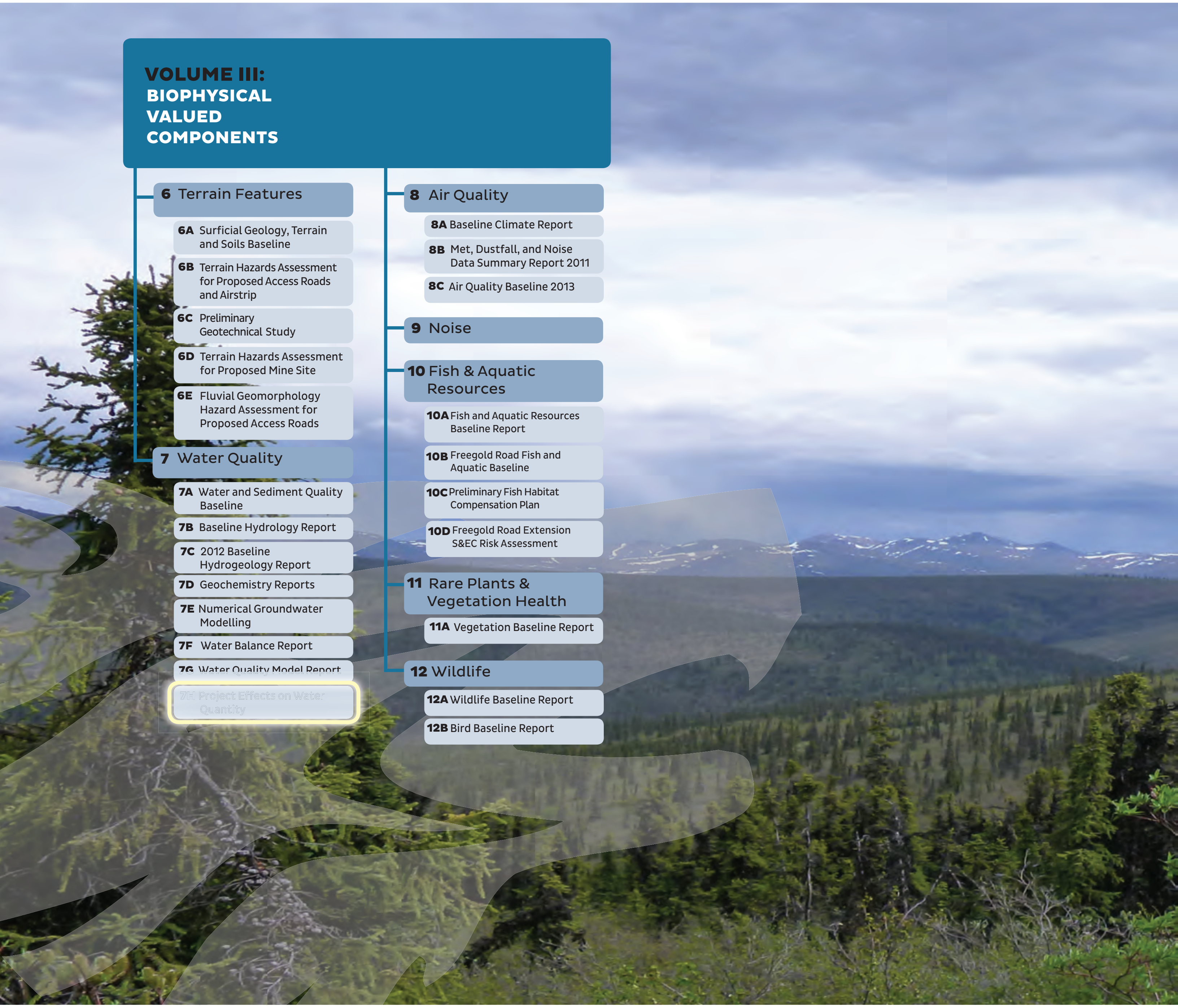
APPENDIX 7H: PROJECT EFFECTS ON WATER QUANTITY



November 12, 2013

File No.:VA101-325/14-A.01
Cont. No.:VA13-02157

ISO 9001 - FS 64925
ISO 14001 - EMS 550121
OHSAS 18001 - OHS 550122

Mr. Paul West-Sells
President & Chief Operating Officer
Casino Mining Corporation
2050 - 1111 West Georgia St.
Vancouver, British Columbia
Canada, V6E 4M3

Dear Paul,

Re: Casino YESAB Proposal – Project Effects on Water Quantity

Knight Piésold Ltd. (KP) has been retained by Casino Mining Corporation (CMC) to determine the potential effects of the Casino Project (the Project) on downstream water quantity. This letter and the results presented herein, were prepared to meet the reporting requirements pertaining to changes to water quantity outlined in the Yukon Environmental and Socioeconomic Assessment Board's (YESAB) Proponents Guide – Water Information Requirements for Quartz Mining Project Proposals (YESAB, 2011). The methodology used to calculate changes in water quantity, and the results of these calculations, are presented in the following sections.

Methodology

Baseline hydrologic conditions at the Project were previously quantified by KP, as presented in the Casino Baseline Hydrology Report (KP, 2013a). Baseline hydrometric conditions were assessed at 9 hydrometric stations on Dip Creek, Casino Creek and Britannia Creek, and several of their major tributaries, as shown on Figure 1. The baseline assessment incorporated 3-5 years of daily discharge data collected during the open water season, plus 2 to 3 annual low flow measurements recorded in March, at each station. The measured streamflow record at each station was then correlated to the concurrent streamflow record for Big Creek, which was determined to be the most representative regional watercourse actively monitored by the Water Survey of Canada. Each station's resultant 37-year synthetic flow series is summarized as a mean monthly hydrograph on Figure 2. A more detailed description of the methodology and results of the baseline hydrologic analysis is provided in the Baseline Hydrology Report (KP, 2013a).

Hydrologic conditions during construction, operations and closure of the Project were modelled using the GoldSim modelling platform. The "YESAB Water Balance Model" (YWBM) was compiled from three separate models; a watershed model, which is a hydrologic model developed in Excel that balances the various aspects of the hydrologic cycle at the Project site and is calibrated to baseline hydrology and hydrogeology information (KP, 2013b); a MODFLOW model, which is a 3-D groundwater model calibrated to baseline hydrogeological information and used to model the groundwater system within the Project during operations and closure (KP, 2013c); and an operational water balance model developed during feasibility design of the Casino Project (KP, 2012). The YWBM was run on a monthly time-step, and used mean monthly net precipitation values, distributed by elevation and calibrated in the Watershed Model, as its inputs. Net precipitation was then partitioned into surface water and groundwater components, and was tracked around the Project site using information from the Watershed and MODFLOW models. Results were output for each baseline hydrologic station downstream of the Project. A more detailed description of the methodology and results of the YWBM is provided in the report prepared by KP (KP, 2013d).

