33816.56	0.199	6.3
7/14/2014	126	Rest																										-18596.6	15219.97		
7/15/2014	127	3.18	0.406											2.776	2.78	2.845	1.025	1.46		446	1.8		7050	34	7016			19568.05	34788.02	0.204	6.5
7/17/2014	129	Ponded																										0	34788.02		
7/21/2014	133	Rest																										0	34788.02		
7/22/2014	134	3.18	0.473											2.707	2.83	2.920	1.030	1.50		448	1.8		6810	290	6520			19306.02	54094.04	0.318	10.1
7/28/2014	140	Rest																										-18890.9	35203.1		
7/29/2014	141	3.18	0.406											2.774	2.94	3.045	1.034	1.52		448	1.7		7490	320	7170			22057.11	57260.21	0.336	10.6
8/4/2014	147	Rest																										-21309.1	35951.16		
8/5/2014	148	3.18	0.335											2.845	2.97	3.080	1.037	1.51		449	1.5		8850	330	8520			26285.44	62236.6	0.366	11.6
8/11/2014	154	Rest																										-21107.3	41129.35		
8/12/2014	155	3.18			4	0.795					2820	4	2816	2.385	3.15	3.264	1.036	1.61		468	1.5		8660	230	8430			27284.02	68413.36	0.402	12.7
8/18/2014	161	Rest																										-27676.3	40737.04		
8/19/2014	162	3.18	0.243											2.937	3.07	3.180	1.037	1.58		475	5.2		9300	70	9230			28518.8	69255.85	0.407	12.9
8/25/2014	168	Rest																										-25835.4	43420.45		
8/26/2014	169	3.18	0.402											2.778	2.91	3.025	1.041	1.51		463	3.2		10900	230	10670			31673.87	75094.32	0.441	14.0

Job No.	**3775-01**
Test No.	**B-2**
Sample	**WWS-13-MC**
Feed Size	**80%-6.3mm**
Agglomeration	**Yes**

Ore Charge, kgs	
Initial (Wet)	17.02
Initial (Dry)	16.88
Finalwt, kg	16.73
Weight loss, kg	0.15
Weight Loss %	0.89

Head Analyses	
Au, g/mt	2.64
Ag, g/mt	8.0
Fe, %	3.16
S=, %	3.36
As, ppm	1355
Cu, ppm	31.9
Zn, ppm	120

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	3.16	3.13	%
S=, %	2.64 [1)]	2.62	%
As, ppm	1180*		ppm
Cu, ppm	16.9*		ppm
Zn, ppm	44*		ppm

* BRT Residue analysis, [1)] Used average of Bottle Roll & Column Leach Tails

Daily Column Biooxidation Data,WWS-13-MC, 80%-6.3mm

		Solution Applied												Recycle	Effluent Solution													Fe Extraction			
			D.I.		Inoculum															Redox											
		Total Vol.	Water	H_2SO_4	Culture	Volume	Free	Redox		Specific	Fe, mg/l			Effluent,	Volume	Weight	Specific		Free	mV	D.O.	Temp	Fe, mg/l			Cu	As		Cum.	Cum.	Est. Pct.
Date	Days	liters	liters	grams	No.	liters	Acid, g/L	mv (Ag/AgCl)	pH	Gravity	total	2+	3+	liters	liters	kg	Gravity	pH	Acid, g/L	(Ag/AgCl)	mg/l	°C	total	2+	3+	mg/L	mg/L	mg	mg	pct.	of Total
9/1/2014	175	Rest																										-5777	69317.32		
9/2/2014	176	0.53	0.000											0.530	3.06	3.175	1.038	1.54		430	2.5		10000	380	9620			30587.67	99904.99	0.587	18.6
9/8/2014	182	Rest																										-8000	91904.99		
9/9/2014	183	1.06	0.260											0.800	0.92	0.958	1.040	1.41		460	2.7		10100	250	9850			9303.654	101208.6	0.595	18.8
9/15/2014	189	Rest																										-10716.1	90492.54		
9/16/2014	190	1.06												1.061	1.20	1.250	1.041	1.53		470	3.9		12300	60	12240			14769.45	105262	0.618	19.6
9/22/2014	196	Rest																										-11931	93330.99		
9/23/2014	197	1.06	0.090											0.970	1.10	1.150	1.046	1.55		447	2.2		12500	230	12270			13742.83	107073.8	0.629	19.9
9/29/2014	203	Rest																										-10562.5	96511.32		
9/30/2014	204	1.06	0.215											0.845	0.97	1.015	1.044	1.55		434	0.6		11800	450	11350			11472.22	107983.5	0.634	20.1
10/6/2014	210	Rest																										-10301.4	97682.14		
10/7/2014	211	1.06	0.187											0.873	0.98	1.025	1.042	1.63		443	2.1		9710	680	9030			9551.583	107233.7	0.630	19.9
10/13/2014	217	Rest																										-7612.64	99621.09		
10/14/2014	218	1.06	0.276											0.784	0.90	0.936	1.040	1.56		460	5.0		10200	220	9980			9180	108801.1	0.639	20.2
10/20/2014	224	Rest																										-8670	100131.1		
10/21/2014	225	1.06	0.210											0.850	0.97	1.006	1.042	1.53		471	2.9		11400	60	11340			11006.14	111137.2	0.653	20.7
10/27/2014	231	Rest																										0	111137.2		
10/28/2014	232														1.03	1.072	1.043	1.54		484	3.2		12000	80	11920			12333.65	123470.9	0.725	23.0
10/30/2014	234	Drain Down																										0	123470.9		
10/31/2014	235														0.08	0.080	1.043	1.49		547	5.1		12000	25	11975			920.4219	124391.3	0.73	23.1

Extracted, %, Fe	**0.73**	**18.9**
Tail Analysis, % Fe	**3.13**	
Calculated head, % Fe	**3.86**	

Job No.	**3775-01**
Test No.	**B-3**
Sample	**WWS-13-MC**
Feed Size	**80%-12.5mm**
Agglomeration	**Yes**

Ore Charge, kgs		
Initial (Wet)		17.13
Initial (Dry)		16.96
Sac Split	Date	
1	4/21	15.86
2	5/19	14.73
3	6/16	13.68
4	7/14	12.64
5	8/11	11.58
6	9/8	10.55
7	10/6	9.51
8		
9		
10	Loss	0.49

Finalwt, kg	16.47
Weight loss, kg	0.49
Weight Loss %	2.90

Head Analyses	
Au, g/mt	2.64
Ag, g/mt	8.0
Fe, %	3.16
S=, %	3.36
As, ppm	1355
Cu, ppm	31.9
Zn, ppm	120

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	3.25	3.16	%
S=, %	2.53 [1)]	2.46	%
As, ppm	1065	1034	ppm
Cu, ppm	22.1	21.5	ppm
Zn, ppm	56	54.4	ppm

Bottle Roll Test Residue analysis

Daily Column Biooxidation Data,WWS-13-MC, 80%-12.5mm

		Solution Applied													Effluent Solution													Fe Extraction			
			D.I.		Inoculum									Recycle						Redox											
		Total Vol.	Water	H_2SO_4	Culture	Volume	Free	Redox		Specific	Fe, mg/l			Effluent,	Volume	Weight	Specific		Free	mV	D.O.	Temp	Fe, mg/l			Cu	As		Cum.	Cum.	Est. Pct.
Date	Days	liters	liters	grams	No.	liters	Acid, g/L	mv (Ag/AgCl)	pH	Gravity	total	2+	3+	liters	liters	kg	Gravity	pH	Acid, g/L	(Ag/AgCl)	mg/l	°C	total	2+	3+	mg/L	mg/L	mg	mg	pct.	of Total
3/10/2014	0					1.14		669	1.81		4299.4	6.4	4293																		
3/11/2014	1	0.53			4	0.53	0.54	610	1.95	1.008	1819.6	3.6	1816															-4884.55	-4884.55	-0.029	-0.9
3/12/2014	2	0.53			4	0.53	0.29	613	1.95	1.004	1224.6	3.5	1221															-964.388	-5848.94	-0.034	-1.1
3/13/2014	3	0.53			4	0.53	0.25	575	1.95	1.003	810.4	2.9	808															-649.038	-6497.97	-0.038	-1.2
3/14/2014	4	0.53		0.4	4	0.110					587.8	2.2	586	0.415	0.54	0.545	1.012	2.15		398	5.9		3408	5	3404			1405.824	-5092.15	-0.030	-1.0
3/15/2014	5	0.53		0.3	4	0.056					604.6	2.2	602	0.473	0.60	0.610	1.013	2.14		394	6.2		2778	4	2774			1608.175	-3483.98	-0.021	-0.7
3/16/2014	6	Rest																										-33.8576	-3517.83	-0.021	-0.7
3/17/2014	7	Rest																										0	-3517.83	-0.021	-0.7
3/18/2014	8	0.53		0.1	4	0.264					1210	8	1203	0.267	0.38	0.385	1.012	2.21		397	7.6		2040	297	1743			776.087	-2741.75	-0.016	-0.5
3/19/2014	9	0.53			4	0.442					1200	2	1198	0.088	0.21	0.210	1.014	2.20		397	7.3		1990	490	1500			-688.63	-3430.38	-0.020	-0.6
3/20/2014	10	0.53		0.1	4	0.148					1160	2	1158	0.383	0.50	0.505	1.012	2.16		410	7.2		2700	380	2320			10.98202	-3419.39	-0.020	-0.6
3/21/2014	11	0.53			4	0.125					2710	6	2704	0.405	0.53	0.540	1.017	1.80		425	7.5		4360	580	3780			1325.264	-2094.13	-0.012	-0.4
3/22/2014	12	0.53			4	0.228					4330	3	4327	0.303	0.43	0.440	1.016	1.68		426	7.4		5540	490	5050			2060.463	-33.6668	0.000	0.0
3/23/2014	13	Rest																										-987.24	-1020.91	-0.006	-0.2
3/24/2014	14	Rest																										0	-1020.91	-0.006	-0.2
3/25/2014	15	1.06			4	0.391					3182	3	3180	0.673	0.79	0.810	1.025	1.67		451	6.0		7220	330	6890			5705.561	4684.654	0.028	0.9
3/27/2014	17	1.76			4	1.035					3061	2	3059	0.720	0.70	0.720	1.029	1.46		455	4.7		6650	220	6430			3408.899	8093.553	0.048	1.5
3/30/2014	20	Rest																										-3168.14	4925.418	0.029	0.9
3/31/2014	21	Rest																										0	4925.418	0.029	0.9
4/1/2014	22	1.59			4	0.044					1469	2	1467	1.547	1.68	1.733	1.032	1.48		407	3.1		7340	160	7180			12325.79	17251.21	0.102	3.2
4/4/2014	25	1.59			4	1.086					1457	2	1455	0.504	0.63	0.640	1.024	1.53		451	6.1		7220	340	6880			4447.86	21699.07	0.128	4.0
4/7/2014	28	Rest																										-12896	8803.031	0.052	1.6
4/8/2014	29	1.59			4	0.023					1288	27	1261	1.567	1.68	1.725	1.025	1.45		446	5.4		5044	73	4971			8489.356	17292.39	0.102	3.2
4/11/2014	32	1.59			4	0.338					709	2	707	1.252	1.35	1.370	1.014	1.58		450	5.6		4101	250	3851			5511.175	22803.56	0.134	4.3
4/14/2014	35	Rest																										-6075.37	16728.2	0.099	3.1
4/15/2014	36	1.59			4	0.167					1552	2	1550	1.423	1.54	1.580	1.026	1.50		457	6.9		7528	105	7423			11592.83	28321.02	0.167	5.3
4/18/2014	39	1.59			4	0.330					1601	2	1599	1.259	1.38	1.405	1.021	1.45		416	5.3		5676	80	5596			7551.57	35872.59	0.212	6.7
4/21/2014	42	Rest																										-528.33	35344.26		
4/22/2014	43	0.00			4										1.75	1.780	1.017	1.55		410	3.6		3062	540	2522			5359.253	**4830.923**	**0.242**	7.7
4/25/2014	46	1.59			4	0.500					2398	20	2378	1.090	1.21	1.235	1.018	1.51		444	4.4		9367	181	9186			11363.7	16194.62	0.314	9.9
4/28/2014	49	Rest																										-14472	1722.582		
4/29/2014	50	1.59			4	0.173					2549	3	2546	1.417	1.55	1.585	1.023	1.46		435	5.2		3948	460	3488			6116.891	7839.474	0.261	8.3
5/2/2014	53	1.59			4	1.590					2392	3	2389															-440.977	7398.497		
5/5/2014	56	Rest																										-3803.28	3595.217		
5/6/2014	57	3.18	0.212											2.968	3.11	3.165	1.019	1.59		419	5.1		3577	860	2717			11110.11	14705.33	0.304	9.6
5/12/2014	63	Rest																										-10523.5	4181.795		
5/13/2014	64	3.18	0.238											2.942	3.08	3.135	1.019	1.56		425	2.5		5341	351	4990			16433.25	20615.04	0.342	10.8
5/19/2014	70	Rest																										-15805.4	4809.661		
5/20/2014	71	3.18	0.221											2.959	3.08	3.150	1.024	1.54		428	1.7		3294	366	2928			10132.91	**-5672.47**	**0.303**	9.6
5/26/2014	77	Rest																										-9124.38	-14796.8		
5/27/2014	78	3.18	0.410											2.770	2.89	2.955	1.021	1.61		415	2.1		3060	260	2800			8856.317	-5940.53	0.301	9.5
6/2/2014	84	Rest																										-8965.8	-14906.3		
6/3/2014	85	3.18	0.250											2.930	3.06	3.120	1.020	1.65		417	1.2		5690	328	5362			17404.71	2498.373	0.358	11.3
6/9/2014	91	Rest																										-7226.3	-4727.93		
6/11/2014	93	2.65	1.380											1.270	1.40	1.432	1.021	1.58		433	4.3		5450	437	5013			7643.879	2915.952	0.361	11.4
6/16/2014	98	Rest																										-15287.3	-12371.3		
6/17/2014	99	3.18	0.375											2.805	2.94	3.000	1.021	1.50		406	1.8		5300	480	4820			15572.97	**285.7177**	**0.363**	11.5
6/23/2014	105	Rest																										-14575	-14289.3		
6/24/2014	106	3.18	0.430											2.750	2.77	2.825	1.020	1.58		446	2.8		5190	200	4990			14374.26	84.98238	0.362	11.5
6/30/2014	112	Rest																										-9222.63	-9137.65		
7/1/2014	113	3.18	1.403											1.777	1.82	1.865	1.025	1.50		458	0.5		5470	220	5250			9952.732	815.0841	0.367	11.6
7/7/2014	119	Rest																										-11651.1	-10836		
7/8/2014	120	3.18	1.050											2.130	2.15	2.205	1.025	1.51		447	1.6		5120	220	4900			11014.24	178.228	0.363	11.5
7/14/2014	126	Rest																										-14238.9	-14060.7		
7/15/2014	127	3.19	0.408											2.781	2.78	2.845	1.023	1.51		457	1.5		5260	10	5250			14628.25	**389.3451**	**0.366**	11.6
7/21/2014	133	Rest																										-10477.9	-10088.6		
7/22/2014	134	3.18	1.188											1.992	2.11	2.165	1.024	1.56		453	1.6		6010	240	5770			12706.69	2618.115	0.383	12.1
7/28/2014	140	Rest																										-12560.9	-9942.79		
7/29/2014	141	3.18	1.090											2.090	2.21	2.260	1.022	1.58		458	2.4		5320	210	5110			11764.38	1821.598	0.377	11.9
8/4/2014	147	Rest																										-12262.6	-10441		
8/5/2014	148	3.18	0.875											2.305	2.43	2.490	1.026	1.57		483	1.2		6180	80	6100			14998.25	4557.244	0.399	12.6
8/11/2014	154	Rest																										-14739.3	-10182.1		

Mr. Glen Van Treek / **Paramount Gold and Silver Corp.**
MLI Job No. 3775

Job No.	**3775-01**
Test No.	**B-3**
Sample	**WWS-13-MC**
Feed Size	**80%-12.5mm**
Agglomeration	**Yes**

Ore Charge, kgs		
Initial (Wet)		17.13
Initial (Dry)		16.96
Sac Split	Date	
1	4/21	15.86
2	5/19	14.73
3	6/16	13.68
4	7/14	12.64
5	8/11	11.58
6	9/8	10.55
7	10/6	9.51
8		
9		
10	Loss	0.49

Finalwt, kg	16.47
Weight loss, kg	0.49
Weight Loss %	2.90

Head Analyses	
Au, g/mt	2.64
Ag, g/mt	8.0
Fe, %	3.16
S=, %	3.36
As, ppm	1355
Cu, ppm	31.9
Zn, ppm	120

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	3.25	3.16	%
S=, %	2.53 [1)]	2.46	%
As, ppm	1065	1034	ppm
Cu, ppm	22.1	21.5	ppm
Zn, ppm	56	54.4	ppm

Bottle Roll Test Residue analysis

Daily Column Biooxidation Data,WWS-13-MC, 80%-12.5mm

		Solution Applied													Effluent Solution													Fe Extraction			
			D.I.		Inoculum									Recycle						Redox											
		Total Vol.	Water	H_2SO_4	Culture	Volume	Free	Redox		Specific	Fe, mg/l			Effluent,	Volume	Weight	Specific		Free	mV	D.O.	Temp	Fe, mg/l			Cu	As		Cum.	Cum.	Est. Pct.
Date	Days	liters	liters	grams	No.	liters	Acid, g/L	mv (Ag/AgCl)	pH	Gravity	total	2+	3+	liters	liters	kg	Gravity	pH	Acid, g/L	(Ag/AgCl)	mg/l	°C	total	2+	3+	mg/L	mg/L	mg	mg	pct.	of Total
8/12/2014	155	3.18			4	0.795					2820	4	2816	2.385	2.73	2.800	1.025	1.67		493	1.4		5650	100	5550			15434.15	**694.8463**	**0.405**	12.8
8/18/2014	161	Rest																										-15502.5	-14807.6		
8/19/2014	162	3.18	0.833											2.347	2.47	2.545	1.031	1.60		491	5.4		7350	60	7290			18143.31	3335.704	0.427	13.5
8/25/2014	168	Rest																										-20388.9	-17053.2		
8/26/2014	169	3.18	0.406											2.774	2.90	2.980	1.029	1.55		501	3.8		7700	50	7650			22299.32	5246.124	0.444	14.0
9/1/2014	175	Rest																										-16901.5	-11655.4		
9/2/2014	176	3.18	0.985											2.195	2.32	2.410	1.037	1.56		494	1.5		9860	30	9830			22914.75	11259.38	0.496	15.7
9/8/2014	182	Rest																										-24157	-12897.6		
9/9/2014	183	3.18	0.730											2.450	2.57	2.668	1.037	1.41		520	2.7		9850	30	9820			25342.14	**1185.141**	**0.507**	16.0
9/15/2014	189	Rest																										-29687.9	-28502.8		
9/16/2014	190	3.18	0.166											3.014	3.14	3.242	1.032	1.57		526	2.4		9720	15	9705			30535.12	2032.357	0.515	16.3
9/22/2014	196	Rest																										-23716.8	-21684.4		
9/23/2014	197	3.18	0.740											2.440	2.56	2.640	1.032	1.56		481	1.8		10000	35	9965			25581.4	3896.952	0.533	16.9
9/29/2014	203	Rest																										-28210	-24313		
9/30/2014	204	3.18	0.356											2.821	2.94	3.030	1.030	1.57		503	2.0		8830	60	8770			25975.63	1662.583	0.512	16.2
10/6/2014	210	Rest																										-26516.5	-24853.9		
10/7/2014	211	3.18	0.177											3.003	3.11	3.210	1.031	1.69		505	5.1		7420	40	7380			23102.04	**-3414.45**	**0.476**	15.1
10/13/2014	217	Rest																										-20516.3	-23930.8		
10/14/2014	218	3.16	0.395											2.765	2.89	2.992	1.036	1.54		493	5.5		9250	130	9120			26714.29	2783.533	0.541	17.1
10/20/2014	224	Rest																										-23217.5	-20434		
10/21/2014	225	3.18	0.670											2.510	2.63	2.726	1.035	1.55		485	2.0		9460	40	9420			24915.9	4481.936	0.559	17.7
10/27/2014	231	Rest																										0	4481.936		
10/28/2014	232														3.17	3.268	1.031	1.55		492	2.4		8780	35	8745			27830.3	32312.24	0.851	26.9
10/30/2014	234	Drain Down																										0	32312.24		
10/31/2014	235														0.16	0.170	1.035	1.53		535	6.1		9320	20	9300			1530.821	33843.06	0.867	27.5

Extracted, %, Fe	**0.87**	**21.6**
Tail Analysis, % Fe	**3.16**	
Calculated head, % Fe	**4.03**	

Job No.	**3775-01**
Test No.	**B-4**
Sample	**WWS-13-MC**
Feed Size	**80%-6.3mm**
Agglomeration	**Yes**

Ore Charge, kgs		
Initial (Wet)		17.04
Initial (Dry)		16.90
Sac Split	Date	
1	4/21	15.84
2	5/19	14.79
3	6/16	13.77
4	7/14	12.77
5	8/11	11.78
6	9/8	10.76
7	10/6	9.77
8		
9		
10	Loss	0.49

Finalwt, kg	16.41
Weight loss, kg	0.49
Weight Loss %	2.91

Head Analyses	
Au, g/mt	2.64
Ag, g/mt	8.0
Fe, %	3.16
S=, %	3.36
As, ppm	1355
Cu, ppm	31.9
Zn, ppm	120

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt		0.0	g/mt ore
Fe, %	3.24	3.15	%
S=, %	2.68 [1]	2.61	%
As, ppm	977	977	ppm
Cu, ppm	22.2	22.2	ppm
Zn, ppm	154.5	154.5	ppm

Bottle Roll Test Residue analysis

Daily Column Biooxidation Data,WWS-13-MC, 80%-6.3mm

Date	Days	Solution Applied: Total Vol. liters	D.I. Water liters	H_2SO_4 grams	Inoculum: Culture No.	Volume liters	Free Acid, g/L	Redox mv (Ag/AgCl)	pH	Specific Gravity	Fe, mg/l total	Fe, mg/l 2+	Fe, mg/l 3+	Recycle Effluent, liters	Effluent Solution: Volume liters	Weight kg	Specific Gravity	pH	Free Acid, g/L	Redox mV (Ag/AgCl)	D.O. mg/l	Temp °C	Fe, mg/l total	Fe, mg/l 2+	Fe, mg/l 3+	Cu mg/L	As mg/L	Fe Extraction mg	Cum. mg	Cum. pct.	Est. Pct. of Total
3/10/2014	0					1.26		669	1.81		4299.4	6.4	4293																		
3/11/2014	1	0.53			4	0.53	0.54	610	1.95	1.008	1819.6	3.6	1816															-5436.591	-5436.591	-0.032	-1.0
3/12/2014	2	0.53			4	0.53	0.29	613	1.95	1.004	1224.6	3.5	1221															-964.388	-6400.979	-0.038	-1.2
3/13/2014	3	0.53			4	0.53	0.25	575	1.95	1.003	810.4	2.9	808															-649.038	-7050.017	-0.042	-1.3
3/14/2014	4	0.53			4	0.385					587.8	2.2	586	0.143	0.27	0.270	1.017	1.30		389	6.0		3081	3	3078			388.4526	-6661.565	-0.039	-1.2
3/15/2014	5	0.53		0.3	4	0.217					604.6	2.2	602	0.313	0.44	0.445	1.016	2.20		390	6.3		3002	4	2998			1088.549	-5573.015	-0.033	-1.0
3/16/2014	6	Rest																										-131.1982	-5704.214	-0.034	
3/17/2014	7	Rest																										0	-5704.214	-0.034	
3/18/2014	8	0.53		0.2	4	0.255					1210	8	1203	0.276	0.39	0.395	1.015	2.33		390	9.3		2390	295	2095			930.0985	-4774.115	-0.028	-0.9
3/19/2014	9	0.53			4	0.456					1200	2	1198	0.074	0.19	0.190	1.016	2.34		391	8.8		2130	560	1570			-244.8232	-5018.938	-0.030	-0.9
3/20/2014	10	0.53			4	0.391					1160	2	1158	0.140	0.26	0.260	1.012	2.36		400	8.2		2600	530	2070			-473.4858	-5492.424	-0.032	-1.0
3/21/2014	11	0.53			4	0.251					2710	6	2704	0.279	0.41	0.410	1.009	2.18		404	8.4		2430	530	1900			-550.3467	-6042.771	-0.036	-1.1
3/22/2014	12	0.53			4	0.113					4330	3	4327	0.417	0.54	0.545	1.011	2.10		405	8.1		3290	540	2750			1093.331	-4949.44	-0.029	-0.9
3/23/2014	13	Rest																										-489.29	-5438.73	-0.032	
3/24/2014	14	Rest																										0	-5438.73	-0.032	
3/25/2014	15	1.06			4	0.513					3182	3	3180	0.551	0.66	0.675	1.020	1.86		416	6.2		2660	700	1960			1760.294	-3678.436	-0.022	-0.7
3/27/2014	17	1.59			4	0.908					3061	2	3059	0.685	0.80	0.815	1.022	1.58		431	6.4		4560	420	4140			2004.033	-1674.402	-0.010	-0.3
3/30/2014	20	Rest																										-2779.388	-4453.79	-0.026	
3/31/2014	21	Rest																										0	-4453.79	-0.026	
4/1/2014	22	1.59			4	0.125					1469	2	1467	1.466	1.60	1.627	1.018	1.52		437	5.5		3210	310	2900			5130.324	676.53378	0.004	0.1
4/4/2014	25	1.59			4	0.309					1457	2	1455	1.281	1.41	1.440	1.023	1.43		451	6.3		6160	270	5890			8487.33	9163.864	0.054	1.7
4/7/2014	28	Rest																										-9677.893	-514.029	-0.003	
4/8/2014	29	1.59			4	0.092					1288	27	1261	1.498	1.62	1.665	1.028	1.43		459	5.7		5057	78	4979			8190.569	7676.5401	0.045	1.4
4/11/2014	32	1.59			4	0.410					709	2	707	1.180	1.31	1.340	1.024	1.43		445	5.3		4135	370	3765			5292.539	12969.079	0.077	2.4
4/14/2014	35	Rest																										-6819.855	6149.2242	0.036	
4/15/2014	36	1.59			4	0.011					1552	2	1550	1.579	1.69	1.735	1.025	1.46		454	6.1		5747	92	5655			9727.849	15877.073	0.094	3.0
4/18/2014	39	1.59			4	0.451					1601	2	1599	1.139	1.27	1.295	1.022	1.40		448	5.6		6736	87	6649			8518.27	24395.343	0.144	4.6
4/21/2014	42	Rest																										-11432.29	12963.052		
4/22/2014	43	1.59			4									1.590	1.76	1.820	1.036	1.42		453	4.1		12829	253	12576			22537.43	**11105.141**	**0.214**	6.8
4/25/2014	46	1.59			4	0.526					2398	20	2378	1.064	1.19	1.225	1.028	1.44		454	4.2		21561	338	21223			25692.83	36797.967	0.377	11.9
4/28/2014	49	Rest																										-31813.29	4984.6823		
4/29/2014	50	1.59			4	0.173					2549	3	2546	1.417	1.54	1.595	1.033	1.40		454	4.5		8169	239	7930			12613.32	17597.998	0.255	8.1
5/2/2014	53	1.59			4	1.590					2392	3	2389															-440.977	17157.021		
5/5/2014	56	Rest																										-3803.28	13353.741		
5/6/2014	57	3.18	0.203											2.977	3.10	3.225	1.040	1.40		459	2.9		10679	43	10636			33115.17	46468.909	0.438	13.9
5/12/2014	63	Rest																										-32442.8	14026.107		
5/13/2014	64	3.18	0.142											3.038	3.17	3.285	1.037	1.48		479	1.1		8287	114	8173			26249.91	40276.013	0.399	12.6
5/19/2014	70	Rest																										-24436.89	15839.125		
5/20/2014	71	3.18	0.231											2.949	3.06	3.205	1.047	1.44		463	1.1		5894	282	5612			18042.28	**-6394.606**	**0.355**	11.2
5/26/2014	77	Rest																										-14617.12	-21011.73		
5/27/2014	78	3.18	0.700											2.480	3.08	3.215*	1.045	1.37		429	0.9		9246	680	8566			28445.83	7434.102	0.449	14.2
6/2/2014	84	Rest																										-12204.72	-4770.618		
6/3/2014	85	3.18	1.860											1.320	3.07	3.215*	1.047	1.54		420	4.4		14300	553	13747			43910.7	39140.079	0.663	21.0
6/9/2014	91	Rest																										-28028	11112.079		
6/10/2014	92	3.18	1.220											1.960	2.08	2.170	1.042	1.49		417	5.7		9190	1055	8135			19138.48	30250.563	0.603	19.1
6/16/2014	98	Rest																										-28158.16	2092.4029		
6/17/2014	99	3.18	0.115											3.064	3.21	3.280	1.022	1.46		401	1.1		5580	550	5030			17908.41	**-10249.75**	**0.529**	16.7
6/23/2014	105	Rest																										-15679.8	-25929.55		
6/24/2014	106	3.18	0.371											2.810	2.79	2.870	1.027	1.49		426	4.6		6570	590	5980			18360.18	-7569.37	0.548	17.3
6/30/2014	112	Rest																										-14913.9	-22483.27		
7/1/2014	113	3.18	0.910											2.270	2.27	2.340	1.032	1.45		439	1.3		7450	479	6971			16892.44	-5590.828	0.563	17.8
7/7/2014	119	Rest																										-14572.2	-20163.03		
7/8/2014	120	3.18	1.224											1.956	1.95	2.020	1.035	1.47		438	1.3		9420	450	8970			18384.93	-1778.1	0.590	18.7
7/14/2014	126	Rest																										-29126.42	-30904.52		
7/15/2014	127	3.19	0.094											3.092	3.09	3.160	1.022	1.48		428	1.2		6290	180	6110			19448.53	**-9677.886**	**0.515**	16.3
7/21/2014	133	Rest																										-9258.88	-18936.77		
7/22/2014	134	3.18	1.708											1.472	1.60	1.650	1.033	1.51		430	1.5		7910	570	7340			12634.56	-6302.207	0.541	17.1
7/28/2014	140	Rest																										-22488.13	-28790.34		
7/29/2014	141	3.18	0.337											2.843	2.96	3.020	1.020	1.60		437	1.3		4830	320	4510			14300.59	-14489.75	0.477	15.1
8/4/2014	147	Rest																										-12828.48	-27318.23		
8/5/2014	148	3.18	0.524											2.656	2.78	2.850	1.024	1.58		457	2.7		5990	230	5760			16671.39	-10646.84	0.507	16.0

Job No.	**3775-01**
Test No.	**B-4**
Sample	**WWS-13-MC**
Feed Size	**80%-6.3mm**
Agglomeration	**Yes**

Ore Charge, kgs		
Initial (Wet)		17.04
Initial (Dry)		16.90
Sac Split	Date	
1	4/21	15.84
2	5/19	14.79
3	6/16	13.77
4	7/14	12.77
5	8/11	11.78
6	9/8	10.76
7	10/6	9.77
8		
9		
10	Loss	0.49

Finalwt, kg	16.41
Weight loss, kg	0.49
Weight Loss %	2.91

Head Analyses	
Au, g/mt	2.64
Ag, g/mt	8.0
Fe, %	3.16
S=, %	3.36
As, ppm	1355
Cu, ppm	31.9
Zn, ppm	120

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt		0.0	g/mt ore
Fe, %	3.24	3.15	%
S=, %	2.68 1)	2.61	%
As, ppm	977	977	ppm
Cu, ppm	22.2	22.2	ppm
Zn, ppm	154.5	154.5	ppm

Bottle Roll Test Residue analysis

Daily Column Biooxidation Data,WWS-13-MC, 80%-6.3mm

Solution Applied

Date	Days	Total Vol. liters	D.I. Water liters	H_2SO_4 grams	Inoculum Culture No.	Inoculum Volume liters	Inoculum Free Acid, g/L	Inoculum Redox mv (Ag/AgCl)	Inoculum pH	Inoculum Specific Gravity	Inoculum Fe, mg/l total	Inoculum Fe, mg/l 2+	Inoculum Fe, mg/l 3+	Recycle Effluent, liters
8/11/2014	154	Rest												
8/12/2014	155	3.18			4	0.795					2820	4	2816	2.385
8/18/2014	161	Rest												
8/19/2014	162	Ponded												
8/25/2014	168	Rest												
8/26/2014	169	Ponded												
9/1/2014	175	Rest												
9/2/2014	176	0.53												0.530
9/8/2014	182	Rest												
9/9/2014	183	1.06	0.530											0.530
9/15/2014	189	Rest												
9/16/2014	190	1.06	0.389											0.672
9/22/2014	196	Rest												
9/23/2014	197	1.06	0.540											0.520
9/29/2014	203	Rest												
9/30/2014	204	1.06												1.060
10/6/2014	210	Rest												
10/7/2014	211	1.06	0.718											0.342
10/13/2014	217	Rest												
10/14/2014	218	1.06	0.278											0.782
10/20/2014	224	Rest												
10/21/2014	225	0.36												
10/27/2014	231	Rest												
10/28/2014	232													
10/30/2014	234	Drain Down												
10/31/2014	235													

Effluent Solution / Fe Extraction

Date	Days	Volume liters	Weight kg	Specific Gravity	pH	Free Acid, g/L	Redox mV (Ag/AgCl)	D.O. mg/l	Temp °C	Fe, mg/l total	Fe, mg/l 2+	Fe, mg/l 3+	Cu mg/L	As mg/L	Fe Extraction mg	Cum. mg	Cum. pct.	Est. Pct. of Total
8/11/2014	154														-14286.15	-24932.99		
8/12/2014	155	3.17	3.254	1.025	1.67		467	1.6		5420	220	5200			17206.52	**2920.3671**	**0.532**	16.8
8/18/2014	161														-2241.9	678.46707		
8/19/2014	162														0	678.46707	0.513	16.2
8/25/2014	168														0	678.46707		
8/26/2014	169														0	678.46707	0.513	16.2
9/1/2014	175														0	678.46707		
9/2/2014	176	0.37	0.375	1.023	1.62		668	3.2		6380	20	6360			2338.71	3017.1768	0.533	16.9
9/8/2014	182														-3381.4	-364.2232		
9/9/2014	183	0.65	0.684	1.051	1.38		447	2.1		10300	460	9840			6703.33	**3321.9302**	**0.563**	17.8
9/15/2014	189														-6921.6	-3599.67		
9/16/2014	190	0.81	0.830	1.027	1.59		456	3.1		8680	160	8520			7014.995	3415.3253	0.564	17.9
9/22/2014	196														-4513.6	-1098.275		
9/23/2014	197	0.64	0.660	1.027	1.60		463	3.1		7390	20	7370			4749.172	3650.8976	0.566	17.9
9/29/2014	203														-7833.4	-4182.502		
9/30/2014	204	1.26	1.290	1.023	1.59		458	2.1		6520	220	6300			8221.701	4039.1985	0.570	18.0
10/6/2014	210														-2229.84	1809.3585		
10/7/2014	211	0.46	0.470	1.030	1.73		488	4.7		6150	70	6080			2806.311	**576.47068**	**0.576**	18.2
10/13/2014	217														-4809.3	-4232.829		
10/14/2014	218	0.90	0.924	1.023	1.59		476	5.7		6150	140	6010			5554.839	1322.0094	0.584	18.5
10/20/2014	224														0	1322.0094		
10/21/2014	225	0.78	0.800	1.020	1.62		488	1.8		5720	50	5670			4486.275	5808.2839	0.630	19.9
10/27/2014	231														0	5808.2839		
10/28/2014	232	0.26	0.262	1.022	1.65		553	3.6		6070	15	6055			1556.106	7364.3896	0.645	20.4
10/30/2014	234														0	7364.3896		
10/31/2014	235	0.10	0.105	1.025	1.61		561	5.2		6220	15	6205			637.1707	8001.5603	0.652	20.6

Extracted, %, Fe	**0.65**	**17.1**
Tail Analysis, % Fe	**3.15**	
Calculated head, % Fe	**3.80**	

Job No.	**3775-01**
Test No.	**B-5**
Sample	**FSU-13-1**
Feed Size	**80%-12.5mm**
Agglomeration	**Yes**

Ore Charge, kgs	
Initial (Wet)	17.06
Initial (Dry)	16.89
Finalwt, kg	16.75
Weight loss, kg	0.14
Weight Loss %	0.83

Head Analyses	
Au, g/mt	0.51
Ag, g/mt	2.8
Fe, %	5.33
S=, %	4.57
As, ppm	351
Cu, ppm	53.3
Zn, ppm	128.5

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	4.56	4.52	%
S=, %	2.56 [1)]	2.54	%
As, ppm	232*		ppm
Cu, ppm	41.2*		ppm
Zn, ppm	38*		ppm

* BRT Residue analysis, [1)] Used average of Bottle Roll & Column Leach Tails

Daily Column Biooxidation Data,FSU-13-1, 80%-12.5mm

Date	Days	Solution Applied: Total Vol. liters	D.I. Water liters	H_2SO_4 grams	Inoculum: Culture No.	Inoculum: Volume liters	Inoculum: Free Acid, g/L	Inoculum: Redox mv (Ag/AgCl)	Inoculum: pH	Inoculum: Specific Gravity	Inoculum Fe, mg/l: total	Inoculum Fe, mg/l: 2+	Inoculum Fe, mg/l: 3+	Recycle Effluent, liters	Effluent Solution: Volume liters	Weight kg	Specific Gravity	pH	Free Acid, g/L	Redox mV (Ag/AgCl)	D.O. mg/l	Temp °C	Fe, mg/l: total	Fe, mg/l: 2+	Fe, mg/l: 3+	Cu mg/L	As mg/L	Fe Extraction: mg	Cum. mg	Cum. pct.	Est. Pct. of Total
3/10/2014	0					1.13		669	1.81		4299.4	6.4	4293																		
3/11/2014	1	0.53			4	0.53	0.54	610	1.95	1.008	1819.6	3.6	1816															-4866.49	-4866.49	-0.029	-0.5
3/12/2014	2	0.53			4	0.53	0.29	613	1.95	1.004	1224.6	3.5	1221															-964.388	-5830.88	-0.034	-0.6
3/13/2014	3	0.53			4	0.53	0.25	575	1.95	1.003	810.4	2.9	808															-649.038	-6479.92	-0.038	-0.7
3/14/2014	4	0.53			4	0.000					587.8	2.2	586	0.600	0.72	0.720	1.000	1.56		377	6.1		161	15	146			-313.592	-6793.51	-0.040	-0.7
3/15/2014	5	0.52		0.5	4	0.054					604.6	2.2	602	0.467	0.61	0.605	1.000	2.75		375	6.6		92	15	77			55.66	-6737.85	-0.039	-0.7
3/16/2014	6	Rest																										-32.6484	-6770.5		
3/17/2014	7	Rest																										0	-6770.5		
3/18/2014	8	0.53		0.5	4	0.044					1210	8	1203	0.486	0.60	0.600	1.000	3.61		357	7.7		70	18	52			42	-6728.5	-0.039	-0.7
3/19/2014	9	0.53		0.2	4	0.255					1200	2	1198	0.276	0.40	0.400	1.000	3.66		357	8.0		50	9	41			-46.68	-6775.18	-0.040	-0.7
3/20/2014	10	0.53		0.2	4	0.339					1160	2	1158	0.192	0.31	0.305	1.000	3.55		409	7.8		10	3	7			-328.35	-7103.53	-0.042	-0.8
3/21/2014	11	0.53		0.3	4	0.022					2710	6	2704	0.508	0.64	0.640	1.000	3.43		456	6.9		2	1	1			-396.04	-7499.57	-0.044	-0.8
3/22/2014	12	0.53		0.4	4	0.122					4330	3	4327	0.408	0.53	0.525	1.000	3.31		500	7.7		10	1	9			-54.37	-7553.94	-0.044	-0.8
3/23/2014	13	Rest																										-528.26	-8082.2		
3/24/2014	14	Rest																										0	-8082.2		
3/25/2014	15	1.06			4	0.542					3182	3	3180	0.522	0.64	0.635	1.000	3.36		501	7.3		7	1	6			4.445	-8077.75	-0.047	-0.9
3/27/2014	17	1.59		0.1	4	0.911					3061	2	3059	0.682	0.80	0.800	1.000	3.07		544	6.6		22	2	20			-1707.04	-9784.8	-0.057	-1.1
3/30/2014	20	Rest																										-2788.57	-12573.4		
3/31/2014	21	Rest																										0	-12573.4		
4/1/2014	22	1.59		1.5	4	0.038					1469	2	1467	1.552	1.68	1.691	1.005	2.58		587	6.5		220	7	214			370.3374	-12203	-0.072	-1.3
4/4/2014	25	1.59		0.8	4	0.265					1457	2	1455	1.325	1.46	1.470	1.010	2.25		626	5.1		915	9	907			1276.489	-10926.5	-0.064	-1.2
4/7/2014	28	Rest																										-1721.67	-12648.2		
4/8/2014	29	1.59		6.0	4	0.130					1288	27	1261	1.459	1.58	1.595	1.011	2.06		653	4.9		2098	79	2019			3309.586	-9338.63	-0.055	-1.0
4/11/2014	32	1.59	0.373											1.217	1.34	1.370	1.022	1.93		666	3.5		2491	10	2481			3171.767	-6166.86	-0.036	-0.7
4/14/2014	35	Rest																										-3861.05	-10027.9		
4/15/2014	36	2.65	1.100											1.550	1.67	1.710	1.027	1.98		664	6.3		5671	11	5660			9442.463	-585.448	-0.003	-0.1
4/21/2014	42	Rest																										-13304.2	-13889.6		
4/22/2014	43	3.18	0.834											2.346	2.47	2.540	1.030	1.91		662	3.1		3239	18	3221			7987.437	-5902.18	-0.035	-0.6
4/29/2014	50	3.18	0.330											2.850	2.98	3.075	1.031	1.83		679	3.5		7305	33	7272			21787.46	15885.29	0.093	1.7
5/5/2014	56	Rest																										-21126.1	-5240.77		
5/6/2014	57	3.18	0.288											2.892	3.02	3.135	1.038	1.84		687	5.5		8622	36	8586			26040.43	20799.66	0.122	2.3
5/12/2014	63	Rest																										-25279.7	-4480.04		
5/13/2014	64	3.18	0.248											2.932	3.05	3.210	1.051	1.85		642	4.1		11344	27	11317			34646.62	30166.58	0.177	3.3
5/19/2014	70	Rest																										-33418.8	-3252.26		
5/20/2014	71	3.18	0.234											2.946	3.06	3.245	1.059	1.72		651	5.9		8297	24	8274			25423.76	22171.51	0.130	2.4
5/26/2014	77	Rest																										-24102.8	-1931.28		
5/27/2014	78	3.18	0.275											2.905	3.03	3.225	1.065	1.67		653	4.0		10658	32	10626			32274.23	30342.95	0.178	3.3
6/2/2014	84	Rest																										-29949	393.965		
6/3/2014	85	3.18	0.370											2.810	2.93	3.145	1.072	1.85		647	5.4		20600	26	20574			60435.63	60829.6	0.357	6.7
6/9/2014	91	Rest																										-53148	7681.599		
6/10/2014	92	3.18	0.600											2.580	2.71	2.920	1.079	1.75		594	6.4		15400	29	15371			41675.63	49357.23	0.289	5.4
6/16/2014	98	Rest																										-35235.2	14122.03		
6/17/2014	99	3.18	0.892											2.288	2.42	2.640	1.090	1.73		540	0.8		19100	36	19064			46260.55	60382.58	0.354	6.6
6/23/2014	105	Rest																										-56727	3655.575		
6/24/2014	106	3.18	0.210											2.970	2.65	2.875	1.085	1.75		497	0.7		19500	39	19461			51670.51	55326.08	0.324	6.1
6/30/2014	112	Rest																										-46234.5	9091.582		
7/1/2014	113	3.18	0.808											2.371	2.15	2.330	1.082	1.83		447	0.4		17700	908	16792			38115.53	47207.11	0.277	5.2
7/7/2014	119	Rest																										-42798.6	4408.509		
7/8/2014	120	3.18	0.762											2.418	2.16	2.355	1.091	1.74		489	0.7		20300	50	20250			43818.97	48227.48	0.283	5.3
7/14/2014	126	Rest																										-45142.5	3084.957		
7/15/2014	127	2.97	0.744											2.224	2.22	2.395	1.077	1.79		447	1.7		16300	560	15740			36247.45	39332.4	0.231	4.3
7/21/2014	133	Rest																										-38696.2	636.204		
7/22/2014	134	3.18	0.806	2.9										2.374	2.50	2.690	1.075	1.92		486	1.0		15600	220	15380			39036.28	39672.48	0.233	4.4
7/28/2014	140	Rest																										-43009.2	-3336.72		
7/29/2014	141	3.18	0.423											2.757	2.93	3.130	1.070	1.90		464	0.6		13900	470	13430			40660.75	37324.03	0.219	4.1
8/4/2014	147	Rest																										-34652.7	2671.33		
8/5/2014	148	3.18	0.687											2.493	2.62	2.810	1.071	1.96		452	1.5		14100	620	13480			36994.4	39665.73	0.233	4.4
8/11/2014	154	Rest																										-33628.5	6037.228		
8/12/2014	155	3.18			4	0.795					2820	4	2816	2.385	2.87	3.070	1.068	2.01		514	1.1		13000	110	12890			37368.91	43406.14	0.254	4.8
8/18/2014	161	Rest																										-19817.9	23588.24		
8/19/2014	162	3.18	1.829	7.3										1.352	1.48	1.575	1.065	1.90		546	4.8		9810	30	9780			14507.75	38095.99	0.223	4.2
8/25/2014	168	Rest																										-29106.3	8989.718		
8/26/2014	169	3.18	0.213											2.967	3.09	3.250	1.051	1.85		473	3.7		10800	310	10490			33396.76	42386.48	0.248	4.7
9/1/2014	175	Rest																										-29095.2	13291.28		
9/2/2014	176	3.18	0.486											2.694	2.83	2.985	1.055	1.90		460	2.1		11300	260	11040			31972.04	45263.32	0.265	5.0
9/8/2014	182	Rest																										-16046	29217.32		
9/9/2014	183	3.18	1.760											1.420	1.54	1.634	1.060	1.89		438	1.8		12100	660	11440			18652.26	47869.59	0.281	5.3
9/15/2014	189	Rest																										-19710.9	28158.69		

Job No. **3775-01**
Test No. **B-5**
Sample **FSU-13-1**
Feed Size **80%-12.5mm**
Agglomeration **Yes**

Ore Charge, kgs	
Initial (Wet)	17.06
Initial (Dry)	16.89
Finalwt, kg	16.75
Weight loss, kg	0.14
Weight Loss %	0.83

Head Analyses	
Au, g/mt	0.51
Ag, g/mt	2.8
Fe, %	5.33
S=, %	4.57
As, ppm	351
Cu, ppm	53.3
Zn, ppm	128.5

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	4.56	4.52	%
S=, %	2.56 [1]	2.54	%
As, ppm	232*		ppm
Cu, ppm	41.2*		ppm
Zn, ppm	38*		ppm

* BRT Residue analysis, [1] Used average of Bottle Roll & Column Leach Tails

Daily Column Biooxidation Data,FSU-13-1, 80%-12.5mm

		Solution Applied												Recycle	Effluent Solution													Fe Extraction			
			D.I.		Inoculum									Effluent,						Redox											
		Total Vol.	Water	H_2SO_4	Culture	Volume	Free	Redox		Specific	Fe, mg/l				Volume	Weight	Specific		Free	mV	D.O.	Temp	Fe, mg/l			Cu	As		Cum.	Cum.	Est. Pct.
Date	Days	liters	liters	grams	No.	liters	Acid, g/L	mv (Ag/AgCl)	pH	Gravity	total	2+	3+	liters	liters	kg	Gravity	pH	Acid, g/L	(Ag/AgCl)	mg/l	°C	total	2+	3+	mg/L	mg/L	mg	mg	pct.	of Total
9/16/2014	190	3.18	1.551											1.629	1.76	1.850	1.050	2.25		444	2.1		11600	180	11420			20438.1	48596.78	0.285	5.3
9/22/2014	196	Rest																										-27376	21220.78		
9/23/2014	197	Rest/No Application												2.360	2.48	2.600	1.047	2.30		411	1.8		9490	790	8700			23566.38	44787.16	0.263	4.9
9/30/2014	204	3.18	0.078											3.102	0.77	0.805	1.045	2.33		432	1.6		8360	680	7680			6440	51227.16	0.300	5.6
10/6/2014	210	Rest																										-10466.7	47530.94		
10/7/2014	211	Ponded/No Application												1.252	1.37	1.425	1.043	2.51		418	4.5		6520	950	5570			8907.958	56438.9	0.331	6.2
10/13/2014	217	Rest																										-8704.2	47734.7		
10/14/2014	218	Ponded/No Application												1.335	1.11	1.159	1.041	2.38		436	6.4		6970	840	6130			7760.067	55494.76	0.325	6.1
10/20/2014	224	Rest																										0	55494.76		
10/21/2014	225	Ponded/No Application																					7140	320	6820			0	55494.76	0.325	6.1
10/27/2014	231	Rest																										0	48724.27		
10/28/2014	232														0.46	0.476	1.037	2.30		441	2.1		7070	440	6630			3245.246	51969.51	0.30	5.6
10/30/2014	234	Drain Down																										0	51969.51		
10/31/2014	235														0.11	0.110	1.041	2.20		460	6.9		6340	180	6160			669.9328	52639.45	0.31	5.8

Extracted, %, Fe	**0.31**	**6.4**
Tail Analysis, % Fe	**4.52**	
Calculated head, % Fe	**4.83**	

Mr. Glen Van Treek / **Paramount Gold and Silver Corp.**
MLI Job No. 3775

Job No.	**3775-01**
Test No.	**B-6**
Sample	**FSU-13-1**
Feed Size	**80%-6.3mm**
Agglomeration	**Yes**

Ore Charge, kgs	
Initial (Wet)	17.12
Initial (Dry)	16.90
Finalwt, kg	16.79
Weight loss, kg	0.11
Weight Loss %	0.65

Head Analyses	
Au, g/mt	0.51
Ag, g/mt	2.8
Fe, %	5.33
S=, %	4.57
As, ppm	351
Cu, ppm	53.3
Zn, ppm	128.5

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	4.62	4.59	%
S=, %	2.07 [1)	2.06	%
As, ppm	186*		ppm
Cu, ppm	33.4*		ppm
Zn, ppm	36*		ppm

* BRT Residue analysis, [1) Used average of Bottle Roll & Column Leach Tails

Daily Column Biooxidation Data,FSU-13-1, 80%-6.3mm

		Solution Applied												Recycle	Effluent Solution													Fe Extraction			
			D.I.		Inoculum									Effluent,						Redox											
		Total Vol.	Water	H_2SO_4	Culture	Volume	Free	Redox		Specific	Fe, mg/l				Volume	Weight	Specific		Free	mV	D.O.	Temp	Fe, mg/l			Cu	As		Cum.	Cum.	Est. Pct.
Date	Days	liters	liters	grams	No.	liters	Acid, g/L	mv (Ag/AgCl)	pH	Gravity	total	2+	3+	liters	liters	kg	Gravity	pH	Acid, g/L	(Ag/AgCl)	mg/l	°C	total	2+	3+	mg/L	mg/L	mg	mg	pct.	of Total
3/10/2014	0					1.13		669	1.81		4299.4	6.4	4293																		
3/11/2014	1	0.53			4	0.53	0.54	610	1.95	1.008	1819.6	3.6	1816															-4875.95	-4875.95	-0.028	-0.5
3/12/2014	2	0.53			4	0.53	0.29	613	1.95	1.004	1224.6	3.5	1221															-964.388	-5840.34	-0.034	-0.6
3/13/2014	3	0.53			4	0.53	0.25	575	1.95	1.003	810.4	2.9	808															-649.038	-6489.38	-0.038	-0.7
3/14/2014	4	0.53			4	0.53	0.25	643	1.95	1.003	587.8	2.2	586															-429.512	-6918.89	-0.040	-0.8
3/15/2014	5	0.53		0.1	4	0.530					604.6	2.2	602		0.10	0.100	1.000	2.04		328	8.3		96	19	77			-301.934	-7220.82	-0.042	-0.8
3/16/2014	6	Rest																										-320.438	-7541.26		
3/17/2014	7	Rest																										0	-7541.26		
3/18/2014	8	0.53		0.2	4	0.110					1210	8	1203	0.420	0.53	0.530	1.000	3.78		363	8.8		60	11	49			31.8	-7509.46	-0.044	-0.8
3/19/2014	9	0.53		0.2	4	0.297					1200	2	1198	0.234	0.35	0.350	1.000	4.06		329	7.6		20	4	16			-132.7	-7642.16	-0.045	-0.8
3/20/2014	10	0.53			4	0.421					1160	2	1158	0.110	0.23	0.225	1.000	3.70		410	7.7		10	3	7			-365.07	-8007.23	-0.047	-0.9
3/21/2014	11	0.55			4									0.546	0.68	0.680	1.000	3.82		391	7.5		6	3	3			-488.38	-8495.61	-0.050	-0.9
3/22/2014	12	0.53		0.3	4	0.120					4330	3	4327	0.410	0.54	0.540	1.000	3.81		379	7.7		10	2	9			5.4	-8490.21	-0.050	-0.9
3/23/2014	13	Rest																										-519.6	-9009.81		
3/24/2014	14	Rest																										0	-9009.81		
3/25/2014	15	1.06		0.1	4	0.464					3182	3	3180	0.600	0.71	0.710	1.000	3.86		391	7.2		3	1	2			2.13	-9007.68	-0.053	-1.0
3/27/2014	17	1.59			4	0.995					3061	2	3059	0.598	0.72	0.715	1.000	3.70		443	6.6		1	0	1			-1475.73	-10483.4	-0.061	-1.1
3/30/2014	20	Rest																										-3045.7	-13529.1		
3/31/2014	21	Rest																										0	-13529.1		
4/1/2014	22	1.59		1.5	4	0.018					1469	2	1467	1.572	1.70	1.702	1.000	3.44		506	6.6		4	0	3			6.4676	-13522.6	-0.079	-1.5
4/4/2014	25	1.59		0.6	4	0.312					1457	2	1455	1.278	1.40	1.415	1.008	2.97		533	6.3		30	10	20			15.52892	-13507.1	-0.079	-1.5
4/7/2014	28	Rest																										-489.956	-13997.1		
4/8/2014	29	1.59		5.9	4	0.407					1288	27	1261	1.183	1.31	1.330	1.018	2.19		625	4.3		1783	13	1770			2328.937	-11668.1	-0.068	-1.3
4/11/2014	32	1.59	0.526											1.064	1.20	1.235	1.030	1.92		573	2.0		3704	14	3691			3916.988	-7751.14	-0.045	-0.8
4/14/2014	35	Rest																										-5781.94	-13533.1		
4/15/2014	36	2.60	1.034											1.561	1.68	1.735	1.035	1.88		593	2.4		8273	12	8261			13868.27	335.18	0.002	0.0
4/21/2014	42	Rest																										-18415.7	-18080.5		
4/22/2014	43	3.18	0.954											2.226	2.35	2.450	1.042	1.83		568	1.1		5906	22	5884			13886.47	-4194.05	-0.024	-0.5
4/29/2014	50	3.18	0.308											2.872	3.00	3.110	1.037	1.84		643	1.0		8939	30	8909			26808.38	22614.33	0.132	2.5
5/5/2014	56	Rest																										-24564.4	-1950.04		
5/6/2014	57	3.18	0.432											2.748	2.87	3.000	1.045	1.72		692	3.7		10679	43	10636			30657.42	28707.38	0.168	3.1
5/12/2014	63	Rest																										-30851.6	-2144.26		
5/13/2014	64	3.18	0.291											2.889	3.02	3.265	1.082	1.71		662	2.0		21240	30	21210			64091.8	61947.54	0.362	6.8
5/19/2014	70	Rest																										-62486.9	-539.39		
5/20/2014	71	3.18	0.238											2.942	3.06	3.300	1.078	1.63		662	5.0		13772	27	13745			42159.18	41619.79	0.243	4.6
5/26/2014	77	Rest																										-39635.8	1983.978		
5/27/2014	78	3.18	0.302											2.878	3.00	3.300	1.100	1.57		665	2.9		19886	38	19848			59658	61641.98	0.360	6.8
6/2/2014	84	Rest																										-56476.2	5165.738		
6/3/2014	85	3.18	0.340											2.840	2.97	3.240	1.092	1.78		658	3.9		27200	30	27170			80703.3	85869.03	0.502	9.4
6/9/2014	91	Rest																										-67184	18685.03		
6/10/2014	92	3.18	0.710											2.470	2.59	2.890	1.115	1.69		618	5.8		21600	35	21565			55985.65	74670.69	0.436	8.2
6/16/2014	98	Rest																										-60868.8	13801.89		
6/17/2014	99	3.18	0.362											2.818	2.95	3.290	1.115	1.82		465	0.8		23800	620	23180			70226.01	84027.89	0.491	9.2
6/23/2014	105	Rest																										-75684	8343.894		
6/24/2014	106	3.18												3.180	2.90	3.200	1.103	1.86		482	1.8		24900	270	24630			72239.35	80583.24	0.471	8.8
6/30/2014	112	Rest																										-69122.4	11460.84		
7/1/2014	113	3.18	0.404											2.776	2.40	2.655	1.106	1.83		476	1.1		20200	417	19783			48490.96	59951.8	0.350	6.6
7/7/2014	119	Rest																										-55913.6	4038.199		
7/8/2014	120	3.18	0.413											2.768	2.38	2.640	1.107	1.81		458	1.3		23000	760	22240			54850.95	58889.15	0.344	6.5
7/14/2014	126	Rest																										-39476.1	19413.09		
7/15/2014	127	2.06	0.344											1.716	1.72	1.900	1.107	1.90		426	1.7		22200	1330	20870			38102.98	57516.07	0.336	6.3
7/21/2014	133	Rest																										-50371.8	7144.267		
7/22/2014	134	3.18	0.911	3.2										2.269	2.39	2.635	1.101	1.98		452	0.8		18900	890	18010			45232.97	52377.24	0.306	5.7
7/28/2014	140	Rest																										-55849.5	-3472.26		
7/29/2014	141	3.18	0.225											2.955	3.12	3.430	1.099	1.98		443	0.8		17800	910	16890			55554.14	52081.88	0.304	5.7
8/4/2014	147	Rest																										-48255.8	3826.078		
8/5/2014	148	3.18	0.469											2.711	2.84	3.085	1.088	1.89		455	1.1		18500	590	17910			52456.34	56282.42	0.329	6.2
8/11/2014	154	Rest																										-44122.5	12159.92		
8/12/2014	155	3.18			4	0.795					2820	4	2816	2.385	2.99	3.260	1.092	1.98		479	0.9		17400	390	17010			51945.05	64104.97	0.374	7.0
8/18/2014	161	Rest																										-56860.5	7244.474		
8/19/2014	162	3.18	0.041											3.139	3.26	3.555	1.089	1.76		522	5.1		12800	30	12770			41785.12	49029.6	0.286	5.4
8/25/2014	168	Rest																										-37529.6	11500		
8/26/2014	169	3.18	0.248											2.932	3.06	3.335	1.090	1.84		456	3.2		16400	680	15720			50177.98	61677.98	0.360	6.8
9/1/2014	175	Rest																										-8692	52985.98		
9/2/2014	176	0.53												0.530	2.99	3.270	1.093	1.88		428	1.1		16900	1010	15890			50560.84	103546.8	0.605	11.3
9/8/2014	182	Rest																										-17238	86308.82		
9/9/2014	183	1.06	0.040											1.020	1.15	1.258	1.095	1.65		515	2.2		18900	40	18860			21713.42	108022.2	0.631	11.8
9/15/2014	189	Rest																										-16764.3	91257.95		

