Appendix 5

Direct, Indirect and Cumulative Effects to Water Resources by Plan
APPENDIX 5

DIRECT, INDIRECT, AND CUMULATIVE EFFECTS TO WATER RESOURCES BY PLAN

The notes below identify what is and is not analyzed in this appendix and the scale of that analysis for the Plans.

Analysis Area for Water Resources

This appendix analyzes the direct and indirect impact to water resources for each Plan individually for Alternatives 2 and 3 only. The analysis areas are typically 10 acres or less (except for Return Placer at 104.6 acres) and based on what the miner proposed to do. The analysis area is identified for each Plan. Data sources used for this analysis were a compilation of various watershed studies of the Powder River Watershed within the Wallowa-Whitman National Forest (1999, 2004, and 2005), stream survey data and assessments from 1998 to 2017, and multiple Forest Service GIS data layers from 2005 to 2017. Water quality data was collected by the Powder Valley Watershed Council to Division of Environmental Quality (DEQ) standards and was shared with the USFS. Direct and indirect impacts to water resources for Alternative 1 are found in Chapter 3. Discharge findings for each Plan is located in Table 7 at the end of Appendix 5.

Cumulative effects to water resources are found at the end of this appendix and summarized in Chapter 3. Chapter 3 evaluates the combined direct and indirect effects of all the Plans that occur within a subwatershed, and the potential cumulative effects between Plans and then at the downstream end of a subwatershed.

Fords

Only fords on 1) Forest Service closed, 2) decommissioned roads or fords on 3) existing or 4) proposed temporary access roads were analyzed. Fords on open roads were NOT analyzed because they are used by the general public and there is no way to assess the potential impacts that could be attributed to the miner and their mining operation.

Suction Dredging

Six plans propose suction dredging which is permitted under DEQ 700PM permit that allows for in-channel dredging of the channel bed. For the purposes of the water resources analysis, the analysis area for suction dredging is limited to the Plan area boundary. The site characteristics presented under the suction dredging section for that Plan is therefore limited to this area. Analysis area for suction dredging is specified for this appendix because the State of Oregon 700PM permit only asks the miner for a Township, Range and Section. The stream name and area within the stream is not identified and was not provided by the miners.

Effects on Wetlands and Floodplains

Executive Order 11988 (Protection of Floodplains) requires government agencies to take actions that reduce the risk of loss due to floods, to minimize the impact of floods on human health and welfare, and to restore and preserve the natural and beneficial values served by floodplains. Executive Order 11988 defines the term “floodplain” as follows: “…that area subject to a one percent or greater change of
flooding in any given year.” Appendix 1B was created to clearly illustrate where these active geomorphic zones are located that receive these floodwaters so that mining activities can avoid them.

Executive Order 11990 (Protection of Wetlands) requires government agencies to take actions that “avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands.” EO 11990 (Sec 2 (a)(1 and 2) further states “shall avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds (1) that there is no practicable alternative to such constructions, and (2) that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use…” Executive Order 11990 defines wetlands and new construction as follows:

**Wetlands:** The term "wetlands" means those areas that are inundated by surface or ground water with a frequency sufficient to support and under normal circumstances does or would support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats, and natural ponds.

**New construction:** The term "new construction" shall include draining, dredging, channelizing, filling, diking, impounding, and related activities and any structures or facilities begun or authorized after the effective date of this Order.

The US Fish and Wildlife Service is the principal US Federal agency tasked with providing wetland information to the public and they have a publicly available mapped resource of all US wetlands, the National Wetland Inventory. The National Wetland Inventory was used as a desktop analysis to provide secondary support for the site visits conducted by the District Hydrologist. In most circumstances, artificial mining ponds and irrigation ditches were mapped as wetlands through the National Wetlands Inventory. These are artificial and created wetlands that were likely not present prior to the 1800s. Other wetlands have been formed on floodplains that were mined once before, but now have a rock berm that impacts the water durations at the sites, like at Native Spirit. Other wetlands have formed around the edge of mining ponds, where the duration of water and the upland form a unique ecosystem. Each Plan has a finding for wetlands and floodplains. Appendix 2 has three requirements for working in wetlands and floodplains for reducing impacts. They are designed to wait until the areas have dried out before mining or reclaiming these sensitive areas, designed to recycle wetland vegetation by keeping its roots wet while mining the area and that the size, location and function of wetlands after reclamation shall be similar to what exists now.

