HEAP LEACHING TESTWORK
ON A SAMPLE FROM
THE KAY TANDA PROSPECT, PHILIPPINES

FOR

MRL GOLD PHILIPPINES INC
(Consultants – Peter J Lewis & Associates)

REPORT MO977
OCTOBER 2005
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It is important to recognise that the results reported relate only to the material tested.

CONTENTS

SUMMARY

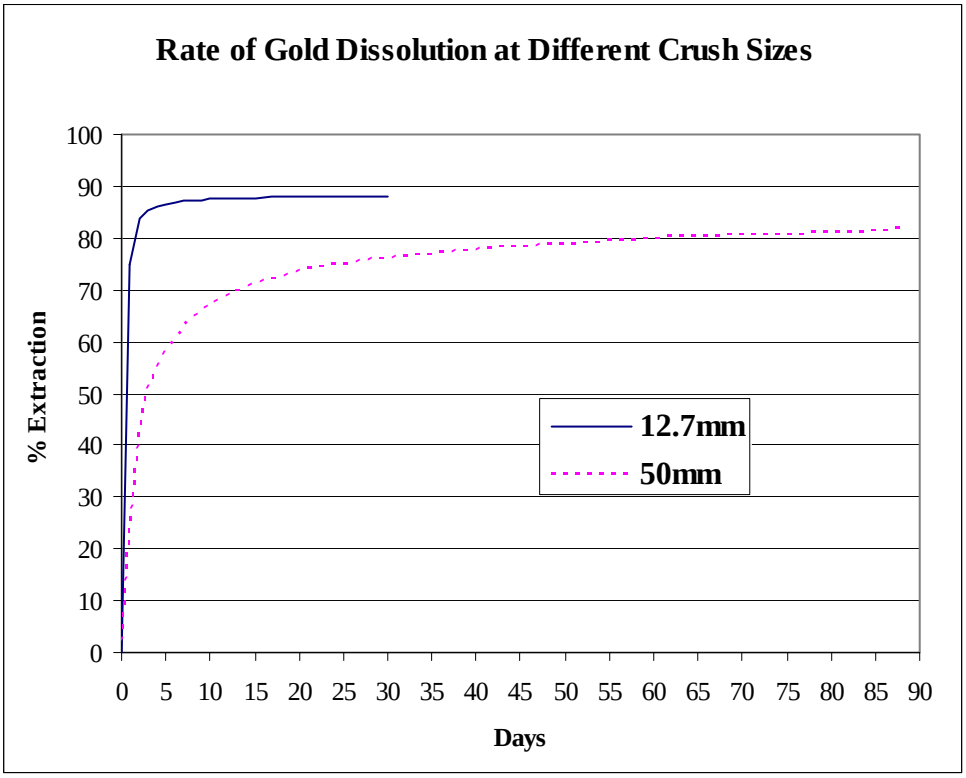
A trench sample from the Kay Tanda gold prospect in the Philippines was subjected to metallurgical testwork to determine its amenability to heap leaching. The assayed head grades of the sample were 3.58g/t gold and 51g/t silver.

An initial carbon-in-leach test was completed at a grind size of 80% passing 75µm to provide an indication of the maximum recoveries achievable from the sample. The gold and silver dissolutions were 94% and 37% respectively.

Column leach tests were subsequently conducted in order to simulate heap leaching at two different crush sizes of 100% passing 12.7mm and 100% passing 50mm. The following results were obtained:

	12.7mm crush (after 30 days)	50mm crush (after 88 days)
Gold dissolution %	88.1	81.7
Calculated head grade g/t Au	3.40	3.89
Gold residue grade g/t	0.41	0.71
Silver dissolution %	7	10
Calculated head grade g/t Ag	39	39
Silver residue grade g/t	36	35
NaCN consumption kg/t	0.92	0.88

The graph below shows the rate of gold dissolution at the two crush sizes



1. INTRODUCTION

A drum containing a 245kg sample from MRL Gold Philippines was delivered to Metcon Laboratories on 23rd March, 2005 . The sample had been collected from a trench at the Kay Tanda gold prospect in the Philippines. A test program was completed to assess the amenability of the sample to heap leaching under the direction of Peter J Lewis & Associates, acting on behalf of MRL Gold Philippines.

2. SAMPLE PREPARATION AND HEAD ASSAYS

2.1 Sample Preparation

The sample was received in 8 bags as listed in Table 1. All the bagged samples were combined and then crushed to minus 50mm (2"), blended and divided as required.

Table 1 Samples received

Bag number	kg	size grading	appearance
6	24	~100mm top size to fines	surface rocks & soil
7	36	~200mm top size to fines	surface rocks & soil
15	40	~150mm top size to fines	surface rocks & soil
18	26	~200mm top size to fines	surface rocks & soil
22	23	~150mm top size to fines	surface rocks & soil
26	23	~150mm top size to fines	surface rocks & soil
32	41	~200mm top size to fines	surface rocks & soil
34	32	~125mm top size to fines	surface rocks & soil
total	245		

2.2 Head Assays

A 5kg portion of the sample that had been crushed to minus 50mm was cut out for a CIL test and head assays. It was recognized that taking such a small weight from a large sample at a coarse crush size would test the ability to sample accurately. The 5kg sample was crushed to minus 2mm, blended and divided by riffling into 1kg test portions.

One of the test portions was further riffled to obtain a 150 gram assay sample, which was pulverized and fire assayed for gold in duplicate and for silver, copper, lead, zinc and sulphur. The actual head assays are shown in Table 2, where they are compared to the calculated gold and silver head assays from the various tests carried out.

Table 2 Head assays

	replicate g/t Au	g/t Au	g/t Ag	ppm Cu	% Pb	% Zn	% S
Head assays	3.60, 3.55	3.58	51	103	0.10	0.03	0.31
CIL test KT1		3.55	37				
CIL test KT2		3.62	40				
Feed sizing		4.16	43				
Column test KT3		3.40	39				
Column test KT4		3.89	39				

3. MAXIMUM GOLD RECOVERY TEST

3.1 Grind Establishment

In order to determine the grind time necessary to achieve the grind size of P80 of 75µm that was to be used in the CIL test to indicate the maximum gold recovery achievable from the sample, three trial grinds were carried out on the 1kg test portions that had been crushed to minus 2mm.

The trial grinds were carried out in a laboratory stainless steel rod mill, measuring 300mm long by 200mm diameter, with a 12kg rod charge. A rod mill was used to give a size distribution similar to that expected from a closed circuit ball mill grind. The grinds were completed at 50% solids w/w for times that were selected to span the desired size range. Each ground product was then sized and its size analysis plotted on a graph. The P80 sizes were then plotted against the grind times, from which the grind time required to achieve P80 75µm was determined. The results of the trial grinds are presented in Appendix 1, from which the following grind time in minutes was selected:

grind P80 (µm)	**75**
minutes	21.5

This grind time showed that the sample was reasonably hard and competent, despite its location at the surface and with some soil present.

3.2 Leach Test at a P80 of 75µm (KT-1)

To indicate the maximum gold dissolution likely to be achieved from the sample, a 1kg portion was ground to 80% passing 75µm and subjected to a 48 hour bottle roll leach test (Test KT-1) in the presence of 10g/L activated carbon. Due to the high silver head grade, the loaded carbon was removed and replaced with fresh carbon after 8 and 24 hours. This was to counter the possible effects of high silver liquor tenors reducing the ability of the carbon to adsorb all the solubilized gold.

The pulp density of the ground sample was adjusted to 40% solids with tap water. Hydrated lime was then used to adjust the pH to 10.5 and NaCN was added to give an initial concentration of 0.1%. The NaCN concentration was maintained above 0.05% for the first 24 hours and then left to decay giving a final concentration of 0.03% which is adequate in a CIL situation.

