

Response to Comments

for

Department of Environmental Conservation  
Waste Management Permit No. 2019DB0001  
and  
Department of Natural Resources  
Reclamation Plan Approval No. J20185690RPA

Constantine Mining LLC  
Palmer Project

Public Noticed April 16, 2019 – May 30, 2019

FINAL

July 17, 2019

## **Introduction**

Public notice start: April 16, 2019

Public notice end: May 15, 2019

Public notice extension: May 30, 2019

The Palmer Project is a copper-zinc-silver-gold-barite prospect in the advanced exploration stage. The Project is operated by Constantine Mining LLC and located within the Porcupine Mining District in the Haines Borough. Roads connect the project area to the village of Klukwan, approximately 17 miles to the east, and the coastal town of Haines, approximately 35 miles to the southeast.

This document summarizes and addresses comments received on Alaska Department of Environmental Conservation (DEC), draft Waste Management Permit (WMP) No. 2019DB0001 and Alaska Department of Natural Resources (DNR), draft Reclamation Plan Approval (RPA) No. J20185690RPA. The WMP regulates the containment and disposal of mine tailings, waste rock, wastewater, and other mine-related wastes at the Palmer Project (Project), while the RPA regulates activities associated with the reclamation and closure of the Project.

The initial public comment period for the permits began on April 16, 2019 and was scheduled to end on May 15, 2019. However on May 20, 2019, the public comment period was revised to include the period from May 16 to May 30, 2019 making the final comment period 45 days from April 16 until May 30, 2019.

Substantive comments concerning requirements of the DEC WMP permit and the DNR RPA and the State's responses are contained in the following pages. The State did not respond to comments outside the scope or beyond regulatory authority of these permits. There were changes made to the draft permits resulting from comments received during the public notice period that are reflected in the final permits. Where comments resulted in changes to the permits, associated changes are included in the response to those comments. There were also some minor changes made to the draft permits after public notice to correct typographical and grammatical errors, formatting, and to clarify information. Minor changes to the permits are not detailed in this document.

## **Comment Overview and General Comments**

The State received a total of 218 comments, the majority of which were general comments that did not concern permit-specific requirements. Instead, general comments included objection to the Project, support for the Project, and concerns over the length of the public notice period or other aspects outside the scope of the permits. Since these general comments do not offer any specific points applicable to permit conditions, no changes to the permits were made as a result of these comments.

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Comment No.	Comment Summary	Agency Response
1	The application does not provide sufficient surface water quality data to establish an adequate baseline for natural conditions - groundwater wells were only sampled twice in an 11 day period, and many of the surface water monitoring sites were sampled only four times.	<p>Regarding groundwater sampling covered in 18 AAC 60.830(f), it states, "Background data must be collected in each of the four seasons before waste is placed in the waste management area being monitored." The department added the most recent data and inserted recalculated triggers for MW-02 in the final permit satisfying 18 AAC 60.830(f).</p> <p>Surface water monitoring at the project began in 2014. Recent data from 2017 and 2018 was considered the most representative of current natural conditions. Background surface water triggers for sites P25 and P27 each used 10 samples taken during 2017 and 2018. While, site P26 used 9 samples taken during 2017 and 2018.</p>
2	The permit fails to demonstrate that the groundwater and surface water are not connected at the site of the Land Application Disposal (LAD) system diffusers.	<p>Under Permit Coverage in condition 1.1 of the Waste Management Permit, it states, "This permit prohibits the discharge of wastewater to surface water." Additionally in Condition 2.2.3, it says, "Land application discharge shall not form a connection with waters of the U.S." The permit goes on to establish background surface water quality triggers at three sites and monitoring at four sites to assure and document the absence of a surface water discharge. Furthermore, the permitted and approved LAD system discharges at least 6.6 feet below the ground surface.</p> <p>No change was made to the permit as a result of this comment.</p>
3	The application fails to adequately explain how the proposed discharge system and monitoring system will work in freezing temperatures or during periods of deep snow cover.	<p>In Section 5.0 of Appendix A to the Waste Management Permit, it states that the Land Application Disposal (LAD) system piping and diffusers will be installed at a minimum depth of 6.6 feet. That is well below the frost line for protection from freezing.</p> <p>No change was made to the permit as a result of this comment.</p>

