Barbara Schuhmann

I would like to incorporate by reference the comments of the US Fish & Wildlife Service as my comments to the two permits pending before DNR and ADEC re Manh Choh. Thank you.

United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Northern Alaska Fish and Wildlife Field Office
101 12th Avenue, Room 110
Fairbanks, Alaska 99701
March 10, 2023

VIA ELECTRONIC MAIL, NO HARD COPY TO FOLLOW

Alaska Department of Natural Resources / Office of Project Management & Permitting
Attn: Ashlee Adoko, Large Project Coordinator
550 West 7th Avenue, Suite 1430
Anchorage, AK 99501-3577
manh.choh.comments@alaska.gov

Re: Peak Gold LLC, Manh Choh Project: Draft Waste Management Permit 2023DB0001 & Reclamation Plan Approval F20232626RPA

Dear Ms. Adoko:

The U.S. Fish and Wildlife Service (Service) has reviewed the referenced Public Notice for application of a State of Alaska Integrated Waste Management Permit and Reclamation Plan Approval to serve the proposed Manh Choh open pit gold mine. The Manh Choh Project (Project) includes development of two gold mine sites within the Tetlin Hills, located approximately 12 miles west from the Upper Tanana Athabascan Village of Tetlin, Alaska, and approximately 10 miles south of the town of Tok. The mine site would be situated on top of a group of low hills in the northern part of a lease between Tetlin and Peak Gold LLC and would be accessible from the Alaska Highway. Access to the mine sites requires two gravel roads, the Manh Choh Twin Road and the Manh Choh Site Road, both on Tetlin Land. The ore would be hauled more than 250 miles one-way to Fort Knox, northeast of Fairbanks, Alaska for processing. Development of the Project site would take about two years, and subsequent mining on site would continue for approximately 4.5 years. Termination of mine operations would include reclamation and revegetation of disturbed areas to minimize erosion and sedimentation.

Background: The Service previously commented on the proposed Project's potential impacts to 5.2 acres of wetlands and waters of the U.S. during the U.S. Army Corps of Engineers (USACE) Public Notice Comment Period (Attachment 1, February 11, 2022; POA-2013-00286). We provided additional comments to the USACE regarding effects to trust species during development of the compensatory mitigation plan for losses under the Clean Water Act (May 18, 2022). Our comments were associated specifically to Waters of the U.S. and the local impacts to aquatic resources presented in the USACE's public notice and not for the entire proposed Project. Based on the information provided to us at that time, we provided an assessment of potential impacts to Bald and Golden Eagles, migratory birds, and floodplain impacts and

recommended strategies to avoid and minimize effects to fish and wildlife. These are incorporated here by reference.

Our comments that follow are in response to two public notices: one from the State of Alaska Department of Environmental Conservation (DEC) draft Waste Management Permit (No. 2023DB0001), and the other from the Department of Natural Resources (DNR) - Division of Mining, Land, and Water, draft Reclamation Plan Approval (F20232626RPA). The DEC permit would authorize the storage and disposal of potentially acid-generating (PAG) rock and potentially metal leaching waste rock associated with mining activities. It would also cover secondary containment for hazardous substances/fuel and monitoring requirements for waste rock characterization and water quality. However, this draft permit does not address waste rock and water management off-site (e.g., along the haul route or at the final dumping location of Fort Knox). The second permit constitutes DNR approval of the applicant's reclamation plan including financial assurances for reclamation, and stabilization of the following major facilities: North and South Pits, Main and North Waste Rock Dumps, site facilities and buildings, haul roads, and other disturbances generated throughout mining activities.

Potentially Affected Fish and Wildlife Trust Resources: The Service's trust resources are natural resources we are entrusted to protect for the benefit of the American people. Within the proposed project area these resources may include migratory birds including bald and golden eagles, inter-jurisdictional fish, wetland and upland habitats used by these species, and lands managed by the Service (e.g., national wildlife refuges and their fish and wildlife management goals for the refuge).

Tetlin National Wildlife Refuge (NWR): Tetlin NWR was established in 1980 to conserve fish and wildlife populations and habitats in their natural diversity to provide subsistence hunting opportunities to rural inhabitants, and interpretation and environmental education to the public. Tetlin NWR is visited by thousands of migratory birds each spring and fall, its lands provide wetlands and waterbodies needed to rest and renew calorie stores for species on their way to the Arctic and beyond. In particular, the Trumpeter Swan (*Cygnus buccinator*), Lesser Scaup (*Aythya affinis),* Mallard (*Anas platyrhynchos*), and Whimbrel (*Numenius phaeopus*) use the aquatic resources of the refuge and surrounding lands.

Tetlin NWR's 730,000 acres are located about 20 miles east of the project site in the Tetlin River/Manh Choh Lake watershed. Tetlin NWR's close proximity and its downstream location from the proposed mine site potentially expose it to secondary effects of the mine operation and transport of ore. Such exposures include increased intensity and duration of noise, fugitive dust, and/or accumulation of leachate where groundwater discharges into waterbodies.

Eagles and Their Nests: The Bald and Golden Eagle Protection Act protects eagles from take, as well as from disturbance to their nests, roosts, and foraging sites. The density of eagles (juveniles and breeding adults), especially Golden eagles (*Aquila chrysaetos*), within Alaska is highly variable statewide and varies by season (McIntyre et al. 2008). The Service can offer guidance on past eagle use, but we cannot predict future use or potential use in areas where we have little or no data, such as the proposed project area. Both Bald (*Haliaeetus leucocephalus*) and Golden

eagles are present within the project area in early summer and fall.[1] However, the mountainous regions of the Alaska Range, including the proposed project location, are more suited to cliff-nesting Golden eagles.

Bald Eagles: Alaska supports a population of Bald eagles greater than that in all other states combined. Bald eagles nest on the south side of the Alaska Range near lakes and rivers.[2] Bald eagles may be present, and may nest, in trees adjacent to anadromous and resident fish waters, [3] and are documented nearby on the Tanana, Tetlin, and Kalutna Rivers.[4]

Golden Eagles: Golden eagles occur throughout much of Alaska. The Alaska population consists of nesting adults and non-nesting juveniles (Kochert and Steenhof 2002), most of which migrate in fall to wintering areas across a vast region of western North America (McIntyre et al. 2008, McIntyre 2012). Recent migration/movement studies of Golden eagles in similar habitats north of the Talkeetna Mountains indicate a density of 0.80 potentially breeding eagles/100 km2 and an overall estimate of 12,717 eagles of all ages within Alaska (Booms et al. 2021). Recent population estimates are three to five times larger than previous estimates and likely represent about one quarter of the total U.S. population (Booms et al. 2021). Tetlin NWR's 2015 raptor survey (Feierabend and Berg 2015) identified seven golden eagle nesting territories in the Upper Tanana Region (essentially, within and around the Refuge).