The final test products (liquor, carbon and residue) were assayed for both gold and silver. The test data sheet is attached as Appendix 2, and the results are summarized in Table 3 below:

Table 3 Summary of Test Results (Test KT-1)

	GOLD	**SILVER**
Calculated head grade g/t	3.55	37
% Dissolution	94.4	37.5
Residue grade g/t	0.20	23
Hydrated lime consumption kg/t	1.06	
NaCN consumption kg/t	1.41	

As shown on the test data sheet in Appendix 2, dissolution of both gold and silver was virtually complete within 24 hours.

4. ASSESSMENT OF CRUSH SIZE FOR HEAP LEACH TEST

To indicate the crush size that would be most suitable for the heap leach test, two 10kg portions of the sample crushed to minus 50mm were used. A size/assay analysis was completed on one 10kg portion. The other portion was subjected to a 7 day bottle roll leach, the product from which was also subjected to size/assay analysis. Comparison of the size/assay analyses before and after leaching normally provides an indication of the crush size most suitable for heap leaching.

4.1 Size/assay analysis of feed sample

A 10kg portion of minus 50mm material was screened to 9.3mm and the size fractions were assayed to determine the distribution of both gold and silver with size. The results are given below in Table 4. The high gold and silver assays initially obtained on the coarsest fraction were considered unusual, but were confirmed by repeat sampling and assaying. The replicate assays for this fraction are shown beneath Table 4.

Table 4 Distribution of Gold and Silver by Size before Leaching

SIZING				ASSAYS		DISTRIBUTION	
screen	wt retained	wt retained	wt passing	Au	Ag	Au	Ag
mm	g	%	%	g/t	g/t	%	%
37.5	1775.2	16.9	83.1	7.69	68	31.2	26.4
25	1914.2	18.2	64.9	2.80	32	12.3	13.4
19	965.5	9.2	55.7	2.65	40	5.8	8.5
12.7	1287.5	12.3	43.4	2.35	38	6.9	10.7
9.3	561.1	5.3	38.1	2.75	41	3.5	5.0
-9.3	4000.6	38.1		4.40	41	40.2	35.9
total	10504.1	100.0		4.16	43	100.0	100.0

		Au g/t	Ag g/t
replicate assays of +37.5mm fraction:	original	7.70	64
	resample A	7.85, 7.90	72
	resample B	7.40, 7.60	

The results showed that the highest gold assays occurred in the finest and particularly the coarsest fractions. There was a distinct bias in the gold distribution to the coarsest fraction where 31.2% of the gold occurred in only 16.9% of the mass. The silver distribution followed a similar trend.

4.2 10kg Bottle Roll Test (KT-2)

This test was conducted for 7 days. A 10kg portion of the sample crushed to minus 50mm was slurried to 40 % solids with tap water. The pH was then adjusted to 10.5 with lime and cyanide added to give an initial concentration of 0.1%. The sample was agitated on slow moving rollers for two hours each day in order to minimize the attritioning of the solids.

After 24 and 120 hours the leach liquor was decanted off and contacted with activated carbon for two hours. The carbon was then screened out and the liquor returned to the leach. This procedure was used to eliminate any possible interference to gold dissolution from high levels of solubilized silver in solution.

The tests data sheet for test KT-2 is attached as Appendix 2 and the results are summarized in Table 5.

Table 5 Summary of Test KT- 2 Results

	GOLD	SILVER
Calculated feed grade g/t	3.62	40
% Dissolution	78.4	5.7
Residue grade g/t	0.78	38
Hydrated lime consumption kg/t	0.88	
NaCN consumption kg/t	1.07	

The residue from this test was then sized and each fraction assayed for gold and silver. Table 6 shows the results.

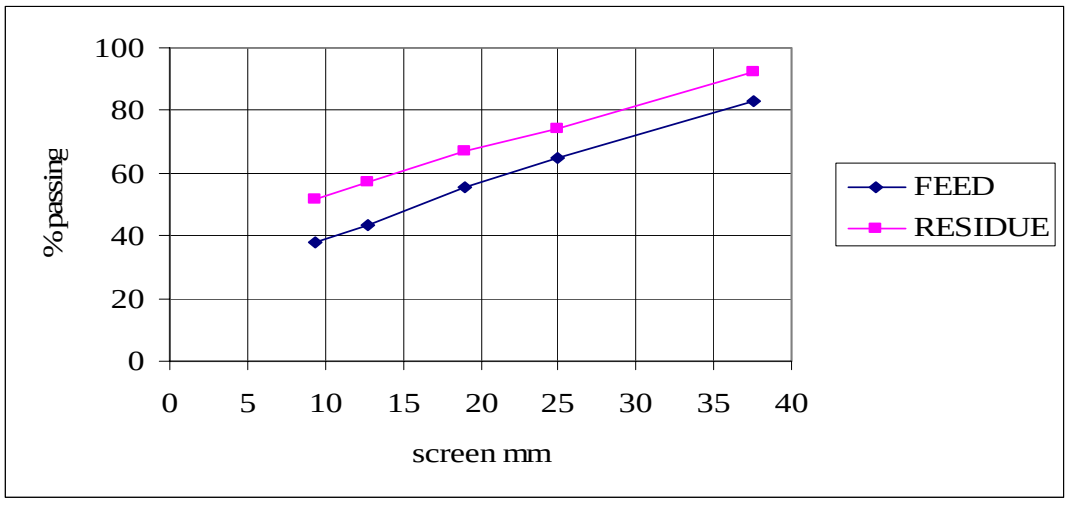
Table 6 Distribution of Gold and Silver by Size in Leach Residue

SIZING				ASSAYS		DISTRIBUTION	
screen mm	wt retained g	wt retained %	wt passing %	Au g/t	Ag g/t	Au %	Ag %
37.5	730.4	7.6	92.4	1.39	43	13.7	8.6
25	1733.8	18.0	74.4	1.71	34	40.0	16.2
19	691.8	7.2	67.3	1.45	47	13.5	8.9
12.7	979.8	10.2	57.1	0.81	39	10.7	10.5
9.3	540.1	5.6	51.5	0.56	36	4.1	5.3
-9.3	4964.1	51.5		0.27	37	18.1	50.4
total	9640.0	100.0		0.77	38	100.0	100.0

		Au g/t
replicate assays of +37.5mm fraction:	original	1.54
	resample A	1.37, 1.52
	resample B	1.38, 1.13

From figure 1 it can be seen that, despite bottle rolling for only 2 hours per day, there was still a significant breakdown of the sample during the course of the leach.

Figure 1 Comparison of Feed and Residue Sizings



The change in the size distribution during leaching, with some of the coarser feed material reporting to finer size fractions in the residue, meant that it was difficult to calculate definitive values for the gold dissolution obtained from each size fraction, The simplest, but not definitive approach, is to base the % dissolutions on the reduction in the assay values in each size fraction, as shown in Table 7.

Table 7 Dissolutions with Size based on Change in Assays

mm	Au %	Ag %
37.5	81.9	36.8
25	38.9	-6.3
19	45.3	-17.5
12.7	65.5	-2.6
9.3	79.6	12.2
-9.3	93.9	9.8
total	81.5	13.1

The very high indicated % gold dissolution from the coarsest fraction was unexpected and unusual. However, as shown beneath Tables 4 and 6, replicate assays were completed on both the feed and residue for this fraction,

4.3 Indicated Gold Recovery vs Crush Size

In order to indicate the potential gold recovery by heap leaching at different crush sizes, a 10kg portion of -50mm ore was cut out and stage crushed progressively to minus 37.5, 25, 19 and 12.7mm, and the size distribution determined at each crush size. By applying the % gold dissolutions shown in Table 7 to the appropriate size fractions, the total gold dissolution at each crush size was calculated. A table showing these calculations is included in Appendix 3, and the estimated % gold dissolution at each crush size is shown in Table 8.

