# Proposed KSM Mine Project: Responses to Federal Comments Provided during Screening of the Environmental Impact Statement (EIS)(May 2013)

| Section is EIS guidelines | Title (IN EIS GUIDELINES) | Descriptive Summary (Information Requirement) | Section of EIS | Department | Comments (missing or incomplete information) | Seabridge Response | EAO Conclusion |
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| 11.7.6 | Assessment of Potential Effects | Flow changes from water management and diversions | 15.7.5.1.3 | DFO | The potential for flow related effects on fish in the fish bearing portion of Sulphurets Creek should be considered in the EIS. | The following sections have been added to Chapter 15 of the Final EIS to address the comment:<br>**15.7.5.1.8 Fish Habitat Loss and Alteration due to Mine Site Infrastructure and Water Management - Sulphurets Creek**<br><u>Hydrology</u><br>Potential changes in stream flow in the lower fish bearing reach of Sulphurets Creek (downstream of the cascade) due to mine site development were assessed quantitatively. Changes in monthly discharge of Sulphurets Creek, during mine construction, operation, and closure (years 0 to 10, 11 to 25, 26 to 30, 31 to 50, 51 to 56, and greater than 56) were predicted by the calibrated groundwater/discharge model at Site SC3 (lower fish bearing reach of Sulphurets Creek) under baseline conditions.<br>Hydrometric stations in Sulphurets Creek were used to calculate the mean annual discharge (MAD) and mean monthly discharge (MMD). The annual flows at different phases of development of the Project were calculated based on the water management simulations. A comparison of predicted discharges in Sulphurets Creek indicates that MAD will be increased and decreased by less than 1.0% during mine site development, except for years 51.5-56 (Table 15.7-35). During years 51.5 to 56, the pits will fill with water; as a result annual discharge in the lower fish bearing reach of Sulphurets Creek will be reduced by 8.2%. The infilling rate could be moderated to accomodate effects on fish and fish habitat.<br>Table 15.7-36 presents baseline MMDs and instream threshold monthly discharges for Sulphurets Creek. In all months, except between June and September, the BC instream flow threshold guidelines exceed baseline MMDs. Therefore, according to the threshold guidelines, water reductions would be acceptable only between June and September. However, the small variations in monthly discharge fall within baseline natural variability in Sulphurets Creek during the short temporal water quantity loss period of Years 51.5 to 56. Furthermore, baseline fish and fish habitat data indicate that Dolly Varden fish populations residing in the lower reach of Sulphurets Creek is marginal due to low catch-per-unit-effort compared to other surrounding waterbodies, naturally poor water quality, high sediment loads, high velocity, and low amount of cover for fish. Based upon this analysis, effects on fish and fish habitat are not expected. Therefore, the low flow variations in Sulphurets Creek will not require an authorization under the federal *Fisheries Act* to permit the destruction or disruption of fish habitat (See new Tables 15.7-36 and 15.7-37; Table 15.8-6; Table 15.9-7).<br>**15.7.5.2.8 Fish Habitat Loss and Alteration due to Mine Site Infrastructure and Water Management - Sulphurets Creek**<br>Project activities including development of the pits and RSFs will alter water management within the Sulphurets Creek watershed. Fish habitat changes in Sulphurets Creek due to mine site water management will be negligible. The extent of changes in water discharge volumes is summarized in Section 15.7.5.1, and an authorization under the Fisheries Act (1985) will not be required. | . Reasonable treatment. |
| 11.7.6 | Assessment of Potential Effects | Mortality (includes fishing) | 15.7.1 | DFO | The direct mortality section should be expanded to consider the potential for stranding of fish due to water quantity loss and the entrapment or impingement of fish during water withdrawals. | For all intents and purposes there will be no water withdrawals. The following section of Chapter 15 of the final EIS will be updated to address the comment:<br>**15.6.2 Overview of Effect Types**<br>Direct mortality of fish can occur due to fishing (increased access resulting in higher fishing pressure), construction machinery impacts, dewatering during construction, salvage and relocation of fish to other waterbodies during TMF construction, and fish stranding during water quantity reductions.<br>**15.7.1.1 Effect of Direct Mortality**<br>Potential causes of direct mortality to fish include construction equipment crossing streams for access road and transmission line right-of-way clearing if crossing structures are not used, dewatering activities for construction, accidents during bridge and culvert construction, salvage and relocation of fish to other waterbodies during TMF construction, fish stranding during water quantity reductions, and associated rock blasting for roads close to watercourses. Effects from direct mortality are expected to be low due to proposed mitigation measures (see 15.7.1.2). | . Reasonable treatment. |



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| | | | | | | **15.7.1.2 Mitigation for Direct Mortality**<br>To mitigate direct mortality effects within fish-bearing streams, construction activities will be done in accordance with the Land Development Guidelines for the Protection of Aquatic Habitat (DFO 1993), the Standards and Best Practices for Instream Works (BC MWLAP 2004), and DFO's operational statements for temporary ford stream crossings (DFO 2010). Appropriate fisheries operating windows for fish-bearing streams will be adhered to where possible. Mitigation strategies include isolating Project work sites to prevent fish movement into the work site, salvage/removal of fish from the enclosed work site, and environmental monitoring. If fording is required, it will occur only if an existing crossing at another location is not available or practical to use. During TMF development, water flow will be reduced at a gradual rate so fish are not stranded downstream. It is anticipated that there will be in-water work within fish-bearing streams associated with stream crossings and TMF dam construction within South Teigen and North Treaty creeks.<br>**15.7.5.2.2 Fish Habitat Loss and Alteration due to Project Infrastructure – Tailing Management Facility Development**<br>Fish habitat loss within the TMF is unavoidable. The extent of fish habitat loss is summarized in Section 15.7.5.1. Prior to TMF construction, an intensive fish salvage program will be implemented within the TMF watercourses. The details of the Fish Salvage Plan are summarized in Section 26.18.3. To mitigate fish habitat loss downstream (i.e., South Teigen and North Treaty creeks) of the TMF dams, the following mitigation measures will be adhered to during construction, operation, and closure:<br>• the environmental monitor will monitor water quality when there is in-water work within fish-bearing streams;<br>• appropriate fisheries operating windows for fish-bearing streams will be adhered to (Section 26.18.1);<br>• appropriate permits will be acquired for out-of-window activities;<br>• water diversion structures will be used to divert dirty water from the work zone to a sediment control area;<br>• during TMF development, water flow will be reduced at a gradual rate as to not strand fish downstream;<br>**15.8.2.1 Direct Mortality**<br>Direct mortality is described in detail in Section 15.7.1. Direct mortality causing tissue damage and direct mortality for fish at all life stages may be associated with the construction, operation, and closure of access roads, transmission lines, TMF and other infrastructure in the PTMA and Mine Site of the LSA and RSA. This effect can be caused by direct contact of heavy equipment, dewatering activities during construction, and fish stranding during flow reductions with fish of various life stages. For example, heavy equipment contacting instream substrate can cause direct mortality to incubating fish eggs. The magnitude of all effects associated with direct mortality will be low because events will be localized and geographically isolated. In addition, direct mortality events will be of short duration and occur sporadically.<br>See Table 15.7-1 | |
| 11.7.6 | Assessment of Potential Effects | The analysis of potential effects | 15.6.2 | DFO | The overview of effect types does not provide a clear description of the different types of effects considered under each category (direct mortality, noise, erosion and sedimentation, etc.). For example, smothering of embryos by an erosion event is provided as an example of direct mortality in the overview of the effect types. However, the effects assessment for direct mortality does not consider the smothering of embryos; rather it is included as a residual effect due to erosion and sedimentation. Recognizing that potential effects overlap, it is important that the overview of the effect types provides a clear description of which type of | The final EIS will be updated to address the comment as follows:<br>**15.6.2 Overview of Effect Types**<br>Adverse effects to water quality can reduce the health of fish populations and change the productivity of primary producers (phytoplankton and periphyton) or food sources (zooplankton and benthic invertebrates). Protecting this productive capacity of fish habitat, "the maximum natural capability of habitats to produce healthy fish, safe for human consumption, or to support or produce aquatic organisms upon which fish feed" is mandated by DFO (1996). Water quality changes can result in sublethal effects. Sublethal effects are those that may affect the relative health or behaviour of individual fish within the LSA and RSA. Examples include: increased stress, decreased health or condition, and habitat avoidance. Sublethal effects do not result in | Reasonable treatment. |



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| | | | | | effect is considered under each category. | direct or immediate mortality, but may ultimately decrease the fitness and fecundity of individual fish, and possibly translate to population level effects in the long-term.<br>Direct mortality of fish can occur due to fishing (increased access will increase fishing pressure), impact with construction machinery, dewatering during construction, salvage and relocation of fish to other waterbodies during TMF construction, and fish stranding during water quantity reductions. | |
| 11.7.6 | Assessment of Potential Effects | Impacts from habitat compensation activities. | Appendix 15-K | DFO | An assessment of the potential for the fish habitat compensation to have effects on other VCs doesn't appear to have been included in the effects assessment. It is DFO's view that inclusion of an effects assessment of compensation works is important to include in the EIS as it is possible the compensation sites will result in changes to the environment that will result in impacts on a different VC. | The following section of Chapter 15 in the final EIS will be updated to address the comment:<br>**Chapter 15 (15.8.4.1.2 Project Infrastructure Habitat Compensation Potential Effects and Mitigation of Compensation Sites)**<br>At the Teigen Creek Site 1, potential effects due to fish habitat compensation works may include loss of existing fish habitat and fish populations, loss of western toad habitat, loss or alteration of provincially rare blue-listed ecosystems. Fish habitat quality at the site was considered poor in mid-summer in most of the shallow beaver ponds. Shallow ponds were frozen to the bottom during mid-winter, or nearly frozen with 0.3 m of water depth. No fish were caught in these ponds and dissolved oxygen concentrations were low (2.5 mg/L). Overwintering habitat quality was strongly influenced by the presence of winter base flow, groundwater seepage, and ice thickness. Most of the existing beaver ponds in the site provide poor quality overwintering habitat. In summary, the existing habitat at the site was only of poor quality with obstructed fish access such that the overall productivity is low. Fish access through the beaver pond complex is obstructed by beaver dams and fish cannot access habitat upstream of dams. Contributing to the fish access problem is the lack of perennial flow, lack of water depth, mainly organic substrate and discontinuous channels between ponds. Typically, coho salmon juveniles rear in off-channel areas similar to the site, but their absence is likely due to a combination of these limitations. Therefore, the potential effects of compensation are predicted to be low on existing fish and fish habitat; and the proposed works would increase the productive capacity at the site.<br>Western toad is listed as a rare species, and is designated as a "species of special concern" by the Committee on the Status of Endangered Wildlife in Canada and is present on Schedule 1 of the federal Species at Risk Act (2002). The species is also present on the red list published by the International Union for Conservation of Nature. Western toads were not observed at the site during breeding surveys. No breeding sites were confirmed; however, suitable breeding habitat was present at the site. To mitigate for western toad habitat loss at compensation sites with potential toad habitat, the following measures will be implemented in the design and construction phases of the project site:<br>• create ponds with shallow areas that maintain solar radiation of the ponds, allowing for suitable toad larval rearing habitat;<br>• create ponds with deep areas that increase the hydroperiod of the ponds to maintain pond habitat throughout the breeding and larval development stages;<br>• plant emergent aquatic vegetation within pond;<br>• create mudflats along the pond margins to provide breeding habitat; and<br>• construct compensation projects that will adhere to western toad breeding and rearing timing windows (i.e., mid-May to early September) within toad habitat.<br>The following provincially blue-listed ecosystems are present at the site: Fm03, Ws06, and Fl02. To mitigate for rare ecosystem habitat alteration and/or loss at compensation sites with rare ecosystems, the following measures will be implemented in the design and construction phases of the Project site:<br>• develop prescriptions to avoid or minimize degradation to rare ecosystems at a spatial and temporal scale prior to construction (including providing a clear definition of degradation, and methodology on how to measure it);<br>• design off-channel complexes to simulate natural conditions through seasonal flooding;<br>• ensure clearing activities are coordinated with other timing restrictions for wildlife and fish; and | Reasonable treatment. |



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| | | | | | | • manage construction spoil to not affect identified rare ecosystems.<br>In Glacier Creek Site 1, potential effects may include loss or alteration of provincially rare blue-listed ecosystems. The mitigation measures listed above are the same as Teigen Creek Site 1 described above.<br>Additional mitigation measures for construction are identified in the HADD Fish Habitat Compensation Plan (Appendix 15-R).<br><br>**15.8.4.1.3 Habitat Compensation related to the Tailing Management Facility (TMF)**<br><u>Potential Effects and Mitigation of Compensation Sites</u><br>At the Treaty Creek Site 1, potential effects may include loss of existing fish habitat and fish populations, loss of western toad habitat, loss or alteration of provincially rare blue-listed ecosystems. The mitigation measures listed for Teigen Creek Site 1 are the same for this site.<br>In Taft Creek Site 1, potential effects may include loss or alteration of provincially rare blue-listed ecosystems. The mitigation measures listed for Teigen Creek Site 1 are the same for this site.<br>Additional mitigation measures for construction are identified in the MMER Fish Habitat Compensation Plan (Appendix 15-Q).<br>Sections 8.1 and 8.2 of the MMER and HADD Fish Habitat Compensations Plans refer to mitigation measures of potential effects related to compensation project development. These potential effects included: increased sedimentation or dewatering of fish habitat; contamination as the result of hazardous substance spills; loss or alteration of fish habitat; alteration of water and/or sediment quality; alteration of the productive capacity of aquatic habitat; vegetation loss; rare ecosystem community loss or alteration; western toad habitat loss; and archaeological site impacts. | |
| 11.7.7 | Mitigation and Environmental Management | The Application will identify mitigation measures and environmental management strategies to avoid, minimize, or otherwise mitigate potential effects of the proposed Project on fish and aquatic habitat. | 15.7.5.2.2 | DFO | The EIS outlines that mitigation for the effects on Dolly Varden in the TMF will include conducting a fish salvage to remove and relocate Dolly Varden from the TMF into downstream habitat. The EIS does not describe the potential effect that the release of the Dolly Varden into the downstream habitat will have on other VC's. The effects assessment should be expanded to include a discussion on the potential effects relocating the Dolly Varden from the TMF footprint will have on the other fish VC's. | Section 26.9.3.3 of the Fish Salvage Plan lists why Treaty Creek is the most suitable location for fish transfer.<br>Section 15.8.2.1 of Chapter 15 of the final EIS will be updated to address the comment as follows:<br>**TMF Fish Salvage Effects and Mitigation**<br>Proposed activities associated with the Project will result in a loss of fish habitat in the North Treaty and South Teigen creeks. As a mitigation measure, it is proposed that Dolly Varden from the proposed TMF will be relocated from North Treaty and South Teigen creeks to the mainstem of Treaty Creek. Potential effects of the relocation include: introduction of a new gene pool, transportation of disease between populations, interspecific competition between introduced individuals and other species, lack of available habitat in the receiving waterbody, increased risk of hybridization, and injury to fish during relocation activities. Each potential effect and mitigation measure is summarized below.<br>Relocated fish will be released in the Treaty Creek mainstem, where Dolly Varden are currently present. No fish will be released in any other waterbody. The relocation will not result in the introduction of species to an area in which they do not currently reside.<br>The transmission of fish parasites or other types of disease carried by transported fish can have effects on local fish populations (Gaughan 2002; Ruesink et al. 1995). The relocation of individuals can introduce novel pathogens to a previously-unexposed population or increase the density of existing pathogens. The relocation of fish from North Treaty Creek and South Teigen Creek may also transport pathogens to the receiving population in Treaty Creek.<br>The potential for introduction of pathogens is low when fish are relocated within a watershed (Williams et al. 1998). North Treaty Creek discharges into Treaty Creek, and it is likely that the two waterbodies will have similar pathogen types. South Teigen Creek is not a tributary of Treaty Creek, however the Treaty Creek and Teigen Creek watersheds are closely linked by the Bell-Irving River. | Reasonable treatment. |



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| | | | | | | During fish salvage, individual fish will be measured to obtain basic information regarding length and weight, providing an opportunity to inspect the salvaged fish for evidence of disease or parasites. A biologist will be involved in all salvage activities and any fish showing evidence of disease or external parasites will be inspected. Professional judgment will be used to determine the risks of relocating diseased fish or fish with high parasite loads, and fish with a high risk of serving as a vector may not be released.<br>Dolly Varden, bull trout, rainbow trout, and mountain whitefish are present in the Treaty Creek mainstem. Sympatric fish species often compete for food, space, or other resources, with negative effects to one or both populations (Connell 1983). Relocating Dolly Varden from other areas will result in an increased density of Dolly Varden in Treaty Creek relative to other fish species. Increased interspecific competition from Dolly Varden could have negative effects on the other fish species present.<br>Treaty Creek is a good candidate for a receiving habitat for relocated Dolly Varden due to the species composition. Dolly Varden are currently the most common species in Treaty Creek so the introduction of new individuals will not likely cause major changes to the fish community composition.<br>Rainbow trout are the second-most common species in Treaty Creek (Rescan 2010). Interspecific competition between rainbow trout and Dolly Varden has been observed, but where the two species exist sympatrically, rainbow trout outcompete Dolly Varden (Baxter et al. 2004). In general, Dolly Varden and trout species show high plasticity in their feeding strategies, and niche partitioning reduces the direct competition and reduces density compensation (Andrusak et al. 1971; Hume and Northcote 1985; Hindar et al. 1988; Dolloff and Reeves 1990; Andrew et al. 1992).<br>There is little information available regarding possible interspecific competition between Dolly Varden and mountain whitefish (IDFG 2007). However, mountain whitefish habitat preference is for deep channels and pools, in contrast with the smaller streams preferred by Dolly Varden, and therefore little interspecific competition is expected (IDFG 2007; McPhail 2007).<br>Bull trout were observed at very low densities in Treaty Creek (Rescan 2010). Bull trout and Dolly Varden occupy similar niches in regards to habitat and food preferences (McPhail 2007). Where bull trout and Dolly Varden exist sympatrically, there is evidence of niche partitioning between the two species to reduce the effects of competition (Hagen and Taylor 2001).<br>The presence of suitable, available habitat for all life stages is an important factor in successful translocation of fish (Williams et al. 1988). Dolly Varden life history requires a variety of habitat types for spawning, juvenile rearing, and adult rearing (McPhail 2007). Insufficient habitat for any life stage will limit population growth and potentially result in a genetic bottleneck that will increase the loss of genetic diversity and contribute to genetic drift. Fish populations relocated long distances may lack the appropriate life history traits or behavior necessary to survive in the area to which they are released (Williams et al. 1988).<br>Dolly Varden are known to hybridize with other char species, primarily Bull Trout (McPhail 2007). Dolly Varden and Bull Trout hybridize in many areas where the two species occur sympatrically. Hybridization can result in loss of genetic information and reduced hybrid fitness (Hagen and Taylor 2001).<br>Treaty Creek is an ideal system for release due to the healthy existing population of Dolly Varden and its proximity to the salvage areas. The presence of existing members of the species indicates appropriate habitat for all life stages. The risk of an unsuccessful transfer due to differences in life history traits or behavior was mitigated by identifying a nearby waterbody for release, as the Treaty Creek, North Treaty Creek, and South Teigen Creek populations are genetically similar; and the three waterbodies are similar in regards to climate and habitat attributes (Rescan 2010). Relocations over short distances and between similar populations and geographic areas are more likely to be successful, as closely related populations are more likely to have similar habitat requirements (Williams 1988).<br>The risks of hybridization will be mitigated by releasing the salvaged fish into Treaty Creek. Bull trout population densities are low in Treaty Creek, reducing the risk of hybridization (Rescan 2010). Dolly Varden and bull trout both naturally occur in Treaty Creek, and there is some evidence of behavioural adjustments to minimize hybridization in some areas where the two species' ranges overlap (Hagen and Taylor 2001). Genetic analysis of | |



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| | | | | | | Dolly Varden in Treaty Creek watershed did not show any evidence of hybridization with bull trout (Rescan 2010).<br>The capture, handling, and transport of fish can induce a stress response that should be minimized when relocating fish (Williams et al. 1988). The physiological changes associated with stress can negatively affect fish health, growth, and behavior (Barton 2002). There is also the potential for physical injury or mortality due to electrofishing activities or rough or inexperienced handling of fish.<br>Fish capture and handling will be undertaken under the supervision of a professional biologist with experience in fish handling techniques. Fish will not be handled more than is necessary and will be captured and handled following established protocols designed to minimize injury and stress to captured fish. Fish will be transported in an aerated live well as quickly as is feasible. Fish will be released in a low velocity area so that they can recover from the stress of the relocation. | |
| 9.3.5.2 | On-site Support Facilities | The Application will describe maintenance and on-site support facilities including the following:<br>IV - potable water sources and treatment; | 4.8.2.1, 4.8.2.2 (and Appendix 4-A (18.11, 20.4.2)) | EC | The proponent plans to use groundwater from a well for potable water supply. Sections 4.8.2.1 and 4.8.2.2 do not contain any details related to the proposed well. The proponent should provide information related to the camp water supply well if the information is available (e.g. proposed depth, water quality). | Groundwater wells will be required for the potable water supply. Details related to potable water supply will be assessed during the permitting stage. Both the BC drinking water quality requirements and the federal Canadian Drinking Water Guidelines will be met. | Reasonable treatment. |
| 11.4.7 | Mitigation and Environmental Management | The Application will provide:<br>mitigation and environmental management strategies for pertinent Project components to address ML/ARD concerns in the event of temporary closure or early permanent closure. | EMP 26.14 | EC | This information could not be readily found in Section 26.14. The proponent is requested to provide this information and/or indicate where this information can be located in the EIS. | Long term management strategies are included in sections 26.14.4.1.2, 26.14.4.2.2, and 26.14.4.3.2 and are principally focused on operational activities that have potential long term impacts such as materials handling, mitigation, control, and reduction. Monitoring will be undertaken during operations as deposit, non-deposit, and tailing materials will not be excavated or handled during a temporary or permanent closure, consequently the on-site laboratory will not be required and will be placed under care and maintenance. Water quality monitoring information can be found in section 26.17 and 26.18.2. Additional information on temporary closure can be found in section 27.10.2. | Reasonable treatment. |
| 11.5.1 | Baseline Study | The Application will include a groundwater quantity and quality baseline study. This study will include the following:<br>Methods used to install groundwater monitoring wells. Logs will be included for geologic materials encountered, and tested. | 11.1.2, 12.1.2 (and Appendix 11-A, 11-B) | EC | An analysis of the soil samples collected, and potential correlations with background groundwater quality, has not been presented. This information should be provided by the proponent as it is important to understanding metal concentrations in groundwater, and establishing appropriate controls prior to mine development. | Baseline studies for groundwater quantity (Chapter 11) and Chapter 12 (groundwater quality) and related appendices provide drill log data for geologic materials. Groundwater quality is related to bedrock characteristics. | Reasonable treatment. |
| 11.7.1 | Baseline Study | Characterization of fish and fish habitat | 15.1.3; Table 15.1-3; Figures 15.1-3 a to j | DFO | Inconsistencies between Table 15.1-3, Figures 15.1-3 a to J, the text in Section 15.1.3 and the baseline studies appended to the EIS have been identified. Specific examples include:<br>• Table 15.1-3 identifies that in 2012 population sampling was conducted on Sulphurets Creek. This information is not displayed on Figures 15.1-3 a to d and Appendix 15I (2012 Fish and Fish Habitat Baseline Report) makes no reference | The final EIS will be updated to address the comments as follows:<br>Figures 15.1-3a to 15.1-3j: All 2012 sample points will be added.<br>Sulpurets Creek instream flow site will be added to Table 15.1-3.<br>**Attachment-1** to this table describes the results of field work completed in late fall/early winter of 2012. | . Reasonable treatment. |



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| | | | | | to fish sampling on Sulphurets Creek in 2012. As a result, it is unclear if the above referenced table includes an error or if there is a baseline report missing from the EIS.<br>• Table 15.1-3 and the text in section 15.1.3.1.3 identify 2009 instream flow assessments on Sulphurets Creek. This information is not shown on Figure 15.1-3 a to d nor is it included in the Appendix 15C (2009 Fish and Fish Habitat Baseline Report). As a result, it is unclear if the above referenced table and text include an error or if there is a baseline report missing from the EIS.<br>• Section 15.1.3.1.9 references a 2012 fish and fish habitat study conducted to confirm the non- fish-bearing status of Sulphurets Creek. This information is not included in Appendix 15I (2012 Fish and Fish Habitat Baseline Report). As a result, it is unclear if the above referenced text includes an error or if there is a baseline report missing from the EIS.<br>There were multiple fish and fish habitat studies conducted in relation to this project. In order for reviewers to have confidence in the information summarized in the EIS it is important that the EIS accurately represents the information gathered during the baseline studies. Section 15.1.3 should be carefully reviewed and updated to ensure the fish and fish habitat studies are accurately summarized and referenced throughout the section, in addition all baseline studies conducted should be appended to the EIS. | Appendix 15-E (2010 Fish and Fish Habitat Baseline Report) provides a summary of instream flow assessment for Sulphurets Creek. | |
| 11.7.6 | Assessment of Potential Effects | Estimated population size or numbers of fish that use the habitat that would potentially be affected by the proposed Project (particularly for the TMF and the tributaries of Teigen and Treaty Creeks that drain the tailing facility area) | 15.1.4.4.3 | DFO | The EIS includes a description of the relative densities of Dolly Varden within the TMF. *The effects assessment considers the creating of fish habitat compensation as mitigation for the loss of the habitat supporting those Dolly Varden.* The fish habitat compensation plans and the effects assessment should clearly explain how the creation of the proposed fish habitat compensation relates to the anticipated impacts on the isolated population of Dolly Varden in the TMF. | Fish habitat lost due to TMF development will be compensated based on proposed HADD and MMER Fish Habitat Compensation Plans in the EIS. The Habitat Evaluation Procedure was used to construct a habitat budget (U.S. Fish and Wildlife Service 1980). It is a generalized procedure for assessing habitat suitability in streams and lakes. Project-affected habitats were quantified and characterized in terms of their importance to fish. The Plan is based on the type of habitat affected. Compensation of lost habitat for created habitat is based upon the estimation of HUs lost. Overall, the Habitat Evaluation Procedure is based upon the suitability of a habitat type to support different life history stages of a species. Furthermore, Sections 15.8.4.1.2 and 15.8.4.1.3 explain how habitat loss will be compensated in the EIS. | Reasonable treatment |
| 11.10.7 | Mitigation and Environmental Management | The Application will:<br>Provide a table with the commitments that the proponent will make with respect to wildlife VCs, based on proposed mitigation; | 28.2 | EC | A table with the proponent's commitments related to wildlife valued components is missing. It should be clarified how/when this information will be provided. | The Wildlife Mitigation and Monitoring Plans are described in Section 26.21 of the EIS. See conditions 27 - 30 in Table 39.5-1 for specific commitments related to wildlife. | Reasonable treatment |
| 16.2.1 | Closure and Decommissioning | Clear phases and objectives for each phase will be presented in sufficient detail to demonstrate the merits of the closure plan in dealing with the breadth | 27.8 | EC | The proposed duration of closure and post closure monitoring activities for Surface Water, Aquatic Resources, Fish and Groundwater is unclear. A detailed plan for monitoring during each phase of closure should be provided to satisfy section 16.2.1 of the AIR. | Chapter 27 (Closure and Reclamation) of final EIS will be updated to provide further details on closure and post closure monitoring activities related to groundwater, surface water, aquatic resources and fish. Surface water, aquatic resources, fish, and groundwater monitoring will be carried out during the closure and post-closure phases (see Chapter 27.11.2). Monitoring will be carried out until the values have stabilized. If monitoring indicates that further remediation is required, this will be carried out. | Reasonable treatment |



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|---|---|---|---|---|---|---|---|
| | | of closure obligations. | | | | | |
| 21 | Background Information and First Nations Setting | *"For the purposes of the CEAA process, the Application will include a discussion of the current use of lands and resources for traditional purposes by Aboriginal persons".* | 30.3.1-30.3.4 | CEAA | Are there other sections within the EIS that address the current use of lands and resources for traditional purposes by Aboriginal persons | Chapter 30: First Nations Interests, Sections 30.3.1-30.3.4 provide an overview of First Nations settings for each of the specified Aboriginal groups. Within these sections, subsections pertaining to "Economic Settings: Subsistence (Non-wage) Activities" and "Current Use of Land and Resources" describe in general terms areas of contemporary resource use and, where information was available, areas of anticipated use. Sections 30.8, 30.9, and 30.10 summarize First Nations interests (i.e., issues, concerns, rights etc.) and potential Project interactions with those interests across a wide range of activities, practices, resources, and values that pertain to the current use of lands and resources for traditional or cultural purposes. Additional supporting ethnographic detail and background on each of the First Nations is presented in Appendices 30-A: Tahltan, 30-B: Skii km Lax Ha, 30-C: Gitanyow, and 30-D: Gitxsan. Chapter 3: Information Distribution and Consultation summarizes Seabridge's efforts and activities to engage and consult with Aboriginal groups in order to gather first hand information pertinent to assessing the effects of the Project on customs and practices important to the specified First Nations. Appendices to Chapter 3, provide further details on specific communications with different groups, summaries of issues raised during consultation along with the corresponding response from Seabridge on an issue by issue basis. This information is provided in the following appendices: Appendix 3-J: Summary of Communications with Nisga'a Nation; Appendix 3-K: Nisga'a Nation Issues and Responses; Appendix 3-M: Summary of Communications with First Nations; Appendix 3-N: First Nations Issues and Responses. | Reasonable treatment |
| 23 | First Nations Effects Assessment | *"The Application will assess the effects of construction, operation and closure and post closure of the proposed Project on social, economic, health and heritage values, and customs and practices important to the specified First Nations".* | 30.4-30.9 | CEAA | Is section 30.9 meant to address the information requirement on assessing the effects of the Project on customs and practices important to the specified First Nations? Are there other sections within the EIS that address this. | With respect to the potential effects of the Project on customs and practices that relate to "current use of lands and resources for traditional purposes by Aboriginal persons" Chapter 30: First Nations Interests, Section 30.9 summarizes the assessment of effects on Aboriginal traditional use of land and resources based primarily on the findings of Chapter 23: Land Use. Chapter 23: Land Use, addresses current use of land and resources for traditional purposes through assessment of potential effects on two land use Valued Components (VC), (i) "Subsistence" which refers to the harvest of wildlife, fish and plants usually for household/community consumption and for which there are strong cultural connections and (ii) "Traditional or Heritage Value of the Land" which focuses mostly on archaeological heritage values (addressed in Chapter 21: Heritage) but includes consideration of other culturally important practices, customs, and/or traditions that may occur within a certain land area. "Subsistence" is addressed on pages 23-66, 23-77, 23-89, and 23-99. Potential cumulative effects to subsistence are discussed on pages 23-116 to 23-120. "Traditional heritage value of the land" is addressed on pages 23-67, 23-77, and 23-91. There are no residual effects identified for "traditional heritage value of the land" and this VC is not carried forward into the cumulative effects assessment.<br>Chapter 30: First Nations Interests, Section 30.10 addresses potential effects of the Project on fish and aquatic habitat, wildlife and wildlife habitat, and terrestrial ecosystems in the context of First Nations' current use of land and resources. Potential effects on the cultural use of fisheries further considers potential effects of the Project on surface water quality and quantity and wetlands.<br>Chapter 3: Information Distribution and Consultation summarizes Seabridge's efforts and activities to engage and consult with Aboriginal groups in order to gather first hand information pertinent to assessing the effects of the Project on customs and practices important to the specified First Nations. Appendices to Chapter 3, provide further details on specific communications with different groups, summaries of issues raised during consultation along with the corresponding response from Seabridge on an issue by issue basis. This information is provided in the following appendices: Appendix 3-J: Summary of Communications with Nisga'a Nation; Appendix 3-K: Nisga'a Nation Issues and Responses; Appendix 3-M: Summary of Communications with First Nations; Appendix 3-N: First Nations Issues and Responses. | Reasonable treatment |
| 22 (AIR) | Aboriginal Rights | *"Identify past, present and anticipated customs and practises of Aboriginal groups in the* | 30.1.5; Apx 30-A-30-D | CEAA | Are there other sections within the EIS that address this information requirement? | Discussion of past, present and anticipated customs and practices (in this case referring primarily to the current use of lands and resources for traditional purposes) of Aboriginal groups or persons is undertaken in several places in Chapter 30: First Nations Interests, with relevant cross references to other parts of the EIS.<br>Section 30.1.4 briefly summarizes the proponent's interpretation of Aboriginal rights as they pertain to current | Reasonable treatment |



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| | | *Project footprint as well as downstream areas (where made available by a First Nation or publically available". (emphasis added)* | | | | use of lands and resources for traditional purposes. Sections 30.3.1-30.3.4 provide overview of First Nations settings for each of the specified Aboriginal groups. Within these sections, subsections pertaining to "Economic Settings: Subsistence (Non-wage) Activities" and "Current Use of Land and Resources" describe in general terms areas of contemporary resource use and, where information was available, areas of anticipated use.<br>Sections 30.8, 30.9, and 30-10 summarize First Nations interests (i.e. issues, concerns, rights etc.) and potential Project interactions with those interests across a wide range of activities, practices, resources, and values that pertain to the current use of lands and resources for traditional or cultural purposes. Additional supporting ethnographic detail and background on each of the First Nations considered in the Application/EIS is presented in Appendices 30-A: Tahltan, 30-B: Skii km Lax Ha, 30-C: Gitanyow, and 30-D: Gitxsan.<br>Sources of information and attempts to obtain information on the current use of lands and resources for traditional purposes by Aboriginal persons and groups is summarized in Section 30.1.5. Chapter 3: Information Distribution and Consultation provides a detailed summary of Seabridge's efforts and activities to engage and consult with Aboriginal groups in order to gather first hand information pertinent to assessing the effects of the Project on customs and practices important to the specified First Nations. Results of these efforts were mixed as it was not always possible to arrange appropriate meetings and interviews or access to such information was restricted due to confidentiality concerns. Appendices to Chapter 3, provide further details on specific communications with different groups, summaries of issues raised during consultation along with the corresponding response from Seabridge on an issue by issue basis. This information is provided in the following appendices: Appendix 3-J: Summary of Communications with Nisga'a Nation; Appendix 3-K: Nisga'a Nation Issues and Responses; Appendix 3-M: Summary of Communications with First Nations; Appendix 3-N: First Nations Issues and Responses. | |
| | | *"Identify specific Aboriginal customs and practices or those that could be practiced in the future (as made available by a First Nation or publically available), which are potentially impacted by the proposed Project".* | 30.1.4, 30.1.5 | CEAA | Are there other sections within the EIS that address this information requirement? | In addition to the responses provided with respect to the identification of past, present, and anticipated customs and practises of specified Aboriginal groups within the Project footprint or downstream of the project, discussion of the interaction and potential impact of the Project on specific Aboriginal customs and practices or those that could be practiced in the future, is provided in sections 30.5, 30.6, 30.9, and 30.10. | Reasonable treatment |
| 24 | Overall Conclusions | *"The Application will summarize any residual effects of the proposed Project on the aboriginal customs and practices and interests and their significance".* | 30.1 | CEAA | Are there other sections within the EIS that address this information requirement? | Summary of potential residual effects on present and/or anticipated customs and practices (in this case referring primarily to the current use of lands and resources for traditional purposes) of Aboriginal groups or persons is provided in Chapter 30: First Nations Interests, Section 30.11. | Reasonable treatment |
| 25 | Navigable Waters | *The Application will identify: potential effects on navigability of waterbodies that may be affected by the proposed Project; the nature of the effect; and mitigation measures to be implemented. For each affected section of waterbody, the* | 2 | Transport Canada | TC requests the proponent correct the information throughout the EIS related to the NWPA/NPA in the following manner:<br>• The footnotes found on p.2-3 and 2-21 should be replaced with the following wording (we request that you remove the reference to 'L. Chayer, pers. comm.)'; please feel free to refer to this communication as your reference if needed:<br>The Navigable Waters Protection Act (NWPA) was subject to amendments in the Jobs and Growth Act, 2012 which received Royal Assent on December 14, 2012. These amendments are not in force yet. The first amendment consists in replacing the | The footnotes referenced in the comments in Chapter 2 will be updated using the wording provided by Transport Canada. | Reasonable treatment |



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| | | *Application will provide data on location (latitude and longitude), width, depth, and any navigation use or issues. The Application will also describe potential effects on navigation with respect to the identified access corridors.* | | | name of the NWPA by the Navigation Protection Act (NPA). Policy guidance on the implementation of the NPA has not been provided by Transport Canada with respect to projects that may require authorizations under the NWPA, but that won't be subject to the provisions of the NPA.<br>1. R.S.C., 1985, c. N-22.<br>2. Jobs and Growth Act, 2012, S.C. 2012, c. 31, s. 318.<br>3. Jobs and Growth Act, 2012, S.C. 2012, c. 31, s. 318. | | |
| 25 | Navigable Waters | *The Application will identify: potential effects on navigability of waterbodies that may be affected by the proposed Project; the nature of the effect; and mitigation measures to be implemented. For each affected section of waterbody, the Application will provide data on location (latitude and longitude), width, depth, and any navigation use or issues. The Application will also describe potential effects on navigation with respect to the identified access corridors.* | 31 | Transport Canada | • This information will need to be corrected in all other parts of the EIS (as one example, the first paragraph on p. 31-1 in Chapter 31). Please update the information throughout the EIS with the information provided in the first bullet above and to reflect that the Project is currently subject to the NWPA. Also, TC requests that you remove the references to L. Chayer, pers. comm. throughout.<br>• The Navigable Waters Protection Act should be referred to in the present tense as it is still in force, and will be until a date in 2014. | Changes have been made to Chapter 31 to address the comment. | Reasonable treatment |
| 25 | Navigable Waters | *The Application will identify: potential effects on navigability of waterbodies that may be affected by the proposed Project; the nature of the effect; and mitigation measures to be implemented. For each affected section of waterbody, the Application will provide data on location (latitude and longitude), width, depth, and any navigation use or issues.* | 31 | Transport Canada | "Navigation' is an indirect environmental effect that must be assessed (as part of "health and socio-economic conditions") under the Canadian Environmental Assessment Act (CEAA). | This is how the effect is described in Chapter 31 of the final EIS. | Reasonable treatment |



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|---|---|---|---|---|---|---|---|
| | | *The Application will also describe potential effects on navigation with respect to the identified access corridors.* | | | | | |
| 25 | Navigable Waters | *The Application will identify: potential effects on navigability of waterbodies that may be affected by the proposed Project; the nature of the effect; and mitigation measures to be implemented. For each affected section of waterbody, the Application will provide data on location (latitude and longitude), width, depth, and any navigation use or issues. The Application will also describe potential effects on navigation with respect to the identified access corridors.* | 31 | Transport Canada | The Project may impact waterways which have been or may be used for navigation; therefore, navigation must be included in the EIS as a Valued Component (VC).<br>The proponent committed to include navigation as a VC in response to TC's June 23, 2010 comments on the draft Application Information Requirements document (Table Q-1 in Appendix 3-Q) and in the final Application Information Requirements, Navigable Waters was included as a VC under Land Use (Chapter 14.2).<br>TC has found that Navigation has not been included as a VC in the EIS. This is demonstrated by the following observations:<br>• Ch. 5 Effects Assessment Methodology – Table 5.2-3 'Valued Components Selected for Assessment' does not include Navigation as an assessment topic or a VC. According to the EIS, the list of VCs was generated from the issues raised during consultation (discussed in Chapter 3 and listed in Appendix 3-Q) and in Appendix 3-Q Table Q-1 the proponent commits to including Navigation as a VC as mentioned above.<br>• Part B – Assessment of Potential Effects, Mitigation and Significance of Effects – does not include the Navigable Waters chapter. If Navigable Waters was to be assessed as a VC outside of Ch.14.2 Land Use, it would appear as its own chapter under Ch.14 Potential Social Effects.<br>• Chapter 14.2 'Land Use' excludes Navigation. Page 23-43 states that some VCs were not carried further in the assessment, either due to a lack of potential effects or the VCs are assessed in another chapter. The Table 23.5-2 specifically states that Navigation was excluded from further analysis "because this topic was considered and assessed in Chapter 31: Navigable Waters." However, Chapter 31 Navigation does not adequately address Navigation as a VC within the environmental assessment as a whole since it does not undergo the same evaluation of effects, residual effects, etc. (as discussed in the bullet points found below).<br>• Ch.31 Navigable Waters does not have its own Potential Residual Effects section; however, p.31-12 of the EIS states that "no significant adverse residual environmental effects are expected from the Project with respect to navigable waters", which implies that residual effects are expected.<br>• Chapter 37 Cumulative Effects (AIR section 10.9) – residual effects of all VCs, regardless of significance, are included in the cumulative effects assessment. Navigable Waters residual effects are not included. | Chapter 31 will be updated to include navigation as a VC. The chapter provides an overview of the Project's potential effects on navigable waterways. It includes a screening level assessment of waterways against the Minor Works and Minor Waters Order (2009) to determine whether a stream in the Project area can be considered technically navigable. The chapter assesses potential indirect effects on navigation with respect to safety and access. Mitigation to reduce the potential for residual effects is discussed, and a significance determination on residual effects is presented and used to support a cumulative effects assessment.<br>Updates to the EIS have been made to reflect navigation as a land use VC; residual effects have been carried forward into the Cumulative Effects chapter, and are referenced as applicable in the First Nation and Nisga'a Nation Interest Chapters. | Reasonable treatment |



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# Proposed KSM Mine Project: Responses to Federal Comments Provided during Screening of the Environmental Impact Statement (EIS)(May 2013)

| Section is EIS guidelines | Title (IN EIS GUIDELINES) | Descriptive Summary (Information Requirement) | Section of EIS | Department | Comments (missing or incomplete information) | Seabridge Response | EAO Conclusion |
|---|---|---|---|---|---|---|---|
| | | | | | • Chapters 29 and 30 Nisga'a Nation Interests/ First Nations and Metis Interests – navigable waters was not mentioned as a VC in either chapter. Because there is no mention of navigation in these chapters, TC cannot determine whether Aboriginal groups and Nisga'a were consulted on navigable waters as a VC (though TC's June 23, 2010 letter of comments requested that the proponent ask Aboriginal groups specifically whether the proposed bridges over Unuk, Teigen and any other watercourses will impact Aboriginal groups' use of the waterways).<br>• Chapter 39 Conclusions states that residual effects arising from the EA of the KSM Project are summarized in Table 39.2-1. Navigable Waters / Navigation are excluded from that table and from the VCs described in the Conclusions chapter.<br>• The assessment of navigation in ch.31 does not clearly distinguish between effects of the project on navigation that would be considered direct versus those that would be considered indirect. In order for the residual adverse (indirect) effects to be carried forward into the cumulative effects assessment, these must be distinguished and specific appropriate mitigation measures identified as appropriate.<br>The EIS must demonstrate transparently that "Navigation" has been assessed as a VC within the environmental assessment in order for that assessment to be complete. TC's Navigable Waters Protection Program has determined that there are navigable waterways that will be impacted by the Project; therefore, the environmental assessment would not be deemed complete without the "Navigation" VC. | | |
| 25 | Navigable Waters | *The Application will identify: potential effects on navigability of waterbodies that may be affected by the proposed Project; the nature of the effect; and mitigation measures to be implemented. For each affected section of waterbody, the Application will provide data on location (latitude and longitude), width, depth, and any navigation use or issues. The Application will also describe potential effects on navigation with respect to the identified access* | 31 | Transport Canada | Pg 76, sec 25 of the AIR states that "the Application will identify: potential effects on navigability of waterbodies that may be affected by the proposed Project; the nature of the effect; and mitigation measures to be implemented. For each affected section of waterbody, the Application will provide data on location (latitude and longitude), width, depth, and any navigation use or issues".<br>Watercourses potentially affected by the Run-of-River component of the project (ie, associated diversions, penstock waterway crossings, weirs, etc), the two temporary Bailey bridge crossings proposed for access to the construction diversion channel portals and west abutment area, and habitat compensation were not discussed in Chapter 31 Navigable Waters. | Chapter 31 will be updated to address the interaction between all Project Works (including fish habitat compensation sites, the McTagg and Sulphurets Power Plants, and the temporary construction bridges) | Reasonable treatment. |



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|---|---|---|---|---|---|---|---|
| | | *corridors.* | | | | | |
| 25 | Navigable Waters | *The Application will identify: potential effects on navigability of waterbodies that may be affected by the proposed Project; the nature of the effect; and mitigation measures to be implemented. For each affected section of waterbody, the Application will provide data on location (latitude and longitude), width, depth, and any navigation use or issues. The Application will also describe potential effects on navigation with respect to the identified access corridors.* | 31 | Transport Canada | For the watercourses potentially affected by these temporary and ancillary works, the proponent must demonstrate that the affected watercourses are non-navigable by assessing them against the Minor Works and Waters Order. This information should then be summarized in the EIS submission.<br>For those waterways that do not fit the Minor Works and Waters Order criteria, TC will require that the proponent submit applications pursuant to the NWPA which must include drawings of the works, methodology of construction (including contingency plans), descriptions of baseline navigational use (including First Nations use), descriptions of the levels of impact, and suggested appropriate mitigation for impacts/ | Chapter 31 will be updated to include information on all potentially navigable waterways in the Project Area. All stream sampling locations have been screened against the Minor Works and Waters Order (MWWO). 42 stream crossing locations have been identified as 'technically navigable' (i.e. exceed the MWWO criteria) and have been included in the effects assessment. | Reasonable treatment |



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# Proposed KSM Mine Project: Responses to KSM Project Working Group Comments Provided during Screening of the Application for an Environmental Assessment Certificate/Environmental Impact Statement (May 2013)

| Comment No. | AIR Section No. | AIR Title | Application / EIS Chapter / Section No. | Reviewer | Comment | Seabridge Response | EAO Conclusion |
|---|---|---|---|---|---|---|---|
| 1. | 1 | Executive Summary | Executive Summary | Gitanyow Hereditary Chiefs (GHC) | Post closure phase described as 250 years, no justification for using this length of time. Many mines in the world have been document to contaminate land and water for much longer then the stated closure period. | The EA requires a temporal boundary be identified. 250 years was chosen for the length of the post-closure phase because this time frame is similar to that used for tailing dam design (e.g., design capacity of dams must be built to withstand 1 in 200 year flood events). Extending the period by 50 years is somewhat arbitrary but it was felt to be more conservative. | Reasonable treatment |
| 2. | 1 | Executive Summary | Executive Summary | Skii km Lax Ha (SKLH) | The summary of economic benefits of the project is lacking in detail with respect to benefits to First Nations. | The AIR (January 2011) requires the Executive Summary to provide a summary of the estimated benefits of the Project. A detailed discussion of the economic benefits of the Project, including to First Nations, is discussed primarily in Chapter 20: Economics. See for example, sections 20.7.2 Change in Employment, 20.7.3 Change in Income and Value-added, and 20.7.4 Change in Business Activity. Further detail on the economic modelling is presented in Appendix 20-B: Economic Model Report. Economic effects of the Project are also discussed and summarized in the context of First Nations issues, concerns, rights, and interests in Section 30.7: Economic Effects of Chapter 30: First Nations Interests. | Reasonable treatment |
| 3. | 1 | Executive Summary | Executive Summary | SKLH | The summary of Skii km Lx Ha Nation considerations does not include Seabridge's response to Skii km Lax Ha Nation concerns. | The AIR (January 2011) requires the Executive Summary to provide a summary of First Nation considerations. First Nation considerations are addressed more specifically in Chapter 30: First Nations Interests. There is additional supporting discussion of economic issues that relate to Skii km Lax Ha issues and concerns in Chapter 20: Economics. Specific issues to the extent raised by Skii km Lax Ha during consultation and the corresponding response from Seabridge are summarized in Chapter 3 - Appendix N: First Nations Issues. | Reasonable treatment |
| 4. | 7.1 | Proponent Description | 1 | GHC | Page 1: "…the estimated initial capital cost of developing the Kerr, Mitchell and Iron Cap deposits is CAN $5.25 billion" → are these all pre-start of mining operations costs? | Yes, these are all pre-production costs. Cdn $5.25 billion is the estimated capital cost based on the 2012 pre-feasibility study which is provided in Appendix 4-A. | Reasonable treatment |
| 5. | 7.1 | Proponent Description | 1 | GHC | Page 26: "Table 1.7-1 Point 4". Define (quantify empirically) what is a marginal amount of cyanide (CN-)? Cyanide is a well-known lethal biotoxin at remarkably low concentrations, therefore it seems highly unlikely that anything short of a [0.0] concentration of CN- would be marginal. Presumably the CIL and geomembrane liner only contain CN- that would otherwise be leached. Will CN- contaminated waters be treated such that all CN- is neutralized and effectively contained | Table 1.7-1 Point 4 refers to changes that have been made to the Project design as a result of the pre-Application stage of the environmental assessment (EA) process. Point 4 refers to a Project design change that will reduce the potential for cyanide release to the environment by confining cyanide-containing waste water to the lined CIL pond.<br>As proposed in the Environmental Assessment Certificate (Application)/ Environmental Impact Statement (EIS), all handling of cyanide will be in accordance with the International Cyanide Management Code (July 2012). Effluent will be treated to 0.5mg/L concentration and stored in a lined CIL pond. The overflow from the CIL pond will be directed to a polishing treatment step prior to discharge to the main tailing storage facility. There will be no discharge of the CIL pond effluent directly to the environment.<br>While elevated cyanide concentrations are known to be toxic to aquatic organisms, concentrations up to 5 µg/L are considered to be acceptable. BC water quality | Reasonable treatment |



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| Comment No. | AIR Section No. | AIR Title | Application / EIS Chapter / Section No. | Reviewer | Comment | Seabridge Response | EAO Conclusion |
|---|---|---|---|---|---|---|---|
| | | | | | so that it (CN-) poses no danger to both terrestrial and aquatic life? | guidelines for the protection of aquatic life indicate that concentrations of weak-acid dissociable cyanide in freshwater up to 5 µg/L for the 30-day average or 10 µg/L maximum are unlikely to cause toxicity in aquatic organisms.<br>Water quality modeling predictions indicate that these guidelines will not be exceeded in the downstream receiving environment. | |
| 6. | 7.1 | Proponent Description | Chapter 1 | GHC | Table 1.7-1 Point 5. Will there indeed be a single compound only (in this case Selenium) water treatment plant? If so, then what about a CN-only Water Treatment Plant? | Table 1.7-1 Point 5: Section 14.7.2.2: As described in Section 14.7.2.2, a selenium treatment plant is proposed for the Mine Site.<br>Water treatment at the TMF is proposed to recover cyanide and copper for both economic considerations and to improve discharge water quality. The residues from the leach circuit will be pumped to a conventional counter-current decantation (CCD) washing circuit and then subjected to SART (sulphurization, acidification, recycling, and thickening of precipitates) and AVR (acidification, volatilization, and re-neutralization) processes to recover cyanide and copper from the circuit.<br>Tailing discharges to the CIL lined pond in the TMF will be further treated using conventional $SO_2$/AIR and supplemented with activated carbon to reduce the weak acid dissociable cyanide ($CN_{WAD}$) and dissolved copper concentrations to 0.5 mg/L or below. The CIL pond will be lined with an impermeable geomembrane HDPE liner to minimize seepage of tailing water into the groundwater.<br>The excess water decanted from the CIL pond to the active flotation tailing pond (either the north cell or south cell) will undergo a further polishing step using hydrogen peroxide to ensure that the flotation pond is not unduly loaded with cyanide or copper. The peroxide oxidation step will oxidize any potential residual oxyanions, such as thiosalts, and potentially oxidize organic process chemicals in the water. The target $CN_{WAD}$ and dissolved copper concentration to the main flotation tailing pond is significantly less than 0.5 mg/L. | Reasonable treatment |
| 7. | 7.2.1; 7.3 | Project Setting; Need for and Purpose of the Project | Chapter 1 | Tahltan Nation | The southern route is not on the maps. | It is assumed that the reviewer is referring to the Treaty Creek Access Road. Figure 1.7-1 in Chapter 1 identifies the Treaty Creek Access Road. | Reasonable treatment |
| 8. | 7.4 | Benefits of the Proposed Project | Chapter 20 / Section 20.7.3 | BC EAO | "local/municipal (property taxes, other)"<br>• Not found (same as rural property tax?) | The Project falls outside of a city, town, district or village so there will be no property tax. Under the *Taxation (Rural Area) Act* [RSBC 1996] Chapter 448, a rural property tax will be levied (see Chapter 20). | Reasonable treatment |
| 9. | 7.4 | Benefits of the Proposed Project | Chapter 20 /Section 20.7.3 | BC EAO | "Regional District (taxes, other)"<br>• Not found; provincial and federal only | See response to comment #8. | Reasonable treatment |
| 10. | 7.4 | Benefits of the Proposed Project | Chapter 1 / Section 1.3.1.3<br>Chapter 20 / Sections 20.7.2, 20.7.3, 20.7.4 | SKLH | Section 1.3.1.3 states that "the Project will provide <u>significant</u> employment, education, and training opportunities to local and regional | Skii km Lax Ha is an aboriginal group of approximately 30 people living in the District of New Hazelton, the Village of Hazelton, and the adjacent Gitxsan reserve community of Gitanmaax. There are no official statistics or census data available on SKLH demographics, labour force, earnings, or key economic sectors. The | Reasonable treatment |



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| | | | 22 / Section 22.7.1<br>Chapter 30 / Section 30.3.4 | | communities, including Aboriginal peoples. It proceeds to list unemployment rates of First Nation communities. No information is provided for the Skii km Lax Ha members or for the Hazelton area, where Skii km Lax Ha members reside. No details are provided regarding what the significant employment, education<br>and training opportunities would be for Skii km La Ha Nation (or for other First Nations). | economic effects assessment therefore relied on information, including census data, from the surrounding communities where SKLH members reside for relevant socio-economic baseline data. Seabridge attempted to arrange interviews with SKLH members, including the offer of funds to participate in the EA process, to gather supplementary economic and social data for baseline purposes of the assessment.<br>SKLH did not respond to Seabridge's attempts prior to filing the Application/EIS. However, Seabridge and the SKLH have recently initiated discussions on these and other matters and Seabridge's consultants met with them on May 27, 2013. Seabridge intends to continue to communicate with the SKLH going forward.<br>Economic benefits of the Project, including to Nisga'a Nation and First Nations, are discussed primarily in Chapter 20: Economics. See for example, sections 20.7.2 Change in Employment, 20.7.3 Change in Income and Value-added, and 20.7.4 Change in Business Activity. Further detail on the economic modeling is presented in Appendix 20-B: Economic Model Report. Economic effects of the Project are also discussed and summarized in the context of Nisga'a Nation and First Nations issues and interests in Section 29.3.2 and Chapter 30, respectively.<br>Several socio-economic management strategies will also directly or indirectly address education and training opportunities for local communities, including Aboriginal people. Strategies currently under development include: (a) Labour Recruitment and Retention Strategy, (b) Workforce Training Strategy, and (c) Workforce Transition Program (See sections 22.7.1.1, 22.7.1.2, and 22.7.1.3)<br>Socio-economic settings information for Skii km Lax Ha is summarized in Section 30.3.4 of Chapter 30: First Nations Interests. Economic baseline information for the Hazeltons (where the majority of contemporary Skii km Lax Ha reside) is provided in Section 20.1.5.3: the Hazeltons of Chapter 20: Economic Effects Assessment.<br>Employment effects are addressed in Section 20.7.2 as noted above. Education and training opportunities addressed in section 20.7.2.1: Mitigation for Change in Employment under the Workforce Training Strategy. Residual effects of the Project linked to education and training are also addressed in Section 22.7.1.3: Education, Skills, and Training: Potential Residual Effects due to Change in Employment.<br>Seabridge is committed to facilitating employment and training opportunities with specific groups, such as the Skii km Lax Ha, through direct discussions. | |
| 11. | 8.1.1 | Provincial Review | Chapter 2 | GHC | Figure 2.1-2: Public Comment Period" What does it mean for the working group (WG) to 'confirm conclusions of significance'? | Figure 2.1-2 in Chapter 2 summarizes the actions undertaken for each phase of the EA process under CEAA 1992. Under the" EIS review stage", there is a standalone bullet "confirm conclusions of significance" which refers to an action that is taken at this stage, and is not specific to the working group. However, the KSM Project Working Group will have an opportunity to review and comment on the Application/EIS, including conclusions related to significance, during the Application/EIS review stage. | Reasonable treatment |
| 12. | 8.1.1 | Provincial Review | Chapter 2 | GHC | What happens with/to the EIS if the | See response to comment #11. | Reasonable |



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| | | | | | WG does not confirm conclusions of significance? | | treatment |
| 13. | 8.1.1.1 | Pre-Application Stage | Chapter 3 / Section 3.4 | BC EAO | Not much info re: engagement with agencies re: development of AIR, and nothing specific with respect to baseline studies. | Details related to engagement activities with government agencies, including development of the AIR and baseline study input is provided in Section 3.4 and Appendices 3-P and 3-Q. | Reasonable treatment |
| 14. | 8.1.1.2 | Application Stage | Chapter 2 | GHC | Section 2.1.3.2.2. What weight do the working group's comments carry in this process? | This comment refers to the screening of the Application/EIS pursuant to the BC EA Act (2002). The EAO and CEA Agency decide whether to accept the Application for formal review based on comments received from the KSM Project Working Group. | Reasonable treatment |
| 15. | 8.1.1.2 | Application Stage | Chapter 3 / Sections 3.2, 3.2 | GHC | Section 2.1.3.2.4. Who determines the 'adequacy of the Crown's consultation efforts'? BCEAO? CEAA? What about First Nations satisfaction with consultation efforts? A significant factor in the discussion? | The federal and provincial Crowns are responsible for assessing the adequacy of consultation with First Nations. | Reasonable treatment |
| 16. | 8.1.1.3 | Provincial Legislation, Policies and Permits | Chapter 2 / Section 2.1.4 | GHC | Should include the Provincial Fisheries Act (RSBC 1996) Chapter 149 | The BC *Fisheries Act* does not apply to the Project. | Reasonable treatment |
| 17. | 8.1.1.3 | Provincial Legislation, Policies and Permits | Chapter 2 / Section 2.1.4 | BC EAO | "*Highway Act"*<br>• Not included, but may not be applicable; confirm w/ proponent | Chapter 2 will be updated to include the BC *Highway Act*. | Reasonable treatment |
| 18. | 8.1.2.1 | Federal Legislation | Chapter 2 / Section 2.1.6 | BC EAO | "*Pacific Salmon Treaty Act*"<br>• Not included, but may not be applicable; confirm w/ proponent | Chapter 2, section 2.1.6 Transboundary Management discusses the Pacific Salmon Treaty (see excerpt below):<br>"The *Treaty between the Government of the United States of America and the Government of Canada Concerning Pacific Salmon* (1985g; as renewed in 1999) is a bi-lateral treaty binding on the federal governments of Canada and the US. The intent of this Treaty is to prevent overfishing and provide for optimum production, and both countries agreed to take measures to avoid the undue disruption of existing fisheries. Chapter 2 and Annex IV of the Treaty specifically prescribe management measures for northwest BC and south-east Alaska to manage the Nass and Skeena sockeye salmon fisheries to achieve an annual catch share of 2.45% of the annual allowable harvest of the Nass and Skeena sockeye stocks for any particular year. There are no permits or authorizations required under this Treaty for the Project". | Reasonable treatment |
| 19. | 8.1.2.1 | Federal Legislation | Chapter 2 / Section 2.1.5 | BC EAO | *"Radio Communication Act"*<br>• Not included, but may not be applicable; confirm w/ | Telecommunication devices and/or radio apparatus (including antenna systems) are required for the Project so permitting provisions specified under the *Radio Communication Act* are applicable to the KSM Project. Chapter 2 will be updated | Reasonable treatment |



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| | | | | | proponent | to include this Act. | |
| 20. | 8.1.2.2 | Metal Mining Effluent Regulations Schedule 2 Amendment | Chapter 2 / Section 2.1.5 | GHC | …in reference to 15.1.2.2 - How exactly is the potential effect of effluent on the use of fisheries resources measured? | Potential downstream effects of mine effluent will be measured in accordance with the requirements of the federal Metal Mining Effluent Regulations (MMER; SOR/2002-222) under the Fisheries Act (1985), and the requirements of the BC *Environmental Management Act.* The Aquatic Effects Monitoring Plan (AEMP) in the Application/EIS provides a high-level overview of the aquatic effects monitoring program (Chapter 26; Section 26.9.2 of the Application/EIS) that will be implemented to ensure that the aquatic receiving environment will be protected from adverse effects due to Project activities. The conceptual AEMP has been designed to incorporate the requirements of MMER and the BC *Environmental Management Act*. The potential effects on fish resources are identified in the Metals Mining Technical Guidance for Environmental Effects Monitoring produced by Environment Canada (2012) and the BC receiving water guidelines. Effects on fish resources are evaluated by three principle endpoint responses for fish community and biology. These include energy use, energy storage, and survival (see Table 26.9.8). In addition, fish tissue data will be analyzed and monitored for metal effects. | Reasonable treatment |
| 21. | 8.1.2.2 | Metal Mining Effluent Regulations Schedule 2 Amendment | Chapter 2 / Section 2.1.5 | GHC | Given the anadromous migratory nature of many species of Pacific Salmonids; what about the fisheries impacts on the USA side of the border? | The anadromous migratory nature of Pacific salmonids and fish resources has been considered in the effects assessment based on the water quality modelling predictions in the Application/EIS. Based on this assessment, fisheries impacts are assessed to be minimal to negligible. At the U.S. border, the water quality predictions indicate that Canadian, BC and Alaska state receiving water criteria will be met.<br>Details of the water quality model, analysis, and comparisons to background are provided in Chapter 14. | Reasonable treatment |
| 22. | 8.1.2.2 | Metal Mining Effluent Regulations Schedule 2 Amendment | Chapter 15 / Section 15.1.3 | GHC | Is the overall fisheries study area as currently conceptualized broad enough to provide the data needed to ascertain key trends definitively? | The fish and fish habitat study area boundaries for the KSM Project were defined in the AIR (January 2011), which was subject to review and incorporation of comments from various government agencies, Nisga'a, and First Nations prior to their approval in 2011. The fish and fish habitat study area boundaries have been presented in all baseline reports for the past 5 years which were subject to review and incorporation of comments from various government agencies, Nisga'a, and First Nations. The fish and aquatic habitat regional study area is broad enough to ascertain potential impacts due to project development. The results of the water quality model and toxicological assessment confirm the adequacy of the regional fish and aquatic habitat study area boundaries. | Reasonable treatment |
| 23. | 8.3 | Land Use | Chapter 23 / Section 23.1.4 | BC EAO | Third party? (Hunting, guide outfitter, trapping, recreation, forestry, mining, water etc. tenures described in 23.1.4.4-23.1.4.10) | Third party tenures refer to tenures that are issued by the Crown under provincial and federal statutes. There are no federal tenures held in the vicinity of the Project. Provincial tenures held by third parties in the vicinity of the Project include guide outfitting, angling guides, commercial recreation, forestry, trapping, mineral claims and water licenses. | Reasonable treatment |



