This form has been developed to document changes to the NorthMet Project (Project) and/or Project SDEIS Water Modeling resulting from the water modeling process. The forms will be used during the water modeling process. At the end of the process, the Project Description, Data Packages and Management Plans will all be updated to reflect the content of all forms submitted during the process.

Change Type:

Project Refinement

Rationale for Change:

The Poly Met Mining Inc. (PolyMet) Proposed Project includes containment systems which will capture virtually all of the Tailings Basin (i.e. Tailings Basin is the entire former LTVSMC tailings basin with the NorthMet Flotation Tailings Basin (FTB) constructed on the eastern portion) seepage and route it either to the FTB or to the Plant Site WWTP. The current plan is for effluent from the WWTP to be routed to Second Creek and Unnamed Creek via the currently permitted surface discharges SD026 and SD006 respectively. With this plan, the Project could have significant impacts on the hydrology of the tributaries near the Tailings Basin by decreasing the flow in Trimble Creek and Mud Lake Creek, and by increasing the flow in Unnamed Creek beyond the acceptable limits of +/- 20%. This CDF presents a Project refinement that would minimize potential hydrologic impacts to the streams. In this CDF, Trimble Creek, Mud Lake Creek, Unnamed Creek and Second Creek are collectively referred to as “the tributaries” consistent with how they have been discussed in agency meetings.

Description:

Through discussions with the Minnesota Department of Natural Resources, Division of Waters (MDNR), it was decided that on an average annual basis, changes to flow in the tributaries within +/- 20% of existing conditions (pre-consent decree) would not be deemed significant and would therefore be acceptable. In order to maintain flows within this range, the following water management changes are proposed:

1) Changes to the discharge locations for the WWTP effluent, and
2) Augmentation by transferring Colby Lake water to the watershed areas for the tributaries.

The discharge strategy from the WWTP is proposed to change so that the WWTP discharges to the tributaries in proportion to the reduction in flow resulting from the containment systems associated with the Project. For Unnamed Creek and Second Creek watersheds, there will be no change in the discharge locations for the WWTP effluent. That is, the water will still be directed to locations near SD-006 and SD-026 downstream of the containment systems.

The exact location to which the WWTP will discharge within the Trimble Creek and Mud Lake Creek watersheds and the number of these locations is not yet determined, but it will likely be multiple spigot points along the downstream side of the containment system so that the WWTP effluent not only provides flow to the tributaries, but also to the wetlands upstream of the headwaters of each tributary. Discharging to the downstream side of the containment system will most closely mimic existing conditions, where seepage from the Tailings Basin emerges in the wetland areas north of the basin. Because the Project discharge locations will be designed to closely mimic existing conditions to protect the existing wetlands, discharges will generally be directed to hydraulically low-lying areas. Project discharges will therefore not affect the water quality of aquifer recharge because the majority of the recharge is occurring in "upland" areas of the watershed where the surficial material is not fully saturated. In areas where wetlands exist (where the Project will discharge), recharge is likely not occurring.

There may not always be sufficient WWTP effluent to maintain annual average flows at 80% (-20%) of the existing annual average flows. Therefore, PolyMet proposes to augment the flow in the tributaries when necessary by pumping water from Colby Lake and directly discharging it (no mixing with any other water) to the tributaries in a manner similar to the WWTP effluent. Water will be transferred from Colby Lake on an "as-needed" basis depending on the flow from the WWTP to the tributaries. If the WWTP effluent is sufficient to meet the minimum flow requirement in the tributaries, no water from Colby Lake will be transferred for flow augmentation. If the WWTP effluent is less than the minimum requirement, the difference will be made up by transferring Colby Lake water.

Table 1 describes the existing conditions which the Project will be compared to with respect to hydrologic impacts. Table 1 shows (1) the existing seepage from the Tailings Basin, the existing seepage split into (2) groundwater and (3) surface flow, (4) the existing contribution from the watershed, and (5) the total annual average surface flow in the tributaries.

