Manh Choh Project

Section 404 Permit Application

Supplemental Information

December 2021

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### Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADEC</td>
<td>Alaska Department of Environmental Conservation</td>
</tr>
<tr>
<td>BMPs</td>
<td>best management practices</td>
</tr>
<tr>
<td>CFR</td>
<td>Code of Federal Regulations</td>
</tr>
<tr>
<td>DOT&amp;PF</td>
<td>Department of Transportation and Public Facilities</td>
</tr>
<tr>
<td>LEDPA</td>
<td>Least Environmental Damaging Practicable Alternative</td>
</tr>
<tr>
<td>ML</td>
<td>Metals Leaching</td>
</tr>
<tr>
<td>NAG</td>
<td>Not Acid Generating</td>
</tr>
<tr>
<td>PAG</td>
<td>Potentially Acid Generating</td>
</tr>
<tr>
<td>Project</td>
<td>Manh Choh Project Study Area</td>
</tr>
<tr>
<td>SWPPP</td>
<td>Stormwater Pollution Protection Plan</td>
</tr>
<tr>
<td>U.S.</td>
<td>United States</td>
</tr>
<tr>
<td>USGS</td>
<td>United States Geological Survey</td>
</tr>
<tr>
<td>WOTUS</td>
<td>waters of the U.S.</td>
</tr>
<tr>
<td>WRDA</td>
<td>Waste Rock Disposal Areas</td>
</tr>
</tbody>
</table>
INTRODUCTION

This document supplements the information provided in Engineering Form 4345, a permit application by Peak Gold LLC, to begin constructing the Manh Choh Project in 2022, with mining beginning in 2024. Peak Gold, LLC is the entity that owns the Manh Choh Project. KG Mining (Alaska) is the manager of Peak Gold, LLC. As part of this application a wetland delineation report and Environmental Information Document have been submitted as supporting documentation. Peak Gold LLC is willing to permit the Manh Choh Project on a Preliminary Jurisdictional Determination and is not requesting an Approved Jurisdictional Determination.

APPLICATION BLOCK 15: LOCATION OF PROJECT

The Manh Choh Project (Project) is located 10 miles southeast of Tok, Alaska (Figure 15-1). The Project is accessed by the current Tetlin Village Road corridor, six miles east of Tok along the Alaska Highway. The Project includes a personnel camp near the Alaska Highway, the new Manh Choh Twin Road for the first 5 miles, and the Manh Choh Site Road to access the remaining facilities.

The study area is in the Tanacross A-4 and B-4 United States Geological Survey (USGS) quadrangle maps, in the Copper River Meridian, and crosses 48 Public Land Survey System sections. Location information is shown in Table 15-1. The latitude and longitude of the current exploration area center is (NAD83 2011, Decimal Degrees) Latitude 63.186581° N and Longitude 142.889417° W.

<table>
<thead>
<tr>
<th>USGS Quadrangles</th>
<th>Public Land Survey System</th>
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<tbody>
<tr>
<td>Scale – 1:250,000</td>
<td>Scale – 1:63,360</td>
</tr>
<tr>
<td>Township</td>
<td>Range</td>
</tr>
<tr>
<td>Tanacross A-4</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>13</td>
</tr>
<tr>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>16</td>
<td>15</td>
</tr>
<tr>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>17</td>
<td>14</td>
</tr>
<tr>
<td>Tanacross B-4</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>13</td>
</tr>
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<td>17</td>
<td>14</td>
</tr>
<tr>
<td>18</td>
<td>14</td>
</tr>
</tbody>
</table>

The center point locations of the key Project components are shown in Table 15-2 and in the attached figure set.
Manh Choh Project

Transportation Corridor

Manh Choh Footprint

Client
Peak Gold LLC

Project
Manh Choh Project

Figure
Manh Choh Project Area

Figure Number
15-1
Table 15-2: Decimal Degree Location of the Key Project Components