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4	<p>There is potential for an avalanche to damage the waste water settling ponds or fuel storage tank, resulting in an unpermitted release of waste water or diesel fuel.</p>	<p>The Waste Management Permit does not account for acts of nature such as avalanches. However, snow reports are being employed in designing, placing, and constructing avalanche berms for the protection of life and property at the project site.</p> <p>No change was made to the permit as a result of this comment.</p>
5	<p>The trigger detection levels for all of the constituents except for mercury and pH are at, or greater than, the Alaska water quality standard for that constituent. Trigger levels should be significantly less than the applicable water quality standard in order to allow some time for the triggered action to keep the contaminant from exceeding the water quality standard. If the trigger level is, or exceeds, the water quality standard, then in all likelihood there will be a violation of that standard.</p> <p>Trigger levels should ideally be set to protect background water quality, since there is to be no discharge to surface waters.<sup>3</sup> However, trigger levels appear to be aimed at protecting surface waters not at background, but at state water quality standards.</p> <p>Why is background water quality not being protected if there is to be no discharge to surface waters?</p>	<p>The trigger levels identify the magnitude of a statistically significant increase in constituent concentration over the naturally occurring background conditions. When a naturally occurring constituent concentration exceeds an Alaska Water Quality Criterion, the prevailing natural condition supersedes the published value. The permit applies trigger levels for the protection of both surface water and groundwater.</p> <p>No change was made to the permit as a result of this comment.</p>

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6	<p>The ML for aluminum is equal to the associated water quality standard. The minimum level of quantification for aluminum needs to be lower than the standard itself. Since several pH measurements from the P25, P26, and P27 have been less than pH = 7, the lower aluminum limit of 0.087 mg/L could apply. It is always appropriate and wise to take surface water quality samples for both dissolved and total constituents, as was done with the background data. This is important for aluminum, since the published standard is for dissolved.</p>	<p>Aluminum's minimum level of quantification (ML) is set 87 µg/L to provide a frame of reference with regard to the most stringent potentially applicable Water Quality Criterion. The most stringent applicable aluminum water quality criterion is published in total recoverable, and it does not offer a coefficient to transform a total recoverable concentration to a dissolved concentration.</p> <p>No change was made to the permit as a result of this comment.</p>
7	<p>There is no discussion of the potential post-closure discharge from the portal. The inclined workings will have a potential hydraulic head of 170 meters on the portal plug. It is very likely that there will be a significant amount of seepage around this plug, despite grouting efforts.</p> <p>It is not reasonable to assume no seepage around this plug. What would the water quality of this seepage be? What is the likely flow?</p>	<p>In Table 10 of Appendix C (page 11), Constantine is basing the costs for design and installation of a plug under the assumption of 232 psi of head pressure, requiring a plug approximately 30 feet in length. Prior to permanent closure the Reclamation Plan calls for an updated water management plan and detailed design of the portal plug to be developed from information gathered throughout the exploration project. Financial assurance is also provided for the detailed design and construction of the portal plug.</p> <p>No change was made to the permit as a result of this comment.</p>

