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Technical Memorandum

To:	Joel Carrasco	**From:**	Ronson Chee
Company:	Tetra Tech	**Date:**	August 3, 2010
Re:	Rosemont Raffinate Pond Volume Requirement	**Doc #:**	206/10-320877-5.3
CC:	David R. Krizek, P.E. (Tetra Tech)		

1.0 Introduction

This Technical Memorandum provides an updated volume requirement for the planned Raffinate Pond at the Rosemont Copper Project (Project) in Pima County, Arizona. This updated pond volume requirement is compared to the pond volume requirement submitted in the Aquifer Protection Permit (APP) application provided to the Arizona Department of Environmental Quality (ADEQ) in February 2009 (Tetra Tech, 2009a). This information is in response to the April 14, 2010 Comprehensive Request for Additional Information from ADEQ to Rosemont Copper Company (Rosemont). Specifically, this Technical Memorandum answers item no. 28 on page 12 of 18.

- *APP Volume 1, Table 7.16 – Raffinate Pond Volume Requirements: There is a discrepancy in the Raffinate Pond Volume Requirements and the Total Volume Required. Please reconcile the volumes (Minimum Pool Volume, Design Operating Volume and Freeboard Volume) to reflect the correct volume of raffinate required in the Raffinate Pond.*

2.0 Raffinate Pond Volume – APP Application

The capacity and storage design of the Raffinate Pond is described in Section 7.5.8 of the February 2009 APP application. Pond volume requirements are summarized in Table 7.16 on the APP application. A direct duplication of Section 7.5.8 from the February 2009 APP application is provided below:

7.5.8 Capacity and Storage Design (Original)

The Raffinate Pond will be sized to provide lined storage for the equivalent of four (4) hours of operational flows assuming maximum values for precipitation, evaporation, and ore moisture. In addition, the pond will be sized to contain a minimum pool depth of ten (10) feet with three (3) feet of freeboard. The dimensions and volume requirements for the Raffinate Pond are presented in Tables 7.15 and 7.16, respectively.

Table 7.15 Raffinate Pond Dimensions

Pond Base Width (feet)	Pond Base Length (feet)	Pond Top Width (feet)	Pond Top Length (feet)	Total Pond Depth (feet)	Pond Side Slopes (H:V)	Total Pond Volume (ft^3)
100.0	175.0	180.5	255.5	16.1	2.5:1	495,000

Table 7.16 Raffinate Pond Volume Requirements

Minimum Pool Depth (feet)	Minimum Pool Volume (ft^3)	Design Operating Volume (ft^3)	3 Feet Freeboard Volume (ft^3)	Total Volume Required (ft^3)
10.0	251,843	98,594	128,803	495,000

Table 7.15 provided "theoretical dimensions" based on water balance calculations. These dimensions are the minimum dimensions and pond volume necessary to satisfy the water balance calculations. Due to the complex nature of satisfying water balance requirements, along with actual design considerations, a range of suitable Raffinate Pond dimensions was created as a guide to designing the actual pond configuration. As long as the actual design dimensions fell within the suitable range of "theoretical dimensions", the pond geometry was deemed adequate.

The "Total Volume Required" entry in Table 7.16 does not equate to the summation of the volume requirements. The "Total Volume Required" entry in Table 7.16 should have been labeled "Sum of Required Volumes" and be equal 479,240 cubic feet (ft^3) (251,843 ft^3 + 98,594 ft^3 + 128,803 ft^3). The "Total Volume Required" value of 495,000 ft^3 listed in Table 7.15 is the volume of the actual Raffinate Pond design assumed in the APP application.

The summation of the volume requirements in Table 7.16 is 479,240 ft^3, which is less than the total pond volume of 495,000 ft^3 provided by the assumed design. This indicates an adequate pond design.

3.0 Raffinate Pond Volume – Updated

Since the submittal of the APP application, the Raffinate Pond has been through a series of changes. The changes included: an increase to eight (8) hours of operational flows versus four (4) hours and a change in location and geometry. These changes were assumed in the *Rosemont Heap Leach Facility Permit Design Report* dated May 2009 and provided to ADEQ (Tetra Tech, 2009b). In addition to the updated pond dimensions, the table entries were modified herein to clarify the volume requirements. Information for the updated tables was taken from the Technical Memorandum titled *Rosemont - Water Balance and Pond Sizing* dated April 17, 2009. This Technical Memorandum, which is included herein as Attachment 1, was

previously provided in the *Rosemont Heap Leach Facility Permit Design Report* dated May 2009. Based on this April 17, 2009 memo, the following should replace Section 7.5.8 in the APP application.

7.5.8 Capacity and Storage Design (Updated)

The Raffinate Pond will be sized to provide lined storage for the equivalent of eight (8) hours of operational flows assuming maximum values for precipitation, evaporation, and ore moisture. In addition, the pond will be sized to contain a minimum pool depth of ten (10) feet with three (3) feet of freeboard. The dimensions and volume requirements for the Raffinate Pond are presented in Tables 7.15 and 7.16, respectively.

Table 7.15 Raffinate Pond Dimensions

	Pond Base Width (feet)	Pond Base Length (feet)	Pond Top Width (feet)	Pond Top Length (feet)	Total Pond Depth (feet)	Pond Side Slopes (H:V)	Total Pond Volume (ft^3)
Design Requirements (Theoretical)	*55*	*96.3*	*166.9*	*208.1*	*22.4*	*2.5:1*	*399,730*
Actual	*50*	*115*	*165*	*230*	*23*	*2.5:1*	*452,305*

Table 7.16 Raffinate Pond Volume Requirements

10 Feet Minimum Pool Volume (ft^3)	Design Operating Volume (ft^3)	3 Feet Freeboard Volume (ft^3)	Sum of Required Volumes (ft^3)
98,887	*194,435*	*95,992*	*389,314*

In Table 7.15, the "Design Requirements (Theoretical)" entries are from the water balance calculations provided in Attachment 1. The "Actual" entries are the final design layout of the Raffinate Pond as shown in the *Rosemont Heap Leach Facility Permit Design Report* dated May 2009. Table 7.16 shows a change in the column entry from "Total Volume Required" to "Sum of Required Volumes" in comparison to the original Table 7.16 headings. Additionally, the first two (2) columns in the original Table 7.16 were combined, i.e., the column "Minimum Pool Depth" was deleted and the column heading "Minimum Pool Volume" was also changed to "10 Feet Minimum Pool Volume". The "Sum of Required Volumes" entry in Table 7.16 (389,314 ft^3) differs from the "Total Pond Volume" (399,730 ft^3) in Table 7.15 based on the theoretical design

requirements due to the iterative nature of the water balance calculation and iteration tolerance - and therefore the difficultly in matching the two (2) numbers exactly.

REFERENCES

Tetra Tech (2009a). *Aquifer Protection Permit (APP) Application*. Prepared for Rosemont Copper Company. Report dated February 2009.

Tetra Tech (2009b). *Rosemont Heap Leach Facility Permit Design Report.* Prepared for Rosemont Copper Company. Report Dated May 2009.

ATTACHMENT A

TETRA TECH

Technical Memorandum

To: Joel Carrasco

From: Elton Smith

Project No: 114-320807-5.3

Subject: **Rosemont – Water Balance and Pond Sizing**

Date: April 17, 2009

1.0 Introduction

This Technical Memorandum presents methodologies and procedures for sizing of the various ponds proposed by Rosemont Copper for construction as part of the Rosemont Copper Project heap leach facility, which entails:

- Pregnant Leach Solution (PLS) Pond;
- Raffinate Solution Pond; and
- Stormwater Pond (for runoff from the Heap Leach Pad).

Once the ponds are sized, estimate the monthly fresh water make-up requirements of the Rosemont heap leach facility.

2.0 Method

Sizing of ponds involved in a heap leach water cycle follows a four-step process:

1. Create a schematic diagram of the heap leach water cycle focusing on inflows to the system, outflows from the system, and portions of the system where water storage exists.
2. Identify the subset of the water cycle on the schematic diagram that must be computed (using the principle of conservation of mass) in order to determine all normal inflows to the pond that is being sized.
3. Estimate maximum inflow rates to the pond that is being sized (in an average year) then compute design volumes by multiplying the aforementioned inflow rates by prescribed design durations.
4. Assume a base width and then compute the dimensions of the pond by stacking the design volumes and computing the height associated with each “slice” subject to the geometric constraints of the pond (side slopes, length to width ratio, etc.)

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Water balance calculations to validate the pond sizing and estimate the monthly fresh water make-up requirements of the heap leach water cycle are based on the principle of conservation of mass, which may be expressed in its most basic form as:

$$\Delta S = (\Sigma I - \Sigma O) \times \Delta t$$

Where:

ΔS = Change in system volume;

ΣI = Sum of inflows to system;

ΣO = Sum of outflows from system; and

Δt = Elapsed time.

For storage structures within the Rosemont heap leach water balance model, normal operations may entail changes in the volume of water stored at the end of a simulated time increment (months). The estimated pond sizes are validated if their respective capacities are not exceeded during simulated operations in an average year.

At the system-wide level, the Rosemont heap leach water balance must operate under the criteria that $\Delta S = 0$. At the Rosemont site, local climatic conditions dictate that additional fresh make-up water has to be added to the system in given months, i.e., the Rosemont heap leach water balance cycle is a net evaporative system.

3.0 Assumptions

Leach ore properties

- Maximum Leach ore production rate = 38,000 tons per day (tpd) (Actual varies by year);
- Leach ore "as-mined" moisture content = 2.0%
- Leach ore field capacity = 7.0%
- Leach ore field capacity for make-up water = 10.0%

Raffinate solution application

- Raffinate application method = drip emitters
- Raffinate application evaporative loss rate = 3.0% (of the raffinate application rate)
- Target PLS flow rate to PLS Pond = 2,500 gallons per minute (gpm)

Heap Leach Pad design

- Active leach surface = 1,000,000 square feet (ft^2)
- Phase 1 lined area = 5,476,769 ft^2
- Phase 2 lined area = 4,511,933 ft^2
- Ultimate lined area = 9,988,702 ft^2

Pond design

- PLS Pond is sized for 8 hours of operational flow plus 24 hours of heap drain-down flow with an additional 3 feet (ft) of dry freeboard
- PLS drain-down flow rates are assumed equivalent to the estimated PLS Pond operational flow rates
- Raffinate Solution Pond is sized for 8 hours of operational flow with an additional 3 ft of dry freeboard
- Stormwater Pond is sized for the 100 year (yr), 24 hour precipitation event, which equals 4.75 inches (in), over the lined heap leach pad area with an additional 3 ft of dry freeboard. In addition, the Stormwater Pond has been sized to allow for a one hour shutdown in the leaching operation during the peak of the 100 year, 24 hour storm event. Six possible construction configurations of the heap leach were investigated for pond sizing, all having differing amounts of liner and/or ore. They are as follows:
    - Case 1: Assuming Phase 1 of the Heap Leach Pad is lined, but ore placement has not begun.
    - Case 2: Assuming both Phases of the Heap Leach Pad are lined and the Phase 1 pad contains 8.6MT of ore (end of year 1 estimated total),
    - Case 3: Assuming both Phases of the Heap Leach Pad are lined, but ore placement has not begun.
    - Case 4: Assuming both Phases of the Heap Leach Pad are lined and the Phase 1 pad contains 29.3 MT of ore (end of year 2 estimated total).
    - Case 5: Assuming both Phases of the Heap Leach Pad are lined, the Phase 1 pad contains 29.3 MT of ore (end of year 2 estimated total), and the Phase 2 pad contains 28.6 MT of ore (end of year 2 estimated total).
    - Case 6: Assuming both Phases of the Heap Leach Pad are lined, the Phase 1 pad contains 40 MT of ore (end of year estimated total), and the Phase 2 pad contains 35 MT of ore (end of year estimated total).
- Process pond (PLS and Raffinate) minimum operating depth = 10 ft
- Pond side slopes (interior) = 2.5 horizontal to 1 vertical (2.5:1)
- Pond shapes are frustums of inverted rectangular pyramids

Climate

- Pond surface evaporation coefficient = 0.70 (of Pan) as given in *Handbook of Applied Hydrology* (Chow, 1964)
- Wetted leach surface evaporation coefficient = 0.85 (of Pan) to account for the additional area exposed on the surface of the heap leach pad
- Average year precipitation values were taken from Santa Rita Experimental Range, Arizona: Average Total Precipitation (inches) (WRCC, 2008)

- Wet and dry year precipitation values were established by averaging the rainfall during the twenty wettest years and the twenty driest years, respectively. The raw precipitation data was obtained from *Nogales 6N, Arizona: Monthly Total Precipitation (inches)* (WRCC, 2008)
- Pan evaporation values were taken from Technical Memo, Rosemont Copper Project Design Storm and Precipitation Data/Design Criteria (Tetra Tech, April 2009)

4.0 Calculations

A schematic diagram of the Rosemont heap leach balance cycles is shown on Figure 1.

PLS Pond sizing focused on the subset of the Rosemont heap leach water balance cycle centered on the PLS Pond. As shown in Figure 1, normal inflow rates to the PLS Pond include the pregnant leach solution flow from the heap leach pad (G_{hl}) and direct precipitation on the PLS Pond (P_{pp}). Details of the PLS Pond sizing are given in Attachment 1, with associated water balance formulas taken from Figure 1. (Note that since the normal inflow rate (G_{hl}) is specified, average precipitation and evaporation data are not required for sizing the PLS Pond.)

Sizing of the Stormwater Pond was performed using three parameters: the lined area of the heap leach pad, design storm runoff from the heap leach pad, and direct precipitation on the Stormwater Pond during the design storm event. Details of the Stormwater Pond sizing are given in Attachment 2.

Raffinate Pond sizing focused on the subset of the Rosemont heap leach water balance cycle centered on inflows and outflows from the Raffinate Pond. Referring to Figure 1, the barren raffinate solution outflow rate to the heap leach pad (B_{rp}) can't exceed the sum of the barren raffinate solution inflow rate (B_{sx}), direct precipitation on the Raffinate Pond (P_{rp}), and the fresh water make-up rate (F_{fs}). Accordingly, the normal inflow rate to the heap leach pad was taken as B_{rp}. Details of the Raffinate Pond sizing are given in Attachment 3, with associated water balance formulas taken from Figure 1. (Note that for this calculation, the greatest required solution application rate is in the month of June at 3,253 gallons per minute from the dry year calculations.)

One year of Rosemont heap leach water cycle operations was simulated under average, dry, and wet year precipitation conditions using a water balance model based on the schematic and water balance equations shown on Figure 1. This model, detailed in Attachment 4a-d, was used to verify pond sizing and to determine monthly fresh water make-up required at the site. Similarly, Case 2 of the aforementioned heap leach configurations was used in the ultimate Stormwater Pond sizing because it produced the highest probable volume and it provided the closest approximation to the one year heap arrangement.

5.0 Conclusions/Results

For the sizing of each pond, various geometric alternatives were computed in order to provide a range of possible dimensions (see Table 2 for pond configurations and results). These results are detailed in Table 2 and are summarized below:

- PLS Pond – depending on the selected geometric configuration (in Table 2), the PLS Pond should have an ultimate capacity between 44 and 60 acre-feet.
- Stormwater Pond – depending on the selected geometric configuration, the Stormwater Pond should have an ultimate capacity between 84 and 97 acre-feet.
- Raffinate Pond – depending on the selected geometric configuration, the Raffinate Pond should have an ultimate capacity between 8 and 14 acre-feet.

The Rosemont heap leach water balance cycle was simulated with average, wet, and dry year climate values (see Climate Data Table 1) and pond configurations as indicated in Table 2 to determine the fresh water make-up requirements. The heap leach water balance results are detailed in Table 3. Key results are summarized below:

- As was mentioned in the Section 2.0, the Rosemont heap leach water balance cycle is a net evaporative system. The water balance results agree with this assertion as fresh water make-up is predicted year-round for all scenarios investigated.
- The results show that the consumptive maximum fresh water requirements for the Rosemont Copper Project are 753 gpm during the driest 20 years.

6.0 References

Arizona Department of Environmental Quality (2005). *Arizona Mining BADCT Guidance Manual, Aquifer Protection Program*. Publication TB-04-01. Phoenix, AZ: ADEQ.

Chow, V.T. (1964). *Handbook of Applied Hydrology*. New York, NY: McGraw-Hill.

Tetra Tech (2009). *Rosemont Copper Project Design Storm and Precipitation Data/Design Criteria.* Technical Memo dated April 7, 2009.

Western Regional Climate Center. (2008). *Nogales 6N, Arizona: Monthly Total Precipitation (inches)*. File retrieved on December 23, 2008 by Tetra Tech from URL: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?az7593. Reno, NV: WRCC.

Western Regional Climate Center. (2008). *Santa Rita Experimental Range, Arizona: Average Total Precipitation (inches)*. File retrieved on December 23, 2008 by Tetra Tech from URL: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?az7593. Reno, NV: WRCC.

TABLES

Table 1 - Average Climate Data

						Pond Evaporation Coefficient (of Pan):	0.70
						Active Wetted Surface Evaporation Coefficient (of Pan):	0.85
Month No.	Operating Month	Avg. Year Precipitation[1] (in/mo)	Dry Year Precipitation[2] (in/mo)	Wet Year Precipitation[2] (in/mo)	Pan Evaporation[3] (in/mo)	Pond Evaporation[4] (in/mo)	Active W.S. Evaporation[5] (in/mo)
1	Jan	1.63	0.10	2.32	4.13	2.89	3.51
2	Feb	1.46	0.14	1.73	4.28	3.00	3.64
3	Mar	1.46	0.10	1.85	7.11	4.98	6.04
4	Apr	0.69	0.01	0.94	8.50	5.95	7.23
5	May	0.24	0.00	0.57	10.38	7.27	8.82
6	Jun	0.62	0.02	1.12	10.75	7.53	9.14
7	Jul	4.87	2.09	6.67	4.93	3.45	4.19
8	Aug	4.32	2.21	6.32	2.89	2.02	2.46
9	Sep	2.15	0.39	2.92	4.40	3.08	3.74
10	Oct	1.62	0.08	3.16	6.15	4.31	5.23
11	Nov	1.15	0.18	1.30	4.11	2.88	3.49
12	Dec	1.96	0.13	3.21	3.89	2.72	3.31
	Yearly Total	22.17	5.45	32.09	71.52	50.06	60.79

[1] Precipitation values were taken from *Santa Rita Experimental Range, Arizona: Average Total Precipitation (inches)* (WRCC, 2008).

[2] Precipitation values calculated from *Nogales 6N, Arizona: Monthly Total Precipitation (inches)* (WRCC, 2008).

[3] Pan evaporation values were taken from Technical Memo, Rosemont Copper Project Design Storm and Precipitation Data/Design Criteria (Tetra Tech, Aril 2009).

[4] Pond evaporation values were computed from pan evaporation values using an assumed pan evaporation coefficient of 0.70 as given in Handbook of Applied Hydrology (Chow, 1964).

