

METCON Research Inc.

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9 August 1999
RJEC-055-99

K D Engineering Company, Inc.
7701 N. Business Park Drive
Tucson, Arizona 85743

Attention: Mr. Joseph Keane

Subject: Testing of Gold Lixiviant - Ricardo Campoy Project
METCON Project No. M-451-15

Dear Mr. Keane:

On 2 July 1999 METCON received a bottle containing approximately 1.5 liters of an unknown yellow solution with some undissolved white salt crystals. One liter of this solution was contacted with a 500 gram sample of gold ore, at a nominal minus 10 mesh crush size, containing approximately 2 grams gold per tonne. After 26 hours of agitation on a bottle roll apparatus, the solution was separated from the solids and the solids were washed with distilled water. The as received solution, the leach and wash solutions, and the leached solids were submitted for assay of total gold. In conjunction with this test, a duplicate standard sodium cyanide bottle roll test was conducted for control purposes on the same gold ore. The data logs for these two tests are attached with the results summarized in the following table.

| GOLD LIXIVIANT EVALUATION Bottle Roll Leach Test Results | | | | |
|---|------------------------------|-----------------------------|-------------------------------|----------------------------|
| Lixiviant | Leach Solution Assay, ppm | Leach Residue Assay, gpt | Calculated Head Assay, gpt | Percent Gold Extraction |
| 1 gpl NaCN Solution | 1.11 | 0.40 | 2.60 | 84.70 |
| Unknown Solution | 1.26 | 0.20 | 2.81 | 92.97 |

After 26 hours the unknown solution extracted 6 percent more gold from the ore than did a solution containing 1 gram per liter sodium cyanide. As only the final leach solution was submitted for assay, no kinetic data for gold extraction were developed.

The unknown feed solution contained no gold, had a measured negative pH value, and an oxidation/reduction potential exceeding 700 mV, relative to the silver/silver chloride electrode. The feed and leach solutions proved to be difficult to analyze by atomic absorption (AA) technique as direct aspiration of the solutions extinguished the AA flame. The analytical chemist who ran the gold assays reports that multiple acid digestion and volume reduction steps were required in conducting the gold analyses.

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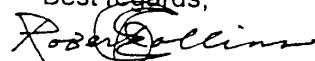
In addition to the gold assay, a multi-element ICP scan was conducted on the unknown solution. The results of this analysis are presented below.

| GOLD LIXIVIANT EVALUATION IPC Multi Element Analysis of Gold Lixiviant | | | |
|---|---------------------|----------------|---------------------|
| Element | Concentration (ppm) | Element | Concentration (ppm) |
| Ag, Silver | <0.03 | Mn, Manganese | 0.7 |
| Al, Aluminum | 8 | Mo, Molybdenum | 0.19 |
| As, Arsenic | 0.5 | Na, Sodium | 59785 |
| B, Boron | <0.5 | Ni, Nickel | 2.6 |
| Ba, Barium | 0.5 | P, Phosphorus | 17 |
| Be, Berillium | <0.01 | Pb, Lead | 0.2 |
| Bi, Bismuth | <0.04 | S, Sulfur | not analyzed |
| Ca, Calcium | 145 | Sb, Antimony | <0.3 |
| Cd, Cadmium | <0.02 | Se, Selenium | <0.3 |
| Co, Cobalt | <0.01 | Si, Silica | 7 |
| Cr, Chromium | 5.4 | Sn, Tin | <0.1 |
| Cu, Copper | 1.1 | Sr, Strontium | 8.3 |
| Fe, Iron | 57 | Ti, Titanium | 1.8 |
| K, Potassium | 54 | V, Vanadium | 0.2 |
| La, Lanthium | 0.16 | W, Tungsten | <0.3 |
| Mg, Magnesium | 5 | Zn, Zinc | 0.2 |

The most abundant element detected was sodium followed by calcium.

METCON trusts that this letter report fulfills your request for initial testing of the gold lixiviant. There are approximately 400 milliliters of the unknown solution at METCON which will be saved for future analytical examination or test work. An invoice covering the laboratory and analytical expenses for this test work is attached.