Table 8 Estimated % Gold Dissolution at Different Crush Sizes

Crush size	Estimated % Gold dissolution
minus 50 mm	71
minus 37.5 mm	65
minus 25 mm	74
minus 19 mm	81
minus 12.7 mm	90

5. HEAP LEACHING

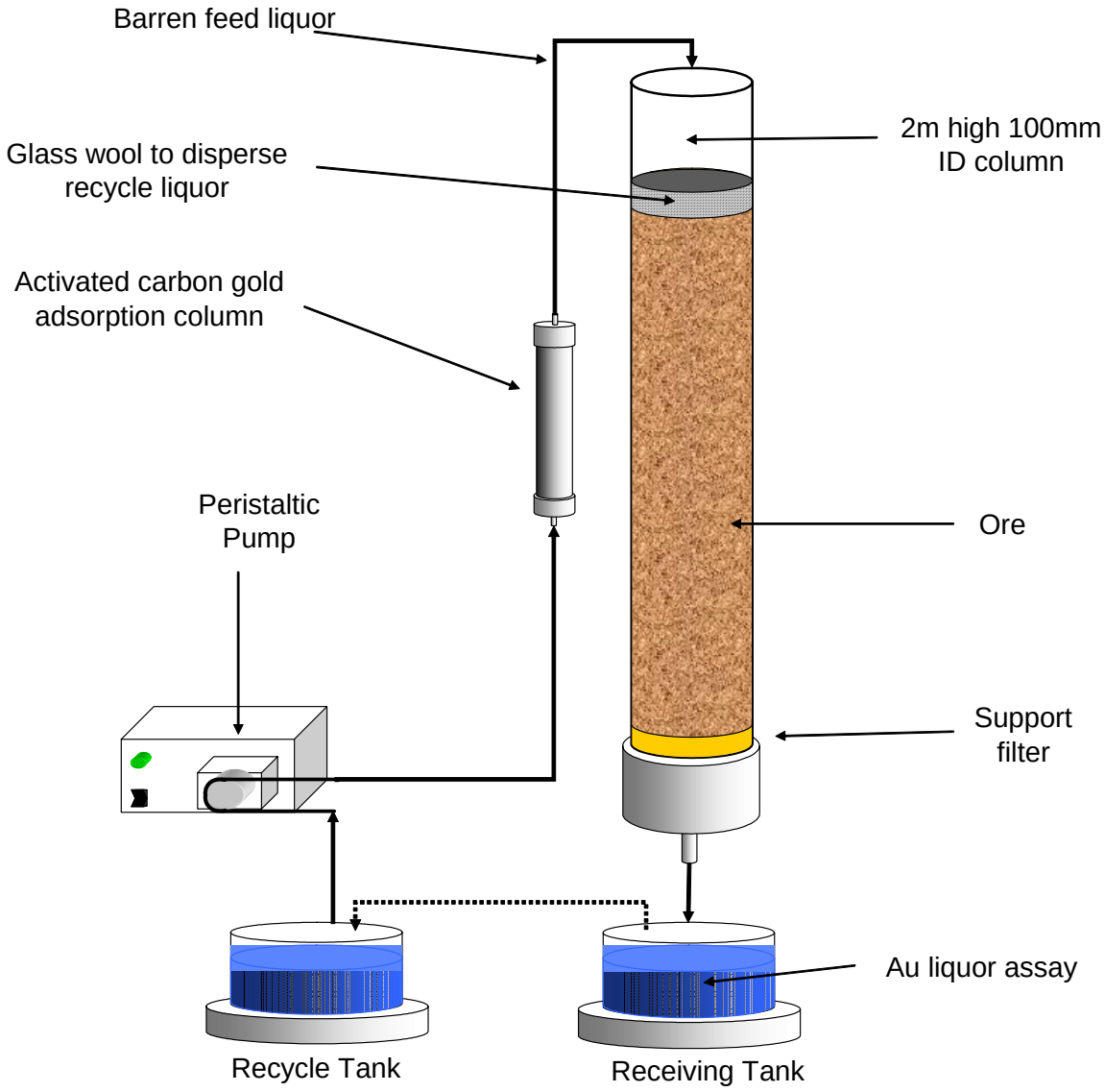
5.1 Column Leach at Minus 12.7mm Crush Size

As the highest % gold dissolution in Table 8 was at a crush size of minus 12.7mm it was decided to conduct a column leach test at this crush size.

A 20kg portion of the crushed sample was agglomerated with lime and NaCN solution. This was carried out in a stainless steel cement mixer with the solution added until visually the fines were sufficiently bound to the coarser particles to allow good percolation.

The agglomerated material was then loaded into a 2m high Perspex column with a diameter of 100mm. The material was allowed to cure for three days before the initial 0.1% NaCN leach solution was applied at a rate of 10L/m^2/hr. The volume, pH and NaCN concentration of the pregnant discharge liquor that had collected in the receiving tank were measured. The liquor was then sampled and assayed for gold and silver. Initially this was done on a daily basis with less frequent sampling as the rate of gold dissolution diminished. After each sampling step the pregnant liquor was transferred to the recycle tank, from where it was pumped to the head of the column via an activated carbon column. NaCN was added as required to maintain a suitable feed liquor concentration and NaOH was added to maintain pH. A schematic diagram of the heap leach circuit is shown in Figure 2.

Figure 2 Column Leach Circuit Schematic



The test was stopped after 30 days by which time the pregnant liquor assay had dropped to below the detection limit for gold. The column was allowed to drain and then wash water was added, which in turn was also allowed to drain. The column was then emptied and the residue was crushed and sampled. The final discharge solution, the wash solution, the carbon and the residue were assayed for gold and silver, with duplicate gold assays on the residue. A full mass balance for both gold and silver was then completed, which gave overall recoveries of 88.1%

for gold and 6.8% for silver. The actual gold recovery was close to that predicted in Table 8 for a minus 12.7mm crush size.

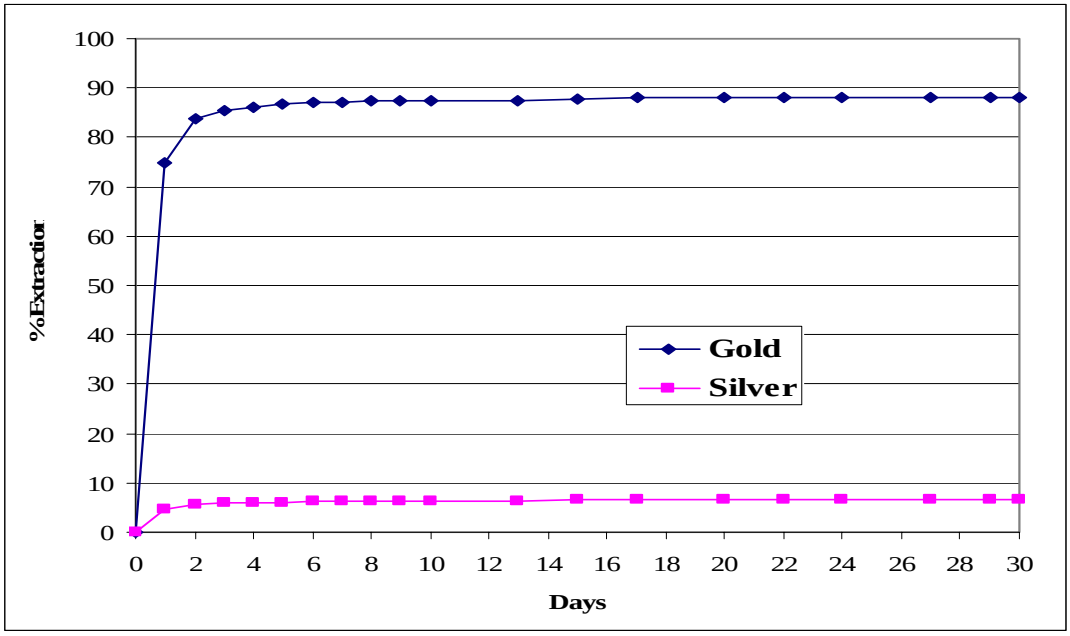
Dissolution of the gold was rapid with 74.7% dissolution in the first day and 86.9% dissolution after 6 days. Total dissolution of both gold and silver was essentially complete after 20 days.