<table>
<thead>
<tr>
<th>Component</th>
<th>Facilities</th>
<th>Acres</th>
<th>Location of Facilities –</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Proposed Manh Choh Mine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mining Area</td>
<td>Open Pits (South Pit and North Pit)</td>
<td>76.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Waste Rock Disposal Area - Main</td>
<td>163.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Waste Rock Disposal Area - North</td>
<td>89.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Water Diversion Ditches, Retention Ditch</td>
<td>18.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dry Stack, Wet Stack, Marginal Stack</td>
<td>58.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ore Stockpile</td>
<td>23.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mine Roads: Site Road, Runaway Truck Ramps</td>
<td>142.6</td>
<td>63.2368 -142.8239</td>
</tr>
<tr>
<td></td>
<td>Explosives Storage Pad (Powder Magazine)</td>
<td>6.0</td>
<td>63.1916 -142.9056</td>
</tr>
<tr>
<td></td>
<td>Infrastructure Pad</td>
<td>13.1</td>
<td>63.1997 -142.8884</td>
</tr>
<tr>
<td></td>
<td>Material Borrow Sites</td>
<td>122.5</td>
<td>Multiple</td>
</tr>
<tr>
<td></td>
<td>Mining Area Subtotal</td>
<td>714.9</td>
<td></td>
</tr>
<tr>
<td>Ore Transfer Site</td>
<td>Ore Transfer and Temporary Storage</td>
<td>31.9</td>
<td>63.2499 -142.7799</td>
</tr>
<tr>
<td></td>
<td>Vehicle Maintenance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Warehousing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Camp Pad</td>
<td>13.7</td>
<td>63.3179 -142.7751</td>
</tr>
<tr>
<td></td>
<td>Twin Road</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Industrial road near the Tetlin Village Access Road, Highway Intersection</td>
<td>47.7</td>
<td>63.2866 -142.7696</td>
</tr>
<tr>
<td></td>
<td>Fill Footprint</td>
<td>120.8</td>
<td>Multiple</td>
</tr>
<tr>
<td></td>
<td>Infrastructure Subtotal</td>
<td>928.9</td>
<td></td>
</tr>
<tr>
<td>25' Vegetation Clearing</td>
<td>Outside of Fill Footprint, non-soil disturbing, temporary</td>
<td>136.0</td>
<td>All facilities/roads</td>
</tr>
<tr>
<td></td>
<td>Total Disturbance</td>
<td>1,064.9</td>
<td></td>
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</table>
Peak Gold LLC proposes to operate an open pit gold mine in the Tetlin Hills, near Tok, Alaska. In conjunction with the Native Village of Tetlin, it has been named the Manh Choh Project (Project). The proposed Project consists of three components: mine development (Manh Choh mine), ore transport, and ore processing.

- Mine development will occur in the Tetlin Hills on land owned by the Native Village of Tetlin. The proposed Project components include the North and South Pits, access roads, waste rock storage, overburden storage, ore transfer site, explosives storage, a personnel camp, and associated infrastructure. The access road construction (Manh Choh Twin Road and Manh Choh Site Road) will start in 2022 with mine development scheduled to begin in 2023.

- Prior to mining ore, the pit locations and other facilities will have the overburden (organic and developed soil horizons) stripped and stockpiled for use in reclamation.

- Ore will be segregated from waste rock (non-ore bearing rock) at the Project site. Ore will be hauled from the two pits by off-road haul trucks to the ore transfer site where the ore will be loaded onto highway capable vehicles for transport to the Fort Knox Mine, near Fairbanks.

- Ore will be hauled from the proposed Project to the Fort Knox Mine, approximately 250 miles one way. The current haulage plan is 3,900 tons of material per day to Fort Knox. This would be accomplished by 4 trips to Fort Knox and 4 return trips every hour, 24 hours a day for the life of the mine (4.5 years). Truck haulage will start in 2024 and continue throughout the 4-year operational life of the mine. Haul trucks will only carry Alaska Department of Transportation & Public Facilities (DOT&PF) approved loads.

- Ore processing and gold recovery will use existing, permitted facilities at Fort Knox. No milling of ore will be completed at the Project. Therefore, no tailings disposal will take place at the Project. Tailings disposal will take place at the permitted Fort Knox Mine. The Project does not require any new federal permits at Fort Knox.

During operations at the Project mine site, a maintenance shop, warm storage, mine offices, fuel island, water treatment ponds, explosive storage (Powder Magazine) and parking will be maintained. These mine facilities will be sited in uplands.

Mining ceases at the end of 2027. Reclamation will be concurrent with mining operations, but full closure begins in 2028 with reclamation of Best Management Practices (BMPs) progressing until meeting all requirements in the Reclamation and Closure Plan.
APPLICATION BLOCK 21: TYPES OF MATERIAL DISCHARGED AND THE AMOUNT OF EACH TYPE IN CUBIC YARDS

Table 21-1 lists the Project components and impacts to waters of the U.S. (WOTUS) to include wetlands, ponds, and streams. Cubic yards of fill are estimated and may vary based onsite conditions. The permanent jurisdictional impact in wetlands and waters is approximately 5.2 acres.

