

**U.S. Department of the Interior  
Bureau of Land Management  
Eastern Interior Field Office**  
1150 University Ave  
Fairbanks, Alaska 99709

**ENVIRONMENTAL ASSESSMENT**

**Placer Mining Plan of Operations  
Joe Gurule**

**DOI-BLM-AK-F020-2013-0003-EA**

Chicken Creek, Near Chicken, Alaska

Located in:  
Copper River Meridian, Township 27 North, Range 18 East, section 20

Prepared by:

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## **1. Introduction**

### **1.1. Background, Location, Land Status, and Land Use Plan Conformance**

#### **1.1.1 Background**

Mr. Joe Gurule has submitted a Plan of Operation (POO) to mine placer gold on two federal mining claims, FF 061745 - #1 Above Discovery and FF 061746 - #2 Above Discovery, above the confluence of Stonehouse Creek and Chicken Creek, a tributary of the Mosquito Fork near Chicken, Alaska. The federal mining claim block at this location is currently owned by Charles Richard Hammond. This area has been subject to intermittent mining activity since the late 1800s. The majority of the surrounding area is land Tentatively Approved to the State of Alaska, with the exception of roughly 200 acres managed by the Bureau of Land Management (BLM) 10 unpatented federal mining claims.

#### **1.1.2. Location**

The proposed action would take place above the confluence of Stonehouse Creek and Chicken Creek, a tributary of the Mosquito Fork River near Chicken, Alaska. The claims are located approximately three air miles upstream from the Fortymile Wild and Scenic River boundary.

#### **1.1.3. Land Status**

The subject lands within Copper River Meridian T27N R18E are Tentatively Approved to the State of Alaska, exclusive of the federal mining claims.

The specific BLM-managed lands affected are: unpatented federal mining claims FF 061745 and FF 061746, CRM T27N R18E Section 20

#### **1.1.4. Conformance with Land Use Plan**

The proposed action is located within the area covered by the Fortymile Management Framework Plan completed in 1980 and is consistent with the following sections:

Section M-5 "Protect public land against adverse environmental mining practices"

Section M-6 "Provide access into all areas where mineral development is occurring"

### **1.2. Purpose and Need**

#### **1.2.1. Applicant's Purpose and Need for Proposed Action**

Joe Gurule has submitted a POO for mechanized placer gold mining on two unpatented federal claims in the Fortymile mining district.

#### **1.2.2. BLM's Purpose and Need**

The purpose of the proposed action is to provide an opportunity for placer mining activities on unpatented federal mining claims by Joe Gurule above the confluence of Chicken and Stonehouse Creeks. The need for the action is established by Section 302(b) of the Federal Land Policy and Management Act (1976) and by the BLM's Surface Management regulations 43 CFR 3809.

### 1.2.3. BLM Decision to be Made

The BLM will make a decision whether or not the proposed plan meets the requirement to avoid unnecessary and undue degradation of public lands, and if so will authorize the proposed action. The BLM could allow the proposed action to occur in its entirety or in part. If a decision to approve the POO is made, the BLM will also determine if mitigation measures are needed to prevent unnecessary and undue degradation of public lands.

## 1.3. Scoping Issues (Potential Issues)

### 1.3.1. Internal Scoping

Internal scoping involved the Eastern Interior Field Office Interdisciplinary Team (IT). The Valued Environmental Components (VEC) matrix was used to identify resources for analysis. The following components were evaluated: access/travel management; air quality; areas of critical environmental concern; cultural resources; environmental justice; essential fish habitat; farm lands; fire management; floodplains; invasive, nonnative species; mineral resources; Native American religious concerns; recreation; socioeconomic; soils; subsistence; threatened or endangered species; vegetative resources; visual resources; wastes, hazardous or solid; water quality, surface or ground; wetlands/riparian zones; wild and scenic rivers; wilderness characteristics; aquatic wildlife; and terrestrial wildlife. Of the components evaluated, the following were identified for analysis: cultural resources, invasive and nonnative species, paleontological resources, and aquatic wildlife. See Section 4, Environmental Effects, for analysis of impacts identified and mitigation measures proposed.

Internal scoping efforts also identified nine resource areas that had the potential to be negligibly affected by the proposed action. They were discussed during the interdisciplinary team process and determined to not warrant further analysis for this action. Wetland and riparian vegetation resources in particular were discussed at length during the IT process as the project has the potential to effect wetland resources on north facing slopes and lowlands. Analysis of these resource areas was not carried forward since the applicant has applied for and must obtain a wetland permit from the Army Corp of Engineers in accordance with Section 404 of the Clean Water Act prior to executing the proposed action. In order to obtain a permit, the applicant will have to demonstrate to the Army Corp of Engineers how they will avoid, minimize, and mitigate unavoidable impacts to wetlands.

### 1.3.2. External Scoping

Since the proposed action is not likely to cause any public concern or controversy given the long-standing history of mining in the Fortymile area; no external scoping was conducted beyond posting a description of the proposed action on the BLM National Environmental Policy Act (NEPA) Register for public awareness and review.

## **2. Proposed Action and Alternatives**

### 2.1. Proposed Action

Mr. Joe Gurule has submitted a POO to mine placer gold on two federal mining claims, FF 061745 - #1 Above Discovery and FF 061746 - #2 Above Discovery, above the confluence of Stonehouse Creek and Chicken Creek, a tributary of the Mosquito Fork near Chicken, Alaska. The federal mining claim block at this location is currently owned by Charles Richard Hammond.

