Design Memorandum CCL-CC4

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Subject: Carmacks Copper Project - Heap Leach Facility Water Balance

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1. Introduction

The report "Updated Detailed Design of the Heap Leach Pad and Events Pond" (prepared for Western Copper Holdings Ltd. by Knight Piesold Ltd., reference 1785/1, April 23, 1997) presented an evaluation of the Carmacks Copper Project heap leach facility water balance. The report included a description of the water balance model used and the results of the model in terms of the requirements for solution storage and make-up water demands. The report recommended a total Events Pond storage volume of 160,000 m^3 to meet the solution storage design criteria. Reviews of the report carried out by the RERC and their consultants identified concerns with regard to the water balance modeling methodology and the derivation of the total design solution storage volume.

This Design Memorandum CCL-CC4 prepared by Clearwater Consultants Ltd. describes a new water balance model and summarizes the most recent water balance analyses carried out for the Carmacks Copper Project. The study has been carried out in accordance with the Consultant Contract between Western Copper Holdings Ltd. and Clearwater Consultants Ltd. dated January 29 , 1998.

The basis for this report is Design Memorandum CCL-CC2, "Site Hydrology Revisions" dated March 12, 1998 and Design Memorandum CCL-CC2A "Revisions to Site Hydrology, Response to RERC" dated April 23, 1998. It is understood that the RERC concurs with the design hydrological parameters presented therein. The analyses and results presented herein have focused on the primary areas of concern identified during the RERC review process: the water balance modeling methodology, input parameters, calculation of draindown volumes, and, total design solution storage volume. As discussed in the Sitka Corp. report "Design Criteria and Parameters Report", Western Copper plan to use run-of-mine ore (ROM ore) for the heap and all water balance results presented herein are for ROM ore.

2. Leach Pad Water Balance Model

2.1. General Description

The water balance for the heap leach facility at the Carmacks Copper project Williams Creek site was modeled using a spreadsheet analysis developed in Microsoft Excel. The analysis used monthly time steps to allow a continuous simulation of the water balance over the eight year mine operating life plus a period of five years (two years residual leaching plus three years heap rinsing) after the completion of ore placement. The model includes user-defined water inputs for the leaching process and for the site hydrology (precipitation, rainfall, snowfall and evaporation). The spreadsheet workbook file CC_WB10.XLS is made up of linked worksheets entitled “Input&Output”, “Summary”, “Graphs”, “Annual”, and “Storage”, respectively. Copies of the worksheets are contained in the Appendices. Descriptions of the input data and assumptions and the modeling methodology are presented following.

The hydrology of the leach pad area at an assumed nominal elevation of 850 m was presented in the Clearwater Consultants Ltd. design memoranda CCL-CC2 (March 12, 1998) and CCL-CC2A (April 23, 1998).

2.2. Input Data and Assumptions

Process-related input data for the water balance analysis have been based on data provided by Kilborn Engineering Pacific Ltd. All input data are presented on page 1 of worksheet “Input&Output” (Table I.2 in Appendix I). The key process-related input data and assumptions are summarized following:

- ore will be placed for leaching at a maximum rate of 9 872 tonnes per day (tpd) over an eight year period. A total of 13.3 million tonnes of ore will be placed in the heap;
- ore placement will commence in May of Year 1 and will be completed by June of Year 8;
- ore will be placed from mid-May to the end of November each year. The model assumes a maximum of 200 days per year of ore placement;
- ore will be placed in nominal 8 m lifts and will have a dry density of 1.6 t/m^3;
- based on heap layouts prepared by Kilborn, the number of complete lifts of ore under leach was estimated to increase from about three during the first year to eight in Year 8;
- the maximum total area under leach at any time will be 47,400 m^2;
- barren leaching solution will be applied to the heap using drip emitters at a total flow rate of 540 m^3/hour. Pregnant leach solution (PLS) will flow by gravity from the heap to the plant. The maximum total solution flow from the heap to the plant will be equal to the maximum flow of barren solution;
- excess solution and runoff water will be stored as required in the Events Pond only. No active solution storage will be available in the in-heap area;
- the area of the leach pad will increase in stages over the eight years of ore placement as shown on Table 1. Subsequent stages of activity are also shown on the table. Assumptions shown below related to the timing and duration of operational stages after the completion of ore placement have been made herein for the purposes of this water balance evaluation. These stages will be subject to change as the closure plan is developed and, at this time, should not be construed as formal commitments by WCHL;

Table 1 - Stages of Development

Stage	Years	Tonnes Placed	Leach Pad Area (m^2)
I	1	1 963 500	142 000
II	2 and 3	3 947 625	219 000

III	4 to 8	7 366 744	315 000
IV	8 and 9	0	315 000
V	10, 11, 12	0	315 000
VI	13 onwards	0	315 000

- leach solution application and copper recovery will continue for two years after all ore has been placed. Stage IV thus corresponds to the most of Year 8 and all of Year 9;
- heap rinsing (Stage V) will be carried out after all leaching and copper recovery has been completed. The model assumes that this stage will be completed over a three year period, Years 10 to 12. During this stage the heap draindown inventory would be progressively released from the system. A soil cover will be placed on the heap to reduce infiltration. Specific requirements for the soil cover will be developed and reviewed as part of the closure plan development. At this time the water balance model does not include installation of a soil cover after completion of ore placement;
- Stage VI applies to Year 13 onwards and corresponds to the decommissioned condition. A water treatment plant and measures to collect and treat runoff and seepage will remain in place if required after decommissioning;
- each "year" in the model is from April 1 to March 31;
- ROM ore moisture contents were estimated by Beattie Consulting Ltd. based on large diameter column leach tests. All moisture contents shown in Table 2 are expressed as a percent by weight of the weight of ore.

Table 2 – ROM Ore Moisture Contents

Condition	Moisture Content
Initial Moisture Content (assumed)	3.0 %
Leaching Moisture Content	12.0 %
Residual Moisture Content	10.0 %
Potential Draindown (Leaching *minus* Residual)	2.0 %

Hydrological data and assumptions used in the model include the following:

- monthly depths of average site rainfall, snowfall, snowmelt and evaporation were presented in the Clearwater Consultants Ltd. Design Memoranda CCL-CC2 and CCL-CC2A and are shown on Table I.2 in Appendix I;
- different return periods for annual precipitation may be specified in the model for each individual year of operation. Annual precipitation may range from a 20 year return period dry year up to a 100 year return period wet year. The base case for the water balance assumes average conditions (assumed equivalent to a two year return period) of monthly precipitation for every year of operation;
- snowmelt is conservatively assumed to occur in a one month period during either April or May each year. There is no provision in the present water balance model for the potential removal of snow from the heap prior to snowmelt;

- evaporation coefficients may be specified for the area under active leaching, for the heap and overliner area, and for other areas draining to the Events Pond. The coefficients are applied to the average monthly lake evaporation to estimate monthly evaporative losses from areas not covered with ponded water;
- allowable maximum, minimum and initial (Year 1) solution storage volumes must be specified in the model input for the in-heap area and for the Events Pond. These volume limitations apply over the complete simulation period. The base case model assumes no active storage of solution within the in-heap area and a maximum and minimum nominal in-heap storage volume of 500 m^3. The Events Pond was also assumed to have a nominal minimum operating volume of 500 m^3. Recommended maximum Events Pond storage capacities are presented in Section 4.4.

The results of the water balance analyses are discussed in Sections 3 and 4 and complete output from the model is presented in Appendices I, II and III.

2.3. Modeling Methodology and Base Case Settings

Appendix I contains output from the “Input&Output” worksheet as Tables I.2 to I.4. Table 1.2 summarizes the process and hydrological input data and assumptions as discussed above. Table I.3 (pages 2 to 5) includes a summary of the basic input data and a series of columns labeled “A” to “X” for the heap leach pad monthly water balance. The calculation methodology for each column is described following:

Columns A to H present input process and hydrological parameters for each month as follows:

- Column A “Stacked Leach Ore, Stacked tonnes” - calculated for each month based on the annual tonnage of placed ore and the number of operating days for that month;
- Column B “Stacked Leach Ore, Stacked Volume” - stacked tonnes converted to cubic metres in place with an assumed dry density of 1.6 t/m^3;
- Column C “Areas, Under Leach” - maximum area up to 47 400 m^2;
- Column D “Areas, Total Heap and Overliner” = total heap area for that year;
- Column E “Areas, Uncovered Heap”, equal to the total heap area. This column is included to allow for the possible installation of a cover over part or all of the heap at some time if needed to minimize infiltration. A soil cover will be placed on the heap during decommissioning, however, the base case setting conservatively assumes that no cover will be placed on the heap;
- Column F “Runoff Return Period” - defined in the input section for each year, may range from 20 year return period dry year up to 100 year return period wet year. The base case setting is a return period of 2 years representing average conditions;
- Column G “Runoff Depth” - calculated for each month based on prorating the monthly average runoff depth (defined in the input section as equal to rainfall plus snowmelt for each month) by the ratio of the actual annual total precipitation (for the defined return period for that year) divided by the estimated long-term average annual total precipitation;
- Column H “Evaporation Depth” - average monthly freewater evaporation depth defined in the input section.

Columns I to K calculate water inflows to the heap as follows:

- Column I "Water Inflows, Leach Pad Runoff" = monthly runoff depth *times* total leach pad area, Column G *times* Column D;
- Column J "Water Inflows, Other Inflows" = monthly volume for other possible inflows to the leach pad defined in the input. The base case setting is zero for other inflows;
- Column K "Water Inflows, Total In" = Column I *plus* Column J.

Columns L to P calculate water outflows and losses from the heap as follows:

- Column L "Evaporation Losses, Leach Area" = monthly evaporation depth *times* coefficient for area under leach irrigation *times* the area under leach, Column H *times* coefficient *times* Column C. The base case evaporation coefficient for the area under leach irrigation is 0.10 (10% of lake evaporation);
- Column M "Evaporation Losses, Heap & Overliner" = monthly evaporation depth *times* coefficient for heap and overliner area *times* (the heap and overliner area minus the area under leach), Column H *times* coefficient *times* (Column D *minus* Column C). The base case evaporation coefficient for the heap and overliner area is 0.05 (5% of lake evaporation);
- Column N "Permanent Loss to Ore Moisture" = water permanently lost in raising the moisture content of the ore from the initial run-of-pit moisture content to the residual moisture content, equal to the stacked ore tonnes in Column A *times* the moisture change (residual *minus* initial). This water loss occurs only when leaching solution is applied to newly-placed ore on the heap. The model assumes that leaching of newly-placed ore will not start each year until June 1, therefore, during May this loss is conservatively set equal to zero;
- Column O "Initial Loss to Leaching Ore" = water temporarily tied up in raising the moisture content of a new lift of ore from the residual moisture content to the leaching moisture content. Column O is equal to the tonnage of ore in one lift (leaching area of 47 400 m^2 *times* the lift depth of 8 m *times* the ore dry density of 1.6 t/m^3) *times* the moisture change (leaching *minus* residual) *times* the number of new lifts of ore in the year (generally equal to one). This loss is also conservatively set equal to zero for May. At any time in the heap operating life, the total of all the initial losses to leaching ore up to that time represents the potential total draindown volume from the heap;
- Column P "Total Out" = sum of Columns L, M, N and O.

Columns Q to U calculate process make-up water requirements for the operation as follows:

- Column Q "Total Required" - equal to zero if the total monthly inflow (Column K) is greater than the total monthly outflow (Column P), otherwise equals Column P *minus* Column K;
- Column R "From Heap Storage" - since no active storage of solution is allowed within the in-heap area, this column is always equal to zero;
- Column S "Total Other" = Column Q *minus* Column R;

- Column T "From Events Pond" - excess runoff to and stored in the Events Pond for that month is used for make-up water if required. This column is linked to the Events Pond water balance portion of the spreadsheet (see Column AD below);
- Column U "From Fresh" = Column Q *minus* Column R *minus* Column T. This is the quantity of additional water that must be provided from an outside source of freshwater to satisfy the total make-up water requirement for that month.

Columns V to X calculate the net monthly inflow of water to the heap and the required release to the Events Pond as follows:

- Column V "Net Inflow to Heap" = total inflow *minus* total outflow *plus* make-up water from Events Pond *plus* make-up water from freshwater source, Column K *minus* Column P *plus* Column T *plus* Column U;
- Column W "Release to Events Pond" - since no active storage is allowed within the in-heap area, this column is always equal to Column V, the net inflow to the heap;
- Column X "Total In-Heap Storage" = previous month-end storage volume *plus* net inflow for the current month *minus* water released to the Events Pond in the current month, equal to previous month Column X *plus* current month (Column V *minus* Column W). This column is always equal to 500 m^3 since no active storage of solution is allowed within the heap.

Table I.4 (pages 6 to 9 from worksheet "Input&Output") in Appendix I presents the monthly water balance for the Events Pond. Columns "AA" to "AL" are described following:

- Column AA "Water Inflows, from Precipitation Runoff" = monthly runoff depth (Column G) *times* Events Pond catchment area;
- Column AB "Water Inflows, from Heap Storage" - water released to the Events Pond from the in-heap storage pond, equal to Column W;
- Column AC "Water Losses to, Evaporation" - monthly lake evaporation depth (Column H) *times* pond area of the Events Pond;
- Column AD "Water Losses to, Make-up to Heap" - water stored in the Events Pond used to partially or to fully meet the total make-up water demand. This column is zero unless the monthly runoff inflow (AA) *plus* water in storage at the end of the previous month (AI) exceeds the monthly evaporation loss (AC) and additional make-up water is required (Column Q). This value is used in Column T;
- Column AE "Net Inflow" = total inflow minus total outflow = Column AA *plus* Column AB *minus* Column AC *minus* Column AD;
- Column AF "Potential Volume in Storage" = previous month-end volume in storage plus net inflow for the current month before any allowance for treatment or release from the Events Pond;
- Column AG "Treated Volume Released" - treatment and release of excess solution, if required, is allowed in the model anytime between May and October. Generally, water is not released from the system during the first eight years until October of each year so that maximum use may be made of water stored in the Events Pond to meet make-up water requirements during the summer months. By the end of October each year, the Events Pond volume is assumed to be drawn down to the minimum allowable operating

volume to ensure maximum storage availability during the winter and prior to the following year's snowmelt;

- Column AH "Untreated Volume" - This column is equal to zero unless the previous month-end storage volume (Column AI) *plus* the current month net inflow (Column AE) *minus* the current month treat and release volume (Column AG) is greater than the maximum allowable Events Pond storage volume, in which case the surplus volume would spilled during that month. Spillage would take place from a lined open channel spillway at the Events Pond dam and would only occur for extreme inflow events more severe than the design events (Section 4.). For all cases modeled in this study this column was always equal to zero, that is, no untreated solution was ever spilled from the Events Pond;
- Column AI "Remaining Volume in Storage" = previous month-end storage volume *plus* net inflow (AE) *minus* treated volume (AG) *minus* spilled volume (AH);
- Column AJ "Cumulative Volumes, Treated & Released" - total volume treated and released since the start of operations;
- Column AK "Cumulative Volumes, Untreated" - total untreated volume that may have been spilled since the start of operations. For the parameters used in this study adequate storage has been provided such that this column is always equal to zero;
- Column AL "Total Solution Storage" - total volume of solution in storage at the end of the present month, equal to total in-heap storage (Column X) *plus* total Events Pond storage (Column AI).

3. Water Balance Results

3.1. General

The water balance results discussed following refer to ROM ore and are presented as a series of tables and figures in Appendices I, II and III. Appendix I contains the results of the base case average precipitation conditions water balance model:

- worksheet "Summary" (Table I.1, one page);
- worksheet "Input&Output" (nine pages) with the input data and assumptions (Table I.2, page 1), the leach pad monthly water balance (Table I.3, pages 2 to 5), and the Events Pond monthly water balance (Table I.4, pages 6 to 9);
- worksheet "Graphs" (one page) with Figure I.1 (Events Pond Water Storage Variation) and Figure I.2 (Variation in Monthly Treat and Release Volumes).