Job No.	**3775-01**
Test No.	**B-6**
Sample	**FSU-13-1**
Feed Size	**80%-6.3mm**
Agglomeration	**Yes**

Ore Charge, kgs	
Initial (Wet)	17.12
Initial (Dry)	16.90
Finalwt, kg	16.79
Weight loss, kg	0.11
Weight Loss %	0.65

Head Analyses	
Au, g/mt	0.51
Ag, g/mt	2.8
Fe, %	5.33
S=, %	4.57
As, ppm	351
Cu, ppm	53.3
Zn, ppm	128.5

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	4.62	4.59	%
S=, %	2.07 [1)	2.06	%
As, ppm	186*		ppm
Cu, ppm	33.4*		ppm
Zn, ppm	36*		ppm

* BRT Residue analysis, [1) Used average of Bottle Roll & Column Leach Tails

Daily Column Biooxidation Data,FSU-13-1, 80%-6.3mm

		Solution Applied														Effluent Solution												Fe Extraction			
			D.I.		Inoculum									Recycle						Redox											
		Total Vol.	Water	H_2SO_4	Culture	Volume	Free	Redox		Specific	Fe, mg/l			Effluent,	Volume	Weight	Specific		Free	mV	D.O.	Temp	Fe, mg/l			Cu	As		Cum.	Cum.	Est. Pct.
Date	Days	liters	liters	grams	No.	liters	Acid, g/L	mv (Ag/AgCl)	pH	Gravity	total	2+	3+	liters	liters	kg	Gravity	pH	Acid, g/L	(Ag/AgCl)	mg/l	°C	total	2+	3+	mg/L	mg/L	mg	mg	pct.	of Total
9/16/2014	190	1.06	0.173											0.887	1.02	1.116	1.093	1.90		592	2.0		20600	40	20560			21033.49	112291.4	0.656	12.3
9/22/2014	196	Rest																										-20600	91691.43		
9/23/2014	197	1.06	0.060											1.000	1.12	1.230	1.096	1.93		463	2.6		18700	350	18350			20986.31	112677.7	0.658	12.3
9/29/2014	203	Rest																										-16325.1	96352.65		
9/30/2014	204	1.06	0.187											0.873	0.99	1.090	1.097	1.96		650	3.5		18400	40	18360			18282.59	114635.2	0.670	12.6
10/6/2014	210	Rest																										-16762.4	97872.84		
10/7/2014	211	1.06	0.149											0.911	1.02	1.125	1.100	1.95		534	4.7		15900	40	15860			16261.36	114134.2	0.667	12.5
10/13/2014	217	Rest																										-222.6	113911.6		
10/14/2014	218	1.06	1.046											0.014	0.13	0.146	1.101	1.93		598	6.2		18400	55	18345			2439.964	116351.6	0.680	12.8
10/20/2014	224	Rest																										-13064	103287.6		
10/21/2014	225	1.06	0.350											0.710	0.83	0.912	1.098	1.90		604	3.2		17300	55	17245			14369.4	117657	0.687	12.9
10/27/2014	231	Rest																										0	117657		
10/28/2014	232														1.01	1.098	1.092	1.86		582	3.2		16100	35	16065			16188.46	133845.4	0.78	14.6
10/30/2014	234	Drain Down																										0	133845.4		
10/31/2014	235														0.06	0.070	1.092	1.90		597	7.4		16400	40	16360			1051.282	134896.7	0.79	14.8

Extracted, %, Fe	**0.79**	**14.7**
Tail Analysis, % Fe	**4.59**	
Calculated head, % Fe	**5.38**	

Mr. Glen Van Treek / **Paramount Gold and Silver Corp.**
MLI Job No. 3775

Job No.	**3775-01**
Test No.	**B-7**
Sample	**FSU-13-1**
Feed Size	**80%-12.5mm**
Agglomeration	**Yes**

Ore Charge, kgs		
Initial (Wet)		17.06
Initial (Dry)		16.86
Sac Split	Date	
1	4/21	15.80
2	5/19	14.73
3	6/16	13.69
4	7/14	12.66
5	8/11	11.63
6	9/8	10.62
7	10/6	9.65
8		
9		
10	Loss	0.49

Finalwt, kg	16.37
Weight loss, kg	0.49
Weight Loss %	2.92

Head Analyses	
Au, g/mt	0.51
Ag, g/mt	2.8
Fe, %	5.33
S=, %	4.57
As, ppm	351
Cu, ppm	53.3
Zn, ppm	128.5

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	4.90	4.76	%
S=, %	3.28 [1)]	3.19	%
As, ppm	252	252	ppm
Cu, ppm	45.3	45.3	ppm
Zn, ppm	146.5	146.5	ppm

Bottle Roll Test Residue analysis

Daily Column Biooxidation Data,FSU-13-1, 80%-12.5mm

		Solution Applied													Effluent Solution													Fe Extraction			
			D.I.		Inoculum									Recycle						Redox											
		Total Vol.	Water	H_2SO_4	Culture	Volume	Free	Redox		Specific	Fe, mg/l			Effluent,	Volume	Weight	Specific		Free	mV	D.O.	Temp	Fe, mg/l			Cu	As		Cum.	Cum.	Est. Pct.
Date	Days	liters	liters	grams	No.	liters	Acid, g/L	mv (Ag/AgCl)	pH	Gravity	total	2+	3+	liters	liters	kg	Gravity	pH	Acid, g/L	(Ag/AgCl)	mg/l	°C	total	2+	3+	mg/L	mg/L	mg	mg	pct.	of Total
3/10/2014	0					1.11		669	1.81		4299.4	6.4	4293																		
3/11/2014	1	0.53			4	0.53	0.54	610	1.95	1.008	1819.6	3.6	1816															-4790.39	-4790.39	-0.028	-0.5
3/12/2014	2	0.53			4	0.53	0.29	613	1.95	1.004	1224.6	3.5	1221															-964.388	-5754.78	-0.034	-0.6
3/13/2014	3	0.53			4	0.53	0.25	575	1.95	1.003	810.4	2.9	808															-649.038	-6403.82	-0.038	-0.7
3/14/2014	4	0.53			4	0.125					587.8	2.2	586	0.405	0.52	0.520	1.000	1.56		390	6.9		112	14	98			-371.272	-6775.09	-0.040	-0.8
3/15/2014	5	0.53		0.4	4	0.186					604.6	2.2	602	0.344	0.47	0.465	1.000	2.39		379	7.1		55	16	39			-47.9	-6822.99	-0.040	-0.8
3/16/2014	6	Rest																										-112.456	-6935.45	-0.041	
3/17/2014	7	Rest																										0	-6935.45	-0.041	
3/18/2014	8	0.53		0.2	4	0.226					1210	8	1203	0.304	0.42	0.415	1.000	3.26		437	8.1		40	2	39			16.6	-6918.85	-0.041	-0.8
3/19/2014	9	0.53		0.2	4	0.371					1200	2	1198	0.160	0.27	0.275	1.001	3.96		331	8.4		20	4	16			-284.445	-7203.29	-0.043	-0.8
3/20/2014	10	0.53		0.3	4	0.119					1160	2	1158	0.412	0.53	0.530	1.000	3.21		467	7.8		10	3	7			-450.42	-7653.71	-0.045	-0.9
3/21/2014	11	0.53		0.4	4	0.004					2710	6	2704	0.526	0.65	0.650	1.000	3.57		410	7.1		8	3	5			-136.08	-7789.79	-0.046	-0.9
3/22/2014	12	0.53		0.2	4	0.207					4330	3	4327	0.324	0.45	0.450	1.000	3.52		410	7.6		10	1	9			-6.34	-7796.13	-0.046	-0.9
3/23/2014	13	Rest																										-896.31	-8692.44	-0.052	
3/24/2014	14	Rest																										0	-8692.44	-0.052	
3/25/2014	15	1.06			4	0.570					3182	3	3180	0.494	0.61	0.605	1.000	3.27		480	7.9		1	0	1			0.605	-8691.84	-0.052	-1.0
3/27/2014	17	1.59		0.1	4	0.865					3061	2	3059	0.728	0.84	0.835	1.000	3.29		483	8.0		1	0	1			-1812.91	-10504.7	-0.062	-1.2
3/30/2014	20	Rest																										-2647.77	-13152.5	-0.078	
3/31/2014	21	Rest																										0	-13152.5	-0.078	
4/1/2014	22	1.59		1.0	4	0.226					1469	2	1467	1.365	1.49	1.495	1.002	2.84		544	6.8		51	4	47			75.34681	-13077.2	-0.078	-1.5
4/4/2014	25	1.59		1.4	4	0.599					1457	2	1455	0.990	1.12	1.125	1.006	2.38		640	5.9		412	6	406			128.6072	-12948.6	-0.077	-1.4
4/7/2014	28	Rest																										-1527.66	-14476.2		
4/8/2014	29	1.59		5.6	4									1.590	1.80	1.810	1.007	2.06		590	5.3		1062	6	1056			1908.858	-12567.4	-0.075	-1.4
4/11/2014	32	1.59		5.4	4	0.124					709	2	707	1.466	1.60	1.620	1.012	2.31		464	1.7		995	28	967			1592.787	-10974.6	-0.065	-1.2
4/14/2014	35	Rest																										-1639.12	-12613.7		
4/15/2014	36	2.65			4	1.091					1552	2	1550	1.559	1.68	1.705	1.017	2.24		521	1.8		3160	11	3149			5297.738	-7315.95	-0.043	-0.8
4/21/2014	42	Rest																										-9153.99	-16469.9		
4/22/2014	43	3.18		10.1	4	0.819					901	8	893	2.361	2.48	2.515	1.014	2.41		459	0.8		1562	197	1365			3874.191	**-5279.8**	**-0.077**	-1.4
4/29/2014	50	3.18		10.7	4	0.527					2549	3	2546	2.653	2.78	2.825	1.017	2.26		456	0.9		3493	121	3372			8964.859	3685.058	-0.020	-0.4
5/5/2014	56	Rest																										-11504.5	-7819.4		
5/6/2014	57	3.18	0.271											2.909	3.03	3.095	1.021	2.08		467	2.1		4496	247	4249			13628.91	5809.511	-0.007	-0.1
5/12/2014	63	Rest																										-13335.1	-7525.63		
5/13/2014	64	3.18	0.214											2.966	3.09	3.190	1.031	2.32		426	3.4		5860	713	5147			18129.91	10604.28	0.024	0.4
5/19/2014	70	Rest																										-16172.3	-5568.05		
5/20/2014	71	3.18	0.420											2.760	2.88	2.980	1.034	2.98		458	1.2		3389	328	3061			9767.137	**-6405.19**	**-0.020**	-0.4
5/26/2014	77	Rest																										-6883.06	-13288.3		
5/27/2014	78	3.18	1.149											2.031	2.83	2.925*	1.035	2.01		437	0.8		4622	740	3882			13062.17	-226.078	0.022	0.4
6/2/2014	84	Rest																										-13403.8	-13629.9		
6/3/2014	85	3.18	0.280											2.900	3.03	3.125	1.033	2.19		414	1.2		7370	591	6779			22295.5	8665.62	0.083	1.5
6/9/2014	91	Rest																										-18498.7	-9833.08		
6/10/2014	92	3.18	0.670											2.510	2.63	2.730	1.037	1.94		436	4.8		6600	755	5845			17375.12	7542.041	0.075	1.4
6/16/2014	98	Rest																										-17001.6	-9459.56		
6/17/2014	99	3.18	0.604											2.576	2.71	2.840	1.048	1.90		485	1.4		8890	130	8760			24091.22	**7089.621**	**0.127**	2.4
6/23/2014	105	Rest																										-22598.4	-15508.8		
6/24/2014	106	3.18	0.638											2.542	2.45	2.565	1.047	1.94		445	0.6		8640	760	7880			21166.76	5658.004	0.116	2.2
6/30/2014	112	Rest																										-16493.8	-10835.8		
7/1/2014	113	3.18	1.271	5.9										1.909	1.82	1.930	1.063	1.95		443	1.7		12700	834	11866			23058.33	12222.57	0.164	3.1
7/7/2014	119	Rest																										-22453.6	-10231		
7/8/2014	120	3.18	1.412											1.768	1.71	1.810	1.061	1.89		434	1.3		11500	850	10650			19618.28	9387.254	0.143	2.7
7/14/2014	126	Rest																										-31889.8	-22502.6		
7/15/2014	127	3.03	0.255											2.773	2.77	2.920	1.053	1.92		436	0.9		11600	290	11310			32167.14	**277.3029**	**0.146**	2.7
7/21/2014	133	Rest																										-22840.4	-22563.1		
7/22/2014	134	3.18	1.211	3.3										1.969	2.07	2.190	1.059	2.05		438	0.8		9790	740	9050			20245.61	-2317.49	0.125	2.3
7/28/2014	140	Rest																										-19472.3	-21789.8		
7/29/2014	141	3.18	1.191											1.989	2.11	2.230	1.057	2.05		447	1.4		8960	550	8410			18903.31	-2886.49	0.121	2.3
8/4/2014	147	Rest																										-19022.1	-21908.6		
8/5/2014	148	3.18	1.057											2.123	2.25	2.380	1.060	2.00		447	2.0		11500	500	11000			25820.75	3912.188	0.174	3.3
8/11/2014	154	Rest																										-27427.5	-23515.3		
8/12/2014	155	3.18			4	0.795					2820	4	2816	2.385	2.86	3.000	1.049	2.01		462	1.8		8100	420	7680			23164.92	**-4262.58**	**0.138**	2.6
8/18/2014	161	Rest																										-22896.9	-27159.5		
8/19/2014	162	3.18	0.630											2.550	2.67	2.835	1.061	1.88		471	5.1		7910	170	7740			21135.58	-6023.9	0.123	2.3
8/25/2014	168	Rest																										-19877.8	-25901.7		

Job No.	**3775-01**
Test No.	**B-7**
Sample	**FSU-13-1**
Feed Size	**80%-12.5mm**
Agglomeration	**Yes**

Ore Charge, kgs		
Initial (Wet)		17.06
Initial (Dry)		16.86
Sac Split	Date	
1	4/21	15.80
2	5/19	14.73
3	6/16	13.69
4	7/14	12.66
5	8/11	11.63
6	9/8	10.62
7	10/6	9.65
8		
9		
10	Loss	0.49

Finalwt, kg	16.37
Weight loss, kg	0.49
Weight Loss %	2.92

Head Analyses	
Au, g/mt	0.51
Ag, g/mt	2.8
Fe, %	5.33
S=, %	4.57
As, ppm	351
Cu, ppm	53.3
Zn, ppm	128.5

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	4.90	4.76	%
S=, %	3.28 [1)]	3.19	%
As, ppm	252	252	ppm
Cu, ppm	45.3	45.3	ppm
Zn, ppm	146.5	146.5	ppm

Bottle Roll Test Residue analysis

Daily Column Biooxidation Data,FSU-13-1, 80%-12.5mm

Solution Applied

Date	Days	Total Vol. liters	D.I. Water liters	H_2SO_4 grams	Inoculum Culture No.	Inoculum Volume liters	Inoculum Free Acid, g/L	Inoculum Redox mv (Ag/AgCl)	Inoculum pH	Inoculum Specific Gravity	Inoculum Fe, mg/l total	Inoculum Fe, mg/l 2+	Inoculum Fe, mg/l 3+	Recycle Effluent, liters
8/26/2014	169	3.18	0.667											2.513
9/1/2014	175	Rest												
9/2/2014	176	3.18	0.841											2.339
9/8/2014	182	Rest												
9/9/2014	183	3.18	0.767											2.413
9/15/2014	189	Rest												
9/16/2014	190	3.18	1.830											1.350
9/22/2014	196	Rest												
9/23/2014	197	Rest/No Application												0.530
9/30/2014	204	3.18	0.289											2.891
10/6/2014	210	Rest												
10/7/2014	211	3.18	0.927											2.253
10/13/2014	217	Rest												
10/14/2014	218	3.18	0.445											2.735
10/20/2014	224	Rest												
10/21/2014	225	3.18	0.240											2.940
10/27/2014	231	Rest												
10/28/2014	232													
10/30/2014	234	Drain Down												
10/31/2014	235													

Effluent Solution

Date	Volume liters	Weight kg	Specific Gravity	pH	Free Acid, g/L	Redox mV (Ag/AgCl)	D.O. mg/l	Temp °C	Fe, mg/l total	Fe, mg/l 2+	Fe, mg/l 3+	Cu mg/L	As mg/L	Fe Extraction mg	Fe Extraction Cum. mg	Fe Extraction Cum. pct.	Est. Pct. of Total
8/26/2014	2.64	2.800	1.060	1.94		476	2.6		10900	240	10660			28792.45	2890.721	0.199	3.7
9/1/2014														-25495.1	-22604.4		
9/2/2014	2.46	2.615	1.062	1.94		473	1.5		11300	50	11250			27824.39	5220.009	0.219	4.1
9/8/2014														-27266.9	-22046.9		
9/9/2014	2.54	2.696	1.061	1.68		477	2.0		12100	160	11940			30746.09	**3479.189**	**0.252**	4.7
9/15/2014														-16335	-12855.8		
9/16/2014	1.47	1.548	1.052	2.03		454	4.9		10300	250	10050			15156.27	2300.462	0.241	4.5
9/22/2014														-5459	-3158.54		
9/23/2014	0.51	0.530	1.043	2.08		458	3.8		8490	100	8390			4314.19	1155.652	0.230	4.3
9/30/2014	2.39	2.480	1.039	2.02		445	2.2		6710	470	6240			16016.17	17171.82	0.381	7.1
10/6/2014														-15117.6	2054.192		
10/7/2014	1.37	1.425	1.042	2.07		462	5.3		6330	40	6290			8656.67	**-6460.96**	**0.314**	5.9
10/13/2014														-17312.6	-23773.5		
10/14/2014	2.86	2.986	1.044	1.96		515	6.3		7550	90	7460			21594.16	-2179.35	0.358	6.7
10/20/2014														-22197	-24376.4		
10/21/2014	3.06	3.206	1.047	1.94		613	2.9		8810	30	8780			26976.94	2600.591	0.408	7.7
10/27/2014														0	2600.591		
10/28/2014	3.06	3.228	1.054	1.85		600	4.4		10100	25	10075			30932.45	33533.04	0.728	13.7
10/30/2014														0	33533.04		
10/31/2014	0.02	0.025	1.054	1.83		602	4.4		11300	30	11270			268.0266	33801.06	0.73	13.7

Extracted, %, Fe	**0.73**	**13.3**
Tail Analysis, % Fe	**4.76**	
Calculated head, % Fe	**5.49**	

Mr. Glen Van Treek / **Paramount Gold and Silver Corp.**
MLI Job No. 3775

Job No.	**3775-01**
Test No.	**B-8**
Sample	**FSU-13-1**
Feed Size	**80%-6.3mm**
Agglomeration	**Yes**

Ore Charge, kgs		
Initial (Wet)		17.18
Initial (Dry)		16.99
Sac Split	Date	
1	4/21	15.98
2	5/19	14.98
3	6/16	13.99
4	7/14	13.03
5	8/11	12.01
6	9/8	11.04
7	10/6	11.04
8		
9		
10	Loss	0.49

Finalwt, kg	16.50
Weight loss, kg	0.49
Weight Loss %	2.90

Head Analyses	
Au, g/mt	0.51
Ag, g/mt	2.8
Fe, %	5.33
S=, %	4.57
As, ppm	351
Cu, ppm	53.3
Zn, ppm	128.5

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	5.09	5.09	%
S=, %	2.88 [1)]	2.81	%
As, ppm	266	266	ppm
Cu, ppm	51.4	51.4	ppm
Zn, ppm	144.5	144.5	ppm

Bottle Roll Test Residue analysis

Daily Column Biooxidation Data,FSU-13-1, 80%-6.3mm

Solution Applied

Date	Days	Total Vol. liters	D.I. Water liters	H_2SO_4 grams	Inoculum Culture No.	Inoculum Volume liters	Inoculum Free Acid, g/L	Inoculum Redox mv (Ag/AgCl)	Inoculum pH	Inoculum Specific Gravity	Inoculum Fe, mg/l total	Inoculum Fe, mg/l 2+	Inoculum Fe, mg/l 3+	Recycle Effluent, liters
3/10/2014	0					1.50		669	1.81		4299.4	6.4	4293	
3/11/2014	1	0.53			4	0.53	0.54	610	1.95	1.008	1819.6	3.6	1816	
3/12/2014	2	0.53			4	0.53	0.29	613	1.95	1.004	1224.6	3.5	1221	
3/13/2014	3	0.53			4	0.53	0.25	575	1.95	1.003	810.4	2.9	808	
3/14/2014	4	0.53			4	0.470					587.8	2.2	586	0.060
3/15/2014	5	0.53		0.4	4	0.136					604.6	2.2	602	0.394
3/16/2014	6	Rest												
3/17/2014	7	Rest												
3/18/2014	8	0.53		0.4	4	0.058					1210	8	1203	0.472
3/19/2014	9	0.53		0.1	4	0.281					1200	2	1198	0.250
3/20/2014	10	0.53		0.4	4	0.387					1160	2	1158	0.144
3/21/2014	11	0.53			4									0.532
3/22/2014	12	0.53			4	0.421					4330	3	4327	0.110
3/23/2014	13	Rest												
3/24/2014	14	Rest												
3/25/2014	15	1.06		0.3	4	0.204					3182	3	3180	0.860
3/27/2014	17	1.59			4	1.019					3061	2	3059	0.574
3/30/2014	20	Rest												
3/31/2014	21	Rest												
4/1/2014	22	1.59		1.4	4	0.022					1469	2	1467	1.568
4/4/2014	25	1.59		0.9	4	0.353					1457	2	1455	1.237
4/7/2014	28	Rest												
4/8/2014	29	1.59		6.6	4	0.161					1288	27	1261	1.429
4/11/2014	32	1.59	0.549		4									1.041
4/14/2014	35	Rest												
4/15/2014	36	2.65	1.116		4									1.534
4/21/2014	42	Rest												
4/22/2014	43	3.18	0.918		4									2.262
4/29/2014	50	3.18			4	1.628					2549	3	2546	1.552
5/5/2014	56	Rest												
5/6/2014	57	3.18	0.316											2.864
5/12/2014	63	Rest												
5/13/2014	64	3.18	0.195											2.985
5/19/2014	70	Rest												
5/20/2014	71	3.18	0.399											2.781
5/26/2014	77	Rest												
5/27/2014	78	3.18	0.688											2.492
6/2/2014	84	Rest												
6/3/2014	85	3.18	0.290											2.890
6/9/2014	91	Rest												
6/10/2014	92	3.18	0.740											2.440
6/16/2014	98	Rest												
6/17/2014	99	3.18	2.617											0.563
6/23/2014	105	Rest												
6/24/2014	106	Ponded												
6/28/2014	110	3.18	0.670											2.510
7/7/2014	119	Rest												
7/8/2014	120	3.18	1.695											1.485
7/14/2014	126	Rest												
7/15/2014	127	3.16	0.404											2.758
7/17/2014	129	Ponded												
7/21/2014	133	Rest												
7/22/2014	134	Ponded												
7/28/2014	140	Rest												
7/29/2014	141	3.18	2.121											1.059
8/4/2014	147	Rest												
8/5/2014	148	3.18	1.043											2.137
8/11/2014	154	Rest												
8/12/2014	155	3.18			4	0.795					2820	4	2816	2.385
8/18/2014	161	Rest												
8/19/2014	162	Ponded												
8/25/2014	168	Rest												

Effluent Solution

Date	Volume liters	Weight kg	Specific Gravity	pH	Free Acid, g/L	Redox mV (Ag/AgCl)	D.O. mg/l	Temp °C	Fe, mg/l total	Fe, mg/l 2+	Fe, mg/l 3+	Cu mg/L	As mg/L	Fe Extraction mg	Fe Extraction Cum. mg	Fe Extraction Cum. pct.	Est. Pct. of Total
3/10/2014																	
3/11/2014														-6463.72	-6463.72	-0.038	-0.7
3/12/2014														-964.388	-7428.11	-0.044	-0.8
3/13/2014														-649.038	-8077.14	-0.048	-0.9
3/14/2014	0.18	0.180	1.005	1.07		417	7.1		73	15	59			-416.437	-8493.58	-0.050	-0.9
3/15/2014	0.53	0.525	1.000	2.39		379	7.6		36	14	22			-257.366	-8750.95	-0.052	-1.0
3/16/2014														-82.2256	-8833.17	-0.052	
3/17/2014														0	-8833.17	-0.052	
3/18/2014	0.59	0.585	1.000	3.73		371	7.5		20	6	15			11.7	-8821.47	-0.052	-1.0
3/19/2014	0.37	0.370	1.000	4.09		332	8.0		10	2	8			-69.36	-8890.83	-0.052	-1.0
3/20/2014	0.26	0.255	1.000	3.65		439	7.8		10	2	8			-339.97	-9230.8	-0.054	-1.0
3/21/2014	0.66	0.655	1.000	3.76		399	7.0		3	2	1			-448.055	-9678.86	-0.057	-1.1
3/22/2014	0.23	0.225	1.000	3.53		395	7.7		10	1	9			2.25	-9676.61	-0.057	-1.1
3/23/2014														-1822.93	-11499.5	-0.068	
3/24/2014														0	-11499.5	-0.068	
3/25/2014	0.98	0.975	1.000	3.82		422	7.5		1	0	1			0.975	-11498.6	-0.068	-1.3
3/27/2014	0.70	0.695	1.000	3.76		431	7.9		4	1	3			-646.348	-12144.9	-0.071	-1.3
3/30/2014														-3119.16	-15264.1	-0.090	
3/31/2014														0	-15264.1	-0.090	
4/1/2014	1.69	1.695	1.004	3.13		547	6.9		25	5	21			42.88147	-15221.2	-0.090	-1.7
4/4/2014	1.35	1.375	1.017	2.25		579	4.1		1534	14	1520			2041.537	-13179.7	-0.078	-1.5
4/7/2014														-2706.26	-15885.9		
4/8/2014	1.55	1.585	1.022	1.99		558	2.5		4155	24	4132			6444.219	-9441.7	-0.056	-1.0
4/11/2014	1.17	1.210	1.034	1.86		556	1.6		4933	14	4919			5565.292	-3876.41	-0.023	-0.4
4/14/2014														-7567.22	-11443.6		
4/15/2014	1.65	1.725	1.043	1.85		571	2.4		10067	14	10053			16649.64	5206.013	0.031	0.6
4/21/2014														-22771.6	-17565.5		
4/22/2014	2.39	2.510	1.052	1.75		590	1.2		7805	25	7780			18622.2	**-4149.36**	**0.005**	0.1
4/29/2014	1.68	1.755	1.044	1.66		477	1.0		10605	281	10324			17827.37	13678.01	0.116	2.2
5/5/2014														-34522.5	-20844.5		
5/6/2014	3.00	3.105	1.036	1.94		453	2.2		8269	329	7940			24783.06	3938.576	0.055	1.0
5/12/2014														-24683	-20744.4		
5/13/2014	3.10	3.230	1.042	2.16		437	1.5		8601	735	7866			26661.95	5917.556	0.068	1.3
5/19/2014														-23919.8	-18002.3		
5/20/2014	2.90	3.015	1.040	2.03		438	0.9		5320	732	4588			15422.88	**-8496.94**	**0.011**	0.2
5/26/2014														-13257.4	-21754.4		
5/27/2014	3.00	3.120*	1.040	2.06		435	0.9		5608	850	4758			16824	-4930.38	0.035	0.7
6/2/2014														-16207.1	-21137.5		
6/3/2014	3.01	3.130	1.041	2.19		408	1.2		10100	1020	9080			30367.92	9230.414	0.129	2.4
6/9/2014														-24644	-15413.6		
6/10/2014	2.56	2.680	1.045	1.98		451	6.9		7790	566	7224			19978.18	4564.596	0.098	1.8
6/16/2014														-4385.77	178.8259		
6/17/2014	0.67	0.710	1.052	2.01		437	1.3		9350	540	8810			6310.361	**1924.591**	**0.112**	2.1
6/23/2014														0	1924.591		
6/24/2014														0	1924.591		
6/28/2014	2.58	2.610	1.012	1.79		470	1.6		8810	1160	7650			22721.44	24646.03	0.274	5.1
7/7/2014														-13082.9	11563.18		
7/8/2014	1.54	1.580	1.027	2.30		409	0.9		4170	490	3680			6415.385	17978.57	0.227	4.3
7/14/2014														-11500	6478.617		
7/15/2014	2.76	2.835	1.028	2.06		419	1.0		5150	440	4710			14202.58	**2702.626**	**0.247**	4.6
7/17/2014														0	2702.626		
7/21/2014														0	2702.626		
7/22/2014														0	2702.626		
7/28/2014														0	2702.626		
7/29/2014	1.18	1.235	1.048	2.12		460	4.4		6190	290	5900			7294.513	9997.14	0.303	5.7
8/4/2014														-13228	-3230.89		
8/5/2014	2.27	2.355	1.039	1.94		438	7.7		5700	410	5290			12919.63	9688.744	0.301	5.6
8/11/2014														-13594.5	-3905.76		
8/12/2014	3.55	3.662	1.031	1.95		485	5.4		3920	140	3780			13923.41	**328.9142**	**0.304**	5.7
8/18/2014														-2241.9	-1912.99		
8/19/2014														0	-1912.99		
8/25/2014														0	-1912.99		

Job No.	**3775-01**
Test No.	**B-8**
Sample	**FSU-13-1**
Feed Size	**80%-6.3mm**
Agglomeration	**Yes**

Ore Charge, kgs		
Initial (Wet)		17.18
Initial (Dry)		16.99
Sac Split	Date	
1	4/21	15.98
2	5/19	14.98
3	6/16	13.99
4	7/14	13.03
5	8/11	12.01
6	9/8	11.04
7	10/6	11.04
8		
9		
10	Loss	0.49

Finalwt, kg	16.50
Weight loss, kg	0.49
Weight Loss %	2.90

Head Analyses	
Au, g/mt	0.51
Ag, g/mt	2.8
Fe, %	5.33
S=, %	4.57
As, ppm	351
Cu, ppm	53.3
Zn, ppm	128.5

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	5.09	5.09	%
S=, %	2.88 [1)]	2.81	%
As, ppm	266	266	ppm
Cu, ppm	51.4	51.4	ppm
Zn, ppm	144.5	144.5	ppm

Bottle Roll Test Residue analysis

Daily Column Biooxidation Data,FSU-13-1, 80%-6.3mm

Solution Applied

Date	Days	Total Vol. liters	D.I. Water liters	H_2SO_4 grams	Inoculum Culture No.	Inoculum Volume liters	Inoculum Free Acid, g/L	Inoculum Redox mv (Ag/AgCl)	Inoculum pH	Inoculum Specific Gravity	Inoculum Fe, mg/l total	Inoculum Fe, mg/l 2+	Inoculum Fe, mg/l 3+	Recycle Effluent, liters
8/26/2014	169	Ponded												
9/1/2014	175	Rest												
9/2/2014	176	1.06	0.220											0.840
9/8/2014	182	Rest												
9/9/2014	183	0.87	0.550											0.510
9/15/2014	189	Rest												
9/16/2014	190	Ponded												
9/18/2014	192	0.53	0.341	5.8										
9/23/2014	197	1.25	1.060	6.7										
9/30/2014	204	No Application												
10/6/2014	210	Rest												
10/7/2014	211	Ponded												
10/13/2014	217	Rest												
10/14/2014	218	Ponded												
10/20/2014	224	Rest												
10/21/2014	225	Ponded												
10/27/2014	231	Rest												
10/28/2014	232													
10/31/2014	235	Drain Down												

Effluent Solution / Fe Extraction

Date	Days	Volume liters	Weight kg	Specific Gravity	pH	Free Acid, g/L	Redox mV (Ag/AgCl)	D.O. mg/l	Temp °C	Fe, mg/l total	Fe, mg/l 2+	Fe, mg/l 3+	Cu mg/L	As mg/L	Fe Extraction mg	Cum. mg	Cum. pct.	Est. Pct. of Total
8/26/2014	169														0	-1912.99		
9/1/2014	175														0	-1912.99		
9/2/2014	176	0.29	0.300	1.047	2.10		664	2.2		6600	20	6580			1891.117	-21.8684	0.301	5.6
9/8/2014	182														-3366	-3387.87		
9/9/2014	183	0.63	0.662	1.046	1.83		452	3.0		7440	300	7140			4708.681	**1342.681**	**0.313**	5.9
9/15/2014	189														0	1342.681		
9/16/2014	190														0	1342.681		
9/18/2014	192														0	1342.681		
9/23/2014	197														0	1342.681		
9/30/2014	204														0	1342.681		
10/6/2014	210														0	1342.681		
10/7/2014	211														0	1342.681		
10/13/2014	217														0	1342.681		
10/14/2014	218														0	1342.681		
10/20/2014	224														0	1342.681		
10/21/2014	225														0	1342.681		
10/27/2014	231														0	1342.681		
10/28/2014	232	0.17	0.176	1.037	2.18		593	4.9		5510	15	5495			935.1591	2277.84		
10/31/2014	235														0	2277.84	0.32	6.0

Extracted, %, Fe	**0.32**	**5.9**
Tail Analysis, % Fe	**5.09**	
Calculated head, % Fe	**5.41**	

Mr. Glen Van Treek / **Paramount Gold and Silver Corp.**
MLI Job No. 3775

Job No.	3775-01
Test No.	B-9
Sample	WOS-MC
Feed Size	80%-12.5mm
Agglomeration	Yes

Ore Charge, kgs	
Initial (Wet)	16.16
Initial (Dry)	16.10
Finalwt, kg	15.73
Weight loss, kg	0.37
Weight Loss %	2.30

Head Analyses	
Au, g/mt	4.04
Ag, g/mt	69.4
Fe, %	3.05
S=, %	2.93
As, ppm	2710
Cu, ppm	85.1
Zn, ppm	215

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	2.35	2.30	%
S=, %	1.99 [1)]	1.94	%
As, ppm	966*		ppm
Cu, ppm	36.7*		ppm
Zn, ppm	50*		ppm

* BRT Residue analysis, [1)] Used average of Bottle Roll & Column Leach Tails

Daily Column Biooxidation Data,WOS-MC, 80%-12.5mm

		Solution Applied													Effluent Solution													Fe Extraction			
			D.I.		Inoculum									Recycle						Redox											
		Total Vol.	Water	H_2SO_4	Culture	Volume	Free	Redox		Specific	Fe, mg/l			Effluent,	Volume	Weight	Specific		Free	mV	D.O.	Temp	Fe, mg/l			Cu	As		Cum.	Cum.	Est. Pct.
Date	Days	liters	liters	grams	No.	liters	Acid, g/L	mv (Ag/AgCl)	pH	Gravity	total	2+	3+	liters	liters	kg	Gravity	pH	Acid, g/L	(Ag/AgCl)	mg/l	°C	total	2+	3+	mg/L	mg/L	mg	mg	pct.	of Total
3/10/2014	0					1.12		669	1.81		4299.4	6.4	4293																		
3/11/2014	1	0.53			4	0.53	0.54	610	1.95	1.008	1819.6	3.6	1816															-4818.34	-4818.34	-0.030	-1.0
3/12/2014	2	0.53			4	0.53	0.29	613	1.95	1.004	1224.6	3.5	1221															-964.388	-5782.73	-0.036	-1.2
3/13/2014	3	0.53			4	0.53	0.25	575	1.95	1.003	810.4	2.9	808															-649.038	-6431.76	-0.040	-1.3
3/14/2014	4	0.72			4						587.8	2.2	586	0.718	0.84	0.860	1.023	1.64		379	7.4		4359	2	4358			3234.945	-3196.82	-0.020	-0.6
3/15/2014	5	0.66		0.2	4						604.6	2.2	602	0.657	0.79	0.800	1.016	2.07		375	8.9		2978	2	2976			2344.882	-851.936	-0.005	-0.2
3/16/2014	6	Rest																										0	-851.936		
3/17/2014	7	Rest																										0	-851.936		
3/18/2014	8	0.53			4	0.250					1210	8	1203	0.505	0.62	0.630	1.014	2.00		398	7.3		2890	290	2600			1795.562	943.626	0.006	0.2
3/19/2014	9	0.53			4	0.334					1200	2	1198	0.197	0.31	0.320	1.017	1.96		392	8.6		3170	750	2420			-270.317	673.309	0.004	0.1
3/20/2014	10	0.53			4	0.197					1160	2	1158	0.334	0.44	0.450	1.019	1.92		405	7.1		3880	620	3260			-63.1354	610.174	0.004	0.1
3/21/2014	11	0.54			4	0.107					2710	6	2704	0.434	0.55	0.555	1.015	1.72		410	7.4		5930	920	5010			1543.472	2153.646	0.013	0.4
3/22/2014	12	0.53			4	0.152					4330	3	4327	0.379	0.50	0.510	1.014	1.71		407	7.5		4180	780	3400			1812.397	3966.043	0.025	0.8
3/23/2014	13	Rest																										-658.16	3307.883		
3/24/2014	14	Rest																										0	3307.883		
3/25/2014	15	1.06			4	0.427					3182	3	3180	0.636	0.76	0.770	1.015	1.72		405	7.2		3260	630	2630			2473.103	5780.987	0.036	1.2
3/27/2014	17	1.59			4	0.940					3061	2	3059	0.653	0.77	0.780	1.017	1.63		411	7.7		4020	680	3340			1724.472	7505.458	0.046	1.5
3/30/2014	20	Rest																										-2877.34	4628.118		
3/31/2014	21	Rest																										0	4628.118		
4/1/2014	22	0.00			4										1.79	1.825	1.018	1.60		427	5.8		4170	710	3460			7475.688	12103.81	0.075	2.5
4/4/2014	25	1.59			4	0.202					1457	2	1455	1.388	1.50	1.530	1.019	1.48		446	5.0		4000	660	3340			6005.888	18109.69	0.112	3.7
4/7/2014	28	Rest																										-6174.31	11935.38		
4/8/2014	29	1.59			4	0.119					1288	27	1261	1.470	1.60	1.635	1.024	1.46		461	2.7		4649	73	4576			7422.325	19357.71	0.120	3.9
4/11/2014	32	1.59			4	0.336					709	2	707	1.254	1.38	1.420	1.032	1.38		455	1.9		7249	450	6799			9821.127	29178.83	0.181	5.9
4/14/2014	35	Rest																										-11764.1	17414.7		
4/15/2014	36	1.59			4									1.590	1.72	1.780	1.035	1.35		479	1.5		8639	98	8541			14857.41	32272.11	0.200	6.5
4/18/2014	39	1.59			4	0.377					1601	2	1599	1.213	1.34	1.390	1.040	1.29		468	1.3		10606	69	10537			14175.33	46447.44	0.287	9.4
4/21/2014	42	Rest																										-17467.1	28980.32		
4/22/2014	43	1.59			4									1.590	1.78	1.855	1.041	1.32		474	1.3		7131	420	6711			12707.02	41687.34	0.258	8.5
4/25/2014	46	1.59			4	0.311					2398	20	2378	1.279	1.40	1.460	1.046	1.31		475	1.0		11631	460	11171			16234.47	57921.81	0.358	11.8
4/28/2014	49	Rest																										-17831.7	40090.09		
4/29/2014	50	1.59			4	0.121					2549	3	2546	1.469	1.59	1.670	1.048	1.24		469	2.9		11267	510	10757			17954.09	58044.19	0.359	11.8
5/5/2014	56	Rest																										-34053.1	23991.09		
5/6/2014	57	3.18	0.185											2.995	3.12	3.265	1.045	1.26		462	2.3		9441	940	8501			29497.48	53488.57	0.331	10.9
5/12/2014	63	Rest																										-28370.2	25118.37		
5/13/2014	64	3.18	0.176											3.005	3.12	3.245	1.039	1.39		473	1.0		10040	310	9730			31357.35	56475.72	0.349	11.5
5/19/2014	70	Rest																										-30130.5	26345.23		
5/20/2014	71	3.18	0.179											3.001	3.12	3.260	1.045	1.32		450	0.6		7885	733	7152			24598.18	50943.41	0.315	10.3
5/26/2014	77	Rest																										-23252.9	27690.54		
5/27/2014	78	3.18	0.231											2.949	3.06	3.215	1.049	1.24		442	2.2		9226	900	8326			28276.06	55966.61	0.346	11.4
6/2/2014	84	Rest																										-28139.3	27827.31		
6/3/2014	85	3.18	0.130											3.050	3.17	3.315	1.046	1.13		442	2.2		15600	611	14989			49439.77	77267.08	0.478	15.7
6/9/2014	91	Rest																										-45552	31715.08		
6/10/2014	92	3.18	0.260											2.920	3.04	3.190	1.049	1.32		447	4.1		10200	1092	9108			31018.11	62733.19	0.388	12.7
6/16/2014	98	Rest																										-21307.8	41425.39		
6/17/2014	99	3.18	1.090											2.089	2.26	2.390	1.057	1.30		426	3.6		12700	880	11820			28716.18	70141.57	0.434	14.2
6/23/2014	105	Rest																										-39370	30771.57		
6/24/2014	106	3.18	0.080											3.100	2.97	3.100	1.043	1.33		433	4.2		10900	890	10010			32396.93	63168.5	0.391	12.8
6/30/2014	112	Rest																										-32732.7	30435.8		
7/1/2014	113	3.18	0.177											3.003	2.96	3.045	1.030	1.57		433	2.3		7630	751	6879			22556.65	52992.45	0.328	10.8
7/7/2014	119	Rest																										-20318.7	32673.76		
7/8/2014	120	3.18	0.517											2.663	2.65	2.720	1.028	1.54		438	2.2		7100	540	6560			18785.99	51459.75	0.318	10.4
7/14/2014	126	Rest																										-17957.2	33502.55		
7/15/2014	127	3.17	0.643											2.529	2.53	2.600	1.028	1.48		438	3.7		8250	470	7780			20865.76	54368.31	0.336	11.0
7/21/2014	133	Rest																										-11508.8	42859.56		
7/22/2014	134	3.18	1.785											1.395	1.52	1.565	1.032	1.50		434	4.3		7700	710	6990			11676.84	54536.4	0.337	11.1
7/28/2014	140	Rest																										-16793.7	37742.7		
7/29/2014	141	3.18	0.999											2.181	2.36	2.430	1.030	1.52		429	3.8		6810	740	6070			16066.31	53809.01	0.333	10.9
8/4/2014	147	Rest																										-21655.8	32153.21		
8/5/2014	148	3.18												3.180	4.09	4.190	1.025	1.46		429	2.7		6550	580	5970			26775.12	58928.34	0.365	12.0
8/11/2014	154	Rest																										-15621.8	43306.59		
8/12/2014	155	3.18			4	0.795					2820	4	2816	2.385	2.98	3.062	1.026	1.60		452	3.2		6080	430	5650			18145.19	61451.77	0.380	12.5
8/18/2014	161	Rest																										-13763.5	47688.27		
8/19/2014	162	3.18	1.285											1.895	2.02	2.067	1.025	1.50		434	6.5		5170	510	4660			10425.75	58114.02	0.360	11.8
8/25/2014	168	Rest																										-16440.6	41673.42		
8/26/2014	169	3.18												3.180	3.59	3.665	1.022	1.57		457	3.6		6570	440	6130			23560.71	65234.13	0.404	13.2
9/1/2014	175	Rest																										-15827.1	49407		
9/2/2014	176	3.18	0.770											2.409	2.54	2.605	1.027	1.54		464	1.8		7400	270	7130			18770.2	68177.21	0.422	13.8

Job No.	**3775-01**
Test No.	**B-9**
Sample	**WOS-MC**
Feed Size	**80%-12.5mm**
Agglomeration	**Yes**

Ore Charge, kgs	
Initial (Wet)	16.16
Initial (Dry)	16.10
Finalwt, kg	15.73
Weight loss, kg	0.37
Weight Loss %	2.30

Head Analyses	
Au, g/mt	4.04
Ag, g/mt	69.4
Fe, %	3.05
S=, %	2.93
As, ppm	2710
Cu, ppm	85.1
Zn, ppm	215

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	2.35	2.30	%
S=, %	1.99 [1)]	1.94	%
As, ppm	966*		ppm
Cu, ppm	36.7*		ppm
Zn, ppm	50*		ppm

* BRT Residue analysis, [1)] Used average of Bottle Roll & Column Leach Tails

Daily Column Biooxidation Data,WOS-MC, 80%-12.5mm

Solution Applied

Date	Days	Total Vol. liters	D.I. Water liters	H_2SO_4 grams	Inoculum Culture No.	Inoculum Volume liters	Inoculum Free Acid, g/L	Inoculum Redox mv (Ag/AgCl)	Inoculum pH	Inoculum Specific Gravity	Inoculum Fe, mg/l total	Inoculum Fe, mg/l 2+	Inoculum Fe, mg/l 3+	Recycle Effluent, liters
9/8/2014	182	Rest												
9/9/2014	183	3.18	1.610											1.570
9/15/2014	189	Rest												
9/16/2014	190	3.18												3.180
9/22/2014	196	Rest												
9/23/2014	197	Rest/No Application												0.930
9/30/2014	204	3.18												3.180
10/6/2014	210	Rest												
10/7/2014	211	3.18	0.569											2.611
10/13/2014	217	Rest												
10/14/2014	218	3.18	0.220											2.960
10/20/2014	224	Rest												
10/21/2014	225	3.18	0.760											2.420
10/27/2014	231	Rest												
10/28/2014	232													
10/30/2014	234	Drain Down												
10/31/2014	235													

Effluent Solution

Date	Days	Volume liters	Weight kg	Specific Gravity	pH	Free Acid, g/L	Redox mV (Ag/AgCl)	D.O. mg/l	Temp °C	Fe, mg/l total	Fe, mg/l 2+	Fe, mg/l 3+	Cu mg/L	As mg/L	Fe Extraction mg	Fe Extraction Cum. mg	Fe Extraction Cum. pct.	Est. Pct. of Total
9/8/2014	182														-11618	56559.21		
9/9/2014	183	1.69	1.734	1.027	1.38		460	3.7		7510	280	7230			12679.98	69239.19	0.428	14.0
9/15/2014	189														-23881.8	45357.39		
9/16/2014	190	4.00	4.082	1.021	1.54		455	3.2		7760	270	7490			31024.8	76382.19	0.473	15.5
9/22/2014	196														-7216.8	70017.32		
9/23/2014	197	1.06	1.080	1.022	1.54		453	5.3		7470	320	7150			7893.933	77911.26	0.482	15.8
9/30/2014	204	1.24	1.265	1.024	1.49		430	3.7		6950	550	6400			8585.693	86496.95	0.535	17.5
10/6/2014	210														-18146.5	67498.56		
10/7/2014	211	2.72	2.800	1.028	1.54		453	6.2		6220	680	5540			16941.63	84440.2	0.523	17.1
10/13/2014	217														-18411.2	66029		
10/14/2014	218	3.08	3.168	1.027	1.48		452	6.9		7440	380	7060			22950.26	88979.26	0.551	18.1
10/20/2014	224														-18004.8	70974.46		
10/21/2014	225	2.54	2.606	1.024	1.50		461	2.8		7420	250	7170			18883.32	89857.78	0.556	18.2
10/27/2014	231														0	89857.78		
10/28/2014	232	3.24	3.318	1.024	1.48		464	4.7		7060	450	6610			22876.05	112733.8	0.698	22.9
10/30/2014	234														0	112733.8		
10/31/2014	235	0.60	0.615	1.030	1.41		452	6.9		6820	615	6205			4072.136	116806	0.72	23.6

Extracted, %, Fe	**0.72**	**23.8**
Tail Analysis, % Fe	**2.30**	
Calculated head, % Fe	**3.02**	

Mr. Glen Van Treek / **Paramount Gold and Silver Corp.**
MLI Job No. 3775

Job No.	**3775-01**
Test No.	**B-10**
Sample	**WOS-MC**
Feed Size	**80%-6.3mm**
Agglomeration	**Yes**

Ore Charge, kgs	
Initial (Wet)	15.99
Initial (Dry)	15.90
Finalwt, kg	15.48
Weight loss, kg	0.42
Weight Loss %	2.64

Head Analyses	
Au, g/mt	4.04
Ag, g/mt	69.4
Fe, %	3.05
S=, %	2.93
As, ppm	2710
Cu, ppm	85.1
Zn, ppm	215

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	2.48	2.41	%
S=, %	2.29 [1)]	2.23	%
As, ppm	1505*		ppm
Cu, ppm	31.9*		ppm
Zn, ppm	58*		ppm

* BRT Residue analysis, [1)] Used average of Bottle Roll & Column Leach Tails

Daily Column Biooxidation Data,WOS-MC, 80%-6.3mm

Solution Applied

Date	Days	Total Vol. liters	D.I. Water liters	H_2SO_4 grams	Inoculum Culture No.	Inoculum Volume liters	Inoculum Free Acid, g/L	Inoculum Redox mv (Ag/AgCl)	Inoculum pH	Inoculum Specific Gravity	Inoculum Fe, mg/l total	Inoculum Fe, mg/l 2+	Inoculum Fe, mg/l 3+	Recycle Effluent, liters
3/10/2014	0					1.55		669	1.81		4299.4	6.4	4293	
3/11/2014	1	0.53			4	0.53	0.54	610	1.95	1.008	1819.6	3.6	1816	
3/12/2014	2	0.53			4	0.53	0.29	613	1.95	1.004	1224.6	3.5	1221	
3/13/2014	3	0.53			4	0.53	0.25	575	1.95	1.003	810.4	2.9	808	
3/14/2014	4	0.69			4						587.8	2.2	586	0.690
3/15/2014	5	0.55		0.2	4						604.6	2.2	602	0.545
3/16/2014	6	Rest												
3/17/2014	7	Rest												
3/18/2014	8	0.53		0.1	4	0.102					1210	8	1203	0.428
3/19/2014	9	0.53			4	0.334					1200	2	1198	0.197
3/20/2014	10	0.53			4	0.144					1160	2	1158	0.387
3/21/2014	11	0.53			4	0.157					2710	6	2704	0.373
3/22/2014	12	0.53			4	0.155					4330	3	4327	0.375
3/23/2014	13	Rest												
3/24/2014	14	Rest												
3/25/2014	15	1.06			4	0.416					3182	3	3180	0.648
3/27/2014	17	1.59			4	0.916					3061	2	3059	0.677
3/30/2014	20	Rest												
3/31/2014	21	Rest												
4/1/2014	22	1.59			4	0.008					1469	2	1467	1.582
4/4/2014	25	1.59			4	0.365					1457	2	1455	1.226
4/7/2014	28	Rest												
4/8/2014	29	1.59			4									1.590
4/11/2014	32	1.59			4	0.335					709	2	707	1.255
4/14/2014	35	Rest												
4/15/2014	36	1.59			4									1.590
4/18/2014	39	1.59			4	0.436					1601	2	1599	1.154
4/21/2014	42	Rest												
4/22/2014	43	1.59			4									1.590
4/25/2014	46	1.59			4	0.210					2398	20	2378	1.380
4/28/2014	49	Rest												
4/29/2014	50	1.59			4	0.147					2549	3	2546	1.443
5/5/2014	56	Rest												
5/6/2014	57	3.18	0.260											2.920
5/12/2014	63	Rest												
5/13/2014	64	3.18	0.188											2.992
5/19/2014	70	Rest												
5/20/2014	71	3.18	0.198											2.982
5/26/2014	77	Rest												
5/27/2014	78	3.18	1.394											1.786
6/2/2014	84	Rest												
6/3/2014	85	3.18	0.170											3.010
6/9/2014	91	Rest												
6/10/2014	92	3.18	1.370											1.810
6/16/2014	98	Rest												
6/17/2014	99	3.18	0.534											2.646
6/23/2014	105	Rest												
6/24/2014	106	3.18	2.350											0.829
6/30/2014	112	Rest												
7/1/2014	113	2.91												2.909
7/7/2014	119	Rest												
7/8/2014	120	3.18	0.387											2.793
7/14/2014	126	Rest												
7/15/2014	127	3.21	1.105											2.109
7/17/2014	129	Ponded												
7/21/2014	133	Rest												
7/22/2014	134	3.18	0.756											2.424
7/28/2014	140	Rest												
7/29/2014	141	3.18												3.180
8/4/2014	147	Rest												
8/5/2014	148	3.18	0.690	9.5										2.490
8/11/2014	154	Rest												
8/12/2014	155	3.18			4	0.795					2820	4	2816	2.385
8/18/2014	161	Rest												
8/19/2014	162	Ponded												
8/25/2014	168	Rest												
8/26/2014	169	Ponded												
9/1/2014	175	Rest												