[5] Wetted surface evaporation values were computed from pan evaporation values using an assumed pan evaporation coefficient of 0.85 to account for the additional area exposed on the wetted surface of the heap leach pad.

Table 2 - Pond Sizing Results

Selected Pond	Base Width (ft)	Base Length (ft)	Top Width (ft)	Top Length (ft)	Total Depth (ft)	Ultimate Capacity (acre-ft)
PLS Pond	200.0	350.0	296.2	446.2	19.2	43.9
	215.0	376.3	308.2	469.5	18.6	47.6
	230.0	402.5	320.7	493.2	18.1	51.6
	245.0	428.8	333.4	517.2	17.7	55.8
	260.0	455.0	346.5	541.5	17.3	60.2
Raffinate Solution Pond	40.0	70.0	162.2	192.2	24.4	8.1
	55.0	96.3	166.9	208.1	22.4	9.2
	70.0	122.5	173.7	226.2	20.7	10.5
	85.0	148.8	182.2	246.0	19.4	12.1
	100.0	175.0	192.1	267.1	18.4	13.9
Stormwater Pond	360.0	450.0	459.0	499.0	19.8	84.0
	400.0	450.0	485.9	535.9	17.2	86.4
	450.0	500.0	524.4	574.4	14.9	89.5
	500.0	550.0	565.3	615.3	13.1	93.1
	550.0	600.0	608.0	658.0	11.6	97.1

Table 3 - Summary Year Water Balance Results

Make-Up Water Results			
Make-Up Water Value Description	Avg. Year Make-Up Water (gpm)	Dry Year Make-Up Water (gpm)	Wet Year Make-Up Water (gpm)
Minimum	566	597	538
Maximum	744	753	737

FIGURE

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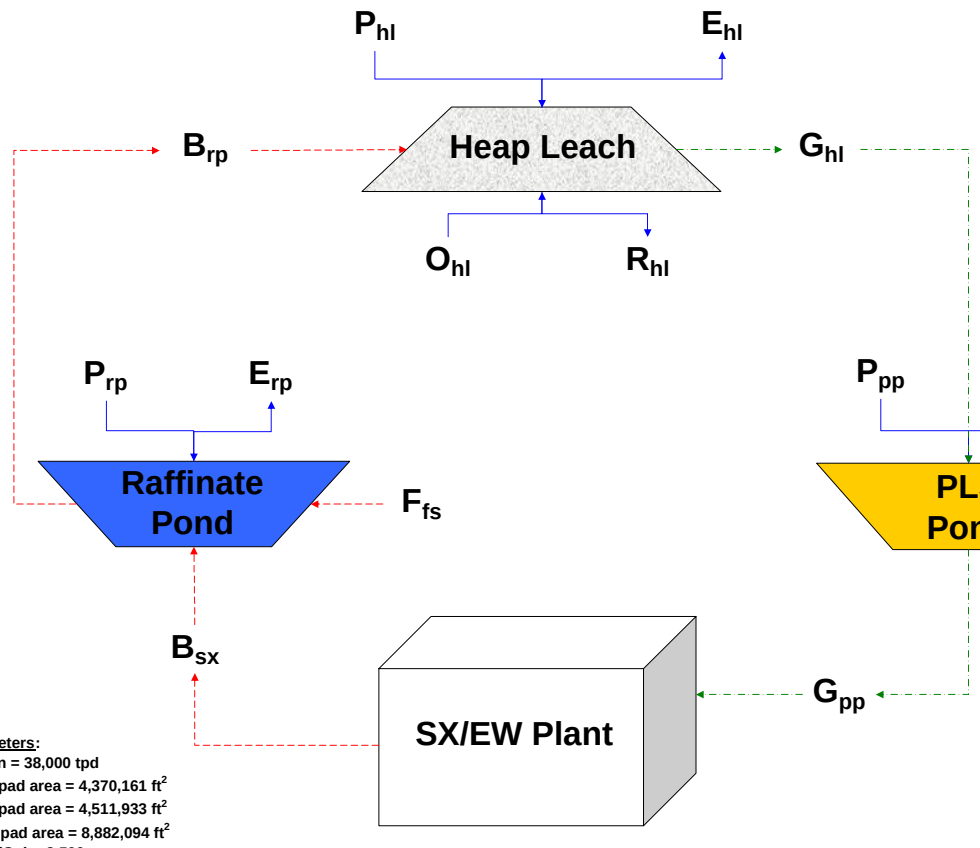
CLIENT:	Rosemont Copper Co.	
PROJECT:	Heap Leach Facility	JOB NO: 320807
SUBJECT:	Water Balance & Pond Sizing	BY: EMS
DETAILS:	Heap Leach Process Schematic	DATE: 4/17/2009



Note: overflows from PLS Pond go to Storm Water Pond (not shown) and are pumped back within 72 hours.

Design Parameters:
Ore production = 38,000 tpd
Phase 1 lined pad area = 4,370,161 ft^2
Phase 2 lined pad area = 4,511,933 ft^2
Ultimate lined pad area = 8,882,094 ft^2
PLS flow rate (G_{hl}) = 2,500 gpm

Legend

- = Pumped Flow
- = Gravity Flow
- = Environmental Flow
- B_{rp} = Barren Solution Flow from Raffinate Pond to Heap Leach
- B_{sx} = Barren Solution Flow from SX/EW Plant to Raffinate Pond
- E_{hl} = Evaporation from Heap Leach
- E_{rp} = Evaporation from Raffinate Pond
- E_{pp} = Evaporation from PLS Pond
- F_{fs} = Fresh water flow from Fresh Water Source to Raffinate Pond
- G_{hl} = Pregnant Solution Flow from Heap Leach to PLS Pond
- G_{pp} = Pregnant Solution Flow from PLS Pond to SX/EW Plant
- O_{hl} = Incoming Ore Moisture
- P_{hl} = Precipitation on Heap Leach
- P_{rp} = Precipitation on Raffinate Pond
- P_{pp} = Precipitation on PLS Pond
- R_{hl} = Ore Moisture Retention
- S_{rp_i-1} = Volume of water in Raffinate Pond for the previous month
- S_{rp_i} = Volume of water in Raffinate Pond for the current month
- S_{rp_max} = Ultimate Raffinate Pond Capacity
- S_{pp_i-1} = Volume of water in PLS Pond for the previous month
- S_{pp_i} = Volume of water in PLS Pond for the current month
- S_{pp_max} = Ultimate PLS Pond Capacity

Equations: Heap Leach

P_{hl} (ft^3/month) = Monthly Precipitation (in/month) x Active Leach Area (ft^2)/ 12 (in/ft)
O_{hl} (ft^3/month) = Ore Heap Production (ton/day) x # of Days in Month (day/month) x Ore Moisture Content (%) x 2000 (lb/ton) / 62.4 (lb/ft^3)
R_{hl} (ft^3/month) = Ore Heap Production (ton/day) x # of Days in Month (day/month) x Ore Moisture Retention (%) x 2000 (lb/ton) / 62.4 (lb/ft^3)
G_{hl} (ft^3/month) = PLS Flow Rate (gpm) x # of Days in Month (day/month) x 1440 (min/day) / 7.48052 (gal/ft^3)
B_{rp} (ft^3/month) = (Monthly Wetted Surface Evaporation (in/month) x Active Leach Area (ft^2) / 12 (in/ft) + R_{hl} + G_{hl} - (O_{hl} + P_{hl})) / (1 - Raffinate Application Loss Rate (%))
E_{hl} (ft^3/month) = Monthly Wetted Surface Evaporation (in/month) x Active Leach Area (ft^2) / 12 (in/ft) + Raffinate Application Loss Rate (%) * B_{rp}

Equations: PLS Pond

P_{pp} (ft^3/month) = Monthly Precipitation (in/month) x PLS Pond Surface Area (ft^2) / 12 (in/ft)
E_{pp} (ft^3/month) = Monthly Pond Evaporation (in/month) x PLS Pond Surface Area (ft^2) / 12 (in/ft)
G_{pp} (ft^3/month) = S_{pp_i-1} / 1 mo + P_{pp} + G_{hl} - E_{pp}
S_{pp_i} (ft^3) = S_{pp_i-1} + (P_{pp} + G_{hl} - E_{pp} - G_{pp}) x 1 mo

Equations: SX/EW Plant

B_{sx} (ft^3/month) = G_{pp}

Equations: Raffinate Pond

P_{rp} (ft^3/month) = Monthly Precipitation (in/month) x Raffinate Pond Surface Area (ft^2) / 12 (in/ft)
E_{rp} (ft^3/month) = Monthly Pond Evaporation (in/month) x Raffinate Pond Surface Area (ft^2) / 12 (in/ft)
F_{fs} (ft^3/month) = (B_{rp} + E_{rp}) - (S_{rp_i-1} / 1 mo + B_{sx} + P_{rp})
S_{rp_i} (ft^3) = S_{rp_i-1} + (P_{rp} + B_{sx} + F_{fs} - B_{rp} - E_{rp}) x 1 mo

Figure 1 - Water Balance Schematic

ATTACHMENTS

ATTACHMENT 1
PLS POND SIZING

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CLIENT: Rosemont Copper Co.	
PROJECT: Heap Leach Facility	JOB NO: 320807
SUBJECT: Water Balance & Pond Sizing	BY: EMS
DETAILS: **Attachment 1: PLS Pond Sizing**	DATE: 4/17/2009

In order to size the PLS Pond, the normal operations volume and the drain-down volume (in the event of a spill) must be determined.
In order to determine these values the pregnant solution flow from the Heap Leach Pad must be estimated as shown below:

PLS Pond Operating Flow Estimate (Part 1 - Design Criteria)

PLS Flow Rate (gpm)	Pan Evaporation Coefficient	Operations Duration (hr)	Drain-down Duration (hr)
2,500	0.70	8	24

Since the PLS flow rate is known, the normal operations and the drain-down volumes can be calculated directly without having to consider environmental effects.

PLS Pond Op. Flow Est. (Part 2 - Calc.)

Normal Op. Volume V_{op} (ft^3)	Drain-Down Volume V_{sp} (ft^3)	Total Volume $V_{sp} + V_{sp}$ (ft^3)
160,417	481,250	641,667

Now, estimate the PLS Pond size based on given design assumptions and Arizona BADCT guidelines:

PLS Pond Sizing Estimate - Input

Length to Width Ratio L/W (ft/ft)	Side Slopes z (H:1V)	Minimum Op. Depth d_{min} (ft)	Normal Op. Volume V_{op} (ft^3)	Drain-Down Volume V_{sp} (ft^3)	Design Storm Depth d_{st} (in)	Dry Freeboard d_{fb} (ft)
1.75	2.5	10.0	160,417	481,250	4.75	3.0

$A_o = W_o \times L_o$

$A_d = (W_o + 2zd) \times (L_o + 2zd)$

$V_d = 1/3d \times (A_o + (A_oA_d)^{1/2} + A_d)$

An iterative solution process was used, with assumptions in yellow cells and calculated comparisor results in green cells. (Tools → Goal Seek)

PLS Pond Base - Calculation			Min. Operations - Calc.		Normal Operations - Calculation			Drain-Down - Calculation		
Base Width W_o (ft)	Base Length L_o (ft)	Base Area A_o (ft^2)	Minimum Op. Area A_{min} (ft^2)	Minimum Op. Volume V_{min} (ft^3)	Assumed Op. Depth d_{op-a} (ft)	Calculated Op. Area A_{op-a} (ft^2)	Calculated Op. Volume V_{op-a} (ft^3)	Assumed D-D Depth d_{sp-a} (ft)	Calculated D-D Area A_{sp-a} (ft^2)	Calculated D-D Volume V_{sp-a} (ft^3)
200.0	350.0	70,000	100,000	845,553	1.6	105,145	160,417	4.3	119,850	481,250
215.0	376.3	80,894	112,956	964,800	1.4	117,810	160,417	3.9	131,786	481,250
230.0	402.5	92,575	126,700	1,091,922	1.2	131,293	160,417	3.5	144,597	481,250
245.0	428.8	105,044	141,231	1,226,920	1.1	145,590	160,417	3.2	158,276	481,250
260.0	455.0	118,300	156,550	1,369,792	1.0	160,697	160,417	2.9	172,814	481,250

	Design Precipitation Event - Calculation					Dry Freeboard - Calc.	
Base Width W_o (ft)	Assumed Runoff Depth d_{ro-a} (in)	Calculated Runoff Area A_{ro-a} (ft^2)	Calculated Runoff Vol. V_{ro-a} (ft^3)	Calculated Storm Vol. V_{st} (ft^3)	Calculation Error $(V_{ro-a} - V_{st})$ (ft^3)	Dry Area A_{fb} (ft^2)	Dry Volume V_{fb} (ft^3)
200.0	4.78	121,265	48,001	48,001	0	132,176	380,044
215.0	4.78	133,270	52,753	52,753	0	144,711	416,853
230.0	4.78	146,153	57,852	57,852	0	158,135	456,314
245.0	4.77	159,905	63,296	63,296	0	172,439	498,397
260.0	4.77	174,516	69,079	69,079	0	187,611	543,072

	PLS Pond Top - Calculation Results							
Base Width W_o (ft)	Total Depth d (ft)	Top Width W_d (ft)	Top Length L_d (ft)	Top Area A_d (ft^2)	Top Area A_d (acre)	Total Volume V_d (ft^3)	Total Volume V_d (acre-ft)	
200.0	19.2	296.2	446.2	132,176	3.0	1,913,834	43.9	
215.0	18.6	308.2	469.5	144,711	3.3	2,074,753	47.6	⇦ used for fresh water make-up estimation
230.0	18.1	320.7	493.2	158,135	3.6	2,246,531	51.6	
245.0	17.7	333.4	517.2	172,439	4.0	2,429,138	55.8	
260.0	17.3	346.5	541.5	187,611	4.3	2,622,539	60.2	

Based on the results of this calculation, the PLS Pond can range in size from roughly 44 to 60 acre-ft, depending on the desired depth and plan area used.

ATTACHMENT 2
STORMWATER POND SIZING

TETRA TECH

CLIENT: Rosemont Copper Co.

PROJECT: Heap Leach Facility | JOB NO: 320807

SUBJECT: Water Balance & Pond Sizing | BY: EMS

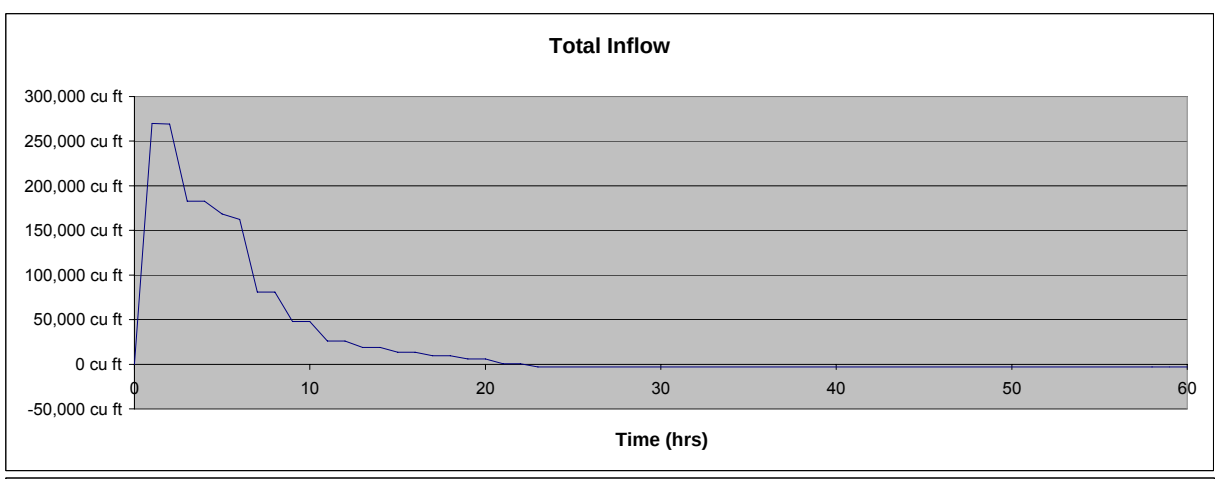
DETAILS: **Attachment 2a: Stormwater Volume - Case 1** | DATE: 4/17/2009

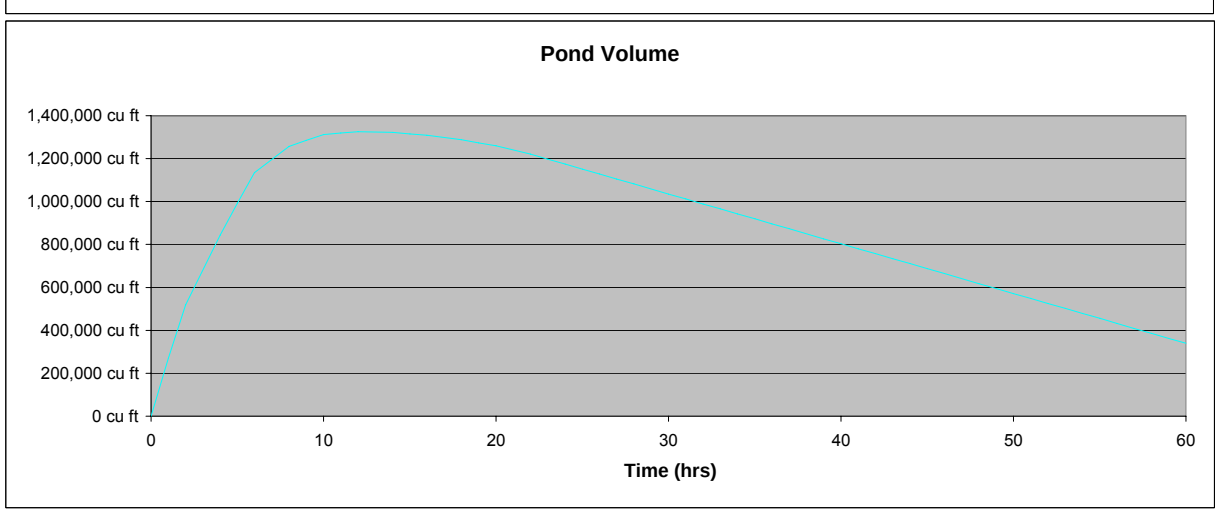
Model Assumptions	Value
Shutdown Duration	1 hr
Plant Flow	2,500 gpm
Runoff from slopes	25%
Total Lined Area	4,320,974 sq ft
Total Heap Slope Area	0 sq ft
Permibility	0.00328 ft/sec
Event Size	4.75 in
Process Flow	2,500 gpm 20,052 cu ft/hr
Tons Placed	38,000 t/d
Moisture of ore from Mine	2%
Field Capacity of ore	7%
Evaporation	3%

Average Distance Above Liner	Area	Time to Travel
0 ft	4,320,974 sq ft	0.00 hr
60 ft	0 sq ft	5.00 hr
120 ft	0 sq ft	10.00 hr
180 ft	0 sq ft	15.00 hr
240 ft	0 sq ft	20.00 hr
300 ft	0 sq ft	25.00 hr