A complete log and details of the column operation are attached in Appendix 4. The results are summarized in Table 9, and Figure 3 shows the rates of gold and silver dissolution.

Table 9 Summarized Results of -12.7mm Column Leach (Test KT-3)

	GOLD	SILVER
Calculated feed grade g/t	3.40	39
% Dissolution (30 days)	88.1	6.8
Residue grade g/t	0.405	36
Hydrated lime consumption kg/t	0.9	
NaCN consumption kg/t	0.92	
NaOH consumption kg/t	0.4	

Figure 3 Dissolution Kinetics for -12.7mm Column Leach (Test KT-3)



Column discharge liquors were clear but orange in colour. The Day 1 discharge was assayed for Cu (72mg/L) and Fe (158mg/L). These levels should not be of concern. Barren liquor from the carbon column retained the same pigmentation, so the risk of carbon fouling does not appear high.

Prior to dismantling, the column was flooded with water to determine the flooded percolation rate in the event of heavy rainfall. The rate was 7600L/m^2/hr, which should pose no real problems. However the discharge liquor was dirty with fines indicating that cement would be better for agglomeration than lime.

5.2 Column Leach at Minus 50mm Crush Size

Due to the encouraging results obtained at the minus 12.7mm crush size, it was decided to carry out a second column test at a much coarser crush size of minus 50mm, this being the crush size of the remaining material.

The circuitry of the test was the same as for the first column test, but for this test a 300mm diameter column was used to accommodate the larger crush size. To avoid solution channeling due to wall effects, the rule of thumb is that the diameter of the column needs to be more than 4 times the crush size. .

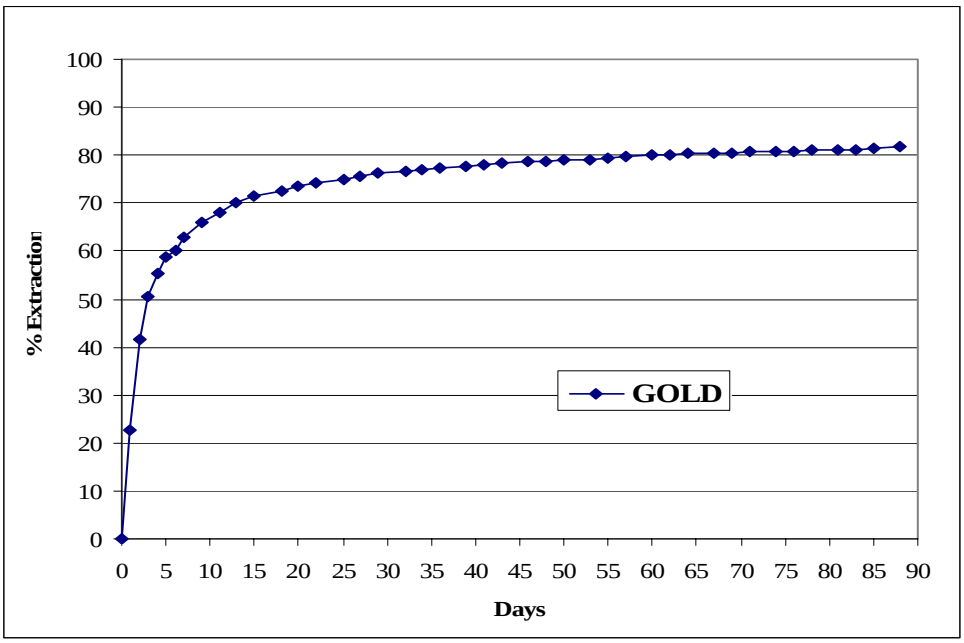
The feed weight to this test was 183kg and agglomeration was carried out using 2kg/t of cement. Otherwise, the procedures were the same as for the first heap leach test, except that no Ag liquor assays were completed because the silver recovery obtained in the first test was insignificant. However, the leach residue and carbon were assayed for silver and these and the assayed head grade were used to estimate the silver recovery.

A complete log and details of the column operation are given in Appendix 5. A summary of the results are given in Table 10, and Figure 4 shows the rate of gold dissolution.

Table 10 Summarised Results of -50mm Column Leach (Test KT-4)

	GOLD	SILVER
Calculated feed grade g/t	3.89	39
% Dissolution (85 days)	81.7	10.2
Residue grade g/t	0.71	35
Cement kg/t	2.0	
NaCN consumption kg/t	0.88	
NaOH consumption kg/t	none added	

Figure 4 Dissolution Kinetics of -50mm Column Leach (Test KT-4)



The % gold dissolution was approximately 10% higher than that predicted in Table 8 for this crush size, but almost identical to that indicated for the -50mm + 37.5mm size fraction in Table 7. The high percentage gold dissolution obtained indicates that even in coarse particles the gold is accessible to the cyanide solution.

6. CONCLUSIONS

The testwork has shown that the sample tested is highly amenable to heap leaching even at a coarse crush size.

The overall gold recovery and the rate of gold dissolution at the finer crush size were exceptionally high for heap leaching. The % gold dissolution was only 6.3% less than that achieved at a grind size of 80% passing 75µm.

The slower leaching rate and reduced gold dissolution at the coarser crush size is as would be expected. Nevertheless, the % gold dissolution was still well above average for heap leaching at this crush size.

However, the gold head grade of the sample was also well above average for heap leach feed and lower gold recoveries at both crush sizes should be anticipated from lower grade feed.

Agglomeration of the sample was required to ensure good percolation. Cement was found to be a better agglomerating agent than lime, and would, in any event, be required in a high rainfall location.