**INFISH: Analysis of Riparian Management Objectives (RMOs)**

Seven RMO parameters are identified in the Forest Plan, as amended by INFISH and SCREENS that relate to streams. They are Pool Frequency, Water Temperature, Large Woody Debris, Substrate Sediment, Bank Stability, Lower Bank Angle, and Width/Depth ratio. The indicator substrate sediment indicator was amended through SCREENS to be included into the Forest Plan. The mining areas are considered points along the stream for this analysis, because the areas proposed for mining are all less than 10 acres (except one of Return Group’s mining areas estimated at approximately 80 acres), with most less than 5 acres, and the length of stream that they could potentially influence in all cases is less than 300 feet. As such, the RMO standards do not apply because the standards are designed to be evaluated at the watershed scale, rather than at a specific point along the stream. Therefore, the discussions below examine the potential for local changes to the RMO parameters as a result of the various activities proposed in the Plans, NOT the RMO standards. RMO parameter findings for each Plan is located in Table 8 at the end of Appendix 5.
Reclamation Activity post mining

All 22 plans propose various means of interim and final reclamation activities (reseeding, re-contouring, straw mulch, decommissioning TA roads, etc.). Under both Alternative 2 and 3, these activities have no potential for discharge concerning reclamation as every individual plan addresses the primary FS General Requirements for mining reclamation.

Cumulative Effects Analysis

The cumulative effects analysis for water resources for each Plan is found in Table 10 at the end of Appendix 5.

Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

Forest Plan

This project is consistent with Forest Plan direction for water resource protection because it would not measurably increase watershed impacts, including stream temperature, over the existing conditions at the 6th field scale. The “Forest Service R6 General Water Quality Best Management Practices” (1988) would be followed under all action alternatives. Interim Strategies of Managing Anadromous Fish Producing Watersheds (INFISH) standards and guidelines and Forest Plan standards for riparian areas not included in INFISH, providing direction for riparian buffers were used. For this analysis, Management Area 3B is described through the term Riparian Habitat Conservation Area (RHCA) because RHCAs are wider and more conservative.

INFISH Compliance with Minerals Management (MM-2)

MM-2: Locate structures, support facilities, and roads outside Riparian Habitat Conservation Areas. Where no alternative to siting facilities in Riparian Habitat Conservation Areas exists, locate and construct the facilities in ways that avoid impacts to Riparian Habitat Conservation Areas and streams and adverse effects on listed inland native fish. Where no alternative to road construction exists, keep roads to the minimum necessary for the approved mineral activity. Close, obliterate and revegetate roads no longer required for mineral or land management activities.

All of the proposed Plans have at least some combination of structures (ponds, roads, bridges) and/or mining activity areas in RHCAs. Two kinds of ponds exist for the project, source water ponds (used to withdraw water from for processing) and settling ponds (would receive sediment created by processing). If the ponds were to be moved outside the RHCA, they would be placed on hillsides where soils are shallow and slopes are steeper. This alternate location (on hillslopes) creates a risk of pond failure because the shallow hillside sediments would become saturated. As pore pressure builds up at the interface between the sediments and a less porous zone (i.e. underlying bedrock), the sediments become mobile, resulting in a small debris flow or gullying. The relocated ponds would also be less likely to tap into shallow groundwater, would eliminate the miner’s water source for the ponds (groundwater), and be more distant from their mining activity. This would require additional equipment and/or disturbance to bring the water to the mining site or materials to the ponds. Under Alternative 3, all ponds would be in compliance with MM-2, as a result of the addition of Forest Service RPMs and/or General Requirements.

Roads and bridges are necessary conduits to provide access to and/or from mining activity areas and processing areas. In some circumstances, bridges have been proposed to minimize resource impacts to streams. Roads inside RHCAs that would not be in compliance with MM-2 include those for which no provisions were made for minimizing disturbance and restoring the road bed once mining was done.
Creation and/or use of these roads that connect directly to a stream would have the potential for a discharge to the waterbody. Under Alternative 3, all roads would be in compliance with MM-2, as a result of the addition of Forest Service WRPMs and/or General Requirements. The intent of the WRPMs and General Requirements identify best management practices for improving road drainage, minerals processing or pond usage with respect to a waterbody within proximity.