This area has been subject to intermittent mining activity since the late 1800s. The majority of the surrounding area is land Tentatively Approved to the State of Alaska, with the exception of roughly 200 acres managed by the BLM (10 unpatented federal mining claims). Mr. Gurule proposes an increase in activity from his current notice-level operations to develop placer resources on Chicken Creek in the standard method for operations in the Fortymile area. Vegetation, topsoil and overburden will be stripped, segregated and stockpiled for use in final reclamation. Mr. Gurule proposes to complete initial reclamation concurrent with his mining operation, replacing tailings into the progressing mine cut. Chicken Creek as it flows through the claims Mr. Gurule intends to mine, is a single-thread channel with a narrow floodplain. It is important to note that due to the unknown distribution of gold-bearing gravels, the effects of this mining operation, to include mine cuts, settling ponds, mine access roads, overburden and ore stockpiles may impact any area of the two aforementioned claims, including near-stream riparian and wetland areas. Mr. Gurule does not propose a stream bypass, or in-stream disturbance at this time.

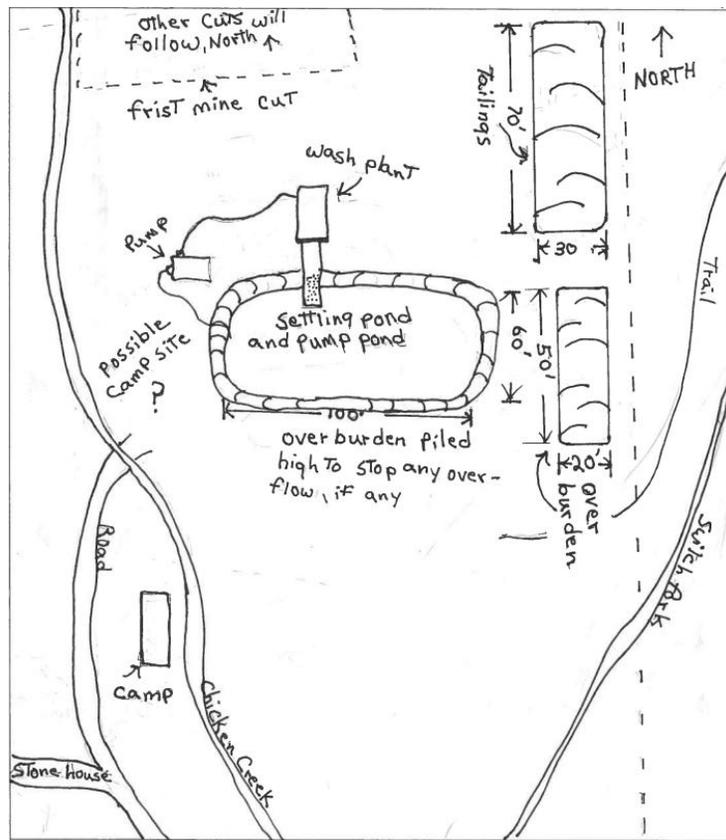
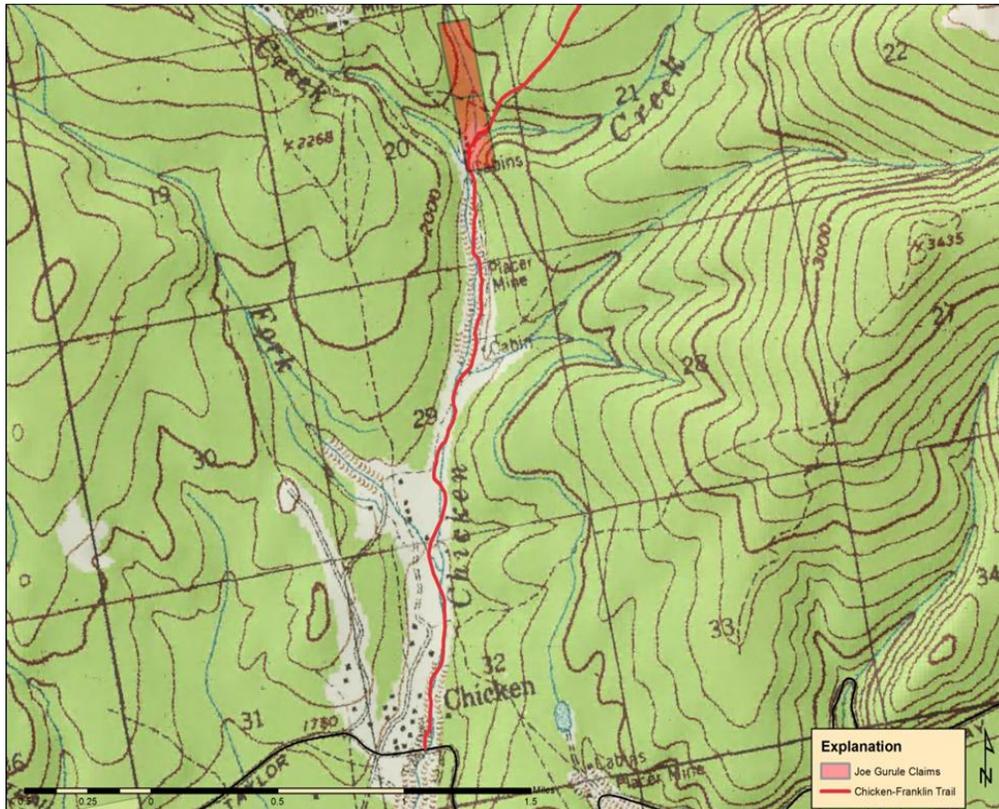