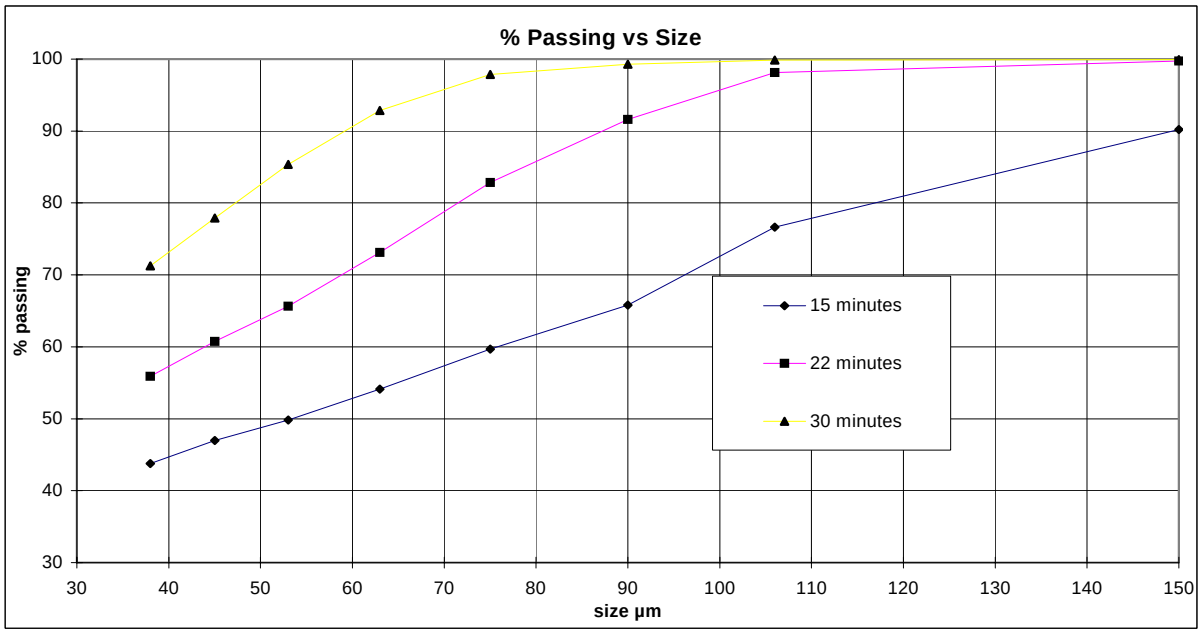
APPENDIX 1

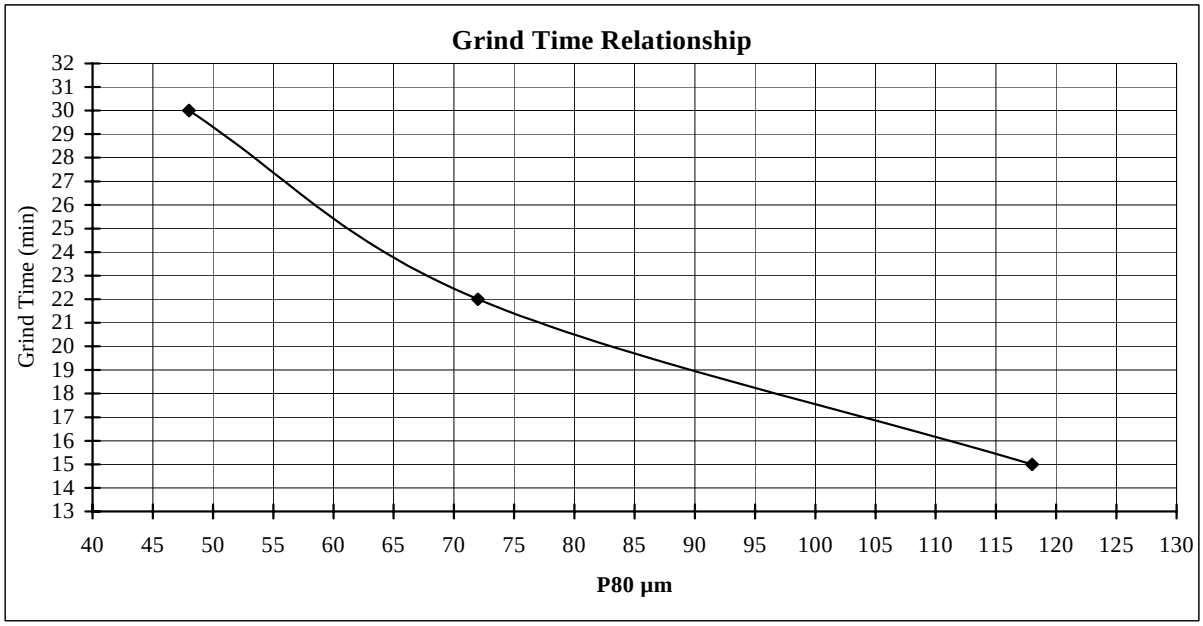
Trial Grinds

Trial Grinds - Kay Tanda

1kg solids @ 50% pulp density
SS rod mill (silver)

Trial grind 1 15 minutes		Trial grind 2 22 minutes		Trial grind 3 30 minutes	
Size (µm)	**% Passing**	**Size (µm)**	**% Passing**	**Size (µm)**	**% Passing**
150	90.2	150	99.7	150	99.9
106	76.6	106	98.1	106	99.9
90	65.8	90	91.6	90	99.3
75	59.7	75	82.8	75	97.8
63	54.1	63	73.1	63	92.8
53	49.8	53	65.6	53	85.4
45	47.0	45	60.8	45	77.9
38	43.8	38	55.9	38	71.3





APPENDIX 2

Bottle Roll Leach Tests

REPORT M0977 KAY TANDA HEAP LEACHING

IDENTIFICATION		ROD MILL GRIND (silver)		LEACH	
Project	M0977	**grams**	1002	**grams**	1002
Sample	Kay Tanda	**mls water**	1002	**mls water**	1503
leach detail	48hr CIL test @ 75µm with multiple carbon contacts	**water type**	tap	**% solids**	40
		% solids	50		
		minutes	21.5		
		target P80 (≅m)	75		
test number	KT-1	**actual P80 (≅m)**			

Time hours	carbon grams	NaCN grams	hyd.lime grams	pH	diss. O2 mg/l	% NaCN	sample mls	liquor mls	carbon assays Au g/t	carbon assays Ag g/t	extr'n % Au	extr'n % Ag
				6.5								
0		1.50	1.01	10.5	7.2	0.100		1503			0.00	0.0
2				10.4	8.6							
4				10.3	8.5	0.068	5					
8	15.21		0.05	10.2	8.6	0.060	5	1502			87.5	35.3
24	15.78	0.36		10.2	8.4	0.036	5	1503			93.7	37.0
36				10.2	8.3							
48	15.26			10.2	9.3	0.030		1500	0.005	0.005	94.2	37.5

final liquor assays for Au & Ag both <0.01mg/L

ASSAYS

residue	g/t Au	0.22, 0.18
	g/t Ag	23

NOTES

GOLD METALLURGICAL BALANCE

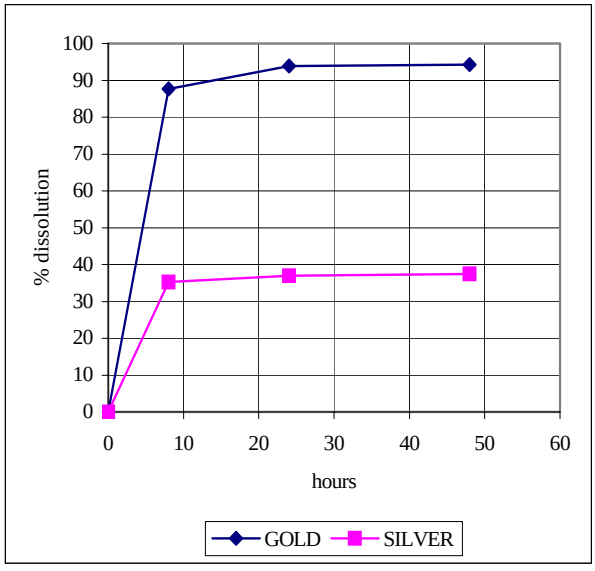
material	amount	assay g/t Au	mg Au	dist. %
carbon 8hr	15.21	205	3.118	87.5
carbon 24hr	15.78	14	0.221	6.2
carbon 48hr*	15.26	1	0.015	0.4
liquor	1500	0.005	0.008	0.2
residue	1002	0.20	0.200	5.6
total		3.56	3.56	100.0

*actual Au for 48hr carbon <1g/t

SILVER METALLURGICAL BALANCE

amount	material	assay g/t Ag	mg Ag	dist. %
carbon 8hr	15.21	857	13.035	35.3
carbon 24hr	15.78	40	0.631	1.7
carbon 48hr*	15.26	11	0.168	0.5
liquor	1500	0.005	0.008	0.0
residue	1002	23	23.046	62.5
total		37	36.89	64.7