**INFISH Compliance with Minerals Management (MM-3)**

MM-3: Prohibit solid and sanitary waste facilities in Riparian Habitat Conservation Areas. If no alternative to locating mine waste (waste rock, spent ore, tailings) facilities in Riparian Habitat Conservation Areas exists, and releases can be prevented and stability can be ensured, then:

a. Analyze the waste material using the best conventional sampling methods and analytic techniques to determine its chemical and physical stability characteristics.

b. Locate and design the waste facilities using the best conventional techniques to ensure mass stability and prevent the release of acid or toxic materials. If the best conventional technology is not sufficient to prevent such releases and ensure stability over the longer term, prohibit such facilities in Riparian Habitat Conservation Areas.

c. Monitor waste and waste facilities to confirm predictions of chemical and physical stability, and make adjustments to operations as needed to avoid adverse effects to inland native fish and to attain Riparian Management Objectives.

d. Reclaim and monitor waste facilities to assure chemical and physical stability and revegetation to avoid adverse effects to native inland fish, and to attain the Riparian Management Objectives.

e. Require reclamation bonds adequate to ensure long-term chemical and physical stability and successful revegetation of mine waste facilities.

This Standard and Guideline applies to the 4 lode mine Plans. The lode mines occur across category 1 through 4 RHCAs and one of the mines (Bald Mountain) occurs on private land, with ponds located on public lands. All of the proposed Plans have Resource Protection Measures and/or General Rules that require tailings, waste rock and soil piles to abide by state and federal water quality standards. If the adit is located on public lands, the first run will be tested by an approved testing facility to see if they will have the potential to release acidity or other contaminates. Additional testing will be required throughout the life of the operation as conditions change. Upon completion of the operations, a final test of the tailings and waste rock will be required before the Plan can be closed out. Additional reclamation procedures may be modified based on the findings of this information. The Plans for Barbara, Pardners and Struggler outline that the tailings, waste rock and soil piles will be placed in separate locations. Tailings and waste rock will be placed a sufficient distance from nearby surface waters to prevent surface discharge from the waste rock or tailings will reach the adjacent waterbody. If contaminated soil is observed at Struggler, then it will be excavated to the saturation level and removed from National Forest lands. The Plan associated with Bald Mountains ponds may require additional permits from DOGAMI, WPCF or NPDES through DEQ if process water is observed to affect groundwater or if it has unusual characteristics. Under Alternative 3, all ponds would be in compliance with MM-3, as a result of the addition of the Forest Service RPMs and/or General Requirements discussed throughout the analysis and in this section.
INFISH Compliance with Minerals Management (MM-6)

MM-6: Develop inspection, monitoring and reporting requirements for mineral activities. Evaluate and apply the results of inspection and monitoring to modify mineral plans, leases or permits as needed to eliminate impacts that prevent attainment of Riparian Management Objectives and avoid adverse effects on inland native fish.

Along with BMP monitoring by a Forest Service hydrologist, Forest Service minerals administrators will inspect mining operations annually as described in Chapter 2, Alternative 2.

Best Management Practice (BMP) Monitoring

The U. S. Forest Service National Best Management Practices (BMP) for Water Quality Management on National Forest System Lands, Vol. 1 (USDA Forest Service, 2012) will be followed for this project. The BMP monitoring protocol is used to evaluate consistency with RPMs, Forest Plan Standards and Guidelines and to evaluate if any adaptive management needs are present with any of the Plans. Random sampling is used to identify which mine Plan receives a visit each year. Best Management Practices (BMPs) are identified as plan specific Resource Protection Measures (Appendix 1A) and/or General Requirements (Appendix 2) and are recognized as the primary means to control non-point source pollution on National Forest lands. BMPs would be monitored by the Blue Mountain Ranger District hydrologists, fish biologist, minerals administrators, and miners.