Effluent Solution / Fe Extraction

Date	Volume liters	Weight kg	Specific Gravity	pH	Free Acid, g/L	Redox mV (Ag/AgCl)	D.O. mg/l	Temp °C	Fe, mg/l total	Fe, mg/l 2+	Fe, mg/l 3+	Cu mg/L	As mg/L	Fe Extraction mg	Fe Extraction Cum. mg	Fe Extraction Cum. pct.	Est. Pct. of Total
3/10/2014																	
3/11/2014														-6650.31	-6650.31	-0.042	-1.4
3/12/2014														-964.388	-7614.7	-0.048	-1.6
3/13/2014														-649.038	-8263.74	-0.052	-1.7
3/14/2014	0.79	0.810	1.022	1.60		376	6.1		4231	1	4230			2923.825	-5339.91	-0.033	-1.1
3/15/2014	0.67	0.685	1.016	2.13		392	7.0		3444	2	3442			2321.988	-3017.93	-0.019	-0.6
3/16/2014														0	-3017.93		
3/17/2014														0	-3017.93		
3/18/2014	0.54	0.550	1.013	2.15		394	7.9		2800	290	2510			1520.237	-1497.69	-0.009	-0.3
3/19/2014	0.32	0.330	1.016	2.10		390	7.9		3150	840	2310			-183.89	-1681.58	-0.011	-0.3
3/20/2014	0.50	0.505	1.018	2.05		402	7.1		3950	720	3230			383.7294	-1297.85	-0.008	-0.3
3/21/2014	0.51	0.515	1.019	1.81		406	6.9		3840	970	2870			292.4362	-1005.41	-0.006	-0.2
3/22/2014	0.50	0.510	1.018	1.80		404	7.2		3730	930	2800			1443.194	437.781	0.003	0.1
3/23/2014														-671.15	-233.369		
3/24/2014														0	-233.369		
3/25/2014	0.76	0.775	1.016	1.83		399	6.6		3290	630	2660			2509.596	2276.228	0.014	0.5
3/27/2014	0.79	0.800	1.016	1.80		407	7.7		3390	640	2750			1345.579	3621.807	0.023	0.7
3/30/2014														-2803.88	817.931		
3/31/2014														0	817.931		
4/1/2014	1.71	1.730	1.014	1.67		415	6.7		3530	820	2710			6022.584	6840.515	0.043	1.4
4/4/2014	1.35	1.370	1.018	1.56		426	6.1		4080	640	3440			5479.013	12319.53	0.077	2.5
4/7/2014														-7019.01	5300.523		
4/8/2014	1.73	1.770	1.022	1.46		443	6.1		4495	68	4427			7784.19	13084.71	0.082	2.7
4/11/2014	1.39	1.420	1.025	1.44		435	5.2		5859	700	5159			8116.859	21201.57	0.133	4.3
4/14/2014														-9553.33	11648.25		
4/15/2014	1.75	1.810	1.036	1.36		460	4.6		9823	98	9725			17161.81	28810.05	0.180	5.9
4/18/2014	1.28	1.330	1.036	1.29		445	5.4		10076	62	10014			12935.41	41745.46	0.261	8.6
4/21/2014														-16718.9	25026.58		
4/22/2014	1.79	1.865	1.044	1.26		452	1.9		8158	750	7408			14573.44	39600.02	0.248	8.1
4/25/2014	1.49	1.560	1.045	1.26		457	3.1		15587	357	15230			23268.63	62868.65	0.393	12.9
4/28/2014														-22995.6	39873.03		
4/29/2014	1.57	1.650	1.049	1.22		450	3.9		11208	1060	10148			17629.36	57502.39	0.360	11.8
5/5/2014														-33102.1	24400.33		
5/6/2014	3.06	3.215	1.052	1.19		446	2.9		11541	1410	10131			35270.26	59670.59	0.373	12.2
5/12/2014														-34530.7	25139.92		
5/13/2014	3.11	3.255	1.048	1.39		456	2.4		12343	545	11798			38337.35	63477.27	0.397	13.0
5/19/2014														-36807.8	26669.46		
5/20/2014	3.10	3.260	1.053	1.24		440	1.7		9413	712	8701			29141.86	55811.32	0.349	11.4
5/26/2014														-16811.6	38999.7		
5/27/2014	1.91	2.012	1.055	1.28		431	3.4		10694	1290	9404			20394.62	59394.32	0.371	12.2
6/2/2014														-32188.9	27205.38		
6/3/2014	3.32	3.460	1.041	1.41		439	4.2		12800	801	11999			42543.71	69749.09	0.436	14.3
6/9/2014														-23168	46581.09		
6/10/2014	1.94	2.030	1.048	1.25		421	7.4		10400	1882	8518			20145.04	66726.13	0.417	13.7
6/16/2014														-27518.4	39207.73		
6/17/2014	2.77	2.905	1.047	1.19		406	2.7		10400	950	9450			28855.78	68063.51	0.426	14.0
6/23/2014														-8621.6	59441.91		
6/24/2014	0.89	0.930	1.042	1.23		407	4.3		11000	1680	9320			9817.658	69259.57	0.433	14.2
6/30/2014														-31999	37260.57		
7/1/2014	3.29	3.395	1.032	1.41		400	2.1		7410	1246	6164			24376.89	61637.45	0.385	12.6
7/7/2014														-20696.1	40941.32		
7/8/2014	2.80	2.865	1.023	1.60		399	1.6		5540	860	4680			15515.25	56456.57	0.353	11.6
7/14/2014														-11685.9	44770.64		
7/15/2014	2.11	2.160	1.024	1.70		418	3.0		5580	510	5070			11770.31	56540.95	0.354	11.6
7/17/2014														0	56540.95		
7/21/2014														0	56540.95		
7/22/2014	2.55	2.610	1.023	1.83		430	1.2		5530	650	4880			14108.8	70649.75	0.442	14.5
7/28/2014														-17585.4	53064.35		
7/29/2014	2.42	2.470	1.020	1.79		424	1.7		4590	640	3950			11115	64179.35	0.401	13.2
8/4/2014														-11429.1	52750.25		
8/5/2014	2.62	2.670	1.020	1.81		443	2.2		4480	330	4150			11727.06	64477.31	0.403	13.2
8/11/2014														-10684.8	53792.51		
8/12/2014	3.61	3.688	1.021	1.80		453	1.9		4660	370	4290			16832.6	70625.1	0.442	14.5
8/18/2014														-2241.9	68383.2		
8/19/2014														0	68383.2		
8/25/2014														0	68383.2		
8/26/2014														0	68383.2		
9/1/2014														0	68383.2		

Job No.	**3775-01**
Test No.	**B-10**
Sample	**WOS-MC**
Feed Size	**80%-6.3mm**
Agglomeration	**Yes**

Ore Charge, kgs	
Initial (Wet)	15.99
Initial (Dry)	15.90
Finalwt, kg	15.48
Weight loss, kg	0.42
Weight Loss %	2.64

Head Analyses	
Au, g/mt	4.04
Ag, g/mt	69.4
Fe, %	3.05
S=, %	2.93
As, ppm	2710
Cu, ppm	85.1
Zn, ppm	215

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	2.48	2.41	%
S=, %	2.29 [1]	2.23	%
As, ppm	1505*		ppm
Cu, ppm	31.9*		ppm
Zn, ppm	58*		ppm

* BRT Residue analysis, [1] Used average of Bottle Roll & Column Leach Tails

Daily Column Biooxidation Data,WOS-MC, 80%-6.3mm

Solution Applied

Date	Days	Total Vol. liters	D.I. Water liters	H_2SO_4 grams	Inoculum Culture No.	Inoculum Volume liters	Inoculum Free Acid, g/L	Inoculum Redox mv (Ag/AgCl)	Inoculum pH	Inoculum Specific Gravity	Inoculum Fe, mg/l total	Inoculum Fe, mg/l 2+	Inoculum Fe, mg/l 3+	Recycle Effluent, liters
9/2/2014	176	0.53												0.530
9/8/2014	182	Rest												
9/9/2014	183	1.06	1.000											0.060
9/15/2014	189	Rest												
9/16/2014	190	1.06												1.060
9/22/2014	196	Rest												
9/23/2014	197	1.06	0.420											0.640
9/29/2014	203	Rest												
9/30/2014	204	1.06	0.032											1.028
10/6/2014	210	Rest												
10/7/2014	211	Ponded												
10/13/2014	217	Rest												
10/14/2014	218	Ponded/No Application												0.093
10/20/2014	224	Rest												
10/21/2014	225	0.62	0.770											0.300
10/27/2014	231	Rest												
10/28/2014	232													
10/31/2014	235	Drain Down												

Effluent Solution

Date	Days	Volume liters	Weight kg	Specific Gravity	pH	Free Acid, g/L	Redox mV (Ag/AgCl)	D.O. mg/l	Temp °C	Fe, mg/l total	Fe, mg/l 2+	Fe, mg/l 3+	Cu mg/L	As mg/L	Fe Extraction mg	Fe Extraction Cum. mg	Fe Extraction Cum. pct.	Fe Extraction Est. Pct. of Total
9/2/2014	176	1.42	1.450	1.021	1.81		518	1.5		5080	10	5070			7214.496	75597.7	0.473	15.5
9/8/2014	182														-304.8	75292.9		
9/9/2014	183	0.19	0.190	1.021	1.47		446	2.7		5300	320	4980			986.288	76279.18	0.477	15.6
9/15/2014	189														-5618	70661.18		
9/16/2014	190	1.28	1.308	1.019	1.71		464	3.3		5580	70	5510			7162.552	77823.74	0.487	16.0
9/22/2014	196														-3571.2	74252.54		
9/23/2014	197	0.77	0.780	1.019	1.70		460	3.5		5110	40	5070			3911.482	78164.02	0.489	16.0
9/29/2014	203														-5253.08	72910.94		
9/30/2014	204	1.00	1.150	1.150	1.64		452	3.0		4390	250	4140			4390	77300.94	0.483	15.9
10/6/2014	210														0	77300.94		
10/7/2014	211														0	77300.94		
10/13/2014	217														0	80318.86		
10/14/2014	218	0.22	0.224	1.019	1.73		563	6.2		4770	10	4760			1048.557	81367.42	0.509	16.7
10/20/2014	224														-1431	76918.5		
10/21/2014	225	0.32	0.330	1.018	1.73		574	3.9		4710	15	4695			1526.817	78445.31	0.491	16.1
10/27/2014	231														0	78445.31		
10/28/2014	232	0.12	0.126	1.018	1.72		539	3.8		4590	15	4575			568.1139	79013.43	0.494	16.2
10/31/2014	235														0	79013.43	0.49	16.1

Extracted, %, Fe	**0.49**	**16.9**
Tail Analysis, % Fe	**2.41**	
Calculated head, % Fe	**2.90**	

Job No.	**3775-01**
Test No.	**B-11**
Sample	**WOS-MC**
Feed Size	**80%-12.5mm**
Agglomeration	**Yes**

Ore Charge, kgs		
Initial (Wet)		16.01
Initial (Dry)		15.91
Sac Split	Date	
1	4/21	14.82
2	5/19	13.64
3	6/16	12.55
4	7/14	11.48
5	8/11	10.41
6	9/8	9.36
7	10/6	8.34
8		
9		
10	Loss	0.49

Finalwt, kg	15.42
Weight loss, kg	0.49
Weight Loss %	3.09

Head Analyses	
Au, g/mt	4.04
Ag, g/mt	69.4
Fe, %	3.05
S=, %	2.93
As, ppm	2710
Cu, ppm	85.1
Zn, ppm	215

Tail Analyses	Actual		Adjusted	
Au, g/mt				g/mt ore
Ag, g/mt				g/mt ore
Fe, %	2.54		2.46	%
S=, %	2.20	1)	2.14	%
As, ppm	1000		1000	ppm
Cu, ppm	57.3		57.3	ppm
Zn, ppm	130.0		130.0	ppm

Bottle Roll Test Residue analysis

Daily Column Biooxidation Data,WOS-MC, 80%-12.5mm

		Solution Applied												Recycle	Effluent Solution													Fe Extraction			
			D.I.			Inoculum														Redox											
		Total Vol.	Water	H_2SO_4	Culture	Volume	Free	Redox		Specific	Fe, mg/l			Effluent,	Volume	Weight	Specific		Free	mV	D.O.	Temp	Fe, mg/l			Cu	As		Cum.	Cum.	Est. Pct.
Date	Days	liters	liters	grams	No.	liters	Acid, g/L	mv (Ag/AgCl)	pH	Gravity	total	2+	3+	liters	liters	kg	Gravity	pH	Acid, g/L	(Ag/AgCl)	mg/l	°C	total	2+	3+	mg/L	mg/L	mg	mg	pct.	of Total
3/10/2014	0					1.28		669	1.81		4299.4	6.4	4293																		
3/11/2014	1	0.53			4	0.53	0.54	610	1.95	1.008	1819.6	3.6	1816															-5508.82	-5508.82	-0.035	-1.1
3/12/2014	2	0.53			4	0.53	0.29	613	1.95	1.004	1224.6	3.5	1221															-964.388	-6473.21	-0.041	-1.3
3/13/2014	3	0.53			4	0.53	0.25	575	1.95	1.003	810.4	2.9	808															-649.038	-7122.25	-0.045	-1.5
3/14/2014	4	0.77		0.2	4						587.8	2.2	586	0.774	0.88	0.895	1.021	2.02		380	6.4		4195	2	4193			3247.79	-3874.46	-0.024	-0.8
3/15/2014	5	0.71		0.1	4						604.6	2.2	602	0.706	0.84	0.850	1.012	2.04		397	6.8		3103	2	3101			2606.275	-1268.18	-0.008	-0.3
3/16/2014	6	Rest																										0	-1268.18		
3/17/2014	7	Rest																										0	-1268.18		
3/18/2014	8	0.53		0.2	4	0.035					1210	8	1203	0.495	0.61	0.615	1.015	2.07		397	7.3		3120	290	2830			1890.443	622.2605	0.004	0.1
3/19/2014	9	0.53			4	0.293					1200	2	1198	0.238	0.32	0.330	1.018	2.06		387	8.2		3030	710	2320			-49.17	573.0905	0.004	0.1
3/20/2014	10	0.53			4	0.214					1160	2	1158	0.317	0.43	0.435	1.017	2.05		397	7.1		3690	710	2980			-48.9114	524.1791	0.003	0.1
3/21/2014	11	0.53			4	0.109					2710	6	2704	0.421	0.55	0.560	1.016	1.84		402	7.1		3650	800	2850			534.801	1058.98	0.007	0.2
3/22/2014	12	0.53			4	0.198					4330	3	4327	0.333	0.45	0.460	1.016	1.80		398	7.5		3490	770	2720			1284.728	2343.708	0.015	0.5
3/23/2014	13	Rest																										-857.34	1486.368		
3/24/2014	14	Rest																										0	1486.368		
3/25/2014	15	1.06			4	0.463					3182	3	3180	0.601	0.71	0.725	1.015	1.80		400	6.8		3210	640	2570			2292.857	3779.225	0.024	0.8
3/27/2014	17	1.59			4	0.904					3061	2	3059	0.689	0.81	0.820	1.016	1.69		404	7.7		3630	640	2990			1456.458	5235.684	0.033	1.1
3/30/2014	20	Rest																										-2767.14	2468.54		
3/31/2014	21	Rest																										0	2468.54		
4/1/2014	22	1.59			4									1.589	1.76	1.785	1.016	1.60		420	6.9		3720	660	3060			6535.63	9004.17	0.057	1.9
4/4/2014	25	1.59			4	0.235					1457	2	1455	1.355	1.48	1.510	1.017	1.52		437	6.0		3770	560	3210			5597.542	14601.71	0.092	3.0
4/7/2014	28	Rest																										-6020.02	8581.697		
4/8/2014	29	1.59			4	0.084					1288	27	1261	1.506	1.62	1.655	1.021	1.46		455	2.5		4542	61	4481			7363.048	15944.74	0.100	3.3
4/11/2014	32	1.59			4	0.297					709	2	707	1.293	1.42	1.460	1.027	1.40		450	2.0		6608	470	6138			9285.849	25230.59	0.159	5.2
4/14/2014	35	Rest																										-10479.4	14751.19		
4/15/2014	36	1.59			4	0.036					1552	2	1550	1.554	1.67	1.725	1.035	1.39		476	2.1		8481	93	8388			14135	28886.19	0.182	6.0
4/18/2014	39	1.59			4	0.308					1601	2	1599	1.282	1.41	1.465	1.039	1.29		468	2.8		9343	67	9276			13117.85	42004.04	0.264	8.7
4/21/2014	42	Rest																										-15339.1	26664.9		
4/22/2014	43	1.59			4	0.001					901	8	893	1.589	1.71	1.775	1.037	1.33		479	1.1		7058	275	6783			12080.95	**-3258.18**	**0.242**	7.9
4/25/2014	46	1.59			4	0.470					2398	20	2378	1.120	1.25	1.305	1.043	1.38		482	2.9		11324	364	10960			14167.67	10909.49	0.338	11.1
4/28/2014	49	Rest																										-17320.4	-6410.89		
4/29/2014	50	1.59			4	0.160					2549	3	2546	1.430	1.56	1.625	1.044	1.24		472	2.6		10088	580	9508			15702.11	9291.217	0.327	10.7
5/5/2014	56	Rest																										-30278.4	-20987.2		
5/6/2014	57	3.18	0.219											2.961	3.09	3.205	1.036	1.26		466	2.7		8190	470	7720			25336.82	4349.634	0.293	9.6
5/12/2014	63	Rest																										-23841.1	-19491.5		
5/13/2014	64	3.18	0.269											2.911	3.03	3.155	1.041	1.36		474	2.8		10069	310	9759			30516.15	11024.7	0.338	11.1
5/19/2014	70	Rest																										-29652.9	-18628.2		
5/20/2014	71	3.18	0.235											2.945	3.06	3.190	1.041	1.27		453	3.9		7155	507	6648			21925.5	**-7727.35**	**0.282**	9.2
5/26/2014	77	Rest																										-19354.3	-27081.6		
5/27/2014	78	3.18	0.475											2.705	2.82	2.940	1.041	1.24		439	4.2		8973	840	8133			25341.61	-1740.01	0.326	10.7
6/2/2014	84	Rest																										-26111.4	-27851.4		
6/3/2014	85	3.18	0.270											2.910	3.03	3.155	1.040	1.43		442	2.8		11600	602	10998			35190.38	7338.946	0.392	12.9
6/9/2014	91	Rest																										-3329.2	4009.746		
6/11/2014	93	2.65	2.360											0.287	0.42	0.436	1.046	1.36		450	3.2		9200	874	8326			3834.799	7844.545	0.396	13.0
6/16/2014	98	Rest																										-17139.6	-9295.05		
6/17/2014	99	3.18	1.317											1.863	1.99	2.055	1.034	1.27		426	4.0		7700	570	7130			15303.19	**-1836.41**	**0.381**	12.5
6/23/2014	105	Rest																										-13706	-15542.4		
6/24/2014	106	3.18	1.400											1.780	1.84	1.875	1.018	1.42		438	6.3		4870	510	4360			8969.794	-6572.61		0.0
6/29/2014	111	Ponded																										0	-6572.61		
6/30/2014	112	Rest																										0	-6572.61		
7/1/2014	113	3.18	1.199											1.981	2.05	2.085	1.016	1.59		411	3.9		3890	985	2905			7982.923	1410.308	0.407	13.4
7/7/2014	119	Rest																										-7352.1	-5941.79		
7/8/2014	120	3.18	1.290											1.890	1.97	1.995	1.014	1.64		412	1.8		3240	360	2880			6374.556	432.7646	0.399	13.1
7/14/2014	126	Rest																										-6997.63	-6564.87		
7/15/2014	127	3.25	1.091											2.160	2.16	2.190	1.014	1.56		418	2.1		3500	430	3070			7559.172	**561.5385**	**0.404**	13.3
7/21/2014	133	Rest																										-5141.5	-4579.96		
7/22/2014	134	3.18	1.711											1.469	1.59	1.615	1.014	1.75		443	1.0		3560	330	3230			5670.02	1090.058	0.409	13.4
7/28/2014	140	Rest																										-8255.64	-7165.58		
7/29/2014	141	3.18	0.861											2.319	2.43	2.455	1.009	1.80		424	3.0		2380	150	2230			5790.783	-1374.8	0.387	12.7
8/4/2014	147	Rest																										-5421.64	-6796.44		
8/5/2014	148	3.18	0.902											2.278	2.41	2.435	1.012	1.60		449	2.9		3490	220	3270			8397.381	1600.943	0.413	13.6

Job No.	**3775-01**
Test No.	**B-11**
Sample	**WOS-MC**
Feed Size	**80%-12.5mm**
Agglomeration	**Yes**

Ore Charge, kgs		
Initial (Wet)		16.01
Initial (Dry)		15.91
Sac Split	Date	
1	4/21	14.82
2	5/19	13.64
3	6/16	12.55
4	7/14	11.48
5	8/11	10.41
6	9/8	9.36
7	10/6	8.34
8		
9		
10	Loss	0.49

Finalwt, kg	15.42
Weight loss, kg	0.49
Weight Loss %	3.09

Head Analyses	
Au, g/mt	4.04
Ag, g/mt	69.4
Fe, %	3.05
S=, %	2.93
As, ppm	2710
Cu, ppm	85.1
Zn, ppm	215

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	2.54	2.46	%
S=, %	2.20 [1)]	2.14	%
As, ppm	1000	1000	ppm
Cu, ppm	57.3	57.3	ppm
Zn, ppm	130.0	130.0	ppm

Bottle Roll Test Residue analysis

Daily Column Biooxidation Data,WOS-MC, 80%-12.5mm

Solution Applied

Date	Days	Total Vol. liters	D.I. Water liters	H_2SO_4 grams	Inoculum Culture No.	Inoculum Volume liters	Inoculum Free Acid, g/L	Inoculum Redox mv (Ag/AgCl)	Inoculum pH	Inoculum Specific Gravity	Inoculum Fe, mg/l total	Inoculum Fe, mg/l 2+	Inoculum Fe, mg/l 3+	Recycle Effluent, liters
8/11/2014	154	Rest												
8/12/2014	155	3.18	0.717		4	0.795					2820	4	2816	1.668
8/18/2014	161	Rest												
8/19/2014	162	3.18	0.360											2.820
8/25/2014	168	Rest												
8/26/2014	169	3.18	0.263											2.917
9/1/2014	175	Rest												
9/2/2014	176	3.18	0.319											2.861
9/8/2014	182	Rest												
9/9/2014	183	3.18	0.270											2.910
9/15/2014	189	Rest												
9/16/2014	190	3.18	1.374											1.806
9/22/2014	196	Rest												
9/23/2014	197	3.18	0.590											2.590
9/29/2014	203	Rest												
9/30/2014	204	3.18	0.218											2.962
10/6/2014	210	Rest												
10/7/2014	211	3.18	0.414											2.766
10/13/2014	217	Rest												
10/14/2014	218	3.18	1.055											2.125
10/20/2014	224	Rest												
10/21/2014	225	3.18	0.200											2.980
10/27/2014	231	Rest												
10/28/2014	232													
10/30/2014	234	Drain Down												
10/31/2014	235													

Effluent Solution

Date	Days	Volume liters	Weight kg	Specific Gravity	pH	Free Acid, g/L	Redox mV (Ag/AgCl)	D.O. mg/l	Temp °C	Fe, mg/l total	Fe, mg/l 2+	Fe, mg/l 3+	Cu mg/L	As mg/L	Fe Extraction mg	Fe Extraction Cum. mg	Cum. pct.	Est. Pct. of Total
8/11/2014	154														-5821.32	-4220.38		
8/12/2014	155	1.79	1.812	1.013	1.76		469	2.7		2910	210	2700			5205.252	**-616.068**	**0.407**	13.4
8/18/2014	161														-10448.1	-11064.2		
8/19/2014	162	2.95	2.985	1.012	1.63		465	5.0		2430	30	2400			7167.54	-3896.63	0.376	12.3
8/25/2014	168														-7088.31	-10984.9		
8/26/2014	169	3.04	3.080	1.012	1.69		466	2.4		3460	190	3270			10530.43	-454.504	0.409	13.4
9/1/2014	175														-9899.06	-10353.6		
9/2/2014	176	2.99	3.030	1.013	1.63		470	2.5		4070	140	3930			12173.84	1820.276	0.431	14.1
9/8/2014	182														-11843.7	-10023.4		
9/9/2014	183	3.03	3.080	1.016	1.45		468	3.2		4480	170	4310			13581.1	**1737.402**	**0.449**	14.7
9/15/2014	189														-8090.88	-6353.48		
9/16/2014	190	1.93	1.962	1.016	1.63		473	3.6		5160	30	5130			9964.488	3611.011	0.469	15.4
9/22/2014	196														-13364.4	-9753.39		
9/23/2014	197	2.71	2.745	1.012	1.64		472	3.3		4100	100	4000			11121.05	1367.658	0.445	14.6
9/29/2014	203														-12144.2	-10776.5		
9/30/2014	204	3.08	3.115	1.013	1.61		475	3.8		4110	150	3960			12638.35	1861.809	0.451	14.8
10/6/2014	210														-11368.3	-9506.45		
10/7/2014	211	2.87	2.920	1.016	1.68		484	5.3		3510	150	3360			10087.8	**-1280.46**	**0.435**	14.3
10/13/2014	217														-7458.75	-8739.21		
10/14/2014	218	2.24	2.276	1.014	1.57		487	5.9		4510	90	4420			10123.04	1383.823	0.467	15.3
10/20/2014	224														-13439.8	-12056		
10/21/2014	225	3.11	3.146	1.013	1.62		510	1.2		3810	10	3800			11832.44	-223.539	0.448	14.7
10/27/2014	231														0	-223.539		
10/28/2014	232	3.05	3.090	1.014	1.62		516	2.4		11600	10	11590			35349.11	35125.57	0.87	28.5
10/30/2014	234														0	35125.57		
10/31/2014	235	0.02	0.025	1.014	1.56		557	2.4		4610	10	4600			113.6588	35239.23	0.87	28.5

Extracted, %, Fe	**0.87**	**26.1**
Tail Analysis, % Fe	**2.46**	
Calculated head, % Fe	**3.33**	

Mr. Glen Van Treek / **Paramount Gold and Silver Corp.**
MLI Job No. 3775

Job No.	**3775-01**
Test No.	**B-12**
Sample	**WOS-MC**
Feed Size	**80%-6.3mm**
Agglomeration	**Yes**

Ore Charge, kgs		
Initial (Wet)		16.09
Initial (Dry)		15.97
Sac Split	Date	
1	4/21	14.89
2	5/19	13.81
3	6/16	12.78
4	7/14	11.76
5	8/11	10.76
6	9/8	9.76
7	10/6	8.76
8		
9		
10	Loss	0.49

Finalwt, kg	15.48
Weight loss, kg	0.49
Weight Loss %	3.08

Head Analyses	
Au, g/mt	4.04
Ag, g/mt	69.4
Fe, %	3.05
S=, %	2.93
As, ppm	2710
Cu, ppm	85.1
Zn, ppm	215

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	2.39	2.32	%
S=, %	2.24 [1]	2.18	%
As, ppm	904	904	ppm
Cu, ppm	43.1	43.1	ppm
Zn, ppm	125.5	125.5	ppm

Bottle Roll Test Residue analysis

Daily Column Biooxidation Data,WOS-MC, 80%-6.3mm

Date	Days	Solution Applied: Total Vol. liters	D.I. Water liters	H_2SO_4 grams	Inoculum: Culture No.	Inoculum: Volume liters	Inoculum: Free Acid, g/L	Inoculum: Redox mv (Ag/AgCl)	Inoculum: pH	Inoculum: Specific Gravity	Inoculum: Fe, mg/l total	Inoculum: Fe, mg/l 2+	Inoculum: Fe, mg/l 3+	Recycle Effluent, liters	Effluent Solution: Volume liters	Weight kg	Specific Gravity	pH	Free Acid, g/L	Redox mV (Ag/AgCl)	D.O. mg/l	Temp °C	Fe, mg/l total	Fe, mg/l 2+	Fe, mg/l 3+	Cu mg/L	As mg/L	Fe Extraction: mg	Cum. mg	Cum. pct.	Est. Pct. of Total
3/10/2014	0					1.44		669	1.81		4299.4	6.4	4293																		
3/11/2014	1	0.53			4	0.53	0.54	610	1.95	1.008	1819.6	3.6	1816															-6175.658	-6175.658	-0.039	-1.3
3/12/2014	2	0.53			4	0.53	0.29	613	1.95	1.004	1224.6	3.5	1221															-964.388	-7140.046	-0.045	-1.5
3/13/2014	3	0.53			4	0.53	0.25	575	1.95	1.003	810.4	2.9	808															-649.038	-7789.084	-0.049	-1.6
3/14/2014	4	0.52		0.4	4	0.120					587.8	2.2	586	0.401	0.51	0.515	1.002	2.10		372	6.8		4474	1	4473			1869.999	-5919.085	-0.037	-1.2
3/15/2014	5	0.53		0.2	4	0.484					604.6	2.2	602	0.047	0.16	0.165	1.021	2.09		376	9.2		4009	1	4008			577.3435	-5341.742	-0.033	-1.1
3/16/2014	6	Rest																										-292.6264	-5634.368		
3/17/2014	7	Rest																										0	-5634.368		
3/18/2014	8	0.53			4	0.530					1210	8	1203		0.11	0.115	1.021	2.28		379	7.6		3680	289	3391			414.4956	-5219.872	-0.033	-1.1
3/19/2014	9	0.53			4	0.345					1200	2	1198	0.186	0.30	0.310	1.021	2.29		378	7.7		3220	840	2380			-973.711	-6193.584	-0.039	-1.3
3/20/2014	10	0.53		0.1	4	0.175					1160	2	1158	0.356	0.47	0.475	1.017	2.32		387	7.4		3410	690	2720			-167.2855	-6360.869	-0.040	-1.3
3/21/2014	11	0.53			4	0.112					2710	6	2704	0.418	0.53	0.540	1.014	2.06		395	7.3		2850	660	2190			114.4315	-6246.437	-0.039	-1.3
3/22/2014	12	0.53			4	0.178					4330	3	4327	0.352	0.48	0.485	1.016	1.90		400	7.6		2720	470	2250			994.9052	-5251.532	-0.033	-1.1
3/23/2014	13	Rest																										-770.74	-6022.272		
3/24/2014	14	Rest																										0	-6022.272		
3/25/2014	15	1.06			4	0.382					3182	3	3180	0.682	0.80	0.805	1.012	1.74		407	6.4		3000	490	2510			2386.364	-3635.909	-0.023	-0.7
3/27/2014	17	1.59			4	0.987					3061	2	3059	0.606	0.72	0.730	1.014	1.59		413	7.6		3680	600	3080			1433.786	-2202.123	-0.014	-0.5
3/30/2014	20	Rest																										-3021.207	-5223.33		
3/31/2014	21	Rest																										0	-5223.33		
4/1/2014	22	1.59			4									1.589	1.79	1.825	1.020	1.48		426	6.9		4980	670	4310			8910.294	3686.9641	0.023	0.8
4/4/2014	25	1.59			4	0.217					1457	2	1455	1.373	1.50	1.530	1.021	1.42		444	2.6		4630	540	4090			6938.198	10625.162	0.067	2.2
4/7/2014	28	Rest																										-7117.639	3507.523		
4/8/2014	29	1.59			4	0.121					1288	27	1261	1.469	1.59	1.635	1.031	1.40		457	2.0		5673	71	5602			8996.147	12503.67	0.078	2.6
4/11/2014	32	1.59			4	0.402					709	2	707	1.188	1.31	1.360	1.037	1.30		452	3.1		9778	680	9098			12667.76	25171.429	0.158	5.2
4/14/2014	35	Rest																										-15480.03	9691.399		
4/15/2014	36	1.59			4	0.036					1552	2	1550	1.554	1.67	1.750	1.045	1.31		470	1.9		11243	90	11153			18827.99	28519.389	0.179	5.9
4/18/2014	39	1.59			4	0.312					1601	2	1599	1.278	1.40	1.460	1.044	1.21		457	3.4		11748	72	11676			16373.32	44892.713	0.281	9.2
4/21/2014	42	Rest																										-19178.83	25713.881		
4/22/2014	43	1.59			4									1.590	1.72	1.800	1.047	1.22		460	1.6		9277	700	8577			15949	**-3229.835**	**0.259**	8.5
4/25/2014	46	1.59			4	0.502					2398	20	2378	1.088	1.22	1.280	1.051	1.18		463	3.8		15054	481	14573			18334.08	15104.247	0.383	12.5
4/28/2014	49	Rest																										-22731.02	-7626.769		
4/29/2014	50	1.59			4	0.160					2549	3	2546	1.430	1.56	1.645	1.056	1.14		460	2.8		12067	790	11277			18797.55	11170.783	0.356	11.7
5/5/2014	56	Rest																										-33712.76	-22541.98		
5/6/2014	57	3.18	0.420											2.760	2.89	3.040	1.052	1.18		449	3.7		11042	960	10082			31908.44	9366.4641	0.344	11.3
5/12/2014	63	Rest																										-33324.76	-23958.29		
5/13/2014	64	3.18	0.162											3.018	3.14	3.270	1.041	1.29		457	2.4		11645	508	11137			36577.98	12619.689	0.366	12.0
5/19/2014	70	Rest																										-34293.2	-21673.51		
5/20/2014	71	3.18	0.235											2.945	3.12	3.270	1.049	1.22		440	2.4		7691	772	6919			23974.8	**-10318.4**	**0.291**	9.5
5/26/2014	77	Rest																										-21142.56	-31460.95		
5/27/2014	78	3.18	0.431											2.749	2.87	3.010	1.050	1.18		429	3.3		9268	1280	7988			26568.27	-4892.688	0.330	10.8
6/2/2014	84	Rest																										-27896.68	-32789.37		
6/3/2014	85	3.18	0.170											3.010	3.13	3.270	1.044	1.35		429	2.2		13400	761	12639			41971.26	9181.8969	0.432	14.2
6/9/2014	91	Rest																										-12569.2	-3387.303		
6/11/2014	93	2.65	1.710											0.938	1.07	1.122	1.050	1.30		434	3.7		10600	1601	8999			11326.86	7939.554	0.423	13.9
6/16/2014	98	Rest																										-23818.2	-15878.65		
6/17/2014	99	3.18	0.933											2.247	2.37	2.475	1.043	1.21		423	3.4		10500	770	9730			24916.11	**1097.9074**	**0.432**	14.2
6/23/2014	105	Rest																										-25620	-24522.09		
6/24/2014	106	3.18	0.740											2.440	2.43	2.505	1.029	1.34		433	4.6		8060	670	7390			19621.28	-4900.81	0.385	12.6
6/30/2014	112	Rest																										-15757.3	-20658.11		
7/1/2014	113	3.18	1.225											1.955	1.98	2.040	1.029	1.56		414	4.6		5430	985	4445			10765.01	-9893.095	0.346	11.3
7/7/2014	119	Rest																										-10132.38	-20025.48		
7/8/2014	120	3.18	1.314											1.866	1.89	1.950	1.030	1.58		425	0.9		5810	640	5170			10999.51	-9025.961	0.353	11.6
7/14/2014	126	Rest																										-14157.64	-23183.6		
7/15/2014	127	3.18	0.748											2.437	2.44	2.505	1.028	1.57		439	2.4		6640	310	6330			16180.16	**2022.5195**	**0.370**	12.1
7/21/2014	133	Rest																										-13691.68	-11669.16		
7/22/2014	134	3.18	1.118											2.062	2.19	2.255	1.032	1.60		435	1.1		6740	620	6120			14727.42	3058.2619	0.379	12.4
7/28/2014	140	Rest																										-14625.8	-11567.54		
7/29/2014	141	3.18	1.010											2.170	2.30	2.355	1.025	1.64		441	2.9		5390	500	4890			12383.85	816.31559	0.360	11.8
8/4/2014	147	Rest																										-11453.75	-10637.43		
8/5/2014	148	3.18	1.055											2.125	2.26	2.325	1.028	1.50		435	3.5		7000	570	6430			15831.71	5194.2777	0.397	13.0
8/11/2014	154	Rest																										-11907	-6712.722		
8/12/2014	155	2.50			4	0.795					2820	4	2816	1.701	2.58	2.648	1.026	1.67		449	3.0		5120	450	4670			13214.19	**1307.191**	**0.409**	13.4

Job No.	**3775-01**
Test No.	**B-12**
Sample	**WOS-MC**
Feed Size	**80%-6.3mm**
Agglomeration	**Yes**

Ore Charge, kgs		
Initial (Wet)		16.09
Initial (Dry)		15.97
Sac Split	Date	
1	4/21	14.89
2	5/19	13.81
3	6/16	12.78
4	7/14	11.76
5	8/11	10.76
6	9/8	9.76
7	10/6	8.76
8		
9		
10	Loss	0.49

Finalwt, kg	15.48
Weight loss, kg	0.49
Weight Loss %	3.08

Head Analyses	
Au, g/mt	4.04
Ag, g/mt	69.4
Fe, %	3.05
S=, %	2.93
As, ppm	2710
Cu, ppm	85.1
Zn, ppm	215

Tail Analyses	Actual	Adjusted	
Au, g/mt			g/mt ore
Ag, g/mt			g/mt ore
Fe, %	2.39	2.32	%
S=, %	2.24 [1)]	2.18	%
As, ppm	904	904	ppm
Cu, ppm	43.1	43.1	ppm
Zn, ppm	125.5	125.5	ppm

Bottle Roll Test Residue analysis

Daily Column Biooxidation Data,WOS-MC, 80%-6.3mm

Solution Applied

Date	Days	Total Vol. liters	D.I. Water liters	H_2SO_4 grams	Inoculum Culture No.	Inoculum Volume liters	Inoculum Free Acid, g/L	Inoculum Redox mv (Ag/AgCl)	Inoculum pH	Inoculum Specific Gravity	Inoculum Fe, mg/l total	Inoculum Fe, mg/l 2+	Inoculum Fe, mg/l 3+	Recycle Effluent, liters
8/18/2014	161	Rest												
8/19/2014	162	3.18	0.954											2.226
8/25/2014	168	Rest												
8/26/2014	169	3.18	0.675											2.505
9/1/2014	175	Rest												
9/2/2014	176	0.53												0.530
9/8/2014	182	Rest												
9/9/2014	183	1.06	0.520											0.540
9/15/2014	189	Rest												
9/16/2014	190	1.06	0.394											0.666
9/22/2014	196	Rest												
9/23/2014	197	1.06	0.980											0.080
9/29/2014	203	Rest												
9/30/2014	204	1.06	0.626											0.434
10/6/2014	210	Rest												
10/7/2014	211	1.06	0.417											0.643
10/13/2014	217	Rest												
10/14/2014	218	1.06	0.471											0.589
10/20/2014	224	Rest												
10/21/2014	225	1.06	0.660											0.400
10/27/2014	231	Rest												
10/28/2014	232													
10/30/2014	234	Drain Down												
10/31/2014	235													

Effluent Solution / Fe Extraction

Date	Volume liters	Weight kg	Specific Gravity	pH	Free Acid, g/L	Redox mV (Ag/AgCl)	D.O. mg/l	Temp °C	Fe, mg/l total	Fe, mg/l 2+	Fe, mg/l 3+	Cu mg/L	As mg/L	Fe Extraction mg	Cum. mg	Cum. pct.	Est. Pct. of Total
8/18/2014														-13639.02	-12331.83		
8/19/2014	2.36	2.420	1.025	1.58		461	5.3		4390	210	4180			10364.68	-1967.146	0.379	12.4
8/25/2014														-10996.95	-12964.1		
8/26/2014	2.64	2.700	1.022	1.63		458	3.6		5580	260	5320			14741.68	1777.5869	0.413	13.6
9/1/2014														-2957.4	-1179.813		
9/2/2014	2.41	2.475	1.028	1.60		470	2.5		6720	40	6680			16178.99	14999.175	0.536	17.6
9/8/2014														-3628.8	11370.375		
9/9/2014	0.66	0.680	1.032	1.39		452	2.5		8230	380	7850			5422.868	**1794.0682**	**0.555**	18.2
9/15/2014														-5481.18	-3687.112		
9/16/2014	0.79	0.822	1.044	1.54		476	3.0		11700	110	11590			9212.069	5524.9572	0.593	19.4
9/22/2014														-936	4588.9572		
9/23/2014	0.19	0.210	1.085	1.40		463	3.2		20900	900	20000			4045.161	8634.1185	0.625	20.5
9/29/2014														-9070.6	-436.4815		
9/30/2014	0.66	0.685	1.038	1.47		444	3.5		9230	680	8550			6091.089	5654.6071	0.594	19.5
10/6/2014														-5934.89	-280.2829		
10/7/2014	0.75	0.775	1.030	1.60		475	5.2		6680	420	6260			5026.214	**-908.6764**	**0.584**	19.1
10/13/2014														-3934.52	-4843.196		
10/14/2014	0.71	0.734	1.036	1.52		498	5.3		8420	120	8300			5965.521	1122.3248	0.607	19.9
10/20/2014														-3368	-2245.675		
10/21/2014	0.52	0.546	1.047	1.40		481	3.5		11100	100	11000			5788.539	3542.8635	0.635	20.8
10/27/2014														0	3542.8635		
10/28/2014	0.71	0.748	1.048	1.44		495	4.2		11600	45	11555			8279.389	11822.253	0.729	23.9
10/30/2014														0	11822.253		
10/31/2014	0.02	0.020	1.048	1.52		567	4.2		7070	25	7045			134.9237	11957.176	0.73	23.9

Extracted, %, Fe	**0.73**	**23.9**
Tail Analysis, % Fe	**2.32**	
Calculated head, % Fe	**3.05**	

APPENDIX

Section 7 - Bottle Roll Test Data

Bottle Roll Test

Project No.	**3775-01**
Test No.	**CY-1**
Composite	**WWS-13-MC**
Feed Size	**80%-12.5mm**
Biooxidation Test	**Baseline**
Biooxidation Time	**0**
Estimated Oxidation	**0.0**

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	2.450	7.8	3.17
Duplicate	2.680	7.6	3.51
Triplicate	2.790	8.5	3.40
Average	2.64	8.0	3.36

Ore Charge 1017.7 g

Solution Vol. 1.5266 L

Final Residue Wt: 1008.9 g

Natural pH 2.9

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.93	4.9	3.83
Duplicate	2.09	5.5	
Triplicate	2.16	5.6	
Average	2.06	5.3	3.83

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.53	1.70	-----	-----	-----	-----	-----
2	100	0.95	10.8	0.18	0.30	0.13	0.28	0.013	0.028	0.095
6	100	0.95	11.0	0.18	0.20	0.14	0.34	0.014	0.034	0.095
24	100	0.85	10.5	0.32	0.50	0.18	0.57	0.018	0.057	0.085
48	100	1.05	11.1	0.03	0.00	0.20	0.84	0.02	0.084	0.105
72	100	0.95	10.5	0.18	0.50	0.21	1.02	0.021	0.102	0.095
96	-----	1.00	11.0	-----	-----	0.20	1.14	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt ore	
Hours	mg	g/mt ore	% of total	mg	g/mt ore	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		1.7
2	0.198	0.195	8.0	0.427	0.420	5.8	0.08	2.0
6	0.227	0.223	9.1	0.547	0.538	7.4	0.16	2.2
24	0.302	0.297	12.2	0.932	0.916	12.5	0.40	2.7
48	0.350	0.344	14.1	1.401	1.377	18.9	0.33	2.7
72	0.386	0.379	15.5	1.760	1.730	23.7	0.40	3.1
96	0.391	0.38	15.6	2.045	2.0	27.4	0.41	3.1

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore	**0.38**	**15.6**	**2.0**	**27.4**
Tail assay, g/mt	**2.06**		**5.3**	
Calculated Head g/mt ore	**2.44**		**7.3**	
NaCN Consumed, kg/mt ore	**0.41**			
Lime Added, kg/mt ore	**3.1**			

Bottle Roll Test

Project No.	**3775-01**
Test No.	**CY-2**
Composite	**WOS-13-MC**
Feed Size	**80%-12.5mm**
Biooxidation Test	**Baseline**
Biooxidation Time	**0**
Estimated Oxidation	**0.0**

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	4.150	68.9	3.08
Duplicate	3.950	65.6	2.59
Triplicate	4.010	73.7	3.11
Average	4.04	69.4	2.93

Ore Charge 980.5 g

Solution Vol. 1.4708 L

Natural pH 3.4

Final Residue Wt 977.7 g

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	3.89	33.7	2.87
Duplicate	3.59	43.0	
Triplicate	3.68	36.0	
Average	3.72	37.6	2.87

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: g/L 1.00

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.47	1.60	-----	-----	-----	-----	-----
2	100	0.95	10.9	0.18	0.20	0.18	2.39	0.018	0.239	0.095
6	100	0.85	10.9	0.31	0.30	0.21	3.25	0.021	0.325	0.085
24	100	0.85	10.5	0.31	0.50	0.24	8.29	0.024	0.829	0.085
48	100	0.90	11.0	0.24	0.00	0.25	15.70	0.025	1.57	0.09
72	100	0.95	10.4	0.17	0.60	0.26	18.20	0.026	1.82	0.095
96	-----	1.00	10.9	-----	-----	0.28	19.50	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt ore	
Hours	mg	g/mt ore	% of total	mg	g/mt ore	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		1.6
2	0.265	0.270	6.3	3.515	3.585	5.0	0.07	1.8
6	0.327	0.333	7.8	5.019	5.119	7.1	0.31	2.1
24	0.392	0.400	9.4	12.757	13.011	18.1	0.54	2.7
48	0.431	0.439	10.3	24.485	24.972	34.8	0.69	2.7
72	0.470	0.480	11.3	29.732	30.323	42.3	0.77	3.3
96	0.526	0.54	12.7	33.464	34.1	47.6	0.77	3.3

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore	**0.54**	**12.7**	**34.1**	**47.6**
Tail assay, g/mt	**3.72**		**37.6**	
Calculated Head g/mt ore	**4.26**		**71.7**	

NaCN Consumed, kg/mt ore	**0.77**
Lime Added, kg/mt ore	**3.3**

Bottle Roll Test

Project No. 3775-01
Test No. CY-3
Composite FSU-13-1
Feed Size 80%-12.5mm
Biooxidation Test Baseline
Biooxidation Time 0
Estimated Oxidation 0.0

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	0.572	3.2	4.33
Duplicate	0.486	2.7	4.73
Triplicate	0.475	2.4	4.66
Average	0.51	2.8	4.57

Ore Charge 1024.7 g
Final Residue Wt 1017.5 g
Solution Vol. 1.5371 L
Natural pH 5.3

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.332	1.7	4.66
Duplicate	0.381	1.9	
Triplicate	0.400	2.1	
Average	0.37	1.9	4.66

Solid Density Wt. % 40.0
Cyanide Conc. Maintained at: g/L 1.00

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.54	1.00	-----	-----	-----	-----	-----
2	100	0.90	10.3	0.25	0.50	0.00	0.06	0	0.006	0.09
6	100	1.00	10.8	0.11	0.30	0.00	0.08	0	0.008	0.1
24	100	0.90	10.4	0.25	0.60	0.01	0.12	0.001	0.012	0.09
48	100	1.00	11.0	0.11	0.00	0.01	0.20	0.001	0.02	0.1
72	100	0.95	10.4	0.18	0.60	0.01	0.15	0.001	0.015	0.095
96	-----	1.00	11.0	-----	-----	0.01	0.16	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt ore	
Hours	mg	g/mt ore	% of total	mg	g/mt ore	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		1.0
2	0.000	0.000	0.0	0.092	0.090	4.1	0.15	1.5
6	0.000	0.000	0.0	0.129	0.126	5.7	0.16	1.8
24	0.015	0.015	3.8	0.198	0.194	8.8	0.32	2.3
48	0.016	0.016	4.1	0.333	0.3	13.6	0.32	2.3
72	0.017	0.017	4.3	0.277	0.3	13.6	0.41	2.9
96	0.018	0.02	5.1	0.307	0.3	13.6	0.42	2.9

	Au	% of Total	Ag	% of Total
Extracted g/mt ore	**0.02**	**5.1**	**0.3**	**13.6**
Tail assay, g/mt	**0.37**		**1.9**	
Calculated Head g/mt ore	**0.39**		**2.2**	

NaCN Consumed, kg/mt ore **0.42**
Lime Added, kg/mt ore **2.9**

Bottle Roll Test

Project No. **3775-01**
Test No. **CY-4**
Composite **WWS-13-MC**
Feed Size **80%-6.3mm**
Biooxidation Test **Baseline**
Biooxidation Time **0**
Estimated Oxidation **0.0**

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	2.450	7.8	3.17
Duplicate	2.680	7.6	3.51
Triplicate	2.790	8.5	3.40
Average	2.64	8.0	3.36

Ore Charge 1010.9 g

Solution Vol. 1.5164 L

Final Residue Wt 1005.2 g

Natural pH 3.2

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	2.02	4.9	3.76
Duplicate	2.74	4.7	
Triplicate	2.43	5.0	
Average	2.40	4.9	3.76

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.52	2.00	-----	-----	-----	-----	-----
2	100	0.90	10.5	0.25	0.50	0.16	0.38	0.016	0.038	0.09
6	100	1.00	11.0	0.11	0.50	0.18	0.43	0.018	0.043	0.1
24	100	0.85	10.5	0.32	0.20	0.22	0.66	0.022	0.066	0.085
48	100	0.95	11.0	0.18	0.00	0.24	0.95	0.024	0.095	0.095
72	100	1.00	10.4	0.11	0.60	0.24	1.09	0.024	0.109	0.1
96	-----	0.95	10.9	-----	-----	0.25	1.20	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt ore	
Hours	mg	g/mt ore	% of total	mg	g/mt ore	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		2.0
2	0.243	0.240	8.3	0.576	0.570	8.1	0.15	2.5
6	0.289	0.286	9.9	0.690	0.683	9.8	0.16	3.0
24	0.368	0.364	12.6	1.082	1.070	15.3	0.40	3.2
48	0.420	0.415	14.4	1.588	1.570	22.4	0.48	3.2
72	0.444	0.439	15.2	1.895	1.874	26.8	0.49	3.8
96	0.483	0.48	16.7	2.171	2.1	30.0	0.57	3.8

	Au	% of Total	Ag	% of Total
Extracted g/mt ore	**0.48**	**16.7**	**2.1**	**30.0**
Tail assay, g/mt	**2.40**		**4.9**	
Calculated Head g/mt ore	**2.88**		**7.0**	
NaCN Consumed, kg/mt ore	**0.57**			
Lime Added, kg/mt ore	**3.8**			

Bottle Roll Test

Project No.	**3775-01**
Test No.	**CY-5**
Composite	**WOS-13-MC**
Feed Size	**80%-6.3mm**
Biooxidation Test	**Baseline**
Biooxidation Time	**0**
Estimated Oxidation	**0.0**

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	4.150	68.9	3.08
Duplicate	3.950	65.6	2.59
Triplicate	4.010	73.7	3.11
Average	4.04	69.4	2.93

Ore Charge 1009.6 g

Final Residue Wt 1009.1 g

Solution Vol. 1.5144 L

Natural pH 3.6

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	3.79	37.5	3.05
Duplicate	3.60	36.5	
Triplicate	3.41	35.2	
Average	3.60	36.4	3.05

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.51	1.60	-----	-----	-----	-----	-----
2	100	0.90	10.6	0.24	0.50	0.20	2.60	0.02	0.26	0.09
6	100	0.95	11.0	0.17	0.20	0.22	3.63	0.022	0.363	0.095
24	100	0.85	10.5	0.31	0.50	0.25	8.15	0.025	0.815	0.085
48	100	0.90	10.9	0.24	0.10	0.25	14.30	0.025	1.43	0.09
72	100	0.95	10.5	0.17	0.50	0.26	17.00	0.026	1.7	0.095
96	-----	0.95	10.9	-----	-----	0.27	18.00	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt ore	
Hours	mg	g/mt ore	% of total	mg	g/mt ore	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		1.6
2	0.303	0.300	7.3	3.937	3.900	5.7	0.15	2.1
6	0.353	0.350	8.5	5.757	5.703	8.4	0.22	2.3
24	0.421	0.417	10.1	12.965	12.842	18.9	0.44	2.8
48	0.446	0.441	10.7	23.094	22.874	33.7	0.59	2.9
72	0.486	0.481	11.7	28.613	28.341	41.7	0.66	3.4
96	0.527	0.52	12.6	31.827	31.5	46.4	0.74	3.4

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore	**0.52**	**12.6**	**31.5**	**46.4**
Tail assay, g/mt	**3.60**		**36.4**	
Calculated Head g/mt ore	**4.12**		**67.9**	
NaCN Consumed, kg/mt ore	**0.74**			
Lime Added, kg/mt ore	**3.4**			

Bottle Roll Test

Project No.	**3775-01**
Test No.	**CY-6**
Composite	**FSU-13-1**
Feed Size	**80%-6.3mm**
Biooxidation Test	**Baseline**
Biooxidation Time	**0**
Estimated Oxidation	**0.0**

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	0.572	3.2	4.33
Duplicate	0.486	2.7	4.73
Triplicate	0.475	2.4	4.66
Average	0.51	2.8	4.57

Ore Charge 1015.3 g

Final Residue Wt 1009.3 g

Solution Vol. 1.5230 L

Natural pH 5.3

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.405	1.9	4.66
Duplicate	0.502	2.1	
Triplicate	0.451	1.8	
Average	0.45	1.9	4.66

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.52	1.90	-----	-----	-----	-----	-----
2	100	0.90	10.6	0.24	0.50	0.01	0.11	0.001	0.011	0.09
6	100	1.00	11.1	0.10	0.10	0.01	0.13	0.001	0.013	0.1
24	100	0.95	10.7	0.17	0.30	0.01	0.16	0.001	0.016	0.095
48	100	1.00	11.0	0.10	0.00	0.02	0.16	0.002	0.016	0.1
72	100	1.00	10.6	0.10	0.40	0.02	0.17	0.002	0.017	0.1
96	-----	1.00	11.0	-----	-----	0.02	0.17	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt ore	
Hours	mg	g/mt ore	% of total	mg	g/mt ore	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		1.9
2	0.015	0.015	3.1	0.168	0.165	7.5	0.15	2.4
6	0.016	0.016	3.3	0.209	0.206	9.4	0.14	2.5
24	0.017	0.017	3.5	0.268	0.264	12.0	0.22	2.8
48	0.033	0.033	6.7	0.284	0.279	12.7	0.22	2.8
72	0.035	0.035	7.1	0.315	0.3	13.6	0.22	3.2
96	0.037	0.04	8.2	0.332	0.3	13.6	0.22	3.2

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore	**0.04**	**8.2**	**0.3**	**13.6**
Tail assay, g/mt	**0.45**		**1.9**	
Calculated Head g/mt ore	**0.49**		**2.2**	

NaCN Consumed, kg/mt ore **0.22**
Lime Added, kg/mt ore **3.2**

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-7**	
Composite	**WWS-13-MC**	
Feed Size	**80%-12.5mm**	
Biooxidation Test	**B-3**	
Biooxidation Time	**42**	days
Estimated Oxidation	**14.9**	%
Weight loss factor:	**99.48**	
Ore Charge	1102.1	g
Solution Vol.	1.6532	L
Natural pH	2.4	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	2.450	7.8	3.17
Duplicate	2.680	7.6	3.51
Triplicate	2.790	8.5	3.40
Average	2.64	8.0	3.36

Final Residue Wt 1098.6 g

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.310	3.5	2.87
Duplicate	1.400	3.8	
Triplicate	1.410	3.7	
Average	1.37	3.7	2.86*

*Adjusted for weight loss during bio-oxidation

	Wt. %		g/L
Solid Density	40.0	Cyanide Conc. Maintained at:	1.00

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.65	7.00	-----	-----	-----	-----	-----
2	109	0.80	10.2	0.41	1.50	0.36	0.81	0.03924	0.08829	0.0872
6	106	1.00	10.5	0.10	1.50	0.43	0.84	0.04558	0.08904	0.106
24	108	0.85	10.3	0.34	4.00	0.51	0.99	0.05508	0.10692	0.0918
48	104	0.90	11.6	0.26	0.00	0.55	1.14	0.0572	0.11856	0.0936
72	100	0.90	10.7	0.25	2.00	0.56	1.18	0.056	0.118	0.09
96	-----	0.95	11.4	-----	-----	0.55	1.20	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		6.4
2	0.595	0.540	22.3	1.339	1.215	20.3	0.30	7.7
6	0.750	0.681	28.1	1.477	1.340	22.3	0.29	9.1
24	0.928	0.842	34.8	1.814	1.646	27.4	0.51	12.7
48	1.049	0.952	39.3	2.169	1.968	32.8	0.66	12.7
72	1.123	1.019	42.1	2.354	2.136	35.6	0.81	14.5
96	1.162	1.05	43.4	2.505	2.3	38.3	0.88	14.5

	Au	% of Total	Ag	% of Total
Extracted g/mt	**1.05**	**43.4**	**2.3**	**38.3**
Tail assay, g/mt	**1.37**		**3.7**	
Calculated Head g/mt	**2.42**		**6.0**	
NaCN Consumed, kg/mt	**0.88**			
Lime Added, kg/mt	**14.5**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**1.04**	**43.3**	**2.3**	**38.3**
Tail assay, g/mt ore [1)]	**1.36**		**3.7**	
Calculated Head g/mt ore [1)]	**2.40**		**6.0**	
NaCN Consumed, kg/mt ore [1)]	**0.88**			
Lime Added, kg/mt ore [1)]	**14.4**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No. 3775-01
Test No. CY-8
Composite FSU-13-1
Feed Size 80%-12.5mm
Biooxidation Test B-7
Biooxidation Time 42 days
Estimated Oxidation 2.8 %
Weight loss factor: 99.48

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	0.572	3.2	4.33
Duplicate	0.486	2.7	4.73
Triplicate	0.475	2.4	4.66
Average	0.51	2.8	4.57

Ore Charge 1057.6 g

Final Residue Wt 1045.1 g

Solution Vol. 1.5864 L

Natural pH 2.8

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.246	1.9	4.46*
Duplicate	0.279	2.1	
Triplicate	0.256	2.5	
Average	0.26	2.2	4.44*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.59	6.00	-----	-----	-----	-----	-----
2	107	0.75	10.2	0.48	1.25	0.03	0.24	0.00321	0.02568	0.08025
6	103	1.00	10.7	0.11	1.00	0.06	0.28	0.00618	0.02884	0.103
24	106	0.80	10.4	0.41	3.50	0.08	0.31	0.00848	0.03286	0.0848
48	103	0.95	11.6	0.26	0.00	0.07	0.33	0.00721	0.03399	0.09785
72	100	1.00	10.7	0.10	2.00	0.06	0.34	0.006	0.034	0.1
96	-----	0.90	11.6	-----	-----	0.06	0.31	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		5.7
2	0.048	0.045	11.8	0.381	0.360	12.9	0.38	6.9
6	0.098	0.093	24.5	0.470	0.444	15.9	0.38	7.8
24	0.136	0.129	33.9	0.546	0.517	18.4	0.69	11.1
48	0.129	0.122	32.1	0.611	0.578	20.6	0.77	11.1
72	0.120	0.114	29.9	0.661	0.6	21.4	0.85	13.0
96	0.126	0.12	31.6	0.647	0.6	21.4	1.00	13.0

	Au	% of Total	Ag	% of Total
Extracted g/mt	**0.12**	**31.6**	**0.6**	**21.4**
Tail assay, g/mt	**0.26**		**2.2**	
Calculated Head g/mt	**0.38**		**2.8**	
NaCN Consumed, kg/mt	**1.00**			
Lime Added, kg/mt	**13.0**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**0.12**	**31.6**	**0.6**	**21.4**
Tail assay, g/mt ore [1)]	**0.26**		**2.2**	
Calculated Head g/mt ore [1)]	**0.38**		**2.8**	
NaCN Consumed, kg/mt ore [1)]	**0.99**			
Lime Added, kg/mt ore [1)]	**12.9**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-9**	
Composite	**WOS-13-MC**	
Feed Size	**80%-12.5mm**	
Biooxidation Test	**B-11**	
Biooxidation Time	**42**	days
Estimated Oxidation	**10.6**	%
Weight loss factor:	**99.45**	
Ore Charge	1091.5	g
Solution Vol.	1.6373	L
Natural pH	2.4	

Head Assay	g Au/mt	g Ag/mt	%, $S^{=}$
Predicted			
Initial	4.150	68.9	3.08
Duplicate	3.950	65.6	2.59
Triplicate	4.010	73.7	3.11
Average	4.04	69.4	2.93