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8	<p>In the estimates for Indirect Costs for the Cost Summary, all of the estimates were chosen at the low end of the recommended ranges from ADNR. For small projects, and for projects off of a road system, higher-end cost estimates should be used. This project meets both of these criteria, yet the cost estimates adopted by the applicant are low-end costs.</p> <p>The Indirect Costs associated with the Closure Summary should be significantly higher than assumed by the applicant. The choice to use low-end cost is not justified by the applicant.</p>	<p>The project is accessed by roads developed for timber harvest truck traffic directly connected to the Haines Highway and is considered to be on a road system. Therefore, higher-end indirect cost estimates are not justified. Additionally, on pages 2 and 3 of the Reclamation Plan in Appendix C, Constantine provides a detailed listing of the reasoning for selecting the indirect percentages, including that several costs are already included as a part of direct costs. Based on the information provided and other similar projects, DNR has found the costs sufficient.</p> <p>No change was made to the permit as a result of this comment.</p>
9	<p>A 3D model of the diffusers is desired to fully understand the potential boundary and interception points between non-domestic wastewater discharge and waters of the U.S., including streams. Item 2.2.3 of the Draft DEC WMP states, "Land application discharge shall not form a connection with waters of the U.S." However, BGC's 2D models show discharged waters reaching Glacier Creek.</p>	<p>There are no regulations requiring or precedents suggesting that 3D models be used. Section 5.0 of Appendix A describes land application. Section 5.2 provides that the conceptual design uses a factor of safety equal to 5. Glacier Creek was set as the downstream boundary and from Section 5.3.2 of the final LAD design, the upstream and downstream vertical model face, as well as the bottom of the model, were set as no flow boundaries.</p> <p>No change was made to the permit as a result of this comment.</p>
10	<p>Sec. 2.2.5.8 states that "Surface expression of wastewater discharge from the LAD system's upper diffuser is prohibited." Surface expression of wastewater may not be visible under a cover of snow. For this reason, the 120-day trial period (Sec. 2.2.5.5) should only take place when the area is free of snow cover. Furthermore, monitoring (Sec. 2.5) should include requirements to visually inspect the area in the spring for presence of <i>aufeis</i> that could indicate surface expression of the discharge.</p>	<p>Condition 2.2.5.5 of the final permit was changed to reflect the suggestion in this comment, and Condition 2.5.1 has been changed to reflect the suggestion in this comment.</p>

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11	Sec. 2.2.6.1 limits flow to the lower diffuser to 800 gpm. BGC's model simulated a total infiltration capacity of 800 gpm. However, BGC LAD design is based on 500 gpm. Authorizing a higher discharge of 800 gpm would exceed the planned system design flow rate of 500 gpm.	The LAD design for the lower diffuser indicated 1) settling pond design for a flow rate of 500 gpm, and 2) an infiltration capacity of 800 gpm. The lower diffuser is limited by the design capacity of the settling ponds, and the condition has been changed to the following. "Flow to the lower diffuser is limited to 500 gpm."
12	Sec. 2.2.9 refers to monitoring of P27. Should this be POI?	P27 is correct.  No changes were made to the permit based on this comment.
13	The location of PO1 is not ideal because it does not capture all the project's waters. A monitoring site below the confluence of Glacier Creek and Hangover should be established to monitor overall project effects to water quality.	PO1 provides background water quality upstream of the project that may affect downstream monitoring results.  No change was made to the permit as a result of this comment.
14	Sec. 2.4.2.4: Besides concerns of liner integrity due to removal of settled solids, stipulations should be added to monitor the depth of settled solids and triggers on when to initiate solids removal. Typically, storm water best management practices require the removal of settled solids when they reach 1/3 pond volume. It seems like following such practice would greatly diminish the storage capacity of the sediment ponds.	The following condition has been added to the final permit in response to your concern. "2.4.2.7 The LAD system and its appurtenances shall be properly operated and maintained."
15	Sec. 2.5.1: Visual monitoring should include signs of sheen on the water at the ponds, groundwater and surface water samples, and actions to report such observations.	Condition 2.5.1 of the final permit was changed to reflect the suggestion in this comment.
16	Sec. 2.5.5.2: Should this be PI, P25, and P26 ... not P27? Also note, PI vs POI - these labels should be consistent.	The final permit has been changed to the following: "2.5.5.2 Surface water must be sampled at the following sites: P01, P25, P26, and P27 and meet the requirements in Table 5."

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17	In the event of an emergency spillway discharge, water samples should be collected during the discharge at the emergency spillway, and at POI.	<p>A spill is an unpermitted activity, and each emergency must be handled on a case-by-case basis by the department's Divisions of Spill Prevention and Response.</p> <p>No change was made to the permit as a result of this comment.</p>
18	Sec. 2.5.5.2 and 2.5.5.4 refer to table 3, but this should be table 5 as it refers to the minimum limits of quantification for laboratory analysis.	The final permit has been corrected as indicated.
19	Sec. 2.5.5.5, table 5, establishes minimum sampling frequency as "quarterly". Considering the poor water quality characterization for the project in terms of existing baseline, and water quality predictions, and the ramp construction duration of 18 months, a quarterly sampling frequency is highly inappropriate. Monthly monitoring must be the minimum sampling frequency, and quarterly sampling could be considered by DEC after completion of construction of the ramp, once more water quality data is available for review.	<p>The LAD system serves to dispose of wastewater encountered during adit construction. Consequently, it must be installed before the adit begins. Regarding quarterly monitoring frequency, it is consistent with groundwater monitoring frequency requirements in all similar permits. Groundwater flow rates lack the dynamics of surface water flow rates. Considering hydraulic conductivity and transmissivity rates compared to surface water flow rates, quarterly monitoring frequency is more than adequate.</p> <p>No change was made to the permit as a result of this comment.</p>