Hour	% of Rainfall	Amount of Rainfall	Pump to Heap Leach	Total Inflow	Volume in Pond	Change in Volume	Process Flow	Ore Wetting	Evaporation	Slope Run-Off	Ore Depth: 0 ft Area at Depth: 4,320,974 sq ft	Cumulative Total
0	0.0%	0.00000 ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft
1	15.9%	0.06301 ft	0 cu ft	269,737 cu ft	269,737 cu ft	269,737 cu ft	0 cu ft	-2,536 cu ft	0 cu ft	0 cu ft	272,273 cu ft	269,737 cu ft
2	31.8%	0.06301 ft	-20,052 cu ft	269,135 cu ft	518,820 cu ft	249,083 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	272,273 cu ft	538,872 cu ft
3	42.7%	0.04303 ft	-20,052 cu ft	182,774 cu ft	681,541 cu ft	162,722 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	185,911 cu ft	721,645 cu ft
4	53.6%	0.04303 ft	-20,052 cu ft	182,774 cu ft	844,263 cu ft	162,722 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	185,911 cu ft	904,419 cu ft
5	63.6%	0.03972 ft	-20,052 cu ft	168,510 cu ft	992,721 cu ft	148,458 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	171,648 cu ft	1,072,929 cu ft
6	73.3%	0.03831 ft	-20,052 cu ft	162,397 cu ft	1,135,066 cu ft	142,345 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	165,535 cu ft	1,235,326 cu ft
7	78.2%	0.01945 ft	-20,052 cu ft	80,920 cu ft	1,195,934 cu ft	60,868 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	84,057 cu ft	1,316,246 cu ft
8	83.1%	0.01945 ft	-20,052 cu ft	80,920 cu ft	1,256,801 cu ft	60,868 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	84,057 cu ft	1,397,166 cu ft
9	86.1%	0.01184 ft	-20,052 cu ft	48,028 cu ft	1,284,777 cu ft	27,975 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	51,165 cu ft	1,445,193 cu ft
10	89.1%	0.01184 ft	-20,052 cu ft	48,028 cu ft	1,312,752 cu ft	27,975 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	51,165 cu ft	1,493,221 cu ft
11	90.8%	0.00677 ft	-20,052 cu ft	26,100 cu ft	1,318,799 cu ft	6,047 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	29,237 cu ft	1,519,320 cu ft
12	92.5%	0.00677 ft	-20,052 cu ft	26,100 cu ft	1,324,847 cu ft	6,047 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	29,237 cu ft	1,545,420 cu ft
13	93.8%	0.00507 ft	-20,052 cu ft	18,790 cu ft	1,323,585 cu ft	-1,262 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	21,928 cu ft	1,564,210 cu ft
14	95.1%	0.00507 ft	-20,052 cu ft	18,790 cu ft	1,322,323 cu ft	-1,262 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	21,928 cu ft	1,583,000 cu ft
15	96.0%	0.00381 ft	-20,052 cu ft	13,308 cu ft	1,315,579 cu ft	-6,744 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	16,446 cu ft	1,596,308 cu ft
16	97.0%	0.00381 ft	-20,052 cu ft	13,308 cu ft	1,308,835 cu ft	-6,744 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	16,446 cu ft	1,609,617 cu ft
17	97.8%	0.00296 ft	-20,052 cu ft	9,654 cu ft	1,298,437 cu ft	-10,399 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	12,791 cu ft	1,619,270 cu ft
18	98.5%	0.00296 ft	-20,052 cu ft	9,654 cu ft	1,288,038 cu ft	-10,399 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	12,791 cu ft	1,628,924 cu ft
19	99.0%	0.00211 ft	-20,052 cu ft	5,999 cu ft	1,273,985 cu ft	-14,053 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	9,137 cu ft	1,634,923 cu ft
20	99.6%	0.00211 ft	-20,052 cu ft	5,999 cu ft	1,259,932 cu ft	-14,053 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	9,137 cu ft	1,640,921 cu ft
21	99.8%	0.00085 ft	-20,052 cu ft	517 cu ft	1,240,397 cu ft	-19,535 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	3,655 cu ft	1,641,438 cu ft
22	100.0%	0.00085 ft	-20,052 cu ft	517 cu ft	1,220,861 cu ft	-19,535 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	3,655 cu ft	1,641,955 cu ft
23	100.0%	0.00000 ft	-20,052 cu ft	-3,138 cu ft	1,197,671 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	0 cu ft	1,638,817 cu ft
24	100.0%	0.00000 ft	-20,052 cu ft	-3,138 cu ft	1,174,482 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	0 cu ft	1,635,679 cu ft
25			-20,052 cu ft	-3,138 cu ft	1,151,292 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,632,542 cu ft
26			-20,052 cu ft	-3,138 cu ft	1,128,102 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,629,404 cu ft
27			-20,052 cu ft	-3,138 cu ft	1,104,912 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,626,266 cu ft
28			-20,052 cu ft	-3,138 cu ft	1,081,722 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,623,128 cu ft
29			-20,052 cu ft	-3,138 cu ft	1,058,532 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,619,990 cu ft
30			-20,052 cu ft	-3,138 cu ft	1,035,342 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,616,853 cu ft
31			-20,052 cu ft	-3,138 cu ft	1,012,152 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,613,715 cu ft
32			-20,052 cu ft	-3,138 cu ft	988,962 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,610,577 cu ft
33			-20,052 cu ft	-3,138 cu ft	965,772 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,607,439 cu ft
34			-20,052 cu ft	-3,138 cu ft	942,583 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,604,301 cu ft
35			-20,052 cu ft	-3,138 cu ft	919,393 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,601,163 cu ft
36			-20,052 cu ft	-3,138 cu ft	896,203 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,598,026 cu ft
37			-20,052 cu ft	-3,138 cu ft	873,013 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,594,888 cu ft
38			-20,052 cu ft	-3,138 cu ft	849,823 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,591,750 cu ft
39			-20,052 cu ft	-3,138 cu ft	826,633 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,588,612 cu ft
40			-20,052 cu ft	-3,138 cu ft	803,443 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,585,474 cu ft
41			-20,052 cu ft	-3,138 cu ft	780,253 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,582,337 cu ft
42			-20,052 cu ft	-3,138 cu ft	757,063 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,579,199 cu ft
43			-20,052 cu ft	-3,138 cu ft	733,873 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,576,061 cu ft
44			-20,052 cu ft	-3,138 cu ft	710,684 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,572,923 cu ft
45			-20,052 cu ft	-3,138 cu ft	687,494 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,569,785 cu ft
46			-20,052 cu ft	-3,138 cu ft	664,304 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,566,647 cu ft
47			-20,052 cu ft	-3,138 cu ft	641,114 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,563,510 cu ft
48			-20,052 cu ft	-3,138 cu ft	617,924 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,560,372 cu ft
49			-20,052 cu ft	-3,138 cu ft	594,734 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,557,234 cu ft
50			-20,052 cu ft	-3,138 cu ft	571,544 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,554,096 cu ft
51			-20,052 cu ft	-3,138 cu ft	548,354 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,550,958 cu ft
52			-20,052 cu ft	-3,138 cu ft	525,164 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,547,821 cu ft
53			-20,052 cu ft	-3,138 cu ft	501,974 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,544,683 cu ft
54			-20,052 cu ft	-3,138 cu ft	478,785 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,541,545 cu ft
55			-20,052 cu ft	-3,138 cu ft	455,595 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,538,407 cu ft
56			-20,052 cu ft	-3,138 cu ft	432,405 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,535,269 cu ft
57			-20,052 cu ft	-3,138 cu ft	409,215 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,532,132 cu ft
58			-20,052 cu ft	-3,138 cu ft	386,025 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,528,994 cu ft
59			-20,052 cu ft	-3,138 cu ft	362,835 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,525,856 cu ft
60			-20,052 cu ft	-3,138 cu ft	339,645 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,522,718 cu ft

5 days Number of days to consume water by ore wetting alone





TETRA TECH

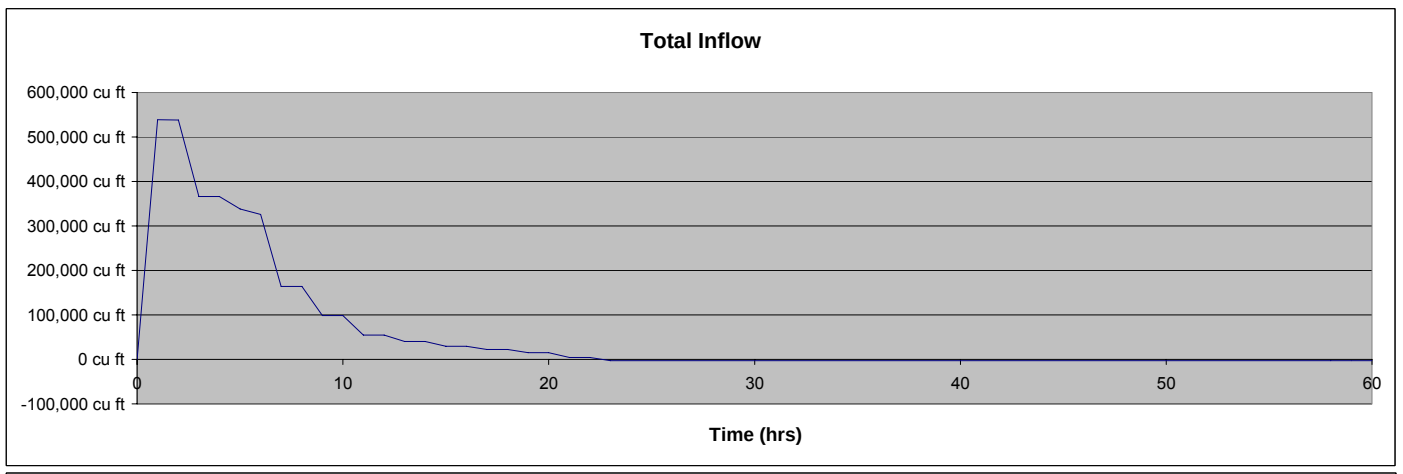
CLIENT: Rosemont Copper Co.
PROJECT: Heap Leach Facility — JOB NO: 320807
SUBJECT: Water Balance & Pond Sizing — BY: EMS
DETAILS: **Attachment 2b: Stormwater Volume - Case 2** — DATE: 4/17/2009

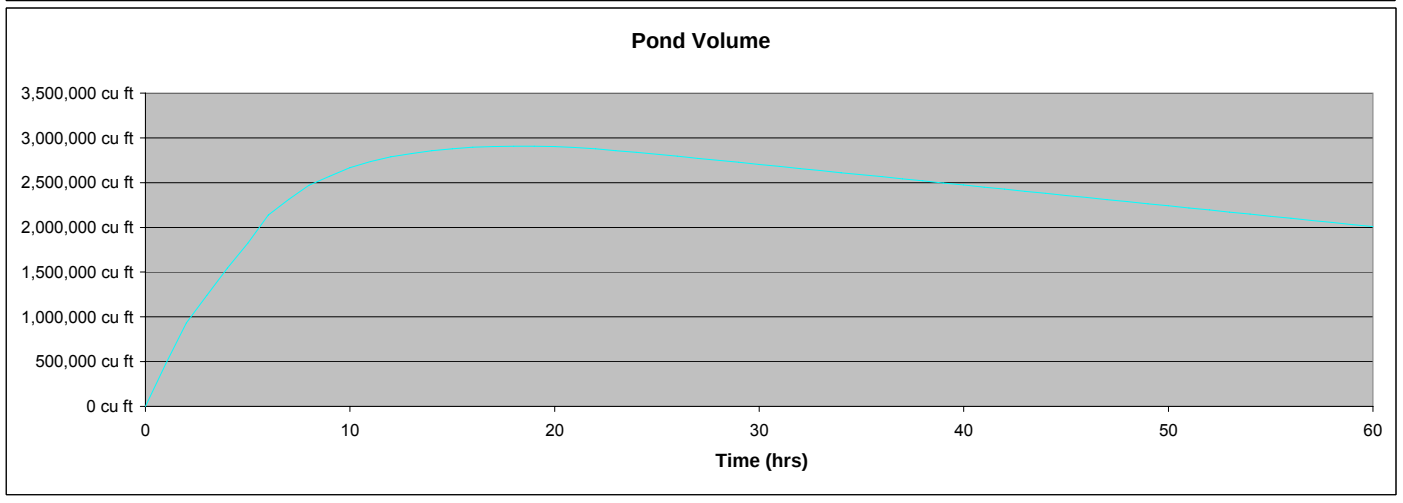
Model Assumptions	Value
Shutdown Duration	1 hr
Plant Flow	2,500 gpm
Runoff from slopes	25%
Total Lined Area	8,590,509 sq ft
Total Heap Slope Area	1,225,052 sq ft
Permibility	0.00328 ft/sec
Event Size	4.75 in
Process Flow	2,500 gpm 20,052 cu ft/hr
Tons Placed	38,000 t/d
Moisture of ore from Mine	2%
Field Capacity of ore	7%
Evaporation	3%

Average Distance Above Liner	Area	Time to Travel
0 ft	7,365,457 sq ft	0.00 hr
60 ft	1,011,782 sq ft	5.00 hr
120 ft	213,270 sq ft	10.00 hr
180 ft	0 sq ft	15.00 hr
240 ft	0 sq ft	20.00 hr
300 ft	0 sq ft	25.00 hr

Hour	% of Rainfall	Amount of Rainfall	Pump to Heap Leach	Total Inflow	Volume in Pond	Change in Volume	Process Flow	Ore Wetting	Evaporation	Slope Run-Off	Ore Depth: / Area at Depth:	0 ft 7,365,457 sq ft	60 ft 1,011,782 sq ft	120 ft 213,270 sq ft	Cumulative Total
0	0.0%	0.00000 ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft		0 cu ft			0 cu ft
1	15.9%	0.06301 ft	0 cu ft	477,514 cu ft	477,514 cu ft	477,514 cu ft	0 cu ft	-2,536 cu ft	0 cu ft	15,939 cu ft		464,112 cu ft			477,514 cu ft
2	31.8%	0.06301 ft	-20,052 cu ft	476,912 cu ft	934,374 cu ft	456,860 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	15,939 cu ft		464,112 cu ft			954,426 cu ft
3	42.7%	0.04303 ft	-20,052 cu ft	324,647 cu ft	1,238,969 cu ft	304,595 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	10,883 cu ft		316,901 cu ft			1,279,073 cu ft
4	53.6%	0.04303 ft	-20,052 cu ft	324,647 cu ft	1,543,564 cu ft	304,595 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	10,883 cu ft		316,901 cu ft			1,603,720 cu ft
5	63.6%	0.03972 ft	-20,052 cu ft	299,498 cu ft	1,823,010 cu ft	279,446 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	10,048 cu ft		292,588 cu ft	0 cu ft		1,903,218 cu ft
6	73.3%	0.03831 ft	-20,052 cu ft	336,536 cu ft	2,139,494 cu ft	316,484 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	9,690 cu ft		282,168 cu ft	47,816 cu ft		2,239,755 cu ft
7	78.2%	0.01945 ft	-20,052 cu ft	192,881 cu ft	2,312,324 cu ft	172,829 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	4,921 cu ft		143,283 cu ft	47,816 cu ft		2,432,636 cu ft
8	83.1%	0.01945 ft	-20,052 cu ft	177,715 cu ft	2,469,986 cu ft	157,663 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	4,921 cu ft		143,283 cu ft	32,649 cu ft		2,610,351 cu ft
9	86.1%	0.01184 ft	-20,052 cu ft	119,722 cu ft	2,569,656 cu ft	99,670 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	2,995 cu ft		87,216 cu ft	32,649 cu ft		2,730,073 cu ft
10	89.1%	0.01184 ft	-20,052 cu ft	117,217 cu ft	2,666,822 cu ft	97,165 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	2,995 cu ft		87,216 cu ft	30,144 cu ft	0 cu ft	2,847,290 cu ft
11	90.8%	0.00677 ft	-20,052 cu ft	87,561 cu ft	2,734,330 cu ft	67,509 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	1,712 cu ft		49,837 cu ft	29,071 cu ft	10,079 cu ft	2,934,851 cu ft
12	92.5%	0.00677 ft	-20,052 cu ft	73,252 cu ft	2,787,530 cu ft	53,200 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	1,712 cu ft		49,837 cu ft	14,762 cu ft	10,079 cu ft	3,008,103 cu ft
13	93.8%	0.00507 ft	-20,052 cu ft	57,168 cu ft	2,824,646 cu ft	37,116 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	1,284 cu ft		37,378 cu ft	14,762 cu ft	6,882 cu ft	3,065,271 cu ft
14	95.1%	0.00507 ft	-20,052 cu ft	51,391 cu ft	2,855,985 cu ft	31,339 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	1,284 cu ft		37,378 cu ft	8,986 cu ft	6,882 cu ft	3,116,663 cu ft
15	96.0%	0.00381 ft	-20,052 cu ft	41,198 cu ft	2,877,131 cu ft	21,146 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	963 cu ft		28,034 cu ft	8,986 cu ft	6,354 cu ft	3,157,861 cu ft
16	97.0%	0.00381 ft	-20,052 cu ft	37,121 cu ft	2,894,200 cu ft	17,069 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	963 cu ft		28,034 cu ft	5,135 cu ft	6,128 cu ft	3,194,981 cu ft
17	97.8%	0.00296 ft	-20,052 cu ft	27,661 cu ft	2,901,809 cu ft	7,609 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	749 cu ft		21,804 cu ft	5,135 cu ft	3,112 cu ft	3,222,642 cu ft
18	98.5%	0.00296 ft	-20,052 cu ft	26,377 cu ft	2,908,134 cu ft	6,325 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	749 cu ft		21,804 cu ft	3,851 cu ft	3,112 cu ft	3,249,020 cu ft
19	99.0%	0.00211 ft	-20,052 cu ft	18,716 cu ft	2,906,799 cu ft	-1,336 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	535 cu ft		15,574 cu ft	3,851 cu ft	1,894 cu ft	3,267,736 cu ft
20	99.6%	0.00211 ft	-20,052 cu ft	17,753 cu ft	2,904,500 cu ft	-2,299 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	535 cu ft		15,574 cu ft	2,888 cu ft	1,894 cu ft	3,285,490 cu ft
21	99.8%	0.00085 ft	-20,052 cu ft	7,276 cu ft	2,891,724 cu ft	-12,776 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	214 cu ft		6,230 cu ft	2,888 cu ft	1,082 cu ft	3,292,766 cu ft
22	100.0%	0.00085 ft	-20,052 cu ft	6,634 cu ft	2,878,307 cu ft	-13,418 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	214 cu ft		6,230 cu ft	2,246 cu ft	1,082 cu ft	3,299,400 cu ft
23	100.0%	0.00000 ft	-20,052 cu ft	-80 cu ft	2,858,175 cu ft	-20,132 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft		0 cu ft	2,246 cu ft	812 cu ft	3,299,321 cu ft
24	100.0%	0.00000 ft	-20,052 cu ft	-722 cu ft	2,837,401 cu ft	-20,774 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft		0 cu ft	1,605 cu ft	812 cu ft	3,298,599 cu ft
25			-20,052 cu ft	-924 cu ft	2,816,425 cu ft	-20,977 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft				1,605 cu ft	609 cu ft	3,297,675 cu ft
26			-20,052 cu ft	-1,887 cu ft	2,794,485 cu ft	-21,939 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft				642 cu ft	609 cu ft	3,295,787 cu ft
27			-20,052 cu ft	-2,022 cu ft	2,772,411 cu ft	-22,075 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft				642 cu ft	474 cu ft	3,293,765 cu ft
28			-20,052 cu ft	-2,664 cu ft	2,749,694 cu ft	-22,716 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft				0 cu ft	474 cu ft	3,291,101 cu ft
29			-20,052 cu ft	-2,800 cu ft	2,726,843 cu ft	-22,852 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft				0 cu ft	338 cu ft	3,288,301 cu ft
30			-20,052 cu ft	-2,800 cu ft	2,703,991 cu ft	-22,852 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft					338 cu ft	3,285,501 cu ft
31			-20,052 cu ft	-3,003 cu ft	2,680,936 cu ft	-23,055 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft					135 cu ft	3,282,499 cu ft
32			-20,052 cu ft	-3,003 cu ft	2,657,882 cu ft	-23,055 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft					135 cu ft	3,279,496 cu ft
33			-20,052 cu ft	-3,138 cu ft	2,634,692 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft					0 cu ft	3,276,359 cu ft
34			-20,052 cu ft	-3,138 cu ft	2,611,502 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft					0 cu ft	3,273,221 cu ft
35			-20,052 cu ft	-3,138 cu ft	2,588,312 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,270,083 cu ft
36			-20,052 cu ft	-3,138 cu ft	2,565,122 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,266,945 cu ft
37			-20,052 cu ft	-3,138 cu ft	2,541,932 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,263,807 cu ft
38			-20,052 cu ft	-3,138 cu ft	2,518,742 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,260,669 cu ft
39			-20,052 cu ft	-3,138 cu ft	2,495,553 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,257,532 cu ft
40			-20,052 cu ft	-3,138 cu ft	2,472,363 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,254,394 cu ft
41			-20,052 cu ft	-3,138 cu ft	2,449,173 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,251,256 cu ft
42			-20,052 cu ft	-3,138 cu ft	2,425,983 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,248,118 cu ft
43			-20,052 cu ft	-3,138 cu ft	2,402,793 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,244,980 cu ft
44			-20,052 cu ft	-3,138 cu ft	2,379,603 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,241,843 cu ft
45			-20,052 cu ft	-3,138 cu ft	2,356,413 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,238,705 cu ft
46			-20,052 cu ft	-3,138 cu ft	2,333,223 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,235,567 cu ft
47			-20,052 cu ft	-3,138 cu ft	2,310,033 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,232,429 cu ft
48			-20,052 cu ft	-3,138 cu ft	2,286,843 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,229,291 cu ft
49			-20,052 cu ft	-3,138 cu ft	2,263,654 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,226,153 cu ft
50			-20,052 cu ft	-3,138 cu ft	2,240,464 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,223,016 cu ft
51			-20,052 cu ft	-3,138 cu ft	2,217,274 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,219,878 cu ft
52			-20,052 cu ft	-3,138 cu ft	2,194,084 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,216,740 cu ft
53			-20,052 cu ft	-3,138 cu ft	2,170,894 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,213,602 cu ft
54			-20,052 cu ft	-3,138 cu ft	2,147,704 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,210,464 cu ft
55			-20,052 cu ft	-3,138 cu ft	2,124,514 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,207,327 cu ft
56			-20,052 cu ft	-3,138 cu ft	2,101,324 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,204,189 cu ft
57			-20,052 cu ft	-3,138 cu ft	2,078,134 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,201,051 cu ft
58			-20,052 cu ft	-3,138 cu ft	2,054,944 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,197,913 cu ft
59			-20,052 cu ft	-3,138 cu ft	2,031,755 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,194,775 cu ft
60			-20,052 cu ft	-3,138 cu ft	2,008,565 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,191,637 cu ft