Appendix II contains copies of the worksheet "Summary" for dry years (Table II.1, 20 year return period) and for wet years (Table II.2, 100 year return period). Table II.3 presents worksheet "Annual", a comparison of the three hydrologic conditions on an annual basis.

Tables 3 and 4 summarize and compare annual make-up water volumes and treat and release volumes, respectively, for each stage of heap development.

3.2. Make-Up Water Requirements

The results on Table 3 and in Appendix I show that, for average and 20 year return period dry year conditions of annual precipitation, the heap will be in a water deficit position until the end of Year 7. For 100 year return period wet years the heap will be in a water deficit position until the end of Year 3. No make-up water will be required after Year 8.

Table 3 - Annual Make-Up Water Requirements (m^3 per year)

Condition	Stage I	Stage II	Stage III (Years 4 to 7)	Stages IV to VI
Average	123 000	69 000	9 000 to 29 000 (2)	0
Dry Years	139 000	93 000	42 000 to 61 000	0
Wet Years	94 000	27 000	0	0

Notes for Table 3

1) Volumes shown represent average values for the indicated stage of operations rounded up to the nearest 1000 m^3. Year-to-year values will vary as shown in the Appendices.

2) Stage III make-up water demands will depend on the number of lifts of ore under leach. Table shows the estimated ranges for Years 4 to 7.

3.3. Treat and Release Requirements

As shown on Table 4 for all precipitation conditions, the system will not require the treatment and release of any excess water during the first three years of ore placement. Average and drier conditions will not require any releases until after Year 7. Some excess water may require treatment and release during Years 4 to 7 as a result of 100 year wet years.

Table 4 - Annual Treat and Release Volumes (m^3 per year)

Condition	Stages I & II (Years 1 to 3)	Stage III (Years 4 to 7)	Stage IV (Years 8 & 9)	Stage V (Note 2)	Stage VI
Average	0	0	91 000 to 112 000	145 000	113 000
Dry Years	0	0	58 000 to 79 000	113 000	80 000
Wet Years	0	29 000 to 49 000	149 000 to 170 000	203 000	171 000

Notes for Table 4

1) Volumes shown represent average values for the indicated stage of operations rounded up to the nearest 1000 m^3. Year-to-year values will vary as shown in the Appendices.

2) Stage V includes the controlled treatment and release of the draindown inventory.

After all ore has been placed but while leaching is still on-going in Stage IV, 91 000 to 112 000 m^3 per year of excess water may have to be treated and released during average conditions since moisture will no longer be lost to wetting of new ore. During the heap rinsing phase (Stage V, Years 10 to 12), it has been assumed that pumping and recirculation rates will be progressively decreased such that draindown of the heap would be accomplished in a controlled manner over a three year period. About 145 000 m^3 per year will require treatment during this stage for average conditions. This volume would decrease significantly after placement of a soil cover on the heap. Volumes for Stage VI are shown in the table to provide an indication of the annual volumes of water expected to report to Williams Creek after heap rinsing has been completed.

Actual monthly treatment and release volumes will be optimized during operations so as to satisfy water quality criteria in the downstream receiving environment. Actual year-to-year treatment volumes will vary depending on the number of lifts of ore under leach, actual ore moisture conditions, and the actual magnitude of monthly and annual precipitation.

3.4. Normal Maximum Solution Storage Volumes

Table 5 summarizes normal maximum solution storage volumes, which would occur each year for average, 20 year dry year and 100 year wet year precipitation conditions. The volumes result from hydrological inflows only with no allowance for any additional process-related inflows.

Table 5 - Normal Maximum Solution Storage Volumes (m^3)

	Stage I	Stage II	Stage III	Stage IV	Stage V
Average Precipitation					
In-Heap	500	500	500	500	500
Events Pond	28 000	42 000	58 500	58 500	500
Total Storage (Note 1)	28 500	42 500	59 000	59 000	1 000
Dry Years (20-year)					
In-Heap	500	500	500	500	500
Events Pond	20 000	30 000	41 500	41 500	500
Total Storage	20 500	30 500	42 000	42 000	1 000
Wet Years (100-year)					
In-Heap	500	500	500	500	500
Events Pond	43 000	64 000	88 500	88 500	500
Total Storage	43 500	64 500	89 000	89 000	1 000

Notes for Table 5

1) "Total Storage" corresponds to the maximum concurrent total of In-Heap (nominal 500 m^3) plus Events Pond storage for each stage. The Events Pond capacity will be 160 000 m^3 (see Section 4.4).

2) Volumes are averaged over the respective periods and rounded to the nearest 500 m^3. Volumes for individual years in each stage are shown in Tables I.1, II.1 and II.2.

3) Stage V volumes correspond to nominal minimum pond volumes. The treatment plant capacity during this stage will be sufficient to treat and release water as fast as it reports to the Events Pond. Temporary storage of water, therefore, will not be required for normal operations during Stage V although the Events Pond facility will remain operational if needed during this stage.

Annual maximum volumes generally occur at the end of the snowmelt period and subsequently decrease during the summer and fall. Minimum volumes are attained by the end of October and maintained throughout the winter period.

The volumes in Table 5 represent averages for each stage of operations. The maximum solution storage volume experienced in a year will depend in part on the actual magnitude of the precipitation each month and year. Extreme hydrological events used for design and recommended total design solution storage volumes are presented in Section 4 following.

4. Total Solution Storage Requirements

4.1. Hydrological Events

Total solution storage requirements will depend in part on the duration and return period of the critical hydrological event adopted for design. The recommended hydrological return period for design of the solution storage is 100 years based on discussions held with the RERC. A number of combinations of hydrological events were evaluated to determine the critical duration and combinations of events for design of the total solution storage volume. The magnitudes (depth of rainfall or runoff) of the various events were presented in the Clearwater Consultants Ltd. Design Memoranda CCL-CC2 and CCL-CC2A.

The hydrological inflow cases evaluated during this study are described following:

Case A - average conditions of rainfall and snowfall throughout the year. This is the "Base Case" and involves annual total precipitation of 372 mm with the snowmelt occurring during April each year. The total runoff depth during the snowmelt period is 161 mm based on a seven month period from October through the end of April. This April runoff depth, therefore, includes snowmelt plus concurrent rainfall during the snowmelt period.

Three cases were considered which involved extreme rainfall wet periods of various duration following immediately after the average April snowmelt as follows:

Case Ai - Case A above with a 100 year return period one month duration wet period in May and average precipitation conditions thereafter. The 100 year one month wet month has an estimated precipitation of 155 mm assumed to be rainfall. The total annual precipitation for this case is 514 mm.

Case Aii - Case A above with a 100 year return period two month duration wet period in May and June and average precipitation conditions thereafter. The 100 year two month wet period has an estimated total precipitation of 229 mm assumed to be rainfall equally distributed in each of May and June. The total annual precipitation for this case is 546 mm, equivalent to a 100 year wet year.

Case Aiii - Case A above with a 100 year return period three month duration wet period in May, June and July and average precipitation conditions thereafter. The 100 year three month wet period has an estimated total precipitation of 288 mm assumed to be rainfall equally distributed in each of May, June and July. The total annual precipitation for this case is 544 mm, equivalent to a 100 year wet year.

Three other cases were considered which involved a 100 year return period wet year as follows:

Case B - a 100 year return period wet year with a total annual precipitation of 541 mm and snowmelt occurring during April. This case represents an incremental annual depth of precipitation of 169 mm over and above average conditions. The additional precipitation was distributed over the May to September period as rainfall in proportion to average monthly rainfall depths. The total April runoff depth for this case was 244 mm;

Case B1 - a 100 year return period wet year including a 100 year return period snowmelt occurring during April. The total April runoff depth for this case was 311 mm based on a seven months duration wet period from the previous October through and including April. Monthly rainfall from May to September was prorated so that the total annual precipitation was equal to 541 mm; and,

Case B2 - a 100 year return period wet year including a 100 year return period snowmelt occurring during May. For this case April runoff was assumed to be zero and total May runoff was 325 mm based on an eight months duration wet period from the previous October through and including May. Monthly rainfall from June to September was prorated so that the total annual precipitation was equal to 541 mm. For this case, evaporation losses during the May snowmelt period were conservatively assumed equal to zero.

The cases above include a range of wet period durations for the calculation of 100 year return period total precipitation, snowfall, snowmelt and runoff as follows:

- one, two and three months duration for rainfall occurring in the summer period after snowmelt (Cases Ai, Aii and Aiii);
- seven months duration (October through April) for snowfall plus rainfall to calculate total runoff in April (Case B1);
- eight months duration (October through May) for snowfall plus rainfall to calculate total runoff in May (Case B2); and,
- twelve months duration to calculate monthly snowfall and rainfall for the 100 year wet year (Case B).

4.2. Process Interruptions

Process interruptions due to power failures, pump breakdown or other operational disruptions may impact directly on the total solution storage requirements. The process interruptions considered during the study included the following:

- if the snowmelt is late and occurs during May, no new ore will be placed or leached during May and, therefore, no water will be consumed due to saturating newly placed ore. In addition, there would be no evaporation losses during a May snowmelt. These conditions would apply only to Case B2 above;
- a loss of solution pumping capacity such that a portion of the total potential draindown volume from the heap must be contained in storage.

Partial heap draindown could result from a power failure causing all solution pumping to cease so that no solution is either applied to the top of the heap or is recycled from the Events Pond to the top of the heap for some period of time until power and pumping capacity is restored. The potential total draindown volume is related to the change in moisture content of the ore from the leaching moisture content to the residual moisture content and to the total tonnes of ore under leach at any time.

The total potential draindown volume at any time is equal to: the area of leach solution application (47 400 m^2) *times* the ore density (1.6 t/m^3) *times* the individual lift height (8 m) *times* the number of lifts under leach (varies over the mine life) *times* the moisture change (2.0%). Based on the process data described in Section 2.2, the total potential draindown volume may range from 39 000 m^3 (3 lifts of ore) at the end of Year 1 to 97 000 m^3 in the last year of operation when about eight lifts of ore may be under leach.

The proportion of the total potential draindown volume reaching the Events Pond storage will depend on the length of time that all solution pumping capacity is lost. The rate of flow of draindown solution from the heap may initially remain constant for a few days and equal to the previous rate of solution application. The total time that the flow will remain constant will depend on the depth of ore under leach. The flow rate, however, will decrease with time in an exponential manner: in theory, an infinite time would be required to completely drain down the heap. The time necessary for 90% to 100% of the total potential draindown volume to flow into the Events Pond will be a function of the depth of ore under leach and the particle size, and hence permeability, of the ore. Solution will be applied to the heap at a total rate of 540 m^3/hour.

Mine operators agree that emergency dedicated stand-alone power generation is critical to ensure continued heap operation:

- to ensure continued normal operation of the recovery plant;
- to prevent the freezing of solution application pipelines as a result of temporary shutdowns during winter operations; and,
- to minimize the potential volume of draindown solution that may report to the solution storage facilities.

Existing heap leach operations typically have either dedicated emergency generation capability on-site or access to emergency generators and pumps that could be delivered from off-site and made operational within a 12 hour to 48 hour time frame.

Western Copper Holdings Ltd. will undertake to have dedicated, stand-alone power generation capability on site sufficient to run all solution pumps. A two day period will allow a reasonable length of time to ensure pumping capacity is restored using the emergency power generator. In addition, various other operational measures and actions will be studied by Western Copper Holdings Ltd. to ensure that design total storage capacities will not be exceeded. These measures may include the provision of duplicate redundant solution pumps and the availability of spare parts on-site for prompt repair in case of pump failure.

The design draindown criterion used in this study was: in conjunction with extreme hydrologic events as described in Section 4.3, the minimum draindown storage capacity will be a volume of about 26 000 m^3 equivalent to two days (48 hours) application of leaching solution.

4.3. Combinations of Events

The critical case for the design of total solution storage volumes was determined by running the water balance model for each of the hydrological inflow cases described in Section 4.1 to calculate total volumes of solution in storage for each month of the entire simulation period. Additional volumes due to process interruptions (Section 4.2) were then added to determine total solution storage requirements. Table III.1 in Appendix III presents the resulting storage volumes for all the above cases. The design total storage volume requirements for each month and each year were taken as the maximum volumes calculated from the various storage cases described above. The results are shown on page 4 of Table III.1 and are discussed following.

4.4. Design Storage Volumes

Table 6 summarizes the maximum total solution storage requirements for each year of operation necessary to prevent an uncontrolled release of solution from the Events Pond for the combinations of hydrologic and process events described previously. The table also shows the month in which the maximum occurs each year and the combination of events case leading to the maximum.

Table 6 - Summary of Solution Storage Requirements

Year	Maximum Total Solution Storage (m^3)	Month of Occurrence	Case
1	55 000	May	B2
2	107 000	May	B2
3	107 000	May	B2
4	138 000	May	B2
5	138 000	May	B2
6	138 000	May	B2
7	138 000	May	B2
8	138 000	May	B2
9	133 000	April	B1

Note for Table 6 Maximum total solution storage volumes are rounded up to the nearest 1 000 m^3 (see Appendix III).

Previous site assessments, geotechnical investigations and engineering design work have indicated that an Events Pond with a storage capacity of 160,000 m^3 can be accommodated. Western Copper Holdings Ltd. intends to construct the Events Pond based on this volume. As shown in Table 6, this capacity comfortably exceeds the maximum required total solution storage volume conservatively estimated in the present water balance study by 22,000 m^3.

Storage capacity for the Events Pond may be increased in stages over the operating period allowing deferment of capital expenditures and flexibility in the provision of total solution storage capability. Routine monitoring of site precipitation, snowpack and all water balance flows during operations must be carried out.

4.5. Capacity for Draindown Storage

During the winter months the Events Pond will contain only minimum volumes of solution in storage. The total available solution storage volume of 160 000 m^3 will provide storage for 100% of the total potential draindown volumes in the winter months. If any draindown from the heap were to occur at any time during the winter, full normal operations and design storage volumes must be re-established prior to the start of the spring snowmelt.

Based on the monthly Events Pond storage volumes calculated from the water balance model (Appendix I, pages 7 to 9, Column AI), 100% of the total potential draindown volume may be stored at all times throughout the mine life for average precipitation conditions.

4.6. Available Solution Storage and System Performance

The following is a summary of the conservative design criteria, operating concepts and design contingencies proposed by Western Copper Holdings Ltd. (WCHL) for the Carmacks Copper Project to ensure that there is adequate solution storage capacity within the system. The expected performance of the heap leach facility as a result of the design criteria and operating concepts is also presented:

Design Criteria

Water balance design criteria are conservative and are based on a combination of several extreme events occurring at the same time during the maximum storage month. The design criteria for solution storage during the maximum storage month are:

⇒ Average precipitation and runoff conditions, *plus*

⇒ Runoff from the 100 year return period snowmelt assumed to occur in the last two weeks of May, *plus*

⇒ No placement of ore and no loss of water to wetting new ore during May, *plus*

⇒ No evaporation losses from the heap or Events Pond during May, *plus*

⇒ 48 hours of heap drain down at a constant rate of 540 m^3/hour assumed to occur during or at the end of the snowmelt.

It is emphasized that the 48 hour draindown criterion applies <u>only in conjunction with</u> all the other inflow events listed above.

Operating Concepts

The heap leach storage facility will be operated to ensure adequate solution storage capacity as follows:

- A storage volume of 160,000 m^3 will be provided in the Events Pond. This volume is 22,000 m^3 more than the maximum required solution storage volume calculated using the above criteria and the present water balance model;
- At the start of the winter season and until the start of the snowmelt every year, the Events Pond will be empty thereby ensuring that the full solution storage capacity of the system is available during the winter and in advance of the annual snowmelt. Therefore, 100% of the total potential draindown volume may be stored in the winter at all times throughout the mine life for all precipitation conditions;
- Emergency systems for power generation are available year round;
- Provision for a water treatment plant by year 3 so that excess solutions are released in a controlled manner to ensure maximum storage capacities are maintained.