Migratory Birds: The Migratory Bird Treaty Act (MBTA) prohibits the take (attempt to or to pursue, hunt, shoot, wound, kill, trap, capture, sell, trade, transport) of protected migratory bird species without prior authorization by the U.S. Fish and Wildlife Service.[5] About 185 bird species migrate through, nest, and/or overwinter within interior Alaska.[6] The Service's birds of conservation concern that may nest or migrate through the project area include: Lesser yellowlegs (*Tringa flavipes*) and Olive-sided flycatcher (*Contopus cooperi*).[7] Additional species of concern using the adjacent Tetlin NWR which are likely to be found in the project area include the Olive-sided Flycatcher (*Contopus cooperi*) and Gray-headed Chickadee (*Poecile cinctus*).[8] Additionally, the density of osprey nests along the east shore of Tetlin Lake is unusually high, possibly the largest in the state). Osprey could be adversely impacted if the water quality of Tetlin Lake declines and affects their primary prey (humpback whitefish) during their nesting and breeding season.

Humpback whitefish: Managing humpback whitefish (*Coregonus pidschian*) is one of Tetlin NWR's management goals to conserve fish and wildlife populations representative of the natural diversity of the Upper Tanana Valley and boreal forest ecosystem (USFWS 2008). Tetlin NWR provides two significant spawning areas for humpback whitefish within the Refuge: one on the Nabesna River and the other on the Chisana River, as well as several important fishing areas (Brown 2006). Two other whitefish species are known to occur on the refuge: round whitefish

[1] https://ipac.ecosphere.fws.gov/location/KPGCTLMDI5D6ZOGWHZL7WMBI5Q/resources#endangered-species
[2] https://www.us-parks.com/denali-national-park-and-preserve/golden-eagle.html
[3] https://www.adfg.alaska.gov/index.cfm?adfg=baldeagle.printerfriendly
[4] https://eagle.abrinc.com/
[5] https://www.fws.gov/law/migratory-bird-treaty-act-1918
[6] https://avibase.bsc-eoc.org/checklist.jsp?region=USak02
[7] https://www.fws.gov/sites/default/files/documents/birds-of-conservation-concern-2021.pdf
[8] https://www.fws.gov/refuge/tetlin/species?category=%5B%22Birds%22%5D

and least cisco, collectively referred to as whitefish, but humpback white fish are the primary subsistence fishery within the Refuge (USFWS 2008).

Brown (2006) described the migrations of humpback whitefish to spawning areas in braided regions of the lower Nabesna River and the Chisana River near the mouth of Scottie Creek on Tetlin NWR, and subsequent migrations downstream into the Tanana River and then for many, up the Tetlin River to overwintering habitat in Tetlin Lake. This is a major fishery resource, one that people in the upper Tanana River cannot afford to lose or have adversely impacted through contamination or other environmental impacts.

Subsistence Uses: Subsistence uses by local residents was one of the purposes for establishing Tetlin NWR (Section 302(4)(B) of ANILCA), and humpback whitefish are the major fish species targeted for subsistence in and adjacent to the Tetlin NWR (U.S. Fish and Wildlife Service (USFWS), 2008). Although Tetlin Tribal members harvest a variety of fish and game; whitefish and moose make up the majority of the harvest each year (Native Village of Tetlin, 2020). Whitefish are harvested throughout the summer while moose are harvested primarily in the fall. Tetlin residents depend on their whitefish catch and moose harvest to make it through the winter (Native Village of Tetlin, 2020). Most subsistence fishing is done by families from the communities of Northway and Tetlin. Case (1986) estimated the average household harvest in Northway was 170 kg per year. Similarly, Halpin (1987) estimated the average household harvest in Tetlin was 258 kg per year. While salmon have been documented in the region, they have never been abundant and are not targeted in the fishery. Halpin (1987) described the fishery in the Tetlin River near the community of Tetlin as a dipnet fishery during migrations into and out of Tetlin Lake. Additional fishing takes place in the Tetlin River upstream from Tetlin Lake as well, in the seasonal camp called Last Tetlin.

Invasive Species: The introduction of non-native species into intact ecosystems is recognized by scientists and land managers as one of the primary causes of biodiversity loss, ranking second only to outright habitat loss (Pimm & Gilpin, 1989, Myers, 1997, Stein, et. al, 1997). When non-native plants displace native plants, habitats may be altered and become no longer suitable for some wildlife. The Alaska Exotic Species Database (Carlson et al. 2008) has documented twenty-seven non-native species on the road system within 20 miles of the proposed project site,[1] though only 8 are ranked above 59 on the invasiveness index (Table 1). These species in and near the moderate to extremely invasive range pose a significant threat to trust species through habitat displacement.

[1] https://aknhp.uaa.alaska.edu/apps/akepic/#map?lg=f37ef462-d080-11e3-a36b-00219bfe5678&z=9&ll=63.26607%2C-141.98302

Table 1. According to the Invasiveness Ranking System for Non-Native Plants of Alaska (2008). ratings from 50–59 are modestly invasive; 60–69 are moderately invasive; 70–79 are highly invasive; and species above 80 are extremely invasive.

Common Name	Scientific Name	Invasiveness Rating
quackgrass	*Elymus repens (L.) Gould*	59
white clover	*Trifolium repens L.*	59
smooth brome	*Bromus inermis Leyss.*	62
foxtail barley	*Hordeum jubatum L.*	63
yellow alfalfa	*Medicago sativa L. ssp. falcata (L.) Arcang.*	64
yellow sweetclover	*Melilotus officinalis (L.) Lam.*	69
bird vetch	*Vicia cracca L. ssp. cracca*	73
white sweetclover	*Melilotus albus Medik.*	81

Comments and Recommendations: We offer the following comments and recommendations to help avoid and minimize the proposed project's impacts on fish and wildlife habitat and impacts to the natural resources within Tetlin NWR.

Golden and Bald Eagles: If project-related disturbances, such as blasting, jackhammering, or piledriving, cannot be timed to occur outside the eagle nesting season (March 1–August 31),[1] the Service recommends, prior to construction, conducting Bald and Golden eagle nest surveys within a half-mile of the project footprint, including cliffs of tributary streams, to determine if and where eagles may be nesting. If nests are located, the Service will work with the project sponsor to recommend buffers and timing windows, within which certain project activities, such as blasting, may be postponed until fledging has occurred. For additional guidance, please see our webpage for measures on how to avoid disturbing eagles and how to determine the likelihood of bald eagle nest disturbance, as well as our national eagle management webpage.[2]

Migratory Birds: Since the proposed project may disturb migratory bird habitat during the nesting season, the Service appreciates the Project employing any measures to help avoid disturbing habitat during the nesting season when eggs, nestlings, and fledglings are most vulnerable. The most effective Best Management Practice (BMP) to minimize injury or mortality to migratory birds is to conduct land disturbing activities (e.g., tree and vegetation clearing, excavation, gravel fill, brush hogging, etc.) before or after the breeding season, which is generally May 1–July 15 at the proposed site.[3] Raptors, such as owls, hawks and eagles, may nest two or more months earlier than other birds, so late summer through mid-winter activities to make the site unsuitable for breeding birds would be preferred in forests and for cliff ledges. Additionally, we appreciate and support employing other conservation measures to minimize impacts to migratory birds. For some example conservation measures to avoid and minimize impacts to birds, please refer to our Migratory Bird Program website.[4]

[1] https://www.fws.gov/birds/management/managed-species/bald-and-golden-eagle-information.php
[2] https://www.fws.gov/birds/management/managed-species/eagle-management.php
[3] https://www.fws.gov/alaska-bird-nesting-season
[4] https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds

Invasive Species: The Service recommends implementing Best Management Practices for minimizing the introduction and proliferation of invasive species, including thoroughly washing equipment before entering the jobsite to remove dirt and debris that might harbor invasive seeds; using weed-free fill, if available, and certified weed-free erosion control materials; appropriately disposing of spoil and vegetation contaminated with invasive species; and revegetating the area with local native plant species. To assist on-the-ground operators in understanding their role in preventing and controlling the introduction and spread of invasive species, we recommend project operators review a free, self-paced training course on invasive species control, which can be found at: http://weedcontrol.open.uaf.edu.

