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Patty McGrath
Donlin Gold Permit Manager

Tuesday, May 31, 2016

Dear Ms. McGrath,

The Chuathbaluk Traditional Council has read and approved the attached comments. If you have any questions, feel free to contact us at (907) 467-4313.

/s/
Patricia Yaska
Chuathbaluk Traditional Council

Chuathbaluk DEIS Comments

Comments by chapter

Commenter	Section Number	Page	Original Language	Proposed Language or Comment	Initial Disposition	Comment Addressed Adequately for Draft EIS?	Disposition	Additional Review Comments
Chuathbaluk/ CSP2	Executive Summary	ES-13	Solid waste would be reused…..or permanently disposed of in a designated section of the WRF	Solid waste should be taken off site, not placed in the WRF				
Chuathbaluk/ CSP2	Executive Summary, impact tables on Chapter 3.6	Table ES-13, page ES-60 to ES-61	Alternative 2: Change in groundwater use impact intensity would be low, long-term in duration, local in extent, and common to important in context. Alternative 5A: Pumping water from the SRS may be required for 200 years for unlined option, 10 to 50 years for lined option.	The Alternative 2 impact should note that pumping water from the SRS will be required for approximately 50 years – equal to or longer than the period for the lined Alternative 5A option.				
Chuathbaluk/ CSP2	Executive Summary, impact tables on Chapter 3.7	Table ES-13, page ES-62 to ES-63	**Summary impacts would be moderate to major.**	All the Alternatives, including Alternative 2, have a summary impact of “Minor” except for Alternative 5A. This is unwarranted. See lines below.				
Chuathbaluk/ CSP2	Executive Summary, impact tables on Chapter 3.7	Table ES-13, page ES-62 to ES-63	Treating water from the SRS may be required for 200 years for unlined option, 10 to 50 years for lined option.	It shouldn't matter how much water there is to treat -- it all goes through the water treatment plant and discharges to meet Alaska water quality standards. If the lined option is chosen, treatment will be required for LESS time at the SRS than for a traditional TSF.				
Chuathbaluk/ CSP2	Executive Summary, impact tables on Chapter 3.7	Table ES-13, page ES-62 to ES-63	Lined option would minimize (but not prevent) impacts to groundwater quality.	This would be no different than the impact of the lined TSF to groundwater.				
Chuathbaluk/ CSP2	Executive Summary, impact tables on Chapter 3.7	Table ES-13, page ES-62 to ES-63	Higher risk of SRS pump failure for unlined option.	This is the only actual increased risk over other options, and it only applies to the unlined option.				
Chuathbaluk/ CSP2	Executive Summary, impact tables on Chapter 3.7	Table ES-13, page ES-62 to ES-63	Pit lake stratification would occur at an approximately 40 percent shallower depth, and metals in pit surface water would likely be higher.	No matter which Alternative is chosen, the pycnocline is going to migrate upwards and eventually the pit lake will overturn, with "bad" water throughout the lake. This is what the models show. Whether the water treatment plant has to deal with the overturn a few years or a few decades sooner should be irrelevant; it will have to deal with it at some point				

Chuathbaluk/ CSP2	Executive Summary, impact tables on Chapter 3.7 And Chapter 4	Table ES-13, page ES-62 to ES-63	Increase in dry stack fugitive dust atmospheric deposition would lower sedimentation quality (BMPs applied).	It is ridiculous to say that sediment will be affected by fugitive dust when air quality and soil will not be affected by fugitive dust. In fact, in the Air Quality discussion in the summary impact table, ***they admit that the increase in fugitive dust off the stack will be offset by the decrease in fugitive dust from not having a tailings beach*** (which Alternative 2 will have) In Chapter 4, Cumulative Impacts, it attributes the "moderate to major" summary impact as due to the increased fugitive dust. However, the impact from dust at Alternative 5A is listed as the same impact as for Alternative 2 with regards to impacts to soil and air quality. Therefore the summary impact table should be "minor", as it is with all the other alternatives. Chapter 4, page 4-36 Impact of Alt 5A on **Air Quality:** "The cumulative effects on air quality from all other action alternatives would be similar to Alternative 2, and therefore would be considered minor." Chapter 4, page 4-18 Impact of Alt 5A on **Soil Quality:** "More notable soil disturbance deviations from Alternative 2 would occur during the closure and reclamation phase of the operating pond. However, since disturbed soil acreages under this alternative are comparable to the proposed action, the **same level effects on soil** are anticipated.... ....Alternative 5A would have minor to moderate direct and indirect impacts on soil disturbance and erosion" Chapter 4, page 4-24 Impact of Alt 5A on **Soil Quality:** Alternative 5A could generate 6.6% more fugitive dust than Alternative 2, but incremental effects would be minor, for an overall rating of "minor to moderate" cumulative impact.				

				Chapter 4, page 4-29 Impact of Alt 2: Impacts to **Water and Sediment quality**….. Impacts to surface water and sediment quality resulting from atmospheric deposition of mercury would be both low and high intensity. High intensity impacts would be likely to occur at some locations within the Crooked Creek and Donlin Creek watersheds, where the inputs of mercury deposition to water are expected to be the greatest. Water quality is likely to be within regulatory limits on average, but could exceed baseline conditions and EPA chronic criteria in some areas. Impacts to sediment……would be **within the range of natural variation.** **Chapter 4, page 4-32 Impact of Alt 5A on Water and sediment quality** …… "Under both options of Alternative 5A (unlined and lined dry stack), effects on downstream surface water and sediment quality in closure would be the same as Alternative 2..."				
Chuathbaluk/ CSP2	Section 4.3.1.7.2 (Relevant to ES section)	4-32	increased potential for high intensity impacts to surface water and sediment quality resulting from atmospheric deposition and terrestrial runoff of fugitive dust from the dry stack tailings facility. Impacts from increased deposition of mercury to sediments and the potential for **increased rates of mercury methylation** would result **from the increased levels of fugitive dust** under Alternative 5A.	This is the root sentence that eventually leads to the decision to rate Alternative 5A impacts to water quality as "moderate to major" instead of "minor. There appears to be a clear bias against Alternative 5A. Please see lines below. These items follow from the lines above comparing summary impacts of Alternative 2 and 5A				
				--Mercury methylation rates should be the same for Alternatives 2 and 5A -- there is no reason they would "increase" under 5A.				
				--It is difficult to see how mercury deposition under Alternative 2 would "be within natural variation" with a max 2.5% increase in sediment, but a possible 6% more dust from the dry stack would shift the impact into being "moderate to major".				
				-- Does the 6% increase in dust at the Dry Stack take into account the fact that it won't have a tailings beach producing dust and that the DSTF can be progressively covered during operations? That was mentioned in the Executive Summary table but I didn't see it anywhere in Chapter 4				
				--It would be virtually impossible for Alternative 5A to have a higher impact on sediment than Alternative 2 when the impacts to soil are the same.				

Chuathbaluk/ CSP2	Executive Summary, impact tables on Chapter 3.7 And Chapter 4	Table ES-13, page ES-62 to ES-63	**Summary impacts would be moderate to major.**	The summary impact of Alternative 5A on water quality should be minor. There seems to be no environmental downside to the lined DSTF option. The SRS system would be closed down sooner, there is less impact to groundwater, and the pit lake fills up sooner. In fact, it seems that the possibility of the pit lake filling faster is a key reason the DEIS shows a bias against Alternative 5A. "A faster pit lake filling rate could require changes in water management/ treatment strategies in post-closure (page 4-25)", and "the pit would fill faster under Alternative 5A, and would likely have greater metals concentrations in surface water (page 4-32)". However, this could be more of a benefit than detractant. The sooner the pit lake fills, the sooner operators will know what adjustments need to be made to the WTP, if any – if this could be accomplished 10 years post closure rather than 50 years post closure.				

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Chuathbaluk/ CSP2	1.1	Figure 1.1-1	Native Village of Chuathbaluk assisted by Center for Science and Public Participation	Native Village of Chuathbaluk assisted by Center for Science *in* Public Participation				
Chuathbaluk/ CSP2	1.1, 1.3.3	1-2, 1-9	A range of alternatives including the No Action Alternative…. by which to accomplish the purpose and need of the proposed project may reasonably be accomplished….	How can the "purpose and need" of the project be accomplished through a No Action Alternative, when the NEPA purpose is to produce gold and the need is for economic benefits? Does this make the "No Action Alternative" infeasible by definition and therefore not a viable alternative?				
Chuathbaluk/ CSP2	1.3.4.1.2	1-10	The overall purpose of the Donlin Gold Project as defined by the Corps, is to produce gold … while maximizing economic benefits for Donlin Gold, Calista, and TKC.	I thought the Corps did not need to consider maximizing economic benefits?				
Chuathbaluk/ CSP2	1.3.4.1.1	1-10	In general, the production of gold from these ore reserves is determined by the Corps not to be a water dependent activity, i.e., the project does not require siting within a "special aquatic site" (such as wetlands) to fulfill its basic purpose. …. there are wetlands that overlie the ore body, which are considered under regulation to be "special aquatic sites."	If wetlands overlie the ore body, how could the project possibly move forward without being required to be sited on wetlands?				