Table 21-3: Project Impacts

<table>
<thead>
<tr>
<th>Project Component</th>
<th>WOTUS Acres Impacted</th>
<th>Cubic Yards Fill in WOTUS</th>
<th>Fill Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 404</td>
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<tr>
<td>Manh Choh Twin Road</td>
<td>3.8</td>
<td>6,130</td>
<td>Clean Fill</td>
</tr>
<tr>
<td>Manh Choh Site Road</td>
<td>0.01</td>
<td>16</td>
<td>Clean Fill</td>
</tr>
<tr>
<td>North Pit</td>
<td>0.3</td>
<td>N/A</td>
<td>Excavation</td>
</tr>
<tr>
<td>South Pit</td>
<td>0.5</td>
<td>N/A</td>
<td>Excavation</td>
</tr>
<tr>
<td>Waste Rock Dump</td>
<td>0.05</td>
<td>81</td>
<td>Clean Waste Rock</td>
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<tr>
<td>Ditch/Spoils/Fill</td>
<td>0.6</td>
<td>968</td>
<td>Excavation/Spoils</td>
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<tr>
<td><strong>Totals</strong></td>
<td><strong>5.2</strong></td>
<td><strong>7,195</strong></td>
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Table 21-4: Project Impacts to Wetlands

<table>
<thead>
<tr>
<th>Cowardin Groups</th>
<th>NWI Code</th>
<th>Wetland Acres</th>
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<tbody>
<tr>
<td>Coniferous Forests</td>
<td>PFO4</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>PSS1/FO4</td>
<td>0.1</td>
</tr>
<tr>
<td>Coniferous Scrub</td>
<td>PSS4/1B</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>PSS4B</td>
<td>1.7</td>
</tr>
<tr>
<td></td>
<td>PSS1/4B</td>
<td>0.9</td>
</tr>
<tr>
<td>Deciduous Shrub</td>
<td>PSS1</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>PSS1/EM1</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>PEM1/SS1</td>
<td>0.4</td>
</tr>
<tr>
<td>Herbaceous</td>
<td>PEM1</td>
<td>0.01</td>
</tr>
<tr>
<td>Ponds</td>
<td>PUB</td>
<td>0.05</td>
</tr>
<tr>
<td>Streams</td>
<td>R3UB</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Total Wetlands and Waters</strong></td>
<td></td>
<td><strong>5.2</strong></td>
</tr>
</tbody>
</table>
APPLICATION BLOCK 23: DESCRIPTION OF AVOIDANCE, MINIMIZATION, AND COMPENSATION ACTIVITIES BOTH UNDERTAKEN AND PROPOSED

23.1 Avoidance and Minimization by Planning and Design

During the preliminary and final planning and design process, Peak Gold LLC evaluated several mine designs, road layouts, and processing scenarios. Multiple scenarios were evaluated to identify the Least Environmentally Damaging Practicable Alternative (LEDPA). During the process, Peak Gold LLC made substantive efforts to avoid and minimize impacts to wetlands at Manh Choh. These avoidance and minimization measures were incorporated in the preferred alternative (i.e., the design presented in this application).

The wetland mapping for the Project site was used to maximize upland construction and minimize wetland impacts at the Project. Uplands and prior disturbance were prioritized for roads, pads, and other disturbance. Each Project alternative and facility design were overlayed on WOTUS mapping to first avoid wetlands and then if impact was inevitable to minimize the wetland footprint.

Material Sites

The WOTUS mapping for the Project site was used when locating material sites at the Project. All material sites are in uplands. Numerous material sites will be used to build roads and pads for safe access to the mine site and place the facilities. Material sites will be along the Manh Choh Twin Road and Manh Choh Site Road. If any of the material sites encounter groundwater, they will be evaluated for development into a pond and wetland complex during reclamation, although hydrologic modeling indicates this is unlikely to occur at any of the proposed material sites.

Wetland delineations were conducted by ABR in 2013 and 2016, and Stantec in 2020 and 2021, resulting in a 6,024-acre field-verified study area covering the Tetlin Village Road corridor off the Alaska Highway, alternative access routes to the proposed mine site, and various areas to place facilities needed for the Project.

The following facilities were sited to avoid all impacts to WOTUS:

- Camp pad
- Ore Transfer Site
- Material sites
- Runaway Truck Ramps
- Explosives Storage Pad
- Manh Choh Site Road
- North Waste Rock Dump

Design minimization measures to reduce the impacts to WOTUS from other facilities are detailed in Section 23.1.1.
23.1.1 Alternatives and Revisions Considered

Numerous alternatives were evaluated during the design process. Onsite ore processing and tailings disposal, and three access routes were reviewed and discarded. The four alternatives are shown in Figure 23-1 and described below.

Alternative 1: Ore Processing and Tailing Disposal at Manh Choh Mine

Under this alternative, ore processing and tailings disposal would be conducted at the proposed Manh Choh mine site. The Project was originally viewed as a conventional mine development with onsite milling. It was envisioned the ore would be mined from open pits and hauled to an onsite mill where the ore would be crushed and run through a cyanide mill circuit to recover gold. Onsite milling requires the construction of both a mill and a tailings disposal facility. The conventional mine design with a crushing system with a mill generates tailings (waste) that would have to be permanently stored in a tailings storage site on Native Village of Tetlin land. Figure 23-2 shows a rough concept from early 2020.