Changes to water quantity downstream of the Project were calculated as the difference between the baseline and project mean monthly flows within the YWBM. The baseline values in the model are calibrated to the baseline hydrology information provided in the Baseline Hydrology Report, and are resultantly not identical. Therefore, water quantity changes must be determined only from values within the YWBM, otherwise uncertainty would arise within the results associated with whether changes are a result of the Project, or as a result of the baseline calibration. Hydrographs for each mine phase, however, were developed for each downstream monitoring station using the Baseline Hydrology Report values and applying the monthly percent changes calculated from the modelled values.

Results

The predicted changes to water quantity downstream of the Project are presented as percent and absolute changes in Table 1 and Table 2, respectively. Predicted hydrographs for stations W3, W18, H18 and W4, during each Project phase, are presented on Figures 3 through 6, respectively. In addition, results are shown for node W5, located in Dip Creek immediately downstream of Casino Creek, and node W314, located in Britannia Creek immediately downstream of Canadian Creek, on Figures 7 and 8, respectively. Neither location is a hydrology station, but rather a modelling node, whose data were developed by summing the values at the two baseline monitoring stations immediately upstream. For W5, this involved summing data for W4 and W9, while for W314 it involved summing data for W3 and W14. Results are not shown for stations unaffected by the Project, nor are they shown for monitoring stations W11 or W16. W11 is located within the TMF Embankment footprint and resultantly the channel will no longer exist at this location once the Project is constructed, while W16 is located a long distance downstream of the Project.

As expected, the results show the most pronounced changes in water quantity for the stations closest to the Project. The greatest changes are experienced at stations H18 and W4 in Casino Creek during the Construction and Operations phases, as a result of the TMF storing and not releasing water to the downstream environment. The effects are indicated by the low levels of the red and blue hydrograph plots on Figures 5 and 6. Once the TMF begins to discharge to Casino Creek during closure, changes from the baseline condition will be much less, though still considerable in some months. The patterns during closure result from a combination of effects from the operation of the winter seepage mitigation pond (WSMP) and the TMF. The WSMP will store seepage from the TMF during the winter months of December through April and then release this water in a fairly sustained and constant fashion during the summer months. The TMF will release spring melt water at a faster rate than the natural watershed because attenuation in the TMF pond will be less than the delay in runoff caused by the temporary storage of runoff within the snowpack and the complicated permafrost network within the shallow groundwater system. A further effect of the TMF is that its pond will experience much greater evapotranspiration losses during the summer months than the natural watershed, so the water available for runoff will be less than during baseline.

A major component of the closure plan is the filling of the Open Pit with water, and once that occurs the Pit will overflow and the amount of runoff at H18 and W4 will increase substantially. The Pit will discharge via a gravity decant system, which will be controlled to discharge the annual volume of runoff only during the months of June through September. Resultantly, the annual discharge at both sites will be much greater than prior to Pit discharge, but only be slightly greater than under natural conditions, with greatly increased flows in April to September. The annual increase is attributed to the larger drainage area contributing to runoff in Casino Creek after the Pit begins spilling, while the higher spring/summer flows and lower winter flows are due to the combined effects of the WSMP, the TMF, and the Pit.

Regardless of the mining phase, once runoff reaches node W5, which is located immediately downstream of Casino Creek in Dip Creek, the contribution of flow from the undisturbed upper Dip Creek watershed greatly reduces the effect of the Project on water quantity. The Project effect is expected to diminish even further downstream in Dip Creek as the area of undisturbed watershed increases relative to the Project footprint. Similarly, the reduction in runoff in Canadian Creek (W3), resulting from the loss of watershed area associated with the Open Pit footprint and the diversion of upper Canadian Creek into the Open Pit at closure, is greatly reduced in Britannia Creek immediately downstream of the Canadian Creek confluence (W314).

Finally, a conservative calculation was completed to assess whether the Project could have a quantifiable effect on discharge within the Yukon River. Effects could result from the flow reductions in Canadian Creek (W3) presented above, or the sourcing of make-up water required for mill operations from the Yukon River groundwater aquifer. Conservatively assuming that discharge in the Yukon River adjacent to the Project is equivalent to the discharge recorded by WSC in the Yukon River upstream of the Project at Carmacks (WSC 09AH001), and using the lowest measured daily discharge recorded at this station (data recorded between 1951-1995), the highest monthly flow reduction at W3 of 48 l/s in July equates to a maximum reduction of less than 0.1% in the Yukon River. Similarly, assuming that the make-up water system was operating at maximum capacity (approximately 1 m^3/s) during the lowest flow day on record, the effect would be a reduction in flow in the Yukon River of less than 1%. Considering these results, and the extreme conservatism built into the calculations (i.e. more realistic calculations would result in even smaller reductions), the Project is considered to have no quantifiable effect on discharge in the Yukon River.

The results presented herein are considered appropriate for use by the Valued Components requiring hydrology inputs as part of their YESAB Proposal sections.

If you have any questions please contact the undersigned.

Yours truly,

KNIGHT PIESOLD LTD.

Attachments:

Table 1 Rev 0	Percent Flow Changes
Table 2 Rev 0	Absolute Flow Changes
Figure 1 Rev 0	Regional Hydrologic and Water Quality Nodes
Figure 2 Rev 0	Long-Term Unit Runoff Comparison – All Stations
Figure 3 Rev 0	W3 (Canadian Creek) – Project Phase Hydrographs
Figure 4 Rev 0	W18 (Brynelson Creek) – Project Phase Hydrographs
Figure 5 Rev 0	H18 (Casino Creek) – Project Phase Hydrographs
Figure 6 Rev 0	W4 (Casino Creek) – Project Phase Hydrographs
Figure 7 Rev 0	W5 (Dip Creek) – Project Phase Hydrographs
Figure 8 Rev 0	W314 (Britannia Creek) – Project Phase Hydrographs

References:

KP (2012). Casino Copper-Gold Project – Report on Feasibility Design of the Tailings Management Facility. Ref. No. VA101-325/8-10 Rev 0, December 20, 2012.

KP (2013a). Casino Project – Baseline Hydrology Report, Ref. No. VA101-325/14-5 Rev 0, October 10, 2013.

KP (2013b). Casino Project – Baseline and Mine Operations Watershed Model, Ref. No. VA13-02073, October 18, 2013.

KP (2013c). Casino Project – Numerical Groundwater Modelling, Ref. No. VA101-325/14-6 Rev 0, October 25, 2013.

KP (2013d). Casino Project – YESAB Water Balance Model Report, Ref. No. VA101-325/14-10 Rev A, October 31, 2013.