Design Contingencies

As part of the water balance modeling study, design contingencies were considered and used conservatively in the development of the water balance model. The water balance does not rely on implementation of these contingencies but they are available to the operator as necessary:

- No snow removal is required to maintain the water balance and satisfy the design solution storage criteria;
- No active evaporation of solutions is required during the summer to reduce solution inventories. Sprinklers or temporary pad covers could be used during summer months to reduce solution inventories if necessary.

System Performance

Based on the water balance study and with implementation of the above noted design criteria, operating concepts and other system contingencies, the heap leach solution storage system is expected to perform as follows:

- There will be storage for 100% of the total potential draindown volume available at all times throughout the mine life for average precipitation conditions;
- There will be 100% draindown storage available in the winter for all conditions as discussed in Section 4.5;
- There will be 3.7 days of draindown solution storage available in combination with the design extreme spring events at a heap draindown rate of 540 m^3/hr.

To ensure that the heap leach facility meets the intended design performance, Western Copper Holdings Limited proposes the following:

⇒ Provision of stand-alone emergency power generation capability at all times.

⇒ Provision of critical spare parts on-site at all times.

⇒ Studies by Year 3 of the need for complete redundant systems, including solution pumping and distribution systems.

⇒ Construction by Year 3 of operations of a water treatment plant with a capacity to release excess solutions in a controlled manner and to ensure maximum storage capacities are maintained.

⇒ Use of on-line instrumentation and meteorological monitoring to provide input to and monitoring of a dynamic water balance model.

⇒ Use of the on-going monitoring and modeling information to review pond capacities and provide information for regulatory review prior to any additional pond construction.

⇒ Review of the water balance model and input parameters after three years of operations and available for regulatory review for year 4 operations.

CLEARWATER CONSULTANTS LTD.

Peter S. McCreath P.Eng.

APPENDIX I

Carmacks Copper Project
Heap Leach Facility Water Balance
Base Case Average Conditions

Run-of-Mine (ROM) Ore

Table I.1 - Summary of Monthly Water Balance

Average Conditions

VERSION 1.2

	Maximum	Minimum	Initial	
Nominal In-Heap Storage	500	500	500	m3
Events Pond Storage	160,000	500	0	m3
Total Solution Storage	160,500	1,000	500	m3

Ore Moistures	
Initial	3.0%
Leaching	12.0%
Residual	10.0%

Treatment Capacity =	270	m3/hour	270
Maximum Daily Ore Production	9,872	tpd	9872

Run-of-Mine (ROM) Ore

Year	Stage	Precipitation Return Period	In-Heap Storage Minimum Volume	In-Heap Storage Maximum Volume	Events Pond Storage Minimum Volume	Events Pond Storage Maximum Volume	Maximum Total Storage	Total Treated	Total Spilled	Make-Up Water (Fresh)
1	I	2	500	500	500	28,119	28,619	-	-	122,732
2	II	2	500	500	500	42,023	42,523	-	-	69,168
3	II	2	500	500	500	42,023	42,523	-	-	69,250
4	III	2	500	500	500	58,310	58,810	-	-	29,011
5	III	2	500	500	500	58,310	58,810	-	-	25,835
6	III	2	500	500	500	58,310	58,810	-	-	19,803
7	III	2	500	500	500	58,310	58,810	-	-	9,296
8	III / IV	2	500	500	500	58,310	58,810	90,566	-	-
9	IV	2	500	500	500	55,900	56,400	111,739	-	-
10	V	2	500	500	500	500	1,000	145,051	-	-
11	V	2	500	500	500	500	1,000	145,051	-	-
12	V	2	500	500	500	500	1,000	145,051	-	-
13	VI	2	500	500	500	500	1,000	112,693	-	-
14	VI	2	500	500	500	500	1,000	112,693	-	-
15	VI	2	500	500	-	-	500	113,193	-	-

NOTES 1) All volumes in cubic metres.
2) "Maximum Total Water Storage" corresponds to the maximum concurrent total of In-Heap plus Events Pond storage.
3) Return Period is for Annual Precipitation, Rainfall and Snowfall.

Table I.2 - Carmacks Copper Project - Heap Leach Pad Water Balance - Input Data

Average Conditions

ROM Ore

VERSION	1.2

Process Input Data

Stage	Year	Stacked Ore Tonnes	Leach Pad Area m2	Precipitation Return Period	No. of Leaching Lifts	Top of Heap Area m2	% of Heap Covered
I	1	**1,963,500**	**142,000**	**2**	**3.2**	50,000	0%
II	2	**1,973,229**	**219,000**	**2**	**4.1**	70,000	0%
II	3	**1,974,396**	**219,000**	**2**	**5**	90,000	0%
III	4	**1,837,363**	**315,000**	**2**	**6**	110,000	0%
III	5	**1,792,000**	**315,000**	**2**	**7**	120,000	0%
III	6	**1,792,500**	**315,000**	**2**	**7.5**	130,000	0%
III	7	**1,642,400**	**315,000**	**2**	**8**	120,000	0%
III / IV	8	**302,481**	**315,000**	**2**	**8**	110,000	0%
IV	9	**0**	**315,000**	**2**	**8**	100,000	0%
V	10	**0**	**315,000**	**2**	**0**	100,000	0%
V	11	**0**	**315,000**	**2**	**0**	100,000	0%
V	12	**0**	**315,000**	**2**	**0**	100,000	0%
VI	13	**0**	**315,000**	**2**	**0**	100,000	0%
VI	14	**0**	**315,000**	**2**	**0**	100,000	0%
VI	15	**0**	**315,000**	**2**	**0**	100,000	0%
	TOTAL	13,277,869					

Notes
1) Top of heap area is at the start of the indicated year.
2) No. of Leaching Lifts is at the end of the indicated year.
3) 100% soil cover may be placed on heap after Year 12.

Ore Production Parameters

Maximum Daily Ore Production	**9,872**	tpd
Leaching Lift Height	**8**	m
Dry Density of Heap Ore	**1.6**	t/m3

ROM Ore

Ore Moisture Contents

Initial	**3.0%**	by weight
Leaching	**12.0%**	by weight
Residual	**10.0%**	by weight
Leach Cycle Time	**120**	days

Flow Rates

Max. Solution Flow On Pad	**540**	m3/hr
Maximum Treatment Rate	**270**	m3/hr
Maximum Area under Leach	**47,400**	m2
Other Inflows to Heap Leach	**0**	m3/hr

Events Pond Areas

Total Catchment	**29,100**	m2
Pond Area	**5,200**	m2

Water Storage Volumes (m3)

	Maximum	Minimum	Initial
Nominal In-Heap Storage	**500**	**500**	**500**
Events Pond Storage	**160,000**	**500**	**0**
Total Solution Storage	160,500	1,000	500

Hydrological Input Data - Williams Creek Area

	Average Monthly Conditions					
	Rainfall	Snowfall	Snowmelt	Evaporation	Number of Days/Month	
Month	mm	mm	mm	mm	Total	Operating
March	**0**	**15.5**	**0**	**0**	31	**0**
April	**14.0**	**14.5**	**147.0**	**0**	30	**0**
May	**13.3**	**0**	**0.0**	**92.9**	31	**17**
June	**41.7**	**0**	**0**	**107.5**	30	**30**
July	**61.0**	**0**	**0**	**98.6**	31	**31**
Aug	**43.6**	**0**	**0**	**71.1**	31	**31**
Sept	**31.4**	**0**	**0**	**32.3**	30	**30**
Oct	**0**	**33.1**	**0**	**0**	31	**31**
Nov	**0**	**31.2**	**0**	**0**	30	**30**
Dec	**0**	**27.4**	**0**	**0**	31	**0**
Jan	**0**	**25.6**	**0**	**0**	31	**0**
Feb	**0**	**19.7**	**0**	**0**	28	**0**
TOTAL	205.0	167.0	147.0	402.4	365	200

% of Annual Snowmelt in	
April	**100%**
May	**0%**

Winter Sublimation Losses **20** mm

Annual Total Precipitation

Return Period (years)		Precipitation	Rainfall
1	Dry	**278**	152.9
2	Average	**372**	204.6
10	Wet	**458**	251.9
20	Wet	**487**	267.9
100	Wet	**541**	297.6
200	Wet	**561**	308.6
500	Wet	**585**	321.8

(Note - Dry Year equal to 20 year return period)

Annual Percent Rainfall **55%**

Evaporation Coefficients

For Area under Leach Irrigation	**10%**
For Heap & Overliner	**5%**
For Events Pond Catchment	**100%**

Table I.3 - Carmacks Copper Project - Heap Leach Pad Monthly Water Balance

Average Conditions

ROM Ore

Version 1.2

Daily Ore Production	9,872	tpd
Initial Ore Moisture	3.0%	by weight
Leaching Ore Moisture	12.0%	
Residual ore Moisture	10.0%	
Maximum Area under Leach	47,400	m2
Leaching Lift Height	8	m
Dry Density of Heap Ore	1.6	t/m3

Leach Cycle Time	120	days
Max. Solution Flow On Pad	540	m3/hr
Other Inflows to Heap	0	m3/hr

Events Pond Areas (m2)	
Total Catchment	29,100
Pond Area	5,200

Maximum Allowable Storage		
In-Heap	500	m3 (nominal)
Events Pond	160,000	m3
Total Solution Storage	160,500	m3

Evaporation Coefficients	
For Area under Leach	10%
For Heap & Overliner	5%
For Events Pond Catchment	100%

No. of Days		YEAR	Month	Stacked Leach Ore		AREAS - m2			Runoff		Evap'n	WATER INFLOWS - m3			WATER OUTFLOWS and LOSSES - m3					MAKE-UP WATER REQUIREMENTS					NET	Release	TOTAL
				Stacked	Volume	Under	Total Heap	Uncovered	Return	Depth	Depth	Leach Pad	Other	TOTAL	Evaporation Losses		Permanent Loss	Initial Loss to	TOTAL	Total	From Heap	Total	From	From	INFLOW	to Events	IN-HEAP
				tonnes	m3	Leach	& Overliner	Heap	Period	mm	mm	Runoff	Inflows	IN	Leach Area	Heap&O'Liner	to Ore Moisture	Leaching Ore	OUT	Required	Storage	Other	Events Pond	Fresh	TO HEAP	Pond	STORAGE
Total	Operating			A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
31	0	1	-1-March	0	0	0	142,000	142,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	1	1-April	0	0	0	142,000	142,000	2	161.0	0	22,862	0	22,862	0	0	0	0	0	0	0	0	0	0	22,862	22,362	500
31	**17**	1	1-May	167,824	104,890	13,111	142,000	142,000	2	13.3	92.9	1,889	0	1,889	122	599	0	0	720	0	0	0	0	0	1,168	1,168	500
30	**30**	1	1-June	296,160	185,100	36,249	142,000	142,000	2	41.7	107.5	5,921	0	5,921	390	568	32,479	9,280	42,717	36,795	0	36,795	28,274	8,522	0	0	500
31	**31**	1	July	306,032	191,270	47,400	142,000	142,000	2	61.0	98.6	8,662	0	8,662	467	466	21,422	6,121	28,477	19,815	0	19,815	1,262	18,552	0	0	500
31	31	1	Aug	306,032	191,270	47,400	142,000	142,000	2	43.6	71.1	6,191	0	6,191	337	336	21,422	6,121	28,216	22,025	0	22,025	899	21,126	0	0	500
30	30	1	Sept	296,160	185,100	47,400	142,000	142,000	2	31.4	32.3	4,459	0	4,459	153	153	20,731	5,923	26,960	22,501	0	22,501	746	21,756	0	0	500
31	31	1	Oct	306,032	191,270	47,400	142,000	142,000	2	0.0	0	0	0	0	0	0	21,422	6,121	27,543	27,543	0	27,543	0	27,543	0	0	500
30	30	1	Nov	285,260	178,288	47,400	142,000	142,000	2	0	0	0	0	0	0	0	19,968	5,265	25,233	25,233	0	25,233	0	25,233	0	0	500
31	0	1	Dec	0	0	47,400	142,000	142,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	1	Jan	0	0	47,400	142,000	142,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
28	0	1	Feb	0	0	47,400	142,000	142,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	1	March	0	0	47,400	142,000	142,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
30	0	2	2-April	0	0	47,400	219,000	219,000	2	161.0	0	35,259	0	35,259	0	0	0	0	0	0	0	0	0	0	35,259	35,259	500
31	17	2	2-May	167,824	104,890	47,400	219,000	219,000	2	13.3	92.9	2,913	0	2,913	440	797	0	0	1,237	0	0	0	0	0	1,675	1,675	500
30	30	2	2-June	296,160	185,100	47,400	219,000	219,000	2	41.7	107.5	9,132	0	9,132	510	922	32,479	4,368	38,279	29,147	0	29,147	29,147	0	0	0	500
31	31	2	July	306,032	191,270	47,400	219,000	219,000	2	61.0	98.6	13,359	0	13,359	467	846	21,422	4,368	27,104	13,745	0	13,745	13,745	0	0	0	500
31	31	2	Aug	306,032	191,270	47,400	219,000	219,000	2	43.6	71.1	9,548	0	9,548	337	610	21,422	2,184	24,553	15,005	0	15,005	1,447	13,558	0	0	500
30	30	2	Sept	296,160	185,100	47,400	219,000	219,000	2	31.4	32.3	6,877	0	6,877	153	277	20,731	0	21,161	14,285	0	14,285	746	13,539	0	0	500
31	31	2	Oct	306,032	191,270	47,400	219,000	219,000	2	0.0	0	0	0	0	0	0	21,422	0	21,422	21,422	0	21,422	0	21,422	0	0	500
30	30	2	Nov	294,989	184,368	47,400	219,000	219,000	2	0	0	0	0	0	0	0	20,649	0	20,649	20,649	0	20,649	0	20,649	0	0	500
31	0	2	Dec	0	0	47,400	219,000	219,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	2	Jan	0	0	47,400	219,000	219,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
28	0	2	Feb	0	0	47,400	219,000	219,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	2	March	0	0	47,400	219,000	219,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
30	0	3	3-April	0	0	47,400	219,000	219,000	2	161.0	0	35,259	0	35,259	0	0	0	0	0	0	0	0	0	0	35,259	35,259	500
31	17	3	3-May	167,824	104,890	47,400	219,000	219,000	2	13.3	92.9	2,913	0	2,913	440	797	0	0	1,237	0	0	0	0	0	1,675	1,675	500
30	30	3	3-June	296,160	185,100	47,400	219,000	219,000	2	41.7	107.5	9,132	0	9,132	510	922	32,479	4,368	38,279	29,147	0	29,147	29,147	0	0	0	500
31	31	3	July	306,032	191,270	47,400	219,000	219,000	2	61.0	98.6	13,359	0	13,359	467	846	21,422	4,368	27,104	13,745	0	13,745	13,745	0	0	0	500
31	31	3	Aug	306,032	191,270	47,400	219,000	219,000	2	43.6	71.1	9,548	0	9,548	337	610	21,422	2,184	24,553	15,005	0	15,005	1,447	13,558	0	0	500
30	30	3	Sept	296,160	185,100	47,400	219,000	219,000	2	31.4	32.3	6,877	0	6,877	153	277	20,731	0	21,161	14,285	0	14,285	746	13,539	0	0	500
31	31	3	Oct	306,032	191,270	47,400	219,000	219,000	2	0.0	0	0	0	0	0	0	21,422	0	21,422	21,422	0	21,422	0	21,422	0	0	500
30	30	3	Nov	296,156	185,098	47,400	219,000	219,000	2	0	0	0	0	0	0	0	20,731	0	20,731	20,731	0	20,731	0	20,731	0	0	500
31	0	3	Dec	0	0	47,400	219,000	219,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	3	Jan	0	0	47,400	219,000	219,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
28	0	3	Feb	0	0	47,400	219,000	219,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	3	March	0	0	47,400	219,000	219,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
30	0	4	4-April	0	0	47,400	315,000	315,000	2	161.0	0	50,715	0	50,715	0	0	0	0	0	0	0	0	0	0	50,715	50,715	500
31	17	4	4-May	167,824	104,890	47,400	315,000	315,000	2	13.3	92.9	4,190	0	4,190	440	1,243	0	0	1,683	0	0	0	0	0	2,506	2,506	500
30	30	4	4-June	296,160	185,100	47,400	315,000	315,000	2	41.7	107.5	13,136	0	13,136	510	1,438	32,479	4,854	39,281	26,145	0	26,145	26,145	0	0	0	500
31	31	4	July	306,032	191,270	47,400	315,000	315,000	2	61.0	98.6	19,215	0	19,215	467	1,319	21,422	4,854	28,063	8,848	0	8,848	8,848	0	0	0	500
31	31	4	Aug	306,032	191,270	47,400	315,000	315,000	2	43.6	71.1	13,734	0	13,734	337	951	21,422	2,427	25,137	11,403	0	11,403	11,403	0	0	0	500
30	30	4	Sept	296,160	185,100	47,400	315,000	315,000	2	31.4	32.3	9,891	0	9,891	153	432	20,731	0	21,316	11,425	0	11,425	11,425	0	0	0	500
31	31	4	Oct	306,032	191,270	47,400	315,000	315,000	2	0.0	0	0	0	0	0	0	21,422	0	21,422	21,422	0	21,422	3,550	17,872	0	0	500
30	30	4	Nov	159,123	99,452	47,400	315,000	315,000	2	0	0	0	0	0	0	0	11,139	0	11,139	11,139	0	11,139	0	11,139	0	0	500
31	0	4	Dec	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	4	Jan	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
28	0	4	Feb	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	4	March	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500