Chuathbaluk/ CSP2	1.3.4.2.2	1-10	In addition to the agency-specific guidance regarding purpose and need, the BLM must also evaluate the proposed project for conformance with two land use plans.	Will the BLM Bering Sea/Western Interior resource management plan also need to be considered once it is finalized? The Land Management section notes the Southwest Area Management Plan, but that is an outdated plan that is being revised and in part replaced by the BSWI				
Chuathbaluk/ CSP2	1.4.9		CENTER FOR SCIENCE AND PUBLIC PARTICIPATION	Center for Science *in* Public Participation				

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Chuathbaluk/ CSP2	2.3.2.1.12	2-40	TSF reclamation	There is no mention of the type of cover that Alternative 2 prefers. Will it be impermeable or permeable? Will there be an overdrain above the tails as well as the underdrain under the tails? These affect cost, draindown time, and pit lake water quality.				
Chuathbaluk/ CSP2	2.3.2.1.12	2-40 to 2-41	WRF reclamation: ….placing a cover designed to minimize infiltration and support vegetation growth. The cover would consist of a 12-inch layer of colluvium or terrace gravel and a top layer of 14 inches of peat and loess.	Infiltration will be best minimized by placing an impermeable cover on the WRF. Without an impermeable cover, it seems it would be questionable whether the pit lake would ever have water quality good enough to allow the water treatment plant to be decommissioned.				
Chuathbaluk/ CSP2	2.3.2.1.12	2-41	Building, Electrical power, mobile equipment reclamation	All of these mention the potential to bury material – mill, crusher, fuel, generators, and vehicles. It seems like all material should be offered for sale to communities or removed from the site.				
Chuathbaluk/ CSP2	2.3.6.1	2-159	The main dam would have a maximum height of 367 feet and would contain the operating pond.	The DSTF option requires an operating pond. Will the downstream dam for the operating pond be built all at once, or in stages (the way the TSF dam in Alternative 2 would be built in stages).				

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Chuathbaluk/ CSP2	3.1.2.1.1	Figure 3.1-1	Upper Matanuska Valley label on map	The physiographic area on the figure labeled “Upper Matanuska Valley” is geographically what we refer to as the Susitna Valley, not the Matanuska Valley. Does USGS 2012 refer to it as the Upper Matanuska?				
Chuathbaluk/ CSP2	3.1.2.1.2	3.1-8	Similar mineralization has been well documented throughout Southwest Alaska (Frost 1990; Frost and Box 1991; Gray et al. 1990; Gray and Sanzolone 1996; Zamzow 2012).	Please remove my reference from this sentence (and from Chapter 9, References if this is the only place the material was cited). The presentation that I gave re-iterated material from Marti Miller, 2008 publication and an AMEC 2012 Technical Report for Donlin Gold. It did not contain original material.				

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Chuathbaluk/ CSP2	3.5.3.6.1	3.5-142	Years 1 to 5 – Closure of TSF facility, all TSF water pumped to the open pit, infiltration water collected in the overdrain system (above the LLPDE) would be pumped….	Replace all “TSF” with “DSTF”. Clarify that it is not “TSF water” that will be pumped to the pit, but rather the water in the operating pond in front of the tailings.				

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Chuathbaluk/ CSP2	3.7.2.1.1	3.7-13, Table 3.7-2, Table 3.7-10	Why was there no testing for uranium in surface water (DEIS Table 3.7-2)? Why was there no analysis for uranium in groundwater (DEIS Table 3.7-10)?	Provide a reason for not including uranium in the suite of analytes. If uranium is detected in water, it should be added to the list of fish tissue (whole body grind) analytes for slimy sculpin, in baseline and in monitoring during operations.				

Chuathbaluk/ CSP2		3.7-32	Due to higher concentrations of mercury and higher flow rates, the mercury load in Crooked Creek increases during spring flow and storm flow conditions relative to base flow (Tetra Tech 2013). Higher stream discharge is usually associated with higher flow velocity, which entrains particulate material from the substrate (Tetra Tech 2013). Thus ***the data suggest*** that a substantial fraction of the total mercury load in the Crooked Creek watershed (measured as total mercury in the water) is associated with particles entrained from the substrate during high flow events.	It would be exceptionally easy to determine whether the higher mercury at freshet is due to particles/TSS. Analyze the total and dissolved concentrations of mercury, and the concentrations of TSS. I thought Donlin had agreed to measure dissolved and total mercury together in at least some locations?				
Chuathbaluk/ CSP2	3.7.2.3.1	3.7-59 and 3.7-60	sediment samples were collected and analyzed to establish baseline concentrations of metals in sediment from the Crooked Creek watershed	Sediment needs to be collected in areas where wind is expected to deposit dust, such as Bell Creek, and areas rich in fish such as Getmuna Creek.				
Chuathbaluk/ CSP2		3.7-157, 3.7-193	As the TSF is drained, it would be reclaimed with an engineered cover overlain by a peat/mineral growth media mix. The engineered cover would promote runoff and reduce the potential for runoff or precipitation to contact the consolidated tailings. And for the DSTF: At mine site closure, an LLDPE geomembrane liner would be incorporated into a soil cover for each of the options described above.	BGC 2015d seems to suggest that the "engineered cover" for the TSF would be a permeable soil cover, but they assessed draindown time for the DSTF using an impermeable cover. The DEIS should be clear on what type of cover is proposed – and if there is a difference in the cover proposed for the TSF and DSTF, explain why. Both covers should include overdrains to promote drainage of infiltration *before* it reaches the tailings below. Without an overdrain (for both either tailings option and for the WRF), infiltration could create poor quality discharge water.				
Chuathbaluk/ CSP2		3.7-158	It is assumed that by approximately Year 52 post-closure, the flow would be essentially all infiltrated precipitation, and SRS water quality would be consistent with natural conditions and suitable for discharge (BGC 2014b).	This sentence in BGC 2014b provides no basis for the conclusion, but cites the 2012 Water Resources Management Plan. I presume this is the July 2012 WRMP that was part of the initial Donlin mining proposal. When I reviewed the 2012 WRMP, I did not see any work that went in to determining how long it would take for water infiltrating the TSF to become clean enough to dismantle the SRS pumps. For something as important as an "assumption" that water from the TSF will be "clean" within 10 years post closure – without details on the TSF cover – it is very important to provide the document the assumption is based on and the work that went into the determination.				

Chuathbaluk/ CSP2	3.7.3.6.1	3.7-192	While detailed water quality modeling has not been conducted for Alternative 5A, it is anticipated that metals and TDS concentrations in dry stack porewater would be the same or higher than those of tailings porewater under Alternative 2 (BGC 2014a), likely due to less leaching and dilution by recirculated process water.	Detailed water quality modeling should be done using the methods described by SRK (April 15 2015: Revised process water pond predictions – draft) – using final tailings filtrate, determine how often water would be recycled and what ions would reach saturation state. The step of "determining pond water chemistry with tailings under sub-oxic conditions resulting from consumption of oxygen by DOC" due to "deep burial in tailings" could be eliminated. Why should this be conducted? The assumption that DSTF operating pond water will look like TSF pore water does not seem entirely logical, given that pond water will not be in contact with tails. Specific comments are on individual lines below.				
				First, spill risk. The operating pond chemistry may be different and indicate different risk if the pond walls were to fail (compared to TSF "water only" spill). For example, if reducing conditions are less strong in the DSTF pond, less arsenic may be mobilized from iron. Also, there will be a greater volume of water than in the TSF pond – could this mean parameters would be more dilute?				
				Second – fugitive emissions. If there is less dissolved mercury, resulting in less mercury volatilizing off the pond during mine life.				
				Third – pit lake water quality. Without modeling operational pond water quality, it doesn't seem that the statement with regards to the pit lake that "surface water concentrations of metals would likely be higher than for Alternative 2" is a conclusion that can be made. (DEIS page 3.7-193)				
				Fourth – pit lake stratification. Stratification in the pit lake depends on sulfate salinity. Both the TSF and DSTF ponds will be pumped to the pit lake at the end of mine life and provide stratification. The extent to which initial stratification is different, and whether this is important decades later when waste rock seepage dominates the inputs, should be identified.				

Chuathbaluk/ CSP2	3.7.3.5	3.7-189	NAG rock would not be used to construct the BTC Road. Impacts to surface water quality could result from leaching of arsenic, selenium, antimony and possibly other constituents of concern from the material used for road construction. The potential for such impacts would be controlled by testing materials from borrow sites for metal leaching potential prior to use for construction. Materials that could act as sources of contaminants of concern would not be used and alternative material sites would be identified.	What work has been done to determine the probability of having enough non-toxic material to build the BTC road? If Alternative 4 is chosen and reconnaissance work shows there is not enough NAG material, what happens? Would material be shipped in, or would a different route need to be identified? There are 40 streams that would need to be crossed – it is critical that contaminants not leach into them, particularly selenium, which can cause deformities in fish and birds.				
Chuathbaluk/ CSP2	BGC 2015d, as cited in 3.7.3.6.2	BGC 2015d p9	The deterministic WBM is based on a synthetic precipitation dataset developed for the period 1940-2010. Within the dataset the synthetic average precipitation is represented by data from 1940-1970, as described in BGC (2014a) and BGC (2011a).	Why was the older precipitation data set (1940-1970) used to determine the average precipitation? Given rapid climate changes, would it not be better to use a more recent subset of the 1940-2010 dataset? What was the variability from 1940-2010, and was there a change in the trend line if data was assessed in 10 year increments?				
Chuathbaluk/ CSP2	3.7.3.6.2	3.7-194	The water would be treated to meet applicable standards prior to discharge to Crooked Creek using a High Density Sludge (HDS) Water Treatment Plant, as described in Section 3.7.3.2.1 (SGS 2012).	Is an HDS plant expected to be built? Would it just be for the construction period? SGS 2012 is not a reference in 3.7.3.2.1, and the section discusses an AWT, not an HDS				
Chuathbaluk/ CSP2	3.7.3.6	3.7-197	Thus, the main difference between Alternative 5A-Option 1, Alternative 5A-Option 2, and Alternative 2 with respect to surface water quality is the time it takes for the SRS water to clean up to the point that it can be discharged to Anaconda Creek, that is, roughly 200 years under Option 1, and about 10 to 50 years under Option 2 and Alternative 2.	This section is confusing and does not provide a good picture of why the options have different draindown times. This information seems to be based on a BGC document March 29, 2015 Dry Stack Tailings Alternative Seepage Assessment. This assessment compares different dry stack scenarios with NO cover or with an impermeable LLDPE to determine a possible range. However, it does NOT compare what the seepage rates would be for a DSTF with an engineered soil cover (possibly 3’ of NAG rock with 1’ of gravel then 1’ of soil on top) and a DSTF with an impermeable LLDPE cover.				