27 days Number of days to consume water by ore wetting alone





TETRA TECH

CLIENT: Rosemont Copper Co.

PROJECT: Heap Leach Facility | JOB NO: 320807

SUBJECT: Water Balance & Pond Sizing | BY: EMS

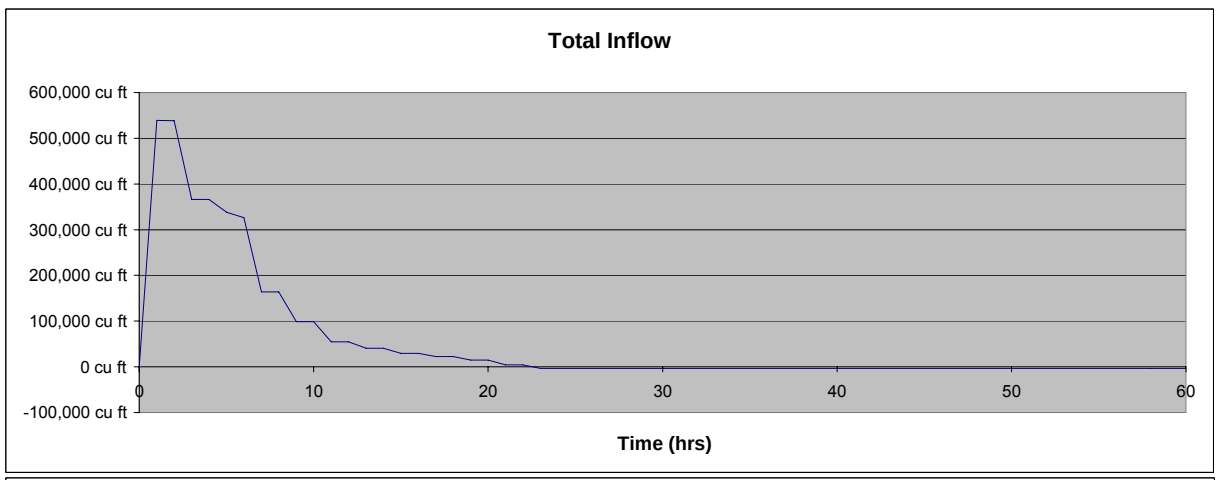
DETAILS: **Attachment 2c: Stormwater Volume - Case 3** | DATE: 4/17/2009

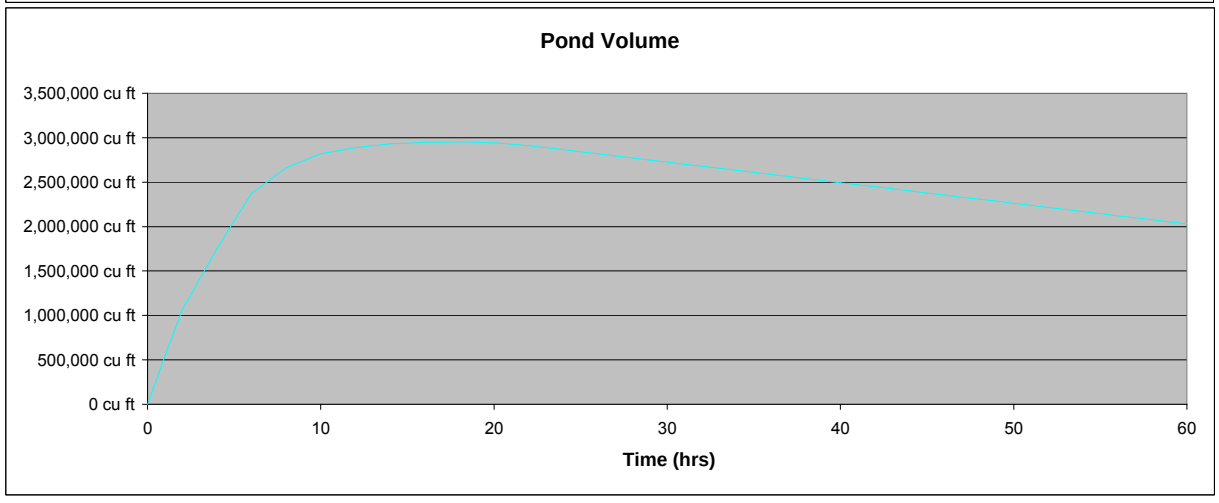
Model Assumptions	Value
Shutdown Duration	1 hr
Plant Flow	2,500 gpm
Runoff from slopes	25%
Total Lined Area	8,590,509 sq ft
Total Heap Slope Area	0 sq ft
Permibility	0.00328 ft/sec
Event Size	4.75 in
Process Flow	2,500 gpm 20,052 cu ft/hr
Tons Placed	38,000 t/d
Moisture of ore from Mine	2%
Field Capacity of ore	7%
Evaporation	3%

Average Distance Above Liner	Area	Time to Travel
0 ft	8,590,509 sq ft	0.00 hr
60 ft	0 sq ft	5.00 hr
120 ft	0 sq ft	10.00 hr
180 ft	0 sq ft	15.00 hr
240 ft	0 sq ft	20.00 hr
300 ft	1 sq ft	25.00 hr

Hour	% of Rainfall	Amount of Rainfall	Pump to Heap Leach	Total Inflow	Volume in Pond	Change in Volume	Process Flow	Ore Wetting	Evaporation	Slope Run-Off	Ore Depth: 0 ft Area at Depth: 8,590,509 sq ft	Cumulative Total
0	0.0%	0.00000 ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft
1	15.9%	0.06301 ft	0 cu ft	538,768 cu ft	538,768 cu ft	538,768 cu ft	0 cu ft	-2,536 cu ft	0 cu ft	0 cu ft	541,305 cu ft	538,768 cu ft
2	31.8%	0.06301 ft	-20,052 cu ft	538,167 cu ft	1,056,883 cu ft	518,115 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	541,305 cu ft	1,076,935 cu ft
3	42.7%	0.04303 ft	-20,052 cu ft	366,472 cu ft	1,403,303 cu ft	346,420 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	369,610 cu ft	1,443,407 cu ft
4	53.6%	0.04303 ft	-20,052 cu ft	366,472 cu ft	1,749,723 cu ft	346,420 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	369,610 cu ft	1,809,879 cu ft
5	63.6%	0.03972 ft	-20,052 cu ft	338,115 cu ft	2,067,785 cu ft	318,063 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	341,253 cu ft	2,147,994 cu ft
6	73.3%	0.03831 ft	-20,052 cu ft	325,962 cu ft	2,373,695 cu ft	305,910 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	329,099 cu ft	2,473,955 cu ft
7	78.2%	0.01945 ft	-20,052 cu ft	163,976 cu ft	2,517,619 cu ft	143,924 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	167,114 cu ft	2,637,932 cu ft
8	83.1%	0.01945 ft	-20,052 cu ft	163,976 cu ft	2,661,543 cu ft	143,924 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	167,114 cu ft	2,801,908 cu ft
9	86.1%	0.01184 ft	-20,052 cu ft	98,584 cu ft	2,740,075 cu ft	78,532 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	101,722 cu ft	2,900,492 cu ft
10	89.1%	0.01184 ft	-20,052 cu ft	98,584 cu ft	2,818,607 cu ft	78,532 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	101,722 cu ft	2,999,076 cu ft
11	90.8%	0.00677 ft	-20,052 cu ft	54,989 cu ft	2,853,544 cu ft	34,937 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	58,127 cu ft	3,054,065 cu ft
12	92.5%	0.00677 ft	-20,052 cu ft	54,989 cu ft	2,888,481 cu ft	34,937 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	58,127 cu ft	3,109,053 cu ft
13	93.8%	0.00507 ft	-20,052 cu ft	40,457 cu ft	2,908,886 cu ft	20,405 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	43,595 cu ft	3,149,511 cu ft
14	95.1%	0.00507 ft	-20,052 cu ft	40,457 cu ft	2,929,291 cu ft	20,405 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	43,595 cu ft	3,189,968 cu ft
15	96.0%	0.00381 ft	-20,052 cu ft	29,558 cu ft	2,938,797 cu ft	9,506 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	32,696 cu ft	3,219,526 cu ft
16	97.0%	0.00381 ft	-20,052 cu ft	29,558 cu ft	2,948,303 cu ft	9,506 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	32,696 cu ft	3,249,085 cu ft
17	97.8%	0.00296 ft	-20,052 cu ft	22,293 cu ft	2,950,544 cu ft	2,241 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	25,430 cu ft	3,271,377 cu ft
18	98.5%	0.00296 ft	-20,052 cu ft	22,293 cu ft	2,952,784 cu ft	2,241 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	25,430 cu ft	3,293,670 cu ft
19	99.0%	0.00211 ft	-20,052 cu ft	15,027 cu ft	2,947,759 cu ft	-5,025 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	18,165 cu ft	3,308,697 cu ft
20	99.6%	0.00211 ft	-20,052 cu ft	15,027 cu ft	2,942,734 cu ft	-5,025 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	18,165 cu ft	3,323,723 cu ft
21	99.8%	0.00085 ft	-20,052 cu ft	4,128 cu ft	2,926,810 cu ft	-15,924 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	7,266 cu ft	3,327,851 cu ft
22	100.0%	0.00085 ft	-20,052 cu ft	4,128 cu ft	2,910,886 cu ft	-15,924 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	7,266 cu ft	3,331,979 cu ft
23	100.0%	0.00000 ft	-20,052 cu ft	-3,138 cu ft	2,887,696 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	0 cu ft	3,328,842 cu ft
24	100.0%	0.00000 ft	-20,052 cu ft	-3,138 cu ft	2,864,506 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	0 cu ft	3,325,704 cu ft
25			-20,052 cu ft	-3,138 cu ft	2,841,316 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,322,566 cu ft
26			-20,052 cu ft	-3,138 cu ft	2,818,126 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,319,428 cu ft
27			-20,052 cu ft	-3,138 cu ft	2,794,936 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,316,290 cu ft
28			-20,052 cu ft	-3,138 cu ft	2,771,746 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,313,152 cu ft
29			-20,052 cu ft	-3,138 cu ft	2,748,556 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,310,015 cu ft
30			-20,052 cu ft	-3,138 cu ft	2,725,366 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,306,877 cu ft
31			-20,052 cu ft	-3,138 cu ft	2,702,177 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,303,739 cu ft
32			-20,052 cu ft	-3,138 cu ft	2,678,987 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,300,601 cu ft
33			-20,052 cu ft	-3,138 cu ft	2,655,797 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,297,463 cu ft
34			-20,052 cu ft	-3,138 cu ft	2,632,607 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,294,326 cu ft
35			-20,052 cu ft	-3,138 cu ft	2,609,417 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,291,188 cu ft
36			-20,052 cu ft	-3,138 cu ft	2,586,227 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,288,050 cu ft
37			-20,052 cu ft	-3,138 cu ft	2,563,037 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,284,912 cu ft
38			-20,052 cu ft	-3,138 cu ft	2,539,847 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,281,774 cu ft
39			-20,052 cu ft	-3,138 cu ft	2,516,657 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,278,636 cu ft
40			-20,052 cu ft	-3,138 cu ft	2,493,467 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,275,499 cu ft
41			-20,052 cu ft	-3,138 cu ft	2,470,278 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,272,361 cu ft
42			-20,052 cu ft	-3,138 cu ft	2,447,088 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,269,223 cu ft
43			-20,052 cu ft	-3,138 cu ft	2,423,898 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,266,085 cu ft
44			-20,052 cu ft	-3,138 cu ft	2,400,708 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,262,947 cu ft
45			-20,052 cu ft	-3,138 cu ft	2,377,518 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,259,810 cu ft
46			-20,052 cu ft	-3,138 cu ft	2,354,328 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,256,672 cu ft
47			-20,052 cu ft	-3,138 cu ft	2,331,138 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,253,534 cu ft
48			-20,052 cu ft	-3,138 cu ft	2,307,948 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,250,396 cu ft
49			-20,052 cu ft	-3,138 cu ft	2,284,758 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,247,258 cu ft
50			-20,052 cu ft	-3,138 cu ft	2,261,568 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,244,120 cu ft
51			-20,052 cu ft	-3,138 cu ft	2,238,379 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,240,983 cu ft
52			-20,052 cu ft	-3,138 cu ft	2,215,189 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,237,845 cu ft
53			-20,052 cu ft	-3,138 cu ft	2,191,999 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,234,707 cu ft
54			-20,052 cu ft	-3,138 cu ft	2,168,809 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,231,569 cu ft
55			-20,052 cu ft	-3,138 cu ft	2,145,619 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,228,431 cu ft
56			-20,052 cu ft	-3,138 cu ft	2,122,429 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,225,294 cu ft
57			-20,052 cu ft	-3,138 cu ft	2,099,239 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,222,156 cu ft
58			-20,052 cu ft	-3,138 cu ft	2,076,049 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,219,018 cu ft
59			-20,052 cu ft	-3,138 cu ft	2,052,859 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,215,880 cu ft
60			-20,052 cu ft	-3,138 cu ft	2,029,669 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			3,212,742 cu ft

27 days Number of days to consume water by ore wetting alone





TETRA TECH

CLIENT: Rosemont Copper Co.