This alternative would have required onsite ore processing and long-term tailing storage. A mill would consume more power than is available locally and would require development of additional power generation. Additional water resource development would be required for the mill operations. Onsite cyanide use would pose the potential for hazardous releases to the environment. Construction of a permanent tailing storage facility would increase the potential impact to land and water resources.

This alternative would increase impacts related to ground disturbance to most resources due to the requirement for greater construction footprint needed for facilities and water management.

Waste Rock Placement Refinements

Waste rock dumps were relocated and reconfigured to avoid and minimize wetland impacts. In 2020, one waste dump configuration crossed the largest wetland complex in the mine area (Figure 23-2). After wetland delineations in 2020, this waste rock dump was moved to the current proposed location to avoid wetlands.

Alternative 2: Ore Transportation Haul Road Crossing Tok River

Under this alternative, a haul road would be constructed across the Tok River. This alternative was assessed to determine if it was feasible to construct a private road that allowed greater access to the Tetlin Hills area, and a safer slope gradient. This alternative was found to increase impacts in almost all categories, including fill material being placed in wetlands and a bridge across the Tok River. This would increase the potential impacts to most resources, with no decrease in impacts in any resource category. In addition, with a planned short mine life, the option to build a permittable bridge was not economically feasible.
Alternative 3: Haul Road Deeper into Tetlin Village Road

Under this alternative access to the proposed mine site would start at approximately mile 9 of the Tetlin Village Road, following better topography towards the proposed mine area. This alternative was originally thought to have the potential for lower grade sections, allowing for safer mine traffic. Further engineering revealed that the Proposed Action had better grade for the roads and was shorter. Alternative 3 was also found to increase disturbed area from fill material, and would increase the potential impacts to most resources, with no decrease of impacts in any resource category. Alternative 3 would also have increased safety issues due to the longer length of co-mingled mine and Tetlin village traffic.

Alternative 4: Co-Use of Existing Tetlin Village Road

Under this alternative, the Project considered widening and co-locating mine traffic and village traffic on the same Tetlin Village Road. The Proposed Action, in contrast, proposes to build a parallel twin road to separate the traffic. Co-use of the same road would have resulted in less impacts to some resources (e.g., wetlands), but crucially would have negative potential life and safety impacts to Tetlin Village residents by increasing the potential for vehicle collisions.

Manh Choh Site Road Refinements

After leaving the Manh Choh Twin Road at mile post 5, alternative road routes were considered to create a safe access to the mine site from the base of the Tetlin Hills. From the base of the hills, the existing access road was considered too steep for haul trucks. Two alternatives were evaluated, Alternative A and B (Figure 23-3). Alternative A was also determined too steep for mining equipment and discarded. After field investigations, it was noted the Alternative B route would cross a wetland complex. Two revisions to Alternative B closer to the existing road were also investigated for aquatic resources; both crossed streams or swales. After further investigation along the base of the hill, the wetland team found that the larger valley terrace to the north was uplands and also found an upland corridor between two wetland complexes. This allowed for the road to run on level ground on the terrace before turning up the hillside through the upland corridor between wetlands. This resulted in a total impact to wetlands from the Manh Choh Site Road of 0.01 acres. The two revisions to Alternative B were discarded as the proposed route was shorter, avoided wetlands and cultural sites, and had less cut and fill than the revisions.
Manh Choh Project

Alternative Footprint

Alternative 1: Waste Rock Storage A

Alternative 1: Waste Rock Storage B

Alternative 1: Tailings Storage

Wetland Delineation

- Wetland
- Stream
- Upland

Client: Peak Gold LLC

Project: Manh Choh Project

Figure: Manh Choh Alternatives

Alternative 1

Figure Number: 23-2
Proposed Alignment

Alternative A

Alternative B

Alternative B, Revision 2

Alternative B, Revision 2, Option 2

Existing Access Road

Wetland Study Area

Stream

Wetland

Client: Peak Gold LLC

Project: Manh Choh Project

Figure: Site Road Alternatives

Figure Number: 23-3
23.2 Minimization Activities Proposed during Construction

Following the preliminary and final WOTUS avoidance and design reviews, Peak Gold LLC evaluated a suite of BMPs to further minimize anticipated impacts from the proposed Project.