/kt

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TABLE 1

CASINO MINING CORPORATION
CASINO PROJECT

PROJECT EFFECTS ON WATER QUANTITY
PERCENT FLOW CHANGES

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Hydrology Station	Construction Phase - Average Flow Changes (% of Baseline)												
	January	February	March	April	May	June	July	August	September	October	November	December	Annual
W3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
W314	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
W18	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
H18	-71%	-70%	-71%	-67%	-48%	-68%	-61%	-61%	-62%	-65%	-72%	-72%	-62%
W4	-71%	-69%	-68%	-47%	-41%	-60%	-55%	-53%	-54%	-58%	-68%	-71%	-55%
W5	-28%	-28%	-31%	-12%	-13%	-15%	-15%	-14%	-14%	-15%	-20%	-25%	-15%
Hydrology Station	Operation Phase - Average Flow Changes (% of Baseline)												
	January	February	March	April	May	June	July	August	September	October	November	December	Annual
W3	-10%	-13%	-15%	1%	-6%	-7%	-4%	-5%	-6%	-6%	-7%	-9%	-6%
W314	-6%	-8%	-9%	0%	-3%	-5%	-3%	-3%	-3%	-3%	-4%	-5%	-3%
W18	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
H18	-70%	-67%	-68%	-66%	-47%	-68%	-61%	-61%	-62%	-65%	-71%	-71%	-61%
W4	-69%	-66%	-65%	-46%	-41%	-60%	-55%	-53%	-54%	-58%	-67%	-69%	-54%
W5	-28%	-27%	-30%	-12%	-13%	-15%	-15%	-14%	-14%	-15%	-20%	-24%	-15%
Hydrology Station	Closure (TMF Discharge) - Average Flow Changes (% of Baseline)												
	January	February	March	April	May	June	July	August	September	October	November	December	Annual
W3	-9%	-12%	-13%	3%	-17%	-21%	-18%	-15%	-14%	-13%	-10%	-9%	-16%
W314	-5%	-7%	-8%	1%	-8%	-16%	-11%	-9%	-8%	-7%	-6%	-5%	-9%
W18	-2%	-2%	-3%	-10%	-4%	-2%	-3%	-4%	-5%	-4%	-2%	-2%	-4%
H18	-67%	-69%	-72%	25%	27%	-17%	-11%	-17%	-14%	-35%	-40%	-69%	-13%
W4	-67%	-68%	-69%	17%	23%	-15%	-10%	-14%	-12%	-31%	-38%	-67%	-12%
W5	-27%	-28%	-32%	4%	7%	-4%	-3%	-4%	-3%	-8%	-11%	-24%	-3%
Hydrology Station	Closure (Open Pit Discharge) - Average Flow Changes (% of Baseline)												
	January	February	March	April	May	June	July	August	September	October	November	December	Annual
W3	-7%	-9%	-10%	4%	-17%	-21%	-18%	-15%	-14%	-12%	-9%	-7%	-16%
W314	-4%	-6%	-6%	2%	-8%	-16%	-10%	-9%	-8%	-7%	-5%	-4%	-9%
W18	-2%	-2%	-3%	-10%	-4%	-2%	-3%	-4%	-5%	-4%	-2%	-2%	-4%
H18	-67%	-68%	-72%	26%	27%	9%	8%	11%	22%	-35%	-40%	-69%	3%
W4	-67%	-67%	-69%	18%	23%	8%	7%	9%	19%	-31%	-38%	-68%	3%
W5	-27%	-28%	-32%	5%	7%	2%	2%	2%	5%	-8%	-11%	-24%	1%

M:\1\01\00325\14\A\Data\Task 310 - Hydrology\Water Quantity Effects Assessment\[Water Quantity Changes_kt_20131025.xlsx]Table 1

NOTES:

1. VALUES WERE CALCULATED USING THE OUTPUTS FROM THE CASINO YESAB WATER BALANCE MODEL
2. VALUES ARE AVERAGED FOR EACH PHASE, AND TRANSITION YEARS WHEN MODEL FLOWS HAVE YET TO STABILIZE ARE NOT INCLUDED IN THE ANALYSIS.

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TABLE 2

CASINO MINING CORPORATION
CASINO PROJECT

PROJECT EFFECTS ON WATER QUANTITY
ABSOLUTE FLOW CHANGES

Print Nov/12/13 10:57:39

Hydrology Station	Construction Phase - Average Flow Changes from Baseline (l/s)												
	January	February	March	April	May	June	July	August	September	October	November	December	Annual
W3	0	0	0	0	-1	-1	-1	-1	0	0	0	0	0
W314	0	0	0	0	-1	-1	-1	-1	0	0	0	0	0
W18	0	0	0	0	0	0	0	0	0	0	0	0	0
H18	-61	-33	-31	-60	-349	-474	-602	-403	-311	-238	-128	-90	-232
W4	-61	-33	-31	-60	-349	-474	-602	-403	-311	-238	-128	-90	-232
W5	-61	-33	-31	-60	-349	-474	-602	-403	-311	-238	-128	-90	-232

Hydrology Station	Operation Phase - Average Flow Changes from Baseline (l/s)												
	January	February	March	April	May	June	July	August	September	October	November	December	Annual
W3	-4	-3	-3	1	-34	-48	-21	-24	-22	-17	-9	-6	-16
W314	-4	-3	-3	1	-34	-48	-21	-25	-22	-17	-9	-6	-16
W18	0	0	0	0	0	0	0	0	0	0	0	0	0
H18	-60	-32	-29	-59	-347	-473	-601	-402	-310	-237	-127	-89	-230
W4	-60	-32	-29	-59	-347	-473	-601	-402	-310	-237	-127	-89	-230
W5	-60	-32	-29	-59	-347	-473	-601	-402	-310	-237	-127	-89	-230

Hydrology Station	Closure Water Management Phase 2 (TMF Discharge Phase) - Average Flow Changes (l/s)												
	January	February	March	April	May	June	July	August	September	October	November	December	Annual
W3	-4	-3	-2	2	-99	-144	-88	-71	-54	-35	-13	-7	-43
W314	-4	-3	-2	2	-99	-144	-88	-71	-54	-35	-13	-7	-43
W18	0	0	0	-3	-16	-4	-12	-11	-9	-5	-1	-1	-5
H18	-58	-33	-31	22	195	-116	-104	-110	-70	-128	-72	-86	-49
W4	-58	-33	-31	22	195	-116	-104	-110	-70	-128	-72	-86	-49
W5	-58	-33	-31	22	195	-116	-104	-110	-70	-128	-72	-86	-49

Hydrology Station	Closure Water Management Phase 3 (Open Pit Discharge Phase) - Average Flow Changes (l/s)												
	January	February	March	April	May	June	July	August	September	October	November	December	Annual
W3	-3	-2	-2	3	-98	-144	-87	-70	-53	-34	-12	-6	-42
W314	-3	-2	-2	3	-98	-144	-87	-70	-53	-34	-12	-6	-42
W18	0	0	0	-3	-16	-4	-12	-11	-9	-5	-1	-1	-5
H18	-58	-33	-31	23	195	64	76	70	110	-129	-72	-86	11
W4	-58	-33	-31	23	195	64	76	70	110	-129	-72	-86	11
W5	-58	-33	-31	23	195	64	76	70	110	-129	-72	-86	11

M:\1\01\00325\14\A\Data\Task 310 - Hydrology\Water Quantity Effects Assessment\[Water Quantity Changes_kt_20131025.xlsx]Table 1

NOTES:
1. VALUES WERE CALCULATED USING THE OUTPUTS FROM THE CASINO YESAB WATER BALANCE MODEL
2. VALUES ARE AVERAGED FOR EACH PHASE, AND TRANSITION YEARS WHEN MODEL FLOWS HAVE YET TO STABILIZE ARE NOT INCLUDED IN THE ANALYSIS.