Figure 1. Operations Map (not to scale)

### Access

Access to the mining operation and occupancy can be reached by an existing road (Chicken-Franklin Trail) at approximately mile 67 of the Taylor Highway. This road is accessible by four-wheel drive vehicles, All Terrain Vehicles (ATV's), and certain types of heavy construction equipment. The road winds through approximately 2.4 miles of land managed by the State of Alaska and through federal mining claims owned by Charles Hammond (see Figure 2).



**Figure 2. Federal mining claims proposed to be mined under this plan of operations and proposed access route from Chicken.**

### Mining

Mining operations will generally follow the typical procedure for Alaskan placer operations: The mining operations will typically begin in May and be completed for the season by early October. Vegetation will be cleared and stockpiled. Overburden will be stripped from the area to be mined and stockpiled separately near the mine cut and protected from erosion and flooding. Topsoil and organic material will be separated from other stockpiles, stored in long piles, and saved for revegetation. The piles will be of sufficient height and slope to minimize erosion. A berm of rocks will be placed at the toe of the slope to provide additional stability. Topsoil will be stored away from any active channels. Topsoil may be stripped during the preceding mining season to allow permafrost in layers of overburden or gold-bearing gravels to thaw. A settling pond 75'-100' x 50'-75' will be constructed for a zero-discharge system. Additional settling ponds may be constructed and makeup water will be pumped from the stream on an as-needed basis. If there is any runoff, berms will be placed at the toe so it drains into the settling ponds. Stripping and mining activities will be conducted using a hydraulic track-hoe excavator or dozer. A front-end loader will be used to transport pay gravels to a trommel and sluice washplant for recovering gold. As the mining cut progresses, the tailings consisting of rock, gravel, and sand, will be redistributed into the mining cut for concurrent reclamation.

### Water Use and Management

Prior to washing pay gravels, ground water infiltration or water pumped out of Chicken Creek will be used to fill the setting pond. Makeup water will be pumped out of the stream as needed.

Water is used for the wash plant only. Used water will go into the settling ponds where it will be recycled for a zero discharge system. The amount of water that will be used a day is estimated at 30,000-40,000 gallons and the makeup water, will be about 5000 gallons a day.

The washed material and additional overburden will be placed into berms around the settling ponds to provide additional overflow protection. Water will be supplied to the washplant using four and five inch Wisconsin Water Pumps, and a three inch Honda Water Pump will be on hand for backup use. All hoses will be above ground and flexible. There will be no discharge into the stream.

#### Occupancy

Mr. Gurule proposes to use his established occupancy on claim FF061745 encompassing an area of approximately one acre. The camp is made up of a trailer-house, a scrap/boneyard area, a storage shed, and a fuel depot (Figure 3).

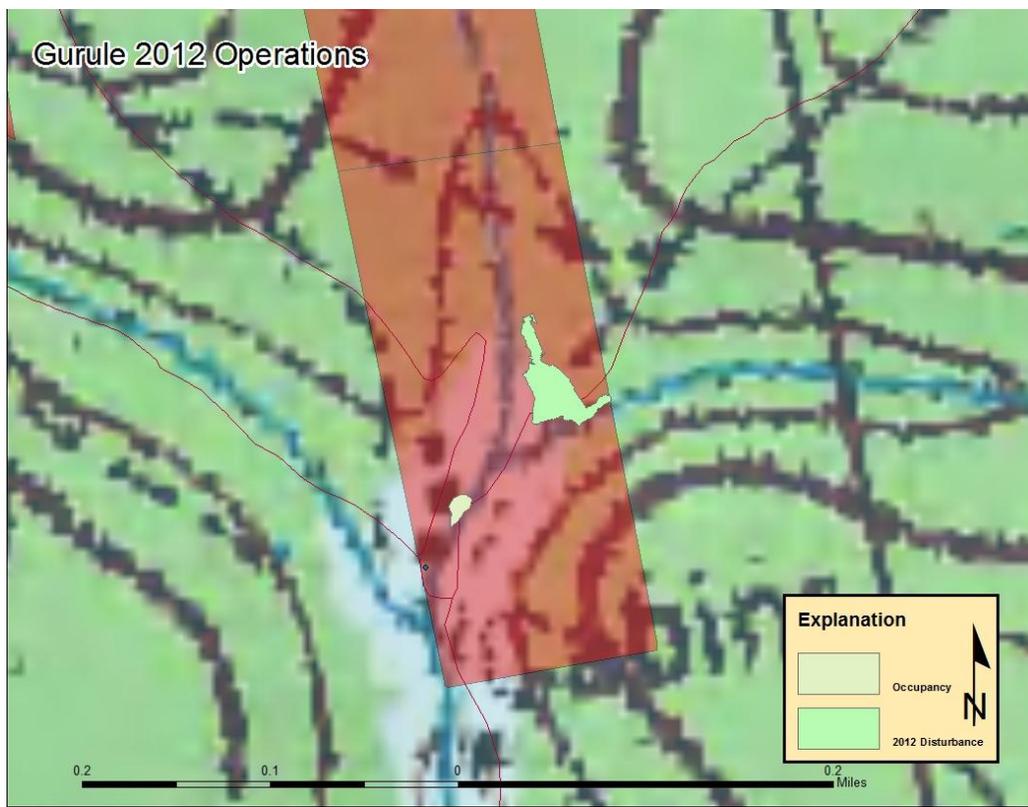


Figure 3. Location of Facilities in 2012 mining season.