Construction Methods

Access Road Drainage Construction Minimization Measures

Culverts will be used along the roadways to maintain hydrologic connectivity at wetland crossings, and to provide water management along ditches for downhill drainage. Swales and other upland drainage features on the road route that collect water will have downhill connectivity maintained with culverts. Appropriately sized culverts will be placed where needed to maintain hydrologic connectivity of drainage patterns.

Best Management Practices

Erosion Control Measures

Erosion control and construction methods will be described in the Stormwater Pollution Prevention Plan (SWPPP) required by the State of Alaska. BMPs for embankment stabilization, including contouring and seeding will be employed. The Project will comply with the State’s Water Quality Standards. BMPs for waste rock and growth media stockpile stabilization including contouring and potentially seeding to reduce erosion and potential sediment runoff into wetland areas.

Temporary Water Use Authorizations or water rights from the State may be required. Water withdrawals may be needed for dust control during construction and during regular road operation. Dust control measures would be implemented as needed to reduce suspension of fugitive dust during construction and operation.

Dust is expected to have minimal impacts to the adjacent vegetation due to the BMPs that will be followed for watering of the access and internal mine roads.

Surface drainage will be culverted at the mine site to ensure flow connectivity. Water will not pond on upstream fills. Existing surface drainage will not be adversely impeded. Existing surface and sediment controls will be maintained on the access roads.

Fish and Wildlife Avoidance

Vegetation along the roadways and mining area will be cleared during migratory bird timing windows to avoid nesting birds. There are no eagle nests along the access roads or at/near the Manh Choh Project.

No streams are crossed or impacted for the Project. Therefore, no direct impacts from fill will occur to fish. There are no threatened or endangered species in the Project area.
Invasive Species Control Measures

Post-construction stabilization would include seeding and stabilizing fill and disturbed areas. To minimize the introduction of invasive species to the Project area, the Project will use native seed mixes for revegetation.

Waste Rock Characterization

Mining of the South and North Pits will generate waste rock and ore. The projected waste rock for the site was analyzed to complete a geochemical characterization. This analysis was used to determine the long term storage location of waste rock onsite, and how to handle specific rock classifications during reclamation and closure. Potentially Acid Generating (PAG) rock when oxidized by weathering may form acid which can leach metals. Leached metal ions can be harmful to aquatic life. PAG must be managed to inhibit oxidation to minimize onsite weathering and potential acid production. PAG and metals leaching (ML) rock will be stored and handled separately from Non-Acid Generating (NAG) waste rock. The Waste Rock Disposal Areas (WRDA) are sited to ensure PAG or ML rock are separate from NAG (SRK 2021).

Reclamation and closure will ensure there is no discharge of surface water from PAG or ML rock to streams or wetlands (Piteau 2021).

During operation, the proposed pits will require low rates of groundwater dewatering, which will be undertaken by localized sumps. A pit lake will not form in either pit because of mining, during reclamation and/or after closure. During operation a diversion ditch will be constructed downslope of mine site activity. All run-off water from WRDAs and overburden stockpiles will flow to the diversion ditch. The diversion ditch is designed to collect all runoff water from the mine operating site. The diversion ditch will be located to ensure surface water that has been in contact with PAG, ML, or ore is collected, contained, and directed to treatment before discharge. Diversion ditch water will be treated using microfiltration followed by reverse osmosis. A head water tank may be used to inject chemicals for water pretreatment to aid in removing iron, manganese, arsenic, and heavy metals. The onsite treatment system will be sized to handle peak flows from the mine. Treated water will be used to supply the wash bay or discharged to the surface infiltration gallery. Brine and filtered wash water will be stored onsite in a pond. Stored water will be used for dust control. During wet periods when dust suppression demand is low, excess water will either be infiltrated or stored for dust control.

At reclamation and closure all surface water will be directed to the backfilled pits or surface drainage features. No long term water treatment is required after mine closure. Surface water leaving the site upon closure will meet State Water Quality Standards (Piteau 2021).

After mine closure, runoff or discharge from waste rock will not be allowed to enter surface water environments. The WRDAs will be closed and recontoured to minimize infiltration of surface water either with an impermeable cover or topsoil/overburden cap.

A Waste Management Permit from the Alaska Department of Environmental Conservation (ADEC) will be required for waste rock placement and storage.
Temporary Impacts

**Air Quality:** The operation of heavy equipment, mining, and blasting would create dust during dry conditions, which may cause localized temporary air quality impacts. This effect would be temporary, short in nature, and would be controlled by BMPs prescribing water control of dust on the mine roads.

**Water Quality:** The Project would require an Erosion and Sediment Control Plan(s) and SWPPP(s) prior to construction. Post-construction stabilization would include seeding and stabilizing fill and disturbed areas. A mining reclamation and closure plan would be prepared for the Manh Choh Project and submitted to the State of Alaska with a financial assurance bond. Water withdrawals would be temporary for dust control.