Final Residue Wt 1095.1 g

Tail Assay	g Au/mt	g Ag/mt	%, $S^{=}$
Initial	2.260	29.4	2.63
Duplicate	2.280	35.4	
Triplicate	2.300	27.8	
Average	2.28	30.9	2.62*

*Adjusted for weight loss during bio-oxidation

	Wt. %		g/L
Solid Density	40.0	Cyanide Conc. Maintained at:	1.00

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.64	4.50	-----	-----	-----	-----	-----
2	107	0.80	10.1	0.42	1.00	0.63	5.45	0.06741	0.58315	0.0856
6	104	1.00	10.9	0.11	0.40	0.78	5.60	0.08112	0.5824	0.104
24	104	0.80	10.4	0.41	2.50	0.91	8.84	0.09464	0.91936	0.0832
48	103	0.90	11.8	0.26	0.00	0.98	13.00	0.10094	1.339	0.0927
72	100	0.90	10.7	0.26	2.00	0.97	13.30	0.097	1.33	0.09
96	-----	0.95	11.8	-----	-----	0.95	13.70	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		4.1
2	1.031	0.945	23.0	8.923	8.175	14.7	0.30	5.0
6	1.345	1.232	30.0	9.752	8.935	16.0	0.31	5.4
24	1.638	1.501	36.5	15.639	14.328	25.7	0.61	7.7
48	1.848	1.693	41.2	23.370	21.411	38.4	0.76	7.7
72	1.932	1.770	43.1	25.200	23.087	41.4	0.92	9.5
96	1.997	1.83	44.5	27.185	24.9	44.6	1.00	9.5

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt	**1.83**	**44.5**	**24.9**	**44.6**
Tail assay, g/mt	**2.28**		**30.9**	
Calculated Head g/mt	**4.11**		**55.8**	
NaCN Consumed, kg/mt	**1.00**			
Lime Added, kg/mt	**9.5**			

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore [1)]	**1.82**	**44.5**	**24.8**	**44.7**
Tail assay, g/mt ore [1)]	**2.27**		**30.7**	
Calculated Head g/mt ore [1)]	**4.09**		**55.5**	
NaCN Consumed, kg/mt ore [1)]	**0.99**			
Lime Added, kg/mt ore [1)]	**9.4**			

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-10**	
Composite	**WWS-13-MC**	
Feed Size	**80%-6.3mm**	
Biooxidation Test	**B-4**	
Biooxidation Time	**42**	days
Estimated Oxidation	**1.2**	%
Weight loss factor:	**99.48**	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	2.450	7.8	3.17
Duplicate	2.680	7.6	3.51
Triplicate	2.790	8.5	3.40
Average	2.64	8.0	3.36

Ore Charge 1059.9 g

Final Residue Wt 1049.0 g

Solution Vol. 1.5899 L

Natural pH 2.3

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.340	3.4	3.34
Duplicate	1.470	5.4	
Triplicate	1.290	3.6	
Average	1.37	4.1	3.32*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.59	9.30	-----	-----	-----	-----	-----
2	108	0.55	9.6	0.77	2.50	0.55	1.16	0.0594	0.12528	0.0594
6	104	1.00	10.7	0.10	1.00	0.67	1.23	0.06968	0.12792	0.104
24	108	0.70	10.2	0.55	3.50	0.79	1.42	0.08532	0.15336	0.0756
48	101	0.90	11.1	0.25	1.00	0.80	1.55	0.0808	0.15655	0.0909
72	100	0.90	10.6	0.24	3.00	0.81	1.62	0.081	0.162	0.09
96	-----	0.95	11.4	-----	-----	0.79	1.64	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		8.8
2	0.874	0.825	28.4	1.844	1.740	24.2	0.68	11.1
6	1.125	1.061	36.5	2.081	1.963	27.3	0.67	12.1
24	1.385	1.307	44.9	2.511	2.369	32.9	1.12	15.4
48	1.486	1.402	48.2	2.871	2.709	37.6	1.26	16.3
72	1.583	1.494	51.3	3.139	2.961	41.1	1.41	19.2
96	1.632	1.54	52.9	3.333	3.1	43.1	1.48	19.2

	Au	% of Total	Ag	% of Total
Extracted g/mt	**1.54**	**52.9**	**3.1**	**43.1**
Tail assay, g/mt	**1.37**		**4.1**	
Calculated Head g/mt	**2.91**		**7.2**	
NaCN Consumed, kg/mt	**1.48**			
Lime Added, kg/mt	**19.2**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**1.53**	**52.9**	**3.1**	**43.1**
Tail assay, g/mt ore [1)]	**1.36**		**4.1**	
Calculated Head g/mt ore [1)]	**2.89**		**7.2**	
NaCN Consumed, kg/mt ore [1)]	**1.47**			
Lime Added, kg/mt ore [1)]	**19.1**			

[1)] Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No. 3775-01
Test No. CY-11
Composite FSU-13-1
Feed Size 80%-6.3mm
Biooxidation Test B-8
Biooxidation Time 42 days
Estimated Oxidation 23.4 %
Weight loss factor: 99.48

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	0.572	3.2	4.33
Duplicate	0.486	2.7	4.73
Triplicate	0.475	2.4	4.66
Average	0.51	2.8	4.57

Ore Charge 1009.6 g

Solution Vol. 1.5144 L

Natural pH 2.5

Final Residue Wt 991.9 g

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.248	1.4	3.52
Duplicate	0.211	1.9	
Triplicate	0.187	1.2	
Average	0.22	1.5	3.50*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.51	11.50	-----	-----	-----	-----	-----
2	107	0.65	9.8	0.59	2.25	0.07	0.40	0.00749	0.0428	0.06955
6	107	1.00	10.7	0.10	1.00	0.10	0.42	0.0107	0.04494	0.107
24	107	0.50	10.3	0.81	3.50	0.12	0.47	0.01284	0.05029	0.0535
48	106	1.05	11.0	0.10	1.00	0.13	0.49	0.01378	0.05194	0.1113
72	100	0.95	10.6	0.17	3.00	0.12	0.49	0.012	0.049	0.095
96	-----	0.95	11.3	-----	-----	0.11	0.47	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		11.4
2	0.106	0.105	23.9	0.606	0.600	25.0	0.52	13.6
6	0.159	0.157	35.8	0.679	0.672	28.0	0.51	14.6
24	0.200	0.198	45.0	0.800	0.792	33.0	1.25	18.1
48	0.228	0.226	51.3	0.880	0.872	36.3	1.18	19.1
72	0.227	0.224	51.0	0.932	0.9	37.5	1.32	22.0
96	0.223	0.22	50.0	0.951	0.9	37.5	1.39	22.0

	Au	% of Total	Ag	% of Total
Extracted g/mt	**0.22**	**50.0**	**0.9**	**37.5**
Tail assay, g/mt	**0.22**		**1.5**	
Calculated Head g/mt	**0.44**		**2.4**	
NaCN Consumed, kg/mt	**1.39**			
Lime Added, kg/mt	**22.0**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**0.22**	**50.0**	**0.9**	**37.5**
Tail assay, g/mt ore [1)]	**0.22**		**1.5**	
Calculated Head g/mt ore [1)]	**0.44**		**2.4**	
NaCN Consumed, kg/mt ore [1)]	**1.38**			
Lime Added, kg/mt ore [1)]	**21.9**			

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-12**	
Composite	**WOS-13-MC**	
Feed Size	**80%-6.3mm**	
Biooxidation Test	**B-12**	
Biooxidation Time	**42**	days
Estimated Oxidation	**3.1**	%
Weight loss factor:	**99.45**	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	4.150	68.9	3.08
Duplicate	3.950	65.6	2.59
Triplicate	4.010	73.7	3.11
Average	4.04	69.4	2.93

Ore Charge 1078.5 g

Solution Vol. 1.6178 L

Natural pH 2.3

Final Residue Wt 1083.1 g

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.760	30.0	2.86
Duplicate	1.910	30.4	
Triplicate	2.040	28.6	
Average	1.90	29.7	2.84*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.62	7.50	-----	-----	-----	-----	-----
2	104	0.85	10.6	0.33	0.45	0.91	6.12	0.09464	0.63648	0.0884
6	103	0.95	10.8	0.18	0.50	1.00	6.98	0.103	0.71894	0.09785
24	103	0.95	10.4	0.18	3.00	1.13	10.70	0.11639	1.1021	0.09785
48	103	0.70	11.9	0.56	0.00	1.19	14.00	0.12257	1.442	0.0721
72	100	0.85	10.7	0.33	2.00	1.15	15.30	0.115	1.53	0.085
96	-----	1.00	12.1	-----	-----	1.11	15.00	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		7.0
2	1.472	1.365	33.5	9.901	9.180	16.0	0.23	7.4
6	1.712	1.588	38.9	11.929	11.060	19.3	0.30	7.8
24	2.026	1.878	46.0	18.666	17.307	30.3	0.38	10.6
48	2.239	2.076	50.9	25.107	23.279	40.7	0.83	10.6
72	2.297	2.130	52.2	28.652	26.566	46.4	1.06	12.5
96	2.347	2.18	53.4	29.697	27.5	48.1	1.06	12.5

	Au	% of Total	Ag	% of Total
Extracted g/mt	**2.18**	**53.4**	**27.5**	**48.1**
Tail assay, g/mt	**1.90**		**29.7**	
Calculated Head g/mt	**4.08**		**57.2**	
NaCN Consumed, kg/mt	**1.06**			
Lime Added, kg/mt	**12.5**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**2.17**	**53.4**	**27.3**	**48.1**
Tail assay, g/mt ore [1)]	**1.89**		**29.5**	
Calculated Head g/mt ore [1)]	**4.06**		**56.8**	
NaCN Consumed, kg/mt ore [1)]	**1.05**			
Lime Added, kg/mt ore [1)]	**12.4**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-13**	
Composite	**WWS-13-MC**	
Feed Size	**80%-12.5mm**	
Biooxidation Test	**B-3**	
Biooxidation Time	**71**	days
Estimated Oxidation	**10.7**	%
Weight loss factor:	**99.12**	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	2.450	7.8	3.17
Duplicate	2.680	7.6	3.51
Triplicate	2.790	8.5	3.40
Average	2.64	8.0	3.36

Ore Charge 1131.4 g

Final Residue Wt 1123.7 g

Solution Vol. 1.6971 L

Natural pH 1.7

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.520	6.9	3.03
Duplicate	1.290	4.5	
Triplicate	1.190	3.9	
Average	1.33	5.1	3.00*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.70	8.40	-----	-----	-----	-----	-----
2	103	0.70	9.9	0.58	4.00	0.44	0.94	0.04532	0.09682	0.0721
6	100	1.00	11.5	0.10	0.00	0.59	1.00	0.059	0.1	0.1
24	108	0.80	10.6	0.43	2.00	0.68	1.22	0.07344	0.13176	0.0864
48	100	0.85	10.3	0.34	5.00	0.71	1.39	0.071	0.139	0.085
72	116	0.95	11.1	0.20	0.00	0.70	1.50	0.0812	0.174	0.1102
96	-----	0.90	10.8	-----	-----	0.67	1.46	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		7.4
2	0.747	0.660	25.1	1.595	1.410	17.8	0.45	11.0
6	1.047	0.925	35.2	1.794	1.586	20.1	0.45	11.0
24	1.258	1.112	42.3	2.267	2.004	25.4	0.75	12.7
48	1.383	1.222	46.5	2.688	2.375	30.1	0.98	17.1
72	1.437	1.270	48.3	3.013	2.663	33.7	1.06	17.1
96	1.467	1.30	49.4	3.119	2.8	35.4	1.21	17.1

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt	**1.30**	**49.4**	**2.8**	**35.4**
Tail assay, g/mt	**1.33**		**5.1**	
Calculated Head g/mt	**2.63**		**7.9**	
NaCN Consumed, kg/mt	**1.21**			
Lime Added, kg/mt	**17.1**			

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore [1)]	**1.29**	**49.4**	**2.8**	**35.4**
Tail assay, g/mt ore [1)]	**1.32**		**5.1**	
Calculated Head g/mt ore [1)]	**2.61**		**7.9**	
NaCN Consumed, kg/mt ore [1)]	**1.20**			
Lime Added, kg/mt ore [1)]	**17.0**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-14**	
Composite	**WWS-13-MC**	
Feed Size	**80%-6.3mm**	
Biooxidation Test	**B-4**	
Biooxidation Time	**71**	days
Estimated Oxidation	**21.4**	%
Weight loss factor:	**99.12**	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	2.450	7.8	3.17
Duplicate	2.680	7.6	3.51
Triplicate	2.790	8.5	3.40
Average	2.64	8.0	3.36

Ore Charge 1053.3 g

Final Residue Wt 1031.7 g

Solution Vol. 1.58 L

Natural pH 1.5

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.160	4.1	2.66
Duplicate	1.260	4.0	
Triplicate	1.230	3.0	
Average	1.22	3.7	2.64*

*Adjusted for weight loss during bio-oxidation

	Wt. %		g/L
Solid Density	40.0	Cyanide Conc. Maintained at:	1.00

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.58	11.50	-----	-----	-----	-----	-----
2	102	0.80	10.1	0.40	2.00	0.52	1.30	0.05304	0.1326	0.0816
6	100	0.95	11.2	0.17	0.00	0.63	1.33	0.063	0.133	0.095
24	103	0.70	10.2	0.55	2.00	0.74	1.52	0.07622	0.15656	0.0721
48	104	0.80	10.5	0.40	3.00	0.80	1.64	0.0832	0.17056	0.0832
72	110	0.95	11.0	0.19	0.20	0.79	1.71	0.0869	0.1881	0.1045
96	-----	0.85	10.6	-----	-----	0.77	1.70	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		10.9
2	0.822	0.780	28.7	2.054	1.950	27.9	0.30	12.8
6	1.048	0.995	36.6	2.234	2.121	30.3	0.38	12.8
24	1.285	1.220	44.9	2.667	2.532	36.2	0.82	14.7
48	1.456	1.383	50.8	3.013	2.861	40.9	1.13	17.6
72	1.524	1.447	53.2	3.295	3.128	44.7	1.20	17.8
96	1.579	1.50	55.1	3.467	3.3	47.1	1.43	17.8

	Au	% of Total	Ag	% of Total
Extracted g/mt	**1.50**	**55.1**	**3.3**	**47.1**
Tail assay, g/mt	**1.22**		**3.7**	
Calculated Head g/mt	**2.72**		**7.0**	
NaCN Consumed, kg/mt	**1.43**			
Lime Added, kg/mt	**17.8**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**1.49**	**55.2**	**3.3**	**47.1**
Tail assay, g/mt ore [1)]	**1.21**		**3.7**	
Calculated Head g/mt ore [1)]	**2.70**		**7.0**	
NaCN Consumed, kg/mt ore [1)]	**1.42**			
Lime Added, kg/mt ore [1)]	**17.6**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-15**	
Composite	**FSU-13-1**	
Feed Size	**80%-12.5mm**	
Biooxidation Test	**B-7**	
Biooxidation Time	**71**	days
Estimated Oxidation	**9.8**	%
Weight loss factor:	**99.12**	
Ore Charge	1183.4	g
Solution Vol.	1.7751	L
Natural pH	1.8	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	0.572	3.2	4.33
Duplicate	0.486	2.7	4.73
Triplicate	0.475	2.4	4.66
Average	0.51	2.8	4.57

Final Residue Wt 1055.5 g

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.280	1.9	4.16
Duplicate	0.329	2.9	
Triplicate	0.211	1.5	
Average	0.27	2.1	4.12*

*Adjusted for weight loss during bio-oxidation

	Wt. %
Solid Density	40.0

	g/L
Cyanide Conc. Maintained at:	1.00

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.78	5.00	-----	-----	-----	-----	-----
2	102	0.90	10.4	0.27	1.50	0.05	0.26	0.0051	0.02652	0.0918
6	100	0.90	11.4	0.27	0.00	0.07	0.29	0.007	0.029	0.09
24	105	0.80	10.5	0.44	1.20	0.08	0.32	0.0084	0.0336	0.084
48	102	0.95	11.0	0.36	0.50	0.09	0.33	0.00918	0.03366	0.0969
72	109	0.80	10.9	0.45	0.75	0.09	0.34	0.00981	0.03706	0.0872
96	-----	0.90	11.0	-----	-----	0.09	0.33	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		4.2
2	0.089	0.075	17.0	0.462	0.390	14.4	0.15	5.5
6	0.129	0.109	24.8	0.541	0.457	16.9	0.30	5.5
24	0.154	0.130	29.6	0.624	0.527	19.5	0.61	6.5
48	0.180	0.152	34.6	0.675	0.570	21.1	0.68	6.9
72	0.189	0.160	36.4	0.726	0.6	22.2	1.13	7.6
96	0.199	0.17	38.6	0.746	0.6	22.2	1.29	7.6

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt	**0.17**	**38.6**	**0.6**	**22.2**
Tail assay, g/mt	**0.27**		**2.1**	
Calculated Head g/mt	**0.44**		**2.7**	
NaCN Consumed, kg/mt	**1.29**			
Lime Added, kg/mt	**7.6**			

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore [1)]	**0.17**	**38.6**	**0.6**	**22.2**
Tail assay, g/mt ore [1)]	**0.27**		**2.1**	
Calculated Head g/mt ore [1)]	**0.44**		**2.7**	
NaCN Consumed, kg/mt ore [1)]	**1.28**			
Lime Added, kg/mt ore [1)]	**7.5**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-16**	
Composite	**FSU-13-1**	
Feed Size	**80%-6.3mm**	
Biooxidation Test	**B-8**	
Biooxidation Time	**71**	days
Estimated Oxidation	**24.7**	%
Weight loss factor:	**99.12**	
Ore Charge	1078	g
Solution Vol.	1.617	L
Natural pH	1.6	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	0.572	3.2	4.33
Duplicate	0.486	2.7	4.73
Triplicate	0.475	2.4	4.66
Average	0.51	2.8	4.57

Final Residue Wt 968.0 g

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.275	2.1	3.47
Duplicate	0.262	2.1	
Triplicate	0.191	1.7	
Average	0.24	2.0	3.44*

*Adjusted for weight loss during bio-oxidation

	Wt. %
Solid Density	40.0

	g/L
Cyanide Conc. Maintained at:	1.00

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.62	8.00	-----	-----	-----	-----	-----
2	104	0.75	10.8	0.49	1.00	0.08	0.33	0.00832	0.03432	0.078
6	102	0.85	11.3	0.33	0.00	0.10	0.36	0.0102	0.03672	0.0867
24	105	0.80	10.5	0.41	1.00	0.11	0.41	0.01155	0.04305	0.084
48	105	0.85	10.9	0.33	0.50	0.11	0.41	0.01155	0.04305	0.08925
72	110	0.85	10.8	0.34	1.00	0.10	0.41	0.011	0.0451	0.0935
96	-----	0.90	10.9	-----	-----	0.10	0.40	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		7.4
2	0.129	0.120	27.3	0.534	0.495	17.7	0.38	8.3
6	0.170	0.158	35.8	0.616	0.572	20.4	0.61	8.3
24	0.196	0.182	41.4	0.734	0.681	24.3	0.91	9.3
48	0.208	0.193	43.8	0.777	0.721	25.7	1.14	9.7
72	0.203	0.189	42.9	0.820	0.761	27.2	1.36	10.7
96	0.214	0.20	45.5	0.849	0.8	28.6	1.52	10.7

	Au	% of Total	Ag	% of Total
Extracted g/mt	**0.20**	**45.5**	**0.8**	**28.6**
Tail assay, g/mt	**0.24**		**2.0**	
Calculated Head g/mt	**0.44**		**2.8**	
NaCN Consumed, kg/mt	**1.52**			
Lime Added, kg/mt	**10.7**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore 1)	**0.20**	**45.5**	**0.8**	**28.6**
Tail assay, g/mt ore 1)	**0.24**		**2.0**	
Calculated Head g/mt ore 1)	**0.44**		**2.8**	
NaCN Consumed, kg/mt ore 1)	**1.51**			
Lime Added, kg/mt ore 1)	**10.6**			

1)Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-17**	
Composite	**WOS-13-MC**	
Feed Size	**80%-12.5mm**	
Biooxidation Test	**B-11**	
Biooxidation Time	**71**	days
Estimated Oxidation	**14.7**	%
Weight loss factor:	**99.07**	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	4.150	68.9	3.08
Duplicate	3.950	65.6	2.59
Triplicate	4.010	73.7	3.11
Average	4.04	69.4	2.93

Ore Charge 1072.5 g

Final Residue Wt 1180.9 g

Solution Vol. 1.6088 L

Natural pH 2.2

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.990	47.0	2.52
Duplicate	1.980	37.3	
Triplicate	2.140	30.9	
Average	2.04	38.4	2.50*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.61	9.00	-----	-----	-----	-----	-----
2	103	0.80	10.3	0.41	2.00	0.70	6.41	0.0721	0.66023	0.0824
6	100	0.95	11.1	0.18	0.00	0.87	8.08	0.087	0.808	0.095
24	105	0.70	10.2	0.56	2.00	1.03	12.65	0.10815	1.32825	0.0735
48	101	0.95	10.8	0.18	1.00	1.10	18.31	0.1111	1.84931	0.09595
72	111	0.95	10.9	0.19	0.40	1.11	20.48	0.12321	2.27328	0.10545
96	-----	0.90	10.8	-----	-----	1.08	22.40	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		8.4
2	1.126	1.050	25.4	10.312	9.615	12.2	0.30	10.3
6	1.472	1.372	33.2	13.659	12.736	16.2	0.38	10.3
24	1.816	1.693	41.0	21.820	20.345	25.9	0.84	12.1
48	2.037	1.899	46.0	32.254	30.073	38.3	0.91	13.1
72	2.164	2.018	48.9	37.594	35.1	44.7	0.99	13.4
96	2.239	2.09	50.6	42.956	40.1	51.1	1.15	13.4

	Au	% of Total	Ag	% of Total
Extracted g/mt	**2.09**	**50.6**	**40.1**	**51.1**
Tail assay, g/mt	**2.04**		**38.4**	
Calculated Head g/mt	**4.13**		**78.5**	
NaCN Consumed, kg/mt	**1.15**			
Lime Added, kg/mt	**13.4**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**2.07**	**50.6**	**39.7**	**51.1**
Tail assay, g/mt ore [1)]	**2.02**		**38.0**	
Calculated Head g/mt ore [1)]	**4.09**		**77.7**	
NaCN Consumed, kg/mt ore [1)]	**1.14**			
Lime Added, kg/mt ore [1)]	**13.3**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No. **3775-01**
Test No. **CY-18**
Composite **WOS-13-MC**
Feed Size **80%-6.3mm**
Biooxidation Test **B-12**
Biooxidation Time **71** days
Estimated Oxidation **16.7** %
Weight loss factor: 99.07

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	4.150	68.9	3.08
Duplicate	3.950	65.6	2.59
Triplicate	4.010	73.7	3.11
Average	4.04	69.4	2.93

Ore Charge 997.6 g

Final Residue Wt 1075.2 g

Solution Vol. 1.4964 L

Natural pH 2.1

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.580	28.5	2.46
Duplicate	1.530	25.2	
Triplicate	1.420	24.1	
Average	1.51	25.9	2.44*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.50	12.00	-----	-----	-----	-----	-----
2	106	0.60	9.9	0.67	3.00	0.99	6.24	0.10494	0.66144	0.0636
6	100	1.00	11.0	0.10	0.30	1.09	7.91	0.109	0.791	0.1
24	108	0.85	10.6	0.32	1.20	1.23	11.14	0.13284	1.20312	0.0918
48	102	1.00	10.9	0.11	0.50	1.25	13.90	0.1275	1.4178	0.102
72	113	0.95	10.9	0.19	0.75	1.25	15.20	0.14125	1.7176	0.10735
96	-----	0.90	10.9	-----	-----	1.21	16.33	-----	-----	-----

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction mg	g/mt	% of total	Cumulative Ag Extraction mg	g/mt	% of total	Reagent Requirements Cumulative kg/mt Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		12.0
2	1.481	1.485	37.7	9.338	9.360	16.7	0.60	15.0
6	1.736	1.740	44.2	12.498	12.528	22.3	0.61	15.3
24	2.055	2.059	52.3	18.122	18.166	32.3	0.84	16.5
48	2.217	2.223	56.4	23.456	23.512	41.8	0.84	17.0
72	2.345	2.350	59.7	26.819	26.883	47.8	0.92	17.8
96	2.426	2.43	61.7	30.227	30.3	53.9	1.08	17.8

	Au	% of Total	Ag	% of Total
Extracted g/mt	**2.43**	**61.7**	**30.3**	**53.9**
Tail assay, g/mt	**1.51**		**25.9**	
Calculated Head g/mt	**3.94**		**56.2**	
NaCN Consumed, kg/mt	**1.08**			
Lime Added, kg/mt	**17.8**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**2.41**	**61.6**	**30.0**	**53.9**
Tail assay, g/mt ore [1)]	**1.50**		**25.7**	
Calculated Head g/mt ore [1)]	**3.91**		**55.7**	
NaCN Consumed, kg/mt ore [1)]	**1.07**			
Lime Added, kg/mt ore [1)]	**17.6**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No. 3775-01
Test No. CY-19
Composite WWS-13-MC
Feed Size 80%-12.5mm
Biooxidation Test B-3
Biooxidation Time 99 days
Estimated Oxidation 9.5 %
Weight loss factor: 98.78

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	2.450	7.8	3.17
Duplicate	2.680	7.6	3.51
Triplicate	2.790	8.5	3.40
Average	2.64	8.0	3.36

Ore Charge 1045.3 g

Final Residue Wt 1032.4 g

Solution Vol. 1.568 L

Natural pH 1.6

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.570	3.2	3.08
Duplicate	1.320	3.9	
Triplicate	1.490	3.2	
Average	1.46	3.4	3.04*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.57	6.50	-----	-----	-----	-----	-----
2	108	0.65	9.9	0.62	1.00	0.46	0.90	0.04968	0.0972	0.0702
6	103	1.00	10.4	0.10	1.25	0.56	0.96	0.05768	0.09888	0.103
24	104	0.65	10.1	0.62	2.00	0.65	1.13	0.0676	0.11752	0.0676
48	102	0.75	10.5	0.47	2.00	0.70	1.27	0.0714	0.12954	0.0765
72	104	0.95	10.9	0.18	0.20	0.69	1.34	0.07176	0.13936	0.0988
96	-----	0.90	10.7	-----	-----	0.67	1.38	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		6.2
2	0.721	0.690	24.9	1.411	1.350	22.5	0.53	7.2
6	0.928	0.888	32.0	1.602	1.533	25.6	0.53	8.4
24	1.127	1.078	38.9	1.968	1.883	31.4	1.05	10.3
48	1.273	1.217	43.9	2.305	2.205	36.8	1.43	12.2
72	1.328	1.271	45.9	2.544	2.434	40.6	1.50	12.4
96	1.369	1.31	47.3	2.746	2.6	43.3	1.66	12.4

	Au	% of Total	Ag	% of Total
Extracted g/mt	**1.31**	**47.3**	**2.6**	**43.3**
Tail assay, g/mt	**1.46**		**3.4**	
Calculated Head g/mt	**2.77**		**6.0**	
NaCN Consumed, kg/mt	**1.66**			
Lime Added, kg/mt	**12.4**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore 1)	**1.29**	**47.3**	**2.6**	**43.3**
Tail assay, g/mt ore 1)	**1.44**		**3.4**	
Calculated Head g/mt ore 1)	**2.73**		**6.0**	
NaCN Consumed, kg/mt ore 1)	**1.64**			
Lime Added, kg/mt ore 1)	**12.2**			

1) Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-20**	
Composite	**WWS-13-MC**	
Feed Size	**80%-6.3mm**	
Biooxidation Test	**B-4**	
Biooxidation Time	**99**	days
Estimated Oxidation	**15.8**	%
Weight loss factor:	**98.77**	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	2.450	7.8	3.17
Duplicate	2.680	7.6	3.51
Triplicate	2.790	8.5	3.40
Average	2.64	8.0	3.36

Ore Charge 1012.4 g

Final Residue Wt 995.6 g

Solution Vol. 1.5186 L

Natural pH 1.4

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.130	3.6	2.87
Duplicate	1.000	2.9	
Triplicate	1.170	4.3	
Average	1.10	3.6	2.83*

*Adjusted for weight loss during bio-oxidation

	Wt. %		g/L
Solid Density	40.0	Cyanide Conc. Maintained at:	1.00

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.52	8.00	-----	-----	-----	-----	-----
2	102	0.55	9.9	0.74	1.20	0.57	1.21	0.05814	0.12342	0.0561
6	102	1.00	10.5	0.10	1.00	0.70	1.32	0.0714	0.13464	0.102
24	123	0.60	10.2	0.68	2.00	0.83	1.51	0.10209	0.18573	0.0738
48	104	0.75	10.4	0.46	2.50	0.83	1.61	0.08632	0.16744	0.078
72	100	0.95	11.1	0.17	0.00	0.82	1.67	0.082	0.167	0.095
96	-----	0.95	10.8	-----	-----	0.81	1.71	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		7.9
2	0.866	0.855	31.5	1.838	1.815	26.3	0.68	9.1
6	1.121	1.107	40.9	2.128	2.102	30.5	0.68	10.1
24	1.390	1.373	50.7	2.551	2.520	36.5	1.27	12.1
48	1.492	1.474	54.4	2.889	2.853	41.4	1.65	14.5
72	1.563	1.544	57.0	3.147	3.109	45.1	1.73	14.5
96	1.630	1.61	59.4	3.375	3.3	47.8	1.80	14.5

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt	**1.61**	**59.4**	**3.3**	**47.8**
Tail assay, g/mt	**1.10**		**3.6**	
Calculated Head g/mt	**2.71**		**6.9**	
NaCN Consumed, kg/mt	**1.80**			
Lime Added, kg/mt	**14.5**			

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore [1)]	**1.59**	**59.3**	**3.3**	**47.8**
Tail assay, g/mt ore [1)]	**1.09**		**3.6**	
Calculated Head g/mt ore [1)]	**2.68**		**6.9**	
NaCN Consumed, kg/mt ore [1)]	**1.78**			
Lime Added, kg/mt ore [1)]	**14.3**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-21**	
Composite	**FSU-13-1**	
Feed Size	**80%-12.5mm**	
Biooxidation Test	**B-7**	
Biooxidation Time	**99**	days
Estimated Oxidation	**12.0**	%
Weight loss factor:	**98.77**	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	0.572	3.2	4.33
Duplicate	0.486	2.7	4.73
Triplicate	0.475	2.4	4.66
Average	0.51	2.8	4.57

Ore Charge 1040.5 g

Final Residue Wt 1020.6 g

Solution Vol. 1.5608 L

Natural pH 1.9

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.210	1.5	4.07
Duplicate	0.248	1.7	
Triplicate	0.192	1.5	
Average	0.22	1.6	4.02*

*Adjusted for weight loss during bio-oxidation

Solid Density: Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.56	1.00	-----	-----	-----	-----	-----
2	106	0.65	10.2	0.61	1.20	0.07	0.23	0.00742	0.02438	0.0689
6	104	1.00	10.7	0.10	1.00	0.08	0.25	0.00832	0.026	0.104
24	108	0.80	10.3	0.40	2.00	0.09	0.29	0.00972	0.03132	0.0864
48	104	0.95	10.8	0.18	1.50	0.10	0.29	0.0104	0.03016	0.0988
72	101	0.95	11.1	0.17	0.00	0.09	0.30	0.00909	0.0303	0.09595
96	-----	1.00	10.9	-----	-----	0.09	0.29	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		1.0
2	0.109	0.105	26.3	0.359	0.345	15.7	0.52	2.1
6	0.132	0.127	31.8	0.415	0.398	18.1	0.52	3.1
24	0.156	0.150	37.5	0.503	0.483	22.0	0.82	5.0
48	0.182	0.174	43.6	0.534	0.514	23.3	0.89	6.4
72	0.176	0.169	42.4	0.580	0.558	25.3	0.97	6.4
96	0.185	0.18	45.0	0.595	0.6	27.3	0.97	6.4

	Au	% of Total	Ag	% of Total
Extracted g/mt	**0.18**	**45.0**	**0.6**	**27.3**
Tail assay, g/mt	**0.22**		**1.6**	
Calculated Head g/mt	**0.40**		**2.2**	
NaCN Consumed, kg/mt	**0.97**			
Lime Added, kg/mt	**6.4**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**0.18**	**45.0**	**0.6**	**27.3**
Tail assay, g/mt ore [1)]	**0.22**		**1.6**	
Calculated Head g/mt ore [1)]	**0.40**		**2.2**	
NaCN Consumed, kg/mt ore [1)]	**0.96**			
Lime Added, kg/mt ore [1)]	**6.3**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-22**	
Composite	**FSU-13-1**	
Feed Size	**80%-6.3mm**	
Biooxidation Test	**B-8**	
Biooxidation Time	**99**	days
Estimated Oxidation	**19.9**	%
Weight loss factor:	**98.78**	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	0.572	3.2	4.33
Duplicate	0.486	2.7	4.73
Triplicate	0.475	2.4	4.66
Average	0.51	2.8	4.57

Ore Charge 988.6 g

Final Residue Wt 965.3 g

Solution Vol. 1.4829 L

Natural pH 1.8

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.221	1.9	3.71
Duplicate	0.196	1.7	
Triplicate	0.180	1.5	
Average	0.20	1.7	3.66*

*Adjusted for weight loss during bio-oxidation

	Wt. %
Solid Density	40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.48	14.00	-----	-----	-----	-----	-----
2	105	0.35	10.5	1.00	0.50	0.10	0.31	0.0105	0.03255	0.03675
6	103	0.85	10.6	0.31	1.00	0.10	0.34	0.0103	0.03502	0.08755
24	106	0.80	10.5	0.38	2.00	0.13	0.40	0.01378	0.0424	0.0848
48	104	1.00	11.0	0.10	1.00	0.13	0.40	0.01352	0.0416	0.104
72	110	0.90	11.2	0.24	0.00	0.12	0.39	0.0132	0.0429	0.099
96	-----	0.95	11.0	-----	-----	0.12	0.38	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		14.2
2	0.148	0.150	34.1	0.460	0.465	18.6	0.97	14.7
6	0.159	0.161	36.5	0.537	0.543	21.7	1.20	15.7
24	0.214	0.216	49.1	0.661	0.668	26.7	1.50	17.7
48	0.227	0.230	52.3	0.703	0.711	28.4	1.50	18.7
72	0.226	0.229	52.0	0.730	0.738	29.5	1.64	18.7
96	0.239	0.24	54.5	0.758	0.8	32.0	1.71	18.7

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt	**0.24**	**54.5**	**0.8**	**32.0**
Tail assay, g/mt	**0.20**		**1.7**	
Calculated Head g/mt	**0.44**		**2.5**	
NaCN Consumed, kg/mt	**1.71**			
Lime Added, kg/mt	**18.7**			

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore [1)]	**0.24**	**54.5**	**0.8**	**32.0**
Tail assay, g/mt ore [1)]	**0.20**		**1.7**	
Calculated Head g/mt ore [1)]	**0.44**		**2.5**	
NaCN Consumed, kg/mt ore [1)]	**1.69**			
Lime Added, kg/mt ore [1)]	**18.5**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-23**	
Composite	**WOS-13-MC**	
Feed Size	**80%-12.5mm**	
Biooxidation Test	**B-11**	
Biooxidation Time	**99**	days
Estimated Oxidation	**20.1**	%
Weight loss factor:	**98.70**	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	4.150	68.9	3.08
Duplicate	3.950	65.6	2.59
Triplicate	4.010	73.7	3.11
Average	4.04	69.4	2.93

Ore Charge 1085.5 g

Final Residue Wt 1084.6 g

Solution Vol. 1.6283 L

Natural pH 1.7

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.370	34.2	2.37
Duplicate	1.800	19.1	
Triplicate	1.670	18.6	
Average	1.61	24.0	2.34*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.63	3.00	-----	-----	-----	-----	-----
2	103	0.90	10.6	0.26	0.40	0.89	6.47	0.09167	0.66641	0.0927
6	105	0.95	11.0	0.18	0.10	1.02	7.02	0.1071	0.7371	0.09975
24	107	0.75	10.3	0.49	2.00	1.13	9.49	0.12091	1.01543	0.08025
48	100	0.85	11.6	0.33	0.00	1.20	13.02	0.12	1.302	0.085
72	107	0.90	11.1	0.26	0.00	1.17	13.56	0.12519	1.45092	0.0963
96	-----	0.95	10.9	-----	-----	1.15	13.96	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		2.8
2	1.449	1.335	34.6	10.535	9.705	19.5	0.15	3.1
6	1.753	1.614	41.8	12.097	11.144	22.4	0.23	3.2
24	2.039	1.878	48.7	16.856	15.528	31.2	0.60	5.1
48	2.274	2.095	54.3	23.619	21.759	43.8	0.83	5.1
72	2.345	2.160	56.0	25.801	23.768	47.8	0.98	5.1
96	2.437	2.25	58.3	27.903	25.7	51.7	1.06	5.1

	Au	% of Total	Ag	% of Total
Extracted g/mt	**2.25**	**58.3**	**25.7**	**51.7**
Tail assay, g/mt	**1.61**		**24.0**	
Calculated Head g/mt	**3.86**		**49.7**	
NaCN Consumed, kg/mt	**1.06**			
Lime Added, kg/mt	**5.1**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**2.22**	**58.3**	**25.4**	**51.7**
Tail assay, g/mt ore [1)]	**1.59**		**23.7**	
Calculated Head g/mt ore [1)]	**3.81**		**49.1**	
NaCN Consumed, kg/mt ore [1)]	**1.05**			
Lime Added, kg/mt ore [1)]	**5.0**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-24**	
Composite	**WOS-13-MC**	
Feed Size	**80%-6.3mm**	
Biooxidation Test	**B-12**	
Biooxidation Time	**99**	days
Estimated Oxidation	**9.6**	%
Weight loss factor:	**98.70**	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	4.150	68.9	3.08
Duplicate	3.950	65.6	2.59
Triplicate	4.010	73.7	3.11
Average	4.04	69.4	2.93

Ore Charge 1035.6 g

Final Residue Wt 1034.1 g

Solution Vol. 1.5534 L

Natural pH 1.4

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.680	21.4	2.68
Duplicate	1.160	27.8	
Triplicate	1.370	21.5	
Average	1.40	23.6	2.65*

*Adjusted for weight loss during bio-oxidation

Solid Density: Wt. % 40.0

Cyanide Conc. Maintained at: g/L 1.00

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.55	5.80	-----	-----	-----	-----	-----
2	102	0.65	10.3	0.61	0.60	1.24	8.35	0.12648	0.8517	0.0663
6	103	0.95	10.9	0.17	0.10	1.31	9.43	0.13493	0.97129	0.09785
24	102	0.70	10.3	0.53	2.00	1.39	13.36	0.14178	1.36272	0.0714
48	102	0.90	11.1	0.24	1.00	1.41	16.62	0.14382	1.69524	0.0918
72	106	0.85	11.2	0.32	0.00	1.34	18.26	0.14204	1.93556	0.0901
96	-----	0.90	11.0	-----	-----	1.32	19.41	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		5.6
2	1.926	1.860	45.9	12.971	12.525	21.1	0.52	6.2
6	2.161	2.087	51.5	15.500	14.967	25.2	0.60	6.3
24	2.421	2.337	57.7	22.576	21.800	36.8	1.04	8.2
48	2.593	2.504	61.8	29.003	28.006	47.2	1.18	9.2
72	2.629	2.538	62.7	33.246	32.103	54.1	1.40	9.2
96	2.740	2.65	65.4	36.968	35.7	60.2	1.55	9.2

	Au	% of Total	Ag	% of Total
Extracted g/mt	**2.65**	**65.4**	**35.7**	**60.2**
Tail assay, g/mt	**1.40**		**23.6**	
Calculated Head g/mt	**4.05**		**59.3**	
NaCN Consumed, kg/mt	**1.55**			
Lime Added, kg/mt	**9.2**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**2.62**	**65.5**	**35.2**	**60.2**
Tail assay, g/mt ore [1)]	**1.38**		**23.3**	
Calculated Head g/mt ore [1)]	**4.00**		**58.5**	
NaCN Consumed, kg/mt ore [1)]	**1.53**			
Lime Added, kg/mt ore [1)]	**9.1**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-25**	
Composite	**WWS-13-MC**	
Feed Size	**80%-12.5mm**	
Biooxidation Test	**B-3**	
Biooxidation Time	**127**	days
Estimated Oxidation	**12.8**	%
Weight loss factor:	**98.43**	
Ore Charge	1040.7	g
Solution Vol.	1.5611	L
Natural pH	2.3	
Solid Density (Wt. %)	40.0	

Final Residue Wt 1031.3 g

Cyanide Conc. Maintained at: 1.00 g/L

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	2.450	7.8	3.17
Duplicate	2.680	7.6	3.51
Triplicate	2.790	8.5	3.40
Average	2.64	8.0	3.36

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.740	4.3	2.98
Duplicate	1.490	4.9	
Triplicate	1.110	4.3	
Average	1.45	4.5	2.93*

*Adjusted for weight loss during bio-oxidation

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.56	8.00	-----	-----	-----	-----	-----
2	105	0.75	10.0	0.47	1.20	0.50	1.08	0.0525	0.1134	0.07875
6	102	0.95	10.5	0.17	1.00	0.58	1.11	0.05916	0.11322	0.0969
24	104	0.65	10.1	0.61	4.00	0.71	1.26	0.07384	0.13104	0.0676
48	100	0.90	11.0	0.24	0.20	0.72	1.45	0.072	0.145	0.09
72	109	0.90	10.6	0.25	2.00	0.73	1.48	0.07957	0.16132	0.0981
96	-----	0.90	11.2	-----	-----	0.70	1.49	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		7.7
2	0.781	0.750	26.6	1.686	1.620	21.9	0.37	8.8
6	0.958	0.920	32.6	1.846	1.774	24.0	0.45	9.8
24	1.220	1.172	41.6	2.194	2.108	28.5	0.97	13.6
48	1.309	1.258	44.6	2.621	2.519	34.0	1.12	13.8
72	1.397	1.342	47.6	2.813	2.703	36.5	1.26	15.8
96	1.430	1.37	48.6	2.990	2.9	39.2	1.41	15.8

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt	**1.37**	**48.6**	**2.9**	**39.2**
Tail assay, g/mt	**1.45**		**4.5**	
Calculated Head g/mt	**2.82**		**7.4**	
NaCN Consumed, kg/mt	**1.41**			
Lime Added, kg/mt	**15.8**			

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore [1)]	**1.35**	**48.6**	**2.9**	**39.7**
Tail assay, g/mt ore [1)]	**1.43**		**4.4**	
Calculated Head g/mt ore [1)]	**2.78**		**7.3**	
NaCN Consumed, kg/mt ore [1)]	**1.39**			
Lime Added, kg/mt ore [1)]	**15.6**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-26**	
Composite	**WWS-13-MC**	
Feed Size	**80%-6.3mm**	
Biooxidation Test	**B-4**	
Biooxidation Time	**127**	days
Estimated Oxidation	**17.6**	%
Weight loss factor:	**98.43**	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	2.450	7.8	3.17
Duplicate	2.680	7.6	3.51
Triplicate	2.790	8.5	3.40
Average	2.64	8.0	3.36

Ore Charge 1003.8 g

Final Residue Wt 989.6 g

Solution Vol. 1.5057 L

Natural pH 2.1

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.911	3.2	2.81
Duplicate	0.957	4.3	
Triplicate	1.060	3.9	
Average	0.98	3.8	2.77*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.51	10.50	-----	-----	-----	-----	-----
2	102	0.75	10.0	0.46	2.00	0.65	1.43	0.0663	0.14586	0.0765
6	103	0.85	10.8	0.32	0.40	0.76	1.50	0.07828	0.1545	0.08755
24	106	0.65	10.1	0.60	4.00	0.89	1.71	0.09434	0.18126	0.0689
48	100	0.95	11.0	0.17	0.20	0.92	1.88	0.092	0.188	0.095
72	107	0.85	10.6	0.32	2.00	0.90	1.92	0.0963	0.20544	0.09095
96	-----	0.95	11.2	-----	-----	0.88	1.91	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		10.5
2	0.979	0.975	35.7	2.153	2.145	28.6	0.38	12.5
6	1.211	1.206	44.2	2.404	2.395	31.9	0.61	12.9
24	1.485	1.479	54.2	2.875	2.864	38.2	1.14	16.8
48	1.624	1.618	59.3	3.312	3.300	44.0	1.22	17.0
72	1.686	1.680	61.5	3.561	3.547	47.3	1.45	19.0
96	1.752	1.75	64.1	3.751	3.7	49.3	1.52	19.0

	Au	% of Total	Ag	% of Total
Extracted g/mt	**1.75**	**64.1**	**3.7**	**49.3**
Tail assay, g/mt	**0.98**		**3.8**	
Calculated Head g/mt	**2.73**		**7.5**	
NaCN Consumed, kg/mt	**1.52**			
Lime Added, kg/mt	**19.0**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore 1)	**1.72**	**64.2**	**3.6**	**49.3**
Tail assay, g/mt ore 1)	**0.96**		**3.7**	
Calculated Head g/mt ore 1)	**2.68**		**7.3**	
NaCN Consumed, kg/mt ore 1)	**1.50**			
Lime Added, kg/mt ore 1)	**18.7**			

1)Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-27**	
Composite	**FSU-13-1**	
Feed Size	**80%-12.5mm**	
Biooxidation Test	**B-7**	
Biooxidation Time	**127**	days
Estimated Oxidation	**19.9**	%
Weight loss factor:	**98.42**	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	0.572	3.2	4.33
Duplicate	0.486	2.7	4.73
Triplicate	0.475	2.4	4.66
Average	0.51	2.8	4.57

Ore Charge 1030 g

Final Residue Wt 1018.4 g

Solution Vol. 1.545 L

Natural pH 2.5

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.260	1.7	3.72
Duplicate	0.308	2.3	
Triplicate	0.302	2.0	
Average	0.29	2.0	3.66*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.55	13.00	-----	-----	-----	-----	-----
2	104	0.55	10.2	0.76	2.00	0.09	0.23	0.00936	0.02392	0.0572
6	103	0.90	10.8	0.25	0.50	0.11	0.26	0.01133	0.02678	0.0927
24	103	0.85	10.4	0.32	4.00	0.12	0.30	0.01236	0.0309	0.08755
48	101	0.95	11.2	0.18	0.20	0.14	0.32	0.01414	0.03232	0.09595
72	115	0.95	11.0	0.19	1.00	0.13	0.32	0.01495	0.0368	0.10925
96	-----	0.95	11.2	-----	-----	0.12	0.31	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		12.6
2	0.139	0.135	25.5	0.355	0.345	13.3	0.68	14.6
6	0.179	0.174	32.8	0.426	0.413	15.9	0.84	15.0
24	0.206	0.200	37.8	0.514	0.499	19.2	1.06	18.9
48	0.249	0.24	45.3	0.576	0.559	21.5	1.14	19.1
72	0.248	0.24	45.3	0.608	0.591	22.7	1.22	20.1
96	0.248	0.24	45.3	0.630	0.6	23.1	1.30	20.1

	Au	% of Total	Ag	% of Total
Extracted g/mt	**0.24**	**45.3**	**0.6**	**23.1**
Tail assay, g/mt	**0.29**		**2.0**	
Calculated Head g/mt	**0.53**		**2.6**	
NaCN Consumed, kg/mt	**1.30**			
Lime Added, kg/mt	**20.1**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**0.24**	**45.3**	**0.6**	**23.1**
Tail assay, g/mt ore [1)]	**0.29**		**2.0**	
Calculated Head g/mt ore [1)]	**0.53**		**2.6**	
NaCN Consumed, kg/mt ore [1)]	**1.28**			
Lime Added, kg/mt ore [1)]	**19.8**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-28**	
Composite	**FSU-13-1**	
Feed Size	**80%-6.3mm**	
Biooxidation Test	**B-8**	
Biooxidation Time	**127**	days
Estimated Oxidation	**23.4**	%
Weight loss factor:	**98.43**	
Ore Charge	965.9	g
Solution Vol.	1.4489	L
Natural pH	2.5	
Solid Density	Wt. % 40.0	

Final Residue Wt 951.6 g

Cyanide Conc. Maintained at: 1.00 g/L

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	0.572	3.2	4.33
Duplicate	0.486	2.7	4.73
Triplicate	0.475	2.4	4.66
Average	0.51	2.8	4.57

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.178	2.0	3.56
Duplicate	0.221	1.7	
Triplicate	0.197	2.2	
Average	0.20	2.0	3.50*

*Adjusted for weight loss during bio-oxidation

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.45	15.00	-----	-----	-----	-----	-----
2	106	0.80	10.4	0.38	2.00	0.11	0.28	0.01166	0.02968	0.0848
6	104	0.95	11.0	0.17	0.20	0.13	0.30	0.01352	0.0312	0.0988
24	116	0.90	10.5	0.25	3.00	0.14	0.33	0.01624	0.03828	0.1044
48	105	0.95	11.3	0.17	0.50	0.12	0.34	0.0126	0.0357	0.09975
72	154	0.90	11.2	0.28	0.50	0.12	0.34	0.01848	0.05236	0.1386
96	-----	1.00	11.3	-----	-----	0.11	0.31	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		15.5
2	0.159	0.165	37.5	0.406	0.420	15.6	0.30	17.6
6	0.200	0.207	47.1	0.464	0.481	17.8	0.38	17.8
24	0.228	0.236	53.7	0.539	0.558	20.7	0.53	20.9
48	0.215	0.223	50.7	0.592	0.613	22.7	0.61	21.4
72	0.228	0.236	53.6	0.627	0.650	24.1	0.75	21.9
96	0.232	0.24	54.5	0.636	0.7	25.9	0.75	21.9

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt	**0.24**	**54.5**	**0.7**	**25.9**
Tail assay, g/mt	**0.20**		**2.0**	
Calculated Head g/mt	**0.44**		**2.7**	
NaCN Consumed, kg/mt	**0.75**			
Lime Added, kg/mt	**21.9**			

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore [1)]	**0.24**	**54.5**	**0.7**	**25.9**
Tail assay, g/mt ore [1)]	**0.20**		**2.0**	
Calculated Head g/mt ore [1)]	**0.44**		**2.7**	
NaCN Consumed, kg/mt ore [1)]	**0.74**			
Lime Added, kg/mt ore [1)]	**21.6**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-29**	
Composite	**WOS-13-MC**	
Feed Size	**80%-12.5mm**	
Biooxidation Test	**B-11**	
Biooxidation Time	**127**	days
Estimated Oxidation	**20.5**	%
Weight loss factor:	**98.33**	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	4.150	68.9	3.08
Duplicate	3.950	65.6	2.59
Triplicate	4.010	73.7	3.11
Average	4.04	69.4	2.93

Ore Charge 1070.3 g

Solution Vol. 1.6055 L

Final Residue Wt 1065.0 g

Natural pH 2.7

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.480	27.6	2.37
Duplicate	1.410	27.3	
Triplicate	1.680	27.9	
Average	1.52	27.6	2.33*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.61	3.00	-----	-----	-----	-----	-----
2	104	0.85	10.4	0.33	0.50	0.94	7.31	0.09776	0.76024	0.0884
6	101	0.95	10.7	0.18	0.60	1.02	7.86	0.10302	0.79386	0.09595
24	113	0.85	10.6	0.34	2.00	1.16	10.98	0.13108	1.24074	0.09605
48	110	0.85	11.6	0.34	0.00	1.16	14.56	0.1276	1.6016	0.0935
72	129	0.90	11.1	0.28	0.50	1.11	14.63	0.14319	1.88727	0.1161
96	-----	0.95	11.3	-----	-----	1.06	11.71	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		2.8
2	1.509	1.410	38.4	11.736	10.965	21.5	0.23	3.3
6	1.735	1.621	44.2	13.379	12.501	24.5	0.30	3.8
24	2.063	1.928	52.5	19.182	17.923	35.1	0.53	5.7
48	2.194	2.050	55.9	26.171	24.452	47.9	0.76	5.7
72	2.242	2.094	57.1	27.885	26.053	51.1	0.92	6.2
96	2.304	2.15	58.6	25.084	23.4	45.9	0.99	6.2

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt	**2.15**	**58.6**	**23.4**	**45.9**
Tail assay, g/mt	**1.52**		**27.6**	
Calculated Head g/mt	**3.67**		**51.0**	
NaCN Consumed, kg/mt	**0.99**			
Lime Added, kg/mt	**6.2**			

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore [1)]	**2.11**	**58.6**	**23.0**	**45.9**
Tail assay, g/mt ore [1)]	**1.49**		**27.1**	
Calculated Head g/mt ore [1)]	**3.60**		**50.1**	
NaCN Consumed, kg/mt ore [1)]	**0.97**			
Lime Added, kg/mt ore [1)]	**6.1**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-30**	
Composite	**WOS-13-MC**	
Feed Size	**80%-6.3mm**	
Biooxidation Test	**B-12**	
Biooxidation Time	**127**	days
Estimated Oxidation	**16.0**	%
Weight loss factor:	**98.33**	
Ore Charge	1015.6	g
Solution Vol.	1.5234	L
Natural pH	2.4	
Solid Density (Wt. %)	40.0	

Final Residue Wt 1001.1 g

Cyanide Conc. Maintained at: 1.00 g/L

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	4.150	68.9	3.08
Duplicate	3.950	65.6	2.59
Triplicate	4.010	73.7	3.11
Average	4.04	69.4	2.93

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.630	28.3	2.50
Duplicate	1.260	31.3	
Triplicate	1.310	29.9	
Average	1.40	29.8	2.46*

*Adjusted for weight loss during bio-oxidation

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.52	9.50	-----	-----	-----	-----	-----
2	106	0.80	10.8	0.39	1.00	1.41	7.85	0.14946	0.8321	0.0848
6	103	0.95	11.2	0.17	0.00	1.46	9.50	0.15038	0.9785	0.09785
24	118	0.80	10.6	0.40	1.50	1.55	13.63	0.1829	1.60834	0.0944
48	112	0.85	11.0	0.32	0.30	1.51	16.64	0.16912	1.86368	0.0952
72	118	0.85	10.8	0.33	1.00	1.40	18.02	0.1652	2.12636	0.1003
96	-----	0.95	11.1	-----	-----	1.32	18.26	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		9.4
2	2.148	2.115	50.6	11.959	11.775	18.3	0.30	10.3
6	2.374	2.337	55.9	15.304	15.069	23.4	0.37	10.3
24	2.661	2.620	62.7	22.575	22.228	34.5	0.67	11.8
48	2.783	2.740	65.6	28.768	28.326	43.9	0.89	12.1
72	2.785	2.742	65.6	32.734	32.231	50.0	1.12	13.1
96	2.828	2.78	66.5	35.226	34.7	53.8	1.19	13.1

	Au	% of Total	Ag	% of Total
Extracted g/mt	**2.78**	**66.5**	**34.7**	**53.8**
Tail assay, g/mt	**1.40**		**29.8**	
Calculated Head g/mt	**4.18**		**64.5**	
NaCN Consumed, kg/mt	**1.19**			
Lime Added, kg/mt	**13.1**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore 1)	**2.73**	**66.4**	**34.1**	**53.8**
Tail assay, g/mt ore 1)	**1.38**		**29.3**	
Calculated Head g/mt ore 1)	**4.11**		**63.4**	
NaCN Consumed, kg/mt ore 1)	**1.17**			
Lime Added, kg/mt ore 1)	**12.9**			

1)Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-31**	
Composite	**WWS-13-MC**	
Feed Size	**80%-12.5mm**	
Biooxidation Test	**B-3**	
Biooxidation Time	**155**	days
Estimated Oxidation	**26.8**	%
Weight loss factor:	**98.09**	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	2.450	7.8	3.17
Duplicate	2.680	7.6	3.51
Triplicate	2.790	8.5	3.40
Average	2.64	8.0	3.36

Ore Charge 1061.5 g

Solution Vol. 1.5923 L

Final Residue Wt 1048.8 g

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.330	4.5	2.51
Duplicate	1.478	4.7	
Triplicate	1.191	6.4	
Average	1.33	5.2	2.46*

*Adjusted for weight loss during bio-oxidation

Natural pH 1.9

Solid Density — Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.59	9.00	-----	-----	-----	-----	-----
2	112	0.65	9.8	0.63	1.20	0.51	0.95	0.05712	0.1064	0.0728
6	102	0.00	10.3	0.10	2.00	0.60	1.00	0.0612	0.102	0
24	130	0.60	9.9	0.71	3.40	0.75	1.24	0.0975	0.1612	0.078
48	101	0.80	10.2	0.40	5.00	0.78	1.68	0.07878	0.16968	0.0808
72	108	0.90	11.1	0.25	3.00	0.78	2.32	0.08424	0.25056	0.0972
96	-----	1.00	11.3	-----	-----	0.78	2.53	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		8.5
2	0.812	0.765	26.7	1.513	1.425	14.7	0.52	9.6
6	1.013	0.954	33.4	1.699	1.600	16.5	2.02	11.5
24	1.313	1.237	43.2	2.183	2.056	21.2	1.22	14.7
48	1.458	1.373	48.0	3.045	2.868	29.6	1.51	19.4
72	1.537	1.448	50.6	4.233	3.988	41.1	1.66	22.2
96	1.621	1.53	53.5	4.818	4.5	46.4	1.66	22.2