Table I.3 - Carmacks Copper Project - Heap Leach Pad Monthly Water Balance

Average Conditions

ROM Ore

Version 1.2

Daily Ore Production	9,872	tpd
Initial Ore Moisture	3.0%	by weight
Leaching Ore Moisture	12.0%	
Residual ore Moisture	10.0%	
Maximum Area under Leach	47,400	m2
Leaching Lift Height	8	m
Dry Density of Heap Ore	1.6	t/m3

Leach Cycle Time	120	days
Max. Solution Flow On Pad	540	m3/hr
Other Inflows to Heap	0	m3/hr

Events Pond Areas (m2)	
Total Catchment	29,100
Pond Area	5,200

Maximum Allowable Storage		
In-Heap	500	m3 (nominal)
Events Pond	160,000	m3
Total Solution Storage	160,500	m3

Evaporation Coefficients	
For Area under Leach	10%
For Heap & Overliner	5%
For Events Pond Catchment	100%

No. of Days		YEAR	Month	Stacked Leach Ore		AREAS - m2			Runoff		Evap'n	WATER INFLOWS - m3			WATER OUTFLOWS and LOSSES - m3					MAKE-UP WATER REQUIREMENTS					NET	Release	TOTAL
				Stacked	Volume	Under	Total Heap	Uncovered	Return	Depth	Depth	Leach Pad	Other	TOTAL	Evaporation Losses		Permanent Loss	Initial Loss to	TOTAL	Total	From Heap	Total	From	From	INFLOW	to Events	IN-HEAP
				tonnes	m3	Leach	& Overliner	Heap	Period	mm	mm	Runoff	Inflows	IN	Leach Area	Heap&O'Liner	to Ore Moisture	Leaching Ore	OUT	Required	Storage	Other	Events Pond	Fresh	TO HEAP	Pond	STORAGE
Total	Operating			A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
30	0	5	5-April	0	0	47,400	315,000	315,000	2	161.0	0	50,715	0	50,715	0	0	0	0	0	0	0	0	0	0	50,715	50,715	500
31	17	5	5-May	167,824	104,890	47,400	315,000	315,000	2	13.3	92.9	4,190	0	4,190	440	1,243	0	0	1,683	0	0	0	0	0	2,506	2,506	500
30	30	5	5-June	296,160	185,100	47,400	315,000	315,000	2	41.7	107.5	13,136	0	13,136	510	1,438	32,479	4,854	39,281	26,145	0	26,145	26,145	0	0	0	500
31	31	5	July	306,032	191,270	47,400	315,000	315,000	2	61.0	98.6	19,215	0	19,215	467	1,319	21,422	4,854	28,063	8,848	0	8,848	8,848	0	0	0	500
31	31	5	Aug	306,032	191,270	47,400	315,000	315,000	2	43.6	71.1	13,734	0	13,734	337	951	21,422	2,427	25,137	11,403	0	11,403	11,403	0	0	0	500
30	30	5	Sept	296,160	185,100	47,400	315,000	315,000	2	31.4	32.3	9,891	0	9,891	153	432	20,731	0	21,316	11,425	0	11,425	11,425	0	0	0	500
31	31	5	Oct	306,032	191,270	47,400	315,000	315,000	2	0.0	0	0	0	0	0	0	21,422	0	21,422	21,422	0	21,422	3,550	17,872	0	0	500
30	30	5	Nov	113,760	71,100	47,400	315,000	315,000	2	0	0	0	0	0	0	0	7,963	0	7,963	7,963	0	7,963	0	7,963	0	0	500
31	0	5	Dec	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	5	Jan	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
28	0	5	Feb	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	5	March	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
30	0	6	6-April	0	0	47,400	315,000	315,000	2	161.0	0	50,715	0	50,715	0	0	0	0	0	0	0	0	0	0	50,715	50,715	500
31	17	6	6-May	167,824	104,890	47,400	315,000	315,000	2	13.3	92.9	4,190	0	4,190	440	1,243	0	0	1,683	0	0	0	0	0	2,506	2,506	500
30	30	6	6-June	296,160	185,100	47,400	315,000	315,000	2	41.7	107.5	13,136	0	13,136	510	1,438	32,479	2,427	36,854	23,718	0	23,718	23,718	0	0	0	500
31	31	6	July	306,032	191,270	47,400	315,000	315,000	2	61.0	98.6	19,215	0	19,215	467	1,319	21,422	2,427	25,636	6,421	0	6,421	6,421	0	0	0	500
31	31	6	Aug	306,032	191,270	47,400	315,000	315,000	2	43.6	71.1	13,734	0	13,734	337	951	21,422	1,213	23,924	10,190	0	10,190	10,190	0	0	0	500
30	30	6	Sept	296,160	185,100	47,400	315,000	315,000	2	31.4	32.3	9,891	0	9,891	153	432	20,731	0	21,316	11,425	0	11,425	11,425	0	0	0	500
31	31	6	Oct	306,032	191,270	47,400	315,000	315,000	2	0.0	0	0	0	0	0	0	21,422	0	21,422	21,422	0	21,422	9,617	11,805	0	0	500
30	30	6	Nov	114,260	71,413	47,400	315,000	315,000	2	0	0	0	0	0	0	0	7,998	0	7,998	7,998	0	7,998	0	7,998	0	0	500
31	0	6	Dec	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	6	Jan	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
28	0	6	Feb	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	6	March	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
30	0	7	7-April	0	0	47,400	315,000	315,000	2	161.0	0	50,715	0	50,715	0	0	0	0	0	0	0	0	0	0	50,715	50,715	500
31	17	7	7-May	167,824	104,890	47,400	315,000	315,000	2	13.3	92.9	4,190	0	4,190	440	1,243	0	0	1,683	0	0	0	0	0	2,506	2,506	500
30	30	7	7-June	296,160	185,100	47,400	315,000	315,000	2	41.7	107.5	13,136	0	13,136	510	1,438	32,479	2,427	36,854	23,718	0	23,718	23,718	0	0	0	500
31	31	7	July	306,032	191,270	47,400	315,000	315,000	2	61.0	98.6	19,215	0	19,215	467	1,319	21,422	2,427	25,636	6,421	0	6,421	6,421	0	0	0	500
31	31	7	Aug	306,032	191,270	47,400	315,000	315,000	2	43.6	71.1	13,734	0	13,734	337	951	21,422	1,213	23,924	10,190	0	10,190	10,190	0	0	0	500
30	30	7	Sept	296,160	185,100	47,400	315,000	315,000	2	31.4	32.3	9,891	0	9,891	153	432	20,731	0	21,316	11,425	0	11,425	11,425	0	0	0	500
31	31	7	Oct	270,192	168,870	47,400	315,000	315,000	2	0.0	0	0	0	0	0	0	18,913	0	18,913	18,913	0	18,913	9,617	9,296	0	0	500
30	**0**	7	Nov	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	7	Dec	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	7	Jan	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
28	0	7	Feb	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	7	March	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
30	0	8	8-April	0	0	47,400	315,000	315,000	2	161.0	0	50,715	0	50,715	0	0	0	0	0	0	0	0	0	0	50,715	50,715	500
31	17	8	8-May	167,824	104,890	47,400	315,000	315,000	2	13.3	92.9	4,190	0	4,190	440	1,243	0	0	1,683	0	0	0	0	0	2,506	2,506	500
30	**13.6**	8	8-June	134,657	84,161	47,400	315,000	315,000	2	41.7	107.5	13,136	0	13,136	510	1,438	21,174	0	23,122	9,986	0	9,986	9,986	0	0	0	500
31	**0**	8	July	0	0	47,400	315,000	315,000	2	61.0	98.6	19,215	0	19,215	467	1,319	0	0	1,787	0	0	0	0	0	17,428	17,428	500
31	**0**	8	Aug	0	0	47,400	315,000	315,000	2	43.6	71.1	13,734	0	13,734	337	951	0	0	1,288	0	0	0	0	0	12,446	12,446	500
30	**0**	8	Sept	0	0	47,400	315,000	315,000	2	31.4	32.3	9,891	0	9,891	153	432	0	0	585	0	0	0	0	0	9,306	9,306	500
31	**0**	8	Oct	0	0	47,400	315,000	315,000	2	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
30	**0**	8	Nov	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	8	Dec	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	8	Jan	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
28	0	8	Feb	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	8	March	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500

Table I.3 - Carmacks Copper Project - Heap Leach Pad Monthly Water Balance

Average Conditions

ROM Ore

Version 1.2

Daily Ore Production	9,872	tpd
Initial Ore Moisture	3.0%	by weight
Leaching Ore Moisture	12.0%	
Residual ore Moisture	10.0%	
Maximum Area under Leach	47,400	m2
Leaching Lift Height	8	m
Dry Density of Heap Ore	1.6	t/m3

Leach Cycle Time	120	days
Max. Solution Flow On Pad	540	m3/hr
Other Inflows to Heap	0	m3/hr

Events Pond Areas (m2)

Total Catchment	29,100
Pond Area	5,200

Maximum Allowable Storage

In-Heap	500	m3 (nominal)
Events Pond	160,000	m3
Total Solution Storage	160,500	m3

Evaporation Coefficients

For Area under Leach	10%
For Heap & Overliner	5%
For Events Pond Catchment	100%

No. of Days		YEAR	Month	Stacked Leach Ore		AREAS - m2			Runoff		Evap'n	WATER INFLOWS - m3			WATER OUTFLOWS and LOSSES - m3					MAKE-UP WATER REQUIREMENTS					NET	Release	TOTAL
				Stacked tonnes	Volume m3	Under Leach	Total Heap & Overliner	Uncovered Heap	Return Period	Depth mm	Depth mm	Leach Pad Runoff	Other Inflows	TOTAL IN	Evaporation Losses Leach Area	Evaporation Losses Heap&O'Liner	Permanent Loss to Ore Moisture	Initial Loss to Leaching Ore	TOTAL OUT	Total Required	From Heap Storage	Total Other	From Events Pond	From Fresh	INFLOW TO HEAP	to Events Pond	IN-HEAP STORAGE
Total	Operating			A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
30	0	9	9-April	0	0	47,400	315,000	315,000	2	161.0	0	50,715	0	50,715	0	0	0	0	0	0	0	0	0	0	50,715	50,715	500
31	**0**	9	9-May	0	0	47,400	315,000	315,000	2	13.3	92.9	4,190	0	4,190	440	1,243	0	0	1,683	0	0	0	0	0	2,506	2,506	500
30	**0**	9	9-June	0	0	47,400	315,000	315,000	2	41.7	107.5	13,136	0	13,136	510	1,438	0	0	1,948	0	0	0	0	0	11,188	11,188	500
31	**0**	9	July	0	0	47,400	315,000	315,000	2	61.0	98.6	19,215	0	19,215	467	1,319	0	0	1,787	0	0	0	0	0	17,428	17,428	500
31	**0**	9	Aug	0	0	47,400	315,000	315,000	2	43.6	71.1	13,734	0	13,734	337	951	0	0	1,288	0	0	0	0	0	12,446	12,446	500
30	**0**	9	Sept	0	0	47,400	315,000	315,000	2	31.4	32.3	9,891	0	9,891	153	432	0	0	585	0	0	0	0	0	9,306	9,306	500
31	**0**	9	Oct	0	0	47,400	315,000	315,000	2	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
30	**0**	9	Nov	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	9	Dec	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	9	Jan	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
28	0	9	Feb	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	9	March	0	0	47,400	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
30	0	10	10-April	0	0	0	315,000	315,000	2	161.0	0	50,715	0	50,715	0	0	0	0	0	0	0	0	0	0	50,715	50,715	500
31	**0**	10	10-May	0	0	0	315,000	315,000	2	13.3	92.9	4,190	0	4,190	0	1,463	0	-5,393	-3,930	0	0	0	0	0	8,119	8,119	500
30	0	10	10-June	0	0	0	315,000	315,000	2	41.7	107.5	13,136	0	13,136	0	1,693	0	-5,393	-3,700	0	0	0	0	0	16,835	16,835	500
31	0	10	July	0	0	0	315,000	315,000	2	61.0	98.6	19,215	0	19,215	0	1,553	0	-5,393	-3,840	0	0	0	0	0	23,055	23,055	500
31	0	10	Aug	0	0	0	315,000	315,000	2	43.6	71.1	13,734	0	13,734	0	1,120	0	-5,393	-4,273	0	0	0	0	0	18,007	18,007	500
30	0	10	Sept	0	0	0	315,000	315,000	2	31.4	32.3	9,891	0	9,891	0	509	0	-5,393	-4,884	0	0	0	0	0	14,775	14,775	500
31	0	10	Oct	0	0	0	315,000	315,000	2	0.0	0	0	0	0	0	0	0	-5,393	-5,393	0	0	0	0	0	5,393	5,393	500
30	0	10	Nov	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	10	Dec	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	10	Jan	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
28	0	10	Feb	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	10	March	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
30	0	11	11-April	0	0	0	315,000	315,000	2	161.0	0	50,715	0	50,715	0	0	0	0	0	0	0	0	0	0	50,715	50,715	500
31	0	11	11-May	0	0	0	315,000	315,000	2	13.3	92.9	4,190	0	4,190	0	1,463	0	-5,393	-3,930	0	0	0	0	0	8,119	8,119	500
30	0	11	11-June	0	0	0	315,000	315,000	2	41.7	107.5	13,136	0	13,136	0	1,693	0	-5,393	-3,700	0	0	0	0	0	16,835	16,835	500
31	0	11	July	0	0	0	315,000	315,000	2	61.0	98.6	19,215	0	19,215	0	1,553	0	-5,393	-3,840	0	0	0	0	0	23,055	23,055	500
31	0	11	Aug	0	0	0	315,000	315,000	2	43.6	71.1	13,734	0	13,734	0	1,120	0	-5,393	-4,273	0	0	0	0	0	18,007	18,007	500
30	0	11	Sept	0	0	0	315,000	315,000	2	31.4	32.3	9,891	0	9,891	0	509	0	-5,393	-4,884	0	0	0	0	0	14,775	14,775	500
31	0	11	Oct	0	0	0	315,000	315,000	2	0.0	0	0	0	0	0	0	0	-5,393	-5,393	0	0	0	0	0	5,393	5,393	500
30	0	11	Nov	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	11	Dec	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	11	Jan	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
28	0	11	Feb	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	11	March	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
30	0	12	12-April	0	0	0	315,000	315,000	2	161.0	0	50,715	0	50,715	0	0	0	0	0	0	0	0	0	0	50,715	50,715	500
31	0	12	12-May	0	0	0	315,000	315,000	2	13.3	92.9	4,190	0	4,190	0	1,463	0	-5,393	-3,930	0	0	0	0	0	8,119	8,119	500
30	0	12	12-June	0	0	0	315,000	315,000	2	41.7	107.5	13,136	0	13,136	0	1,693	0	-5,393	-3,700	0	0	0	0	0	16,835	16,835	500
31	0	12	July	0	0	0	315,000	315,000	2	61.0	98.6	19,215	0	19,215	0	1,553	0	-5,393	-3,840	0	0	0	0	0	23,055	23,055	500
31	0	12	Aug	0	0	0	315,000	315,000	2	43.6	71.1	13,734	0	13,734	0	1,120	0	-5,393	-4,273	0	0	0	0	0	18,007	18,007	500
30	0	12	Sept	0	0	0	315,000	315,000	2	31.4	32.3	9,891	0	9,891	0	509	0	-5,393	-4,884	0	0	0	0	0	14,775	14,775	500
31	0	12	Oct	0	0	0	315,000	315,000	2	0.0	0	0	0	0	0	0	0	-5,393	-5,393	0	0	0	0	0	5,393	5,393	500
30	0	12	Nov	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	12	Dec	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	12	Jan	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
28	0	12	Feb	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	12	March	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500