**23.3 Minimization as Part of the Project**

The mining of two pits on a ridge top reduced wetland impacts in the upper reaches of two watersheds. All roads were laid out to minimize wetland impact by routing. Mine roads must be designed to meet Mine Safety and Health Administration road grade safety requirements. The routing shown in the figures represents the smallest possible impact to wetlands and waters while ensuring the design meets safety requirements. Waste dumps were configured to minimize headwater stream and wetland impacts.

In addition, by hauling the ore to Fort Knox there is no onsite gold processing at Manh Choh. There will be no cyanide usage or tailings impoundment constructed at the mine.

**Reclamation and Restoration at Manh Choh**

When mining ceases all waste rock dumps will be graded enhance restoration. Growth media stockpiles will be hauled to the regraded waste rock piles and spread over the waste rock to a minimum one-foot to two-foot depth. The regraded and covered rock dumps will be reseeded. All seeding onsite will be done with native seeds. The growth media storage sites will be recontoured and seeded when growth media is removed. All laydown areas, facility areas, and ore storage areas will be regraded and seeded. Pit access roads will be regraded to establish surface drainage, scarified, and seeded.
23.4 Compensatory Mitigation

Onsite Wetland Restoration

Manh Choh Project mining is located on one ridge. The wetlands impacted by the Project at the mine site are on slopes and swales near the tops of the hill. These locations make wetland creation or restoration difficult to non-feasible during mine reclamation. There is no assurance there will be a water source(s) for creation/restoration of wetlands in these landscape positions. Onsite restoration is not practicable.

The lack of shallow groundwater along the Manh Choh Twin Road corridor also makes wetland creation or restoration difficult to non-feasible. Numerous materials sites line the current roadway; none have intersected groundwater.

The Manh Choh Project will be fully bonded for reclamation and closure with the State of Alaska. At the end of mining activities in 2027 the mine surface disturbance will be reclaimed and closed according to the Reclamation and Closure Plan.

In Watershed Restoration

In watershed compensatory mitigation for the Project will be proposed to offset the loss of 5.2 acres of wetlands by the Manh Choh Project. A separate 12-step Permittee Responsible Mitigation plan will be supplied as part of the Department of Army permit application.

Public Interest

The Project provides new employment for the Native Village of Tetlin and continued employment at Fort Knox. This private need can be measured by the continued economic benefit to shareholders of Peak Gold LLC and the Native Village of Tetlin. Public benefit can be measured by the goods and services purchased in Tok and the Fairbanks North Star Borough for the years of mining and reclamation.

The private landowner, Native Village of Tetlin has sought economic development opportunities and has authorized the use of the land for the proposed Project. The Native Village of Tetlin will benefit economically from the Project, including through employment of local residents.

Power will be purchased locally from Alaska Power and Telephone for the personnel camp. Additional power requirements will be generated onsite at the mine and ore transfer site.

The Project follows local land use and zoning. The Project will not adversely affect local wells or community water supplies.

The Project maximizes the use of uplands and minimizes the use of wetlands for mine pits, waste dumps, staging areas, and access roads. The location of the mine pits cannot be relocated, as they drive the Project. Roads and ancillary facilities were located to avoid and minimize wetland impacts.
The Project can be constructed and operated to meet State of Alaska Water Quality Standards. Peak Gold LLC will apply for all State permits for the Project. There are no discharges of toxic materials at the Project. No impoundments will be constructed at the Project.

No endangered species will be impacted by the action. No adverse impacts to fish and wildlife are anticipated. The impacted wetlands are not associated with fish habitat.

**Least Environmental Damaging Practicable Alternative**

During the preliminary and final planning and design process, Peak Gold LLC evaluated multiple mine designs, road layouts, and processing scenarios to identify the Least Environmentally Damaging Practicable Alternative (LEDPA). During the process, Peak Gold LLC utilized a substantive screening process to avoid and minimize impacts to wetlands and waters at the Project. These avoidance and minimization measures were incorporated in the preferred alternative (i.e., the design presented in this application).

Peak Gold LLC selected an alternative that has been demonstrated as the LEDPA considering costs, available technology, and logistics. The co-use alternative for the Tetlin Village Road was rejected by the landowner - the Native Village of Tetlin - as unsafe, therefore this alternative is not practicable. The Project utilized existing disturbance and uplands to the greatest extent practicable in the final design. The Project disturbs over 920 acres of uplands and only 5.2 acres of wetlands.

A temporary personnel camp to house workers is planned for construction in uplands. The camp is located at the beginning of the Manh Choh Twin Road. The personnel camp will not interfere with local traffic.

No direct or indirect impacts are anticipated to anadromous or resident streams.