DISSOLUTION KINETICS



EXTRACTION % SUMMARY

	Au	Ag
calculated	94.4	37.5
head & tails calculation	94.4	54.9

REAGENT CONSUMPTION

kg/t NaCN	1.41
kg/t hyd. lime	1.06

HEAD ASSAY

	g/t Au	g/t Ag
actual	3.58	51
calculated	3.56	37

REPORT M0977 KAY TANDA HEAP LEACHING

IDENTIFICATION		ROD MILL GRIND (silver)		LEACH	
Project	M0977	**grams**		**grams**	9640
Sample	Kay Tanda	**mls water**	no grind	**mls water**	14460
leach detail	7 day leach test @ -50mm with two carbon contacts	**water type**		**% solids**	40
		% solids			
		minutes			
		target P80 (≅m)			
test number	KT-2	**actual P80 (≅m)**			

Time hours	NaCN grams	hyd.lime grams	pH	diss. O2 mg/l	% NaCN	liquor mls	liquor assays Au mg/L	Ag mg/L	carbon assays Au g/t	Ag g/t	extr'n % Au	extr'n % Ag
			6.5									
0	14.46	4.50	10.5	8.5	0.100	14460					0.00	0.0
1		0.50	10.1	8.4								
24		1.00	10.0	8.6	0.064	99.82 g carbon contact			186	115		
48		1.00	10.0	7.6	0.060	14560	0.32	0.57			66.6	5.1
72		1.00	10.0	8.3		14555	0.61	0.99			78.7	6.7
96			10.3			14556	0.51	0.84			74.5	6.1
120		0.50	10.1		0.056	100.60 g carbon contact			64	52		
144												
168			10.1	8.4	0.028	14668	0.16	0.37			78.4	5.7

ASSAYS

residue	g/t Au	0.78
	g/t Ag	38

GOLD METALLURGICAL BALANCE

material	amount	assay g/t Au	mg Au	dist. %
carbon 24hr	99.82	186	18.567	53.2
carbon 120hr	100.6	64	6.438	18.5
final liquor	14668	0.16	2.347	6.7
residue	9640	0.78	7.519	21.6
total		3.62	34.87	100.0

SILVER METALLURGICAL BALANCE

amount	material	assay g/t Ag	mg Ag	dist. %
carbon 24hr	99.82	115	11.479	3.0
carbon 120hr	100.6	52	5.231	1.3
final liquor	14668	0.37	5.427	1.4
residue	9640	38	366.320	94.3
total		40	388.46	100.0

EXTRACTION % SUMMARY

	Au	Ag
calculated	78.4	5.7
head & tails calculation	78.2	25.5

REAGENT CONSUMPTION

kg/t NaCN	1.07
kg/t hyd. lime	0.88

HEAD ASSAY

	g/t Au	g/t Ag
actual	3.58	51
calculated	3.62	40

NOTES

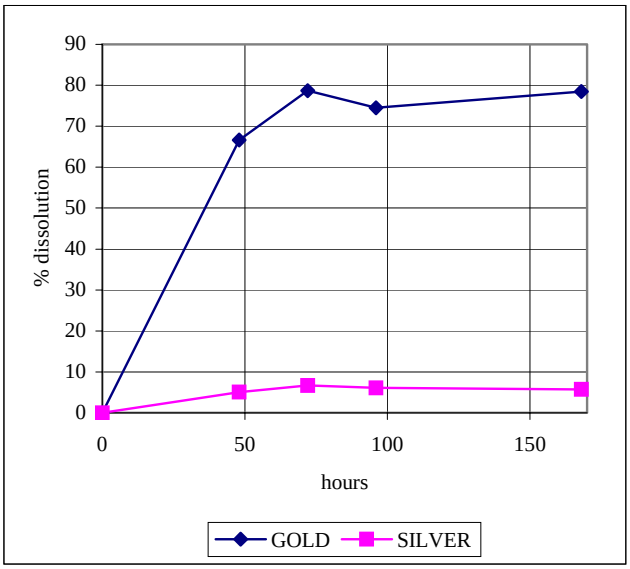
1) Slurry was rolled for 2hrs per day to minimise grinding effect

2) Residue assays determined from size / assay exercise of residue

3) Carbon contacts involved syphoning off liquor (and some fines) which was agitated for 2hrs with carbon. Carbon was recovered by screening with liquor returned to leach.

4) Dissolution kinetics are calculated based on liquor sampling points and take into account Au/Ag removed in carbon contact prior to that point.

DISSOLUTION KINETICS



APPENDIX 3

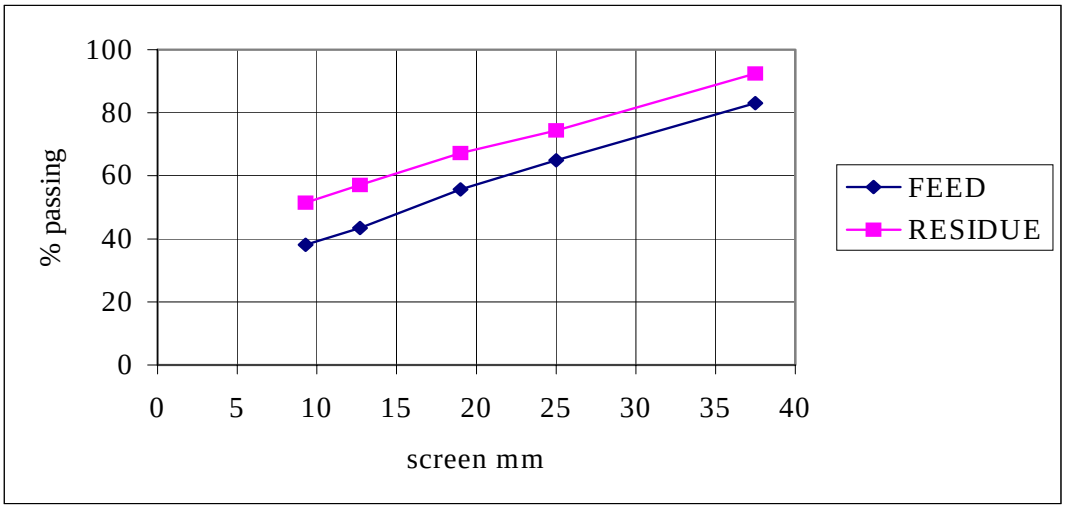
Analysis of Gold Recovery vs Crush Size

KAY TANDA 10kg LEACH - FEED AND RESIDUE SIZINGS

FEED

SIZING				ASSAYS		DISTRIBUTION	
screen	wt retained	wt retained	wt passing	Au	Ag	Au	Ag
mm	g	%	%	g/t	g/t	%	%
37.5	1775.2	16.9	83.1	7.69	68	31.2	26.4
25	1914.2	18.2	64.9	2.80	32	12.3	13.4
19	965.5	9.2	55.7	2.65	40	5.8	8.5
12.7	1287.5	12.3	43.4	2.35	38	6.9	10.7
9.3	561.1	5.3	38.1	2.75	41	3.5	5.0
-9.3	4000.6	38.1		4.40	41	40.2	35.9
total	10504.1	100.0		4.16	43	100.0	100.0

		Au g/t	Ag g/t
replicate assays of +37.5mm fraction:	original	7.70	64
	resample A	7.85, 7.90	72
	resample B	7.40, 7.60	