Table 1 Existing average annual flow conditions in the tributaries in gallons per minute

	Mud Lake Creek (MLC-3)	Trimble Creek (TC-1)	Unnamed Creek (PM-11)	Second Creek (SD026)
Current total Tailings Basin seepage to watershed[1]	1480		540	500
Seepage split to groundwater[2]	44	55	110	0
Seepage split to the tributaries[3]	207	1174	430	500
Existing contribution from the watershed[4]	458	714	750	0
Total annual average surface flow[5]	665	1888	1180	500

1 Average annual seepage to the toes of the Tailings Basin (splits into items 2 and 3).

2 Average aquifer capacity at the upstream end of each flow path (Table 1 of CDF061, Version 1, 01/17/13).

3 Flow (seepage – aquifer capacity) that reports to each tributary. Note that 75% of the seepage from the north bank (870 gpm) of Cell 2E that *does not* stay in the aquifer actual reports to Trimble Creek because of the location of the watershed divide.

4 Watershed area includes both the undisturbed watershed areas and the outer banks of the Tailings Basin.

5 Sum of items 3 and 4.

The Tailings Basin has a contributing watershed immediately to the east of Cell 1E that drains into Cell 1E. In year 7 of the Project, the East Dam will be constructed so that Flotation Tailings can be deposited into Cell 1E. At that time, the watershed that currently drains into Cell 1E will be rerouted via a constructed drainage swale to drain to the watershed of Mud Lake Creek.

Table 2 shows the minimum flow that must be discharged (in total) on an average annual basis from the WWTP and Colby Lake to each of the four tributaries upstream of the headwaters. These flow requirements are determined by taking +/- 20% of the existing annual average flow and subtracting out what is expected to come from the remaining watershed to the tributaries. If the flow requirements are met at the headwaters, they will be met at locations further downstream in the tributaries.

Table 2 Determination of combined flow requirement from the WWTP and Colby Lake in gallons per minute

	Mud Lake Creek (MLC-3)[5]	Trimble Creek (TC-1)	Unnamed Creek (PM-11)	Second Creek (SD026)
Total annual average surface flow[1]	665	1888	1180	500
Expected future contribution from the watershed[2]	439 / 734	599	664	0
Minimum requirement from WWTP/Colby Lake[3]	93 / 0	911	280	400
Maximum allowable from WWTP/Colby Lake[4]	359 / 64	1667	752	600
Percent of WWTP Discharge before the drainage swale is constructed	5.53%	54.09%	16.63%	23.75%
Percent of WWTP Discharge after the drainage swale is constructed	0%	57.26%	17.60%	25.14%

1 Equivalent to item 5 of Table 1.

2 The future contribution from the watershed decreases because the containment system, which is away from the toes of the Tailings Basin, removes watershed area and any runoff from the outer banks of the Tailings Basin.

3 80% of the existing total annual average surface flow, less the expected future watershed contribution.

4 120% of the existing total annual average surface flow, less the expected future watershed contribution.

5 X / Y values: X indicates the flow values before the drainage swale is in place; Y indicates the flow values after the watershed area to Mud Lake Creek is increased (from 1.34 mi^2 to 2.24 mi^2) because of the construction of the drainage swale at time > 7 years.

The total combined flow required from the WWTP effluent and Colby Lake prior to construction of the drainage swale must be between 1684 gpm and 3378 gpm on an average annual basis (+/- 20% of the current total annual average surface flow, less the expected future watershed contribution, summed for all tributaries). For modeling purposes, it is proposed that the minimum flow requirement will be set at 1700 gpm. The maximum annual average WWTP effluent flow to the tributaries is currently estimated to be less than 2000 gpm which is less than the maximum allowable of 3378 gpm which means that there is no concern of causing hydrologic impacts with too much flow.

The total combined flow required from the WWTP effluent and Colby Lake after the construction of the drainage swale must be between 1591 gpm and 3083 gpm on an average annual basis (+/- 20% of the current total annual average surface flow, less the expected future watershed contribution, summed for all tributaries). For modeling purposes, it is proposed that the minimum flow requirement will be set at 1600 gpm. The maximum annual average WWTP effluent flow to the tributaries is currently estimated to be less than 2000 gpm which is less than the maximum allowable of 3083 gpm which means that there is no concern of causing hydrologic impacts with too much flow.