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| 24. | 8.3 | Land Use | Chapter 29 / Section 29.1.2 | Nisga'a Lisims Government (NLG) | No mention of Nisga'a fee simple lands. | Chapter 29 of the Application/EIS has been revised to further describe Nisga'a fee simple land and Figure 29.1-1 has been modified to identify the land parcels. | Reasonable treatment |
| 25. | 8.3 | Land Use | Chapter 30 / Section 30.3.2 | GHC | Must also address how the Project will interact with the objectives of the Gitahyow Huwilp Land Use Plan. | The Gitanyow Lax'yip Land Use Plan was approved after the AIR and is now described in Section 30.3.2.4 with the following paragraph:<br>"In March 2012 the Gitanyow Nation and the Province of British Columbia signed the Gitanyow Huwilp Recognition and Reconciliation Agreement (GHRRA) as a, "bridging step towards reconciliation and a constructive step towards creating a positive and enduring relationship between the Gitanyow and British Columbia" (Gitanyow Nation and Province of BC 2012). One of the overarching goals of the agreement is the development of meaningful, shared decision making with respect to land and resources within Gitanyow traditional territory (Lax'yip) and a collaborative approach to sustainable economic development. Part 2 of the GHRRA is the Gitanyow Lax'yip Land Use Plan which articulates a co-management approach to land and resource use planning, with an emphasis on shared decision making and the maintenance of Wilp Sustainability including the establishment of various land use designations, zoning and management objectives."<br>The main interaction between the Project and the objectives of the Gitanyow Lax'yip Land Use Plan are with respect to the passage of Project traffic through Gitanyow wilp territories. In particular, Project traffic will traverse the Hanna-Tintina watershed north of Meziadin Junction. The Hanna-Tintina and Biodiversity Areas are designated Ha'nii tokxw areas under the GHRRA. Ha'nii tokxw, which literally means "our food table" is a Gitanyow designation for landscapes (broadly defined to encompass land, air, and water resources) that are intended under the terms of the GHRRA to remain in a, "predominantly natural condition…" (Gitanyow Nation and Province of BC 2012: pp. 4.) The traffic study entitled "KSM Project Highway 37 and 37A Traffic Effects Assessment" provides a detailed report on project traffic, potential effects on Gitanyow interests, and proposed mitigations and monitoring. | Reasonable treatment |
| 26. | 8.3 | Land Use | Chapter 23 / Section 23.1.1 | GHC | Direct quote from EA 23.1.1 "Species information, including home range sizes, habitat use, and seasonal movement patterns, were considered when selecting the RSA boundary." Truth is that nothing was known about habitat use, and especially seasonal movement patterns when selecting the RSA boundary. | Section 23.1.1 indicates the Land Use RSA includes the boundary of the RSA utilized in both the Wildlife and Wildlife Habitat and Terrestrial Ecosystems Baseline Reports. The specific comment referred to by GHC relates to the rationale for the wildlife and wildlife habitat RSA. Section 18.1 describes the process for determining this RSA. Adjustments were made to the RSA based on feedback from the KSM Project Working Group, including Nisga'a Nation and other First Nations. | Reasonable treatment |
| 27. | 8.3 | Land Use | Various chapters (land use planning objective sections) | GHC | Does not discuss how the project would interact with the objectives of the Nass South SRMP. It just lists | Chapters for each discipline consider the applicability of the objectives of the Cassiar-Iskut Stikine Land and Resource Management Plan and Nass South Sustainable Resource Management Plan as they relate to the Project (refer to | Reasonable treatment |



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| | | | | | some of the objectives of the Nass South SRMP. | sections in each chapter called "Land Use Planning Objectives"). | |
| 28. | 8.3 | Land Use | Chapter 30 / Sections 30.3.2 and 30.10.1 | GHC | Section 23.1.4.3 – Does not include potential for downstream effects to the Gitanyow (i.e. pollution of the Nass River affecting salmon populations and food security). | Potential downstream effects to the Gitanyow are discussed in Sections 30.3.2.4 and 30.10.1. | Reasonable treatment |
| 29. | 8.3 | Land Use | Chapter 23 / Section 23.9 | GHC | The Application will identify existing land uses and activities in the biophysical regional study area and reasonably anticipated activities that may contribute cumulative environment, economy, heritage, health or social effects.<br><br>There was no identification of cumulative environmental effects in this section. | Potential cumulative effects with respect to land uses and activities are identified and assessed in "Section 23.9: Potential Cumulative Effects for Land Use". | Reasonable treatment |
| 30. | 8.3 | Land Use | Appendix 15-C | GHC | Table 6.3-27 – Metals Included in Dolly Varden Whole Body Tissue Analysis, 2009: No explanation is provided of the method(s) of detection used. No explanation is provided as to the possibility of alternative detection methods (at higher sensitivity levels) for Antimony (Sb), Beryllium (Be), Bismuth (Bi), Lithium (Li) and Tin (Sn). | Tissue metal concentrations in Dolly Varden were analyzed at ALS in Burnaby, BC using standard methodology, using best available detection limits. Metals in tissue were analyzed using ICPOES and CPMS. This method is adapted from US EPA Method 200.3 "Sample Procedures for Spectrochemical Determination of Total Recoverable Elements in Biological Tissues" (1996). Tissue samples are homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with repeated additions of hydrogen peroxide. Analysis is by Inductively Coupled Plasma - Optical Emission Spectrophotometry and Mass Spectrometry adapted from US EPA Method 6010B and 6020A. Mercury in tissue were analyzed using CVAFS. This method is adapted from US EPA Method 200.3 "Sample Procedures for Spectrochemical Determination of Total Recoverable Elements in Biological Tissues" (1996). Tissue samples are homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with repeated additions of hydrogen peroxide. Analysis is by atomic fluorescence spectrophotometry, adapted from US EPA Method 245.7.<br>The metals excluded from this analysis (Table 6.3-27 of the 2009 Fish and Fish Habitat Baseline Report in Appendix 15-C) were rarely (antimony, lithium, and tin) or never (beryllium and bismuth) detected in fish tissue (n=26). | Reasonable treatment |
| 31. | 8.5 | First Nation Information Distribution and | Chapter 2 / Section 2.1.3 | GHC | The Section 11 Order directs the Proponent to consult with the Tahltan Central Council (on behalf of the | The Section 11 Order (November 6, 2009) requires Seabridge to consult with Nisga'a Nation and First Nations, defined as "the Tahltan Central Council (on behalf of the Tahltan Nation), the Gitanyow wilp Wiiltsx-Txawokw, and the wilps of the | Reasonable treatment |



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| | | Consultation | | | Tahltan Nation), the Gitanyow wilp Wiiltsx-Txawokw, and the wilps of the Gitxsan First Nation (as identified by the Gitxsan Hereditary Chiefs Office), including, but not limited to, wilp Skii km Lax Ha<br>• Delete: Txawokw<br>• Add: the Gitanyow Huwilp of Gwass Hlaam, Gamlaxyeltxw, Malii and Gwinuu | Gitxsan Nation (as identified by the Gitxsan Hereditary Chiefs), including, but not limited to, wilp Skii km Lax Ha."<br>The BC EAO issued a Section 13 Order on September 29, 2011, which amended the Section 11 Order, as follows:<br>• By replacing the last bullet under section 3.1 that reads "transportation of ore processing reagents and other hazardous chemicals to the plant site, and of explosives to the mine, along the access roads" with the following new bullet: "Use of the access roads to the proposed Project site, and Highway 37 between the proposed Project site and its junction with Highway 16 at Kitwanga (as shown in Figure 2), including those potential effects arising from the transport of people, goods and materials, including, but not limited to, fuel, hazardous chemicals and explosives."<br>• By adding a new section 4.2 as follows: For purposes of section 4.1.2, the term "First Nations" includes Gitanyow *wilp* Malii, *wilp* Gamlaxyeltxw, wilp Gwaas Hlaam and *wilp* Gwinuu.<br>• By adding a new section 20.8 as follows:<br>"20.8 The Environmental Assessment Office will, in relation to the environmental assessment of the proposed Project, consult with Gitanyow *wilp* Malii, *wilp* Gamlaxyeltxw, *wilp* Gwaas Hlaam and *wilp* Gwinuu (either directly or, if requested, through the Gitanyow Hereditary Chief's Office) in the following manner:<br>20.8.1 The Environmental Assessment Office will form a technical working group to discuss road use and potential effects on the aboriginal interests of the Gitanyow *wilp* Malii, *wilp* Gamlaxyeltxw, *wilp* Gwaas Hlaam, *wilp* Gwinuu and other potentially affected First Nations and the Nisga'a Nation arising from the use of Highway 37 by Project-related traffic. The Environmental Assessment Office will inform the proponent that they are required to participate in these technical working group meetings.<br>20.8.2 The Environmental Assessment Office will inform Gitanyow *wilp* Malii, *wilp* Gamlaxyeltxw, *wilp* Gwaas Hlaam, *wilp* Gwinuu of all major milestones with respect to the environmental assessment of the Project."<br>• In sections 23.1, 24.1, 25.1 and 27.1.1 by adding "Gitanyow *wilp* Malii, *wilp* Gamlaxyeltxw, *wilp* Gwaas Hlaam, and *wilp* Gwinuu" after "First Nation".<br>• By adding a new section 25.2 as follows:<br>"25.2 The Nisga'a Nation, First Nations and *wilp* Malii, *wilp* Gamlaxyeltxw, *wilp* Gwaas Hlaam, and *wilp* Gwinuu will have the opportunity to provide the Environmental Assessment Office their respective written submissions about the Assessment Report, which written submissions will be included in the package of materials sent to ministers when the Project is referred to ministers for decision." | |



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| | | | | | | • By adding Figure 2.<br>• By deleting sections 27.1.2. | |
| 32 | 8.5 | First Nation Information Distribution and Consultation | Chapter 30 / Section 3.3 | Tahltan Nation | Why is Gitxsan as a whole not represented? | The Gitxsan First Nation is considered in Chapter 3: Information Distribution and Consultation and in Chapter 30: First Nations Interests in accordance with the Section 11 Order. The Gitxsan are represented on the KSM Project Working Group by the Gitxsan Chiefs Office (GCO). Section 3.3 and Appendices 3-M and 3-N provide a summary of information distribution and consultation activities with First Nations. | Reasonable treatment |
| 33 | 8.5.1 | Pre-application Consultation | Chapter 30 (Appendix 30-C) | BC EAO | The GHC requires a full review of the TUS prepared by Rescan and attached as Appendix. | In February 2011, the GHCO and wilp Wii'litsxw were provided with the draft Gitanyow Traditional Knowledge and Use Desk-Based Research Report for review and comment. A meeting was held with wilp Wii'litsxw on April 13, 2011 to discuss the draft. Where TK/TU information has been provided by the Gitanyow Nation, it has been incorporated into the Application/EIS. The Gitanyow will have an opportunity to provide comments during the review of the Application/EIS. | Reasonable treatment |
| 34. | 8.5.1 | Pre-application Consultation | Chapter 30 (Appendix 30-C) | BC EAO | Application should recognize the existence of the Gitanyow Huwilp Land Use Plan and undertake an assessment of the potential impacts of the proposed Project on the GHLUP | The Gitanyow Lax'yip Land Use Plan was approved after the AIR and is described in Section 30.3.2.4 with the following paragraph:<br>"In March 2012 the Gitanyow Nation and the Province of British Columbia The Gitanyow Lax'yip Land Use Plan is described in Section 30.3.2.4 with the following paragraph:<br>"In March 2012 the Gitanyow Nation and the Province of British Columbia signed the Gitanyow Huwilp Recognition and Reconciliation Agreement (GHRRA) as a, "bridging step towards reconciliation and a constructive step towards creating a positive and enduring relationship between the Gitanyow and British Columbia" (Gitanyow Nation and Province of BC 2012). One of the overarching goals of the agreement is the development of meaningful, shared decision making with respect to land and resources within Gitanyow traditional territory (Lax'yip) and a collaborative approach to sustainable economic development. Part 2 of the GHRRA is the Gitanyow Lax'yip Land Use Plan which articulates a co-management approach to land and resource use planning, with an emphasis on shared decision making and the maintenance of Wilp Sustainability including the establishment of various land use designations, zoning and management objectives."<br>The main interaction between the Project and the objectives of the Gitanyow Lax'yip Land Use Plan are with respect to the passage of Project traffic through Gitanyow wilp territories. In particular, Project traffic will traverse the Hanna-Tintina watershed north of Meziadin Junction. The Hanna-Tintina and Biodiversity Areas are designated Ha'nii tokxw areas under the GHRRA. Ha'nii tokxw, which literally means "our food table" is a Gitanyow designation for landscapes (broadly defined to encompass land, air, and water resources) that are intended under the terms of the GHRRA to remain in a, "predominantly natural condition…" (Gitanyow Nation and Province of BC 2012: pp. 4.) The traffic study entitled "KSM Project Highway 37 and 37A Traffic Effects Assessment" provides a detailed report on project traffic, | Reasonable treatment |



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| | | | | | | potential effects on Gitanyow interests, and proposed mitigations and monitoring. | |
| 35. | 8.5.1 | Pre-application Consultation | Chapter 3 / Sections 3.3 (Appendices 3-M and 3-N)<br>Chapter 30 | SKLH | Skii km Lax Ha notes that the consultation record provided in the EIS does not provide a full description of issues and concerns raised by Skii km Lax Ha Nation. With regard to the proponent's description of Skii km Lax Ha's participation in working group meetings, review of documents and provision of comments, Skii km Lax Ha notes that it did not have the capacity to respond to the multiple requests made by the Proponent at that time, nor did it feel the relationship with the proponent was one that fostered meaningful consultation. | A draft consultation report was provided to the SKLH in December 2012 for review and comment. The draft report described information distribution and consultation activities with the SKLH and other First Nations during the pre-Application stage of the process. The report also identified issues raised and Seabridge's responses to those issues during this stage of the process. No comments were received from the SKLH during the pre-Application phase.<br>The consultation report helped inform the preparation of the Application /EIS (e.g., See Chapter 3 and Appendices 3-M and 3-N). Appendix 3-N: First Nations Issues and Interests summarizes the issues raised by Aboriginal groups, including Skii km Lax Ha, along with a brief description of the responses provided by Seabridge to these issues. These issues were compiled from comments provided by First Nations at KSM Project Working Group meetings; individual meetings between Seabridge and First Nations' representatives; written comments on drafts of the AIR, annual baseline study work plans, KSM Project Tailing Management Facility Alternatives Assessment, and Highway 37 and 37A Traffic Effects Assessment reports; and in correspondence with Seabridge. Appendix 3-M summarizes communications with the SKLH during the pre-Application stage.<br>Chapter 30, First Nations Interests, considers the issues and concerns raised by First Nations in the context of potential Project effects on those interests (see Section 3.3).<br>Regarding the SKLH lack of capacity, Seabridge initially offered to provide capacity funding to the SKLH for their participation in the pre-application phase including a TU/TK study as early as 2009. Seabridge left the offer open during the entire pre-application phase. | Reasonable treatment |
| 36. | 8.5.1 | Pre-application Consultation | Chapter 3 / Section 3.1.3 | SKLH | Consultation objectives are not described in Section 3.3 or 30.2. The Proponent is requested to clearly state the consultation objectives, process undertaken to achieve them, and outstanding issues. | Section 3.1.3 describes the objectives of information distribution and consultation activities to date, consistent with the requirements of the AIR (January 2011). These objectives include to:<br>• share information about the Project and associated environmental and socio-economic baseline studies and obtain feedback on the Project and related studies;<br>• consider the feedback and make changes to the Project where feasible;<br>• document the issues raised to date in the EA process and provide responses to the issues in the Application/EIS, including proposed measures to enhance positive effects, and avoid or mitigate potential adverse effects; and<br>• comply with provincial and federal requirements related to public and Aboriginal consultation, including the Section 11 Order issued by the BC EAO and CEAA (1992) requirements.<br>See response to comment # 35. | Reasonable treatment |



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| 37. | 8.5.2 | Planned Consultation during Application Review | Chapter 3 / Section 3.3.1.8 | SKLH | Section 3.3.4 does not include Requirement 20.5 of the BC EAO Section 11 Order – "The Proponent, within time limits set by the Project Assessment Manager, must provide to the Project Assessment Manager and the First Nations, a written report on the results of the First Nations consultation activities, identifying issues and concerns raised by the First Nations with respect to the proposed Project's potential adverse effects on the First Nations' aboriginal interests and on the potential for other adverse environmental economic social, health and heritage effects, and how these issues and concerns are to be addressed" *BCEAO 2009: 13). This report should be in addition to the issues tracking table referenced in the EIS. | Reports were prepared in accordance with the Section 11 Order 17.1 to summarize information distribution and consultation activates with Nisga'a Nation and First Nations. A report in accordance with Section 20.5 of the Section 11 Order will be submitted to the BC EAO during Application/EIS review and provided to SKLH for review and comment. | Reasonable treatment |
| 38. | 8.5.2 | Planned Consultation during Application Review | Chapter 3 / Section 3.3.4 | SKLH | Section 3.3.2 does not propose a process for resolving outstanding issues. This is required. | Section 3.3.4 proposes a plan for consulting First Nations during the Application/EIS review. At the end of the section, it states: "Based on issues and concerns raised by First Nations during the Application/EIS review stage, and based on input from First Nations, Seabridge will consider other measures to respond to issues and concerns raised by First Nations, as well as identify methods to attempt to resolve outstanding issues". The process for resolving outstanding issues will depend on the nature of the outstanding issue and will ultimately need to be resolved to the satisfaction of the Crown. | Reasonable treatment |
| 39. | 8.5.2 | Planned Consultation during Application | Chapter 3 / Section 3.3.4 | SKLH | The plan for consultation with First Nations proposed in Section 3.3.4 is deficient in many respects. 1) the proposed plan does not identify any consultation objectives other than the intent to meet the requirements of the Section 11 and 13 Orders and CEAA 1992. 2) The focus of the plan is substantially on communications rather than meaningful consultation - there is no detail around how the proponent intends to engage in meaningful consultation with respect | The following sentence has been added to the first paragraph of Section 3.3.4 to expand on the goals and objectives of the proposed consultation plan' "The goal is to maintain open lines of communication and develop mutually beneficial working relationships with identified Aboriginal groups during the Application/EIS review phase and, ultimately, throughout the life of the Project." | Reasonable treatment |



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| | | | | | to the proposed project or how the proponent intends to identify and consult in accordance with First Nations' consultation protocols during the Application review process. More detail is required in this section and a commitment to develop First Nation-specific Consultation Plans for the Application review period should be made. | | |
| 40. | 8.6.2 | Planned Consultation during Application Review | Chapter 2 / Section 2.1.3<br><br>Chapter 3 / Section 3.4 | BC EAO | The Application will include a proposed plan of consultation activities with government (Canadian federal, British Columbia, Alaska-based US federal and State) agencies and local governments during the review of the Application.<br>• (Doesn't reference U.S./state agencies) | Section 3.4 describes information distribution and consultation with government agencies (including U.S. federal and Alaska State agencies and local governments). Table 2.1-1 in Chapter 2 identifies the members of the KSM Project Working Group which include U.S. federal and Alaska State agencies. | Reasonable treatment |
| 41. | 8.6.2 | Planned Consultation during Application Review | Chapter 3 / Section 3.3.4 | BC EAO | The Application will also identify the proposed process for attempting to resolve outstanding issues.<br>• **(**Not very detailed or informative) | See response to comment #38. | Reasonable treatment |
| 42. | 9 | Project Description | Chapter 33 (Appendix 33-B) | Tahltan Nation | Data for the southern route is insufficient to be able to compare to northern route as a better option. | The multiple accounts analysis for road access alignment to the TMF is provided in Appendix I of Appendix 33-B. This analysis provides detailed information on road alignment (length and grade), geohazards and snow avalanche risks, wildlife habitat, fisheries, wetlands, and commercial land uses for both a northern access route and a southern access route. | Reasonable treatment |
| 43. | 9.3.2 | Water Management | Chapter 4 / Section 4.5<br>Chapter 14 / Sections 14.1, 14.7<br>Chapter 33 / Section 33.12 | GHC | Whose stringent selenium requirements? USA? Canada? Both? Will part of the KSM project involve research and experimentation to find better techniques to treat water contaminated with Selenium? What are the current technique(s) to treat Selenium contaminated waters? | The water quality guidelines for the protection of aquatic life in BC (2 µg/L for selenium) are more stringent than the water quality guidelines of the United States EPA (5 µg/L for selenium).<br>The research testwork and results on selenium removal conducted at BioteQ and overseen by Rescan and funded by Seabridge has led Teck Corporation to fund a full scale pilot plant for the Elk River in Southeast British Columbia. More information can be provided on request. The selection of ion exchange to remove selenium was not done in isolation. A number of research evaluation reports were reviewed prior to embarking on the laboratory scale testwork. There are no full scale ion exchange selenium removal plants in operation in British Columbia. Fortunately, Teck is moving ahead with a field pilot plant being developed and managed by BioteQ that will provide important information. At KSM selenium | Reasonable treatment |



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| | | | | | | treatment will not be required for approximately 30 years or until mining commences on the Kerr deposit, however additional work will continue with BioteQ and others. The focus of the research will be the reduction to elemental selenium and recovery of the selenium for offsite disposal or economic recovery.<br>Section 33.12 (Table 33.12-4) of the Application/EIS (Alternatives) provides an overview of the different selenium treatment technologies that are available. | |
| 44. | 9.3.2 | Water Management | Chapter 4 / Section 4.5 | GHC | Table 4.5-15 Why is there no 'Removal Efficiency' of Selenium (Se (VI))? | The "n.a" in Table 4.5-15 for the removal efficiency of selenium (Se(VI)) means that that a concentration reduction was not observed between the feed water quality and the effluent water quality. | Reasonable treatment |
| 45. | 9.3.2 | Water Management | Chapter 4 / Section 4.5 | GHC | Table 4.5-16. These comments not only apply to the aforementioned table; but also the general issues surrounding selenium as well. It appears that controlling selenium discharges for the entirety of the KSM project is an issue that is far from being definitively resolved; this is very troubling especially from an environmental and fisheries protection standpoint. Selenium is an ion (Se+) that is known to have similar chemical properties to calcium (Ca+) and thus selenium can be taken up by aquatic organisms in Se+ contaminated waters in lieu of calcium; with predictably toxic results. Thus Seabridge Gold should be able to demonstrate at this point that their selenium control measures for the KSM project are indeed protective of aquatic life. At the very least one of the conditions of an EAC that should be placed on Seabridge Gold is performing more research to find more effective selenium control and water treatment techniques. | Seabridge acknowledges that selenium is a key aspect requiring ongoing research. Seabridge has committed to conducting additional selenium speciation research as well as participating in treatment research studies. Condition # 18 in Table 39-5.1 includes the commitment for ongoing selenium research. | Reasonable treatment |
| 46. | 9.3.3 | Process Plant<br>• Water Management | Chapter 4 / Section 4.5 | GHC | Where and exactly why is cyanide required in the process water supply system? | Cyanide is the principal reagent used and required to recover precious metals. This reagent is used safely throughout the world with minimal consequences. Seabridge understands the risks of using cyanide and significant mitigation measures have been implemented to protect the health of employees and the environment. This includes state of the art water treatment, a lined storage pond, and an adherence to the most stringent health and safety regulatory requirements. There is an | Reasonable treatment |



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| | | | | | | International Cyanide Management Code sanctioned by the International Cyanide Management Institute (ICMI) and most regulatory agencies on a worldwide basis. Seabridge commits to seeking membership and adhering to the policies and procedures of the International Cyanide Management Code (2012). | |
| 47. | 9.3.3<br>9.3.4 | Process Plant<br>• Water Management | Chapter 4 / Section 4.5<br>Chapter 13 / Section 13.7<br>Chapter 15 / Section 15.7 | Tahltan Nation | Section 4.5.3: Processing and Tailing Mgt. Area. The leach process involves sodium cyanide raising issues around residual cyanide seepage and storage of reagents. TSF overflow will report to the Treaty Creek watershed. The center cell of the TSF will be equipped with relief wells to bleed off artesian groundwater pressures to prevent uplift of the liner. No leak detection systems or seepage recovery system is proposed for the center CIL cell. The TSF is predicted to be in hydrologic surplus so long term discharge of TSF overflow is likely.<br>Tiegen Creek will be subjected to diversion losses which may mean in-stream flow issues for the receiving environment.<br>Contingencies for off spec seepage below the tailings impoundment were not found.<br>This will likely get picked up at the permit stage. | Seepage recovery systems are designed to capture the seepage from the CIL cell in the north and in the south at the saddle areas during the mine operations up to Year 25 before the south tailing cell is in place. The CIL centre cell is going to be hydraulically contained afterwards by both of the north and south tailing cells during later operational years and post-closure according to the design. In addition, seepage mitigation system has been designed with the CIL cell to be lined with geomembrane liners to minimize the seepage.<br>An instream flow analysis was conducted for Teigen Creek using the British Columbia Instream Flow Guidelines for Aquatic Habitat. These guidelines include Instream Flow Thresholds (Hatfield et al. 2003) and Instream Flow Assessment Methods (Lewis at al. 2004). The results of the analysis for Teigen Creek are provided in Chapter 15.7.5.1.4. Additional analysis on potential flow effects (specifically, annual volumes, monthly flows, peak flows and low flows) are presented in Chapter 13.7.<br>Any potential off spec seepage is all reporting to the seepage recovery pond and pumped back to the main tailings impoundment. | Reasonable treatment |
| 48. | 9.4 | Project Description<br>• Project Development Schedule | Chapter 15 (Appendices 15-Q and 15-R) | NLG | Did not see any mention of the timing of construction of habitat compensation works. | The timing of the fish habitat compensations works is provided in the HADD Fish Habitat Compensation Plan (Appendix 15-R) and MMER Fish Habitat Compensation Plan (Appendix 15-Q). Section 8.3 (Proposed Schedule) in each plan provides details on the proposed schedule for the fish habitat compensation works. The schedule includes six phases: Detailed Design Assessment, Detailed Design Planning, Permitting, Second Year Fisheries Monitoring Assessment, Pre-construction Planning, and Construction (see Table 8.3-1). Construction is tentatively scheduled after permit decisions and within one year after construction of the KSM Project has commenced. Construction timelines may change depending on the overall project schedule. DFO will be consulted about construction timelines as they relate to the habitat to be lost (due to project infrastructure) and habitat to be created. | Reasonable treatment |



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| 49. | 9.5.3 | Project Description<br>• Personnel Requirements | Chapter 4 / Section 4.9.7<br>Chapter 20 / Section 20.7.2 | BC EAO | Labour requirements for mine operation only in 4.9.7, employment effects for construction and operations in PYs/FTE in 20.7.2 (Info not in Appendix 4-A (Section 1.23.3) | The labour requirements for both construction and operation are indicated in paragraph two of section 4.9.7. In Section 20.7.2, a general description is provided on the types of positions required for both construction and operation. A detailed breakdown for construction is not yet known but is expected to be typical of heavy engineering projects. | Reasonable treatment |
| 50. | 9.5.3 | Project Description<br>• Personnel Requirements | Chapter 4 / Section 4.9.7 | BC EAO | Doesn't distinguish between permanent, seasonal or temporary positions. | For presentation of data in the effects assessment employment numbers for all positions, including permanent, seasonal or temporary are standardized to person-years. This is necessary for the economic analysis and assessment of economic effects. As described in 4.9.7 much of the construction activity will be seasonal, whereas most operations employment is expected to be full-time. | Reasonable treatment |
| 51. | 9.5.3 | Project Description<br>• Personnel Requirements | Chapter 20 / Section 20.7.1 (Appendix 20-B) | BC EAO | Section 20.6.1.7 does not exist, in Section 20.7.1.1? | Yes, the economic modelling, including discussion of indirect effects is presented in Section 20.7.1.1. Detailed discussion of multipliers and other aspects of the model and analysis is provided in the *2012 Economic Model Report* (Appendix 20-B). | Reasonable treatment |
| 52. | 9.5.4 | Project Description<br>• Procurement | Chapter 20 / Section 20.7.4 (Appendix 20-B) | BC EAO | The Application will identify the types and approximate overall value of contracts that will be required for the construction and operation of the proposed Project and indicate in general terms the potential for the contracts to be won by local, provincial, national or international contractors.<br>• Not found in these sections | The types of contracts required are discussed in general terms in Section 20.7.4. Approximate overall value of contracts is estimated by the economic impacts model as indicated by the indirect GDP estimates provided in tables of Appendix 20-B. GDP is used as a preferred measure instead of overall value of purchases (i.e. contract value) because it is a more accurate measure of economic benefit to the immediate supplier or contractor. The value of individual contracts is expected to vary substantially depending on the specific good or service required. | Reasonable treatment |
| 53. | 9.6 | Project Description<br>• Project Capital Costs | Chapter 20 / Sections 20.6.3 and 27.10 | BC EAO | The Application will provide the best available estimate, at a prefeasibility study level, of proposed Project capital costs over the life of the Project from construction through decommissioning.<br>• Capital cost for construction and operation by years. Does not specify decommissioning in these sections | A detailed description of closure costs is provided in Sections 27.10 and 20.6.3 and has been further clarified. | Reasonable treatment |
| 54. | 10 | Methodology for Assessment of Potential Effects | Chapter 5; Various chapters (see effects assessment sections) | BC MOE | The effects assessment essentially indicates that moderate to minor effects will be the result of the project once all of the mitigation strategies have been implemented. Given the massive scale of the project, the detailed, overlapping and intricate on- | This Project was designed to incorporate mitigation measures that would result with a maximum environmental effect of moderate significance rating. Any effect that was deemed significant was considered a fatal flaw and redesigned to meet at minimum a moderate effect. The general intention of the design was to mitigate the effects to a minor rating where ever possible. For example, Table 1.7-1 provides an overview of key changes made to the project design to reduce the short and long term effects of the Project on the environment. | Reasonable treatment |



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| | | | | | going engineering requirements, complex physical environment in which the project is located, and the perpetual duration of this project, the effects assessment appears to be overly optimistic and downplays the dynamic environment and the complicated operating conditions under which the project would be constructed, operated and perpetually maintained. | | |
| 55. | 10 | Methodology for Assessment of Potential Effects | Chapter 5; Various chapters (see effects assessment sections) | BC MOE | For the post-closure phase of the project, 250 years has been stated as the amount of time required for follow-up maintenance and on-going water management during the Post-Closure' phase. The reality of this project is that the Post-Closure phase will be forever and will involve centuries of on-going management of water flow, chemistry and infrastructure maintenance. The implications of this extremely long-term responsibility has not been adequately explained, addressed and considered in the cumulative effects assessment. There is insufficient detail in describing the rationalization of the 250 yrs in terms of materials management, sulphide oxidation, on-going treatment and waste disposal, operating costs, availability of materials, site evolution over time and other issues germane to on-going post-closure management requirements for a project as complex as this. | See response to comment #1. | Reasonable treatment |
| 56. | 10 | Methodology for Assessment of Potential Effects | Chapter 5 / Section 5.2.12<br>Chapter 37 / Sections 37.6.9 and 37.6.14 | GHC | In this chapter they do not explain how cumulative effects will be assessed. They do lay out some generalities about what will be considered (i.e. past industrial projects, present project, etc). Their description of other activities, such as | The methodology for the Cumulative Effects Assessment (CEA) is outlined in Section 5.2.12, Chapter 5, Effects Assessment Methodology. The CEA follows the same methods as previously discussed in the chapter for Project-specific effects.<br>The scope of the CEA includes a consideration of how Project-specific residual effects potentially interact with Aboriginal harvesting activities to cause an adverse cumulative residual effect (see section 5.3.6.4). Cumulative residual effects related | Reasonable treatment |



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| | | | | | Nisga'a or First Nations hunting is very general and not of use in terms of predicting/assessing cumulative impacts. This chapter falls very short of explaining how they will actually assess cumulative impacts. | to hunting land use activities are reported on in Chapter 23, section 23.9. Cumulative effects related to moose mortality are analyzed in Chapter 18, section 18.9.<br>Cumulative effects on subsistence harvesting activities are further summarized in Chapter 37, section 37.6.14 and for wildlife (e.g., moose mortality) in Chapter 37, section 37.6.9. | |
| 57. | 10 | Methodology for Assessment of Potential Effects | Chapter 30 / Section 3.3.1.5 | Tahltan Nation | Lack of Tahltan criteria used in assessment for entire chapter | Seabridge funded a TK/TU study with THREAT which was carried out in 2011/2012. The report was made available to Seabridge but due to confidentiality obligations required by THREAT, the information in the report was not permitted to be used in the preparation of the Application/EIS. Seabridge and its environmental consultant (Rescan) did, however meet with Tahltan members from THREAT in a knowledge integration workshop held in Vancouver in August 2012, prior to submitting the Application/EIS for screening. At the workshop Tahltan members made presentations and provided information and key messages about Tahltan TK/TU and answered questions from the assessment team.<br>Key messages from the Tahltan Knowledge Study and the workshop emphasized the importance of Tahltan oral data, the potential archaeological importance of high-elevation land-use, and the need to develop principles for working to integrate knowledge systems. In response to this workshop, Seabridge conducted additional archaeology studies to address comments provided (e.g, glacier ice-patch archaeology)<br>Seabridge has used the information and knowledge gleaned from the workshop and from the desk-based ethnographic report provided in Appendix 30- A to form the basis for "Tahltan criteria" that has been used as appropriate, throughout the Application/EIS including in:<br>• Identification of VCs<br>• Identification of key issues and concerns<br>• Development of mitigation/monitoring measures and plans | Reasonable treatment |
| 58. | 10 | Methodology for Assessment of Potential Effects | Chapter 3 / Section 3.3.1.5 (Appendix<br>Chapter 30 / Section 30.1.5<br>(Appendix 30-B) | SKLH | TK information is not apparent in the EIS. Skii km Lax Ha Nation requests that Seabridge identify where in the EIS it has incorporated traditional knowledge. | TK/TU is summarized for each First Nation in the Appendices to Chapter 30. Appendix 30-B provides SKLH ethnographic information obtained principally from secondary sources and other publicly available information from other EAs recently conducted in the region. Despite repeated offers from Seabridge to fund their participation in the study, SKLH did not make themselves available to provide additional information (see Chapter 3, Section 3.3.1.5). Available TK/TU information was provided to each discipline team during the pre-application phase and was used, for example, to inform preparation of the assessment by/in:<br>• Identification of VCs<br>• Identification of key issues and concerns<br>• Development of mitigation/monitoring measures and plans<br>The process is further described in Section 30.1.5. | Reasonable treatment |



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| | | | | | | Attempts by Seabridge to initiate a TK/TU study with Skii km Lax Ha are documented in Chapter 3.3 and Appendices 3-M and 3-N. SKLH did not respond to Seabridge's attempts prior to filing the Application/EIS. However, Seabridge and the SKLH have recently initiated discussions on these and other matters and Seabridge's consultants met with them on May 27, 2013. Seabridge intends to continue to communicate with the SKLH going forward. | |
| 59. | 10 | Methodology for Assessment of Potential Effects | Chapter 3 / Section 3.3.1.5 (Appendices 3-M and 3-N)<br>Chapter 30 / Section 30.1.5<br>(Appendix 30-B) | SKLH | 5.2.4 does not discuss the integration of TK/TU.<br>Appendix 30B is deficient. It contains no original, primary research relevant to the Project area, either TU or TK. It contains no relevant baseline information, and offers no assessment of possible effects on Skii km Lax Ha Nation interests.<br>TK information is not apparent in the EIS. Skii km Lax Ha Nation requests that Seabridge identify where in the EIS it has incorporated traditional knowledge.<br>5.2.5 does not discuss the integration of TK/TU<br>Appendix 30B is deficient. It contains no original, primary research relevant to the Project area, either TU or TK. It is not clear where or how in the EIS TK has been incorporated – The proponent is requested to provide a summary of where an how it has been incorporated into the EIS. | TK/TU is summarized for each First Nation in the Appendices to Chapter 30. Appendix 30-B provides SKLH ethnographic information obtained principally from secondary sources and other publicly available information from other EAs recently conducted in the region. Despite repeated offers from Seabridge to fund their participation in the study, SKLH did not make themselves available to provide additional information (see Chapter 3, Section 3.3.1.5). Available TK/TU information was provided to each discipline team during the pre-application phase and was used, for example, to inform preparation of the assessment by/in:<br>• Identification of VCs<br>• Identification of key issues and concerns<br>• Development of mitigation/monitoring measures and plans<br>The process is further described in Section 30.1.5.<br>Attempts by Seabridge to initiate a TK/TU study with Skii km Lax Ha are documented in Chapter 3.3 and Appendices 3-M and 3-N. SKLH did not respond to Seabridge's attempts prior to filing the Application/EIS. However Seabridge and the SKLH have recently initiated discussions on these and other matters and Seabridge's consultants met with them on May 27, 2013. Seabridge intends to continue to communicate with the SKLH going forward. | Reasonable treatment |
| 60. | 10 | Methodology for Assessment of Potential Effects | Chapter 4 / Section 4.5<br>Chapter 14<br>Chapter 15 | GHC | The Bell Irving River and the Nass River should be included as one of the potential aquatic ecosystems affected by the proposed project in Chapter 14. The spatial boundaries were based on predicted water quality modelling, but the data set used for the modelling was so small and temporarily limited that its results are of little value and should be considered inconclusive and | The proposed mitigation strategies and surveillance at the TMF and downstream in Treaty Creek provide a high level of scrutiny and awareness of any potential issues that may arise. The regulatory permits will require daily monitoring which will provide an early warning system that would allow mitigation of any issues well before any measureable effect on the Bell-Irving or the Nass rivers. The design of the TMF includes the ability to store and resolve any potential issue prior to discharge into the receiving environment at Treaty Creek.<br>The level of test work including pilot plant studies, toxicological assessments and empirical assessments are very comprehensive. The mitigation measures in the TMF design including 200-year flood events are state of the art design. In the receiving environment, baseline studies included monitoring of forty-nine stream | Reasonable treatment |



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| | | | | | scientifically indefensible.<br>The Bell Irving and the Nass River should be included as one of the potential aquatic ecosystems affected by the proposed project in Chapter 15. At a bare minimum there should be some defensible scientific justification for not including it. Section 15.4 states: *The primary factor that determined the placement of the RSA boundary was the potential extent of water quality degradation due to the KSM Project.* The spatial boundaries were based on predicted water quality modeling, but the data set used for the modelling was so small and temporally limited that its results are of little value and should be considered inconclusive and scientifically indefensible. | and river sites monitored over 5 years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. The baseline water quality program exceeds the standards outlined in the 2012 "Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators". The baseline monitoring program was been fully vetted by MOE and presented at multiple KSM Project Working Group meetings. Baseline data is continuing to be collected.<br>The fish and fish habitat study area boundaries for the KSM Project were defined in the AIR (January 2011) which were subject to review by government agencies, Nisga'a, First Nations and the public prior to their approval in 2011. The fish and fish habitat study area boundaries were presented in baseline reports, work plans, and discussed with the KSM Project Working Group meetings. The Bell-Irving River is included in the fish and aquatic habitat regional study area as indicated in Figure 15.4-1 of the Application/EIS. The Nass River is excluded from the fish and aquatic habitat regional study area. | |
| 61. | 10. | Methodology for Assessment of Potential Effects | Chapter 18 /Section 18.1.4 | NLG | Habitat suitability modeling does not appear to incorporate climatic considerations. | Vegetation components of all habitat suitability maps were developed considering plant communities and their phenology. While plant communities are dependent on features of soil nutrients and moisture, phenology is driven by weather and climatic conditions (at multiple scales). The use of phenology for defining seasonal habitat suitability was chosen to allow flexibility in determining suitability if influenced by climate change or annual variation in weather (e.g., if spring occurs two months earlier, spring phenology and thus associated value of plant forage, will also occur two months earlier).<br>Consideration of extreme climate variations is not within the scope of habitat suitability model development (British Columbia Wildlife Habitat Rating Standards – RISC 1999). | Reasonable treatment |
| 62. | 10 | Methodology for Assessment of Potential Effects | Chapter 30 / Section 3.3.1.5 | Tahltan Nation | Lack of Tahltan criteria used in assessment for entire chapter | Chapter 5 identifies the assessment methodology followed for the EA. Tahltan criteria were considered in the EA where information had been provided by the Tahltan. | Reasonable treatment |
| 63. | 10 | Methodology for Assessment of Potential Effects | Chapter 30 / Section 3.3.1.5 | Tahltan Nation | No extra measures provided for mitigation identified in section 37 that are not basic features or requirements of the project. | The Application/EIS proposes mitigation based on assessment of the potential effects of the Project. As members of the KSM Project Working Group, the Tahltan will have an opportunity to comment on proposed mitigation measures during the Application/EIS review stage. | Reasonable treatment |
| 64. | 10 | Methodology for Assessment of | Chapter 7 | Tahltan Nation | The Application will describe proposed mitigation methods and | As members of the KSM Project Working Group, the Tahltan will have an opportunity to name the equipment that they believe is missing from the | Reasonable treatment |



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| | | Potential Effects | | | identify equipment needs and procedures (including monitoring requirements) and policies associated with the proposed measures.<br>(26)<br>• (37) some equipment described in AQ section but not in others-incomplete. | Application/EIS during the formal review. | |
| 65. | 10 | Methodology for Assessment of Potential Effects | Chapter 30 / Section 3.3.1.5 | Tahltan Nation | The Application will propose impact mitigation measures such as fish habitat compensation, where effects cannot be mitigated on-site.<br>(26)<br>• (37) not outlined in this section-only mentioned. | The HADD Fish Habitat Compensation Plan is provided in Appendix 15-R and the MMER Fish Habitat Compensation Plan is provided in Appendix 15-Q. | Reasonable treatment |
| 66. | 10 | Methodology for Assessment of Potential Effects: | Chapter 5 /Section 5.2.3 | BC MOE | AIR requires the proponent to identify residual effects according to the procedure in the CEAA reference guide from 1994. The guidance provided seems to limit an assessment to determining if residual effects are either significant or not significant. The application has introduced a moderate level of significance (page 5-15, not significant – moderate) which is included as “not significant”. We find this unhelpful for the review. The definition of “not significant-moderate” includes both temporal and geographic scope that could in fact be significant. Therefore the application may list as not significant residual impacts that we consider are significant. We note there is no category called significant – moderate.<br>We ask for guidance from the EAO on how we sort out differences of opinion on moderate residual effects. Such guidance may be crucial to permit as | The presentation of significance conclusions in the Application/EIS represents Seabridge’s interpretation of its own analyses and conclusions.<br>The use of not significant – moderate rankings is not new to the EA process and has been used in other EA Applications (e.g., Kitsault Molybdenum Mine Project, Morrison Gold-Copper Project).<br>Seabridge defers to the EAO and the Agency to provide further guidance on significance ratings. | Reasonable treatment |



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| | | | | | impartial a review as possible. | | |
| 67. | 10 | Methodology for Assessment of Potential Effects | Chapter 30 / Section 3.3.1.5 | Tahltan Nation | Residual Adverse Effects and their Significance → The Application will assess the significance of predicted effects according to the following criteria:<br>• lack of Tahltan criteria used in assessment for entire chapter | Chapter 5 identifies the assessment methodology followed for the EA. Tahltan criteria were considered in the EA where information had been provided by the Tahltan. | Reasonable treatment |
| 68. | 10 | Methodology for Assessment of Potential Effects | Chapter 5 / Section 5.3 | GHC | Kitsault Mine – a closed mine. Located in the Nass Area about 65 kilometres south of the proposed KSM Project.<br>• The Avanti-Kitsault Mine Project was recently approved for re-opening by BC | The former reference to the Kitsault mine as a past producer is correct Avanti's Kitsault mine received an EA certificate after the Application/EIS was submitted for screening. Section 5.3.5.7 and Table 5.3-3 will be updated to indicate an EA certificate was issued on March 18, 2013. | Reasonable treatment |
| 69. | 10 | Methodology for Assessment of Potential Effects | Section 18 / Section 18.7.5 | GHC | By not including hunting Nisga'a and other First Nations and non-First Nations hunting, the proponent has missed a large potential impact source to moose and other wildlife. In previous sections it was stated that hunting would be included in the assessment but is not included in this list. | The effect of hunting on wildlife is discussed in Chapter 18. Hunting is considered an "Indirect Mortality" effect. The primary source of indirect mortality identified for wildlife VCs in association with Project development is increased hunting pressure on ungulates and bears—both legal and illegal—as a result of greater human access to the RSA. | Reasonable treatment |
| 70. | 10 | Methodology for Assessment of Potential Effects | Chapter 37 / Section 37.2 | | The list of EA reviewable projects is incomplete. Both the TransCanada (PRGT) and Spectra Pipelines need to be included in the Cumulative Impacts scope. These projects will have impact on Moose and other wildlife within the KSM Study Area. | The list of past, present, and reasonably foreseeable Projects and activities was included in the AIR (January 2011) and updated with EAO in early 2012 prior to these projects entering the EA process. | Reasonable treatment |
| 71. | 10 | Methodology for Assessment of Potential Effects | Chapter 5 / Section 5.3 | GHC | Red Chris Mine<br>Project is approved and under construction<br>Kitsault Mine<br>Recently approved<br>Northwest Transmission Line | Table 5.3-2 in Chapter 5 indicates the Red Chris mine is certified and under construction as of May 2012.<br>Avanti's Kitsault mine project received an EA certificate on March 18, 2013 after the Application/EIS was submitted for screening. Section 5.3.5.7 and Table 5.3-3 will be updated to indicate that an EA certificate has been issued.<br>Table 5.3-2 in Chapter 5 indicates the Northwest Transmission Line is certified in February 2011and construction began in January 2012. | Reasonable treatment |



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| | | | | | Approved and under construction | | |
| 72. | 10 | Methodology for Assessment of Potential Effects | Chapter 30 / Section 3.3.1.5 | Tahltan Nation | Potential Cumulative Effects<br>- The Application will assess potential environmental, economic, health, social and heritage cumulative impacts of the proposed Project.<br>- Prior to the identification of potential overlapping effects, the following issue scoping steps will be taken: 2 - Define the spatial and temporal boundaries of other Projects and Actions<br>• lack of Tahltan criteria used in assessment for entire chapter | Chapter 5 identifies the assessment methodology followed for the EA. Tahltan criteria were considered in the EA where information had been provided by the Tahltan. | Reasonable treatment |
| 73. | 10 | Methodology for Assessment of Potential Effects | Chapter 30 / Section 30.1.4 | Tahltan Nation | The Application will include a rationale for including or excluding potentially relevant projects from the cumulative impacts/effects assessment. The following projects or human activities, illustrated in Figure 5, are initially identified as possible candidates for inclusion in the cumulative environmental effects assessment<br>• Tahltan Land Uses are more than just harvesting that should be considered in the analysis | Section 30.1.4, paragraph three, has been clarified as follows:<br>"First Nations traditional uses of, and connection to, the land and associated terrestrial and aquatic resources are the most obvious, but not the only, expression of Aboriginal rights and title in their traditional territories. That is, the Aboriginal rights most relevant to the Project are those related to hunting, fishing, trapping, the collection of traditional food and medicinal plants, and related environmental resources, activities or practices, and attributes which are important to the specified First Nations." | Reasonable treatment |
| 74. | 11.1 | Climate and Air Quality | Chapter 6 / Sections 6.2 and 6.7 | BC EAO | Determination of the industry GHG profile<br>• Not found | The industry facility level GHG profile is provided in Chapter 6 as follows:<br>• Section 6.2.2, The National and Provincial Greenhouse Gas Setting, including Table 6.2-2, National and Provincial Greenhouse Gas Emissions, Including the Mining Sector, and Figure 6.2-1, BC Land Use Change from Deforestation and Afforestation, 1990-2010<br>• Section 6.7.4.1 Provincial, National and International Comparison of Project Greenhouse Gas Emissions, including Table 6.7-8, Comparison of KSM Project to Provincial and National Facility-level GHG Emissions, and<br>• Section 6.7.4.2 Sector Comparison, including Table 6.7-9, KSM Project and other BC Mining Project GHGs, which provides $CO_2e$ emission intensities of analogous mining sector projects | Reasonable treatment |



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| 75. | 11.1 | Climate and Air Quality | Chapter 7 / Section 7.8.3 | BC EAO | Predicted ambient air concentrations determined through modelling will be compared to appropriate federal and provincial air quality objectives/standards. The atmospheric dispersion of air emissions will emphasize fine particulate matter such as $PM_{2.5}$ and $PM_{10}$ on a local and regional scale.<br>• Unable to find results defined at a local and regional scale. | The air emissions dispersion model results for criteria air contaminants (CACs) for the regional scale are presented in Section 7.8.3.2 for the construction phase and Section 7.8.3.3 for the operations phase. Since the LSA is embedded in the RSA, a separate model for the LSA was not required. The results presented for the RSA dispersion modelling include the maxiumum concentration predicted for both the local and regional scales. A similar approach has been taken in other EAs such as the Kitsault mine project review. | Reasonable treatment |
| 76. | 11.1 | Climate and Air Quality | Chapter 26 / Section 26.12 | BC EAO | If the proposed Project results in medium or high emissions or departs from industry or jurisdictional profiles then a GHG management plan would be developed. | A GHG management plan is provided in Section 26.12 although the emissions are predicted to be low. | Reasonable treatment |
| 77. | 11.1 | Climate and Air Quality | Chapter 26 / Section 26.11 | BC EAO | Provide a list of commitments that the proponent will make with respect to air quality and climate conditions based on proposed mitigation.<br>• Not found. Mitigations only. | Commitments related to climate and air quality are described in Section 26.11 (Air Quality Management Plan) of the Application/EIS. Additional commitments related to climate and air quality are provided in Table 39.5-1 (see Condition 5). | Reasonable treatment |
| 78. | 11.1 | Climate and Air Quality | Chapter 7 / Section 7.8 | BC MOE | A table and map showing all proposed waste discharge locations should be presented (air emissions and effluent discharges). | The location of effluent discharges will be included in the *Environmental Management Act* permit application.<br>Air emission discharge locations are shown on Figure 7.8-3 for construction (Year -1) and Figure 7.8-4 for operation (Year 4). For point sources such as generators and incinerator stacks, locations are provided in coordinates (in UTM) in the Table 7.8-16. For area sources, maps (Figures 7.8-3 and 7.8-4) are better representations and coordinates therefore not included. Coordinates of all vertices for area sources could be provided upon request. | Reasonable treatment |
| 79. | 11.1 | Climate and Air Quality | Chapter 6 / Section s 6.1.2 and 6.8 | BC EAO | Cumulative effects not assessed for GHG emissions | As described in the introduction to Chapter 6, and Section 6.8.2.2 of the Application/EIS, the effects of GHG emissions for the Project were not assessed due to the global scale and complexity involved in evaluating the contribution of the Project to the overall effect of climate change brought about by anthropogenic GHG emissions *in toto*. Assessing cumulative effects of GHG emissions is the work of international scientists and panels, whose findings (summarized in Section 6.1.1 and in Section 34.1.8, ) on the effects of global warming (i.e., global average temperature increases, rising sea level, and changes in precipitation regimes) have set the impetus for the GHG regulations (Section 6.1.2) and the need to account for and report on GHG emissions at the project level in the EA phase, as well as throughout the entire life cycle of large projects. Related, the assessment of | Reasonable treatment |



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| | | | | | | cumulative effects was not called for in the AIR (January 2011).<br>For this reason, instead of assessing cumulative effects of GHG emissions, as set out in the methods laid out in the guidance document identified by the AIR for the climate change/GHG assessment (CEA Agency 2003), a proxy was used to compare project GHG emission levels rather than looking at their direct or cumulative effects. This method is consistent with the majority of Canadian environmental effects assessments. In addition, the KSM Project GHG assessment also included an evaluation of international GHG emissions to provide an additional comparison to the global cumulative scale—which goes beyond what is called for in the 2003 guidance document. | |
| 80. | 11.3 | Geohazards | Chapter 9 / Section 9.6 | Forests Lands and Natural Resource Operations (FLNRO) | Some clarification is required in Section 9.6 as the maps are labeled as though they portray the "(Construction or Operational) Footprint Affected by Terrain Stability Class (IV or V)" yet given my interpretations of the maps and the supporting text, the maps are actually depicting the "Terrain Stability Class (IV or V) Areas Potentially Affected by the (Construction or Operational) Footprint". This difference is significant and I believe the current labels are misleading. | Maps in Section 9.6 of the Application/EIS have been clarified. | Reasonable treatment |
| 81. | 11.2 | Terrain, Surficial Geology and Soils | Chapter 8 | FLNRO | Regarding the bridge over the Bell Irving River, Seabridge has been informed that the previous bridge at that site encountered issues with soil stability. Is this issue being addressed? | Prior to finalizing the detailed design and initiating construction of the Bell-River bridge crossing, a soils and geotechnical investigation will be undertaken to assess soil stability. Information available from the Stikine-Skeena Forest District Office in Smithers will be reviewed to help inform the scope of the geotechnical investigation. | Reasonable treatment |
| 82. | 11.2 | Terrain, Surficial Geology and Soils | Chapter 8 | BC MOE | The project is situated in a structurally complex and dynamic environment and although there is information provided on structure, at first glance there appears to be a lack of connection between the structural components and the possible environmental effects they may have, (such as drainage conduits, implications to storage, seepage considerations, structural stability, etc.), over the short and long term. Is | Baseline data collection to date has been sufficient to guide the locating of Project infrastructure for EA purposes. | Reasonable treatment |



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| | | | | | there sufficient baseline assessment to reach a valid conclusion as to the structurally related impacts on the project? | | |
| 83. | 11.9 | Ecosystems and Plant Communities | Chapter 17 / Section 17.1.2 | BC EAO | A field program to check the terrain mapping in support of the Terrestrial Ecosystem Mapping (TEM) program and collect information for closure planning. Nothing found about closure planning. | In accordance with TEM standards (RIC 1998A), TEM was completed by manually mapping ecosystems; it was the basis for all footprint calculations in the effects assessment. The TEM information was used to guide closure planning and is outlined in Chapter 27 (Closure and Reclamation). | Reasonable treatment |
| 84. | 11.9 | Ecosystems and Plant Communities | Chapter 17 (Appendix 17-A and 17-B) | BC EAO | NOTE: Title pages of Appendices 17-A and 17-B are incorrect and do not match the content of the adjacent document. 17A – title page “2009 Vegetation and Ecosytem mapping Baseline Report”, and report attached: “Assessment of Culturally Important Plants”; Appendix 17B – title page “Assessment of Culturally Important Plants” and report attached is 2009 Vegetation and Ecosystem Mapping Baseline Report | The title page of Appendix 17-A has been corrected to “Assessment of Culturally Important Plants.”<br>The title page of Appendix 17-B has been corrected to” 2009 Vegetation and Ecosystem Mapping Baseline Report”. | Reasonable treatment |
| 85. | 11.2 | Terrain, Surficial Geology and Soils | Chapter 8 (Appendix 8-A) | BC EAO | Description of soils and sites in detail including information on slope, aspect, surficial material, horizon depth, soil texture, coarse fragment content, root depth, soil structure, drainage, soil classification, and topsoil depth;<br>• Not found in 17.1 | A description of soils and sites, including information on slope, aspect, surficial material, horizon depth, soil texture, coarse fragment content, root depth, soil structure, drainage, soil classification, and topsoil depth is provided in Appendix 8-A of Chapter 8. | Reasonable treatment |
| 86. | 11.2 | Terrain, Surficial Geology and Soils | Chapter 8 / Sections 8.1 and 8.4 | BC EAO | For the access road, pipelines, and transmission line, the study area will include a buffer extending 1.5 km along either side of the centre line of the linear development, whichever comes first.<br>• Spatial boundary not found for access road, pipelines and transmission line | The transmission line parallels the Treaty Creek Access Road. There are no pipelines coming into the Project area as a linear corridor. Spatial boundaries for the Coulter Creek Access Road and Treaty Creek Access Road are described in Sections 8.1.1 and 8.4.1 and show in Figure 8.1-1. | Reasonable treatment |
| 87. | 11.2 | Terrain, Surficial | Chapter 8 / Sections | BC EAO | This section of the Application will | Commitments related to terrain, surficial geology and soils are described in Chapter | Reasonable |



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| | | Geology and Soils | 8.7.1 and 8.7.2<br>Chapter 26 / Section 26.13<br>Chapter 39 | | also describe the Proponent's commitments, including those related to implementation of best practices.<br>• Not found | 8 (Sections: 8.7.1.1 and 8.7.2.1) and Chapter 26 (Section 26.13 - Terrain, Surficial Geology, and Soil Management and Monitoring Plans). Additional commitments related to terrain, surficial geology and soils are provided in Table 39.52-1 (see Conditions 10 and 11). | treatment |
| 88. | 11.2 | Terrain, Surficial Geology and Soils | Chapter 8 / Sections 8.7.1 and 8.7.2<br>Chapter 26 / Section 26.13<br>Chapter 39 | Tahltan Nation | (26) No commitments identified in this section. | Commitments related to terrain, surficial geology and soils are described in Chapter 8 (Sections: 8.7.1.1 and 8.7.2.1) and Chapter 26 (Section 26.13 - Terrain, Surficial Geology, and Soil Management and Monitoring Plans). Additional commitments related to terrain, surficial geology and soils are provided in Table 39.52-1 (see Conditions 10 and 11). | Reasonable treatment |
| 89. | 11.3 | Geohazards | Chapter 9 / Section 9.7 | FLNRO | Although a number of sackung (indicators of slope distress) were noted on slopes above the proposed roads and unstable slopes were identified that require follow-up monitoring, I did not see an associated monitoring plan. How will these hazards be managed? | Monitoring plans will be developed for areas where unstable or potentially unstable terrain interact with Project infrastructure (See Table 9.7-3 in Chapter 9 of the Application/EIS). | Reasonable treatment |
| 90. | 11.3 | Geohazards | Chapter 9 (Appendices 9_A through 9-E) | Tahltan Nation | • The Application will provide preliminary mitigation and management plans to avoid, minimize or mitigate the potential effects of geohazards on proposed Project infrastructure.<br>• This section of the Application will also describe the Proponent's commitments, including those related to implementation of best practices.<br>• (26) Not completed. | Proposed mitigation measures are described in Appendices 9-A through 9-E. | Reasonable treatment |
| 91. | 11.3 | Geohazards | Chapter 9 / References | BC EAO | Terrain mapping - completed in accordance with the BC Resource Inventory (1997) standards with *refinements* as necessary for mine site specific geohazard assessments.<br>• BC Resource Inventory 1997 standards listed in References (Can't find | The BC resource inventory standard referred to by the reviewer is the terrain methodology as presented by Howards and Kenk. This reference is in the References section of the Geohazard chapter.<br>Howes, D.E. and E. Kenk (eds.) 1997. Terrain Classification System for British Columbia, Version 2. A system for the classification of surficial materials, landforms and geological processes of British Columbia. Resource Inventory Branch, Ministry of Environment, Lands and Parks, Province of B.C. Victoria, B.C. 100p. | Reasonable treatment |



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| | | | | | Appendices 9-F/G) | | |
| 92. | 11.3 | Geohazards | Chapter 9 / (Appendix 9-E) | BC EAO | Snow avalanche hazard potential - completed according to the Canadian Avalanche Association Guidelines for Snow Avalanche Risk Determination and Mapping in Canada. Locator style mapping (identification of paths using arrows) will be used for avalanche paths intersecting the access road, and Atlas style mapping (delineation of avalanche polygons) will be used for the mine site area. Along the access road, only avalanche paths intersecting the road will be delineated, and mine site area mapping will focus on paths with the potential to intersect proposed mine infrastructure.<br>• Can't find Appendix 9-E | The Application/EIS includes:<br>Appendix 9-E, which provides a preliminary geohazard and risk assessment of landslides and snow avalanches for the TMF, proposed facilities for tunnel construction in Upper Treaty Creek and Teigen and Treaty Creek Access Roads. | Reasonable treatment |
| 93. | 11.3 | Geohazards | Chapter 9 (Appendix 9-E) | Tahltan Nation | Was a geohazard study conducted for the southern access route alignment and where is that study located? | Appendix 9-E provides a preliminary geohazard and risk assessment of landslides and snow avalanches for the Tailings Management Facility (TMF), proposed facilities for tunnel construction in Upper Treaty Creek and Teigen and Treaty Creek Access Roads. | Reasonable treatment |
| 94. | 11.3 | Geohazards | Chapter 9 (Appendices)<br>Chapter 39 | BC EAO | This section of the Application will also describe the Proponent's commitments, including those related to implementation of best practices.<br>• Mitigation measures identified, but no specifically identified commitments found | Proposed mitigation measures are described in Appendices 9-A through 9-E. Additional commitments are provided in Table 39.5-1 (see Conditions 6 – 9). | Reasonable treatment |
| 95. | 11.4 | Geochemistry | Chapter 26 / Appendices 26-B and 26-C | MEMNG | To fully understand the mine plan, the timing of key mine developments and water management features and the interplay between various mine components, staged development drawings should be provided for key time steps during the mine life for both the mine area and processing and tailings management area (i.e. not just construction and end of mine life). | Although the requirements of AIR have been met, Appendices 26-B (see **Attachment #6**) and 26-C (see **Attachment 7**) have been added to the Application/EIS to enhance the understanding of the mine development plan and includes staged development drawings that include key mine developments and water management features at 5-year intervals for the mine life. | Reasonable treatment * |



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| 96. | 9 | Project Description | Chapter 4 | MEMNG | The mine schedule (Figure 12, Appendix 4-D) indicates that Sulphurets pre-stripping does not begin until year -3. What is the source of non-PAG rock in year -4? | The sources of non-PAG rock in year -4 are the upstream and downstream WSD rock quarries and the rock from the bypass tunnel for dam construction. | Reasonable treatment |
| 97. | 11.4 | Geochemistry | Chapter 10 (Appendix 10-A, Appendix 7-1)<br>Chapter 26 / Section 26.14 | MEMNG | There are only 2 rock samples from the WSD borrow areas. One of the samples has a high sulphur content of 1.68 %S (Table 10.1-17). The results of these samples were not located in Appendix 10-A. How will these materials be used for construction? They may not be suitable for downstream construction of the WSD. | Two samples have been collected specifically from the WSD borrow areas; the data was inadvertently omitted from Appendix 10-A due to an oversight. A Sub-Appendix 7-1 of Appendix 10-A will be updated to include this data. The high AdjSNPR of the sample with elevated sulphur is well above any Canadian governmental guidelines for designation as potentially acid generating. Additionally, only one sample out of 14 Stuhini Formation, stratigraphic unit TrSsm, samples has an AdjSNPR value of less than 3.0 (sample S 043 along CCAR had AdjSNPR of 2.2).<br>Based on the ML/ARD Management Plan (Section 26.14) material with an AdjSNPR greater than 3.0 and a 'not likely' metal leaching potential can be used outside of the WSF catchment, therefore the materials in question could be used for downstream construction of the WSD. | Reasonable treatment |
| 98. | 11.4 | Geochemistry | Chapter 26 / Section 26.14 | MEMNG | Additional information is required to demonstrate the certainty to which the block model can predict Non-PAG availability according to the 3 methods used in the model. Information is also required to demonstrate that sufficient quantities can be delineated and segregated on a mining scale during operations. | The ML/ARD Management Plan (Section 26.14.4) outlines that the ARD block model by itself is not considered sufficient to adequately characterize waste material during operation, especially when material has the potential to be used outside the WSF catchment, and that additional sampling and analysis of mine rock will be undertaken at the on-site laboratory using blast hole chips. This process will allow for rapid turnaround times and enable delineation and segregation during operations.<br>The block modelling was undertaken by Mr. Michael Lechner (P.Geo., RPG, CPG and Qualified Person for the Project NI 43-101 resource model). The ABA block model uses the three methods sequentially from highest confidence to lowest confidence. As a result where there is good control, due to a sample or proximity to samples, the block is assigned the highest confidence value in preference to the lower confidence values. | Reasonable treatment * |
| 99. | 11.4 | Geochemistry | Chapter 26 / Section 26.14 | MEMNG | The Sulphurets monzonite unit is the main deposit rock that is proposed to be used for construction of the WSD and the underdrain in the Mitchell waste rock dump. The distributions of paste pH, total S, sulphide S and AdjSNPR are not provided (Appendix 10, Figures 5.1-14 through 5.1-16 and 5.1-24). Figure 5.1-24 indicates that not all monzonite samples have AdjSNPR of >2. Due to the proposed | The omission of Sulphurets monzonite from the summary statistics box and whisker charts was an oversight. These graphs are included in Appendix 10-A of the Application/EIS. As outlined in the ML/ARD Management Plan (Section 26.14.4) sampling of chips from blast holes during operations will be undertaken to ensure that only material with an AdjSNPR > 3.0 and a 'not likely' metal leaching potential will be used in downstream construction. Approximately 80% of the Sulphurets samples classified as monzonite would be classified as not-PAG according to the criteria listed in Section 26.14.4. | Reasonable treatment * |