Best regards,



Robert J.E. Collins
Chemical Engineer

RJEC:rjec

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LEACH TEST DATA LOG

OBJECTIVE: LEACH COMPARISON OF SODIUM CYANIDE AND GOLD LIXIVIANT TESTS

Client: KD - Ricardo Campoy Project
 Sample I.D.: Quartz-Alunite-Hematite Gold Ore
 Feed Weight: 502.84 grams, dry
 Feed Size:
 Moisture: 0.00 % wet basis

Leaching System: Sodium Cyanide
 Concentration: 1.00 gram per liter
 Solution Volume: 1.00 liters

Project No: M451-15
 Date: 07/06/99
 Test No: BR-01
 Test by: R.C.

| OPERATION | Time (hours) | CONDITIONS | | TITRATION | | REAGENT ADDITION | |
|-----------|-----------------|---------------|---------|---|---------------|------------------|-----------------|
| | | Solids (%) | pH, pHf | Volume (ml) | NaCN (gpl) | CaO (gpl) | NaCN (grams) |
| Condition | 0 | 33.5% | -0.33 | 1000 | | | |
| Leach | 26 | 36.1% | -0.63 | 890 | 0.87 | | 1.00 |
| Wash | 26 | 9.80 | | 710 | 0.10 | | 0.63 |
| | | | | Total Reagent Consumption (kilograms per ton) = | 0.31 | 1.25 | |

REMARKS: Aliquot Volume = 0.000 liters

METALLURGICAL RESULTS

| PRODUCT | WEIGHT (grams) | VOLUME (ml) | ASSAYS | | CONTENT | | CUMULATIVE EXTRACTION | |
|-------------------------|-------------------|----------------|-----------------|-----------------|------------|------------|--------------------------|-----------|
| | | | Au (ppm gpt) | Ag (ppm gpt) | Au (mg) | Ag (mg) | Au (%) | Ag (%) |
| 0 hr pregnant solution | | 1000 | | | | | | |
| 26 hr pregnant solution | | 890 | 1.11 | | 0.988 | | | |
| Wash solution | | 710 | 0.17 | | 0.121 | | | |
| Leach Residue | 500.62 | | 0.40 | | 0.200 | | | |
| Calculated Head | | | 2.60 | | 1.309 | | | |
| Assay Head | 502.84 | | 1.98 | 1.30 | 0.996 | 0.654 | | |

METCON RESEARCH, INC.

LEACH TEST DATA LOG

OBJECTIVE: LEACH COMPARISON OF SODIUM CYANIDE AND GOLD LIXIVIANT TESTS

Client: KD - Ricardo Campoy Project
 Sample I.D.: Quartz-Alunite-Hematite Gold Ore
 Feed Weight: 492.6 grams, dry
 Feed Size:
 Moisture: 0.00 % wet basis

Leaching System: Unknown Gold Lixiviant
 Concentration: "As Received"
 Solution Volume: 1.00 liters

Project No: M451-15
 Date: 07/06/99
 Test No: BR-02
 Test by: R.C.

| OPERATION | Time (hours) | CONDITIONS | | TITRATION | | REAGENT ADDITION | |
|-----------|-----------------|---------------|---------|---|----------|------------------|--|
| | | Solids (%) | pH, pHf | Volume (ml) | Emf (mV) | | |
| Condition | 0 | 33.5% | -0.33 | 1000 | 744 | | |
| Leach | 26 | 36.4% | -0.63 | 660 | 623 | | |
| Wash | 26 | 0.55 | | 780 | 509 | | |
| | | | | Total Reagent Consumption (kilograms per ton) = | | | |

REMARKS: Aliquot Volume = 0.000 liters

METALLURGICAL RESULTS

| PRODUCT | WEIGHT (grams) | VOLUME (ml) | ASSAYS | | CONTENT | | CUMULATIVE EXTRACTION | |
|-------------------------|-------------------|----------------|-----------------|-----------------|------------|------------|--------------------------|-----------|
| | | | Au (ppm gpt) | Ag (ppm gpt) | Au (mg) | Ag (mg) | Au (%) | Ag (%) |
| 0 hr pregnant solution | | 1000 | | | | | | |
| 26 hr pregnant solution | | 880 | 1.26 | | 1.109 | | | |
| Wash solution | | 780 | 0.23 | | 0.179 | | | |
| Leach Residue | 486.93 | | 0.20 | | 0.097 | | | |
| Calculated Head | | | 2.81 | | 1.386 | | | |
| Assay Head | 492.60 | | 1.98 | 1.30 | 0.975 | 0.640 | | |