Water Quality: The Service agrees with the draft permit's prohibition on the discharge of wastewater to surface water. Similarly, we do not find the use of wastewater from dewatering wells and storm water runoff to be problematic when repurposed as a dust suppressant on mine roads, provided that no puddling or runoff occurs and assuming well water meets State safety thresholds for any toxicants such as naturally occurring arsenic. The use of microfiltration and reverse osmosis treatment for recaptured surface water runoff is also appreciated by the Service as it limits negative offsite effects to trust species habitats.

However, there are still concerns toxicants from the proposed mine may enter downstream waters and habitats. Maintaining good water quality adjacent to the proposed mine is essential to supporting Service trust species such as migratory birds, anadromous and resident fisheries (e.g., humpback whitefish), and the food webs and habitats they rely upon. Supporting documents to Peak Gold, LLC (SRK Consulting 2021) and other studies (Illig, 2015) describe arsenic and acid-forming sulfides in the ore body of both proposed pits and provide various plans to manage exposure and escapement of these toxicants to the surrounding environment. Both proposed pits sit atop a ridgeline in the Tetlin Hills and shed surface and ground waters via runoff and perennial streams to both the Tok River watershed to the west and the Tetlin Lake watershed to the east. In its August 2022 letter to the USACE (Attachment 2), the Environmental Protection Acenge (EPA) outlined multiple ways in which the current plans do not sufficiently address protections for arsenic leaching into the ground and perennial surface streams, and from there potentially into Tetlin Lake and Tok River. The EPA also identified insufficiencies in the plan to manage potentially acid generating tailings underwater in the south pit and contained multiple cautionary recommendations for minimizing the spread of contaminants to adjacent waters. The logic for EPA's cautionary letter is well established. Acid mine drainage and associated metal leaching into surface and sub-surface waters are the biggest environmental consequences of hard rock mining ventures. Sulfides acidify upon exposure to air and can be leached into surface water through rain and snowmelt. These and other metalloid chemicals in the ore, such as arsenic, become toxic to living things, especially fish and other aquatic life, and can persist for many years in lakes and ponds receiving the runoff where these chemicals concentrate. From other legacy clean-up operations, we know that acid mine drainage and metal leaching have the longest-lasting consequences and are the most expensive to mitigate (Kempton et al. 2010; Skousen, et al. 2017; Rambabu et al., 2020).

The Service agrees with the EPA, and we share several additional concerns. First, the proponent's hydrologic modeling and assumptions regarding infiltration rate and the potential for contaminated groundwater to discharge into surface perennial streams cannot be assured. Factors affecting infiltration are not static, and many such as discontinuous relic bedrock permafrost

subsidence, bedrock fracturing from mining activity, and seasonal melt/precipitation fluctuations all greatly affect groundwater at the site (SRK Consulting 2023). Secondly, the current plan does not fully account for groundwater infiltration from PAG waste rock leachate from on-site or dispersion of PAG fugitive dust from Project Site operations and uncovered waste rock dumps. Water quality in several downgradient waterbodies is already degraded by high background levels of chemicals associated with the ore body. Increased exposure of groundwater through mining activities will only add to concentrate levels downstream.

As even the most comprehensive plans cannot account for all outcomes, we recommend additional downgradient water quality monitoring (both extended timeframes and sampling intensity) and the publication for agency and public review of proactive adaptive contingent plans if downgradient degraded water quality occurs. As per the draft Permit, the current protocol for remediating exceedances or noncompliance with water quality standards is to submit a plan of action after the fact (draft Permit Section 2.5.3). However, the Service believes an after-the-fact response puts important habitats, subsistence resources, and trust species at risk of harm, so a remediation plan should be proactively submitted and reviewed by stakeholders to assure effective and immediate response.

According to the geochemical characterization report the ore and much of the waste rock is acid producing and metal leaching, which means it must be handled carefully at every step of the process and contained in such a way that the contaminated effluent can be captured and mitigated before it causes harm in downstream aquatic habitats. The proposed draft permit focuses on the project site consisting of the North Pit, South Pit, North Waste Rock Dump, Main Waste Rock Dump, and Water Quality Monitoring Sites. However, the project site is only one of five areas in which the material must be contained to process the ore at Fort Knox. Our concerns for each of these areas are discussed below.

1) Onsite Waste Rock and Exposed Pit Wall: The reclamation and closure plan for the mine site, once the ore has been removed, is to move the waste rock back into the two pits, the primarily metal leaching rock in the north pit and the primarily acid producing rock in the south pit. The North Pit will be filled with non-reactive waste rock until it is slightly domed over the pit. An impermeable cap layer will be just below the top layer where vegetation will be reestablished. As such, snow and rain are expected to mostly run off and not fill the north pit, which will have groundwater saturating the lower reaches of the pit. Minimizing the rain and snowmelt is expected to reduce the metal leaching of the buried rock. The Service agrees this is a reasonable minimization strategy to manage metal leaching into groundwater. However, through the process of gold extraction, bedrock below this pit may undergo changes in fracturing or compaction that will affect the rate of groundwater movement. Based on the groundwater flow experiments that were conducted, the proponent believes there will be a slow exchange of water from the pit to the larger groundwater reservoir and then into perennial streams that flow to the Tetlin Lake and Tetlin River on the south and east side of the Tetlin Hills, and the Tok River on the north and west side of the Tetlin Hills. The assumption is that acid and dissolved metals will be sufficiently diluted once they reach surface waters that they will achieve State of Alaska water quality standards. The intent to monitor water quality for at least 10 years following mining, and seven years following

closure may not be sufficient to detect changes in water quality if these time periods are calculated from current rates of groundwater flow and diffusion. We recommend a longer period of monitoring to account for unknown changes in the rates of groundwater flow due to the potential for disturbance in expected bedrock hydraulic conductivity.

The most reactive acid producing waste rock in the south pit will be below the level where the top of the groundwater is expected to reach. Submerging the reactive rock in water will minimize oxygen exposure and subsequent sulfuric acid production. A thick layer of nonreactive waste rock will cap the reactive material and elevate the surface above the expected water level, but not as high as the rim of the pit. There will then be a depression in the south pit, rather than a dome, but the project proponents are not expecting a lake to form. The remaining uncovered South Pit wall will be exposed to weathering by rain and snow, which could increase the expected amount of acid leachate in this waste rock location. The Service recommends the South Pit be filled and capped similarly to the North Pit to minimize the potential for continued exposure of PAG rock. Fill and capping would also prevent any possibility for ponding to occur at this location, which would attract waterfowl and potentially expose them to toxicity or acidic conditions beyond the environmental background levels.