Table I.3 - Carmacks Copper Project - Heap Leach Pad Monthly Water Balance

Average Conditions

ROM Ore

Version 1.2

Daily Ore Production	9,872	tpd
Initial Ore Moisture	3.0%	by weight
Leaching Ore Moisture	12.0%	
Residual ore Moisture	10.0%	
Maximum Area under Leach	47,400	m2
Leaching Lift Height	8	m
Dry Density of Heap Ore	1.6	t/m3

Leach Cycle Time	120	days
Max. Solution Flow On Pad	540	m3/hr
Other Inflows to Heap	0	m3/hr

Events Pond Areas (m2)

Total Catchment	29,100
Pond Area	5,200

Maximum Allowable Storage

In-Heap	500	m3 (nominal)
Events Pond	160,000	m3
Total Solution Storage	160,500	m3

Evaporation Coefficients

For Area under Leach	10%
For Heap & Overliner	5%
For Events Pond Catchment	100%

				Stacked Leach Ore		AREAS - m2			Runoff		Evap'n	WATER INFLOWS - m3			WATER OUTFLOWS and LOSSES - m3					MAKE-UP WATER REQUIREMENTS					NET	Release	TOTAL
No. of Days		YEAR	Month	Stacked tonnes	Volume m3	Under Leach	Total Heap & Overliner	Uncovered Heap	Return Period	Depth mm	Depth mm	Leach Pad Runoff	Other Inflows	TOTAL IN	Evaporation Losses Leach Area	Evaporation Losses Heap&O'Liner	Permanent Loss to Ore Moisture	Initial Loss to Leaching Ore	TOTAL OUT	Total Required	From Heap Storage	Total Other	From Events Pond	From Fresh	INFLOW TO HEAP	to Events Pond	IN-HEAP STORAGE
Total	Operating			A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
30	0	13	13-April	0	0	0	315,000	315,000	2	161.0	0	50,715	0	50,715	0	0	0	0	0	0	0	0	0	0	50,715	50,715	500
31	0	13	13-May	0	0	0	315,000	315,000	2	13.3	92.9	4,190	0	4,190	0	1,463	0	0	1,463	0	0	0	0	0	2,726	2,726	500
30	0	13	13-June	0	0	0	315,000	315,000	2	41.7	107.5	13,136	0	13,136	0	1,693	0	0	1,693	0	0	0	0	0	11,442	11,442	500
31	0	13	July	0	0	0	315,000	315,000	2	61.0	98.6	19,215	0	19,215	0	1,553	0	0	1,553	0	0	0	0	0	17,662	17,662	500
31	0	13	Aug	0	0	0	315,000	315,000	2	43.6	71.1	13,734	0	13,734	0	1,120	0	0	1,120	0	0	0	0	0	12,614	12,614	500
30	0	13	Sept	0	0	0	315,000	315,000	2	31.4	32.3	9,891	0	9,891	0	509	0	0	509	0	0	0	0	0	9,382	9,382	500
31	0	13	Oct	0	0	0	315,000	315,000	2	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
30	0	13	Nov	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	13	Dec	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	13	Jan	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
28	0	13	Feb	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	13	March	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
30	0	14	14-April	0	0	0	315,000	315,000	2	161.0	0	50,715	0	50,715	0	0	0	0	0	0	0	0	0	0	50,715	50,715	500
31	0	14	14-May	0	0	0	315,000	315,000	2	13.3	92.9	4,190	0	4,190	0	1,463	0	0	1,463	0	0	0	0	0	2,726	2,726	500
30	0	14	14-June	0	0	0	315,000	315,000	2	41.7	107.5	13,136	0	13,136	0	1,693	0	0	1,693	0	0	0	0	0	11,442	11,442	500
31	0	14	July	0	0	0	315,000	315,000	2	61.0	98.6	19,215	0	19,215	0	1,553	0	0	1,553	0	0	0	0	0	17,662	17,662	500
31	0	14	Aug	0	0	0	315,000	315,000	2	43.6	71.1	13,734	0	13,734	0	1,120	0	0	1,120	0	0	0	0	0	12,614	12,614	500
30	0	14	Sept	0	0	0	315,000	315,000	2	31.4	32.3	9,891	0	9,891	0	509	0	0	509	0	0	0	0	0	9,382	9,382	500
31	0	14	Oct	0	0	0	315,000	315,000	2	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
30	0	14	Nov	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	14	Dec	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	14	Jan	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
28	0	14	Feb	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	14	March	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
30	0	15	15-April	0	0	0	315,000	315,000	2	161.0	0	50,715	0	50,715	0	0	0	0	0	0	0	0	0	0	50,715	50,715	500
31	0	15	15-May	0	0	0	315,000	315,000	2	13.3	92.9	4,190	0	4,190	0	1,463	0	0	1,463	0	0	0	0	0	2,726	2,726	500
30	0	15	15-June	0	0	0	315,000	315,000	2	41.7	107.5	13,136	0	13,136	0	1,693	0	0	1,693	0	0	0	0	0	11,442	11,442	500
31	0	15	July	0	0	0	315,000	315,000	2	61.0	98.6	19,215	0	19,215	0	1,553	0	0	1,553	0	0	0	0	0	17,662	17,662	500
31	0	15	Aug	0	0	0	315,000	315,000	2	43.6	71.1	13,734	0	13,734	0	1,120	0	0	1,120	0	0	0	0	0	12,614	12,614	500
30	0	15	Sept	0	0	0	315,000	315,000	2	31.4	32.3	9,891	0	9,891	0	509	0	0	509	0	0	0	0	0	9,382	9,382	500
31	0	15	Oct	0	0	0	315,000	315,000	2	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
30	0	15	Nov	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	15	Dec	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	15	Jan	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
28	0	15	Feb	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
31	0	15	March	0	0	0	315,000	315,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500

Table I.4 - Carmacks Copper Project - Events Pond Monthly Water Balance

Average Conditions
ROM Ore
Version 1.2

Events Pond Areas
Total Catchment 29,100 m2
Pond Area 5,200 m2

Events Pond Water Storage Limits
Maximum 160,000 m3
Minimum 500 m3
Initial 0 m3

		AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
		Water Inflows from		Water Losses to							Cumulative Volumes		In-Heap plus Events Pond
YEAR	Month	Precipitation Runoff	Heap Storage	Evaporation	Make-up to Heap	NET INFLOW	Potential Volume in Storage	Treated Volume Released	Untreated Volume	Remaining Volume in Storage	Treated & Released	Untreated	Total Solution Storage
1	-1-March	0	0	0	0	0	0	0	0	0	0	0	0
1	1-April	4,685	22,362	0	0	27,047	27,047	0	0	27,047	0	0	27,547
1	1-May	387	1,168	483	0	1,072	28,119	0	0	28,119	0	0	28,619
1	1-June	1,213	0	559	28,274	-27,619	500	0	0	500	0	0	1,000
1	July	1,775	0	513	1,262	0	500	0	0	500	0	0	1,000
1	Aug	1,269	0	370	899	0	500	0	0	500	0	0	1,000
1	Sept	914	0	168	746	0	500	0	0	500	0	0	1,000
1	Oct	0	0	0	0	0	500	0	0	500	0	0	1,000
1	Nov	0	0	0	0	0	500	0	0	500	0	0	1,000
1	Dec	0	0	0	0	0	500	0	0	500	0	0	1,000
1	Jan	0	0	0	0	0	500	0	0	500	0	0	1,000
1	Feb	0	0	0	0	0	500	0	0	500	0	0	1,000
1	March	0	0	0	0	0	500	0	0	500	0	0	1,000
2	2-April	4,685	35,259	0	0	39,944	40,444	0	0	40,444	0	0	40,944
2	2-May	387	1,675	483	0	1,579	42,023	0	0	42,023	0	0	42,523
2	2-June	1,213	0	559	29,147	-28,492	13,531	0	0	13,531	0	0	14,031
2	July	1,775	0	513	13,745	-12,483	1,048	0	0	1,048	0	0	1,548
2	Aug	1,269	0	370	1,447	-548	500	0	0	500	0	0	1,000
2	Sept	914	0	168	746	0	500	0	0	500	0	0	1,000
2	Oct	0	0	0	0	0	500	0	0	500	0	0	1,000
2	Nov	0	0	0	0	0	500	0	0	500	0	0	1,000
2	Dec	0	0	0	0	0	500	0	0	500	0	0	1,000
2	Jan	0	0	0	0	0	500	0	0	500	0	0	1,000
2	Feb	0	0	0	0	0	500	0	0	500	0	0	1,000
2	March	0	0	0	0	0	500	0	0	500	0	0	1,000
3	3-April	4,685	35,259	0	0	39,944	40,444	0	0	40,444	0	0	40,944
3	3-May	387	1,675	483	0	1,579	42,023	0	0	42,023	0	0	42,523
3	3-June	1,213	0	559	29,147	-28,492	13,531	0	0	13,531	0	0	14,031
3	July	1,775	0	513	13,745	-12,483	1,048	0	0	1,048	0	0	1,548
3	Aug	1,269	0	370	1,447	-548	500	0	0	500	0	0	1,000
3	Sept	914	0	168	746	0	500	0	0	500	0	0	1,000
3	Oct	0	0	0	0	0	500	0	0	500	0	0	1,000
3	Nov	0	0	0	0	0	500	0	0	500	0	0	1,000
3	Dec	0	0	0	0	0	500	0	0	500	0	0	1,000
3	Jan	0	0	0	0	0	500	0	0	500	0	0	1,000
3	Feb	0	0	0	0	0	500	0	0	500	0	0	1,000
3	March	0	0	0	0	0	500	0	0	500	0	0	1,000
4	4-April	4,685	50,715	0	0	55,400	55,900	0	0	55,900	0	0	56,400
4	4-May	387	2,506	483	0	2,410	58,310	0	0	58,310	0	0	58,810
4	4-June	1,213	0	559	26,145	-25,491	32,820	0	0	32,820	0	0	33,320
4	July	1,775	0	513	8,848	-7,585	25,234	0	0	25,234	0	0	25,734
4	Aug	1,269	0	370	11,403	-10,504	14,730	0	0	14,730	0	0	15,230
4	Sept	914	0	168	11,425	-10,680	4,050	0	0	4,050	0	0	4,550
4	Oct	0	0	0	3,550	-3,550	500	0	0	500	0	0	1,000
4	Nov	0	0	0	0	0	500	0	0	500	0	0	1,000
4	Dec	0	0	0	0	0	500	0	0	500	0	0	1,000
4	Jan	0	0	0	0	0	500	0	0	500	0	0	1,000
4	Feb	0	0	0	0	0	500	0	0	500	0	0	1,000
4	March	0	0	0	0	0	500	0	0	500	0	0	1,000

Table I.4 - Carmacks Copper Project - Events Pond Monthly Water Balance

Average Conditions
ROM Ore
Version 1.2

Events Pond Areas

Total Catchment	29,100	m2
Pond Area	5,200	m2

Events Pond Water Storage Limits

Maximum	160,000	m3
Minimum	500	m3
Initial	0	m3

		AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
		Water Inflows from		Water Losses to			Potential	Treated	Untreated	Remaining	Cumulative Volumes		In-Heap plus Events Pond Total
YEAR	Month	Precipitation Runoff	Heap Storage	Evaporation	Make-up to Heap	NET INFLOW	Volume in Storage	Volume Released	Volume	Volume in Storage	Treated & Released	Untreated	Solution Storage
5	5-April	4,685	50,715	0	0	55,400	55,900	0	0	55,900	0	0	56,400
5	5-May	387	2,506	483	0	2,410	58,310	0	0	58,310	0	0	58,810
5	5-June	1,213	0	559	26,145	-25,491	32,820	0	0	32,820	0	0	33,320
5	July	1,775	0	513	8,848	-7,585	25,234	0	0	25,234	0	0	25,734
5	Aug	1,269	0	370	11,403	-10,504	14,730	0	0	14,730	0	0	15,230
5	Sept	914	0	168	11,425	-10,680	4,050	0	0	4,050	0	0	4,550
5	Oct	0	0	0	3,550	-3,550	500	0	0	500	0	0	1,000
5	Nov	0	0	0	0	0	500	0	0	500	0	0	1,000
5	Dec	0	0	0	0	0	500	0	0	500	0	0	1,000
5	Jan	0	0	0	0	0	500	0	0	500	0	0	1,000
5	Feb	0	0	0	0	0	500	0	0	500	0	0	1,000
5	March	0	0	0	0	0	500	0	0	500	0	0	1,000
6	6-April	4,685	50,715	0	0	55,400	55,900	0	0	55,900	0	0	56,400
6	6-May	387	2,506	483	0	2,410	58,310	0	0	58,310	0	0	58,810
6	6-June	1,213	0	559	23,718	-23,064	35,247	0	0	35,247	0	0	35,747
6	July	1,775	0	513	6,421	-5,158	30,088	0	0	30,088	0	0	30,588
6	Aug	1,269	0	370	10,190	-9,291	20,797	0	0	20,797	0	0	21,297
6	Sept	914	0	168	11,425	-10,680	10,117	0	0	10,117	0	0	10,617
6	Oct	0	0	0	9,617	-9,617	500	0	0	500	0	0	1,000
6	Nov	0	0	0	0	0	500	0	0	500	0	0	1,000
6	Dec	0	0	0	0	0	500	0	0	500	0	0	1,000
6	Jan	0	0	0	0	0	500	0	0	500	0	0	1,000
6	Feb	0	0	0	0	0	500	0	0	500	0	0	1,000
6	March	0	0	0	0	0	500	0	0	500	0	0	1,000
7	7-April	4,685	50,715	0	0	55,400	55,900	0	0	55,900	0	0	56,400
7	7-May	387	2,506	483	0	2,410	58,310	0	0	58,310	0	0	58,810
7	7-June	1,213	0	559	23,718	-23,064	35,247	0	0	35,247	0	0	35,747
7	July	1,775	0	513	6,421	-5,158	30,088	0	0	30,088	0	0	30,588
7	Aug	1,269	0	370	10,190	-9,291	20,797	0	0	20,797	0	0	21,297
7	Sept	914	0	168	11,425	-10,680	10,117	0	0	10,117	0	0	10,617
7	Oct	0	0	0	9,617	-9,617	500	0	0	500	0	0	1,000
7	Nov	0	0	0	0	0	500	0	0	500	0	0	1,000
7	Dec	0	0	0	0	0	500	0	0	500	0	0	1,000
7	Jan	0	0	0	0	0	500	0	0	500	0	0	1,000
7	Feb	0	0	0	0	0	500	0	0	500	0	0	1,000
7	March	0	0	0	0	0	500	0	0	500	0	0	1,000
8	8-April	4,685	50,715	0	0	55,400	55,900	0	0	55,900	0	0	56,400
8	8-May	387	2,506	483	0	2,410	58,310	0	0	58,310	0	0	58,810
8	8-June	1,213	0	559	9,986	-9,332	48,979	48,479	0	500	48,479	0	1,000
8	July	1,775	17,428	513	0	18,691	19,191	18,691	0	500	67,169	0	1,000
8	Aug	1,269	12,446	370	0	13,345	13,845	13,345	0	500	80,514	0	1,000
8	Sept	914	9,306	168	0	10,052	10,552	10,052	0	500	90,566	0	1,000
8	Oct	0	0	0	0	0	500	0	0	500	90,566	0	1,000
8	Nov	0	0	0	0	0	500	0	0	500	90,566	0	1,000
8	Dec	0	0	0	0	0	500	0	0	500	90,566	0	1,000
8	Jan	0	0	0	0	0	500	0	0	500	90,566	0	1,000
8	Feb	0	0	0	0	0	500	0	0	500	90,566	0	1,000
8	March	0	0	0	0	0	500	0	0	500	90,566	0	1,000