Wetlands and Floodplains

Wetlands and floodplains occur throughout the project area, including within the project boundaries of mining operations. The wetlands are mainly springs or seeps associated with draws or slumps, or associated with old dredge sites. Active floodplains (1 to 2 year event) occur along the streams within the project area and there are several areas where there are areas flooded less frequently, about every 5 to 10 years based on the vegetation present.

Executive Order 11990: Protection of Wetlands was signed in 1977 in order to “minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.” Wetlands are “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils. Wetlands generally include swamps, marshes, bogs, and similar areas.”

Executive Order 11988 (Protection of Floodplains) requires government agencies to take actions that reduce the risk of loss due to floods, to minimize the impact of floods on human health and welfare, and to restore and preserve the natural and beneficial values served by floodplains. Executive Order 11988 defines the term “floodplain” as follows: “...that area subject to a one percent or greater change of flooding in any given year.” This equates to the 100 year flood.

Effects on Wetlands and Floodplains

Executive Order 11990 (Protection of Wetlands) requires government agencies to take actions that “avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands.” EO 11990 (Sec 2 (a)(1 and 2) further states “shall avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds (1) that there is no practicable alternative to such constructions, and (2) that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use…”
Executive Order 11988 (Protection of Floodplains) requires government agencies to take actions that reduce the risk of loss due to floods, to minimize the impact of floods on human health and welfare, and to restore and preserve the natural and beneficial values served by floodplains. Executive Order 11988 defines the term “floodplain” as follows: “...that area subject to a one percent or greater chance of flooding in any given year.”

Under Alternative 2, six Plans propose some activity in floodplains (Table 9). AC Placer, Blue Jay, Hi Bar and David 1 would place sediment overburden onto the active floodplain and could increase the risk of floods and impact beneficial values served by floodplains. Fine Gold would have ponds and structures placed on the active floodplain. Medic could be actively mining on the active floodplain and impact values served by floodplains. Under Alternative 3, these portions of their Plans are in compliance with the protection of Floodplains and Executive Order (11988), primarily because of Appendix 1B and the setback from the ordinary high water mark portion of the stream and active floodplain.

Under Alternative 2, six Plans propose some activity in wetlands (Table 9). Medic, Dead Horse, Native Spirit, and J & J would actively mine in wetland areas, impacting their ability to function as wetlands until after mining and reclamation has been completed. Bald Mountain and the Return Group would use ponds that could disturb wetland communities around the fringes. Stormwater runoff from mining the intermittent drainage at the Return Group could add sediment to wetlands along the margins of Deer Creek that could negatively influence their ability to function. Under Alternative 3, these portions of their Plans are in compliance with the protection of wetlands and Executive Order (11990), primarily the General Requirements (Appendix 2). Appendix 2 has three requirements for working in wetlands and floodplains for reducing impacts. They are designed to wait until the areas have dried out before mining or reclaiming these sensitive areas, designed to recycle wetland vegetation by keeping its roots wet while mining the area and that the size, location and function of wetlands after reclamation shall be similar to what exists now. They may be impacted through project activities, however, design criteria would minimize the impacts to wetlands and there would not be a net loss to the size or function of wetlands than what exists today. It’s also important to note that many of these sites with wetlands have had past mining impacts that may have artificially created them.

**Clean Water Act**

The effects to water resources for the three alternatives are summarized below in Table 3-26 of the EIS. The reduction of effects under Alternative 3 is the result of the addition of Forest Service RPMs and General Requirements as discussed in detail in the direct/indirect effects sections above.
AC Placer

Plan type: Placer  
Subwatershed: Cracker Creek (HUC 170502030101)  
Subwatershed size: 21,645 acres  
Analysis area: 11.4 acres  
Creek: Cracker Creek  
303(d) listed: Yes  
Suction Dredging: No  
Designated Critical Habitat: Yes

**ALTERNATIVE 2**

Water Resources
Direct and Indirect Effects

**Clean Water Act, Section 401 (potential for a discharge)**

**Mining Activity**

The miner proposes within the Plan of Operation (PoO) to mine old tailings adjacent to Cracker Creek. There are some areas of spotty and mature riparian vegetation with low pockets of tailings between the proposed mining site and the adjacent Cracker Creek.