PROJECT: Heap Leach Facility | JOB NO: 320807

SUBJECT: Water Balance & Pond Sizing | BY: EMS

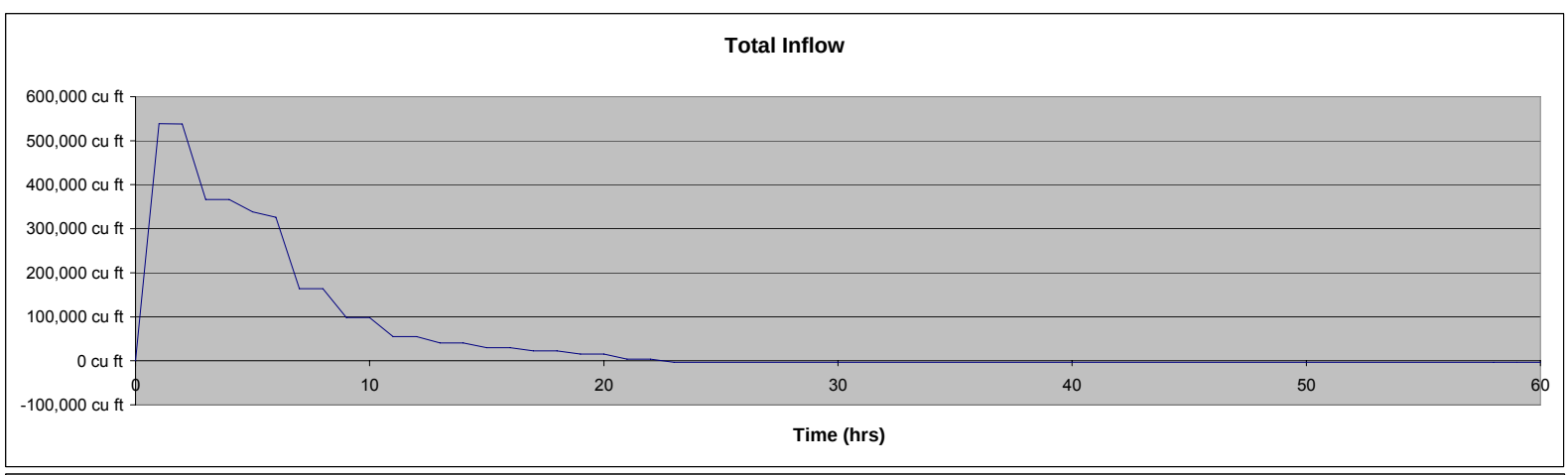
DETAILS: **Attachment 2d: Stormwater Volume - Case 4** | DATE: 4/17/2009

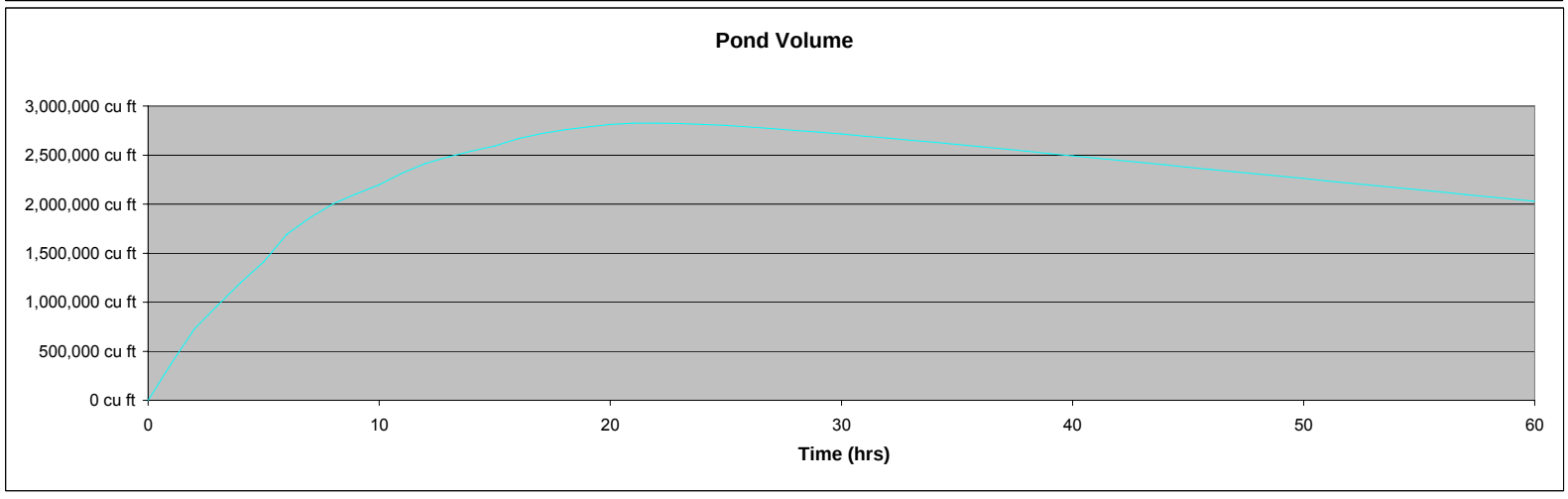
Model Assumptions	Value
Shutdown Duration	1 hr
Plant Flow	2,500 gpm
Runoff from slopes	25%
Total Lined Area	8,590,509 sq ft
Total Heap Slope Area	3,468,618 sq ft
Permibility	0.00328 ft/sec
Event Size	4.75 in
Process Flow	2,500 gpm 20,052 cu ft/hr
Tons Placed	38,000 t/d
Moisture of ore from Mine	2%
Field Capacity of ore	7%
Evaporation	3%

Average Distance Above Liner	Area	Time to Travel
0 ft	5,121,891 sq ft	0.00 hr
60 ft	1,573,729 sq ft	5.00 hr
120 ft	1,196,429 sq ft	10.00 hr
180 ft	688,800 sq ft	15.00 hr
240 ft	9,660 sq ft	20.00 hr
300 ft	0 sq ft	25.00 hr

Hour	% of Rainfall	Amount of Rainfall	Pump to Heap Leach	Total Inflow	Volume in Pond	Change in Volume	Process Flow	Ore Wetting	Evaporation	Slope Run-Off	Ore Depth:	0 ft	60 ft	120 ft	180 ft	240 ft	Cumulative Total
											Area at Depth:	5,121,891 sq ft	1,573,729 sq ft	1,196,429 sq ft	688,800 sq ft	9,660 sq ft	
0	0.0%	0.00000 ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft		0 cu ft					0 cu ft
1	15.9%	0.06301 ft	0 cu ft	374,693 cu ft	374,693 cu ft	374,693 cu ft	0 cu ft	-2,536 cu ft	0 cu ft	54,489 cu ft		322,740 cu ft					374,693 cu ft
2	31.8%	0.06301 ft	-20,052 cu ft	374,091 cu ft	728,732 cu ft	354,039 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	54,489 cu ft		322,740 cu ft					748,784 cu ft
3	42.7%	0.04303 ft	-20,052 cu ft	254,439 cu ft	963,119 cu ft	234,387 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	37,206 cu ft		220,371 cu ft					1,003,223 cu ft
4	53.6%	0.04303 ft	-20,052 cu ft	254,439 cu ft	1,197,506 cu ft	234,387 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	37,206 cu ft		220,371 cu ft					1,257,662 cu ft
5	63.6%	0.03972 ft	-20,052 cu ft	234,677 cu ft	1,412,131 cu ft	214,625 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	34,351 cu ft		203,464 cu ft	0 cu ft				1,492,340 cu ft
6	73.3%	0.03831 ft	-20,052 cu ft	300,581 cu ft	1,692,660 cu ft	280,529 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	33,128 cu ft		196,218 cu ft	74,373 cu ft				1,792,921 cu ft
7	78.2%	0.01945 ft	-20,052 cu ft	187,695 cu ft	1,860,303 cu ft	167,643 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	16,822 cu ft		99,638 cu ft	74,373 cu ft				1,980,615 cu ft
8	83.1%	0.01945 ft	-20,052 cu ft	164,105 cu ft	2,004,356 cu ft	144,053 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	16,822 cu ft		99,638 cu ft	50,783 cu ft				2,144,720 cu ft
9	86.1%	0.01184 ft	-20,052 cu ft	118,534 cu ft	2,102,837 cu ft	98,481 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	10,240 cu ft		60,649 cu ft	50,783 cu ft				2,263,254 cu ft
10	89.1%	0.01184 ft	-20,052 cu ft	114,637 cu ft	2,197,423 cu ft	94,585 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	10,240 cu ft		60,649 cu ft	46,887 cu ft	0 cu ft			2,377,891 cu ft
11	90.8%	0.00677 ft	-20,052 cu ft	139,129 cu ft	2,316,499 cu ft	119,077 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	5,851 cu ft		34,657 cu ft	45,217 cu ft	56,542 cu ft			2,517,020 cu ft
12	92.5%	0.00677 ft	-20,052 cu ft	116,873 cu ft	2,413,320 cu ft	96,821 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	5,851 cu ft		34,657 cu ft	22,961 cu ft	56,542 cu ft			2,633,893 cu ft
13	93.8%	0.00507 ft	-20,052 cu ft	88,811 cu ft	2,482,079 cu ft	68,759 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	4,388 cu ft		25,993 cu ft	22,961 cu ft	38,608 cu ft			2,722,704 cu ft
14	95.1%	0.00507 ft	-20,052 cu ft	79,827 cu ft	2,541,854 cu ft	59,775 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	4,388 cu ft		25,993 cu ft	13,976 cu ft	38,608 cu ft			2,802,531 cu ft
15	96.0%	0.00381 ft	-20,052 cu ft	69,269 cu ft	2,591,071 cu ft	49,217 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	3,291 cu ft		19,494 cu ft	13,976 cu ft	35,646 cu ft	0 cu ft		2,871,800 cu ft
16	97.0%	0.00381 ft	-20,052 cu ft	94,562 cu ft	2,665,581 cu ft	74,510 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	3,291 cu ft		19,494 cu ft	7,986 cu ft	34,376 cu ft	32,552 cu ft		2,966,363 cu ft
17	97.8%	0.00296 ft	-20,052 cu ft	72,579 cu ft	2,718,108 cu ft	52,526 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	2,560 cu ft		15,162 cu ft	7,986 cu ft	17,456 cu ft	32,552 cu ft		3,038,941 cu ft
18	98.5%	0.00296 ft	-20,052 cu ft	60,257 cu ft	2,758,313 cu ft	40,205 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	2,560 cu ft		15,162 cu ft	5,990 cu ft	17,456 cu ft	22,227 cu ft		3,099,198 cu ft
19	99.0%	0.00211 ft	-20,052 cu ft	48,363 cu ft	2,786,624 cu ft	28,311 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	1,828 cu ft		10,830 cu ft	5,990 cu ft	10,625 cu ft	22,227 cu ft		3,147,561 cu ft
20	99.6%	0.00211 ft	-20,052 cu ft	45,160 cu ft	2,811,732 cu ft	25,108 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	1,828 cu ft		10,830 cu ft	4,492 cu ft	10,625 cu ft	20,522 cu ft	0 cu ft	3,192,721 cu ft
21	99.8%	0.00085 ft	-20,052 cu ft	32,737 cu ft	2,824,416 cu ft	12,685 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	731 cu ft		4,332 cu ft	4,492 cu ft	6,072 cu ft	19,791 cu ft	457 cu ft	3,225,458 cu ft
22	100.0%	0.00085 ft	-20,052 cu ft	21,997 cu ft	2,826,362 cu ft	1,945 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	731 cu ft		4,332 cu ft	3,494 cu ft	6,072 cu ft	10,050 cu ft	457 cu ft	3,247,455 cu ft
23	100.0%	0.00000 ft	-20,052 cu ft	15,271 cu ft	2,821,581 cu ft	-4,781 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft		0 cu ft	3,494 cu ft	4,554 cu ft	10,050 cu ft	312 cu ft	3,262,727 cu ft
24	100.0%	0.00000 ft	-20,052 cu ft	10,340 cu ft	2,811,869 cu ft	-9,712 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft		0 cu ft	2,496 cu ft	4,554 cu ft	6,117 cu ft	312 cu ft	3,273,067 cu ft
25			-20,052 cu ft	9,178 cu ft	2,800,995 cu ft	-10,874 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft				2,496 cu ft	3,415 cu ft	6,117 cu ft	288 cu ft	3,282,245 cu ft
26			-20,052 cu ft	5,049 cu ft	2,785,992 cu ft	-15,003 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft				998 cu ft	3,415 cu ft	3,496 cu ft	278 cu ft	3,287,294 cu ft
27			-20,052 cu ft	4,153 cu ft	2,770,093 cu ft	-15,899 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft				998 cu ft	2,656 cu ft	3,496 cu ft	141 cu ft	3,291,447 cu ft
28			-20,052 cu ft	2,281 cu ft	2,752,322 cu ft	-17,771 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft				0 cu ft	2,656 cu ft	2,622 cu ft	141 cu ft	3,293,729 cu ft
29			-20,052 cu ft	1,467 cu ft	2,733,737 cu ft	-18,585 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft				0 cu ft	1,897 cu ft	2,622 cu ft	86 cu ft	3,295,196 cu ft
30			-20,052 cu ft	812 cu ft	2,714,497 cu ft	-19,241 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft					1,897 cu ft	1,966 cu ft	86 cu ft	3,296,007 cu ft
31			-20,052 cu ft	-364 cu ft	2,694,081 cu ft	-20,416 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft					759 cu ft	1,966 cu ft	49 cu ft	3,295,643 cu ft
32			-20,052 cu ft	-801 cu ft	2,673,228 cu ft	-20,853 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft					759 cu ft	1,529 cu ft	49 cu ft	3,294,843 cu ft
33			-20,052 cu ft	-1,572 cu ft	2,651,605 cu ft	-21,624 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft					0 cu ft	1,529 cu ft	37 cu ft	3,293,271 cu ft
34			-20,052 cu ft	-2,009 cu ft	2,629,544 cu ft	-22,061 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft					0 cu ft	1,092 cu ft	37 cu ft	3,291,262 cu ft
35			-20,052 cu ft	-2,018 cu ft	2,607,474 cu ft	-22,070 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						1,092 cu ft	28 cu ft	3,289,245 cu ft
36			-20,052 cu ft	-2,673 cu ft	2,584,748 cu ft	-22,725 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						437 cu ft	28 cu ft	3,286,571 cu ft
37			-20,052 cu ft	-2,679 cu ft	2,562,017 cu ft	-22,732 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						437 cu ft	21 cu ft	3,283,892 cu ft
38			-20,052 cu ft	-3,116 cu ft	2,538,848 cu ft	-23,168 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						0 cu ft	21 cu ft	3,280,775 cu ft
39			-20,052 cu ft	-3,122 cu ft	2,515,674 cu ft	-23,175 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						0 cu ft	15 cu ft	3,277,653 cu ft
40			-20,052 cu ft	-3,122 cu ft	2,492,499 cu ft	-23,175 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							15 cu ft	3,274,530 cu ft
41			-20,052 cu ft	-3,132 cu ft	2,469,315 cu ft	-23,184 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							6 cu ft	3,271,399 cu ft
42			-20,052 cu ft	-3,132 cu ft	2,446,132 cu ft	-23,184 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							6 cu ft	3,268,267 cu ft
43			-20,052 cu ft	-3,138 cu ft	2,422,942 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							0 cu ft	3,265,129 cu ft
44			-20,052 cu ft	-3,138 cu ft	2,399,752 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							0 cu ft	3,261,991 cu ft
45			-20,052 cu ft	-3,138 cu ft	2,376,562 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								3,258,854 cu ft
46			-20,052 cu ft	-3,138 cu ft	2,353,372 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								3,255,716 cu ft
47			-20,052 cu ft	-3,138 cu ft	2,330,182 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								3,252,578 cu ft
48			-20,052 cu ft	-3,138 cu ft	2,306,992 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								3,249,440 cu ft
49			-20,052 cu ft	-3,138 cu ft	2,283,802 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								3,246,302 cu ft
50			-20,052 cu ft	-3,138 cu ft	2,260,613 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								3,243,165 cu ft
51			-20,052 cu ft	-3,138 cu ft	2,237,423 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								3,240,027 cu ft
52			-20,052 cu ft	-3,138 cu ft	2,214,233 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								3,236,889 cu ft
53			-20,052 cu ft	-3,138 cu ft	2,191,043 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								3,233,751 cu ft
54			-20,052 cu ft	-3,138 cu ft	2,167,853 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								3,230,613 cu ft
55			-20,052 cu ft	-3,138 cu ft	2,144,663 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								3,227,475 cu ft
56			-20,052 cu ft	-3,138 cu ft	2,121,473 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								3,224,338 cu ft
57			-20,052 cu ft	-3,138 cu ft	2,098,283 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								3,221,200 cu ft
58			-20,052 cu ft	-3,138 cu ft	2,075,093 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								3,218,062 cu ft
59			-20,052 cu ft	-3,138 cu ft	2,051,903 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								3,214,924 cu ft
60			-20,052 cu ft	-3,138 cu ft	2,028,714 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								3,211,786 cu ft

27 days Number of days to consume water by ore wetting alone





TETRA TECH

CLIENT: Rosemont Copper Co.

PROJECT: Heap Leach Facility | JOB NO: 320807

SUBJECT: Water Balance & Pond Sizing | BY: EMS

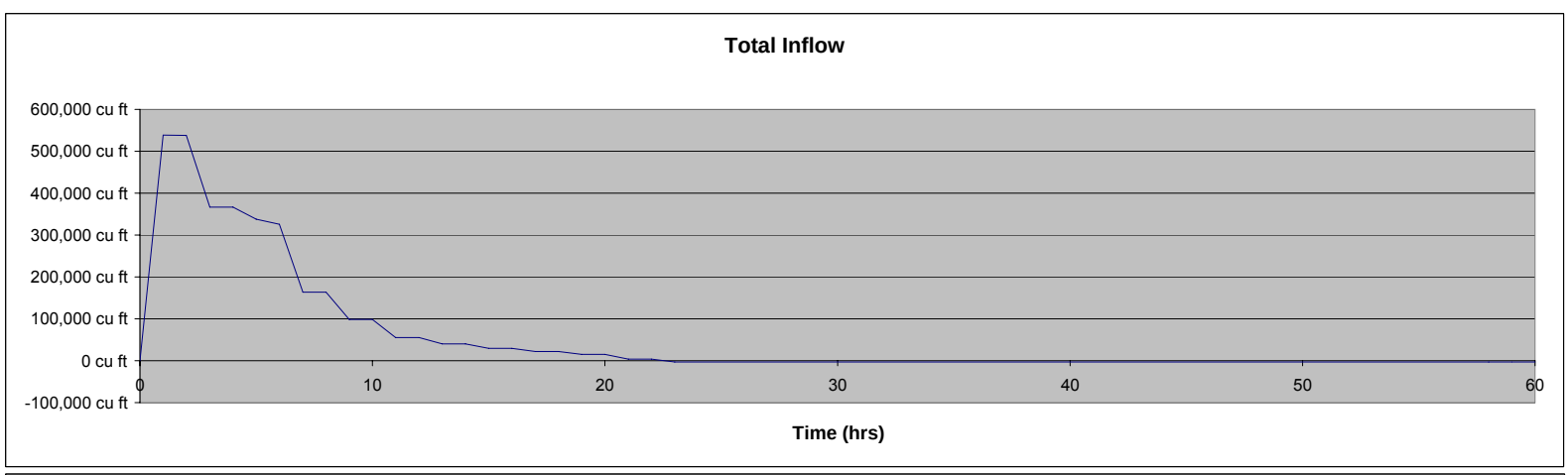
DETAILS: **Attachment 2e: Stormwater Volume - Case 5** | DATE: 4/17/2009