Chuathbaluk DEIS Comments

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Chuathbaluk/ CSP2	3.10.3.2.1	3.10-44	"will develop…Invasive Species Management Plan"	Given the cluster of invasives at the Donlin airport and one road, it would seem that there has been no interest in controlling invasive plants at least to this point in time. Why is there not a plan already in place? If there is one, it appears to be failing.				

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Chuathbaluk/ CSP2	Table 3.12-7, Section 3.12.3.2.2 and 3.10.3.2.1	3.12-29 to 33, 3.10-44 to -48	Impacts from invasive species (plants, rats) will be temporary, local, and minor at the mine site and for transportation facilities; for the pipeline medium impact for plants and low for rats	There is no analysis to support the conclusion that impacts from invasive species – particularly aquatic invasives and rats – would be temporary or minor. For prevention, monitoring and control, the text references the Invasive Species Management Plan in Chapter 3.10 (Vegetation). In that section, it says the ISMP "will be developed" and tosses out a bunch of ideas that could be included, but which are not required. There is virtually no mention of prevention for aquatic invasives or rats, other than inspecting docks. Chapter 3.12 essentially bases their conclusion that rats will not become a problem on the fact that they have not been a problem to date. However, the Donlin camp will be bigger than most of the villages currently on the river and this project will triple the barge traffic, expand one port, and build an entirely new port. The mine and ports will have food and garbage that could be attractants not previously found in abundance – possibly even an increase despite garbage control measures that could be put in place. Rats are known to devastate populations of ground dwelling birds. How have rats previously reached and spread in other areas? In areas where rats have impacted ground dwelling birds, what has been done to reduce their numbers or their impact? There are problems with rats in Dutch Harbor. Why would rats not travel from Dutch to Bethel by barge?				

Chuathbaluk/ CSP2	Table 3.12-7, Section 3.12.3.2.2 and 3.10.3.2.1	3.12-29 to 33, 3.10-44 to -48	Impacts from invasive species (plants, rats) will be temporary, local, and minor at the mine site and for transportation facilities; for the pipeline medium impact for plants and low for rats	Float planes have brought the invasive aquatic plant Elodea to lakes throughout Alaska. Donlin will not be able to control the spread of Elodea or other invasives brought by float planes if people who work at the mine decide to fly back to the area to hunt or fish on off-days.				

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Chuathbaluk/ CSP2	3.13.2.2.1	3.13-36		No studies have been done on fish in the BTC road area, although it will apparently cross 40 streams – 8 of them wide enough to require bridges. It will also cross the Owhat, an important fishing river for people in the central Kuskokwim. Studies HAVE been done on vegetation (3.10.2.4, Figure 3.10-4). **Studies need to be done on fish in the streams along the BTC corridor in order to understand the potential impacts if Alternative 4 is chosen.**				
Chuathbaluk/ CSP2	3.13.3.2.5	3.13-166	Table 3.30 The terms low and high "K scenario" are not explained anywhere in this chapter, but they create a difference in impacts.	Explain in detail what high and low K factors are, and how they affect the uncertainty around potential impacts.				
Chu/ CSP2	3.13	3.13-173	A single-season 12-mile ice road would be developed during construction from Crooked Creek Village to the mine site vicinity along Crooked Creek valley as a temporary late-winter access to material borrow sites for road construction.	This sentence is under the description of Alternative 4. Is it in the right place? Would borrow material for the BTC road be accessed along Crooked Creek road?				

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Chuathbaluk/ CSP2	3.18	3.18-39	From DEIS: The agreement with TKC included initial plans for regional training, including a potential training facility in Aniak (Dischner 2014). From Dischner citation: TKC will use some of the signing agreement payment for a training facility, but many of those details must still be worked out. The training program will try to target recent graduates of Kuskokwim-area schools, as well as older members of the workforce who may already have some training, and the generation that will eventually join the workforce.	Residents are balancing the potential positive benefits of jobs with a variety of potential negative impacts. To obtain good, career jobs, residents will need to have the appropriate skills and will need to enter a welcoming environment. How much training has actually been put in place? The fact that a 2014 Journal of Commerce article is the citation for "training" makes it seem as if no effort has actually moved forward. Has Donlin worked with the local college to develop classwork relevant to jobs that will open up, including those that could translate to other employers (electrical engineering, nursing etc)? In the Yukon, mining companies (including those very early in the permitting process without developed assets) are working closely with the Yukon college campuses to ensure a local workforce will have the skills needed. http://www.emr.gov.yk.ca/mining/pdf/from_the_trenches_vol5_spring_2013.pdf https://www.yukoncollege.yk.ca/research/project/developing_protocols_and_capacity_for_northern_restoration_with_local_nativ https://yukoncollege.yk.ca/research/post/restoring_mine_sites_with_local_native_plants				

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Chuathbaluk/ CSP2	3.19	3.19-25	Assistance to develop project related training programs for local residents to enhance local hire potential during construction, and operations and maintenance phases;	See comment for page 3.18-39				

Chuathbaluk/ CSP2	3.19	3.19-27	Communication between Donlin Gold and subsistence users to ensure dissemination of factual information concerning actual ecological risks and potential exposure of waterfowl to contamination is important to address concerns and perceptions about contamination. This may include monitoring and testing of bird carcasses, if appropriate.	Communication without data is propaganda. Waterfowl tissue testing should be integrated as part of normal wildlife monitoring, as should fish tissue testing.				
Chuathbaluk/ CSP2	3.19	3.19-27	Mitigation	Additional mitigations for Environmental Justice: Require cultural sensitivity training for all workers coming in from out of the area. Local workers should feel respected at and outside the workplace. Require training in what sexual harassment is, and institute a zero tolerance policy Ensure health and psych counselors are available at local clinics, at a minimum in Aniak Work with local communities to establish (funding, training) large scale gardening that could be sustained in villages after the mine is closed. Set up courses in financial management and provide workers and their families with the time to take the course Promote respect for cultural activities, such as language, arts, drumming				

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Chuathbaluk/ CSP2	3.21	Table 3.21-12	Per capita harvest on the Lower Kuskokwim	Why are no marine mammals listed? Marine mammals in Kuskokwim Bay are potentially at risk if there is a fuel spill.				
Chuathbaluk/ CSP2	3.21	3.21-128	Based on the calculations and discussion of exposure in the ERA, no birds would be expected to be at risk from ingestion of water during the filling stage of the pit lake or from ingestion of surface water, sediment, or food from the mature pit lake.	This trivializes the actual findings, which concluded there is some – if low – risk to mallards (or similar waterfowl) due to aluminum and arsenic, and low risk due to arsenic and antimony for the American dipper. Both the 2013 Arcadis assessment and the 2015 ERM assessment categorized the risk as “low”, not as “no risk”. More appropriately the wording should reflect what was in the ERM 2015 Ecological Risk Assessment report, with additions shown in bold: “The potential risk to ~~wildlife~~ **waterfowl** from exposure to aluminum, **arsenic, and antimony** concentrations in the proposed pit lake is regarded as low **even if waterfowl spend all their time at the pit lake**.”				

Chuathbaluk/ CSP2	3.21	3.21-128	Based on the calculations and discussion of exposure in the ERA, no birds would be expected to be at risk from ingestion of water during the filling stage of the pit lake or from ingestion of surface water, sediment, or food from the mature pit lake.	The 1993 EPA "Wildlife Exposures Handbook", which was the basis of the risk assessment, says (p1-3): "**I**f estimated doses fall far below the toxicity values associated with adverse effects, especially from chronic exposures, further assessment may be unnecessary…..When a screening-level exposure assessment indicates that adverse effects are likely, additional confirmatory data may be needed in the decision-making process…..For wildlife, confirmatory data may be obtained from chemical analyses of tissue samples from potentially exposed wildlife or their prey and from observed incidence of disease, reproductive failure, or death in exposed wildlife." The assessed risk was not "likely", but neither did it "fall far below the toxicity values", therefore mitigation should include monitoring at the mine site through collection of "confirmatory data" to determine the levels of arsenic, antimony, aluminum, selenium and copper, which were all determined to have some potential risk (above NOAEL hazard quotient, below LOAEL hazard quotient). Although the ecological risk assessment made some conservative assumptions, there are also significant uncertainties associated with predicting into the future (as listed in Arcadis 2013 and in Lorax and SRK source documents), therefore monitoring wildlife health is warranted in order to determine whether additional measures need to be taken (during and post operations) to prevent wildlife exposure. This would require baseline monitoring of wildlife (including birds) to determine contaminant levels prior to the mine opening and at some points during mining (which would capture potential effects from dust as well as water sources, particularly important if the Dry Stack Tailings option is chosen), as well as post closure when the pit lake becomes a potential source. More appropriately the wording: "The potential risk to wildlife, **including birds,** from exposure to aluminum, **arsenic, antimony**, **copper, and selenium** concentrations in the proposed pit lake is regarded as low **even if waterfowl spend all their time at the pit lake**. **Wildlife, including birds, identified to be at risk will be monitored before the mine opens, during mining, and post mining for these analytes."**				
Chuathbaluk/ CSP2	3.21	3.21-139	As noted in Section 3.12.5.2.2, Wildlife, in the subsection addressing Birds, the standing waterbodies would have varying levels of contamination (inorganic constituents), with the TSF likely to have higher concentrations of antimony, arsenic, and selenium than the pit lake.	The TSF will also have higher cyanide.				