There are no surface water mixing zones. Alaska State Water Quality Standards can be met by the Project.

State of Alaska Air Quality Standards can be met by the Project.

All activities will follow, and comply with, Native Village of Tetlin and State Historic Preservation Office requirements.

No direct or indirect impacts are anticipated to State or Federal Parks or Refuges.

Direct impacts to Native Lands are sanctioned and will benefit the Native Village of Tetlin.

All surface impacts will be reclaimed to the satisfaction of the local landowner, Native Village of Tetlin and bonded by the State of Alaska for success. A qualitative Project impact summary is presented in Table 23-1. Alternatives 1, 2, and 3 all have greater impacts than the proposed action.
### Table 23-5: Alternative Impact Summary

<table>
<thead>
<tr>
<th>Proposed Action</th>
<th>Alt 1: Ore Processing and Tailing Storage at Manh Choh</th>
<th>Alt 2: Haul Road Crossing Tok River</th>
<th>Alt 3: Haul Road Deeper into Tetlin Village Road</th>
<th>Alt 4: Co-Use of Tetlin Village Road</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical and Chemical Environment</strong></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Noise</td>
<td>More Impact</td>
<td>Less Impact</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Visual</td>
<td>Middle Impact</td>
<td>Most Impact</td>
<td>Most Impact</td>
<td>Most Impact</td>
</tr>
<tr>
<td>Hazardous Materials</td>
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<td>Geology and Geochemistry</td>
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<tr>
<td>Soils</td>
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<tr>
<td><strong>Biological Environment</strong></td>
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<tr>
<td>Fish</td>
<td>Less Impact</td>
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<td><strong>Social and Economic Environment</strong></td>
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<td>Recreation</td>
<td>Middle Impact</td>
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<tr>
<td>Environmental Justice</td>
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<td>-</td>
</tr>
</tbody>
</table>
MANH CHOH PROJECT

