DFO's Review Comments for the Back River Project, Water Management Plan for B2Gold, Water Licence 2AM-BRP1831

SUBJECT	Comment	Recommendation
Water Management Plan: Table 6.2-4 Culvert Design Criteria Section 6.5, Table 6.5-1 Culvert Sizing, Pg 41	Watercourse crossings have the potential to result in a harmful alteration, disruption, or destruction of fish habitat with associated footprint, infilling; by causing fish passage issues, and/or by causing hydraulic issues resulting in blocked debris movement, erosion, scour, and deposition. Fish passage must be maintained during certain biologically significant periods of the fish's life cycle when migration is important. This includes allowing upstream passage when certain fish species migrate to spawn in the spring or the fall and allowing young of the year fish to move from rearing areas to habitat where they can overwinter. Fish passage should be maintained for those fish that wish to pass at various times of year. DFO defines fish passage as suitable if fish are not delayed in their upstream migration for more than 3 consecutive days during a 1:10 year flow event. The document reports that "The fish-bearing crossings will be sized to keep maximum water velocities below 1.5 m/s for the average June flow such that they do not present a velocity barrier to migrating Arctic Grayling". Based on DFO's Swim Performance Online Tools (SPOT) (fishprotectiontools.ca), only 87.5% of 245 mm Arctic Grayling can swim against 1.5 m/s current for 1.6 m and that number falls to 50% for 7.3 m.	Please provide context/rationale on why the 1.5 m/s velocity value for the average June flow was used to inform culvert design, as it appears high and high flows may impede fish passage.
Water Management Plan: Section 6.5, Table 6.5-1 Culvert Sizing, Pg 41 Section 8.1.7, Stream Diversions. Pg 55-56	In section 6.5 the document states "there are five proposed culvert crossing locations at the Goose Property: one crossing through the airstrip and four crossing through the all-weather roads". In section 8.1.7 of the document the document states "a culvert crossing denoted as the Goose Airstrip Culvert (C3), will facilitate drainage through the Goose Airstrip to Goose Lake via the Goose Main Diversion Berm. Three additional culvert crossings along the haul road, including the Goose Neck Culvert (C5) south of Llama Pit, the Echo Culvert (C4), and the Gander Pond Culvert (C2), northwest of the Goose Airstrip. It is unclear if culverts have already been built. In addition, DFO is required to ensure that the proponent is following the fish passage requirement for culverts in fish bearing crossings. Table 6.5.1. Goose Property Culvert Characteristic -Design Storm does not include the length of the proposed culverts.	Please confirm which of the five proposed culvert crossings (C1, C2, C3, C4, or C5) are fish bearing and non-fish bearing and if they have already been installed. Please provide culvert length and diameters (if as-built deviated from table).
Water Management Plan: Section: 7.6.1 Winter Ice Road Construction and Use Section: 9.2 Water Usage	The proponent's proposed water withdrawal will occur within Zone 2 of the Nunavut Restricted Activity Period Timing Windows for the protection of Fish and Fish Habitat (Projects Near Water - Nunavut Restricted Activity Timing Windows for the Protection of Fish and Fish Habitat (dfo-mpo.gc.ca)). Although other protective measures are proposed to be followed (e.g., use of fish screens, limiting of water withdrawal volumes), a request for review should still be submitted. In addition, the document discusses water intake construction which will require a request for review once the design plans have been finalized.	DFO recommends the proponent complete and submit a request for review form for water withdrawal activities (https://www.dfo-mpo.gc.ca/pnw-ppe/reviews-revues/request-review-demande-d-examen-004-eng.html) as the application meets the criteria for a site specific review (e.g., will occur during the restricted activity period), as described on DFO's website (https://www.dfo-mpo.gc.ca/pnw-ppe/reviews-revues/request-review-demande-d-examen-003-eng.html). DFO recommends the proponent confirm a request for review will be submitted for the construction of water intake structures.
Water Management Plan: Section 6.5, Culvert Sizing, Pg 41.	The document outlines that circular corrugated steel pipe culverts are proposed, and to be designed with a diameter of 1.2 m or 2.5 m. The fish-bearing culverts will be embedded at depth and a thin layer of streambed material will be placed to promote fish passage and habitat suitability. Closed bottom culverts in fish-bearing watercourses require significant consideration during the design to maintain fish passage due to the alteration of natural bed composition, transport, and can increase water velocity, low water depths, and can become perched during periods of low flow. Open bottom culverts allow natural stream process to occur through the crossing and are well suited for fish and other organism passage.	DFO recommends the proponent to use open bottom box culverts or provide rationale of why open bottom culverts were not used.