In long-term closure, it is expected that the effluent from the WWTP will be sufficient to meet the minimum flow requirements of the tributaries to prevent significant hydrologic impacts. On an average annual basis, the total inflow to the WWTP (including Tailings Basin seepage, runoff water within the containment system, and water from the FTB pond to prevent overflow) is expected to be about 2200 gpm. Removing water losses from the treatment process, the annual average discharge from the WWTP is expected to be less than 2000 gpm, which is between the minimum and maximum flow constraints for all four tributaries. Therefore, Colby Lake water will not be transferred to the tributaries for flow augmentation in long-term closure.

Figure 1 shows the percent of flow discharged to the tributaries estimated to be required from Colby Lake for stream augmentation; the percent from the WWTP would therefore be 100% minus the percent shown in Figure 1.

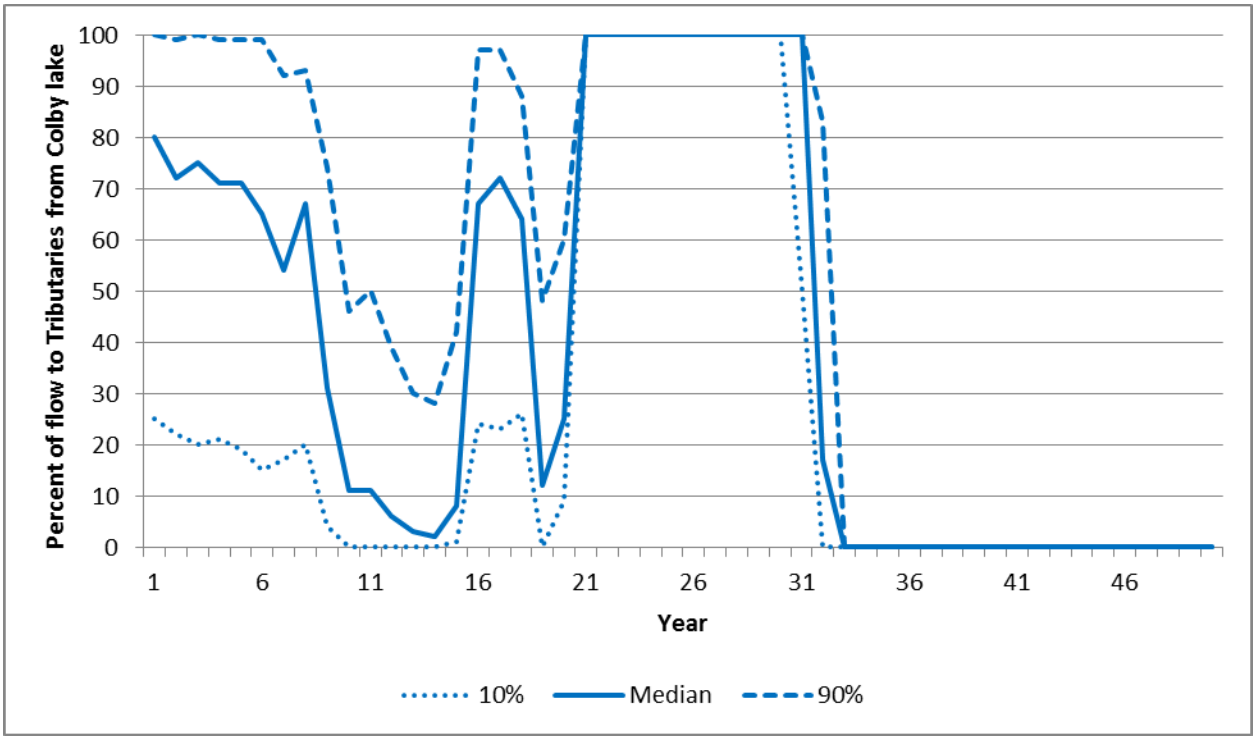

Figure 1 Range in average annual percent of Project discharges to the tributaries that was transferred from Colby Lake

The amount of water needed for augmentation from Colby Lake is expected to vary significantly through time (Figure 1). A few periods of interest are:

- Earlier years when seepage from the FTB is estimated to be near existing conditions and flow from the Mine Site is estimated to be relatively low. Most seepage will be returned to the FTB pond and less water will be treated by the WWTP and discharged. During this period, the demand from Colby Lake is estimated to be high.
- Years 10 to 15 when flow from the Mine Site is estimated to have increased substantially and seepage rates from the Tailings Basin are estimated to have increased. More water must be treated and discharged by the WWTP reducing the demand for Colby Lake water.
- Years 15 to 18 when water from the Mine Site is estimated to have significantly decreased due to filling the East/Central Pit. Again, more seepage can be returned to the FTB pond, increasing the demand from Colby Lake.
- Years 18 to 20 when it is expected that the pond will be reduced in size to prepare for reclamation. More water will be treated and demand from Colby Lake will be reduced.
- Years 20 to about 32 when all treated and collected water will be sent to either the FTB pond to maintain water levels or to fill the West Pit at the Mine Site. Therefore, the entire flow demand in the tributaries will be met with Colby Lake Water.

- Finally, in Long-Term Closure, the flow that will be captured, treated by the WWTP and discharged will be sufficient to meet the average annual demand of the tributaries and Colby Lake water will no longer be needed for augmentation.

The tables below (Table 3 through Table 6) show the range in the annual average flow rates from each water source to the tributaries as a function of time that will occur if this CDF is accepted

Table 3 Flows from Colby Lake/WWTP to Mud Lake Creek

Year	From Colby Lake to Mud Lake Creek			From WWTP to Mud Lake Creek		
	P10	Median	P90	P10	Median	P90
1	24	75	94	0	19	73
2	21	68	93	1	26	76
3	19	71	94	0	23	78
4	20	67	93	1	27	78
5	18	67	93	1	27	79
6	14	61	93	1	32	84
7	16	51	86	8	43	82
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	0	0	0	0	0	0
16	0	0	0	0	0	0
17	0	0	0	0	0	0
18	0	0	0	0	0	0
19	0	0	0	0	0	0
20	0	0	0	0	0	0
Reclamation	0	0	0	0	0	0
Long-Term	0	0	0	0	0	0

Table 4 Flows from Colby Lake/WWTP to Trimble Creek

Year	From Colby Lake to Trimble Creek			From WWTP to Trimble Creek		
	P10	Median	P90	P10	Median	P90
1	232	736	918	2	183	710
2	201	661	910	10	258	748
3	184	692	916	4	227	767
4	192	654	914	5	264	759
5	173	652	909	11	266	777
6	138	601	913	7	317	817
7	153	495	845	74	425	807

Year	From Colby Lake to Trimble Creek			From WWTP to Trimble Creek		
	P10	Median	P90	P10	Median	P90
8	181	612	853	63	304	749
9	36	284	674	242	638	1046
10	0	103	424	491	881	1380
11	0	100	461	454	868	1332
12	0	59	359	557	964	1441
13	0	27	274	641	1067	1477
14	0	14	257	659	1101	1576
15	9	73	385	527	943	1454
16	216	614	886	30	302	703
17	210	662	889	27	254	711
18	243	590	810	180	400	753
19	0	111	438	662	1077	1418
20	79	232	548	368	689	1011
Reclamation	916	916	916	0	0	0
Long-Term	0	0	0	935	1136	1392

Table 5 Flows from Colby Lake/WWTP to Unnamed Creek

Year	From Colby Lake to Unnamed Creek			From WWTP to Unnamed Creek		
	P10	Median	P90	P10	Median	P90
1	71	226	282	1	56	218
2	62	203	280	3	79	230
3	57	213	282	1	70	236
4	59	201	281	2	81	233
5	53	200	279	3	82	239
6	43	185	281	2	98	251
7	47	152	260	23	131	248
8	56	188	262	19	93	230
9	11	87	207	74	196	321
10	0	32	130	151	271	424
11	0	31	142	140	267	409
12	0	18	110	171	296	443
13	0	8	84	197	328	454
14	0	4	79	203	338	485
15	3	22	118	162	290	447
16	67	189	272	9	93	216
17	65	203	273	8	78	218
18	75	181	249	55	123	231
19	0	34	135	203	331	436
20	24	71	168	113	212	311
Reclamation	282	282	282	0	0	0
Long-Term	0	0	0	287	349	428