#### Hazardous Material Control

Diesel fuel will be stored in a 1000 gallon steel tank. This tank and other petroleum, oil, and lubricant (POL) materials will be stored in a secondary containment system consisting of a larger, skid mounted steel tank (3000-5000 gal.) modified to become a secondary containment facility. Drip pans and absorbent pads will be on hand during refueling activities to contain any spills. This facility will be located a minimum of 200 feet from the stream. All hazardous material will be monitored through the use of a Spill Prevention Control and Countermeasures Plan (SPCC) similar to the plan described in 40 CFR 112. Mr. Gurule will be required to comply with a "Self-Certified" SPCC at all times and report to the Alaska Department of Environmental Conservation (ADEC), the BLM and the Environmental Protection Agency (EPA) for any and all

events related to their hazardous material program. Appropriate spill response equipment and supplies must be on hand when hazardous materials or petroleum products are stored or used. It is recommended that secondary containment or drip pans be placed under all fuel container inlet and outlet points, hose connections and hose ends during fuel transfers. All spills of oil or hazardous substances shall first be reported to ADEC at 800-478-9300 and then to a BLM Spill Reporting Official at 800-478-1263.

#### Reclamation

The reclamation plan will involve all disturbed areas including access. There is an all-season road from the Taylor Highway to the mine site that is used by other miners and also used for recreation purposes. There are no bridges, culverts or any drainage structures from the mine site to the Taylor Highway. Damage incurred on this road by the operator will be repaired to its original condition or better. Small terraces, vegetation cover, overflow channels, and small rip rap berms will help provide erosion control where necessary.

#### Erosion and Mine Site Stability:

Much of the reclamation effectiveness will be a result of stockpiles composed of overburden, vegetation, and topsoil; as identified in Mining Operations. These stockpiles will aid in returning the mine site to the pre-disturbance topography and landscape. Erosion on slopes will be controlled with small terraces with vegetation cover. Followed by small rock berms or depressions for control, dead trees, and topped with reaming tundra.

In sloped areas where stream bank stabilization is required, riparian vegetation will be distributed and re-established to prevent erosion and restore a more productive condition at the mining site. First the coarse material will be spread, followed by smaller material, and finally topsoil and organic material. Some vegetated mass will be placed where erosion may occur along the side of the stream. When stockpiled vegetative material is insufficient for revegetation, vegetative materials, including soils may be removed from otherwise undisturbed areas of the mining claims for this purpose. Water remaining in the settling ponds following the completion of mining activities will be pumped out on a flat area to evaporate. The fine sediments in the ponds will be stockpiled and used in the reclamation and revegetation process. The ponds will be filled with coarse tailings and graded to a natural contour. Fine sediment, topsoil, and organic material will be used to cap the area and serve as the medium for revegetation.

#### Monitoring Plan

Settling ponds will be monitored on a daily basis by visual inspection. If ponds are found to be discharging material into the stream, all operations will be ceased until sufficient repairs to the ponds can be made. The fuel and POL storage and distribution system will be monitored on a daily basis, ensuring the secondary containment system is in proper functioning condition. All equipment in use on the mine site will be inspected daily for leaks. Drip pans and absorbent pads will be used to contain spills from leaking equipment until repairs can be made to stop leaks.

#### Interim Management Plan

At the end of the mining season, the site will be stabilized in preparation for the next mining season. Settling ponds that will be used in future operations will be isolated from additional water inflow. Ponds no longer to be used will be reclaimed as previously described. Berms around ponds and the active mine site are reinforced and equipment is moved to higher ground.

## 2.2. No Action Alternative

The no action alternative would result in the applicant not being able to pursue mineral exploration as proposed on BLM-managed lands. This does not mean no mining indefinitely, but that the Plan as proposed could not be approved because it fails to prevent unnecessary or undue degradation. The No Action Alternative is used to help identify baseline conditions and is used as the basis for comparing the impacts of the proposed action, and the alternative action with the current conditions, and expected future conditions in the absence of the project.

## 3. **Affected Environment**

### 3.1. Proposed Action

3.1.2. Impacts requiring analysis. Internal scoping identified four components where mineral development activities would have an impact and requires further analysis.