Four Waste Rock Dumps (WRD) at the project site will be used during operations (North Pit, South Pit, North Waste Rock Dump, Main Waste Rock Dump) and remain uncapped until reclamation. Water in contact with tailings in WRDs outside of both pits will be routed via perimeter ditches, be recaptured in ponds, and directed through water treatment facilities. Prior to treatment, we assume this water will not meet water quality standards after it interacts with the WRDs and could have negative effects to fish and wildlife in the surrounding area. Long-term studies of waterbirds exposure to acidified mine waters and metal leachate generally point to elevated arsenic accumulation in muscle and liver tissue (Gomez, et al., 2004), especially in certain species such as geese and gulls. Other than having a detrimental influence on aquatic food webs (McNicol et al. 1987), it is difficult to assess the effects of acidic waters to waterfowl when no pH range is available, but it is safe to assume the lower the pH, the more likely fish and wildlife will be adversely affected. When open water is present, it can attract birds and other species. To avoid attracting additional wildlife, especially waterbirds, to these open waters and putting them at risk of exposure to toxicants and acidic waters, we recommend using bird deterrents at these locations, such as the Brine Pond and Untreated Water Pond in the North sector of the mine, to minimize the risk of wildlife interactions.

2) Transport of Ore to the (Offsite) Ore Transfer Station: Large dump trucks unsuitable for public roads will be used to transport the ore to a transfer station where the ore will be transferred to trucks suitable for travel on the Alaska Highway system. Transporting ore from the mine site to the transfer station is poorly described in the mine plan and is not addressed in the draft Waste Management Permit. It is not clear if the large dump trucks used for this segment of the ore transportation operation will or will not be covered, how load and truck body dust will be minimized, or if plans are in place for spill response of ore and/or hazardous materials. If there are no covers on the large dump trucks, unmitigated amounts of

fugitive dust will contaminate the landscape and continue to waterbodies through surface waters. The Service is concerned that fugitive dust could adversely impact adjacent vegetation and permafrost. Studies of other similar ore transport has shown particulate contamination up to 328 feet (100 meters) from the roadbed (U.S. Department of the Interior 2020), risking contamination to adjacent waterbodies important for subsistence fisheries and waterfowl. We recommend the Waste Management Permit include provisions for the management and mitigation of fugitive dust and surface-water runoff contaminated by fugitive dust, and the applicant submit a clear mitigation plan for accidental spills, including ore, along the entire transportation route.

3) Management of Ore Stockpile at the Ore Transfer Area: The draft permit and associated documents are not clear whether there will be any indoor facility, wash station, or wind shelter at the transfer area where ore will be dumped from the mine trucks and then reloaded onto the highway haul trucks. The Manh Choh Document "Support Document for the Waste Management Permit and Plan of Operations" (2023, pg. 39) states the ore Transfer Area Stockpile and the Mine Site Ore Stockpile will be a total of 20.55 acres. The Mine Site Ore Stockpile is currently covered under this Permit application, the Ore Transfer Area Stockpile is not. No detail is provided on how waste management will be handled outside the main Permit Site at the Ore Transfer Area. The Service has concerns that without an indoor facility or other protection, the dumping and transfer of ore will cause large cumulative concentrations of fine material to blow away and deposit across a large landscape, impacting and the wetland habitats that prevail in that area. Surface runoff at the site will also have high concentrations of ore dust, and therefore PAG and metal leaching materials. We recommend monitoring groundwater for toxicant infiltration, and the Waste Management Permit include the management and mitigation of fugitive dust and contaminated surface water from runoff at this location.

4) Fugitive Dust along the Alaska Highway System: A 250-mile route along a series of public highways and roads will be used to transport the ore to Fort Knox for processing. The highway haul trucks are designed to have covers over their load beds to minimize fugitive dust. However, residue from vehicle bodies and wheels of covered trucks are equally concerning as vectors which deposit mine contaminants along haul routes (U.S. Department of the Interior 2020). Studies along the Red Dog haul road in northwest Alaska showed that despite truck covers, contaminants still concentrated in the transport route roadbed at 6 to 12 times the ambient background levels (Brumbaugh and May 2008). Another study in the same area discovered fugitive dust dispersal from covered trucks as far away as 25 kilometers (15.5 miles) (Hasselbach et al. 2005), likely transported on wheel wells, tires, underbeds, and other external features of the trucks. The route between the Tetlin transfer area and Fort Knox will intersect multiple wetlands and streams important to trust species that rely upon uncontaminated sources of forage and water for critical stages in their lifecycles. The contamination risk from fugitive dust to trust species habitats adjacent to this haul route could be substantial during the life of the Manh Choh mine. Similar to mining operations, we recommend the Waste Management Permit include provisions for the management and mitigation of fugitive dust and surface-water runoff contaminated by fugitive dust along the entire transportation route, including the Alaska Highway System, and the applicant submit a clear mitigation plan for accidental spills, including ore.

5) Waste Rock Processed at Fort Knox: The Fort Knox milling facility will be used to process and extract gold, leaving all the acid producing and metal leaching tailings at the Fort Knox mine, which currently does not produce acid or large quantities of dissolved metals and must be retrofitted for these new materials. Ore from the Fort Knox mine does not generate acid mine drainage or substantial amounts of metal leaching. Their reclamation and closure plan suggests when Fort Knox exhausts the local mineral deposits, they will be able to attain complete closure and stabilization of the mine site, the affected environment, and associated effluent within 100 years. However, the imported Manh Choh ore is high in both acid and arsenic producing compounds and will require a much longer timeline of active management for reclamation and mitigation of toxic effluents. Due to the introduction of acid-producing waste materials after processing Manh Choh ore, we expect the character of Fort Knox waste-water management, reclamation, and closure plans to change. The Manh Choh geochemical characterization report describes blending Manh Choh ore with Fort Knox ore at 20:80 and 30:70, presumably to see whether tailings with a mix of ore types would neutralize acid production and metal leaching. The report concludes that all ore samples produce acid and elevated levels of dissolved metals. The Manh Choh documents suggest that Fort Knox will not require any additional permits or oversight to accept these additional ore imports.

   Based on the available information, the Service recommends the DEC's Integrated Waste Management Permit account for the effects of all ore coming from the Manh Choh mine. We recommend the Manh Choh's waste management plan consider all aspects from cradle to grave, including potential effects on the adjacent environment from the ore-generating mine site, the transportation route to Fort Knox, and at the Fort Knox mine site. Oversight of the waste and effluent from Fort Knox is of great importance to Service trust species because it effects the downstream anadromous waters of the Little Chena and Chena Rivers (Brown et al. 2017), which are second only to the nearby Salcha River in the Yukon River watershed when considering Chinook salmon returning to spawn. We recommend the management and mitigation of imported ore from Manh Choh be incorporated into either this draft Waste Management permit or be incorporated in a modified Waste Management permit at Fort Knox, and that these permits undergo public comments and review through a regular public notice period.

Finally, the Service recommends the permit account for bonding and financial assurances to facilitate long term monitoring, restoration, and reclamation activities, including provisions for monitoring and reclamation at the off-site areas described above.

Conclusion: We appreciate the DEC and the DNR considering our concerns. While the project appears on the verge of detailed design and construction, there remains room for informed discussion regarding how to best minimize the negative effects of PAG waste rock and arsenic release into an otherwise pristine environment. We would welcome an opportunity to discuss our

comments with you. Please contact Amy Tippery at 907-456-0558 or amy_tippery@fws.gov should you have any questions concerning these comments.