Table 6 Flows from Colby Lake/WWTP to Second Creek

Year	From Colby Lake to Second Creek			From WWTP to Second Creek		
	P10	Median	P90	P10	Median	P90
1	102	323	403	1	81	312
2	88	290	399	4	113	329
3	81	304	402	2	100	337
4	84	287	401	2	116	333
5	76	286	399	5	117	341
6	61	264	401	3	139	359
7	67	217	371	33	186	354
8	79	269	374	28	133	329
9	16	125	296	106	280	459
10	0	45	186	216	387	606
11	0	44	202	199	381	585
12	0	26	157	245	423	633
13	0	12	120	282	468	648
14	0	6	113	290	483	692
15	4	32	169	231	414	638
16	95	270	389	13	133	309
17	92	291	390	12	112	312
18	106	259	356	79	176	331
19	0	49	192	291	473	623
20	35	102	241	161	303	444
Reclamation	402	402	402	0	0	0
Long-Term	0	0	0	410	499	611

The GoldSim model will be changed to distribute WWTP effluent among the tributaries at the ratio of their average annual flow requirement. If the resultant flow to each tributary is less than the Minimum Requirements in Table 2, Colby Lake water will be added to the tributaries until the resultant flow equals the Minimum Requirement. The modeled water quantity and quality in the tributaries will include the water quantity and quality parameters of WWTF effluent and Colby Lake.

Advantages of this change:

1. Prevents the Proposed Project from having hydrologic impacts on the wetlands and the tributaries around the Tailings Basin.

Disadvantages of this change:

1. Increases the withdrawal from Colby Lake, although total withdrawal will be less than historic water appropriations from Colby Lake.

Other Potential Impacts:

No change in direct wetland impacts is expected.

No change in geotechnical impacts is expected.

No change in air emissions impacts is expected.

No change in Project footprint is expected.

Attachments:

Revised Table 1-1 of the Plant Site Water Modeling Work Plan (no inputs changed, only added to end of Table 1-1).

References:

None

Project Description Changes:

The Project Description will be changed to reflect the flow augmentation plan.

Data Package Changes:

Changes will be made to the Water Modeling Data Package, Volume 2 – Plant Site, Version 8, Section 6.1.3.6 and *new* Section 6.3.1 and are shown below:

Section 6.1.3.6 FTB WWTP

The quantity and quality of influent water to the FTB WWTP will be calculated in the probabilistic model. The FTB WWTP is designed to treat the excess water that is collected by the groundwater seepage ~~collection~~ containment system. The water will be treated and discharged to all four of the tributaries around the Tailings Basin (Mud Lake Creek, Trimble Creek, Unnamed Creek, and Second Creek). For Unnamed Creek and Second Creek watersheds, there will be no change in the discharge locations for the WWTP effluent. That is, the water will still be directed to locations near SD-006 and SD-026 downstream of the containment systems. ~~the existing outfalls SD026 and/or SD006~~. The exact location to which the WWTP will discharge within the Trimble Creek and Mud Lake Creek watersheds and the number of these locations is not yet determined, but it will likely be multiple spigot points along the downstream side of the containment system so that the WWTP effluent not only provides flow to the tributaries, but also to the wetlands upstream of the headwaters of each tributary. Discharging to the downstream side of the containment system will most closely mimic existing conditions, where seepage from the Tailings Basin emerges in the wetland areas north of the basin.

During the first 7 years of operations, prior to the construction of the proposed East Dam, the effluent from the WWTP will be distributed to Mud Lake Creek (5.53%), Trimble Creek (54.09%), Unnamed Creek (16.63%) and Second Creek (23.75%) in proportion to the flow required to prevent significant hydrologic impacts (see Section 6.3.1). At the time of construction of the East Dam, a drainage swale will hydraulically connect additional watershed area to Mud Lake Creek effectively removing the need to augment stream flow with either the WWTP or Colby Lake. Therefore, the effluent from the WWTP will be distributed to Trimble Creek (57.26%), Unnamed Creek (17.60%) and Second Creek (25.14%) in proportion to the flow required to prevent significant hydrologic impacts (see Section 6.3.1).