Test Report

Date: January 28, 1999

Lab No: 54412

Client: Paul M. Jones
466 Lloyd Rd
Matawan, NJ 07747

Sample description: Tailings pond sludge (caution – cyanide sludge) Rosario Resources, Dominican Republic

Purpose: Test the effectiveness of customer supplied leach liquor

Procedure:

Split sample – retain one-half for records

1. Analyze sample for Au content by fire assay.
2. Utilize supplied CDE 2 leaching agent and conduct a static leach test:
 - a. place 400 grams of the split sample in a 1000 ML beaker
 - b. add twice the volume of CDE 2 to beaker
 - c. stir occasionally
 - d. when digestion ceases, filter the pregnant solution to a separate beaker
 - e. place the retained sludge back into the original beaker
 - f. check the retained sludge for complete digestion by adding a small volume of CDE 2 to the retained sludge
 - g. if digestion is complete **no** bubbling will occur
 - h. If digestion isn't complete, bubbling **will** occur. This would indicate the pregnant solution had reached a fully loaded or saturated condition. Go back to step b to f.
 - i. After digestion is complete, rinse the sludge with distilled water and add the liquid to the pregnant solution.
 - j. Repeat this step three times. This is extremely important as much of the values could still be on the surface of the sludge.
3. Analyze the sludge for Au content by fire assay

ASSAY RESULTS

Line item 1
Au --- 1.16 grams per ton

Line item 3
Au --- 0.0014 grams per ton

Conclusion: The supplied leach liquor removed a very high percentage of the Au contained in the supplied sample. We recommend another test using the retained split sample to verify the results. Since the supplied sample was identified as cyanide tailings the potential for this liquor may have widespread application.

Note: All results are on a dry basis.

Test Report

Date: February 4, 1999

Lab No: 55001

Client: Paul M. Jones
466 Lloyd Rd
Matawan, NJ 07747

Sample description: Pregnant solution obtained from test 54412

Purpose: Test the effectiveness of customer supplied gold recovery methodology

Procedure:

With 25 ML of the pregnant solution in a 250 ML beaker

1. add 25 ML 25% HCl solution to the beaker
2. Shake well, filter(42 Whatman) and rinse
3. Bring the total to 100 ML
4. Add 100 CDE 5 and vigorously agitate for 15 minutes at 90 degrees F.
5. Transfer the solution to a separatory funnel. Allow settling until the layers are fully separated. Drain the bottom layer and set aside. Do not allow the top layer to exit with the bottom layer. The top layer contains the Au.
6. Add 25 ML of 10% HCl to the remaining solution (top layer) and shake it well for 15 minutes. Allow to settle and separate again. Drain the bottom layer as before. Repeat this step two more times. All of the drained materials should be tested for other metals.
7. Drain the top layer from the separatory funnel to a 1000 ML beaker
8. Make a super-saturated solution of CDE 9 with distilled water.
9. Add 100 ML of this solution to the beaker
10. Heat to 85 degrees F, maintain temperature and violently agitate for at least 15 minutes to assure complete reduction of gold to the metallic state.
11. Pour the solution through a 42 Whatman filter to separate the metallic gold cement.
12. Wash the Au cement with the same filter using 25 ML each of: (in the order given)
 - a. 10% hydrochloric acid – do this three times
 - b. Distilled water
 - c. Methylated spirit (alcohol)
13. Dry the powder and assay.

ASSAY RESULTS

Line item 13 – test 1
Au --- 0.994 fine

Line item 13 – test 2
Au --- 0.994 fine

Conclusion: The pregnant solution is obviously quite complex. The fact that this method selectively recovered the gold is very interesting and would certainly appear to have unusual value with some ores.