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20	<p>Sec. 2.9.2 established a WMP permit period of "five years" and options for future permit renewals. BGC's LAD design includes the statement "Management of water flow beyond the 3-year exploration activities are outside the scope of this design". This statement was made in relation to the lack of sedimentation loading data in the discharge. The permitted activity must not exceed the engineer's design parameters of the LAD system. If the LAD engineer is unable to justify proper system operation beyond the three-year operation at this time, the WMP should add a condition to limit operation of the LAD to three years. This should allow Constantine enough time to gather the necessary sediment load data, which could be used by BGC or another engineering firm to evaluate LAD system functionality beyond the three years. If practical, Constantine could then request an extension from DEC for LAD operation.</p>	<p>The following condition has been added to the final permit in response to your concern. "2.4.2.7 The LAD system and its appurtenances shall be properly operated and maintained."</p>
21	<p>The Wastewater Discharge System Design Report (Waste Management Permit Appendix A; page 8) shows groundwater connectivity and the Waste Management Plan (Waste Management Permit Attachment 2; page 6) predicts contamination of water from wastewater and waste rock. Considering the anticipated contamination of water quality in permit documents, more information should demonstrate how the proposed LAD system removes contaminants like aluminum, manganese, vanadium, nitrate, nitrite, and selenium before reaching protected ground and surface waters and how the system and receiving ground and surface waters responds to different levels of contaminants and volume of water moving and diffusing through the underground pipes.</p>	<p>Background data analyzed using conservatively protective assumptions indicate that wastewater will contain lower concentrations of mineral constituents than natural groundwater quality.</p> <p>No change was made to the permit as a result of this comment.</p>

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22	Constantine Mining LLC seems to be choosing too few locations and potentially inappropriate locations for its ground water monitoring program.	DEC has reviewed and approved the locations of monitoring wells for providing representative samples of potentially effected groundwater.  No change was made to the permit as a result of this comment.
23	The project applicant is proposing to forgo the scheduled monitoring events during high flows (Monitoring Plan Sec. 1.1.2) and during the months with snow, when the road is impassible (Reclamation Plan Appendix C; page 6). If people are not able to monitor for exceedances to water quality during these periods, then some form of applicable remote monitoring should be considered, or alternative locations for the waste water treatment facility and waste rock storage areas should be analyzed.	Section 1.1.2 of the Monitoring Plan, Attachment 1 to the Waste Management Permit, refers to safely measuring surface water flows in Hangover, Waterfall, and Glacier Creeks by avoiding dangerously high flows. The Waste Management Permit allows discharge wastewater through the LAD system at least 6.6 feet below the ground surface, and it requires at least quarterly water quality monitoring. Groundwater flow rates lack the dynamics of surface water flow rates. Considering hydraulic conductivity and transmissivity rates compared to surface water flow rates, quarterly monitoring frequency is more than adequate, and it is reasonable to assume that the exploration site will be accessible at least once a quarter.  No change was made to the permit as a result of this comment.
24	Small amounts of copper can disrupt a salmon’s sense of smell.	The Waste Management Permit allows discharge to groundwater and prohibits a connection between wastewater and surface water.  No change was made to the permit as a result of this comment.
25	The LAD system may not be designed to handle 100% of predicted wastewater flows from the full length of the proposed tunnel (i.e. beyond the Kudo Fault zone).	Exploration activities involve a great deal of uncertainty. As wastewater flows increase incrementally with adit length, the permittee will have to manage the inflow of water to the adit to stay within the permitted limits. Predicted wastewater flows have been maximized for this reason.  No change was made to the permit as a result of this comment.