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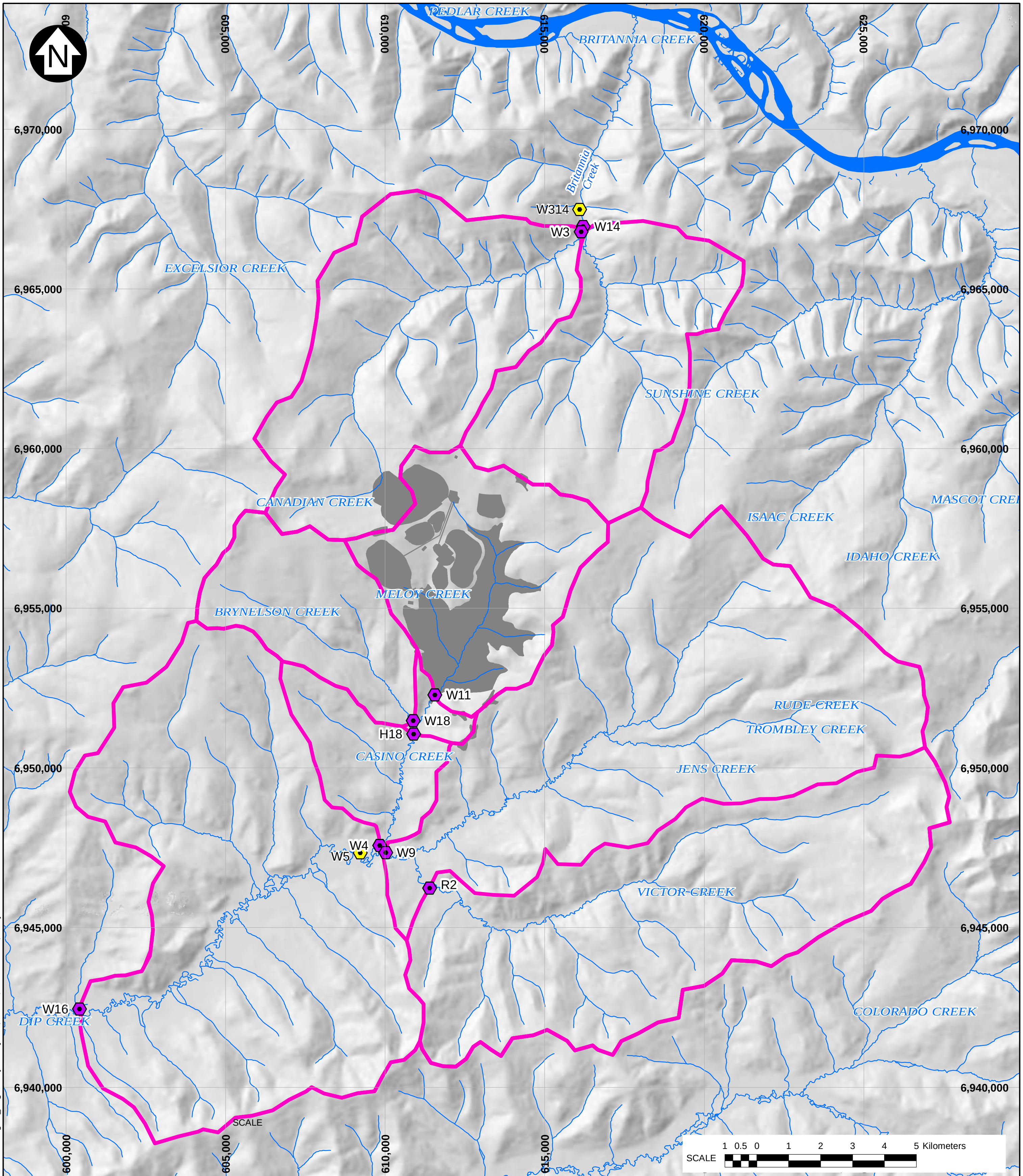

LEGEND:

- MODELLING NODE
- HYDROLOGIC AND WATER QUALITY NODE
- RIVER/CREEK
- SUB-CATCHMENT BOUNDARY
- PROPOSED MINE SITE FACILITIES

NOTES:

1. BASE MAP: ESRI ARCGIS ONLINE YUKON SHADED RELIEF AND CANVEC DATA.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 7N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:160,000 FOR 8.5x11 (LETTER) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.

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CASINO PROJECT

REGIONAL HYDROLOGIC AND WATER QUALITY NODES

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P/A NO.	REF NO.	
VA101-325/14	VA13-02157	
FIGURE 1		REV 0

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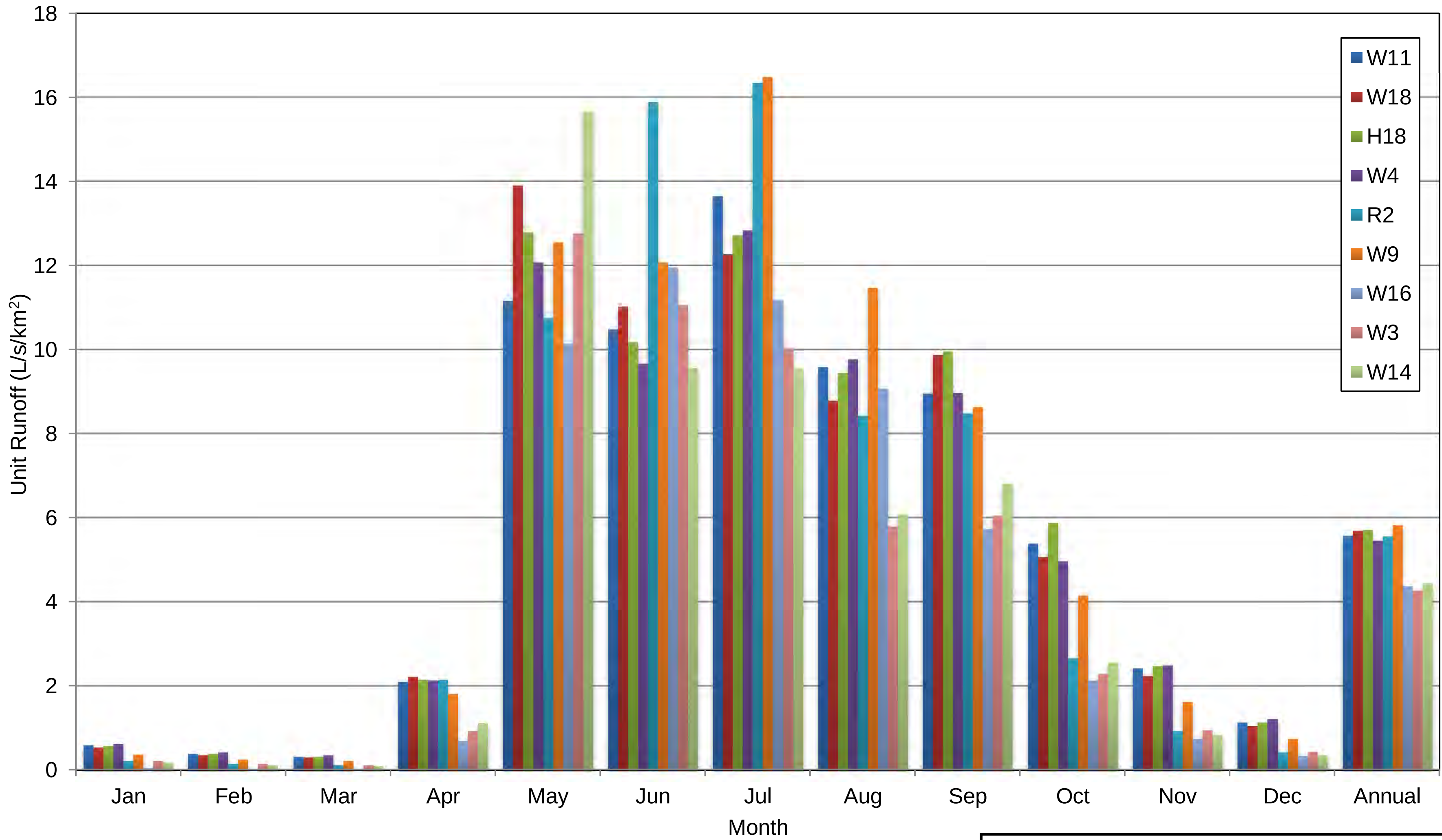