There is a potential for a discharge via both surface and subsurface flow of sediment into Cracker Creek as a result of the mining activity proposed, because there are 1) no specific buffer distances identified in the Plan of Operations, 2) no proposed alternative actions addressing placement of overburden and 3) locations of excavation pits. There is also potential for flow reversal in excavation pits if the pits are created deeper than that of the channel bed, resulting in decreased instream flow and subsequent increased instream temperatures during times of low-flows. This flow reversal could have an impact on water temperature and is analyzed in the upcoming RMO section.

**Ponds**

Source water pond and settling ponds

There are five existing ponds currently on the site, all of which have been observed to have fine sediment lining them that will produce a substantial barrier to sedimentation into Cracker Creek via subsurface flow. There is no potential for sediment discharge. The source pond is spring-fed and resides closest to Cracker Creek Road. It is the largest of all five ponds and fills the others noticeably through groundwater transfer in the direction towards Cracker Creek.

**Fords**

None Proposed

**Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads**

The proposed mine access road is of CO RD 553 (Cracker Creek RD). There are no proposed Temporary Access Roads (TA)
Clean Water Act, Section 303(d) (antidegradation)

Cracker Creek is 303(d) listed for dissolved oxygen by ODEQ. Dissolved oxygen is defined by ODEQ as: Not less than 11.0 mg/L or 95% saturation between January 1 and May 15th.

Grab sampled data has been collected for dissolved oxygen at two water quality monitoring locations on Cracker Creek from 2014-2018. The site Cracker 1 is located upstream of AC Placer. Sampling dates for dissolved oxygen occurred from June to October and does not capture the period from January to May 15. However, we do have one grab sample from April for the two sites in 2018, with the lower site having a measurement at 10.61 mg/L and the upper site of 10.76 mg/L. It appears as streamflows increase in spring and fall and the dissolved oxygen levels correspond. The activities proposed in this Plan are not likely to reduce the water quality condition of dissolved oxygen in Cracker Creek, because water is not being withdrawn.

![Dissolved Oxygen levels for Cracker Creek](image)

Figure 1. Dissolved Oxygen levels for Cracker Creek

**Suction Dredging**

None proposed

**INFISH: Riparian Management Objective (RMO) Parameters**
Pool Frequency: **Potential** changes in Pool Frequency would occur as a result of having an unspecified buffer from mining activities to Cracker Creek, placement of overburden in floodplain, and risk of sedimentation via both surface and subsurface flows. There are no changes to pool frequency concerning large woody recruitment (see below) and no suction dredging is proposed.

Water Temperature: **Potential** changes in Water Temperature would occur, because there is a possibility for flow reversal through excavation of mining areas in the floodplain going lower the groundwater level of Cracker Creek. This has the potential to cause a flow reversal, or the formation of a groundwater gradient that directs the water towards the open hole and may limit the water flowing downstream in Cracker Creek. Decreasing the streamflow in Cracker Creek has the potential to change the water temperatures in Cracker Creek downstream. Water temperatures currently exceed INFISH water temperature standards, but meets DEQ water temperature standards for redband trout at Cracker 2 (upstream). However, Cracker 1 is located upstream of this mine and met the DEQ standard 6 years and did not for 3 years, likely these were drought years with minimal April snowpack to recharge groundwater supplies. Table 1 illustrates that August tends to be when the water temperatures achieve their warmest values and is likely due to the lowest volumes of streamflow. The stream survey report indicated streamflows on August 30th, 2006 was approximately 5.6 cubic feet per second. This impact would not be permanent, but would occur until the storage capacity was full in the excavated floodplain sections. This could affect streamflows on the scale of a few hours for these sites.