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| | | | | | placement location of this material, a clear and detailed characterization of the monzonite is required. | | |
| 100. | 11.4 | Geochemistry | Chapter 10 (Appendix 10-A) | MEMNG | A logical approach and rationale for identifying Non-PAG waste is presented in the Geochemical Baseline Report (Appendix 10A) and was based on paste pH and bulk NP values. Specifically, the proposed Non-PAG criteria is AdjNP/SAP > 2.0, where AdjNP = NP - 15 kgCaCO3/t and SAP = Sulphide S% x 31.25. However, the ARD management plan (Section 26.14.4.1) defines Non-PAG rock as having NP/AP > 3 and paste pH > 6 with NP calculated from total C and AP calculated from S content measured by Leco furnace of an HCl leached sample. There is no justification of the segregation criteria in the extensive baseline report in Appendix 10A. A consistent rationalized geochemical criteria needs to be proposed and justified with site-specific data. | The Geochemical Baseline Report (Appendix 10-A) used a non-PAG criteria of AdjNP/SAP > 2.0 as a benchmark for further waste rock management planning. The ML/ARD Management Plan (Section 26.14.4) uses the more conservative [available Total Carbon NP/Total Sulphur AP] ratio of 3.0 because run-off outside the WSF catchment will not be treated at the WTP. Additionally the use of Total C as a proxy for neutralization potential was used because the turnaround time for Total C by Leco is faster than Sobek NP. The relationship between Total C NP and Sobek NP is displayed in Figure 10.1-4. There is good agreement above the unavailable NP (15 kg CaCO3/t). | Reasonable treatment * |
| 101. | 11.4 | Geochemistry | Chapter 10 / Section 10.1.2 | MEMNG | The kinetic dataset does not appear to fully represent the Sulpurets monzonite material or the sources terms used for it in the water quality model; the metal leaching potential of the Sulphurets monzonite does not appear to have been fully assessed. The description of the HC program in Table 4.4-2 (Appendix 10-A) indicates that there are no humidity cells containing the Sulphurets monzonite unit and Table 10.1-5 (Chapter 10) also highlights that the monzonite unit is not represented by the humidity cell program. However, Appendix 10-A (beginning at Figure 5.2-16), identifies S-06-04 as | Nine additional humidity cells were initiated in August 2012 which included three Sulphurets monzonite cells. Stable metal leaching rates had not been achieved at the time of writing the baseline; therefore, the data was not included in the baseline (Appendix 10-A) or as part of the effects assessment (10.1.2.2.2).<br>The graph legend for Sulphurets waste rock humidity cells is out of date and has been corrected (See Section XX). The legends should read: S-06-04 UP Hazelton, S-06-05 Overburden, HC17 UP Hazelton, HC18 Undefined, HC19 Undefined, HC24 Lower Au zone, and HC25 Lower Au zone. The original humidity cells for the Project were established and identified by the rock type and lithology of the material in the drill core, consequently humidity cell S-06-04 was classified as feldspar porphyry intrusive. In 2011 it was reclassified as Main Copper Monzonite (monzonite above the MC fault). Subsequent to the updated block model all kinetic tests were reclassified according to the block model code attached to the drill hole interval that the kinetic test material came from.<br>Table 10.1-6 contains an error - the source term for S monzonite neutral drainage is HC S-06-04 and will be updated in the EA/EIS. | Reasonable treatment * |



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| | | | | | monzonite and HC18 as undefined sulphurets waste. The water quality model utilized HC18 and an acidic overburden sample as inputs for the monzonite. These source terms do not appear to be well supported based on the information in the application. Additional information and rationale are required. | Acidic leach rates for Sulphurets block model codes were derived from the acidic leach rates of HC S-06-05 [model code: overburden] as this was the only humidity cell from Sulphurets deposit that had generated an acidic leachate at the time of modelling. | |
| 102. | 11.4 | Geochemistry | Chapter 10 | MEMNG | The geochemical behaviour of Kerr mine waste is of critical importance as the seepage from it and the Kerr pit itself will form the main inputs to the selenium water treatment plant. The selenium water treatment plant must be effective in treating the predicted water quality of Kerr seepage. However, the waste rock geochemistry of the Kerr deposit has not been adequately characterized. The static testing data has been lumped together and has not been evaluated based on lithology or alteration type, even though lithology and alteration were said to form the rationale for sample selection for the kinetic testing program. The static and kinetic data for both the Kerr and the Iron Cap show large variation in characteristics. Further work is needed to establish and understand the geochemical variability of the waste rock and to establish the representativeness and appropriateness of samples used for kinetic testing and inputs into the water quality model. | The AIR requirement was met. Kerr and Iron Cap lithologies were lumped together because an overwhelming proportion of material was classified as PAG and there was no benefit to attempting to segregate the material.<br>The Kerr waste rock strategy is not to segregate but to move and isolate all of the waste into the Sulphurets Pit, where it will be lined, drained and treated. A reclassification of the Kerr and Iron Cap samples will be included to clarify the understanding. | Reasonable treatment * |
| 103. | 11.6 | Surface Water Quality | Chapter 14 / Section 14.7 | MEMNG | pH and acidity/alkalinity have not been predicted in the modelling work. Since the bulk of the mitigation plans for the project rely on effective treatment of water, these are crucial parameters to be assessed at the EA | The mass balance approach used for water quality modelling does not predict pH and acidity/alkalinity. Mass balance modelling is an industry standard approach to predict water quality by modeling at the EA stage. The GoldSim model is dynamic responding to conditions as they occur. Estimates of water quality of the WSF for engineering design purposes indicated that the pH will range from 3.5 to 5.5 depending on the time of year, freshet, and rainfall events. This was done using | Reasonable treatment |



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| | | | | | stage. Please provide full estimates of water quality for all modelled conditions for the WSF, individual mine site components and downstream locations. | Phreeqc. The treatment pH of the HDS plant is proposed at 10.5 (to control manganese and sulphate concentrations) which is significantly higher than any expected influent from the WSF and effective metal removal has been demonstrated in the pilot plant testwork. The HDS treatment is resilient to variable concentrations as demonstrated in the pilot plant work. The acidity of the feed water will vary the amount of lime required to raise pH to a target level. The pilot plant work was completed at a high acidity. The pH and alkalinity of downstream locations within the Sulphurets drainage will be controlled by the treated water discharge, rather than the conditions in the WSF. | |
| 104. | 11.6 | Surface Water Quality | Chapter 14 / Section 14.7 | MEMNG | Assumptions on the oxidation state of selenium (page 14-47) that will be in the present in seepage from waste rock are key to predicting selenium concentrations in the receiving environment, as selenite is easier to remove in the HDS water treatment processes than selenate. The application has assumed that 75% of selenium will be present as selenate and 25% will be selenite in the WSF during all phases of the project. EMNG believes it may not be sufficiently conservative to assume that the localized reducing conditions associated with seeps at the base of the Mitchell Glacier would be endemic or pervasive in the 2.3 BT of PAG/AG waste rock stored in oxidizing wastes in the Mitchell/McTagg waste rock dump. While there is some potential for having stable selenite in acidic environments, the actual speciation will be dependent on local eH and pH conditions. Also In highly acidic environments, selenite has the potential to disassociate from sorption sites which could also lead to further treatability issues. Since the downstream water quality predictions and effects assessment are highly dependent on selenium speciation, further rationale must be developed for the assumptions of selenium | The drainage of the flow from under the Mitchell Glacier which 90% plus selenite is not directed through the rock dump but conduit directly to the WSF through a tunnel. The importance of selenite being directed to the WSF non-oxidized is key from a treatment perspective. As a backup, the potential of adding a small amount of hydrosulphide to maintain reducing conditions if required is being examined. The oxidation kinetics of selenium are relatively slow. In the HDS treatment process there is no acidic environment and downstream into the receiving environment all the selenium will be as selenate.<br>Ongoing work will be conducted during the summer 2013 to further investigate selenium speciation in the Mitchell Valley. Selenite desorption in acidic environments does not lead to further treatability issues as selenite in solution has been demonstrated to be effectively removed by the HDS water treatment process. Residual selenium in the discharge from the HDS water treatment plant is expected to be predominantly Se(VI). Baseline selenium speciation data in the downstream environment indicate the selenium is almost exclusively present as Se(VI). Downstream water quality predictions and effects assessments have not considered any natural attenuation of selenium concentrations (that may be specific to reduced forms of selenium). | Reasonable treatment * |



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| | | | | | speciation and the eH and pH conditions that are expected to occur. This must be accompanied by a sensitivity analyses for downstream water quality for a range of speciation distributions to demonstrate the range of potential outcomes. Additional mitigation and/or contingency plans should be provided. | | |
| 105. | 11.4 | Geochemistry | Chapter 10 / Section 10.1 | BC MOE | Although extensive, there is a question as to the characterization adequacy given the scale of the project and the heterogeneity of the geology. The lack of modified Sobek NP characterization appears to be a miss relative to the requirements of the AIR. This has material implications to the prediction work. Other characterization concerns involve the dataset compilations, data manipulation (averages), sensitivity analysis, uncertainty and assumption inclusion and overall discussion and assessment of the data. Overall there is a concurrence with the geochemistry conclusion (Section 10.3) that there is a potential for adverse effects to surface and groundwater quality from the drainage generated from the waste rock. The conclusions, their derivation and the effects assessment will be further addressed in the detailed review of the application. (Skeena MOE) | The first 268 samples for the project were collected in 2003 and analyzed by Placer Dome Research these samples were analyzed using EPA 600 - Sobek NP. EPA 600 is a widely used analytical method.<br>In subsequent years leading up to the issuing of the AIR (January 2011) an additional 1,442 ABA analyses were carried out using the Sobek NP method. Once the AIR was received, the methodology of standard Sobek versus modified Sobek was discussed at a working group meeting in 2011. The approach using the EPA 600 Sobek method and applying the Price correction factor was explained. No subsequent comments were received.Switching analytical ABA methods mid-stream through a geochemical characterization program is not appropriate.<br>As outlined in Price (2009) a correction was applied to the Sobek NP results to account for unavailable NP partially due to analytical method bias. As discussed in Appendix 10-A, an unavailable NP of 15 kg $CaCO_3$ /t was applied to all deposit waste material as a conservative measure. This is a very conservative measure as a value of 9 to 13 kg $CaCO_3$/t could be used for the majority of waste rock units. If modified Sobek was used as the analytical method and an unavailable NP was determined it would likely be less than 15 kg $CaCO_3$ /t and the resulting available NP number would likely be similar regardless of the analytical method used.<br>When comparing the proportion of material that is PAG using Sobek and total carbon NP the differences were usually less than 10% by deposit and lithology (Figure 10.1-4). The difference between Sobek and modified Sobek is expected to be less than the difference between Sobek and total carbon NP, therefore performing modified Sobek NP will not change the overall interpretation.<br>The management plan outlines that all deposit waste rock is stored within the catchment of the WSF, therefore under or overestimating the NP by several percent will not impact the downstream environment. | Reasonable treatment |
| 106. | 11.4 | Geochemistry | Chapter 10 / Section 10.1 | BC MOE | Modified Sobek methodology has not been used for the 4 pits. Data presented only indicate Sobek which will affect the results assessment. | See response to comment #105. | Reasonable treatment |
| 107. | 11.4 | Geochemistry | Chapter 10 | BC MOE | The characterization does not separate out the ore from the waste | See response to comment #102. This additional characterization will not affect waste rock, water management plans or water quality predictions. | Reasonable treatment |



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| | | | | | and evaluate them as distinct populations. | | |
| 108. | 11.4 | Geochemistry | Chapter 10 | BC MOE | "Geochemistry is a cause-effect pathway to surface water quality, groundwater quality, fish and aquatic habitat. Previously discussed with BC EAO and CEA Agency; significance analysis not undertaken for geochemistry."<br>• Need some clarification on this...what does this mean? An agreement of sorts? | Seabridge met with EAO and the Agency on November 2, 2102 to discuss the AIR commitment regarding geochemistry as a Valued Component (VC) in the Application/EIS. Geochemistry is not typically characterized as a VC and subject to an effects assessment and significance determination. Rather, geochemical characterisation is considered as a factor affecting the design of the Project and typically discussed in the Project Description (see Mt. Milligan, Line Creek Coal, and Kitsault Mine EA applications as examples). This section is also typically supported by proposed mitigation and testing programs, summarized in a supporting ML/ARD plan. Results from the geochemical predictive studies are applied, where relevant, to the assessment of other VCs (e.g. surface and ground water quality).<br>The Application/EIS includes a Geochemistry Chapter (separate from the Project Description and other VC chapters) that identifies the predictive studies that were carried out, and includes an assessment of the ML/ARD risk on mine site and TMF components, non-deposit overburden material, and along access roads for the KSM project. Mitigation, testing procedures, and monitoring programs are presented in a supporting Environmental Management Plan. A project-specific residual effects assessment, significance determination, and cumulative impact assessment were not conducted on geochemistry. However, significance criteria, e.g., temporal lag phase were discussed. Geochemical data were used, where relevant, to support the assessment of effects on other VCs affected by ML/ARD (e.g., surface water quality and groundwater quality). | Reasonable treatment. See table from Nov 2, 2012 meeting regarding deviations from the AIR. |
| 109. | 11.4 | Geochemistry | Chapter 10 | BC MOE | The Application will provide: if waste rock segregation is proposed: geochemical segregation criteria, identification of methods that will be used for geochemical characterization during operations; and identification of operational plans and procedures for segregation.<br>• but may be affected by aba methodology. | Waste rock will not be segregated and the ABA methodology is not relevant. The segregation only applies to quarry material. Total carbon analysis by Leco to determine NP and a net potential ratio cut-off of 3:1 is considered conservative. | Reasonable treatment |
| 110. | 11.4 | Geochemistry | Chapter 10 (Appendix 10-A) | Tahltan Nation | If a water cover is proposed: identification of the types and volumes of mine waste to be flooded; an assessment of geochemical stability under flooded conditions; the lag time to ML/ARD onset; the disposal methods and location(s); the | Humidity cells, subaqueous columns and subaqueous aging tests of tailing material were completed (Appendix 10-A, Section 6.2). Only material to be deposited in the CIL pond is predicted to become acid generating when exposed to an oxygenated environment. The discharge to the CIL pond is subaqueously and as such the tailings are continuously covered by water.<br>Extreme flooding events will not impact water quality in the TMF as this will keep tailing submerged and result in dilution of tailing pond chemistry. | Reasonable treatment |



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| | | | | | time until full flooding will occur; design and contingency that support geochemical stability during extreme climatic events; mitigation measures to minimize soluble constituents that could affect water quality; and a monitoring and maintenance plan to ensure geochemical and physical stability of the flooded mine wastes.<br>• (26) Not complete-no contingency to support geochemical stability during extreme climatic events | | |
| 111. | 11.4 | Geochemistry | | Tahltan Nation | Temporary Closure not identified and the long term management strategies not identified (i.e. monitoring etc.) | Long term management strategies are included in Section 26.14.4.1.2, 26.14.4.2.2, and 26.14.4.3.2 and are comprised principally of operational activities that have long term impacts such as materials handling, mitigation, control, and reduction.<br>Short term closure may be encountered due to labour disputes or other events. During this period, all water diversion and treatment infrastructure will be maintained.<br>Water quality monitoring information can be found in Section 26.17 and 26.18.2.<br>Additional information on temporary closure can be found in Section 27.10.2. | Reasonable treatment |
| 112. | 11.4 | Geochemistry | Chapter 10 (Appendix 10-B) | Tahltan Nation | - a conceptual operational waste rock characterization and handling plan for access road and tunnel construction, to be finalized during the permitting process.<br>• (26) Not completed. | Waste rock characterization of the access roads is included in Appendix 10-B. Further characterization will be addressed during the permitting process. | Reasonable treatment |
| 113. | 11.4 | Geochemistry | Chapter 26 (Section 26.14)<br>Chapter 39 | Tahltan Nation | This section of the Application will also describe the Proponent's commitments, including those related to implementation of best practices.<br>• (26) No commitments identified in this section. | Commitments are described in the Metal Leaching and Acid Rock Drainage Management Plan in Section 26.14. Additional commitments are provided in Chapter 39, Table 39.5-1 (see conditions related to the follow-up program, groundwater and surface water). | Reasonable treatment |
| 114. | 11.5 | Groundwater Quality and Quantity | Chapter 35 | BC MOE | As part of the hydrogeology review, Piteau Associates recently noted that a zone of poor rock quality (and therefore potentially highly conductive) was intercepted during the drilling programs at the Water Storage Facility (WSF) Dam area. | The potential preferential flow paths through the identified and interpreted poor quality bedrock at the local WSF has been incorporated into the groundwater modeling. The upper estimate of seepage rate from the WSF was examined by model sensitivity analysis, and the permeability 1e-3 m/s was assigned for the identified calcareous bedrock formations. Further characterization of the local bedrock can be done during the Project's detailed design and construction phases. The Failure Modes and Effects Analysis (FMEA) item B has identified and ranked | Reasonable treatment |



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| | | | | | This zone has the potential to be a preferential seepage pathway and the adequacy of the field investigation and modelling in this area is receiving special attention. For the purposes of the EA review, further information may be requested – in particular, inclusion of additional seepage estimates from the WSF in the water quality model. These seepage estimates would consider potential seepage pathways that are not included in the current model, including a worst-case scenario. The primary mitigation measure with regards to receiving environment water quality depends on the effective functioning of the WSF and the water treatment plants; this has the potential to significantly change the conclusions of the water quality assessment. | this risk. Appropriate mitigations were incorporated into the design. | |
| 116. | 11.5 | Groundwater Quantity and Quality | Chapter 11 (and related chapter appendices) | BC MOE | In general, as long as the proponent continues to provide additional details, the document will be reviewable from a hydrogeology perspective. So far I have identified the following areas that require additional details:<br>• Streamflow data and/or hydrographs to properly assess the recession and low-flow portion of the hydrograph as it pertains to understanding the large-scale behaviour of the groundwater system<br>• Rescan groundwater model (they have responded to my request, review pending)<br>• KCB groundwater models of WSF and TSF (request for | The AIR requirement was met. The following information was requested and provided to complete MOE's review of the groundwater model during the Application/EIS review stage.<br>The requested information was provided to MOE on the following dates:<br>• April 23, 2013: see **Attachment #1**<br>• May 5, 2013: see **Attachment #2**<br>• May 15, 2013: see **Attachment #3** | Reasonable treatment |



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| | | | | | details submitted)<br>• BGC groundwater model of pits (meeting pending)<br>• Groundwater quality data plots and tabulated results of analytical results by well and by sampling event (request pending).<br>These details, and perhaps others that come to light, are critical to reviewing the hydrogeology portion of the submission. The following information was provided to MOE during the screening of the Application/EIS: :<br>• Two maps, one each for the TSF and WSF, of head calibration targets by layer with well/piezometer name displayed;<br>• Head residual vs. observed plots and calibration statistics (mean residual, absolute mean residual, RMS%) for head calibration targets at the WSF and TSF as outlined in the attached Powerpoint file;<br>• Head residual map and head calibration statistics by layer for head calibration targets at the WSF and TSF as outlined in the attached Powerpoint file;<br>• Summary of flow rates for the mine site model as detailed in the attached Excel file;<br>• Summary of head calibration results for the tailings area model and mine site model as detailed in the attached Excel file (these results | | |



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| | | | | | should be readily available in a Visual MODFLOW file); and<br>• Zoomed-in detail of head contours (1 or 2 m interval) and pathlines at WSD and TSD's for each layer. | | |
| 117. | 11.5 | Groundwater Quantity and Quality | Chapter 11 (and related chapter appendices) | BC MOE | The following information is required to complete MOE's review of the groundwater model in the Application/EIS:<br>Model Input<br>Baseline models (WSF and TSF)<br>• maps of boundary conditions<br>o colour flood of recharge<br>o polygon(s) showing area(s) assigned as seepage face boundaries<br>o specified head<br>• contour map of difference between topography and modelled water table elevation with locations of mapped seeps overlain<br>• color flood of hydraulic conductivity of 3 or 4 key layers for baseline and predictive models with traces of discrete feature elements overlain<br>Predictive models (WSF and TSF)<br>• maps of hydraulic conductivity showing representation of cutoff walls for predictive models zoomed in to dam sites (zoomed approximately to Figures 1-4)<br>• maps of boundary conditions representing ponds in TSF | The AIR requirement was met. The following information was requested and provided to complete MOE's review of the groundwater model during the Application/EIS review stage.<br><br>The requested information was provided to MOE on the following dates:<br>• April 23, 2013: see **Attachment #1**<br>• May 5, 2013: see **Attachment #2**<br>• May 15, 2013: see **Attachment #3** | Reasonable treatment |



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| | | | | | and WSF map(s) of boundary conditions representing seepage collection tunnels at the WSD (zoomed approximately to Figure 1)<br>Field Water Levels<br>• posting of field water levels and hand contouring in TSF (zoomed approximately to Figures 2-4)<br>• posting of shallow minus deep water levels where multi-level piezometers are installed in TSF and WSF (indicate which drill holes are inclined)<br>• posting of (shallow – deep water level)/(difference in elevation between mid-point of monitoring zone) i.e. posting of vertical gradient in TSF and WSF (indicate which drill holes are inclined)<br>Modelled Water Level Contours<br>• water table contours and piezometric contours of a key slice zoomed in to each of the dams (zoomed approximately to Figures 1-4) with discrete feature elements overlain (same contour levels as hand interpretted contours)<br>o baseline models<br>o predictive models<br>• cross section views of modelled piezometric contours for baseline and predictive models at WSF<br>o parallel to dams<br>o parallel to drainages<br>o baseline and | | |



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| | | | | | predictive models showing cutoff walls and seepage collection tunnels<br>Water Balance and Modelled Flows<br>• water balance by boundary type for baseline and predictive models<br>o global<br>o local around the WSD and TSD's (zoomed approximately to Figures 1-4, including lateral<br>o inflows and outflows)<br>• modelled baseflow<br>o WSF: Mitchell Cr. just above confluence with Sulphurets Cr.<br>o TSF: NTWM-H1, NTWM-H2, NTWM-H3, STWM-H2, STWM-H1<br>• map view of recharge and discharge for WSF and TSF similar to Fig 25 "TMF Base Case Steady State Calibrated Model Recharge and Discharge" but color coded to indicate flow rates (preferably normalized to the area represented by the respective nodes), including locations of field-mapped seeps/groundwater discharge<br>o global<br>o local around the WSD and TSD's (zoomed approximately to Figures 1-4) | | |



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| | | | | | o baseline and predictive models<br>Head Calibration<br>• maps of head calibration target locations (with labels) by model slice<br>• head residual vs. observed head scatter plots (different than the calculated head vs. observed head presented in the report)<br>o full model area (largest residuals labelled with drill hole number, perhaps 3-4 symbol types to distinguish the area of model)<br>o local to WSD and TSD's (zoomed approximately to Figures 1-4, labelled with drill hole number)<br>• map of head residual by slice for WSF and TSF<br>o full model<br>o zoomed in views of WSD and TSD's (zoomed approximately to Figures 1-4)<br>• local head calibration statistics for baseline models in proximity to the dams (extents as in Figures 1-4)<br>o all slices together<br>o by slice<br>• scatter plot of modelled vs. measured vertical head difference between deep and | | |



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| | | | | | shallow piezometers where installed (labelled with drill hole)<br>Pathlines in Predictive Models<br>• particle tracking for predictive model<br>o map of particle starting locations by slice<br>o zoomed in plan view of particle pathlines (zoomed approximately to Figures 1-4) | | |
| 118. | 11.5 | Groundwater Quantity and Quality | Chapter 11 (Appendix 11-B) | BC MOE | Missing Sub-Appendix E which should have been in Appendix 11-B. | The Application/EIS will be updated to include Sub-Appendix E as part of Appendix 11-B which was inadvertently omitted. | Reasonable treatment |
| 119. | 11.5 | Groundwater Quantity and Quality | Chapter 11 (Appendix 11-B) | BC MOE | The full set of groundwater quality data was not submitted with the application and has been requested. Some groundwater quality data are included in the appendices to Chapter 11, including an appendix E to Appendix 11-B, which has the groundwater data collected in 2009 - 10. A single table with the results for each parameter organized by well and sampling date would be useful.<br>Locations of groundwater quality collection points are shown on various maps (such as Figure 11-1) but a listing of the sampling sites would be useful, along with the abbreviation used on the map and a site description including sampling depth. | The AIR requirement was met. The following information was requested and provided to complete MOE's review of the groundwater model during the Application/EIS review stage.<br>The requested information on groundwater quality including sampling sites and depths and site descriptions is included in the 2008, 2009-2010 and 2012 hydrogeology baseline reports in the appendices of Chapter 11. Baseline groundwater quality conditions are summarized at a high level in Chapter 11 of the Application/EIS. The data will be compiled for clarification as the reviewer has requested and provided during the Application/EIS review stage. | Reasonable treatment |
| 120. | 11.5 | Groundwater Quantity and Quality | Chapter 11 (Appendix 4-H) | NLG | The groundwater quality modeling appears to indicate that the seepage ponds on either side of the TSF are expected to capture 100% of the source load emanating from the tailings facility. It is not clear in the | The AIR requirement was met. The requested information on groundwater quality including sampling sites and depths and site descriptions is included in the 2008, 2009-2010 and 2012 hydrogeology baseline reports in the appendices of Chapter 11. Baseline groundwater quality conditions are summarized at a high level in Chapter 11 of the Application/EIS.<br>See Section 7.1.11 from the TMF Engineering design report included below | Reasonable treatment |



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| | | | | | Goldsim model if/where this load enters back into the surface water quality modelling. For example, is there any leakage from the tailings seepage ponds to the downstream receiving environment? In addition, the basis for the optimistic seepage capture efficiency should be made clear. Are there similar mines where such efficient seepage capture has been achieved? In addition, please explain why the KCB Appendix H-4 includes a prediction of seepage bypass from the seepage ponds. This appears to contradict the groundwater modelling. | (Appendix 4-H).<br>The seepage estimates referenced in the question are the 2d SEEPW modelling results included the TMF Design Report (Table 7.3) which show much higher seepages under the dams than the full 3d FeFlow ground water model results in Table 7.4 do (indicating that 3d effects such as natural hydraulic containment limit seepage – making the 2d analysis inapplicable for estimating actual seepage under the dam – however 2d analyses – essentially worst case analysis are standard design practice for design of the drains and to assess piezometric levels within the dams themselves as part of dam stability analysis).<br>Seepage flows referenced in the Table 7.3 SEEPW model results are not flows bypassing the dam, rather these are what the flows into the seepage ponds would be, if there was no natural lateral hydraulic confinement or 3d groundwater mounding resulting in increased pore pressures which is what actually controls the seepage into the dams and the bypass seepage under the seepage dam.<br>A description of the water quality model is included in Chapter 14. The description of the water balance is included in Appendices 14-F and 14-G. In order to provide greater clarity and for ease of review, further water quality model clarification will be provided that describes both the surface water quality and quantity model assumptions and source terms. | |
| 121. | 11.5 | Groundwater Quantity and Quality | Chapter 11 (Appendix 4-H) | NLG | The tailings dams are proposed to be about 200 m high. This picture of the dam below gives a sense of the scale involved. While it is clear that the site is a groundwater discharge area, it is not clear how a 200 m high dam is going to have no impacts in terms of winter seepage. | The hydraulic gradient containment and the seepage mitigation designs will minimize seepage from the TMF. The seepage rates estimated from groundwater modelling represent the long term average groundwater flow conditions through the TMF dam foundations. Surface water quality was assessed by incorporating surface runoff during winter months using long term groundwater average water predictions. Seepage through the dams was predicted separately using 2D Seep/W model (see Appendix 4-H). | Reasonable treatment |
| 123. | 11.5/11.6 | Groundwater Quantity and Quality<br>Surface Water and Quality | Chapters 11 and 14 (related chapter appendices) | NLG | At a more basic level, please define the seepage loadings emanating from the TSF based on the quality from the geochemical assessment and the KCB seepage rates. Please compare these loadings rates with the modelled loadings to the receiving environment on an annual basis. Because the groundwater modelling is based on precent of source rather than on loadings as a mass flux, it is not clear that the total load from seepage is accounted for the in the Goldsim modelling. A clear conceptual model of the groundwater | The AIR requirement was met. The requested information on groundwater quality including sampling sites and depths and site descriptions is included in the 2008, 2009-2010 and 2012 hydrogeology baseline reports in the appendices of Chapter 11. Baseline groundwater quality conditions are summarized at a high level in Chapter 11 of the Application/EIS. The data will be presented as the reviewer has requested and provided during the Application/EIS review stage.<br>See response to comment #150. | Reasonable treatment |



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| | | | | | loadings and the link to surface water should be explained without reference to the "percent of source" approach as this confuses the issue and appears to result in mass loadings that are unaccounted for. | | |
| 124. | 11.5/11.6 | Groundwater Quantity and Quality<br>Surface Water Quality and Quantity | Chapters 11 and 14 (related chapter appendices) | NLG | Typically in tailings facility there is a long-term source associated with the slow movement of pore water in the facility tailings. Please explain if this is the case or if the tailings seepage is modelled as a gradually diluted source. | The AIR requirement has been met.The requested information on groundwater quality including sampling sites and depths and site descriptions is included in the 2008, 2009-2010 and 2012 hydrogeology baseline reports in the appendices of Chapter 11. Baseline groundwater quality conditions are summarized at a high level in Chapter 11 of the Application/EIS. The data will be presented as the reviewer has requested and provided during the Application/EIS review stage.<br>See response to comment #150. | Reasonable treatment |
| 125. | 11.5/11.6 | Groundwater Quantity and Quality<br>Surface Water Quality and Quantity | Chapters 11 and 14 (related chapter appendices) | NLG | It is not clear where the loadings originate from in the seepage ponds. Please break down the loadings to the seepage pond by source and for this analysis please show that the source loadings are conserved (i.e. no mass loss). The loads to seepage ponds appear to include 1) the contact water flowing through the unsaturated dam shell, 2) the TSF seepage, and 3) during closure the discharge from the tailings ponds. Please describe all the loadings to the tailings ponds as well. A graph showing the source concentration with time of TSF seepage would be helpful with a link to the load of groundwater seepage entering the water quality model. | The requested information on groundwater quality including sampling sites and depths and site descriptions is included in the 2008, 2009-2010 and 2012 hydrogeology baseline reports in the appendices of Chapter 11. Baseline groundwater quality conditions are summarized at a high level in Chapter 11 of the Application/EIS. The data will be presented as the reviewer has requested and provided during the Application/EIS review stage.<br>See response to comment #150. | Reasonable treatment |
| 126. | 11.5 | Groundwater Quantity and Quality | Chapter 11 (Appendix 11-E) | NLG | The assumption that the CIL liner is not a source [of seepage] is confusing. Typically HDPE liners are modelled as imperfect, with holes resulting from imperfect installation. As a result, a plume from the CIL is expected to develop. It appears from the review of the groundwater model that no such plume is expected due to the assumption that the HDPE liner | The groundwater model assumed that the CIL liner had a permeability of 1e-9 m/s based on the engineering design which accounts for potential manufacturing or construction defects in the liner.<br>The entire CIL cell including the liners was assumed as a constant contaminant source. A plume with low concentrations is predicted by the groundwater modeling to emanate from the CIL in the saddle area but it will be captured in the seepage recovery pond. The CIL cell is hydraulically contained in the north by the north tailing cell during the operations and post-closure, and in the south once the south tailing cell is in place during the operation and post-closure. | Reasonable treatment |



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| | | | | | will be installed perfectly with no holes. In addition, typically an initial plume is expected from the water placed in the lined facility before tails fully cover the liner. This initial rate of seepage escape is typically larger than the long-term plume as the tails act to reduce seepage through the line. Please explain how it is possible that no appreciable seepage load would result from the CIL lined cell. | | |
| 127. | 11.5 | Groundwater Quantity and Quality | Chapter 11 (Appendix 11-E) | NLG | What is the size of the seepage pond pumps? Please describe maximum and average pumping conditions expected long-term. It would be helpful to provide a costing if long-term pump back of seepage is proposed so that this reviewer can assess the practicality of long-term seepage pump back. The transition of operation to long term closure appears to rely on pump back. What alternatives have been considered to avoid long-term pump back and site presence? | During operations pumping will be required to return cyclone sand dam construction water (collected in sumps at the tailing dam toes), dam seepage and undiverted precipitation run-off into the seepage collection pond.<br>At closure, seepage and undiverted precipitation run-off reporting to seepage collection ponds will require pump-back. Pumping will be required for the medium to long term.<br>The following describes design criteria for the seepage pond pumping installation, predicted flow rates:<br>1. Seepage pond pumps will be sized to pump-back the volume resulting from a 200 yr 24hr duration precipitation event plus seepage over a nominal period of 60 days. A pump capacity of 150 L/s is specified to deal with the resulting maximum flow rate (pumping seepage, construction water, average precipitation and 200 yr 24 hr event in 60 days during operations – at closure the maximum would be 50% of this (ie 75 L/s) as construction water is not present during Closure).<br>2. Note that pumping costs are more sensitive to a 200 year wet year than the occurrence of a single 200 year 24hr storm event so the analysis below focuses on the 200 year wet year:<br>In the following spreadsheet, two scenarios are analyzed to estimate annual pump-back volumes and cost;<br>• Average Scenario: assuming 100% average annual precipitation falling inside diversion perimeter, plus 100% of seepage (from 3D FeFlow Analysis; N Dam 23 l/s, SE Dam 22 l/s) reporting to seepage collection dam.<br>• 200yr Wet Year Scenario: assuming 100% 200yr return period annual precipitation falling inside diversion perimeter plus, 100% of seepage (from 3D FeFlow Analysis; N Dam 23l/s, SE Dam 22l/s) reporting to seepage collection dam.<br>Following annual pump-back volumes and costs result at closure: | Reasonable treatment |



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<table>
<tr><th>Comment No.</th><th>AIR Section No.</th><th>AIR Title</th><th>Application / EIS Chapter / Section No.</th><th>Reviewer</th><th>Comment</th><th>Seabridge Response</th><th>EAO Conclusion</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>
<table>
<tr><th></th><th>Scenario</th><th>Annual Pump-back Volume ($m^3$)</th><th>Annual Average Pump Rate (L/s)</th><th>Annual Pump-back Cost ($)</th></tr>
<tr><td rowspan="2">North Seepage Pond</td><td>Average</td><td>2,915,152</td><td>92.4</td><td>162,530</td></tr>
<tr><td>200-yr Wet Year</td><td>4,219,728</td><td>133.8</td><td>235,265</td></tr>
<tr><td rowspan="2">Southeast Seepage Pond</td><td>Average</td><td>2,175,608</td><td>69.0</td><td>75,719</td></tr>
<tr><td>200-yr Wet Year</td><td>3,058,392</td><td>97.0</td><td>106,443</td></tr>
</table>
Note that catchment area of the SE seepage pond is smaller for the SE Dam than at the N Dam, thus the pumping rates are lower.<br>c) “Alternatives to Seepage Pump Back”. This question primarily revolves around water quality and related acceptable seepage rates, if seepage exceeds this rate pumpback was considered to be a solution. The TMF was designed to a seepage criteria provided by the client.</td><td></td></tr>
<tr><td>128.</td><td>11.5</td><td>Groundwater Quantity and Quality</td><td>Chapter 12</td><td>NLG</td><td>Diversion ditch efficiency will be a key parameter in the water balance and volume of contact water released to the environment. It is not clear how groundwater flow in the valley sides has been accounted for, and the base case diversion ditch efficiency is quite high. The volume of contact water could be higher than predicted.</td><td>The diversion ditches are located above the groundwater table, and groundwater flow into the ditches will be minimal. The baseline groundwater quality from the valley slope is good.</td><td>Reasonable treatment</td></tr>
<tr><td>129.</td><td>11.5</td><td>Groundwater Quantity and Quality</td><td>Chapter 12</td><td>NLG</td><td>It is not clear why the TMF seepage collection ponds are situated so far downstream of the dams (nearly a kilometer). This arrangement increases the volume of contact water which must be managed.</td><td>The locations of the TMF seepage collection dams and ponds presented in the Application/EIS were optimized through iterations of the Project design which were influenced by groundwater modelling predictions and the surface water quality effects assessments. The design changes ensure that the seepage would be captured by the facility and downstream effects are minimized.</td><td>Reasonable treatment</td></tr>
<tr><td>130.</td><td>11.5</td><td>Project Description<br>Tailing Management Facility Monitoring and Management Plan</td><td>4.5.3.10<br>Appendix 4G<br>Appendix 4H<br>26.4</td><td>NLG</td><td>Stability of the downstream (CIL liner side) of the Splitter Dam during the early part of the construction/operation does not appear to have been addressed.</td><td>The dam design follows Canadian Dam Design Standards (CDA 2007) and takes into consideration stability issues. Information on the splitter dam can be found in the Project Description (Chapter 4) and associated appendices, and in the Tailing Management Facility Management and Monitoring Plan (26.4).</td><td>Reasonable treatment</td></tr>
<tr><td>131.</td><td>11.5</td><td>Groundwater Quantity<br>Groundwater Quality</td><td>11.6<br>12.6</td><td>NLG</td><td>Considering the width and height of the dams, the seepage loss through</td><td>The seepage rate through the dams was estimated using a 2D Seep/W model. The core of the dam will be filled with packed clay materials.</td><td>Reasonable treatment</td></tr>
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| | | Groundwater Management Plan | 26.15 | | the dams (at 0.04 $m^3$/s or 40 lps) seems low. | If seepage rates reporting to seepage recovery dams are higher than modeled rates, additional foundation jet grouting or bedrock grouting, where appropriate, can be evaluated as alternative additional seepage mitigation measures. Further, in the event that permeability of the till available for construction of cores was lower than determined in the site investigations, an addition of bentonite to the till cores has been assessed and an allowance for potential bentonite addition was included in the cost estimates. Note that at this site, interception efficiency of seepage into the collection dams is primarily controlled by the interaction of the TMF structures within the three dimensional natural hydraulic setting of the long narrow valley and not by the performance of the seepage mitigation structures under the dam foundations. | |
| 132. | 11.5.2 | Groundwater Quantity<br>Project Description | 11.1.2<br>Appendix 4Q | Tahltan Nation | 11.4.5. Was a profile done on the road to the minesite via the Eskay Creek road and if so where is the profile? | MacElhanney completed a profile of the road, found in Appendix 4-Q (Coulter Creek Access Road). Baseline work is not normally completed along linear corridors except in high groundwater discharge areas.<br>Additional information on the Coulter Creek Access Road can be found in the Project Description and within each of the effects assessment chapters. | Reasonable treatment |
| 133. | 11.5.2 | Groundwater Quantity<br>Project Description | 11.1.2<br>Appendix 4R | Tahltan Nation | 11.10.1 Baseline study data for the southern access route is minimal compared to work done supporting the northern route. | MacElhanney completed a profile of the Treaty Creek Access Road found in Appendix 4-R. Baseline work is not normally completed along linear corridors except in high groundwater discharge areas. McElhanney engineers assessed these areas for constructability and avoided them where possible.<br>Additional information on Treaty Creek Access Road can be found in the Project Description and within each of the effects assessment chapters. | Reasonable treatment |
| 134. | 11.5.4 | Groundwater Quantity | 11.4.2<br>11.6.1 | BC MOE | The temporal boundaries will include the following three phases:<br>• Construction Phase – estimated 3 to 4 year period;<br>• Operations Phase – approximately 50 to 55 year life of the mine; and<br>• Closure and Post-Closure – mine site reclamation and post-closure monitoring.<br>- Y – but construction phase not included. | Effects of construction activities on groundwater quantity are considered and qualitatively discussed in section 11.6.1. Residual effects on groundwater quantity during the construction phase are considered minor. The groundwater monitoring plan (Appendix 11-E) has been developed to monitor the potential effects from landfill sites during construction and throughout the mine life. According to the engineering design, the landfills are covered and lined, which means that the effects from the landfills during the construction period will be minimal. | Reasonable treatment |
| 136. | 11.5.4 | Groundwater Quantity | 11.7<br>Appendix 11-F<br>Appendix 11-G | Tahltan Nation | Section 11.4.2.2: Groundwater Quantity; Temporal Domain. Groundwater flow regime changes were only modeled at “key stages” the earliest of which is at the end of “Stage 1” in the 25th year of operation. There are no early tailings | The groundwater regime changes were modelled by assuming the tailing cells are in their full capacities with the highest operational water levels in the tailing ponds and cells during the entire operations and post-closure. This represents the worst scenario and likely overestimates the flow regime changes during the early mine years before Year 25 when the cells are not full. Although no pumping tests have been done to calculate the bulk permeability of the geological materials on site, sensitivity analyses were carried out to characterize the uncertainties of the | Reasonable treatment |



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| | | | | | placement scenarios to estimate early changes in the groundwater regime or for early stage<br>tailings placement seepage assessment. There don't appear to be any pump test results to verify aquifer characteristics. | hydraulic properties of the materials. | |
| 137. | 11.5.6 | Groundwater Quantity | 11.7, Appendices 11-F, 11-G | Tahltan Nation | AIR Section: 11.5.6: Assessment of Potential Effects (Groundwater Quantity and Quality). Groundwater quality predictions are only provided for the end of "stage 1" at year 25. Since seepage is likely significantly different at the early phase of tailings placement it would be useful to have predictions for early stage groundwater quality. Can you provide Groundwater quality and quantity predictions for the early placement phase of tailings pond development? | The potential changes of groundwater quantity (seepage) and quality (plume) were modeled with the assumptions that the tailing cells are in their full capacities with the highest operational water levels and constant conservative solute sources (without attenuation of the plumes and dilution of the source over time) in the tailing ponds and cells during the entire operations and post-closure. This represents the worst scenario during the entire operations and post-closure and likely overestimates the groundwater quantity and quality changes during the early mine years. The changes in the early phase of tailing placement will be less than the model predicted. | Reasonable treatment |
| 138. | 11.5.7 | Groundwater Quantity<br>Groundwater Quality<br>Groundwater Mgmt Plan<br>Conclusions | 11.7<br>12.7<br>26.15<br>39.4.4<br>39.4.5 | Tahltan Nation | This section of the Application will also describe the Proponent's commitments, including those related to implementation of best practices.<br>• (26) No commitments identified in these sections. | Commitments related to groundwater quantity and quality are described in Chapters 11 and 12 and Section 26.16 (Groundwater Monitoring Plan). Additional commitments related to groundwater is provided in Table 39.52-1 (see Condition 12). | Reasonable treatment |
| 139. | 11.5.8 | Groundwater Quantity<br>Groundwater Quality | 12.7<br>14.7<br>Appendix 14-J | Tahltan Nation | Chapter 12: Groundwater Quality. The application's groundwater modeling predicts that some degree of residual groundwater quality effect is likely from plumes emanating from the TMF. Groundwater quality predictions were only modeled at key stages the earliest of which is year 25. There was no modeling of early tailings<br>placement scenarios despite the likelihood that seepage will be highest at the outset of tailings placement. | The groundwater plumes were modeled with the assumptions that the tailing cells are in their full capacities with the highest operational water levels in the tailing ponds and cells during the entire operations and post-closure and that the solute sources in the cells are constant and conservative without attenuation and dilution. This represents the worst scenario and likely overestimates the groundwater quality changes during the early mine years. Sensitivity analysis was carried out to investigate the uncertainties of the predictions. | Reasonable treatment |
| 140. | 11.6.1 | Surface Water | 13 | GHC | Summary of on-site hydrometric | Methodologies are explained in the baseline report in Appendix 13-A. A logarithmic | Reasonable |



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| | | Quantity | Appendix 13-A | | monitoring which has been occurring since the fall of 2007. Currently, the monitoring network includes 16 automated gauging locations in the Unuk, Sulphurets, *Teigen*, and Treaty watersheds;<br>• Proponent has completed very limited winter hydrology work in the Teigen and Treaty Watersheds.<br>• In Section 13.1-6 they provide winter average flows yet they haven't done winter flow measurements? How did they estimate these?<br>• 13.1.3 – they only estimated up to 1 in 200 year flood events. When asked at meetings if the TMF would withstand large floods we were told they modelled up to 1 in 10,000 year floods. Does this mean the TMF is only engineered to withstand a 1 in 200 year flood event? If not then where does the proponent describe how they modelled for large flood events? This is critical for Gitanyow because of the high risk of catastrophic downstream impacts to the Nass River ecosystem. Explain. | decay function is used to extend flows from the final measurement in either October, November, or December to the first flow measured new year. From that flow measurement a logarithmic growth function is used to estimate flows from the February measurement until the April measurement in the spring. During the winter period hydrometric stations either remain in place or are removed to protect the transducer. Stages recorded during this time are generally unreliable due to ice and snow effects. Rating curves during this period are therefore notoriously unreliable.<br>In accordance to the "Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators" only flows up to the 1 in 200 year flood event were considered for water quantity and quality effects assessment. For the structural stability purpose, KCBL (2012) and KCBL (2013) used the PMF as the design flow for TMF and the WSF. | treatment |
| 141. | 11.6.1 | Surface Water Quantity | 13<br>Appendix 13-A | GHC | Site water balances will be developed for the proposed mine areas as well as the proposed TMF area and will be used to facilitate the effects assessment on the hydrologic regime within and downstream of these areas.<br>• Proponent indicated to | The staging of discharge from the TMF is planned to occur from May 15 to October 15 a period covered by the existing hydrometric program. Actual discharge from the site will be done in accordance with existing site conditions in order to minimize any adverse effects to downstream resources. The natural hydrographs were estimated based on a scientifically supported methodology that integrates recorded baseline data into a long-term regional hydrologic analysis (Appendix 13-A). During operations the flow in Treaty Creek will be measured continuously and the discharge will be adjusted to meet the hydrgraph. | Reasonable treatment |



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| | | | | | Gitanyow (Appendix 3-N, table N.1, issue 48) that staging discharge from the TMF to Treaty Creek would match the natural hydrograph. Hydrology data collected on Treaty Creek (TC-HI, Chapter 13 of the application, table 13.1-3) is very limited because data was only collected part time (April to Nov.) for three years and no winter flow data was collected. With this limited flow data it would be next to impossible to mimic the natural hydrograph with any accuracy. | | |
| 142. | 11.6.1 | Surface Water Quality | 14<br>Appendix 14-J | Tahltan Nation | Chapter 14: Surface Water Quality. There are no water quality predictions for the center cell of the TMF. Sewage from the Mill Site is proposed to be discharged to the TMF. | Water quality predictions for the CIL Cell are included Appendix 14-J. The treated sewage effluent will be combined with the tailings from the mill. The ratio of sewage effluent to mill tailings will be very low and inconsequential in total flow, both chemically and volumetrically. | Reasonable treatment |
| 143. | 11.6 | Surface Water Quality | 14.1.3<br>14.1.5 | Tahltan Nation | 14.1.3 Telegraph Creek not included.<br>14.1.5 Telegraph Creek was not included. | The spatial boundaries for the RSA for the water quality effects assessment focused on watersheds that could potentially be affected by mine development and operation, including the Mitchell/Sulphurets/Unuk/Teigen/Snowbank/Bell-Irving, and Treaty/Bell-Irving watersheds. The spatial boundaries were confined to the downstream limits of predicted changes as determined by water quality modelling. | Reasonable treatment |
| 144. | 11.6 | Surface Water Quantity | 13<br>Appendix 13-B<br>Appendix 13-C | BC MOE | As a component of the project development, glaciers within the immediate project area as well as glaciers adjacent to the site will be impacted. This will occur at various scales, time frames and intensities including:<br>• Removal and destruction of existing glacial ice to access the specific resource (Mitchell, Iron Cap deposits),<br>• Reduced albedo effect causing increased melting | The potential impacts of climate change and the resultant impact on reduced glacial volume on streamflows in the Sulphurets Creek watershed are assessed in Appendix 13-B.<br>Given the current rates of glacial retreat (estimated to be almost 50 m per year - for additional details please refer to Appendix 13-C), it is anticipated that the Mitchell glacier will no longer cover the southeastern portion of the proposed Mitchell pit area in the time frame proposed for the development of the Mitchell pit. The Iron Cap deposit will be mined by block caving underground method thus minimizing any impact to the glacier.<br>The temporary use of the Frank Mackie glacier access route for construction purposes will be for two short winter periods and all efforts will be made to minimize any potential effects. During this short period it is not anticipated to increase melting and any downstream effects. | Reasonable treatment |



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| | | | | | due to development related dusting,<br>• Increased contamination and melting along the glacier road leading to the project site.<br>• Impacts to drainage as a result of increased melting and or contamination of the glaciers.<br>In the context of climate change, protection of freshwater sources, active glacier protection legislation in other jurisdictions of the world, the overall potential impacts and policy acceptability of this process must be evaluated and a conclusion reached. It would also be appropriate for the proponent to consider development scenarios which would not impact the associated glaciers | | |
| 145. | 11.6 | Project Description<br>Surface Water Quantity | 4<br>13<br>Appendix 13-C | BC MOE | Chapter 4 – Project Description (4.5.1.2), Chapter 13 (13.6.5) and Appendix 34-B -The possibility that glacial ice will be removed to facilitate pit development (as outlined in App. 34-B) raises some significant issues – specifically, the Province's stance on development activity that will impact glacial mass balance.<br>In addition, consideration should be given to the possibility that removal of ice will debuttress the lateral moraine complexes, potentially resulting in increased frequency/magnitude of slope failures. | Given the current rates of glacial retreat (estimated to be nearly 50 m per year – for additional details please refer to Appendix 13-C), it is anticipated that Mitchell glacier will no longer cover the southeastern extremity of the proposed Mitchell pit area in the time frame proposed for the development of the Mitchell pit. | Reasonable treatment |
| 146. | 11.6.6.1 | Project Description<br>Air Quality<br>Surface Water Quantity | 4<br>7<br>Appendix 7-B<br>13 | BC MOE | Chapter 13 (13.6.5) - The issue of dust fall (from mine operations) on the glacier surface also requires some attention, and has been the subject of intense scrutiny in other jurisdictions globally (e.g., the Pascua-Lama | Chapter 13 (Section 13.6.5) of the Application/EIS has been further clarified as follows:<br>Activities such as blasting, bulldozing, grading, and material handling, as well as road dust are sources of fugitive dust. Fugitive dusts are typically mechanically generated and have large particle sizes. For example, unpaved industrial road dust contains approximately 3% PM2.5 and 28% PM10 following the calculations | Reasonable treatment |



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| | | | | | Project in Chile). Given this and the potential for excavation of the glacier toe, some higher level discussion will be required to outline the province's stance on potential development impacts to glaciers, as well as commitments by the proponent to limit the potential for dust fall on the glacier surface. The current statement that dust fall on the glacier surface is not expected to occur (13.6.5) because the dominant winds are from the east and south-east does not provide enough event specific detail to draw this conclusion. Nor does the glaciers location (higher) relative to the pit preclude deposition by anabatic wind events. Further analysis should include: The potential for anabatic winds to deposit dust on the glacier surface. A single deposition event is sufficient to change the surface albedo, and the surface energy balance in the glacial forefield can be expected to be altered by pit development (i.e., lower albedo and potentially increased surface warming and convection);<br>Given the inherent uncertainties in such an assessment, particular focus should be placed on the dust management plan for the Mitchell Pit, with emphasis on prevention of dust deposition on the glacier surface. | outlined in US EPA AP-42 Chapter 13.2.2-2 while blasting fugitive dust contains 3% PM2.5 and 52% PM10 (US EPA AP-42 Chapter 11.9-1). Due to the larger particle size, fugitive dust tends to deposit within a short distance with limited vertical movement.<br>An anabatic wind around the glacier occurs only during the summer months when the slopes are free of snow and drier, which allow vertical sun rays to heat the ground faster. (U. Haritashya et al. 2011). From seasonal windrose observation at Mitchell Creek, the increase in westerly winds from winter (6%) to summer (10%) indicated infrequent anabatic wind (Figure 3.6-2). The winter windrose at Mitchell Creek indicated the dominant wind direction in both summer and winter seasons from the east-southeast is common katabatic wind for downslope wind flowing from glacier down to the valleys (A. Kumar. 2011).<br>During the construction and operation phases, the dust deposition at the Mitchell glacier does not increase from the baseline value (Figures 7.8-18 and 7.8-33) due to the elevation difference and predominant wind direction from the east-southeast recorded at the Mitchell meteorology station (Figure 7.1-3). The dispersion modelling was conducted using CALPUFF which is a multi-layer non-steady-state puff dispersion model that is capable of simulating the effect of time- and space-varying meteorological conditions. The meteorological data for on-site observations and prognostic data, land use, and terrain information were provided into CALMET for one complete year. Land use, including albedo information, was extracted from GeoBC Baseline Thematic Mapping and the data was translated to USGS (US Geological Survey) land use.<br>The highest dust deposition rate at the Mitchell glacier, predicted from dispersion model, was 1.3411 mg/dm2/day while the highest for the entire model domain was predicted to be 1.3416 mg/dm2/day, including the baseline dust deposition rate of 1.34 mg/dm2/day. This is much lower than the BC objectives of 1.7 to 2.9 mg/dm2/day, and the increase in dust deposition due to the Project activities is very small, representing 0.1% increase from the baseline. The small amount of dust deposition from the Project operation to the Mitchell glacier indicates that anabatic wind which brings large amount of dust from the mine area to the Mitchell glacier is not predicted.<br>Many researches and studies have been conducted on evaluating the effect of dust on snow, mostly focusing on significant source of dust such as deserts. It is agreed that with the uncertainties of such energy balance approach, and emphasis should be on the prevention of dust deposition on the glacier surface.<br>The proponent has agreed to various mitigation methods listed in section 7.7 and the air quality management plan (26.11). The commitments include:<br>• watering of the road which reduce fugitive road dust by 87.5%;<br>• speed limits will be imposed to further fugitive road dust;<br>• install baghouses for each crushing circuit to reduce dust emissions by | |



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| | | | | | | more than 99.5%;<br>• stockpiles of process ore will be enclosed to reduce wind erosion;<br>• install baghouses or wet scrubbers in the MTT to reduce fugitive dust; and<br>• drop distance between conveyor belt and stockpile will be reduced as much as feasible.<br>• Dust from exhaust may also contribute to dust induced snowmelt on the glacier. Dust from exhaust will also be mitigated by:<br>• using equipment that comply with the US EPA Tier 4 standards, which is the highest tier available;<br>• Inspect and maintain equipment and vehicle to ensure low emissions; and<br>• Vehicle idling will be limited.<br>As part of the air quality monitoring plan, dustfall levels at various locations throughout the Project area will be monitored (Figure 26.11-1 and below). More mitigation methods will be incorporated if dustfall results are higher than the objectives set by BC MOE. | |
| 147. | 11.6.6.1 | Surface Water Quantity | 13.4<br>13.7 | BC MOE | Figure 13.7-14 and low flow estimates (Table 13.7-39; Figure 13.7-18) for both the mine site and PTMA provide a range of results that for certain locations, are both above and below baseline conditions. One would expect that increasing (decreasing) contributing basin areas would result in discharges being consistently higher (lower) than baseline conditions. The same would be true for land cover changes resulting from project development and operation. Project development would not be expected to result in an equal probability of either increased or decreased peak flows, all other variables held equal. This appears to be an artefact of the analysis, without consideration of the physical mechanisms that would underlie changes to peak flow and low flow regimes. These estimates will require further review to determine whether the ranges that have been provided are representative of the processes | The need for "consideration of the physical mechanisms" for precisely estimating the peak and low flows is acknowledged. However, lack of practical physical-based models with sufficient spatial and temporal scales has resulted in common practices that either ignore the effects of the projects on peak and low flows, or use oversimplifying approaches for such estimates. Knowing the insufficiency of over simplistic approaches and the complications of underlying physical mechanisms, we aimed to improve the previous approaches by accounting for sources of uncertainty in the estimates of peak and low flows, and provide ranges of assessments instead of point predictions which would not be reliable.<br>The blue boxes and their associated error bars in Figure 13.7-14 show the expected range of changes in peak flows during the 57 years of operations and closure. The contributing basin areas of assessment points vary during this period. We will update Tables 13.4-2 to 13.4-3, 13.7-2 to 13.7-5, and 13.7-23 to 13.7-68 to show the changes in contributing areas during the 57 years of operations and closure. For example, the contributing area of NTR1A (15.5 $km^2$ at baseline conditions) varies from 7.9 $km^2$ to 18.4 km2 during the 57 years of operations and closure; this is the main reason that both increased and decreased peak flows are seen in Figures 13.7-14 to 13.7-18. If different stages of the project are looked into separately, it is seen that as the reviewer suggested, generally "increasing (decreasing) contributing basin areas would result in discharges being consistently higher (lower) than baseline conditions".<br>Low estimates of peak flows represent the effect of contributing basin areas on peak flows (please see Section 13.7-3). This is in agreement with the aforementioned reviewer's logical statement. For example, low estimates of peak Q10 flows at NTR1A during different stages of the project (Table 13.7-23) follow the | Reasonable treatment |



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| | | | | | that drive these events, and following that, whether these estimates have been used appropriately to inform the water quality predictions. | aforementioned logical rule.<br>As explained in text (Section 13.7-3), high estimates of peak flows consider the additive effect that water diversion structures may have on peak flows of smaller sub-watersheds. That is, the high estimates of peak flows are provided to account for uncertainty due to factors other than the contributing basin area.<br>For example, the high estimate of peak Q10 flow at NTR1A during years 0-24 is higher than baseline conditions even though the contributing area during years 0-24 (13 $km^2$) is less than baseline conditions (15.5 $km^2$). | |
| 148. | 11.6.6.1 | Surface Water Quantity | 13 | BC MOE | We have also requested that the full stream discharge and precipitation data sets be provided to the reviewers, this request is still unfulfilled as of the time of writing. | The requested raw data as presented in the Application/EIS was provided to MOE on May 23, 2013. Please see **Attachment #4** which contains the requested precipitation and stream discharge data. | Reasonable treatment |
| 149. | 11.6.6.2 | Surface Water Quality | Appendix 14-J | Tahltan Nation | AIR Section 11.6.6.2: Surface Water Quality. I was unable to find water quality predictions for the center cell of the TSF. Since this is a source term for seepage and input to the other cells it would be useful to see some predictions. Can you provide predictions also for early phase placement water quality in the TMF? | Water quality predictions of the centre cell are included in Appendix 14-J. | |
| 150. | 11.6.6.2 | Groundwater Quality<br>Surface Water Quality | 12<br>14<br>Appendix 14-F<br>Appendix 14-G | NLG | In general, it is not clear how the water quality impacts in the receiving environment were modeled. The information provided on water quality sources and resulting impacts in the receiving environment is spread throughout a lot of information in the Main EIS. As expected, the main EIS is designed as an impact assessment rather than a technical document describing the water quality modeling.<br><br>The recommendation is for the proponent/consultants to prepare a technical appendix of the loading mass balance and the water quality modeling such that is it is possible for the technical reviewer to understand the assumptions and modeling | A description of the water quality model is included in Chapter 14. The description of the water balance is included in Appendices 14-F and 14-G. In order to provide greater clarity and for ease of review, further water quality model clarification will be provided that describes both the surface water quality and quantity model assumptions and source terms. | Reasonable treatment |



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| | | | | | completed. | | |
| 151. | 11.6.6.2 | Project Description<br>Groundwater Quality<br>Surface Water Quality | 4.5.3.8.2<br>12.7<br>14.7 | NLG | Please explain why water treatment was not considered for discharge from the flotation tailings cells. | Water quality in the TMF discharge is predicted to meet BC MOE permit discharge criteria and ultimately the BC WQGs in Treaty Creek. The water from the CIL pond is treated prior to discharge into the TMF. The water treatment considered for the TMF tailings discharge is total suspended solids to meet a 15mg/L discharge criteria under the MMER. The chemical treatment process is described in detail in the Project Description (section 4.5.3.8.2). | Reasonable treatment |
| 152. | 11.6.6.2 | Groundwater Quality<br>Surface Water Quality | 12<br>14 | NLG | Please also confirm the following flows are approximately correct in terms of dilution of the seasonal discharge of the TMF tailings ponds. Flows in Treaty Creek are on the order of 40 $m^3$/s while the piped discharge is on the order of 0.6 $m^3$/s. In comparison North Treaty Trib is on the order of 2 $m^3$/s. | The flows are approximately correct. For example, at year 10 during the discharge period (May 15 – October 15) flows from the TMF are estimated as follows: 0.68 $m^3$/s near the outlet of North Treaty Creek (NTR2): 2.16 $m^3$/s; and 32.35 $m^3$/s in Treaty Creek (TRC2). | Reasonable treatment |
| 153. | 11.6.6.2 | Surface Water Quality | 14 | NLG | The figure provided in the Main Volume of the EIS, Figure 14.7-10, appears to be missing information (expected case is not provided as shown below). In addition, it would be useful if this figure were plotted on the same graph as the resulting water quality after direct discharge in Treaty Creek (both figures under discussion are shown below).<br>*Figures 14.7-36 and 14.7-10 are provided in memo* | The expected case is equivalent to the upper case, which is identified in a note underneath Figure 14.7-10. | Reasonable treatment |
| 154. | | Surface Water Quality | 14.7 | NLG | Baseline water quality in Treaty Creek appears to vary considerably when looking at total and dissolved fractions. Please compare the dissolved load (rather than total load) in Treaty Creek for the parameters of concern shown in Figure 14.7-36. The rationale for this is that while total concentrations may be within the mean baseline limits, the direct discharge of a large dissolved load | Total metal concentrations were used based on consultation during the KSM Project Working Group meetings and to enable comparison with provincial water quality guidelines which are for total metals. | Reasonable treatment |