#### 3.1.2.1. Cultural Resources

The two federal claims in question, and the lands immediately surrounding them, have not been surveyed for cultural resources by qualified archaeologists. The Alaska Heritage Resources Survey database, maintained by the Alaska State Historic Preservation Office, indicates one known cultural site on the two federal mining claims mentioned in the proposed action. This site, 49-EAG-00140, is the historic 10 mile long trail connecting the historic town of Chicken and the old Townsite of Franklin, located at the confluence of Franklin Creek and the South Fork of the Fortymile River. This historic trail is still used today by ATV riders. There has been near-continuous mining on Chicken Creek since the 1890s, when placer gold was discovered on Chicken just below the mouth of Stonehouse Creek, and includes all manner of placer mining activities including small-scale hand workings, underground, hydraulicking, bulldozers, and dredging. Hundreds of men were reported working or prospecting in the area in the early 20<sup>th</sup> century.

#### 3.1.2.2 Invasive, Nonnative Species

Cortes-Burns et al. (2008) summarizes the status of invasive plants relative to disturbance in Alaska: While invasive plants constitute a major problem in the Lower 48 states (cf. Randall 1996), Alaska has been considered relatively immune to their deleterious impacts. In the past five years, however, this perception has changed (Shephard 2004, Carlson and Shephard 2007). More and more non-native species and populations are being recorded and, disturbingly, a number of species have moved off of the anthropogenic footprint and have overrun natural areas, clearly damaging the area's ecology (Carlson 2006, Conn et al. in press). Even so, invasive plants in this state are still mainly restricted to the regions of greatest anthropogenic disturbance. Consequently, land managers in Alaska have the unique opportunity to be proactive in managing exotic and invasive plants. Invasive plants are often opportunistic species that thrive under the types of conditions created by disturbances: increased light and nutrient availability, reduced interspecific competition, and increased bare soil (Rejmánek 1989, Harrod and Reichard 2001). Forest and grassland fires are a well-known disturbance and have accelerated non-native plant establishment in the Lower 48, through both increase in availability of disturbed habitat and due to inadvertent dispersal during firefighting activities (Hobbs and Huenneke 1992, Brooks 2001, Harrod and Reichard 2000). See Cortes-Burns et al. 2008 for references. Carlson and Shephard (2007) argue that the spread of non-native plants in Alaska

may be shifting from a lag phase to an exponential growth phase, similar to patterns in the rest of the U.S. 60-100 years ago.

The status of invasive plants in the project area is unknown, because surveys have not been conducted. In surveys of the Taylor in 2007 (Cortes-Burns et al. 2008), small and isolated infestations were documented. Twenty-five species of non-native plants were recorded, including smooth brome, bird vetch, white sweetclover, yellow alfalfa, narrowleaf hawksbeard, Norwegian cinquefoil, and alsike clovers. A search of the Alaska Exotic Plants Information Clearinghouse (AKEPIC) database for records of invasive species in and around Chicken, which is the portal to the proposed action, reveals that several species of concern occur in the area, including smooth brome, white sweetclover, and bird vetch.

### 3.1.2.3 Paleontological Resources

Pleistocene fossils of large land mammals (e.g., horses, bison, and mammoths) have been found in abundance in the Chicken Creek area. Paleontological resources have been reported from the Chicken Creek-Stonehouse Creek-Myers Fork drainage.

### 3.1.2.4 Aquatic Wildlife

Issue for analysis: How would soil erosion and subsequent water turbidity and sedimentation to the stream from the proposed action affect fish and aquatic resources in downstream areas? The area proposed to be mined is located in the headwaters of Chicken Creek, a tributary to the Mosquito Fork, which is a tributary to the South Fork Fortymile River. Resident fish species that are commonly found in tributary streams of similar size to Chicken Creek within the Fortymile River drainage include Arctic Grayling (*Thymallus arcticus*), slimy sculpin (*Cottus cognatus*), longnose suckers (*Catostomus catostomus*), and Round Whitefish (*Prosopium cylindraceum*).

The creek and upland areas within the area proposed to be mined are immediately upstream of mining disturbance and thought to be in a natural and stable condition. The creek is thought to be approximately 2 feet wide and a few inches deep. Although fish have been observed in lower Chicken Creek, the creek within the area proposed to be mined is small enough that fish are probably not present.

The Chicken Creek drainage, immediately downstream of the area proposed to be mined, has been subject to placer mining activity since the late 1800's and continues today. As a result, much of the fish habitat has been degraded through channelization, sedimentation, and removal of riparian vegetation [Alaska Department of Fish and Game (ADFG) 1987]. Because pre-mining fisheries data are unavailable, the full extent to which mining activities have impacted fish and aquatic resources in Chicken Creek is unknown (ADFG 1987). The ADFG performed a fish inventory in Chicken Creek in 1975. Although no fish were observed during the survey, placer miners have observed Arctic Grayling in Chicken Creek (ADFG 1987).

## 4. Environmental Effects

### 4.1. Proposed Action

#### 4.1.1. Cultural Resources

#### 4.1.1.1. Indirect and Direct Effects

It is a certainty that the area encompassed by the two federal mining claims in question has been prospected as early as the 1890s. The degree and extent of previous historic (>50 years ago) mining on these claims is not presently known. Present day ground stripping for mining purposes on previously undisturbed ground on the two claims will destroy unknown surface and subsurface cultural resources, if any are present. The likelihood of unknown cultural resources on these two claims – probably historic resources related to previous mining exploits – is high, owing to their close proximity to historic Chicken, a mining town founded 100+ years ago, and continuous mining and prospecting in the area since the 1890s.

#### 4.1.1.2. Cumulative Effects

There are no cumulative effects to cultural resources by the proposed action; any sites present in the way of the proposed mining activities will be destroyed.