![Figure 2. Water Temperature seven day average daily maximums for Cracker Creek](image)
### Table 1. Water temperature seven day average daily max with standards and dates for Cracker Creek

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Survey Year</th>
<th>State Standard (based on DEQ map Figure 260A: Fish Use Designations Powder Basin, OR)</th>
<th>7-day moving average max temperature (°F)</th>
<th>Meets or exceeds State Temperature Standard</th>
<th>7-day Maximum temp date</th>
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<td>Cracker Creek 1</td>
<td>1995</td>
<td>63.32</td>
<td>Meets</td>
<td>8/6/1995</td>
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<td></td>
<td>1996</td>
<td>65.08</td>
<td>Meets</td>
<td>8/16/1996</td>
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<td></td>
<td>1999</td>
<td>63.32</td>
<td>Meets</td>
<td>8/28/1999</td>
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<td></td>
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<td>68.83</td>
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<td>7/24/2003</td>
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<td>67.98</td>
<td>Meets</td>
<td>8/10/2005</td>
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<td>66.24</td>
<td>Meets</td>
<td>8/11/2014</td>
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<tr>
<td></td>
<td>2015</td>
<td>68.63</td>
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<td>8/17/2015</td>
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<td></td>
<td>2016</td>
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<td>8/21/2016</td>
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<td>Meets</td>
<td>8/8/1997</td>
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<td>Meets</td>
<td>8/15/1998</td>
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<td>60.21</td>
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<td>8/2/1999</td>
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</tbody>
</table>

Other activities located with this plan would not have an impact to water temperature, including 1) there would be no activity in the channel or on the stream banks which would alter channel width and therefore change flow depths for a given discharge, and 2) no trees are proposed for removal.

Large Woody Debris: No changes would occur in Large Woody Debris recruitment or existing wood in the stream because 1) no trees are proposed for removal and 2) there would be no activity in the channel to alter existing amounts and distributions.

Substrate Sediment: **Potential** changes in Substrate Sediment, because there is potential for both surface and subsurface discharge of sediment from mining activities due to an unspecified buffer distance to Cracker Creek; specifically from mining overburden sites and excavation sites. The other activities in this plan would not have an impact to sediment, because there are no in-channel activities proposed.

Bank Stability: No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.

Lower Bank Angle: No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.
Width/Depth ratio: No changes in Width/Depth ratio would occur because there would be 1) no change to Bank Stability and therefore channel widths and 2) no instream activity would occur which could trigger a head-cut and alter channel depths.

Wetlands and Floodplains

These proposed activities occur in floodplains and wetlands. The floodplains have been artificially constrained due to past mining activities and there is the potential for floodplains to become further constrained through placing overburden in the riparian zone. Therefore, floodplains could be impacted through this activity. Riverine and freshwater pond wetlands have been mapped through viewing the national wetland inventory. The ponds may be used for processing water and/or sediment and will not be negatively altered in a manner that will degrade their wetland values.

Reclamation

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.

ALTERNATIVE 3

Water Resources

Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

Different from Alternative 2, because of the implementation of watershed resource protection measures (RPMs) and general requirements (GRs) that function similar to best management practices. Under Alternative 3, the discharge potential would be eliminated with the addition of the Forest Service RPM (See Appendix 1B and Figures 1B-2 and 1B-3 for explanations of this feature) which clarifies the starting point of the buffer width measurement. This RPM will setback any overburden from being placed into the riparian area, floodplain or within the area of sediment transport in which a discharge of sediment could occur. In addition to a setback buffer, straw bales or waddles will be placed between the processing site and Cracker Creek to increase the ability to filter surface sediment. Additional RMPs associated with this plan include the miner will monitor excavation pits for groundwater. If groundwater does become noticeable, then they will limit further excavation to prevent Cracker Creek from reversing flow across the valley.

Ponds

Source water pond and settling ponds

Same as Alternative 2.

Fords

Same as Alternative 2, no fords on closed, decommissioned Forest Service roads, or temporary mine access roads proposed for use.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads
Same as Alternative 2.

**Clean Water Act, Section 303(d) (antidegradation)**

Cracker Creek is 303(d) listed for dissolved oxygen. Same as Alternative 2.

**Suction Dredging**

None proposed. Therefore, same as Alternative 2.