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| | | | | | from the tailings process ponds could have additional impacts to downstream water quality. The impact could result because water quality guidelines are exceeded and the dissolved baseline water quality is also exceeded. | | |
| 155. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | In addition, the baseline water quality assessment considered mean water quality rather than median water quality. Please use median baseline water quality rather than mean as median provides a much better representation of the data and does not skew the data towards high runoff events with huge total suspended loads. | The water quality model input of baseline water quality (mean concentrations) has been presented at the KSM Project Working Groups. Mean data has been used consistently throughout the water quality model, both for background concentrations and source term concentrations. Finally, predicted concentrations are also compared to mean data for consistency. | Reasonable treatment |
| 156. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | It appears from inspection of the pipeline discharge location into Treaty Creek (below) and the modelling point TRC2, that the modelling point is fairly far downstream. A figure showing both locations in detail would be helpful. It is not clear why there is no water quality modeling prediction point just downstream of the pipeline discharge into Treaty Creek. | The modeling point TRC2 coincides with a baseline monitoring location that has been monitored since 2008. This point was selected because salt dilution studies indicated that fully mixed conditions, a model assumption, will occur by TRC2. Discharge locations will be defined during the permitting stage. | Reasonable treatment |
| 157. | 11.6.6.2 | Groundwater Quantity<br>Groundwater Quality<br>Surface Water Quality | 11<br>12<br>Appendix 11-C<br>14 | NLG | Based on the screening level assessment, it is not clear that the Goldsim water quality is correctly accounting for the loadings to surface water from the groundwater model (via seepage pathway). Because there is no technical appendix for the Goldsim model, Dr. Freed met with Rescan staff in April to review the Goldsim model and the groundwater model linkages.<br>Rescan staff were very helpful in terms of answering questions and discussing the modeling. Some questions were identified for further | As noted by the reviewer, Seabridge met with NLG representative during the screening of the Application/EIS to explain the groundwater modeling predictions and their incorporation into the water balance and water quality effects assessment.<br>The requested information on groundwater quality including sampling sites and depths and site descriptions is included in the 2008, 2009-2010 and 2012 hydrogeology baseline reports in the appendices of Chapter 11. Baseline groundwater quality conditions are summarized at a high level in Chapter 12 of the Application/EIS.<br>The data will be presented as the reviewer has requested and will be provided during the Application/EIS review stage. | Reasonable treatment |



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| | | | | | discussion, and they are documented within this screening review. | | |
| 158. | 11.6.6.2 | Groundwater quantity<br>Groundwater quality<br>Surface water quality | 11<br>12<br>14 | NLG | It is expected that there will be some load of contaminants in the seepage from the tailings facility. This will be a year-round load as seepage occurs in the winter when there is little-to-no surface water flowing in the streams. During this winter period, it is expected that the tailings seepage source would cause some level of impact in the downstream environment. This expectation is based on the experience at many existing mine sites. However, in the water quality predictions for South Teigen Tributary, there appears to be no such prediction of a winter impact. | The seepage rates estimated from groundwater modelling represent the long term average groundwater flow conditions. The predicted groundwater seepage was incorporated into the surface water quality model. In order to provide greater clarity and for ease of review, further water quality model clarification will be provided that describes both the surface water quality and quantity model assumptions and source terms. | Reasonable treatment |
| 159. | 11.6.6.2 | Surface Water Quality | 14 | BC MOE | Table 14.1-1. Water Quality of Streams and Rivers of the Mine Site Area, KSM Project 2007-2012. Values below MDL were listed at ½ MDL but it is not known which values apply this rule. P. 5. Why are some values for the Unuk River (for example Selenium and Cadmium for May to October) lower for the 95th percentile than for the mean in the Dissolved Metals? Why was the May-Oct mean for Cadmium high in the Unuk (0.191 mg/L)?<br>P. 27. There are 10 Temporary Water Treatment Plants of the KSM construction period (Appendix 4-Y). Appendix 4-Y only lists 9 TWTPs.<br>P. 47. Table 14.7-9. This table has no units. What is the n? Indicate that parameters that exceed the BC WQGs.<br>Provide rationale for excluding the McTagg Power Plant, Mine Site Avalanche Control, Upper Sulphurets | Values below the MDL are identified in Appendix 14-A. The Unuk River selenium and cadmium data have been corrected in Table 14.1-1.<br>Chapter 14 has been corrected to indicate there will be nine temporary water treatment plants.<br>The tables have been corrected to include a footnote with the units. All measured values are in mg/L. The n is based on the number of average monthly concentration values from the model results. Therefore, n= 60 for the construction phase, n=3085 for the operations phase, n=180 for the closure phase and n=2735 for the post-closure phase. This will be updated on tables 14.7-9 through 14.7-12. The table will indicate parameters that exceed the BC WQGs.<br>The mine site infrastructures noted in the comment are included in the mine site footprint and all runoff from these areas is considered contact water. Runoff is directed to the temporary water storage facility for storage and treatment prior to discharge. Any changes to the surface water chemistry from these areas would only occur as a result of a spill, which is considered as part of the spill management plan. | Reasonable treatment |



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| | | | | | Power Plant, Mitchell Truck Shop, Kerr rope conveyor, and Explosives Manufacturing Facility from surface water quality analysis. Do any of these facilities present potential inputs to surface waters? Provide the rationale for omitting these facilities from the analysis. | | |
| 160. | 11.6.6.2 | Surface Water Quality | 14 | BC MOE | Chapter 14 - It is unclear at this stage what combination of flow scenarios and loading inputs were run in the water quality model, and this requires clarification, and a request will likely be made for additional sensitivity analyses to be run. | The requested information on groundwater quality including sampling sites and depths and site descriptions is included in the 2008, 2009-2010 and 2012 hydrogeology baseline reports in the appendices of Chapter 11. Baseline groundwater quality conditions are summarized at a high level in Chapter 11 of the Application/EIS.<br>In order to provide greater clarity and for ease of review, further water quality model clarification will be provided that describes both the surface water quality and quantity model assumptions and source terms. | Reasonable treatment |
| 161. | 11.6.6.1 | Surface Water Quantity | 13 | BC MOE | Appendix 14-F and 14-G - The water balance models for the TMF and mine site have not been compared to baseline conditions, nor have a comprehensive suite of sensitivity analyses been run. While the argument could be made that the parameters in the models are based on measured data, and conservative estimates used where possible, it would still be helpful to see how the model outputs compare to the measured data, in order to prove that that model does indeed produce results that are representative of current conditions. The models in their current form provide a good starting point for the project water balance estimates, but further sensitivity analyses will be required. While limited sensitivity analyses have been run on these water balance models (diversion efficiencies for TMF and mine site) they are not fully representative of the possible range of hydro-climatic conditions that | The modelled streamflows in the water balance model at both of the PTMA and Mine site were calibrated with observed baseline streamflows at the PTMA and Mine site during 2008 to 2011. This is different from the water balance report from KCBL that was included in the EA submittal.<br>><br>> In addition, in order to verify the reliability of using normal years as water balance model inputs, 5 global climate models were used to generate a data set containing 14 scenarios of an annually varying precipitation timeseries. Three commonly used classes of scenarios for GCMs by the various climate institutes around the world were used B1, A1B, and A2 emission scenarios. Each scenario included 150 years of synthetically generated precipitation and temperature data from 1950 to 2100. Results of these scenarios were calibrated so that the average simulated precipitation, streamflow and runoff observed at Teigen Creek and Sulphurets Creek climate stations as well as selected hydrometric stations between 2008 and 2011 matched the observed data during this period.<br>The results of these multiple climate scenarios for the water balance (essentially a proxy for sensitivity analysis) were presented in Ch. 13 of the EA along with the "normal" or static case. Additional details of the modeling procedures and calibration framework used will be included in the water quality model appendix. | Reasonable treatment |



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| | | | | | the project will be subject to over the course of its substantial operational and closure periods. There are several ways to resolve this, and will require further discussion with the proponent and the consultants, ideally in a meeting focussed on the water balance modelling. | | |
| 162. | 11.6.6.2 | Surface Water Quality | 14 | BC MOE | Surface Water Quality → Predictions of water quality will be provided for discharges from pits, pit lakes, rock storage facilities, ore stockpiles (including low grade ore), road cuts, tunnels, borrow pits, tailing, dams, site surface water discharges, groundwater seepages and relevant receiving environment locations in local and regional watersheds.<br>• Y—with the exception of the tunnels | Tunnel water will be directed to temporary water treatment plants during the construction phase and to the WSF during operations. | Reasonable treatment |
| 163. | 11.6.6.1 | Surface Water Quantity | 13 | BC MOE | Surface Water Quantity→ The Application will assess water quality and effects for key flow conditions and relevant time steps in the mine life (including time frames for future pit lake discharging and steady state conditions).<br>• Y—scenarios require more detailed descriptions | The AIR requirement has been met. As requested, Seabridge will provide further clarification in the Application review. | Reasonable treatment |
| 164. | 11.6.6.1 | Surface Water Quantity | 13 | BC MOE | Surface Water Quantity→<br>The assessment will take into consideration the components of the proposed Project that could affect surface water quality including: Discharges from the TMF, collection ponds, process plant, water treatment facilities, tunnels, settling ponds, open pits and other mine workings;<br>• Y—with the exception of the tunnels | It is not anticipated that the volume of water intercepted in the tunnels will be significant to surface water flow volumes. Base case estimates from groundwater flow volumes are on the order of 20 – 85 L/s. The production tunnels drain towards the Mitchell valley and the flows will be directed to the WSF for treatment. | Reasonable treatment |



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| 165. | 11.6.6.2 | Project Description<br>Surface Water Quality | 4<br>Appendix 4-Y<br>Appendix 4-Z<br>14.7 | MEMNG | Mobile and temporary water treatment plants have not been widely used at BC minesistes. Additional information is required to demonstrate technical feasibility for their application to the KSM project. Please provide information on the predicted ranges of construction effluent water quality to be treated. If water quality is quite dilute during the initial stages (i.e. low strength ARD or elevated metals in neutral pH) will the construction phase water treatment plants be able to effectively treat water? Analogues from other mines with performance data should be provided along with performance guarantees where possible, to demonstrate that these technologies will be feasible and effective for use at KSM. | The mobile water treatment plant and layout proposed is the same as that engineered and developed by Rescan and installed for the tunnel development at the Galore Creek development project. Rescan licensed and permitted that plant with MOE in Smithers. For the short time that it operated it was very effective. At KSM, 9 mobile plants are proposed because there are 9 portal and tunnel developments that are being developed simultaneously and in different areas. The mobile plants are containerized and built offsite for quick implementation at the start of construction. The Galore tunnel development did not produce acid water but was ready in case of such an event, and included a lime treatment step. | Reasonable treatment * |
| 166. | 11.6.6.2 | Project Description<br><br>Surface Water Quality | 4<br>Appendix 4-W<br>14<br>Appendix 14-H | MEMNG | HDS lime treatment is a well-established and effective form of water treatment for ARD. However, water treatment of ARD on the scale proposed for the KSM project is unprecedented in BC and possibly globally. EMNG has concerns whether treatment on this scale and in this climate and remote geographical setting is feasible. Please provide examples from other analogue mines in similar topographic and climatic setting with performance data that demonstrates successful water treatment. | The proposed HDS water treatment plant is based on 7 individual water treatment circuits in the range of proven throughput technology. There is a 1.0 $m^3$/s plant being built or operating in South America. The proposed circuits are set up in parallel where one circuit can operate at low flow and all seven at high flow. There is significant redundancy in the treatment process. The plant has been configured and the preliminary capital cost for a 7.5 $M^3$/s throughput has been completed. The preliminary capital cost for the plant and all associated infrastructure is approximately $150 million. As for the operability in the environment of the lower Mitchell valley the plant will operate primarily in the spring, summer and fall months and minimally in the winter. The lime requirements will be transported to the site and consumed during these more temperate periods. Operation in remote areas will be no different than operating a mine year around. | Reasonable treatment * |
| 167. | 11.6.6.2 | Project Description<br>Surface Water Quality | 4<br>14<br>Appendix 14-I<br>Appendix 14-K | MEMNG | Water from the Kerr pit and backfilled Kerr waste in the Sulphurets pit will require additional treatment for selenium. Water from these areas will be conveyed to the proposed ion | The selenium treatment plant will treat 60 L/s. Water will only be directed to the WSF during spring freshet and high intensity rainfall events. During these events, more dilute concentrations are expected from the Kerr and Sulphurets pits. Backfill of Kerr waste into Sulphurets Pit begins in Year 27.<br>If required, as indicated by operational experience with the development of the Kerr | |



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| | | | 33.12 | | exchange selenium treatment plant via 2 separate pipelines. The current treatment design basis is for a selenium ion exchange treatment plant with a capacity of 60L/s that will treat to concentrations less than 1 ug/l. Water will be pre-treated with caustic soda in a feed tank, and then will undergo an iron removal stage through solid-liquid separation. The overflow water will then undergo multimedia filtration to remove fine particles before being treated using ion exchange columns. The treated effluent would then be routed to the WSF for further treatment. The selenium would be removed from the spent regenerant using a biological reduction stage. The resin would be regenerated using sodium sulphate ($Na_2SO_4$). Bench scale treatment testing was completed by BioteQ on synthetic feed water using BioteQ's Selen-IX ion exchange technology to test both selenium removal and recovery of selenium in the spent regenerant as a solid phase. Key parameters to performance were regenerant, regenerant strength, resin type, flow rates and temperature.<br>The study suggested that selenium could be reduced to elemental selenium in BioteQ's bioreactor or through other undetermined physico – chemical processes. Estimates of reduced selenium in the bioreactor were 0.55 kg/d selenium and 11.8 kg/d of selenium rich biomass sludge. The report also noted substantial drawbacks with operating a biological system in a cold, remote location, with challenges to ensuring reliability and the sophisticated controls | Pit, addition to the Selenium plant will be completed.<br>Further information on the design specifications will be provided during the review phase. An assessment of different selenium treatment alternatives is provided in Chapter 33, section 33.12 | |



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| | | | | | systems needed for operations.<br>While the results of the limited bench scale selenium testing show some promise, the information on selenium treatment is not currently at a level that demonstrates technical feasibility for the scale of treatment required for the KSM project. Selenium treatment is a primary mitigation strategy that must be demonstrated to be feasible at the EA phase and a higher level of design information is required.<br>• What volumes of water from the Kerr Pit and Sulphurets Pit areas will require selenium treatment? EMNG anticipates that significant volumes will require treatment, especially on a seasonal basis. Will the entire hydrograph be treated? How will this water be stored and what are the contingencies for storage? | | |
| 168. | 11.6.6.2 | Project Description<br>Surface Water Quality | 4<br>14<br>Appendix 14-H<br>Appendix 14-I | MEMNG | The application states that in the event that flows exceed the capacity of the selenium treatment plant, the high selenium water would be directed to the WSF. This seems counterproductive since the HDS system cannot effectively treat for selenate. What would be the consequence of directing high selenium water to HDS treatment performance and effluent discharge? If unacceptable effluent quality results, then additional treatment or storage of high selenium water must be provided to prevent an upset from occurring, or an alternate mitigation strategy must be provided. | In the event that flow exceeds the capacity of the selenium treatment plant, the selenium concentrations are anticipated to be low given the increased dilution. The selenium treatment plant is not required for approximately 30 years. In the interim Seabridge intends to keep working on the technology with BioteQ.<br><br>The need for, and design of, any potentially required bypass works will be discussed during permitting. | Reasonable treatment |
| 169. | 11.6.6.2 | ML/ARD | 26.14 | MEMNG | There is contrary information on the | The indicated capacity of 0.2$m^3$/s (Page 26-166) is an error. The initial planned | Reasonable |



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| | | Environmental Management Plan | | | capacity of the selenium treatment system. The application states (Page 26-166) that a capacity of 0.2m3/s is needed, yet the design basis memorandum states that ion exchange is planned for a capacity for only 0.06m3/s. | capacity is 0.06$m^3$/s for the drainage from the Kerr Waste Rock backfilled in the Sulphurets Pit. With the liner in place the leachate from the waste rock will have minimal dilution and higher selenium concentration. Additional treatment capacity may be required for the Kerr pit dewatering. The concentration will be significantly diluted with runoff resulting in lower selenium concentrations. The plant may be expanded to 0.2$m^3$/s by adding more ion exchange columns. | treatment |
| 170. | 11.6.6.2 | Project Description<br>Surface Water Quality | 4<br>14.7 | MEMNG | EMNG understands that ion exchange technologies can be very sensitive to parameters such as TSS and TDS. Will settling ponds of large storage tanks be required? Please provide design information for how this will be mitigated prior to the ion exchange treatment step. | During stage 2 of the laboratory investigation of selenium (VI) selenate removal, it was determined that iron negatively impacted the resin and reduced the selenium removal efficiency (Appendix 14-I page 13). As a result feed water will undergo an iron removal pre-treatment step before selenium is removed by ion exchange (Appendix 14-I, page 18). This step removes dissolved ferric iron in the form of solid ferric (III) oxyhydroxides. Other dissolved parameters can also be removed during this stage lowering the TDS. The iron removal tank is proposed to be 7.5m by 3m and the sludge collection tank 1.1 m OD (Appendix 14-I, page 19). The overflow water will then undergo multimedia filtration to remove fine particles before being treated using ion exchange columns. The feed stock solution for the testwork was Mitchell Creek water spiked with appropriate elements to match the predicted concentration in the WSF. The ionic strength of the feed water is likely significantly higher than the flow from the Kerr waste rock and the Kerr Pit. | Reasonable treatment |
| 171. | 11.6. | Project Description<br>Surface Water Quality | 4<br>14<br>Appendix 14-I | MEMNG | Space requirements can be very large for these proposed selenium treatment technologies. Where will the components be sited and is sufficient room available for all aspects of the selenium treatment (plant, ponds, reagents, waste etc.)? It is noted that the space currently allocated for selenium treatment is very small. | A detailed layout diagram of the proposed selenium treatment plant is provided in Appendix 14-I. The proposed layout of the selenium treatment plant is 19m by 15m (Appendix 14-I, page 19). | Reasonable treatment |
| 172. | 11.6. | Surface Water Quality | 4<br>14<br>Appendix 14-I<br>Appendix 14-K<br>33.12 | MEMNG | There are currently no ion exchange water treatment facilities operating at mines in BC. Please provide relevant analogues and performance data of ion exchange plants from other mines operating in similar conditions on a similar scale. Performance guarantees for this technology applicable to the KSM site should be provided. | The research testwork and results on selenium removal conducted at BioteQ and overseen by Rescan and funded by Seabridge has led Teck Corporation to fund a full scale pilot plant for the Elk River in Southeast British Columbia. More information can be provided on request. The selection of ion exchange to remove selenium was not done in isolation. A number of research evaluation reports were reviewed prior to embarking on the laboratory scale testwork. We agree that there are no full scale ion exchange selenium removal plants in operation in British Columbia. Fortunately, Teck is moving ahead with a significant pilot plant being developed and managed by BioteQ that will provide very important information. At KSM selenium treatment is not required for approximately 30 years or until Kerr deposit mining commences but Seabridge intends to keep working on the technology development with BioteQ and others. The focus of the research will be | Reasonable treatment |



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| | | | | | | the reduction to elemental selenium and recovery of the selenium for offsite disposal or recovery. | |
| 173. | 11.6. | Project Description<br>Surface Water Quality | 4<br>14 | MEMNG | There is insufficient design information provided on the biological reduction step. The laboratory test was conducted on a very small scale using an undisclosed biosolution. Some selenium reduction was achieved in the lab test, however a significant set up time was required. Biological systems are known for being very sensitive to changes in temperature, flow rate, nitrate, etc. How will these issues and risks be overcome and managed for KSM? What will be the energy requirements for selenium treatment, including water heating for the biological reduction step? | The biological reduction step takes time and by the time Seabridge submitted the Application/EIS for screening, the results of the reduction step were incomplete. The biological reduction step worked but as identified in your question it is the difficult step of the ion exchange treatment process. Since the submission of the EIS, BioteQ has demonstrated that the biological reduction step works. The pilot plant being developed for TECK does include the new proprietary step being developed by BioteQ for selenium reduction as well as biological reduction. The issue of temperature is somewhat a moot point because the flows are mainly in the spring and summer and the plant is in a heated building. The ion exchange concentration process is not sensitive to temperature. The biological reduction step treats a small concentrated volume which is a small portion of the original flow. It is recognized that the biological reduction process is heat sensitive. The requirement to heat the feed to the biological reduction process is included in the process operating costs. As indicated in the BioteQ report (Appendix 4-Z), nitrates are also removed by the resin and the selenium can be selectively stripped from the resin thus not impacting the efficiency of the bioreactor. The resin as demonstrated in the test work, preferentially removes selenium. | Reasonable treatment * |
| 174. | 11.6. | Project Description<br>Surface Water Quality | 4<br>14 | MEMNG | There are currently no biological reduction selenium water treatment facilities operating at mines in BC. Please provide relevant analogues and performance data of this technology from other mines operating in similar conditions on a similar scale. Performance guarantees for this technology applicable to the KSM site should be provided. | There are a number of mines in British Columbia with selenium issues. Seabridge is at the forefront with proposing to apply a treatment technology that works. The ion exchange technology is not new, but the full scale application for selenium treatment is new. The BioteQ results have stimulated interest at Teck Corp where they are going forward with a full scale BioteQ pilot plant at Elkford for their Elk River selenium issue. It is well known that there are no other mines using this technology at this time nor is there any alternate technology being used economically and successfully at other mines in Canada. Fortunately, at KSM Seabridge does not need the treatment technology for approximately 30 years. Seabridge plans to continue our work with BioteQ to perfect an economic and reliable selenium removal technology. | Reasonable treatment * |
| 175. | 11.6.6.2 | Project Description<br>Surface Water Quality | 4.5.1.11.5<br>14.7<br>Appendix 4-Z | MEMNG | What are the waste disposal plans for the reduced selenium and the selenium biosludge that will produced. Conceptual designs are required that will ensure physical containment and geochemical stability. | The plan as indicated in the report is to store the elemental selenium in appropriately sealed containers and remove off site once a year by truck to a waste handling facility or a hydrometallurgical facility to recover elemental selenium as a viable product. There is no intention to store the concentrated selenium on site over the long term. The amount of material generated is relatively small (approximately 4 tonnes per year). | Reasonable treatment |
| 176. | 11.6.6.2 | Surface Water Quality | 4<br>14 | MEMNG | The selenium treatment will generate large amounts of iron (ferric oxyhydroxides) solids that are proposed to be disposed of in the | The dissolved iron in the feed solution for the testwork was from the predicted concentration in the WSF. The high iron had to be removed because it impacted the resin and reduced the selenium loading efficiency. The iron is a key component in the operation of an HDS plant. Dissolution of iron into an acidic WSF will be | Reasonable treatment |



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| | | | | | WSF. What are the potential issues with this disposal strategy? Iron hydroxides can be difficult to settle and could potentially redissolve depending on the pH of the WSF (which has not been included in the water quality predictions). This will add very significant additional iron to the WSF that will need to be treated a second time. It could also cause problems with the operation of the HDS treatment system. Have the water quality predictions for the WSF included this significant iron input? Is there sufficient capacity/ability of the HDS plant to treat this change in water quality? What would be the anticipated increase in lime demand and lime costs for the HDS plant be from adding this iron to the WSF? What will be the potential effects to sludge production rates and sludge storage and handling requirements? It appears that the two treatment systems have been designed in isolation. The implications of the selenium water treatment plant on the HDS treatment system performance, sludge management and downstream water quality must be fully assessed. | beneficial to the HDS plant. The amount of iron coming from a 60L/s plant flow compared to up to HDS 7500L/s throughput flow is insignificant. Dissolved iron is an essential element in the production of a good sludge and the effective removal of elements such as selenite. The two processes were developed in isolation of each other but are linked in the treatment process. The selenium plant flow will have no measurable effect on the operation of the HDS plant other than to lower the concentration of selenate in the WSF. The effects of selenium removal were modelled in the GoldSim modelling starting in the year that Kerr Pit comes on line (Year 27). | |
| 177. | 11.6.6.2 | Surface Water Quality | 4<br>14 | MEMNG | What are the estimated capital and operating costs of all phases of selenium treatment? | The preliminary capital cost and operating cost for the selenium treatment is as follows:<br>Capital Costs: Estimate capital cost for small plant is $15 million<br>Operating Costs: Treatment cost is 5 cents per litre of treated feed water or $260,000 per day based on 60L/s. | Reasonable treatment |
| 178. | 11.6 | Surface Water Quality | 14 | BC MOE | The paper version of the chapter could use a Table of Contents to help reviewers navigate the chapter. | The Table of Contents is included in the electronic and paper copy of the Application/EIS. | Reasonable treatment |
| 179. | 11.6 | Surface Water Quality | 14<br>Appendix 14-A | BC MOE | Surface water sampling locations are shown on Figure 14-1 but a list of these along with the abbreviation on | Sample locations and site descriptions are included in Appendix 14-A. | Reasonable treatment |



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| | | | | | the map and a site description would be useful. | | |
| 180. | 11.6 | Surface Water Quality | 14 | BC MOE | Data summaries in Tables 14.1-1, 14.1-4 are of baseline data in various drainages. The AIR asked for an Overview, but the summaries do not permit an understanding of where in the drainages the water quality issues are. | Baseline summary data now includes explicit comparison to BC WQGs. Chapter 14 will be clarified to address the comment. | Reasonable treatment |
| 181. | 11.6.6.2 | Surface Water Quality | 14 | BC MOE | The tables do not highlight exceedances of water quality guidelines. BC guidelines are specified in columns on the left hand side of the tables, but values exceeding the guidelines in the table are not highlighted. | Tables 14.1-1 and 14.1-4 will be updated to show elements above the BC WQGs. | Reasonable treatment |
| 182. | 11.6.6.2 | Surface Water Quality | 14 | BC MOE | Average hardness values are shown in Tables 14.1-1 and 14.1-4, but related guidelines were not calculated with the hardness and highlighted if average values exceed the calculated guideline. | Average hardness values were used to calculate the respective guidelines. Tables 14.1-1 and 14.1-4 will be updated to include explicit comparison to the BC WQGs. | Reasonable treatment |
| 183. | 11.6.6.2 | Surface Water Quality | 14<br>Appendix 14-B<br>Appendix 14-C | BC MOE | Appendices 14-A, 14-B, 14-C show baseline water quality data but there are no highlighted values where measured quality exceeds guidelines. There is a discussion of guideline exceedances in the text but we want to be able to verify the discussion by looking at the data. We cannot commit the time to look at every number and determine for ourselves where variables exceed guidelines. | Appendices 14-B and 14-C will be updated to show baseline water quality data that is explicitly compared to BC WQGs. | Reasonable treatment |
| 184. | 11.6.6.2 | Surface Water Quality | 14 | BC MOE | We suggest that EAO request that the proponent re-submit the water quality data tables and appendices in a form that shows exceedances of BC acute and chronic guidelines, and CCME guidelines where BC has none. A colour code can be used to highlight exceedances and make distinctions | Water quality data tables will be updated to explicitly compare to approved and working BC WQGs. | Reasonable treatment |



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| | | | | | between guidelines authorities. | | |
| 185. | 11.6.6.2 | Surface Water Quantity Surface Water Quality | 13.7<br>14.7 | BC MOE | We ask that the sensitivity analysis be explained more clearly. Four water quality scenarios are presented (Page 14-42), but it is not clear which is the dry and wet year for expected and upper release of COPC. Should there not be predictions for dry year expected and upper, as well as wet year expected and upper? This would make 6 scenarios, not 4. (i.e. normal year expected, normal year upper, dry year expected, dry year upper, wet year expected, wet year upper). Since scenarios 1-4 are carried through for all WQ predictions, clarifying this now is key. | For the surface water quantity report, multiple scenarios were completed to investigate a wide range of future climate scenarios. Variability up to the 1:100 dry and 1:200 wet was also included. The comment that the data are not fully representative of the possible range of hydro-climatic conditions that the project will be subject to over the course of its substantial operational and closure periods is not completely accurate. Further discussions on this subject will be conducted during the Application/EIS review stage. | Reasonable treatment |
| 186. | 11.6.6.2 | Surface Water Quality | 14.7<br>Appendix 14-J | BC MOE | The AIR requested modeling and predictions of receiving environment water quality at stages of mine life. This has been provided in the application. Predictions are shown in tables and charts and as data tables in appendix 14-J. Plots of predicted water quality are provided, such as Figures 14.7-19 to 26. These plots do show the water quality guidelines, but these are not highlighted in the accompanying supporting tables. Modeling results in the tables do not highlight instances where results exceed guidelines. This makes the modeling results difficult to review. | Water quality data tables will be updated to explicitly compare to approved and working BC WQGs. | Reasonable treatment |
| 187. | 11.6.6.2 | Surface Water Quality | 14 | BC MOE | The plots appear to predict receiving environment water quality for the base case water balance, but the AIR asks for predictions for extreme dry and wet conditions in addition to expected and upper concentrations of COPC. These plots are missing except for the “variable case” in Treaty Ck. at station TRC2 (Figures | Variable case predictions are included in Appendix 14-J and summary tables in Chapter 14. The variable case plots were inadvertently included for station TRC2. Upper and expected case predictions are included on all figures presenting water quality predictions in Chapter 14. | Reasonable treatment |



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| | | | | | 14.7-39 to 42). The accompanying data tables would be more reviewable if guideline exceedances were highlighted. We ask that the EAO require the proponent to prepare a full set of figures for the extreme conditions and highlight exceedances on the accompanying tables of predicted water quality. | | |
| 188. | 11.6 | Surface Water Quality | 14<br>Appendix 14-A | BC MOE | Comments from Greg Tamblyn to a 2009 Water Quality Baseline report requested that certain explanations and correction be included in the application. These are:<br>• Section 4.1 - The report clearly explained how data < detection limit were dealt with for analyses. Action: Please explain the biases caused when using ½ the detection limit (Tamblyn, Application)<br>• Section 5.1.3 Fig 5.1-24 and 25 – Appendix 5.1-1 shows a number of occasions on which guidelines were exceeded for both dissolved and total cadmium at NTR2. This is not reflected in the graphs. Action: Ensure this is corrected for the Application (Tamblyn, Application).<br>• Fig. 5.1-27 – NTR2 exceeds guidelines for total copper on 3 occasions according to Appendix 5.1-1 - This is not reflected in the graph. Action: Update graph for Application (Tamblyn, Application).<br>• Section 5.4 - RPD are high for a number of analytes on specific days. Action: Provide plausible reasons for high | The reviewer's comments pertain to a 2009 baseline report. An updated cumulative baseline was included as Appendix 14-A which replaces the 2009 report previously reviewed. | Reasonable treatment |



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| | | | | | numbers of metals with RPDs > 20% for SC1 on Aug 4 (dissolved metals), UR2 on June 13 (dissolved metals), and TRC2 (total metals) Sept 13th (Tamblyn, Baseline).<br>• Appendix 5.1-1 - Results for total nitrogen could not be found in the raw data. Action: Confirm is this data is available (Tamblyn, Application).<br>• Appendix 5.1-4 - This table only shows 2 decimal places for each concentration. Action: Clarify if values have been rounded to 2 decimal places for calculations, or if using two decimal places was an issue related to compressing the table (Tamblyn, Baseline)<br>• Appendix 5.1-5 - Weak-acid dissociable cyanide (not "cyanide") is the form of cyanide with a provincial water quality guideline. Action: Make this change in the application (Tamblyn, Application).<br>• The lithium guideline is incorrect: It should be 0.870 max and 0.024-0.096 mg/L for average. Action: Please correct this in the application (Tamblyn, Application).<br>• Maximum guideline for Al with pH>6.5 = 0.1 mg/L Action: Please note this in the application (Tamblyn, Application).<br>• The proponent must show | | |



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| | | | | | where these comments were incorporated in the application. | | |
| 189. | 11.6 | Project Description<br>Groundwater Quality<br>Surface Water Quality | 4<br>Appendix 4-H<br>12.7<br>14.7<br>26.4<br>26.15<br>26.17<br>26-B<br>26-C | NLG | The water management proposed for the TMF side of the project is complicated and contradictory within different parts of the submission. Further diagrams showing the key water management of the pipeline discharge, the seepage ponds, the CIL and the diversions would be of assistance. This comment is provided largely with respect to understanding the water quality impacts of the project. For example the description provided in Appendix 4-H does not match the main EIS for the closure period. It is not clear if seepage pump back stops at closure. This appears to be contradictory in various documents. Please explain clearly the way seepage pump back is modelled in the water quality model and the concept for long-term water management. | As indicated in the Application/EIS, seepage will be pumped back at closure until such time as it is not required due to water quality improvements. The pump back is modelled in closure for a 250 year period.<br><br>Although the requirements of AIR have been met, Appendices 26-B (see **Attachment #6**) and 26-C (see **Attachment 7**) have been added to the Application/EIS to enhance the understanding of the mine development plan and includes staged development drawings that include key mine developments and water management features at 5-year intervals for the mine life. | Reasonable treatment |
| 190. | 9.3 | Project Description<br>Groundwater Quality<br>Surface Water Quality | 11<br>13<br>Appendix 11-E<br>Appendix 26-B | NLG | Please provide a clear, consistent version of the water management plan through the project phases. For the water management mitigations proposed for the purposes of meeting water quality objectives, please provide a reasonable range in the loadings expected. In addition, please evaluate the implications for the success of the proposed mitigation measure in the worst case expected ranges. For example, the assumption that the CIL liner will be installed perfectly, resulting in no holes and 10-9 m/s hydraulic conductivity is overly optimistic. Perhaps with a worst case liner assumption, the impacts to the receiving environment | Although the requirements of AIR have been met, Appendices 26-B (see **Attachment #6**) and 26-C (see **Attachment 7**) have been added to the Application/EIS to enhance the understanding of the mine development plan and includes staged development drawings that include key mine developments and water management features at 5-year intervals for the mine life.<br>The permeability of the geomembrane liner was modelled 1e-9 m/s based on engineering design. Seabridge engineers are confident with the dam and tailing design based on their experience with other similar projects. Sensitivity analyses were carried out for the geological materials surrounding the TMF cells to investigate the upper estimates. The range of seepage rates were predicted in the groundwater modelling (results are available in Appendix 11-E).<br><br>Sensitivity was run for the liner permeability in the previous version of the groundwater model, and the liner permeability has an insignificant effect on the seepage through the TMF dam foundations, in comparison with the geological materials in the foundations. Seepage through the dams was predicted by the KCBL engineers. | Reasonable treatment |



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| | | | | | would be serious or perhaps not. Other examples may include the range of TSF seepage expected for the range in hydraulic conductivity measured in the field studies. A 200 m high cyclone sand dam may involve seepage rates higher than expected. Please also compare KSM seepage rates to sites such as Highland Valley, Gibralter, or other existing tailings dams of a similar nature as proposed at KSM.<br><br>Another example, Section 4.5.3.10.4 Water Management provides confusing figures and not enough detail on flood management in the event the water quality from the tailings pond is not acceptable for discharge during storm events. | The Highland Valley Copper (HVC) mine tailing storage facility differs from the KSM Project TMF as follows:<br><br>• HVC is located in a wide valley with lower topographic relief compared to the KSM tailing storage facility which is located in narrow U-shape glacial valleys with higher topographic relief. The hydraulic containment may also differ with KSM having a stronger hydraulic containment.<br><br>• HVC and the KSM project have different geology under the dams. | |
| 191. | 11.6.6.2 | Surface Water Quality | 12.7<br>14.7 | NLG | A prediction of water quality (seasonal) should be provided in the seepage ponds and the streams between the main dam and the seepage pond dams. | The AIR requirements have been met. The quality of the water in the seepage pond will vary throughout the seasons. During the summer when active cycloning and construction of the dam is ongoing, 50% of the water collecting in the seepage pond will be tailing supernatant. The remainder will be primarily from runoff into the reach between the toe of the main dam and the seepage recovery dam. The actual groundwater seepage will contribute less than 5%. During the winter, when there is no active construction, there will be no tailings supernatant, no runoff and primarily groundwater discharge into the seepage collection area. This information will be provided during the Application/EIS review. | Reasonable treatment |
| 192. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | The surface water quality data that have been collected to date in the vicinity of the proposed project are insufficient to characterize baseline conditions in receiving water systems. | Forty-nine stream and river baseline sites have been monitored over 5 years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. Baseline data is continuing to be collected. The baseline water quality program exceeds the standards outlined in the 2012 “Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators”. The baseline monitoring program has been fully vetted by MOE and presented at multiple working group meetings. | Reasonable treatment |
| 193. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | Insufficient data have been collected to support a robust evaluation of temporal variability at most stations; | Forty-nine stream and river baseline sites have been monitored over 5 years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. Baseline data is continuing to be collected. The baseline water quality program exceeds the standards outlined in the 2012 “Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators”. The baseline monitoring program has been fully vetted by MOE and presented at multiple | Reasonable treatment |



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| | | | | | | working group meetings. | |
| 194. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | Insufficient data have been collected to support comparisons of the measured concentrations of chemicals of potential concern (COPCs) to long-term water quality guidelines; | Forty-nine stream and river baseline sites have been monitored over 5 years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. Baseline data is continuing to be collected. The baseline water quality program exceeds the standards outlined in the 2012 "Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators". The baseline monitoring program has been fully vetted by MOE and presented at multiple working group meetings. | Reasonable treatment |
| 195. | 11.7 | Fish and Aquatic Habitat | 15.7<br>26.18 | NLG | The locations of certain sampling stations do not correspond to the locations of sampling stations that will be required to be included in the long-term monitoring program to evaluate project-related effects (i.e., Aquatic Effects Monitoring Program; AEMP); | Locations of sampling sites for long-term monitoring as part of the AEMP will be determined during the permitting stage. Discharge locations will be informed by current baseline data. | Reasonable treatment |
| 196. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | Certain groups of substances that could be released from the proposed facility in the future were not adequately measured in the baseline monitoring program for surface water; | It is unclear as to which groups of substances the reviewer is referring to. Monitored water quality parameters are presented in Chapter 14 and were established with the working group in 2008 and 2009. | Reasonable treatment |
| 197. | 11.6.6.2 | Surface Water Quality<br>Fish and Aquatic Habitat | 14.7<br>15.7 | NLG | Some of the baseline surface water toxicity data are of uncertain reliability and/or an inappropriate reference area was selected; | Surface water toxicity testing was conducted by Nautilus Environmental, following established Environment Canada standard methodologies (see Nautilus reports in Appendix 14-D). The reference area selected for baseline water toxicity testing was included as a reference site in the water quality baseline program. The water quality baseline program was vetted by MOE and presented at KSM Project Working Group meetings; any deficiencies in reference area selection likely would have been identified by the MOE and/or the Working Group. | Reasonable treatment |
| 198. | 11.7 | Fish and Aquatic Habitat | 15.7<br>26.18 | NLG | No sediment chemistry data have been collected in Bell-Irving River. In addition, simultaneously extracted metals and acid volatile sulfides, key indicators of metal bioavailability, were not collected at any location in the vicinity of the proposed mine site; | The Bell-Irving River was not sampled for sediment quality. It was considered to be sufficiently far downstream with limited potential for Project-related impacts. Multiple sites upstream on Snowbank (SNO1 and SNO2), Teigen (TEC1, TEC2), South Teigen (STE1, STE2), North Treaty (NTR1, NTR2), and Treaty (TRC1, TRC2, TRC3) creeks, which are tributaries of the Bell-Irving were monitored. The baseline data collection program was also vetted by the MOE and was designed following the guidance provided in the "Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators (2012)".<br>Sediments (3 to 5 replicates per site) were collected at a total of 28 sampling sites in 2009/2010 and 27 sampling sites in 2012 in multiple watersheds in the vicinity of the proposed mine site (and TMF). Metal analysis of sediment samples was conducted by ALS Environmental Laboratories using the CSR Analytical Method "Strong Acid Leachable Metals In Soil". According to information provided by ALS, | Reasonable treatment |



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| | | | | | | this method "is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment." It is possible that, if anything, the concentration of bioavailable metals in the sediment have been over-estimated using this method, resulting in over-estimation of the potential for toxicity to aquatic organisms. | |
| 199. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | It is not clear that water quality predictions have been developed in a manner that supports direct comparison to the federal or provincial WQGs. That is, water quality predictions should include estimates for stations located at the edge of the initial dilution zone for all discharges from the proposed mine site. | Maximum and monthly mean concentrations for water quality predictions were presented in Appendix 14-J. Determination of the IDZ will occur in the Environmental Management Act permitting process. | Reasonable treatment |
| 200. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | As indicated above, there are a number of concerns relative to the characterization of baseline conditions in the vicinity of the mine site. As predictions of future water quality conditions are dependent on the baseline water quality data, there is uncertainty in the predictions that were developed. | Forty-nine stream and river baseline sites have been monitored over 5 years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. Baseline data is continuing to be collected. The baseline water quality program exceeds the standards outlined in the 2012 "Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators". The baseline monitoring program has been fully vetted by MOE and presented at multiple working group meetings. | Reasonable treatment |
| 201. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | Expectations for Baseline Water Quality Data: Our expectation is that surface water chemistry data would be collected on, at least, a monthly basis for a period of three years to document temporal variability in baseline conditions at each sampling station. Such data also need to be evaluated relative to numerical WQGs. In addition, our expectation is that five samples in 30-d would be collected at least twice each year (i.e., during the high flow period and during the low flow period) during three years of baseline monitoring, with the results compared to long-term WQGs. Such data need to be | Seabridge looks forward to working with NLG on water quality issues through the EA review and permitting phases. | Reasonable treatment |



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| | | | | | collected upstream and downstream (i.e., up to 100 m downstream) of all discharges from the mine with the potential to influence water quality conditions. All of the substances that could be released into receiving waters due to mining related activities need to be measured in water samples, along with the variables that are required to interpret the resultant data (e.g., pH, water hardness, temperature, etc.). A conceptual site model is typically developed to support decisions relative to the selection of monitoring locations and chemical analytes. The detection limits achieved for each substance need to be sufficient to facilitate comparison to federal and provincial WQGs. It is recommended that detection limits be 5x below the corresponding WQGs. | | |
| 202. | 11.6.6.2 | Surface Water Quality | 14.7<br>Appendix 14-B | NLG | The data presented in Appendix 4-1 indicate that baseline surface water chemistry data were collected at two locations on the Bell-Irving River (BIR1 and BIR2). A total of 29 surface water samples were collected between October, 2008 and November, 2011 at these locations. Three additional samples were collected in 2012 and the results for those samples are reported in Appendix 14-B.<br>The baseline surface water quality data collected for the Bell-Irving River are inadequate for defining baseline conditions in the river for several reasons. First, these data do not provide a basis for evaluating within-year and between-year variability in water quality conditions at the sampling stations because sampling | Forty-nine stream and river baseline sites have been monitored over 5 years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. Baseline data is continuing to be collected. The baseline water quality program exceeds the standards outlined in the 2012 “Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators”. The baseline monitoring program has been fully vetted by MOE and presented at multiple working group meetings.<br>The Bell-Irving River sites have limited potential for Project-related effects which was confirmed through predictive water quality modeling. | Reasonable treatment |



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| | | | | | frequency was inadequate. In addition, the data were not collected in a manner that facilitated their evaluation relative to provincial WQGs (i.e., long-term WQGs, which require collection of five samples within a 30-d period). Furthermore, the detection limits achieved for mercury were not sufficiently low to evaluate compliance with numerical WQGs. Therefore, additional water quality sampling is required to establish baseline conditions in the Bell-Irving drainage. | | |
| 203. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | The data presented in Appendix 4-1 indicate that baseline surface water chemistry data were collected at 12 locations within the Teigen Creek watershed (SNO1, SNO2, STE1, STE1A, STE2, STE3, TEC1, TEC1B, TEC2, UNK1, UNK2, and HLO). A total of 210 surface water samples were collected between October, 2008 and 2012 (The data collected in 2012 are reported in Appendix 14-B).<br>The baseline surface water quality data collected for the Teigen/ Snowbank watershed are generally inadequate for defining baseline conditions in the drainage basin for several reasons. First, the data for SNO1, SNO2, STE1, STE1A, STE3, TEC1B, UNK1, UNK2, and HLO do not provide a basis for evaluating within-year and between-year variability in water quality conditions because sampling frequency was inadequate. In addition, the data were not collected in a manner that facilitated their evaluation relative to provincial WQGs (i.e., long-term WQGs, which require collection of five samples within a 30-d period). | Forty-nine stream and river baseline sites have been monitored over 5 years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. Baseline data is continuing to be collected. The baseline water quality program exceeds the standards outlined in the 2012 “Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators”. The baseline monitoring program has been fully vetted by MOE and presented at multiple working group meetings. | Reasonable treatment |



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| | | | | | The data collected at STE2, TEC1 and TEC2 were more robust (i.e., included more frequent sampling and included one or more 5-in-30 d sampling events), but still did not provide all of the information required to establish baseline conditions. Furthermore, the detection limits achieved for mercury were not sufficiently low to evaluate compliance with numerical WQGs. Therefore, additional water quality sampling is required to establish baseline conditions in the Teigen/ Snowbank drainage. | | |
| 204. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | The data presented in Appendix 4-1 indicate that baseline surface water chemistry data were collected at eight locations within the Treaty Creek watershed (NTR1, NTR1A, NTR2, TRC0, TRC1, TRC1B, TRC2, TRC3). A total of 167 surface water samples were collected between 2008 and 2012 (The data collected in 2012 are reported in Appendix 14-B).<br>The baseline surface water quality data collected for the Treaty Creek watershed are generally inadequate for defining baseline conditions in the drainage basin for several reasons. First, the data for NTR1, NTR1A, TRC0, TRC1, and TRC1B do not provide a basis for evaluating within-year and between-year variability in water quality conditions because sampling frequency was inadequate. In addition, the data were not collected in a manner that facilitated their evaluation relative to provincial WQGs (i.e., long-term WQGs, which require collection of five samples within a 30-d period). The data collected at NTR2, TRC2 and TRC3 | Forty-nine stream and river baseline sites have been monitored over 5 years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. Baseline data is continuing to be collected. The baseline water quality program exceeds the standards outlined in the 2012 “Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators”. The baseline monitoring program has been fully vetted by MOE and presented at multiple working group meetings. | Reasonable treatment |



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| | | | | | were more robust (i.e., included more frequent sampling and included one or more 5-in-30 d sampling events), but still did not provide all of the information required to establish baseline conditions. Furthermore, the detection limits achieved for mercury were not sufficiently low to evaluate compliance with numerical WQGs. Therefore, additional water quality sampling is required to establish baseline conditions in the Treaty Creek drainage.<br>Station TRC2 represents a key monitoring location relative to discharges from the tailings management facility (TMF). However, it appears that this sampling station is located more than 100 m downstream of the proposed discharge from the TMF. As one or more tributaries may enter Treaty Creek between the proposed effluent discharge and the baseline monitoring station, future monitoring must be conducted at a station located within 100 m of the discharge (i.e., to support monitoring for compliance with WQGs). | | |
| 205. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | For each sampling station in the study area, baseline monitoring data for surface waters were compiled for conventional variables, major ions, nutrients, cyanides, and metals (total and dissolved). However, discharges from the mine site could also result in releases of hydrocarbons to receiving waters. Therefore, various indicators of contamination by petroleum hydrocarbons (e.g., benzene, toluene, ethylbenzene, and toluene - BTEX; diesel-range organics - DROs) should have been included in the list of analytes to establish baseline | Forty-nine stream and river baseline sites have been monitored over 5 years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. Baseline data is continuing to be collected. The baseline water quality program exceeds the standards outlined in the 2012 "Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators". The baseline monitoring program has been fully vetted by MOE and presented at multiple working group meetings.<br>Petroleum hydrocarbons were monitored in Teigen and Sulphurets creeks in 2008 and were not detected. Additional monitoring will occur in 2013 at all water quality sampling stations and particularly in Treaty Creek. | Reasonable treatment |



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| | | | | | conditions relative to these substances. Although certain indicators of petroleum hydrocarbons were measured at one location (TEC2), such data are not sufficient to establish baseline conditions. | | |
| 206. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | Within the PTMA, water quality effects were evaluated at Treaty Creek (TRC2), North Treaty Creek (NTR2), South Teigen Creek (STE3), and Teigen Creek (TEC2). While it is instructive to present predictions of future water quality for these sites, quantitative predictions of water quality conditions are required for stations located 100 m of all discharges (i.e., at the edge of the initial dilution zone) to support an evaluation of the potential exceedances of federal and provincial WQGs. It is not clear from the information presented that the four stations evaluated provide information on predicted water quality conditions at the edge of the initial dilution zones for all discharges from the proposed mine site (i.e., prior to mixing with water from other sources). Therefore, a map (or series of maps) needs to be added to the Application that identifies the location of all discharges to receiving waters and the location of all water quality monitoring/ modelling stations. Such a map will provide a basis for evaluating the adequacy of the stations that were selected for water quality sampling and water quality modelling. | Forty-nine stream and river baseline sites have been monitored over 5 years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. Baseline data is continuing to be collected. The baseline water quality program exceeds the standards outlined in the 2012 “Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators”. The baseline monitoring program has been fully vetted by MOE and presented at multiple working group meetings.<br>Discharge locations will be determined during the permitting stage. | Reasonable treatment |
| 207. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | This section of the Application indicates that the baseline water quality data were sufficient to support water quality modelling at a monthly scale during all phases of mine | Forty-nine stream and river baseline sites have been monitored over 5 years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. Baseline data is continuing to be collected. The baseline water quality program exceeds the standards outlined in the 2012 “Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators”. The baseline | Reasonable treatment |



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| | | | | | development (Rescan 2013). However, the deficiencies in the baseline data identified above results in substantial uncertainty in the predictions of future water quality conditions. In addition, failure to define the full temporal extent of the water quality assessment represents an important deficiency. At minimum, the water quality assessment should continue through Year 100. If water quality predictions show that water quality could be degraded beyond Year 100, then the temporal extent of the assessment needs to be extended accordingly. | monitoring program has been fully vetted by MOE and presented at multiple working group meetings.<br>As outlined in Chapter 14, source terms do not change after year 65 and therefore static conditions are modeled. Continued modelling after year 100 does not provide any additional information. | |
| 208. | 11.6.6.2 | Surface Water Quality<br>Fish and Aquatic Habitat | 14.7<br>15.7 | NLG | The information contained therein indicates that surface water is a key indicator of environmental health because it is linked to other ecosystem components, including fish and fish habitat, aquatic resources (sediment quality, benthos, and periphyton), soil, vegetation, wildlife, and human health. While water quality is a key valued component, several other ecosystem components need to be explicitly evaluated in the environmental assessment because they are inextricably linked to water quality conditions, including:<br>• Sediment Chemistry;<br>• Sediment Toxicity;<br>• Invertebrate Tissue Chemistry; and,<br>• Fish Tissue Chemistry.<br>While it is understood that sediment quality is addressed to a certain extent in the aquatic habitat section of the Application (i.e., Section 15), it is important to evaluate sediment quality directly because it can influence the | VCs for the KSM Project were defined in the AIR (January 2011), which was subject to review and incorporation of comments from various government agencies, Nisga'a, First Nations and the public prior to their approval in 2011. Sediment chemistry, sediment toxicity, invertebrate tissue chemistry, and fish tissue chemistry were not identified as valued components (VCs) in the AIR. Therefore, these items were not required to be explicitly or individually assessed as valued components in the Application/EIS.<br>Sediment chemistry was described in Chapter 15 under both baseline (Sections 15.1.5.2.1 and 15.1.5.3.3) and predicted conditions (Appendix 15-L and Section 15.7.4.3.1). Sediment toxicity was not explicitly addressed, although metals that were greater than sediment quality guidelines were highlighted in the introductory sections (15.1.5.2.1 and 15.1.5.3.3). Those metals have the potential to cause toxicity to exposed organisms.<br>The potential for metal bioaccumulation in aquatic organisms, particularly fish, was discussed throughout Chapter 15. The potential for selenium (and other contaminant) bioaccumulation and subsequent toxic effects was discussed in the effects assessment portion of Chapter 15 (see Sections 15.7.4.3, 15.8.2.4 and 15.8.3.2). | Reasonable treatment |



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| | | | | | productivity of aquatic ecosystems. It is also important to include an assessment of the potential for bioaccumulation of contaminants in the tissues of aquatic organisms because a number of bioaccumulative substances are likely to be released into receiving waters in association with mine-related activities (e.g., arsenic, cadmium, mercury, selenium). | | |
| 209. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | Tabulated predictions of future water quality conditions at the selected modeling stations were not explicitly compared to federal and provincial WQGs (i.e., the WQGs were not included in the tables, making it difficult to identify exceedances of the WQGs);<br>Neither the graphical or tabulated presentations of the water quality predictions included physical variables (e.g., pH, water hardness) or process chemicals (with the exception of WAD cyanide);<br>The tabulated presentations of the water quality predictions did not include dissolved metals (making it difficult to compare the tabulated and graphic results for aluminum to understand the predicted levels of the more bioavailable forms of the metals or to compare predictions to WQGs);<br>Baseline water quality conditions appear to be incorrectly presented on several of the graphs (i.e., predicted concentrations appear to be lower than baseline in certain cases); | Forty-nine stream and river baseline sites have been monitored over 5 years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. Baseline data is continuing to be collected. The baseline water quality program exceeds the standards outlined in the 2012 "Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators". The baseline monitoring program has been fully vetted by MOE and presented at multiple working group meetings.<br>Water hardness will be outlined in the technical appendix; pH and process chemicals other than cyanide were not predicted. Non-acidic conditions are expected for discharge from the flotation tailings cells given the NPAG classification of flotation tailing humidity cells and the alkaline process water. A discussion of process chemicals is presented in Chapter 14, Section 14.7.2.2.4. Organic process chemicals in the CIL tailings will be oxidized by the peroxide oxidation step. | Reasonable treatment |
| 210. | 11.6.6.2 | Surface Water Quality<br>Fish and Aquatic Habitat | 14.7<br>15.7 | NLG | Predictions of future surface water toxicity were not located in this section of the Application; | Predictions of the potential for toxicity to aquatic organisms based on water quality modeling results can be found in Chapter 15 (Sections 15.7.4). | Reasonable treatment |



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| 211. | 11.7 | Fish and Aquatic Habitat | 15.7 | NLG | Predictions of future sediment quality conditions or tissue-residue chemistry were not located in this section of the Application; | Predictions of future sediment quality based on water quality modeling and hydrology can be found in Chapter 15 (Appendix L and Section 15.7.4.3.1). Discussion of the potential for metal bioaccumulation and toxicity in fish and other aquatic organisms based on water quality modeling can be found is Chapter 15 (Section 15.7.4.3.1, 15.8.2.4.1, and 15.8.3.2.1). | Reasonable treatment |
| 212. | 11.6.6.2 | Surface Water Quality | 14.7 | | No request for site-specific water quality objectives was located in this section of the Application; therefore, it appears that no such WQOs are required; | Site-specific water quality objectives will be discussed during the permitting stage at the discretion of the BC MOE. | Reasonable treatment |
| 213. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | The evaluation of water quality conditions did not include an evaluation of the effects of mixtures of metals on aquatic organisms. This is a deficiency because metals are known to exhibit additive or greater toxicity to aquatic organisms (USEPA 2005). | The effect of metal/contaminant mixtures on aquatic organism toxicity was not specifically assessed in the Application/EIS. In Chapter 15 (Section 15.7.4.1.1), it is acknowledged that "the toxicology of mixtures of metals and other chemicals in the aquatic environment is poorly understood, although it is known that antagonistic, additive, synergistic, or potentiating effects are possible outcomes". Detailed evaluation of mixture toxicity was not required in the AIR (January 2011). | Reasonable treatment |
| 214. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | The evaluation of water quality conditions did not include an evaluation of the effects of contaminants, together with other potential stressors associated with mining-related activities at the site and/or climate change. | The effect of multiple stressors (e.g., climate change, other mining-related activities) on chemical toxicity is a complex and rapidly developing field in toxicology. There are no standard methodologies to assess the effect of multiple stressors in a quantitative manner. Evaluation of multiple stressor effects on chemical toxicity was not required in the AIR (January 2011). | Reasonable treatment |
| 215. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | Based on the foregoing review of the Application Information Requirements (EAO 2011) and the Application that was submitted by the Proponent (Rescan 2013), there appear to be a number of deficiencies in the Application, including:<br>• Insufficient data have been collected to support a robust evaluation of temporal variability in surface water quality conditions at most stations; | Forty-nine stream and river baseline sites have been monitored over 5 years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. Baseline data is continuing to be collected. The baseline water quality program exceeds the standards outlined in the 2012 "Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators". The baseline monitoring program has been fully vetted by MOE and presented at multiple working group meetings. | Reasonable treatment |
| 216. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | • Insufficient data have been collected to support comparisons of the measured concentrations of chemicals of potential concern | Forty-nine stream and river baseline sites have been monitored over 5 years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. Baseline data is continuing to be collected. The baseline water quality program exceeds the standards outlined in the 2012 "Water and Air Baseline | Reasonable treatment |



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| | | | | | (COPCs) in surface water to long-term water quality guidelines; | Monitoring Guidance Document for Mine Proponents and Operators". The baseline monitoring program has been fully vetted by MOE and presented at multiple working group meetings. | |
| 217. | 11.6.6.2 | Surface Water Quality<br>Fish and Aquatic Habitat | 14.7<br>15.7 | NLG | The locations of certain surface water sampling stations do not correspond to the requirements for long-term monitoring to evaluate project-related effects (e.g., Aquatic Effects Monitoring Program; which requires sampling at the edge of the initial dilution zone); | Forty-nine stream and river baseline sites have been monitored over 5 years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. Baseline data is continuing to be collected. The baseline water quality program exceeds the standards outlined in the 2012 "Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators". The baseline monitoring program has been fully vetted by MOE and presented at multiple working group meetings. | Reasonable treatment |
| 218. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | Certain groups of substances that could be released from the proposed facility in the future were not adequately measured in the baseline monitoring program for surface water (e.g., petroleum hydrocarbons); | Forty-nine stream and river baseline sites have been monitored over five years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. Baseline data is continuing to be collected. The baseline water quality program exceeds the standards outlined in the 2012 "Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators". The baseline monitoring program has been fully vetted by MOE and presented at multiple working group meetings. Petroleum hydrocarbons were measured in 2008 in Teigen Creek and Sulphurets Creek and were found to be below the method detection limit. Additional monitoring will occur in 2013. | Reasonable treatment |
| 219. | 11.6.7 | Surface Water Quantity and Quality | 13<br>14<br>26 | Tahltan Nation | The effectiveness and limitations of identified mitigation measures and environmental management strategies will be discussed.<br>• (26) Not identified in this section.<br>This section of the Application will also describe the Proponent's commitments, including those related to implementation of best practices.<br>(26) No commitments identified in these sections. | Sections 26.17.4 and 26.18.2 describe the best practices to be used at the mine site.<br><br>Prior to construction, additional plans will be developed for water management and AEMP. | Reasonable treatment |
| 220. | 11.7 | Fish and Aquatic Habitat | 15.7 | NLG | No sediment toxicity data have been collected in the vicinity of the proposed mine site | Sediment toxicity testing was not conducted as part of baseline studies. Sediment toxicity testing is not recommended by the "Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators (2012)" as part of sediment quality/aquatic resources baseline programs for proposed new mines. There was no requirement for sediment toxicity testing in the AIR (January 2011), nor is this type of toxicity testing required under the MMER for monitoring of effluents from existing mines. | Reasonable treatment |
| 221. | 11.7 | Fish and Aquatic | 15.7 | NLG | No invertebrate tissue-chemistry data | Invertebrate tissue chemistry data will be collected during the field season in 2013 | Reasonable |



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| | | Habitat | | | have been collected in the vicinity of the proposed mine site; and, | and will be required in the future as part of the AEMP (Chapter 26.18.2). Note that the AIR (January 2011) did not require the collection of this data during baseline studies. | treatment |
| 222. | 11.7 | Fish and Aquatic Habitat | 15.7 | NLG | The available fish tissue-chemistry data that have been collected in the vicinity of the proposed mine site may not be sufficient to document baseline conditions. | Fish tissue chemistry data was collected at 5 sites over 3 years (see Table 15.7-4). There are few Dolly Varden in Sulphurets Creek; therefore, the catch-per-unit-effort (CPUE) for tissue metals sampling was low. The relative abundance of Dolly Varden in Sulphurets Creek was 0.01 fish/100 seconds of electrofishing effort compared to the Unuk River (2.06 fish/100 s) and the South Unuk River (2.09 fish/100 s). The AEMP in Chapter 26, Section 26.9.2 of the Application/EIS proposes sampling Dolly Varden in the Unuk River pursuant to sample sizes allowed by fish collection permit. | Reasonable treatment |
| 223. | 11.6.6.2 | Surface Water Quality<br>Fish and Aquatic Habitat | 14.7<br>15.7 | NLG | Not all of the valued components of the ecosystem have been included in the water quality assessment. Some of the key valued components that need to be explicitly considered in predictions of future conditions include surface-water toxicity, whole-sediment chemistry, whole-sediment toxicity, invertebrate-tissue chemistry, and fish-tissue chemistry. | VCs for the KSM Project were defined in the AIR (January 2011), which was subject to review and incorporation of comments from various government agencies, Nisga'a, and First Nations prior to their approval in 2011. Surface water toxicity, whole sediment chemistry, whole sediment toxicity, invertebrate tissue chemistry, and fish tissue chemistry were not identified as VCs in the AIR. Therefore, these items have not been explicitly or individually assessed as valued components in the Application/EIS. | Reasonable treatment |
| 224. | 11.6.6.2 | Surface Water Quality | 14.7 | NLG | Surface water toxicity data were collected at several locations to evaluate baseline conditions in the study area, including South Teigen Creek (STE2), North Treaty Creek (NTR2), Teigen Creek (TEC2), Treaty Creek (TRC2), and the selected reference area (Scott Creek; SCR). These results indicate that surface water from STE2, NTR2, and SCR were toxic to the cladoceran, *Ceriodaphnia dubia*, the alga, *Pseudokircheneriella subcapitata*, and/or the macrophyte, *Lemna minor*, in July, but not in November. While this is one possibility, observations of toxicity in cladocerans and plants exposed to water from the reference site indicate that the toxicity tests conducted in July might have lower reliability or the reference station is | Surface water toxicity testing was conducted by Nautilus Environmental, following established Environment Canada standard methodologies (see Nautilus reports in Appendix 14-D). The reference site selected for baseline water toxicity testing was also one of the reference sites in the water quality baseline program. The water quality baseline program was vetted by MOE and presented at KSM Project Working Group meetings; any deficiencies in reference site selection likely would have been identified by the MOE and/or the working group. A reference site for field studies is intended to be as representative as possible to the sites of interest (i.e., representative of those sites close to potentially impacted areas), meaning that it may have similar catchment areas or geological settings. A reference site does not necessarily have water or sediment quality that meets all guidelines, and water collected from reference sites may exert toxicity to exposed organisms.<br>All of the toxicity tests conducted by Nautilus Environmental included the use of both negative and positive control groups, as specified in the Environment Canada methodologies. For example, in all water samples tested in both July and November 2009 with the cladoceran, Ceriodaphnia dubia, the negative control group had 100% survival and the greatest amount of reproduction, indicating that the organisms were healthy and that the test was valid. The results of the tests are therefore interpreted to mean that the natural (baseline) surface water from some of the sites (SC2, NTR2, and SCR) collected in July was naturally toxic to cladoceran species since reproductive ability was impaired. Similarly, acceptable performance | Reasonable treatment |