Sincerely,

Charleen Buncic

for Robert J. Henszey
Branch Manager,
Conservation Planning Assistance

Attachments:

1. USFWS Comments and Recommendations Letter in response to U.S. Army Corps of Engineers Public Notice POA-2013-00286, dated February 11, 2022
2. Environmental Protection Agency, Region 10 Comment Letter in response to U.S. Army Corps of Engineers Public Notice POA-2013-00286, dated August 19, 2022

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Literature Cited:

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United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Northern Alaska Fish and Wildlife Field Office
101 12th Avenue, Room 110
Fairbanks, Alaska 99701
February 11, 2022

VIA ELECTRONIC MAIL, NO HARD COPY TO FOLLOW

U.S. Army Corps of Engineers
Attn: Colonel Damon Delarosa
District Commander, Alaska District
Post Office Box 6898
JBER, Alaska 99506-0898

Re: POA-2013-00286
Tanana River

Dear Colonel Delarosa:

The U.S. Fish and Wildlife Service (Service) has reviewed the U.S. Army Corps of Engineers (ACOE) Public Notice of Application (PN) for a Permit dated January 13, 2022. The proposed Manh Choh Project (Project) allows Peak Gold, LLC (Applicant) to mine and produce gold from lands owned by the Native Village of Tetlin (NVT), Alaska. The purpose of the Project is to benefit the NVT and Applicant shareholders in a joint partnership, to mine and process gold to meet global demand.

The proposed Project includes development of two gold mine sites within the Tetlin Hills, located approximately 12 miles west from the Native Village of Tetlin. Access to the mine sites will require construction of two gravel roads, the Manh Choh Twin Road and the Manh Choh Site Road. The Twin Road will be constructed parallel to the existing Tetlin Village Road for approximately five miles, where it will then connect to the Manh Choh Site Road to access the mine sites. In order to avoid potential direct and indirect impacts to local aquatic resources, extracted ore will be hauled to Fort Knox northeast of Fairbanks, Alaska, for processing. Mining on site will continue for approximately 4.5 years. Termination of mine operations will include reclamation and revegetation of disturbed areas to minimize erosion and sedimentation.

The Project will permanently impact 5.2 acres of waters of the U.S. to include fill of wetlands, small parts of a pond, and a non-fish bearing stream within the mining area, in addition to infrastructure development along existing Alaska Department of Transportation and Public Facilities (ADOT&PF) roads to Fort Knox.

Potentially Affected Fish and Wildlife Trust Resources: The Service's trust resources are natural resources we have been entrusted to protect for the benefit of the American people. Within the proposed study area, these resources may include species listed as threatened or

endangered under the Endangered Species Act (ESA), migratory birds (including bald and golden eagles), inter-jurisdictional fish, and wetland habitats used by these species.

Threatened and Endangered Species: The purpose of the Endangered Species Act (ESA) is to conserve threatened and endangered species and the ecosystems upon which they depend. Projects that may affect listed species or designated critical habitat should be evaluated under procedures of the ESA to ensure that those agencies authorizing and conducting the projects remain in compliance with the ESA. In this case, the project area contains no ESA-listed species or designated critical habitat, therefore no effects to listed species are expected, and no further action is required. This information can be confirmed, and the potential for effects of other projects can be evaluated, at https://ipac.ecosphere.fws.gov/

Eagles and Their Nests: The Bald and Golden Eagle Protection Act protects eagles from take,[1] including disturbance to their nests, roosts, and foraging sites. The density of eagles (juveniles and breeding adults), especially Golden eagles, within Alaska is highly variable statewide and varies by season (McIntyre et al. 2008). Bald and Golden eagles are present within the project area.

Bald Eagles: Alaska supports a population of Bald eagles greater than that in all other states combined. Within the project area Bald eagles are known to nest in trees adjacent to waters supporting anadromous and resident fish, including major rivers and shorelines of large lakes.

Golden Eagles: Golden eagles occur throughout much of Alaska (Booms et al. 2021). The Alaska population consists of nesting adults and non-nesting juveniles (Kochert and Steenhof 2002), most of which migrate in fall to wintering areas across a vast region of western North America (McIntyre et al. 2008, McIntyre 2012). Golden eagles are rare breeders within the nearby Tetlin National Wildlife Refuge and adjacent areas.

Comments and Recommendations: The Service notes the Applicant's intention to process extracted ore at Fort Knox, northeast of Fairbanks, which will help avoid/minimize direct and indirect impacts to local aquatic resources at the mine site. We offer the following comments and recommendations to further minimize the proposed project's impacts on fish and wildlife habitats.

Eagles and Their Nests: If project-related disturbances, such as blasting, jackhammering, or pile-driving, cannot be timed to occur outside the eagle nesting season (March 1–August 31), the Service recommends Bald and Golden eagle nest surveys within a half-mile of the project footprint, including cliffs of tributary streams, to determine if and where eagles may be nesting. If an eagle nest is discovered, please contact our office for further assistance. For additional guidance, please see our webpages for measures to avoid disturbing eagles,[2] how to determine the likelihood of disturbing nesting bald eagles,[3] and our national eagle management webpage.[4]

[1] https://www.fws.gov/birds/policies-and-regulations/laws-legislations/bald-and-golden-eagle-protection-act.php
[2] https://www.fws.gov/alaska/pages/migratory-birds/eagles-other-raptors/eagle-permits/voluntary%20guidance
[3] https://www.fws.gov/alaska/pages/migratory-birds/eagles-other-raptors/eagle-permits/disturbance-guidance
[4] https://www.fws.gov/birds/management/managed-species/eagle-management.php

Other Migratory Birds: Birds of conservation concern that may nest or migrate through the project area include: Lesser yellowlegs (*Tringa flavipes*) and Olive-sided flycatcher (*Contopus cooperi*).[1] Since the proposed project may impact nesting and/or fledging birds depending upon the timing of vegetation clearing and ground disturbance, the Service appreciates employing any measures to help avoid disturbing migratory-bird nesting habitat during the nesting season when nests and nestlings are most vulnerable. The most effective Best Management Practice (BMP) to help minimize impacts to nesting birds is to conduct land disturbing activities (e.g., tree and vegetation clearing, excavation, gravel fill, brush hogging, etc.) before or after the breeding season, which is generally May 1 through July 31 at the proposed site.[2] Some bird species may nest at different times or the habitat may affect nesting dates (e.g., eagles nest two or more months earlier), so we recommend consulting our timing recommendations for your area. Additionally, we appreciate and support employing other conservation measures to minimize impacts to migratory birds. For some example conservation measures to avoid and minimize impacts to birds, please refer to our Migratory Bird Program website.[3]

Floodplain Connectivity: If the proposed project includes upgrades to stream/river crossings, the Service recommends including provisions for maintaining the floodplain integrity both up and downstream at all floodplain crossings in addition to considering hydraulics and fish passage (USFWS 2021). Floodplains are an important component of the aquatic ecosystem and have many benefits beyond enhancing fish habitat. When considering floodplain connectivity (U.S. Forest Service 2008, Figures 2.5 and 6.30), options for water crossings range from no connectivity (simple high discharge passage) to preserving full functioning of all floodplain processes (full-span crossing). Thus, we recommend constructing stream crossings that preserve floodplain connectivity to the greatest extent possible to maintain aquatic ecosystem integrity. We also recommend setting the invert for overflow culverts at the same grade level as the floodplain. These culverts would be in addition to the elevated culverts intended to account for aufeis overflow, which would not support floodplain connectivity because they are elevated.