	Au	% of Total	Ag	% of Total
Extracted g/mt	**1.53**	**53.5**	**4.5**	**46.4**
Tail assay, g/mt	**1.33**		**5.2**	
Calculated Head g/mt	**2.86**		**9.7**	
NaCN Consumed, kg/mt	**1.66**			
Lime Added, kg/mt	**22.2**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**1.50**	**53.6**	**4.4**	**46.3**
Tail assay, g/mt ore [1)]	**1.30**		**5.1**	
Calculated Head g/mt ore [1)]	**2.80**		**9.5**	
NaCN Consumed, kg/mt ore [1)]	**1.63**			
Lime Added, kg/mt ore [1)]	**21.8**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-32**	
Composite	**WWS-13-MC**	
Feed Size	**80%-6.3mm**	
Biooxidation Test	**B-4**	
Biooxidation Time	**155**	days
Estimated Oxidation	**19.3**	%
Weight loss factor:	**98.08**	
Ore Charge	993.4	g
Solution Vol.	1.4901	L
Natural pH	1.7	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	2.450	7.8	3.17
Duplicate	2.680	7.6	3.51
Triplicate	2.790	8.5	3.40
Average	2.64	8.0	3.36

Final Residue Wt 978.5 g

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.089	2.7	2.76
Duplicate	1.110	3.4	
Triplicate	0.982	2.5	
Average	1.06	2.9	2.71*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.49	12.50	-----	-----	-----	-----	-----
2	103	0.75	10.0	0.45	1.20	0.71	1.50	0.07313	0.1545	0.07725
6	105	0.90	10.4	0.24	2.00	0.78	1.56	0.0819	0.1638	0.0945
24	105	0.65	10.1	0.59	3.00	0.90	1.77	0.0945	0.18585	0.06825
48	102	0.80	10.5	0.38	3.50	0.92	1.83	0.09384	0.18666	0.0816
72	104	0.90	11.2	0.23	2.00	0.90	1.91	0.0936	0.19864	0.0936
96	-----	0.90	11.4	-----	-----	0.84	1.92	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		12.6
2	1.058	1.065	38.6	2.235	2.250	33.6	0.37	13.8
6	1.235	1.244	45.1	2.479	2.496	37.2	0.53	15.8
24	1.496	1.506	54.6	2.956	2.975	44.4	1.05	18.8
48	1.620	1.631	59.1	3.231	3.252	48.5	1.35	22.3
72	1.684	1.696	61.4	3.537	3.560	53.1	1.50	24.4
96	1.689	1.70	61.6	3.750	3.8	56.7	1.63	24.4

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt	**1.70**	**61.6**	**3.8**	**56.7**
Tail assay, g/mt	**1.06**		**2.9**	
Calculated Head g/mt	**2.76**		**6.7**	
NaCN Consumed, kg/mt	**1.63**			
Lime Added, kg/mt	**24.4**			

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore [1)]	**1.67**	**61.6**	**3.7**	**56.9**
Tail assay, g/mt ore [1)]	**1.04**		**2.8**	
Calculated Head g/mt ore [1)]	**2.71**		**6.5**	
NaCN Consumed, kg/mt ore [1)]	**1.60**			
Lime Added, kg/mt ore [1)]	**23.9**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No. 3775-01
Test No. CY-33
Composite FSU-13-1
Feed Size 80%-12.5mm
Biooxidation Test B-7
Biooxidation Time 155 days
Estimated Oxidation 25.6 %
Weight loss factor: 98.07

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	0.572	3.2	4.33
Duplicate	0.486	2.7	4.73
Triplicate	0.475	2.4	4.66
Average	0.51	2.8	4.57

Ore Charge 1033.3 g

Final Residue Wt 1004.6 g

Solution Vol. 1.55 L

Natural pH 2.2

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.212	1.2	3.47
Duplicate	0.224	1.7	
Triplicate	0.351	1.4	
Average	0.26	1.4	3.40*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.55	17.50	-----	-----	-----	-----	-----
2	108	0.75	10.3	0.47	2.00	0.12	0.21	0.01296	0.02268	0.081
6	103	1.00	10.7	0.10	1.50	0.13	0.22	0.01339	0.02266	0.103
24	121	0.80	10.3	0.41	4.00	0.13	0.26	0.01573	0.03146	0.0968
48	113	0.90	11.0	0.26	2.00	0.13	0.26	0.01469	0.02938	0.1017
72	109	1.00	11.3	0.11	1.00	0.13	0.26	0.01417	0.02834	0.109
96	-----	0.95	11.4	-----	-----	0.12	0.28	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		16.9
2	0.186	0.180	35.3	0.326	0.315	15.8	0.38	18.9
6	0.214	0.208	40.7	0.364	0.352	17.6	0.38	20.3
24	0.228	0.221	43.2	0.448	0.434	21.7	0.67	24.2
48	0.244	0.236	46.2	0.480	0.464	23.2	0.83	26.1
72	0.258	0.250	49.0	0.509	0.493	24.6	0.83	27.1
96	0.257	0.25	49.0	0.569	0.6	30.0	0.91	27.1

	Au	% of Total	Ag	% of Total
Extracted g/mt	**0.25**	**49.0**	**0.6**	**30.0**
Tail assay, g/mt	**0.26**		**1.4**	
Calculated Head g/mt	**0.51**		**2.0**	
NaCN Consumed, kg/mt	**0.91**			
Lime Added, kg/mt	**27.1**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**0.25**	**50.0**	**0.6**	**30.0**
Tail assay, g/mt ore [1)]	**0.25**		**1.4**	
Calculated Head g/mt ore [1)]	**0.50**		**2.0**	
NaCN Consumed, kg/mt ore [1)]	**0.89**			
Lime Added, kg/mt ore [1)]	**26.6**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-34**	
Composite	**FSU-13-1**	
Feed Size	**80%-6.3mm**	
Biooxidation Test	**B-8**	
Biooxidation Time	**155**	days
Estimated Oxidation	**23.4**	%
Weight loss factor:	**98.09**	
Ore Charge	1018.1	g
Solution Vol.	1.5272	L
Natural pH	2.3	

Final Residue Wt 994.3 g

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	0.572	3.2	4.33
Duplicate	0.486	2.7	4.73
Triplicate	0.475	2.4	4.66
Average	0.51	2.8	4.57

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.155	1.7	3.57
Duplicate	0.155	1.7	
Triplicate	0.124	1.2	
Average	0.14	1.5	3.50*

*Adjusted for weight loss during bio-oxidation

Solid Density: Wt. % 40.0

Cyanide Conc. Maintained at: g/L 1.00

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.53	17.00	-----	-----	-----	-----	-----
2	106	0.85	10.4	0.39	1.00	0.11	0.21	0.01166	0.02226	0.0901
6	102	1.00	10.6	0.10	1.50	0.13	0.22	0.01326	0.02244	0.102
24	105	0.95	10.4	0.25	3.00	0.13	0.26	0.01365	0.0273	0.09975
48	106	0.95	10.8	0.18	2.50	0.14	0.28	0.01484	0.02968	0.1007
72	108	0.90	11.2	0.25	1.00	0.13	0.28	0.01404	0.03024	0.0972
96	-----	1.00	11.3	-----	-----	0.13	0.30	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		16.7
2	0.168	0.165	41.3	0.321	0.315	15.0	0.23	17.7
6	0.210	0.206	51.6	0.358	0.352	16.8	0.30	19.2
24	0.223	0.219	54.9	0.442	0.434	20.7	0.37	22.1
48	0.252	0.248	62.0	0.500	0.491	23.4	0.52	24.6
72	0.252	0.247	61.9	0.529	0.520	24.8	0.67	25.5
96	0.266	0.26	65.0	0.590	0.6	28.6	0.67	25.5

	Au	% of Total	Ag	% of Total
Extracted g/mt	**0.26**	**65.0**	**0.6**	**28.6**
Tail assay, g/mt	**0.14**		**1.5**	
Calculated Head g/mt	**0.40**		**2.1**	
NaCN Consumed, kg/mt	**0.67**			
Lime Added, kg/mt	**25.5**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore 1)	**0.26**	**65.0**	**0.6**	**28.6**
Tail assay, g/mt ore 1)	**0.14**		**1.5**	
Calculated Head g/mt ore 1)	**0.40**		**2.1**	
NaCN Consumed, kg/mt ore 1)	**0.66**			
Lime Added, kg/mt ore 1)	**25.0**			

1)Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-35**	
Composite	**WOS-13-MC**	
Feed Size	**80%-12.5mm**	
Biooxidation Test	**B-11**	
Biooxidation Time	**155**	days
Estimated Oxidation	**22.2**	%
Weight loss factor:	**97.96**	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	4.150	68.9	3.08
Duplicate	3.950	65.6	2.59
Triplicate	4.010	73.7	3.11
Average	4.04	69.4	2.93

Ore Charge 1069.5 g

Final Residue Wt 1072.9 g

Solution Vol. 1.6043 L

Natural pH 2.4

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.254	18.1	2.33
Duplicate	1.079	25.0	
Triplicate	1.314	24.5	
Average	1.22	22.5	2.28*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.60	8.00	-----	-----	-----	-----	-----
2	113	0.90	10.5	0.26	0.50	1.15	7.82	0.12995	0.88366	0.1017
6	104	0.95	10.8	0.17	0.50	1.23	8.45	0.12792	0.8788	0.0988
24	107	0.75	10.3	0.48	1.00	1.37	11.27	0.14659	1.20589	0.08025
48	105	0.85	10.5	0.33	2.00	1.35	13.83	0.14175	1.45215	0.08925
72	111	0.95	11.3	0.18	1.00	1.31	16.25	0.14541	1.80375	0.10545
96	-----	0.90	11.4	-----	-----	1.25	16.54	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		7.5
2	1.845	1.725	46.1	12.546	11.730	22.1	0.15	7.9
6	2.103	1.967	52.6	14.440	13.502	25.4	0.22	8.4
24	2.456	2.296	61.4	19.843	18.553	34.9	0.59	9.4
48	2.570	2.403	64.3	25.156	23.521	44.3	0.81	11.2
72	2.648	2.476	66.2	30.490	28.509	53.7	0.88	12.2
96	2.697	2.52	67.4	32.759	30.6	57.6	1.03	12.2

	Au	% of Total	Ag	% of Total
Extracted g/mt	**2.52**	**67.4**	**30.6**	**57.6**
Tail assay, g/mt	**1.22**		**22.5**	
Calculated Head g/mt	**3.74**		**53.1**	
NaCN Consumed, kg/mt	**1.03**			
Lime Added, kg/mt	**12.2**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**2.47**	**67.3**	**30.0**	**57.7**
Tail assay, g/mt ore [1)]	**1.20**		**22.0**	
Calculated Head g/mt ore [1)]	**3.67**		**52.0**	
NaCN Consumed, kg/mt ore [1)]	**1.01**			
Lime Added, kg/mt ore [1)]	**12.0**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-36**	
Composite	**WOS-13-MC**	
Feed Size	**80%-6.3mm**	
Biooxidation Test	**B-12**	
Biooxidation Time	**155**	days
Estimated Oxidation	**27.6**	%
Weight loss factor:	**97.97**	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	4.150	68.9	3.08
Duplicate	3.950	65.6	2.59
Triplicate	4.010	73.7	3.11
Average	4.04	69.4	2.93

Ore Charge 1003 g

Final Residue Wt 993.7 g

Solution Vol. 1.5045 L

Natural pH 2.0

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.825	18.5	2.16
Duplicate	0.834	20.6	
Triplicate	0.943	21.6	
Average	0.87	20.2	2.12*

*Adjusted for weight loss during bio-oxidation

	Wt. %
Solid Density	40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.50	9.00	-----	-----	-----	-----	-----
2	111	0.80	10.4	0.39	1.00	1.41	8.48	0.15651	0.94128	0.0888
6	103	0.95	11.0	0.17	0.25	1.44	9.05	0.14832	0.93215	0.09785
24	108	0.75	10.3	0.45	2.00	1.52	12.35	0.16416	1.3338	0.081
48	101	0.85	10.7	0.31	2.00	1.46	15.07	0.14746	1.52207	0.08585
72	108	0.95	11.2	0.17	1.00	1.43	16.75	0.15444	1.809	0.1026
96	-----	0.90	11.3	-----	-----	1.35	17.05	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		9.0
2	2.121	2.115	57.8	12.758	12.720	24.3	0.30	10.0
6	2.323	2.316	63.3	14.557	14.513	27.8	0.37	10.2
24	2.592	2.584	70.6	20.454	20.393	39.0	0.74	12.2
48	2.666	2.658	72.6	25.880	25.803	49.3	0.96	14.2
72	2.768	2.760	75.4	29.930	29.840	57.1	1.03	15.2
96	2.802	2.79	76.2	32.190	32.1	61.4	1.18	15.2

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt	**2.79**	**76.2**	**32.1**	**61.4**
Tail assay, g/mt	**0.87**		**20.2**	
Calculated Head g/mt	**3.66**		**52.3**	
NaCN Consumed, kg/mt	**1.18**			
Lime Added, kg/mt	**15.2**			

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore [1)]	**2.73**	**76.3**	**31.4**	**61.3**
Tail assay, g/mt ore [1)]	**0.85**		**19.8**	
Calculated Head g/mt ore [1)]	**3.58**		**51.2**	
NaCN Consumed, kg/mt ore [1)]	**1.16**			
Lime Added, kg/mt ore [1)]	**14.9**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No. **3775-01**
Test No. **CY-37**
Composite **WWS-13-MC**
Feed Size **80%-12.5mm**
Biooxidation Test **B-3**
Biooxidation Time **183** days
Estimated Oxidation **16.1** %
Weight loss factor: **97.74**

Head Assay	g Au/mt	g Ag/mt	%, S=
Predicted			
Initial	2.450	7.8	3.17
Duplicate	2.680	7.6	3.51
Triplicate	2.790	8.5	3.40
Average	2.64	8.0	3.36

Ore Charge 1028.4 g

Solution Vol. 1.5426 L

Final Residue Wt 1018.9 g

Tail Assay	g Au/mt	g Ag/mt	%, S=
Initial	1.714	7.9	2.89
Duplicate	1.624	8.2	
Triplicate	1.970	5.9	
Average	1.77	7.3	2.82*

*Adjusted for weight loss during bio-oxidation

Natural pH 2.2

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.54	13.00	-----	-----	-----	-----	-----
2	101	0.90	10.7	0.24	1.00	0.55	1.14	0.05555	0.11514	0.0909
6	104	0.95	10.9	0.17	1.00	0.63	1.20	0.06552	0.1248	0.0988
24	113	0.65	10.4	0.61	3.00	0.74	1.36	0.08362	0.15368	0.07345
48	110	0.80	11.1	0.39	1.00	0.77	1.49	0.0847	0.1639	0.088
72	113	0.95	10.9	0.18	1.70	0.75	1.54	0.08475	0.17402	0.10735
96	-----	0.85	11.3	-----	-----	0.75	1.62	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		12.6
2	0.848	0.825	25.3	1.759	1.710	16.4	0.15	13.6
6	1.027	0.999	30.6	1.966	1.912	18.4	0.22	14.6
24	1.263	1.228	37.7	2.338	2.273	21.9	0.74	17.5
48	1.392	1.354	41.5	2.692	2.618	25.2	1.03	18.5
72	1.446	1.406	43.1	2.933	2.852	27.4	1.10	20.1
96	1.531	1.49	45.7	3.231	3.1	29.8	1.32	20.1

	Au	% of Total	Ag	% of Total
Extracted g/mt	**1.49**	**45.7**	**3.1**	**29.8**
Tail assay, g/mt	**1.77**		**7.3**	
Calculated Head g/mt	**3.26**		**10.4**	
NaCN Consumed, kg/mt	**1.32**			
Lime Added, kg/mt	**20.1**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**1.46**	**45.8**	**3.0**	**29.7**
Tail assay, g/mt ore [1)]	**1.73**		**7.1**	
Calculated Head g/mt ore [1)]	**3.19**		**10.1**	
NaCN Consumed, kg/mt ore [1)]	**1.29**			
Lime Added, kg/mt ore [1)]	**19.6**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**
Test No.	**CY-38**
Composite	**WWS-13-MC**
Feed Size	**80%-6.3mm**
Biooxidation Test	**B-4**
Biooxidation Time	**183** days
Estimated Oxidation	**28.3** %
Weight loss factor:	**97.73**

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	2.450	7.8	3.17
Duplicate	2.680	7.6	3.51
Triplicate	2.790	8.5	3.40
Average	2.64	8.0	3.36

Ore Charge 1021.5 g

Final Residue Wt 1009.5 g

Solution Vol. 1.5323 L

Natural pH 2.1

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.970	4.6	2.47
Duplicate	1.019	3.7	
Triplicate	1.001	3.8	
Average	1.00	4.0	2.41*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.53	15.00	-----	-----	-----	-----	-----
2	103	0.80	10.6	0.39	1.00	0.70	1.45	0.0721	0.14935	0.0824
6	103	0.90	10.8	0.24	1.00	0.78	1.51	0.08034	0.15553	0.0927
24	116	0.75	10.4	0.54	3.00	0.91	1.70	0.10556	0.1972	0.087
48	112	0.85	11.0	0.32	1.00	0.94	1.83	0.10528	0.20496	0.0952
72	112	0.90	11.0	0.25	1.30	0.91	1.82	0.10192	0.20384	0.1008
96	-----	0.95	11.2	-----	-----	0.87	1.83	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		14.7
2	1.073	1.050	38.0	2.222	2.175	28.6	0.30	15.7
6	1.267	1.241	45.0	2.463	2.411	31.7	0.45	16.6
24	1.547	1.514	54.9	2.910	2.849	37.5	0.82	19.6
48	1.698	1.663	60.2	3.306	3.237	42.6	1.11	20.6
72	1.758	1.721	62.3	3.496	3.422	45.0	1.26	21.8
96	1.798	1.76	63.8	3.715	3.6	47.4	1.33	21.8

	Au	% of Total	Ag	% of Total
Extracted g/mt	**1.76**	**63.8**	**3.6**	**47.4**
Tail assay, g/mt	**1.00**		**4.0**	
Calculated Head g/mt	**2.76**		**7.6**	
NaCN Consumed, kg/mt	**1.33**			
Lime Added, kg/mt	**21.8**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**1.72**	**63.7**	**3.5**	**47.3**
Tail assay, g/mt ore [1)]	**0.98**		**3.9**	
Calculated Head g/mt ore [1)]	**2.70**		**7.4**	
NaCN Consumed, kg/mt ore [1)]	**1.30**			
Lime Added, kg/mt ore [1)]	**21.3**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-39**	
Composite	**FSU-13-1**	
Feed Size	**80%-12.5mm**	
Biooxidation Test	**B-7**	
Biooxidation Time	**183**	days
Estimated Oxidation	**39.8**	%
Weight loss factor:	**97.73**	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	0.572	3.2	4.33
Duplicate	0.486	2.7	4.73
Triplicate	0.475	2.4	4.66
Average	0.51	2.8	4.57

Ore Charge 1001.2 g

Solution Vol. 1.5018 L

Final Residue Wt 986.7 g

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.380	2.0	2.81
Duplicate	0.362	2.1	
Triplicate	0.436	2.1	
Average	0.39	2.1	2.75*

*Adjusted for weight loss during bio-oxidation

Natural pH 2.6

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.50	19.50	-----	-----	-----	-----	-----
2	103	0.35	10.3	1.01	3.00	0.09	0.19	0.00927	0.01957	0.03605
6	101	0.95	10.9	0.17	1.00	0.11	0.22	0.01111	0.02222	0.09595
24	106	0.80	10.5	0.38	3.00	0.14	0.25	0.01484	0.0265	0.0848
48	106	0.95	11.0	0.17	1.00	0.15	0.27	0.0159	0.02862	0.1007
72	105	1.00	11.1	0.10	0.50	0.15	0.26	0.01575	0.0273	0.105
96	-----	0.90	11.2	-----	-----	0.14	0.26	-----	-----	-----

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction mg	g/mt	% of total	Cumulative Ag Extraction mg	g/mt	% of total	Reagent Requirements Cumulative kg/mt Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		19.5
2	0.135	0.135	20.1	0.285	0.285	11.0	0.97	22.5
6	0.174	0.174	26.0	0.350	0.350	13.4	1.05	23.5
24	0.231	0.230	34.4	0.417	0.417	16.0	1.34	26.5
48	0.260	0.260	38.8	0.474	0.473	18.2	1.41	27.5
72	0.276	0.276	41.2	0.487	0.487	18.7	1.41	28.0
96	0.277	0.28	41.8	0.515	0.5	19.2	1.55	28.0

	Au	% of Total	Ag	% of Total
Extracted g/mt	**0.28**	**41.8**	**0.5**	**19.2**
Tail assay, g/mt	**0.39**		**2.1**	
Calculated Head g/mt	**0.67**		**2.6**	
NaCN Consumed, kg/mt	**1.55**			
Lime Added, kg/mt	**28.0**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**0.27**	**41.5**	**0.5**	**19.2**
Tail assay, g/mt ore [1)]	**0.38**		**2.1**	
Calculated Head g/mt ore [1)]	**0.65**		**2.6**	
NaCN Consumed, kg/mt ore [1)]	**1.51**			
Lime Added, kg/mt ore [1)]	**27.4**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-40**	
Composite	**FSU-13-1**	
Feed Size	**80%-6.3mm**	
Biooxidation Test	**B-8**	
Biooxidation Time	**183**	days
Estimated Oxidation	**38.5**	%
Weight loss factor:	**97.74**	
Ore Charge	975	g
Solution Vol.	1.4625	L
Natural pH	2.6	
Solid Density (Wt. %)	40.0	

Final Residue Wt 934.4 g

Cyanide Conc. Maintained at: 1.00 g/L

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	0.572	3.2	4.33
Duplicate	0.486	2.7	4.73
Triplicate	0.475	2.4	4.66
Average	0.51	2.8	4.57

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.176	1.6	2.88
Duplicate	0.170	1.7	
Triplicate	0.239	1.6	
Average	0.20	1.6	2.81*

*Adjusted for weight loss during bio-oxidation

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.46	24.00	-----	-----	-----	-----	-----
2	102	0.50	10.4	0.78	2.00	0.11	0.17	0.01122	0.01734	0.051
6	102	0.90	10.7	0.24	2.00	0.13	0.20	0.01326	0.0204	0.0918
24	111	0.95	10.6	0.18	3.00	0.15	0.23	0.01665	0.02553	0.10545
48	106	0.95	11.0	0.17	1.00	0.15	0.25	0.0159	0.0265	0.1007
72	108	1.00	11.2	0.11	0.00	0.14	0.24	0.01512	0.02592	0.108
96	-----	0.90	11.0	-----	-----	0.14	0.25	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		24.6
2	0.161	0.165	34.4	0.249	0.255	12.1	0.75	26.7
6	0.201	0.207	43.0	0.310	0.318	15.1	0.90	28.7
24	0.244	0.250	52.1	0.374	0.384	18.3	0.97	31.8
48	0.261	0.267	55.7	0.429	0.440	20.9	1.05	32.8
72	0.262	0.268	55.9	0.441	0.452	21.5	1.04	32.8
96	0.277	0.28	58.3	0.481	0.5	23.8	1.20	32.8

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt	**0.28**	**58.3**	**0.5**	**23.8**
Tail assay, g/mt	**0.20**		**1.6**	
Calculated Head g/mt	**0.48**		**2.1**	
NaCN Consumed, kg/mt	**1.20**			
Lime Added, kg/mt	**32.8**			

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore [1)]	**0.27**	**57.4**	**0.5**	**23.8**
Tail assay, g/mt ore [1)]	**0.20**		**1.6**	
Calculated Head g/mt ore [1)]	**0.47**		**2.1**	
NaCN Consumed, kg/mt ore [1)]	**1.17**			
Lime Added, kg/mt ore [1)]	**32.1**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**
Test No.	**CY-41**
Composite	**WOS-13-MC**
Feed Size	**80%-12.5mm**
Biooxidation Test	**B-11**
Biooxidation Time	**183** days
Estimated Oxidation	**34.1** %
Weight loss factor:	**97.59**

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	4.150	68.9	3.08
Duplicate	3.950	65.6	2.59
Triplicate	4.010	73.7	3.11
Average	4.04	69.4	2.93

Ore Charge 1047.2 g

Final Residue Wt 1047.8 g

Solution Vol. 1.5708 L

Natural pH 2.5

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.343	34.5	1.98
Duplicate	1.256	37.3	
Triplicate	1.212	32.0	
Average	1.27	34.6	1.93*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.57	8.00	-----	-----	-----	-----	-----
2	102	0.90	11.3	0.25	0.00	1.26	8.35	0.12852	0.8517	0.0918
6	106	0.95	11.3	0.18	0.00	1.48	10.30	0.15688	1.0918	0.1007
24	105	0.80	10.7	0.40	1.50	1.71	15.10	0.17955	1.5855	0.084
48	102	0.85	11.1	0.32	0.00	1.65	18.30	0.1683	1.8666	0.0867
72	113	0.90	10.8	0.26	1.30	1.53	19.40	0.17289	2.1922	0.1017
96	-----	0.90	11.4	-----	-----	1.51	20.55	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		7.6
2	1.979	1.890	44.0	13.116	12.525	17.2	0.15	7.6
6	2.453	2.343	54.5	17.031	16.263	22.4	0.23	7.6
24	2.971	2.838	66.0	25.663	24.506	33.7	0.53	9.1
48	3.057	2.919	67.9	32.275	30.820	42.4	0.75	9.1
72	3.037	2.900	67.4	35.869	34.252	47.1	0.90	10.3
96	3.178	3.03	70.5	39.868	38.1	52.4	1.05	10.3

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt	**3.03**	**70.5**	**38.1**	**52.4**
Tail assay, g/mt	**1.27**		**34.6**	
Calculated Head g/mt	**4.30**		**72.7**	
NaCN Consumed, kg/mt	**1.05**			
Lime Added, kg/mt	**10.3**			

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore [1)]	**2.96**	**70.5**	**37.2**	**52.4**
Tail assay, g/mt ore [1)]	**1.24**		**33.8**	
Calculated Head g/mt ore [1)]	**4.20**		**71.0**	
NaCN Consumed, kg/mt ore [1)]	**1.02**			
Lime Added, kg/mt ore [1)]	**10.1**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-42**	
Composite	**WOS-13-MC**	
Feed Size	**80%-6.3mm**	
Biooxidation Test	**B-12**	
Biooxidation Time	**183**	days
Estimated Oxidation	**33.4**	%
Weight loss factor:	**97.60**	
Ore Charge	1000	g
Solution Vol.	1.5	L
Natural pH	2.3	

Head Assay	g Au/mt	g Ag/mt	%, $S^{=}$
Predicted			
Initial	4.150	68.9	3.08
Duplicate	3.950	65.6	2.59
Triplicate	4.010	73.7	3.11
Average	4.04	69.4	2.93

Final Residue Wt 998.3 g

Tail Assay	g Au/mt	g Ag/mt	%, $S^{=}$
Initial	1.056	35.0	2.00
Duplicate	1.150	34.8	
Triplicate	0.971	31.5	
Average	1.06	33.8	1.95*

*Adjusted for weight loss during bio-oxidation

Solid Density: Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.50	10.00	-----	-----	-----	-----	-----
2	100	0.75	11.0	0.52	0.50	1.59	9.27	0.159	0.927	0.075
6	103	0.90	11.1	0.24	0.00	1.61	9.94	0.16583	1.02382	0.0927
24	103	0.80	10.4	0.38	1.50	1.75	13.60	0.18025	1.4008	0.0824
48	105	0.90	10.9	0.24	1.00	1.71	15.95	0.17955	1.67475	0.0945
72	104	0.95	11.1	0.17	0.70	1.62	17.00	0.16848	1.768	0.0988
96	-----	0.90	11.1	-----	-----	1.53	17.35	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		10.0
2	2.385	2.385	56.7	13.905	13.905	20.9	0.38	10.5
6	2.574	2.574	61.1	15.837	15.837	23.8	0.60	10.5
24	2.950	2.950	70.1	22.351	22.351	33.6	0.89	12.0
48	3.070	3.070	72.9	27.277	27.277	41.0	1.04	13.0
72	3.115	3.115	74.0	30.526	30.526	45.8	1.11	13.7
96	3.148	3.15	74.8	32.819	32.8	49.2	1.26	13.7

	Au	% of Total	Ag	% of Total
Extracted g/mt	**3.15**	**74.8**	**32.8**	**49.2**
Tail assay, g/mt	**1.06**		**33.8**	
Calculated Head g/mt	**4.21**		**66.6**	
NaCN Consumed, kg/mt	**1.26**			
Lime Added, kg/mt	**13.7**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**3.07**	**74.9**	**32.0**	**49.2**
Tail assay, g/mt ore [1)]	**1.03**		**33.0**	
Calculated Head g/mt ore [1)]	**4.10**		**65.0**	
NaCN Consumed, kg/mt ore [1)]	**1.23**			
Lime Added, kg/mt ore [1)]	**13.4**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-43**	
Composite	**WWS-13-MC**	
Feed Size	**80%-12.5mm**	
Biooxidation Test	**B-3**	
Biooxidation Time	**210**	days
Estimated Oxidation	**26.8**	%
Weight loss factor:	**97.41**	
Ore Charge	1038.3	g
Solution Vol.	1.5575	L
Natural pH	2.2	
Solid Density (Wt. %)	40.0	

Final Residue Wt 1026.2 g

Cyanide Conc. Maintained at: 1.00 g/L

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	2.450	7.8	3.17
Duplicate	2.680	7.6	3.51
Triplicate	2.790	8.5	3.40
Average	2.64	8.0	3.36

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.300	4.3	2.53
Duplicate	1.030	5.8	
Triplicate	1.160	4.5	
Average	1.16	4.9	2.46*

*Adjusted for weight loss during bio-oxidation

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.56	14.00	-----	-----	-----	-----	-----
2	103	0.95	11.3	0.18	0.00	0.55	1.11	0.05665	0.11433	0.09785
6	104	0.90	11.0	0.25	0.50	0.61	1.21	0.06344	0.12584	0.0936
24	104	0.70	10.4	0.54	1.50	0.72	1.43	0.07488	0.14872	0.0728
48	111	0.80	10.7	0.40	1.50	0.77	1.60	0.08547	0.1776	0.0888
72	105	0.90	10.8	0.25	1.50	0.75	1.66	0.07875	0.1743	0.0945
96	-----	0.90	11.1	-----	-----	0.73	1.65	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		13.5
2	0.857	0.825	31.7	1.729	1.665	20.6	0.08	13.5
6	1.007	0.970	37.3	1.999	1.925	23.8	0.23	14.0
24	1.241	1.196	46.0	2.467	2.376	29.3	0.68	15.4
48	1.394	1.343	51.6	2.881	2.775	34.3	0.98	16.9
72	1.449	1.395	53.7	3.152	3.036	37.5	1.13	18.3
96	1.496	1.44	55.4	3.311	3.2	39.5	1.28	18.3

	Au	% of Total	Ag	% of Total
Extracted g/mt	**1.44**	**55.4**	**3.2**	**39.5**
Tail assay, g/mt	**1.16**		**4.9**	
Calculated Head g/mt	**2.60**		**8.1**	
NaCN Consumed, kg/mt	**1.28**			
Lime Added, kg/mt	**18.3**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**1.40**	**55.3**	**3.1**	**39.2**
Tail assay, g/mt ore [1)]	**1.13**		**4.8**	
Calculated Head g/mt ore [1)]	**2.53**		**7.9**	
NaCN Consumed, kg/mt ore [1)]	**1.25**			
Lime Added, kg/mt ore [1)]	**17.8**			

[1)] Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-44**	
Composite	**WWS-13-MC**	
Feed Size	**80%-6.3mm**	
Biooxidation Test	**B-4**	
Biooxidation Time	**210**	days
Estimated Oxidation	**22.3**	%
Weight loss factor:	**97.40**	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	2.450	7.8	3.17
Duplicate	2.680	7.6	3.51
Triplicate	2.790	8.5	3.40
Average	2.64	8.0	3.36

Ore Charge 983.8 g

Final Residue Wt 966.1 g

Solution Vol. 1.4757 L

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.993	2.9	2.68
Duplicate	0.940	4.3	
Triplicate	1.040	4.6	
Average	0.99	3.9	2.61*

*Adjusted for weight loss during bio-oxidation

Natural pH 2.2

	Wt. %		g/L
Solid Density	40.0	Cyanide Conc. Maintained at:	1.00

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.48	17.00	-----	-----	-----	-----	-----
2	105	0.75	11.3	0.45	0.00	0.66	1.40	0.0693	0.147	0.07875
6	105	0.95	11.2	0.18	0.00	0.76	1.52	0.0798	0.1596	0.09975
24	116	0.65	10.5	0.60	1.00	0.92	1.75	0.10672	0.203	0.0754
48	108	0.85	10.6	0.32	2.00	0.97	1.91	0.10476	0.20628	0.0918
72	103	0.90	11.0	0.24	0.50	0.97	1.94	0.09991	0.19982	0.0927
96	-----	0.90	10.9	-----	-----	0.95	2.00	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		17.3
2	0.974	0.990	34.4	2.066	2.100	26.9	0.38	17.3
6	1.191	1.210	42.0	2.390	2.429	31.1	0.46	17.3
24	1.507	1.532	53.2	2.889	2.937	37.6	0.99	18.3
48	1.687	1.715	59.5	3.328	3.383	43.4	1.22	20.3
72	1.792	1.822	63.2	3.579	3.638	46.6	1.38	20.8
96	1.862	1.89	65.6	3.867	3.9	50.0	1.53	20.8

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt	**1.89**	**65.6**	**3.9**	**50.0**
Tail assay, g/mt	**0.99**		**3.9**	
Calculated Head g/mt	**2.88**		**7.8**	
NaCN Consumed, kg/mt	**1.53**			
Lime Added, kg/mt	**20.8**			

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore [1)]	**1.84**	**65.7**	**3.8**	**50.0**
Tail assay, g/mt ore [1)]	**0.96**		**3.8**	
Calculated Head g/mt ore [1)]	**2.80**		**7.6**	
NaCN Consumed, kg/mt ore [1)]	**1.49**			
Lime Added, kg/mt ore [1)]	**20.3**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-45**	
Composite	**FSU-13-1**	
Feed Size	**80%-12.5mm**	
Biooxidation Test	**B-7**	
Biooxidation Time	**210**	days
Estimated Oxidation	**30.2**	%
Weight loss factor:	**97.39**	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	0.572	3.2	4.33
Duplicate	0.486	2.7	4.73
Triplicate	0.475	2.4	4.66
Average	0.51	2.8	4.57

Ore Charge 975.8 g

Final Residue Wt 944.8 g

Solution Vol. 1.4637 L

Natural pH 2.6

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.215	1.5	3.28
Duplicate	0.165	1.5	
Triplicate	0.184	1.3	
Average	0.19	1.4	3.19*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.46	23.00	-----	-----	-----	-----	-----
2	102	0.85	10.6	0.30	1.00	0.07	0.18	0.00714	0.01836	0.0867
6	105	0.45	10.6	0.85	2.00	0.08	0.20	0.0084	0.021	0.04725
24	107	0.80	10.9	0.37	1.00	0.10	0.25	0.0107	0.02675	0.0856
48	111	0.95	10.7	0.17	2.00	0.10	0.25	0.0111	0.02775	0.10545
72	106	0.95	11.1	0.17	0.00	0.10	0.25	0.0106	0.0265	0.1007
96	-----	0.95	10.9	-----	-----	0.10	0.25	-----	-----	-----

Metallurgical Results

Leach Time Hours	Cumulative Au Extraction mg	g/mt	% of total	Cumulative Ag Extraction mg	g/mt	% of total	Reagent Requirements Cumulative kg/mt Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		23.6
2	0.102	0.105	26.9	0.263	0.270	14.2	0.22	24.6
6	0.124	0.127	32.6	0.311	0.319	16.8	1.04	26.6
24	0.162	0.166	42.5	0.405	0.415	21.9	1.34	27.7
48	0.173	0.177	45.4	0.432	0.443	23.3	1.40	29.7
72	0.184	0.188	48.3	0.460	0.471	24.8	1.47	29.7
96	0.194	0.20	51.3	0.486	0.5	26.3	1.54	29.7

	Au	% of Total	Ag	% of Total
Extracted g/mt	**0.20**	**51.3**	**0.5**	**26.3**
Tail assay, g/mt	**0.19**		**1.4**	
Calculated Head g/mt	**0.39**		**1.9**	
NaCN Consumed, kg/mt	**1.54**			
Lime Added, kg/mt	**29.7**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**0.19**	**50.0**	**0.5**	**26.3**
Tail assay, g/mt ore [1)]	**0.19**		**1.4**	
Calculated Head g/mt ore [1)]	**0.38**		**1.9**	
NaCN Consumed, kg/mt ore [1)]	**1.50**			
Lime Added, kg/mt ore [1)]	**28.9**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-46**	
Composite	**WOS-13-MC**	
Feed Size	**80%-12.5mm**	
Biooxidation Test	**B-11**	
Biooxidation Time	**210**	days
Estimated Oxidation	**27.0**	%
Weight loss factor:	**97.23**	

Head Assay	g Au/mt	g Ag/mt	%, S=
Predicted			
Initial	4.150	68.9	3.08
Duplicate	3.950	65.6	2.59
Triplicate	4.010	73.7	3.11
Average	4.04	69.4	2.93

Ore Charge 1022.1 g

Final Residue Wt 1023.4 g

Solution Vol. 1.5332 L

Natural pH 2.4

Tail Assay	g Au/mt	g Ag/mt	%, S=
Initial	2.910	32.3	2.20
Duplicate	1.240	30.0	
Triplicate	1.260	26.1	
Average	1.80	29.5	2.14*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.53	8.00	-----	-----	-----	-----	-----
2	100	0.95	11.5	0.17	0.00	1.53	9.17	0.153	0.917	0.095
6	103	0.90	11.3	0.24	0.00	1.71	10.90	0.17613	1.1227	0.0927
24	106	0.75	11.1	0.46	0.40	1.90	14.10	0.2014	1.4946	0.0795
48	106	0.85	10.8	0.32	1.00	1.89	16.00	0.20034	1.696	0.0901
72	107	0.95	11.2	0.18	0.00	1.81	17.00	0.19367	1.819	0.10165
96	-----	0.90	10.8	-----	-----	1.72	17.30	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		7.8
2	2.346	2.295	43.5	14.059	13.755	22.1	0.07	7.8
6	2.775	2.715	51.4	17.629	17.248	27.7	0.22	7.8
24	3.242	3.172	60.1	23.658	23.146	37.2	0.59	8.2
48	3.428	3.354	63.5	28.066	27.459	44.1	0.81	9.2
72	3.506	3.430	65.0	31.295	30.618	49.1	0.89	9.2
96	3.562	3.48	65.9	33.574	32.8	52.6	1.04	9.2

	Au	% of Total	Ag	% of Total
Extracted g/mt	**3.48**	**65.9**	**32.8**	**52.6**
Tail assay, g/mt	**1.80**		**29.5**	
Calculated Head g/mt	**5.28**		**62.3**	
NaCN Consumed, kg/mt	**1.04**			
Lime Added, kg/mt	**9.2**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**3.38**	**65.9**	**31.9**	**52.6**
Tail assay, g/mt ore [1)]	**1.75**		**28.7**	
Calculated Head g/mt ore [1)]	**5.13**		**60.6**	
NaCN Consumed, kg/mt ore [1)]	**1.01**			
Lime Added, kg/mt ore [1)]	**8.9**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No. **3775-01**
Test No. **CY-47**
Composite **WOS-13-MC**
Feed Size **80%-6.3mm**
Biooxidation Test **B-12**
Biooxidation Time **210** days
Estimated Oxidation **25.6** %
Weight loss factor: **97.25**

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	4.150	68.9	3.08
Duplicate	3.950	65.6	2.59
Triplicate	4.010	73.7	3.11
Average	4.04	69.4	2.93

Ore Charge 1022.5 g

Final Residue Wt 1023.1 g

Solution Vol. 1.5338 L

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.060	34.0	2.24
Duplicate	0.999	28.2	
Triplicate	0.872	30.4	
Average	0.98	30.9	2.18*

*Adjusted for weight loss during bio-oxidation

Natural pH 2.3

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.53	10.00	-----	-----	-----	-----	-----
2	101	0.80	11.5	0.38	0.00	1.43	8.41	0.14443	0.84941	0.0808
6	104	1.00	11.3	0.10	0.00	1.55	10.20	0.1612	1.0608	0.104
24	105	0.80	11.1	0.39	0.50	1.65	13.00	0.17325	1.365	0.084
48	106	0.90	11.0	0.24	0.80	1.60	14.90	0.1696	1.5794	0.0954
72	104	0.90	11.2	0.24	0.00	1.54	15.60	0.16016	1.6224	0.0936
96	-----	0.90		-----	-----	1.46	16.20	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		9.8
2	2.193	2.145	54.2	12.899	12.615	20.5	0.30	9.8
6	2.522	2.466	62.3	16.494	16.131	26.2	0.29	9.8
24	2.836	2.774	70.1	21.850	21.369	34.7	0.58	10.3
48	2.933	2.868	72.4	26.129	25.554	41.6	0.73	11.1
72	3.011	2.944	74.4	28.782	28.149	45.8	0.88	11.1
96	3.048	2.98	75.3	31.325	30.6	49.8	1.02	11.1

	Au	% of Total	Ag	% of Total
Extracted g/mt	**2.98**	**75.3**	**30.6**	**49.8**
Tail assay, g/mt	**0.98**		**30.9**	
Calculated Head g/mt	**3.96**		**61.5**	
NaCN Consumed, kg/mt	**1.02**			
Lime Added, kg/mt	**11.1**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**2.90**	**75.3**	**29.8**	**49.8**
Tail assay, g/mt ore [1)]	**0.95**		**30.0**	
Calculated Head g/mt ore [1)]	**3.85**		**59.8**	
NaCN Consumed, kg/mt ore [1)]	**0.99**			
Lime Added, kg/mt ore [1)]	**10.8**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-48**	
Composite	**WWS-13-MC**	
Feed Size	**80%-12.5mm**	
Biooxidation Test	**B-1**	
Biooxidation Time	**235**	days
Estimated Oxidation	**22.9**	%
Weight loss factor:	**99.64**	

Head Assay	g Au/mt	g Ag/mt	%, $S^{=}$
Predicted			
Initial	2.450	7.8	3.17
Duplicate	2.680	7.6	3.51
Triplicate	2.790	8.5	3.40
Average	2.64	8.0	3.36

Ore Charge 999.7 g

Final Residue Wt 981.8 g

Solution Vol. 1.4996 L

Tail Assay	g Au/mt	g Ag/mt	%, $S^{=}$
Initial	1.81	3.7	2.51
Duplicate	1.33	3.1	2.69
Triplicate	1.45	3.9	
Average	1.53	3.6	2.59*

*Adjusted for weight loss during bio-oxidation

Natural pH 2.1

	Wt. %		g/L
Solid Density	40.0	Cyanide Conc. Maintained at:	1.00

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.50	11.00	-----	-----	-----	-----	-----
2	100	0.85	10.5	0.31	2.00	0.55	1.19	0.055	0.119	0.085
6	105	0.95	11.5	0.18	0.00	0.63	1.18	0.06615	0.1239	0.09975
24	104	0.70	10.3	0.52	1.50	0.73	1.33	0.07592	0.13832	0.0728
48	105	0.80	10.6	0.38	2.00	0.76	1.43	0.0798	0.15015	0.084
72	103	0.95	11.1	0.17	0.80	0.76	1.55	0.07828	0.15965	0.09785
96	-----	0.85	10.9	-----	-----	0.76	1.58	-----	-----	-----

Metallurgical Results

	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Leach Time Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		11.0
2	0.825	0.825	27.2	1.785	1.785	26.6	0.23	13.0
6	1.000	1.000	33.0	1.889	1.889	28.2	0.30	13.0
24	1.216	1.216	40.1	2.237	2.238	33.4	0.76	14.5
48	1.337	1.337	44.1	2.526	2.526	37.7	1.05	16.5
72	1.417	1.417	46.8	2.856	2.857	42.6	1.12	17.3
96	1.495	1.50	49.5	3.060	3.1	46.3	1.35	17.3

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt	**1.50**	**49.5**	**3.1**	**46.3**
Tail assay, g/mt	**1.53**		**3.6**	
Calculated Head g/mt	**3.03**		**6.7**	
NaCN Consumed, kg/mt	**1.35**			
Lime Added, kg/mt	**17.3**			

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore [1)]	**1.49**	**49.5**	**3.1**	**46.3**
Tail assay, g/mt ore [1)]	**1.52**		**3.6**	
Calculated Head g/mt ore [1)]	**3.01**		**6.7**	
NaCN Consumed, kg/mt ore [1)]	**1.35**			
Lime Added, kg/mt ore [1)]	**17.2**			

[1)] Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-49**	
Composite	**WWS-13-MC**	
Feed Size	**80%-6.3mm**	
Biooxidation Test	**B-2**	
Biooxidation Time	**235**	days
Estimated Oxidation	**22.0**	%
Weight loss factor:	**99.11**	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	2.450	7.8	3.17
Duplicate	2.680	7.6	3.51
Triplicate	2.790	8.5	3.40
Average	2.64	8.0	3.36

Ore Charge 996.3 g

Final Residue Wt 984.8 g

Solution Vol. 1.4945 L

Natural pH 2.0

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.13	3.1	2.59
Duplicate	1.16	9.4	2.68
Triplicate	1.25	3.6	
Average	1.18	5.4	2.62*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.49	13.00	-----	-----	-----	-----	-----
2	107	0.75	10.1	0.45	4.00	0.63	1.27	0.06741	0.13589	0.08025
6	103	1.00	11.6	0.10	0.00	0.74	1.31	0.07622	0.13493	0.103
24	101	0.70	10.6	0.51	1.50	0.87	1.50	0.08787	0.1515	0.0707
48	102	0.85	10.7	0.31	2.50	0.88	1.63	0.08976	0.16626	0.0867
72	105	0.90	11.1	0.24	0.80	0.87	1.69	0.09135	0.17745	0.0945
96	-----	0.95	11.0	-----	-----	0.84	1.71	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		13.0
2	0.942	0.945	33.2	1.898	1.905	21.9	0.37	17.1
6	1.173	1.178	41.3	2.094	2.101	24.2	0.37	17.1
24	1.444	1.449	50.8	2.513	2.522	29.0	0.81	18.6
48	1.547	1.552	54.5	2.858	2.869	33.0	1.03	21.1
72	1.621	1.627	57.1	3.114	3.126	35.9	1.18	21.9
96	1.668	1.67	58.6	3.322	3.3	37.9	1.25	21.9

	Au	% of Total	Ag	% of Total
Extracted g/mt	**1.67**	**58.6**	**3.3**	**37.9**
Tail assay, g/mt	**1.18**		**5.4**	
Calculated Head g/mt	**2.85**		**8.7**	
NaCN Consumed, kg/mt	**1.25**			
Lime Added, kg/mt	**21.9**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**1.66**	**58.7**	**3.3**	**37.9**
Tail assay, g/mt ore [1)]	**1.17**		**5.4**	
Calculated Head g/mt ore [1)]	**2.83**		**8.7**	
NaCN Consumed, kg/mt ore [1)]	**1.24**			
Lime Added, kg/mt ore [1)]	**21.7**			

[1)] Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-50**	
Composite	**FSU-13-1**	
Feed Size	**80%-12.5mm**	
Biooxidation Test	**B-5**	
Biooxidation Time	**235**	days
Estimated Oxidation	**44.4**	%
Weight loss factor:	**99.17**	
Ore Charge	997.7	g
Solution Vol.	1.4966	L
Natural pH	2.5	

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	0.572	3.2	4.33
Duplicate	0.486	2.7	4.73
Triplicate	0.475	2.4	4.66
Average	0.51	2.8	4.57

Final Residue Wt 1041.6 g

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.215	1.8	2.51
Duplicate	0.359	2.3	2.61
Triplicate	0.162	1.2	
Average	0.25	1.8	2.54*

*Adjusted for weight loss during bio-oxidation

	Wt. %		g/L
Solid Density	40.0	Cyanide Conc. Maintained at:	1.00

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.50	18.00	-----	-----	-----	-----	-----
2	106	0.40	10.1	0.94	4.00	0.10	0.18	0.0106	0.01908	0.0424
6	105	0.85	11.1	0.32	0.00	0.10	0.21	0.0105	0.02205	0.08925
24	104	0.70	10.3	0.52	3.00	0.13	0.26	0.01352	0.02704	0.0728
48	105	0.90	10.7	0.25	2.50	0.13	0.28	0.01365	0.0294	0.0945
72	107	1.00	11.3	0.11	0.50	0.13	0.29	0.01391	0.03103	0.107
96	-----	0.95	11.1	-----	-----	0.13	0.28	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		18.0
2	0.150	0.150	29.4	0.269	0.270	11.7	0.90	22.1
6	0.160	0.161	31.5	0.333	0.334	14.5	1.13	22.1
24	0.216	0.216	42.4	0.430	0.431	18.7	1.58	25.1
48	0.229	0.230	45.0	0.487	0.488	21.2	1.73	27.6
72	0.243	0.243	47.7	0.532	0.5	21.7	1.74	28.1
96	0.257	0.26	51.0	0.548	0.5	21.7	1.82	28.1

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt	**0.26**	**51.0**	**0.5**	**21.7**
Tail assay, g/mt	**0.25**		**1.8**	
Calculated Head g/mt	**0.51**		**2.3**	
NaCN Consumed, kg/mt	**1.82**			
Lime Added, kg/mt	**28.1**			

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore [1)]	**0.26**	**51.0**	**0.5**	**21.7**
Tail assay, g/mt ore [1)]	**0.25**		**1.8**	
Calculated Head g/mt ore [1)]	**0.51**		**2.3**	
NaCN Consumed, kg/mt ore [1)]	**1.80**			
Lime Added, kg/mt ore [1)]	**27.9**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**
Test No.	**CY-51**
Composite	**FSU-13-1**
Feed Size	**80%-6.3mm**
Biooxidation Test	**B-6**
Biooxidation Time	**235**
Estimated Oxidation	**54.9 %**
Weight loss factor:	**99.35**

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	0.572	3.2	4.33
Duplicate	0.486	2.7	4.73
Triplicate	0.475	2.4	4.66
Average	0.51	2.8	4.57

Ore Charge 1003.2 g

Final Residue Wt 988.0 g

Solution Vol. 1.5048 L

Natural pH 2.2

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	0.171	1.5	2.01
Duplicate	0.244	1.4	2.13
Triplicate	0.322	1.4	
Average	0.25	1.4	2.06*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.50	24.00	-----	-----	-----	-----	-----
2	108	0.65	10.0	0.59	5.00	0.14	0.19	0.01512	0.02052	0.0702
6	104	1.00	11.0	0.10	0.00	0.15	0.20	0.0156	0.0208	0.104
24	108	0.85	10.3	0.31	4.00	0.17	0.25	0.01836	0.027	0.0918
48	106	1.00	10.9	0.10	2.00	0.16	0.25	0.01696	0.0265	0.106
72	107	0.95	11.2	0.17	0.50	0.16	0.26	0.01712	0.02782	0.10165
96	-----	1.00	11.1	-----	-----	0.15	0.25	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		23.9
2	0.211	0.210	37.5	0.286	0.285	15.0	0.52	28.9
6	0.241	0.240	42.9	0.321	0.320	16.9	0.51	28.9
24	0.287	0.286	51.0	0.418	0.416	21.9	0.73	32.9
48	0.290	0.289	51.6	0.445	0.443	23.3	0.73	34.9
72	0.307	0.306	54.6	0.486	0.485	25.5	0.80	35.4
96	0.309	0.31	55.4	0.499	0.5	26.3	0.79	35.4

	Au	% of Total	Ag	% of Total
Extracted g/mt	**0.31**	**55.4**	**0.5**	**26.3**
Tail assay, g/mt	**0.25**		**1.4**	
Calculated Head g/mt	**0.56**		**1.9**	
NaCN Consumed, kg/mt	**0.79**			
Lime Added, kg/mt	**35.4**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**0.31**	**55.4**	**0.5**	**26.3**
Tail assay, g/mt ore [1)]	**0.25**		**1.4**	
Calculated Head g/mt ore [1)]	**0.56**		**1.9**	
NaCN Consumed, kg/mt ore [1)]	**0.78**			
Lime Added, kg/mt ore [1)]	**35.2**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No. 3775-01
Test No. CY-52
Composite WOS-13-MC
Feed Size 80%-12.5mm
Biooxidation Test B-9
Biooxidation Time 235 days
Estimated Oxidation 33.8 %
Weight loss factor: 97.70

Head Assay	g Au/mt	g Ag/mt	%, $S^=$
Predicted			
Initial	4.150	68.9	3.08
Duplicate	3.950	65.6	2.59
Triplicate	4.010	73.7	3.11
Average	4.04	69.4	2.93

Ore Charge 1007.8 g

Final Residue Wt 1007.7 g

Solution Vol. 1.5117 L

Natural pH 2.2

Tail Assay	g Au/mt	g Ag/mt	%, $S^=$
Initial	1.160	31.2	1.92
Duplicate	1.830	23.8	2.05
Triplicate	1.140	29.8	
Average	1.38	28.3	1.94*

*Adjusted for weight loss during bio-oxidation

Solid Density Wt. % 40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.51	8.00	-----	-----	-----	-----	-----
2	105	0.95	11.9	0.17	0.00	0.79	5.72	0.08295	0.6006	0.09975
6	106	0.95	11.7	0.17	0.00	0.89	6.65	0.09434	0.7049	0.1007
24	106	0.80	11.2	0.39	0.00	1.10	8.91	0.1166	0.94446	0.0848
48	108	0.85	11.1	0.32	0.00	1.18	9.90	0.12744	1.0692	0.0918
72	103	0.90	10.8	0.24	0.50	1.17	10.40	0.12051	1.0712	0.0927
96	-----	0.90	11.0	-----	-----	1.16	10.50	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		7.9
2	1.194	1.185	32.4	8.647	8.580	17.7	0.07	7.9
6	1.428	1.417	38.7	10.653	10.571	21.8	0.14	7.9
24	1.840	1.826	49.9	14.775	14.660	30.3	0.44	7.9
48	2.078	2.062	56.3	17.216	17.083	35.3	0.66	7.9
72	2.190	2.173	59.4	19.041	18.893	39.0	0.82	8.4
96	2.295	2.28	62.3	20.263	20.1	41.5	0.96	8.4

	Au	% of Total	Ag	% of Total
Extracted g/mt	**2.28**	**62.3**	**20.1**	**41.5**
Tail assay, g/mt	**1.38**		**28.3**	
Calculated Head g/mt	**3.66**		**48.4**	
NaCN Consumed, kg/mt	**0.96**			
Lime Added, kg/mt	**8.4**			

	Au	% of Total	Ag	% of Total
Extracted g/mt ore [1)]	**2.23**	**62.3**	**19.6**	**41.5**
Tail assay, g/mt ore [1)]	**1.35**		**27.6**	
Calculated Head g/mt ore [1)]	**3.58**		**47.2**	
NaCN Consumed, kg/mt ore [1)]	**0.94**			
Lime Added, kg/mt ore [1)]	**8.2**			

[1)]Adjusted for weight loss during bio-oxidation

Bottle Roll Test

Project No.	**3775-01**	
Test No.	**CY-53**	
Composite	**WOS-13-MC**	
Feed Size	**80%-6.3mm**	
Biooxidation Test	**B-10**	
Biooxidation Time	**235**	days
Estimated Oxidation	**23.9**	%
Weight loss factor:	**97.36**	

Head Assay	g Au/mt	g Ag/mt	%, S=
Predicted			
Initial	4.150	68.9	3.08
Duplicate	3.950	65.6	2.59
Triplicate	4.010	73.7	3.11
Average	4.04	69.4	2.93

Ore Charge 999.4 g

Solution Vol. 1.4991 L

Natural pH 2.3

Final Residue Wt 998.0 g

Tail Assay	g Au/mt	g Ag/mt	%, S=
Initial	1.180	35.7	2.34
Duplicate	1.310	39.4	2.24
Triplicate	1.210	49.9	
Average	1.23	41.7	2.23*

*Adjusted for weight loss during bio-oxidation

	Wt. %
Solid Density	40.0

Cyanide Conc. Maintained at: 1.00 g/L

Raw Data

Leach Time	Solution Withdrawn			Reagents Applied		Sol. Analysis		Removed from pulp		
Hours	mL	NaCN (gpL)	pH	NaCN (g)	Lime (g)	Au (mg/L)	Ag (mg/L)	Au (mg)	Ag (mg)	NaCN (g)
0	-----	1.00	-----	1.50	8.00	-----	-----	-----	-----	-----
2	100	0.85	11.4	0.31	0.00	1.15	6.51	0.115	0.651	0.085
6	107	0.85	11.3	0.32	0.00	1.27	7.91	0.13589	0.84637	0.09095
24	103	0.85	11.1	0.31	0.00	1.48	11.10	0.15244	1.1433	0.08755
48	103	0.85	10.7	0.31	1.00	1.51	13.50	0.15553	1.3905	0.08755
72	104	0.85	11.0	0.17	0.50	1.45	15.00	0.1508	1.56	0.0884
96	-----	0.90	11.0	-----	-----	1.37	15.60	-----	-----	-----

Metallurgical Results

Leach Time	Cumulative Au Extraction			Cumulative Ag Extraction			Reagent Requirements Cumulative kg/mt	
Hours	mg	g/mt	% of total	mg	g/mt	% of total	Cyanide Consumed	Lime Added
0		0.000	0.0		0.000	0.0		8.0
2	1.724	1.725	43.1	9.759	9.765	13.8	0.23	8.0
6	2.019	2.020	50.5	12.509	12.516	17.7	0.45	8.0
24	2.470	2.471	61.8	18.137	18.148	25.7	0.68	8.0
48	2.667	2.669	66.7	22.879	22.892	32.4	0.90	9.0
72	2.733	2.734	68.4	26.518	26.534	37.5	1.13	9.5
96	2.763	2.77	69.3	28.977	29.0	41.0	1.13	9.5