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| | | | | | inappropriate. As characterizing surface water toxicity under baseline conditions is important, certain toxicity tests need to be repeated to confirm that exposure to surface water from the study area can result in toxicity to aquatic organisms. Accordingly, the baseline data for surface water toxicity are not adequate. | of the negative control group in the algal and plant toxicity tests in both July and November 2009 indicate that these organisms were also healthy and that any toxicity measured during the tests should be attributed to the water quality of the field-collected water samples. | |
| 225. | 11.7 | Fish and Aquatic Habitat | 15.7 | NLG | A variety of substances could be released to surface waters as a result of mining related activities. While many of these substances are likely to partition primarily into water, others can become associated with particulate matter and subsequently be deposited in streambed or lake-bed sediments. Yet, no sediment chemistry data have been collected in Bell-Irving River. In addition, simultaneously extracted metals and acid volatile sulfides, key indicator of metal bioavailability, were not collected at any location in the vicinity of the proposed mine site. Furthermore, no sediment toxicity data have been collected in the vicinity of the proposed mine site. This represents a major deficiency of the baseline data. | The Bell-Irving River was not sampled for sediment quality. It was considered to be sufficiently far downstream with limited potential for Project-related impacts. Multiple sites upstream on Snowbank (SNO1 and SNO2), Teigen (TEC1, TEC2), South Teigen (STE1, STE2), North Treaty (NTR1, NTR2), and Treaty (TRC1, TRC2, TRC3) creeks, which are tributaries of the Bell-Irving were monitored. The baseline data collection program was also vetted by the MOE and was designed following the guidance provided in the "Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators (2012)".<br>Sediments (3 to 5 replicates per site) were collected at a total of 28 sampling sites in 2009/2010 and 27 sampling sites in 2012 in multiple watersheds in the vicinity of the proposed mine site (and TMF). Metal analysis of sediment samples was conducted by ALS Environmental Laboratories using the CSR Analytical Method "Strong Acid Leachable Metals In Soil". According to information provided by ALS, this method "is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment." It is possible that, if anything, the concentration of bioavailable metals in the sediment have been over-estimated using this method, resulting in over-estimation of the potential for toxicity to aquatic organisms.<br>Sediment toxicity testing was not conducted as part of baseline studies. Sediment toxicity testing is not recommended by the "Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators (2012)" as part of sediment quality/aquatic resources baseline programs for proposed new mines. There was no requirement for sediment toxicity testing in the AIR, nor is this type of toxicity testing required under the MMER for monitoring of effluents from existing mines.<br>Notwithstanding the above information, Seabridge has agreed to collect sediment samples at two locations in the Bell-Irving. One sampling site will be located above the confluence of Treaty Creek and one sampling site downstream of the Treaty Creek confluence. | Reasonable treatment |
| 226. | 11.7 | Fish and Aquatic Habitat | 15.7 | NLG | Some of the substances that may be released to receiving waters during the construction, operation, or closure | Invertebrate tissue chemistry data will be collected during the field season in 2013 and will be required in the future as part of the AEMP (Chapter 26.18.2). Note that the AIR (January 2011) did not require the collection of this data during baseline | Reasonable treatment |



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| | | | | | of the proposed KSM mine have the potential to accumulate in the tissues of aquatic organisms (e.g., arsenic, cadmium, mercury, and selenium). However no baseline invertebrate-tissue chemistry data were presented in the Application, and the available fish-tissue chemistry data may not be sufficient to document baseline conditions at all locations. This represents a major deficiency of the baseline data. | studies.<br>Fish tissue chemistry data was collected at 5 sites over 3 years (see Table 15.7-4). There are few Dolly Varden in Sulphurets Creek; therefore the catch-per-unit-effort (CPUE) for tissue metals sampling was low. The relative abundance of Dolly Varden in Sulphurets Creek was 0.01 fish/100 seconds of electrofishing effort compared to the Unuk River (2.06 fish/100 s) and the South Unuk River (2.09 fish/100 s). The AEMP in Chapter 26, Section 26.9.2 of the Application/EIS proposes sampling Dolly Varden in the Unuk River pursuant to based on sample sizes allowed by fish collection permit. | |
| 227. | 11.7 | Fish and Aquatic Habitat | 15.7 | NLG | As a result of the foregoing deficiencies, the surface water quality data, surface water toxicity data, sediment quality data, and tissue residue data that have been collected to date (and included in the Application) are not sufficient to characterize baseline conditions in the vicinity of the proposed KSM mine site. | This appears to be a summary statement. See responses for individual issues.<br>Forty-nine stream and river baseline sites have been monitored over 5 years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. Baseline data is continuing to be collected. The baseline water quality program exceeds the standards outlined in the 2012 “Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators”. The baseline monitoring program has been fully vetted by MOE and presented at multiple working group meetings. | Reasonable treatment |
| 228. | 11.7 | Fish and Aquatic Habitat | 15 | BC MOE | Predictions of effects, project mitigations and residual effects on aquatic habitat are based on the “expected case” results from the water quality modeling. This means the base case water balance and the expected release of COPC were used in the effects assessment. No impact assessment or residual effects assessment is provided for extreme conditions. While this was not requested in the AIR, the proponent can consider that questions will arise concerning the potential aquatic effects during extreme conditions. | As noted by the reviewer, this assessment was not required by the AIR (January 2011), Seabridge looks forward to discussing this comment during the Application/EIS review stage. | Reasonable treatment |
| 229. | 11.7 | Fish and Aquatic Habitat | 15 | BC MOE | Appendix 15-F adds more water quality data to project areas streams. Some of these results are shown in Figures with BC and CCME guidelines marked on them, but the | Appendix 15-F was included with Chapter 15 because it contains the 2010 aquatic resources sampling data for Gingras Creek and was not specifically intended to provide additional water quality information. The water quality data provided within Appendix 15-F is also contained within Appendix 14-A (the cumulative water quality baseline study). Tables 14.1-1 and 14.1-4 has been clarified to highlight guideline | Reasonable treatment |



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| | | | | | accompanying data tables exclude highlighting exceedances. | exceedances. | |
| 230. | 11.7 | Fish and Aquatic Habitat | 15.7 | BC MOE | Section 4.1.2 - Many of the detection limits are <10X the ISQG guidelines. Action: Mention this fact in the application and discuss the precision and accuracy concerns when guidelines and detection limits are very close (Tamblyn, Application). | Concerns with detection limits for sediment samples collected in the 2008/09 baseline years were noted in the Application/EIS (Section 15.1.5.2.1). The second paragraph of Section 15.1.5.2.1 of the Application/EIS will be clarified as follows: "It was noted that detection limits for some metals were close to or greater than guideline limits in the 2008-2009, so an additional sampling at 27 sites was completed in 2012. Ideally, detection limits should be lower than guideline concentrations by one order of magnitude, but at minimum should be at least five times lower (BC MOE 2012). When the measured concentration and detection limits are too close together, accuracy and precision of the data is decreased which can affect the confidence in the comparison between guideline concentrations and measured concentrations. Since the detection limits were substantially improved for the 2012 sediment samples (63 µm fractions), this data is summarized separately in Table 15.1-9 and raw data is compiled in Appendix 15-J.<br>During review of detection limits for sediment quality samples, it was noted that the 2008 stream sediment quality analyses were conducted on whole sediment samples, while the 2009/2010/2012 stream sample analyses were conducted on the 63 µm fraction. For consistency and to better characterize baseline conditions, the 2008 stream sediment data has been removed from the summary tables in the EIS (Table 15.1-8) and only the 2009/2010/2012 sediment quality data is presented (discussed in first paragraph of Section 15.1.5.2.1). Discussion of inter-year comparisons between 2008 and other years of sampling have also been removed from the text of Section 15.1.5.2.1. | Reasonable treatment |
| 231. | 11.7 | Fish and Aquatic Habitat | 15.7 | BC MOE | Section 5.1.1.4 - It is unclear as to how the specific parameters were chosen for the power analysis. Action: Please clarify why N, Cu, Fe and Ni were selected vs. other parameters (Tamblyn, Baseline). | The parameters selected for power analysis were chosen based on concentrations observed from among the list of parameters of concern. | |
| 232. | 11.7 | Fish and Aquatic Habitat | 15.7 | BC MOE | Section 5.2.1 - The interpretation of the D.O. profiles needs another look. D.O appears to vary significantly with depth, with obvious oxyclines throughout or in portions of 3 of the lakes. Action: Re-interpret this data in the effects assessment (Tamblyn, Application). | Section 15.1.5.3.2 of the Application/EIS will be updated as follows: "KGL was stratified (thermocline at 2 m), slightly warmer (4 to 12°C), and had an oxycline at approximately 6 m in depth. The lower elevation lakes, LAL and TDL, were the warmest, with surface temperatures near 15 to 16°C. LAL was weakly stratified (at 8 to 10 m), while TDL had a strong thermocline at 5 m. Both of these lakes were well-oxygenated in the epilimnion, but in LAL, dissolved oxygen levels dropped to near anoxic conditions near the sediment bed in the deeper parts of the lake. An oxycline was most apparent in TDL at depths of approximately 7 m." | Reasonable treatment |
| 233. | 11.7 | Fish and Aquatic Habitat | 15.7 | BC MOE | Section 5.2.2 - General physical descriptions of lake sediments including colour, consistency, and | All available baseline information is included in the Application/EIS. | Reasonable treatment |



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| | | | | | odours are useful in characterizing the lake bottoms. Photographs can supplement written descriptions. Action: Include this information in the Application if it is available (Tamblyn, Application). | | |
| 234. | 11.7 | Fish and Aquatic Habitat | 15.7 | BC MOE | Section 5.2.2.2 - Mg/L is used in this section, which appears to be a typo. Action: Change to mg/kg or similar mass-based unit (Tamblyn, Application).<br>The proponent must show where these comments were incorporated in the application. | Baseline (Appendix 15-D) will be clarified as requested to reflect unit changes from mg/L to mg/kg. | Reasonable treatment |
| 235. | 11.7 | Fish and Aquatic Habitat Baseline | 15 | BC MOE | The Application will identify potential effects, such as potential impacts from predicted water and sediment chemistry changes, on fish and aquatic habitat during all phases of the proposed Project with regard to: Dewatering activities;<br>• N—an assessment of dewatering impacts could not be found in this Chapter | Chapter 15 of the Application/EIS has been clarified to identify potential effects on fish and aquatic habitat with regard to dewatering activities. These activities will be part of various infrastructure development activities (e.g., road construction, TMF construction, water quantity loss downstream of the TMF). Sections of stream channels may need to be dewatered to facilitate road crossing construction. Potential impacts from dewatering during construction include direct mortality impacts (Section 15.7.1.1) and habitat loss (Sections 15.7.5.1.1, 15.7.5.1.2 and 15.7.5.1.3). Potential impacts will be mitigated by: adhering to construction timing windows, isolating Project work sites to prevent fish movement into the work site, salvage/removal of fish from the enclosed work site, and environmental monitoring (Section 15.7.1.2 and Chapter 26.9.1 (Fish and Aquatic Habitat Protection and Mitigation Plan) and Chapter 26.9.1 (Fish Salvage Plan).<br>Habitat impacted by dewatering that cannot be mitigated will be compensated based on the HADD Fish Habitat Compensation Plan (Appendix 15-R) and further referenced in Section 15.8.4.1.2.<br>The Application/EIS will be clarified to address the comment as follows:<br>**15.6.2 Overview of Effect Types**<br>Direct mortality of fish can occur due to fishing (increased access will increase fishing pressure), impact with construction machinery, dewatering during construction, salvage and relocation of fish to other waterbodies during TMF construction, and fish stranding during water quantity reductions.<br>**15.7.1.1 Effect of Direct Mortality**<br>Potential causes of direct mortality to fish in the LSA and RSA include construction equipment crossing streams for access road and transmission line right-of-way clearing if crossing structures are not used, dewatering activities for construction, accidents during bridge and culvert construction, salvage and relocation of fish to other waterbodies during TMF construction, fish stranding during water quantity | Reasonable treatment |



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| | | | | | | reductions, and associated rock blasting for roads close to watercourses. Effects from direct mortality are expected to be low.<br>**15.7.1.2 Mitigation for Direct Mortality**<br>To mitigate direct mortality effects within fish-bearing streams, construction activities will work in accordance with the Land Development Guidelines for the Protection of Aquatic Habitat (DFO 1993), the Standards and Best Practices for Instream Works (BC MWLAP 2004), and DFO's operational statements for temporary ford stream crossings (DFO 2010). Appropriate fisheries operating windows for fish-bearing streams will be adhered to where possible. Mitigation strategies include isolating Project work sites to prevent fish movement into the work site, salvage/remove fish from the enclosed work site, and environmental monitoring. If fording is required, it will occur only if an existing crossing at another location is not available or practical to use. During TMF development, water flow will be reduced at a gradual rate as to not strand fish downstream. It is anticipated that there will be in-water work within fish-bearing streams associated with stream crossings and TMF dam construction within South Teigen and North Treaty creeks.<br>**15.7.5.2.2 Fish Habitat Loss and Alteration due to Project Infrastructure – Tailing Management Facility Development**<br>Fish habitat loss within the TMF is unavoidable. The extent of fish habitat loss is summarized in Section 15.7.5.1. Prior to TMF construction, an intensive fish salvage program will be implemented within the TMF watercourses. The details of the Fish Salvage Plan are summarized in Section 26.18.3. To mitigate fish habitat loss downstream (i.e., South Teigen and North Treaty creeks) of the TMF dams, the following mitigation measures will be adhered to during construction, operation, and closure:<br>• the environmental monitor will monitor water quality when there is in-water work within fish-bearing streams;<br>• appropriate fisheries operating windows for fish-bearing streams will be adhered to (Section 26.18.1);<br>• appropriate permits will be acquired for out-of-window activities;<br>• water diversion structures will be used to divert dirty water from the work zone to a sediment control area;<br>• during TMF development, water flow will be reduced at a gradual rate as to not strand fish downstream;<br>**15.8.2.1 Direct Mortality**<br>Direct mortality is described in detail in Section 15.7.1. Direct mortality causing tissue damage and direct mortality for fish at all life stages may be associated with the construction, operation, and closure of access roads, transmission lines, TMF and other infrastructure in the PTMA and Mine Site of the LSA and RSA. This effect can be caused by direct contact of heavy equipment, dewatering activities during construction, and fish stranding during flow reductions with fish of various life | |



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| | | | | | | stages. For example, heavy equipment contacting instream substrate can cause direct mortality to incubating fish eggs. The magnitude of all effects associated with direct mortality will be low because events will be localized and geographically isolated. In addition, direct mortality events will be of short duration and occur sporadically. | |
| 236. | 11.7 | Fish and Aquatic Habitat | 15 (Appendix 15-1, page 16) | GHC | "Turbidity was visually estimated"<br>• With an Imhoff Cone? Therefore giving an actual number? What is a normal flood period? Definition of? | At each stream crossing location, streams were assessed using the methods identified in the British Columbia guide, Reconnaissance 1:20,000 Fish and Fish Habitat Inventory: Site Card Field Guide (RISC 1999a). Based on this guide, turbidity was visually estimated.<br>The "normal flood period" is defined as the mean annual high water level which is determined in the field based upon the Reconnaissance 1:20,000 Fish and Fish Habitat Inventory: Site Card Field Guide (RISC 1999a). | Reasonable treatment |
| 237. | 11.7 | Fish and Aquatic Habitat | 15 (Appendix 15-1, page 25) | GHC | • GHC Comment: Why no baseline data collection/fieldwork done in areas outside [of] the Project mine site? Even in areas immediately adjacent to the Project site (but not on it)? | The objectives of the 2012 Treaty Creek Fish and Fish Habitat study were to:<br>• determine fish presence, community composition, spatial distribution and barriers to fish movement for watercourses along the proposed Treaty Creek Access Road and the transmission line corridor; and<br>• assess the quality of fish habitat in watercourses along the proposed Treaty Creek Access Road and the transmission line corridor.<br>Fish habitat data collected along the proposed Treaty Creek Access Road and the transmission line corridor indicate the quality of fish habitat present at watercourses.<br><br>Data collected within the fish and aquatic habitat study area are provided in Figures 15.1-3a to 15.1-3j and Table 15.1-3 as well as described in the environmental setting in Chapter 15. Data related to watercourses along the proposed Treaty Creek Access Road and the transmission line corridor will inform the design of watercourse crossings to mitigate potential fish habitat impacts. | Reasonable treatment |
| 238. | 11.7 | Fish and Aquatic Habitat | 15 (Appendix 15-C) | GHC | Table 5.4-1 – Whole Body Fish Tissue Quality Variables and Detection Limits for KSM Project 2009<br>This table really just highlights the inherent limits of different testing techniques to detect different metals and ions, but unfortunately does nothing to relate the levels of different compounds to toxic effects potentially seen in aquatic organisms. Thus this table is of marginal utility from an environmental effects analysis | As indicated in the baseline report in Appendix 15-C, these tables are the results of the Principle Component Analysis (PCA) analysis. PCA was used to reduce redundancy in the tissue metals dataset and to allow clearer interpretation of trends in the data. PCA is a statistical routine that reduces a dataset containing a large number of correlated observations into a smaller number of uncorrelated artificial variables called components. PCA is also called data reduction because there are always fewer components than original variables once the redundant information has been removed.<br><br>Tissue metal concentrations cannot be directly compared to water quality guidelines or limits contained within the MMER. Tissue residues are measured in mg/kg (mass per weight), while water quality guidelines are provided in mg/L (mass per volume of water). There are only tissue metal residue guidelines available for | Reasonable treatment |



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| | | | | | standpoint (as presented). Thus the table would have more value if detection limits were compared and contrasted with British Columbia Water Quality Guidelines (BCWQGs) and the Metal Mining Effluent Regulations (MMERs) limits at which deleterious environmental effects are considered likely. | selenium (BC) and mercury (BC and CCME). Table 15.7-4 provides data on tissue metal concentrations in Dolly Varden in the baseline study area, 2008 to 2011 with shaded cells that indicates concentrations exceeding tissue residue guidelines. | |
| 239. | 11.7 | Fish and Aquatic Habitat | 15 | GHC | Tables 6.3-26 to 6.3-30:<br>• Unfortunately, despite there being five (5) tables of data, the information presented whether looked at on an individual basis or collectively as 5 tables, is of marginal value from an environmental effects on aquatic organism's perspective. What data and why such data was collected are not explained. The Rescan researchers admit that not enough Dolly Varden were sampled to gain meaningful results, especially in terms of energy use and reproduction (gonads), yet a data table is presented that really doesn't tell one much. Additionally, the data is not presented in the context of an overall environmental effects assessment, i.e. what do the naturally elevated levels of metals within the waters of the project area mean in terms of effects on aquatic organisms within the project area and downstream? | Tables 6.3-26 to 6.3-30 are intended to summarize existing data. Environmental effects analysis is based upon hypothesis testing (e.g. to determine effects from a project operation). The objectives of the 2009 baseline study were to assess whole body fish tissue metals quality, fish diet, fish health, fish energy and reproductive investment at potential monitoring sites that may be required under the Metal Mining Effluent Regulations (MMER). Therefore, data was collected as per the MMER Environment Canada guidelines. Data collection is stipulated in Environment Canada. 2002. Metal mining guidance document for aquatic environmental effects monitoring (Environment Canada 2002) and 2012 Metal Mining Environmental Effects Monitoring Technical Guidance (Environment 2012). This baseline data is then used to develop an aquatics environmental monitoring plan. Using this data, the draft AEMP is presented in the Application/EIS. For additional information on electrofishing effort please see comment # 226<br><br>The number of fish sacrificed for MMER baseline data collection was stipulated in the fish collection permit.<br><br>Acknowledgement of the presence of naturally-elevated metals in the water and sediments measured during baseline studies and the likely impacts to aquatic organisms is provided in several locations of the Application/EIS such as: Sections 14.1.2.1.1 and 14.1.2.2.1 (water quality), 14.1.2.1.2 and 14.1.2.2.2 (water toxicity), 15.1.1 (overview, fish and aquatics), 15.1.5.2.1 (stream sediment quality), 15.1.5.2.3 (benthic invertebrates), and 15.7.4.1.1 (metals). | Reasonable treatment |
| 240. | 11.7.1 | Fish and Aquatic Habitat | 15 | GHC | Application is incomplete - Missing important Aquatic Habitat information for information key streams such as North Treaty and Treaty Creeks.<br>Figure 15.1-1. How was the baseline Fish and Aquatic Habitat Study area | Both North Treaty and Treaty creeks were sampled for sediment quality and aquatic resources (aquatic habitat) at multiple sites over several years (see Figure 15.1-8 for sampling locations). Section 15.1.5.2.1 of the Application/EIS presents baseline sediment quality data for North Treaty and Treaty creeks and information about aquatic resources in these creeks is found in Sections 15.1.5.2.2 and 15.1.5.2.3. It is also summarized in Tables 15.1-7 to 15.1-9. Details of the annual sampling | Reasonable treatment |



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| | | | | | established? No description of the reasoning used is provided. What about fisheries impacts on the USA (Alaska) side of the border? Not part of the assessment?<br>15.1.2.1 – Does this mean that Seabridge Gold and its associated consultants will be quantifying the current productivity levels of all fish habitats potentially affected by the KSM project? No numeric productivity estimates of fish habitat are currently provided in any of the KSM EA literature thus far. | programs are detailed in Appendices 15-B, 15-D, 15-F, and 15-J.<br><br>The baseline fish and aquatic habitat study area boundary was established in 2007 based upon the locations of Project infrastructure and potential for Project related downstream impacts. The baseline fish and aquatic habitat study area encompasses two major watersheds that include the Unuk and Bell-Irving rivers (Figure 15.1-1). The baseline fish and aquatic habitat study area was evaluated each year as the project plan evolved and has been reviewed with the KSM Project Working Group since 2007. Potential fisheries impacts on the Alaska side of the border were evaluated and data was gathered based upon a background literature review. This information has been presented in baseline reports.<br><br>Section 15.1.2.1 of the Application/EIS provides legislative information regarding the federal *Fisheries Act*. The approved AIR (January 2011) does not indicate that numeric productivity estimates of fish habitat shall be provided in the Application/EIS. | |
| 241. | 11.7.1 | Fish and Aquatic Habitat | 15 | GHC | Stream periphyton community (genus richness, density, relative abundance, evenness, diversity and biomass as chlorophyll); Stream and lake benthic invertebrate community (genus richness, relative abundance, evenness, diversity and biomass).<br><br>Application is incomplete - Missing important Aquatic Habitat information for information key streams such as North Treaty and Treaty Creeks. | The Application/EIS presents periphyton and benthic invertebrate data for North Treaty and Treaty creeks in Section 15.1.5.2.2 and 15.1.5.2.2 and the listed Appendices (15-B, 15-D, and 15-F). | Reasonable treatment |
| 242. | 11.7.1 | Fish and Aquatic Habitat | 15 | GHC | Fisheries values in the Bell Irving and the Nass Rivers should have been documented. | The Bell-Irving River is located within the fish and aquatic habitat baseline study area and is discussed in Section 15.1.1 of the Application/EIS. The Nass River which is situated well downstream of the project site, is not located within the fish and aquatic habitat baseline or regional study areas therefore was not discussed in extensive detail. However, Nass River fisheries values were discussed in context to the Bell-Irving Watershed. | Reasonable treatment |
| 243. | 11.7.1 | Fish and Aquatic Habitat | 15 | GHC | 15.1.4.2 What about fish species on the USA side of the border that cross (potentially) into Canadian waters (e.g. sockeye)? What about USA endangered and threatened species legislation? | Fish populations in the Unuk River on the Alaska side of the border are discussed in Section 15.1.4.2.3 of the Application/EIS. | Reasonable treatment |



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| 244. | 11.7.1 | Fish and Aquatic Habitat | 15 | GHC | 15.1.4.4.2 - What about "downstream/upstream" impacts on fisheries from the TMF? What about cumulative impacts on fisheries from the TMF? | Section 15.1.4.4.2 describes the baseline fish habitat information within South Teigen and North Treaty creeks within and downstream of the TMF. Fish habitat within Treaty and Teigen creeks is discussed in Section 15.1.4.2.2 of the Application/EIS. Sections 15.7.4, 15.7.5, 15.8.3, 15.8.4, and 15.9 consider potential downstream/upstream and cumulative effects on fisheries from the TMF. | Reasonable treatment |
| 245. | 11.7.1 | Fish and Aquatic Habitat | 15 (15.7.5.1.4 Fish Habitat Loss and Alteration due to Tailing Management Facility Water Management – Teigen and Treaty Creeks) | GHC | No instream flow assessment performed on Teigen and Treaty Creeks. Given that these two creeks could potentially experience some levels of de-watering, it is imperative that these be assessed. | An instream flow threshold assessment following the guidelines outlined in Instream Flow Thresholds (Hatfield et al. 2003) and Instream Flow Assessment Methods (Lewis at al. 2004) for BC was conducted for Teigen Creek and Treaty Creek (see Section 15.7.5.1.4 of the Application/EIS). The predicted low variations in Teigen and Treaty Creeks flow s will not require an authorization under the *Fisheries Act* (1985) to permit the destruction or disruption of fish habitat. | Reasonable treatment |
| 246. | 11.7.1 | Fish and Aquatic Habitat | 15 | GHC | Fish community composition presented in the application should be considered incomplete. Many of the key streams were no adequately sampled (sampling design flaws: e.g., using red counts or the visual presence of spawners to determine fish presence, not an acceptable method to confirm absence of fish). | The methods used to collect fish community composition in streams are accepted methods to determine fish presence or absence. Electrofishing is a provincially and federally accepted method to determine fish community composition and was conducted according to RIC standards (RIC 1997). More than one sampling gear was used to determined fish presence within certain water courses (e.g., minnow trapping, visual spawner survey, redd surveys, three-pass electrofishing, snorkel surveys, etc). Watercourses were sampled during different years and times of the year. All techniques and sampling locations are summarized in Table 15.1-3 of the Application / EIS. The fish community sampling methods are presented in Appendices 15-A, 15-C, 15-E, 15-H, 15-G, and 15-I.<br><br>The primary objective of the aerial spawning survey was to confirm chinook and coho salmon spawning habitat distribution throughout the watershed and focus additional ground redd surveys. The secondary objective was to provide an index of chinook and coho salmon escapement for Teigen Creek. Aerial spawning survey methods followed those detailed in Johnston et al. (2007).Ground redd survey methods followed those detailed in Johnston et al. (2007). Johnston et al. (2007) (Salmonid Field Protocols Handbook: Techniques for Assessing Status and Trends in Salmon and Trout Populations) is a peer reviewed accepted book developed by the American Fisheries Society, which develops standards for fisheries assessment in North America. | Reasonable treatment |
| 247. | 11.7.1 | Fish and Aquatic Habitat | 15 | GHC | Some of the key streams were not sampled for fish tissue, specifically North Treaty Creek, Treaty Creek and the Bell Irving River. Given that the TMF will be discharging it's effluent directly into these stream, it is imperative that baselines be set-up | Fish tissue samples were collected in North Treaty Creek in 2008 and 2009 as indicated in Section 15.7.4.1.1 of the Application/EIS and Figure 15.1-3h. Table 15.1-3 will be amended in the EA Application to coincide with Section 15.7.4.1.1 and Figure 15.1-3h.<br><br>The key streams were sampled for fish tissue. According to the MMER guidelines | Reasonable treatment |



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| | | | | | so that the fish toxicity levels can be monitored in the future. This is a fatal flaw in the project methodology. | (EC 2012), exposure area sampling should be done in an area proximate to the effluent discharge where effects may be found. The boundary of the exposure area is defined by the zone of effluent mixing (EC 2012). Fish tissues were sampled for metals toxicity in North Treaty Creek as it was a near-field site close to TMF discharge according to the proposed project design plan from 2007 to 2012. Mid-field and far-field sites were sampled in Treaty Creek and the Bell-Irving River to evaluate other MMER endpoint response variables (EC 2012). In 2012, the TMF design was altered to discharge into Treaty Creek and water quality modeling predictions were conducted. Based upon TMF design changes and water quality predictions future sampling will occur. The proposed AEMP (Section 26.) indicates that fish tissue sampling will be conducted in Treaty Creek and Bell-Irving River in 2013. | |
| 248. | 11.7.1 | Fish and Aquatic Habitat | 15 | Tahltan Nation | Fish presence, community, distribution and barriers to fish movement for watercourses within the study area;<br>• Although the format for providing fish distribution is not distinctly prescribed, there are no spatial distribution maps for fish species.<br>• (To note, there is relevant information in the Application such as: maps of sampling sites; Table 15.1-4 summary of known fish species by watershed; and Tables 15.5-3 / 15.5-4 which list VC fish species distribution for Teigen and Treaty watersheds. Fish distribution is also described within the Application narrative and Appendix 15-A Figures 10.6-25, 26 & 27 display Dolly Varden fish habitat distribution within the proposed TMF and plant site.)<br>• Not having maps of fish distribution by species | Fish distribution information was provided in the Application/EIS (Chapter 15). For greater clarity a fish specific spatial distribution map, **Attachment #5**, for the Treaty Creek Watershed, Teigen Creek Watershed, and Unuk River Watershed is attached to this table. | Reasonable treatment |

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| | | | | | provides challenges to effectively reviewing details of the fish and aquatic habitat section. As well, without such maps it is difficult to provide a high level overview at forums such as community meetings.<br>• In consideration of the above, it is recommended that spatial distribution maps for all VC fish species be developed (inclusive of the different salmon species.) Information sources should include background data such as FISS along with data collected for the KSM project. | | |
| 249. | 11.7.1 | Fish and Aquatic Habitat | 15 | Tahltan Nation | The wetland component of this section is lacking in detail other than some mention of coho and Dolly Varden use in Teigen and Treaty off-channel wetlands. There appears to be further information on wetland locations, fish composition and habitat quality within the various Appendices. However, given the importance of wetlands to ecosystem function a summary of these aspects should be included in the Application. | The importance of wetlands is recognized, and is included in the Application/EIS. All wetlands assessed for fish and fish habitat are included in baseline Appendices (including site specific data) 15-A, 15-C, 15-E, and 15-H. Wetlands were assessed along the Treaty, Teigen, and Unuk floodplains, proposed TMF watersheds, as well as other wetlands for identification of fish habitat compensation options. It is identified that Dolly Varden and coho salmon utilize these habitats in the EA application.<br><br>In summary, off-channel wetland habitats are present within and outside of the fish and aquatic habitat study area, particularly along the floodplains of Treaty and Teigen creeks, and the Bell-Irving, Bowser, and Unuk rivers (Rescan 2010, 2011b). The majority of off-channel wetlands, along the floodplain, is inaccessible to fish, limited in supply, and has a low productive capacity. Poor quality off-channel wetlands are limiting the productive capacity for summer rearing and overwintering fish habitat. Availability of good spawning habitat to seed off-channel and side-channel habitat is limited.<br><br>Off-channel habitat includes beaver ponds, side channels, wall-base channels, small tributaries and relic overflow channels along floodplains. These features typically have low seasonal flows, well-developed riparian communities, beaver dams, and a low to moderate risk of flooding from mainstem creeks. These characteristics result in rearing, overwintering, and a minor amount of spawning areas for salmonids (Lister and Finnigan 1997; Solazzi et al. 2000; Rescan 2007, 2011a, 2012a). Off-channel wetlands in the fish and aquatic habitat study area are used for summer rearing and overwintering by the target species, Dolly Varden, and | Reasonable treatment |



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| | | | | | | juvenile coho salmon (Rescan 2010, 2011a). The natural complex shape and features in wetlands ponds maximize the littoral area for invertebrate and aquatic plant production as well as fish foraging, cover, and deep refuge value. Wetland ponds help improve water quality by settling out fine particulate matter (i.e., suspended sediments). Silt deposited into ponds will contribute to aquatic and riparian soil formation and nutrient cycling. | |
| 250. | 11.7.1 | Fish and Aquatic Habitat | 15 | Tahltan Nation | Unuk River salmonid catch data provided by Alaskan state and US federal agencies.<br>• Some escapement data (for Chinook and coho) is discussed in this section, however catch data is not included. | Escapement data for coho and chinook salmon was provided in the Application/EIS because it provides a more scientifically defensible approach to estimating population size of coho and Chinook salmon specific to the Unuk River. To track the spawning escapement the ADFG, DFO, and Taku River Tlingit First Nation, and Tahltan Nation count spawning Chinook and coho salmon in elven watershed of Southeast Alaska, which includes the Unuk River (ADFG 2003). Studies to estimate stock abundance include aerial surveys, radio telemetry studies, and mark-recapture studies. Using this escapement data harvest allocations are determined, which results in the commercial harvest/catch data.<br><br>Alaska State catch data provides commercial and sport harvest data for the entire southeast Alaska marine waters; therefore this catch data represents coho and chinook salmon from all rivers in Southeast Alaska. Therefore, providing catch data for the southeast Alaska marine waters was determined to be not appropriate and not informative for the EA application. | Reasonable treatment |
| 251. | 11.7.2 | Fish and Aquatic Habitat | 15 | Tahltan Nation | Application will: Describe freshwater fish and aquatic habitat within the proposed Project area. Aquatic habitat includes aquatic resources (i.e., biological values including periphyton, phytoplankton, zooplankton, and benthic invertebrate, and sediment quality for stream and lake habitats) and fish habitat (i.e., stream, wetland and lake fish habitat, including fish passage and riparian habitat); and<br><br>• As related on the previous page, fish and associated habitat descriptions for wetlands is lacking in this section or not referenced to particular Appendix.<br>• A summary of the current | Forty-nine stream and river baseline sites have been monitored over 5 years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. The baseline water quality program exceeds the standards outlined in the 2012 “Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators”. The baseline monitoring program has been fully vetted by MOE and presented at multiple working group meetings. The fish community sampling methods are presented in Appendices 15-A, 15-C, 15-E, 15-H, 15-G, and 15-I. | Reasonable treatment |



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| | | | | | status of wetland fish and fish habitat should be incorporated. This is useful baseline information which may be critical to future monitoring. As well, wetlands appear to be a focal point within the proposed aquatic compensation plans. | | |
| 252. | 11.7.2 | Fish and Aquatic Habitat | 15<br>15.1.4.2 Baseline Study Area Fish Community | Tahltan Nation | Provide an overview of background information, environmental setting and characteristic of the fish and aquatic habitat.<br>• Existing Conservation Units (CUs) under the DFO Wild Salmon Policy were not identified or discussed in relation to the upper Nass and Unuk River systems | The Application/EIS will be clarified to include any existing Conservation Units (CUs) under the DFO Wild Salmon Policy (Section 15.1.4.2.1). | Reasonable treatment |
| 253. | 11.7.2 | Fish and Aquatic Habitat | 15 | GHC | Describe freshwater fish and aquatic habitat within the proposed Project area. Aquatic habitat includes aquatic resources (i.e., biological values including periphyton, phytoplankton, zooplankton, and benthic invertebrate, and sediment quality for stream and lake habitats) and fish habitat (i.e., stream, wetland and lake fish habitat, including fish passage and riparian habitat);<br>• Application is incomplete - Missing important Aquatic Habitat information for information key streams such as North Treaty and Treaty Creeks. | Both North Treaty and Treaty creeks were sampled for sediment quality and aquatic resources (aquatic habitat) at multiple sites over several years (see Figure 15.1-8 for sampling locations). Section 15.1.5.2.1 of the Application/EIS presents baseline sediment quality data for North Treaty and Treaty creeks and information about aquatic resources in these creeks is found in Sections 15.1.5.2.2 and 15.1.5.2.3. It is also summarized in Tables 15.1-7 to 15.1-9. Details of the annual sampling programs are detailed in Appendices 15-B, 15-D, 15-F, and 15-J. | Reasonable treatment |
| 254. | 11.7.3 | Fish and Aquatic Habitat | 15 | GHC | The Bell Irving River and the Nass River should be included as one of the potential aquatic ecosystems | The fish and fish habitat study area boundaries for the KSM Project were defined in the AIR (January 2011), which was subject to review by government agencies, Nisga'a, First Nations and the public prior to their approval in 2011. The fish and | Reasonable treatment |



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| | | | | | affected by the proposed project in Chapter 15. At a bare minimum there should be some defensible scientific justification for not including it. Section 15.4.1 states: *The primary factor that determined the placement of the RSA boundary was the potential extent of water quality degradation due to the KSM Project.* The spatial boundaries were based on predicted water quality modeling, but the data set used for the modelling was so small and temporally limited that its results are of little value and should be considered inconclusive and scientifically indefensible. | fish habitat study area boundaries were presented in all baseline reports, work plans, and KSM Project Working Group meetings. The Bell-Irving River is included in the fish and aquatic habitat regional study area as indicated in Figure 15.4-1 of the Application/EIS.<br>Potential effects in the Bell-Irving were assessed; such as bridge crossings. As per the water quality model results, no effects are predicted at the Treaty Creek, Teigen Creek and Bell-Irving confluences. Selenium concentrations in Treaty Creek (TRC2) and Teigen Creek (TEC2) are predicted to remain at or below baseline levels (Table 15.7-5) and well below guideline limits. Therefore, potential effects in the Bell-Irving and Nass rivers, which are further downstream of the TRC2 and TEC2, are not expected.<br>Forty-nine stream and river baseline sites have been monitored over 5 years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. Baseline data is continuing to be collected. The baseline water quality program exceeds the standards outlined in the 2012 "Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators". The baseline monitoring program has been fully vetted by MOE and presented at multiple working group meetings. | |
| 255. | 11.7.4 | Fish and Aquatic Habitat | 15<br>5 | Tahltan Nation | The temporal boundaries will include the following three phases:<br>• Construction Phase – estimated 3 to 4 year period;<br>• Operations Phase – approximately 50 to 55 year life of the mine; and<br>• Closure and Post-Closure – mine site reclamation and post-closure monitoring.<br>The temporal boundary for post-closure monitoring is identified as 250 years. How was this time period determined? | The EA requires a temporal boundary be identified. 250 years was chosen for the length of the post-closure phase because this time frame is similar to that used for tailing dam design (e.g., design capacity of dams must be built to withstand 1 in 200 year flood events). Extending the period by 50 years is somewhat arbitrary but it was felt to be more conservative. | Reasonable treatment |
| 256. | 11.7.5 | Fish and Aquatic Habitat | 15 | GHC | The Application will identify potential effects on fish and aquatic habitat VCs. Aquatic habitat is defined as the periphyton, phytoplankton, zooplankton, benthic invertebrates and sediment quality of the study area lakes, streams and rivers, and associated fish habitat. The identified valued components (VC) for the | Section 15.7.4.1.1 of the Application/EIS describes the potential effects of metals on migratory behavior of salmon as follows: "Olfactory toxicity in fish has also been associated with exposure to low pH, metals, and various other contaminants (Tierney et al. 2010). Some metals, such as copper, can interact with sensory nerves located in the olfactory rosettes causing avoidance responses or impairment of the ability to "smell," which can alter normal olfactory-mediated behaviors (Tierney et al. 2010)." | Reasonable treatment |



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| | | | | | Application are…<br>• The Gitanyow raised concerns around the potential changes in water chemistry and the effects on the migratory behaviour of salmon (e.g. chemoreception). The proponent stated that it would be addressed this issue in Chapter 15 of the application (Appendix 3-N, table N-1, issues 78). Yet we found no reference to these potential impacts.<br>• The Gitanyow raised concerns around the potential to Hanna and Tintina Creeks (the largest salmon producers in the Nass Watershed). Yet we find no reference to the potential impacts on these two streams. The transportation corridor for the project crosses both systems, the potential effects should have been considered.<br>• Were these concerns incorporated into the sampling plans? If so, how specifically? Were these concerns integrated into an environmental monitoring program? (Concerns of water quality degradation downstream of the TMF in salmon-bearing watercourses…)<br>• Table 15.5-1 – Valued Components (VC) Selection Table - Were valued | The results of the water quality model indicate that concentrations of some water quality parameters, including total copper, appear to increase above baseline concentrations and water quality guidelines in South Teigen Creek in some months during various Project phases for the expected case (see Section 15.7.4.3.1). However, flows in South Teigen Creek are predicted to be reduced as a result of operation of the TMF (see Section 15.7.5.1 or Chapter 13). This suggests that the predictions of elevated concentrations of these metals are an artifact of mass balance modeling as the baseline load in the predicted lower flow is calculated in the model to be greater than the baseline concentration. Mitigation including controlling seepage beyond the North Cell seepage collection dam and the commitment to not discharge water to South Teigen Creek until receiving environment targets are met (see Section 26.17, Water Management Plan) will ensure that concentrations of metals in South Teigen Creek will not increase above baseline concentrations. No increase of copper is predicted according to the water quality model in North Treaty or Treaty creeks.<br>The Hanna and Tintina creeks were not included in the fish and aquatic habitat regional study area boundary as these creeks discharge into Meziadin Lake which then discharges in to the Meziadin River. The confluence of the Meziadin River and Nass River is approximately 89 km downstream of the Treaty Creek confluence. Selenium water concentrations in Treaty Creek (TRC2) and Teigen Creek (TEC2) are predicted to remain at or below baseline levels (Table 15.7-5) and well below guideline limits. Therefore, potential effects in Hanna and Tintina creeks, which are further downstream of the TRC2 and TEC2 sites, are not expected.<br><br>The AEMP (Chapter 26.18.2) outlines the proposed monitoring plan and general location/frequency of sampling. It includes monitoring required by the MMER and provincial permitting requirements (to be determined during permitting phase), as well as additional monitoring for effects related to potential water quality degradation and water quantity changes downstream of the TMF (e.g. annual aquatic resources sampling, Teigen Creek Chinook salmon monitoring).<br><br>Table 15.5-1: VCs for the KSM Project were defined in the AIR (January 2011), which was subject to review and incorporation of comments from various government agencies, Nisga'a, and First Nations prior to their approval in 2011. The rationale for the selection and inclusion of specific VCs is provided in detail in the text of section 15.5.1.<br><br>The rationale for including Dolly Varden as a keystone species is listed in Section 26.9.2.8.1 of the Application/EIS. According to Environment Canada guidelines (Environment Canada 2012), Dolly Varden is a suitable monitoring species: "Dolly Varden is a resident fish species with limited movement and dispersal (Bryant and Lukey 2004; Ihlenfeldt 2005) and would therefore have greater risk of metal | |



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| | | | | | components considered in the context of the physical project area only? Or were valued components also considered within the context of downstream and cumulative effects as well? This not clear in the current EA documentation and needs to be explicitedly stipulated as to what the actual case is either way.<br>• "Dolly Varden was selected as the Keystone species for monitoring fish and aquatic environment health for numerous ecological reasons." What are some of these 'numerous ecological reasons'?<br>• "Aquatic Habitat is defined as those parts of the environment on which fish depend, directly or indirectly, to carry out their life processes (DFO 1986)." Does this mean that Seabridge Gold Inc. (and their associated consultants) are considering water quality an integral part of fish habitat for their analyses?<br>• "Eulachon exclusion from being a VC. The lower reach is hundreds of kilometers downstream of the baseline study area boundary." How exactly was the baseline study area boundary established? What is the probability of deleterious environmental effects (e.g. degraded water quality) | bioaccumulation than migratory fish species such as salmon. The species possesses short- to medium-term longevity (8 to 9 years), age and length at maturation are relatively short (3 to 5 years and 130 to 162 mm, respectively), spawning is site-specific, and their diet is primarily benthic invertebrates (Ihlenfeldt 2005; BC MOE 2012; McPhail 2007).....Dolly Varden are less susceptible to toxic effects associated with some metals (e.g. selenium; McDonald et al 2010) and can therefore tolerate higher body burdens, so they can serve as a good indicator species for whether metals are accumulating in fish tissue to concentrations greater than baseline levels."<br><br>As indicated in Section 15.5.1, fish and aquatic habitat includes riparian habitat and physical in stream features (e.g., large woody debris [LWD], boulders, pools, etc.) that support spawning, rearing, overwintering, and migration life history stages. Aquatic habitat also includes water quality, sediment quality, primary producers, and secondary producers, which perform a critical function in the transfer of energy from primary producers to higher trophic levels (e.g., fish, birds, and humans). Potential effects to instream habitat, riparian habitat, water and sediment quality, primary and secondary producers are addressed through this VC. Therefore, water quality data is an integral part of fish habitat and used specifically to address potential effects on aquatic habitat and fish.<br><br>The BC EAO determined that eulachon would not be included as a VC because they are primarily restricted to the lower reaches of the Nass River, and the Project is a significant distance from the area (approximately 200 kilometres). The BC EAO also determined that other VCs for aquatic species such as Dolly Varden, bull trout, rainbow trout/steelhead, and Pacific salmon will be sufficient to determine if there are any adverse effects on downstream eulachon populations. This approach was confirmed in a letter addressed to the NLG from the BC EAO dated May 5, 2010. | |



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| | | | | | occurring beyond the baseline study area boundary? Surely if eulachon are not being considered as a VC under the reasoning that this species occurs hundreds of kilometers from the baseline study area boundary then an analysis has been conducted that indicates with a reasonable rate of statistical confidence the farthest distance over which effects might be seen? Where is this analysis?<br>How can one make the determination that 'changes (comment cut off) | | |
| 257. | 11.7.6 | Fish and Aquatic Habitat | 15 | GHC | Footprint of development<br>• 15.6.1 What is the exact geographical scope of this assessment? e.g., Treaty and Teigen Creeks extend well-beyond the study area therefore will all of each creek be considered or only the parts within the study area?<br>• 15.6.4 Over what geographical area/context is the issue of water quality degradation being considered? | The fish and fish habitat study area boundaries for the KSM Project were defined in the AIR (January 2011), which was subject to review and incorporation of comments from various government agencies, Nisga'a, and First Nations prior to their approval in 2011. The fish and fish habitat study area boundaries were presented in all baseline reports, work plans, and working group meetings for the past 5 years which was subject to review and incorporation of comments from various government agencies, Nisga'a, and First Nations.<br><br>The footprint of development is the physical area of the development including potentially impacted tributaries. The LSA encompass watersheds in the immediate area of the Project with a potential for direct effects (Figure 15.4-1). The LSA includes streams that are located within and downstream of the proposed open pits, rock storage facilities, PTMA, as well as ancillary components such as buildings, roads, tunnels, power generation facilities, and transmission lines route, which includes existing and proposed access roads. The sub-watersheds with a potential for direct effects include those identified in Table 15.1-1, except Scott Creek, south Unuk River, Hodkin Creek, West Teigen Creek, and Bowser River.<br><br>The geographic scope of potential effects of water quality degradation is the regional fish and aquatic habitat study area boundaries (Figure 15.4.1). The RSA includes the portion of the watersheds downstream of the Project with a potential for direct effects, as well as watersheds upstream of those with a potential for direct effects. | Reasonable treatment |
| 258. | 11.7.6 | Fish and Aquatic | 15 | GHC | Infrastructure development activities | AIR requirements have been met. Table 15.7.3: Potential effects of erosion and | Reasonable |



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| | | Habitat | | | • Table 15.7.3 Will these effects be quantified? Will these effects be mitigated for in the KSM Fish Habitat Compensation Plan (FHCP)? | mitigation will be mitigated as detailed in the Erosion and Sediment Management Plan and Fish and Aquatic Habitat Protection and Mitigation Plan. There are no anticipated residual effects. | treatment |
| 259. | 11.7.6 | Fish and Aquatic Habitat | 15 | GHC | Infrastructure development activities<br>• 15.7.4.1.1 "The toxicology of mixtures of metals and other chemicals in the aquatic environment is poorly understood, although it is known that antagonistic, additive, synergistic, or potentiating effects are possible outcomes." Will KSM (Seabridge Gold) put more effort into rectifying this understanding, given the strong likelihood of their project mobilizing various metals into the local and regional aquatic ecosystem? | Monitoring for effects to fish and aquatic resources/habitat is detailed in the AEMP (Chapter 26.18). The monitoring program is intended to identify changes in the aquatic environment that may occur as a result of discharges from the Project. The proponent has also committed to conducting a risk assessment of aquatic effects in the Unuk River since there is potential for changes to water quality in this area. | Reasonable treatment |
| 260. | 11.7.6 | Fish and Aquatic Habitat | 15 | GHC | Infrastructure development activities<br>• 15.7.4.1.1 "Concentrations of selenium in Dolly Varden tissue collected during baseline studies were above the BC MOE tissue residue guideline of 1 micrograms/gram wet weight…" Does this mean that Rescan followed up to see if the aforementioned Dolly Varden were experiencing toxic effects to their physiological functions from increased selenium? | Tissue residues for selenium greater than the BC MOE aquatic life (tissue) selenium guideline of 2 µg/g occurred in Dolly Varden under baseline conditions. It is not known whether toxic effects are currently occurring. Continued monitoring of tissue residues and fish community/biology endpoints are proposed under the AEMP. | Reasonable treatment |
| 261. | 11.7.6 | Fish and Aquatic Habitat | 15 | GHC | Infrastructure development activities<br>• 15.7.4.1.1 "…evidence | The evidence that Dolly Varden may be less sensitive to selenium toxicity is within the referenced study by McDonald et al (2010). This study examined the effects of selenium on development of field-collected Dolly Varden embryos. Based on the | Reasonable treatment |



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| | | | | | suggests that Dolly Varden may be less sensitive to selenium toxicity than other fish species (McDonald et al. 2010)." What evidence exactly? | findings of this study (survival, weight and deformities), the authors concluded that "The egg concentration corresponding to a 10% increase in the frequency of deformity (EC1)) was 54 mg/kg dry weight, which is substantially higher than reported for other cold-water fish species." | |
| 262. | 11.7.6 | Fish and Aquatic Habitat | 15 | GHC | Infrastructure development activities<br>• 15.7.4.1.1 "…Acidic aquatic pH can also lead to the liberation of sediment-bound metals, which can then enter the dissolved phase and be more bioavailable to aquatic organisms resulting in toxicity." How far into the surrounding watersheds are these effects likely to occur? | The potential for toxicity due to mobilization of metals by acidic pH will vary with a number of factors. Changes in pH back to a more neutral or alkaline pH will affect metal solubility, causing some metals to precipitate or form complexes with substrates. Dilution will contribute to decreasing metal concentrations with distance from the source. Metals in water must be present at concentrations high enough to elicit toxic effects in exposed organisms. Water quality modeling (as described in Chapter 14) is a tool used to estimate metal concentrations, which can then be used to estimate the potential for toxicity. | Reasonable treatment |
| 263. | 11.7.6 | Fish and Aquatic Habitat | 15 | GHC | Infrastructure development activities<br>• "Important or heavily used chemicals that will be used during Project activities include sodium cyanide (gold extraction)…" Is NaCN the only viable way to extract gold? Given cyanide's known toxicological effects on both terrestrial and aquatic organisms, it would be prudent to investigate other more environmentally friendly gold extraction techniques given the high volumes of gold expected to be extracted during the 50 plus years of mining operation | The use of alternatives to cyanide in the gold recovery method is investigated in Chapter 33 (Alternative Means of Undertaking the Project), Section 33.10 (Gold Recovery Method). This section includes a discussion of the gold recovery processes, identification of alternatives to cyanide use, a comparison of alternatives based on a comparison of technical and economically feasible and health and safety and environmental potential effects, and a rationale for the selection of cyanidation in the gold recovery process. | Reasonable treatment |
| 264. | 11.7.6 | Fish and Aquatic Habitat | 15 | GHC | Dewatering activities<br>15.7.4.2.2 "Discharges from the TMF will only occur between May and October, with discharge volumes | Section 15.7.4.2.2 has been clarified to address the comment as follows: "Discharges from the TMF will only occur between May and October, with discharge volumes staged to match the hydrological regime of the receiving environment". | Reasonable treatment |



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| | | | | | dictated by the assimilative capacity of the receiving environment." Presumably this means that the assimilative capacity of the environment has been quantified? What is the number?<br>15.7.4.2.3 "The cyanide-containing tailings released from the Plant will be contained within the Lined Centre Cell TMF where seepage can be prevented, and not discharged until post-closure when water quality in the pond is acceptable." Does this mean that there will not be any cyanide when the time for water discharge comes?<br>15.7.4.3.1 "These slight increases in Selenium in North Treaty or South Teigen creeks may pose a risk to aquatic organisms, since increased uptake may be possible if additional selenium enters the food chain. However, it is unlikely that fish tissue residues would approach toxicity thresholds, since selenium concentrations are predicted to be below water quality guidelines." → SFC Comment: Which selenium concentrations are predicted to be below guidelines? The active selenium discharge? The background selenium already there? The combination of discharged selenium and background selenium? What are the exact concentrations being referred to here? | There are both discharge criteria and BC water quality guidelines for the protection of aquatic life for (weak-acid dissociable) cyanide. Cyanide concentrations below these limits are considered acceptable for discharge. Cyanide-containing water from within the lined CIL pond will not be discharged directly into the environment. CIL pond water will be further treated prior to discharge into the North or South tailings ponds.<br><br>The concentration of selenium in the water of North Treaty (NTR2) and South Teigen (STE3) creeks is predicted to be below BC water quality guidelines for the protection of aquatic life at all times following discharge from the TMF. The selenium concentrations being referred to are the predicted water concentrations at the NTR2 or STE3 sites compared to background. Section 15.7.4.3.1 will be clarified to address the comment as follows: It is possible that these slight increases in predicted selenium water concentrations relative to baseline concentrations in North Treaty or South Teigen creeks. | |
| 265. | 11.7.6 | Fish and Aquatic Habitat | 15 | GHC | Flow changes from water management and diversions<br>• Baseline instream flow data collected / presented in the application is largely incomplete, providing large | The British Columbia Instream Flow Guidelines for Aquatic Habitat support a two-tiered process. These guidelines include Instream Flow Thresholds (Hatfield et al. 2003) and Instream Flow Assessment Methods (Lewis at al. 2004). The first tier, i.e., Instream Flow Thresholds, serves as a coarse filter when only hydrological data are available and little or no biological or physical information is accessible. The guideline acknowledges that a minimum of twenty years of continuous natural daily flow discharge records is generally not available for the majority of hydrometric | Reasonable treatment |



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| | | | | | gaps in the baseline. Stream flow data was successfully collected on only a few streams for the 3 year sample period and was largely isolated to the post thaw peiod of the year (on some streams only 1 year was collected). This incomplete data was then used for modelling the predicted impacts of flow changes on fish for the project life >250 years, which is scientifically unfounded. The application acknowledges that to effectively model flow impacts it is recommended that 20 years of data be used. Given this, 1 to 3 years of data is at best a very poor prediction of what will happen to water flow if the project should proceed to the development stage. | monitoring stations in the province. Thus, synthetic periods of flow discharge records are usually constructed and accepted based on the guideline. This is the process that has been followed in the tier 1 instream flow analysis.<br><br>If the coarse filter indicates that instream flow issues are a concern, the second tier of review, i.e., Instream Flow Assessment, must be conducted. Given the results of the tier 1 analysis and the uncertainty associated with such an analysis (including the 20-year synthetic data generation), a tier 2 analysis, based on hydraulic modeling and physical habitat assessment, was also conducted. | |
| 266. | 11.7.6 | Fish and Aquatic Habitat | 15 | GHC | The locations and estimated areas of fish habitat potentially affected;<br><br>• This prediction should be considered incomplete, given that water flow changes predicted in the application are based on too small of a data set to have any real scientific value. | The locations and estimated areas of fish habitat potentially affected are included in Section 15.7.5, Section 15.8.4, MMER Fish Habitat Compensation Plan (Appendix 15-Q), and HADD Fish Habitat Compensation Plan (Appendix 15-R). Predicted changes in flow were based upon scientifically supported methodologies. That is, integration of recorded baseline data, regional hydrologic analysis, long-term climate scenarios, and the water management plan in the water balance model. Given these projected flows, potential effects on fish habitat were predicted based upon following the provincially approved BC Instream Flow Methodology (see Sections 15.7.5.1.3 and 15.7.5.1.4). Therefore, the predictions of water quantity effects on fish habitat are considered complete. | Reasonable treatment |
| 267. | 11.7.6 | Fish and Aquatic Habitat | 15 | GHC | Estimated population size or numbers of fish that use the habitat that would potentially be affected by the proposed Project (particularly for the TMF and the tributaries of Teigen and Treaty Creeks that drain the tailing | Fish community composition and sampling methods are appropriate for the study objectives.<br><br>Density estimates of Dolly Varden in North Treaty and South Teigen creeks, within the TMF, were conducted in 2009 (see Appendix 15-C). Relative abundance estimates of Dolly Varden and other fish species were conducted in South Teigen | Reasonable treatment |



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| | | | | | facility area)<br>• Fish community composition presented in the application should be considered incomplete. Many of the key streams were no adequately sampled (sampling design flaws: e.g. using red counts or the visual presence of spawners to determine fish presence, not an accepteable method to confirm absence of fish).<br>• No estimate of fish population size were made for Teigen Creek, Treaty Creek or South Teigen Creek. Fish population size studies were only performed in 2009 on North Treaty Creek and West Teigen Creek. Teigen and Treaty Creek are the main salmon producers in the study area, and much of the productive habitat is located downstream of the TMF site. An accurate assessment of fish population sizes / fish use must be performed for these systemas. | and North Treaty Creeks downstream of the TMF (see Appendices 15-E and 15-G). Fish sampling methods of relative abundance for mainstems creeks such as Teigen Creek are appropriate for the study objectives. Furthermore, Section 26.9.2.9 of the EA Application indicates that a chinook salmon stock-recruitment monitoring program will be used to monitor adult spawning abundance and fry recruitment. | |
| 267. | 11.7.6 | Fish and Aquatic Habitat | 15 | GHC | Mitigation and/or habitat compensation requirements (based on DFO's Policy for the Management of Fish Habitat and the related principle of no net loss of the productive capacity of fish habitat)<br>• 15.7.5.1.2 "Furthermore, the deposition of deleterious substances within the TMF and seepage ponds will cause a loss of fish habitat in North Treaty and South | The locations and estimated areas of fish habitat potentially affected have been quantified and are included in Table 15.7-16 of Section 15.7.5.1.2 and the MMER Fish Habitat Compensation Plan (Appendix 15-Q).<br><br>Section 15.7.5.1.6 provides summaries of predicted water quality in both the receiving environment (Treaty and Teigen Creek) and in the TMF ponds are provided in Chapter 14 (Sections 14.7.1.2.3 and 14.7.3.2.2) and detailed outputs of results are available in Appendix 14-J.<br><br>Figure 15.7-12 is a map of non-fish-bearing aquatic habitat loss in the KSM Project mine site and relates to the text provided in the EA Application. Fish species | Reasonable treatment |



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| | | | | | Teigen watersheds." Has this loss of fish habitat in the watershed been quantified? If not, application is incomplete.<br>• 15.7.5.1.6 Intended Discharges into Treaty and Teigen Creeks. What are the intended concentrations of compounds to be discharged into Treaty and Teigen Creeks?<br>• Figure 15.7-12 What about fish bearing and non-fish bearing habitat off the project site but in the immediately adjacent watershed? | presence and distribution within the large Unuk River Watershed is provided in Table 15.1-4 and in Section 15.1.4.2.3. | |
| 268. | 11.7.6 | Fish and Aquatic Habitat | 15 | Tahltan Nation | The Application will identify potential effects, such as potential impacts from predicted water and sediment chemistry changes, on fish and aquatic habitat during all phases of the proposed Project with regard to: Dewatering activities;<br>• Dewatering is not mentioned within Chapter 15 (with the exception of the AIR descriptor). If it is specifically discussed elsewhere, then reference should be provided. | The Application/EIS considered the potential effects of dewatering impacts on fish. The Application/EIS will be amended to highlight that this has been considered.<br><br>Chapter 15 of the Application/EIS identifies potential impacts on fish and aquatic habitat with regard to dewatering activities. These activities will be part of various infrastructure development activities (e.g., road construction, TMF construction, water quantity loss downstream of the TMF). Sections of stream channels may need to be dewatered to facilitate road crossing construction. Potential impacts from dewatering during construction include direct mortality impacts (Section 15.7.1.1) and habitat loss (Sections 15.7.5.1.1, 15.7.5.1.2 and 15.7.5.1.3). Potential impacts will be mitigated by: adhering to construction timing windows, isolating Project work sites to prevent fish movement into the work site, salvage/removal of fish from the enclosed work site, and environmental monitoring (Section 15.7.1.2 and Chapter 26.9.1 (Fish and Aquatic Habitat Protection and Mitigation Plan) and Chapter 26.9.1 (Fish Salvage Plan).<br>Habitat impacted by dewatering that cannot be mitigated will be compensated based on the HADD Fish Habitat Compensation Plan (Appendix 15-R) and further referenced in Section 15.8.4.1.2. | Reasonable treatment |
| 269. | 11.7.6 | Fish and Aquatic Habitat | 15 | Tahltan Nation | The application will identify potential harmful alteration, disruption or destruction (HADD) of fish habitat and will describe:<br>• The locations and estimated areas of fish habitat potentially affected; | AIR requirements have been met. Information on potential habitat effects and losses (i.e. HADD) for salmon species is not limited and is provided throughout the EA application and in a detailed HADD Fish Habitat Compensation Plan (Appendix 15-R).<br><br>The comments referring to "minor amount of salmon habitat loss" are minor in terms of total area lost. Critical salmon habitat refers to the overall habitat quality criteria | Reasonable treatment |



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| | | | | | • Types of fish habitats that would potentially be affected (e.g. wetlands, stream channels, riparian habitat, etc) as well as the use by fish (e.g. spawning/incubation, rearing, food/nutrient, overwintering, migration, etc) including habitats that would potentially be affected by flow changes;<br>• Fish habitat types and areas of each type of habitat affected by the proposed Project, in a tabular format<br><br>Specific information on potential habitat effects and losses (i.e. HADD) for salmon species is limited.<br>Section 15.7.5.1.1 (page 15-174) states: "A minor amount of coho salmon habitat will be lost at the Coulter Creek, Unuk River, and Bell-Irving River crossings." "A minor amount of chinook salmon habitat will be lost at the Unuk and Bell-Irving River crossings." It then indicates that none of these crossings will result in the loss of critical salmon habitat.<br>Table 15.7-12 of the application provides some information on species present at stream crossings where habitat will be lost. Tables 4.3-3 and 4.3-4 in Appendix 15-R provides estimated habitat losses for coho and Chinook salmon, but only for Coulter Creek and Bell Irving River culverts or bridges.<br>It is recognized that Dolly Varden are focused upon, particularly for the footprint infrastructure areas. Also there is clearly habitat overlap | assessed at stream crossing sites. Critical fish habitat is defined as "rare or exceptionally productive or unusual habitat with very high habitat values which are of uncommon and/or highly valuable production". This definition comes from the BC Fish Stream Crossing Guidebook (BC MOF 2002). In the cases of these stream crossings critical habitat was determined not to be present based upon field assessments.<br><br>The HADD Fish Habitat Compensation Plan (see Sections 3.1 and 4.3 of Appendix 15-R) provides the answer to the reviewers comment regarding habitat loss. For habitat unit calculation and budgeting habitat loss the primary dominant species (based upon sampling data) residing within that particular stream was used. Multiple species may benefit from compensation projects or multiple species may be affected from habitat loss. To avoid double counting areas and habitat unit calculations the primary target species was selected for HU calculation.<br><br>Further details that the reviewer seeks are all provided in Appendix 15-R and appendices therein. As previously mentioned, Seabridge will provide a fish specific spatial distribution map for the Treaty Creek Watershed, Teigen Creek Watershed, and Unuk River Watershed. These maps will provide supplementary information to the EA application and provide a high level overview. | |