It will be assumed, based on the current conceptual level design of the FTB WWTP, that 90 percent of influent water quantity will be either discharged or sent to the Process Plant as a source of clean water. ~~During operations and in closure, up to 500 gpm of treated water will be discharged through the existing outfall at SD026. Flows in excess of 500 gpm will be discharged through the existing outfall at SD006. The discharge to SD006 will be added to the proper surface water stream nodes to account for this flow.~~ Table 6-7 shows the assumed effluent concentration for the FTB WWTP which will be discharged (Reference (59)).

Section 6.3.1 Flow Augmentation to Prevent Significant Hydrologic Impacts

Construction of a seepage containment system around portions of the FTB will significantly reduce the amount of seepage leaving the FTB, a portion of which would become streamflow in downstream tributary streams. Based on discussions with the Minnesota Department of Natural Resources, Division of Waters (MDNR), flow augmentation to the tributary streams was designed to offset potential hydrologic impacts to the following streams: Unnamed Creek, Mud Lake Creek, Trimble Creek, and Second Creek. The goal of the flow augmentation is to limit the change in average annual flow with the Proposed Project to +/- 20% of existing conditions (pre-consent decree). Although the WWTP effluent will be distributed among the four tributaries near the Tailings Basin (see Section 6.1.3.6), the total effluent may not be sufficient to maintain 80% of the existing annual average flows (i.e., no more than a 20% reduction). . Therefore, water will be transferred from Colby Lake to meet the target annual average flow in the headwaters of the tributaries. Water will be transferred from Colby Lake on an “as-needed” basis depending on the flow from the WWTP to the tributaries. If the WWTP effluent is sufficient to meet the target average annual flow in the tributaries, no water from Colby Lake will be transferred for flow augmentation. If the WWTP effluent is less than that necessary to satisfy the target flows in each tributary, the difference will be made up by transferring Colby Lake water.

Table 6-10 describes the average annual flows under existing conditions, to which the Project will be compared in order to assess hydrologic impacts. Table 6-10 shows (1) the existing seepage from the Tailings Basin, the existing seepage split into (2) groundwater and (3) surface flow, (4) the existing contribution from the watershed, and (5) the total annual average surface flow in the tributaries.

Table 6-10 Existing average annual flow conditions in the tributaries in gallons per minute

	Mud Lake Creek (MLC-3)	Trimble Creek (TC-1)	Unnamed Creek (PM-11)	Second Creek (SD026)
Current total Tailings Basin seepage to watershed[1]	1480		540	500
Seepage split to groundwater[2]	44	55	110	0
Seepage split to the tributaries[3]	207	1174	430	500
Existing contribution from the watershed[4]	458	714	750	0
Total annual average surface flow[5]	665	1888	1180	500

1 Average annual seepage to the toes of the Tailings Basin (splits into items 2 and 3).
2 Average aquifer capacity at the upstream end of each flow path (Table 1 of CDF061, Version 1, 01/17/13).
3 Flow (seepage – aquifer capacity) that reports to each tributary. Note that 75% of the seepage from the north bank (870 gpm) of Cell 2E that *does not* stay in the aquifer actual reports to Trimble Creek because of the location of the watershed divide.
4 Watershed area includes both the undisturbed watershed areas and the outer banks of the Tailings Basin.
5 Sum of items 3 and 4.

The Tailings Basin has a contributing watershed immediately to the east of Cell 1E that drains into Cell 1E. In year 7 of the Project, the East Dam will be constructed so that Flotation Tailings can be deposited into Cell 1E. At that time, the watershed that currently drains into Cell 1E, will be rerouted via a constructed drainage swale to drain to the watershed of Mud Lake Creek.