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt	**2.77**	**69.3**	**29.0**	**41.0**
Tail assay, g/mt	**1.23**		**41.7**	
Calculated Head g/mt	**4.00**		**70.7**	
NaCN Consumed, kg/mt	**1.13**			
Lime Added, kg/mt	**9.5**			

	Au	**% of Total**	**Ag**	**% of Total**
Extracted g/mt ore 1)	**2.70**	**69.2**	**28.2**	**41.0**
Tail assay, g/mt ore 1)	**1.20**		**40.6**	
Calculated Head g/mt ore 1)	**3.90**		**68.8**	
NaCN Consumed, kg/mt ore 1)	**1.10**			
Lime Added, kg/mt ore 1)	**9.2**			

1)Adjusted for weight loss during bio-oxidation

APPENDIX

Section 8 - Column Leach (Cyanide) Test Data

3775-01 P-1

	NaCN added	99.16 g	NaCN	1.00 g/L solution		g/mt ore

Kilograms 16.97	NaCN Consumption	2.62 kg/mt ore			Au	Ag
				Head Grade	2.73	7.5
Metric Tons 0.017	Lime:	3.1 kg/mt ore		Head Screen	2.65	8.5
	MOL:	3.5 kg /mt ton of ore to adust pH with Milk of Lime		Tail Screen	2.23	4.3
	Total:	6.6 kg/mt ore		Tail Assay	2.36	4.8

Daily Column Leach Test Data, Baseline
Sample I.D. WWS-13 MC

Feed Size 80%-12.5mm

		Pregnant Solution Analyses					Barren Solution Analyses		Au Extraction		Ag Extraction		NaCN	Au		Ag	
			NaCN														
Date	Days Leached	Vol. l.	Conc. g/l	pH	Au ppm	Ag ppm	Au ppm	Ag ppm	Cum. g/mt ore	Cum. %	Cum. g/mt ore	Cum. %	Consumed kg/mt ore	mg	cum. mg	mg	cum. mg
3/2	1								0.000	0.0	0.000	0.0	0.00	0.00	0.00	0.00	0.00
3/3	2								0.000	0.0	0.000	0.0	0.08	0.00	0.00	0.00	0.00
3/4	3	2.02	0.15	9.0	1.79	2.48	0.01	0.00	0.213	7.7	0.295	4.5	0.14	3.62	3.62	5.01	5.01
3/5	4	1.27	0.35	9.8	0.87	3.77	0.00	0.00	0.277	10.0	0.577	8.9	0.19	1.09	4.71	4.79	9.80
3/6	5	1.25	0.30	9.6	0.46	1.54	0.00	0.00	0.311	11.2	0.691	10.6	0.25	0.58	5.28	1.93	11.72
3/7	6	1.21	0.35	9.6	0.28	1.07	0.00	0.00	0.331	12.0	0.767	11.8	0.30	0.34	5.62	1.29	13.02
3/8	7	1.24	0.30	9.7	0.19	0.85	0.00	0.01	0.345	12.5	0.829	12.8	0.36	0.24	5.86	1.05	14.07
3/9	8	1.23	0.40	9.9	0.16	0.81	0.00	0.00	0.357	12.9	0.887	13.6	0.41	0.20	6.05	0.98	15.05
3/10	9	1.26	0.50	9.9	0.13	0.70	0.00	0.00	0.366	13.2	0.939	14.4	0.45	0.16	6.22	0.88	15.94
3/11	10	1.22	0.55	9.9	0.12	0.71	0.00	0.01	0.375	13.5	0.990	15.2	0.49	0.15	6.36	0.87	16.80
3/12	11	1.24	0.60	10.0	0.09	0.58	0.00	0.00	0.382	13.8	1.032	15.9	0.53	0.11	6.48	0.71	17.51
3/13	12	1.15	0.50	9.9	0.12	0.61	0.00	0.00	0.390	14.1	1.073	16.5	0.57	0.14	6.61	0.70	18.21
3/14	13	1.23	0.55	10.0	0.10	0.54	0.00	0.00	0.397	14.3	1.112	17.1	0.61	0.12	6.74	0.66	18.87
3/15	14	1.26	0.55	10.1	0.07	0.46	0.00	0.00	0.402	14.5	1.146	17.6	0.65	0.09	6.82	0.58	19.45
3/16	15	1.03	0.60	10.1	0.08	0.51	0.00	0.01	0.407	14.7	1.177	18.1	0.69	0.08	6.91	0.53	19.98
3/17	16	1.24	0.65	10.2	0.08	0.46	0.00	0.00	0.413	14.9	1.210	18.6	0.72	0.10	7.01	0.56	20.54
3/18	17	1.12	0.60	10.2	0.07	0.53	0.00	0.04	0.417	15.1	1.245	19.2	0.76	0.08	7.08	0.59	21.13
3/19	18	1.29	0.65	10.3	0.07	0.39	0.00	0.00	0.423	15.3	1.272	19.6	0.79	0.09	7.17	0.45	21.58
3/20	19	1.20	0.60	10.3	0.07	0.39	0.00	0.00	0.428	15.4	1.299	20.0	0.83	0.08	7.26	0.47	22.05
3/21	20	1.22	0.70	10.2	0.06	0.42	0.00	0.00	0.432	15.6	1.329	20.5	0.86	0.07	7.33	0.51	22.56
3/22	21	1.16	0.55	10.3	0.05	0.40	0.00	0.00	0.435	15.7	1.357	20.9	0.90	0.06	7.39	0.46	23.02
3/23	22	1.29	0.60	10.3	0.05	0.32	0.00	0.00	0.439	15.9	1.381	21.2	0.93	0.06	7.45	0.41	23.44
3/24	23	1.18	0.70	10.4	0.05	0.34	0.00	0.00	0.443	16.0	1.405	21.6	0.96	0.06	7.51	0.40	23.84
3/25	24	1.27	0.70	10.3	0.05	0.30	0.00	0.00	0.446	16.1	1.427	22.0	0.99	0.06	7.58	0.38	24.22
3/26	25	1.21	0.60	10.3	0.04	0.30	0.00	0.00	0.449	16.2	1.449	22.3	1.03	0.05	7.63	0.36	24.58
3/27	26	1.22	0.60	10.4	0.04	0.28	0.00	0.00	0.452	16.3	1.469	22.6	1.06	0.05	7.67	0.34	24.92
3/28	27	1.24	0.75	10.3	0.05	0.29	0.01	0.00	0.456	16.5	1.490	22.9	1.09	0.06	7.74	0.36	25.28
3/29	28	1.21	0.65	10.4	0.04	0.27	0.00	0.00	0.458	16.5	1.509	23.2	1.12	0.04	7.77	0.33	25.61
3/30	29	1.07	0.65	10.3	0.05	0.31	0.00	0.00	0.461	16.6	1.529	23.5	1.16	0.05	7.82	0.33	25.94
3/31	30	1.33	0.70	10.5	0.03	0.27	0.00	0.00	0.463	16.7	1.550	23.8	1.18	0.04	7.86	0.36	26.30
4/1	31	1.25	0.75	10.5	0.04	0.25	0.00	0.00	0.466	16.8	1.568	24.1	1.20	0.05	7.91	0.31	26.61
4/2	32	1.21	0.75	10.5	0.02	0.28	0.00	0.00	0.468	16.9	1.588	24.4	1.23	0.02	7.94	0.34	26.95
4/3	33	1.23	0.76	10.5	0.04	0.27	0.00	0.00	0.471	17.0	1.608	24.7	1.25	0.05	7.99	0.33	27.28
4/4	34	1.25	0.65	10.5	0.04	0.27	0.00	0.00	0.474	17.1	1.628	25.0	1.28	0.05	8.04	0.34	27.62
4/5	35	1.27	0.60	10.3	0.04	0.22	0.00	0.00	0.477	17.2	1.644	25.3	1.32	0.05	8.09	0.28	27.90
4/6	36	1.20	0.55	10.2	0.04	0.24	0.00	0.00	0.479	17.3	1.661	25.6	1.36	0.05	8.14	0.29	28.19
4/7	37	1.27	0.65	10.3	0.03	0.22	0.00	0.00	0.482	17.4	1.678	25.8	1.39	0.04	8.17	0.28	28.47
4/8	38	1.29	0.70	10.3	0.03	0.20	0.00	0.00	0.484	17.5	1.693	26.0	1.41	0.04	8.21	0.26	28.73
4/9	39	1.27	0.70	10.3	0.03	0.20	0.00	0.00	0.486	17.6	1.708	26.3	1.44	0.04	8.25	0.25	28.98
4/10	40	1.26	0.65	10.3	0.02	0.19	0.00	0.00	0.488	17.6	1.722	26.5	1.47	0.03	8.28	0.24	29.22
4/11	41	1.17	0.60	10.3	0.03	0.18	0.00	0.00	0.490	17.7	1.734	26.7	1.51	0.04	8.31	0.21	29.43
4/12	42	1.23	0.70	10.3	0.02	0.17	0.00	0.00	0.491	17.7	1.747	26.9	1.54	0.02	8.34	0.21	29.64
4/13	43	1.30	0.70	10.3	0.02	0.17	0.00	0.00	0.493	17.8	1.760	27.1	1.56	0.03	8.36	0.22	29.86
4/14	44	1.25	0.65	10.3	0.02	0.18	0.00	0.00	0.494	17.8	1.773	27.3	1.59	0.03	8.39	0.23	30.08
4/15	45	1.29	0.60	10.3	0.03	0.14	0.00	0.00	0.497	17.9	1.783	27.4	1.63	0.04	8.43	0.18	30.27
4/16	46	1.23	0.60	10.3	0.02	0.16	0.00	0.00	0.498	18.0	1.795	27.6	1.66	0.02	8.45	0.20	30.46
4/17	47	1.25	0.65	10.3	0.02	0.16	0.00	0.00	0.499	18.0	1.807	27.8	1.69	0.03	8.48	0.20	30.66
4/18	48	1.27	0.60	10.4	0.03	0.15	0.00	0.00	0.502	18.1	1.818	28.0	1.73	0.04	8.51	0.19	30.85
4/19	49	1.24	0.65	10.5	0.02	0.15	0.00	0.00	0.503	18.2	1.829	28.1	1.76	0.02	8.54	0.19	31.04
4/20	50	1.23	0.65	10.4	0.02	0.15	0.02	0.00	0.505	18.2	1.840	28.3	1.79	0.02	8.56	0.18	31.22
4/21	51	1.21	0.60	10.4	0.03	0.17	0.00	0.00	0.505	18.2	1.852	28.5	1.83	0.01	8.57	0.21	31.43
4/22	52	1.30	0.65	10.5	0.00	0.14	0.00	0.00	0.505	18.2	1.863	28.7	1.86	0.00	8.57	0.18	31.61
4/23	53	1.24	0.65	10.5	0.00	0.13	0.00	0.00	0.505	18.2	1.872	28.8	1.89	0.00	8.57	0.16	31.77
4/24	54	1.20	0.65	10.4	0.00	0.14	0.00	0.00	0.505	18.2	1.882	29.0	1.92	0.00	8.57	0.17	31.94
4/25	55	1.24	0.60	10.4	0.01	0.15	0.00	0.00	0.506	18.3	1.893	29.1	1.96	0.01	8.59	0.19	32.13
4/26	56	1.24	0.65	10.5	0.02	0.14	0.00	0.00	0.507	18.3	1.903	29.3	1.99	0.02	8.61	0.17	32.30
4/27	57	1.26	0.60	10.7	0.02	0.12	0.00	0.00	0.509	18.4	1.912	29.4	2.02	0.03	8.64	0.15	32.45
4/28	58	1.24	0.65	10.4	0.01	0.13	0.00	0.00	0.510	18.4	1.922	29.6	2.05	0.01	8.65	0.16	32.61
4/29	59	1.27	0.65	10.3	0.01	0.13	0.00	0.00	0.510	18.4	1.931	29.7	2.08	0.01	8.66	0.17	32.78
4/30	60	1.23	0.65	10.2	0.01	0.13	0.00	0.00	0.511	18.4	1.941	29.9	2.12	0.01	8.67	0.16	32.94
5/1	61	1.27	0.65	10.3	0.01	0.23	0.00	0.00	0.512	18.5	1.958	30.1	2.15	0.01	8.69	0.29	33.23
5/2	62			Rest Cycle													
5/15	75												2.15				
5/16	76	0.86	0.30	9.6	0.10	1.01	0.00	0.00	0.517	18.7	2.009	30.9	2.21	0.09	8.77	0.87	34.10
5/17	77	1.24	0.55	10.1	0.07	0.48	0.00	0.00	0.522	18.8	2.044	31.5	2.25	0.09	8.86	0.60	34.69
5/18	78	0.89	0.65	10.2	0.04	0.24	0.01	0.00	0.524	18.9	2.057	31.6	2.29	0.04	8.89	0.21	34.91
5/19	79	1.45	0.75	10.3	0.00	0.15	0.00	0.00	0.523	18.9	2.070	31.8	2.31	-0.01	8.88	0.22	35.12
5/20	80	1.21	0.70	10.3	0.00	0.14	0.00	0.00	0.523	18.9	2.080	32.0	2.34	0.00	8.88	0.17	35.29
5/21	81	1.27	0.65	10.3	0.00	0.12	0.00	0.00	0.523	18.9	2.089	32.1	2.37	0.00	8.88	0.15	35.45
5/22	82	1.26	0.65	10.3	0.01	0.11	0.00	0.00	0.524	18.9	2.097	32.3	2.40	0.01	8.89	0.14	35.58
5/23	83			Rest Cycle													
6/5	96												2.40				
6/6	97	0.84	0.20	9.6	0.09	0.95	0.00	0.00	0.528	19.1	2.144	33.0	2.47	0.08	8.97	0.80	36.38

3775-01 P-1

		NaCN added	99.16 g	NaCN	1.00 g/L solution	
Kilograms	16.97	NaCN Consumption	2.62 kg/mt ore			
Metric Tons	0.017	Lime:	3.1 kg/mt ore			
		MOL:	3.5 kg /mt ton of ore to adust pH with Milk of Lime			
		Total:	6.6 kg/mt ore			

	g/mt ore	

	Au	Ag
Head Grade	2.73	7.5
Head Screen	2.65	8.5
Tail Screen	2.23	4.3
Tail Assay	2.36	4.8

Daily Column Leach Test Data, Baseline
Sample I.D. WWS-13 MC

Feed Size 80%-12.5mm

		Pregnant Solution Analyses					Barren Solution Analyses		Au Extraction		Ag Extraction		NaCN	Au		Ag	
			NaCN														
	Days	Vol.	Conc.		Au	Ag	Au	Ag	Cum.	Cum.	Cum.	Cum.	Consumed		cum.		cum.
Date	Leached	l.	g/l	pH	ppm	ppm	ppm	ppm	g/mt ore	%	g/mt ore	%	kg/mt ore	mg	mg	mg	mg
6/7	98	1.14	0.50	10.4	0.05	0.52	0.00	0.00	0.532	19.2	2.179	33.5	2.51	0.06	9.03	0.59	36.98
6/8	99	1.30	0.80	10.6	0.02	0.18	0.00	0.00	0.533	19.3	2.193	33.7	2.53	0.03	9.05	0.23	37.21
6/9	100	1.20	0.60	10.5	0.01	0.12	0.00	0.00	0.534	19.3	2.2	33.8	2.57	0.01	9.06	0.14	37.35
6/10	101	1.22	0.55	10.5	0.01	0.12	0.00	0.00	0.535	19.3	2.2	33.8	2.61	0.01	9.08	0.15	37.50
6/11	102	1.16	0.65	10.2	0.01	0.13	0.00	0.00	0.535	19.3	2.2	33.8	2.64	0.01	9.09	0.15	37.65
6/12	103	1.25	0.60	10.1	0.00	0.13	0.01	0.00	0.535	19.3	2.2	33.8	2.68	0.00	9.09	0.16	37.81
				Rinse Cycle													
6/13	104	0.14	0.15	9.2	0.01	0.16	0.00	0.02	0.536	19.3	2.2	33.8	2.67	0.00	9.09	0.02	37.84
6/14	105	1.08	0.50	10.2	0.02	0.18			0.537	19.4	2.2	33.8	2.64	0.02	9.11	0.17	38.00
6/15	106	1.26	0.20	10.1	0.01	0.08			0.538	19.4	2.2	33.8	2.63	0.01	9.12	0.10	38.10
6/16	107	1.27	0.05	10.2	0.01	0.02			0.538	19.4	2.2	33.8	2.62	0.01	9.14	0.03	38.13
6/17	108	1.24	0.00	10.1	0.01	0.00			0.539	19.5	2.2	33.8	2.62	0.01	9.15	0.00	38.13
6/18	109	1.26	0.00	10.1	0.01	0.00			0.54	19.5	2.2	33.8	2.62	0.01	9.16	0.00	38.13
				Drain Down													
6/21	112	0.78	0.00	8.5	0.02	0.00			0.54	19.5	2.2	33.8	2.62	0.02	9.18	0.00	38.13

	Au g/mt ore	Au %	Ag g/mt ore	Ag %
Extracted, g/mt ore	**0.54**	**19.5**	**2.2**	**33.8**
Tail , g/mt ore	**2.23**		**4.3**	
Calculated Head, g/mt ore	**2.77**		**6.5**	

3775-01 P-2

		NaCN added	99.16 g	NaCN	1.00 g/L solution		g/mt ore	

Kilograms	16.28	NaCN Consumption	2.61 kg/mt ore				Au	Ag
						Head Grade	4.00	60.8
Metric Tons	0.016	Lime:	3.3 kg/mt ore			Head Screen	3.99	57.9
		MOL:	2.9 kg /mt ton of ore to adust pH with Milk of Lime			Tail Screen	3.27	35.6
		Total:	6.2 kg/mt ore			Tail Assay	3.91	35.9

Daily Column Leach Test Data, Baseline
Sample I.D. WOS-13 MC

Feed Size 80%-12.5mm

		Pregnant Solution Analyses					Barren Solution Analyses		Au Extraction		Ag Extraction		NaCN	Au		Ag	
			NaCN														
Date	Days Leached	Vol. l.	Conc. g/l	pH	Au ppm	Ag ppm	Au ppm	Ag ppm	Cum. g/mt ore	Cum. %	Cum. g/mt ore	Cum. %	Consumed kg/mt ore	mg	cum. mg	mg	cum. mg
3/2	1								0.000	0.0	0.000	0.0	0.00	0.00	0.00	0.00	0.00
3/3	2								0.000	0.0	0.000	0.0	0.08	0.00	0.00	0.00	0.00
3/4	3	2.16	0.20	9.0	1.69	4.52	0.00	0.00	0.224	5.8	0.600	1.0	0.14	3.65	3.65	9.76	9.76
3/5	4	1.27	0.30	9.4	0.95	10.20	0.00	0.00	0.298	7.8	1.395	2.4	0.20	1.21	4.86	12.95	22.72
3/6	5	1.26	0.25	9.3	0.45	10.30	0.01	0.01	0.333	8.7	2.193	3.7	0.26	0.57	5.42	12.98	35.70
3/7	6	1.23	0.25	9.6	0.26	16.10	0.00	0.01	0.352	9.2	3.408	5.8	0.32	0.31	5.73	19.79	55.48
3/8	7	1.25	0.30	9.7	0.19	16.20	0.00	0.03	0.367	9.5	4.651	7.9	0.38	0.24	5.97	20.24	75.72
3/9	8	1.23	0.60	9.9	0.16	19.80	0.00	0.07	0.379	9.9	6.145	10.4	0.42	0.20	6.16	24.31	100.04
3/10	9	1.27	0.60	10.0	0.12	13.90	0.00	0.02	0.388	10.1	7.223	12.2	0.46	0.15	6.32	17.56	117.59
3/11	10	1.24	0.50	9.9	0.10	11.00	0.00	0.02	0.396	10.3	8.059	13.6	0.50	0.12	6.44	13.61	131.21
3/12	11	1.24	0.55	10.0	0.07	8.23	0.00	0.01	0.401	10.4	8.685	14.7	0.54	0.09	6.53	10.18	141.39
3/13	12	1.17	0.55	10.0	0.08	8.44	0.00	0.00	0.407	10.6	9.290	15.7	0.58	0.09	6.62	9.86	151.25
3/14	13	1.24	0.55	10.1	0.08	7.85	0.00	0.00	0.413	10.8	9.888	16.7	0.62	0.10	6.72	9.73	160.98
3/15	14	1.27	0.60	10.2	0.07	6.48	0.00	0.01	0.418	10.9	10.394	17.6	0.66	0.09	6.81	8.23	169.21
3/16	15	1.06	0.60	10.1	0.06	6.85	0.00	0.02	0.422	11.0	10.839	18.3	0.70	0.06	6.87	7.25	176.46
3/17	16	1.25	0.70	10.3	0.06	6.87	0.00	0.02	0.427	11.1	11.365	19.2	0.73	0.08	6.95	8.56	185.02
3/18	17	1.15	0.65	10.3	0.06	6.69	0.00	0.02	0.431	11.2	11.836	20.0	0.77	0.07	7.02	7.67	192.69
3/19	18	1.29	0.75	10.4	0.06	5.30	0.00	0.02	0.436	11.3	12.254	20.7	0.79	0.08	7.09	6.81	199.50
3/20	19	1.22	0.65	10.4	0.04	4.67	0.00	0.01	0.439	11.4	12.602	21.3	0.82	0.05	7.14	5.67	205.17
3/21	20	1.23	0.70	10.4	0.05	5.08	0.00	0.00	0.443	11.5	12.985	21.9	0.85	0.06	7.20	6.24	211.40
3/22	21	1.19	0.60	10.4	0.05	4.51	0.00	0.01	0.446	11.6	13.315	22.5	0.89	0.06	7.26	5.37	216.77
3/23	22	1.29	0.75	10.4	0.04	4.03	0.00	0.00	0.449	11.7	13.634	23.0	0.91	0.05	7.32	5.19	221.95
3/24	23	1.23	0.70	10.4	0.04	3.84	0.00	0.02	0.452	11.8	13.924	23.5	0.94	0.05	7.37	4.72	226.68
3/25	24	1.28	0.70	10.4	0.04	3.52	0.00	0.00	0.456	11.9	14.199	24.0	0.97	0.05	7.42	4.48	231.16
3/26	25	1.23	0.65	10.4	0.03	3.42	0.00	0.02	0.458	11.9	14.457	24.4	1.00	0.04	7.45	4.21	235.36
3/27	26	1.24	0.65	10.5	0.03	3.17	0.00	0.01	0.460	12.0	14.697	24.8	1.04	0.04	7.49	3.90	239.27
3/28	27	1.25	0.75	10.4	0.03	3.25	0.00	0.01	0.462	12.0	14.946	25.2	1.06	0.04	7.53	4.05	243.32
3/29	28	1.22	0.80	10.6	0.02	3.26	0.00	0.00	0.464	12.1	15.189	25.7	1.08	0.02	7.55	3.96	247.28
3/30	29	1.09	0.65	10.6	0.05	3.48	0.00	0.00	0.467	12.2	15.422	26.1	1.12	0.05	7.61	3.79	251.07
3/31	30	1.36	0.75	10.6	0.02	2.88	0.00	0.01	0.469	12.2	15.663	26.5	1.14	0.03	7.63	3.92	254.99
4/1	31	1.10	0.75	10.5	0.05	3.03	0.00	0.01	0.472	12.3	15.867	26.8	1.17	0.06	7.69	3.32	258.31
4/2	32	1.41	0.75	10.6	0.03	2.68	0.00	0.03	0.475	12.4	16.098	27.2	1.19	0.04	7.73	3.77	262.07
4/3	33	1.24	0.70	10.6	0.03	2.59	0.00	0.08	0.477	12.4	16.293	27.5	1.22	0.04	7.77	3.17	265.25
4/4	34	1.27	0.65	10.7	0.04	2.51	0.00	0.03	0.480	12.5	16.482	27.8	1.25	0.05	7.82	3.08	268.33
4/5	35	1.26	0.70	10.5	0.03	2.26	0.00	0.02	0.483	12.6	16.654	28.1	1.28	0.04	7.86	2.81	271.13
4/6	36	0.87	0.60	10.2	0.04	2.77	0.00	0.02	0.485	12.6	16.801	28.4	1.33	0.03	7.89	2.38	273.52
4/7	37	1.59	0.65	10.4	0.04	2.32	0.00	0.02	0.489	12.7	17.026	28.8	1.35	0.06	7.96	3.66	277.18
4/8	38	1.28	0.70	10.5	0.03	2.05	0.00	0.02	0.491	12.8	17.185	29.0	1.38	0.04	7.99	2.60	279.78
4/9	39	1.26	0.70	10.5	0.02	2.26	0.00	0.02	0.493	12.8	17.359	29.3	1.40	0.03	8.02	2.82	282.60
4/10	40	1.26	0.70	10.5	0.02	2.19	0.00	0.02	0.494	12.9	17.526	29.6	1.43	0.03	8.04	2.73	285.33
4/11	41	1.23	0.65	10.5	0.03	2.10	0.00	0.02	0.496	12.9	17.683	29.9	1.47	0.04	8.08	2.56	287.89
4/12	42	1.26	0.70	10.5	0.02	1.98	0.00	0.01	0.498	13.0	17.835	30.1	1.49	0.03	8.11	2.47	290.35
4/13	43	1.25	0.65	10.5	0.02	2.08	0.00	0.01	0.499	13.0	17.994	30.4	1.53	0.03	8.13	2.59	292.94
4/14	44	1.13	0.60	10.5	0.03	2.09	0.00	0.02	0.502	13.1	18.138	30.6	1.57	0.03	8.17	2.35	295.29
4/15	45	1.36	0.60	10.4	0.02	1.80	0.00	0.02	0.503	13.1	18.287	30.9	1.60	0.03	8.19	2.42	297.71
4/16	46	1.24	0.65	10.4	0.02	1.89	0.00	0.03	0.505	13.1	18.429	31.1	1.63	0.02	8.22	2.32	300.03
4/17	47	1.24	0.65	10.3	0.02	1.95	0.00	0.03	0.506	13.2	18.575	31.4	1.66	0.02	8.24	2.38	302.40
4/18	48	1.28	0.65	10.4	0.04	1.90	0.02	0.03	0.509	13.3	18.722	31.6	1.70	0.05	8.29	2.39	304.80
4/19	49	1.25	0.60	10.6	0.03	1.85	0.00	0.03	0.510	13.3	18.862	31.9	1.73	0.01	8.30	2.27	307.07
4/20	50	1.23	0.55	10.5	0.02	1.89	0.00	0.03	0.512	13.3	19.002	32.1	1.77	0.02	8.33	2.28	309.35
4/21	51	1.26	0.60	10.5	0.04	2.01	0.00	0.03	0.515	13.4	19.155	32.4	1.81	0.05	8.38	2.49	311.85
4/22	52	1.28	0.65	10.5	0.01	1.73	0.00	0.05	0.515	13.4	19.289	32.6	1.84	0.01	8.39	2.17	314.02
4/23	53	1.25	0.70	10.6	0.01	1.72	0.00	0.04	0.516	13.4	19.417	32.8	1.87	0.01	8.40	2.08	316.10
4/24	54	1.22	0.70	10.5	0.00	1.75	0.00	0.04	0.516	13.4	19.544	33.0	1.90	0.00	8.40	2.08	318.18
4/25	55	1.25	0.60	10.6	0.00	1.79	0.00	0.04	0.516	13.4	19.679	33.2	1.93	0.00	8.40	2.18	320.37
4/26	56	1.24	0.60	10.6	0.03	1.62	0.00	0.04	0.519	13.5	19.799	33.4	1.97	0.04	8.44	1.96	322.32
4/27	57	1.26	0.65	10.8	0.02	1.51	0.00	0.05	0.520	13.5	19.912	33.6	2.00	0.03	8.47	1.85	324.17
4/28	58	1.23	0.70	10.5	0.01	1.66	0.00	0.05	0.521	13.6	20.034	33.8	2.03	0.01	8.48	1.97	326.15
4/29	59	1.26	0.65	10.4	0.01	1.64	0.00	0.05	0.522	13.6	20.156	34.0	2.06	0.01	8.49	2.00	328.15
4/30	60	1.24	0.60	10.3	0.01	1.59	0.00	0.05	0.522	13.6	20.273	34.2	2.10	0.01	8.50	1.90	330.05
5/1	61	1.26	0.65	10.3	0.01	1.54	0.00	0.06	0.523	13.6	20.388	34.4	2.13	0.01	8.52	1.87	331.92
5/2	62			Rest Cycle													
5/15	75												2.13				
5/16	76	0.88	0.30	9.7	0.14	8.94	0.00	0.03	0.531	13.8	20.872	35.3	2.20	0.12	8.64	7.87	339.79
5/17	77	1.24	0.50	10.0	0.08	5.23	0.00	0.05	0.537	14.0	21.268	35.9	2.24	0.10	8.74	6.45	346.24
5/18	78	1.15	0.65	10.3	0.05	3.17	0.00	0.05	0.540	14.1	21.487	36.3	2.28	0.06	8.80	3.58	349.82
5/19	79	1.25	0.70	10.5	0.02	2.18	0.00	0.06	0.542	14.1	21.651	36.6	2.31	0.03	8.82	2.66	352.47
5/20	80	1.21	0.70	10.4	0.02	1.94	0.00	0.08	0.543	14.1	21.790	36.8	2.34	0.02	8.85	2.27	354.74
5/21	81	1.26	0.65	10.5	0.01	1.59	0.00	0.07	0.544	14.2	21.906	37.0	2.37	0.01	8.86	1.90	356.64
5/22	82	1.26	0.70	10.5	0.00	1.51	0.00	0.08	0.544	14.2	22.018	37.2	2.40	0.00	8.86	1.81	358.45
5/23	83			Rest Cycle													
6/5	96												2.40				
6/6	97	0.87	0.15	9.6	0.12	0.85	0.00	0.06	0.551	14.3	22.063	37.3	2.47	0.10	8.96	0.74	359.18

3775-01 P-2

		NaCN added	99.16 g	NaCN	1.00 g/L solution	
Kilograms	16.28	NaCN Consumption	2.61 kg/mt ore			
Metric Tons	0.016	Lime:	3.3 kg/mt ore			
		MOL:	2.9 kg /mt ton of ore to adust pH with Milk of Lime			
		Total:	6.2 kg/mt ore			

	g/mt ore	

	Au	Ag
Head Grade	4.00	60.8
Head Screen	3.99	57.9
Tail Screen	3.27	35.6
Tail Assay	3.91	35.9

Daily Column Leach Test Data, Baseline
Sample I.D. WOS-13 MC

Feed Size 80%-12.5mm

		Pregnant Solution Analyses					Barren Solution Analyses		Au Extraction		Ag Extraction		NaCN	Au		Ag	
			NaCN														
Date	Days Leached	Vol. l.	Conc. g/l	pH	Au ppm	Ag ppm	Au ppm	Ag ppm	Cum. g/mt ore	Cum. %	Cum. g/mt ore	Cum. %	Consumed kg/mt ore	mg	cum. mg	mg	cum. mg
6/7	98	1.16	0.45	10.4	0.07	5.67	0.00	0.10	0.556	14.5	22.462	37.9	2.52	0.08	9.04	6.50	365.68
6/8	99	1.29	0.75	10.7	0.02	3.05	0.00	0.14	0.557	14.5	22.695	38.3	2.55	0.03	9.07	3.80	369.48
6/9	100	1.21	0.70	10.6	0.02	2.69	0.00	0.14	0.559	14.5	22.884	38.7	2.58	0.02	9.09	3.07	372.55
6/10	101	1.22	0.65	10.7	0.02	2.17	0.00	0.20	0.560	14.6	23.035	38.9	2.61	0.02	9.12	2.46	375.01
6/11	102	1.19	0.60	10.3	0.02	2.06	0.00	0.23	0.562	14.6	23.169	39.1	2.65	0.02	9.14	2.18	377.19
6/12	103	1.26	0.65	10.3	0.02	2.01	0.00	0.27	0.563	14.7	23.306	39.4	2.68	0.03	9.17	2.22	379.42
				Rinse Cycle													
6/13	104	0.10	0.15	9.3	0.02	2.29	0.00	0.29	0.563	14.7	23.320	39.4	2.68	0.00	9.17	0.23	379.65
6/14	105	1.13	0.60	10.4	0.03	2.65			0.565	14.7	23.480	39.7	2.64	0.03	9.20	2.61	382.25
6/15	106	1.26	0.30	10.3	0.01	1.46			0.566	14.7	23.593	39.9	2.61	0.01	9.22	1.84	384.09
6/16	107	1.27	0.05	10.7	0.02	0.25			0.568	14.8	23.6	39.9	2.61	0.03	9.24	0.32	384.41
6/17	108	1.25	0.00	10.7	0.03	0.04			0.57	14.8	23.6	39.9	2.61	0.04	9.28	0.05	384.46
6/18	109	1.26	0.00	10.6	0.01	0.00			0.57	14.8	23.6	39.9	2.61	0.01	9.29	0.00	384.46
				Drain Down													
6/21	112	0.76	0.00	8.9	0.03	0.00			0.57	14.8	23.6	39.9	2.61	0.02	9.31	0.00	384.46

Extracted, g/mt ore	**0.57**	**14.8**	**23.6**	**39.9**
Tail , g/mt ore	**3.27**		**35.6**	
Calculated Head, g/mt ore	**3.84**		**59.2**	

3775-01 P-3

		NaCN added	54.94 g	NaCN	1.00 g/L solution
Kilograms	16.90	NaCN Consumption	1.65 kg/mt ore		
Metric Tons	0.017	Lime:	2.9 kg/mt ore		
		MOL:	0.5 kg /mt ton of ore to adust pH with Milk of Lime		
		Total:	3.4 kg/mt ore		

	g/mt ore	

	Au	Ag
Head Grade	0.46	2.4
Head Screen	0.38	2.0
Tail Screen	0.30	1.7
Tail Assay		

Daily Column Leach Test Data, Baseline
Sample I.D. FSU-13-1

Feed Size 80%-12.5mm

		Pregnant Solution Analyses					Barren Solution Analyses		Au Extraction		Ag Extraction		NaCN	Au		Ag	
			NaCN														
Date	Days Leached	Vol. l.	Conc. g/l	pH	Au ppm	Ag ppm	Au ppm	Ag ppm	Cum. g/mt ore	Cum. %	Cum. g/mt ore	Cum. %	Consumed kg/mt ore	mg	cum. mg	mg	cum. mg
3/2	1								0.000	0.0	0.000	0.0	0.00	0.00	0.00	0.00	0.00
3/3	2								0.000	0.0	0.000	0.0	0.08	0.00	0.00	0.00	0.00
3/4	3	2.03	0.20	9.8	0.13	0.72	0.00	0.00	0.016	4.5	0.086	4.1	0.13	0.26	0.26	1.46	1.46
3/5	4	1.26	0.40	10.2	0.10	0.69	0.00	0.00	0.023	6.6	0.138	6.6	0.18	0.13	0.39	0.87	2.33
3/6	5	1.25	0.40	10.1	0.07	0.39	0.00	0.00	0.028	8.1	0.167	7.9	0.23	0.09	0.48	0.49	2.82
3/7	6	1.23	0.40	10.1	0.04	0.28	0.00	0.00	0.031	8.9	0.187	8.9	0.28	0.05	0.53	0.34	3.16
3/8	7	1.26	0.40	10.1	0.04	0.22	0.00	0.00	0.034	9.8	0.204	9.7	0.33	0.05	0.58	0.28	3.44
3/9	8	1.24	0.50	10.2	0.03	0.22	0.00	0.00	0.036	10.4	0.220	10.5	0.38	0.04	0.61	0.27	3.71
3/10	9	1.28	0.60	10.3	0.02	0.15	0.00	0.00	0.038	10.8	0.231	11.0	0.41	0.03	0.64	0.19	3.90
3/11	10	1.25	0.60	10.1	0.02	0.14	0.00	0.00	0.039	11.2	0.241	11.5	0.44	0.03	0.66	0.18	4.08
3/12	11	1.27	0.60	10.2	0.01	0.09	0.00	0.00	0.040	11.5	0.248	11.8	0.48	0.01	0.68	0.11	4.19
3/13	12	1.18	0.55	10.3	0.01	0.11	0.00	0.00	0.041	11.7	0.256	12.2	0.52	0.01	0.69	0.13	4.32
3/14	13	1.25	0.60	10.2	0.00	0.10	0.00	0.00	0.041	11.7	0.263	12.5	0.55	0.00	0.69	0.13	4.45
3/15	14	1.28	0.60	10.3	0.01	0.08	0.00	0.00	0.042	11.9	0.269	12.8	0.59	0.01	0.70	0.10	4.55
3/16	15	1.09	0.60	10.2	0.00	0.08	0.00	0.00	0.042	11.9	0.274	13.1	0.63	0.00	0.70	0.09	4.64
3/17	16	1.27	0.65	10.2	0.01	0.06	0.00	0.00	0.042	12.1	0.279	13.3	0.66	0.01	0.71	0.08	4.71
3/18	17	1.15	0.60	10.3	0.00	0.09	0.00	0.00	0.042	12.1	0.285	13.6	0.70	0.00	0.71	0.10	4.82
3/19	18	1.31	0.65	10.4	0.00	0.06	0.00	0.00	0.042	12.1	0.290	13.8	0.73	0.00	0.71	0.08	4.90
3/20	19	1.24	0.55	10.4	0.00	0.06	0.00	0.00	0.042	12.1	0.294	14.0	0.77	0.00	0.71	0.07	4.97
3/21	20	1.25	0.60	10.3	0.00	0.05	0.00	0.00	0.042	12.1	0.298	14.2	0.80	0.00	0.71	0.06	5.03
3/22	21	1.19	0.45	10.3	0.00	0.06	0.00	0.00	0.042	12.1	0.302	14.4	0.85	0.00	0.71	0.07	5.11
3/23	22	1.29	0.50	10.3	0.00	0.04	0.00	0.00	0.042	12.1	0.305	14.5	0.89	0.00	0.71	0.05	5.16
3/24	23	1.21	0.65	10.4	0.00	0.05	0.00	0.00	0.042	12.1	0.309	14.7	0.92	0.00	0.71	0.06	5.22
3/25	24	1.28	0.70	10.4	0.00	0.03	0.00	0.00	0.042	12.1	0.311	14.8	0.95	0.00	0.71	0.04	5.26
3/26	25	1.23	0.50	10.2	0.00	0.04	0.00	0.00	0.042	12.1	0.314	14.9	0.99	0.00	0.71	0.05	5.30
3/27	26	1.25	0.45	10.3	0.00	0.05	0.00	0.00	0.042	12.1	0.318	15.1	1.04	0.00	0.71	0.06	5.37
3/28	27	1.28	0.50	10.2	0.00	0.04	0.00	0.00	0.042	12.1	0.321	15.3	1.08	0.00	0.71	0.05	5.42
3/29	28	1.24	0.45	10.3	0.00	0.04	0.00	0.00	0.042	12.1	0.324	15.4	1.13	0.00	0.71	0.05	5.47
3/30	29	1.08	0.40	10.3	0.00	0.04	0.00	0.00	0.042	12.1	0.326	15.5	1.18	0.00	0.71	0.04	5.51
3/31	30	1.37	0.50	10.3	0.00	0.04	0.00	0.00	0.042	12.1	0.329	15.7	1.22	0.00	0.71	0.05	5.57
4/1	31	1.25	0.55	10.3	0.01	0.03	0.00	0.00	0.043	12.3	0.332	15.8	1.26	0.01	0.73	0.04	5.60
4/2	32	1.26	0.55	10.3	0.00	0.04	0.00	0.01	0.043	12.3	0.335	15.9	1.29	0.00	0.73	0.05	5.65
4/3	33	1.24	0.50	10.3	0.00	0.03	0.00	0.00	0.043	12.3	0.336	16.0	1.34	0.00	0.73	0.02	5.68
4/4	34	1.26	0.50	10.2	0.00	0.03	0.00	0.00	0.043	12.3	0.338	16.1	1.38	0.00	0.73	0.04	5.72
4/5	35	1.27	0.50	10.1	0.00	0.03	0.00	0.00	0.043	12.3	0.340	16.2	1.42	0.00	0.73	0.04	5.75
4/6	36			Rest Cycle													
4/19	49												1.42				
4/20	50	0.63	0.15	8.9	0.02	0.23	0.00	0.00	0.044	12.5	0.349	16.6	1.49	0.01	0.74	0.14	5.90
4/21	51	1.49	0.45	9.8	0.00	0.13	0.00	0.00	0.044	12.5	0.360	17.2	1.53	0.00	0.74	0.19	6.09
4/22	52	1.26	0.65	10.1	0.00	0.05	0.00	0.01	0.044	12.5	0.364	17.3	1.57	0.00	0.74	0.06	6.16
4/23	53	1.22	0.65	10.1	0.00	0.03	0.00	0.01	0.044	12.5	0.366	17.4	1.60	0.00	0.74	0.02	6.18
4/24	54	1.20	0.60	10.1	0.00	0.03	0.00	0.00	0.044	12.5	0.367	17.5	1.63	0.00	0.74	0.02	6.20
4/25	55	1.24	0.65	10.2	0.00	0.03	0.00	0.00	0.044	12.5	0.369	17.6	1.67	0.00	0.74	0.04	6.24
4/26	56	1.24	0.65	10.2	0.00	0.03	0.00	0.00	0.044	12.5	0.371	17.7	1.70	0.00	0.74	0.04	6.28
4/27	57			Rest Cycle													
				Rinse Cycle													
5/1	61	0.13	0.10	8.2	0.00	0.04	0.00	0.00	0.044	12.5	0.372	17.7	1.70	0.00	0.74	0.01	6.28
5/2	62	1.02	0.45	9.9	0.00	0.09			0.044	12.5	0.377	18.0	1.67	0.00	0.74	0.09	6.37
5/3	63	1.30	0.15	9.8	0.00	0.04			0.044	12.5	0.38	18.1	1.66	0.00	0.74	0.05	6.42
5/4	64	1.28	0.05	9.7	0.00	0.02			0.044	12.5	0.38	18.1	1.65	0.00	0.74	0.03	6.45
5/5	65	1.26	0.05	9.8	0.00	0.00			0.044	12.5	0.38	18.1	1.65	0.00	0.74	0.00	6.45
5/6	66	1.24	0.00	9.6	0.02	0.00			0.045	12.9	0.38	18.1	1.65	0.02	0.76	0.00	6.45
5/7	67	1.26	0.00	9.4	0.00	0.00			0.045	12.9	0.38	18.1	1.65	0.00	0.76	0.00	6.45
				Drain Down													
5/11	71	0.81	0.00	7.2	0.01	0.00			0.05	14.3	0.4	19.0	1.65	0.01	0.77	0.00	6.45

	Au g/mt ore	Au %	Ag g/mt ore	Ag %
Extracted, g/mt ore	**0.05**	**14.3**	**0.4**	**19.0**
Tail , g/mt ore	**0.30**		**1.7**	
Calculated Head, g/mt ore	**0.35**		**2.1**	

3775-01 P-4							g/mt ore
		NaCN added	99.16 g	NaCN	1.00 g/L solution		-------
Kilograms	16.92	NaCN Consumption	2.78 kg/mt ore				Au	Ag
						Head Grade	2.73	7.5
Metric Tons	0.017	Lime:	3.8 kg/mt ore			Head Screen	2.94	7.2
		MOL:	2.8 kg /mt ton of ore to adust pH with Milk of Lime			Tail Screen	2.16	5.2
		Total:	6.6 kg/mt ore			Tail Assay	2.05	4.4

Daily Column Leach Test Data, Baseline
Sample I.D. WWS-13 MC

Feed Size 80%-6.3mm

		Pregnant Solution Analyses					Barren Solution Analyses		Au Extraction		Ag Extraction		NaCN	Au		Ag	
			NaCN														
Date	Days Leached	Vol. l.	Conc. g/l	pH	Au ppm	Ag ppm	Au ppm	Ag ppm	Cum. g/mt ore	Cum. %	Cum. g/mt ore	Cum. %	Consumed kg/mt ore	mg	cum. mg	mg	cum. mg
3/2	1								0.000	0.0	0.000	0.0	0.00	0.00	0.00	0.00	0.00
3/3	2								0.000	0.0	0.000	0.0	0.08	0.00	0.00	0.00	0.00
3/4	3	2.08	0.15	9.0	1.67	0.81	0.02	0.01	0.205	7.5	0.100	1.3	0.14	3.47	3.47	1.68	1.68
3/5	4	1.28	0.30	9.5	1.43	4.63	0.00	0.00	0.312	11.5	0.449	5.8	0.20	1.80	5.28	5.91	7.60
3/6	5	1.25	0.30	9.6	0.62	3.75	0.00	0.00	0.358	13.2	0.726	9.3	0.25	0.78	6.05	4.69	12.29
3/7	6	1.22	0.35	9.8	0.31	2.38	0.00	0.00	0.380	14.0	0.898	11.5	0.31	0.38	6.43	2.90	15.19
3/8	7	1.25	0.30	9.8	0.20	1.44	0.00	0.00	0.395	14.5	1.004	12.9	0.36	0.25	6.68	1.80	16.99
3/9	8	1.26	0.40	9.9	0.16	1.01	0.00	0.00	0.407	15.0	1.079	13.8	0.41	0.20	6.88	1.27	18.26
3/10	9	1.28	0.50	10.0	0.13	0.82	0.00	0.00	0.417	15.3	1.141	14.6	0.46	0.17	7.05	1.05	19.31
3/11	10	1.23	0.50	10.0	0.11	0.77	0.00	0.00	0.425	15.6	1.197	15.3	0.50	0.14	7.18	0.95	20.26
3/12	11	1.24	0.55	10.1	0.07	0.66	0.00	0.00	0.430	15.8	1.246	16.0	0.54	0.09	7.27	0.82	21.08
3/13	12	1.14	0.50	10.0	0.10	0.66	0.00	0.00	0.436	16.0	1.290	16.5	0.58	0.11	7.38	0.75	21.83
3/14	13	1.23	0.55	10.1	0.08	0.62	0.00	0.00	0.442	16.3	1.335	17.1	0.62	0.10	7.48	0.76	22.59
3/15	14	1.27	0.55	10.1	0.07	0.54	0.00	0.00	0.448	16.5	1.376	17.6	0.66	0.09	7.57	0.69	23.28
3/16	15	1.06	0.55	10.1	0.07	0.56	0.00	0.00	0.452	16.6	1.411	18.1	0.70	0.07	7.65	0.59	23.87
3/17	16	1.26	0.60	10.2	0.07	0.51	0.00	0.00	0.457	16.8	1.449	18.6	0.74	0.09	7.73	0.64	24.51
3/18	17	1.10	0.65	10.2	0.07	0.59	0.00	0.00	0.462	17.0	1.487	19.1	0.78	0.08	7.81	0.65	25.16
3/19	18	1.32	0.70	10.3	0.06	0.47	0.00	0.00	0.466	17.1	1.524	19.5	0.80	0.08	7.89	0.62	25.78
3/20	19	1.22	0.65	10.3	0.06	0.44	0.00	0.00	0.471	17.3	1.556	19.9	0.83	0.07	7.96	0.54	26.32
3/21	20	1.21	0.65	10.3	0.05	0.44	0.00	0.00	0.474	17.4	1.587	20.3	0.87	0.06	8.02	0.53	26.85
3/22	21	1.15	0.50	10.4	0.05	0.42	0.00	0.00	0.478	17.6	1.616	20.7	0.91	0.06	8.08	0.48	27.34
3/23	22	1.30	0.65	10.4	0.06	0.39	0.00	0.00	0.482	17.7	1.646	21.1	0.94	0.08	8.16	0.51	27.84
3/24	23	1.19	0.70	10.3	0.05	0.39	0.00	0.00	0.486	17.9	1.673	21.4	0.97	0.06	8.22	0.46	28.31
3/25	24	1.27	0.70	10.4	0.04	0.34	0.00	0.00	0.489	18.0	1.698	21.8	1.00	0.05	8.27	0.43	28.74
3/26	25	1.03	0.65	10.5	0.05	0.37	0.00	0.00	0.492	18.1	1.721	22.1	1.04	0.05	8.32	0.38	29.12
3/27	26	1.34	0.60	10.5	0.03	0.31	0.00	0.00	0.494	18.2	1.746	22.4	1.07	0.04	8.36	0.42	29.53
3/28	27	1.30	0.65	10.3	0.03	0.29	0.00	0.00	0.496	18.3	1.768	22.7	1.10	0.04	8.40	0.38	29.91
3/29	28	1.22	0.60	10.4	0.03	0.28	0.00	0.00	0.499	18.3	1.788	22.9	1.13	0.04	8.44	0.34	30.25
3/30	29	1.00	0.50	10.3	0.04	0.30	0.00	0.00	0.501	18.4	1.806	23.2	1.18	0.04	8.48	0.30	30.55
3/31	30	1.45	0.55	10.4	0.04	0.27	0.00	0.00	0.504	18.5	1.829	23.4	1.21	0.06	8.54	0.39	30.94
4/1	31	1.27	0.55	10.4	0.04	0.23	0.01	0.00	0.507	18.7	1.846	23.7	1.25	0.05	8.59	0.29	31.24
4/2	32	1.25	0.60	10.5	0.02	0.23	0.01	0.00	0.508	18.7	1.863	23.9	1.29	0.01	8.60	0.29	31.52
4/3	33	1.23	0.60	10.4	0.02	0.23	0.00	0.00	0.509	18.7	1.880	24.1	1.32	0.01	8.61	0.28	31.81
4/4	34	1.26	0.60	10.4	0.04	0.23	0.00	0.00	0.512	18.8	1.897	24.3	1.36	0.05	8.66	0.29	32.10
4/5	35	1.26	0.60	10.2	0.02	0.20	0.00	0.00	0.513	18.9	1.912	24.5	1.39	0.03	8.68	0.25	32.35
4/6	36	1.18	0.60	10.1	0.02	0.22	0.00	0.00	0.515	18.9	1.927	24.7	1.43	0.02	8.71	0.26	32.61
4/7	37	1.28	0.60	10.2	0.03	0.22	0.00	0.00	0.517	19.0	1.944	24.9	1.46	0.04	8.75	0.28	32.89
4/8	38	1.30	0.60	10.2	0.02	0.20	0.00	0.00	0.518	19.1	1.959	25.1	1.50	0.03	8.77	0.26	33.15
4/9	39	1.26	0.65	10.2	0.02	0.19	0.00	0.00	0.520	19.1	1.973	25.3	1.53	0.03	8.80	0.24	33.39
4/10	40	1.26	0.65	10.3	0.02	0.19	0.00	0.00	0.521	19.2	1.988	25.5	1.56	0.03	8.82	0.24	33.63
4/11	41	1.23	0.55	10.2	0.01	0.19	0.00	0.00	0.522	19.2	2.001	25.7	1.60	0.01	8.84	0.23	33.86
4/12	42	1.26	0.55	10.2	0.01	0.18	0.00	0.00	0.523	19.2	2.015	25.8	1.64	0.01	8.85	0.23	34.09
4/13	43	1.25	0.55	10.2	0.01	0.18	0.00	0.00	0.524	19.3	2.028	26.0	1.67	0.01	8.86	0.23	34.31
4/14	44	1.21	0.65	10.3	0.00	0.20	0.00	0.00	0.524	19.3	2.042	26.2	1.71	0.00	8.86	0.24	34.56
4/15	45	1.28	0.60	10.2	0.01	0.17	0.00	0.00	0.524	19.3	2.055	26.3	1.74	0.01	8.87	0.22	34.77
4/16	46	1.24	0.60	10.2	0.00	0.18	0.00	0.00	0.524	19.3	2.068	26.5	1.78	0.00	8.87	0.22	35.00
4/17	47	1.23	0.55	10.2	0.00	0.18	0.00	0.00	0.524	19.3	2.081	26.7	1.81	0.00	8.87	0.22	35.22
4/18	48	1.28	0.60	10.3	0.03	0.17	0.00	0.00	0.527	19.4	2.094	26.9	1.85	0.04	8.91	0.22	35.44
4/19	49	1.24	0.55	10.3	0.01	0.17	0.00	0.00	0.527	19.4	2.107	27.0	1.89	0.01	8.92	0.21	35.65
4/20	50	1.23	0.50	10.3	0.02	0.17	0.01	0.00	0.529	19.4	2.119	27.2	1.93	0.02	8.95	0.21	35.86
4/21	51	1.23	0.60	10.3	0.03	0.18	0.00	0.00	0.530	19.5	2.132	27.3	1.97	0.02	8.97	0.22	36.08
4/22	52	1.29	0.65	10.4	0.02	0.17	0.00	0.01	0.532	19.6	2.145	27.5	2.00	0.03	9.00	0.22	36.30
4/23	53	1.23	0.65	10.4	0.01	0.15	0.00	0.00	0.533	19.6	2.155	27.6	2.03	0.01	9.01	0.17	36.47
4/24	54	1.21	0.60	10.3	0.00	0.15	0.00	0.00	0.533	19.6	2.166	27.8	2.06	0.00	9.01	0.18	36.65
4/25	55	1.24	0.60	10.3	0.00	0.16	0.00	0.00	0.533	19.6	2.178	27.9	2.10	0.00	9.01	0.20	36.85
4/26	56	1.23	0.60	10.4	0.00	0.15	0.00	0.00	0.533	19.6	2.189	28.1	2.13	0.00	9.01	0.18	37.03
4/27	57	1.15	0.55	10.9	0.02	0.16	0.00	0.00	0.534	19.6	2.200	28.2	2.18	0.02	9.03	0.18	37.22
4/28	58	1.30	0.65	10.4	0.00	0.14	0.00	0.00	0.534	19.6	2.210	28.3	2.21	0.00	9.03	0.18	37.40
4/29	59	1.27	0.60	10.2	0.00	0.14	0.00	0.00	0.534	19.6	2.221	28.5	2.24	0.00	9.03	0.18	37.58
4/30	60	1.24	0.65	10.2	0.00	0.14	0.00	0.00	0.534	19.6	2.231	28.6	2.27	0.00	9.03	0.17	37.75
5/1	61	1.25	0.60	10.2	0.00	0.14	0.00	0.00	0.534	19.6	2.241	28.7	2.31	0.00	9.03	0.18	37.92
5/2	62			Rest Cycle													
5/15	75												2.31				
5/16	76	0.87	0.30	9.7	0.08	0.97	0.00	0.00	0.538	19.8	2.291	29.4	2.37	0.07	9.10	0.84	38.77
5/17	77	1.24	0.40	10.0	0.06	0.65	0.00	0.00	0.542	19.9	2.339	30.0	2.42	0.07	9.18	0.81	39.57
5/18	78	1.13	0.75	10.2	0.02	0.28	0.00	0.00	0.544	20.0	2.358	30.2	2.45	0.02	9.20	0.32	39.89
5/19	79	1.27	0.70	10.3	0.01	0.18	0.00	0.00	0.544	20.0	2.371	30.4	2.48	0.01	9.21	0.23	40.12
5/20	80	1.20	0.70	10.3	0.00	0.16	0.00	0.00	0.544	20.0	2.382	30.5	2.51	0.00	9.21	0.19	40.31
5/21	81	1.28	0.65	10.3	0.00	0.13	0.00	0.00	0.544	20.0	2.392	30.7	2.54	0.00	9.21	0.17	40.48
5/22	82	1.26	0.60	10.3	0.00	0.12	0.00	0.00	0.544	20.0	2.401	30.8	2.57	0.00	9.21	0.15	40.63
5/23	83			Rest Cycle													
6/5	96												2.57				
6/6	97	0.78	0.25	9.6	0.05	1.00	0.00	0.00	0.547	20.1	2.447	31.4	2.64	0.04	9.25	0.78	41.41

3775-01 P-4

		NaCN added	99.16 g	NaCN	1.00 g/L solution		g/mt ore
Kilograms	16.92	NaCN Consumption	2.78 kg/mt ore				Au	Ag
						Head Grade	2.73	7.5
Metric Tons	0.017	Lime:	3.8 kg/mt ore			Head Screen	2.94	7.2
		MOL:	2.8 kg /mt ton of ore to adust pH with Milk of Lime			Tail Screen	2.16	5.2
		Total:	6.6 kg/mt ore			Tail Assay	2.05	4.4