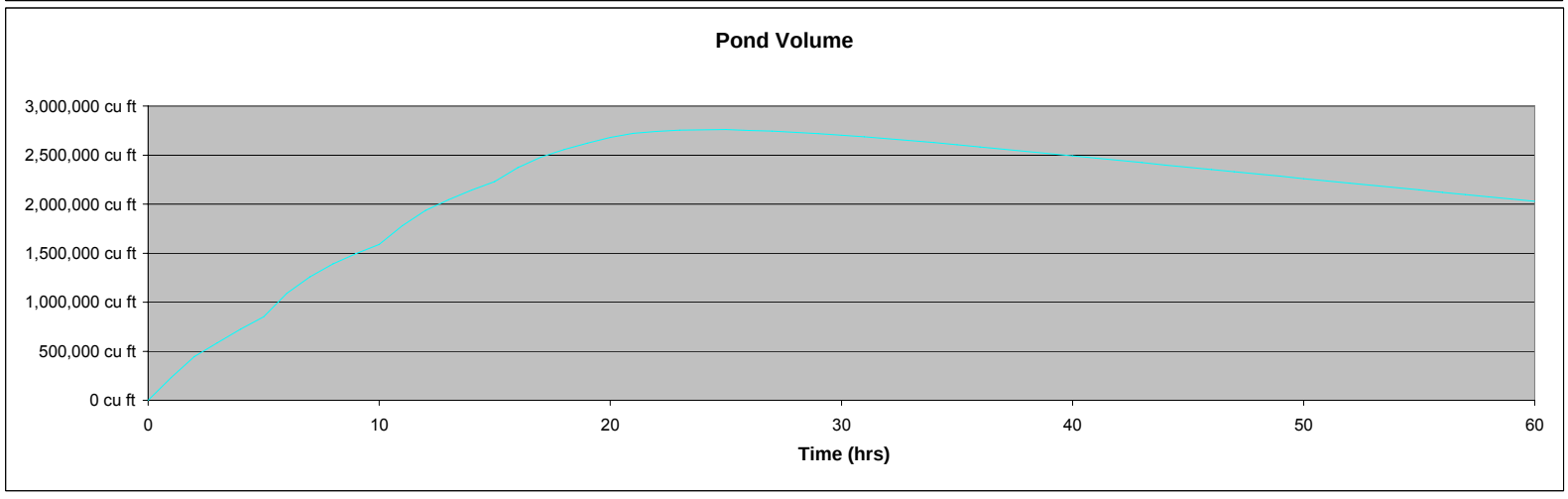
Model Assumptions	Value
Shutdown Duration	1 hr
Plant Flow	2,500 gpm
Runoff from slopes	25%
Total Lined Area	8,590,509 sq ft
Total Heap Slope Area	6,440,739 sq ft
Permibility	0.00328 ft/sec
Event Size	4.75 in
Process Flow	2,500 gpm 20,052 cu ft/hr
Tons Placed	38,000 t/d
Moisture of ore from Mine	2%
Field Capacity of ore	7%
Evaporation	3%

Average Distance Above Liner	Area	Time to Travel
0 ft	2,149,770 sq ft	0.00 hr
60 ft	2,524,432 sq ft	5.00 hr
120 ft	2,441,055 sq ft	10.00 hr
180 ft	1,459,654 sq ft	15.00 hr
240 ft	15,598 sq ft	20.00 hr
300 ft	0 sq ft	25.00 hr

Hour	% of Rainfall	Amount of Rainfall	Pump to Heap Leach	Total Inflow	Volume in Pond	Change in Volume	Process Flow	Ore Wetting	Evaporation	Slope Run-Off	Ore Depth: / Area at Depth: 0 ft / 2,149,770 sq ft	60 ft / 2,524,432 sq ft	120 ft / 2,441,055 sq ft	180 ft / 1,459,654 sq ft	240 ft / 15,598 sq ft	Cumulative Total
0	0.0%	0.00000 ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft					0 cu ft
1	15.9%	0.06301 ft	0 cu ft	234,140 cu ft	234,140 cu ft	234,140 cu ft	0 cu ft	-2,536 cu ft	0 cu ft	101,215 cu ft	135,461 cu ft					234,140 cu ft
2	31.8%	0.06301 ft	-20,052 cu ft	233,538 cu ft	447,626 cu ft	213,486 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	101,215 cu ft	135,461 cu ft					467,679 cu ft
3	42.7%	0.04303 ft	-20,052 cu ft	158,468 cu ft	586,042 cu ft	138,416 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	69,111 cu ft	92,495 cu ft					626,146 cu ft
4	53.6%	0.04303 ft	-20,052 cu ft	158,468 cu ft	724,458 cu ft	138,416 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	69,111 cu ft	92,495 cu ft					784,614 cu ft
5	63.6%	0.03972 ft	-20,052 cu ft	146,069 cu ft	850,475 cu ft	126,017 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	63,809 cu ft	85,398 cu ft	0 cu ft				930,683 cu ft
6	73.3%	0.03831 ft	-20,052 cu ft	260,057 cu ft	1,090,480 cu ft	240,005 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	61,536 cu ft	82,357 cu ft	119,302 cu ft				1,190,741 cu ft
7	78.2%	0.01945 ft	-20,052 cu ft	189,232 cu ft	1,259,660 cu ft	169,180 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	31,248 cu ft	41,820 cu ft	119,302 cu ft				1,379,973 cu ft
8	83.1%	0.01945 ft	-20,052 cu ft	151,391 cu ft	1,390,999 cu ft	131,339 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	31,248 cu ft	41,820 cu ft	81,461 cu ft				1,531,364 cu ft
9	86.1%	0.01184 ft	-20,052 cu ft	122,799 cu ft	1,493,746 cu ft	102,747 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	19,020 cu ft	25,456 cu ft	81,461 cu ft				1,654,163 cu ft
10	89.1%	0.01184 ft	-20,052 cu ft	116,549 cu ft	1,590,244 cu ft	96,497 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	19,020 cu ft	25,456 cu ft	75,211 cu ft	0 cu ft			1,770,712 cu ft
11	90.8%	0.00677 ft	-20,052 cu ft	210,171 cu ft	1,780,363 cu ft	190,119 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	10,869 cu ft	14,546 cu ft	72,533 cu ft	115,362 cu ft			1,980,884 cu ft
12	92.5%	0.00677 ft	-20,052 cu ft	174,470 cu ft	1,934,781 cu ft	154,418 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	10,869 cu ft	14,546 cu ft	36,831 cu ft	115,362 cu ft			2,155,354 cu ft
13	93.8%	0.00507 ft	-20,052 cu ft	131,525 cu ft	2,046,254 cu ft	111,473 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	8,152 cu ft	10,910 cu ft	36,831 cu ft	78,770 cu ft			2,286,879 cu ft
14	95.1%	0.00507 ft	-20,052 cu ft	117,113 cu ft	2,143,315 cu ft	97,061 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	8,152 cu ft	10,910 cu ft	22,419 cu ft	78,770 cu ft			2,403,992 cu ft
15	96.0%	0.00381 ft	-20,052 cu ft	106,304 cu ft	2,229,567 cu ft	86,252 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	6,114 cu ft	8,182 cu ft	22,419 cu ft	72,727 cu ft	0 cu ft		2,510,296 cu ft
16	97.0%	0.00381 ft	-20,052 cu ft	163,088 cu ft	2,372,603 cu ft	143,036 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	6,114 cu ft	8,182 cu ft	12,811 cu ft	70,137 cu ft	68,982 cu ft		2,673,384 cu ft
17	97.8%	0.00296 ft	-20,052 cu ft	125,389 cu ft	2,477,940 cu ft	105,337 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	4,755 cu ft	6,364 cu ft	12,811 cu ft	35,615 cu ft	68,982 cu ft		2,798,773 cu ft
18	98.5%	0.00296 ft	-20,052 cu ft	100,306 cu ft	2,558,194 cu ft	80,254 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	4,755 cu ft	6,364 cu ft	9,608 cu ft	35,615 cu ft	47,102 cu ft		2,899,079 cu ft
19	99.0%	0.00211 ft	-20,052 cu ft	83,193 cu ft	2,621,334 cu ft	63,141 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	3,396 cu ft	4,546 cu ft	9,608 cu ft	21,679 cu ft	47,102 cu ft		2,982,272 cu ft
20	99.6%	0.00211 ft	-20,052 cu ft	77,177 cu ft	2,678,459 cu ft	57,125 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	3,396 cu ft	4,546 cu ft	7,206 cu ft	21,679 cu ft	43,488 cu ft	0 cu ft	3,059,449 cu ft
21	99.8%	0.00085 ft	-20,052 cu ft	62,309 cu ft	2,720,717 cu ft	42,257 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	1,359 cu ft	1,818 cu ft	7,206 cu ft	12,388 cu ft	41,939 cu ft	737 cu ft	3,121,758 cu ft
22	100.0%	0.00085 ft	-20,052 cu ft	40,065 cu ft	2,740,730 cu ft	20,013 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	1,359 cu ft	1,818 cu ft	5,605 cu ft	12,388 cu ft	21,296 cu ft	737 cu ft	3,161,824 cu ft
23	100.0%	0.00000 ft	-20,052 cu ft	33,558 cu ft	2,754,235 cu ft	13,505 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	0 cu ft	5,605 cu ft	9,291 cu ft	21,296 cu ft	503 cu ft	3,195,381 cu ft
24	100.0%	0.00000 ft	-20,052 cu ft	23,623 cu ft	2,757,806 cu ft	3,571 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft	0 cu ft	4,003 cu ft	9,291 cu ft	12,963 cu ft	503 cu ft	3,219,004 cu ft
25			-20,052 cu ft	21,261 cu ft	2,759,015 cu ft	1,209 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			4,003 cu ft	6,968 cu ft	12,963 cu ft	465 cu ft	3,240,265 cu ft
26			-20,052 cu ft	13,287 cu ft	2,752,251 cu ft	-6,765 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,601 cu ft	6,968 cu ft	7,407 cu ft	448 cu ft	3,253,553 cu ft
27			-20,052 cu ft	11,518 cu ft	2,743,717 cu ft	-8,534 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			1,601 cu ft	5,420 cu ft	7,407 cu ft	228 cu ft	3,265,071 cu ft
28			-20,052 cu ft	8,065 cu ft	2,731,730 cu ft	-11,987 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			0 cu ft	5,420 cu ft	5,556 cu ft	228 cu ft	3,273,136 cu ft
29			-20,052 cu ft	6,427 cu ft	2,718,105 cu ft	-13,625 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft			0 cu ft	3,871 cu ft	5,556 cu ft	139 cu ft	3,279,563 cu ft
30			-20,052 cu ft	5,039 cu ft	2,703,092 cu ft	-15,013 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft				3,871 cu ft	4,167 cu ft	139 cu ft	3,284,602 cu ft
31			-20,052 cu ft	2,656 cu ft	2,685,696 cu ft	-17,396 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft				1,548 cu ft	4,167 cu ft	79 cu ft	3,287,259 cu ft
32			-20,052 cu ft	1,731 cu ft	2,667,375 cu ft	-18,322 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft				1,548 cu ft	3,241 cu ft	79 cu ft	3,288,989 cu ft
33			-20,052 cu ft	162 cu ft	2,647,485 cu ft	-19,890 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft				0 cu ft	3,241 cu ft	59 cu ft	3,289,151 cu ft
34			-20,052 cu ft	-764 cu ft	2,626,669 cu ft	-20,816 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft				0 cu ft	2,315 cu ft	59 cu ft	3,288,388 cu ft
35			-20,052 cu ft	-778 cu ft	2,605,838 cu ft	-20,831 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft					2,315 cu ft	45 cu ft	3,287,609 cu ft
36			-20,052 cu ft	-2,167 cu ft	2,583,619 cu ft	-22,219 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft					926 cu ft	45 cu ft	3,285,442 cu ft
37			-20,052 cu ft	-2,177 cu ft	2,561,390 cu ft	-22,229 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft					926 cu ft	35 cu ft	3,283,265 cu ft
38			-20,052 cu ft	-3,103 cu ft	2,538,234 cu ft	-23,155 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft					0 cu ft	35 cu ft	3,280,161 cu ft
39			-20,052 cu ft	-3,113 cu ft	2,515,069 cu ft	-23,165 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft					0 cu ft	25 cu ft	3,277,048 cu ft
40			-20,052 cu ft	-3,113 cu ft	2,491,904 cu ft	-23,165 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						25 cu ft	3,273,935 cu ft
41			-20,052 cu ft	-3,128 cu ft	2,468,724 cu ft	-23,180 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						10 cu ft	3,270,807 cu ft
42			-20,052 cu ft	-3,128 cu ft	2,445,544 cu ft	-23,180 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						10 cu ft	3,267,679 cu ft
43			-20,052 cu ft	-3,138 cu ft	2,422,354 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						0 cu ft	3,264,542 cu ft
44			-20,052 cu ft	-3,138 cu ft	2,399,164 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						0 cu ft	3,261,404 cu ft
45			-20,052 cu ft	-3,138 cu ft	2,375,974 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							3,258,266 cu ft
46			-20,052 cu ft	-3,138 cu ft	2,352,785 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							3,255,128 cu ft
47			-20,052 cu ft	-3,138 cu ft	2,329,595 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							3,251,990 cu ft
48			-20,052 cu ft	-3,138 cu ft	2,306,405 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							3,248,853 cu ft
49			-20,052 cu ft	-3,138 cu ft	2,283,215 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							3,245,715 cu ft
50			-20,052 cu ft	-3,138 cu ft	2,260,025 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							3,242,577 cu ft
51			-20,052 cu ft	-3,138 cu ft	2,236,835 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							3,239,439 cu ft
52			-20,052 cu ft	-3,138 cu ft	2,213,645 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							3,236,301 cu ft
53			-20,052 cu ft	-3,138 cu ft	2,190,455 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							3,233,163 cu ft
54			-20,052 cu ft	-3,138 cu ft	2,167,265 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							3,230,026 cu ft
55			-20,052 cu ft	-3,138 cu ft	2,144,075 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							3,226,888 cu ft
56			-20,052 cu ft	-3,138 cu ft	2,120,886 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							3,223,750 cu ft
57			-20,052 cu ft	-3,138 cu ft	2,097,696 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							3,220,612 cu ft
58			-20,052 cu ft	-3,138 cu ft	2,074,506 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							3,217,474 cu ft
59			-20,052 cu ft	-3,138 cu ft	2,051,316 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							3,214,337 cu ft
60			-20,052 cu ft	-3,138 cu ft	2,028,126 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							3,211,199 cu ft

27 days Number of days to consume water by ore wetting alone





TETRA TECH

CLIENT: Rosemont Copper Co.
PROJECT: Heap Leach Facility
SUBJECT: Water Balance & Pond Sizing
DETAILS: **Attachment 2f: Stormwater Volume - Case 6**

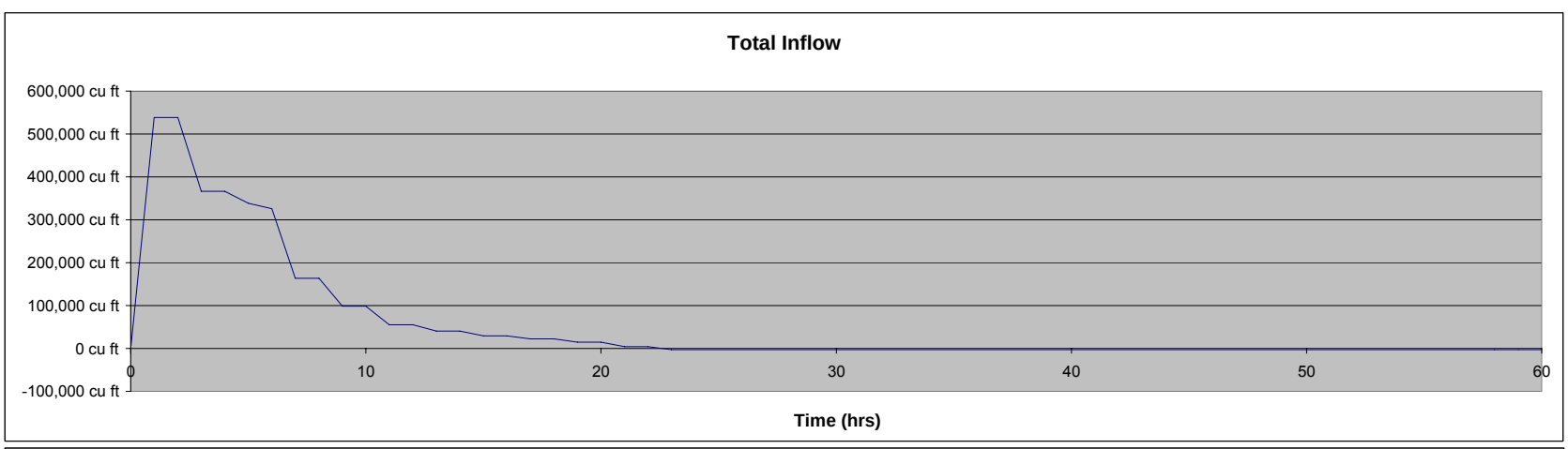
JOB NO: 320807
BY: EMS
DATE: 4/17/2009

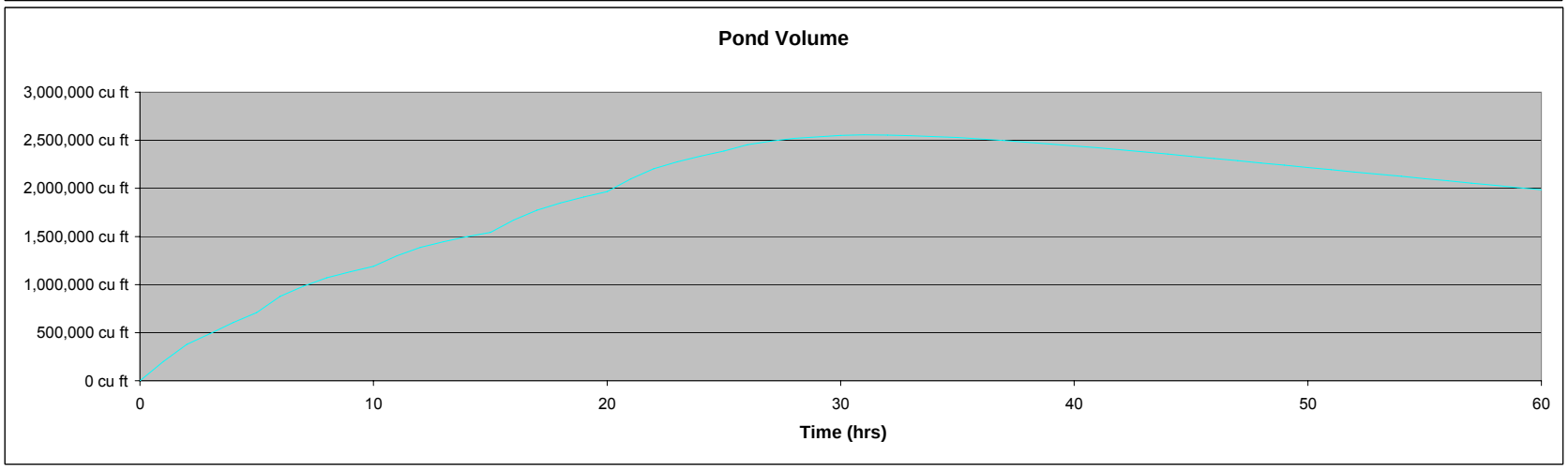
Model Assumptions	Value
Shutdown Duration	1 hr
Plant Flow	2,500 gpm
Runoff from slopes	25%
Total Lined Area	8,590,509 sq ft
Total Heap Slope Area	7,048,617 sq ft
Permibility	0.00328 ft/sec
Event Size	4.75 in
Process Flow	2,500 gpm
	20,052 cu ft/hr
Tons Placed	38,000 t/d
Moisture of ore from Mine	2%
Field Capacity of ore	7%
Evaporation	3%