Table I.4 - Carmacks Copper Project - Events Pond Monthly Water Balance

Average Conditions
ROM Ore
Version 1.2

Events Pond Areas		
Total Catchment	29,100	m2
Pond Area	5,200	m2

Events Pond Water Storage Limits		
Maximum	160,000	m3
Minimum	500	m3
Initial	0	m3

		AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL (In-Heap plus Events Pond)
		Water Inflows from		Water Losses to			Potential	Treated	Untreated	Remaining	Cumulative Volumes		Total
YEAR	Month	Precipitation Runoff	Heap Storage	Evaporation	Make-up to Heap	NET INFLOW	Volume in Storage	Volume Released	Volume	Volume in Storage	Treated & Released	Untreated	Solution Storage
9	9-April	4,685	50,715	0	0	55,400	55,900	0	0	55,900	90,566	0	56,400
9	9-May	387	2,506	483	0	2,410	58,310	57,810	0	500	148,376	0	1,000
9	9-June	1,213	11,188	559	0	11,842	12,342	11,842	0	500	160,218	0	1,000
9	July	1,775	17,428	513	0	18,691	19,191	18,691	0	500	178,909	0	1,000
9	Aug	1,269	12,446	370	0	13,345	13,845	13,345	0	500	192,253	0	1,000
9	Sept	914	9,306	168	0	10,052	10,552	10,052	0	500	202,305	0	1,000
9	Oct	0	0	0	0	0	500	0	0	500	202,305	0	1,000
9	Nov	0	0	0	0	0	500	0	0	500	202,305	0	1,000
9	Dec	0	0	0	0	0	500	0	0	500	202,305	0	1,000
9	Jan	0	0	0	0	0	500	0	0	500	202,305	0	1,000
9	Feb	0	0	0	0	0	500	0	0	500	202,305	0	1,000
9	March	0	0	0	0	0	500	0	0	500	202,305	0	1,000
10	10-April	4,685	50,715	0	0	55,400	55,900	55,400	0	500	257,705	0	1,000
10	10-May	387	8,119	483	0	8,023	8,523	8,023	0	500	265,728	0	1,000
10	10-June	1,213	16,835	559	0	17,490	17,990	17,490	0	500	283,218	0	1,000
10	July	1,775	23,055	513	0	24,317	24,817	24,317	0	500	307,536	0	1,000
10	Aug	1,269	18,007	370	0	18,906	19,406	18,906	0	500	326,442	0	1,000
10	Sept	914	14,775	168	0	15,521	16,021	15,521	0	500	341,963	0	1,000
10	Oct	0	5,393	0	0	5,393	5,893	5,393	0	500	347,356	0	1,000
10	Nov	0	0	0	0	0	500	0	0	500	347,356	0	1,000
10	Dec	0	0	0	0	0	500	0	0	500	347,356	0	1,000
10	Jan	0	0	0	0	0	500	0	0	500	347,356	0	1,000
10	Feb	0	0	0	0	0	500	0	0	500	347,356	0	1,000
10	March	0	0	0	0	0	500	0	0	500	347,356	0	1,000
11	11-April	4,685	50,715	0	0	55,400	55,900	55,400	0	500	402,756	0	1,000
11	11-May	387	8,119	483	0	8,023	8,523	8,023	0	500	410,780	0	1,000
11	11-June	1,213	16,835	559	0	17,490	17,990	17,490	0	500	428,269	0	1,000
11	July	1,775	23,055	513	0	24,317	24,817	24,317	0	500	452,587	0	1,000
11	Aug	1,269	18,007	370	0	18,906	19,406	18,906	0	500	471,493	0	1,000
11	Sept	914	14,775	168	0	15,521	16,021	15,521	0	500	487,014	0	1,000
11	Oct	0	5,393	0	0	5,393	5,893	5,393	0	500	492,407	0	1,000
11	Nov	0	0	0	0	0	500	0	0	500	492,407	0	1,000
11	Dec	0	0	0	0	0	500	0	0	500	492,407	0	1,000
11	Jan	0	0	0	0	0	500	0	0	500	492,407	0	1,000
11	Feb	0	0	0	0	0	500	0	0	500	492,407	0	1,000
11	March	0	0	0	0	0	500	0	0	500	492,407	0	1,000
12	12-April	4,685	50,715	0	0	55,400	55,900	55,400	0	500	547,808	0	1,000
12	12-May	387	8,119	483	0	8,023	8,523	8,023	0	500	555,831	0	1,000
12	12-June	1,213	16,835	559	0	17,490	17,990	17,490	0	500	573,321	0	1,000
12	July	1,775	23,055	513	0	24,317	24,817	24,317	0	500	597,638	0	1,000
12	Aug	1,269	18,007	370	0	18,906	19,406	18,906	0	500	616,545	0	1,000
12	Sept	914	14,775	168	0	15,521	16,021	15,521	0	500	632,066	0	1,000
12	Oct	0	5,393	0	0	5,393	5,893	5,393	0	500	637,459	0	1,000
12	Nov	0	0	0	0	0	500	0	0	500	637,459	0	1,000
12	Dec	0	0	0	0	0	500	0	0	500	637,459	0	1,000
12	Jan	0	0	0	0	0	500	0	0	500	637,459	0	1,000
12	Feb	0	0	0	0	0	500	0	0	500	637,459	0	1,000
12	March	0	0	0	0	0	500	0	0	500	637,459	0	1,000

Table I.4 - Carmacks Copper Project - Events Pond Monthly Water Balance

Average Conditions
ROM Ore
Version 1.2

Events Pond Areas

Total Catchment	29,100	m2
Pond Area	5,200	m2

Events Pond Water Storage Limits

Maximum	160,000	m3
Minimum	500	m3
Initial	0	m3

		AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
		Water Inflows from		Water Losses to			Potential	Treated	Untreated	Remaining	Cumulative Volumes		In-Heap plus Events Pond Total
YEAR	Month	Precipitation Runoff	Heap Storage	Evaporation	Make-up to Heap	NET INFLOW	Volume in Storage	Volume Released	Volume	Volume in Storage	Treated & Released	Untreated	Solution Storage
13	13-April	4,685	50,715	0	0	55,400	55,900	55,400	0	500	692,859	0	1,000
13	13-May	387	2,726	483	0	2,630	3,130	2,630	0	500	695,489	0	1,000
13	13-June	1,213	11,442	559	0	12,097	12,597	12,097	0	500	707,586	0	1,000
13	July	1,775	17,662	513	0	18,924	19,424	18,924	0	500	726,510	0	1,000
13	Aug	1,269	12,614	370	0	13,513	14,013	13,513	0	500	740,024	0	1,000
13	Sept	914	9,382	168	0	10,128	10,628	10,128	0	500	750,152	0	1,000
13	Oct	0	0	0	0	0	500	0	0	500	750,152	0	1,000
13	Nov	0	0	0	0	0	500	0	0	500	750,152	0	1,000
13	Dec	0	0	0	0	0	500	0	0	500	750,152	0	1,000
13	Jan	0	0	0	0	0	500	0	0	500	750,152	0	1,000
13	Feb	0	0	0	0	0	500	0	0	500	750,152	0	1,000
13	March	0	0	0	0	0	500	0	0	500	750,152	0	1,000
14	14-April	4,685	50,715	0	0	55,400	55,900	55,400	0	500	805,552	0	1,000
14	14-May	387	2,726	483	0	2,630	3,130	2,630	0	500	808,182	0	1,000
14	14-June	1,213	11,442	559	0	12,097	12,597	12,097	0	500	820,279	0	1,000
14	July	1,775	17,662	513	0	18,924	19,424	18,924	0	500	839,203	0	1,000
14	Aug	1,269	12,614	370	0	13,513	14,013	13,513	0	500	852,717	0	1,000
14	Sept	914	9,382	168	0	10,128	10,628	10,128	0	500	862,845	0	1,000
14	Oct	0	0	0	0	0	500	0	0	500	862,845	0	1,000
14	Nov	0	0	0	0	0	500	0	0	500	862,845	0	1,000
14	Dec	0	0	0	0	0	500	0	0	500	862,845	0	1,000
14	Jan	0	0	0	0	0	500	0	0	500	862,845	0	1,000
14	Feb	0	0	0	0	0	500	0	0	500	862,845	0	1,000
14	March	0	0	0	0	0	500	0	0	500	862,845	0	1,000
15	15-April	4,685	50,715	0	0	55,400	55,900	55,900	0	0	918,745	0	500
15	15-May	387	2,726	483	0	2,630	2,630	2,630	0	0	921,375	0	500
15	15-June	1,213	11,442	559	0	12,097	12,097	12,097	0	0	933,472	0	500
15	July	1,775	17,662	513	0	18,924	18,924	18,924	0	0	952,396	0	500
15	Aug	1,269	12,614	370	0	13,513	13,513	13,513	0	0	965,909	0	500
15	Sept	914	9,382	168	0	10,128	10,128	10,128	0	0	976,038	0	500
15	Oct	0	0	0	0	0	0	0	0	0	976,038	0	500
15	Nov	0	0	0	0	0	0	0	0	0	976,038	0	500
15	Dec	0	0	0	0	0	0	0	0	0	976,038	0	500
15	Jan	0	0	0	0	0	0	0	0	0	976,038	0	500
15	Feb	0	0	0	0	0	0	0	0	0	976,038	0	500
15	March	0	0	0	0	0	0	0	0	0	976,038	0	500

FIGURE I.1 - Events Pond Water Storage Variation
Average Conditions

VERSION 1.2

Run-of-Mine (ROM) Ore

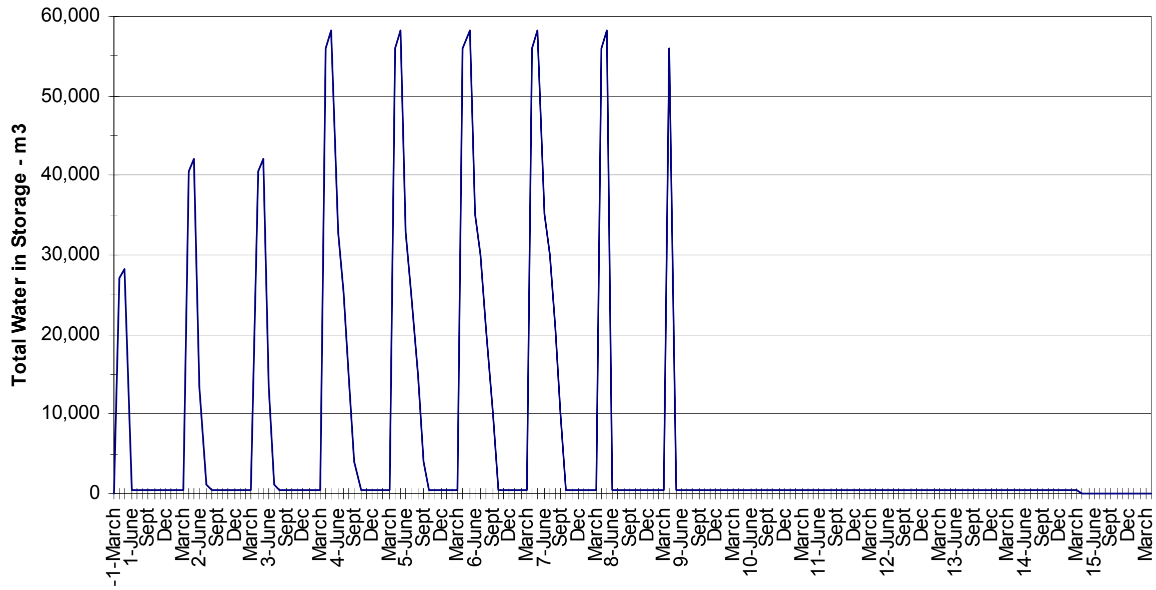
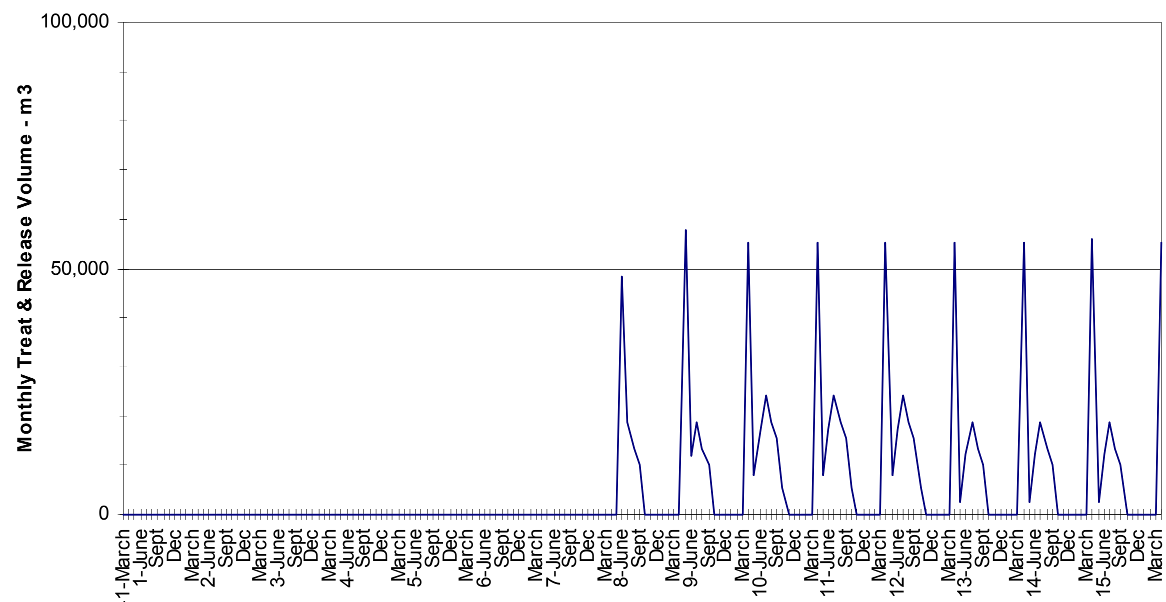


FIGURE I.2 - Variation in Monthly Treat and Release Volumes
Average Conditions



APPENDIX II

Carmacks Copper Project
Heap Leach Facility Water Balance
Dry and Wet Years

Run-of-Mine (ROM) Ore

Table II.1 - Summary of Monthly Water Balance

Dry Years

VERSION 1.2

	Maximum	Minimum	Initial	
Nominal In-Heap Storage	500	500	500	m3
Events Pond Storage	160,000	500	0	m3
Total Solution Storage	160,500	1,000	500	m3

Ore Moistures	
Initial	3.0%
Leaching	12.0%
Residual	10.0%

Treatment Capacity =	270	m3/hour
Maximum Daily Ore Production	9,872	tpd

Run-of-Mine (ROM) Ore

Year	Stage	Precipitation Return Period	In-Heap Storage Minimum Volume	In-Heap Storage Maximum Volume	Events Pond Storage Minimum Volume	Events Pond Storage Maximum Volume	Maximum Total Storage	Total Treated	Total Spilled	Make-Up Water (Fresh)
1	I	20 yr Dry	500	500	500	19,719	20,219	-	-	138,815
2	II	20 yr Dry	500	500	500	29,842	30,342	-	-	92,490
3	II	20 yr Dry	500	500	500	29,842	30,342	-	-	92,571
4	III	20 yr Dry	500	500	500	41,416	41,916	-	-	61,356
5	III	20 yr Dry	500	500	500	41,416	41,916	-	-	58,181
6	III	20 yr Dry	500	500	500	41,416	41,916	-	-	52,148
7	III	20 yr Dry	500	500	500	41,416	41,916	-	-	41,641
8	III / IV	20 yr Dry	500	500	500	41,416	41,916	58,220	-	-
9	IV	20 yr Dry	500	500	500	40,162	40,662	79,394	-	-
10	V	20 yr Dry	500	500	500	500	1,000	112,706	-	-
11	V	20 yr Dry	500	500	500	500	1,000	112,706	-	-
12	V	20 yr Dry	500	500	500	500	1,000	112,706	-	-
13	VI	20 yr Dry	500	500	500	500	1,000	80,348	-	-
14	VI	20 yr Dry	500	500	500	500	1,000	80,348	-	-
15	VI	20 yr Dry	500	500	-	-	500	80,848	-	-

NOTES 1) All volumes in cubic metres.
2) "Maximum Total Water Storage" corresponds to the maximum concurrent total of In-Heap plus Events Pond storage.
3) Return Period is for Annual Precipitation, Rainfall and Snowfall.