Table 6-11 shows the minimum additional flow that must be discharged (in total) on an average annual basis from the WWTP and/or Colby Lake to each of the four tributaries upstream of the headwaters. These flow requirements are determined by taking +/- 20% of the existing annual average flow and subtracting out what is expected to come from the remaining watershed to the tributaries (seepage through the containment system is considered negligible and is not included in the calculation of maximum and minimum flow augmentation). If the target flows are met at the headwaters, they will be met at locations further downstream in the tributaries (as the natural watershed area increases, decreasing the percentage of total flow originating as augmentation).

Table 6-11 Determination of combined flow requirement from the WWTP and Colby Lake in gallons per minute

	Mud Lake Creek (MLC-3)[5]	Trimble Creek (TC-1)	Unnamed Creek (PM-11)	Second Creek (SD026)
Total annual average surface flow[1]	665	1888	1180	500
Expected future contribution from the watershed[2]	439 / 734	599	664	0
Minimum requirement from WWTP/Colby Lake[3]	93 / 0	911	280	400
Maximum allowable from WWTP/Colby Lake[4]	359 / 64	1667	752	600
Percent of WWTP Discharge before the drainage swale is constructed	5.53%	54.09%	16.63%	23.75%
Percent of WWTP Discharge after the drainage swale is constructed	0%	57.26%	17.60%	25.14%

1 Equivalent to item 5 of Table 1.
2 The future contribution from the watershed decreases because the containment system, which is away from the toes of the Tailings Basin, removes watershed area and any runoff from the outer banks of the Tailings Basin.
3 80% of the existing total annual average surface flow, less the expected future watershed contribution.
4 120% of the existing total annual average surface flow, less the expected future watershed contribution.
5 X / Y values: X indicates the flow values before the drainage swale is in place; Y indicates the flow values after the watershed area to Mud Lake Creek is increased (from 1.34 mi^2 to 2.24 mi^2) because of the construction of the drainage swale at time > 7 years.

The total combined flow required from the WWTP effluent and Colby Lake prior to construction of the drainage swale must be between 1684 gpm and 3378 gpm on an average annual basis (+/- 20% of the current total annual average surface flow, less the expected future watershed contribution, summed for all tributaries). For modeling purposes, it is proposed that the minimum flow requirement will be set at 1700 gpm. The maximum annual average WWTP effluent flow to the tributaries is currently estimated to be less than 2000 gpm which is less than the maximum allowable of 3378 gpm which means that there is no concern of causing hydrologic impacts with too much flow.

The total combined flow required from the WWTP effluent and Colby Lake after the construction of the drainage swale must be between 1591 gpm and 3083 gpm on an average annual basis (+/- 20% of the current total annual average surface flow, less the expected future watershed contribution, summed for all tributaries). For modeling purposes, it is proposed that the minimum flow requirement will be set at 1600 gpm. The maximum annual average WWTP effluent flow to the tributaries is currently estimated to be less than 2000 gpm which is less than the maximum allowable of 3083 gpm which means that there is no concern of causing hydrologic impacts with too much flow.

In long-term closure, it is expected that the effluent from the WWTP will be sufficient to meet the minimum flow requirements of the tributaries to prevent significant hydrologic impacts. On an average annual basis, the total inflow to the WWTP (including Tailings Basin seepage, runoff water within the containment system, and water from the FTB pond to prevent overflow) is expected to be about 2200 gpm. Removing water losses from the treatment process, the annual average discharge from the WWTP is expected to be less than 2000 gpm, which is between the minimum and maximum flow constraints for all four tributaries. Therefore, Colby Lake water will not be transferred to the tributaries for flow augmentation in long-term closure.

Work Plan Changes:

Table 1-1 of the Plant Site Water Modeling Work Plan will be added to; see the attached revised tables.

Management Plan Changes:

The AWMP will be changed to reflect the flow augmentation plan.