Average Distance Above Liner	Area	Time to Travel
0 ft	1,541,892 sq ft	0.00 hr
60 ft	1,457,068 sq ft	5.00 hr
120 ft	1,433,649 sq ft	10.00 hr
180 ft	1,893,254 sq ft	15.00 hr
240 ft	1,819,421 sq ft	20.00 hr
300 ft	445,225 sq ft	25.00 hr

Hour	% of Rainfall	Amount of Rainfall	Pump to Heap Leach	Total Inflow	Volume in Pond	Change in Volume	Process Flow	Ore Wetting	Evaporation	Slope Run-Off	Ore Depth:	0 ft	60 ft	120 ft	180 ft	240 ft	300 ft	Cumulative Total
											Area at Depth:	1,541,892 sq ft	1,457,068 sq ft	1,433,649 sq ft	1,893,254 sq ft	1,819,421 sq ft	445,225 sq ft	
0	0.0%	0.00000 ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft	0 cu ft		0 cu ft						0 cu ft
1	15.9%	0.06301 ft	0 cu ft	198,644 cu ft	198,644 cu ft	198,644 cu ft	0 cu ft	-2,536 cu ft	0 cu ft	104,023 cu ft		97,158 cu ft						198,644 cu ft
2	31.8%	0.06301 ft	-20,052 cu ft	198,043 cu ft	376,635 cu ft	177,991 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	104,023 cu ft		97,158 cu ft						396,687 cu ft
3	42.7%	0.04303 ft	-20,052 cu ft	134,231 cu ft	490,814 cu ft	114,179 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	71,028 cu ft		66,340 cu ft						530,918 cu ft
4	53.6%	0.04303 ft	-20,052 cu ft	134,231 cu ft	604,993 cu ft	114,179 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	71,028 cu ft		66,340 cu ft						665,149 cu ft
5	63.6%	0.03972 ft	-20,052 cu ft	123,692 cu ft	708,633 cu ft	103,640 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	65,579 cu ft		61,251 cu ft	0 cu ft					788,841 cu ft
6	73.3%	0.03831 ft	-20,052 cu ft	188,034 cu ft	876,615 cu ft	167,982 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	63,243 cu ft		59,069 cu ft	68,860 cu ft					976,876 cu ft
7	78.2%	0.01945 ft	-20,052 cu ft	127,831 cu ft	984,394 cu ft	107,779 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	32,115 cu ft		29,995 cu ft	68,860 cu ft					1,104,707 cu ft
8	83.1%	0.01945 ft	-20,052 cu ft	105,990 cu ft	1,070,332 cu ft	85,938 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	32,115 cu ft		29,995 cu ft	47,018 cu ft					1,210,697 cu ft
9	86.1%	0.01184 ft	-20,052 cu ft	81,686 cu ft	1,131,966 cu ft	61,634 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	19,548 cu ft		18,258 cu ft	47,018 cu ft					1,292,383 cu ft
10	89.1%	0.01184 ft	-20,052 cu ft	78,079 cu ft	1,189,993 cu ft	58,027 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	19,548 cu ft		18,258 cu ft	43,411 cu ft	0 cu ft				1,370,461 cu ft
11	90.8%	0.00677 ft	-20,052 cu ft	128,083 cu ft	1,298,024 cu ft	108,031 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	11,170 cu ft		10,433 cu ft	41,865 cu ft	67,753 cu ft				1,498,544 cu ft
12	92.5%	0.00677 ft	-20,052 cu ft	107,477 cu ft	1,385,448 cu ft	87,425 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	11,170 cu ft		10,433 cu ft	21,259 cu ft	67,753 cu ft				1,606,021 cu ft
13	93.8%	0.00507 ft	-20,052 cu ft	80,586 cu ft	1,445,982 cu ft	60,534 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	8,378 cu ft		7,825 cu ft	21,259 cu ft	46,262 cu ft				1,686,607 cu ft
14	95.1%	0.00507 ft	-20,052 cu ft	72,267 cu ft	1,498,197 cu ft	52,215 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	8,378 cu ft		7,825 cu ft	12,940 cu ft	46,262 cu ft				1,758,874 cu ft
15	96.0%	0.00381 ft	-20,052 cu ft	64,667 cu ft	1,542,812 cu ft	44,615 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	6,283 cu ft		5,869 cu ft	12,940 cu ft	42,713 cu ft	0 cu ft			1,823,541 cu ft
16	97.0%	0.00381 ft	-20,052 cu ft	147,073 cu ft	1,669,834 cu ft	127,021 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	6,283 cu ft		5,869 cu ft	7,394 cu ft	41,192 cu ft	89,473 cu ft			1,970,615 cu ft
17	97.8%	0.00296 ft	-20,052 cu ft	124,098 cu ft	1,773,880 cu ft	104,046 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	4,887 cu ft		4,564 cu ft	7,394 cu ft	20,917 cu ft	89,473 cu ft			2,094,713 cu ft
18	98.5%	0.00296 ft	-20,052 cu ft	93,870 cu ft	1,847,697 cu ft	73,818 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	4,887 cu ft		4,564 cu ft	5,546 cu ft	20,917 cu ft	61,093 cu ft			2,188,583 cu ft
19	99.0%	0.00211 ft	-20,052 cu ft	82,984 cu ft	1,910,630 cu ft	62,932 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	3,491 cu ft		3,260 cu ft	5,546 cu ft	12,732 cu ft	61,093 cu ft			2,271,567 cu ft
20	99.6%	0.00211 ft	-20,052 cu ft	76,911 cu ft	1,967,488 cu ft	56,859 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	3,491 cu ft		3,260 cu ft	4,159 cu ft	12,732 cu ft	56,406 cu ft	0 cu ft		2,348,478 cu ft
21	99.8%	0.00085 ft	-20,052 cu ft	151,379 cu ft	2,098,815 cu ft	131,327 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	1,396 cu ft		1,304 cu ft	4,159 cu ft	7,275 cu ft	54,397 cu ft	85,984 cu ft		2,499,857 cu ft
22	100.0%	0.00085 ft	-20,052 cu ft	123,680 cu ft	2,202,443 cu ft	103,628 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	1,396 cu ft		1,304 cu ft	3,235 cu ft	7,275 cu ft	27,623 cu ft	85,984 cu ft		2,623,536 cu ft
23	100.0%	0.00000 ft	-20,052 cu ft	91,887 cu ft	2,274,278 cu ft	71,835 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft		0 cu ft	3,235 cu ft	5,457 cu ft	27,623 cu ft	58,711 cu ft		2,715,424 cu ft
24	100.0%	0.00000 ft	-20,052 cu ft	80,154 cu ft	2,334,380 cu ft	60,102 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft	0 cu ft		0 cu ft	2,311 cu ft	5,457 cu ft	16,814 cu ft	58,711 cu ft		2,795,578 cu ft
25			-20,052 cu ft	74,286 cu ft	2,388,613 cu ft	54,234 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft				2,311 cu ft	4,092 cu ft	16,814 cu ft	54,207 cu ft	0 cu ft	2,869,863 cu ft
26			-20,052 cu ft	84,804 cu ft	2,453,365 cu ft	64,752 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft				924 cu ft	4,092 cu ft	9,608 cu ft	52,276 cu ft	21,041 cu ft	2,954,667 cu ft
27			-20,052 cu ft	58,164 cu ft	2,491,477 cu ft	38,111 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft				924 cu ft	3,183 cu ft	9,608 cu ft	26,545 cu ft	21,041 cu ft	3,012,831 cu ft
28			-20,052 cu ft	48,163 cu ft	2,519,588 cu ft	28,111 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft				0 cu ft	3,183 cu ft	7,206 cu ft	26,545 cu ft	14,367 cu ft	3,060,994 cu ft
29			-20,052 cu ft	36,867 cu ft	2,536,403 cu ft	16,815 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft				0 cu ft	2,274 cu ft	7,206 cu ft	16,158 cu ft	14,367 cu ft	3,097,861 cu ft
30			-20,052 cu ft	33,963 cu ft	2,550,313 cu ft	13,911 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft					2,274 cu ft	5,404 cu ft	16,158 cu ft	13,265 cu ft	3,131,824 cu ft
31			-20,052 cu ft	25,202 cu ft	2,555,463 cu ft	5,149 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft					909 cu ft	5,404 cu ft	9,233 cu ft	12,792 cu ft	3,157,025 cu ft
32			-20,052 cu ft	17,704 cu ft	2,553,115 cu ft	-2,348 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft					909 cu ft	4,203 cu ft	9,233 cu ft	6,496 cu ft	3,174,729 cu ft
33			-20,052 cu ft	14,486 cu ft	2,547,549 cu ft	-5,566 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft					0 cu ft	4,203 cu ft	6,925 cu ft	6,496 cu ft	3,189,216 cu ft
34			-20,052 cu ft	10,744 cu ft	2,538,241 cu ft	-9,309 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft					0 cu ft	3,002 cu ft	6,925 cu ft	3,954 cu ft	3,199,959 cu ft
35			-20,052 cu ft	9,012 cu ft	2,527,201 cu ft	-11,040 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						3,002 cu ft	5,194 cu ft	3,954 cu ft	3,208,972 cu ft
36			-20,052 cu ft	5,516 cu ft	2,512,665 cu ft	-14,536 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						1,201 cu ft	5,194 cu ft	2,259 cu ft	3,214,488 cu ft
37			-20,052 cu ft	4,362 cu ft	2,496,975 cu ft	-15,690 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						1,201 cu ft	4,040 cu ft	2,259 cu ft	3,218,850 cu ft
38			-20,052 cu ft	2,596 cu ft	2,479,519 cu ft	-17,456 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						0 cu ft	4,040 cu ft	1,695 cu ft	3,221,446 cu ft
39			-20,052 cu ft	1,442 cu ft	2,460,909 cu ft	-18,610 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft						0 cu ft	2,885 cu ft	1,695 cu ft	3,222,888 cu ft
40			-20,052 cu ft	1,018 cu ft	2,441,876 cu ft	-19,034 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							2,885 cu ft	1,271 cu ft	3,223,907 cu ft
41			-20,052 cu ft	-713 cu ft	2,421,111 cu ft	-20,765 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							1,154 cu ft	1,271 cu ft	3,223,194 cu ft
42			-20,052 cu ft	-995 cu ft	2,400,063 cu ft	-21,047 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							1,154 cu ft	988 cu ft	3,222,199 cu ft
43			-20,052 cu ft	-2,149 cu ft	2,377,862 cu ft	-22,201 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							0 cu ft	988 cu ft	3,220,050 cu ft
44			-20,052 cu ft	-2,432 cu ft	2,355,378 cu ft	-22,484 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft							0 cu ft	706 cu ft	3,217,618 cu ft
45			-20,052 cu ft	-2,432 cu ft	2,332,894 cu ft	-22,484 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								706 cu ft	3,215,186 cu ft
46			-20,052 cu ft	-2,855 cu ft	2,309,987 cu ft	-22,907 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								282 cu ft	3,212,331 cu ft
47			-20,052 cu ft	-2,855 cu ft	2,287,079 cu ft	-22,907 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								282 cu ft	3,209,475 cu ft
48			-20,052 cu ft	-3,138 cu ft	2,263,890 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								0 cu ft	3,206,337 cu ft
49			-20,052 cu ft	-3,138 cu ft	2,240,700 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft								0 cu ft	3,203,200 cu ft
50			-20,052 cu ft	-3,138 cu ft	2,217,510 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft									3,200,062 cu ft
51			-20,052 cu ft	-3,138 cu ft	2,194,320 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft									3,196,924 cu ft
52			-20,052 cu ft	-3,138 cu ft	2,171,130 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft									3,193,786 cu ft
53			-20,052 cu ft	-3,138 cu ft	2,147,940 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft									3,190,648 cu ft
54			-20,052 cu ft	-3,138 cu ft	2,124,750 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft									3,187,511 cu ft
55			-20,052 cu ft	-3,138 cu ft	2,101,560 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft									3,184,373 cu ft
56			-20,052 cu ft	-3,138 cu ft	2,078,370 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft									3,181,235 cu ft
57			-20,052 cu ft	-3,138 cu ft	2,055,180 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft									3,178,097 cu ft
58			-20,052 cu ft	-3,138 cu ft	2,031,991 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft									3,174,959 cu ft
59			-20,052 cu ft	-3,138 cu ft	2,008,801 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft									3,171,821 cu ft
60			-20,052 cu ft	-3,138 cu ft	1,985,611 cu ft	-23,190 cu ft	20,052 cu ft	-2,536 cu ft	-602 cu ft									3,168,684 cu ft

26 days Number of days to consume water by ore wetting alone





TETRA TECH

CLIENT:	Rosemont Copper Co.	
PROJECT:	Heap Leach Facility	JOB NO: 320807
SUBJECT:	Water Balance & Pond Sizing	BY: EMS
DETAILS:	**Attachment 2g: Stormwater Pond Sizing**	DATE: 4/17/2009

Determine the design storm runoff volume to the Phase 1+2 Stormwater Pond and estimate the Phase 1+2 Stormwater Pond size based on given design assumptions and Arizona BADCT guidelines:

Phase 1+2 Stormwater Pond Sizing Estimate (Input & Runoff Volume Calculation)

Side Slopes **z** (H:1V)	Minimum Op. Depth d_{min} (ft)	Design Storm Depth d_{st} (in)	Design Storm Duration (hr)	Dry Freeboard d_{fb} (ft)	Phase 1+2 Lined Area (ft^2)	Calculated Ro. Volume V_{ro} (ft^3)
2.5	0.0	4.75	24.0	3.0	8,590,509	2,908,134

Case 2 was used to calculate the amount of lined area and runoff volume

$A_o = W_o \times L_o$

$A_d = (W_o + 2zd) \times (L_o + 2zd)$

$V_d = 1/3d \times (A_o + (A_oA_d)^{1/2} + A_d)$

An iterative solution process was used, with assumptions in yellow cells and calculated comparison results in green cells. (Tools → Goal Seek)

Stormwater Pond Base - Calc.			**Min. Operations - Calc.**		**Runoff Operations - Calculation**		
Base Width W_o (ft)	Base Length L_o (ft)	Base Area A_o (ft^2)	Minimum Op. Area A_{min} (ft^2)	Minimum Op. Volume V_{min} (ft^3)	Assumed Ro. Depth d_{ro-a} (ft)	Calculated Ro. Area A_{ro-a} (ft^2)	Calculated Ro. Volume V_{ro-a} (ft^3)
360.0	400.0	144,000	144,000	0	16.4	213,018	2,908,134
400.0	450.0	180,000	180,000	0	13.8	243,362	2,908,134
450.0	500.0	225,000	225,000	0	11.5	282,816	2,908,134
500.0	550.0	275,000	275,000	0	9.7	328,034	2,908,134
550.0	600.0	330,000	330,000	0	8.2	378,900	2,908,134

	Design (Direct) Precipitation Event - Calculation					**Dry Freeboard - Calc.**	
Base Width W_o (ft)	Assumed Direct Depth d_{do-a} (in)	Calculated Direct Area A_{do-a} (ft^2)	Calculated Direct Vol. V_{do-a} (ft^3)	Calculated Storm Vol. V_{st} (ft^3)	Calculation Error ($V_{do-a} - V_{st}$) (ft^3)	Dry Area A_{fb} (ft^2)	Dry Volume V_{fb} (ft^3)
360.0	4.77	214,858	85,048	85,048	0	229,002	665,678
400.0	4.77	245,329	97,109	97,109	0	260,432	758,529
450.0	4.77	284,935	112,787	112,787	0	301,192	879,078
500.0	4.77	330,315	130,750	130,750	0	347,798	1,017,056
550.0	4.77	381,350	150,951	150,951	0	400,116	1,172,087

	Stormwater Pond Top - Calculation Results						
Base Width W_o (ft)	Total Depth **d** (ft)	Top Width W_d (ft)	Top Length L_d (ft)	Top Area A_d		Total Volume V_d	
				(ft^2)	(acre)	(ft^3)	(acre-ft)
360.0	19.8	459.0	499.0	229,002	5.3	3,658,831	84.0
400.0	17.2	485.9	535.9	260,432	6.0	3,763,744	86.4
450.0	14.9	524.4	574.4	301,192	6.9	3,899,982	89.5
500.0	13.1	565.3	615.3	347,798	8.0	4,055,929	93.1
550.0	11.6	608.0	658.0	400,116	9.2	4,231,166	97.1

Based on the results of this calculation, the Stormwater Pond can range in size from roughly 84 to 97 acre-ft, depending on the desired depth and area used.