Commenter	Section Number	Page	Original Language	Proposed Language or Comment	Initial Disposition	Comment Addressed Adequately for Draft EIS?	Disposition	Additional Review Comments
Chuathbaluk/ CSP2	3.22.2	3.22-5	The majority of the information presented for the scoping and baseline assessment of health is drawn from the two sources listed below: · NewFields 2015. Draft Health Impact Assessment, Baseline Community Health Data Assessment, Donlin Gold Project. Prepared for ADHSS Health Impact Assessment Program.	This document does not appear to be available on the AECOM document site				
Chuathbaluk/ CSP2	3.22	3.22-39	Increases in economic opportunities could result in an increase in the number of individuals in the potentially affected communities investing in their education, resulting in positive behavioral changes that could improve health.	Is there any evidence to support this? If not, remove.				
Chuathbaluk/ CSP2	3.22	3.22-39	Benefits may be noticeable in terms of being able to afford increased and **faster access** to and utilization of healthcare	How would there be faster access to healthcare?				
Chuathbaluk/ CSP2	3.22.4.2.3	3.22-53	Overall, the health concerns are related to how hazardous constituents would be stored, handled, and used at the mine site, how emissions and releases would be controlled and managed, and how accidental spills and releases related to the transportation and pipeline components would be minimized so that there are no unacceptable exposures to on-site workers or off-site communities.	The wording on this is awkward, and seems to suggest that there will be no unacceptable exposure, when in fact it says the health concerns were related to whether there would be unacceptable exposure.				
Chuathbaluk/ CSP2	3.22.3.4.4	Figure 3.22-4	Exposure route: dust and vapor inhalation	The model indicates that only wind-born gas and particulates contribute to the risk of exposure to mercury from inhalation. This is incorrect. There is also a risk of inhalation at the processing plant. No mitigation – such as mercury monitors at mercury emission collection sites – is discussed or proposed. This risk was mentioned in scoping (DEIS p 3.22-53)				
Chuathbaluk/ CSP2	3.22.4.2. 11	3.22-97	Design features most important for reducing impacts to human health include: · Donlin Gold would develop and implement a drug and alcohol abuse prevention program for employees;	Donlin Gold should also implement a mandatory cultural awareness program and hire a mediator/ombudsman who can manage cultural harassment issues.				
Chuathbaluk/ CSP2	3.22.4.6	3.22-102	For the mine site, the probability for exposure to potentially hazardous materials (HEC 3) would be reduced, but the summary impact rating would be medium, the same as Alternative 2.	Would there be a higher risk of respiratory problems for employees due to increased dust for Alternative 5A?				

Commenter	Section Number	Page	Original Language	Proposed Language or Comment	Initial Disposition	Comment Addressed Adequately for Draft EIS?	Disposition	Additional Review Comments
Chuathbaluk/ CSP2	3.24	3.24-61	Based on historical Crooked Creek discharge measurements in closest proximity to the confluence with Anaconda Creek (upstream of Crevice Creek), long-term average daily discharges seasonally range from approximately 100 cfs to 250 cfs. A maximum average daily discharge of 880 cfs was recorded in late August of 2006. The 2-year and 5-year flood magnitude for the Crooked Creek water shed is 783 cfs, and 1,284 cfs, respectively. With the exception of brief peak flood events, total discharge under this release scenario would likely be well within the range of historical flow conditions.	From BGC 2015n (August 12, 2015 memo), they note that the average monthly flow at the confluence of Crooked Creek and Anaconda is 0.6 to 4.6 cfs, depending on the month. This is much different than the 100-250 cfs quoted in the DEIS. The modeled flow of a water only or a tailings + water spill estimated flow rates of 600 cfs (again, restricted by pushing the material through a 33' diameter pipe). A more thorough analysis of the impact of scour and sediment deposition, particularly impact on changing the geomorphology of Anaconda and Crooked Creeks, impacts to gravel and the streambed, and impacts to aquatic resources is required in a thoughtful, quantitative manner rather than the generally qualitative discussions provided in the DEIS. Please see the Bristol Bay Watershed Assessment section 9.4 for an example of a thorough analysis of scour and deposition. This document also provides an example of a better way to inform the reader of potential impacts to several resources from a single possible event – together in one section rather than distributed out by "impact to soil, impact to surface water hydrology, impact to groundwater hydrology" etc – which makes it extremely difficult to follow the full impact of an event. I continue to emphasize the need to develop a scenario with a larger, more realistic release of material – and a thorough analysis of the impact.				
Chuathbaluk/ CSP2	3.24.6.13.1	3.24-152	(re a Water Release only scenario): The maximum flow rates of water would be approximately 4.0 percent of flow rates of the Kuskokwim River in the winter months (November to April),	Flow rates at Crooked Creek are closer to 1 cfs and a 600 cfs tailings water flow would be a much more significant impact on Anaconda Creek and Crooked Creek than has been discussed. No real analysis of stream bank incision and erosion/instability or scour of stream bed has been provided. Provide an analysis of scour of stream beds and banks for the Anaconda and Crooked Creeks, including lasting damage such as changes in stream geomorphology or bank instability and changes in stream bed make up (% gravel, % cobble, etc).				

Chuathbaluk/ CSP2	3.24.6.13.1	3.24-152 to 156		Discussion of impacts is qualitative. The discussion should tie directly back to baseline data on fish species and abundance in stream reaches (rather than "suggests few spawning redds", data on stream beds and banks (actual habitat used for spawning, rearing, and migration).				
Chuathbaluk/ CSP2	3.24.6.13.1	3.24-156	Depending on the physical and chemical nature of water quality effects from such releases, the intensity of impacts to overall fish production in Crooked Creek could range from medium to high, **would be local**, and could persist over several years.	A water only release, and water from the tails + water scenario, would move out of the mine footprint area. This means the geographical extent is **regional**.				
Chuathbaluk/ CSP2	3.24.5.9	Table 3.24-10	Duration of spill	How does changing the duration of the spill release affect the environmental impact? How were the 5 hr (water and tailings) and >48 hour (water only) time periods chosen?				
Chuathbaluk/ CSP2	3.24.5.9	Figure 3.24-2 and 3.24-3	Tailings and water spill	How is it that water from a 50% slurry would not continue to move down Crooked Creek even as tails settle at the confluence of Crooked and Anaconda? It does not make sense that the Inundation area (which would include water) would be exactly the same as the extent of the tailings deposition area. Rather, it seems that there would be a flood wave that would travel with and ahead of the tails, and continue downstream along Crooked Creek after the tails settled at the confluence. Related questions and comments are on individual lines below.				
				If there is no justification for ignoring the flood wave, then the speed of the wave and time/depth at Crooked Creek need to be provided				
				The environmental impacts of a flood wave need to be modeled, including stream scour and associated impacts to aquatic life.				
Chuathbaluk/ CSP2	3.24.5.9		Piping erosion scenario	Please confirm that the piping erosion failure occurred at the toe of the dam, which would have the highest head (most force) compared to a piping failure at mid-elevation or near the top of the dam (BGC 2015n and EPA Region 10, 2014, BBWA Box 9-4).				
Chuathbaluk/ CSP2	3.24.5.9.1	3.24-49	Should the release occur in the winter, the cone-shaped deposit of tailings could be excavated and transported back to the tailings facility, thereby limiting the impact…….. The tailings would be excavated and transported back to the TSF or other designated temporary storage area.	This is one of many aspects of a TSF dam failure that could be very different if the size of the tailings release is greater than the 0.5% modeled. If something like 10 million m3 of tailings is released, instead of 2 million m3 there could be an issue of where to put the excavated tails. They might not all be able to be returned to the TSF and remain below the dam break. "Other designated temporary storage area" is vague. A series of questions related to this comment are provided on separate lines below:				

				This continues to indicate the need to examine different sized TSF spills, perhaps at different stages of mine life (dam height/tailings volume). And the need to consider mitigation and remediation for a larger spill – what locations could be available to store the material?				
				How long would it take to get enough liner material from warehouses to location and get it installed in order to place tailings on a lined pad? Could liners be welded in winter, if the spill occurred in winter and lined storage was needed to place excavated tails?				
				If millions of cubic meters of material needed to be temporarily stored on a pad, would it be necessary to bring in non-reactive, non-leaching rock to create berms around the area, and would there be enough non-leaching waste rock to provide this, considering that rock would also need to be supplied to fix the dam breach and possibly also be placed on the dam slope to make it thicker (less steep slope).				
				Should the release be greater than the 2 million m3 modeled, tailings would flow down Crooked Creek. This could require a road to be built to reach the material to excavate it. The road itself would create additional environmental impacts.				
				Should the release be greater than 2 million m3, the duration of time during which tailings and/or water are released will be longer than the 5 hrs or 48 hrs modeled – how would this impact the environmental effects?				
Chuathbaluk/ CSP2	3.24.5.9.1	3.24-49	Should the release occur in the winter, the cone-shaped deposit of tailings could be excavated and transported back to the tailings facility, thereby limiting the impact…….. The tailings would be excavated and transported back to the TSF or other designated temporary storage area.	There is no discussion of how a spill would be addressed in spring or summer. Some questions related to this comment are provided on separate lines below:				
				What would be the impacts of disturbing Anaconda and Crooked Creek to remove tailings in spring or summer?				
				Would stream beds be permanently damaged by excavation equipment?				
				How would turbidity below excavation activity be reduced?				
				Where would excavated material be placed?				
				Where would excavated material be placed if 10 million m3 or 20 million m3 of material was released, instead of the 2 million m3 modeled?				
				How long would it take for liners to be positioned on site and welded before tailings could be placed on a lined, temporary facility?				
				If the temporary storage facility is not going to be lined, what are the expected impacts to surface water and groundwater as the uncovered material leaches?				