Invasive Species: Invasive plants are introduced species that out-compete native plants for light, water, and nutrients. They often grow rapid, mature early, spread seeds that survive a long time, and have no natural controls. When invasive plants displace native plants, habitats may be altered and become no longer suitable for some wildlife. The Service recommends implementing Best Management Practices for minimizing the introduction and proliferation of invasive species, including thoroughly washing equipment before entering the jobsite to remove dirt and debris that might harbor invasive seeds; using weed-free fill and certified weed-free erosion control materials; appropriately disposing of spoil and vegetation contaminated with invasive species; and revegetating the area with local native plant species. To assist on-the-ground operators in understanding their role in preventing and controlling the introduction and spread of invasive species, we recommend project operators review a free, self-paced training course on invasive species control, which can be found at: http://weedcontrol.open.uaf.edu.

[1] https://www.fws.gov/uploadedFiles/Region_7/NWRS/Zone_1/Tetlin/PDF/bird_checklist.pdf
[2] https://www.fws.gov/alaska/pages/nesting-birds-timing-recommendations-avoid-land-disturbance-vegetation-clearing
[3] https://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php

Mitigation: The Applicant proposed a Permittee-Responsible Mitigation (PRM) plan designed to compensate for impacts to aquatic resources. The proposed PRM includes replacing dysfunctional culverts at two locations along the Tetlin Village Road to improve hydrologic connectivity with downstream wetlands and waters, reduce erosion and sedimentation, and enhance wetland functions. Our recommendations for floodplain connectivity should also be considered when replacing these culverts.

Conclusion: The Service does not object to permit issuance provided the following special conditions are included in the permit:

1. Floodplain integrity and connectivity shall be maintained at floodplain crossings by installing properly sized culvert(s) and/or bridges that allow high water in the floodplain to pass with minimal backwater impoundment upstream and minimal diversion of high water from the floodplain downstream.

2. Natural drainage patterns shall be maintained to the extent practicable by the installation of culverts in sufficient number and size under access roads and trails to prevent ponding, diversion, or concentrated runoff that would result in adverse impacts to adjacent wetlands and other fish and wildlife habitats.

3. All disturbed, stockpile and fill areas shall be stabilized to prevent erosion. Increased water turbidity and accumulation of sediment in drainages, sloughs, and other wetlands shall be evidence of insufficient stabilization.

4. Best management practices for preventing the introduction of invasive weeds shall be implemented, such as thoroughly washing equipment before deployment onsite.

These comments are submitted in accordance with provisions of the National Environmental Policy Act (NEPA) of 1969 (83 Stat. 852; 42 U.S.C. 4321 et seq.), the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), the Migratory Bird Treaty Act (40 Stat. 755, as amended; 16 U.S.C. 703 et seq.), the Bald and Golden Eagle Protection Act (54 Stat. 250, as amended, 16 U.S.C. 668a-d) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). These comments are also for use in your determination of 404 (b)(1) guidelines compliance (40 CFR 230), and in your public interest review (33 CFR 320.4) relating to protection of fish and wildlife resources.

The Service appreciates the opportunity to comment regarding the proposed project. We would be glad to discuss our comments with you. Our comments are based on the information provided in the Public Notice. Should project plans change, we would appreciate an opportunity

to review and comment. Please contact Louise Smith at 907-456-0306 (*louise_smith@fws.gov*) should you have questions concerning these comments.

Sincerely,

ROBERT HENSZEY

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Robert J. Henszey
Branch Chief
Conservation Planning Assistance

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Greg Mazer, USACE, Fort Wainwright
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Audra Brase, ADF&G-Division of Habitat, Fairbanks
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Matt LaCroix, EPA, Anchorage

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 155
Seattle, WA 98101-3188

WATER
DIVISION

August 19, 2022

Mr. Gregory Mazer
Project Manager
U.S. Army Corps of Engineers, Alaska District
Fairbanks Field Office
Regulatory Division (1145)
CEPOA-RD
PO Box 35066
Fort Wainwright, Alaska 99703

Dear Mr. Mazer:

As I am sure you are aware, the U.S. Environmental Protection Agency has been reviewing Peak Gold LLC's proposal to develop the Manh Choh Mine to "produce gold from land owned by the Native Village of Tetlin utilizing open-pit mining methods and existing proven recovery processes."[1] The proposed work would impact 5.2 acres of waters of the United States to extract gold-laden ore, deposit waste rock, and develop the infrastructure necessary to operate the mine and haul the ore to Fort Knox.

On February 11, 2022, EPA provided comments pertaining to potential environmental impacts of the project in response to the U.S. Army Corps of Engineers (Corps) Public Notice (PN) POA-2013-00286 dated January 13, 2022.[2] This letter expressed concerns with impacts associated with development of the Manh Choh Mine, including compliance with the restrictions on discharge contained in the Clean Water Act Section 404(b)(1) Guidelines and provided related recommendations for the Corps' permitting process and forthcoming supporting NEPA analysis.

Since February, the Corps and the applicant have provided some additional information to EPA in response to our initial comment letter. On May 11, 2022, EPA received initial responses to our comments from the applicant, which included responses to concerns expressed by the U.S. Fish and Wildlife Service. EPA also received additional responses to our February comment letter from the applicant on June 30, 2022.[3] In July, EPA requested additional information referenced in the June 30th responses and received the majority of these reports on August 4, 2022. In total, EPA has received 19 new technical reports and documents from the applicant since the closure of the PN comment period on February 11, 2022.

EPA is providing supplemental responses based on our review of the additional information provided. Specifically:

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[1] U.S. Army Corps of Engineers, Alaska District. (2022, January 13). Public Notice POA-2013-00286. p.2.
[2] EPA letter to USACE regarding POA-2013-00286, February 11, 2022.
[3] Kinross. June 30, 2022. Peak Gold, LLC Responses to US EPA Region 10 February 11, 2022, Comment Letter to USACE Public Notice POA-2013-00286. 74 pp.

- Additional measures should be applied to minimize impacts to the aquatic ecosystem and downgradient waters of the United States. Adaptive management should be required if contamination is observed in downgradient waters.
- The proposal to haul ore over 250 miles to facilities in Fort Knox, AK has the potential to contribute additional air quality concerns in the Fairbanks $PM_{2.5}$ Nonattainment Area;

Please see the attached information, which includes recommendations for how to offset these impacts. This information may be relevant in development of your NEPA documents and permitting decision process.

Thank you for considering our recommendations in support of the Corps permit decision. If you have questions about our review, please contact me at jensen.amy@epa.gov or have your staff contact Kelly McDonald at 907-271-1208 or by email at mcdonald.kelly@epa.gov.

Sincerely,

AMY JENSEN

Digitally signed by AMY JENSEN
Date: 2022.08.19 15:24:58 -07'00'

Amy Jensen
Regional Wetland Coordinator

Enclosure

cc: Mr. Robert Henszey, US Fish and Wildlife Service,
Ms. Louise Smith, US Fish and Wildlife Service,

Enclosure

Synthesis of Key Findings from Review of Additional Documents Regarding the Proposed Man Choh Mine

The following summarizes the key findings of the U.S. Environmental Protection Agency following review of documents provided by Kinross regarding Peak Gold LLC's proposal to produce gold from land owned by the Native Village of Tetlin in Alaska utilizing open-pit mining methods and existing proven recovery processes.