**PACFISH: Riparian Management Objectives (RMOs)**

Pool Frequency: Change from Alternative 2. Impacts in Pool Frequency would not occur as a result of the proposed activities for the following reasons: 1) There would be no sediment inputs related to the activities, 2) no changes to large woody recruitment are expected (see below), and 3) no suction dredging is proposed. The RPMs associated with alternative 3 would increase the filtering function of sediment to prevent a discharge to Cracker Creek. These RPMs are to increase the buffer distance of an avoidance area between the active floodplain edge and work activities. This buffer along with placement of straw bales and waddles between the proposed processing site and the active floodplain will ensure no transfer of sediment will occur. The 25 foot set back and the monitoring requirements for daily sediment upstream and downstream of the mining sites will ensure sediment inputs are limited and pools will not fill in.

Water Temperature: No changes in Water Temperature would occur because 1) there would be no activity in the channel or on the stream banks which would alter channel width and therefore change flow depths for a given discharge, and 2) no trees are proposed for removal. The RPM to monitor excavation pits would decrease the potential for a groundwater flow reversal to occur across the floodplain and therefore, would not have the potential to increase stream temperatures for Cracker Creek.

Large Woody Debris: No changes would occur in Large Woody Debris recruitment or existing wood in the stream because 1) no trees are proposed for removal and 2) there would be no activity in the channel to alter existing amounts and distributions.

Substrate Sediment: Change from Alternative 2. There is no impact to the substrate of Cracker Creek due to this plan because there will be a berm and setback from Cracker Creek. Other reasons why sediment will not be impacted include no other in-channel activity is proposed.

Bank Stability: No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.

Lower Bank Angle: No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.

Width/Depth ratio: No changes in Width/Depth ratio would occur because there would be 1) no change to Bank Stability and therefore channel widths and 2) no instream activity would occur which could trigger a headcut and alter channel depths.

**Wetlands and Floodplains**

Riverine and freshwater pond wetlands have been mapped through the national wetland inventory. These proposed activities occur in floodplains and wetlands. The floodplains have been artificially constrained
due to past mining activities and the threat to place overburden in the floodplain and riparian zone has been removed through addition of setback RPMs from active floodplain and the riparian zones. The ponds may be used for processing water and/or sediment and will not be negatively altered in a manner that will degrade their wetland values. Three general requirements for working in wetlands and floodplains have been designed to minimize impacts for alternative 3 and exist in appendix 2. These include timing restrictions after these areas have adequately dried out after July 1. If wetland vegetation is approved to be removed, it shall be kept wet and used for reclamation purposes. The third RPM talks about the size, location and most importantly, the function of the wetland will be reclaimed to what exists now. Also, the 25 foot set back from the edge of the active floodplain will ensure materials are not placed in that important zone. Therefore, this alternative is consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

Reclamation

Same as Alternative 2. No potential for discharge.

Amigo

Plan type: Placer
Subwatershed: Elk Creek (HUC 170502030204)
Subwatershed size: 12,826 acres
Analysis area: 3.8 acres
Creek: Tributary to Wilson Creek (approximately 150 feet away) and 3,300 feet distance to Elk Creek
303(d) listed: Yes (Elk Creek)
Suction Dredging: No

ALTERNATIVE 2

Water Resources
Direct and Indirect Effects

Clean Water Act, Section 401 (No potential for a discharge)

Mining Activity

Site visits for Amigo indicated that streamflow started in the unnamed tributary just downstream of the mining activities. Past mining has altered the landforms and topography so that a defined stream channel is not connected through the mining site. Groundwater is present along the draw and has cottonwood, rocky mountain maple aspen, willow and snowberry plant communities and has standing water in some of the ponds present.

No potential for a discharge because the placer activity would occur in an area that was historically hydraulically mined and the drainage in this area no longer has a defined channel that is connected through surface flow to Wilson Creek.

Ponds

Source water pond

The plan of operation states this is an adit, but site visits confirm this to be charged through groundwater and is not an adit. No potential for a discharge through surface or subsurface flow because only withdrawing water.
Settling ponds

There are three existing ponds extending downhill from one another. No potential for a discharge via surface or subsurface flow because the mining site is of adequate distance to filter sediment. Also, the disconnected stream channel should also break up any sediment impacts from occurring.

Fords

No fords on closed or decommissioned Forest Service roads or temporary mine access roads proposed for use.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

Miner would only use open Forest Service roads that are also used by the general public or private roads.