				Simply digging ditches around temporary storage areas may not be sufficient containment – would there be enough non-leaching rock to provide berms/ small dams?				
				Would monitoring wells be placed hydrologically downgradient of temporary storage facilities?				
Chuathbaluk/ CSP2	Table 3.24-10	3.24-49	0.6 hrs for spill to reach confluence of Anaconda and Crooked Creeks (1.6 miles)	What is the assumed speed of a water and tailings slurry release? 1.6 miles/0.6 hrs appears to be 2.7 mph. Please provide a justification. The spill in Stava Italy traveled at 37 mph, and this is the speed assumed in the EPA Region 10 Bristol Bay Watershed Assessment analysis of a potential dam failure. (BBWA, Chapter 9.1.1) The original reference for the Stave spill was ICOLD 2001: ICOLD (International Commission on Large Dams). 2001. *Tailings Dams, Risk of Dangerous Occurrences, Lessons Learnt from Practical Experiences*. United Nations Environmental Programme, Bulletin 121.				
Chuathbaluk/ CSP2	Table 3.24-10	3.24-49	Water and tailings spill, time to reach Crooked Creek/Kusko confluence	Although the model indicates that tailings (if 2 million m3 released) would stop at the confluence of Anaconda and Crooked Creeks, water would continue to flow to the Kusko. Please provide the estimated time of arrival, the speed water would be traveling (in mph, not cfs) and justification for the estimated speed.				
Chuathbaluk/ CSP2	Table 3.24-10	3.24-49	25 hours for water from a spill to move 13 miles to Crooked Creek	Please provide the assumed speed (as mph, not cfs) and the justification for it. If water actually moves at anything like 37 mph (ICOLD 2001), it would reach Crooked in less than half an hour. ICOLD (International Commission on Large Dams). 2001. *Tailings Dams, Risk of Dangerous Occurrences, Lessons Learnt from Practical Experiences*. United Nations Environmental Programme, Bulletin 121.				
Chuathbaluk/ CSP2	3.24.5.9		Size of TSF spill scenario	In 2014, Fort Knox developed a dam breach scenario and inundation map to examine what they would need for emergency response and evacuation. They considered a "dam break scenario coincident with the probable maximum flood" as a worst case scenario to understand the potential for inundation. This should be done at Donlin. Although the "worst case scenario" is not required in the EIS, it is required by the state of Alaska. (Kinross. 2014. Walter Creek Valley Fill Heap Leach Pad operations and maintenance manual, revision 5. Last 2 pages)				

Chuathbaluk DEIS Comments

Commenter	Section Number	Page	Original Language	Proposed Language or Comment	Initial Disposition	Comment Addressed Adequately for Draft EIS?	Disposition	Additional Review Comments
Chuathbaluk/ CSP2	3.27.1	3.27-1	Unavoidable impacts. Water quality: Atmospheric deposition of mercury could create high intensity impacts to surface water quality depending on watershed location. Fish: changes in habitat (including effects of wetland removal), direct habitat removal, stream flow and temperature changes, and sedimentation.	How is it possible to have high intensity impacts from mercury to surface water without impacting fish? There is no mention of mercury or chemical contamination as an unavoidable impact on fish.				
Chuathbaluk/ CSP2	3.27.1	3.27-1	Water quality	There is no mention of the unavoidable impacts of introduction of aquatic invasive plant and animal species – which will be extremely difficult to prevent				
Chuathbaluk/ CSP2	3.27.1	3.27-1	Cultural resources -- changes to cultural landscape of INHT at a scale that would not reduce the scenic quality rating class, impact to sites not eligible for the NRHP, and loss of integrity or destruction of sites eligible for the NHRP.	This sentence makes no sense. What are the unavoidable impacts to cultural resources? State this plainly.				
Chuathbaluk/ CSP2	3.27.1	3.27-1	Subsistence -- disturbance and displacement from subsistence use areas, potential for increased competition for resources, disturbance to subsistence fishing in narrow reaches of the Kuskokwim River, and potential or perceived contamination of waterfowl due to the tailings pond and pit lake.	…… ~~potential for~~ increased competition for resources, disturbance to subsistence fishing in narrow reaches of the Kuskokwim River, and potential or perceived contamination of waterfowl due to the tailings pond, **contact water ponds,** and pit lake.				
Chuathbaluk/ CSP2	3.27.1	3.27-1	The probability of spills of a magnitude that could adversely affect resources is low.	The probability of spills of a magnitude that could adversely affect resources is low **but the impact of a spill that size would be high and potentially permanent, depending on the material spilled and location.** Resources that could be adversely affected by spills include vegetation, fish, wildlife, water resources, subsistence harvest and uses, recreation, cultural resources, and the economy.				
Chuathbaluk/ CSP2	3.27.3	3.27-2	Annual revenues and taxes resulting from the mining activity would cease upon the conclusion of project operations. The loss of these economic benefits could have long-term impacts to the local and regional economy if they are not replaced with other resource development revenues.	If a mine does not go in, the economy will remain unchanged, it will not be a loss relative to what is present today. Resource development may not be the only option for revenue for local economies. The development of additional lands to further resource development after the closure of the mine could have long term environmental, social and cultural impacts and would not guarantee economic benefits.				

Chuathbaluk DEIS Comments

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Chuathbaluk/ CSP2	Appendix C	Table C-9	Per MS-53 option: Air transport of mercury is limited to 77 pounds per shipment and 76 pound containers are commercially available for elemental mercury. Donlin Gold estimates the mine would remove approximately 22,000 pounds per year of mercury from the gaseous waste streams. At 76 pounds per shipment, it would require 290 individual containers (packages) to transport this amount of mercury. This number of air shipments is not practical.	I called the National Hazmat Information Center (202-366-0386) and spoke with Eamon. You can reach them from 9-5 Eastern Time. They said there are federal regulations on the quantity of mercury PER PACKAGE to 35 kg, but that there is NO limit to the number of packages per airplane. The only limits would be those placed by the specific air carrier, not by federal regulations. The only other difference in shipping by air or "other" (vessel, rail, highway) is in the packaging requirements. Air requires the most robust packaging (49 CFR Section 173.164 Paragraph A), called "Packing Group 1". Transporting by "other means" requires less robust packing, Packing Group 3 (49 CFR Section 173.164 Paragraph D) The PHMSA Hazardous Materials Table, which outlines the quantity limits is at http://www.phmsa.dot.gov/portal/site/PHMSA/menuitem.6f23687cf7b00b0f22e4c6962d9c8789/?vgnextoid=d84ddf479bd7d110VgnVCM1000009ed07898RCRD&vgnextchannel=4f347fd9b896b110VgnVCM1000009ed07898RCRD				
Chuathbaluk/ CSP2	Appendix C	Table C-10	MS-71. Secondary dam, downstream of TSF as a means of capturing spilled material……..Eliminated because it would create a larger footprint and greater environmental impact, and collect more precipitation.	Viewing Figure 2.3-1, it appears that there could be room to place a secondary dam in the Anaconda Valley below the main TSF if the overburden stockpile was moved. If such a facility were built to hold something the size of the modeled 2 million m3 tailings release (argued to be improbable by Donlin and too small by some agencies), a 100' dam less than 950' on each side would be sufficient. It could be designed with a spillway and other methods to allow captured water to be released. Such an area could also serve as another way to diversify water management and as emergency storage for TSF pond water if needed. What is not clear from the Figure 2.3-1 is whether the topography would be amenable to building a secondary dam. It could be worthwhile to cost out this option and then keep or eliminate it after reviewing the cost. Although the TSF dam is to be built with a good design, there is always the potential for human error in the future, or the need for cost cutting measures that would result in later dam lifts being less robust than planned. A secondary dam would provide some measure of environmental security against future cost cutting measures.				

Chuathbaluk DEIS Comments

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Chuathbaluk/ CSP2	Appendix H	Table H-5	Pore water quality for NAG and PAG portions of WRF during operations	The source for this table is SRK 2007, presumably based on HCT data. This table should reflect updated HCT information from 2011 (SRK 2011 ML and ARD update report Feb 2011) or 2015 (DEIS Appendix S notes that data is available from SRK as recently as a February 2015 report)				
Chuathbaluk/ CSP2	Appendix H	Table H-5		The DEIS Appendix H (Geochemistry) uses the SRK 2007 data to describe the WRF drainage (Table H-5 Operations) rather than the updated 2012 or 2015 data. This may mis-represent WRF seepage water quality during operations.				
Chuathbaluk/ CSP2	Appendix H	Table H-11	Reference for the table is Lorax 2015 Table 2-1	In Lorax 2015, table 2-1 references source documents SRK Feb 4 2015, SRK April 2015 and Hatch May 2015. Please make SRK Feb 4 2015 report of HCT data available.				
Chuathbaluk/ CSP2	Appendix H	Table H-11	Reference for the table is Lorax 2015 Table 2-1	With regards to pit lake water quality (Appendix H, Table H-11), the citation for the table is Lorax 2015 but it is not clear whether the information is derived from HCTs (a February 4 2015 SRK document cited in Lorax 2015 but not found in the DEIS references) or from field barrel tests (SRK 2015c). The Lorax 2015 Table 2-1 and DEIS Table H-11 are the same table and both say NAG and PAG seepage are from humidity cell tests (HCT), but the reference is a field barrel report. If field barrel tests were used to develop the table, we do not know how those results compare to HCTs; if the updated HCT data was used, we don't know if they are the same columns that were continued into 2015, as no data after 2013 is provided. **Clarify whether humidity cell tests or field barrel tests were used as input terms for waste rock seepage to the pit lake, and provide the reason** why.				