ATTACHMENT 3
RAFFINATE POND SIZING

TETRA TECH

CLIENT:	Rosemont Copper Co.	
PROJECT:	Heap Leach Facility	JOB NO: 320807
SUBJECT:	Water Balance & Pond Sizing	BY: EMS
DETAILS:	**Attachment 3: Raffinate Pond Sizing**	DATE: 4/17/2009

In order to size the Raffinate Pond, the normal operations volume must be determined. This estimation was made using the total operational outflows from the Raffinate Pond, as shown below:

Raffinate Pond Operating Flow Estimate (Part 1 - Design Criteria)

PLS Flow Rate (gpm)	Application Method	Soln. App. Loss Rate (%)	Active Area (ft^2)	Pan Evaporation Coefficient	W.S. Evaporation Coefficient	Ore App. Rate (ton/d)	Ore Moisture Content (%)	Ore Field Capacity (%)	Operations Duration (hr)
2,500	Dripper	3.0%	1,000,000	0.70	0.85	38,000	2.0%	7.0%	8

Raffinate Pond Operating Flow Estimate (Part 2 - Average Year Climate Input)

Operating Month	# Days in Month	Avg. Year Precipitation (in/mo)	Pan Evaporation (in/mo)	Pond Evaporation (in/mo)	W.S. Evaporation (in/mo)
Jan	31	1.63	4.13	2.89	3.51
Feb	28	1.46	4.28	3.00	3.64
Mar	31	1.46	7.11	4.98	6.04
Apr	30	0.69	8.50	5.95	7.23
May	31	0.24	10.38	7.27	8.82
Jun	30	0.62	10.75	7.53	9.14
Jul	31	4.87	4.93	3.45	4.19
Aug	31	4.32	2.89	2.02	2.46
Sep	30	2.15	4.40	3.08	3.74
Oct	31	1.62	6.15	4.31	5.23
Nov	30	1.15	4.11	2.88	3.49
Dec	31	1.96	3.89	2.72	3.31

Raffinate Pond Operating Flow Estimate (Part 3 - Calculation)

Operating Month	Precipitation on Heap Area P_{hl} (ft^3/d)	Incoming Ore Moisture O_{hl} (ft^3/d)	Ore Moisture Retention R_{hl} (ft^3/d)	PLS Flow to PLS Pond G_{hl} (ft^3/d)	Raffinate Flow B_{rp} (ft^3/d)	Evaporation from Heap Area E_{hl} (ft^3/d)	Normal Op. Volume V_{op} (ft^3)
Jan	4,382	24,359	85,256	481,250	564,126	26,361	188,042
Feb	4,345	24,359	85,256	481,250	565,597	27,795	188,532
Mar	3,925	24,359	85,256	481,250	571,617	33,394	190,539
Apr	1,917	24,359	85,256	481,250	577,629	37,398	192,543
May	645	24,359	85,256	481,250	582,701	41,199	194,234
Jun	1,722	24,359	85,256	481,250	583,306	42,881	194,435
Jul	13,091	24,359	85,256	481,250	557,032	27,976	185,677
Aug	11,613	24,359	85,256	481,250	553,751	23,216	184,584
Sep	5,972	24,359	85,256	481,250	563,468	27,293	187,823
Oct	4,355	24,359	85,256	481,250	568,912	31,120	189,637
Nov	3,194	24,359	85,256	481,250	565,626	26,673	188,542
Dec	5,269	24,359	85,256	481,250	562,646	25,768	187,549

Now, estimate the Raffinate Pond size based on given design assumptions and Arizona BADCT guidelines for June, which requires the greatest volume:

Raffinate Pond Sizing Estimate - Input

Length to Width Ratio **L/W** (ft/ft)	Side Slopes **z** (H:1V)	Minimum Op. Depth d_{min} (ft)	Normal Op. Volume V_{op} (ft^3)	Design Storm Depth d_{st} (in)	Dry Freeboard d_{fb} (ft)
1.75	2.5	10.0	194,435	4.75	3.0

$$A_o = W_o \times L_o$$

$$A_d = (W_o + 2zd) \times (L_o + 2zd)$$

$$V_d = 1/3d \times (A_o + (A_o A_d)^{1/2} + A_d)$$

An iterative solution process was used, with assumptions in yellow cells and calculated comparison results in green cells. (Tools → Goal Seek)

Raffinate Pond Base - Calculation			Min. Operations - Calc.		Normal Operations - Calculation		
Base Width W_o (ft)	Base Length L_o (ft)	Base Area A_o (ft^2)	Minimum Op. Area A_{min} (ft^2)	Minimum Op. Volume V_{min} (ft^3)	Assumed Op. Depth $d_{op\text{-}a}$ (ft)	Calculated Op. Area $A_{op\text{-}a}$ (ft^2)	Calculated Op. Volume $V_{op\text{-}a}$ (ft^3)
40.0	70.0	2,800	10,800	63,664	11.0	25,444	194,435
55.0	96.3	5,294	15,356	98,887	9.0	28,648	194,435
70.0	122.5	8,575	20,700	141,993	7.3	32,773	194,435
85.0	148.8	12,644	26,831	192,979	6.0	37,829	194,435
100.0	175.0	17,500	33,750	251,843	5.0	43,810	194,435

	Design Precipitation Event - Calculation					Dry Freeboard - Calc.	
Base Width W_o (ft)	Assumed Runoff Depth $d_{ro\text{-}a}$ (in)	Calculated Runoff Area $A_{ro\text{-}a}$ (ft^2)	Calculated Runoff Vol. $V_{ro\text{-}a}$ (ft^3)	Calculated Storm Vol. V_{st} (ft^3)	Calculation Error ($V_{ro\text{-}a} - V_{st}$) (ft^3)	Dry Area A_{fb} (ft^2)	Dry Volume V_{fb} (ft^3)
40.0	4.81	26,090	10,327	10,327	0	31,182	85,794
55.0	4.81	29,335	11,611	11,612	0	34,735	95,992
70.0	4.80	33,509	13,264	13,264	0	39,282	109,073
85.0	4.80	38,621	15,287	15,288	0	44,819	125,046
100.0	4.80	44,663	17,679	17,679	0	51,327	143,870

	Raffinate Pond Top - Calculation Results							
Base Width W_o (ft)	Total Depth **d** (ft)	Top Width W_d (ft)	Top Length L_d (ft)	Top Area A_d (ft^2)	Top Area A_d (acre)	Total Volume V_d (ft^3)	Total Volume V_d (acre-ft)	
40.0	24.4	162.2	192.2	31,182	0.7	353,016	8.1	
55.0	22.4	166.9	208.1	34,735	0.8	399,730	9.2	
70.0	20.7	173.7	226.2	39,282	0.9	457,639	10.5	⇦ used for fresh water make-up est.
85.0	19.4	182.2	246.0	44,819	1.0	526,707	12.1	
100.0	18.4	192.1	267.1	51,327	1.2	606,872	13.9	

Based on the results of this calculation, the Raffinate Pond can range in size from roughly 5 to 11 acre-ft, depending on the desired depth and plan area used.

ATTACHMENT 4
HEAP LEACH WATER BALANCE CALCULATIONS

TETRA TECH

Client:	Rosemont Copper Co.	
Project:	Heap Leach Facility	JOB NO: 320807
Subject:	Water Balance & Pond Sizing	BY: EMS
Details:	**Attachment 4a: Heap Leach Water Balance Calculations**	DATE: 4/17/2009

Raffinate Parameter Input				**Ore Production Input**		
PLS Flow Rate (gpm)	Application Method	Soln. App. Loss Rate (%)	Active Area (ft^2)	Ore App. Rate (ton/d)	Ore Moisture Content (%)	Ore Field Capacity (%)
2,500	Dripper	3.0%	1,000,000	38,000	2.0%	10.0%

PLS Pond Input				**Raffinate Pond Input**			
Base Width (ft)	Pond Area (ft^2)	Initial Pond Volume (ft^3)	Ultimate Capacity (ft^3)	Base Width (ft)	Pond Area (ft^2)	Initial Pond Volume (ft^3)	Ultimate Capacity (ft^3)
215.0	144,711	0	2,074,753	70.0	39,282	0	457,639

TETRA TECH

Client: Rosemont Copper Co.

Project: Heap Leach Facility | JOB NO: 320807

Subject: Water Balance & Pond Sizing | BY: EMS

Details: **Attachment 4b: Water Balance Calculations - Average Year Precipitation** | DATE: 4/17/2009

Simulated Time			Heap Leach						PLS Pond: Ult. Capacity =		2,074,753 ft^3	
Operating Year (yr)	Operating Month (mo)	# of Days in Month (d/mo)	Precipitation on Heap Area P_{hl} (ft^3/mo)	Incoming Ore Moisture O_{hl} (ft^3/mo)	Ore Moisture Retention R_{hl} (ft^3/mo)	PLS Flow to PLS Pond G_{hl} (ft^3/mo)	Raffinate Flow B_{rp} (ft^3/mo)	Evaporation from Heap Area E_{hl} (ft^3/mo)	Precipitation on PLS Pond P_{pp} (ft^3/mo)	Evaporation from PLS Pond E_{pp} (ft^3/mo)	Pregnant Solution Flow G_{pp} (ft^3/mo)	PLS Pond Water Volume S_{pp_i} (ft^3)
1	Jan	31	135,833	755,128	3,775,641	14,918,749	18,655,639	852,211	19,657	34,863	14,903,542	0
1	Feb	28	121,667	682,051	3,410,256	13,474,999	16,891,448	809,910	17,606	36,129	13,456,476	0
1	Mar	31	121,667	755,128	3,775,641	14,918,749	18,887,856	1,070,261	17,606	60,019	14,876,337	0
1	Apr	30	57,500	730,769	3,653,846	14,437,499	18,458,927	1,155,851	8,321	71,752	14,374,068	0
1	May	31	20,000	755,128	3,775,641	14,918,749	19,231,455	1,312,194	2,894	87,622	14,834,021	0
1	Jun	30	51,667	730,769	3,653,846	14,437,499	18,629,245	1,320,336	7,477	90,746	14,354,230	0
1	Jul	31	405,833	755,128	3,775,641	14,918,749	18,435,708	902,280	58,728	41,616	14,935,861	0
1	Aug	31	360,000	755,128	3,775,641	14,918,749	18,333,990	754,728	52,096	24,396	14,946,449	0
1	Sep	30	179,167	730,769	3,653,846	14,437,499	18,034,099	852,690	25,927	37,142	14,426,284	0
1	Oct	31	135,000	755,128	3,775,641	14,918,749	18,804,007	999,745	19,536	51,915	14,886,370	0
1	Nov	30	95,833	730,769	3,653,846	14,437,499	18,098,833	834,090	13,868	34,694	14,416,673	0
1	Dec	31	163,333	755,128	3,775,641	14,918,749	18,609,763	833,835	23,636	32,837	14,909,548	0

Simulated Time			SX/EW Plant	Raffinate Pond: Ult. Capacity = 457,639 ft^3				
Operating Year (yr)	Operating Month (mo)	# of Days in Month (d/mo)	Barren Solution Flow B_{sx} (ft^3/mo)	Precipitation on Raffinate Pond P_{rp} (ft^3/mo)	Evaporation from Raffinate Pond E_{rp} (ft^3/mo)	Make-up from Fresh Water (FW) Pump F_{fs} (ft^3/mo)	Make-up from Fresh Water (FW) Pump F_{fs} (gpm)	Raffinate Pond Water Volume S_{rp_i} (ft^3)
1	Jan	31	14,903,542	5,336	9,464	3,756,225	629	0
1	Feb	28	13,456,476	4,779	9,807	3,440,000	638	0
1	Mar	31	14,876,337	4,779	16,292	4,023,032	674	0
1	Apr	30	14,374,068	2,259	19,477	4,102,078	710	0
1	May	31	14,834,021	786	23,785	4,420,434	741	0
1	Jun	30	14,354,230	2,030	24,633	4,297,618	744	0
1	Jul	31	14,935,861	15,942	11,297	3,495,202	586	0
1	Aug	31	14,946,449	14,142	6,622	3,380,022	566	0
1	Sep	30	14,426,284	7,038	10,082	3,610,859	625	0
1	Oct	31	14,886,370	5,303	14,092	3,926,426	658	0
1	Nov	30	14,416,673	3,765	9,418	3,687,813	639	0
1	Dec	31	14,909,548	6,416	8,914	3,702,713	620	0

TETRA TECH

Client: Rosemont Copper Co.

Project: Heap Leach Facility | JOB NO: 320807

Subject: Water Balance & Pond Sizing | BY: EMS

Details: **Attachment 4c: Water Balance Calculations - Dry Year Precipitation** | DATE: 4/17/2009

Simulated Time			Heap Leach						PLS Pond: Ult. Capacity = 2,074,753 ft^3			
Operating Year (yr)	Operating Month (mo)	# of Days in Month (d/mo)	Precipitation on Heap Area P_{hl} (ft^3/mo)	Incoming Ore Moisture O_{hl} (ft^3/mo)	Ore Moisture Retention R_{hl} (ft^3/mo)	PLS Flow to PLS Pond G_{hl} (ft^3/mo)	Raffinate Flow B_{rp} (ft^3/mo)	Evaporation from Heap Area E_{hl} (ft^3/mo)	Precipitation on PLS Pond P_{pp} (ft^3/mo)	Evaporation from PLS Pond E_{pp} (ft^3/mo)	Pregnant Solution Flow G_{pp} (ft^3/mo)	PLS Pond Water Volume S_{pp_i} (ft^3)
1	Jan	31	8,292	755,128	3,775,641	14,918,749	18,787,126	856,155	19,657	34,863	14,903,542	0
1	Feb	28	11,375	682,051	3,410,256	13,474,999	17,005,150	813,321	17,606	36,129	13,456,476	0
1	Mar	31	8,625	755,128	3,775,641	14,918,749	19,004,394	1,073,757	17,606	60,019	14,876,337	0
1	Apr	30	583	730,769	3,653,846	14,437,499	18,517,604	1,157,611	8,321	71,752	14,374,068	0
1	May	31	0	755,128	3,775,641	14,918,749	19,252,074	1,312,812	2,894	87,622	14,834,021	0
1	Jun	30	1,625	730,769	3,653,846	14,437,499	18,680,834	1,321,883	7,477	90,746	14,354,230	0
1	Jul	31	174,375	755,128	3,775,641	14,918,749	18,674,325	909,438	58,728	41,616	14,935,861	0
1	Aug	31	184,333	755,128	3,775,641	14,918,749	18,515,089	760,161	52,096	24,396	14,946,449	0
1	Sep	30	32,583	730,769	3,653,846	14,437,499	18,185,216	857,223	25,927	37,142	14,426,284	0
1	Oct	31	7,042	755,128	3,775,641	14,918,749	18,935,923	1,003,703	19,536	51,915	14,886,370	0
1	Nov	30	14,750	730,769	3,653,846	14,437,499	18,182,424	836,598	13,868	34,694	14,416,673	0
1	Dec	31	10,417	755,128	3,775,641	14,918,749	18,767,409	838,564	23,636	32,837	14,909,548	0

Simulated Time			SX/EW Plant	Raffinate Pond: Ult. Capacity = 457,639 ft^3				
Operating Year (yr)	Operating Month (mo)	# of Days in Month (d/mo)	Barren Solution Flow B_{sx} (ft^3/mo)	Precipitation on Raffinate Pond P_{rp} (ft^3/mo)	Evaporation from Raffinate Pond E_{rp} (ft^3/mo)	Make-up from Fresh Water (FW) Pump F_{fs}		Raffinate Pond Water Volume S_{rp_i} (ft^3)
						(ft^3/mo)	(gpm)	
1	Jan	31	14,903,542	5,336	9,464	3,887,711	651	0
1	Feb	28	13,456,476	4,779	9,807	3,553,702	659	0
1	Mar	31	14,876,337	4,779	16,292	4,139,570	694	0
1	Apr	30	14,374,068	2,259	19,477	4,160,755	720	0
1	May	31	14,834,021	786	23,785	4,441,053	744	0
1	Jun	30	14,354,230	2,030	24,633	4,349,208	753	0
1	Jul	31	14,935,861	15,942	11,297	3,733,819	626	0
1	Aug	31	14,946,449	14,142	6,622	3,561,121	597	0
1	Sep	30	14,426,284	7,038	10,082	3,761,976	651	0
1	Oct	31	14,886,370	5,303	14,092	4,058,342	680	0
1	Nov	30	14,416,673	3,765	9,418	3,771,404	653	0
1	Dec	31	14,909,548	6,416	8,914	3,860,359	647	0

TETRA TECH

Client: Rosemont Copper Co.

Project: Heap Leach Facility | JOB NO: 320807

Subject: Water Balance & Pond Sizing | BY: EMS

Details: **Attachment 4d: Water Balance Calculations - Wet Year Precipitation** | DATE: 4/17/2009

Simulated Time			Heap Leach						PLS Pond: Ult. Capacity = 2,074,753 ft^3			
Operating Year (yr)	Operating Month (mo)	# of Days in Month (d/mo)	Precipitation on Heap Area P_{hl} (ft^3/mo)	Incoming Ore Moisture O_{hl} (ft^3/mo)	Ore Moisture Retention R_{hl} (ft^3/mo)	PLS Flow to PLS Pond G_{hl} (ft^3/mo)	Raffinate Flow B_{rp} (ft^3/mo)	Evaporation from Heap Area E_{hl} (ft^3/mo)	Precipitation on PLS Pond P_{pp} (ft^3/mo)	Evaporation from PLS Pond E_{pp} (ft^3/mo)	Pregnant Solution Flow G_{pp} (ft^3/mo)	PLS Pond Water Volume S_{pp_i} (ft^3)
1	Jan	31	192,958	755,128	3,775,641	14,918,749	18,596,748	850,444	19,657	34,863	14,903,542	0
1	Feb	28	144,292	682,051	3,410,256	13,474,999	16,868,123	809,210	17,606	36,129	13,456,476	0
1	Mar	31	154,333	755,128	3,775,641	14,918,749	18,854,179	1,069,250	17,606	60,019	14,876,337	0
1	Apr	30	78,250	730,769	3,653,846	14,437,499	18,437,535	1,155,209	8,321	71,752	14,374,068	0
1	May	31	47,875	755,128	3,775,641	14,918,749	19,202,718	1,311,332	2,894	87,622	14,834,021	0
1	Jun	30	93,042	730,769	3,653,846	14,437,499	18,586,590	1,319,056	7,477	90,746	14,354,230	0
1	Jul	31	555,542	755,128	3,775,641	14,918,749	18,281,370	897,649	58,728	41,616	14,935,861	0
1	Aug	31	526,292	755,128	3,775,641	14,918,749	18,162,555	749,585	52,096	24,396	14,946,449	0
1	Sep	30	243,000	730,769	3,653,846	14,437,499	17,968,291	850,715	25,927	37,142	14,426,284	0
1	Oct	31	263,292	755,128	3,775,641	14,918,749	18,671,748	995,777	19,536	51,915	14,886,370	0
1	Nov	30	108,292	730,769	3,653,846	14,437,499	18,085,989	833,705	13,868	34,694	14,416,673	0
1	Dec	31	267,250	755,128	3,775,641	14,918,749	18,502,632	830,621	23,636	32,837	14,909,548	0

Simulated Time			SX/EW Plant	Raffinate Pond: Ult. Capacity = 457,639 ft^3				
Operating Year (yr)	Operating Month (mo)	# of Days in Month (d/mo)	Barren Solution Flow B_{sx} (ft^3/mo)	Precipitation on Raffinate Pond P_{rp} (ft^3/mo)	Evaporation from Raffinate Pond E_{rp} (ft^3/mo)	Make-up from Fresh Water (FW) Pump F_{fs} (ft^3/mo)	Make-up from Fresh Water (FW) Pump F_{fs} (gpm)	Raffinate Pond Water Volume S_{rp_i} (ft^3)
1	Jan	31	14,903,542	5,336	9,464	3,697,333	620	0
1	Feb	28	13,456,476	4,779	9,807	3,416,675	634	0
1	Mar	31	14,876,337	4,779	16,292	3,989,355	669	0
1	Apr	30	14,374,068	2,259	19,477	4,080,686	707	0
1	May	31	14,834,021	786	23,785	4,391,697	736	0
1	Jun	30	14,354,230	2,030	24,633	4,254,964	737	0
1	Jul	31	14,935,861	15,942	11,297	3,340,863	560	0
1	Aug	31	14,946,449	14,142	6,622	3,208,587	538	0
1	Sep	30	14,426,284	7,038	10,082	3,545,052	614	0
1	Oct	31	14,886,370	5,303	14,092	3,794,167	636	0
1	Nov	30	14,416,673	3,765	9,418	3,674,970	636	0
1	Dec	31	14,909,548	6,416	8,914	3,595,582	603	0