Daily Column Leach Test Data, Baseline
Sample I.D. WWS-13 MC

Feed Size 80%-6.3mm

		Pregnant Solution Analyses					Barren Solution Analyses		Au Extraction		Ag Extraction		NaCN	Au		Ag	
			NaCN														
Date	Days Leached	Vol. l.	Conc. g/l	pH	Au ppm	Ag ppm	Au ppm	Ag ppm	Cum. g/mt ore	Cum. %	Cum. g/mt ore	Cum. %	Consumed kg/mt ore	mg	cum. mg	mg	cum. mg
6/7	98	1.14	0.35	10.3	0.05	0.71	0.00	0.00	0.550	20.2	2.495	32.0	2.69	0.06	9.31	0.81	42.22
6/8	99	1.31	0.60	10.5	0.01	0.29	0.00	0.00	0.551	20.3	2.518	32.3	2.73	0.01	9.32	0.38	42.60
6/9	100	1.19	0.75	10.6	0.01	0.16	0.00	0.00	0.552	20.3	2.529	32.4	2.75	0.01	9.33	0.19	42.79
6/10	101	1.23	0.65	10.6	0.01	0.16	0.00	0.00	0.552	20.3	2.541	32.6	2.78	0.01	9.35	0.20	42.99
6/11	102	1.16	0.60	10.2	0.01	0.15	0.00	0.00	0.553	20.3	2.551	32.7	2.82	0.01	9.36	0.17	43.16
6/12	103	1.28	0.65	10.2	0.00	0.13	0.00	0.00	0.553	20.3	2.561	32.8	2.85	0.00	9.36	0.17	43.33
				Rinse Cycle													
6/13	104	0.10	0.10	9.0	0.00	0.18	0.00	0.02	0.553	20.3	2.562	32.8	2.85	0.00	9.36	0.02	43.34
6/14	105	1.13	0.60	10.2	0.00	0.19			0.553	20.3	2.573	33.0	2.81	0.00	9.36	0.19	43.53
6/15	106	1.26	0.35	10.1	0.01	0.13			0.554	20.4	2.583	33.1	2.79	0.01	9.37	0.16	43.70
6/16	107	1.27	0.05	10.1	0.02	0.04			0.555	20.4	2.586	33.1	2.78	0.03	9.40	0.05	43.75
6/17	108	1.24	0.00	10.3	0.02	0.00			0.557	20.5	2.586	33.1	2.78	0.02	9.42	0.00	43.75
6/18	109	1.25	0.00	10.2	0.02	0.00			0.558	20.5	2.586	33.1	2.78	0.03	9.45	0.00	43.75
				Drain Down													
6/21	112	0.74	0.00	8.7	0.04	0.00			0.56	20.6	2.6	33.3	2.78	0.03	9.47	0.00	43.75

	Au g/mt ore	Au %	Ag g/mt ore	Ag %
Extracted, g/mt ore	**0.56**	**20.6**	**2.6**	**33.3**
Tail , g/mt ore	**2.16**		**5.2**	
Calculated Head, g/mt ore	**2.72**		**7.8**	

3775-01 P-5

		NaCN added	99.16 g	NaCN	1.00 g/L solution		
Kilograms	15.99	NaCN Consumption	2.83 kg/mt ore				
Metric Tons	0.016	Lime:	3.4 kg/mt ore				
		MOL:	2.0 kg /mt ton of ore to adust pH with Milk of Lime				
		Total:	5.4 kg/mt ore				

	g/mt ore -------	
	Au	Ag
Head Grade	4.00	60.8
Head Screen	3.88	54.8
Tail Screen	3.50	40.5
Tail Assay	3.24	45.4

Daily Column Leach Test Data, Baseline
Sample I.D. WOS-13 MC

Feed Size 80%-6.3mm

		Pregnant Solution Analyses					Barren Solution Analyses		Au Extraction		Ag Extraction		NaCN	Au		Ag	
			NaCN														
Date	Days Leached	Vol. l.	Conc. g/l	pH	Au ppm	Ag ppm	Au ppm	Ag ppm	Cum. g/mt ore	Cum. %	Cum. g/mt ore	Cum. %	Consumed kg/mt ore	mg	cum. mg	mg	cum. mg
3/2	1								0.000	0.0	0.000	0.0	0.00	0.00	0.00	0.00	0.00
3/3	2								0.000	0.0	0.000	0.0	0.08	0.00	0.00	0.00	0.00
3/4	3	2.16	0.15	9.0	1.64	3.11	0.00	0.01	0.222	5.4	0.420	0.7	0.15	3.54	3.54	6.72	6.72
3/5	4	1.27	0.25	9.4	1.25	18.60	0.00	0.02	0.321	7.8	1.897	3.0	0.21	1.59	5.13	23.61	30.33
3/6	5	1.26	0.30	9.4	0.52	14.30	0.00	0.00	0.362	8.8	3.022	4.7	0.27	0.66	5.79	17.99	48.32
3/7	6	1.23	0.35	9.7	0.26	15.20	0.00	0.00	0.382	9.3	4.191	6.6	0.33	0.32	6.10	18.70	67.01
3/8	7	1.25	0.30	9.8	0.18	14.40	0.01	0.00	0.396	9.7	5.317	8.3	0.39	0.23	6.33	18.00	85.01
3/9	8	1.24	0.55	10.0	0.14	14.70	0.00	0.05	0.406	9.9	6.457	10.1	0.43	0.16	6.49	18.23	103.24
3/10	9	1.26	0.55	10.1	0.12	12.30	0.00	0.01	0.415	10.2	7.422	11.7	0.47	0.15	6.64	15.43	118.67
3/11	10	1.24	0.55	10.0	0.10	10.90	0.00	0.00	0.423	10.3	8.266	13.0	0.51	0.12	6.77	13.50	132.18
3/12	11	1.24	0.55	10.1	0.07	7.86	0.00	0.00	0.429	10.5	8.876	13.9	0.55	0.09	6.85	9.75	141.92
3/13	12	1.18	0.55	10.1	0.08	7.86	0.00	0.01	0.434	10.6	9.456	14.8	0.60	0.09	6.95	9.27	151.20
3/14	13	1.24	0.60	10.2	0.07	7.22	0.00	0.00	0.440	10.8	10.015	15.7	0.63	0.09	7.03	8.94	160.14
3/15	14	1.27	0.70	10.2	0.06	6.19	0.00	0.01	0.445	10.9	10.506	16.5	0.66	0.08	7.11	7.86	168.00
3/16	15	1.06	0.65	10.2	0.06	6.23	0.00	0.00	0.449	11.0	10.919	17.1	0.70	0.06	7.17	6.59	174.59
3/17	16	1.25	0.70	10.4	0.05	5.63	0.00	0.00	0.453	11.1	11.359	17.8	0.73	0.06	7.24	7.04	181.62
3/18	17	1.14	0.65	10.4	0.06	6.06	0.00	0.02	0.457	11.2	11.791	18.5	0.77	0.07	7.30	6.91	188.53
3/19	18	1.28	0.70	10.5	0.05	5.00	0.00	0.00	0.461	11.3	12.189	19.1	0.80	0.06	7.37	6.37	194.91
3/20	19	1.22	0.65	10.5	0.04	4.27	0.00	0.00	0.464	11.3	12.515	19.6	0.83	0.05	7.42	5.21	200.12
3/21	20	1.24	0.70	10.5	0.05	4.35	0.00	0.00	0.468	11.4	12.852	20.2	0.86	0.06	7.48	5.39	205.51
3/22	21	1.19	0.45	10.5	0.04	4.17	0.00	0.00	0.471	11.5	13.163	20.7	0.91	0.05	7.53	4.96	210.47
3/23	22	1.28	0.70	10.5	0.05	3.66	0.00	0.00	0.475	11.6	13.456	21.1	0.94	0.06	7.59	4.68	215.16
3/24	23	1.26	0.70	10.6	0.04	3.33	0.00	0.03	0.478	11.7	13.718	21.5	0.97	0.05	7.64	4.20	219.35
3/25	24	1.27	0.75	10.5	0.04	3.16	0.00	0.00	0.481	11.8	13.967	21.9	0.99	0.05	7.69	3.97	223.33
3/26	25	1.24	0.60	10.5	0.04	2.87	0.00	0.02	0.484	11.8	14.189	22.3	1.03	0.05	7.74	3.56	226.88
3/27	26	1.25	0.55	10.5	0.03	2.63	0.00	0.02	0.486	11.9	14.393	22.6	1.07	0.04	7.78	3.26	230.15
3/28	27	1.28	0.60	10.4	0.03	2.53	0.00	0.01	0.489	12.0	14.594	22.9	1.10	0.04	7.82	3.21	233.36
3/29	28	1.24	0.55	10.6	0.04	2.61	0.00	0.01	0.492	12.0	14.795	23.2	1.15	0.05	7.87	3.22	236.58
3/30	29	1.12	0.55	10.5	0.04	2.70	0.00	0.00	0.495	12.1	14.984	23.5	1.19	0.04	7.91	3.01	239.59
3/31	30	1.36	0.55	10.6	0.03	2.39	0.00	0.01	0.497	12.2	15.187	23.8	1.23	0.04	7.95	3.25	242.84
4/1	31	1.27	0.60	10.6	0.05	2.12	0.02	0.02	0.501	12.3	15.355	24.1	1.26	0.06	8.02	2.68	245.52
4/2	32	1.25	0.60	10.6	0.01	2.23	0.01	0.02	0.500	12.2	15.527	24.4	1.30	-0.01	8.00	2.76	248.28
4/3	33	1.25	0.60	10.6	0.01	2.23	0.00	0.01	0.500	12.2	15.700	24.6	1.34	0.00	8.00	2.76	251.04
4/4	34	1.26	0.55	10.5	0.03	2.09	0.00	0.01	0.503	12.3	15.864	24.9	1.38	0.04	8.04	2.62	253.66
4/5	35	1.26	0.55	10.3	0.02	1.96	0.00	0.01	0.504	12.3	16.017	25.1	1.42	0.03	8.06	2.46	256.12
4/6	36	1.21	0.50	10.3	0.02	2.09	0.00	0.01	0.506	12.4	16.175	25.4	1.47	0.02	8.09	2.52	258.63
4/7	37	1.25	0.60	10.3	0.03	2.12	0.00	0.01	0.508	12.4	16.340	25.7	1.50	0.04	8.13	2.64	261.27
4/8	38	1.29	0.60	10.3	0.03	1.99	0.00	0.02	0.511	12.5	16.499	25.9	1.54	0.04	8.16	2.55	263.82
4/9	39	1.27	0.60	10.3	0.00	2.09	0.00	0.02	0.511	12.5	16.664	26.2	1.57	0.00	8.16	2.63	266.45
4/10	40	1.26	0.65	10.4	0.02	2.11	0.00	0.01	0.512	12.5	16.828	26.4	1.61	0.03	8.19	2.63	269.08
4/11	41	1.25	0.55	10.3	0.02	2.01	0.00	0.01	0.514	12.6	16.984	26.7	1.65	0.03	8.21	2.50	271.58
4/12	42	1.27	0.55	10.3	0.02	1.93	0.00	0.01	0.515	12.6	17.137	26.9	1.69	0.03	8.24	2.44	274.02
4/13	43	1.26	0.70	10.3	0.02	1.95	0.00	0.01	0.517	12.6	17.290	27.1	1.72	0.03	8.26	2.44	276.46
4/14	44	1.22	0.60	10.4	0.02	2.15	0.00	0.02	0.518	12.7	17.453	27.4	1.75	0.02	8.29	2.61	279.07
4/15	45	1.27	0.60	10.3	0.02	1.88	0.00	0.02	0.520	12.7	17.601	27.6	1.79	0.03	8.31	2.36	281.43
4/16	46	1.24	0.60	10.3	0.01	1.87	0.00	0.03	0.521	12.7	17.744	27.9	1.83	0.01	8.33	2.29	283.73
4/17	47	1.25	0.60	10.2	0.03	1.90	0.01	0.03	0.523	12.8	17.890	28.1	1.86	0.04	8.36	2.33	286.06
4/18	48	1.28	0.60	10.3	0.04	1.88	0.01	0.02	0.525	12.8	18.038	28.3	1.90	0.04	8.40	2.37	288.43
4/19	49	1.25	0.60	10.4	0.02	1.92	0.00	0.03	0.526	12.9	18.186	28.5	1.94	0.01	8.41	2.37	290.80
4/20	50	1.24	0.60	10.5	0.01	1.92	0.00	0.02	0.527	12.9	18.333	28.8	1.97	0.01	8.43	2.34	293.14
4/21	51	1.20	0.55	10.4	0.03	2.00	0.00	0.03	0.529	12.9	18.481	29.0	2.02	0.04	8.46	2.37	295.51
4/22	52	1.27	0.60	10.5	0.02	1.78	0.00	0.05	0.531	13.0	18.620	29.2	2.05	0.03	8.49	2.22	297.73
4/23	53	1.26	0.65	10.5	0.01	1.74	0.00	0.04	0.532	13.0	18.753	29.4	2.09	0.01	8.50	2.13	299.86
4/24	54	1.23	0.60	10.5	0.01	1.78	0.00	0.03	0.532	13.0	18.886	29.6	2.12	0.01	8.51	2.14	301.99
4/25	55	1.27	0.60	10.5	0.01	1.85	0.00	0.04	0.533	13.0	19.031	29.9	2.16	0.01	8.53	2.31	304.30
4/26	56	1.25	0.60	10.5	0.02	1.73	0.00	0.03	0.535	13.1	19.163	30.1	2.20	0.03	8.55	2.11	306.41
4/27	57	1.26	0.60	10.9	0.02	1.58	0.00	0.04	0.536	13.1	19.285	30.3	2.23	0.03	8.58	1.95	308.36
4/28	58	1.25	0.65	10.5	0.01	1.67	0.00	0.04	0.537	13.1	19.412	30.5	2.27	0.01	8.59	2.03	310.40
4/29	59	1.26	0.60	10.3	0.03	1.71	0.00	0.04	0.539	13.2	19.543	30.7	2.30	0.04	8.63	2.10	312.50
4/30	60	1.25	0.65	10.3	0.02	1.70	0.00	0.04	0.541	13.2	19.673	30.9	2.33	0.03	8.65	2.07	314.57
5/1	61	1.26	0.65	10.3	0.01	1.68	0.00	0.05	0.542	13.2	19.802	31.1	2.37	0.01	8.66	2.06	316.63
5/2	62			Rest Cycle													
5/15	75												2.37				
5/16	76	0.91	0.30	10.0	0.12	9.91	0.00	0.03	0.549	13.4	20.366	32.0	2.43	0.11	8.77	9.02	325.65
5/17	77	1.26	0.45	10.1	0.08	5.83	0.00	0.05	0.555	13.6	20.823	32.7	2.48	0.10	8.87	7.31	332.96
5/18	78	1.16	0.65	10.4	0.02	3.09	0.00	0.05	0.556	13.6	21.043	33.0	2.52	0.02	8.90	3.52	336.47
5/19	79	1.27	0.70	10.5	0.02	2.14	0.00	0.08	0.558	13.6	21.209	33.3	2.55	0.03	8.92	2.65	339.13
5/20	80	1.23	0.70	10.5	0.01	1.98	0.00	0.07	0.559	13.7	21.354	33.5	2.58	0.01	8.93	2.33	341.45
5/21	81	1.27	0.70	10.5	0.02	1.66	0.00	0.08	0.560	13.7	21.480	33.7	2.61	0.03	8.96	2.01	343.47
5/22	82	1.28	0.70	10.5	0.02	1.47	0.00	0.08	0.562	13.7	21.591	33.9	2.63	0.03	8.99	1.77	345.24
5/23	83			Rest Cycle													
6/5	96												2.63				
6/6	97	0.89	0.35	9.9	0.08	1.13	0.00	0.06	0.566	13.8	21.654	34.0	2.70	0.07	9.06	1.01	346.25

Mr.Glen Van Treek / **Paramount Gold and Silver Corp.- Sleeper**
MLI Job No. 3775

3775-01 P-5

		NaCN added	99.16 g	NaCN	1.00 g/L solution		g/mt ore	

Kilograms	15.99	NaCN Consumption	2.83 kg/mt ore				Au	Ag
						Head Grade	4.00	60.8
Metric Tons	0.016	Lime:	3.4 kg/mt ore			Head Screen	3.88	54.8
		MOL:	2.0 kg /mt ton of ore to adust pH with Milk of Lime			Tail Screen	3.50	40.5
		Total:	5.4 kg/mt ore			Tail Assay	3.24	45.4

Daily Column Leach Test Data, Baseline
Sample I.D. WOS-13 MC

Feed Size 80%-6.3mm

		Pregnant Solution Analyses					Barren Solution Analyses		Au Extraction		Ag Extraction		NaCN	Au		Ag	
			NaCN														
Date	Days Leached	Vol. l.	Conc. g/l	pH	Au ppm	Ag ppm	Au ppm	Ag ppm	Cum. g/mt ore	Cum. %	Cum. g/mt ore	Cum. %	Consumed kg/mt ore	mg	cum. mg	mg	cum. mg
6/7	98	1.16	0.50	10.5	0.07	6.86	0.00	0.11	0.571	14.0	22.147	34.8	2.75	0.08	9.14	7.88	354.13
6/8	99	1.30	0.80	10.7	0.02	2.98	0.00	0.15	0.573	14.0	22.380	35.1	2.76	0.03	9.16	3.73	357.85
6/9	100	1.21	0.65	10.7	0.02	2.23	0.00	0.14	0.575	14.0	22.536	35.4	2.80	0.02	9.19	2.50	360.35
6/10	101	1.23	0.65	10.7	0.02	1.97	0.01	0.20	0.576	14.1	22.676	35.6	2.83	0.02	9.21	2.24	362.58
6/11	102	1.19	0.60	10.3	0.01	1.86	0.00	0.22	0.576	14.1	22.797	35.8	2.87	0.00	9.21	1.95	364.53
6/12	103	1.28	0.65	10.3	0.01	1.80	0.00	0.28	0.577	14.1	22.923	36.0	2.90	0.01	9.22	2.01	366.54
				Rinse Cycle													
6/13	104	0.08	0.15	9.2	0.03	2.19	0.00	0.32	0.577	14.1	22.934	36.0	2.90	0.00	9.23	0.18	366.71
6/14	105	1.18	0.60	10.4	0.02	2.43			0.578	14.1	23.086	36.2	2.86	0.02	9.25	2.44	369.15
6/15	106	1.29	0.30	10.5	0.02	1.56			0.580	14.2	23.2	36.4	2.83	0.03	9.28	2.01	371.17
6/16	107	1.27	0.05	10.6	0.02	0.38			0.582	14.2	23.2	36.4	2.83	0.03	9.30	0.48	371.65
6/17	108	1.25	0.00	10.6	0.02	0.05			0.583	14.3	23.2	36.4	2.83	0.03	9.33	0.06	371.71
6/18	109	1.25	0.00	10.7	0.02	0.00			0.585	14.3	23.2	36.4	2.83	0.03	9.35	0.00	371.71
				Drain Down													
6/21	112	0.73	0.00	9.1	0.03	0.00			0.59	14.4	23.2	36.4	2.83	0.02	9.37	0.00	371.71
									0.60		22.3						

Extracted, g/mt ore	**0.59**	**14.4**	**23.2**	**36.4**
Tail , g/mt ore	**3.50**		**40.5**	
Calculated Head, g/mt ore	**4.09**		**63.7**	

3775-01 P-6

		NaCN added	54.94 g	NaCN	1.00 g/L solution		g/mt ore	

Kilograms	16.85	NaCN Consumption	1.55 kg/mt ore				Au	Ag
						Head Grade	0.46	2.4
Metric Tons	0.017	Lime:	3.2 kg/mt ore			Head Screen	0.55	3.2
		MOL:	2.3 kg /mt ton of ore to adust pH with Milk of Lime			Tail Screen	0.37	2.0
		Total:	5.5 kg/mt ore			Tail Assay		

Daily Column Leach Test Data, Baseline
Sample I.D. FSU-13-1

Feed Size 80%-6.3mm

		Pregnant Solution Analyses					Barren Solution Analyses		Au Extraction		Ag Extraction		NaCN	Au		Ag	
			NaCN														
Date	Days Leached	Vol. l.	Conc. g/l	pH	Au ppm	Ag ppm	Au ppm	Ag ppm	Cum. g/mt ore	Cum. %	Cum. g/mt ore	Cum. %	Consumed kg/mt ore	mg	cum. mg	mg	cum. mg
3/2	1								0.000	0.0	0.000	0.0	0.00	0.00	0.00	0.00	0.00
3/3	2								0.000	0.0	0.000	0.0	0.08	0.00	0.00	0.00	0.00
3/4	3	2.02	0.00	8.6	0.11	0.18	0.00	0.00	0.013	3.1	0.022	0.9	0.16	0.22	0.22	0.36	0.36
3/5	4	1.28	0.30	9.8	0.16	1.96	0.00	0.00	0.025	6.0	0.170	7.1	0.22	0.20	0.43	2.51	2.87
3/6	5	1.26	0.35	9.9	0.09	0.77	0.00	0.00	0.032	7.6	0.228	9.5	0.27	0.11	0.54	0.97	3.84
3/7	6	1.22	0.40	10.0	0.06	0.37	0.00	0.00	0.036	8.7	0.255	10.6	0.32	0.07	0.61	0.45	4.29
3/8	7	1.25	0.35	9.9	0.04	0.23	0.00	0.00	0.039	9.4	0.272	11.3	0.37	0.05	0.66	0.29	4.58
3/9	8	1.23	0.45	10.0	0.03	0.20	0.00	0.00	0.042	9.9	0.286	11.9	0.42	0.04	0.70	0.25	4.83
3/10	9	1.28	0.55	10.1	0.02	0.16	0.00	0.00	0.043	10.3	0.299	12.4	0.46	0.03	0.73	0.20	5.03
3/11	10	1.23	0.60	10.1	0.02	0.14	0.00	0.00	0.045	10.6	0.309	12.9	0.49	0.02	0.75	0.17	5.20
3/12	11	1.24	0.60	10.2	0.01	0.10	0.00	0.00	0.045	10.8	0.316	13.2	0.53	0.01	0.76	0.12	5.33
3/13	12	1.15	0.55	10.1	0.02	0.11	0.00	0.00	0.047	11.1	0.324	13.5	0.57	0.02	0.79	0.13	5.46
3/14	13	1.23	0.60	10.2	0.01	0.10	0.00	0.00	0.047	11.3	0.331	13.8	0.61	0.01	0.80	0.12	5.58
3/15	14	1.27	0.70	10.3	0.00	0.09	0.00	0.00	0.047	11.3	0.338	14.1	0.63	0.00	0.80	0.11	5.69
3/16	15	1.06	0.65	10.3	0.00	0.08	0.00	0.00	0.047	11.3	0.343	14.3	0.67	0.00	0.80	0.08	5.78
3/17	16	1.26	0.75	10.4	0.00	0.06	0.00	0.00	0.047	11.3	0.347	14.5	0.70	0.00	0.80	0.08	5.85
3/18	17	1.11	0.65	10.4	0.00	0.09	0.00	0.01	0.047	11.3	0.353	14.7	0.73	0.00	0.80	0.10	5.95
3/19	18	1.31	0.75	10.5	0.00	0.05	0.00	0.00	0.047	11.3	0.356	14.8	0.75	0.00	0.80	0.05	6.00
3/20	19	1.21	0.65	10.5	0.00	0.05	0.00	0.00	0.047	11.3	0.360	15.0	0.79	0.00	0.80	0.06	6.07
3/21	20	1.23	0.70	10.5	0.00	0.05	0.00	0.00	0.047	11.3	0.364	15.2	0.81	0.00	0.80	0.06	6.13
3/22	21	1.17	0.65	10.5	0.00	0.05	0.00	0.00	0.047	11.3	0.367	15.3	0.85	0.00	0.80	0.06	6.19
3/23	22	1.30	0.60	10.5	0.00	0.04	0.00	0.00	0.047	11.3	0.370	15.4	0.88	0.00	0.80	0.05	6.24
3/24	23	1.21	0.65	10.5	0.00	0.05	0.00	0.00	0.047	11.3	0.374	15.6	0.92	0.00	0.80	0.06	6.30
3/25	24	1.28	0.70	10.5	0.00	0.02	0.00	0.00	0.047	11.3	0.375	15.6	0.94	0.00	0.80	0.03	6.32
3/26	25	1.22	0.65	10.4	0.00	0.04	0.00	0.00	0.047	11.3	0.378	15.8	0.97	0.00	0.80	0.05	6.37
3/27	26	1.24	0.60	10.5	0.00	0.04	0.00	0.00	0.047	11.3	0.381	15.9	1.01	0.00	0.80	0.05	6.42
3/28	27	1.28	0.55	10.3	0.00	0.03	0.00	0.00	0.047	11.3	0.383	16.0	1.05	0.00	0.80	0.04	6.46
3/29	28	1.23	0.60	10.5	0.00	0.03	0.00	0.00	0.047	11.3	0.386	16.1	1.08	0.00	0.80	0.04	6.50
3/30	29	1.05	0.50	10.5	0.00	0.03	0.00	0.00	0.047	11.3	0.387	16.1	1.13	0.00	0.80	0.03	6.53
3/31	30	1.39	0.60	10.5	0.00	0.03	0.00	0.00	0.047	11.3	0.390	16.2	1.16	0.00	0.80	0.04	6.57
4/1	31	1.28	0.55	10.5	0.02	0.03	0.00	0.00	0.049	11.6	0.392	16.3	1.20	0.03	0.82	0.04	6.61
4/2	32	1.25	0.60	10.5	0.01	0.03	0.00	0.00	0.05	11.9	0.394	16.4	1.23	0.01	0.84	0.04	6.65
4/3	33	1.25	0.60	10.5	0.01	0.03	0.00	0.00	0.05	11.9	0.397	16.5	1.27	0.01	0.85	0.04	6.68
4/4	34	1.26	0.60	10.4	0.00	0.03	0.00	0.00	0.05	11.9	0.399	16.6	1.30	0.00	0.85	0.04	6.72
4/5	35	1.27	0.60	10.3	0.00	0.03	0.00	0.00	0.05	11.9	0.4	16.7	1.34	0.00	0.85	0.04	6.76
4/6	36			Rest Cycle													
4/19	49																
4/20	50	0.88	0.15	9.7	0.02	0.15	0.00	0.00	0.05	11.9	0.4	16.7	1.41	0.02	0.87	0.13	6.89
4/21	51	1.20	0.35	10.0	0.01	0.12	0.00	0.00	0.05	11.9	0.4	16.7	1.46	0.01	0.88	0.14	7.04
4/22	52	1.25	0.65	10.4	0.00	0.06	0.00	0.01	0.05	11.9	0.4	16.7	1.50	0.00	0.88	0.08	7.11
4/23	53	1.22	0.50	10.5	0.00	0.03	0.00	0.00	0.05	11.9	0.4	16.7	1.54	0.00	0.88	0.02	7.13
4/24	54	1.20	0.70	10.5	0.00	0.02	0.00	0.00	0.05	11.9	0.4	16.7	1.57	0.00	0.88	0.02	7.16
4/25	55	1.23	0.70	10.4	0.00	0.02	0.00	0.00	0.05	11.9	0.4	16.7	1.60	0.00	0.88	0.02	7.18
4/26	56	1.23	0.70	10.5	0.00	0.02	0.00	0.00	0.05	11.9	0.4	16.7	1.63	0.00	0.88	0.02	7.21
4/27	57			Rest Cycle													
				Rinse Cycle													
5/1	61	0.11	0.05	8.2	0.00	0.03	0.00	0.00	0.05	11.9	0.4	16.7	1.62	0.00	0.88	0.00	7.21
5/2	62	1.02	0.55	10.1	0.00	0.06			0.05	11.9	0.4	16.7	1.59	0.00	0.88	0.06	7.27
5/3	63	1.31	0.40	10.1	0.00	0.04			0.05	11.9	0.4	16.7	1.56	0.00	0.88	0.05	7.32
5/4	64	1.28	0.10	10.1	0.00	0.01			0.05	11.9	0.4	16.7	1.55	0.00	0.88	0.01	7.34
5/5	65	1.25	0.05	10.0	0.00	0.00			0.05	11.9	0.4	16.7	1.55	0.00	0.88	0.00	7.34
5/6	66	1.24	0.00	9.9	0.03	0.00			0.05	11.9	0.4	16.7	1.55	0.04	0.92	0.00	7.34
5/7	67	1.25	0.00	9.9	0.00	0.00			0.05	11.9	0.4	16.7	1.55	0.00	0.92	0.00	7.34
				Drain Down													
5/11	71	0.81	0.00	8.2	0.01	0.00			0.05	11.9	0.4	16.7	1.55	0.01	0.92	0.00	7.34

	Au g/mt ore	Au %	Ag g/mt ore	Ag %
Extracted, g/mt ore	**0.05**	**11.9**	**0.4**	**16.7**
Tail , g/mt ore	**0.37**		**2.0**	
Calculated Head, g/mt ore	**0.42**		**2.4**	

3775-01 P-7

							g/mt ore		
Kilograms feed	15.42	NaCN added	84.41 g	NaCN	1.00 g/L solution		-------		
Kilograms ore [1]	15.47	NaCN Consumption	3.55 kg/mt ore [1]				Au	Ag	
						Head Grade	2.73	7.5	
Metric Tons	0.015	Lime:	17.0 kg/mt ore			Head Screen	2.65	8.5	
		MOL:	4.1 kg /mt ton of ore to adust pH with Milk of Lime			Tail Screen	0.93	4.1	
Bio Ox wt loss:	0.36%	Total:	21.1 kg/mt ore			Tail Assay			

Daily Column Leach Test Data, Bio Oxidized Residue
Sample I.D. WWS-13 MC
Bio Ox Test: B-1

Feed Size 80%-12.5mm

[1] Adjusted for weight loss during bio-oxidation

		Pregnant Solution Analyses					Barren Solution Analyses		Au Extraction		Ag Extraction		NaCN	Au		Ag	
			NaCN														
Date	Days Leached	Vol. l.	Conc. g/l	pH	Au ppm	Ag ppm	Au ppm	Ag ppm	Cum. g/mt ore [1]	Cum. %	Cum. g/mt ore [1]	Cum. %	Consumed g/mt ore [1]	mg	cum. mg	mg	cum. mg
11/17	1								0.000	0.0	0.000	0.0	0.00	0.00	0.00	0.00	0.00
11/18	2								0.000	0.0	0.000	0.0	0.09	0.00	0.00	0.00	0.00
11/19	3	1.80	0.00	9.0	6.20	3.42	0.03	0.01	0.721	26.8	0.398	5.4	0.17	11.16	11.16	6.16	6.16
11/20	4	1.45	0.15	9.2	3.13	5.78	0.00	0.01	1.012	37.6	0.939	12.7	0.25	4.50	15.66	8.37	14.52
11/21	5	1.20	0.10	9.3	1.80	4.80	0.00	0.01	1.152	42.8	1.310	17.7	0.32	2.16	17.82	5.75	20.27
11/22	6	1.20	0.15	9.5	1.12	2.97	0.00	0.00	1.239	46.0	1.540	20.8	0.40	1.34	19.16	3.55	23.82
11/23	7	1.37	0.30	9.8	0.53	1.68	0.00	0.00	1.286	47.8	1.689	22.8	0.46	0.73	19.89	2.30	26.12
11/24	8	1.13	0.20	9.7	0.55	1.79	0.00	0.00	1.326	49.3	1.819	24.6	0.53	0.62	20.51	2.02	28.15
11/25	9	1.21	0.15	9.7	0.43	1.25	0.00	0.00	1.359	50.5	1.917	25.9	0.61	0.52	21.03	1.51	29.66
11/26	10	1.24	0.15	9.6	0.34	1.05	0.00	0.01	1.387	51.5	2.001	27.0	0.68	0.42	21.45	1.30	30.96
11/27	11	1.00	0.10	9.5	0.28	0.97	0.00	0.00	1.405	52.2	2.063	27.9	0.76	0.28	21.73	0.96	31.92
11/28	12	1.32	0.20	9.6	0.24	0.74	0.00	0.00	1.425	53.0	2.126	28.7	0.83	0.32	22.05	0.98	32.89
11/29	13	1.36	0.25	10.1	0.20	0.63	0.00	0.00	1.443	53.6	2.182	29.5	0.90	0.27	22.32	0.86	33.75
11/30	14	1.25	0.40	10.1	0.22	0.72	0.01	0.00	1.461	54.3	2.240	30.3	0.95	0.28	22.60	0.90	34.65
12/1	15	1.37	0.45	10.0	0.15	0.38	0.01	0.00	1.473	54.8	2.273	30.7	1.00	0.19	22.79	0.52	35.17
12/2	16	1.12	0.25	9.9	0.20	0.58	0.00	0.00	1.487	55.3	2.315	31.3	1.07	0.21	23.00	0.65	35.82
12/3	17	1.24	0.30	9.9	0.15	0.46	0.00	0.00	1.499	55.7	2.352	31.8	1.13	0.19	23.18	0.57	36.39
12/4	18	1.25	0.40	10.0	0.14	0.51	0.00	0.00	1.510	56.1	2.394	32.3	1.18	0.18	23.36	0.64	37.03
12/5	19		Rest Cycle/Power Outage										1.27	0.00	23.36	0.00	37.03
12/6	20	1.09	0.25	9.8	0.20	0.63	0.00	0.00	1.524	56.7	2.438	32.9	1.25	0.22	23.58	0.69	37.71
12/7	21	1.21	0.25	10.0	0.17	0.42	0.01	0.00	1.537	57.2	2.471	33.4	1.32	0.21	23.78	0.51	38.22
12/8	22	1.43	0.50	10.0	0.08	0.30	0.02	0.02	1.544	57.4	2.499	33.8	1.36	0.10	23.88	0.43	38.65
12/9	23	1.11	0.30	9.9	0.14	0.42	0.01	0.00	1.552	57.7	2.527	34.1	1.42	0.13	24.01	0.44	39.09
12/10	24	1.21	0.30	9.8	0.15	0.37	0.00	0.01	1.563	58.1	2.556	34.5	1.49	0.17	24.18	0.45	39.54
12/11	25	1.24	0.35	9.9	0.11	0.32	0.00	0.00	1.572	58.4	2.581	34.9	1.54	0.14	24.32	0.38	39.92
12/12	26	1.16	0.35	9.9	0.10	0.34	0.00	0.00	1.579	58.7	2.606	35.2	1.60	0.12	24.43	0.39	40.32
12/13	27	1.26	0.35	9.9	0.09	0.27	0.00	0.00	1.587	59.0	2.628	35.5	1.66	0.11	24.55	0.34	40.66
12/14	28	1.23	0.45	9.9	0.08	0.28	0.01	0.00	1.593	59.2	2.650	35.8	1.71	0.10	24.64	0.34	41.00
12/15	29	1.20	0.35	9.8	0.13	0.26	0.03	0.00	1.602	59.6	2.671	36.1	1.77	0.14	24.79	0.31	41.31
12/16	30	1.18	0.35	9.7	0.10	0.30	0.00	0.00	1.607	59.8	2.693	36.4	1.83	0.08	24.87	0.35	41.67
12/17	31	1.29	0.40	9.8	0.08	0.24	0.00	0.00	1.614	60.0	2.713	36.7	1.89	0.10	24.97	0.31	41.98
12/18	32	1.13	0.35	9.8	0.08	0.28	0.00	0.00	1.620	60.2	2.734	36.9	1.95	0.09	25.06	0.32	42.29
12/19	33	1.33	0.40	10.0	0.07	0.23	0.00	0.00	1.626	60.4	2.754	37.2	2.00	0.09	25.15	0.31	42.60
12/20	34	1.14	0.35	9.8	0.07	0.24	0.00	0.00	1.631	60.6	2.771	37.5	2.06	0.08	25.23	0.27	42.87
12/21	35	1.06	0.35	9.8	0.07	0.25	0.00	0.00	1.636	60.8	2.788	37.7	2.12	0.07	25.31	0.27	43.14
12/22	36	1.48	0.45	9.9	0.06	0.23	0.00	0.02	1.642	61.0	2.810	38.0	2.17	0.09	25.39	0.34	43.48
12/23	37	1.24	0.45	9.9	0.07	0.22	0.00	0.02	1.647	61.2	2.826	38.2	2.22	0.09	25.48	0.25	43.72
12/24	38	1.19	0.45	9.9	0.06	0.24	0.00	0.00	1.652	61.4	2.843	38.4	2.27	0.07	25.55	0.26	43.98
12/25	39	1.23	0.35	10.0	0.06	0.22	0.00	0.01	1.657	61.6	2.861	38.7	2.33	0.07	25.63	0.27	44.25
12/26	40	1.12	0.45	9.9	0.05	0.22	0.00	0.01	1.660	61.7	2.876	38.9	2.38	0.06	25.68	0.23	44.49
12/27	41	1.32	0.35	9.9	0.04	0.19	0.00	0.00	1.664	61.8	2.891	39.1	2.44	0.05	25.74	0.24	44.72
12/28	42	1.16	0.40	10.0	0.05	0.21	0.00	0.00	1.667	62.0	2.907	39.3	2.50	0.06	25.79	0.24	44.97
12/29	43	1.32	0.60	10.0	0.06	0.17	0.00	0.00	1.672	62.2	2.921	39.5	2.53	0.08	25.87	0.22	45.19
12/30	44	1.19	0.55	10.0	0.04	0.19	0.00	0.00	1.676	62.3	2.936	39.7	2.58	0.05	25.92	0.23	45.42
12/31	45	1.22	0.55	10.0	0.04	0.19	0.00	0.00	1.679	62.4	2.951	39.9	2.62	0.05	25.97	0.23	45.65
1/1	46	1.15	0.50	10.1	0.05	0.19	0.00	0.00	1.682	62.5	2.965	40.1	2.67	0.06	26.03	0.22	45.87
1/2	47	1.35	0.55	10.0	0.05	0.16	0.00	0.01	1.687	62.7	2.979	40.3	2.71	0.07	26.09	0.22	46.08
1/3	48	1.22	0.45	10.1	0.04	0.17	0.00	0.01	1.690	62.8	2.991	40.4	2.76	0.05	26.14	0.19	46.28
1/4	49	1.20	0.35	10.0	0.03	0.17	0.00	0.00	1.692	62.9	3.004	40.6	2.82	0.04	26.18	0.19	46.47
1/5	50	1.22	0.50	10.0	0.04	0.17	0.00	0.00	1.695	63.0	3.017	40.8	2.86	0.05	26.23	0.21	46.68
1/6	51	1.31	0.55	10.0	0.02	0.14	0.00	0.00	1.697	63.1	3.029	40.9	2.90	0.03	26.25	0.18	46.86
1/7	52	1.21	0.55	10.0	0.02	0.16	0.00	0.00	1.699	63.1	3.042	41.1	2.95	0.02	26.28	0.19	47.05
1/8	53	1.20	0.45	10.0	0.03	0.15	0.00	0.00	1.701	63.2	3.053	41.3	3.00	0.04	26.31	0.18	47.23
1/9	54	1.28	0.50	10.1	0.00	0.14	0.00	0.00	1.701	63.2	3.065	41.4	3.04	0.00	26.31	0.18	47.41
1/10	55	1.16	0.55	10.1	0.03	0.16	0.00	0.00	1.703	63.3	3.077	41.6	3.09	0.03	26.35	0.19	47.60
1/11	56	1.34	0.50	10.1	0.06	0.15	0.00	0.00	1.708	63.5	3.090	41.8	3.13	0.08	26.43	0.20	47.80
1/12	57	1.22	0.50	10.1	0.03	0.14	0.00	0.00	1.711	63.6	3.101	41.9	3.18	0.04	26.47	0.17	47.97
1/13	58	1.20	0.55	10.1	0.04	0.14	0.00	0.00	1.714	63.7	3.112	42.1	3.22	0.05	26.51	0.17	48.14
1/14	59			Rest Cycle									3.22	0.00	26.51	0.00	48.14
1/27	72												3.22	0.00	26.51	0.00	48.14
1/28	73	1.05	0.05	8.2	0.17	0.58	0.00	0.00	1.725	64.1	3.151	42.6	3.31	0.18	26.69	0.61	48.75
1/29	74	1.22	0.45	9.8	0.11	0.40	0.00	0.00	1.734	64.5	3.183	43.0	3.36	0.13	26.83	0.49	49.24
1/30	75	1.27	0.65	9.3	0.04	0.21	0.00	0.00	1.737	64.6	3.200	43.2	3.39	0.05	26.88	0.27	49.50
1/31	76	1.26	0.70	10.1	0.08	0.16	0.00	0.00	1.744	64.8	3.213	43.4	3.42	0.10	26.98	0.20	49.70
2/1	77	0.95	0.40	9.1	0.05	0.15	0.00	0.00	1.747	64.9	3.222	43.5	3.48	0.05	27.03	0.14	49.85
2/2	78	1.43	0.50	10.0	0.03	0.12	0.00	0.00	1.750	65.0	3.233	43.7	3.52	0.04	27.07	0.17	50.02
2/3	79	1.32	0.55	9.8	0.01	0.10	0.00	0.00	1.751	65.1	3.242	43.8	3.56	0.01	27.08	0.13	50.15
2/4	80												3.56	0.00	27.08	0.00	50.15
													3.56	0.00	27.08	0.00	50.15
				Rinse Cycle									3.56	0.00	27.08	0.00	50.15
2/12	88	0.18	0.00	8.3	0.00	0.14			1.751	65.1	3.243	43.8	3.56	0.00	27.08	0.03	50.17
2/13	89	1.06	0.15	8.4	0.09	0.49			1.757	65.3	3.277	44.3	3.55	0.10	27.18	0.52	50.69

3775-01 P-7

Kilograms feed	15.42	NaCN added	84.41 g	NaCN	1.00 g/L solution	
Kilograms ore [1]	15.47	NaCN Consumption	3.55 kg/mt ore [1]			
Metric Tons	0.015	Lime:	17.0 kg/mt ore			
		MOL:	4.1 kg /mt ton of ore to adust pH with Milk of Lime			
Bio Ox wt loss:	0.36%	Total:	21.1 kg/mt ore			

g/mt ore	Au	Ag
Head Grade	2.73	7.5
Head Screen	2.65	8.5
Tail Screen	0.93	4.1
Tail Assay		

Daily Column Leach Test Data, Bio Oxidized Residue
Sample I.D. WWS-13 MC
Bio Ox Test: B-1

Feed Size 80%-12.5mm

[1] Adjusted for weight loss during bio-oxidation

		Pregnant Solution Analyses	NaCN				Barren Solution Analyses		Au Extraction		Ag Extraction		NaCN	Au		Ag	
Date	Days Leached	Vol. l.	Conc. g/l	pH	Au ppm	Ag ppm	Au ppm	Ag ppm	Cum. g/mt ore [1]	Cum. %	Cum. g/mt ore [1]	Cum. %	Consumed g/mt ore [1]	mg	cum. mg	mg	cum. mg
2/14	90	1.31	0.05	8.4	0.05	0.19			1.76	65.4	3.293	44.5	3.55	0.07	27.24	0.25	50.94
2/15	91	1.31	0.00	8.7	0.00	0.00			1.76	65.4	3.293	44.5	3.55	0.00	27.24	0.00	50.94
2/16	92	1.31	0.00	8.7	0.00	0.00			1.76	65.4	3.293	44.5	3.55	0.00	27.24	0.00	50.94
				Drain Down									3.55	0.00	27.24	0.00	50.94
2/21	97	0.98	0.00	8.2	0.00	0.00			1.76	65.4	3.3	44.6	3.55	0.00	27.24	0.00	50.94

	Au g/mt ore	Au %	Ag g/mt ore	Ag %
Extracted, g/mt ore[1]	**1.76**	**65.4**	**3.3**	**44.6**
Tail, g/mt ore [1]	**0.93**		**4.1**	
Calculated Head, g/mt ore[1]	**2.69**		**7.4**	

3775-01 P-8

Feed Kilograms	14.33	NaCN added	84.42 g	NaCN	1.00 g/L solution		g/mt ore	
Kilograms Ore [1)]	14.66	NaCN Consumption	3.37 kg/mt ore [1)]				-------	
							Au	Ag
						Head Grade	4.00	60.8
Metric Tons	0.015	Lime:	8.4 kg/mt ore			Head Screen	3.99	57.9
		MOL:	4.3 kg /mt ton of ore to adust pH with Milk of Lime			Tail Screen	1.18	33.8
Bio Ox wt loss:	2.30%	Total:	12.7 kg/mt ore			Tail Assay		

Daily Column Leach Test Data, Bio Oxidized Residue
Sample I.D. WOS-13 MC
Bio Ox Test: B-9

Feed Size 80%-12.5mm

[1)] Adjusted for weight loss during bio-oxidation

		Pregnant Solution Analyses					Barren Solution Analyses		Au Extraction		Ag Extraction		NaCN	Au		Ag	
			NaCN														
Date	Days Leached	Vol. l.	Conc. g/l	pH	Au ppm	Ag ppm	Au ppm	Ag ppm	Cum. g/mt ore [1)]	Cum. %	Cum. g/mt ore [1)]	Cum. %	Consumed g/mt ore [1)]	mg	cum. mg	mg	cum. mg
11/17	1								0.000	0.0	0.000	0.0	0.00	0.00	0.00	0.00	0.00
11/18	2								0.000	0.0	0.000	0.0	0.09	0.00	0.00	0.00	0.00
11/19	3	1.96	0.00	8.5	12.40	31.6	0.02	0.03	1.658	40.5	4.225	7.5	0.18	24.30	24.30	61.94	61.94
11/20	4	1.43	0.15	9.5	4.48	32.7	0.01	0.08	2.093	51.2	7.412	13.1	0.26	6.38	30.68	46.72	108.66
11/21	5	1.22	0.20	9.6	1.98	26.2	0.00	0.02	2.257	55.2	9.585	16.9	0.33	2.40	33.09	31.86	140.51
11/22	6	1.24	0.15	9.7	1.34	18.4	0.02	0.02	2.370	58.0	11.139	19.6	0.41	1.66	34.75	22.79	163.30
11/23	7	1.30	0.35	9.8	0.65	11.0	0.00	0.02	2.426	59.3	12.113	21.4	0.47	0.82	35.57	14.27	177.58
11/24	8	1.18	0.25	9.8	0.60	11.6	0.04	0.03	2.474	60.5	13.045	23.0	0.54	0.71	36.27	13.66	191.24
11/25	9	1.18	0.15	9.8	0.48	9.38	0.00	0.02	2.509	61.4	13.797	24.3	0.62	0.51	36.79	11.03	202.27
11/26	10	1.21	0.20	9.7	0.34	8.13	0.00	0.03	2.537	62.0	14.466	25.5	0.70	0.41	37.20	9.81	212.08
11/27	11	1.11	0.20	9.7	0.32	7.58	0.00	0.01	2.562	62.6	15.037	26.5	0.78	0.36	37.55	8.37	220.45
11/28	12	1.30	0.30	9.8	0.27	6.08	0.00	0.02	2.586	63.2	15.576	27.5	0.84	0.35	37.90	7.89	228.34
11/29	13	1.36	0.30	10.1	0.21	4.82	0.00	0.00	2.605	63.7	16.021	28.3	0.90	0.29	38.19	6.53	234.87
11/30	14	1.24	0.30	10.1	0.22	5.07	0.02	0.01	2.624	64.1	16.450	29.0	0.97	0.27	38.46	6.29	241.16
12/1	15	1.32	0.45	10.1	0.16	2.94	0.01	0.01	2.636	64.5	16.714	29.5	1.02	0.18	38.65	3.87	245.02
12/2	16	1.15	0.30	10.1	0.21	4.64	0.01	0.01	2.652	64.8	17.077	30.1	1.09	0.23	38.87	5.32	250.35
12/3	17	1.25	0.45	10.1	0.17	3.86	0.00	0.00	2.665	65.2	17.405	30.7	1.14	0.20	39.07	4.81	255.16
12/4	18	1.24	0.45	10.1	0.17	3.77	0.00	0.02	2.680	65.5	17.724	31.3	1.19	0.21	39.28	4.67	259.83
12/5	19		Rest Cycle/Power Outage										1.29	0.00	39.28	-0.03	259.80
12/6	20	1.13	0.20	9.9	0.21	4.55	0.00	0.01	2.696	65.9	18.073	31.9	1.27	0.24	39.52	5.14	264.95
12/7	21	1.25	0.40	10.1	0.18	3.07	0.01	0.00	2.711	66.3	18.334	32.3	1.33	0.23	39.75	3.82	268.77
12/8	22	1.35	0.55	10.2	0.12	2.15	0.00	0.04	2.721	66.5	18.532	32.7	1.37	0.15	39.90	2.90	271.67
12/9	23	1.16	0.40	10.1	0.14	2.94	0.00	0.01	2.732	66.8	18.761	33.1	1.43	0.16	40.06	3.36	275.03
12/10	24	1.23	0.40	10.0	0.17	2.43	0.00	0.02	2.747	67.2	18.964	33.4	1.49	0.21	40.27	2.98	278.01
12/11	25	1.23	0.50	10.1	0.09	2.25	0.02	0.02	2.754	67.3	19.150	33.8	1.54	0.11	40.38	2.74	280.75
12/12	26	1.14	0.50	10.1	0.11	2.42	0.00	0.01	2.761	67.5	19.337	34.1	1.59	0.10	40.48	2.73	283.48
12/13	27	1.28	0.40	10.0	0.09	1.85	0.00	0.02	2.769	67.7	19.497	34.4	1.64	0.12	40.59	2.35	285.83
12/14	28	1.25	0.50	10.0	0.08	1.86	0.00	0.02	2.776	67.9	19.654	34.7	1.69	0.10	40.69	2.30	288.13
12/15	29	1.22	0.50	10.0	0.13	1.88	0.03	0.02	2.787	68.1	19.809	34.9	1.74	0.16	40.85	2.27	290.40
12/16	30	1.17	0.45	9.9	0.10	1.98	0.00	0.03	2.792	68.3	19.965	35.2	1.80	0.08	40.93	2.29	292.69
12/17	31	1.29	0.55	10.0	0.08	1.63	0.00	0.02	2.799	68.4	20.106	35.5	1.84	0.10	41.03	2.06	294.75
12/18	32	1.14	0.50	10.0	0.09	1.96	0.00	0.04	2.806	68.6	20.256	35.7	1.89	0.10	41.13	2.21	296.96
12/19	33	1.30	0.50	10.1	0.08	1.46	0.00	0.04	2.813	68.8	20.382	35.9	1.94	0.10	41.24	1.84	298.80
12/20	34	1.17	0.40	10.0	0.07	1.65	0.00	0.02	2.818	68.9	20.510	36.2	2.00	0.08	41.32	1.88	300.68
12/21	35	1.17	0.45	10.0	0.07	1.58	0.00	0.03	2.824	69.0	20.634	36.4	2.06	0.08	41.40	1.82	302.50
12/22	36	1.34	0.50	10.0	0.07	1.44	0.00	0.05	2.830	69.2	20.763	36.6	2.10	0.09	41.49	1.89	304.39
12/23	37	1.24	0.55	10.0	0.07	1.42	0.00	0.03	2.836	69.3	20.879	36.8	2.15	0.09	41.58	1.69	306.08
12/24	38	1.21	0.55	10.0	0.05	1.57	0.00	0.04	2.841	69.4	21.006	37.0	2.19	0.06	41.64	1.86	307.94
12/25	39	1.22	0.45	10.1	0.06	1.43	0.00	0.04	2.845	69.6	21.121	37.3	2.25	0.07	41.72	1.69	309.63
12/26	40	1.17	0.45	10.1	0.05	1.43	0.00	0.04	2.849	69.7	21.232	37.4	2.30	0.06	41.77	1.62	311.25
12/27	41	1.26	0.55	10.1	0.04	1.24	0.00	0.04	2.853	69.8	21.334	37.6	2.35	0.05	41.82	1.51	312.76
12/28	42	1.18	0.55	10.2	0.06	1.41	0.00	0.03	2.858	69.9	21.444	37.8	2.39	0.07	41.89	1.61	314.37
12/29	43	1.29	0.70	10.2	0.05	1.05	0.00	0.04	2.862	70.0	21.534	38.0	2.42	0.06	41.96	1.31	315.69
12/30	44	1.21	0.65	10.2	0.05	1.15	0.00	0.04	2.866	70.1	21.625	38.1	2.46	0.06	42.02	1.34	317.03
12/31	45	1.22	0.60	10.2	0.04	1.10	0.00	0.05	2.870	70.2	21.713	38.3	2.50	0.05	42.07	1.29	318.31
1/1	46	1.19	0.55	10.3	0.05	1.14	0.00	0.05	2.874	70.3	21.801	38.4	2.55	0.06	42.13	1.29	319.60
1/2	47	1.29	0.65	10.3	0.04	0.97	0.00	0.09	2.877	70.3	21.882	38.6	2.58	0.05	42.18	1.18	320.79
1/3	48	1.22	0.50	10.2	0.03	1.03	0.00	0.05	2.880	70.4	21.959	38.7	2.63	0.04	42.22	1.14	321.92
1/4	49	1.22	0.50	10.2	0.03	1.04	0.00	0.05	2.882	70.5	22.041	38.9	2.68	0.04	42.25	1.20	323.13
1/5	50	1.23	0.60	10.2	0.04	1.03	0.00	0.06	2.886	70.6	22.123	39.0	2.72	0.05	42.30	1.20	324.33
1/6	51	1.26	0.60	10.2	0.03	0.94	0.00	0.05	2.888	70.6	22.198	39.2	2.76	0.04	42.34	1.10	325.43
1/7	52	1.19	0.60	10.3	0.02	1.01	0.00	0.06	2.890	70.7	22.276	39.3	2.81	0.02	42.36	1.13	326.56
1/8	53	1.22	0.55	10.3	0.05	0.91	0.00	0.06	2.894	70.8	22.346	39.4	2.85	0.06	42.42	1.03	327.59
1/9	54	1.20	0.70	10.5	0.00	0.82	0.00	0.06	2.894	70.8	22.408	39.5	2.89	0.00	42.42	0.90	328.50
1/10	55	1.27	0.65	10.3	0.01	0.89	0.00	0.06	2.895	70.8	22.479	39.6	2.92	0.01	42.44	1.05	329.55
1/11	56	1.30	0.60	10.3	0.03	0.88	0.00	0.04	2.897	70.8	22.552	39.8	2.96	0.04	42.48	1.06	330.61
1/12	57	1.24	0.65	10.3	0.02	0.90	0.00	0.08	2.899	70.9	22.624	39.9	3.00	0.02	42.50	1.06	331.67
1/13	58	1.21	0.65	10.4	0.03	0.89	0.00	0.05	2.902	70.9	22.691	40.0	3.03	0.04	42.54	0.97	332.64
1/14	59			Rest Cycle									3.03	0.00	42.54	0.00	332.64
1/27	72												3.03	0.00	42.54	0.00	332.64
1/28	73	1.05	0.05	8.3	0.14	3.22	0.00	0.06	2.912	71.2	22.921	40.4	3.12	0.15	42.68	3.38	336.02
1/29	74	1.19	0.40	9.3	0.09	2.04	0.00	0.09	2.919	71.4	23.081	40.7	3.18	0.11	42.79	2.35	338.37
1/30	75	1.30	0.70	10.2	0.00	1.22	0.00	0.09	2.919	71.4	23.181	40.9	3.21	0.00	42.79	1.47	339.84
1/31	76	1.26	0.70	9.2	0.04	0.96	0.00	0.05	2.922	71.5	23.255	41.0	3.24	0.05	42.84	1.09	340.93
2/1	77	1.00	0.50	10.2	0.04	0.89	0.00	0.04	2.925	71.5	23.312	41.1	3.30	0.04	42.88	0.82	341.75
2/2	78	1.42	0.55	9.2	0.00	0.75	0.00	0.10	2.925	71.5	23.381	41.2	3.34	0.00	42.88	1.01	342.76
2/3	79	1.29	0.55	10.2	0.03	0.71	0.00	0.07	2.928	71.6	23.434	41.3	3.38	0.04	42.92	0.78	343.54
2/4	80			Rest Cycle									3.38	0.00	42.92	0.00	343.54
													3.38	0.00	42.92	0.00	343.54
				Rinse Cycle									3.38	0.00	42.92	0.00	343.54
2/12	88	0.10	0.00	8.4	0.04	1.40			2.928	71.6	23.444	41.3	3.38	0.00	42.92	0.14	343.68
2/13	89	1.10	0.15	8.8	0.04	2.52			2.931	71.7	23.633	41.7	3.37	0.04	42.97	2.77	346.45

3775-01 P-8

Feed Kilograms	14.33	NaCN added	84.42 g	NaCN	1.00 g/L solution		g/mt ore
Kilograms Ore [1]	14.66	NaCN Consumption	3.37 kg/mt ore [1]				Au / Ag
						Head Grade	4.00 / 60.8
Metric Tons	0.015	Lime:	8.4 kg/mt ore			Head Screen	3.99 / 57.9
		MOL:	4.3 kg /mt ton of ore to adust pH with Milk of Lime			Tail Screen	1.18 / 33.8
Bio Ox wt loss:	2.30%	Total:	12.7 kg/mt ore			Tail Assay	

Daily Column Leach Test Data, Bio Oxidized Residue
Sample I.D. WOS-13 MC
Bio Ox Test: B-9

Feed Size 80%-12.5mm

[1] Adjusted for weight loss during bio-oxidation

		Pregnant Solution Analyses					Barren Solution Analyses		Au Extraction		Ag Extraction		NaCN	Au		Ag	
Date	Days Leached	Vol. l.	NaCN Conc. g/l	pH	Au ppm	Ag ppm	Au ppm	Ag ppm	Cum. g/mt ore [1]	Cum. %	Cum. g/mt ore [1]	Cum. %	Consumed g/mt ore [1]	mg	cum. mg	mg	cum. mg
2/14	90	1.30	0.00	8.4	0.04	0.87			2.935	71.7	23.7	41.8	3.37	0.05	43.02	1.13	347.58
2/15	91	1.31	0.00	8.5	0.04	0.18			2.938	71.8	23.7	41.8	3.37	0.05	43.07	0.24	347.82
2/16	92	1.33	0.00	9.3	0.01	0.03			2.939	71.9	23.7	41.8	3.37	0.01	43.09	0.04	347.86
			Drain Down										3.37	0.00	43.09	0.00	347.86
2/21	97	0.96	0.00	8.5	0.00	0.01			2.94	71.9	23.7	41.8	3.37	0.00	43.09	0.01	347.87

	Au Cum. g/mt ore	Au Cum. %	Ag Cum. g/mt ore	Ag Cum. %
Extracted, g/mt ore[1]	**2.94**	**71.9**	**23.7**	**41.8**
Tail, g/mt ore[1]	**1.15**		**33.0**	
Calculated Head, g/mt ore[1]	**4.09**		**56.7**	