Chuathbaluk/ CSP2	Appendix H			The source terms for "major inflows" to the pit lake were the 75th percentile of well mixed NAG in year 2036 and 75th percentile of poorly mixed PAG in year 2050. It is not clear what this represents. If the mine starts in year 2020 and goes for 27 years before closure, 2036 is actually during operations and 2050 is just a few years into starting to fill the lake – TSF will only be 2-3 years into an estimated 52 years of draindown. If we assume year 2024 (PAG) or 2027 (NAG) is meant to represent Year 0 of filling the pit, therefore 2036 would be 9 years in and 2050 would be 26 years in. The water quality summaries for Year 0 ("initial pit lake"), Year 2- 52 ("filling"), Year 53 ("full"), and Year 99 are provided in Arcadis 2013 but not in the Lorax 2015 or ERM 2015 documents. This is a better way to represent water quality. **Provide pit lake source terms in a clear manner based on "pit lake year"**				

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Chuathbaluk/ CSP2	Appendix J	4	Looking ahead to 2016, Donlin Gold will reduce the study area of the 2014 PJD to the proposed project described in the final permit application, and update the wetlands data within this study area to reflect the 2007 ARS. Additional field work will be required to complete this task, which will result in the submission of an updated PJD towards the 4th quarter of 2016. Subsequently, Donlin Gold **will update the permit application to a final permit application.**	How can environmental impacts be described or adequately commented on without the final information? The public must be provided with an opportunity to comment on wetland delineation methods, wetland impacts and mitigation. **The DEIS may be incomplete without the full 404 analysis.**				
Chuathbaluk/ CSP2	Appendix J	6	Tables 22.1A, 22.1B "expected material site impacts for FSA and PSA" **will be updated with final permit application.**	How can environmental impacts be described or adequately commented on without the final information? The public must be provided with an opportunity to comment on wetland delineation methods, wetland impacts and mitigation.				
Chuathbaluk/ CSP2	Appendix J	7	Tables 22.3, 22.5, 22.6 "are no longer accurate…..revised summary tables **will be developed following revision of the Functional Assessment"**	How can environmental impacts be described or adequately commented on without the final information? The public must be provided with an opportunity to comment on wetland delineation methods, wetland impacts and mitigation. **The DEIS may be incomplete without the full 404 analysis.**				

Commenter	Section Number	Page	Original Language	Proposed Language or Comment	Initial Disposition	Comment Addressed Adequately for Draft EIS?	Disposition	Additional Review Comments
Chuathbaluk/ CSP2	Appendix M	Ii	A final compensatory Mitigation Plan will be developed as the 404 evaluation and permitting process progresses.	How can environmental impacts be described or adequately commented on without the final information? The public must be provided with an opportunity to comment on wetland wetland impacts and mitigation. **The DEIS may be incomplete without the final Mitigation Plan.**				

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Chuathbaluk/ CSP2	Appendix S – Memo "Addendum to ERA…"	1	This scenario is referred as Advanced Water Treatment (AWT). As a consequence of the AWT, the surface water quality predictions were revised (Lorax 2015). The updated surface water quality predictions for year 99 shows that two additional constituents, aluminum and copper, are predicted to occur in concentrations above ecological water quality criteria.	The 6 page memo is not sufficient for us to determine whether the ERA was conducted in an adequate manner, and the Lorax 2015 paper upon which the pit lake water quality was based is unavailable. We are unable to see how the analysis in 2015 differed from the 2012 analysis of ecological risk.				
Chuathbaluk/ CSP2	Appendix S	2013 ERA Ex Sum, no page number	Predicted concentrations of mercury were less than this screening level and were therefore not evaluated further for purposes of this ERA. A more detailed, comprehensive evaluation of mercury effects associated with the proposed project, however**, is being completed separately.**	Is this "comprehensive evaluation" included in the DEIS or in other public documents? The public needs access to the detailed evaluation to ensure all sources (tailings pond draindown, tailings pore water draindown, pit wall sloughing, waste rock leachate, etc) are included in the model, and that an appropriate timeline(s) has (have) been selected. There are different timelines of interest in pit lake evolution. 1) During or just after tailings facility draindown when TSF water may make up a significant part of the water quality 2) After pit lake has reached its maximum height but before pit lake overturn and 3) Since the pit lake water is expected to worsen as the pycnocline gets shallower, ecological risk assessments should be conducted after a pit lake overturn.				
Chuathbaluk/ CSP2	Appendix S	Table 4-3	Reference for antimony TRV is actually a study on lead, and also does not use ducks as the receptor: Damron, B.L. and H.R. Wilson. 1975. Lead toxicity of Bobwhite Quail. Bulletin of Environmental Contamination and Toxicology 14:489-496/	Recommend using a study on effects of antimony on waterfowl				

Topic specific comments

Ecological risk from dust deposition – 3.12 (wildlife), 3.2 (soils), 3.10 (vegetation).

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Chuathbaluk/ CSP2	3.10.3.2.1 And 3.2.3.2.4	3.10-50 And Table 3.2-13	Impacts of dust on vegetation (related to Section 3.2 Impacts of dust accumulation on soil)	Arsenic is toxic to plants and can cause seeds, leaves, and roots to die. (Eisler 2004. Arsenic hazards to humans, plants, and animals from gold mining. Rev Env Contam Toxicol 180: 133-165) Although the amount of arsenic in the upper layer of soil is only expected to increase about 5% during mine life, how will potential impacts to vegetation be monitored and assessed? Will there be monitoring of changes in plant communities?				
Chuathbaluk/ CSP2	3.12.2.2	Table 3.12-4	The selected LOECs are the lowest of LOECs protective of plants, soil, invertebrates, birds, and mammals.	Not enough information is provided here, and the link in the citation (LANL 2014) in the References chapter does not work. The table suggests that flora and fauna in the region are not sensitive to arsenic and mercury – given that baseline soil is already much higher than LOEC. However, the baseline is provided as a mean and without regard to how soil chemistry changes at different parts of the mine site. The timing of high concentrations is likely more important than the mean.				

Chuathbaluk/ CSP2	3.12.2.2 And 3.2.3.2.4	Table 3.12-4 And Figure 3.2-12	Mean concentrations in baseline soil also are compared to LOECs.	Although the mean is predicted to only increase incrementally, some areas may experience significant changes while others experience very few or no change. The mean is less important than the change in specific areas. A map of baseline soil arsenic and the expected increase in soil arsenic – similar to Figure 3.2-12 for mercury – should be provided in the soils chapter and referred to in section 3.12.2.2. We should be provided with information on the range and mean of arsenic and antimony in soils of specific areas, and then the expected increase due to dust in those areas. An addition of 10 mg/kg of arsenic in dust in an area that has 170 mg/kg in soil already may not have much effect, but if applied to an area that is only 10 mg/kg baseline, it could push soil from safe to phytotoxic (Eisler 2000. Arsenic. In Handbook of Chemical Risk Assessment, vol 3 pp 1501-1566).				

Chuathbaluk/ CSP2	3.12.2.2 , 3.12.3.2.2, and Appendix S	Table 3.12-4, App S Table 4-3	Choice of receptors for pit lake – and potential toxicity due to dust	Several mammals were chosen as potential receptors to examine ecological risk of the pit lake (including water and sediment) – but none were potential analogs for moose or caribou. As moose and caribou are unlikely to spend time at the pit lake, this is reasonable. However, they could be exposed to arsenic and antimony in dust. Tables in Eisler 2004 suggest animals like horse and cow (analogs for moose/ caribou?) may be more sensitive to arsenic than dogs (analog for wolf?). (Eisler 2004. Arsenic hazards to humans, plants, and animals from gold mining. Rev Env Contam Toxicol 180: 133-165). This brings into question **whether the best receptors were chosen to look at ecological risk** (App S Table 4-3). The chapter on wildlife (Section 3.12.3.2.2) states there is no risk to wildlife from dust, referencing section 3.12.2.2. However, while Appendix S (Arcadis 2013) specifically lays out what receptors they chose, the LOAEL and NOAEL for those receptors with references, and a clear method – none of this is provided for the potential risk of dust (Table 3.12-4, section 3.12.2.2). **The risk of ecological toxicity from arsenic and antimony in dust needs to be clearly provided, including receptors, toxicity values with references, and method.** Basing a conclusion that there is no ecological risk because the average soil concentrations over the entire area will increase minimally is not sufficient. Particularly when the baseline soil is provided as 169 mg/kg (As) and 11 mg/kg (Sb) (Table 3.12-4)– much higher than the baselines provided when assessing pit lake ecotoxicology risk.				
Chuathbaluk/ CSP2	3.12.2.2 and Appendix S	Table 3.12-4, App S Table 4-3	Greater than NOAEL-HQ of 1 for arsenic and antimony for voles and mallards	Given the potential risk to wildlife and birds, a program to monitor hair and feathers – where arsenic can concentrate – should be a required part of mitigation. There appears to be little to no data on arsenic toxicity to moose/caribou, therefore they should be included in hair monitoring.				