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26	<p>The Care and Maintenance Plan (Reclamation Plan Appendix C) for the temporary closure scenario states that the applicant will “continue to perform all maintenance, monitoring and reporting tasks that are necessary to protect public health and the environment during the temporary closure” (page 3), but the cost estimates assume biweekly inspections during 6 snow free months and when access road is passable" (Table 3, page 5). How will waste water be managed during months where snow accumulations inhibit access under a temporary closure scenario, and what are the estimated costs for all maintenance, monitoring, and reporting tasks during such scenario?</p>	<p>Section 2.8 SUSPENSION OF OPERATIONS of the Waste Management Permit addresses these temporary closure concerns with the following Conditions. "2.8.1...The permittee shall submit a conceptual suspension of operations plan to the department either (i) 90 days after the effective date of the permit or (ii) 90 days prior to commencing phase II exploration, whichever is later." 2.8.3 2.8.3 No later than ten days after operations have been suspended, the permittee shall submit a detailed and updated suspension of operations plan that supersedes the suspension of operations conceptual plan required by Section 2.8.1 with current information and specific details. The suspension plan shall address the following:... 2.8.3.3 Procedures, methods, and schedule to be implemented for the treatment, disposal, or storage of wastewater;"</p> <p>No change was made to the permit as a result of this comment.</p>
27	<p>The applicant should relocate the mid-Glacier Creek monitoring station currently designated P-27. This site will not detect any significant change in water quality, over time, that may be coincide with Constantine’s underground exploration activities because of the upstream influence of Oxide Creek.</p>	<p>Site P27 is properly situated just downstream of all permitted activity to monitor the cumulative impact of exploration activities on offsite water quality.</p> <p>No change was made to the permit as a result of this comment.</p>

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28	Changes from compaction of the ground under the avalanche diversion structures could change the percolation rate near the lower diffuser locally and the performance of the LAD as a whole. Loading and stability issues under large rock structures could alter the hydrology and direction of ground water.	<p>Final design, number and location of the avalanche berms is yet to be determined.</p> <p>In the event that hydrology changes necessitate physical modifications to the LAD system, the permittee must develop a construction plan. It must be submitted and approved under Condition 2.4.2.1 of the Waste Management Permit, which follows. "2.4.2.1 Changes that may have a significant impact on surface or groundwater quality; information on engineering changes to the wastewater disposal systems that may affect water quality; new waste treatment processes; changes to ground and surface water interception, conveyance or monitoring systems; or the addition of new waste streams to the discharge that could significantly change the quality or increase the quantity of pollutants in a waste stream must be submitted to the department and approval must be obtained prior to any such changes or discharges."</p>
29	The Reclamation Plan does not discuss what happens to the material in the settling ponds upon permanent reclamation of the project.	This information is discussed on Page 13 of Appendix C under the notes for the Cost for Removing Settling Ponds on Table 14. Ponds shall be reclaimed by pushing the liners into the center of the ponds, then burying with clean fill, recontouring to prevent ponding, and reseeding.
30	The applicant estimates two years to construct the avalanche deflection berms. How will the permitted facilities be protected from avalanches during that time?	<p>The following condition has been added to the final permit in response to your concern. "2.4.2.7 The LAD system and its appurtenances shall be properly operated and maintained."</p> <p>Please note that the design and construction of the avalanche deflection berms at the project site lie outside the regulatory authority and scope of the Waste Management Permit.</p>

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31	An anti-degradation review is required for any discharge into existing groundwater.	<p>Groundwater quality is protected by prohibiting statistically significant increases of constituents over their background concentrations. Therefore, the permit prohibits degradation of groundwater quality, thus satisfying the department's Antidegradation Policy at 18 AAC 70.015.</p> <p>Additionally, under 18 AAC 70.016, the department will make an antidegradation analysis and findings for discharges subject to authorization by the department under 18 AAC 83, Alaska Pollutant Discharge Elimination System (APDES) Program; and under 33 United States Code (USC) 1341 (Clean Water Act, Section 401 water quality certificates of a Clean Water Act, Section 404 permit).</p> <p>This permit is neither a permit issued under the APDES Program nor a Clean Water Act, 401 certification of a Clean Water Act, Section 404 permit. Therefore, the department's antidegradation implementation methods do not apply.</p> <p>No change was made to the permit as a result of this comment.</p>