REFERENCES


ATTACHMENT 1  404 FIGURES
Applicant: Peak Gold, LLC

File No.: POA-

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

Lat.: 63.2500
Long.: -142.8100

Sheet: 1 of 31

December 2021

Wetland Study Area
Fill Footprint

Wetlands and Waters

- Stream
- Waterbody
- Wetland
Applicant: Peak Gold, LLC

File No.: POA-

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

See Supplement Table 15-1 for Public Land Survey Data

Lat.: 63.3206   Long.: -142.7952

Sheet 2 of 31   December 2021
Applicant: Peak Gold, LLC

File No.: POA-

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

See Supplement Table 15-1 for Public Land Survey Data

Lat.: 63.3184 Long.: -142.7753

Sheet: 3 of 31 December 2021
Applicant: Peak Gold, LLC

File No.: POA-

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

See Supplement Table 15-1 for Public Land Survey Data

Lat.: 63.3093  Long.: -142.7748

Sheet: 4 of 31  December 2021

Fill Footprint
Project Component
Wetland or Water Impact
Wetland Study Area

Wetlands and Waters

Stream
Waterbody
Wetland

Contour Data: 5m IFSAR

1 inch = 400 feet  1:4,800
Applicant: Peak Gold, LLC

File No.: POA-

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

See Supplement Table 15-1 for Public Land Survey Data

Lat.: 63.3002  Long.: -142.7742

Sheet 5 of 31  December 2021
Applicant: Peak Gold, LLC

File No.: POA-03000150600

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

See Supplement Table 15-1 for Public Land Survey Data

Lat.: 63.2912  Long.: -142.7696

Sheet: 6 of 31  December 2021
Applicant: Peak Gold, LLC

File No.: POA-

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

See Supplement Table 15-1 for Public Land Survey Data

Lat.: 63.2821 Long.: -142.769

Sheet: 7 of 31 December 2021
Applicant: Peak Gold, LLC

File No.: POA-

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

See Supplement Table 15-1 for Public Land Survey Data

Lat.: 63.273 Long.: -142.7685

Sheet: 8 of 31 December 2021
Applicant: Peak Gold, LLC

File No.: POA-

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

See Supplement Table 15-1 for Public Land Survey Data

Lat.:  63.2641  Long.: -142.7526

Sheet: 9 of 31  December 2021
Applicant: Peak Gold, LLC

File No.: POA-

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

See Supplement Table 15-1 for Public Land Survey Data

Lat.: 63.2551  Long.: -142.7477

Sheet 10 of 31  December 2021

Contour Data: 5m IFSAR
Loadout Pad

Manh Choh Site Road

Applicant: Peak Gold, LLC

December 2021

See Supplement Table 15-1 for Public Land Survey Data

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

Contour Data: 5m IFSAR

Wetlands and Waters
- Stream
- Waterbody
- Wetland

File No.: POA-0300150

Fill Footprint
Project Component
Wetland Study Area

Lat.: 63.251
Long.: -142.7671
Sheet 11 of 31

December 2021
Applicant: Peak Gold, LLC

See Supplement Table 15-1 for Public Land Survey Data

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

Contour Data: 5m IFSAR
Applicant: Peak Gold, LLC

File No.: POA-

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

See Supplement Table 15-1 for Public Land Survey Data

Lat.: 63.2503  Long.: -142.8261

Sheet 14 of 31  December 2021
Applicant: Peak Gold, LLC

File No.: POA-

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

See Supplement Table 15-1 for Public Land Survey Data

Lat.: 63.2483 | Long.: -142.8457

Sheet 15 of 31 | December 2021
Applicant: Peak Gold, LLC

File No.: POA-

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

See Supplement Table 15-1 for Public Land Survey Data

Lat.: 63.236 Long.: -142.8252

Sheet 17 of 31 December 2021
Applicant: Peak Gold, LLC

File No.: POA-

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

See Supplement Table 15-1 for Public Land Survey Data

Lat.: 63.2205  Long.: -142.8105

Sheet 19 of 31  December 2021

Contour Data: 5m IFSAR

Fill Footprint

Project Component

Wetland Study Area

Wetlands and Waters

Stream

Waterbody

Wetland
Applicant: Peak Gold, LLC

File No.: POA-

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

See Supplement Table 15-1 for Public Land Survey Data

Lat.: 63.2152 Long.: -142.8298

Sheet: 20 of 31  December 2021

Contour Data: 5m IFSAR

Fill Footprint
Project Component
Wetland Study Area

Wetlands and Waters

Stream
Waterbody
Wetland
Applicant: Peak Gold, LLC
File No.: POA-
Waterway: Tanana River
Proposed Activity: Manh Choh Mine

See Supplement Table 15-1 for Public Land Survey Data
Lat.: 63.1969  Long.: -142.8426
Sheet 22 of 31  December 2021
Applicant: Peak Gold, LLC

File No.: POA-

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

See Supplement Table 15-1 for Public Land Survey Data

Lat.: 63.2077  Long.: -142.8826

Sheet: 24 of 31  December 2021
Aboveground Storm Water Piping
Fill Footprint
Project Component
Wetland Study Area

Wetlands and Waters

Stream
Waterbody
Wetland

Contour Data: 5m IFSAR

Applicant: Peak Gold, LLC

File No.: POA-

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

See Supplement Table 15-1 for Public Land Survey Data

Lat.: 63.1984 Long.: -142.9016

Sheet: 25 of 31 December 2021
Applicant: Peak Gold, LLC

File No.: POA-

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

See Supplement Table 15-1 for Public Land Survey Data

Lat.: 63.1986  Long.: -142.882

Sheet: 26 of 31  December 2021
Aboveground Storm Water Piping
Fill Footprint
Project Component
Wetland Study Area

Wetlands and Waters
Stream
Waterbody
Wetland

Contour Data: 5m IFSAR

Applicant: Peak Gold, LLC
File No.: POA-

Waterway: Tanana River
Proposed Activity: Manh Choh Mine

See Supplement Table 15-1 for Public Land Survey Data

Lat.: 63.1893  Long.: -142.901
Sheet: 27 of 31  December 2021
Applicant: Peak Gold, LLC

File No.: POA-

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

See Supplement Table 15-1 for Public Land Survey Data

Lat.: 63.1805 Long.: -142.8808

Sheet: 30 of 31 December 2021
Applicant: Peak Gold LLC
File No.: POA-
Waterway: Tanana River
Proposed Activity: Manh Choh Mine

Sheet: 32 of 36 December 2021
Road, Flat Cross Section

A. TYPICAL SECTION 8: MINE TRUCK TRAFFIC, MINE ACCESS ROAD, FLATS; LOADOUT TO HILL
   ASSUME 20.5' WIDE DESIGN VEHICLE, SINGLE LANE

B. TYPICAL SECTION 7: HIGHWAY TRUCK TRAFFIC, TETLIN VILLAGE ROAD & TETLIN VILLAGE ROAD TO LOADOUT
   ASSUME 8.5' WIDE DESIGN VEHICLE, DOUBLE LANE
Applicant: Peak Gold LLC

File No.: POA-

Waterway: Tanana River

Proposed Activity: Manh Choh Mine

Sheet: 34 of 36

December 2021
Applicant: Peak Gold LLC
File No.: POA-
Waterway: Tanana River
Proposed Activity: Manh Choh Mine
Lat.: 63.1854 N  Long.: 142.8917 W
Sheet: 35 of 36

December 2021