#### 4.1.1.3. Mitigation and Residual Effects

On grounds previously disturbed by past mining activity, present day mining as outlined in the Proposed Action MAY PROCEED without a need for an on-the-ground cultural resources survey. On grounds that have NOT been previously disturbed, an on-the-ground survey by BLM archaeologists will need to take place prior to present day mining occurring. **This survey will take place as soon as most snow ground cover has melted away in May 2013. If cultural sites are NOT found** on the two federal mining claims in question, then BLM archaeologists will provide a notice to proceed in writing to the applicant at the time of the survey in May 2013. This notice to proceed will either be hand delivered to the applicant at the camp identified in the Plan of Operations, or else left taped to the front door of his trailer at this same camp. **If cultural sites ARE found** in the locations of the proposed action, then BLM archaeologists will clearly mark these sites on the ground with labeled flagging, and take GPS points and photographs. These points and photos will then be printed out and will accompany the notice to proceed, which will be provided in writing to the applicant in May 2013. If the applicant is present at that time and available to discuss the findings, then BLM archaeology will coordinate with the applicant about how to proceed. If the applicant is not present or available to discuss the findings in May 2013, then a written notice will be left at his camp outlining how he may proceed to work on the claims. In short, there will be no working within 25 feet of any cultural sites until the adverse effects of the mining to significant cultural resources have been mitigated.

#### 4.1.2. Invasive, Nonnative Species

##### 4.1.2.1. Indirect and Direct Effects

##### Indirect and Direct Effects

In the absence of disturbance, most upland habitats have been resistant to invasion by non-native plant species. Most non-native species occur in or near disturbed habitat. Surface disturbance creates sites conducive to colonization by non-native species, and motorized vehicles can transport seeds of non-native species. The likelihood of colonization depends in part on the likelihood of seed transport, which is increasing as non-native invasive species become more common along the road system in AK, and the length of time that the site remains open to motorized vehicle travel and/or without native vegetation cover. The length of time that the mined area will remain un-vegetated depends on the reclamation schedule and success of

reclamation. The time between disturbance and beginning of reclamation is likely to be one year or more. Establishment and growth of native vegetation is highest when reclamation is immediate, and deteriorates through time due to death of seeds, vegetative parts, and soil microflora in stored soil. Revegetation may also be delayed at sites of potential soil instability, such as permafrost sites. In addition, erosion can remove topsoil, organic material, and fine soil material, further delaying recovery of native vegetation.

The proposed action will result in some increase in risk of establishment and spread of invasive plant species. Factors affecting this risk include: extent of disturbance, speed and effectiveness of reclamation and revegetation, levels of continued motorized use, the availability of seed for potential transport to the site, and detection and rapid control by permittee.

#### 4.1.2.2. Cumulative Effects

Disturbance and use of native habitats by adjacent mining operations will increase the likelihood of invasive plant establishment in the area, as will a regional increase in numbers of non-native plant species and their abundance. Both will increase likelihood of invasive plant establishment on lands disturbed by this proposed action, and the proposed action will add to the increased likelihood of invasive plant establishment in the general area. The proposed ground disturbance is relatively small in area compared to total past, recent and future disturbances, therefore the relative contribution to the Chicken Creek and adjacent area by invasive species is likely relatively small.

#### 4.1.2.3. Mitigation and Residual Effects

One objective of the 2010 BLM - Alaska Invasive Species Management policy is to: “*Integrate invasive species prevention, detection and control activities into all on-the-ground activities conducted on BLM administered land in the State.*”

Preventive measures to be considered and included in permitted actions when practical include:

- *Minimize soil disturbance and salvage vegetative mat to reduce the likelihood of weed establishment. Reseeding where appropriate may be recommended.*
- *Monitor project sites to detect new infestations when risk of weed spread is moderate to high.*
- *Retain bonds for weed control on all mineral activity until site is successfully revegetated, when appropriate.*

Recommended mitigation measures for this proposed action and alternative:

1. Require post-reclamation survey of invasive plant populations and require control of any populations of species of moderate or high concern.
2. A more detailed reclamation plan would better enable BLM to ensure that effective reclamation occurs. For example, post-reclamation diagrams and specifying recontouring to approximate original surface.

#### 4.1.3. Paleontological Resources

##### 4.1.3.1. Indirect and Direct Effects

Pleistocene fossils of large land mammals (e.g., horses, bison, and mammoths) have been found in abundance in the Chicken Creek area. Paleontological resources have been reported

from the Chicken Creek-Stonehouse Creek-Myers Fork drainage. Any paleontological resources that are present on the mining claims will be destroyed by mining activities.

#### 4.1.3.2. Cumulative Effects

There are no cumulative effects to paleontological resources by the proposed action; any fossils present in the way of the proposed mining activities will be destroyed.

#### 4.1.3.3. Mitigation and Residual Effects

Paleontological resources are protected by federal law on federally managed lands (Paleontological Resources Preservation Act of 2009; 16 U.S.C. 470aaa et seq). However, surveying for paleontological resources in the field is not practical. Unusual fossils (anything other than horse, mammoth, or bison), fossils with frozen/preserved organic tissues (hair, skin), or complete/near-complete skeletons of a single animal are of particular concern to researchers. The BLM requests that ANY Pleistocene fossils and bones uncovered during mining operations, once they are authorized, be piled up at the applicants' camp for inspection. A BLM archaeologist will visit to examine this pile at least once annually. If something particularly spectacular emerges (like frozen/preserved tissue; complete or near complete animals; unusual species like any predator), the applicant is requested to please contact the BLM Chicken Field Station, whose personnel will contact the appropriate BLM archaeologist.