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CASINO PROJECT

LONG-TERM UNIT RUNOFF BASELINE
ALL STATIONS

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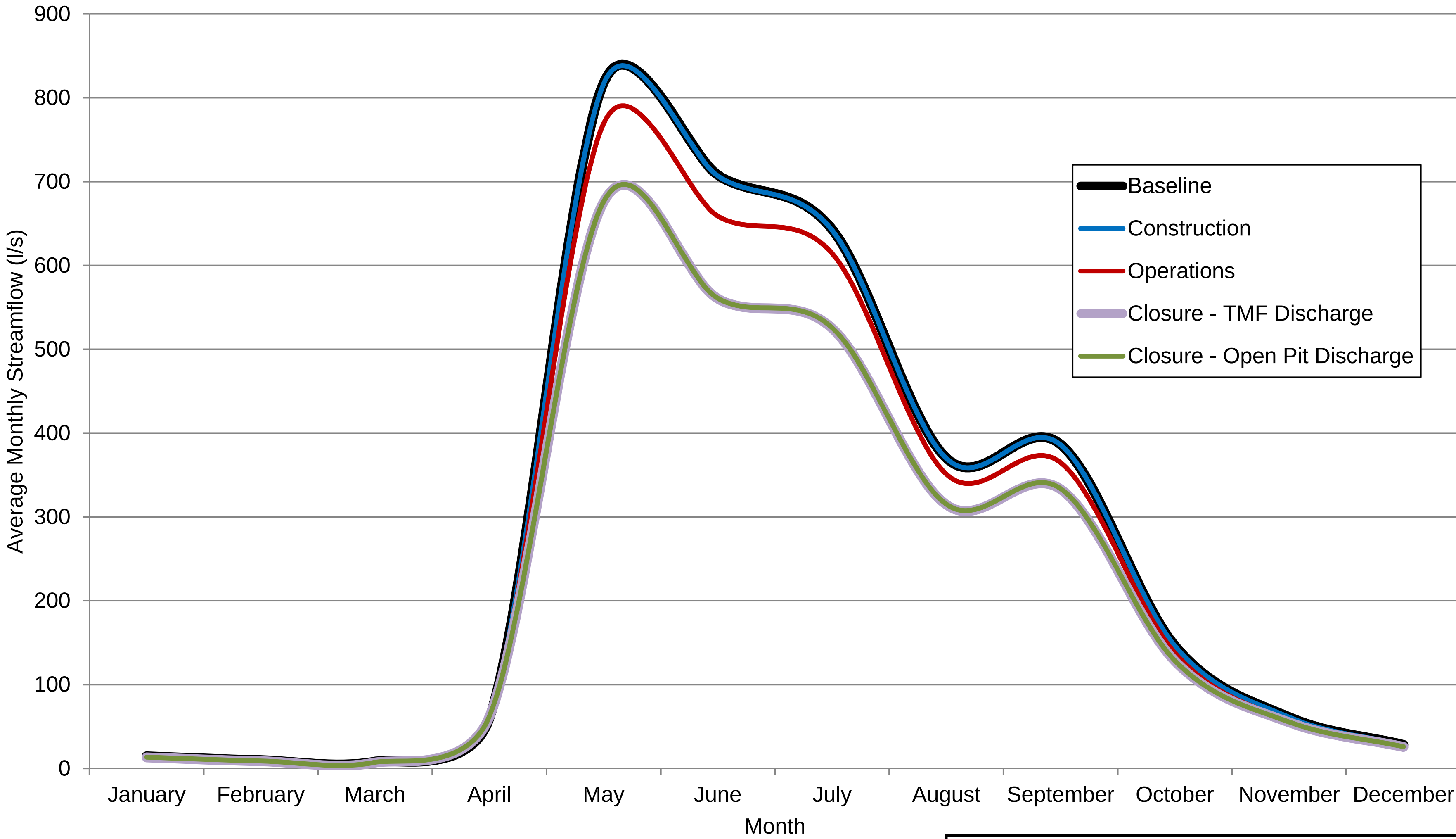
REF. NO. VA13-02157

FIGURE 2

REV 0



NOTES:
1. THE FIGURE PRESENTS AVERAGE MONTHLY FLOWS FOR EACH PROJECT PHASE. TRANSITION YEARS BETWEEN PHASES WHEN MODEL FLOWS HAVE YET TO STABILIZE ARE NOT INCLUDED IN THE MONTHLY AVERAGE.