3775-01 P-9							g/mt ore
Feed Kilograms	15.39	NaCN added	60.30 g	NaCN	1.00 g/L solution		-------
Kilograms Ore [1)]	15.52	NaCN Consumption	2.73 kg/mt ore [1)]				Au / Ag
						Head Grade	0.46 / 2.4
Metric Tons	0.016	Lime:	28.0 kg/mt ore			Head Screen	0.38 / 2.0
		MOL:	2.8 kg /mt ton of ore to adust pH with Milk of Lime			Tail Screen	0.12 / 1.4
Bio Ox wt loss:	0.83%	Total:	30.8 kg/mt ore			Tail Assay	

Daily Column Leach Test Data, Bio Oxidized Residue
Sample I.D. FSU-13-1
Bio Ox Test: B-5

Feed Size 80%-12.5mm

[1)] Adjusted for weight loss during bio-oxidation

		Pregnant Solution Analyses					Barren Solution Analyses		Au Extraction		Ag Extraction		NaCN	Au		Ag	
Date	Days Leached	Vol. l.	NaCN Conc. g/l	pH	Au ppm	Ag ppm	Au ppm	Ag ppm	Cum. g/mt ore [1)]	Cum. %	Cum. g/mt ore [1)]	Cum. %	Consumed g/mt ore [1)]	mg	cum. mg	mg	cum. mg
11/17	1								0.000	0.0	0.000	0.0	0.00	0.00	0.00	0.00	0.00
11/18	2								0.000	0.0	0.000	0.0	0.09	0.00	0.00	0.00	0.00
11/19	3	1.75	0.00	9.3	0.46	0.64	0.03	0.01	0.052	12.7	0.072	3.0	0.17	0.81	0.81	1.12	1.12
11/20	4	1.36	0.10	9.5	0.48	0.65	0.00	0.01	0.091	22.3	0.128	5.3	0.25	0.61	1.42	0.87	1.99
11/21	5	1.23	0.10	9.4	0.47	0.79	0.00	0.01	0.129	31.4	0.190	7.9	0.33	0.58	2.00	0.96	2.95
11/22	6	1.25	0.15	9.6	0.46	0.99	0.02	0.00	0.166	40.4	0.269	11.2	0.40	0.58	2.57	1.22	4.17
11/23	7	1.31	0.30	9.8	0.28	0.82	0.00	0.00	0.188	45.7	0.338	14.1	0.46	0.34	2.91	1.07	5.25
11/24	8	1.20	0.15	9.7	0.29	1.02	0.00	0.00	0.210	51.2	0.417	17.4	0.54	0.35	3.26	1.22	6.47
11/25	9	1.16	0.15	9.6	0.20	0.87	0.00	0.00	0.225	54.9	0.482	20.1	0.61	0.23	3.49	1.01	7.48
11/26	10	1.28	0.15	9.5	0.12	0.69	0.01	0.01	0.235	57.3	0.539	22.5	0.69	0.15	3.64	0.88	8.36
11/27	11	1.18	0.20	9.6	0.08	0.57	0.00	0.00	0.240	58.5	0.581	24.2	0.76	0.08	3.73	0.66	9.02
11/28	12	1.28	0.20	9.7	0.07	0.44	0.00	0.00	0.246	60.0	0.618	25.7	0.83	0.09	3.81	0.56	9.59
11/29	13	1.31	0.35	10.0	0.04	0.33	0.00	0.00	0.249	60.8	0.646	26.9	0.89	0.05	3.87	0.43	10.02
11/30	14	1.25	0.35	9.9	0.05	0.30	0.00	0.00	0.253	61.8	0.670	27.9	0.94	0.06	3.93	0.38	10.39
12/1	15	1.35	0.40	9.9	0.04	0.21	0.01	0.00	0.257	62.6	0.688	28.7	1.00	0.05	3.98	0.28	10.68
12/2	16	1.14	0.25	9.9	0.03	0.25	0.00	0.00	0.258	62.9	0.706	29.4	1.06	0.02	4.00	0.29	10.96
12/3	17	1.27	0.30	9.8	0.02	0.22	0.00	0.00	0.260	63.3	0.724	30.2	1.13	0.03	4.03	0.28	11.24
12/4	18	1.26	0.40	9.8	0.01	0.20	0.00	0.00	0.260	63.5	0.741	30.9	1.18	0.01	4.04	0.25	11.49
12/5	19			Rest Cycle/Power Outage									1.27	0.00	4.04	0.00	11.49
12/6	20	1.14	0.30	9.7	0.03	0.25	0.00	0.00	0.263	64.1	0.759	31.6	1.24	0.03	4.08	0.29	11.78
12/7	21	1.22	0.25	9.8	0.05	0.19	0.02	0.00	0.267	65.0	0.774	32.2	1.31	0.06	4.14	0.23	12.01
12/8	22	1.37	0.40	9.9	0.03	0.14	0.00	0.02	0.268	65.3	0.786	32.8	1.36	0.01	4.15	0.19	12.20
12/9	23	1.16	0.35	9.8	0.03	0.14	0.00	0.00	0.270	65.8	0.795	33.1	1.42	0.03	4.19	0.14	12.34
12/10	24	1.24	0.35	9.8	0.04	0.13	0.00	0.00	0.273	66.6	0.805	33.6	1.48	0.05	4.24	0.16	12.50
12/11	25	1.25	0.40	9.8	0.02	0.12	0.00	0.00	0.275	67.0	0.815	34.0	1.53	0.03	4.26	0.15	12.65
12/12	26	1.13	0.40	9.9	0.00	0.11	0.00	0.00	0.275	67.0	0.823	34.3	1.59	0.00	4.26	0.12	12.77
12/13	27	1.31	0.35	10.0	0.01	0.09	0.00	0.00	0.275	67.2	0.831	34.6	1.65	0.01	4.27	0.12	12.89
12/14	28	1.25	0.45	9.8	0.00	0.08	0.00	0.00	0.275	67.2	0.837	34.9	1.70	0.00	4.27	0.10	12.99
12/15	29	1.22	0.45	9.7	0.00	0.08	0.00	0.00	0.275	67.2	0.843	35.1	1.75	0.00	4.27	0.10	13.09
12/16	30	1.15	0.35	9.7	0.00	0.08	0.00	0.00	0.275	67.2	0.849	35.4	1.81	0.00	4.27	0.09	13.18
12/17	31	1.31	0.35	9.8	0.00	0.07	0.00	0.00	0.275	67.2	0.855	35.6	1.87	0.00	4.27	0.09	13.27
12/18	32	1.14	0.35	9.8	0.00	0.07	0.00	0.00	0.275	67.2	0.860	35.8	1.93	0.00	4.27	0.08	13.35
12/19	33	1.35	0.45	9.8	0.02	0.07	0.00	0.00	0.277	67.6	0.866	36.1	1.97	0.03	4.30	0.09	13.45
12/20	34			Rest Cycle									1.97	0.00	4.30	0.00	13.45
1/2	47												1.97	0.00	4.30	0.00	13.45
1/3	48	0.97	0.15	8.8	0.03	0.25	0.00	0.01	0.279	68.1	0.882	36.8	2.05	0.03	4.33	0.24	13.69
1/4	49	1.22	0.15	9.2	0.02	0.19	0.00	0.00	0.281	68.4	0.896	37.3	2.13	0.02	4.36	0.22	13.91
1/5	50	1.22	0.30	9.6	0.00	0.11	0.00	0.00	0.281	68.4	0.905	37.7	2.19	0.00	4.36	0.13	14.04
1/6	51	1.28	0.40	9.7	0.01	0.06	0.00	0.00	0.281	68.6	0.910	37.9	2.24	0.01	4.37	0.08	14.12
1/7	52	1.23	0.40	9.8	0.02	0.05	0.00	0.00	0.283	69.0	0.914	38.1	2.30	0.02	4.39	0.06	14.18
1/8	53	1.22	0.40	9.8	0.01	0.05	0.00	0.00	0.284	69.2	0.918	38.2	2.35	0.01	4.40	0.06	14.24
1/9	54	1.27	0.45	9.8	0.00	0.04	0.00	0.00	0.284	69.2	0.921	38.4	2.40	0.00	4.40	0.05	14.29
1/10	55			Rest Cycle									2.40	0.00	4.40	0.00	14.29
1/23	68												2.40	0.00	4.40	0.00	14.29
1/24	69	0.96	0.10	8.4	0.00	0.15	0.00	0.00	0.284	69.2	0.930	38.8	2.48	0.00	4.40	0.14	14.44
1/25	70	1.29	0.25	9.4	0.02	0.12	0.00	0.00	0.285	69.6	0.940	39.2	2.55	0.03	4.43	0.15	14.59
1/26	71	1.14	0.40	9.8	0.00	0.08	0.00	0.00	0.285	69.6	0.946	39.4	2.60	0.00	4.43	0.09	14.68
1/27	72	1.36	0.45	8.6	0.00	0.05	0.00	0.00	0.285	69.6	0.950	39.6	2.65	0.00	4.43	0.07	14.75
1/28	73	1.25	0.50	8.4	0.00	0.04	0.00	0.00	0.285	69.6	0.954	39.7	2.70	0.00	4.43	0.05	14.80
1/29	74	1.26	0.45	8.8	0.00	0.03	0.00	0.00	0.285	69.6	0.956	39.8	2.75	0.00	4.43	0.04	14.84
1/30	75	1.30	0.50	9.9	0.00	0.03	0.00	0.00	0.285	69.6	0.959	39.9	2.79	0.00	4.43	0.04	14.88
1/31	76			Rest Cycle									2.79	0.00	4.43	0.00	14.88
													2.79	0.00	4.43	0.00	14.88
				Rinse Cycle									2.79	0.00	4.43	0.00	14.88
2/4	80	0.14	0.00	8.3	0.00	0.04			0.285	69.6	0.959	40.0	2.79	0.00	4.43	0.01	14.88
2/5	81	1.12	0.30	8.3	0.00	0.06			0.285	69.6	0.963	40.1	2.77	0.00	4.43	0.07	14.95
2/6	82	1.27	0.35	8.3	0.00	0.05			0.285	69.6	0.967	40.3	2.74	0.00	4.43	0.06	15.01
2/7	83	1.35	0.10	8.3	0.00	0.03			0.285	69.6	0.970	40.4	2.73	0.00	4.43	0.04	15.05
2/8	84	1.27	0.00	8.7	0.00	0.01			0.285	69.6	0.971	40.4	2.73	0.00	4.43	0.01	15.07
2/9	85	1.27	0.00	8.4	0.00	0.00			0.285	69.6	0.971	40.4	2.73	0.00	4.43	0.00	15.07
				Drain Down									2.73	0.00	4.43	0.00	15.07
2/14	90	1.00	0.00	8.3	0.00	0.00			0.29	70.7	1.0	41.7	2.73	0.00	4.43	0.00	15.07

	Au g/mt ore	Au %	Ag g/mt ore	Ag %
Extracted, g/mt ore[1)]	**0.29**	**70.7**	**1.0**	**41.7**
Tail, g/mt ore [1)]	**0.12**		**1.4**	
Calculated Head, g/mt ore[1)]	**0.41**		**2.4**	

3775-01 P-10

Feed Kilograms	15.34	NaCN added	84.39 g	NaCN	1.00 g/L solution		g/mt ore
Kilograms Ore [1]	15.48	NaCN Consumption	3.40 kg/mt ore [1]				-------
							Au / Ag
						Head Grade	2.73 / 7.5
Metric Tons	0.015	Lime:	22.0 kg/mt ore			Head Screen	2.94 / 7.2
		MOL:	4.1 kg /mt ton of ore to adust pH with Milk of Lime			Tail Screen	0.83 / 4.4
Bio Ox wt loss:	0.89%	Total:	26.1 kg/mt ore			Tail Assay	

Daily Column Leach Test Data, Bio Oxidized Residue
Sample I.D. WWS-13 MC
Bio Ox Test: B-2

Feed Size 80%-6.3mm

[1] Adjusted for weight loss during bio-oxidation

		Pregnant Solution Analyses					Barren Solution Analyses		Au Extraction		Ag Extraction		NaCN	Au		Ag	
			NaCN														
	Days	Vol.	Conc.		Au	Ag	Au	Ag	Cum.	Cum.	Cum.	Cum.	Consumed		cum.		cum.
Date	Leached	l.	g/l	pH	ppm	ppm	ppm	ppm	g/mt ore [1]	%	g/mt ore [1]	%	g/mt ore [1]	mg	mg	mg	mg
11/17	1								0.000	0.0	0.000	0.0	0.00	0.00	0.00	0.00	0.00
11/18	2								0.000	0.0	0.000	0.0	0.09	0.00	0.00	0.00	0.00
11/19	3	1.62	0.00	8.5	5.73	0.12	0.02	0.02	0.600	22.9	0.013	0.2	0.17	9.28	9.28	0.19	0.19
11/20	4	1.53	0.10	9.3	4.43	7.59	0.01	0.02	1.036	39.5	0.761	9.5	0.25	6.75	16.03	11.59	11.78
11/21	5	1.21	0.15	9.5	1.86	7.53	0.00	0.01	1.180	45.0	1.348	16.8	0.32	2.24	18.27	9.08	20.86
11/22	6	1.23	0.20	9.7	1.11	4.48	0.00	0.00	1.268	48.4	1.703	21.3	0.39	1.37	19.64	5.50	26.36
11/23	7	1.36	0.15	9.8	0.64	2.59	0.01	0.00	1.325	50.6	1.931	24.1	0.47	0.87	20.51	3.52	29.88
11/24	8	1.14	0.20	9.8	0.58	2.40	0.00	0.00	1.367	52.2	2.107	26.3	0.54	0.65	21.15	2.74	32.62
11/25	9	1.16	0.15	9.7	0.48	1.79	0.00	0.00	1.403	53.5	2.241	28.0	0.61	0.56	21.71	2.08	34.70
11/26	10	1.13	0.20	9.6	0.39	1.35	0.00	0.01	1.431	54.6	2.340	29.2	0.69	0.44	22.15	1.53	36.22
11/27	11	1.11	0.15	9.7	0.33	1.07	0.00	0.00	1.455	55.5	2.416	30.2	0.76	0.37	22.52	1.17	37.40
11/28	12	1.30	0.25	9.8	0.28	0.80	0.00	0.01	1.478	56.4	2.483	31.0	0.83	0.36	22.88	1.04	38.44
11/29	13	1.47	0.25	10.0	0.20	0.57	0.00	0.00	1.497	57.1	2.536	31.7	0.89	0.29	23.18	0.82	39.26
11/30	14	1.24	0.35	10.1	0.21	0.61	0.01	0.00	1.514	57.8	2.585	32.3	0.95	0.26	23.44	0.76	40.02
12/1	15	1.39	0.35	10.1	0.17	0.41	0.02	0.00	1.528	58.3	2.622	32.8	1.00	0.22	23.66	0.57	40.59
12/2	16	1.12	0.30	10.0	0.19	0.49	0.00	0.00	1.540	58.8	2.657	33.2	1.07	0.19	23.85	0.55	41.14
12/3	17	1.25	0.30	10.0	0.14	0.45	0.00	0.00	1.552	59.2	2.694	33.7	1.13	0.18	24.02	0.56	41.70
12/4	18	1.27	0.45	10.1	0.14	0.46	0.01	0.00	1.563	59.7	2.731	34.1	1.18	0.18	24.20	0.58	42.28
12/5	19		Rest Cycle/Power Outage										1.27	-0.01	24.18	0.00	42.28
12/6	20	1.11	0.40	9.9	0.20	0.58	0.02	0.00	1.577	60.2	2.773	34.7	1.24	0.22	24.41	0.64	42.93
12/7	21	1.21	0.25	10.0	0.17	0.46	0.02	0.00	1.588	60.6	2.809	35.1	1.31	0.18	24.59	0.56	43.48
12/8	22	1.43	0.45	10.1	0.11	0.33	0.00	0.00	1.597	60.9	2.839	35.5	1.35	0.13	24.72	0.47	43.96
12/9	23	1.09	0.40	10.1	0.11	0.38	0.00	0.00	1.604	61.2	2.866	35.8	1.41	0.12	24.84	0.41	44.37
12/10	24	1.23	0.40	9.9	0.14	0.37	0.00	0.00	1.616	61.7	2.896	36.2	1.46	0.17	25.01	0.46	44.82
12/11	25	1.24	0.45	10.0	0.10	0.32	0.00	0.00	1.624	62.0	2.921	36.5	1.51	0.12	25.13	0.40	45.22
12/12	26	1.15	0.40	10.1	0.09	0.31	0.00	0.00	1.630	62.2	2.944	36.8	1.57	0.10	25.24	0.36	45.58
12/13	27	1.31	0.35	10.0	0.10	0.26	0.00	0.00	1.639	62.5	2.966	37.1	1.63	0.13	25.37	0.34	45.92
12/14	28	1.25	0.45	10.0	0.10	0.26	0.00	0.00	1.647	62.9	2.987	37.3	1.68	0.13	25.49	0.33	46.24
12/15	29	1.19	0.35	9.9	0.09	0.25	0.00	0.00	1.654	63.1	3.007	37.6	1.74	0.11	25.60	0.30	46.54
12/16	30	1.17	0.35	9.8	0.08	0.28	0.00	0.00	1.660	63.3	3.028	37.8	1.80	0.09	25.69	0.33	46.87
12/17	31	1.33	0.50	9.9	0.08	0.25	0.00	0.00	1.667	63.6	3.049	38.1	1.84	0.11	25.80	0.33	47.20
12/18	32	1.13	0.40	9.9	0.09	0.27	0.00	0.00	1.673	63.9	3.069	38.4	1.90	0.10	25.90	0.31	47.51
12/19	33	1.38	0.45	10.0	0.07	0.24	0.00	0.00	1.679	64.1	3.090	38.6	1.95	0.10	26.00	0.33	47.84
12/20	34	1.13	0.40	9.9	0.07	0.24	0.00	0.00	1.685	64.3	3.108	38.8	2.00	0.08	26.08	0.27	48.11
12/21	35	1.06	0.35	9.9	0.06	0.24	0.00	0.00	1.689	64.5	3.124	39.1	2.07	0.06	26.14	0.25	48.36
12/22	36	1.52	0.45	10.0	0.06	0.23	0.00	0.02	1.695	64.7	3.147	39.3	2.11	0.09	26.23	0.35	48.71
12/23	37	1.25	0.40	10.0	0.06	0.20	0.00	0.00	1.699	64.9	3.161	39.5	2.16	0.08	26.31	0.22	48.94
12/24	38	1.18	0.45	10.0	0.05	0.23	0.00	0.00	1.703	65.0	3.179	39.7	2.21	0.06	26.37	0.27	49.21
12/25	39	1.25	0.40	10.1	0.05	0.23	0.00	0.02	1.707	65.2	3.197	40.0	2.27	0.06	26.43	0.29	49.49
12/26	40	1.12	0.45	10.0	0.05	0.22	0.00	0.01	1.711	65.3	3.211	40.1	2.32	0.06	26.48	0.22	49.71
12/27	41	1.34	0.40	10.1	0.04	0.20	0.00	0.00	1.714	65.4	3.228	40.3	2.37	0.05	26.54	0.25	49.97
12/28	42	1.13	0.45	10.1	0.05	0.22	0.00	0.00	1.718	65.6	3.244	40.6	2.43	0.06	26.59	0.25	50.22
12/29	43	1.37	0.60	10.1	0.05	0.18	0.00	0.00	1.722	65.7	3.260	40.7	2.46	0.07	26.66	0.25	50.46
12/30	44	1.18	0.55	10.1	0.05	0.19	0.00	0.00	1.726	65.9	3.274	40.9	2.51	0.06	26.72	0.22	50.69
12/31	45	1.22	0.55	10.1	0.06	0.20	0.00	0.00	1.731	66.1	3.290	41.1	2.55	0.07	26.79	0.24	50.93
1/1	46	1.14	0.55	10.1	0.05	0.19	0.00	0.00	1.735	66.2	3.304	41.3	2.60	0.06	26.85	0.22	51.15
1/2	47	1.38	0.60	10.2	0.04	0.17	0.00	0.02	1.738	66.3	3.319	41.5	2.63	0.06	26.91	0.23	51.38
1/3	48	1.22	0.50	10.1	0.04	0.17	0.00	0.02	1.741	66.5	3.331	41.6	2.68	0.05	26.96	0.18	51.56
1/4	49	1.18	0.40	10.1	0.05	0.17	0.00	0.00	1.745	66.6	3.342	41.8	2.73	0.06	27.01	0.17	51.74
1/5	50	1.22	0.50	10.0	0.04	0.17	0.00	0.01	1.748	66.7	3.356	41.9	2.78	0.05	27.06	0.21	51.95
1/6	51	1.35	0.60	10.1	0.02	0.15	0.00	0.01	1.750	66.8	3.368	42.1	2.81	0.03	27.09	0.19	52.13
1/7	52	1.23	0.60	10.1	0.03	0.16	0.00	0.01	1.752	66.9	3.380	42.2	2.85	0.04	27.13	0.18	52.32
1/8	53	1.20	0.50	10.1	0.04	0.15	0.00	0.00	1.756	67.0	3.390	42.4	2.90	0.05	27.18	0.17	52.48
1/9	54	1.31	0.50	10.1	0.03	0.13	0.00	0.00	1.758	67.1	3.401	42.5	2.94	0.04	27.21	0.17	52.65
1/10	55	1.13	0.55	10.1	0.04	0.15	0.00	0.00	1.761	67.2	3.412	42.7	2.99	0.05	27.26	0.17	52.82
1/11	56	1.37	0.60	10.2	0.03	0.14	0.00	0.00	1.764	67.3	3.425	42.8	3.02	0.04	27.30	0.19	53.02
1/12	57	1.21	0.65	10.2	0.03	0.14	0.00	0.00	1.766	67.4	3.436	42.9	3.06	0.04	27.34	0.17	53.19
1/13	58	1.19	0.60	10.2	0.05	0.14	0.00	0.00	1.770	67.5	3.446	43.1	3.10	0.06	27.40	0.17	53.35
1/14	59			Rest Cycle									3.10	0.00	27.40	0.00	53.35
1/27	72												3.10	0.00	27.40	0.00	53.35
1/28	73	1.09	0.05	8.6	0.13	0.50	0.00	0.00	1.779	67.9	3.482	43.5	3.18	0.14	27.54	0.55	53.90
1/29	74	1.24	0.45	9.7	0.09	0.46	0.00	0.00	1.786	68.2	3.519	44.0	3.23	0.11	27.65	0.57	54.47
1/30	75	1.28	0.80	10.3	0.03	0.28	0.00	0.01	1.789	68.3	3.542	44.3	3.25	0.04	27.69	0.36	54.83
1/31	76	1.28	0.65	10.2	0.04	0.17	0.00	0.00	1.792	68.4	3.555	44.4	3.29	0.05	27.74	0.20	55.03
2/1	77	0.92	0.50	10.0	0.03	0.15	0.00	0.00	1.794	68.5	3.564	44.5	3.34	0.03	27.77	0.14	55.17
2/2	78	1.39	0.50	9.6	0.01	0.14	0.00	0.00	1.795	68.5	3.576	44.7	3.39	0.01	27.78	0.19	55.36
2/3	79	1.41	0.55	10.1	0.02	0.09	0.00	0.00	1.796	68.6	3.585	44.8	3.42	0.03	27.81	0.13	55.49
2/4	80			Rest Cycle									3.42	0.00	27.81	0.00	55.49
													3.42	0.00	27.81	0.00	55.49
				Rinse Cycle									3.42	0.00	27.81	0.00	55.49
2/12	88	0.21	0.00	8.3	0.03	0.15			1.797	68.6	3.587	44.8	3.42	0.01	27.82	0.03	55.52
2/13	89	1.01	0.20	9.4	0.04	0.40			1.799	68.7	3.6	45.0	3.41	0.04	27.86	0.40	55.92

3775-01 P-10

Feed Kilograms	15.34	NaCN added	84.39 g	NaCN	1.00 g/L solution		g/mt ore	

Kilograms Ore [1)]	15.48	NaCN Consumption	3.40 kg/mt ore [1)]				Au	Ag
						Head Grade	2.73	7.5
Metric Tons	0.015	Lime:	22.0 kg/mt ore			Head Screen	2.94	7.2
		MOL:	4.1 kg /mt ton of ore to adust pH with Milk of Lime			Tail Screen	0.83	4.4
Bio Ox wt loss:	0.89%	Total:	26.1 kg/mt ore			Tail Assay		

Daily Column Leach Test Data, Bio Oxidized Residue
Sample I.D. WWS-13 MC
Bio Ox Test: B-2

Feed Size 80%-6.3mm

[1)] Adjusted for weight loss during bio-oxidation

		Pregnant Solution Analyses					Barren Solution Analyses		Au Extraction		Ag Extraction		NaCN	Au		Ag	
			NaCN														
Date	Days Leached	Vol. l.	Conc. g/l	pH	Au ppm	Ag ppm	Au ppm	Ag ppm	Cum. g/mt ore [1)]	Cum. %	Cum. g/mt ore [1)]	Cum. %	Consumed g/mt ore [1)]	mg	cum. mg	mg	cum. mg
2/14	90	1.32	0.15	9.5	0.05	0.26			1.80	68.7	3.6	45.0	3.40	0.07	27.92	0.34	56.27
2/15	91	1.33	0.00	8.9	0.00	0.06			1.80	68.7	3.6	45.0	3.40	0.00	27.92	0.08	56.35
2/16	92	1.32	0.00	8.6	0.01	0.00			1.80	68.7	3.6	45.0	3.40	0.01	27.94	0.00	56.35
				Drain Down									3.40	0.00	27.94	0.00	56.35
2/21	97	0.95	0.00	8.4	0.00	0.00			1.80	68.7	3.6	45.0	3.40	0.00	27.94	0.00	56.35

	Au g/mt ore	Au %	Ag g/mt ore	Ag %
Extracted, g/mt ore[1)]	**1.80**	**68.7**	**3.6**	**45.0**
Tail, g/mt ore [1)]	**0.82**		**4.4**	
Calculated Head, g/mt ore[1)]	**2.62**		**8.0**	

3775-01 P-11

Feed Kilograms	14.11	NaCN added	84.42 g	NaCN	1.00 g/L solution		g/mt ore
Kilograms Ore [1)]	14.48	NaCN Consumption	2.85 kg/mt ore [1)]				-------
							Au / Ag
						Head Grade	4.00 / 60.8
Metric Tons	0.014	Lime:	9.5 kg/mt ore			Head Screen	3.88 / 54.8
		MOL:	4.3 kg /mt ton of ore to adust pH with Milk of Lime			Tail Screen	0.89 / 33.3
Bio Ox wt loss:	2.64%	Total:	13.8 kg/mt ore			Tail Assay	

Daily Column Leach Test Data, Bio Oxidized Residue
Sample I.D. WOS-13 MC
Bio Ox Test: B-10

Feed Size 80%-6.3mm

[1)] Adjusted for weight loss during bio-oxidation

Date	Days Leached	Vol. l.	Pregnant Solution Analyses NaCN Conc. g/l	pH	Au ppm	Ag ppm	Barren Solution Analyses Au ppm	Ag ppm	Au Extraction Cum. g/mt ore [1)]	Au Extraction Cum. %	Ag Extraction Cum. g/mt ore [1)]	Ag Extraction Cum. %	NaCN Consumed g/mt ore [1)]	Au mg	Au cum. mg	Ag mg	Ag cum. mg
11/17	1								0.000	0.0	0.000	0.0	0.00	0.00	0.00	0.00	0.00
11/18	2								0.000	0.0	0.000	0.0	0.09	0.00	0.00	0.00	0.00
11/19	3	2.01	0.00	8.6	13.40	11.1	0.02	0.42	1.860	47.2	1.541	2.7	0.19	26.93	26.93	22.31	22.31
11/20	4	1.43	0.15	9.4	5.97	51.4	0.00	0.23	2.448	62.1	6.578	11.4	0.26	8.51	35.44	72.94	95.25
11/21	5	1.24	0.20	9.7	1.89	41.5	0.00	0.04	2.610	66.2	10.111	17.5	0.34	2.34	37.79	51.15	146.40
11/22	6	1.25	0.20	10.0	0.92	24.7	0.00	0.00	2.689	68.3	12.239	21.2	0.41	1.15	38.94	30.82	177.22
11/23	7	1.29	0.35	10.0	0.46	12.7	0.02	0.03	2.730	69.3	13.371	23.1	0.47	0.59	39.53	16.38	193.61
11/24	8	1.20	0.30	10.0	0.41	11.4	0.01	0.02	2.762	70.1	14.313	24.8	0.54	0.47	40.00	13.64	207.25
11/25	9	1.19	0.30	10.0	0.31	9.76	0.00	0.01	2.787	70.7	15.113	26.1	0.61	0.36	40.35	11.59	218.83
11/26	10	1.28	0.30	9.9	0.25	7.56	0.00	0.03	2.809	71.3	15.780	27.3	0.68	0.32	40.67	9.66	228.50
11/27	11	1.20	0.25	9.9	0.20	6.11	0.00	0.02	2.825	71.7	16.284	28.2	0.75	0.24	40.91	7.29	235.79
11/28	12	1.18	0.25	10.0	0.16	5.25	0.00	0.02	2.838	72.0	16.710	28.9	0.82	0.19	41.10	6.17	241.96
11/29	13	1.38	0.35	10.2	0.15	4.26	0.00	0.01	2.853	72.4	17.114	29.6	0.88	0.21	41.31	5.85	247.81
11/30	14	1.28	0.50	10.3	0.16	4.88	0.01	0.01	2.867	72.8	17.544	30.4	0.93	0.20	41.51	6.23	254.04
12/1	15	1.32	0.60	10.3	0.14	3.51	0.01	0.00	2.879	73.1	17.863	30.9	0.97	0.17	41.68	4.62	258.66
12/2	16	1.19	0.45	10.2	0.15	3.99	0.01	0.02	2.890	73.4	18.191	31.5	1.02	0.17	41.85	4.75	263.41
12/3	17	1.28	0.45	10.2	0.10	3.59	0.00	0.01	2.898	73.6	18.507	32.0	1.07	0.11	41.96	4.57	267.98
12/4	18	1.25	0.55	10.3	0.10	3.37	0.00	0.02	2.907	73.8	18.797	32.5	1.12	0.13	42.09	4.20	272.18
12/5	19		Rest Cycle/Power Outage										1.21	0.00	42.09	-0.03	272.15
12/6	20	1.16	0.40	10.1	0.16	4.26	0.01	0.01	2.919	74.1	19.136	33.1	1.18	0.19	42.27	4.94	277.09
12/7	21	1.24	0.50	10.3	0.13	3.32	0.02	0.01	2.930	74.4	19.420	33.6	1.23	0.15	42.42	4.10	281.20
12/8	22	1.33	0.65	10.3	0.07	2.40	0.00	0.03	2.934	74.5	19.639	34.0	1.26	0.07	42.49	3.18	284.37
12/9	23	1.19	0.65	10.3	0.10	2.86	0.00	0.02	2.943	74.7	19.871	34.4	1.30	0.12	42.61	3.36	287.74
12/10	24	1.25	0.50	10.2	0.11	2.55	0.00	0.01	2.952	74.9	20.090	34.8	1.35	0.14	42.74	3.16	290.90
12/11	25	1.25	0.60	10.3	0.06	2.27	0.00	0.02	2.957	75.1	20.285	35.1	1.39	0.08	42.82	2.82	293.72
12/12	26	1.18	0.65	10.4	0.06	2.36	0.00	0.02	2.962	75.2	20.475	35.4	1.43	0.07	42.89	2.76	296.48
12/13	27	1.28	0.50	10.2	0.06	1.98	0.00	0.02	2.967	75.3	20.648	35.7	1.48	0.08	42.97	2.51	298.99
12/14	28	1.25	0.60	10.3	0.05	1.88	0.00	0.03	2.972	75.4	20.809	36.0	1.52	0.06	43.03	2.32	301.31
12/15	29	1.24	0.60	10.2	0.06	1.89	0.01	0.02	2.977	75.6	20.968	36.3	1.56	0.07	43.10	2.30	303.61
12/16	30	1.20	0.65	10.2	0.08	2.08	0.00	0.04	2.983	75.7	21.138	36.6	1.60	0.08	43.19	2.47	306.08
12/17	31	1.29	0.65	10.2	0.05	1.85	0.00	0.03	2.987	75.8	21.299	36.9	1.63	0.06	43.25	2.33	308.42
12/18	32	1.18	0.60	10.2	0.06	1.95	0.00	0.05	2.992	75.9	21.456	37.1	1.68	0.07	43.32	2.26	310.68
12/19	33	1.29	0.65	10.3	0.05	1.61	0.00	0.05	2.996	76.0	21.594	37.4	1.71	0.06	43.39	2.01	312.69
12/20	34	1.21	0.55	10.2	0.04	1.66	0.00	0.03	3.000	76.1	21.729	37.6	1.76	0.05	43.44	1.94	314.63
12/21	35	1.21	0.55	10.3	0.04	1.64	0.00	0.04	3.003	76.2	21.863	37.8	1.81	0.05	43.48	1.94	316.57
12/22	36	1.31	0.65	10.4	0.04	1.53	0.00	0.05	3.007	76.3	21.998	38.1	1.84	0.05	43.54	1.95	318.52
12/23	37	1.25	0.65	10.2	0.04	1.47	0.00	0.04	3.010	76.4	22.120	38.3	1.88	0.05	43.59	1.77	320.29
12/24	38	1.22	0.65	10.3	0.03	1.57	0.00	0.04	3.013	76.5	22.248	38.5	1.91	0.04	43.62	1.86	322.16
12/25	39	1.23	0.60	10.4	0.02	1.46	0.00	0.04	3.014	76.5	22.369	38.7	1.96	0.02	43.65	1.74	323.90
12/26	40	1.21	0.50	10.2	0.03	1.38	0.00	0.05	3.017	76.6	22.480	38.9	2.01	0.04	43.68	1.62	325.51
12/27	41	1.26	0.60	10.3	0.02	1.27	0.00	0.04	3.019	76.6	22.586	39.1	2.05	0.03	43.71	1.53	327.05
12/28	42	1.20	0.60	10.5	0.03	1.35	0.00	0.04	3.021	76.7	22.694	39.3	2.09	0.04	43.74	1.57	328.61
12/29	43	1.28	0.80	10.5	0.03	1.12	0.00	0.04	3.024	76.7	22.790	39.4	2.11	0.04	43.78	1.38	329.99
12/30	44	1.23	0.75	10.4	0.02	1.13	0.00	0.04	3.025	76.8	22.882	39.6	2.14	0.02	43.81	1.34	331.33
12/31	45	1.23	0.70	10.4	0.03	1.13	0.00	0.05	3.028	76.9	22.974	39.7	2.17	0.04	43.84	1.34	332.67
1/1	46	1.22	0.65	10.4	0.03	1.09	0.00	0.05	3.030	76.9	23.061	39.9	2.21	0.04	43.88	1.26	333.93
1/2	47	1.29	0.70	10.4	0.04	0.98	0.00	0.09	3.034	77.0	23.144	40.0	2.24	0.05	43.93	1.20	335.13
1/3	48	1.23	0.65	10.4	0.02	1.04	0.00	0.05	3.036	77.0	23.224	40.2	2.28	0.02	43.96	1.16	336.29
1/4	49	1.24	0.55	10.4	0.04	0.99	0.00	0.05	3.039	77.1	23.304	40.3	2.32	0.05	44.01	1.16	337.45
1/5	50	1.25	0.65	10.4	0.00	1.00	0.00	0.06	3.039	77.1	23.386	40.5	2.36	0.00	44.01	1.18	338.63
1/6	51	1.28	0.65	10.3	0.02	0.89	0.00	0.05	3.041	77.2	23.459	40.6	2.40	0.03	44.03	1.06	339.69
1/7	52	1.25	0.70	10.4	0.00	0.92	0.00	0.06	3.041	77.2	23.534	40.7	2.43	0.00	44.03	1.08	340.77
1/8	53	1.23	0.70	10.4	0.03	0.93	0.00	0.06	3.043	77.2	23.607	40.8	2.46	0.04	44.07	1.06	341.83
1/9	54	1.27	0.70	10.5	0.00	0.87	0.00	0.06	3.043	77.2	23.678	41.0	2.49	0.00	44.07	1.02	342.86
1/10	55	1.21	0.60	10.4	0.00	0.94	0.00	0.06	3.043	77.2	23.751	41.1	2.53	0.00	44.07	1.06	343.92
1/11	56	1.30	0.70	10.5	0.01	0.87	0.00	0.06	3.044	77.3	23.824	41.2	2.56	0.01	44.08	1.05	344.97
1/12	57	1.25	0.70	10.6	0.00	0.91	0.00	0.07	3.044	77.3	23.897	41.3	2.60	0.00	44.08	1.06	346.02
1/13	58	1.23	0.70	10.5	0.02	0.89	0.00	0.06	3.046	77.3	23.966	41.5	2.63	0.02	44.11	1.00	347.02
1/14	59			Rest Cycle									2.63	0.00	44.11	0.00	347.02
1/27	72												2.63	0.00	44.11	0.00	347.02
1/28	73	1.02	0.25	9.8	0.05	4.39	0.00	0.05	3.050	77.4	24.275	42.0	2.70	0.05	44.16	4.48	351.50
1/29	74	1.26	0.55	10.4	0.05	2.66	0.00	0.10	3.054	77.5	24.502	42.4	2.75	0.06	44.22	3.28	354.79
1/30	75	1.27	0.85	10.5	0.01	1.53	0.00	0.09	3.055	77.5	24.627	42.6	2.77	0.01	44.23	1.81	356.60
1/31	76	1.27	0.70	10.1	0.03	0.99	0.00	0.06	3.057	77.6	24.705	42.7	2.80	0.04	44.27	1.14	357.73
2/1	77	1.16	0.60	8.7	0.02	0.91	0.00	0.05	3.059	77.6	24.773	42.9	2.84	0.02	44.30	0.98	358.71
2/2	78	1.30	0.65	10.1	0.00	0.80	0.00	0.09	3.059	77.6	24.840	43.0	2.88	0.00	44.30	0.97	359.68
2/3	79	1.29	0.70	9.8	0.01	0.74	0.00	0.07	3.060	77.7	24.897	43.1	2.91	0.01	44.31	0.83	360.51
2/4	80			Rest Cycle									2.91	0.00	44.31	0.00	360.51
													2.91	0.00	44.31	0.00	360.51
				Rinse Cycle									2.91	0.00	44.31	0.00	360.51
2/12	88	0.10	0.00	8.4	0.03	1.85			3.060	77.7	24.910	43.1	2.91	0.00	44.31	0.19	360.70
2/13	89	1.12	0.45	10.1	0.05	3.50			3.064	77.8	25.181	43.6	2.87	0.06	44.37	3.92	364.62

3775-01 P-11							g/mt ore
Feed Kilograms	14.11	NaCN added	84.42 g	NaCN	1.00 g/L solution		-------
Kilograms Ore [1]	14.48	NaCN Consumption	2.85 kg/mt ore [1]				Au	Ag
						Head Grade	4.00	60.8
Metric Tons	0.014	Lime:	9.5 kg/mt ore			Head Screen	3.88	54.8
		MOL:	4.3 kg /mt ton of ore to adust pH with Milk of Lime			Tail Screen	0.89	33.3
Bio Ox wt loss:	2.64%	Total:	13.8 kg/mt ore			Tail Assay		

Daily Column Leach Test Data, Bio Oxidized Residue
Sample I.D. WOS-13 MC
Bio Ox Test: B-10

Feed Size 80%-6.3mm

[1] Adjusted for weight loss during bio-oxidation

		Pregnant Solution Analyses					Barren Solution Analyses		Au Extraction		Ag Extraction		NaCN	Au		Ag	
			NaCN														
Date	Days Leached	Vol. l.	Conc. g/l	pH	Au ppm	Ag ppm	Au ppm	Ag ppm	Cum. g/mt ore [1]	Cum. %	Cum. g/mt ore [1]	Cum. %	Consumed g/mt ore [1]	mg	cum. mg	mg	cum. mg
2/14	90	1.32	0.20	10.0	0.05	1.74			3.069	77.9	25.340	43.8	2.85	0.07	44.43	2.30	366.92
2/15	91	1.29	0.00	8.7	0.02	0.35			3.07	77.9	25.371	43.9	2.85	0.03	44.46	0.45	367.37
2/16	92	1.32	0.00	8.4	0.00	0.06			3.07	77.9	25.376	43.9	2.85	0.00	44.46	0.08	367.45
2/17	93	0.90	0.00	8.2	0.01	0.03			3.07	77.9	25.378	43.9	2.85	0.01	44.47	0.03	367.47
				Drain Down													
2/25	101	0.98	0.00	8.2	0.00	0.02			3.07	77.9	25.4	43.9	2.85	0.00	44.47	0.02	367.49

Extracted, g/mt ore[1]	**3.07**	**77.9**	**25.4**	**43.9**
Tail, g/mt ore [1]	**0.87**		**32.4**	
Calculated Head, g/mt ore[1]	**3.94**		**57.8**	

3775-01 P-12							g/mt ore	

Feed Kilograms	15.75	NaCN added	60.29 g	NaCN	1.00 g/L solution		Au	Ag
Kilograms Ore [1)]	15.85	NaCN Consumption	2.50 kg/mt ore [1)]			Head Grade	0.46	2.4
Metric Tons	0.016	Lime:	35.0 kg/mt ore			Head Screen	0.55	3.2
		MOL:	2.7 kg /mt ton of ore to adust pH with Milk of Lime			Tail Screen	0.08	1.6
Bio Ox wt loss:	0.65%	Total:	37.7 kg/mt ore			Tail Assay		

Daily Column Leach Test Data, Bio Oxidized Residue
Sample I.D. FSU-13-1
Bio Ox Test: B-6

Feed Size 80%-6.3mm

[1)] Adjusted for weight loss during bio-oxidation

Date	Days Leached	Pregnant Solution Analyses Vol. l.	NaCN Conc. g/l	pH	Au ppm	Ag ppm	Barren Solution Analyses Au ppm	Ag ppm	Au Extraction Cum. g/mt ore [1)]	Cum. %	Ag Extraction Cum. g/mt ore [1)]	Cum. %	NaCN Consumed g/mt ore [1)]	Au mg	Au cum. mg	Ag mg	Ag cum. mg
11/17	1								0.000	0.0	0.000	0.0	0.00	0.00	0.00	0.00	0.00
11/18	2								0.000	0.0	0.000	0.0	0.08	0.00	0.00	0.00	0.00
11/19	3	1.52	0.00	8.6	0.56	0.65	0.01	0.02	0.054	12.8	0.062	2.4	0.17	0.85	0.85	0.99	0.99
11/20	4	1.36	0.00	9.0	0.54	0.56	0.00	0.02	0.099	23.6	0.109	4.2	0.25	0.72	1.57	0.73	1.72
11/21	5	1.19	0.00	9.2	0.55	0.73	0.00	0.01	0.140	33.4	0.162	6.2	0.34	0.65	2.23	0.84	2.56
11/22	6	1.21	0.10	9.6	0.53	0.94	0.01	0.02	0.181	43.1	0.233	9.0	0.42	0.64	2.87	1.12	3.69
11/23	7	1.34	0.15	9.7	0.36	0.98	0.00	0.00	0.211	50.1	0.314	12.1	0.49	0.47	3.34	1.29	4.98
11/24	8	1.14	0.15	9.6	0.36	1.21	0.01	0.00	0.236	56.3	0.401	15.4	0.56	0.41	3.75	1.38	6.35
11/25	9	1.16	0.10	9.7	0.26	1.11	0.00	0.00	0.255	60.6	0.482	18.5	0.64	0.29	4.04	1.29	7.64
11/26	10	1.13	0.15	9.6	0.19	0.96	0.00	0.01	0.268	63.8	0.551	21.2	0.71	0.21	4.25	1.08	8.73
11/27	11	1.12	0.15	9.6	0.13	0.84	0.00	0.00	0.277	66.0	0.609	23.4	0.79	0.15	4.40	0.93	9.65
11/28	12	1.24	0.20	9.7	0.14	0.65	0.00	0.01	0.288	68.6	0.660	25.4	0.85	0.17	4.57	0.81	10.46
11/29	13	1.43	0.30	10.0	0.07	0.46	0.00	0.00	0.295	70.1	0.701	26.9	0.91	0.10	4.67	0.64	11.10
11/30	14	1.24	0.40	10.0	0.07	0.37	0.00	0.00	0.300	71.4	0.730	28.1	0.97	0.09	4.76	0.46	11.56
12/1	15	1.40	0.40	10.0	0.05	0.26	0.00	0.00	0.305	72.5	0.753	28.9	1.01	0.07	4.83	0.36	11.93
12/2	16	1.08	0.30	10.0	0.07	0.27	0.00	0.02	0.309	73.6	0.771	29.7	1.08	0.08	4.90	0.29	12.22
12/3	17	1.24	0.30	10.0	0.03	0.23	0.00	0.00	0.312	74.2	0.787	30.3	1.14	0.04	4.94	0.26	12.48
12/4	18	1.25	0.35	10.1	0.03	0.21	0.00	0.00	0.314	74.8	0.804	30.9	1.20	0.04	4.98	0.26	12.74
12/5	19		Rest Cycle/Power Outage										1.28	0.00	4.98	0.00	12.74
12/6	20	1.07	0.25	10.0	0.03	0.21	0.00	0.00	0.316	75.2	0.818	31.5	1.26	0.03	5.01	0.22	12.96
12/7	21	1.19	0.35	10.1	0.03	0.17	0.00	0.00	0.318	75.8	0.831	32.0	1.32	0.04	5.04	0.20	13.17
12/8	22	1.46	0.40	10.1	0.01	0.13	0.00	0.00	0.319	76.0	0.843	32.4	1.37	0.01	5.06	0.19	13.36
12/9	23	1.07	0.40	10.2	0.03	0.12	0.00	0.00	0.321	76.5	0.851	32.7	1.43	0.03	5.09	0.13	13.49
12/10	24	1.21	0.40	10.0	0.03	0.09	0.00	0.00	0.324	77.0	0.858	33.0	1.48	0.04	5.13	0.11	13.59
12/11	25	1.21	0.45	10.1	0.00	0.09	0.00	0.00	0.324	77.0	0.865	33.3	1.53	0.00	5.13	0.11	13.70
12/12	26	1.13	0.45	10.2	0.00	0.08	0.00	0.00	0.324	77.0	0.870	33.5	1.58	0.00	5.13	0.09	13.79
12/13	27	1.29	0.45	10.1	0.01	0.06	0.00	0.00	0.324	77.2	0.875	33.7	1.63	0.01	5.14	0.08	13.87
12/14	28	1.24	0.45	10.1	0.00	0.06	0.00	0.00	0.324	77.2	0.880	33.8	1.68	0.00	5.14	0.07	13.95
12/15	29	1.18	0.50	10.1	0.03	0.05	0.01	0.00	0.327	77.7	0.884	34.0	1.73	0.04	5.18	0.06	14.00
12/16	30	1.12	0.40	10.0	0.00	0.05	0.00	0.00	0.326	77.5	0.887	34.1	1.78	-0.01	5.16	0.06	14.06
12/17	31	1.36	0.55	10.1	0.00	0.05	0.00	0.00	0.326	77.5	0.891	34.3	1.82	0.00	5.16	0.07	14.13
12/18	32	1.08	0.50	10.1	0.00	0.04	0.00	0.00	0.326	77.5	0.894	34.4	1.87	0.00	5.16	0.04	14.17
12/19	33	1.40	0.55	10.1	0.00	0.04	0.00	0.00	0.326	77.5	0.898	34.5	1.91	0.00	5.16	0.06	14.23
12/20	34			Rest Cycle									1.91	0.00	5.16	0.00	14.23
1/2	47												1.91	0.00	5.16	0.00	14.23
1/3	48	0.89	0.15	9.4	0.03	0.14	0.00	0.00	0.327	77.9	0.905	34.8	1.98	0.03	5.19	0.12	14.35
1/4	49	1.15	0.30	9.8	0.05	0.12	0.00	0.00	0.331	78.8	0.914	35.2	2.05	0.06	5.25	0.14	14.49
1/5	50	1.20	0.35	9.9	0.01	0.09	0.00	0.01	0.332	79.0	0.921	35.4	2.11	0.01	5.26	0.11	14.60
1/6	51	1.33	0.50	10.1	0.00	0.05	0.00	0.00	0.332	79.0	0.924	35.6	2.15	0.00	5.26	0.05	14.65
1/7	52	1.25	0.70	10.4	0.01	0.04	0.00	0.00	0.333	79.2	0.928	35.7	2.18	0.01	5.27	0.05	14.70
1/8	53	1.19	0.60	10.2	0.02	0.03	0.00	0.00	0.334	79.5	0.930	35.8	2.22	0.02	5.29	0.04	14.74
1/9	54	1.31	0.55	10.2	0.01	0.02	0.00	0.00	0.335	79.7	0.931	35.8	2.26	0.01	5.31	0.03	14.76
1/10	55			Rest Cycle									2.26	0.00	5.31	0.00	14.76
1/23	68												2.26	0.00	5.31	0.00	14.76
1/24	69	0.83	0.20	9.1	0.01	0.06	0.00	0.00	0.335	79.9	0.935	35.9	2.33	0.01	5.32	0.05	14.81
1/25	70	1.30	0.35	10.0	0.03	0.05	0.00	0.00	0.338	80.4	0.939	36.1	2.39	0.04	5.36	0.07	14.88
1/26	71	1.10	0.45	9.5	0.00	0.05	0.00	0.00	0.338	80.4	0.942	36.2	2.44	0.00	5.36	0.06	14.93
1/27	72	1.43	0.60	9.0	0.02	0.03	0.00	0.00	0.34	81.0	0.945	36.3	2.47	0.03	5.38	0.04	14.98
1/28	73	1.22	0.65	10.3	0.00	0.02	0.00	0.00	0.34	81.0	0.946	36.4	2.50	0.00	5.38	0.02	15.00
1/29	74	1.25	0.65	8.3	0.02	0.02	0.00	0.00	0.34	81.0	0.948	36.5	2.54	0.03	5.41	0.03	15.03
1/30	75	1.30	0.60	9.5	0.00	0.02	0.00	0.00	0.34	81.0	0.950	36.5	2.57	0.00	5.41	0.03	15.05
1/31	76			Rest Cycle									2.57	0.00	5.41	0.00	15.05
													2.57	0.00	5.41	0.00	15.05
				Rinse Cycle									2.57	0.00	5.41	0.00	15.05
2/4	80	0.24	0.00	9.6	0.00	0.02			0.34	81.0	0.950	36.5	2.57	0.00	5.41	0.00	15.06
2/5	81	0.98	0.40	10.6	0.02	0.02			0.34	81.0	0.951	36.6	2.55	0.02	5.43	0.02	15.08
2/6	82	1.22	0.35	8.4	0.00	0.02			0.34	81.0	0.953	36.6	2.52	0.00	5.43	0.02	15.10
2/7	83	1.37	0.15	10.0	0.00	0.02			0.34	81.0	0.954	36.7	2.51	0.00	5.43	0.03	15.13
2/8	84	1.30	0.10	9.2	0.00	0.01			0.34	81.0	0.955	36.7	2.50	0.00	5.43	0.01	15.14
2/9	85	1.12	0.00	8.4	0.00	0.00			0.34	81.0	0.955	36.7	2.50	0.00	5.43	0.00	15.14
2/10	86	1.25	0.00	8.2	0.00	0.00			0.34	81.0	0.955	36.7	2.50	0.00	5.43	0.00	15.14
2/11	87	1.20	0.00	8.8	0.00	0.00			0.34	81.0	0.955	36.7	2.50	0.00	5.43	0.00	15.14
				Drain Down									2.50	0.00	5.43	0.00	15.14
2/16	92	1.22	0.00	8.3	0.00	0.04			0.34	81.0	1.0	38.5	2.50	0.00	5.43	0.05	15.19

	Au g/mt ore	Au %	Ag g/mt ore	Ag %
Extracted, g/mt ore[1)]	**0.34**	**81.0**	**1.0**	**38.5**
Tail, g/mt ore [1)]	**0.08**		**1.6**	
Calculated Head, g/mt ore[1)]	**0.42**		**2.6**	

Table A6-1. - Drain Down Rate Tests, Column Leached Residues, Sleeper Drill Core Composites (Baseline Tests) 12.5mm Feed

	Effluent Solution								
Drain	WWS-13 MC			WOS-13 MC			FSU-13-1		
Time, hours	Liters	Cum. L/mt ore	Rate, L/hr/mt	Liters	Cum. L/mt ore	Rate, L/hr/mt	Liters	Cum. L/mt ore	Rate, L/hr/mt
0.08	0.002	0.12	1.471	0.003	0.18	2.301	0.004	0.24	2.959
0.25	0.008	0.59	2.768	0.008	0.67	2.887	0.010	0.83	3.481
0.50	0.010	1.18	2.353	0.011	1.35	2.699	0.012	1.54	2.840
1.0	0.023	2.53	2.706	0.024	2.82	2.945	0.025	3.02	2.959
2.0	0.043	5.06	2.529	0.045	5.58	2.761	0.044	5.62	2.604
4.0	0.075	9.47	2.206	0.072	10.00	2.209	0.055	8.88	1.627
8.0	0.070	13.59	1.029	0.061	13.74	0.936	0.066	12.78	0.976
24	0.086	18.65	0.316	0.063	17.61	0.242	0.088	17.99	0.325
48	0.022	19.94	0.054	0.010	18.22	0.026	0.029	19.70	0.071
72							0.001	19.76	0.002

Table A6-2. - Drain Down Rate Tests, Column Leached Residues,
Sleeper Drill Core Composites (Baseline Tests) 6.3mm Feed

	Effluent Solution								
Drain	WWS-13 MC			WOS-13 MC			FSU-13-1		
Time, hours	Liters	Cum. L/mt ore	Rate, L/hr/mt	Liters	Cum. L/mt ore	Rate, L/hr/mt	Liters	Cum. L/mt ore	Rate, L/hr/mt
0.08	0.003	0.18	2.219	0.003	0.19	2.344	0.004	0.24	2.959
0.25	0.007	0.59	2.436	0.007	0.63	2.574	0.010	0.83	3.481
0.50	0.009	1.12	2.130	0.010	1.25	2.500	0.012	1.54	2.840
1.0	0.021	2.37	2.485	0.023	2.69	2.875	0.025	3.02	2.959
2.0	0.045	5.03	2.663	0.046	5.56	2.875	0.049	5.92	2.899
4.0	0.083	9.94	2.456	0.087	11.00	2.719	0.060	9.47	1.775
8.0	0.090	15.27	1.331	0.073	15.56	1.141	0.070	13.61	1.036
24	0.085	20.30	0.314	0.059	19.25	0.230	0.094	19.17	0.348
48	0.011	20.95	0.027	0.000	19.25	0.000	0.024	20.59	0.059
72							0.002	20.71	0.005

Table A6-3. - Drain Down Rate Tests, Column Leached Residues, Sleeper Drill Core Composites (Bio Oxidized) 12.5mm Feed

	Effluent Solution								
Drain	WWS-13 MC			WOS-13 MC			FSU-13-1		
Time, hours	Liters	Cum. L/mt ore	Rate, L/hr/mt	Liters	Cum. L/mt ore	Rate, L/hr/mt	Liters	Cum. L/mt ore	Rate, L/hr/mt
0.08	0.005	0.32	4.032	0.005	0.34	4.252	0.004	0.26	3.226
0.25	0.008	0.84	3.036	0.009	0.95	3.601	0.009	0.84	3.416
0.50	0.014	1.74	3.613	0.015	1.97	4.082	0.013	1.68	3.355
1.0	0.026	3.42	3.355	0.027	3.81	3.673	0.027	3.42	3.484
2.0	0.051	6.71	3.290	0.054	7.48	3.673	0.053	6.84	3.419
4.0	0.076	11.61	2.452	0.048	10.75	1.633	0.087	12.45	2.806
8.0	0.076	16.52	1.226	0.039	13.40	0.663	0.084	17.87	1.355
24	0.064	20.65	0.258	0.048	16.67	0.204	0.107	24.77	0.431
48	0.080	25.81	0.215	0.016	17.76	0.045	0.033	26.90	0.089
72	0.027	27.55	0.073	0.002	17.89	0.006	0.011	27.61	0.030
96	0.004	27.81	0.011	0.000	17.89	0.000	0.001	27.68	0.003

Table A6-4. - Drain Down Rate Tests, Column Leached Residues, Sleeper Drill Core Composites (Bio Oxidized) 6.3mm Feed

	Effluent Solution								
Drain	WWS-13 MC			WOS-13 MC			FSU-13-1		
Time, hours	Liters	Cum. L/mt ore	Rate, L/hr/mt	Liters	Cum. L/mt ore	Rate, L/hr/mt	Liters	Cum. L/mt ore	Rate, L/hr/mt
0.08	0.004	0.26	3.226	0.004	0.28	3.448	0.005	0.31	3.931
0.25	0.009	0.84	3.416	0.008	0.83	3.245	0.009	0.88	3.330
0.50	0.014	1.74	3.613	0.013	1.72	3.586	0.013	1.70	3.270
1.0	0.027	3.48	3.484	0.026	3.52	3.586	0.028	3.46	3.522
2.0	0.053	6.90	3.419	0.052	7.10	3.586	0.071	7.92	4.465
4.0	0.094	12.97	3.032	0.068	11.79	2.345	0.125	15.79	3.931
8.0	0.088	18.65	1.419	0.048	15.10	0.828	0.139	24.53	2.186
24	0.105	25.42	0.423	0.048	18.41	0.207	0.128	32.58	0.503
48	0.036	27.74	0.097	0.013	19.31	0.037	0.061	36.42	0.160
72	0.010	28.39	0.027	0.002	19.45	0.006	0.015	37.36	0.039
96	0.000	28.39	0.000	0.000	19.45	0.000	0.003	37.55	0.008