I. Key Findings from EPA's Review of Additional Information

A. Water Resource Impacts

The Clean Water Act Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material are the substantive environmental criteria used to evaluate proposed discharges of dredged or fill material.[4] The Guidelines require the Corps to make written factual determinations of the potential short-term or long-term effects of a proposed discharge on the physical, chemical, and biological components of the aquatic environment and "[s]uch factual determinations shall be used in § 230.12 in making findings of compliance or non-compliance with the restrictions in § 230.10."[5]

Based on EPA's review of several materials received from the applicant, specifically the Peak Gold Response,[6] Hydrogeological Report,[7] Water Management Plan,[8] Waste Rock Management Plan,[9] and the Reclamation and Closure Report,[10] we remain concerned that Manh Choh Mine Project as proposed has the potential to adversely impact additional waters of the United States (WOTUS) downgradient of the mine site over time. More specifically, EPA is concerned that perennial streams in the project vicinity would be subject to increased transport of dissolved arsenic during and after mining activities due to the proposed plans for water and waste rock management. Allowing for the discharge of polluted, contact water to groundwater has the potential to cause or contribute to water quality exceedances in downgradient WOTUS that already have recorded water quality exceedances on multiple occasions.

According to the Hydrogeological Report, several creeks located downgradient from the mining activities are supported by groundwater flow discharging from the bedrock water table, such as Hillside Creek and Tors Creek.[11] The baseline monitoring in these streams indicates that several water quality parameters exceed the state water quality standards on occasion. For example, Tors Creek, which drains east to Tetlin Lake, and Hillside Creek, which drains west to Tok River, have recorded levels of pH, alkalinity, arsenic, aluminum, lead, and manganese in exceedance of ADEC water quality standards due

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[4] 40 CFR § 230.10; 40 CFR § 230.12.
[5] 40 CFR § 230.11.
[6] Kinross. June 30, 2022. Peak Gold, LLC Responses to US EPA Region 10 February 11, 2022, Comment Letter to USACE Public Notice POA-2013-00286. 74 pp.
[7] Piteau Associates. 2021. Manh Choh Project Hydrogeological Characterization and Groundwater Modeling Summary Report, Prepared for Peak Gold, LLC.
[8] Piteau Associates. 2021. Manh Choh Project Water Management Plan. Prepared for Peak Gold, LLC.
[9] SRK Consulting. 2021. Manh Choh Project. Waste Rock Management Plan. Prepared for Peak Gold, LLC.
[10] SRK Consulting. 2021. Manh Choh Project Reclamation and Closure Plan. Prepared for Peak Gold, LLC.
[11] "The near-surface groundwater elevation limits recharge and thus most groundwater and precipitation that does not evaporate will discharge as surface water flow." Source: Hydrogeological Report. p.17.

to existing interactions between groundwater, the ore body, and the discharge of that groundwater into these streams.[12] The Guidelines at 230.10(b)(2) specify that no discharge of dredged or fill material shall be permitted if it causes or contributes, after consideration of disposal site dilution and dispersion, to violations of any applicable water quality standard, thus the proximity of these downgradient waters to the proposed mining infrastructure prompt the need for accurate baseline water quality characterization and monitoring over time.

Accurate baseline information is critical to understand how the project is impacting water quality over the long term. In our review of the available baseline information, we have identified some inconsistencies in the water sampling data from Tors Creek and Hillside Creek that was used in project planning phases.[13] The supplied baseline surface water quality data includes data that is indicated by a table note to be erroneous due to instrument malfunction.[14] Furthermore, at Hillside Creek on July 28, 2021 (i.e., which is not a date indicated in footnotes that contains erroneous results), a surface water sample was collected that resulted in a 11.9 mg/L dissolved iron content with a pH of 7.68.[15] Given the fact that iron solubility in natural water is determined heavily by pH and that iron begins to precipitate out of solution around neutral pH,[16] this reading also appears to be erroneous and not an accurate reading of the baseline parameters. This reading and others call into question the quality assurance and quality control (QAQC) used in the existing water quality monitoring data. EPA encourages the continuation of water quality monitoring in Tors and Hillside Creeks prior to beginning mining activities with sufficient QAQC in an effort to accurately characterize baseline water quality conditions. EPA supports the monitoring proposed by the applicant and recommends that this water quality monitoring should continue during operations and after mining has ended.

EPA has concerns about the level of uncertainty associated with the hydrologic modelling provided by the applicant and the disclosed potential for metal and arsenic pollution from the project. Specifically, EPA is concerned assumptions used in the modeling may have led to modeling results that underestimate the potential for groundwater contamination. For example, the assumption that all precipitation would runoff surficially and not infiltrate the waste rock piles during operations appears unfounded given the annual precipitations rates and patterns, that waste rock areas will not be covered, and that broken waste rock is highly permeable, even if the crystalline rocks themselves are not. Even if precipitation infiltration of the proposed waste rock piles is minimal during operations, portions of the waste rock backfilled into the pits will be in contact with groundwater.

Additionally, the arsenic adsorption model prepared for this project may not accurately represent the geologic setting of the mine site. The arsenic adsorption model described in the Hydrogeological Report uses a sorption coefficient for a soil/water partition and is not applicable to groundwater movement through bedrock.[17,18] While we acknowledge that the modelers attempted to account for this point by scaling for surface area in fractured limestone, this model is objectionable for evaluating the attenuation of arsenic in bedrock that is primarily quartz muscovite schist. As such, EPA does not have confidence that the provided arsenic transport model results accurately represent the likelihood for groundwater contamination by arsenic from waste rock from the proposed mining activities.

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[12] Hydrogeological Report. Table B-2, p.108, Table B-11b, p. 120.
[13] Hydrogeological Report. Appendix B, Table B-2, p.108, Table B-11b, p. 120.
[14] Hydrogeological Report. Appendix B, Table B-3, p. 109.
[15] Hydrogeological Report. Appendix B, Table B-11b, p. 120.
[16] USGS. Chemistry of Iron in Natural Water, Geological Survey Water-Supply paper 1459. 1962. 268 pp.
[17] Allison, J. D., & Allison, T. L. 2005. Partition coefficients for metals in surface water, soil, and waste. Rep. EPA/600/R-05, 74.
[18] Hydrogeological Report. p. 33.

Compliance with the Guidelines at 230.10(d) requires projects to incorporate appropriate and practicable steps to minimize impacts to the aquatic ecosystem. In accordance with 230.10(d), EPA believes additional practicable mitigation measures should be applied to the project to minimize the potential degradation of water quality from secondary impacts of the project. Specifically, we are providing recommendations on measures for site preparation and reclamation work to ensure secondary impacts are minimized to downgradient WOTUS.

The project includes subaqueous disposal of PAG waste rock within the South Pit. According to the Reclamation and Closure Report,[19] after reclamation, the South Pit is proposed to be left as a depression that can collect more water than under current, natural conditions. EPA recommends the South Pit be fully backfilled, mounded and capped as proposed for the North Pit. Fully backfilling the South Pit will restore the original site contours to the maximum extent practicable and will minimize the size and footprint of the post-closure Main Waste Rock Dump. It will also more fully encapsulate the PAG waste rock and provide greater protection from environmental weathering. Reducing the infiltration of water into the pit will also minimize the potential for the project to increase the seasonal groundwater fluctuations beyond the natural conditions.