#### 4.1.4 Aquatic Wildlife

##### 4.1.4.1. Indirect and Direct Effects

The effects analysis for fish and aquatic resources does not address a stream bypass or stream channel alterations. This analysis is based on the surface disturbing activities and mine operations proposed to occur on the uplands and in the near-stream riparian areas of the two claim blocks previously mentioned. This analysis also assumes that all of the erosion control measures described to be used during mining and for final reclamation will be implemented.

Fish are probably not present in the area to be mined and therefore there are no anticipated direct effects to fish and aquatic habitat. Fish and aquatic habitat in downstream areas may be indirectly and adversely impacted by the proposed action due to increased sedimentation and turbidity. The adverse effects from the proposed action may result in further degradation to Chicken Creek.

Surface disturbing activities that remove and destroy natural vegetation, as those described in the proposed action, often result in some level of surface erosion. This erosion could result in additional sedimentation to Chicken Creek and result in "cementing" of the stream bottom. If this occurred, the interstitial spaces in the gravel would be filled in with sediment smothering fish eggs and reducing the amount of space available for juvenile fish and macroinvertebrates. Many of the macroinvertebrates that are favored as food by fish (e.g. mayflies, caddisflies and stoneflies) prefer coarse streambed substrates and thus are adversely impacted by an increase of fine sediments. Developing fish eggs and larvae need a constant supply of cold, oxygen rich water which flows through the interstitial spaces in stream gravels. The filling of pools with sediment also limits overwintering and summer feeding sites for juvenile and adult fish (Meehan 1991). Although it's difficult to determine how long these impacts would remain, they would likely be considered long term and be measured in years. A streambed in a "cemented"

condition would likely remain that way until a stream discharge event occurred with enough energy to change the profile of the stream.

The surface disturbing activities described in the proposed action may result in turbidity to Chicken Creek and its receiving waters. Sediment pollution in the form of turbidity is one of the more common forms of pollution in Alaskan waters (Lloyd et al. 1987) and is known to affect freshwater fish in a variety of ways including: decreased food availability (reduced primary and secondary production), reduced growth and survival, reduced feeding efficiency in sight-feeding species, stress, and avoidance (effects summarized in Lloyd et al. 1987). Many streams within the Interior of Alaska where conventional mining methods have been used experience short duration but chronically occurring episodes of elevated turbidity as a result of destabilized stream channels and surface erosion. Turbidity commonly exceeds the State standard during periods of high flow and occasionally, as a result of water control issues, during active mining operations. The impacts from turbidity would be short term and be measured in hours.

If the proposed action disturbs the near-stream riparian area and destroys the riparian vegetation, additional erosion and turbidity will occur. Impacts from erosion and turbidity have been previously described. In the absence of mitigation to stabilize these areas, the destruction of the near-stream riparian area and vegetation will also result in eroding and unstable stream banks, a wider and shallower stream channel, channelization, reduced pool habitat and instream habitat complexity, and increased stream velocities. Even with mitigation there would be a decrease in shade cover and increase in water temperature, and a decreased input of nutrients and large woody debris (fish habitat), all of which adversely impact fish and aquatic resources. These impacts would be long term and measured in decades. This is due to the short growing season in the subarctic environment and due to the loss of the already nutrient poor soil during the mining process. The severity of these impacts and loss of riparian vegetation depends on the amount disturbed by the operator within these two claim blocks (40 acres) over the life of the mine plan. Mitigation to temporarily stabilize near-stream riparian areas should reduce the impacts to a level that would maintain water quality and prevent unnecessary or undue degradation (UUD) to public land. Maintaining a small area of undisturbed land (buffer) between the mine operation and the stream would alleviate these impacts and the need for mitigation. The BLM recommends the use of buffers as a practical means for minimizing disturbance in their handbook "Placer Mining in Alaska, A Guide to Mitigation and Reclamation, 1989."

The BLM provides guidance for the construction and maintenance of settling ponds in their Guide to Placer Mining in Alaska (BLM 1989) and in the U.S. Department of the Interior Bureau of Land Management Solid Minerals Reclamation Handbook, H-3042-1. The applicant did not provide the methodology (drainage area, rate of inflow, etc.) used to design or maintain the proposed sediment ponds. In recent years, the water level in sediment ponds found at placer mining operations in the Interior of Alaska have been observed beyond the holding capacity of the pond, i.e., the pond was breached and water was spilling over the berm. Leaks at the base of sediment ponds have also been observed. When these events occurred, sediment and turbid water entered the stream at levels far exceeding state water quality standards. A mitigation measure has been proposed to reduce the chance of sediment pond breaching to maintain state water quality standards and to avoid UUD.