Chuathbaluk/ CSP2	Appendix S and Chapter 3.2.34.2.4	Appendix S Table 5-3 and Chapter 3.2 Table 3.2-13	Arsenic in soil (baseline) = 10.35 mg/kg Arsenic in soil (baseline) = mean of 78.8 mg/kg and 95% UCL of 169 mg/kg	When evaluating the ecological risk of the pit lake (sediment/littoral zone) to wildlife, a soil concentration of 10.35 mg/kg was used for arsenic, 1.09 for antimony. (Appendix S table 5.-3, no page number) When the potential for dust to impact wildlife was considered, much higher levels (79 to 169 mg/kg as means for arsenic, 5 to 11 mg/kg as means for antimony) were given as the baseline – which led to the conclusion that the increase in arsenic and antimony in soil, from dust settling, would be a small increase (<1% to 5%) and therefore not an ecological risk. The baseline concentrations of arsenic and antimony in soil need to be reconciled, and these two areas of potential risk – from fugitive dust and from sediment in the pit lake – need to be reconsidered.				

Chuathbaluk DEIS Comments

Pit lake ecotoxicology – risk to birds. DEIS Section 3.12.2.1.1., Appendix S (=Arcadis 2013 ERA) [did they accurately evaluate the chemical ecotox risks? Are birds at more risk than shown in DEIS? I could not independently confirm the NOAEL, LOAEL, or "time to chronic or acute exposure". After going through Wildlife Tox and EPA docs, it looks as if they correctly assessed that the pit lake (if looking at individual trace element harm based on lab studies) will not be toxic. Also, the

What was not done – did not look at tox of CN at TSF pond (relevant to an early closure scenario); did not look at overturned (well mixed) pit lake – which WILL occur (find the section of Appendix H where this is stated)

Commenter	Section Number	Page	Original Language	Proposed Language or Comment	Initial Disposition	Comment Addressed Adequately for Draft EIS?	Disposition	Additional Review Comments
Chuathbaluk/ CSP2	3.12.2.1	3.12-6	The ARCADIS ERA (2013b) focused only on the risk of exposure from the pit lake after closure. An addendum prepared in August 2015 assessed the potential risk of exposure to mine-related water sources (Tailings Storage Facility [TSF], Contact Water Dam [CWD] Ponds) available during operations ERM 2015).	The ERM 2015 document, only 6 pages long, focuses on the pit lake under an AWT scenario– not on the TSF pond or CWD pond during operations. From the ERM 2015 introduction: "The purpose of this memorandum is to provide an addendum to the 2013 ERA with an analysis of the potential risk to wildlife from exposure to aluminum and copper constituents in the proposed pit lake at year 99." All references to ERM 2015 as a document that assesses risks to birds from the TSF pond and contact water ponds need to be removed. **There is no assessment of the elevated cyanide in the tailings pond.** **There is no discussion of potential impacts at the TSF or CWD if there is temporary closure.**				
Chuathbaluk/ CSP2	3.12.2.1	3.12-10	The mallard is not at risk in the TSF	The "streamlined ERA" has no background report. It states that the formula used for the pit lake was applied to the TSF pond (for mallards) for Al, Sb, As, Cu, and Se. The upper layers of the pit lake are expected to have worse water than the TSF pond, with the exception of sulfate and cyanide. We do not know what the concentration of CN will be at the pit lake. We do know the expected concentrations at the TSF pond. **The TSF pond risk for toxicity due to cyanide needs to be assessed. Particularly in the context of risks if there is a temporary closure.**				
Chuathbaluk/ CSP2	3.12.2.1	3.12-10	The mallard is not at risk in the TSF	If there is a temporary closure, could mallards, voles, and other wildlife be at risk from the tailings beach? Could a littoral zone or vegetation develop near the beach and pond water as an attractant? Would ingestion of beach sediment be a risk?				

Chuathbaluk/ CSP2	3.12.2.1	3.12-10	The mallard is not at risk in the TSF	If there is a temporary closure, could mallards, voles, and other wildlife be at risk from the tailings beach? Would ingestion of beach sediment be a risk?				
Chuathbaluk/ CSP2	3.12.2.1	3.12-5 to 3.12-13	Data gap in the Wildlife "Attraction to mine site open areas" section: The pit lake water accumulation was defined in two stages after closure: filling stage (Year 2-52) and mature stage, after the lake was filled to capacity (Year 53 and beyond).	Source document Lorax 2015 notes "However, because the pit lake is predicted to be stratified, the poorest quality waters remain largely isolated from surface waters. " However, the pit lake **will turn over** (DEIS Appendix H) bringing the worst quality water to the surface. There is no assessment of the risks of the pit lake under an overturn scenario. **An ecological risk assessment should be done for a turnover state**. The DEIS pit lake ecotox risk section should include a discussion of the conditions that could cause the pit lake to remain mixed or re-stratify and the range of length of time poor water could be at the surface.				
Chuathbaluk/ CSP2	3.12.2.1	3.12-5 to 3.12-13	Data gap in the Wildlife "Attraction to mine site open areas" section	There is no assessment of the risks of the pit lake under any scenario (operating, pit filling, mature pit, pit lake 100 years post closure) if the Dry Stack Tailings scenario is chosen.				
Chuathbaluk/ CSP2	3.12.2.1	3.12-5 to 3.12-13	Data gap in the Wildlife "Attraction to mine site open areas" section	There is no assessment of the risks of the pit lake if the WRF is poorly mixed, which would result in significantly worse water quality. How will mixing be monitored to determine whether waste rock is well mixed? If it is poorly mixed in the first 2-5 years of mine life, how long would it take for the decline in water quality to show up in monitoring wells or the contact water ponds? How would that be mitigated to reduce the ecological risks due to pit lake water quality becoming worse than predicted?				
Chuathbaluk/ CSP2	3.12.2.1	3.12-5 to 3.12-13	Data gap in the Wildlife "Attraction to mine site open areas" section	If poor mixing occurred only in the last 2-5 years of mine life, would the decline in water quality show up before mine closure? How would it be mitigated, if poor mixing occurred only in the later years of mine life, to reduce the ecological risks of the pit lake?				

Chuathbaluk/ CSP2	3.12.2.1.1	3.12-8	Several conservative exposure assumptions were used including: use of maximum estimated COPC concentrations in surface water and sediment; 100 percent bioavailability of metals in the ingested water, sediment, and food; and that wildlife are exposed exclusively, year-round (i.e.,100 percent of the time), to water in the pit lake.	The pit lake water quality geochem models by Lorax included source terms for snow/ice on the surface of the pit lake. This would make the pit lake inaccessible to wildlife for virtually all of the months that migratory birds would be out of the area. Explain how the ecological risk assessment assumed wildlife presence 100% of the year when the pit lake model assumed the lake was covered for several months out of the year? Did the model only look at snow/ice as an input of freshwater – and not as a barrier to exposure?				
Chuathbaluk/ CSP2	3.12.2.1.3	3.12-11	Estimated concentrations of metals (milligrams per liter [mg/L], dissolved) in the TSF used in the risk calculations were taken from Table H-6 for the Lower CWD Pond and H-7 for the Upper CWD Pond (See Appendix H).	The Lower CWD water quality is very much influenced by how well waste rock is mixed. Table H-6 shows potentially very different water quality at different years based on different mixing. Table H-7 also varies. Specifically which concentrations of Al, Sb, As, Cu, and Se were used?				
Chuathbaluk/ CSP2	3.12.2.1.3	3.12-10 to -11	HQs for the CWD ponds were estimated for the five metals (aluminum, antimony, arsenic, copper, and selenium) that were identified as COPCs in the first ERA	The first ERA (Arcadis 2013) only looked at COPCs for the pit lake; it did not identify ones for the CWD. The lower CWD is also expected to exceed AWQC for Cd, Pb, Mn, Mo, Zn, and Hg. If we assume that the authors of the "streamlined ERA" used the 50th or 95th percentiles of the "Water Treatment Design basis" (Appendix H, Table H-6), mercury is expected to be significantly higher in the Lower CWD than in the pit lake (130-150 ng/L vs 35 ng/L in pit lake)				
Chuathbaluk/ CSP2	3.12.2.1.3	3.12-10 to -11	Method for assessing risk at Lower Contact Water pond	Presumably this method uses the 50th or 95th percentile of the "water treatment design basis". While determining the 50th and 95th percentiles would be appropriate for designing a water treatment plant, an ecological risk assessment should provide a range of risks that would include poorly mixed PAG (Table H-6 Appendix H), which has significantly worse water quality. The Lower Contact Water pond could represent a significant ecological risk if there is a temporary closure; with low activity on site, the pond could be a greater attractant.				

Chuathbaluk/ CSP2	3.12.5.2	3.12-145	Based on the calculations and discussion of exposure in the ERA, no birds would be expected to be at risk from ingestion of water during the filling stage of the pit lake or from ingestion of surface water, sediment, or food from the mature pit lake.	This is not accurate				
Chuathbaluk/ CSP2	Appendix S	Table 1	BAF: sediment to aquatic invertebrate or sediment to aquatic plant	Why is there no BAF listed for water to bird or insect to bird?				
Chuathbaluk/ CSP2	Appendix S	15	Non-nutritive chemicals were compared to State of Alaska aquatic life chronic criteria for freshwater organisms (ADEC 2008c)…… Sources of screening levels were consulted in the following order: 1) USEPA chronic criteria for freshwater aquatic life,	The pit lake will have around 3,800 mg/L of sulfate as it is initially filling. This makes it essentially saltwater. Water quality criteria for marine life should be used instead of freshwater for the pit filling stage. This is particularly important for arsenic, which is toxic at much lower levels in saltwater than in fresh. Water may be less toxic for other contaminants at this stage. The "marine" conditions will also likely apply during pit lake turnover.				
Chuathbaluk/ CSP2	Appendix S	22	This included screening the toxicity databases for studies that assessed chronic exposure of physiologically similar species and measured endpoints consistent with the objectives and goals of this ERA, which are to protect reproduction, growth and development in wildlife.	Why was cancer not used as a toxicological endpoint?				
Chuathbaluk/ CSP2	Appendix S	23, 25	Acute studies were excluded from the database since these studies do not assess long-term effects on animals……Acute studies were not considered appropriate for TRV derivation.	If contaminant concentrations are in the range that could cause acute toxicity, this should be included in the analysis. Why were they not included?				