EPA is concerned about infiltration through waste rock in the waste rock dumps both during and after mine closure. EPA believes it is practicable to reduce the potential for water to infiltrate beneath the proposed waste rock dumps by establishing low-permeability foundations of compacted fine-grained materials during site preparation. The foundations should be established after clearing, removing overburden/organics, and leveling the waste rock dump sites. The foundations should be graded or crowned to direct site precipitation laterally to the perimeter ditches. The post-closure Main Waste Rock Dump should also be contoured and capped to promote runoff and minimize infiltration into the waste rock as proposed for the North Pit.

The proposed management of contact water also presents opportunities for infiltration or the spread of contaminants. EPA recommends that opportunities for contact water in the perimeter ditches to pond and infiltrate should be minimized by maintaining consistent flow lines and gradient within the ditches. The applicant should avoid excavating or establishing the proposed holding ponds within jurisdictional waters, including wetlands. Contact water and treated effluent should not be used for dust control unless sampling indicates it would not alter the chemistry of potential receiving waters (e.g., wetlands adjacent to mine facilities or the road that could receive runoff or fugitive dust). Brine from the water treatment plant and filter wash water should generally not be used for dust suppression, as it can elevate the concentration of metal salts in adjacent surface waters. Brine from the water treatment plant and filter wash water could potentially be used for dust suppression or material compaction at the waste rock dumps. Obviously, point source discharges into jurisdictional waters would require APDES authorization pursuant to CWA Section 402.

Even with these additional minimization measures, there is still some potential for adverse impacts to downgradient WOTUS from pit seepage and groundwater altered by contact with PAG waste rock. EPA recommends that the Corps require as a condition of the permit that the applicant develop an adaptive management plan that identifies how seepage from the pits will be collected for treatment if the groundwater or surface water monitoring indicates that groundwater chemistry has been altered by the contact water. A specific concern is that contact water from the South Pit will move downgradient and emerge in the drainages flowing to Hillside Creek. There appears to be less risk that the chemistry of

[19] Reclamation and Closure Report. Figure 10.

groundwater within the North Pit will be altered by contact water and that seepage will impact Tors Creek; however, the adaptive management plan should address the potential need to capture seepage from both pits.

B. Air Quality Impacts

In an effort to use existing ore processing infrastructure, the applicant proposes to transport extracted materials from the Manh Choh mine to the Fort Knox ore processing center using the Alaska highway system and other public roads. As EPA indicated in our February 11, 2022 comment letter, the PN did not mention the planned haul route or provide details for the transportation of ore being hauled to Fort Knox for processing. According to subsequent information received from the applicant, the general route the extracted materials would take via truck would travel via constructed gravels roads to Tetlin Village Road, then on Alaska Highway 2 to Delta Junction, where the trucks would likely take Richardson Highway to Fairbanks, and pass through Fox, AK to the Fort Knox Facility on Steese Highway. The route is approximately 250 miles long each way, and the proposed route would experience an increase in the annual average daily traffic (AADT) of 192 vehicles along this route.[20]

Based on this new information, the proposed haul route would seemingly direct trucks through an airshed that has been formally designated by EPA as "Serious" Nonattainment for exceedances of the National Ambient Air Quality Standards (NAAQS).[21] A portion of the Fairbanks North Star Borough, including the City of Fairbanks and the City of North Pole, was designated as a Nonattainment Area for Particulate Matter ($PM_{2.5}$) in December 2009 because these areas exceed the health based 24-hour $PM_{2.5}$ NAAQS of 35 micrograms/cubic meter.[22] According to Alaska Department of Environmental Conservation (ADEC), particulate pollution in this area is the result of local emissions from emissions from wood stoves, burning distillate oil, and industrial sources, as well as motor vehicles and trucks. $PM_{2.5}$ is primarily a concern during the winter months (October through March) when extremely strong temperature inversions are frequent and human-caused air pollution impacts increase.

Emissions that originate from gasoline and diesel engines, primarily motor vehicles, contribute to these $PM_{2.5}$ concentrations. The drastic increase in AADT resulting from this project is likely to have an adverse effect on the air quality in the nonattainment area.

EPA recommends that the Corps consider and disclose the air quality impacts that would result from the proposed use of heavy duty vehicles in the Fairbanks $PM_{2.5}$ Nonattainment Area, particularly the effect on emission budgets for transportation planning and conformity purposes.

To help reduce the $PM_{2.5}$ emissions from the heavy-duty trucks carrying ore through Fairbanks from the Manh Choh Mine to the Fort Knox ore processing facility, EPA suggests the applicant consider and identify mitigation measures. Implementing measures that ensure efficient vehicle performance and best practices for heavy-duty hauling will minimize air quality impacts. Examples include:

1) Only use heavy duty trucks with Tier 3 engines, preferably 2010 or newer. In addition to the Tier 3 engines, we recommend that the project verify that the engines in these trucks have fully functional emission reduction systems.
2) Ensure all trucks have a tarp deployed over the bed to "cover the load" and minimize material from blowing out the back of the truck.

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[20] Peak Gold Response. p.29.
[21] 40 CFR § 81.302.
[22] See 86 FR 10511, 10511-12 (Feb. 22, 2021).

3) The project could supply the municipalities in the nonattainment area with a street sweeper capable of removing $PM_{2.5}$ and smaller, and the municipalities would then operate this sweeper on the truck route to remove road dust, which decreases particulates raised by these trucks.

Further, EPA understands the applicant has proposed to cover the beds of trucks that will be transporting ore via Alaska public highways,[23] and it is not clear whether all roads used to haul ore are considered Alaska public highways and would be subject to this measure. EPA recommends applying this mitigating measure to the entire haul route as feasible.

While covering the truck beds will help reduce the amount of particulate matter generated by this proposed activity, particulate matter is also generated from the emissions of the truck engines, wearing of tires and brake pads, and traffic congestion. Thus EPA expects particulate matter would still increase in the Fairbanks $PM_{2.5}$ nonattainment area as a result of the sheer volume of additional heavy duty trucks proposed to be operating to haul ore from the Manh Choh Mine to the ore processing facility in Fort Knox, as well as the potential for increased traffic congestion and subsequent vehicular emissions. Such impacts to air quality have the potential in the near term[24] to impact the Fairbanks North Star Borough's ability to build future transportation infrastructure projects if the area is not able to meet the State Implementation Plan developed by ADEC and approved by EPA. Over the long term, these truck emissions could impact the area's ability to meet the 24-hour $PM_{2.5}$ NAAQS of 35 micrograms/cubic meter in a timely manner. EPA recommends that at a minimum, the Corps evaluate and disclose the potential impacts to air quality in the NEPA analysis for this project.

[23] Peak Gold Response. p. 30.

[24] The current transportation conformity approval for the Fairbanks NorthStar Borough expires January 19, 2023. If the motor vehicle emissions budget (MVEB) cannot be met by FAST Planning in the transportation conformity analysis currently underway, then the area enters a 12-month grace period on January 20, 2023. If the conformity analysis cannot be approved within that 12-month grace period, a lapse goes into effect. Such a lapse could lead to the delay or diversion of federal transportation dollars as well is triggering transportation planning issues.