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| | | | | | amongst freshwater and anadromous species. However, given the importance of salmon as a VC, further details should be provided for habitat effects and losses by salmon species which includes: mapped spatial locations; estimated areas for all impacted sites; habitat type and use; and quantitative assessment of the impact severity. | | |
| 270. | 11.7.7 | Fish and Aquatic Habitat | 15 | GHC | The Application will identify mitigation measures and environmental management strategies to avoid, minimize, or otherwise mitigate potential effects of the proposed Project on fish and aquatic habitat.<br>• 15.7.5.2.4 "A chinook salmon monitoring program in Teigen Creek will be developed and will be implemented for the first 10 years of the TMF operation phase to monitor the predicted results of the effects assessment (Section 26.19.2)" What happens if the results found don't coincide/match predictions? How has the Proponent arrived at 10 years for the duration of the monitoring program? | If the results of the Teigen Creek chinook salmon monitoring program don't match/coincide with the predictions of the water quality/quantity model results then a review of the TMF water management design will be conducted. Based upon that review, a plan will be developed to reduce negative impacts to the Teigen Creek.<br><br>The 10 year duration of the monitoring program was proposed because it occurs during the first phase of TMF development (Years 0 -25). During the subsequent TMF development phases, Years 25-56 and Years >56, the percentage of change from baseline conditions will be less (Table 15.7-27); therefore potential impacts would be observed in the first phase of TMF development. The 10 year duration allows for sufficient time for annual recruitment (within natural cycles) and ability to detect changes due to water quantity loss. | Reasonable treatment. |
| 271. | 11.7.7 | Fish and Aquatic Habitat | 15 | GHC | Where required, a fish habitat compensation program to offset potential effects to fish and aquatic habitat, will be outlined.<br>• 15.8.2.4.1 "Effluent discharged from these components may also include process chemicals such as cyanide (TMF)…" Free | There are both discharge criteria and BC water quality guidelines for the protection of aquatic life for (weak-acid dissociable) cyanide. Cyanide-containing water from within the lined CIL pond will not be discharged directly into the environment. The overflow from the CIL pond will be treated through a final polishing stage ($H_2O_2$) treatment prior to discharge to the South or North tailings impoundment area. Free cyanide will not be not be present in the tailings impoundment area. | Reasonable treatment. |



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| | | | | | cyanide (CN-) will be found in the TMF? This is a concern, why not use a chemical binding agent to remove CN- from the TMF and/or render CN- inert? Cyanide is known to be highly toxic to both terrestrial and aquatic organisms alike. | | |
| 272. | 11.7.7 | Fish and Aquatic Habitat | 15 | GHC | Where required, a fish habitat compensation program to offset potential effects to fish and aquatic habitat, will be outlined.<br>• "… which provides guidance when assessing whether fish are within areas that may be affected by TMF discharge." Have the areas that the TMF discharge will impact been determined? | Locations of discharge from the TMF are described in the Water Management Plan (section 26.17), Chapter 14 (hydrology), and Chapter 14 (water quality). The TMF has the potential to affect water quantity in North Treaty Creek, to a lesser extent Treaty Creek, South Teigen Creek and to a lesser extent Teigen Creek. The water quality model was used to predict water quality changes and determine whether fish were likely to be affected by TMF discharge based on comparison of predicted water concentrations to guideline limits for the various metals (see Sections 15.7.4.3.1 and 15.8.2.4.1). Table 15.1-4 provides a summary of which species of fish were found in the various waterways during baseline studies. This table enabled determination of whether a fish species was found in one of the potentially affected creeks. | Reasonable treatment. |
| 273. | 11.7.7 | Fish and Aquatic Habitat | 15 | GHC | Where required, a fish habitat compensation program to offset potential effects to fish and aquatic habitat, will be outlined.<br>• "The potential increase in selenium tissue concentration is likely small… However, there is uncertainty associated with this assessment since tissue residues are not quantitatively estimated and toxic effects thresholds can't be well defined for most of the VC fish species." Will Seabridge Gold Inc. commit to conducting research that will effectively and definitively define toxic effects thresholds for the VC fish species? | Monitoring for effects to fish and aquatic resources/habitat is detailed in the AEMP (Chapter 26.18). The monitoring program is intended to identify changes in the aquatic environment that may occur as a result of discharges from the Project. The proponent has also committed to conducting a risk assessment of aquatic effects in the Unuk River since there is potential for changes to water quality in this area.<br><br>The data collected for the AEMP will further the scientific communities understanding of toxic effects from selenium on fish species in the Unuk River watershed. | Reasonable treatment. |
| 274. | 11.7.7 | Fish and Aquatic | 15 | GHC | Where required, a fish habitat | Section 15.8.2.4.1 will be updated to address the comment as follows: "The | Reasonable |



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| | | Habitat | | | compensation program to offset potential effects to fish and aquatic habitat, will be outlined.<br>• "The geographic extent of the residual effect was determined to be landscape for all fish species, since any effects are expected to occur downstream of the TMF, which is just outside of the Project footprint." The TMF is outside of the project footprint? This needs to be clarified, and corrected, if so. | geographic extent of the residual effect was determined to be landscape for all fish species, since any effects are expected to occur just outside of the Project footprint downstream of the TMF". | treatment. |
| 275. | 11.7.7 | Fish and Aquatic Habitat | 15 | GHC | The impacts to fish habitat resulting from the deposit of a deleterious substance in the TIA. Both plans should be prepared in consultation with DFO and accordance with the DFO's national Policy for the Management of Fish Habitat (1986) and consistent with DFO's Practitioners Guide to Habitat Compensation.<br>• Table 15.8-5 Description of Residual Effect – "Toxicity due to metals or process chemical exposure downstream of the Mine site WTP associated with scheduled discharge or seepage from the Mine Site WTP." How exactly will this be reversible on a regional scale? Will monitoring of these long-term perpetual effects be ongoing in perpetuity for as long as the effects are detectable/measureable? | Definitions of the criteria used in the effects assessment are found in Table 15.8-1. The rationale for selecting each descriptor of residual effect for Mine Site WTP discharge is provided in Section 15.8.2.4.1, subsection for Mine Site Water Treatment Plant Discharge. The residual effect was assessed as reversible since, over long periods of time, the concentrations of metals or process chemicals released from the Mine Site WTP will decrease. As the concentrations decrease, the potential for toxicity decreases and the effect becomes reversible. The residual effect was assessed as regional based on the water quality model results (predicted changes in water quality relative to BC water quality guidelines extend past the LSA, but remain within the RSA boundaries).<br><br>Monitoring of the aquatic environment is described in the AEMP in Section 26.18, and monitoring requirements for the Mine Site WTP will continue as long as the Project is subject to the MMER. Additional monitoring requirements may be established at the provincial level during permitting as conditions of the discharge permit for the Mine Site WTP. | Reasonable treatment. |



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| 276. | 11.7.7 | Fish and Aquatic Habitat | 15 | Tahltan Nation | Where required, a fish habitat compensation program to offset potential effects to fish and aquatic habitat, will be outlined.<br>The effectiveness and limitations of identified mitigation measures and environmental management strategies will be discussed.<br>• (26) Not outlined in this section | The fish habitat compensation plans to offset habitat loss are outlined and discussed in Section 15.8.4.1 of the EA Application. The details required for the fish habitat compensation plans are provided in Appendices 15-Q and 15-R.<br><br>Mitigation strategies and environmental management strategies are proposed throughout Chapter 15 and Section 26.9.1 of the EA Application. The fish and aquatic habitat mitigation and environmental management strategies proposed in the EA Application are all based upon peer –reviewed and professionally adopted best management practices. The best management practices were taken directly from accepted industry standards and published government literature (e.g., DFO and MOE). These are listed in Section 26.9.1.1 of Chapter 26.<br><br>Project infrastructure mitigation features, such as water diversion channels and dams, have been designed, reviewed, and stamped by a professional engineer according to industry standards.<br>In additional, water quality treatment mitigation proposed in the Application/EIS, is consistent with industry standards and technological solutions for water treatment systems. | Reasonable treatment. |
| 277. | 11.7.7 | Fish and Aquatic Habitat | 15 | Tahltan Nation | This section of the Application will also describe the Proponent's commitments, including those related to implementation of best practices.<br>• (26) No commitments identified in this section. | Seabridge's commitments related to implementation of best management practices are documented and identified throughout Chapter 26 – Section 26.9.1.<br>Mitigation objectives were identified: to minimize fish habitat loss due to the Project, where possible; where not possible, to receive the required permits to achieve DFO's no net loss of fish habitat requirements; and to protect listed species at risk. Commitments are proposed for general construction activities, access roads, transmission line, power plant, camps, mine site, tunnels, and tailing management facility. | Reasonable treatment. |
| 278. | 11.7.7 | Fish and Aquatic Habitat | 15 | Tahltan Nation | The HADD of fish habitat resulting from the project (including the dams and associated infrastructure required for the tailing impoundment area (TIA) and loss of habitat due to downstream flow impacts, transmission lines, road building, etc.);and<br>• (26) Not outlined in this section | The fish habitat compensation plan to offset habitat loss are outlined and discussed in Section 15.8.4.1 of the EA Application. The details required for the HADD Fish Habitat Compensation Plan is provided in Appendix 15-R. | Reasonable treatment. |
| 279. | 11.7.8 | Fish and Aquatic Habitat | 15 | Tahltan Nation | The Application will: Identify potential residual effects from the proposed Project on fish and aquatic habitat VCs after mitigation measures and | Line 3 of Table 15.7-35 of the Application/EIS has been deleted and the table has been relabelled as Table 15.7-36.<br><br>The residual effect is a "decrease in the productive capacity of aquatic habitat within | Reasonable treatment. |



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| | | | | | environmental management strategies have been applied;<br>• Table 15.7-35 (row 3) states that potential residual effects on fish and aquatic habitat VC's due to habitat loss and alteration at the mine site would be an: "Increase in aquatic habitat in open diversion channels/ditches.<br>• How was this determined and qualified? | non-fish bearing reaches of Mitchell, McTagg, Gingras, and Sulphurets Creeks", as indicated in line 2 of the table. The positive contribution of open diversion channels/ditches as potential aquatic habitat is discussed in Section 15.7.5.1.7. | |
| 280. | 11.7.9 | Fish and Aquatic Habitat | 15 | Tahltan Nation | Residual cumulative impacts on relevant VCs will be assessed.<br>• Section 15.9.3.5 (Overall Cumulative Effect on Aquatic Habitat Valued Component) states: "The potential for residual cumulative effects related to water quality changes was rated as not applicable (N/A)."<br>• What is the specific rationale for the above rating?<br>• In relation to the above question, section 15.9.3.3.1 (Project-specific Cumulative Effect of Water Quality Degradation) states: "The majority of past, present, and future projects identified as having potential linkages for residual cumulative effects may contribute to toxicity in fish associated with water quality degradation…" This does not seem to support an N/A rating. | The rationale for this assessment is provided in Section 15.9.2.5.1 for fish and 15.9.3.3.1 for aquatic habitat (and see example of the rationale for Brucejack and KSM Project interactions in the next paragraph). The rationale and conclusions in Chapter 15 (fish and aquatic resources) is consistent with the rationale and similar conclusions made in the cumulative effects assessment in the water quality chapter (Chapter 14; Section 14.9.2).<br><br>A potential linkage between projects means that the projects have some kind of temporal or spatial overlap. It does not necessarily mean that there will definitely be residual effects emanating from both of the overlapping projects that would lead to residual cumulative effects (i.e., the cumulative residual effect would be different than for just KSM Project residual effect alone). The reason for this is that even though projects may have temporal overlap and spatial overlap on a regional scale, the residual effects may be localized and may therefore not interact on a regional scale. For example, the Brucejack Project, which potentially has both spatial and temporal overlap with the KSM Project, is projected to have only local, low magnitude effects on water quality (as described in the publicly available Project Description for Brucejack). These effects are not expected to extend into areas (e.g. Sulphurets Creek) where water quality changes related to the KSM Project may occur. Thus, there would be no residual cumulative effects of the two projects (i.e. the cumulative residual effect is indistinguishable from that of the KSM Project alone), leading to an assessment of 'not applicable'. | Reasonable treatment. |
| 281. | 11.8 | Wetlands | Chapter 16 / Sections 16.3 and16.5<br>Chapter 23 | NLG | Aesthetic / recreational values not mentioned | Aesthetic / recreational values are assessed in Chapters 23 and 24 of the Application/EIS. Based on the lack of access to the Project area, these values are low in relation to the wetlands that will be impacted by the Project. | Reasonable treatment. |



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| | | | Chapter 24 | | | | |
| 282. | 11.8 | Wetlands | Chapter 16 / Sections16.5 and 16.7 | NLG | It is not clear that the Application identified and evaluated the potential effects of the proposed Project on wetland extent and function in relation to the federal policy as per the AIR. It is clear that a compensation plan was developed with the federal policy in mind. | Potential effects of the Project on wetland extent and function are assessed in Section 16.5 of the Application/EIS as follows: Two aspects of wetlands were studied: (1) wetland extent and (2) wetland function.<br>The text in Section 16.5 indicates that wetland extent and function were selected because:<br>• there is a growing concern over the escalating rate of wetland loss in BC (BC MOE 2011);<br>• federal wetland policy and environmental assessment guidelines request that wetland functions be included in environmental assessments (Environment Canada 1991; Milko 1998); and<br>• wetland functions are valued by society.<br>.Section 16.7 focuses on lost wetland extent and wetland function. Section 16.7.1 includes information identifying published wetland functions, tied to observed wetland classes and types within the project area. This information, in conjunction with observed and recorded wetland parameters; including vegetation, hydrology, and soils information, was used to draw broad based wetland functionality conclusions for each wetland class observed in the project area.<br>Lost wetland function was tied to lost wetland area for each affected wetland, as well as indirect impacts to other wetlands that were not identified as lost. The functions being identified by a set of criteria equating wetland class and function as per Hanson et al. 2008.<br>Table 16.7-4 discusses Project effects on wetlands in terms of extent and the four primary wetland functions as identified by Environment Canada (Hanson et al. 2008). | |
| 283. | 11.8 | Wetlands | Chapter 16<br>Chapter 26 / Section 26.19 | NLG | 16.6 does not appear to discuss hypothesized effectiveness; could not find the word 'effectiveness' in section 26.19 | Section 26.19.1.5 of the Application/EIS notes the following: which addresses this issue under the monitoring heading.<br>"Monitoring programs are recommended to assess ongoing effects of construction and operation and identify changes in wetland ecosystems that may trigger additional mitigation. Specific monitoring programs will be instituted within each associated management plan referenced in the Wetlands Management Plan to ensure mitigation measures and strategies are effective."<br>This section of text specifically applies to determining the "effectiveness" of the management strategies and the resultant adaptive management strategy response. | Reasonable treatment. |
| 284. | 11.8 | Wetlands | Chapter 16 / Section 16.7 | GHC | Fig. 16.7-1 explains nothing. What is that figure trying to convey? | Figure 16.7-1 of the Application/EIS is intended to show the steps taken during the design of the Project to avoid potential wetland impacts. The figure illustrates the changes that were made to the siting of Project infrastructure from 2010 through 2012 to avoid wetlands. | Reasonable treatment. |
| 285. | 11.8 | Wetlands | Chapter 16 / Sections | GHC | Sect. 16.7.1.1.1 explains that in 2010, | The metrics are intended to be the same even though the language differs (direct | Reasonable |



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| | | | 16.7 | | the TMF access road would have affected 2.6 Ha directly and 40 Ha indirectly of wetlands (total of 42.6 Ha wetland affected). However, the new road alignment up Treaty Creak would affect 22.6 Ha (a loss of 0.8 Ha and degradation of 21.8 Ha). The Proponent is doing a comparison of two scenarios, explaining how in the second scenario they have degraded/affected a smaller wetland area. The first problem is they use different metrics for each option (directly/indirectly in first, loss of and degraded in second). The second problem is their calculation is wrong (if 42.6 Ha was going to be affected, but by changing plans only 21.8 Ha was affected, this reduces the area affected by 20.0 Ha, and they claim it reduces is by 31.3 Ha. | impacts = LOSS; indirect impacts = DEGRADED).<br>The area calculation includes both the wetlands avoided at the Treaty OPC as well as the Treaty Creek Access Road. The numbers represent data used during the analysis and rounded to the nearest number. The total area of wetlands avoided due to re-sting Project infrastructure should read 29.2 ha (based on the numbers derived from the original table). | treatment. |
| 286. | 11.8 | Wetlands | Chapter 16 (Appendix 16-B) | GHC | The Gitanyow are concerned about downstream impacts in the Nass Watershed. The proponent does a good job of explaining how wetlands provide ecological, hydrological and biochemical function within a watershed. The majority of the wetlands within the Teigen and Treaty watersheds would be eliminated by this project, therefore affecting the function of these headwater systems. The Proponent claims that by developing a wetland restoration/enhancement project in the Bulkley River drainage 275km away from the project area will compensate for negative impacts to wetlands in the project area.<br>In principle, developing a wetland compensation project near Smithers, with a conceptual plan of creating a research/education site, is a good | The majority of the wetland restoration/compensation activities (55% by area, 94% by proposed enhanced/restored/constructed wetland polygon) are within 35 km of the Project site and fall in the Teigen, Treaty and Taft watersheds. The Treaty and Taft sites are sub basins of the Nass Watershed, providing compensated wetland functions and values to this watershed.<br>The Wetland Compensation Plan (Appendix 16-B of the Application/EIS) describes the rationale for selecting the compensation sites. The majority of the wetland restoration/compensation activities (55% by area, 94% by proposed enhanced/restored/constructed wetland polygon) is within 35 km of the Project. Site selection of the compensation options in the vicinity of the Project included an evaluation of the following: land availability, current impacts to the proposed compensation areas, and accessibility. In addition these sites were tied directly to the fish habitat compensation sites to provide for ecosystem restoration rather than mono-typical restoration.<br>The intent was also to limit manipulation of existing wetland habitats or other habitats that are/were largely undisturbed and at a natural equilibrium to prevent additional inadvertent environmental damage or change of natural function. The inaccessibility of the Project site limits the ability to restore, enhance or create new wetlands in the immediate vicinity of the Project.<br>A portion of the compensation is proposed for the Smithers area (approximately 20 hectare). This site has a high educational component. | Reasonable treatment. |



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| | | | | | idea. However, this does not compensate for the affects to the Teigen/Treaty/Bell-Irving/Nass watersheds and therefore should NOT be included in the compensation ratio.<br>The Smithers project comes across more as a great publicitiy tactic by Seabridge which should be done at their own expense and not as compensation for a destroyed wetland 275 km away.<br>In contrast, the Proponent does initially propose two wetland compensation projects off-site but in the Nass Watershed: one near Van Dyke camp and one near the Brown Bear airstrip. These would at least be within the same major watershed as the mine and TMF. | The Van Dyke Camp site is problematic because it is located on private land and has limited compensation value (see Brown Bear discussion below). The preference is to locate compensation projects on Crown land to better ensure perpetuity of the compensation investment.<br>The Brown Bear Airstrip site is a small infill area that would not provide significant gains towards compensation goals. This restoration would also not have a significant impact to restoring the wetland functions as the in-filled area is relatively small compared to the entire undisturbed wetland ecosystem. In addition there are potential bureaucratic hindrances with multiple layers of governmental consultation required to make changes to identified airstrips, along with land ownership, and minimal environmental returns. | |
| 287. | 11.8 | Wetlands | Chapter 16<br>Chapter 39 | GHC | The proponent has only put forth conceptual designs for compensation, with no firm commitments stated. | The Application/EIS includes a conceptual-level wetland compensation plan. Seabridge anticipates the EA certificate would include a commitment to provide compensation for impacted wetlands (see Chapter 39, Table 39-5.1, Conditions 23 and 24). | Reasonable treatment. |
| 288. | 11.8 | Wetlands | Chapter 16<br>Chapter 3 (Appendix 3-N) | GHC | The Proponent should have consulted with First Nations groups when looking for potential wetland compensation sites. | First Nations were consulted during the development of the wetland compensation plan during KSM Project Working Group meetings. No comments were received by Aboriginal groups on the proposed wetland compensation plan (see Appendix 3-N for summary of the issues raised by Frist Nations during the Application/EIS review stage). Aboriginal groups will have an opportunity to comment on proposed wetland compensation plan during the Application/EIS review stage. | Reasonable treatment. |
| 289. | 11.8 | Wetlands | Chapter 16<br>Chapter 26 / Section 26.19 | Tahltan Nation | The Application will:<br>Discuss the hypothesized effectiveness of identified mitigation measures and environmental management strategies;<br>Develop a conceptual wetlands compensation plan based on concepts in the *Federal Policy on Wetland Conservation*.<br>• (26) Not outlined in this section | Section 26.19.1.5 of the Application/EIS notes the following: which addresses this issue under the monitoring heading.<br>"Monitoring programs are recommended to assess ongoing effects of construction and operation and identify changes in wetland ecosystems that may trigger additional mitigation. Specific monitoring programs will be instituted within each associated management plan referenced in the Wetlands Management Plan to ensure mitigation measures and strategies are effective."<br>This section of text specifically applies to determining the "effectiveness" of the management strategies and the resultant adaptive management strategy response. | Reasonable treatment. |



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| 290. | 11.8 | Wetlands | Chapter 16 / 16.7, 16.8 | Tahltan Nation | The Application will:<br>-Identify potential residual effects of the proposed Project on wetland ecosystems, after mitigation measures and environmental management strategies have been applied; and<br>-Determine the significance of the identified potential residual effects from the proposed Project, based on the significance criteria listed in Section 10.8.<br>• Tahltan Land Uses are more than just harvesting that should be considered in the analysis | Text in Chapter 30: First Nations Interests will be updated to address the comment as follows, "First Nations traditional uses of, and connection to, the land and associated terrestrial and aquatic resources are the most obvious, but not the only, expression of Aboriginal rights and title in their traditional territories. That is, the Aboriginal rights most relevant to the Project are those related to hunting, fishing, trapping, the collection of traditional food and medicinal plants, and related environmental resources, activities or practices, and attributes which are important to the specified First Nations"<br>Seabridge acknowledges Tahltan land uses are more than just harvesting, however, the effects assessment of harvesting activities and issues is uses as a proxy for Tahltan use of land and resources for traditional purposes. | Reasonable treatment. |
| 291. | 11.9 | Ecosystems and Plant Communities | Chapter 17 / Section 17.1.2 | BC EAO | Results of Terrestrial Ecosystem Mapping (TEM), which will be from aerial photographs. The TEM will be used to characterize the local study area. Air photo interpretation will be conducted using 1:20,000 scale 2008 colour aerial photographs. Mapping methods will include those for digital data capture. Mapping will be guided by the following relevant provincial standards:<br>• No mention of 1:20,000 scale 2008 aerial photographs | The use of 2008 colour aerial photography for terrestrial ecosystem mapping is referenced within Appendix 17-A: *KSM Project: 2009 Vegetation and Ecosystem Mapping Baseline Report.* Refer to Section 3.2.2 (Page 3-3).<br>Section 17.1.2 of the Application / EIS refers to Appendix 17-A: *KSM Project: 2009 Vegetation and Ecosystem Mapping Baseline Report* for the detailed mapping methodology, including the use of digital imagery based on aerial photos. | Reasonable treatment. |
| 292. | 11.9 | Ecosystems and Plant Communities | Chapter (Appendix 17-A) | BC EAO | Howes, D. E., and E. Kenk. 1997. Terrain Classification System for British Columbia. Version 2. Victoria: BC Ministry of Environment.<br>• No reference found | This standards document (Howes and Kenk 1997) is referenced within Appendix 17-A: KSM Project: 2009 Vegetation and Ecosystem Mapping Baseline Report. Refer to Section 3.2.2 (Page 3-3).<br>Section 17.1.2 of the Application / EIS refers to Appendix 17-A: KSM Project: 2009 Vegetation and Ecosystem Mapping Baseline Report for the detailed methodology. | Reasonable treatment. |
| 293. | 11.9 | Ecosystems and Plant Communities | Chapter 17 (Appendix 17-A) | BC EAO | RIC. 1999. Standard for Predictive Ecosystem Mapping in British Columbia. Victoria, BC: Terrestrial Ecosystem Mapping Alternatives Task Force, Resources Inventory Committee, Version 1.0. | This standards document (RIC 1999) is referenced within Appendix 17-A: *KSM Project: 2009 Vegetation and Ecosystem Mapping Baseline Report.* Refer to Section 3.2.4 (Page 3-9).<br>Section 17.1.2 of the Application / EIS refers to Appendix 17-A: *KSM Project: 2009 Vegetation and Ecosystem Mapping Baseline Report* for the detailed methodology. | Reasonable treatment. |



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| | | | | | • No reference found | | |
| 294. | 11.9 | Ecosystems and Plant Communities | Chapter 17 (Appendix 17-A) | BC EAO | Results of Predictive Ecosystem Mapping (PEM), which will be conducted using the Landmapper program, which uses digital elevation models (DEM) and satellite images to produce a raster-based vegetation map of the area. Each cell in the map will include data on both structural stage and site series within BEC sub-zones.<br>• No reference to Landmapper found | The reference to the LandMapR software toolkit developed by LandMapper Environmental Solutions Inc. (MacMillan 2003) appears within Appendix 17-A: *KSM Project: 2009 Vegetation and Ecosystem Mapping Baseline Report.* Refer to Section 3.2.3 (Page 3-5).<br>Section 17.1.2 of the Application / EIS refers to Appendix 17-A: *KSM Project: 2009 Vegetation and Ecosystem Mapping Baseline Report* for the detailed methodology. | Reasonable treatment. |
| 295. | 11.9 | Ecosystems and Plant Communities | Chapter 17 (Appendix 17-A) | BC EAO | TEM and PEM will be ground-truthed through ecosystem surveys. The ecosystem mapping fieldwork will focus on general characterization of the ecological community structure and diversity in collaboration with the wildlife and soils researchers. Data will be collected using standard Ground Inspection Forms (GIF) in accordance with provincial standards and regional field guides:<br>• No reference to GIF found | The reference to the completion of Ground Inspection Forms (GIF) appears within Appendix 17-A: *KSM Project: 2009 Vegetation and Ecosystem Mapping Baseline Report.* Refer to Section 3.2.5 (Page 3-10).<br>Section 17.1.2 of the Application / EIS refers to Appendix 17-A: *KSM Project: 2009 Vegetation and Ecosystem Mapping Baseline Report* for the detailed methodology. | Reasonable treatment. |
| 296. | 11.9 | Ecosystems and Plant Communities | Chapter 17 / Section 17.1.3 | MOE | The rare plant data presented in the KSM application was obtained from Pretium Resources Inc's Brucejack Mine under a data sharing agreement and provides inadequate representation of the local study area and regional study area pertinent to KSM. This is a gap in the data required by the AIR Section 11.9.1. | The Application/EIS (Section 17.1.3.3) included information from a rare plant survey that was conducted for the Brucejack Project as the terrestrial ecosystem study areas for the KSM and Brucejack Project overlap. Surveys completed for the KSM Project included undertaking an inventory of TEM plots in the summer months when most plants, including rare (listed) species, would be flowering and most easily identified. All plant species identified within each of the field plots were compared with the BC CDC's list of rare plants potentially occurring in the area to determine if any rare species had been identified. Using this presence / not detected survey methodology and survey intensity, none of the rare plants on the BC CDC list were identified.<br>Seabridge has committed to undertaking rare plant surveys this summer. The results of this survey will be provided to the KSM Project Working Group in September 2013. In preparation for the KSM Project rare plant surveys, a list of potential rare species and associated habitat will be compiled. This list will include those species that have a conservation-priority S-ranking (subnational [i.e., provincial] conservation ranking according to NatureServe, protection under the | Reasonable treatment. |



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| | | | | | | Species at Risk Act (SARA 2002b) and those ranked as threatened or endangered by COSEWIC. | |
| 297. | 11.9 | Ecosystems and Plant Communities | Chapter 17 / Section 17.1.3 | BC EAO | Rare plant surveys will be conducted in concert with ground-truthing fieldwork. Only conducted for Brucejack, not KSM. | See response to comment #296. | Reasonable treatment. |
| 298. | 11.9 | Ecosystems and Plant Communities | Chapter 17/ Section 17.7.<br>Chapter 26 / Section 26.20 | BC EAO | Plant samples will be collected for metals analysis in collaboration with the country foods baseline. Principal wildlife forage species and berry plants will be chosen, as well as alpine plants. Plants will be collected close to potential dust-sources such as the proposed open pits and TMF and at a greater distance (~5 km) to serve as controls.<br>• Reference to the fact that samples will be collected in the future | Sections 17.7.2.2.3 and 26.20.4.2 of the Application / EIS, which previously stated that "*Sampling will begin during the Construction Phase and continue throughout the Operation Phase*…" have been amended to include the Closure and Post-closure Phases.<br>Section 26.20.4.2 states that "*Proposed monitoring after the Closure phase is addressed separately within the Post-closure Monitoring Program (Chapter 27)*."<br>Details of the Post-closure sampling and monitoring are outlined within Section 27.10.2.3. Section 25.7.3.1 also outlines the continued monitoring of vegetation through the Closure / Post-closure phases to assess potential changes to country food quality. | Reasonable treatment. |
| 299. | 11.9 | Ecosystems and Plant Communities | Chapter 17<br>Chapter 26 / Section 26.20 | Tahltan Nation | Plant samples will be collected for metals analysis in collaboration with the country foods baseline. Principal wildlife forage species and berry plants will be chosen, as well as alpine plants. Plants will be collected close to potential dust-sources such as the proposed open pits and TMF and at a greater distance (~5 km) to serve as controls.<br>• Incorrect Management Plan this is for invasive plants not plant toxicity | Invasive Plant Management Plan will be reviewed to ensure any toxicity-related information is removed and placed into the appropriate management plan. No information of relevance to toxicity exists within Section 26.20.2 – Invasive Plant Management Plan. Section 26.20.4 contains the Terrestrial Plant Tissue Metal Concentrations Monitoring Plan. | Reasonable treatment. |
| 300. | 11.9 | Ecosystems and Plant Communities | Chapter 17 (Appendix 17-A) | BC EAO | Develop both TEM and PEM for the proposed Project area. TEM will be conducted at 1:20,000 scale and PEM will be conducted using 90 m2 pixel sizes.<br>• No reference to 1:20,000 scale for TEM mapping or pixel size for PEM found | The reference scale of mapping for TEM appears within Appendix 17-A: *KSM Project: 2009 Vegetation and Ecosystem Mapping Baseline Report.* Refer to Section 3.2.3.1 (Page 3-5).<br>The references to pixel sizes associated with the PEM output; and the input data (SPOT5 and Landsat imagery) appears within Appendix 17-A: *KSM Project: 2009 Vegetation and Ecosystem Mapping Baseline Report.* Refer to Sections 3.2.3 (Page 3-4) and 3.2.3.1 (Page 3-5).<br>Section 17.1.2 of the Application / EIS refers to Appendix 17-A: *KSM Project: 2009* | Reasonable treatment. |



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| | | | | | | *Vegetation and Ecosystem Mapping Baseline Report* for the detailed methodology. | |
| 301. | 11.9 | Ecosystems and Plant Communities | Chapter 17 (Appendix 17-A) | BC EAO | The RSA will include the area used to assess potential effects for regional wildlife VCs. This area will match the Predictive Ecosystem Mapping area, studied in the baseline.<br>• Unclear whether RSA matches PEM mapping area | The following sentences appear within Appendix 17-A: *KSM Project: 2009 Vegetation and Ecosystem Mapping Baseline Report.* Refer to Section 3.2.1 (Page 3-3): *"For the KSM Project, TEM was used for the LSA and PEM was used for the RSA. These two mapping methods are described in the following sections."*<br>Section 17.1.2 of the Application / EIS refers to Appendix 17-A: *KSM Project: 2009 Vegetation and Ecosystem Mapping Baseline Report* for the detailed methodology. | Reasonable treatment. |
| 302. | 11.9 | Ecosystems and Plant Communities | Chapter 17 / Section 17.7.2<br>Chapter 16 / Section 16.20 | BC EAO | Use of herbicide along transmission line and access road rights of way to manage vegetation<br>• Unable to locate potential effects from herbicides on VCs in these sections | Chapter 17, Sections 17.7.2.1.4 and 17.7.2.2.4 will be updated to more clearly articulate the potential degradation effects from herbicide use along transmission corridors, access roads rights-of-way, or other Project infrastructure. Section 26.20.2.3 currently references the methodology outlined within the *IVMP for Transmission Rights-of-Way* (BC Hydro 2010) in the event herbicide use is proposed. | Reasonable treatment. |
| 303. | 11.9 | Ecosystems and Plant Communities | Chapter 17 / Chapter 26 (Appendix 26.20)<br>Chapter 39 | BC EAO | List the commitments that the Proponent will make with respect to ecosystem and plant community VCs, based on proposed mitigation.<br>• Mitigation measures are presented, but in the form of specific commitments | Management and mitigation measures are provided in the Terrestrial Ecosystems Management and Monitoring Plans within Chapter 26 (Section 20). Table 39.2-1 in Chapter 39 summarizes the key mitigation measures for Terrestrial Ecosystem VCs and Table 39.5-1 includes the following conditions:<br>• The EA Certificate holder must conduct a rare plant survey prior to Construction; and<br>• The EA Certificate holder must develop and implement a Terrestrial Ecosystems Management and Monitoring Plan to assess the success of re-vegetation. | Reasonable treatment. |
| 304. | 11.9 | Ecosystems and Plant Communities | Chapter 17<br>Chapter 30 / Section 3.3.1.5 | Tahltan Nation | Ecosystems and Plant Communities→Mitigation and Environmental Management→The Application will: Identify mitigation measures and environmental management strategies to avoid, minimize, or otherwise mitigate potential effects of the proposed Project on ecosystem and plant community VCs;<br>• For sections17.7 – 17.11 it is not clear on Tahltan criteria was used on determining effects, significance, and mitigations | Chapter 5 identifies the assessment methodology followed for the EA. Tahltan criteria were considered in the EA where information had been provided by the Tahltan. | Reasonable treatment. |
| 305. | 11.9 | Ecosystems and Plant | Chapter 17 | Tahltan | List the commitments that the Proponent will make with respect to | Management and mitigation measures are provided throughout the Terrestrial Ecosystems Management and Monitoring Plans within Chapter 26 (Section 26.20). | Reasonable |



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| | | Communities | Chapter 26 / Section 26.20<br>Chapter 39 | Nation | ecosystem and plant community VCs, based on proposed mitigation.<br>• (26) No commitments identified in this section. | Table 39.2-1 in Chapter 39 summarizes the key mitigation measures for Terrestrial Ecosystem VCs and Stable 39.5-1 includes the following conditions:<br>• The EA Certificate holder must conduct a rare plant survey prior to Construction; and<br>• The EA Certificate holder must develop and implement a Terrestrial Ecosystems Management and Monitoring Plan to assess the success of re-vegetation. | treatment. |
| 306. | 11.10 | Wildlife and Wildlife Habitat | Chapter 18 / Section 18.1.4 | BC EAO | Inventory Methods for Bears – Standards for Components of British Columbia Biodiversity No 21. May 1998<br>• Unable to locate specific reference to this in the text | The Inventory Methods for Bears – Standards for Components of British Columbia Biodiversity No 21. May 1998 is referenced in Appendix 18-C of the Application/EIS.<br>Section 18.1.4 provides an overview of baseline study methodologies. The use of the RISC inventory methods for all VCs was summarized in this section: "Field surveys were conducted for moose, mountain goats, grizzly bears, furbearers, groundhogs (a term used by the Tahltan to describe both hoary marmots and Arctic ground squirrels), small mammals, bats, songbirds, raptors, waterfowl, and amphibians, following the inventory standards established by the BC Resources Information Standards Committee (RISC)." | Reasonable treatment. |
| 307. | 11.10 | Wildlife and Wildlife Habitat | Chapter 18 / Section 18.1.4 | BC EAO | Inventory Methods for Pond Rearing Amphibians and Painted Turtle – Standards for Components of British Columbia's Biodiversity No. 37. March 1998. Version 2.0;<br>• No reference found | The RISC Standards for amphibians (Inventory Methods for Pond Rearing Amphibians and Painted Turtle – Standards for Components of British Columbia's Biodiversity No. 37 March 1998 Version 2.0) provide general guidance for amphibian surveys. The focus of baseline surveys for the Project were western toads; therefore, field methods for detecting western toads were adapted from standard amphibian sampling techniques and western toad monitoring programs, particularly methodologies presented in Pyare 2005 ("Establishment of a large-scale monitoring program for the western toad (Bufo boreas) in Southeast Alaska. Juneau, Alaska, Alaska Department of Fish and Game"), which is considered the scientific standard for this work for western toads. These standards were used within the context of the RISC Standards. Pyare 2005 is referenced in Appendix 18-A of the Application/EIS.<br>Section 18.1.4 provides an overview of baseline study methodologies. The use of the RISC inventory methods for all VCs was summarized in this section: "Field surveys were conducted for moose, mountain goats, grizzly bears, furbearers, groundhogs (a term used by the Tahltan to describe both hoary marmots and Arctic ground squirrels), small mammals, bats, songbirds, raptors, waterfowl, and amphibians, following the inventory standards established by the BC Resources Information Standards Committee (RISC)." | Reasonable treatment. |
| 308. | 11.10 | Wildlife and Wildlife Habitat | Chapter 18 / Section 18.1.5 | BC EAO | Habitat suitability models are considered for by relying on models of grizzly bear and marten habit as well as ecosystem mapping of mature cottonwood within riparian areas. | The Application/EIS relies on American marten and black bear habitat suitability models for fisher because they use similar habitat as fisher. The black bear denning habitat models (Section 18.1.5.2.2.) use algorithms for predicting ecosystem units that may support large trees (such as decadent cottonwood) that are similar to the algorithms used for fisher habitat suitability models (British | Reasonable treatment. |



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| | | | | | Fisher habitat use and potential effects of the Project are reflected in the American marten and bear effects assessments and mitigation for black bears (e.g., avoiding den sites). | Columbia Wildlife Habitat Rating Standards – RISC 1999).<br>Both black bears and fisher den in forested areas and are dependent on trees with sufficient diameter to permit denning within the boles. Black bears also develop ground dens underneath the root wads of large trees. These requirements suggest that stands with the potential to support vegetation features that could be used as dens are sufficiently similar for the two species that they may be modelled together; therefore, the black bear denning habitat suitability model was used as a proxy for fisher winter habitat.<br>The proposed methods for wildlife baseline surveys, including habitat suitability modelling were discussed with the KSM Project Working Group in the winter of 2008. The habitat suitability baseline report was presented at Working Group meetings in 2010, 2011, and 2012.<br>The wildlife management plan identifies pre-construction monitoring for evaluating wildlife use and conservation of large trees, such as cottonwood, given their value as denning habitat for fisher and black bear. | |
| 309. | 11.10 | Wildlife and Wildlife Habitat | Chapter 18 / Section 18.9.1 | GHC | The Proponent objected to conducting any work towards determining movement in and out of the RSA by species known to be far ranging, such as moose (March 23/2010 letter to Gitanyow from Greg McKillop, Rescan), grizzly bears, Kermode/black bears, wolverine and migratory birds. In the absence of this information, and considering the close proximity of the RSA to Gitanyow Territory, the Gitanyow assume that the wildlife species mentioned above would potentially range between the RSA and Gitanyow Territory and therefore will be affected by this project. | The EA focused on wildlife within the RSA and potential effects of the Project in this area. The potential effects on wildlife populations outside of the RSA are considered in the Cumulative Effects Assessment (CEA; see section 18.9.1 of the Application/EIS). The CEA encompasses a broader spatial area that extends south of the RSA for moose, mountain goats, and bears. For example, the two Wildlife Management Units that converge at the KSM Project (WMUs 6-21 and 6-17) were used as the spatial boundary for the moose and mountain goat CEA, while the grizzly bear population unit (GBPU) boundaries (the outer periphery of the three GBPUs that converge at the KSM Project) were used as the spatial boundary for the grizzly and black bear CEA. | Reasonable treatment. |
| 310. | 11.10 | Wildlife and Wildlife Habitat | Chapter 18 / Section 18.1 | GHC | It was not clear that any significant literature review was conducted. There were two land use plans mentioned (Cassiar-Iskut-Stikine and Nass South SRMP). | Section 18.1 of Chapter 18 describes the Wildlife and Wildlife Habitat Setting. This section was developed using information from a variety of government sources (e.g., Cassiar-Iskut Stikine Land and Resource Management Plan and Nass South Sustainable Resource Management Plan), scientific literature, and databases (e.g., BC Conservation Data Centre). A list of references is provided on pages 18-426 to 18-450. It includes381 references related to wildlife). | Reasonable treatment. |
| 311. | 11.10 | Wildlife and Wildlife Habitat | Chapter 18 / Section 18.1.5 | GHC | The AIR states clearly that the Proponent must conduct habitat suitability modelling for fisher and | The Application/EIS relies on American marten and black bear habitat suitability models for fisher because they use similar habitat as fisher. The black bear denning habitat models (Section 18.1.5.2.2.) use algorithms for predicting | Reasonable treatment. |



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| | | | | | they have not. Instead they have relied on grizzly bear and marten models and ecosystem mapping as stated above. They have not indicated whether this is an acceptable method or whether it was approved. | ecosystem units that may support large trees (such as decadent cottonwood) that are similar to the algorithms used for fisher habitat suitability models (British Columbia Wildlife Habitat Rating Standards – RISC 1999).<br><br>Both black bears and fisher den in forested areas and are dependent on trees with sufficient diameter to permit denning within the boles. Black bears also develop ground dens underneath the root wads of large trees. These requirements suggest that stands with the potential to support vegetation features that could be used as dens are sufficiently similar for the two species that they may be modelled together; therefore, the black bear denning habitat suitability model was used as a proxy for fisher winter habitat.<br>The proposed methods for wildlife baseline surveys, including habitat suitability modelling were discussed with the KSM Project Working Group in the winter of 2008. The habitat suitability baseline report was presented at Working Group meetings in 2010, 2011, and 2012.<br><br>The wildlife management plan identifies pre-construction monitoring for evaluating wildlife use and conservation of large trees, such as cottonwood, given their value as denning habitat for fisher and black bear. | |
| 312. | 11.10 | Wildlife and Wildlife Habitat | Chapter 18 / Section 18.1.5 | Skii km Lax Ha TOC Comments | No bat mist netting conducted | The Application/EIS assumes that bats are found in the wildlife RSA, including species of conservation concern (e.g., little brown myotis and the silver-haired bat). The methods used to detect bats are consistent with the detection methods identified in the "Inventory Methods for Bats – Standards for Components of British Columbia's Biodiversity No. 20. 1998", referenced in section 11.10.1 of the AIR. The Anabat system was used to detect and identify the distribution of bats in the RSA. Bat mist netting was not undertaken as the Anabat system provided the information required for the effects assessment, as it was assumed that species at risk (e.g., little brown myotis) occurred in the RSA/LSA as well as the sensitive silver-haired bat (identified from other regional inventory). Because the approach was taken to assume that these species were present, further characterization of the species from mist netting would not have influenced the impact assessment/management plans, as these were developed assuming these species occur in the area. | Reasonable treatment. |
| 313. | 11.10 | Wildlife and Wildlife Habitat | Chapter 18 / Section 18.2 | GHC | There is no significant mention of the Nass moose population decline. Considering the baseline studies indicate that the Teigen and Treaty Creeks, which are Nass drainages, contain significant high value moose range, this should have been considered as important background | The importance of moose in the Nass is included in the Application/EIS. The EA focuses on moose populations within the RSA and potential effects of the Project in this area. Section 18.2 outlines historical activities in the RSA that may have or continue to affect wildlife. The CEA encompasses a broader area and considers the moose population decline in the Nass, including a discussion of various possible causes and how traffic and hunting might further affect the population. Based on the concerns raised by the KSM Project Working Group, Seabridge prepared a population viability assessment of the Nass moose population. A population | Reasonable treatment. |



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| | | | | | information and current pressures on wildlife.<br><br>Another important context piece missing from the background information was around cumulative impacts to wildlife, as well as uncertainties around populations. | dynamics model received from the British Columbia Ministry of Environment was used to perform a historical reconstruction of the Nass population under known harvests and demographic rates, and a moose vehicle collision model was imbedded into the population dynamics model (see Appendix D of Appendix 22-C in the Application/EIS). | |
| 314. | 11.10 | Wildlife and Wildlife Habitat | Chapter 18 / Section 18.4.1 (Appendix 18-B) | BC EAO | The RSA will include the area used to assess potential effects for regional wildlife VCs. This area will match the Predictive Ecosystem Mapping area, studied in the baseline.<br>• Not explicit; need to confirm | The RSA used for the assessment (Figure 18-4-1 in the Application/EIS) is the same RSA used for the baseline report (Figure 1.5-1 in Appendix 18-A) and as the RSA used for PEM and therefore, the habitat suitability models (Figure 1.5-1 in Appendix 18-B). | Reasonable treatment. |
| 315. | 11.10 | Wildlife and Wildlife Habitat | Chapter 18 / Sections 18.3, 18.5<br>Chapter 23 / Section 23.1 | BC EAO | Species important to local peoples for hunting, trapping and recreation.<br>• Not specifically referenced in this section | Table 18.5-1 lists the wildlife VCs and their rationale for inclusion as VCs in the Application/EIS.<br>Section 18.3 (Table 18.3-1) of the Application/EIS outlines the wildlife objectives of the Cassiar Iskut-Stikine Land and Resource Management Plan and the Nass South Sustainable Resource Management Plan.<br>Further information on the species that are important to local peoples for hunting, trapping, and recreation is included in Sections 23.1.4.3, 23.1.4.4, 23.1.4.5, and 23.1.4.6 of the Application/EIS. | Reasonable treatment. |
| 316. | 11.10 | Wildlife and Wildlife Habitat | Chapter 18 / Section 18.7 (Appendix 18-B) | BC EAO | Direct habitat loss or alteration for each wildlife VC using the results of habitat suitability modelling and field surveys to map and rate habitat quality;<br>• Only did habitat suitability modelling for 6 of the VCs | Habitat suitability modeling was conducted for 6 of the 11 VCs: moose, mountain goat, grizzly bear, black bear, American marten, and hoary marmot. Direct habitat loss or alteration for the remaining 5 VCs (bats, raptors, wetland birds, forest/alpine birds, and western toads) used results from field surveys to rate habitat quality, and habitat loss was assessed from known habitat preferences and the results of vegetation/ecosystem mapping.<br>For example, raptor habitat loss was assessed using suitable nesting habitat for raptors, which was identified as mature and old-growth forests from ecosystem mapping, including structural stages 6 and 7 in all BEC zones, and old, large deciduous trees (structural stage 5) in floodplain forests in the ICH and CWH BECs (see Section 18.7.1.8.1 of the Application/EIS).<br>Wetland bird habitat loss was assessed separately for three groups of wetland birds that occupy different types of habitat: (1) wetland birds, (2) cavity-nesting waterfowl, and (3) riverine birds. Wetland birds (e.g., dabbling ducks, geese, etc.) occupy lakes, swamps, marshes, and shallow open water wetlands. Cavity-nesting waterfowl (e.g., common goldeneye) occupy mature forested areas, usually within 1 km of suitable wetlands. Riverine birds (e.g., harlequin duck) occupy montane rivers | Reasonable treatment. |



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| | | | | | | and streams. Habitat loss and alteration assessments were conducted separately for each of these three wetland bird groups. For example, suitable habitat for cavity-nesting waterfowl was identified as riparian areas and mature forested habitat within 1 km of an appropriate waterbody (lakes, marshes, swamps, shallow open-water wetlands; see Section 18.7.1.8.2 of the Application/EIS).<br>Section 18.7.1.7.1 of the Application/EIS outlines methods used for assessing the effects of habitat loss and alteration on bats, Section 18.7.1.8.3 of the Application/EIS outlines methods used for assessing the effects of habitat loss and alteration on forest and alpine birds, and Section 18.7.1.9.1 of the Application/EIS outlines methods used for assessing the effects of habitat loss and alteration on western toad, based on habitat suitability assessments conducted in the field during baseline surveys (Appendix 18-A, Section 6.2.3). | |
| 317. | 11.10 | Wildlife and Wildlife Habitat | Chapter 18 / Sections 18.7.5 and 18.9.1 | GHC | The potential for increased predator access was mentioned but not assessed. Very little appears to be known about wolves in the RSA, as they were not considered in the baseline assessment. Population and habitat of other predators such as grizzly and black bears was assessed adequately, however no linkage was made to predation and how the project may affect predation rates. | The EA focuses on the potential effects of increased human access on wildlife, as this is the primary concern related to increased access (i.e., increased hunting pressure).<br>Considerable research over the past 30 years has shown that the primary effect of new linear features (e.g., roads, transmission line clearings) on wildlife has been to increase access for recreation users and hunters.<br>The potential effect of indirect mortality on moose due to predation is assessed in Section 18.7.5.3, and in the Cumulative Effects Assessment of the Application/EIS (Section 18.9.2.5). The cumulative effect of indirect mortality on moose is assessed as a combined effect of increased hunting pressure and increased predator access.<br>The potential effect of indirect mortality on mountain goats due to predation is assessed in the Cumulative Effects Assessment of the Application/EIS (Section 18.9.3.6). | Reasonable treatment. |
| 318. | 11.10 | Wildlife and Wildlife Habitat | Chapter 18 / Sections 18.7.5 and 18.9.1 | SKLH | Increased predator access due to development activities;<br>• The focus in this section appears to be on human access. Limited focus on predators. | See response to comment #317. | |
| 319. | 11.10 | Wildlife and Wildlife Habitat | Chapter 18 9 / Sections 18.8.3 and 19.9.3 | Tahltan Nation | The Application will identify and evaluate potential effects of the proposed Project on wildlife VCs. Potential effects will include, but are not limited to: Direct habitat loss or alteration for each wildlife VC using the results of habitat suitability modeling and field surveys to map and rate habitat quality | Tahltan values were incorporated into the Application/EIS in the following ways:<br>• Initially, the RSA northern boundary was the Unuk River. This northwestern extent of the RSA was expanded northwest of Unuk Lake and west of Teigen Lake on the north side of the Unuk River following a request from the Tahltan to examine this area for mountain goats, which was conducted in 2009.<br>• The importance of high elevation areas and the importance of grizzly bears, hoary marmots, and mountain goats are considered throughout the Application/EIS, as these species were selected as VCs. Hoary marmots | Reasonable treatment. |



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| | | | | | • For sections18.7 – 18.11 it is not clear on Tahltan criteria was used on determining effects, significance, and mitigations | were added as a VC based on specific requests from the Tahltan.<br>The residual effects assessment for mountain goats is presented in Section 18.8.3 of the Application/EIS, for grizzly bears in Section 18.8.4, and for hoary marmots in Section 18.8.6.<br>The cumulative effects assessment for mountain goats is included in Section 18.9.3 of the Application/EIS, for grizzly bears in Section 18.9.4, and for hoary marmots in 18.9.7. | |
| 320. | 11.10 | Wildlife and Wildlife Habitat | Chapter 18<br>Chapter 26 / Section 16.21<br>Chapter 39 | BC EAO | Provide a table with the commitments that the proponent will make with respect to wildlife VCs, based on proposed mitigation;<br>• No commitments included | Commitments related to wildlife are described throughout the Wildlife Mitigation and Monitoring Plan in Section 26.21 of the Application/EIS. Additional commitments related to wildlife are provided in Table 39.5-1 in Section 39.5 of the Application/EIS (see Conditions 27-30). | Reasonable treatment. |
| 321. | 11.10 | Wildlife and Wildlife Habitat | Chapter 26 / Section 26.2.1 | NLG | • Not clear to me that section 28.2 contains the relevant information. Is there an error in this reference? Where is this info? Table 26.21.2? Table 39.5-1? | The information is provided in Chapter 26 (Section 26.2.1). | Reasonable treatment. |
| 322. | 11.10 | Wildlife and Wildlife Habitat | Chapter 26 | NLG | • The reference to section 23.21.3 3 in the Table of Concordance would seem to be in error. | The reference in the Table of Concordance should have read 26.21.3. | Reasonable treatment. |
| 323. | 11.10 | Wildlife and Wildlife Habitat | Chapter 18<br>Chapter 26 / Section 26.21<br>Chapter 39 | SKLH | The Application will: provide a table with the commitments that the proponent will make with respect to wildlife VCs, based<br>on proposed mitigation<br>• General table provided; measures are not specific enough | Commitments related to wildlife are described throughout the Wildlife Mitigation and Monitoring Plan in Section 26.21 of the Application/EIS. Additional commitments related to wildlife are provided in Table 39.5-1 in Section 39.5 of the Application/EIS (see Conditions 27-30). | Reasonable treatment. |
| 324. | 11.10 | Wildlife and Wildlife Habitat | Chapter 26 / Section 26.21<br>Chapter 38 | SKLH | The Application will: provide a table with the commitments that the proponent will make with respect to wildlife VCs, based<br>on proposed mitigation<br>• The proponent is requested to provide more clarity with regards to the adaptive management process. | Following the CEA Agency guidelines, the adaptive management process will involve continuously improving the management practices by learning about their outcomes through monitoring identified in Section 26.21 and in the follow-up program in Section 38.5 of the Application/EIS. Section 38.1.1 of the Application/EIS outlines the adaptive management process for the Project.<br>Specific to wildlife, adaptive management will be informed by monitoring results and will be implemented if targets outlined Section 26.21 of the Application/EIS are not met. Targets are identified throughout this section. For example, the process for adaptive management for mountain goats (Section 26.21.3.2.3) states that | Reasonable treatment. |



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| | | | | | | "identifying reduced kid to adult ratio due to the Project or loss of high quality habitat greater than the amount identified in the Application/EIS will trigger a review of management and mitigation". | |
| 325. | 11.11 | Noise | Chapter 19 / Section 19.1 | BC EAO | The Application will summarise the available noise baseline information for the proposed Project region.<br>• Not found | Noise baseline data from the adjacent Brucejack Gold Mine Project is provided in Chapter 19 (Table 19.1-2) of the Application/EIS. This data are considered to be relevant analogues for the KSM Project regional and local areas. | Reasonable treatment. |
| 326. | 11.11 | Noise | Chapter 19 / Section 19.4.1 | BC EAO | The LSA will include areas within 1.5 km of the proposed Project footprint or disturbance area<br>• Unclear – not explicitly stated | The spatial boundary for the dispersion model is defined in Section 19.4.1. Two rectangular areas of 10 km by 15 km centred at the Mine Area and PTMA were used. Another area of 4 km by 8 km centred at the Saddle Area was also included. Since the LSA, 1.5 km of the Project footprint, is embedded in the RSA, a separate model for the LSA was not required. The model domain (RSA) includes noise dispersion model results for both RSA and LSA as shown in Figures 19.8-1 to 19.8-6. A similar approach was taken in other EAs such as the recently certified Kitsault Mine Project. | Reasonable treatment. |
| 327. | 11.11 | Noise | Chapter 19 /Section 19.4.1 | BC EAO | The RSA will include an area within 10 km of the proposed Project footprint or disturbance area. Noise is generally considered a local effect due to the tendency to diminish with distance from a source. Most human generated noise has been found to attenuate to below background levels or be undetectable within 5 km for a large industrial source. A 10 km range is expected to encompass all potential acoustic effects of the proposed Project.<br>• Unclear – not explicitly stated | See response to comment #326. | Reasonable treatment. |
| 328. | 11.11 | Noise | Chapters 18, 19, 26 and 39 | Tahltan Nation | The application will: Provide a list of the commitments that the proponent will make with respect to noise, based on proposed mitigation.<br><br>(26) No commitments identified in this section. | In the Noise Management Plan (Section 26.22 of Chapter 26), the Proponent is committed to "avoid, control and mitigate" noise levels. Mitigation measures are identified in Chapter 18, Chapter 19 and Chapter 39, Table 39.2-1. These measures include:<br>• consideration of noise specifications when purchasing equipment;<br>• regular maintenance of vehicles;<br>• imposition of speed limits;<br>• installation of mufflers on vehicles;<br>• application of noise dampening measures where possible;<br>• following helicopter flight paths to minimize wildlife disturbance; | Reasonable treatment. |



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| | | | | | | • periodic noise monitoring noise at various human and wildlife receptor locations<br>• maximization distances from major noise sources to sleeping quarters;<br>• Improve building insulation so that predicted indoor $L_{eq}$ are 30 dBA or less;improving building insulation so that predicted indoor $L_{eq}$ are 30 dBA or less;<br>• avoidance of use of equipment that generates impulsive noise;<br>minimization of need for reversing alarm;<br>• avoidance dropping materials from a height;<br>• avoidance of metal-to-metal contact on equipment;<br>• if possible, schedule truck movements to avoid roads near mining camps;<br>• avoidance of mobile plant clustering near residences and other sensitive receptors;<br>• utilization of blast mats to reduce noise levels;<br>• proper stagger delays for blast pattern to minimize the number of charges simultaneously being ignited; and<br>• implementation of Noise Management Plan<br>Additional mitigation methods will be implemented if noise exceedances occur. | |
| 329. | 12 | Heritage | Chapter 21 /Section 21.4 | Tahltan Nation | The Heritage Chapter in the AIR are standard and generic. The Tahltan Archaeological Standards were discussed on a number of occasions both with the EAO and the proponent and yet we do not see them referenced. The application speaks to a number of standards but does not speak to the Tahltan Archaeological Standards. Given that the area of the proposed tailings impoundment and the southern access route are within Tahltan territory, we are concerned that any archaeological study undertaken in these areas may be incomplete. | Section 21. 4 (Chapter 21) has been clarified to address the comment as follows: The Tahltan Archaeological Standards were also taken into account when conducting the archaeological assessments for the Project. The Tahltan have identified a number of archaeological issues that are considered priorities for archaeological studies conducted in their traditional territory. These archaeological issues include (1) ice patch and glacier sites; (2) cave and rock shelter sites; (3) cairns; (4) trails; (5) ancient continental movement of obsidian from Ah zeeth-zaa (Mount Edziza); (6) cultural history, including radiocarbon dating, obsidian hydration, tephra layers; and (7) regional archaeology (Asp 2006; THREAT 2011). | Reasonable treatment. |
| 330. | 12 | Heritage | Chapter 21 / Section 21.8<br>Chapter<br>26 / Section | Tahltan Nation | Application will:<br>- If protected archaeological/heritage sites are identified as a result of the AIA, outline mechanisms for avoidance or appropriate mitigation of | Section 21.8 outlines these mechanisms for avoiding sites including sites avoided through Project redesign.<br>Section 26.23.2 identifies archaeological sites that may be impacted by the Project and puts forward potential mitigation measures that will be subject to Archaeology Branch approval. | Reasonable treatment. |



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| | | | 26.23 | | potential adverse effects of the proposed Project.<br>- Provide procedures to be followed in the event that archaeological materials are unexpectedly encountered during proposed Project development. Archaeological impact management measures may include monitoring, if necessary, to ensure that potential adverse impacts to archaeological resources which could not be predicted or evaluated prior to construction are addressed.<br>- Provide procedures to be followed in the event that archaeological materials are unexpectedly encountered during proposed Project development. Archaeological impact management measures may include monitoring, if necessary, to ensure that potential adverse impacts to archaeological resources which could not be predicted or evaluated prior to construction are addressed.<br><br>(26) Not outlined in this section | **26.23.3.3.2 Construction**<br>An Archaeological Chance Find Procedure will be implemented prior to the commencement of construction activities and all mine employees and contractors will be made familiar with the procedure. Any revisions to the currently proposed Project footprint should be reviewed by a qualified professional archaeologist to determine if additional AIA work is required. | |
| 331. | 12 | Heritage | Chapter 21 / Sections 21.8, 21.9 | Tahltan Nation | The Application will:<br>- Identify potential residual effects of construction, operation and closure/post closure activities on archaeological and heritage resources, and the related consequences, after mitigation measures and environmental management strategies have been applied.<br>- Determine the significance of the identified potential residual effects from the proposed Project, based on the significance criteria listed in Section 10.8. | Potential residual effects on archaeological and heritage resources and significance of these effects are provided in Sections 21.8 and 21.9. | Reasonable treatment. |



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| | | | | | • (26) Not identified in this section. [12.18] | | |
| 332. | 13 | Economic | Chapter 20 / Section 20.7<br>Chapter 30 / Section 30 (various sections) | SKLH | The LSA will include the communities of Terrace, Stewart, the Hazeltons, Dease Lake and Smithers and the Tahltan, Nisga'a Nation, Gitxsan Wilp Skii km Lax Ha and Gitanyow Wilp Wiiltsx-Txawokw (e.g. Village of Gitanyow) territories and communities.<br>• Skii km Lax Ha is not included as a Local Study Area Community, as required by the EISG. As a result, an economic profile is not included for Skii km Las Ha, as it is for other First Nations listed in the EISG. The Skii km Lax Ha economic branch is referred to briefly in the section called "The Hazeltons", but no other information is provided on labour force, earnings, or economicsectors of importance for Skii km Lax Ha.<br>• Economic data and information regarding Skii km Lax Ha is required in order to understand the Project's economic effects on the Skii km Lax Ha Nation. | Skii km Lax Ha is an aboriginal group of approximately 30 people living in the District of New Hazelton, the Village of Hazelton, and the adjacent Gitxsan reserve community of Gitanmaax. There are no official statistics or census data available on SKLH demographics, labour force, earnings, or key economic sectors. The economic effects assessment therefore relied on information, including census data, from the surrounding communities where SKLH members reside for relevant socio-economic baseline data. Seabridge attempted to arrange interviews with SKLH members, including offering them funds to participate in the EA process, to gather supplementary economic and social data for baseline purposes of the assessment. No response was made to Seabridge's offer prior to filing the Application/EIS. However, Seabridge and the SKLH have recently initiated discussions on these and other matters and Seabridge's consultants met with them on May 27, 2013. Seabridge intends to communicate with the SKLH going forward.<br>Economic benefits of the Project, including those to Nisga'a Nation and First Nations, are discussed primarily in Chapter 20: Economics. See for example, sections 20.7.2 Change in Employment, 20.7.3 Change in Income and Value-added, and 20.7.4 Change in Business Activity. Further detail on the economic modeling is presented in Appendix 20-B: Economic Model Report. Economic effects of the Project are also discussed and summarized in the context of First Nations issues, concerns, rights, and interests in Section 30.7: Economic Effects of Chapter 30: First Nations Interests.<br>• Several socio-economic management strategies will also directly or indirectly address education and training opportunities for local communities, including Aboriginal people. Strategies currently under development include: (a) Labour Recruitment and Retention Strategy, (b) Workforce Training Strategy, and (c) Workforce Transition Program (See sections 22.7.1.1, 22.7.1.2, and 22.7.1.3)<br>• Socio-economic settings information for Skii km Lax Ha is summarized in Section 30.3.4 of Chapter 30: First Nations Interests. Economic baseline information for the Hazeltons (where the majority of contemporary Skii km Lax Ha reside) is provided in Section 20.1.5.3: the Hazeltons of Chapter 20: Economic Effects Assessment.<br>• Employment effects are addressed in Section 20.7.2 as noted above. Education and training opportunities addressed in section 20.7.2.1: Mitigation for Change in Employment under the Workforce Training Strategy. Residual effects of the Project linked to education and training are also addressed in Section 22.7.1.3: Education, Skills, and Training: Potential Residual Effects due to Change in Employment. | Reasonable treatment. |