RESIDUE

SIZING				ASSAYS		DISTRIBUTION	
screen	wt retained	wt retained	wt passing	Au	Ag	Au	Ag
mm	g	%	%	g/t	g/t	%	%
37.5	730.4	7.6	92.4	1.39	43	13.7	8.6
25	1733.8	18.0	74.4	1.71	34	40.0	16.2
19	691.8	7.2	67.3	1.45	47	13.5	8.9
12.7	979.8	10.2	57.1	0.81	39	10.7	10.5
9.3	540.1	5.6	51.5	0.56	36	4.1	5.3
-9.3	4964.1	51.5		0.27	37	18.1	50.4
total	9640.0	100.0		0.77	38	100.0	100.0

		Au g/t
replicate assays of +37.5mm fraction:	original	1.54
	resample A	1.37, 1.52
	resample B	1.38, 1.13

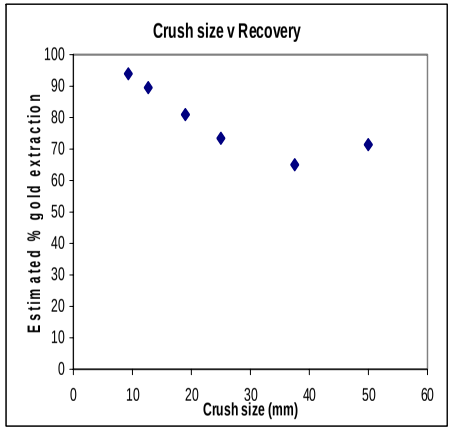
RECOVERY BASED ON GRADES

mm	Au %	Ag %
37.5	81.9	36.8
25	38.9	-6.3
19	45.3	-17.5
12.7	65.5	-2.6
9.3	79.6	12.2
-9.3	93.9	9.8
total	81.5	13.1

ESTIMATED RECOVERY AT DIFFERENT CRUSH SIZES

Crushed size	minus 50mm				minus 37.5mm					minus 25mm					minus 19mm					minus 12.7mm				
size fraction	crushed grams	% weight	Fraction recovery	Units recovery	crushed grams	combined grams	% weight	Fraction recovery	Units recovery	crushed grams	combined grams	% weight	Fraction recovery	Units recovery	crushed grams	combined grams	% weight	Fraction recovery	Units recovery	crushed grams	combined grams	% weight	Fraction recovery	Units recovery
37.5	1850.0	18.08	81.9	1480.6																				
25	2270.9	22.19	38.9	863.2	1227.6	3498.5	34.29	38.9	1334.0															
19	970.8	9.49	45.3	429.7	294.3	1265.1	12.40	45.3	561.8	1369.2	2634.3	25.86	45.3	1171.5										
12.7	975.3	9.53	65.5	624.3	115.2	1090.5	10.69	65.5	700.2	1242.8	2333.3	22.91	65.5	1500.3	1572.9	3906.2	38.38	65.5	2513.8					
9.3	621.8	6.08	79.6	483.7	60.2	682.0	6.69	79.6	532.1	298.0	980.0	9.62	79.6	765.8	487.7	1467.7	14.42	79.6	1147.8	1636.1	3103.8	30.54	79.6	2431.3
-9.3	3544.6	34.64	93.9	3252.5	120.9	3665.5	35.93	93.9	3373.9	573.7	4239.2	41.61	93.9	3907.6	565.1	4804.3	47.20	93.9	4432.3	2253.7	7058.0	69.46	93.9	6521.9
total	10233.4	100.00	71.3	7133.9	1818.2	10201.6	100.00	65.0	6502.0	3483.7	10186.8	100.00	73.5	7345.1	2625.7	10178.2	100.00	80.9	8093.9	3889.8	10161.8	100.00	89.5	8953.2

Crush size minus	Est rec'y
50	71.3
37.5	65.0
25	73.5
19	80.9
12.7	89.5
9.3	93.9



APPENDIX 4

Column Leach Test Log
Test KT-3 (minus 12.7mm)

FINAL MASS BALANCES TEST KT-3												
product		**g/kg/mL**	**GOLD assay**	**mg**	**SILVER assay**	**mg**					**GOLD**	**SILVER**
							EXTRACTION %				88.1	6.8
carbon		171.30	355	60.81	304	52.1						
residue		20.61	0.405	8.347	36.1	744.0	**CALCULATED FEED g/t**				3.40	39
final discharge		425	<0.01	<0.01	0.13	0.06	**ASSAY HEAD g/t**				3.58	51
wash		5107	<0.01	<0.05	0.12	0.61	**REAGENT ADDITIONS kg/T**					
liquor sub-samples				0.931		1.27	hydrated lime		0.9			
feed liquor		6190	<0.01	<0.06	0.17	1.05	NaCN		0.92			
total			3.40	70.09	39	799.1	NaOH		0.4			

REPORT M0977 KAY TANDA HEAP LEACHING

KAY TANDA - SIMULATED HEAP LEACH LOG

	AGGLOMERATION		**FEED SOLUTION**
	Date	06-05-05	
	Weight kg	20.61	Volume tap water 10L
	Crush size	12.7mm	NaCN 0.02%
Test KT-3	Lime kg/t	0.9	pH 10.0
	NaCN kg/t	0.72	application rate approx 10 L/m^2/hr
	Total water mls	1000	flooded drainage rate 7600L/m^2/hr
	% moisture	4.6	**HEAD ASSAYS** Au g/t Ag g/t
OBJECTIVE	Heap height m	1.850	assay head 3.58 51
Heap leach extraction @ 12.7mm	Heap diameter mm	100	calc head
	Cure	3 days	**RESIDUE ASSAYS** 0.37, 0.44 36.1
	Slump mm	67	
	carbon column	170g	**CARBON ASSAYS** 355 304

DAY	DISCHARGE			BARREN FEED			LIQUOR		UNITS							DISSOL'N	
	Vol (L)	pH	NaCN %	NaCN %	Au	Ag	GOLD	SILVER	GOLD			SILVER				Au	Ag
										sample	cum		sample	cum			
				/ pH	mg/L	mg/L	mg/L	mg/L	mg	mg	mg	mg	mg	mg		%	%
	- solution application commenced 8am 9/5/05									- sample volume taken = 25mL							
0	- initial discharge at 8am 10/5/05 - orange in colour (71.8mg/L Cu, 158mg/L Fe)									- dissolutions are based on final product assays						0	0
1	1.970	10.7	0.132	0.020/10.0			32.3	36.9	63.63	0.81	63.63	72.69	0.92	72.69		74.7	4.7
2	2.091	10.4	0.030				3.30	6.2	6.90	0.08	71.34	12.96	0.16	86.58		83.8	5.6
3	1.983	10.6	0.020	0.036/10.5	<0.01	<0.01	0.64	1.59	1.27	0.02	72.69	3.15	0.04	89.89		85.4	5.8
4	2.241	10.7	0.016				0.32	1.08	0.72	0.01	73.42	2.42	0.03	92.35		86.2	6.0
5	1.996	10.7	0.012				0.19	0.79	0.38	0.00	73.81	1.58	0.02	93.95		86.7	6.1
6	2.027	10.6	0.012	0.020/10.4	<0.01	<0.01	0.11	0.57	0.22	0.00	74.04	1.16	0.01	95.13		86.9	6.2
7	2.165	10.5	0.016				0.08	0.48	0.17	0.00	74.21	1.04	0.01	96.18		87.1	6.2
8	2.008	10.3	0.016				0.06	0.42	0.12	0.00	74.34	0.84	0.01	97.04		87.3	6.3
9	2.155	10.3	0.014	0.016/10.3	<0.01	<0.01	0.04	0.33	0.09	0.00	74.42	0.71	0.01	97.76		87.4	6.3
10	2.230	10.2	0.010	0.012/10.3 (6.583L feed adjust			0.04	0.25	0.09	0.00	74.51	0.56	0.01	98.32		87.5	6.4
11				0.02% NaCN - 0.53g addition)													
12																	
13	0.528	9.6	0.010	pumping failure over weekend			0.05	0.30	0.03	0.00	74.54	0.16	0.01	98.49		87.5	6.4
14																	
15	4.178	9.5	0.010	0.012/9.6 (6.18L feed adjuste			0.06	0.35	0.25	0.00	74.79	1.46	0.01	99.96		87.8	6.5
16				0.02% NaCN - 0.49g addition, plus													
				3g NaOH)													
17	4.425	9.6	0.008	(2g NaOH, 1.0g NaCN)			0.02	0.13	0.09	0.00	74.88	0.58	0.00	100.54		87.9	6.5
18																	
19																	
20	6.195	9.7	0.008	(2g NaOH, 1.0g NaCN)			0.01	0.10	0.06	0.00	74.95	0.62	0.00	101.16		88.0	6.5
21																	
22	4.541	9.9	0.016	(2L make-up water, 1g NaOH,			0.02	0.21	0.09	0.00	75.04	0.95	0.01	102.12		88.1	6.6
23				1g NaCN)													
24	4.691	10.2	0.012				<0.01	0.18			75.04	0.84	0.00	102.97		88.1	6.7
27	6.798	10	0.014				<0.01	0.17			75.04	1.16	0.00	104.13		88.1	6.7
29	4.248	10	0.010				<0.01	0.13			75.04	0.55	0.00	104.69		88.1	6.8
30	0.425	9.7	0.008				<0.01	0.17			75.04	0.07	0.00	104.76		88.1	6.8
wash	5.107	9.6	<0.002				<0.01	0.12			75.04	0.61	0.00	105.38		88.1	6.8
nal column moisture = 11.3 %				flooded percolation rate = 1L/min													