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CASINO MINING CORPORATION

CASINO PROJECT

W3 (CANADIAN CREEK) - PROJECT PHASE HYDROGRAPHS

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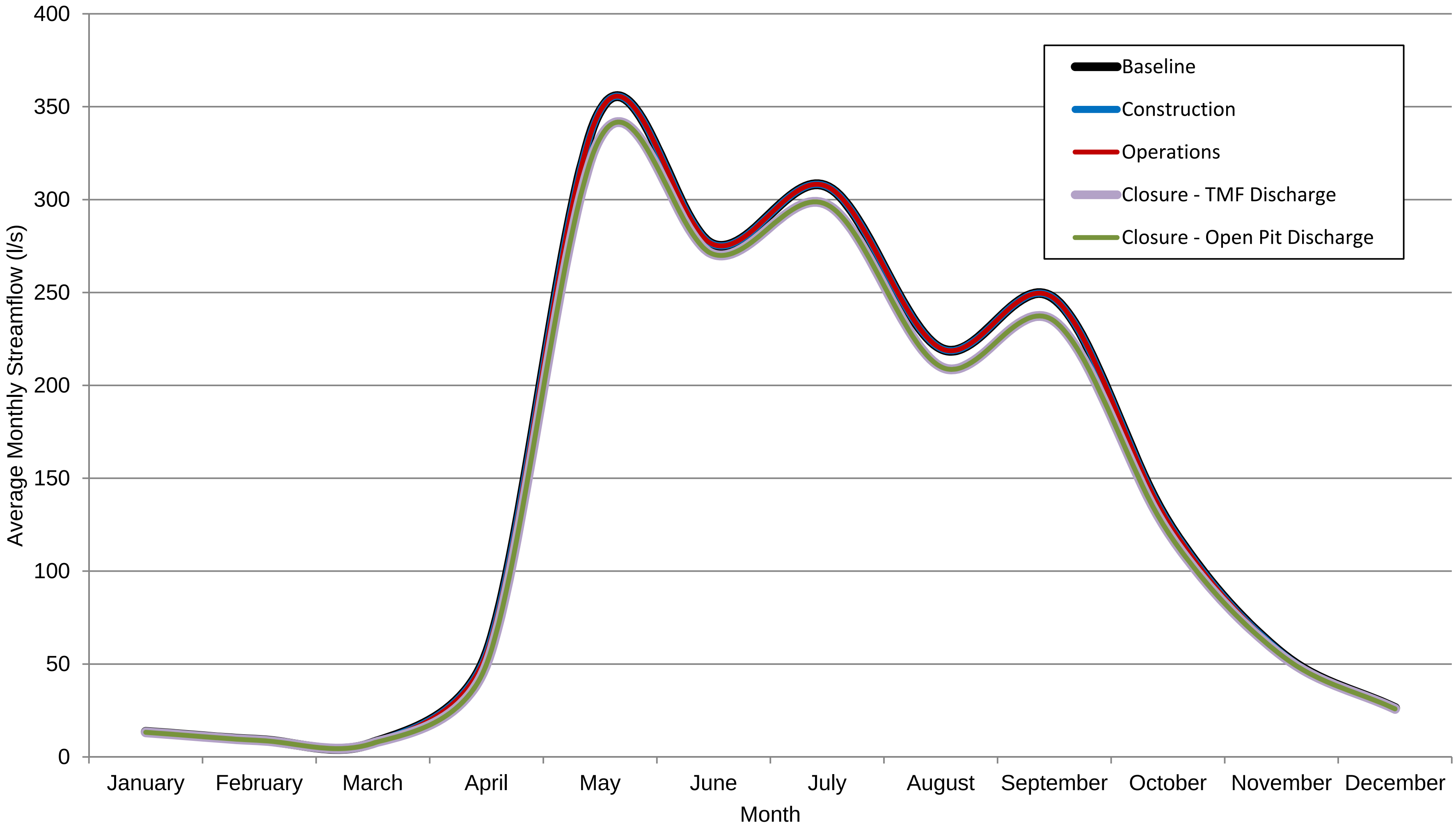
REF. NO. VA13-02157

FIGURE 3

REV 0



NOTES:
1. THE FIGURE PRESENTS AVERAGE MONTHLY FLOWS FOR EACH PROJECT PHASE. TRANSITION YEARS BETWEEN PHASES WHEN MODEL FLOWS HAVE YET TO STABILIZE ARE NOT INCLUDED IN THE MONTHLY AVERAGE.

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CASINO MINING CORPORATION

CASINO PROJECT

W18 (BRYNELSON CREEK) - PROJECT PHASE HYDROGRAPHS

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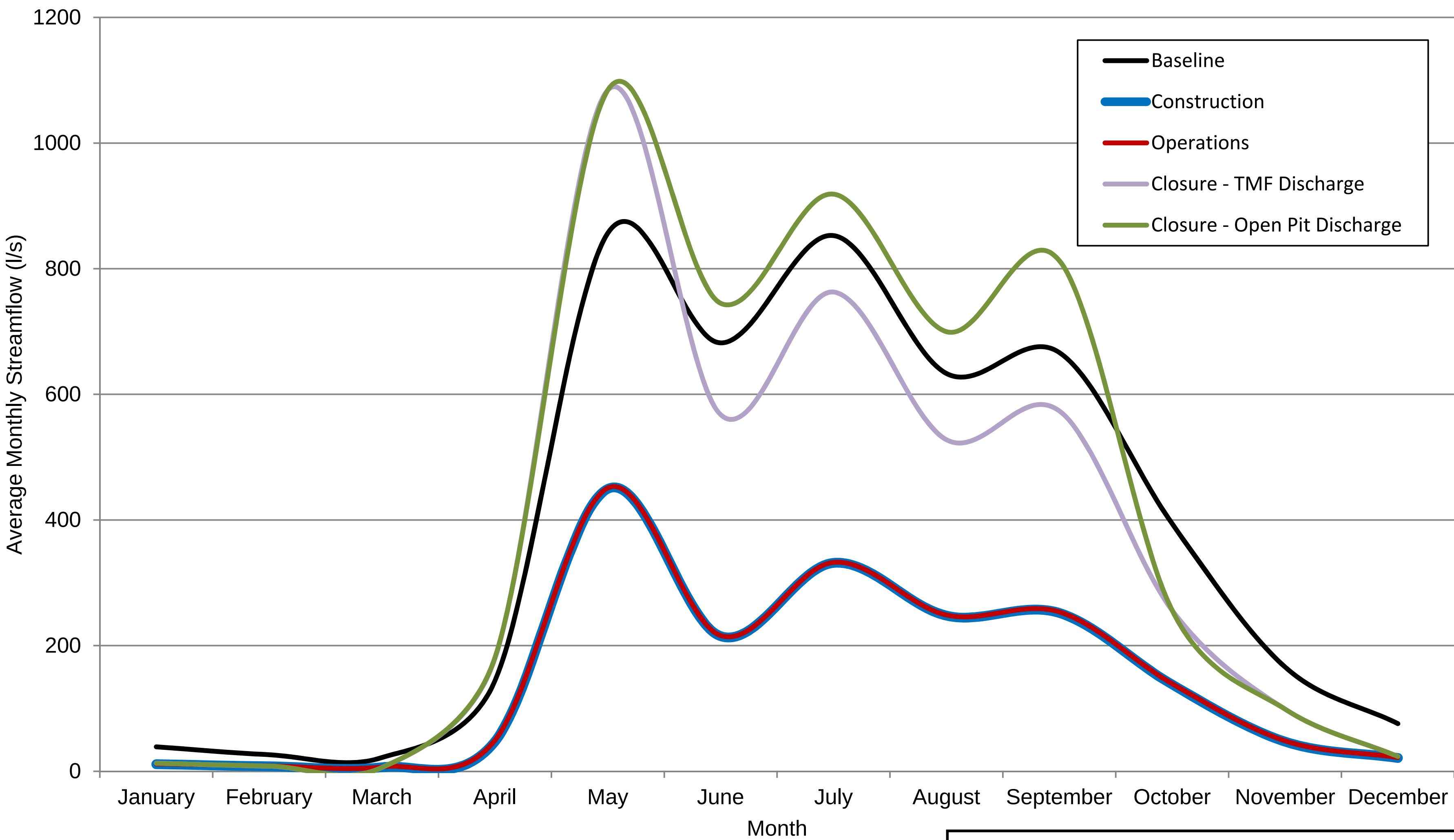
P/A NO. VA101-325/14

REF. NO. VA13-02157

FIGURE 4

REV 0



NOTES:
1. THE FIGURE PRESENTS AVERAGE MONTHLY FLOWS FOR EACH PROJECT PHASE. TRANSITION YEARS BETWEEN PHASES WHEN MODEL FLOWS HAVE YET TO STABILIZE ARE NOT INCLUDED IN THE MONTHLY AVERAGE.