#### 4.1.4.2. Cumulative Effects

Impacts affecting fish and aquatic resources from the past, in areas immediately downstream of the proposed action, were previously described in the no action alternative section. The current

condition of the creek and uplands in the area proposed to be mined is thought to be in a stable and natural condition. Current impacts immediately downstream include a handful of active mining operations within the Chicken Creek drainage. Impacts from the current operations are assumed to be similar to those described for this operation and may incrementally decrease water quality and fish habitat. The foreseeable future impacts would include a continuation of mining activities within the Chicken Creek drainage. For each additional mining operation or surface disturbing activity in the drainage there would be the potential for some incremental decrease in water quality and fish habitat.

#### 4.1.4.3. Mitigation and Residual Effects

##### Mitigation

The following mitigation measures would reduce erosion, sedimentation, turbidity, and their effects to prevent UUD on public lands. These mitigation measures are directly linked to Performance Standards found in 43 CFR 3809.420 which are required to prevent UUD. These mitigations should be carried forward as "Conditions of Approval" in the Decision Record.

1) In areas where the streambank and/or streambank vegetation has been mechanically altered or stripped by the operator, the streambank will be immediately stabilized using material of sufficient size to dissipate stream energy, prevent erosion, and maintain water quality standards. Material may include rip-rap, coir logs, silt fencing, brush barriers, etc. The effectiveness of the stabilization practices will be monitored by BLM staff during compliance exams and site visits. This mitigation measure prevents UUD by controlling erosion and providing measures to maintain water quality standards.

2) Sufficient free board (the elevation difference between the top of the sediment pond berm and the water surface) in the sediment ponds will be maintained at all times to accommodate an influx of rain and surface water runoff from typical storm events. The amount of free board will be 20% of the pond depth. In this case, with a pond depth of 10 ft., the amount of freeboard would be 2 ft. The applicant will visually monitor for leaks and measure the freeboard on a daily basis. This information will be recorded in a logbook with the date, any leaks noted, amount of freeboard, and name of the recorder. The logbook will be reviewed for completeness during compliance exams. If the pond is leaking or free board is found to be insufficient, mining will cease and efforts will focus on fixing the problem. This mitigation measure prevents UUD by providing measures to control erosion, landslides, water runoff, and maintain water quality standards.

3) Topsoil or fine, unconsolidated material should not be stored as a berm in the stream bank. This mitigation measure prevents UUD by avoiding practices that would result in erosion or exceed state water quality standards for turbidity.

##### Residual Effects

Implementation of the proposed mitigation measures is intended to substantially reduce the chance for erosion, sedimentation, and turbidity to the stream. Even with mitigation the effectiveness depends on how well they are implemented and the chance of storm events occurring that exceed the design of the mitigating measures.

## 4.2. No Action Alternative

### 4.2.1. Cultural Resources

#### 4.2.1.1. Indirect and Direct Effects

There are no direct or indirect effects to cultural resources if the project is not permitted.

#### 4.2.1.2. Cumulative Effects

There are no cumulative effects to cultural resources if the project is not permitted.

#### 4.2.1.3. Mitigation and Residual Effects

There would be no need for mitigation measures to address cultural resources if the project is not permitted.

### 4.2.2. Invasive, Nonnative Species

#### 4.2.2.1. Indirect and Direct Effects

No direct or indirect effects are expected if the project is not permitted.

#### 4.2.2.2. Cumulative Effects

No cumulative effects are expected if the project is not permitted.

#### 4.2.2.3. Mitigation and Residual Effects

No mitigation is identified or necessary.

### 4.2.3. Paleontological Resources

#### 4.2.3.1. Indirect and Direct Effects

There are no anticipated direct or indirect effects if the project is not permitted.

#### 4.2.3.2. Cumulative Effects

There are no cumulative effects to paleontological resources if the project is not permitted.

#### 4.2.3.3. Mitigation and Residual Effects

There is no need for mitigation and no residual effects to paleontological resources if the project is not permitted.

### 4.2.4. Aquatic Wildlife

The creek and upland areas within the area proposed to be mined are immediately upstream of mining disturbance and thought to be in a natural and stable condition. The creek is thought to

be approximately 2 feet wide and a few inches deep. Although fish have been observed in lower Chicken Creek, the creek within the area proposed to be mined is small enough that fish are probably not present. Under this alternative, the fish and aquatic resources are likely to remain unchanged from their current condition.

#### 4.2.4.1. Indirect and Direct Effects

There are no anticipated indirect or direct effects to fish and aquatic resources if the project is not permitted.

#### 4.2.4.2. Cumulative Effects

There are no anticipated cumulative effects to fish and aquatic resources if the project is not permitted.

#### 4.2.4.3. Mitigation and Residual Effects

There is no need for mitigation and no residual effects to fish and aquatic resources if the project is not permitted.

### **5. Tribes, Individuals, Organizations, or Agencies Consulted**

Joe Gurule, Applicant and Mine Operator

### **6. List of Preparers**

Robin Mills, Archaeologist, BLM  
Cultural Resources, Paleontological Resources

Ruth Gronquist, Wildlife Biologist, BLM  
Invasive/Nonnative Species

Jason Post, Fisheries Biologist, BLM  
Aquatic Wildlife

Matthew Reece, Geologist, BLM  
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Victoria Kohn, Geologist, BLM  
NEPA Document Preparer, Mineral Resources

/s/ Michael Gibson FOR  
Matthew Reece  
Geologist, Preparer

5/8/2013  
Date

## List of Attachments

### References:

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