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| | | | | | | • Seabridge is committed to facilitating employment and training opportunities with specific groups, such as the Skii km Lax Ha, through direct discussions. | |
| 333. | 13 | Economic | Chapter 4<br>Chapter 20 | BC EAO | The temporal boundaries will include the following three phases: Construction Phase – estimated 3 to 4 year period;<br>• (though construction numbers don't match – construction phase 5 yrs) | The KSM Project has been updated since the development and approval of the AIR (January 2011). The construction schedule is now 5 years. | Reasonable treatment. |
| 334. | 13 | Economic | Chapter 20 / Section 20.7 | BC EAO | Public, Nisga'a Nation and First Nations consultation findings as they pertain to economic issues will be reviewed and considered in the economic effects assessment results<br>• Not found | Perceptions and concerns of local populations are woven into the general narrative of Application/EIS chapters, for example, where referenced by "pers comm" denoting information based on key informant interviews. Elsewhere, reference to 'qualitative data' or 'anecdotal evidence' also signifies the incorporation of local perceptions and values. Perceptions and concerns of local populations and Aboriginal people was also gleaned from secondary sources, including reports and documents produced by local/Aboriginal groups themselves. For example, proceedings of April 4-6, 2003 Tahltan Mining Symposium, "Out of Respect: The Tahltan, Mining, and the Seven Questions of Sustainability or from the Gitanyow recognition and reconciliation agreement with the province of BC. Appendix 20-B: Skii km Lax Ha provides economic baseline information on Skii km Lax Ha. Seabridge intends to continue to communicate with Skii km Lax Ha going forward.<br>First Nations consultation findings pertaining to economic issues are incorporated in the economic assessment through the following:<br>• Informing the selection of economic VCs, namely, "employment and income" and "business opportunities and economic development"<br>• Informing the development of the Labour Recruitment and Retention Strategy, the Procurement Strategy, the Workforce Training Strategy, and the Workforce Transition Program described in Section 20.7.2.1<br>• Discussion of economic effects in the context of First Nations interests in Section 30.7<br>• Discussion of insufficient skills and/or education levels as a key barrier to realizing economic benefits of the Project in Section 30.3 | Reasonable treatment. |
| 335. | 13. | Economic | Chapter 20 / Section 20.6 | BC EAO | Consideration for potential to use local services and supply companies currently underutilized<br>• Not found | See Section 20.7.2.1 for discussion of Procurement Strategy. | Reasonable treatment. |
| 336. | 13 | Economic | Chapter 20<br>Chapter 30 (various | SKLH | Section 20.4.1 provides no economic baseline information for Skii km Lax | Skii km Lax Ha is an aboriginal group of approximately 30 people living in the District of New Hazelton, the Village of Hazelton, and the adjacent Gitxsan reserve | Reasonable treatment. |



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| | | | sections) | | Ha Nation. As a result, Section 20.6 falls short of complying with EISG Section 13.1.6. The qualitative evaluation of the VC is not based on the economic characteristics of the Skii km Lax Ha, one of the local communities. | community of Gitanmaax. There are no official statistics or census data available on SKLH demographics, labour force, earnings, or key economic sectors. The economic effects assessment therefore relied on information, including census data, from the surrounding communities where SKLH members reside for relevant socio-economic baseline data. Seabridge attempted to arrange interviews with SKLH members, including offering them funds to participate in the EA process over three years ago, to gather supplementary economic and social data for baseline purposes of the assessment. No response was made to Seabridge's offer prior to filing the Application/EIS. However Seabridge and the SKLH have recently initiated discussions on these and other matters and Seabridge's consultants met with them on May 27, 2013. Seabridge intends to continue to communicate with the SKLH going forward.<br><br>Economic benefits of the Project, including to those to Nisga'a Nation and First Nations, are discussed primarily in Chapter 20: Economics. See for example, Sections 20.7.2 Change in Employment, 20.7.3 Change in Income and Value-added, and 20.7.4 Change in Business Activity. Further detail on the economic modeling is presented in Appendix 20-B: Economic Model Report. Economic effects of the Project are also discussed and summarized in the context of Nisga'a Nation and First Nations issues and interests in Chapters 29 and 30.<br>Several socio-economic management strategies will also directly or indirectly address education and training opportunities for local communities, including Aboriginal people. Strategies currently under development include: (a) Labour Recruitment and Retention Strategy, (b) Workforce Training Strategy, and (c) Workforce Transition Program (See Sections 22.7.1.1, 22.7.1.2, and 22.7.1.3)<br>Socio-economic settings information for Skii km Lax Ha is summarized in Section 30.3.4 of Chapter 30: First Nations Interests. Economic baseline information for the Hazeltons (where the majority of contemporary Skii km Lax Ha reside) is provided in Section 20.1.5.3: the Hazeltons of Chapter 20: Economic Effects Assessment.<br>Employment effects are addressed in Section 20.7.2 as noted above. Education and training opportunities addressed in Section 20.7.2.1: Mitigation for Change in Employment under the Workforce Training Strategy. Residual effects of the Project linked to education and training are also addressed in Section 22.7.1.3: Education, Skills, and Training: Potential Residual Effects due to Change in Employment.<br>Seabridge is committed to facilitating employment and training opportunities with specific groups, such as the Skii km Lax Ha, through direct discussions. | |
| 337. | 13 | Economic | Chapter 20 (Appendix 20-B) | SKLH | The proponent is requested to indicate where and how potential effects were evaluated based on perceptions and concerns of local populations and Aboriginal | Perceptions and concerns of local populations are woven into the general narrative of Application/EIS chapters, for example, where referenced by "pers comm" denoting information based on key informant interviews. Elsewhere, reference to 'qualitative data' or 'anecdotal evidence' also signifies the incorporation of local perceptions and values. Perceptions and concerns of local populations and Aboriginal people is also gleaned from secondary sources, including reports and | Reasonable treatment. |



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| | | | | | communities. | documents produced by local/Aboriginal groups themselves. For example, proceedings of April 4-6, 2003 Tahltan Mining Symposium, "Out of Respect: The Tahltan, Mining, and the Seven Questions of Sustainability or from the Gitanyow recognition and reconciliation agreement with the province of BC. Appendix 20-B: Skii km Lax Ha provides economic baseline information on Skii km Lax Ha.<br>Seabridge and the SKLH have recently initiated discussions on these and other matters and Seabridge's consultants met with them on May 27, 2013. Seabridge intends to continue to communicate with the SKLH going forward. | |
| 338. | 13 | Economic | Chapter 20 / Section 20.7<br>Chapter 30 / Section 30.3 | SKLH | The proponent is requested to indicate where and how First Nations consultation findings as they pertain to economic issues were reviewed and considered in the economic effects assessment results. | Nisga'a Nation and First Nations interests pertaining to economic issues are incorporated in the economic assessment by informing:<br>• the selection of economic VCs, namely, "employment and income" and "business opportunities and economic development"<br>• the development of the Labour Recruitment and Retention Strategy, the Procurement Strategy, the Workforce Training Strategy, and the Workforce Transition Program described in Section 20.7.2.1<br>A discussion of economic effects, including barriers to realizing economic benefits, is provided in Chapter 30. | Reasonable treatment. |
| 339. | 13 | Economic | Chapter 20 (Section 20.7.2.1) | BC EAO | List the commitments that the proponent will make with respect to the local and regional economies, based on proposed mitigation.<br>• Stated as mitigation and strategies. Commitments not found. | Commitments related to potential economic effects are described in Chapter 20. Table 39.5-1 identifies a condition related to economic effects (Condition 34). | Reasonable treatment. |
| 340. | 13 | Economic | Chapter 20 / Section 20.7) | Tahltan Nation | No discussion of royalties, this doesn't give a clear picture of government income. | Chapter 20: Economics provides a discussion and quantitative analysis of government revenue generation expected from the Project, including estimated revenues from the BC mineral tax. Please see Section 20.7: Potential for Residual Effects for Economics. | Reasonable treatment. |
| 341. | 13 | Economic | Chapter 20 | Tahltan Nation | There is no discussion on the sensitivity of the mine economics on the price of resources. | Mine economics and sensitivity of a project to commodity prices and other cost factors is generally outside of the specific scope of EA. The issue of mine economics is addressed separately as part of the mine financial analysis, and related information reported in the most recent prefeasibility study and related work. | Reasonable treatment. |
| 342. | 13 | Economic | Chapter 20 | Tahltan Nation | Impact on communities? Will the project create long term local jobs or will it be staffed by people commuting out of camps? | The Project will be staffed by a combination of people from the northwest region of BC, including First Nations, and people from elsewhere in the province and Canada. All workers, regardless of community of origin, will commute to and from their home community to the mine camps for working shifts of varying duration, but usually in the range of 1-3 weeks. Chapter 20: Economics discusses the level of local/regional employment predicted through economic modeling. Seabridge is | Reasonable treatment. |



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| | | | | | | committed to maximizing the number of long term, local jobs as much as possible. | |
| 343. | 14 | Social | Chapter 22 (Appendix 20-A) | BC EAO | Informant interviews with key government and community representatives to further clarify and gather information on social issues as well as community infrastructure and capacity. Informants include (but may not be limited to) government economic development officers, employment and training officers; business associations, chambers of commerce; health and education services representatives, Non-Government Organizations (NGOs)/community-based organizations and elected officials.<br>• Noted in section 22.1.1.2 and in Appendix 22-A. No reference | Key informant interviews are referenced in the section of the Reference List entitled "Personal Communications" of Appendix 22-A. | Reasonable treatment. |
| 344. | 14 | Social | Chapter 3 (Appendix 3-N)<br>Chapter 22<br>Chapter 30 | SKLH | Best practice for socio-economic assessments is to gather primary information through interviews, focus group discussions, workshops or other methods. Primary information supplements and helps to validate secondary information such as census data.<br>Interviews with First Nations representatives does not appear to have been contemplated or undertaken in the EIS.<br>As it is written, the baseline study does not reflect the existing social context of the Skii km Lax Ha. It is difficult to assess impacts without a better understanding of the socio-economic situation.<br>The proponent is requested to undertake primary data collection with Skii km Lax Ha to fill gaps in the socio-economic baseline. | Qualitative social research methods were used to help support and validate census and other statistical data. Primary data is typically referenced by "pers comm" denoting information based on key informant interviews. Very limited interview data was obtained from representatives of Skii km Lax Ha due to a lack of response by the SKLH to efforts on Seabridge's part. Seabridge offered capacity funding to Skii km Lax Ha, for this purpose over 3 years ago, however, this was not accepted and SKLH did not consent to researchers meeting with or interviewing Skii km Lax Ha members prior to submission of the Application/EIS.<br>Appendix 3-N: First Nations Issues and Interests summarizes the issues raised by Aboriginal groups, including Skii km Lax Ha, along with a brief description of the responses provided by Seabridge to these issues. These issues were compiled from comments provided by aboriginal people at working group meetings; individual meetings between Seabridge and First Nations' representatives; written comments on drafts of the AIR, annual baseline study work plans, KSM Project Tailing Management Facility Alternatives Assessment, and Highway 37 and 37A Traffic Effects Assessment reports; and in correspondence with Seabridge.<br>Chapter 30, First Nations Interests, considers the issues and concerns raised by First Nations in the context of potential Project effects on those interests. | Reasonable treatment. |



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| 345. | 14 | Social | Chapter 22<br>Chapter 30 | Tahltan Nation | Social volume only looked at registered band members, not amount of Tahltans as recognized by the TCC (Tahltan ancestry). | Chapter 30 has been clarified to explain that many Tahltan members live off-reserve and outside of Tahltan traditional territory and outside of the Project's RSA. The information and effects assessment as presented in Chapter 22: Social pertains to the RSA as defined for the social and economic impact assessment. | Reasonable treatment. |
| 346. | 14 | Social | Chapter 22 / Section 22.1.2 | Tahltan Nation | Does not capture off-reserve Tahltans in Dease Lake. (Social pg. 15) | The unincorporated community of Dease Lake is discussed in Section 22.1.2.3. Tahltan members are, however, considered/ counted as part of the community as a whole and are not separated out for independent analysis. | Reasonable treatment. |
| 347. | 14 | Social | Chapter 22 | SKLH | The Application will: Describe the historical and current state of local communities and society within the local and regional spatial boundaries.<br>• The presentation of social baseline information regarding Skii km Lax Ha under the section called "Municipalities" is inappropriate. Baseline information on Skii km Lax Ha should appear in the section on Aboriginal Communities. | Skii km Lax Ha is an Aboriginal group of approximately 30 people living in the District of New Hazelton, the Village of Hazelton, and the adjacent Gitxsan reserve community of Gitanmaax. There are no official statistics or census data available on Skii km Lax Ha demographics, or with respect to standard social indicators including health, education, and employment. The presentation of social baseline information regarding Skii km Lax Ha within the broader description of the Hazelton's reflects the social setting of the group in terms of the communities in which they live. The description of Skii km Lax Ha with respect to their status as a distinct Aboriginal group is presented in Section 30.3.4<br>Seabridge attempted to arrange interviews, including offering funds to facilitate participation in the EA process. SKLH did not respond to Seabridge's attempts prior to filing the Application/EIS. However Seabridge and the SKLH have recently initiated discussions on these and other matters and Seabridge's consultants met with them on May 27, 2013. Seabridge intends to continue to communicate with the SKLH going forward. | Reasonable treatment. |
| 348. | 14 | Social | 22 | SKLH | The Application will: Provide an overview of background information, social setting and characteristics of the communities within the proposed Project area.<br>• It appears that no primary data was collected from Skii km Lax Ha or other First Nations to fill data gaps. Community-based information is lacking from this section. As it is written, the baseline study does not reflect the existing social context of the Skii km Lax Ha. It is difficult to assess impacts without a better understanding of the socio-economic situation. | Appendix 30-N provides information specific to the social, cultural, and economic conditions of Skii km Lax Ha. In addition, Seabridge compiled social baseline information of a more general nature that reflects the social, economic and cultural conditions of local and Aboriginal people in northwest BC, including Skii km Lax Ha. The level of detail and sorts of information obtained provides sufficiently detailed understanding of social life from which to make a valid assessment of the proposed Project's potential impact on the various facets of the human environment in the region and communities of northwest BC. | Reasonable treatment. |



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| | | | | | • The proponent is requested to undertake primary data collection with Skii km Lax Ha to fill gaps in the socio-economic baseline. | | |
| 349. | 14 | Social | 22 | GHC | The spatial boundary will take into consideration the communities, both Aboriginal and non-Aboriginal, which are likely to experience proposed Project-related effects on VCs. Communities will be selected based on proximity to the proposed Project and related haul routes, potential downstream effects, and the communities' expected role in proposed Project development and operations. These areas will include:<br>- The LSA will include the communities of Terrace, Stewart, the Hazeltons, Dease Lake and Smithers and the communities of the Nisga'a Nation.<br>- The RSA will include Northwest BC (including the Kitimat-Stikine Regional District, the Stikine Region and Electoral Area A of the Bulkley Nechako Regional District).<br>• Why is Gitanyow not included when communities on all sides of it are? | Gitanyow is included as a LSA community as identified in the Application/EIS. Specifically, as noted in Section 22.4.1: Spatial Boundaries of Chapter 22: Social, "The LSA includes the four Nisga'a Nation communities, Telegraph Creek, Dease Lake, Iskut, the District of Stewart, Gitanyow, the Hazeltons, Smithers, Terrace, and unincorporated communities along Highway 37 (Figure 22.1-2)." Gitanyow huwilp traditional territories (Lax'yip) are described in section 23.1.4.3.2 and illustrated in Figure 23.1-6. | Reasonable treatment. |
| 350. | 14.1.3 | Social | 22 | SKLH | • Skii km Lax Ha should be included under the LSA Aboriginal Communities.<br>• The Proponent is requested to include Skii km Lax Ha in the LSA as an Aboriginal group rather than include them as a sub-set of the Hazeltons. | The definition of the LSA and presentation of social baseline information regarding Skii km Lax Ha within the broader description of the Hazelton's reflects the social setting of the group in terms of the social setting in which they live.<br><br>Although for the purposes of the Application/EIS the BC EAO designated the Skii km Lax Ha as wilp Skii km Lax Ha of the Gitxsan Nation in the Section 11 Order, a description of Skii km Lax Ha is presented in Section 30.3.4. | Reasonable treatment. |



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| 351. | 14.1.5 | Social | 22 | SKLH | • Community well-being appears to be defined without input from First Nations.<br>• The Proponent is requested to indicate where input from First Nations was incorporated in the definition of community well-being. | Nisga'a Nation and First Nations input was received with respect to concerns about the potential impacts of the Project on various dimensions of community wellbeing. First Nations input also informed the inclusion of community wellbeing (CWB) as a social VC. As a social indicator the concept of wellbeing attempts to link both concrete and less concrete elements of health, family relationships, household income, social behaviours and so on. A practical, measureable definition of community wellbeing is difficult to define and would tend to vary from group to group. For the level of analysis required for the Application/EIS the AANDC's community wellbeing index (CWBI) as a proxy indicator because, notwithstanding its limitations, it is relatively consistent and allows for comparison between communities and over time.<br><br>The use of community wellbeing and the AANDC index is discussed in last paragraph of Section 22.5.1 and in several sections of Chapter 30: First Nations Interests. | Reasonable treatment. |
| 352. | 14.1.6 | Social | 22 (Section 22.6) | BC EAO | Evaluation and characterization of identified VCs based on proposed Project characteristics, understanding of the social characteristics of the region and local communities (as developed through the review and analysis of baseline data), and understanding how local and regional social priorities and activities interact with construction, operations and closure. Potential effects will also be evaluated based on perceptions and concerns of local populations and Aboriginal communities.<br>• Unclear if included in this section | Perceptions and concerns of local communities, including Aboriginal groups were raised and recorded during consultation events (e.g. individual meeting and open houses), working group meetings, interviews with community leaders and administrators, local and regional service providers (health, social, emergency, education), local economic development agencies, and land use rights holders. The temporal and spatial dimensions of the Project were discussed at these events. Local and regional social priorities and activities were further assessed through and review of publically available documents, including research reports, conference proceedings, community plans (including OCPs), media and other statements issued by local groups and organizations. Consultation findings are summarized for Aboriginal groups (i.e. treaty and non-treaty nations), public stakeholders, and Government agencies in Chapter 3 with additional information on consultation events, issues raised along with accompanying responses from Seabridge in the appendices to Chapter 3. Information on the perceptions and concerns of local populations and Aboriginal communities was used in preparation of the social baseline report (Appendix 22-A) and was instrumental to the:<br>• Identification of VCs<br>• Identification of key issues and concerns<br>• Development of mitigation/monitoring measures and plans<br><br>Additional details on the integration of this information in the context of Aboriginal communities is further described in Section 30.1.5. | Reasonable treatment. |
| 353. | 14.1.6 | Social | 22 (Section 22.6) | BC EAO | Public, Nisga'a Nation and First Nations consultation findings as they pertain to social issues will be | Perceptions and concerns of local populations are woven into the general narrative of Application/EIS chapters, for example, where referenced by "pers comm" denoting information based on key informant interviews. Elsewhere, reference to | Reasonable treatment. |



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| | | | | | reviewed and considered in the social effects assessment.<br>• Not found | 'qualitative data' or 'anecdotal evidence' also signifies the incorporation of local perceptions and values. Perceptions and concerns of local populations and Aboriginal people is also gleaned from secondary sources, including reports and documents produced by local/Aboriginal groups themselves. For example, proceedings of April 4-6, 2003 Tahltan Mining Symposium, "Out of Respect: The Tahltan, Mining, and the Seven Questions of Sustainability or from the Gitanyow recognition and reconciliation agreement with the province of BC. Appendix 20-B: Skii km Lax Ha provides economic baseline information on Skii km Lax Ha. Seabridge continues to communicate with Skii km Lax Ha on this and other topics, and met as recently as May 27, 2013. | |
| 354. | 14.1.6 | Social | 22 (Section 22.6) | SKLH | • The proponent is asked to describe where and how potential effects were evaluated based on perceptions and concerns of Aboriginal communities.<br>• The effects assessment does not discuss effects on Aboriginal communities. This is a major gap in the assessment.<br>• - The proponent is requested to indicate where and how consultation findings as they pertain to social issues were reviewed and considered in the social effects assessment. | Perceptions and concerns of First Nations and Nisga'a Nation were raised and recorded during consultation events, working group meetings, interviews, and review of publically available documents, including research reports, conference proceedings, media and other statements issued by Aboriginal groups or persons. Consultation findings are summarized for each Nisga'a Nation and First Nation in Chapter 3 with additional information on consultation events and issues raised in the accompanying appendices to Chapter 3. The information was used in preparation of the social baseline report (Appendix 22-A) and contributed to the:<br>• Identification of VCs<br>• Identification of key issues and concerns<br>• Development of mitigation/monitoring measures and plans<br>The process is further described in Section 30.1.5<br><br>Attempts by Seabridge to initiate a TK/TU study with Skii km Lax Ha are documented in Chapter 3 and in Section 11 Reports provided to BC and First Nations as a summary of consultation efforts and activities. SKLH did not respond to Seabridge's attempts prior to filing the Application/EIS. However Seabridge and the SKLH have recently initiated discussions on these and other matters and Seabridge's consultants met with them on May 27, 2013. Seabridge intends to continue to communicate with the SKLH going forward. | Reasonable treatment. |
| 355. | 14.1 | Social | Chapter 22 (Sections 22.7.1.1, 22.7.2.1, 22.7.3.1, 22.7.4.1, 22.7.5.1) | BC EAO | List the commitments that the proponent will make with respect to local and regional communities and society, based on proposed mitigation.<br>• Not found | Commitments related to potential social effects described in Chapter 22. Table 39.5-1 identifies a condition related to social effects (Condition 32). | Reasonable treatment. |
| 356. | 14.1 | Social | Chapter 22 (Sections 22.7.1.1, 22.7.2.1, 22.7.3.1, 22.7.4.1, | Tahltan Nation | States, "Opportunities for on-the-job training are also expected for junior, intermediate, and senior positions." | Opportunities for training on the job apply to residents of the RSA and LSA communities in general. This includes both Aboriginal and non-Aboriginal workers. | Reasonable treatment. |



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| | | | 22.7.5.1) | | (Social pg.41) Is this for aboriginal people or anyone? | | |
| 357. | 14.1 | Social | Chapter 22 (Sections 22.7.1.1, 22.7.2.1, 22.7.3.1, 22.7.4.1, 22.7.5.1) | Tahltan Nation | What is the proposed schedule for rotations during operations? (Social pg 44) | The shift rotation during operations has yet to be finalized; however, it is expected to be consistent with current practice in the mining sector in BC (e.g., typically in the range of two weeks on/two weeks off rotation). | Reasonable treatment. |
| 358. | 14.1 | Social | Chapter 22 (Section 22.7.3.1) | Tahltan Nation | Is KSM going to have anything to do with this infrastructure and services? (Social pg 49) | Infrastructure and services are primarily a government responsibility. Seabridge will contribute to government revenue through various taxes that the project will pay. The Project will also contribute indirectly to government revenue through taxes raised in relation to direct, indirect, and induced economic activity generated from project expenditures and employment, for example, through personal income taxes, corporate taxes, and sales taxes.<br>The Project will also facilitate government/agency planning in relation to infrastructure and services through provision of regular and timely updates on the schedule and activities of the Project as defined in Section 22.7.3.1, a Community Engagement Plan. | Reasonable treatment. |
| 359. | 14.1 | Social | Section 22 / Section 22.7.3 | Tahltan Nation | States, “in the long term, increased demand may result in enhanced community services and infrastructure.” (Social pg. 49) It does not describe how these enhanced services will come about and responsibility will KSM have in enhanced community services? | Infrastructure and services are primarily a government responsibility. Seabridge will contribute to government revenue through various taxes that the project will pay. The Project will also contribute indirectly to government revenue through taxes raised in relation to direct, indirect, and induced economic activity generated from project expenditures and employment, for example, through personal income taxes, corporate taxes, and sales taxes.<br>The Project will also facilitate government/agency planning in relation to infrastructure and services through provision of regular and timely updates on the schedule and activities of the Project as defined in Section 22.7.3.1, a Community Engagement Plan.<br>The underlined text below was added to the following sentence at the end of paragraph eight, Section 22.7.3, “However, in the long term, increased demand may spur additional investment in enhanced community services and infrastructure.” | Reasonable treatment. |
| 360. | 14.1 | Social | Chapter 22 / Section 22.7 | Tahltan Nation | I believe family stress is significant, what will be available to the families of workers on the project? (Social pg. 67) | Family stress is addressed under the social VC community wellbeing (CWB), Chapter 22: Social. Seabridge has committed to provision of an Employee Assistance Program (EAP) which will minimize demand on local services and contribute to mitigation of potential adverse effects on CWB through the provision of a variety of counselling and life-skill support services (See Section 22.7.3.1). The details of the EAP are not yet known, but it is expected that some services will also be to the benefit of immediate family members for work-related issues. In addition, several socio-economic management strategies will also indirectly address family and social issues related to mine workers, such as the Labour Recruitment and Retention Strategy, and the Workforce Transition Program (See sections 22.7.1.1, 22.7.1.2, and 22.7.1.3) | Reasonable treatment. |



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| 361. | 14.2 | Land Use | Chapter 23 / Section 23.1 | BC EAO | Mapping of data from local governments and regional districts<br>• Data used to develop Figure 23.1-2? | References for the data used in development of this figure are provided in the map legend under the respective mapped features for the Nass Area, Nass Wildlife Area, Nass South SRMP, and the Cassiar Iskut-Stikine LRMP. Resource management zones shown in the figure are from either the, Nass South SRMP, or the Cassiar Iskut-Stikine LRMP. | Reasonable treatment. |
| 362. | 14.2 | Land Use | Chapter 23 (Appendix 23-A) | BC EAO | Interviews with potentially affected commercial and forest tenure holders.<br>• Not found | See "Personal Communications" section of Reference in Appendix 23-A. | Reasonable treatment. |
| 363. | 14.2 | Land Use | Chapter 23 /Section 23.5 | BC EAO | The Application will identify potential effects on: Access<br>• Not included in assessment; rationale for exclusion in section 23.5.2 | As stated in Table 23.5-2: "Access is excluded as a VC as issues related to any change or restriction to access are discussed as potential effects, as opposed to a VC. Potential changes are reflected in the assessments of other VCs, including subsistence; commercial recreation, guide outfitting and trapping; traditional/heritage value of the land; and mining and mineral exploration." | Reasonable treatment. |
| 364. | 14.2 | Land Use | Chapter 23 / Section 23.5<br>Chapter 24 (Appendix 24-C) | BC EAO | The Application will identify potential effects on: Quality of experience<br>• Not included in assessment; rationale for exclusion in section 23.5.2; not found in 24.6 | The rationale presented in Section 23.5.2 is as follows, "Quality of experience is excluded as a VC because potential effects are reflected in the assessments of other VCs, including commercial recreation, guide outfitting and trapping, and traditional/heritage value of the land, as well as Chapter 24: Visual and Aesthetic Resources."<br>In other words the information requirement to "identify potential effects on quality of experience" is addressed as a subset of other VCs and project effects in Chapter 23: Land Use. In Chapter 24: Visual and Aesthetic Resources the assessment of quality of experience is examined in detail in relation to project effects on views and other aesthetic features of the landscape (e.g. roads, removal of trees, or project infrastructure).<br>Appendix 24-C provides an analysis of the potential effects of the Project components on visual quality during each Project phase, and Table 24.6-1 summarizes the interaction of potential effects with project areas. | Reasonable treatment. |
| 365. | 14.2 | Land Use | Chapter 23 /Section 23.5 | BC EAO | The Application will identify potential effects on: Quantity of resources<br>• Not included in assessment; rationale for exclusion in section 23.5.2 | As stated in Table 23.5-2: "Quantity of resources is excluded as a VC because issues related to potential changes in the amount of available resources are discussed as potential effects, as opposed to a VC. These potential effects are reflected in the assessments of other VCs, including subsistence; commercial recreation, guide outfitting and trapping; and traditional/heritage value of the land." | Reasonable treatment. |
| 366. | 14.2 | Land Use | Chapter 23<br>Chapter 31 | BC EAO | The Application will identify potential effects on: Navigable waters<br>• Not included as VC, assessed in section 31.6 of Application | The AIR requirement has been met. Chapter 31 has been clarified to address comments from Transport Canada. | Reasonable treatment. |
| 367. | 14.2 | Land Use | Chapter 23 / Section | BC EAO | The Application will identify potential effects on: Land management | Section 23.1.4.1 identifies the two provincial land and resource management plans that are relevant to the Project: the Cassiar Iskut-Stikine LRMP and the Nass South | Reasonable |



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| | | | 23.1.4 | | objectives<br>• Not included in assessment; rationale for exclusion in section 23.5.2 | SRMP (Shown in Figure 23.1-2) and provides details on the regulatory and legislative context for land management objectives in the region. Section 23.3 provides a detailed summary of both plans and their main land management objectives. The potential effects of the Project on land management objectives are considered in Section 23.5, and more specifically in Table 23.5-2 in which the rationale for why Land Use Management Objectives are excluded as VCs. Exclusion as a valued component does not mean the issue is not considered.<br><br>The rationale in Table 23.5-2 explains that, "The VCs selected in Table 23.5-1 collectively consider Cassiar-Iskut Stikine LRMP and Nass South SRMP objectives … applicable to the land and resources … potentially affected by the Project. … Project development does not undermine other planning objectives as the existing land management objectives in the CIS LRMP, including the Unuk River RMZ, [and] the Nass South SRMP allow for mineral exploration and development to occur. The Project is also located away from any protected area such as parks or ecological reserves. Land Management Objectives are … excluded as a VC as Project activities comply with existing land and resource management plans." | treatment. |
| 368. | 14.2 | Land Use | Chapter 23 | Tahltan Nation | Assessment of affects post-closure is insufficient. | The details of post-closure assessment are provided in Chapter 27: Closure and Reclamation which sets out planning objectives and strategies to deal with a wide variety of environmental management, reclamation and monitoring issues, many of which extend into the post closure phase. Post-closure monitoring is discussed in virtually all chapters of the Application/EIS. | Reasonable treatment. |
| 369. | 14.2 | Land Use | Chapter 23<br>Chapter 26 (various sections) | BC EAO | Provide with a list of the commitments that the Proponent will make with respect to land use, based on proposed mitigation.<br>• Commitments not found | Seabridge commits to carrying out a variety of mitigation, management, and monitoring measures with respect to land use effects of the Project as defined and discussed in Chapter 23. Table 23.10-1: Summary of Assessment of Potential Environmental Effects on Land Use and Resources lists by each Land Use VC, the key measures and plans containing these commitments. The relevant plans are described in Chapter 26: Summary of Proposed Environmental Management Plans and include the following:<br>• Access Management Plan;<br>• Fish and Aquatic Habitat Management Plan;<br>• Monitoring and Adaptive Management;<br>• Negotiated Agreements Traffic Management Plan;<br>• Noise Management Plan; Visual Quality Mitigation;<br>• Terrestrial Ecosystems Management and Monitoring Plans;<br>• Traffic Management Plan; Noise Management Plan;<br>• Wildlife Management Plan | Reasonable treatment. |
| 370. | 14.3 | Visual & Aesthetic Resources | Chapter 24 / Section 24.7 | BC EAO | List the commitments that the proponent will make with respect to visual quality, based on proposed mitigation. | Seabridge commits to carrying out a variety of mitigation, management, and monitoring measures with respect to the effects of the Project on visual quality as defined and discussed in Chapter 24: Visual and Aesthetic Resources. Explicit description of the proposed mitigations are provided in Sections; 24.7.2.1, 24.7.3.1, | Reasonable treatment. |



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| | | | | | • No specifically-identified commitments based on mitigation measures were found in these sections | 24.7.4.1, 24.7.5.1, 24.7.6.1, and 24.7.7.1. | |
| 371. | 14.3 | Visual & Aesthetic Resources | Chapter 24 / Section 24.7 | Tahltan Nation | List the commitments that the proponent will make with respect to visual quality, based on proposed mitigation.<br>• (26) Not identified in this section | See response to comment #370. | Reasonable treatment. |
| 372. | 15 | Human Health | 25 | SKLH | The country foods survey presented in Appendix 25-A does not appear to include community-based information pertaining to First Nations' harvest and consumption of country foods. This is a major gap. On page 3-2 of Appendix 25A, the Proponent states that "the use of literature information to represent the actual use of a study area for harvesting has a large degree of uncertainty whereas country food interviews with local country food harvesters provides the most accurate and current information regarding country food consumption habits in a specific area. Thus, once the interviews with the Aboriginal groups have taken place, this report will be amended to include the more relevant consumption information".<br>Human health risks associated with consumption of country foods cannot be understood without understanding harvesting and consumption patterns. The proponent is requested to undertake a community harvest and consumption survey to fill this gap. | Country food consumption data was not provided by the SKLH prior to Seabridge submitting the Application/EIS for screening. Attempts were made during the pre-Application stage to obtain this information from the SKLH.<br>On May 22, 2013, a country foods questionnaire was provided to the SKLH to review and complete. On May 27, 2013, Seabridge met with the SKLH to obtain information on country food consumption and TU. The SKLH identified they consume about 29 different country food items. In the questionnaire, the SKLH quantified the frequency of country food consumption for some country foods, but in many cases indicated the food is consumed 'occasionally'.<br>The information provided by the SKLH does not alter the country foods effects assessment (Chapter 25) because the assessment assumes higher frequencies of country food consumption. For example, the assessment assumes a frequency of moose consumption of seven servings per week whereas the SKLH indicated a frequency of two to three servings per week. | Reasonable treatment. |
| 373. | 15 | Human Health | Chapter 25 | GHC | Potential drinking water impacts were based on predicted water quality modeling, but the data set used for the modelling was so small and | Forty-nine stream and river baseline sites have been monitored over 5 years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. Seabridge is continuing to collect baseline data. The baseline water quality program exceeds the standards outlined in the 2012 "Water and Air | Reasonable treatment. |



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| | | | | | temporally limited that its results are of little value and should be considered inconclusive and scientifically indefensible | Baseline Monitoring Guidance Document for Mine Proponents and Operators". The baseline monitoring program has been fully vetted by MOE and presented at multiple working group meetings. | |
| 374. | 15 | Human Health | Chapter 25 | GHC | Country Foods – Based on the spatial boundary for air quality effects assessment (5 km zone extending from any mine-site infrastructure), a 1 km zone extending from the centre-line of the access roads, and a zone consisting of the transmission line right of way will be used.<br>For watercourses a zone extending from project infrastructure downstream to the first receptor will be used, on the assumption that assessment of this zone will determine the highest potential concentrations of any contaminants.<br>• Potential impacts to country foods (e.g. salmon) were based on predicted water quality modeling, but the data set used for the modelling was so small and temporally limited that its results are of little value and should be considered inconclusive and scientifically indefensible. | Forty-nine stream and river baseline sites have been monitored over 5 years (2007-2012) at a monthly and/or quarterly timescale. Freshet sampling was completed in 2008 and 2009. Seabridge is continuing to collect baseline data.The baseline water quality program exceeds the standards outlined in the 2012 "Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators". The baseline monitoring program has been fully vetted by MOE and presented at multiple working group meetings. | Reasonable treatment. |
| 375. | 16 | Summary of Proposed Environmental Management Plans | Chapter 1<br>Chapter 26<br>Chapter 35 | BC MOE | Given the scale and complexity of the project location, development plans and the on-going management requirements, (especially water diversion, collection, and control), it will be very difficult to ascertain the achievability of the management plans. Can they effectively be implemented over time and maintained in perpetuity? Given that there is a high likely-hood of failure to some degree; it is unclear as to whether or not this likelihood has | Residual effects of the Project are reduced through the implementation of adaptive Project design changes (as summarized in Chapter 1, section 1.7.1, Table 1.7-1). Effects are further mitigated through the use of standard mitigation measures and best practises as further summarized in each effects assessment chapter, and in Chapter 26, Environmental Management Plans.<br>For those residual effects where there is some degree of uncertainty or risk (e.g., geohazards), commitments to implement Follow-Up Monitoring Programs were made, and are provided in Chapter 38: Follow-Up Programs. A cornerstone of a follow-up program is adaptive management to ensure effective implementation of mitigation measures over time. Combined with a comprehensive Environmental Management System and Reporting Requirements, Seabridge is confident that on-going management requirements will be effectively overseen, both internally, and externally via the EA/EIS approval and the permitting process. | Reasonable treatment. |



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| | | | | | been included within the effects assessment. | Accidents and malfunctions of the Project and the likelihood of failure was assessed in Chapter 35. | |
| 376. | 16 | Summary of Proposed Environmental Management Plans | Chapter 26 | BC MOE | P. 253. Table 26.18-3. Sampling Locations and Frequency for Monitoring Required under the Metal Mining Effluent Regulation, KSM Project. Several location sites do not show a monitoring schedule.<br><br>P. 261. Table 26.18-7. Follow-up Monitoring Under the CEAA and for Risk Assessment, KSM Project. This table appears to be incomplete. Downstream sites on the Unuk River show no sampling. It is not clear why water quality sampling is not scheduled for Treaty Creek where the TMF outfall is located. | In Table 26.18-3, sampling of Mine Site reference sites should be at the same frequency as for downstream sites on Sulphurets Creek or the Unuk River.<br><br>Similarly, in Table 26.18-7, sampling of Mine Site downstream site(s) on the Unuk River should be the same as the line above (for downstream site(s) on Sulphurets Creek). Sampling of the PTMA downstream site(s) on Teigen, North Treaty, and Treaty Creeks and the reference site(s), should be the same as in the first line for South Teigen Creek. | Reasonable treatment. |
| 377. | 16 | Summary of Proposed Environmental Management Plans | Chapter 26<br>Chapter 39 | BC EAO | The Application will describe how the Project developer will ensure that commitments in EMPs will be carried forward on those acting for the Project developer, including contractors and sub-contractors.<br>• Not found | The Project developer will ensure that any contractor or sub-contractor will adhere to EMP commitments as a condition of their contract of works. Chapter 26 will be clarified to reflect this commitment. | Reasonable treatment. |
| 378. | 16 | Environmental Management Plans | Chapter 26<br>Chapter 39 | NLG | The Application will describe how the Project developer will ensure that commitments in EMPs will be carried forward on those acting for the Project developer, including contractors and sub-contractors.<br>• This does not seem to be clearly presented | The Project developer will ensure that any contractor or sub-contractor will adhere to EMP commitments as a condition of their contract of works. Chapter 26 will be clarified to reflect this commitment. | Reasonable treatment. |
| 379. | 16 | Environmental Management Plans | Chapter 26/Section 26.1.3<br>Chapter 39 | Tahltan Nation | A high level framework will be included in the Application which will commit the Proponent to specific and detailed goals, objectives and procedures for producing the EMPs. Included in this step will be a | See response to comment 375. | Reasonable treatment. |



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| | | | | | procedure for re-evaluation of the monitoring plan, methods and objectives for adaptive management goals.<br>• No there is not commitment of specific detailed goals, objectives, procedures for producing EMP's or re-evaluation of the monitoring plan, methods and objectives for adaptive management. | | |
| 380. | 16 | Summary of Proposed Environmental Management Plans | Chapter 27 | NLG | Post-closure obligations (such as water treatment, monitoring and maintenance), contingency plans, and emergency preparedness plan (with cost estimates).<br>• Not clear that all cost estimates have been presented. | The Closure and Reclamation Plan (Chapter 27) has been revised to clarify these costs. | Reasonable treatment. |
| 381. | 16 | Summary of Proposed Environmental Management Plans | Chapter 27 | MEMNG | During the Application/EIS screening, MEMNG requested that information from other parts of this Application/EIS be added to Chapter 27 (Reclamation and Closure). | Chapter 27, the Closure and Reclamation Plan, has been revised to integrate reclamation information from other chapters in the Application/EIS. | Reasonable treatment. |
| 382. | 16 | Summary of Proposed Environmental Management Plans | Chapter 27 | FLNRO | A deactivation plan with the associated cost estimate is required for the Treaty Creek Access as well [as for the Coulter Creek Access Road]. This will be required for the SUP at the permitting level. The deactivation plan and cost estimate forms an integral part of the SUP deposit. | A deactivation plan will be required as part of the permitting process. The Treaty Creek access road will remain in use as it will be required for on-going maintenance. The deactivation plan and the costs for deactivation of the Coulter Creek Access Road is described in Chapter 27. | Reasonable treatment. |
| 383. | 16 | Summary of Proposed Environmental Management Plans | Chapter 27 | BC MOE | Post-closure obligations (such as water treatment, monitoring and maintenance), contingency plans, and emergency preparedness plan (with cost estimates).<br>• Y but minimal discussion on | The AIR requirement has been met. The water and sediment monitoring plans have been clarified. The water treatment plant will be operated using electricity which will be generated on site. The reagent is lime. The RSFs, the TMF, and all dams will be monitored for stability according to the various guidelines including the Canadian Dam Association's Dam Safety Guidelines (CDA 2007), and as presented in Chapter 26. Monitoring of the RSFs will be carried out to allow for record keeping and will include factors described in the Mine Rock and Overburden Piles Investigation and Design Manual: Interim Guidelines (Piteau Associates 1991). | Reasonable treatment. |



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| | | | | | this. Especially costing on the lime treatment requirements. | Closure and reclamation related to a temporary and an early stoppage of the project has been included. | |
| 384. | 16 | Summary of Proposed Environmental Management Plans | Chapter 27 | BC MOE | Closure, decommissioning and reclamation components and activities will be listed. An estimate of decommissioning, closure, reclamation and reclamation monitoring costs will be provided.<br>• Y but minimal discussion on this. Especially costing on the lime treatment requirements. Se treatment costs? | The decommissioning and reclamation costs have been developed based on labour and materials according to standard practices and costs. The monitoring costs have been more fully developed including for the lime and selenium treatment plant. These costs are included in Chapter 27. | Reasonable treatment. |
| 385. | 16 | Summary of Proposed Environmental Management Plans | Chapter 27 | BC MOE | The Application will provide an overview of the key site reclamation options considered and explain the rationale for selecting some and rejecting others, e.g., the removal of all material from site versus partial or total burial, including costs and associated potential environmental effects. The Application will describe methods and locations of materials disposal, both on and off-site, including the structural foundations, tailing management facility, rock storage facilities and sedimentation ponds.<br>• Y but minimal in many areas without well-considered rationalization. Often revert to “if feasible” statements | Chapter 27 has been clarified to address these comments. | Reasonable treatment. |
| 386. | 16 | Summary of Proposed Environmental Management Plans | Chapter 27 | Tahltan Nation | The Application will provide an overview of the key site reclamation options considered and explain the rationale for selecting some and rejecting others, e.g., the removal of all material from site versus partial or total burial, including costs and associated potential environmental | The AIR requirement has been met. The Reclamation and Closure Plan (Chapter 27) has been clarified to include more rationale for the approaches for reclamation and closure in the plan. | Reasonable treatment. |



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| | | | | | effects. The Application will describe methods and locations of materials disposal, both on and off-site, including the structural foundations, tailing management facility, rock storage facilities and sedimentation ponds.<br>• Not completed-some rationale provided for selecting certain methods and no rationale provided for others. | | |
| 387. | 16 | Summary of Proposed Environmental Management Plans | Chapter 15 (Appendices 15_Q and 1-R)<br>Chapter 26 (26.9) | Tahltan Nation | A fisheries habitat compensation plan may be required by DFO as a condition of proposed Project approval. Such a plan would be developed in consultation with DFO and the BC Ministry of Environment, as well as First Nations and the Nisga'a Nation. The Application will include a conceptual habitat impact avoidance, mitigation and compensation plan.<br>• (26) Fish and Aquatic Habitat Management Plan present. | The Fish Habitat Compensation Plans are in Included in the Application/EIS (see Appendix 15-R for the HADD Fish Habitat Compensation Plan and is located in Appendix 15-Q for the MMER Fish Habitat Compensation Plan). The Fish and Aquatic Habitat Management Plan is located in the Application/EIS in Chapter 26, Section 26.9.1. | Reasonable treatment. |
| 388. | 18. | Nisga'a Nation Interests | Chapter 29 / Section 29.4.4 | BC EAO | The Application will describe relevant Nisga'a archaeology and heritage interests with regards to the proposed Project. However, environmental effects on archaeology will be discussed in Part B.<br>• Not found in 29.3.4 (heritage interests found in section 29.3.3); √ (heritage sites, traditional/cultural value of land); | Section 29.4.4 summarizes Nisga'a issues with respect to heritage sites and traditional/cultural value of the land. | Reasonable treatment. |
| 389. | 18 - 20 | Nisga'a Nation Interests | Nisga'a Economic, Social, Culture Impact Assessment (ESCIA) Report<br>29 | Nisga'a Lisims Government (NLG) | • Mitigation: the ESCIA Report does not address mitigation of the predicted economic, social and cultural impacts to Nisga'a citizens but rather | The AIR referenced the preparation of a work plan which was issued to Seabridge in July 2011 after being approved by BC and Canada. The ESCIA report was prepared consistent with that work plan which was separate from the Application/EIS. | Reasonable treatment. |



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| | | | | | states (p.18/532) that "this report focuses on providing a technical analysis of the potential impacts of the project on Nisga'a as required by the NLG guidelines." We wish to point out tha tth NLG ESCIA Guidelines call for an assessment of the impacts a project is expected or may have, and it specifically call for the setting out of mitigation and monitoring plans to manage those impacts.<br>• Employment Impacts: the ESCIA Report states (p. 25/532) that "the number of Nisga'a citizens that are potentially interested and able to work in the projects (that may take place in the NW) will exceed demand even under the scenario of high regional resourecs development". However, the numbers of the potential total demand for labour referred to in the ESCIA Report far exceed the potential Nisga'a labour supply, especially the labour supply living in the Nisga'a Villages. This is important because it bears on the issue as to whether the Proposed Project will attract workers from their current jobs or state of un/underemployment, or whether it will attract workers who might otherwise have taken up jobs at other new | | |



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| | | | | | developments in the region (including Kitsault should it proceed). If the demand for workers in the region will exceed the number of Nisga'a interested and likely to take up jobs in the new developments, then the incremental effect of the Proposed Project will be depend on whatever advantage it offers relative to the other new opportunities—not the difference between incomes at the Proposed Project and current income/opportunity levels;<br>• Business Impacts: the ESCIA Report suggests (p. 38/532) that the incremental effect of the Proposed Project on Nisga'a business activity will be the same regardless of the amount of other development taking place in the region. That assumes that there is unlimited capacity of Nisga'a businesses to expand. The ESCIA Report as a result fails to consider the strategic or other real incremental value of the Proposed Project to Nisga'a businesses.<br>• Impact of Employment at the Proposed Project on Traditional Resource Harvesting Activities: the ESCIA Report misinterprets (p.42/532) the significance of the survey results, where 55% of the respondents said that employment at a mine would reduce their traditional | | |



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| | | | | | harvesting activity. This is a statistically significant result that appears to be downplayed in the effects assessment analysis.<br>• Effects on Nisga'a Businesses: The ESCIA Report notes that there could be adverse effects on other Nisga'a businesses because of the competition for labour and wage inflation the Proposed Project and other new projects could give rise to, however, the ESCIA Report did not address how significant that effect might be.<br>• NLG Net Revenues: the ESCIA Report does not provide an estimate of the impact on NLG finances—in particular what it might cost NLG to participate in and respond to monitoring and/or responding to social and cultural impacts occurring in the Nisga'a communities.<br>• Importance of Proactive Measures: the ESCIA Report acknowledges that the achievement of significant employment and business benefits and mitigation of social and cultural impacts will require proactive measures including training, direct contract awards and other such measures as you might expect in a typical benefits agreement.<br>• Social and Cultural Impacts: | | |



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| | | | | | the ESCIA Report sets out a thorough analysis and recognition of the potential for both positive and negative social and cultural effects which speaks for the need for appropriate monitoring of and effective response to such impacts as required. | | |
| 390. | 18 - 20 | Nisga'a Nation Interests | Chapter 29 / Sections 29.4 and 29.5 | BC EAO | Summarize any residual effects (direct or cumulative) of the proposed Project on the Nisga'a Nation treaty rights and interests and their potential significance.<br>• No detailed significance analysis found | Section 29.4 and 29.5 assess potential effects on Nisga'a interests and provide conclusions with potential effects on Nisga'a interests. | Reasonable treatment. |
| 391. | 21 - 24 | First Nations' Interests | Chapter 30 | GHC | The Section 11 Order pursuant to the BCEAA requires the Proponent to consult with First Nations which are defined as the Tahltan Central Council, (on behalf of the Tahltan Nation), the Gitanyow wilp Wiiltsx – Txawokw, and the wilps of the Gitxsan First Nation (as identified by the Gitxsan Hereditary Chiefs Office), including, but not limited to, WIlp Skii km Lax Ha.<br>• Delete: "Txawokw"<br>• Add: the Gitanyow Huwilp of Gwass Hlaam, Gamlaxyeltxw, Malii and Gwinuu and the Gitanyow Hereditary Chiefs as per the September 29, 2011 Section 13 Order | The Section 11 Order (November 6, 2009) requires Seabridge to consult with Nisga'a Nation and First Nations, defined as "the Tahltan Central Council (on behalf of the Tahltan Nation), the Gitanyow wilp Wiiltsx-Txawokw, and the wilps of the Gitxsan Nation (as identified by the Gitxsan Hereditary Chiefs), including, but not limited to, wilp Skii km Lax Ha."<br>The BC EAO issued a Section 13 Order on September 29, 2011, which amended the Section 11 Order, as follows:<br>• By replacing the last bullet under section 3.1 that reads "transportation of ore processing reagents and other hazardous chemicals to the plant site, and of explosives to the mine, along the access roads" with the following new bullet: "Use of the access roads to the proposed Project site, and Highway 37 between the proposed Project site and its junction with Highway 16 at Kitwanga (as shown in Figure 2), including those potential effects arising from the transport of people, goods and materials, including, but not limited to, fuel, hazardous chemicals and explosives."<br>• By adding a new section 4.2 as follows: For purposes of section 4.1.2, the term "First Nations" includes Gitanyow *wilp* Malii, *wilp* Gamlaxyeltxw, wilp Gwaas Hlaam and *wilp* Gwinuu.<br>• By adding a new section 20.8 as follows:<br>"20.8 The Environmental Assessment Office will, in relation to the environmental assessment of the proposed Project, consult with Gitanyow *wilp* Malii, *wilp* Gamlaxyeltxw, *wilp* Gwaas Hlaam and *wilp* Gwinuu (either directly or, if requested, through the Gitanyow Hereditary Chief's Office) in the following manner:<br>20.8.1 The Environmental Assessment Office will form a technical working | Reasonable treatment. |



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| | | | | | | group to discuss road use and potential effects on the aboriginal interests of the Gitanyow *wilp* Malii, *wilp* Gamlaxyeltxw, *wilp* Gwaas Hlaam, *wilp* Gwinuu and other potentially affected First Nations and the Nisga'a Nation arising from the use of Highway 37 by Project-related traffic. The Environmental Assessment Office will inform the proponent that they are required to participate in these technical working group meetings.<br>20.8.2 The Environmental Assessment Office will inform Gitanyow *wilp* Malii, *wilp* Gamlaxyeltxw, *wilp* Gwaas Hlaam, *wilp* Gwinuu of all major milestones with respect to the environmental assessment of the Project."<br>• In sections 23.1, 24.1, 25.1 and 27.1.1 by adding "Gitanyow *wilp* Malii, *wilp* Gamlaxyeltxw, *wilp* Gwaas Hlaam, and *wilp* Gwinuu" after "First Nation".<br>• By adding a new section 25.2 as follows:<br>"25.2 The Nisga'a Nation, First Nations and *wilp* Malii, *wilp* Gamlaxyeltxw, *wilp* Gwaas Hlaam, and *wilp* Gwinuu will have the opportunity to provide the Environmental Assessment Office their respective written submissions about the Assessment Report, which written submissions will be included in the package of materials sent to ministers when the Project is referred to ministers for decision."<br>• By adding Figure 2. | |
| 392. | 21 - 24 | First Nations' Interests | Chapter 30 | GHC | The Application will provide background information on each of the First Nations specified in the Section 11 Order.<br>Gitanyow First Nation and Wilp Wii'litsxw<br>• Delete: "and Wilp Wii'litsxw" from heading<br>• Revise 3rd Para:<br>• The Gitanyow Lax'yip (Territory) is comprised of the Wilp Lax'yip belonging to the individual Wilp.<br>• Describe the Lax'yip of each Wilp identified in the Section 13 Order | The text "and Wilp Wii'litsxw" has been deleted from heading to section 30.3.2.<br>The Lax'yip (traditional territory) of wilp Malii, wilp Gamlaxyeltxw, wilp Gwaas Hlaam and wilp Gwinuu are described in section 4.1.1 of Appendix 30-C. | Reasonable treatment. |
| 393. | 21 - 24 | First Nations' Interests | Chapter 30 | GHC | Populations and demographics:<br>• It is important to recognize that Gitanyow Band | The AIR requirement has been met. Seabridge provided funding to Gitanyow in late 2012 to undertake a Socio-Cultural Needs Assessment. Seabridge looks forward to discussing the results of the Needs Assessment following receipt of the report and using the report as a basis for future discussions with Gitanyow during the | Reasonable treatment. |



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| | | | | | membership and membership of the Gitanyow Huwilp is not co-extensive. Gitanyow Wilp members may belong to other 'Indian Bands', most notably the Kitwanga and Kitseguekla Indian Band while a number of Gitanyow Band members are members of various Gitxsan or other neighbouring Wilp. Aboriginal rights and title do not arise from membership in a government established 'Indian Band', but from ones membership in traditional body, which in Gitanyow's case, one of the 8 historical Gitanyow Huwilp. Gitanyow has been provided funding by Seabridge to complete a Socio-Cultural Needs Assessment which will include more accurate Wilp-based baseline data. Gitanyow is requesting a Seabridge to incorporate the results of this study into the Application. | Application/EIS review. | |
| 394. | 21 - 24 | First Nations' Interests | Chapter 30 | GHC | • 2nd para. Add: Approximately 85% of the Nass River salmon spawn in the Hanna – Tintina watersheds. The area contains small, easily fished streams and the surrounding wetland-brush-forest habitat provide very high-value food supply and habitat for Grizzly bear. The area is of high cultural value to the Gitanyow Huwilp and contains numerous Traditional Use sites (Philpot, 2004) This | In response to the request, the suggested text has been added to the 2nd paragraph of section 30.3.2.4.as follows (NB the adjustment to the percentage based on Nass South SRMP as no reference provided in the comment): "Approximately 60-80% of the Nass River salmon spawn in the Hanna – Tintina watersheds (Nass South SRMP 2012, pp. 58 URL: http://www.ilmb.gov.bc.ca/slrp/srmp/south/nass/index.html. Accessed May 24, 2013). The area contains small, easily fished streams and the surrounding wetland-brush-forest habitat provide very high-value food supply and habitat for Grizzly bear. The area is of high cultural value to the Gitanyow Huwilp and contains numerous Traditional Use sites. (Philpot, 2004) This area was legally established as the Hanna-Tintina Conservancy (23,702 hectares) (March 15, 2013 – Bill 5 Protected Areas of BC Amendment Act, 2013) as a result of the Nass South SRMP and the Gitanyow Huwilp Reconciliation and Recognition Agreement. " | Reasonable treatment. |



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| | | | | | area was legally established as the Hanna-Tintina Conservancy (23,702 hectares) (March 15, 2013 – Bill 5 *Protected Areas of BC Amendment Act, 2013*) as a result of the Nass South SRMP and the Gitanyow Huwilp Reconciliation and Recognition Agreement. | | |
| 395. | 21 - 24 | First Nations' Interests | Chapter 30 / Section 30.3.2 | GHC | For the purposes of the CEAA process, the Application will include a discussion of the current use of lands and resources for traditional purposes by Aboriginal persons.<br>• Include information on the Gitanyow Huwilp Land Use Plan | The Gitanyow Lax'yip Land Use Plan was approved after the AIR and is described in Section 30.3.2.4 with the following paragraph:<br><br>In March 2012 the Gitanyow Nation and the Province of British Columbia signed the Gitanyow Huwilp Recognition and Reconciliation Agreement (GHRRA) as a, "bridging step towards reconciliation and a constructive step towards creating a positive and enduring relationship between the Gitanyow and British Columbia" (Gitanyow Nation and Province of BC 2012). One of the overarching goals of the agreement is the development of meaningful, shared decision making with respect to land and resources within Gitanyow traditional territory (Lax'yip) and a collaborative approach to sustainable economic development. Part 2 of the GHRRA is the Gitanyow Lax'yip Land Use Plan which articulates a co-management approach to land and resource use planning, with an emphasis on shared decision making and the maintenance of Wilp Sustainability including the establishment of various land use designations, zoning and management objectives. | Reasonable treatment. |
| 396. | 21 - 24 | First Nations' Interests | Chapter 30 | GHC | A summary of Traditional knowledge and traditional use (TK/TU) information from each First Nation, or relevant *Wilp* of each First Nation, and other sources, relevant to the proposed Project and not subject to confidentiality provisions, will be presented. Full reports, containing only non-confidential information, will be provided as appendices.<br>• The TK/TU prepared by the Proponent's consultant is not comprehensive and requires input from the GHC & the 5 Huwilp affected by the proposed Project. This work will be completed in time to | In February 2011, the GHCO and wilp Wii'litsxw were provided with the draft Gitanyow Traditional Knowledge and Use Desk-Based Research Report for review and comment. A meeting was held with wilp Wii'litsxw on April 13, 2011 to discuss the draft report. Where TK/TU information has been provided by the Gitanyow Nation, it has been incorporated into the Application/EIS. | Reasonable treatment. |



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| | | | | | ensure that its findings are included in the assessment of Project impacts on Gitanyow Aboriginal rights, including title. | | |
| 397. | 21 - 24 | First Nations' Interests | Chapter 30 | Tahltan Nation | Generally the comments of "little or no effect on" clause which is consistently used to describe most this projects impact on game. For example 30.10.2.4 Mountain Goats…"residual effects are rated not significant (minor). What is this based on… conclusions prior to or without research. | Chapter 30: First Nations Interests is a synthesis of the various effects assessment chapters completed by discipline specific specialists for the Application/EIS. The results of their respective data collection and analysis are reported in detail in the relevant chapters, including baseline information and evaluation of potential project effects. For example, the assessment of potential effects on Wildlife and Wildlife Habitat is presented in Chapter 18. Discipline specific effects assessments that are considered most relevant to First Nations – such as fisheries or wildlife – are summarized in Chapter 30 in the context of issues, concerns, rights, and interests relevant to the Aboriginal groups specified in the Section 11 and 13 Orders. | Reasonable treatment. |
| 398. | 21 - 24 | First Nations' Interests | Chapter 30 | Tahltan Nation | The application states that the majority of Tahltan member reside within the communities of TC, Dease and Iskut which is not incorrect. | The text in Chapter 30 has been corrected to reflect the fact that most Tahltan members live outside Tahltan traditional territory in various parts of BC and Yukon Territory. | Reasonable treatment. |
| 399. | 21 - 24 | First Nations' Interests | Chapter 30 | Tahltan Nation | Seasonal work, so how was study conducted; was it any work within the year? EI a big part of winter lifestyle due to lack of work in winter months. | In response to the request, the following text has been added to Chapter 30 to address the comment: "Employment Insurance supplements are especially important during winter months when there is less paid employment available and fewer opportunities to hunt and fish." | Reasonable treatment. |
| 400. | 21 - 24 | First Nations' Interests | Chapter 30 / Section 30.1.3 | Tahltan Nation | 2 main Tahltan Communities, not the main Tahltan communities of Telegraph Creek and Iskut; as Dease Lake is also a main Tahltan community... (First Nations Interests pg. 5) | In response to the request, the text in Section 30.1.3 has been altered as follows to address the comment: "The main Tahltan reserve communities at Telegraph Creek and Iskut are roughly equidistant from the Project, which lies approximately 140 km (straight line distance) to the south. Travelling north by road on Highway 37 from the turn off for the TCAR, it is approximately 181 km to Iskut, and a further 83 km to Dease Lake, a non-reserve, unincorporated community with a large proportion of Tahltan residents. Telegraph Creek is another 108 km by road southwest from Dease Lake" | Reasonable treatment. |
| 401. | 21 - 24 | First Nations Interests | Chapter 30 / Section 30.3.1 | Tahltan Nation | The Tahltan school does not go to grade 12 as students going into high school are required to leave Telegraph Creek for further education. (First Nations Interests pg. 20) | In response to the request, minor adjustments have been made to the text in Section 30.3.1.1, page 30-20, to address the comment. | Reasonable treatment. |
| 402. | 21 - 24 | First Nations' Interest | Chapter 30 / Section 30.3.1 | Tahltan Nation | THSSA's services are not accurate anymore as the woman's shelter is closed. (First Nations Interests pg. 21) | In response to the request, the text in Section 30.3.1.1, page 30-21, has been adjusted as follows to address the comment, "Social services in Telegraph Creek and Dease Lake are provided by the THSSA, a non-profit organization that provides National Native Alcohol and Drug Abuse Program (NNADAP) services, and mental | Reasonable treatment. |



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| | | | | | | health services. Previously offered shelter services for women involved in domestic violence are no longer available." | |
| 403. | 21 - 24 | First Nations' Interests | Chapter 30 / Section 30.3.4 | SKLH | The Proponent's section on Skii km Lax Ha Nation relies on poor source material.<br><br>Section 30.3.4 does not state clearly that the project lies entirely within the asserted traditional territory of Skii km Lax Ha. As mentioned above, there is little information provided on any of the socio-economic topics treated in other sections of the EIS pertaining to Aboriginal communities.<br><br>• These sections do not include information on language, traditional learning, family and cultural practices, skills development and training for Skii km Lax Ha Nation. This is a gap and the proponent is requested to provide the information. | In response to the request, the first sentence of paragraph two in Section 30.3.4 will be updated to address the comment as follows: "The Project Mine Site and PTMA and associated infrastructure fall within the asserted traditional territory of the Skii km Lax Ha which extends from the north side of Cranberry River to Ningunsaw Pass, encompassing large portions of the Nass and Bell-Irving river basins (Rescan 2009)." | Reasonable treatment. |
| 404. | 21 - 24 | First Nations' Interests | Chapter 30 | SKLH | No economic information is provided for Skii km Lax Ha Nation. We note that this information was compiled for other First Nations. For Skii km Lax Ha Nation, there is no information provided on any of the socio-economic topics that were treated in the other sections pertaining to Aboriginal groups. | Skii km Lax Ha is an aboriginal group of approximately 30 people living in the District of New Hazelton, the Village of Hazelton, and the adjacent Gitxsan reserve community of Gitanmaax. There are no official statistics or census data available on SKLH demographics, labour force, earnings, or key economic sectors. The economic effects assessment therefore relied on information, including census data, from the surrounding communities where SKLH members reside for relevant socio-economic baseline data.<br>Seabridge attempted to arrange interviews with SKLH members, including offering funds to facilitate participation in the EA process, to gather supplementary economic and social data for baseline purposes of the assessment. SKLH did not respond to Seabridge's attempts prior to filing the Application/EIS. However Seabridge and the SKLH have recently initiated discussions on these and other matters and Seabridge's consultants met with them on May 27, 2013. Seabridge intends to continue to communicate with the SKLH going forward.<br>In response to the request, the following information has been added to the Application/EIS, Section 30.3.4, second paragraph, "The Skii km Lax Ha own and operate a contracting business, Tsesaut Ventures Ltd. currently focused on | Reasonable treatment. |