Table II.2 - Summary of Monthly Water Balance

Wet Years

VERSION 1.2

	Maximum	Minimum	Initial	
Nominal In-Heap Storage	500	500	500	m3
Events Pond Storage	160,000	500	0	m3
Total Solution Storage	160,500	1,000	500	m3

Ore Moistures	
Initial	3.0%
Leaching	12.0%
Residual	10.0%

Treatment Capacity = 270 m3/hour
Maximum Daily Ore Production 9,872 tpd

Run-of-Mine (ROM) Ore

Year	Stage	Precipitation Return Period	In-Heap Storage Minimum Volume	In-Heap Storage Maximum Volume	Events Pond Storage Minimum Volume	Events Pond Storage Maximum Volume	Maximum Total Storage	Total Treated	Total Spilled	Make-Up Water (Fresh)
1	I	100	500	500	500	43,222	43,722	-	-	93,816
2	II	100	500	500	500	63,923	64,423	-	-	27,239
3	II	100	500	500	500	63,923	64,423	-	-	27,321
4	III	100	500	500	500	88,684	89,184	29,142	-	-
5	III	100	500	500	500	88,684	89,184	32,318	-	-
6	III	100	500	500	500	88,684	89,184	38,350	-	-
7	III	100	500	500	500	88,684	89,184	48,857	-	-
8	III / IV	100	500	500	500	88,684	89,184	148,718	-	-
9	IV	100	500	500	500	84,195	84,695	169,892	-	-
10	V	100	500	500	500	500	1,000	203,204	-	-
11	V	100	500	500	500	500	1,000	203,204	-	-
12	V	100	500	500	500	500	1,000	203,204	-	-
13	VI	100	500	500	500	500	1,000	170,846	-	-
14	VI	100	500	500	500	500	1,000	170,846	-	-
15	VI	100	500	500	-	-	500	171,346	-	-

NOTES 1) All volumes in cubic metres.
2) "Maximum Total Water Storage" corresponds to the maximum concurrent total of In-Heap plus Events Pond storage.
3) Return Period is for Annual Precipitation, Rainfall and Snowfall. Results are for individual years with 100 year return periods with average conditions assumed for all preceeding and following years..

Table II.3 - Summary of Annual Water Balances for Leach Pad & Events Pond - Average, Dry & Wet Years

VERSION 1.2

Daily Ore Production	9872	tpd
Initial Ore Moisture	3.0%	
Leaching Ore Moisture	12.0%	
Residual ore Moisture	10.0%	
Maximum Area under Leach	47,400	m2
Leaching Lift Height	8	m
Dry Density of Heap Ore	1.6	t/m3

Max. Solution Flow On Pad	540	m3/hr
Maximum Treatment Rate	270	m3/hr
Other Inflows to Heap Leach	0	m3/hr

Events Pond Areas		
Total Catchment	29,100	m2
Pond Area	5,200	m2

Maximum Allowable Storage		
In-Heap Storage	500	m3 (nominal)
Events Pond Storage	160,000	m3
Total Solution Storage	160,500	m3

Run-of-Mine (ROM) Ore

(all volumes in cubic metres per year)

YEAR	Stacked Ore tonnes	Runoff Depth mm	Evap. Depth mm	Runoff Inflows Leach Pad	Runoff Inflows Events Pond	TOTAL RUNOFF IN	Evaporation & Ore Moisture Losses: Leach Area	Heap & O'Liner	Events Pond	Ore Moisture to: Permanent	Ore Moisture to: Leaching	TOTAL LOSSES OUT	Make-Up Water: From Heap	From E. Pond	From Fresh	NET TOTAL INFLOW	Release to Events Pond	Treat and Release	Remaining Solution in Storage at Year-End
	A	G	H	I	AA		L	M	AC	N	M		R	T	U		W	AG	
Average Conditions																			
1	1,963,500	352	402	49,984	10,243	60,227	1,469	2,123	2,092	137,445	38,830	181,959	-	31,181	122,732	1,000	23,530	-	1,000
2	1,973,229	352	402	77,088	10,243	87,331	1,907	3,453	2,092	138,126	10,921	156,499	-	45,085	69,168	0	36,934	-	1,000
3	1,974,396	352	402	77,088	10,243	87,331	1,907	3,453	2,092	138,208	10,921	156,581	-	45,085	69,250	0	36,934	-	1,000
4	1,837,363	352	402	110,880	10,243	121,123	1,907	5,384	2,092	128,615	12,134	150,134	-	61,372	29,011	0	53,221	-	1,000
5	1,792,000	352	402	110,880	10,243	121,123	1,907	5,384	2,092	125,440	12,134	146,958	-	61,372	25,835	0	53,221	-	1,000
6	1,792,500	352	402	110,880	10,243	121,123	1,907	5,384	2,092	125,475	6,067	140,926	-	61,372	19,803	-	53,221	-	1,000
7	1,642,400	352	402	110,880	10,243	121,123	1,907	5,384	2,092	114,968	6,067	130,419	-	61,372	9,296	0	53,221	-	1,000
8	302,481	352	402	110,880	10,243	121,123	1,907	5,384	2,092	21,174	-	30,558	-	9,986	-	90,566	92,401	90,566	1,000
9	-	352	402	110,880	10,243	121,123	1,907	5,384	2,092	-	-	9,384	-	-	-	111,739	103,589	111,739	1,000
10	-	352	402	110,880	10,243	121,123	-	6,338	2,092	-	- 32,358	- 23,928	-	-	-	145,051	136,901	145,051	1,000
11	-	352	402	110,880	10,243	121,123	-	6,338	2,092	-	- 32,358	- 23,928	-	-	-	145,051	136,901	145,051	1,000
12	-	352	402	110,880	10,243	121,123	-	6,338	2,092	-	- 32,358	- 23,928	-	-	-	145,051	136,901	145,051	1,000
13	-	352	402	110,880	10,243	121,123	-	6,338	2,092	-	-	8,430	-	-	-	112,693	104,542	112,693	1,000
14	-	352	402	110,880	10,243	121,123	-	6,338	2,092	-	-	8,430	-	-	-	112,693	104,542	112,693	1,000
15	-	352	402	110,880	10,243	121,123	-	6,338	2,092	-	-	8,430	-	-	-	112,693	104,542	113,193	500
Dry Years (20-year Return Period)																			
1	1,963,500	258	402	36,636	7,508	44,144	1,469	2,123	2,092	137,445	38,830	181,959	-	21,474	138,815	1,000	16,558	-	1,000
2	1,973,229	258	402	56,502	7,508	64,010	1,907	3,453	2,092	138,126	10,921	156,499	-	31,597	92,490	-	26,182	-	1,000
3	1,974,396	258	402	56,502	7,508	64,010	1,907	3,453	2,092	138,208	10,921	156,581	-	31,597	92,571	-	26,182	-	1,000
4	1,837,363	258	402	81,270	7,508	88,778	1,907	5,384	2,092	128,615	12,134	150,134	-	43,171	61,356	-	37,755	-	1,000
5	1,792,000	258	402	81,270	7,508	88,778	1,907	5,384	2,092	125,440	12,134	146,958	-	43,171	58,181	-	37,755	-	1,000
6	1,792,500	258	402	81,270	7,508	88,778	1,907	5,384	2,092	125,475	6,067	140,926	-	43,171	52,148	-	37,755	-	1,000
7	1,642,400	258	402	81,270	7,508	88,778	1,907	5,384	2,092	114,968	6,067	130,419	-	43,171	41,641	-	37,755	-	1,000
8	302,481	258	402	81,270	7,508	88,778	1,907	5,384	2,092	21,174	-	30,558	-	13,305	-	58,220	66,110	58,220	1,000
9	-	258	402	81,270	7,508	88,778	1,907	5,384	2,092	-	-	9,384	-	-	-	79,394	73,979	79,394	1,000
10	-	258	402	81,270	7,508	88,778	-	6,338	2,092	-	- 32,358	- 23,928	-	-	-	112,706	107,291	112,706	1,000
11	-	258	402	81,270	7,508	88,778	-	6,338	2,092	-	- 32,358	- 23,928	-	-	-	112,706	107,291	112,706	1,000
12	-	258	402	81,270	7,508	88,778	-	6,338	2,092	-	- 32,358	- 23,928	-	-	-	112,706	107,291	112,706	1,000
13	-	258	402	81,270	7,508	88,778	-	6,338	2,092	-	-	8,430	-	-	-	80,348	74,932	80,348	1,000
14	-	258	402	81,270	7,508	88,778	-	6,338	2,092	-	-	8,430	-	-	-	80,348	74,932	80,348	1,000
15	-	258	402	81,270	7,508	88,778	-	6,338	2,092	-	-	8,430	-	-	-	80,348	74,932	80,848	500
Wet Years (100-year Return Period)																			
1	1,963,500	521	402	73,982	15,161	89,143	1,469	2,123	2,092	137,445	38,830	181,959	-	48,633	93,816	1,000	36,065	-	1,000
2	1,973,229	521	402	114,099	15,161	129,260	1,907	3,453	2,092	138,126	10,921	156,499	-	69,334	27,239	-	56,266	-	1,000
3	1,974,396	521	402	114,099	15,161	129,260	1,907	3,453	2,092	138,208	10,921	156,581	-	69,334	27,321	-	56,266	-	1,000
4	1,837,363	521	402	164,115	15,161	179,276	1,907	5,384	2,092	128,615	12,134	150,134	-	64,953	-	29,142	81,026	29,142	1,000
5	1,792,000	521	402	164,115	15,161	179,276	1,907	5,384	2,092	125,440	12,134	146,958	-	61,777	-	32,318	81,026	32,318	1,000
6	1,792,500	521	402	164,115	15,161	179,276	1,907	5,384	2,092	125,475	6,067	140,926	-	58,054	-	38,350	83,335	38,350	1,000
7	1,642,400	521	402	164,115	15,161	179,276	1,907	5,384	2,092	114,968	6,067	130,419	-	47,547	-	48,857	83,335	48,857	1,000
8	302,481	521	402	164,115	15,161	179,276	1,907	5,384	2,092	21,174	-	30,558	-	4,019	-	148,718	139,668	148,718	1,000
9	-	521	402	164,115	15,161	179,276	1,907	5,384	2,092	-	-	9,384	-	-	-	169,892	156,824	169,892	1,000
10	-	521	402	164,115	15,161	179,276	-	6,338	2,092	-	- 32,358	- 23,928	-	-	-	203,204	190,136	203,204	1,000
11	-	521	402	164,115	15,161	179,276	-	6,338	2,092	-	- 32,358	- 23,928	-	-	-	203,204	190,136	203,204	1,000
12	-	521	402	164,115	15,161	179,276	-	6,338	2,092	-	- 32,358	- 23,928	-	-	-	203,204	190,136	203,204	1,000
13	-	521	402	164,115	15,161	179,276	-	6,338	2,092	-	-	8,430	-	-	-	170,846	157,777	170,846	1,000
14	-	521	402	164,115	15,161	179,276	-	6,338	2,092	-	-	8,430	-	-	-	170,846	157,777	170,846	1,000
15	-	521	402	164,115	15,161	179,276	-	6,338	2,092	-	-	8,430	-	-	-	170,846	157,777	171,346	500