Attachments

Revised

Page from Table 1-1 (Plant Site Water Modeling Work Plan)

Table 1-1 **Input Variables for the Plant Site Model**

Variable Name	*Units*	*Deterministic/ Uncertain*	*Sampling/ Calculation Frequency*	*Distribution*	*Mean or Mode*	*Standard Deviation*	*Minimum*	*Maximum*	*Description*	*Source of Input Data*	*Modeling Package Section*
Additional Inputs											
Max_Vol_To_Mine	[acre-ft]	Deterministic	N/A	Constant	60000	N/A	N/A	N/A	Maximum volume that can be sent to the Mine Site, determined by the Mine Site model	AWMP	
HRF_Drainage_Period	[yr]	Deterministic	N/A	Constant	10	N/A	N/A	N/A	Time it takes to drain the HRF	Residue Management Plan	
OPS_Treatment_Capacity	[gpm]	Deterministic	N/A	Constant	2000	N/A	N/A	N/A	Treatment capacity of the FTB WWTP from year 0 to year 8		
CLSR_Treatment_Capacity	[gpm]	Deterministic	N/A	Constant	3500	N/A	N/A	N/A	Design flow to the treatment plant during reclamation		
GW_Capture_Eff	[%]	Deterministic	N/A	Constant	90	N/A	N/A	N/A	Efficiency of the groundwater containment system		
Min_Flow_To_4Tribs_Early	[gpm]	Deterministic	N/A	Constant	1700	N/A	N/A	N/A	Minimum flow to the four tributaries (including SD026)	CDF059	Water Section 6.3.1 - *Flow Augmentation to Prevent Significant Hydrologic Impacts*
Trib_Demand_Fracs_Early[N]	[%]	Deterministic	N/A	Constant	5.53	N/A	N/A	N/A	Demand from each tributary to not have significant hydrologic impacts (to Mud Lake Creek)	CDF059	Water Section 6.3.1 - *Flow Augmentation to Prevent Significant Hydrologic Impacts*
Trib_Demand_Fracs_Early[NW]	[%]	Deterministic	N/A	Constant	54.09	N/A	N/A	N/A	Demand from each tributary to not have significant hydrologic impacts (to Trimble Creek)	CDF059	Water Section 6.3.1 - *Flow Augmentation to Prevent Significant Hydrologic Impacts*
Trib_Demand_Fracs_Early[W]	[%]	Deterministic	N/A	Constant	16.63	N/A	N/A	N/A	Demand from each tributary to not have significant hydrologic impacts (to Unnamed Creek)	CDF059	Water Section 6.3.1 - *Flow Augmentation to Prevent Significant Hydrologic Impacts*
Trib_Demand_Fracs_Early[S]	[%]	Deterministic	N/A	Constant	23.75	N/A	N/A	N/A	Demand from each tributary to not have significant hydrologic impacts (to Second Creek)	CDF059	Water Section 6.3.1 - *Flow Augmentation to Prevent Significant Hydrologic Impacts*
Min_Flow_To_4Tribs_Late	[gpm]	Deterministic	N/A	Constant	1600	N/A	N/A	N/A	Minimum flow to the four tributaries (including SD026)	CDF059	Water Section 6.3.1 - *Flow Augmentation to Prevent Significant Hydrologic Impacts*
Trib_Demand_Fracs_Late[N]	[%]	Deterministic	N/A	Constant	0	N/A	N/A	N/A	Demand from each tributary to not have significant hydrologic impacts (to Mud Lake Creek)	CDF059	Water Section 6.3.1 - *Flow Augmentation to Prevent Significant Hydrologic Impacts*
Trib_Demand_Fracs_Late[NW]	[%]	Deterministic	N/A	Constant	57.26	N/A	N/A	N/A	Demand from each tributary to not have significant hydrologic impacts (to Trimble Creek)	CDF059	Water Section 6.3.1 - *Flow Augmentation to Prevent Significant Hydrologic Impacts*
Trib_Demand_Fracs_Late[W]	[%]	Deterministic	N/A	Constant	17.6	N/A	N/A	N/A	Demand from each tributary to not have significant hydrologic impacts (to Unnamed Creek)	CDF059	Water Section 6.3.1 - *Flow Augmentation to Prevent Significant Hydrologic Impacts*
Trib_Demand_Fracs_Late[S]	[%]	Deterministic	N/A	Constant	25.14	N/A	N/A	N/A	Demand from each tributary to not have significant hydrologic impacts (to Second Creek)	CDF059	Water Section 6.3.1 - *Flow Augmentation to Prevent Significant Hydrologic Impacts*