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| | | | | | | provision of a variety of support services to the mine exploration and mining sectors. The company has become an important employer in the Hazeltons in recent years creating over 100 jobs for local Aboriginal and non-Aboriginal residents in the area (Hume, 2013)." | |
| 405. | 21 - 24 | First Nations' Interests | Chapter 30 | SKLH | Skii km Lax Ha notes that the spatial information drawn from other studies is irrelevant to this Project. | There is a spatial overlap between the current Project and previous EAs.<br>The land use description for Skii km Lax Ha is derived from the ethnographic report in Appendix 30-B and the publically available supporting sources. Seabridge attempted to arrange TU/TK interviews with SKLH members, including offering funds to facilitate participation in the EA process.<br>These efforts are summarized in Chapter 3: Information Distribution and Consultation. No response was made to Seabridge's offer prior to filing the Application/EIS. However Seabridge and the SKLH have recently initiated discussions on these and other matters and Seabridge's consultants met with them on May 27, 2013. Seabridge intends to continue to communicate with the SKLH going forward. | Reasonable treatment. |
| 406. | 21 - 24 | First Nations' Interests | Chapter 30 | SKLH | No information is provided on health for Skii km Lax Ha Nation. | Skii km Lax Ha is an aboriginal group of approximately 30 people living in the District of New Hazelton, the Village of Hazelton, and the adjacent Gitxsan reserve community of Gitanmaax. There are no official statistics or census data available on SKLH demographics, labour force, earnings, or key economic sectors. The social and economic effects assessments therefore relied on information, including census data, from the surrounding communities where SKLH members reside for relevant socio-economic baseline data. Sources of health information included the 2006 Canada Census, periodic 'community profiles' produced by BC Stats, and community well-being profiles produced by Aboriginal Affairs and Northern Development Canada (AANDC).<br>Seabridge attempted to arrange interviews with SKLH members, including offering them funds to facilitate participate in the EA process. No response was made to Seabridge's offer prior to filing the Application/EIS. However Seabridge and the SKLH have recently initiated discussions on these and other matters and Seabridge's consultants met with them on May 27, 2013. Seabridge intends to continue to communicate with the SKLH going forward. | Reasonable treatment. |
| 407. | 21 - 24 | First Nations' Interests | Chapter 30 | SKLH | Many of the issues, where they are addressed, are treated as "First Nations" issues, and are not ascribed to a particular source. Skii km Lax Ha Nation requests that the Proponent ascribe concerns and discussion to their individual sources. | The Application/EIS seeks to strike a balance between the specific discussion of issues and interests of individual Aboriginal groups and more inclusive discussion of the Aboriginal groups in general that are identified in the Section 11 and 13 orders. Where there are unique or especially relevant distinguishing characteristics these are addressed as such throughout the Application/EIS. In many cases a more general approach is justified due to similarities and overlap between different First Nation groups with respect to identified issues and concerns. | Reasonable treatment. |
| 408. | 21 - 24 | First Nations' Interests | Chapter 30 | SKLH | The current land use description provided for Skii km Lax Ha Nation is drawn from marginally relevant | Land use description for Skii km Lax Ha is derived from the ethnographic report provided in Appendix 30-B and the publically available secondary sources that support that work. Seabridge made attempts to work with Skii km Lax Ha to | Reasonable treatment. |



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| | | | | | sources, and cannot be expected to substitute for original research. | produce original research and offered them funds to facilitate their participation. These efforts are summarized in Chapter 3: Information Distribution and Consultation. SKLH did not respond to Seabridge's attempts prior to filing the Application/EIS. However Seabridge and the SKLH have recently initiated discussions on these and other matters and Seabridge's consultants met with them on May 27, 2013. Seabridge intends to continue to communicate with the SKLH going forward. | |
| 409. | 21 - 24 | First Nations' Interests | Chapter 30 | SKLH | There is a full report present in the appendices. Skii km Lax Ha Nation has already indicated to the Proponent that this report is drawn from the NTL project, deals with another area of Skii km Lax Ha's territory, and is a distraction from the site-specific concerns about the KSM project. | See response to comment #408. | Reasonable treatment. |
| 410. | 21 - 24 | First Nations' Interests | Chapter 30 (Appendix 30-B) | SKLH | Skii km Lax Ha Nation observes that there is no obvious traditional knowledge incorporated into the EIS, and there is no indication that the Proponent understands the difference between TU and TK, and where TK might be useful to it in project planning processes and construction.<br><br>Skii km Lax Ha Nation requests that both the Crown and Seabridge state clearly what they mean by "traditional knowledge" and describe how this might differ from "traditional use" information. Skii km Lax Ha Nation requests that Seabridge describe where it has incorporated TK into the assessment. | TK/TU is summarized for each First Nation in the Appendices to Chapter 30. Appendix 30-B provides Skii km Lax Ha ethnographic information obtained principally from secondary sources and other publicly available EA applications recently conducted in the region. TK/TU information was provided to each discipline team during the pre-application phase and was used, for example, to inform preparation of the assessment by/in:<br>• Identification of VCs<br>• Identification of key issues and concerns<br>• Development of mitigation/monitoring measures and plans<br>The process is further described in Section 30.1.5.<br>Attempts by Seabridge to initiate a TK/TU study with Skii km Lax Ha are documented in Chapter 3 and in Section 11 reports provided to BC and First Nations as a summary of consultation efforts and activities. SKLH did not respond to Seabridge's attempts prior to filing the Application/EIS. However, Seabridge and the SKLH have recently initiated discussions on these and other matters and Seabridge's consultants met with them on May 27, 2013. Seabridge intends to continue to communicate with the SKLH going forward. | Reasonable treatment. |
| 411. | 21 -24 | First Nations' Interests | Chapter 30 | SKLH | Seabridge has not defined a proper spatial setting for the consideration of First Nation interests, interactions or Project effects. Seabridge relies on the Project footprint as a study area, but there is no recognition of effects that will surely spill outside the gates of the minesite. This approach is | The First Nations' Interests chapter does not have a spatially defined study area, rather the chapter is a synthesis of other effects assessment chapters that make up the core of the Application/EIS. Seabridge used accepted EA practice that defines both a local study area (LSA) and a regional study area (RSA) on a discipline by discipline basis. Disciplines most relevant to Skii km Lax Ha interests include wildlife, fisheries, water, terrestrial ecosystems, land use, and socio economics. The RSA and LSA for each discipline is clearly defined at the beginning of each respective chapter and includes a map outlining the area. The land use chapter | Reasonable treatment. |



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| | | | | | unsatisfactory, and does not allow for a rigorous and realistic assessment of project effects on Skii km Lax Ha Nations' interests. The spatial setting, as it is defined, underplays the potential for the Project to affect Skii km Lax Ha lands and resources.<br>Skii km Lax Ha Nation requests that the Crown direct Seabridge to define both a local study area and a regional study area to aid in the assessment of project effects on Skii km Lax Ha interests. Skii km Lax Ha requests that the Crown deem the application insufficient until proper assessment areas are described and used for additional analysis. | uses the same RSA and LSA as that defined for wildlife effects assessment. Socio-economics uses an RSA that encompasses the entire Regional District of Kitimat-Stikine plus Electoral Area A of the Regional District of Bulkley-Nechako. The LSA for socio-economics is a non-contiguous area made up of First Nations reserve communities, Nisga'a villages, municipalities, and one unincorporated community as defined in Chapters 20 and 22. | |
| 412. | 21 - 24 | First Nations' Interests | Chapter 30 | GHC | 30.1.4 2nd para<br>Gitanyow disagrees with the notion that it is Seabridge's "*understanding of Aboriginal Rights*" that will be assessed for impacts by Project activities and components.<br>The Courts (Haida, Taku, Wii'litsxw) have stated that in assessing the adequacy of the Crown's efforts to fulfil its duty to consult and accommodate, it will look at the overall offer of accommodation and weigh it against the potential impact on the asserted Aboriginal interests having regard to the strength of those asserted interests. (see Wii'litsxw at para. 16) [Emphasis added] | The information requirement is, first, to summarize how Seabridge understands Aboriginal rights (including title). In the context of the Project and its potential effects, Seabridge summarizes its understanding of Aboriginal rights (including title) as the right to carry out "traditional" customs and practices and to use the land and resources in ways or for purposes, related to the practice and perpetuation of Aboriginal culture.<br>The second and third parts of Section 22 of the AIR require Seabridge to: (a) identify customs and practices within the defined study area; and (b) identify those practices that could be impacted by the Project.<br>Seabridge assessed potential project impacts on customs and practices related to current use of land and resources for traditional purposes in accordance with the AIR. The assessment of potential impacts is necessarily based on our understanding of Aboriginal rights and title as it specifically relates to use of land and resources. | Reasonable treatment. |
| 413. | 21 - 24 | First Nations' Interests | Chapter 30 | SKLH | As stated above, the information on Skii km Lax Ha Nation's interests is based entirely on secondary sources and is not relevant to the Project area. Skii km Lax Ha cannot assess the effects of the Project on the basis of this information. Skii km Lax Ha | Seabridge used accepted EA practice to define both local and regional study areas (LSAs and RSAs respectively) for each scientific discipline used in the assessment of Project effects. Seabridge attempted, to obtain first-hand information from Skii km Lax Ha related to their use of land and resources for traditional purposes and other customs and practices that could potentially interact with the Project and offered them funds to facilitate their participation. These attempts were documented in Chapter 3 and in the Section 11 reports provided to BC and First Nations as a | Reasonable treatment. |



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| | | | | | Nation requests that the Crown direct Seabridge to undertake additional research, and to undertake an assessment of project effects using appropriate spatial study settings. | summary of consultation efforts and activities. SKLH did not respond to Seabridge's attempts prior to filing the Application/EIS. However Seabridge and the SKLH have recently initiated discussions on these and other matters and Seabridge's consultants met with them on May 27, 2013. Seabridge intends to continue to communicate with the SKLH going forward. | |
| 414. | 21 - 24 | First Nations' Interests | Chapter 30 | SKLH | As stated above, the information on Skii km Lax Ha Nation's interests is based entirely on secondary sources and is not relevant to the Project area. Skii km Lax Ha cannot assess the effects of the Project on the basis of this information. Skii km Lax Ha requests that the Crown direct Seabridge to undertake additional research, and to undertake an assessment of project effects using appropriate spatial study settings. | See response to comment #413. | Reasonable treatment. |
| 415. | 21 -24 | First Nations' Interests | Chapter 30 | GHC | The Application will describe where and how TK/TU is incorporated into the design and assessment of the proposed Project, including its contribution to selecting Valued Components, predicting effects, determining mitigation measures and considering alternatives. Where TK/TU information is not available or not provided to the Proponent in a timely manner despite reasonable diligence, the Application will describe efforts taken to obtain it.<br>Gitanyow requires that this information be provided specific to each Gitanyow Wilp. | Seabridge provided a desk-based ethnographic report to Gitanyow for review and did not receive feedback on this report. Seabridge has also provided funding to the Gitanyow for additional research and looks forward to the results of that work to inform future discussions and communication with Gitanyow during the Application/EIS review. All information that was provided to Seabridge prior to the end of 2012 has been incorporated into the Application/EIS in the appropriate chapters and appendices. | Reasonable treatment. |
| 416. | 21 - 24 | First Nations' Interests | Chapter 30 | GHC | Gitanyow requires that this information be provided specific to each Gitanyow Wilp. This should be done in accordance with the Gitanyow Huwilp Recognition & Reconciliation Agreement definition of Wilp Sustainability. | Seabridge provided a desk-based ethnographic report to Gitanyow for review and did not receive feedback on this report. Seabridge has also provided funding to the Gitanyow for additional research and looks forward to the results of that work to inform future discussions and communication with Gitanyow during the Application/EIS review. All information that was provided to Seabridge prior to the end of 2012 has been incorporated into the Application/EIS in the appropriate chapters and appendices. | Reasonable treatment. |
| 417. | 21 - 24 | First Nations' Interests | Chapter 30 | GHC | 30.10.1.2 "Two separate fish habitat | Changes to the physical fish habitats downstream of Project infrastructure have | Reasonable |



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| | | | | | compensation plans have been developed: (1) to regulate the deposit of tailings and other waste matter produced during mining activities into natural fish-bearing waters (Section 36, Fisheries Act and the Metal Mining Effluent Regulation); and (2) to regulate the loss of fish habitat due to Project infrastructure (Section 35, Fisheries Act).” The water quality and physical fish habitats downstream of the project site are not in either FHCP? Please clarify.<br>“The plans were developed according to DFO’s policy of a 2:1 habitat gain-to-loss ratio to ensure that overall net productive capacity is maintained. The habitat lost in the TMF will not affect Pacific salmon species, as they are not present within the proposed TMF footprint.” Is there an actual quantification (empirical number) that can be ascribed to the ‘overall net productive capacity’? It appears that the FHCP concept is indeed flawed in this case – what about TMF downstream effects on fish habitat including water quality? The claim that the TMF won’t impact Pacific salmon habitats is erroneous because the rationale used is NOT fully scientifically defensible.<br>“However, the probability that toxicity (due to bioaccumulation of selenium) may occur in fish species is less certain, since increased tissue residue do not necessarily mean increased toxicity until a threshold level is reached.” What is this threshold level being referred to? An empirical number please. Is this ‘threshold level’ a species specific | been evaluated, mitigated, and compensated for in the HADD Fish Habitat Compensation Plan (Appendix 15-R). Potential changes in downstream water quality are not in the Fish Habitat Compensation Plan because they are not required under the *Fisheries Act.* The water quality model results (Chapter 14) indicate that metal concentrations in the receiving environment downstream of the TMF are expected to either meet guideline limits or be below background concentrations (for those metals that were greater than guidelines during baseline studies).<br><br>As noted, the FHCP were developed according to DFO’s policies. Overall net productive capacity was not determined during baseline studies and was not required as part of the AIR (January 2011) or DFO’s policies. The water quality model results (Chapter 14) indicate that metal concentrations in the receiving environments downstream of the TMF are expected to either meet guideline limits or be below background concentrations (for those metals that were greater than guidelines during baseline studies). Pacific salmon habitat (in Teigen Creek), is not expected to be affected by changes in water quality as a result of TMF construction.<br><br>A threshold level for toxicity is the concentration at which a contaminant causes an adverse effect in an organism. Since selenium is an essential element, a certain concentration or tissue residue is required for good health. With increased bioaccumulation of selenium, at some point (the toxicity threshold) the concentration of selenium stops being beneficial to the organisms and begins to cause toxic effects. The toxicity threshold is contaminant, species, and (possibly) life-stage specific. It may also vary between individuals due to various other factors such as temperature, presence of other contaminants, and metabolism/elimination of the contaminant. A single value cannot be used to describe the toxicity threshold for all organisms. As part of a detailed monitoring plan to be determined during permitting, caution, warning or trigger levels may be developed as described in Section 26.18.2.5.9 of the AEMP. It may include the development of these criteria for selenium, based on literature-derived toxicity thresholds for fish species. | treatment. |



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| | | | | | value? | | |
| 418. | 21 - 24 | First Nations' Interests | Chapter 30 / Section 30.5<br>22 (Appendix 22-C) | Tahltan Nation | What were the findings of the Highway 37 Project related traffic aboriginal interests? (First Nations Interests. Pg 1) | Chapter 30: First Nations Interests, Section 30.5: Effects Related to Project Traffic Along Highways 37/37A. This section identified the main Aboriginal issues, concerns and issues related to traffic identified by Nisga'a Nation and First Nations during the pre-Application period (e.g. through Working Group meetings and other consultation and engagement processes). This section also summarizes key traffic related effects and mitigations with respect to spills, fish, wildlife, and safety.<br>The following text is from Section 9: Summary of Appendix 22-C: Highway Traffic Effects Assessment:<br>"As described in Chapter 5, the potential effects of KSM Project-related traffic on highways 37 and 37A were assessed by considering normal Project traffic and traffic accidents. The potential risk of traffic accidents was also assessed, as described in Section 6. A summary of proposed mitigation and environmental management measures to avoid or mitigate effects from KSM Project traffic is provided in Section 7.<br>"In general, most potential effects identified in this assessment are characterized as being of minor or negligible severity (see Figure 9-1).<br>The KSM Project-specific traffic assessment concludes there will primarily be minor to negligible effects on wildlife, terrestrial ecosystems, and climate VCs. Some minor effects to human health and socio-economic VCs may also occur. There are two moderately severe effects to Terrestrial Ecosystem VCs (the risk of increased wildfire incidence on rare and sensitive ecosystems and old growth forests), which are characterized as rare; and one moderately severe effect to wildlife (the risk of moose mortality), which has a likelihood of possible.<br>"In the event of traffic accidents, most potential risks to VCs are characterized as unlikely or rare occurrences. The two potential risks characterized as possible and catastrophic (represented by the two hollow circles on the left side of Figure 9-1) both refer to the potential for a collision resulting in severe human injury or fatality. While the collision model described in Chapter 3 does not predict any significant increase to collisions as a result of Project traffic on the highways, the serious consequence of such a collision is reflected in this risk rating. The Proponent's proposed Traffic and Access Management and Emergency Response plans described in Sections 7.3 and 7.4 are designed to prevent KSM Project-related traffic accidents from occurring, and to promptly take appropriate measures in the unlikely event that an accident occurs.<br>"The cumulative traffic assessment conducted concludes that effects will remain primarily minor to negligible for traffic effects on wildlife, terrestrial ecosystems, and climate VCs. Effects of increases noise on human health and social VCs that were rated as minor in the KSM Project-specific analysis were adjusted to moderate as a result of other predicted traffic from other projects. Additionally, effects relating to moose mortality were adjusted to major, but unlikely, and the reduced availability of resources for hunting and trapping was adjusted to moderate severity as a result of | Reasonable treatment. |



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| | | | | | | the potential increased pressure on moose populations along highways 37 and 37A from moose-vehicle collisions involving both KSM and other project traffic (see Figure 9-1)." | |
| 419. | 21 - 24 | First Nations' Interests | Chapter 30 | SKLH | There is a poor organization of material throughout this chapter. There needs to be a clearer connection drawn between this assessment, the biophysical assessments of fish, wildlife and terrestrial resources (among others), and the assessment of Project effects on aboriginal rights. The Proponent has gathered very little information on which to base the assessment. The sections on social effects, education, skills, and training, and well-being are brief and contain very little information. In the absence of more detailed baseline and analysis, Skii km Lax Nation cannot assess the Project's likely effects. | Chapter 30: First Nations Interests is a synthesis of the various effects assessment chapters completed by discipline specific specialists for the Application/EIS. Discipline specific effects assessments that are considered most relevant to First Nations – such as fisheries or wildlife – are summarized in Chapter 30 in the context of issues and concerns raised by Aboriginal groups and in the context of rights and interests as understood by Seabridge to be most relevant to the Aboriginal groups specified in the Section 11 and 13 Orders.<br>As noted above in response to comment #73, "the Aboriginal rights most relevant to the Project are those related to hunting, fishing, trapping, the collection of traditional food and medicinal plants, and related environmental resources, activities or practices, and attributes which are important to the specified First Nations." Given this context the intent of Section 30.10: Effects on First Nations Current Use of Lands and Resources attempts to summarize and synthesized the findings of discipline specific effects assessment chapters in the context of First Nations' interests which are summarized at the head of each discipline-specific subsection. For example, the section summarizing effects on fish (30.10.1) begins with a brief summary of key fish related issues, concerns, rights, and interests for each of the specified First Nations (30.10.1.1). The following section (30.10.1.2) presents a summary of the effects assessment of key, relevant fish and aquatic resources VCs, followed by a summary of residual effects (30.10.1.3). | Reasonable treatment. |
| 420. | 21 - 24 | First Nations' Interests | Chapter 3<br>Chapter 30 | SKLH | The Application will describe where and how TK/TU is incorporated into the design and assessment of the proposed Project, including its contribution to selecting Valued Components, predicting effects, determining mitigation measures and considering alternatives. Where TK/TU information is not available or not provided to the Proponent in a timely manner despite reasonable diligence, the Application will describe efforts taken to obtain it.<br>TK information is not apparent in the EIS. Skii km Lax Ha Nation requests that the Proponent identify where in the EIS it has incorporated traditional knowledge. | TK/TU is summarized for each First Nation in the Appendices to Chapter 30. Appendix 30-B provides Skii km Lax Ha ethnographic information obtained principally from secondary sources and other publicly available EA applications recently conducted in the region. TK/TU information was provided to each discipline team during the pre-application phase and was used, for example, to inform preparation of the assessment by/in:<br>• Identification of VCs<br>• Identification of key issues and concerns<br>• Development of mitigation/monitoring measures and plans<br>The process is further described in Section 30.1.5<br>Attempts by Seabridge to initiate a TK/TU study with Skii km Lax Ha are documented in Chapter 3 and in the Section 11 reports provided to BC and First Nations as a summary of consultation efforts and activities.<br>SKLH did not respond to Seabridge's attempts prior to filing the Application/EIS. However, Seabridge and the SKLH have recently initiated discussions on these and other matters and Seabridge's consultants met with them on May 27, 2013. Seabridge intends to continue to communicate with the SKLH going forward. | Reasonable treatment. |



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| 421. | 21 - 24 | First Nations' Interests | Chapter 30 | SKLH | This analysis cannot be undertaken without proper information about Skii km Lax Ha Nation, coupled with a more well-defined study area for the Project (see comments on study area above). | Seabridge used accepted EA practice to define the local and regional study areas (LSAs and RSAs respectively) for each scientific discipline used in the assessment of Project effects. Seabridge attempted, to obtain first-hand information from Skii km Lax Ha related to their use of land and resources for traditional purposes and other customs and practices that could potentially interact with the Project and offered them funds to facilitate their involvement. SKLH did not respond to Seabridge's attempts prior to filing the Application/EIS. However Seabridge and the SKLH have recently initiated discussions on these and other matters and Seabridge's consultants met with them on May 27, 2013. Seabridge intends to continue to communicate with the SKLH going forward. | Reasonable treatment. |
| 422. | 21 - 24 | First Nations' Interests | Chapter 22 / Section 22.7<br>Chapter 23<br>Chapter 26<br>Chapter30 | SKLH | The Application will also describe mitigation measures to avoid or reduce such effects, where practical.<br>• There are very few mitigation measures mentioned. Skii km Lax Ha requests that the Proponent undertake a mitigation exercise as part of its ongoing engagement. | Several socio-economic mitigation and management strategies will be developed to directly or indirectly address socio-economic issues or effects of the Project that relate to local populations, including Aboriginal communities. Strategies currently under development include: (a) Labour Recruitment and Retention Strategy, (b) Workforce Training Strategy, and (c) Workforce Transition Program (See sections 22.7.1.1, 22.7.1.2, and 22.7.1.3)<br>Mitigation measures related to the use of land and resources for traditional purposes are addressed primarily in Chapter 23: Land Use and include those related to:<br>• Potential effects on access to land and resources discussed in Section 23.7.1.1 and elaborated on in Chapter 4: Project Description, principally in Sections 4.5.4.1.6 and 4.5.4.2.7. Mitigation for potential effects on subsistence due to restrictions on access are further discussed in Section 23.7.1.5.<br>• Potential effects of sensory disturbance on subsistence use are discussed in Section 23.7.2.5 and cross-referenced to management plans discussed in Chapter 26 including Wildlife Management Plan (Section 26.21), Noise Management Plan (Section 26.22), and Traffic and Access Management Plan (Section 26.25).<br>• Potential effects related to change in the amount of resources on subsistence use are discussed in Section 23.7.3.1 and cross-referenced to management plans discussed in Chapter 26 including the Wildlife Management Plan (Section 26.21), the Fish and Aquatic Habitat Management Plan (Section 26.18), the Noise Management Plan (Section 26.22; Section 23.7.2.2), and the Vegetation Clearing Management Plan (Section 26.20.1). Added pressures on harvest resources (fish, vegetative, and wildlife) due to potential increase in access to the study areas will be mitigated through the Access Management Plan (Section 26.25.2) as well as the Traffic and Access Management Plan (Section 26.25.1).<br>In general mitigation practices, monitoring and adaptive management will be implemented to mitigate the potential Project effects to subsistence users through | Reasonable treatment. |



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| | | | | | | mitigation measures identified in the Wildlife Management Plan (Chapter 26.21), the Noise Management Plan (Chapter 26.22), the Traffic and Access Management Plan (Chapter 26.25), and the Terrestrial Ecosystems Management and Monitoring Plan (Chapter 26.20). | |
| 423. | 21 - 24 | First Nations' Interests | Chapter 30 | GHC | Summary of Gitanyow Interests re: Potential Effects on Fish & Fish Habitat. Revise 1st sentence: Gitanyow raised concerns regarding fish and fish habitat for all 8 Gitanyow Huwilp. (not just Wilp Wii'litsxw) | In response to the comment, the Chapter 30 (Section 30.10.1) has been clarified to address the comment as follows:<br>• "The Gitanyow raised concerns regarding fish and fish habitat with respect to the traditional territories (Lax'yip) of Gitanyow huwilp, including issues of water quality, water quantity and fisheries survival in the Bell-Irving River and the Hanna and Tintina watershed." (pp 30-65 bottom) | Reasonable treatment. |
| 424. | 26 | Alternative Means of Undertaking the Project | Chapter 34 (Appendix 33-B) | GHC | The discussion of tailing management alternatives will be prepared with consideration of the (Draft) Guidelines for the Assessment of Alternatives for Tailing Storage for Metal Mining Projects Proposing to use Natural, Fish-bearing Water Bodies as Tailings Impoundment Areas, (Environment Canada - Mining and Processing Division, January 9, 2009).<br>• The methods used to assess the TMF alternatives was fataly flawed because one of the criteria that screened out many potential better / environmentally safer TMF sites included the following:<br>• "Does the proposed facility have insufficient capacity for the entire proposed mine life?"<br>• This criteria was predetermined by the proponent, yet it should have been a collective social decision made by the parties potentially affected by the project and the federal / provincial governments. | It is up to the Proponent to present their project; and the EA is based on the Project design as proposed in the Application/EIS.<br>In the fatal flaw analysis, multiple TMF alternatives were investigated that were located within the Unuk Watershed: Unuk Valley, McTagg Creek Valley, Sulphurets Creek Valley, Ted Morris Creek Valley, combined Ted Morris Creek Valley/Sulphurets Creek Valley, and In-pit Tailing Storage. With the exception of the Unuk Valley TMF, all other potential TMFs had greater than 1 fatal flaw. For example, the Ted Morris Creek Valley TMF was assessed to have inadequate geological foundation conditions, water management issues, excessive geohazard risk, as well as insufficient capacity to house life-of-mine tailing. Thus, all TMFs alternatives within the Unuk River Watershed were excluded from further analysis, with the exception of the Unuk Valley TMF. This TMF had insufficient capacity to hold life-of-mine tailing, but when combined with West Teigen Lake TMF was forwarded for full analysis and characterization. After a full multiple accounts analysis, it was not the selected alternative.<br>However, based on Nisga'a Nation and First Nation comments and feedback, Seabridge considered the technical feasibility of two additional TMF alternatives with expanded containment capacity, but would be located completely within the Unuk River Watershed. These were: (a) Unuk TMF combined with a lower tailings elevation within West Teigen Lake TMF to store up to 2.5 Bt; and (b) Unuk TMF combined with a new dam and TMF upstream of the Unuk TMF and a lower tailings elevation within West Teigen Lake TMF to store up to 2.5 Bt.<br>The full analysis is provided in Appendix E of Appendix 33-B of the Application/EIS. However, it was determined that neither alternative could store the life-of-mine tailing, and these alternatives would still have significant water management issues. Thus, they were considered to be not feasible. | Reasonable treatment. |



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| | | | | | • For example, if the mine life would be shortened to 40 years instead of 52 years, it would have opened up the possibility of using many other potential TMF sites, by not allowing input into the mine life and accordingly how much waste rock will be produced it significantly weakens this assessment. The Gitanyow and many of the other KSM WG members were clear that they preffered keeping all waste rock in the Unuk Watershed where they originate from. This input from the WG was ignored by the proponent during the completion of the TMF alternatives assessment. | | |
| 425. | 26 | Alternative Means of Undertaking the Project | Chapter 33 | Tahltan Nation | Isn't there a road just built on the other side of treaty creek by Bruce Jack? Why aren't they utilizing it instead of build a second road so close to the other one. (First Nations Interests pg. 2) | Section 33.7.2.1.3 discusses the options related to access and the Brucejack project. The longevity of the KSM Project precludes long-term glacier access, as currently utilized by Brucejack. Brucejack, which has a shorter proposed project life, access is proposed along Bowser Lake and then over the Knipple Glacier. The KSM Project will be accessed via a temporary glacier access trail during the construction phase. Additionally, utilization of this route will not allow access to the TMF. | Reasonable treatment. |
| 426. | 28 | Environmental Effects of Accidents and Malfunctions | Chapter 35 | GHC | In the case of a potential failure of a tailing dam, the Application will examine the likelihood and potential magnitude of the likely worst case accident or malfunction scenario through a dam break analysis.<br>• This chapter is incomplete. The Dam break analysis should have include the potential short and longterm effects of ML/ARD entering the water bodies below the TMF site. This should have been one the focal point of | The dam break analysis appended to Chapter 35, Accidents and Malfunctions is primarily a safety focused exercise to measure the extent of a catastrophic event and its impact on human health. As provided in the report, results of various failure scenarios include an estimate of sediment transport downstream. The dam break is a flood event which results in a transient plume that extends a long distance downstream until it is fully attenuated. The concentration of suspended solids diminishes as the plume dilutes and moves downstream. The bulk of the sediment will not move long distance. The environmental effect of increase suspended solids is short term and transient in the water column but more lasting in the sediment bed. The tailing sediment resulting from either a North or South dam failure would be essentially devoid of sulphides as these dams will be built from de-sulphidized tailing. The resulting ML/ARD from these tailing sediments would be very low. The water entering the stream would be tailing supernatant water which is primarily nontoxic. The environmental effect is more the physical impact of burring and | Reasonable treatment. |



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| | | | | | the analysis. | smothering. A catastrophic dam failure would have a very significant impact on the downstream environment for a few kilometers downstream. Long term, a few months, the system would flush back to normal. The environmental effects on the Bell Irving River would be moderate and the Nass River would be minimal. | |
| 427. | 30 | Cumulative Environmental Effects Assessment | Chapter 5<br>Chapter 37 | GHC | The Application will include an evaluation of cumulative environmental effects of residual effects that are likely to result from the proposed development and how they may combine with environmental effects from other past, present and reasonably foreseeable projects and activities.<br>• The CEE Assessment for this project did not include the proposed TransCanada and Spectra Pipeline projects. These projects are proposed to traverse in an east-west direction, also within the Nass Watershed, affecting the Nass Moose population. | The list of past, present, and reasonably foreseeable Projects and activities was included in the AIR (January 2011) and updated with EAO in early 2012 prior to those LNG projects entering the EA process. | Reasonable treatment. |
| 428. | 30 | Cumulative Environmental Effects Assessment | Chapter 5<br>Chapter 37 | Tahltan Nation | The Application will include an evaluation of cumulative environmental effects of residual effects that are likely to result from the proposed development and how they may combine with environmental effects from other past, present and reasonably foreseeable projects and activities.<br>• (37) Not all completed in this section | Each effects assessment chapter in the Application/EIS contains a Cumulative Effects Assessment if applicable (i.e., if residual effects were identified).<br>Chapter 37 of the Application/EIS contains a standalone summary of all of the CEAs that were conducted. | Reasonable treatment. |
| 429. | 27 | Effects of the Environment on the Proposed Project | Chapter 34 / Section 34.1 8 | BC MOE | The Application will assess the potential of environmental factors that may affect the proposed Project during construction, operations, decommissioning and closure and the predicted effects of those environmental factors. The full range | Section 34.1.8 in Chapter 34, *Effects of the Environment on the Proposed Project*, of the Application/EIS, provides a discussion of projected climate change parameters for up to the year 2100 and discusses methods the Project will use to adapt to the potential impacts of climate change. Climate change predictions past this time are typically not done due to the uncertainty involved (but they will be redone during the life of the Project and applied iteratively as necessary). The section discusses the range of proactive and adaptive management strategies that | Reasonable treatment. |



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| | | | | | of climate conditions (including extreme weather events, wet, dry and normal precipitation and extreme temperature spells, freeze-thaw cycles, changes in permafrost and climate change) will be considered. The Application will describe and assess how the potential for climate change, extremes in current climate, seismic activity and potential volcanic activity (e.g., Hoodoo Mountain) and other extreme events such as fires and floods could affect the integrity of the proposed development infrastructure, particularly the ore transport tunnel, tailing management facility, water diversions, pit wall stability, road operation, and rock storage facilities. Measures to mitigate these potential effects, and contingency plans and response options, will be identified.<br><br>• Y: Further assessment is required concerning the post-closure long term effects; especially those of climate change. Operationally may be ok, but perpetuity will likely be different. | will be implemented to address the potential risks to the Project associated with climate change. In particular, dams have been designed already with a high degree of conservativeness that reasonably provides assurance against climate change related hydrological impacts. These dams will also be regularly inspected during the life of the Project per Canadian Dam Association guidelines and upgraded as recommended by inspectors at the time based on any new regulatory requirements that may roll out per improved knowledge of climate change at that time. A statement will be added to the Section 34.1.8 indicating how this kind of monitoring of dams and adaptive management will continue in the post-closure phase per CDA guidelines. | |
| 430. | 28 | Environmental Effects of Accidents and Malfunctions | Chapter 35 | Gitanyow Hereditary Chiefs (GHC) | Comments on Chapter 35 – Environmental Effects of Accidents and Malfunctions (59 pages):<br>• GHC General Comments on the overall context of Chapter 35: The overall topic of this chapter is unclear; is this chapter supposed to be devoted to the risks posed to the project by natural disasters (e.g. earthquakes, avalanches, landslides, etc.)? | Under section 16(1)(a) of the *Canadian Environmental Assessment Act* (1992), every comprehensive study of a project shall include a consideration of the environmental effects of malfunctions or accidents that may occur in connection with the Project. The Application Information Requirements (AIR) document provides further clarity:<br>"The Application will identify the probability and potential magnitude of an accident and/or malfunction associated with the proposed Project….and describe the outcome of accidents and/or malfunctions with an analysis of consequential effects to the environment. The Application will identify potential contingency plans and response options for probable accidents and/or malfunctions."<br><br>The methods outlined in Chapter 35 section 35.2.2 state that the Failures Modes | Reasonable treatment. |



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| | | | | | | Effects Assessment (FMEA) used to assess accidents and malfunctions is a qualitative methodology intended to provide a structured and transparent analysis to assess:<br>• the potential for, or likelihood of, failure of structures, equipment or processes and variation from assumptions made during design and estimates; and<br>• the effects or consequences of such failures on the larger systems of which they form a part, and on the surrounding ecosystem, including human health and safety.<br>It is clear that the intended purpose of Chapter 35 is to provide an assessment of environmental effects caused by Project accidents/malfunctions, and that this requirement was met. | |
| 431. | 28 | Environmental Effects of Accidents and Malfunctions | Chapter 35 | GHC | Page 3: What were the specific Biological Impacts that were considered to be caused by Accidents and Malfunctions? | The Failure Modes and Effect Analysis (FMEA) assesses major risks based on potential events or failures. The potential biological impacts evaluated varied depending on each event but included impacts to water quality, air quality, fish, animals, vegetation and human life. | Reasonable treatment. |
| 432. | 28 | Environmental Effects of Accidents and Malfunctions | Chapter 35 | GHC | GHC General Comments on Chapter 35: Ideally this Chapter should be further subdivided into two separate chapters: (i) Effects of Accidents and Malfunctions on the Mine Site, Structures and Personnel. (ii) Effects of Accidents and Malfunction on the Environment – both on the LSA and RSA and watershed levels overall. | The Failure Modes and Effect Analysis (FMEA) assesses major risks based on potential events or failures. The assessment was organized by main areas (A being Treaty Plant and Tailings Area and B the Mine Site Area) followed by scope types (Tunnels, Access Roads, Power, Fuel, Explosives, etc.). This review methodology allows the team to focus on the same type of potential events and impacts as the assessment evolves. | Reasonable treatment. |
| 433. | 28 | Environmental Effects of Accidents and Malfunctions | Chapter 35 | Tahltan Nation | The Galore Creek project was approved by the EAO; however, issues with water quality and risk of dam failures came to light after the project was approved. These issues were influential in raising the costs of construction to the point that the mine was no longer considered feasible as it was designed and approved.<br>• In light of that project, what is being done differently by the EAO and the proponent to ensure that the project, as laid out in this application, has been sufficiently researched such that the true risks are understood and accounted for | The favourable geotechnical conditions in the Project area suggest that the risk of dam failures is not expected to be significant.<br><br>The KSM team conducted a Risk Assessment Workshop, where experiences from Galore helped set design criteria and layouts for the KSM Project. Strategies used on KSM include: incorporation of sensitivity analysis of diversion efficiencies and availabilities in the water balances and design of the Water Storage Dam, use of tunnels rather than large surface channels for water management, etc.<br><br>Seismic risks were included in the assessments and design. | Reasonable treatment. |



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| | | | | | in this application?<br>• Were seismic risks included in the assessment and engineering? | | |
| 434. | 30 | Cumulative Environmental Effects Assessment | Chapter 37 | Tahltan Nation | The Application will include an evaluation of cumulative environmental effects of residual effects that are likely to result from the proposed development and how they may combine with environmental effects from other past, present and reasonably foreseeable projects and activities.<br>• lack of Tahltan criteria used in assessment for entire chapter | Chapter 5 identifies the assessment methodology followed for the EA. Tahltan criteria were considered in the EA where information had been provided by the Tahltan. | Reasonable treatment. |
| 435. | 30 | Cumulative Environmental Effects Assessment | Chapter 30 | Tahltan Nation | As with the proposed Project effects assessments, residual cumulative effects will be characterized in terms of magnitude, geographic extent, duration and frequency, reversibility, resilience and anticipated resiliency time frame and probability of occurrence and confidence. This section will describe the basis for determining the significance of the cumulative effects and the proposed Project contribution to cumulative effects.<br>• Tahltan Land Uses are more than just harvesting that should be considered in the analysis | In response to the request, text in Chapter 30: First Nations Interests has been adjusted to address the comment as follows, “First Nations traditional uses of, and connection to, the land and associated terrestrial and aquatic resources are the most obvious, but not the only, expression of Aboriginal rights and title in their traditional territories. That is, the Aboriginal rights most relevant to the Project are those related to hunting, fishing, trapping, the collection of traditional food and medicinal plants, and related environmental resources, activities or practices, and attributes which are important to the specified First Nations”. | Reasonable treatment. |
| 436. | 30 | Cumulative Environmental Effects Assessment | Chapter 37 | Tahltan Nation | The number of IPP projects provided is insufficient. It does not account for McLymont, Volcano or the Northland projects. | The list of past, present, and reasonably foreseeable Projects and activities was included in the AIR (January 2011) and updated with EAO in early 2012. McLymont is included in the list of projects in the cumulative effects assessment. | Reasonable treatment. |
| 437. | 32 - 35 | Conclusions | Chapter 1<br>Chapter 39 | BC MOE | Development of the KSM Gold Project will have significant short- and long-term effects to the land upon which the project will be constructed and will have an uncertain effect upon | The Project was designed to incorporate mitigation measures that would result with a maximum environmental effect of moderate significance rating. Any effect that was deemed significant was considered a fatal flaw and redesigned to meet at minimum a moderate effect. The general intention of the design was to mitigate the effects to a minor rating where ever possible. For example, Table 1.7-1 provides an | Reasonable treatment. |



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| | | | | | the receiving environment. The uncertainty is a product of prediction accuracy and the impact of changes to the project area over time. The magnitude and duration of these effects will vary over time and be contingent upon a multitude of factors such as climatic changes, physical changes to the site, short/medium/long term natural variability, on-going water quality and treatment requirements, overall mitigation effectiveness, the effects of spills and process upsets during and after mining operations, management decisions and their implementation and a host of other factors. As the site evolves over time, it would be expected that some effects or potential effects will decrease while others may increase.<br>The proponent has concluded that the residual effects of the project are principally negligible to moderate. The Environmental Protection Division (Skeena Region) of the Ministry of Environment (EPD) does not concur with this conclusion at this time given the sheer scale of the project, the intense and complicated engineering requirements, the requirement for very long-term collection and treatment of mine-water, and the "in perpetuity" maintenance requirements for the site infrastructure. | overview of key changes made to the project design to reduce the short and long term effects of the Project on the environment.<br>The KSM Project will provide an estimated CAN$24.3 billion to BC's GDP and CAN$1.4 billion in tax revenues to BC. Nationally, the Project will generate approximately CAN$48 billion to Canada's GDP and a total of CAN$9.1 billion in tax revenues during the construction and operation phases.<br>In addition to positive economic benefits, the Project will provide significant employment, education, and training opportunities to local and regional communities, including Aboriginal peoples. During construction, there will be an estimated average of 1,800 direct (on-site) jobs (full-time equivalent [FTE]). For indirect jobs, there will be an estimated average of about 2,510 FTE jobs in BC and 4,770 in Canada (including BC). Additionally, the number of induced jobs (from workers spending their incomes) will average approximately 4,410 FTE jobs across Canada, with approximately 2,220 of those in BC. For operation, it is estimated that there will be an average of 1,040 jobs (FTE) on site annually, with an average of an additional 1,840 indirect jobs in BC and 3,780 indirect jobs in Canada (including BC). Induced jobs in BC will average approximately 1,110 (FTE) during operation, with approximately 2,680 jobs in Canada (including BC). | |
| 438. | 32 - 35 | Conclusions | Chapter 39 | BC MOE | Summary of Residual Effects: The Application will summarize the potential effects of the proposed Project and proposed mitigation measures. The Application will indicate whether the proposed Project is predicted to result in significant adverse residual environmental, | This Project was designed to incorporate mitigation measures that would result with a maximum environmental effect of moderate significance rating. Any effect that was deemed significant was considered a fatal flaw and redesigned to meet at minimum a moderate effect. The general intention of the design was to mitigate the effects to a minor rating where ever possible. For example, Table 1.7-1 provides an overview of key changes made to the project design to reduce the short and long term effects of the Project on the environment. | Reasonable treatment. |



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| | | | | | social, economic, heritage or health effects<br>Summary of Cumulative Effects: The Application will summarize the potential cumulative effects of the proposed Project.<br>Summary of Commitments: The Application will include a table or list that summarizes the commitments made in the Application to avoid, reduce or otherwise mitigate the potential adverse effects of the proposed Project.<br>Conclusion: The Conclusion will indicate whether the proposed Project is predicted to result in significant adverse residual environmental, social, economic, heritage or health effects.<br>• Y However, it is difficult to comprehend that the majority of possible effects have been mitigated to a point whereby "minor" is the overall conclusion; given the scale and duration of the project, especially post-closure. The project will not be environmentally beneficial and the footprint will be significant with very long term treatment and site maintenance requirements. Effects assessments also seem to rely on effective implementation of EMP which is often not the case. Language in section is also conflicting in terms of potential effects. More clarity around the total, and long-term implications of the | | |



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| | | | | | project is required. | | |
| 439. | 11.3 | Geohazards | Chapter 9 | MEMNG | In Section 5.8 of Appendix F1, BGC states that, *"The ultimate pit wall in design sectors I-078 and III-105 [also I-125 and III-138?] may intersect the rock mass associated with the Snowfield landslide; however the extents of the landslide are not well defined at this point in time.*" Elsewhere in Appendix F1, BGC states that, "*The Snowfield landslide will require a separate study of its extent, material properties, mode of deformation, and potential run-out path and distance.*" In Appendix F2, BGC indicates that, "*Future investigations of the landslide and stability analyses should be conducted to determine where the pit wall will intersect the landslide, and to evaluate whether or not the pit slope angles should be reduced in this portion [SE Wall] of the proposed pit.*" Finally, in Appendix 9-H, BGC states that, "*the slope will very likely continue to deform if no mitigative actions are undertaken as part of the mine development and the Snowfield Landslide appears susceptible to sudden collapse (Section 5.1).*" It is understood that the Snowfield landslide is located on property controlled by others (Silver Standard) and that this has constrained the investigation. However, the level of uncertainty with respect to an active (moving at 10-50 cm/year) landslide this size (57,000,000 $m^3$) is too high at the EA stage, and requires additional work. Feasibility level design on this side of the Mitchell Pit has not been demonstrated. Section 9.1.4.3.1 indicates that, "*In the event* | A three-dimensional (3D) interpretation of the basal surface of the Snowfield Landslide (BGC, 2012c) has been completed by BGC. Data used for this interpretation are geotechnical drilling completed by BGC for Silver Standard in 2010, exploration drilling data from Silver Standard, and geotechnical drilling completed by BGC in 2012 for Seabridge.<br>This 3D surface was used to assess the portion of the Mitchell Pit that would intersect the west side of the Snowfield Landslide mass. Based on the economic pit phases and mine plan (years provided are approximate):<br>• The Phase 1 pit (approx. Year -2 to Year 1) does not intersect the landslide.<br>• The Phase 2 pit (approx. Year 1 to Year 5) intersects the landslide mass.<br>• The Phase 4 pit (approx. Year 5 to EOP), which represents the ultimate extent of the southern half of the Mitchell pit, also intersects the landslide mass. Approximately six double benches (or 180 m high portion of the pit slope) would be developed in the west side of the landslide.<br>BGC (2012c) recommended that the pit designs be modified so that:<br>• Permanent access or haulage ramps are not developed below the benches intersecting the slide.<br>• A geotechnical berm should be included in the pit design at the base of the slope intersecting the landslide mass to facilitate dewatering of the slope and provide catchment for unstable materials from these slopes.<br>Moose Mountain Technical Services (2012) indicated these modifications will be completed during the next update to the pit design.<br>The latest stability analysis of Cross section C (BGC, 2012a), which intersects the Snowfield Landslide edge and assumes a distribution of landslide material consistent with the interpreted 3D basal failure surface, demonstrates that this section of wall meets the required design factor of safety for the pit slopes.<br><br>As recommended in 2010, further studies of the Snowfield Landslide have been undertaken (BGC 2012b):<br>• Review of data from previous drilling for Silver Standard in the Snowfield Landslide<br>• Empirical analysis of potential run out path and distance<br>• BGC 2012c:<br>• Interpretation of a 3D basal surface of the landslide<br>• BGC 2012d:<br>• Review of piezometric data for the slope, installed in boreholes completed | Reasonable treatment * |



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| | | | | | *of slope failure, portions of the landslide would run into the pit and impact workers and equipment.*" It is recommended that the EAO require a better characterization of the slide mass and its potential impact on human health (life) before accepting the EA Application. If the slide mass is to be removed (see Item #8), plans and sections illustrating how this will be accomplished safely will be required. It is anticipated that a fuller understanding of the slide mass would be required even if slide removal is contemplated. | for Silver Standard<br>• Drilling and instrumentation of two additional geotechnical holes in the landslide in 2012<br>• Installation of six permanent survey targets for ongoing monitoring of the slope were installed for on-going monitoring<br>• Installation of two time-domain-reflectrommetry cables to investigate the base of the landslide in 2012<br>Updated estimates of the rate of landslide deformation<br>• Additional work is also underway via a university research project at Simon Fraser University; in collaboration by BGC with and under the supervision of Dr. D Stead, an international expert in large bedrock landslides and slope stability. The aim of the study is to further characterize the landslide to allow the optimization of the mitigation plan.<br><br>Appendix 9-H Preliminary Geotechnical Assessment of the Snowfield Landslide, June 13, 2012<br>Adequate data exists to develop mitigation plans for the Snowfield Landslide. Mitigation plans, in preparation, will be a combination of:<br>• Surface water management to reduce infiltration into the landslide mass<br>• Removing material to unload the "sliding" block of the Snowfield Landslide<br>• Real time slope deformation monitoring of the landslide and the pit slope cut into the landslide during construction and mining<br>Monitoring is well established in mining as a strategy to reduce risk from large slope instabilities. The recent slope failure at the Bingham Canyon Mine (April 10, 2013) is an excellent example of the use of monitoring to avoid injury or loss of life related to the collapse of a large unstable slope.<br>BGC has been provided access to the slide area and has undertaken additional field work and office assessments for the Snowfield Landslide to reduce uncertainty. The work carried out and further work, which is ongoing, to asses deformations and optimize the stability of the slide contribute to the development of a plan that provides a safe working environment.<br>Removal of the slide is one of several possible mitigations. It is recommended that attempts to stabilize the slope be undertaken though water management and depressurization, prior to attempting to remove parts of the slope.<br>At all times, a real time monitoring system would be in-place to provide warning to workers and facilitate evacuation of the area in the event of an increase in the rate of slope deformation. | |
| 440. | 9 | Project Description | Chapter 4 (related appendices) | MEMNG | Section 6.1.10(7) of the [Health, Safety and Reclamation] Code | The preferred location of the Mitchell OPC is constrained by a variety of factors, which include: tunnel portal stability with respect to geo-hazards and snow | Reasonable treatment. |



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| | | | | | prohibits extended activity below active dumps and requires a program of monitoring to allow work below inactive dumps. This Section of the Code is intended to protect the health and safety of mine personnel. In the current mine plan, it appears that construction and operation of the Mitchell OPC occurs concurrently with the development of the Mitchell RSF above. The proponent is asked to indicate how this Code requirement will be satisfied. It is recommended that the EAO require that this information be submitted before accepting the EA Application. It is not clear that the proposed location of the Mitchell OPC has been demonstrated to be feasible, particularly in light of the uncertainties surrounding the extent and strength of the lacustrine soils supporting the Mitchell RSF in the area of the Mitchell OPC. | avalanches; proximity to the open pit; and optimization of the mine rock storage facilities to the west of the Mitchell OPC.<br>Spatial extents of the clay layers have been determined with drill hole sampling and geotechnical testing (water contents, washed sieves and Atterberg limits) from five geotechnical boreholes. (KC08-03 with 31 sample tests, KC09-07 3m of moraine with visual descriptions only, KC09-08 with 4 sample tests, KC09-09 with 23 sample tests and KC10-OVB20 with 4 sample tests). Geotechnical stability modeling was based on the properties of drill hole samples as well as in-situ permeability (falling head and packer), SPT testing in the drill holes and surface geophysics to provide correlation between drill holes (five km of refraction seismic for layer and bedrock elevations, eight resistivity soundings for identification of clay layers).<br>The data indicates that clay layers are found within an area of minimum extent of 200 m by 200 m and maximum extent of approximately 300 m x 300 m. Strengths used for the clay in stability models were based on lower bound strengths derived from empirical correlations with test result plasticity index that have been developed from a worldwide database of clay behavior. As a result of the use of lower bound values these are therefore, considered to be appropriately conservative. In addition, 3-D effects resulting from the geometry of plausible failure surfaces (i.e. where lateral extent of clay is similar to depth below dump surface), that would increase stability, were not included in the stability calculations. Based on the geotechnical assessment and model results there is minimal concern regarding construction of the Mitchell OPC and the Mitchell RSF on this foundation.<br>Pore pressure and deformations will be monitored to confirm stability. Undisturbed samples will be collected from the instrumentation drill holes and tri-axial and consolidation tests will be carried out to further confirm the design strength and pore pressure response. “Trigger” values for monitored parameters will be developed from these results to ensure safe operation and placement of the rock fill. If trigger values are exceeded, the rate of construction will be slowed or halted and placement will move to alternate areas while assessment if design modifications are required is performed. These procedures are standard practice for mine rock dumps in British Columbia and are implemented to ensure the health and safety of workers.<br>The berms and benches constructed of waste rock fill located south of the Mitchell OPC are required as a series of haul road terraces used to access the Mitchell RSF located to the southwest of the pit. Initial drain and “consolidation” layers will be placed across the base of the entire Mitchell valley in Years -2 to Year 1 to confine the toe of the slope and to allow pore pressure to dissipate before construction of the haul road terraces. The drain and consolidation layers will be placed across valley, from downstream to upstream. Rock fill to define the haul road terraces will then be raised approximately 100 m/yr up to the final height as engineered lifts. The terrace fills above the OPC that form the haul road between the pit and the main section of the RSF will be placed from the bottom up in bench heights of approximately 20 m. As a result of these procedures the slope area above the | |



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| | | | | | | Mitchell OPC is not considered to be an active rock dump face but rather a structural fill for the haul roads. A rock fall catch berm is located at the toe and 90 m wide benches are placed approximately every 100 m in elevation. Staging of the overall RSF development, placement sequences for drain and consolidation layers and general mine rock placement is shown on drawing D-4201-B from the KCB Mine Area design report.<br>Seabridge recognizes the requirements of the code and will implement special placement sequences and monitoring procedures for the period of time that the haul road terraces are being constructed uphill of the Mitchell OPC. In other areas where temporary construction or access is required downhill of an active rock dump the procedures will prohibit entry between the catch berm and the RSF face during activities on the working faces. With these procedures in place the design of the Mitchell RSF, the configuration of the haul road terraces and the location of the Mitchell OPC is in accordance with Section 6.10.1 Dumps Roads and Ramps, Managers Responsibilities.<br>Further comments from the mine design engineers are provided below:<br><br>Stage 1 – OPC cuts<br>Approximately half-way through Year -3, the cut portions of the OPC pads will be started (on the north slope of Mitchell valley). During this time there is no mining activity in the Mitchell pit area.<br><br>Stage 2 – OPC Pad construction and Mitchell fill road construction (EAST of the OPC pad)<br>During this stage the construction of the OPC pads will continue and the fill road from Mitchell Pit to connect to the OPC will start. The OPC pad fill will be sourced from a borrow pit to the west of the OPC pads. The Mitchell road fill material will be sourced from the pre-stripping activity in the Mitchell pit area. The Mitchell fill road and the Mitchell pre-strip activities are ~1.2km east of the OPC pad area. Access in the Mitchell valley bottom (to the MDT inlet area for example) will be restricted and will only be allowed if the trigger values of the instrumentation are below the threshold values. The crest and dump face of the Mitchell fill road will be monitored with wire line extensometers or 3D imaging techniques as is done in other mines in BC. The active dump faces will also be monitored visually watching for early indications of localized instability. Threshold values will be used to control the access below active dumping areas as well as access to the active dumping crest. These threshold values will be determined during the detailed design phase. If a trigger value is reached, access below the affected area will be closed off and dumping of material around the affected area will be suspended until lower monitor readings indicate that there is no danger of a dump failure. When the toe of the Mitchell fill road reaches the bottom of the Mitchell valley an impact berm will be built at the toe to catch any ravelling material from the crest of the Mitchell fill road. | |



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| | | | | | | This impact berm will be constructed behind the advance of the active dumping face of the fill road to ensure there is no activity occurring below an active dump face.<br><br>Stage 3 – OPC pad construction and Mitchell fill road construction (Across from the OPC pad)<br>The fill portion of the OPC pads will continue to be constructed and the Mitchell fill road construction will continue. During this time there is still no activity occurring below an active dump face since the OPC pad is across the Mitchell valley and upslope from the toe of the Mitchell fill road. An impact berm will be built in advance at the base of the OPC pad during the time interval when the portion of the active dump face for the Mitchell fill road is immediately across the valley from the OPC and the fill road toe berm is not yet far enough advanced.<br>During this stage, the threshold values of the monitors will be lowered to a value determined to be safe for any portions of the access to the OPC pad fill construction, that are near and active dump face.<br><br>Stage 4 – OPC pad, Mitchell closure dam and consolidation layer construction<br>After the Mitchell fill road has been completed to the Mitchell valley bottom, the Mitchell closure dam and consolidation layer construction below the (now) in-active portion of the Mitchell fill road can commence**.** The crest of the fill road above these areas that are below in-active dump sites, will continue to be monitored (visually and with instrumentation) and access to these working areas will be controlled using safe threshold values.<br><br>Terrace construction<br>The terraces across the valley from the OPC will be constructed in 20-30m lifts. Each terrace will be 90-105m in ultimate height with a flat platform left between terraces and an impact berm constructed on the platform at the base of each terrace. The impact berm is designed to catch any ravelling material from the active dump face. During the terrace construction, there will be 2 vertical stages to consider on an operational basis. The upper stage is the active dumping area where the 20-30m lifts are being placed in order to build the upper terrace. The active dump face on the 20-30m lift will be monitored and the impact berm at the base of the active terrace will be built to catch ravelling material. Access to the 65m wide platform left at the base of the active dump stage will not be permitted since this platform is directly below the face of an active dump. The lower stage consists of a previously constructed terrace and will have an impact berm at the toe and another 65m wide terrace at its base. Access along this lower terrace will be allowed since it is now below an inactive dump. In this situation the threshold values on monitors above must be below safe levels or access will be closed. | |



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| 441. | 26 | Alternative Means of Undertaking the Project | Chapter 33 (Appendix 33-B) | Tahltan Nation | Additional information is required to support the change in routing for the access road as a number of potential impacts (ie. Wildlife, community outreach and First Nations concerns, sediment and erosion and impacts to the Preston watershed) lack sufficient data to support the conclusions presented in the application and the AIR clearly identifies that certain data will be collected to support the analysis and conclusions. | The multiple accounts analysis for road access alignment to the TMF is provided in Appendix I of Appendix 33-B. This analysis provides detailed information on road alignment (length and grade), geohazards and snow avalanche risks, wildlife habitat, fisheries, wetlands, and commercial land uses for both a northern access route and a southern access route. | Reasonable treatment. |
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**KSM AIR Modifications**



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| AIR Section Number, Topic | AIR Requirement | Comment | EAO Response |
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| ***General Comment***: The EIS/Application Table of Contents will not replicate the AIR to minimize repetition between chapters. The Table of Concordance in the EIS/EA Application will clearly identify where AIR requirements can be found in the EIS/Application. | | | |
| Crown land requirements | 9.5.2: The Application will describe the Crown land tenure requirements for the construction, operation and commissioning of the proposed KSM Project. | This section is interpreted as: "The Application will describe anticipated permits, licenses and approvals required for the construction, operation and commissioning of the proposed KSM Project". | |
| Climate and Air Quality | 11.1.6: The Application will identify and evaluate potential effects of the proposed Project on maintaining ambient air quality….that are consistent with both provincial and federal standards….<br><br>The Air Quality effects assessment will…undertake air dispersion modeling to determine ambient air concentrations….. | The Guidelines for Air Quality Dispersion Modeling in BC (March 2008) identify preferred receptor spacing which varies with distance from emission sources (Section 6.2 of Guidelines). BC MOE (B. Weinstein, Air Quality Meteorologist) has approved the Air Quality Dispersion Model using different receptor spacing than required by the Guidelines. The Air Quality Dispersion Model will use a more dense receptor grid (i.e., receptors will be closer together) to model concentrations in close proximity to point and area-based sources. Greater receptor spacing will be used in more remote areas of the modeling domain. | |
| Climate and Air Quality | 11.1.9: Residual cumulative impacts on relevant VCs will be assessed. | The approach to the climate effects assessment will focus on estimating project-specific Greenhouse Gas emissions and comparing these to the provincial, national, and international total GHG emissions and to sector profiles as per the Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners (CEA Agency, 2003). This approach does not include a cumulative effects assessment on the climate VC. In addition to following the policy guidance, this approach (i.e. using sector comparisons to support a project-specific effects assessment, and not | |



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| | | analyzing cumulative impacts) is consistent with that taken on the Galore and Line Creek Coal EA projects. | |
| Geohazards | 11.3.8: "The Application will identify potential residual effects of geohazards on construction, operation and closure/post closure activities, and the related consequences, after mitigation…"<br><br>"Determine the significance of the identified potential residual effects from the proposed Project…" | Geohazards are not typically characterized as a Valued Component in EAs. The assessment of geohazards is related to risk, and identifying measures to mitigate that risk. Geohazards will also be considered in the Effects of the Environment on the Project, and the Accidents and Malfunctions chapters.<br><br>Seabridge is not planning to conduct a residual effects or determination of significance, and cumulative impact analysis for geohazards. However, significance criteria, e.g., magnitude and likelihood, will be discussed. | |
| Geochemistry | 11.4.8: "Where ML/ARD predictions indicate that after mitigation, a component of the predicted seepage or surface runoff from source components will reach the receiving environment, an effects assessment will be completed to determine the significance. | Geochemistry is not typically characterized as a Valued Component and subject to an effects assessment and significance determination. Rather, geochemical characterisation is considered as a factor affecting the design of the Project and typically discussed in the Project Description (see Mt. Milligan, Line Creek Coal, and Kitsault Mine EA applications as examples). This section is also typically supported by proposed mitigation and testing programs, summarized in a supporting ML/ARD plan. Results from the geochemical predictive studies are applied, where relevant, to the assessment of other VCs (e.g. surface and ground water quality).<br><br>Seabridge proposes to include a Geochemistry Chapter (separate from the Project Description and other VC chapters) that identifies the predictive studies that | |



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| | | were carried out, and includes an assessment of the ML/ARD risk on mine site and TMF components, non-deposit overburden material, and along access roads for the KSM project. Mitigation, testing procedures, and monitoring programs are proposed to be presented in a supporting Environmental Management Plan. A project-specific residual effects assessment, significance determination, and cumulative impact assessment will not be conducted on geochemistry. However, significance criteria, e.g., temporal lag phase may be discussed. Geochemical data will be used, where relevant, to support the assessment of effects on other VCs affected by ML/ARD (e.g., surface water quality and groundwater quality). | |
| Economic | 13.1.6: "The Application will identify and evaluate potential effects of the proposed Project on the local and<br><br>regional economies. This will include:<br><br>Quantitative methods will also be used including economic modeling, use of multipliers and<br><br>cause and effects matrices. Indirect and induced employment, income, revenue generation and<br><br>GDP effects will be predicted and measured using the BC Stats Input-Output Model (BCIOM).<br><br>Input modeling data will be based on employment and expenditure data provided by the | To predict indirect and induced employment, income, revenue generation and GDP effects, the Application/EIS uses a proprietary economic impact model that is based on Statistic Canada's Input-Output Model rather than the BC Stats Input-Output Model. This model has several benefits: 1) the model can be adjusted to be specific to the Project rather than being based on general statistical averages from secondary data sources; 2) the model can incorporate dynamic behaviour rather than relying on linear, static input-output structure; and 3) generate estimates at the sub-provincial level (i.e., Regional District or Census Division) rather than only at the provincial level. | |



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