APPENDIX III

Carmacks Copper Project

Heap Leach Facility Water Balance

Design Inflow Events and Storage Volumes

Run-of-Mine (ROM) Ore

Table III.1 - Carmacks Copper Project - Design Inflow Events and Storage Volumes

	Maximum	Minimum	
In-Heap Storage Volumes	500	500	m3

VERSION 1.2

Run-of-Mine (ROM) Ore

Events Pond Storage

CASE	HYDROLOGIC EVENT			Month	Month-End Volumes (m3) in Events Pond Storage Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	Base Case Average Conditions	372	mm/year	April	27,047	40,444	40,444	55,900	55,900	55,900	55,900	55,900	55,900	500	500	500	500	500	0
	- Average Snowmelt in April			May	28,119	42,023	42,023	58,310	58,310	58,310	58,310	58,310	500	500	500	500	500	500	0
	Total April Runoff =	161	mm	June	500	13,531	13,531	32,820	32,820	35,247	35,247	500	500	500	500	500	500	500	0
	May Runoff =	13.3	mm	July	500	1,048	1,048	25,234	25,234	30,088	30,088	500	500	500	500	500	500	500	0
	(average runoff thereafter)			August	500	500	500	14,730	14,730	20,797	20,797	500	500	500	500	500	500	500	0
				Sept	500	500	500	4,050	4,050	10,117	10,117	500	500	500	500	500	500	500	0
				Oct	500	500	500	500	500	500	500	500	500	500	500	500	500	500	0
Ai	Base Case Average Conditions			April	27,047	40,444	40,444	55,900	55,900	55,900	55,900	55,900	55,900	500	500	500	500	500	0
	Snowmelt in April...Total April Runoff =	161	mm	May	52,364	77,179	77,179	107,069	107,069	107,069	107,069	107,069	500	500	500	500	500	500	0
	PLUS 100 year One Month Wet Period			June	16,223	48,687	48,687	81,579	81,579	84,005	84,005	500	500	500	500	500	500	500	0
	May Runoff =	155	mm	July	500	36,204	36,204	73,993	73,993	78,847	78,847	500	500	500	500	500	500	500	0
	(average runoff thereafter)			August	500	22,098	22,098	63,489	63,489	69,556	69,556	500	500	500	500	500	500	500	0
				Sept	500	8,559	8,559	52,809	52,809	58,876	58,876	500	500	500	500	500	500	500	0
				Oct	500	500	500	11,639	8,463	8,498	500	500	500	500	500	500	500	500	0
Aii	Base Case Average Conditions			April	27,047	40,444	40,444	55,900	55,900	55,900	55,900	55,900	55,900	500	500	500	500	500	0
	Snowmelt in April...Total April Runoff =	161	mm	May	45,434	67,131	67,131	93,133	93,133	93,133	93,133	93,133	500	500	500	500	500	500	0
	PLUS 100 year Two Month Wet Period			June	21,750	56,700	56,700	92,693	92,693	95,120	95,120	500	500	500	500	500	500	500	0
	May Runoff =	114.5	mm	July	3,198	44,218	44,218	85,108	85,108	89,962	89,962	500	500	500	500	500	500	500	0
	June Runoff =	114.5	mm	August	500	30,112	30,112	74,603	74,603	80,671	80,671	500	500	500	500	500	500	500	0
	(average runoff thereafter)			Sept	500	16,573	16,573	63,924	63,924	69,991	69,991	500	500	500	500	500	500	500	0
				Oct	500	500	500	11,639	8,463	8,498	500	500	500	500	500	500	500	500	0
Aiii	Base Case Average Conditions			April	27,047	40,444	40,444	55,900	55,900	55,900	55,900	55,900	55,900	500	500	500	500	500	0
	Snowmelt in April...Total April Runoff =	161	mm	May	42,269	62,541	62,541	86,767	86,767	86,767	86,767	86,767	500	500	500	500	500	500	0
	PLUS 100 year Three Month Wet Period			June	15,419	47,521	47,521	79,961	79,961	82,388	82,388	500	500	500	500	500	500	500	0
	May Runoff =	96	mm	July	2,855	43,722	43,722	84,420	84,420	89,273	89,273	500	500	500	500	500	500	500	0
	June Runoff =	96	mm	August	500	29,615	29,615	73,915	73,915	79,982	79,982	500	500	500	500	500	500	500	0
	July Runoff =	96	mm	Sept	500	16,076	16,076	63,235	63,235	69,303	69,303	500	500	500	500	500	500	500	0
	(average runoff thereafter)			Oct	500	500	500	11,639	8,463	8,498	500	500	500	500	500	500	500	500	0
B	100 year Wet Year	541	mm/year	April	41,308	61,124	61,124	84,581	84,581	84,581	84,581	84,581	84,581	500	500	500	500	500	0
	with Snowmelt in April			May	43,413	64,200	64,200	89,068	89,068	89,068	89,068	89,068	500	500	500	500	500	500	0
	Total April Runoff =	244	mm	June	10,509	40,401	40,401	70,087	70,087	72,513	72,513	500	500	500	500	500	500	500	0
	Total May Runoff =	19.3	mm	July	500	34,784	34,784	72,024	72,024	76,877	76,877	500	500	500	500	500	500	500	0
	(monthly precipitation prorated each month)			August	500	25,585	25,585	68,325	68,325	74,393	74,393	500	500	500	500	500	500	500	0
				Sept	500	15,580	15,580	62,547	62,547	68,614	68,614	500	500	500	500	500	500	500	0
				Oct	500	500	500	11,639	8,463	8,498	500	500	500	500	500	500	500	500	0
B1	100 year Wet Year			April	52,712	77,659	77,659	107,515	107,515	107,515	107,515	107,515	107,515	500	500	500	500	500	0
	with 100 Year Snowmelt in APRIL			May	54,022	79,584	79,584	110,404	110,404	110,404	110,404	110,404	500	500	500	500	500	500	0
	Total April Runoff =	311	mm	June	18,629	52,175	52,175	86,416	86,416	88,843	88,843	500	500	500	500	500	500	500	0
	Total May Runoff =	14.7	mm	July	1,169	41,277	41,277	81,029	81,029	85,883	85,883	500	500	500	500	500	500	500	0
				August	500	28,304	28,304	72,096	72,096	78,163	78,163	500	500	500	500	500	500	500	0
	(April runoff from 7 Month Wet Period)			Sept	500	15,580	15,580	62,547	62,547	68,614	68,614	500	500	500	500	500	500	500	0
				Oct	500	500	500	11,639	8,463	8,498	500	500	500	500	500	500	500	500	0
B2	100 year Wet Year			April	0	500	500	500	500	500	500	500	500	500	500	500	500	500	0
	with 100 Year Snowmelt in MAY			May	53,904	79,412	79,412	110,166	110,166	110,166	110,166	110,166	500	500	500	500	500	500	0
	Total April Runoff =	0	mm	June	18,538	52,043	52,043	86,234	86,234	88,661	88,661	500	500	500	500	500	500	500	0
	Total May Runoff =	325	mm	July	1,119	41,204	41,204	80,928	80,928	85,782	85,782	500	500	500	500	500	500	500	0
				August	500	28,273	28,273	72,053	72,053	78,121	78,121	500	500	500	500	500	500	500	0
	(May runoff from 8 Month Wet Period)			Sept	500	15,580	15,580	62,547	62,547	68,614	68,614	500	500	500	500	500	500	500	0
				Oct	500	500	500	11,639	8,463	8,498	500	500	500	500	500	500	500	500	0

Table III.1 (continued) — Inflow Volumes from Process-Related Events

Run-of-Mine (ROM) Ore

Heap Draindown Volumes

Maximum Area under Leach	47,400	m2
Leaching Lift Height	8	m
Dry Density of Heap Ore	1.6	t/m3
Leaching Ore Moisture Content	**12.0%**	by weight
Residual Ore Moisture Content	**10.0%**	by weight

Max. Solution Flow On Pad	540	m3/hr
Use	**100%**	of Full Draindown Volume in Year 1
Maximum of	25,920	m3 thereafter
(Equal to	**2.0**	days at maximum solution flow)

Period	100% Draindown		# Lifts	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Stage I - end of Year 1	38,830	m3	3.2	38,830														
end of Year 2	49,751	m3	4.1		25,920													
Stage II - end of Year 3	60,672	m3	5			25,920												
end of Year 4	72,806	m3	6				25,920											
end of Year 5	84,941	m3	7					25,920										
Stage III - end of Year 6	91,008	m3	7.5						25,920									
end of Year 7	97,075	m3	8							25,920								
Stage IV - end of Year 8	97,075	m3	8								25,920							
end of Year 9	97,075	m3	8									25,920						
Stage V - start of Year 10	97,075	m3	0										25,920					
start of year 11	64,717	m3	0											25,920				
start of Year 12	32,358	m3	0												25,920			
Stage VI - Years 13 to ...	-	m3	0													0	0	0

NOTES 1) During the first year, potential draindown volumes increase from zero at the end of May to the maximum indicated above by the end of November
100% draindown volumes at the end of each month during Year 1 are:

April	0	m3
May	0	m3
June	9,280	m3
July	15,401	m3
August	21,522	m3
September	27,445	m3
October	33,566	m3
November	38,831	m3

These draindown volumes are added for the respective months for Year 1 ONLY.

2) The total draindown "inventory" is assumed to be progressively treated and released during Years 10, 11 and 12.

Evaporation Losses from Ore Sprinkling during May

No ore will be placed or sprinkled during May if Snowmelt occurs during May.
i.e. these evaporation losses are added for Case B2 ONLY

Case	100% Snowmelt in	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A - Base Case Average Conditions	April															
Ai - Base Case + 100 year One Month	April															
Aii - Base Case + 100 year Two Month	April															
Aiii - Base Case + 100 year Three Month	April															
B - 100 yeat Wet Year	April															
B1 - 100 yr. Wet Yr with 100 yr.APRIL Snowmelt	April															
B2 - 100 yr. Wet Yr with 100 yr.MAY Snowmelt	**May**	720	1,237	1,237	1,683	1,683	1,683	1,683	1,683	1,683						

Normal Evaporation Losses apply for all cases with snowmelt during April

No ore sprinkling is carried out after the start of Year 10

Table III.1 (continued) **Combinations of Events - Total Solution Storage Requirements - Events Pond**

Event Combinations are: Hydrologic Cases plus Process-Related Events

Run-of-Mine (ROM) Ore (Note - Hydrologic cases determined from water balance model runs and include minimum pond operating volume at all times)

VERSION 1.2

			Total Events Pond Solution Storage (m3) at end of indicated month and Year														
CASE	DESCRIPTION	Month	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	Base Case Average Conditions	April	27,047	66,364	66,364	81,820	81,820	81,820	81,820	81,820	81,820	26,420	26,420	26,420	500	500	-
	plus Draindown allowance	May	28,119	67,943	67,943	84,230	84,230	84,230	84,230	84,230	26,420	26,420	26,420	26,420	500	500	-
		June	9,780	39,451	39,451	58,740	58,740	61,167	61,167	26,420	26,420	26,420	26,420	26,420	500	500	-
		July	15,901	26,968	26,968	51,154	51,154	56,008	56,008	26,420	26,420	26,420	26,420	26,420	500	500	-
		August	22,022	26,420	26,420	40,650	40,650	46,717	46,717	26,420	26,420	26,420	26,420	26,420	500	500	-
		Sept	27,945	26,420	26,420	29,970	29,970	36,037	36,037	26,420	26,420	26,420	26,420	26,420	500	500	-
		Oct	34,066	26,420	26,420	26,420	26,420	26,420	26,420	26,420	26,420	26,420	26,420	26,420	500	500	-
Ai	Base Case Average Conditions	April	27,047	66,364	66,364	81,820	81,820	81,820	81,820	81,820	81,820	26,420	26,420	26,420	500	500	-
	plus 100 year One Month Wet Period	May	52,364	103,099	103,099	132,989	132,989	132,989	132,989	132,989	26,420	26,420	26,420	26,420	500	500	-
	plus Draindown allowance	June	25,503	74,607	74,607	107,499	107,499	109,925	109,925	26,420	26,420	26,420	26,420	26,420	500	500	-
		July	15,901	62,124	62,124	99,913	99,913	104,767	104,767	26,420	26,420	26,420	26,420	26,420	500	500	-
		August	22,022	48,018	48,018	89,409	89,409	95,476	95,476	26,420	26,420	26,420	26,420	26,420	500	500	-
		Sept	27,945	34,479	34,479	78,729	78,729	84,796	84,796	26,420	26,420	26,420	26,420	26,420	500	500	-
		Oct	34,066	26,420	26,420	37,559	34,383	34,418	26,420	26,420	26,420	26,420	26,420	26,420	500	500	-
Aii	Base Case Average Conditions	April	27,047	66,364	66,364	81,820	81,820	81,820	81,820	81,820	81,820	26,420	26,420	26,420	500	500	-
	plus 100 year Two Month Wet Period	May	45,434	93,051	93,051	119,053	119,053	119,053	119,053	119,053	26,420	26,420	26,420	26,420	500	500	-
	plus Draindown allowance	June	31,030	82,620	82,620	118,613	118,613	121,040	121,040	26,420	26,420	26,420	26,420	26,420	500	500	-
		July	18,599	70,138	70,138	111,028	111,028	115,882	115,882	26,420	26,420	26,420	26,420	26,420	500	500	-
		August	22,022	56,032	56,032	100,523	100,523	106,591	106,591	26,420	26,420	26,420	26,420	26,420	500	500	-
		Sept	27,945	42,493	42,493	89,844	89,844	95,911	95,911	26,420	26,420	26,420	26,420	26,420	500	500	-
		Oct	34,066	26,420	26,420	37,559	34,383	34,418	26,420	26,420	26,420	26,420	26,420	26,420	500	500	-
Aiii	Base Case Average Conditions	April	27,047	66,364	66,364	81,820	81,820	81,820	81,820	81,820	81,820	26,420	26,420	26,420	500	500	-
	plus 100 year Three Month Wet Period	May	42,269	88,461	88,461	112,687	112,687	112,687	112,687	112,687	26,420	26,420	26,420	26,420	500	500	-
	plus Draindown allowance	June	24,699	73,441	73,441	105,881	105,881	108,308	108,308	26,420	26,420	26,420	26,420	26,420	500	500	-
		July	18,256	69,642	69,642	110,340	110,340	115,193	115,193	26,420	26,420	26,420	26,420	26,420	500	500	-
		August	22,022	55,535	55,535	99,835	99,835	105,902	105,902	26,420	26,420	26,420	26,420	26,420	500	500	-
		Sept	27,945	41,996	41,996	89,155	89,155	95,223	95,223	26,420	26,420	26,420	26,420	26,420	500	500	-
		Oct	34,066	26,420	26,420	37,559	34,383	34,418	26,420	26,420	26,420	26,420	26,420	26,420	500	500	-
B	100 year Wet Year	April	41,308	87,044	87,044	110,501	110,501	110,501	110,501	110,501	110,501	26,420	26,420	26,420	500	500	-
	with Snowmelt in April	May	43,413	90,120	90,120	114,988	114,988	114,988	114,988	114,988	26,420	26,420	26,420	26,420	500	500	-
	plus Draindown allowance	June	19,789	66,321	66,321	96,007	96,007	98,433	98,433	26,420	26,420	26,420	26,420	26,420	500	500	-
		July	15,901	60,704	60,704	97,944	97,944	102,797	102,797	26,420	26,420	26,420	26,420	26,420	500	500	-
		August	22,022	51,505	51,505	94,245	94,245	100,313	100,313	26,420	26,420	26,420	26,420	26,420	500	500	-
		Sept	27,945	41,500	41,500	88,467	88,467	94,534	94,534	26,420	26,420	26,420	26,420	26,420	500	500	-
		Oct	34,066	26,420	26,420	37,559	34,383	34,418	26,420	26,420	26,420	26,420	26,420	26,420	500	500	-
B1	100 year Wet Year with 100 Year Snowmelt in APRIL	April	52,712	103,579	103,579	133,435	133,435	133,435	133,435	133,435	133,435	26,420	26,420	26,420	500	500	-
		May	54,022	105,504	105,504	136,324	136,324	136,324	136,324	136,324	26,420	26,420	26,420	26,420	500	500	-
	plus Draindown allowance	June	27,909	78,095	78,095	112,336	112,336	114,763	114,763	26,420	26,420	26,420	26,420	26,420	500	500	-
		July	16,570	67,197	67,197	106,949	106,949	111,803	111,803	26,420	26,420	26,420	26,420	26,420	500	500	-
		August	22,022	54,224	54,224	98,016	98,016	104,083	104,083	26,420	26,420	26,420	26,420	26,420	500	500	-
		Sept	27,945	41,500	41,500	88,467	88,467	94,534	94,534	26,420	26,420	26,420	26,420	26,420	500	500	-
		Oct	34,066	26,420	26,420	37,559	34,383	34,418	26,420	26,420	26,420	26,420	26,420	26,420	500	500	-
B2	100 year Wet Year with 100 Year Snowmelt in MAY	April	-	26,420	26,420	26,420	26,420	26,420	26,420	26,420	26,420	26,420	26,420	26,420	500	500	-
		May	54,624	106,569	106,569	137,769	137,769	137,769	137,769	137,769	28,103	26,420	26,420	26,420	500	500	-
	plus Draindown allowance	June	27,818	77,963	77,963	112,154	112,154	114,581	114,581	26,420	26,420	26,420	26,420	26,420	500	500	-
	plus no ore sprinkling in May	July	16,520	67,124	67,124	106,848	106,848	111,702	111,702	26,420	26,420	26,420	26,420	26,420	500	500	-
		August	22,022	54,193	54,193	97,973	97,973	104,041	104,041	26,420	26,420	26,420	26,420	26,420	500	500	-
		Sept	27,945	41,500	41,500	88,467	88,467	94,534	94,534	26,420	26,420	26,420	26,420	26,420	500	500	-
		Oct	34,066	26,420	26,420	37,559	34,383	34,418	26,420	26,420	26,420	26,420	26,420	26,420	500	500	-

Table III.1 (continued)

VERSION 1.2

Total Events Pond Solution Storage - Maximum Volumes each Month

Run-of-Mine (ROM) Ore

Month	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
April	52,712	103,579	103,579	133,435	133,435	133,435	133,435	133,435	133,435	26,420	26,420	26,420	500	500	-
May	54,624	106,569	106,569	137,769	137,769	137,769	137,769	137,769	28,103	26,420	26,420	26,420	500	500	-
June	31,030	82,620	82,620	118,613	118,613	121,040	121,040	26,420	26,420	26,420	26,420	26,420	500	500	-
July	18,599	70,138	70,138	111,028	111,028	115,882	115,882	26,420	26,420	26,420	26,420	26,420	500	500	-
Aug	22,022	56,032	56,032	100,523	100,523	106,591	106,591	26,420	26,420	26,420	26,420	26,420	500	500	-
Sept	27,945	42,493	42,493	89,844	89,844	95,911	95,911	26,420	26,420	26,420	26,420	26,420	500	500	-
Oct	34,066	26,420	26,420	37,559	34,383	34,418	26,420	26,420	26,420	26,420	26,420	26,420	500	500	-

Events Pond Storage Capacity

	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Minimum Required Volume	54,624	106,569	106,569	137,769	137,769	137,769	137,769	137,769	133,435	26,420	26,420	26,420	500	500	0

FIGURE III.1 - Maximum Events Pond Storage each Month