Chuathbaluk DEIS Comments

Tailings facility risks. Our goal in providing comments on this topic are to ensure that the wet slurry (Alternative 2) and dry stack (Alternative 5) options are evenly compared, and that the environmental and social risks of a tailings facility failure are adequately described. In these comments, we do not advocate for a specific alternative.

A meeting, without cooperating agencies, was held in January 2015 to discuss "Failure Mode Effects Analysis" (FMEA, different ways a tailings facility could fail). At this meeting, 49 different failure scenarios were listed, and 13 that were "Possible" or "unlikely" (but not "very unlikely") and had consequences that were "Moderate", "Major", or "Critical" were moved forward for analysis. Two of these scenarios were provided in the DEIS. In general, it was a thoughtful process, however we believe some issues were ignored or underplayed including – the risk for dam failure due to slope instability (listed in the FMEA but not pursued for risk analysis), no analysis of an actual breach in the dam, no analysis of a "flood wave" preceding tailings, the choice of a very small volume of tailings released, and the speed with which tailings and water traveled. The analysis of the impacts on fish and aquatic life are descriptive but qualitative. There is no discussion that pulls in the data on streambed composition or riverbank vegetation to discuss how that is likely to change (specifically, eg xx% gravel suitable for spawning will be buried under tailings or fines are expected to move xx miles downstream if tailings spill occurs in the summer, based on xx cfs flows, accompanied by maps of fish habitat and spawning areas).

A key aspect of the TSF spill scenarios is the arbitrarily chosen size of the spill. This size results in tailings reaching, but not moving more than ½ mile up/downstream of, Crooked Creek at the confluence with Anaconda Creek. If a larger spill were modeled, many impacts not discussed would be relevant: incision of the Crooked Creek channel and resulting bank instability and stream geomorphology changes, impacts of fines in spawning gravel, physical barriers to other tributaries (e.g. Bell, Getmuna, Crevice, etc), and more. We feel this is important enough that the FEIS must include an analysis of a larger spill.

Chuathbaluk/ CSP2			Tailings facility risks					
Chuathbaluk/ CSP2	2.3.2.1.8 and 3.24.3.5.2	2-30 and 3.24-31	[TSF dam size] Constructed in phases, the height of the tailings dam at completion would be 464 feet. Downstream tailings dams like that proposed for this project are less likely to fail compared to centerline or upstream designs (Chambers and Higman 2011). Based on International Commission on Large Dams (ICOLD) statistical data for dam failure, HydroCoop (2013) noted that far fewer failures have occurred worldwide for rockfill dams as compared to earthfill dams. In a benchmarking study of B.C. tailings dam failure frequency, IEEIRP (2015) noted that there were no failures of rockfill dams out of 525 dam-years of active operation for U.S. water dams.	The highest part of the TSF dam is proposed to be 464' high, making it one of the highest TSF dams in the world. How many tailings dams, in particular rock-filled tailings dams, are currently this high? **The dam design should be vetted by an independent tailings dam review board, which should continue to track the progress of the dam lifts constructions through the life of the mine.** BGC, which is designing the Donlin dam, had this statement in a review of the Casino project in the Yukon: "Conventional design procedures and assumptions based on empirical knowledge cannot be relied upon with the same degree of confidence as is normally used in smaller dams that are within the state of the practice." (BGC Engineering. 2014. Report to Little Salmon Carmacks First Nation on Casino Project, Geotechnical and Hydrological Review of Tailing Management Facility and Heap Leach Facility Design, 36p)				

Chuathbaluk/ CSP2	2.3.6.1	2-161`	There is no precedent in current mining operations for using the dry stack tailings method at this production rate.	I would like to note that there is ALSO little to no precedent for a 464' high rock filled tailings dam. Although both may be unprecedented, there seems to be a rosy assumption that the dam will be fine and alternatively that the DSTF is an "unprecedented risk". There should be a better write up that notes that no matter which tailings facility is chosen, TSF or DSTF, it will have unprecedented components that introduce risk.				
Chuathbaluk/ CSP2	3.24.5.9, FMEA source documents		TSF dam failure scenarios chosen for analysis	In the April 2015 FMEA Tailings spill meeting, Scenario 48 "Degradation of rockfill leads to slope failure of the dam face" was categorized as "Very Unlikely" with major consequences and moderate risk. What justification is there for the "Very Unlikely" categorization of likelihood? Slope instability is the highest causes of failures (EPA Region 10, 2014, Bristol Bay Watershed Assessment, Chapter 9, Table 9-1). How could a slope failure have different impacts or remediation compared with the two scenarios provided in the DSEIS? What mitigation is provided to ensure slope failure does not occur?				
Chuathbaluk/ CSP2	3.24.5.9, FMEA source documents		TSF dam failure scenarios chosen for analysis	"overtopping" is listed as the second biggest cause of tailings facility failures (EPA Region 10, 2014, Bristol Bay Watershed Assessment, Chapter 9, Table 9-1), and the FMEA considered several overtopping scenarios, but did not move them forward to analysis in the DEIS. Was it assumed that the results (environmental and social impacts) would be the same as the "water only" release scenario that was provided in the DEIS?				
Chuathbaluk/ CSP2	3.24.5.9, BGC 2015n		Tailings dam failure model	In the reference BGC 2015n, the document explains that the model used was the FLO-2D FEMA 2D hydrologic model "developed for muddy flows over complex terrain." The Bristol Bay Watershed Assessment used the Army Corps of Engineers HEC-RAS (hydrologic engineering center's river analysis system) to model a possible spill at the proposed Pebble mine. What are the advantages and disadvantages of FLO-2D compared to HEC-RAS?				

Chuathbaluk/ CSP2	BGC 2011 relevant to 2.3.2.1.8 and 3.7.3.6.1	3.7-192	Ice rich soils will be excavated so that the dam foundation will be on bedrock. And The dry stack tailings would be placed on existing overburden material following removal of ice-rich or saturated overburden.	Provide details of storage of frozen material unsuitable for use in construction.				
Chuathbaluk/ CSP2	BGC 2015 relevant to 3.24.5.9		Source information for the Tailings spill analysis includes BGC June 12 2015, 20 page memo from BGC to Donlin Gold (RFAI 62), in which an assumption was made that the "progression of the partial breach from a piping failure was omitted".	Why was this omitted, and how would it impact the volume spilled and environmental impacts if a breach occurred? It should be noted that "slope instability", which would cause a breach, is one of the biggest reasons for tailings dam failures.				
Chuathbaluk/ CSP2	BGC 2015 relevant to 3.24.5.9		Source information for the Tailings spill analysis includes BGC June 12 2015, 20 page memo from BGC to Donlin Gold (RFAI 62), in which an assumption was made that "rock fill material in the underdrain is eroded at the exit of the underdrain due to high hydraulic pressure"	How would erosion in this part of the dam affect dam slope stability?				
Chuathbaluk/ CSP2	BGC 2015 relevant to 3.24.5.9	Choice of volume of tailings spill	Source information for the Tailings spill analysis includes BGC 2015n (Aug 12 2015 memo), which notes that: "The maximum pipe size (33' diameter) was estimated based on the released volume requested by AECOM…" (memo section 5.1) And "A volume of 1,620 acre-ft of tailings and process-affected water released in the spill scenarios requested by AECOM was chosen by the participants of the early stage FMEA. There is no technical basis for this volume, rather it was considered as representative of a significant release consistent with that described in the FMEA." (memo section 1)	The pipe diameter is the critical component controlling rate of water and tailings + water release and apparently also controls the volume released. There was no discussion in the memo or in the FMEA that justified the choice of volume and pipe diameter, and there are several references that suggest a release of 20% of tailings is a more realistic failure volume. Convince me that scenario authors did not choose a size of tailings that would only reach just to Crooked Creek and "walk it back" to see what size of spill that would be. Authors need to include a 20% tailings spill release analysis, or provide much better justification for the current 2 million m3 volume (0.5% of the end of mine life volume of 412 million m3 tails)				

Chuathbaluk/ CSP2	3.24.6.2.1	3.24-58	would cause significant impacts to undisturbed soils located downstream of the TSF dam toe,	The analysis of the impact of a spill on soils does not expand much more than this statement. Authors need to provide much greater detail. Will Anaconda and/or Crooked Creek experience deep incision and subsequent bank instability? Will their geomorphology change? What is the make up of the stream beds (% silt, % sand, % gravel, % cobble) and how will that be changed after a spill? Will the original stream bed be flushed out and replaced with tails? Will interstitial gravel be clogged with fines? Assuming tails are removed as best as possible, what will the final stream bed make up look like? The State of Alaska requires that accumulation of fines be "less than 5% above natural background, with a maximum of 30% in waters used by fish for spawning" (ADEC 2011. Water Quality Standards. Report 18–AAC–70.) There is no discussion of this, and in particular whether the entire stream bottom would need to be removed and replaced to prevent a substantial amount of tailings fines to remain.				