APPENDIX 5

Column Leach Test Log
Test KT-4 (minus 50mm)

FINAL MASS BALANCES TEST KT-4												
product		**g/kg/mL**	**GOLD assay**	**mg**	**SILVER assay**	**mg**					**GOLD**	**SILVER**
							EXTRACTION %				81.7	10.2
carbon		379.6	1525	578.89	1785	677.6						
residue		183.7	0.71	130.43	35.0	6429.5	**CALCULATED FEED g/t**				3.89	39
final discharge		15.84	0.05	0.79	1.65	26.1	**ASSAY HEAD g/t**				3.58	51
wash		47.89	0.05	2.39	0.55	26.3	**REAGENT ADDITIONS kg/T**					
liquor sub-samples				1.32			cement		2.0			
feed liquor		0					NaCN		0.88			
total			3.89	713.82	39	7159.6						

KAY TANDA - SIMULATED HEAP LEACH LOG

		AGGLOMERATION		FEED SOLUTION		
		Date	06-07-05			
		Weight kg	183.7	Volume tap water	40L	
		Crush size	50mm	NaCN	0.1%	
Test	**KT-4**	Cement kg/t	2.0	pH	10.2	
		NaCN kg/t	0.72	application rate	approx 10 $L/m^2/hr$	
		Total water mls	9200	flooded drainage rate	$336m^3/m^2/hr$	
		% moisture	4.6	**HEAD ASSAYS**	Au g/t	Ag g/t
OBJECTIVE		Heap height m	2.190	assay head	3.58	51
Heap leach extraction @ 50mm		Heap diameter mm	300	calc head	3.89	39
Cement Agglomeration		Cure	1 day	**RESIDUE ASSAYS**	0.60, 0.81	35
		Slump mm	120			
		2 x 170 g carbon columns in series		**CARBON ASSAYS**	1525	1785

DAY	DISCHARGE				LIQUOR	UNITS GOLD			DISSOL'N
	Vol (L)	pH	NaCN	NaCN %	GOLD				GOLD
			%	/ pH	mg/L	disch. mg	sample mg	cum. mg	%
	- solution application commenced 10am 7/7/05					- dissolutions preliminary only as based on head assay			
0						- sample volume taken = 25mL			0
1	7.72	11.5	0.500		20.6	159.032	0.515	159.032	22.8
2	11.49	11.4	0.250		11.5	132.135	0.288	291.682	41.7
3	11.84	11.3	0.190		5.10	60.384	0.128	352.354	50.4
4	11.21	11.1	0.210		3.00	33.630	0.075	386.111	55.3
5	11.59	11.0			2.11	24.455	0.053	410.641	58.8
6	6.16	10.9		pump failure o/night	1.60	9.856	0.040	420.550	60.2
7	11.70	10.8	0.230		1.65	19.305	0.041	439.895	63.0
9	18.81	10.7			1.15	21.632	0.029	461.567	66.1
11	19.08	10.7	0.180		0.74	14.119	0.019	475.715	68.1
13	19.000	10.6	0.162		0.68	12.920	0.017	488.654	69.9
15	18.500	10.6	0.150		0.52	9.620	0.013	498.291	71.3
18	18.630	10.7	0.128		0.43	8.011	0.011	506.315	72.5
20	18.040	10.7	0.116		0.42	7.577	0.011	513.902	73.6
22	17.910	10.8	0.108		0.32	5.731	0.008	519.644	74.4
25	17.350	10.6	0.080		0.26	4.511	0.007	524.163	75.0
27	17.070	10.7	0.074		0.26	4.438	0.007	528.608	75.7
29	16.160	10.6	0.066		0.22	3.555	0.006	532.169	76.2
32	16.590	10.6	0.056		0.18	2.986	0.005	535.161	76.6
34	15.590	10.6	0.044		0.18	2.806	0.005	537.972	77.0
36	14.650	10.5	0.034	6 grams NaCN, 4 litres water	0.17	2.491	0.004	540.467	77.4
39	18.700	10.4	0.042		0.15	2.805	0.004	543.276	77.8
41	17.430	10.5	0.034	feed <0.01 mg/l Au: 6g NaCN	0.13	2.266	0.003	545.546	78.1
43	14.950	10.4	0.042		0.10	1.495	0.003	547.044	78.3
46	17.780	10.5	0.036		0.09	1.600	0.002	548.647	78.5
48	16.290	10.4	0.034		0.09	1.466	0.002	550.115	78.7
50	16.950	10.4	0.026	6 grams NacN	0.08	1.356	0.002	551.473	78.9
53	16.120	10.4	0.030		0.07	1.128	0.002	552.604	79.1
55	16.530	10.4	0.024		0.13	2.149	0.003	554.754	79.4
57	16.320	10.3	0.018		0.12	1.958	0.003	556.716	79.7
60	15.970	10.3	0.012		0.12	1.916	0.003	558.635	80.0
62	14.520	10.3			0.11	1.597	0.003	560.236	80.2
64	14.030	10.2	0.010	6 grams NaCN, 2 litres water	0.06	0.842	0.002	561.080	80.3
67	17.020	10.3	0.018		0.04	0.681	0.001	561.762	80.4
69	16.02	10.3			0.06	0.961	0.002	562.725	80.5
71	15.57	10.2			0.06	0.934	0.002	563.660	80.7
74	15.72	10.1	0.008		0.04	0.629	0.001	564.291	80.8
76	14.98	10.1		6 grams NaCN, 2 litres water	0.04	0.599	0.001	564.891	80.9
78	16.9	10.2			0.04	0.676	0.001	565.568	81.0
81	16.63	10.2	0.024		0.06	0.998	0.002	566.567	81.1
83	16.27	10.1			0.06	0.976	0.002	567.544	81.2
85	15.84	10.1	0.018	1.65 mg/l Ag	0.05	0.792	0.001	568.338	81.3
wash (88)	47.89	10.0	0.008	0.55mg/l Ag	0.05	2.395	0.001	570.734	81.7
final column moisture = 10.4%				flooded percolation rate = 44L/min					