CASINO MINING CORPORATION

CASINO PROJECT

H18 (CASINO CREEK) - PROJECT PHASE HYDROGRAPHS

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P/A NO. VA101-325/14

REF. NO. VA13-02157

FIGURE 5

REV 0

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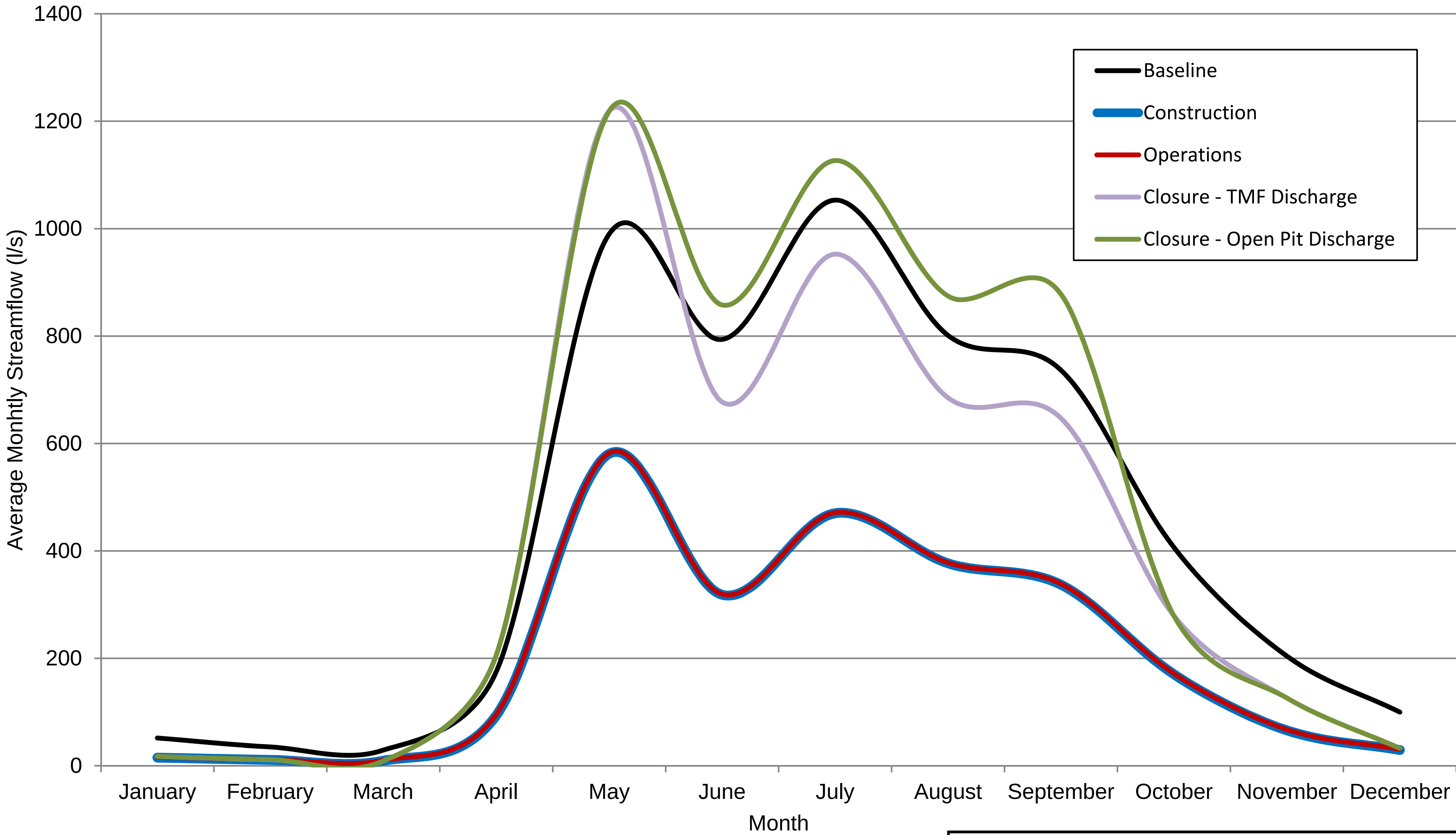

NOTES:
1. THE FIGURE PRESENTS AVERAGE MONTHLY FLOWS FOR EACH PROJECT PHASE. TRANSITION YEARS BETWEEN PHASES WHEN MODEL FLOWS HAVE YET TO STABILIZE ARE NOT INCLUDED IN THE MONTHLY AVERAGE.

0	06NOV'13	ISSUED WITH LETTER	KTT	JGC	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

CASINO MINING CORPORATION

CASINO PROJECT

W4 (CASINO CREEK) - PROJECT PHASE HYDROGRAPHS

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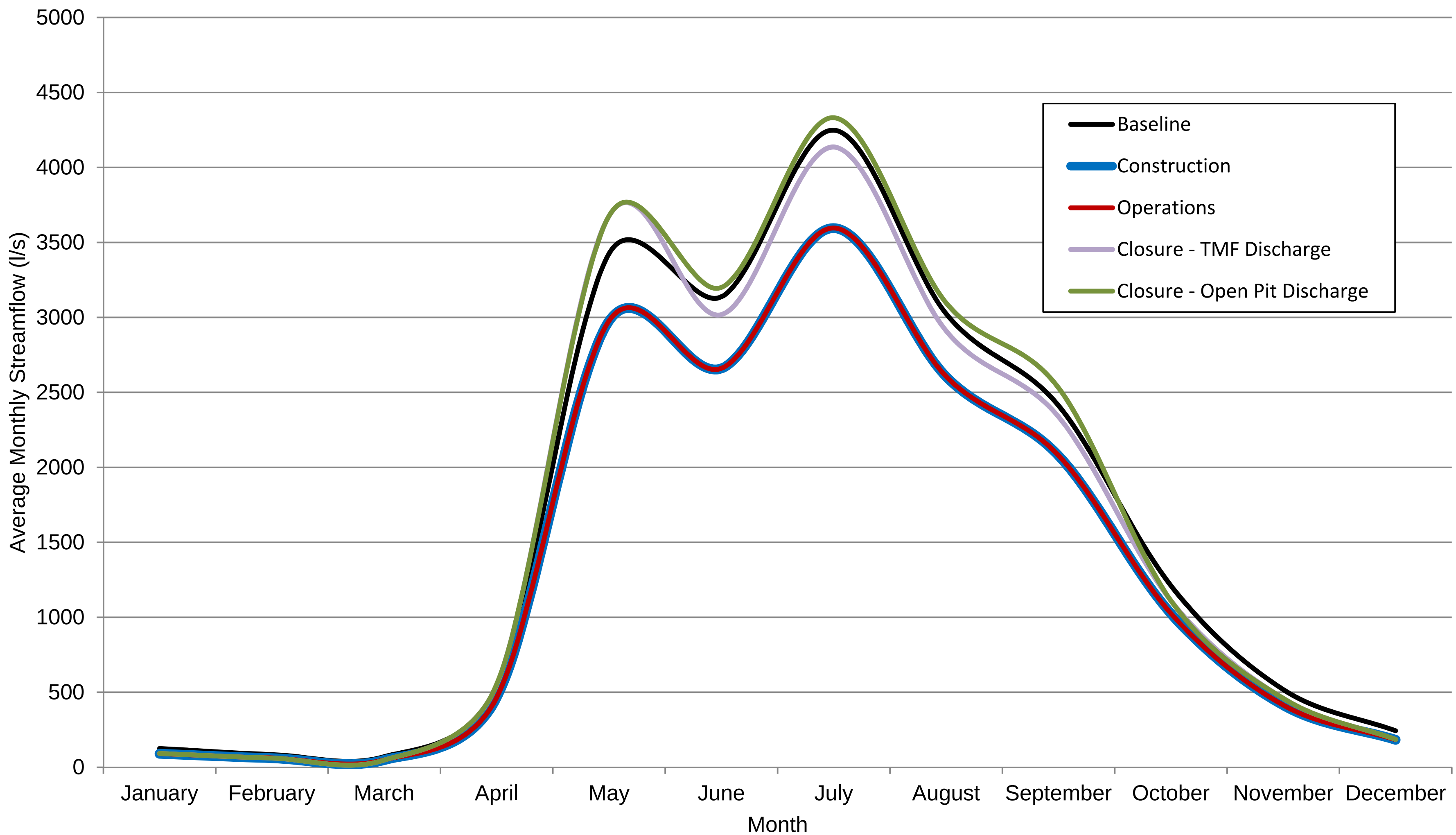
P/A NO. VA101-325/14

REF. NO. VA13-02157

FIGURE 6

REV 0



NOTES:

1. THE FIGURE PRESENTS AVERAGE MONTHLY FLOWS FOR EACH PROJECT PHASE. TRANSITION YEARS BETWEEN PHASES WHEN MODEL FLOWS HAVE YET TO STABILIZE ARE NOT INCLUDED IN THE MONTHLY AVERAGE.

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REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

CASINO MINING CORPORATION

CASINO PROJECT

W5 (DIP CREEK) - PROJECT PHASE HYDROGRAPHS

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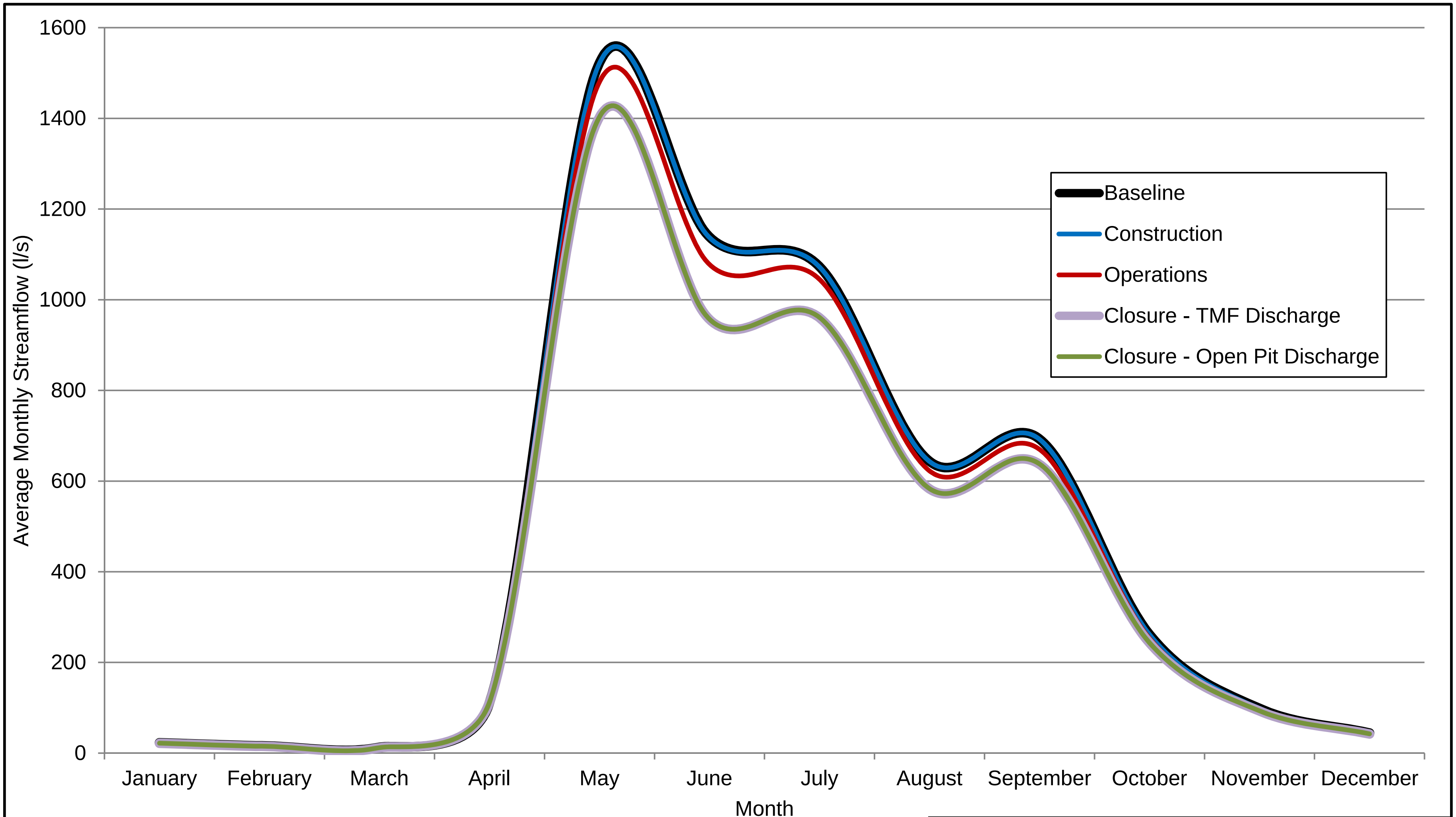
P/A NO. VA101-325/14

REF. NO. VA13-02157

FIGURE 7

REV 0



NOTES:
1. THE FIGURE PRESENTS AVERAGE MONTHLY FLOWS FOR EACH PROJECT PHASE. TRANSITION YEARS BETWEEN PHASES WHEN MODEL FLOWS HAVE YET TO STABILIZE ARE NOT INCLUDED IN THE MONTHLY AVERAGE.

0	06NOV'13	ISSUED WITH LETTER	KTT	JGC	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

CASINO MINING CORPORATION

CASINO PROJECT

W314 (BRITANNIA CREEK) - PROJECT PHASE HYDROGRAPHS

Knight Piésold CONSULTING

P/A NO. VA101-325/14

REF. NO. VA13-02157

FIGURE 8

REV 0