Clean Water Act, Section 303(d) (antidegradation)

Elk Creek is 303(d) listed for water temperature by DEQ. A water temperature standard of 68 degrees Fahrenheit during the summer for redband trout is listed by DEQ.

The activities proposed in this Plan would not change the water quality condition for which this stream is listed due to distance from creek and lack of impacts to streamside shade and channel dimensions.

Suction Dredging

None proposed

INFISH: Riparian Management Objective (RMO) Parameters

The plan takes place in an ephemeral draw. RMOs from INFISH generally apply on 3-6th order streams and not a 1st or 2nd order stream like this riparian area. Therefore, the RMOs do not apply for this plan of operation.

Wetlands and Floodplains

A riverine wetland is shown on the National Wetlands Inventory in the project area of Amigo. No activity is proposed in floodplains or wetlands. Therefore, Executive Orders 11988 (Floodplain Management) does not apply and 11990 (Protection of Wetlands) will be managed for in this plan of operation.

Reclamation

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.

ALTERNATIVE 3

Water Resources
Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity
Same as Alternative 2. No potential for a discharge.

**Ponds**

Same as Alternative 2. No potential for a discharge.

**Fords**

No fords on closed or decommissioned Forest Service roads or temporary mine access roads proposed for use.

**Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads**

Same as Alternative 2. No potential for a discharge.

**Clean Water Act, Section 303(d) (antidegradation)**

Same as Alternative 2. Elk Creek is listed for water temperature and the activities proposed in this Plan would not alter the existing water quality condition for which this stream is listed.

**Suction Dredging**

Same as Alternative 2. None proposed.

**Access Roads**

Same as Alternative 2.

**PACFISH: Riparian Management Objectives (RMOs)**

Same as Alternative 2. The plan takes place in an ephemeral draw. RMOs from INFISH generally apply on 3-6th order streams and not a 1st or 2nd order stream like this riparian area. Therefore, the RMOs do not apply for this plan of operation.

**Wetlands and Floodplains**

Same as Alternative 2. A riverine wetland is shown on the National Wetlands Inventory in the project area of Amigo. No activity proposed in floodplains or wetlands. Therefore, project activities are consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

**Reclamation**

Same as Alternative 2. No potential for discharge.

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**Anchor #1, Old Crow, Peerless**

Plan type: Placer  
Subwatershed: Elk Creek (HUC 170502030204)  
Subwatershed size: 12,826 acres  
Analysis area: 20.1 acres  
Creek: Elk Creek and Wilson Creek  
303(d) listed: Yes  
Suction Dredging: No
ALTERNATIVE 2

Water Resources
Direct and Indirect Effects

Site #1

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

There is a potential for a discharge through surface flow of sediment into Elk Creek as a result of the mining activity proposed, because there are buffer distances identified in the Plan of Operations of 10 feet in portions of Site 1. This does not provide for an adequate filter strip to stop sedimentation impacts to Elk Creek.

Ponds

Source water pond

No potential for a discharge from source water pond construction because the pond would be dug into the ground and separated from the creek by 50 feet of flat ground.

Settling ponds

No potential for a discharge from source water pond construction because the pond would be dug into the ground and separated from the creek by 50 feet of flat ground.

Fords

There is an existing ford that crosses Elk Creek adjacent to the mining site on FS Road 7225 that is well graveled. No potential for a discharge because the existing ford approaches are already rocked, sloped, and stable.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

The miner proposes to use Temporary Access road 7225-E1A; Constructed of both tailings and native materials.

Clean Water Act, Section 303(d) (antidegradation)

Elk Creek is 303(d) listed for water temperature by ODEQ. Elk Creek is 303(d) listed for water temperature by DEQ. A water temperature standard of 68 degrees Fahrenheit during the summer for redband trout is listed by DEQ.

The activities proposed in this Plan would not change the water quality condition for which this stream is listed due to distance from creek and lack of impacts to both streamside shade and channel dimensions.

Suction Dredging

None proposed

INFISH: Riparian Management Objective (RMO) Parameters
Pool Frequency: No changes in Pool Frequency would occur as a result of the proposed activities for the following reasons: 1) The sediment impacts from mining activities are expected to flush through the system, 2) no changes to large woody recruitment are expected (see below), and 3) no suction dredging is proposed.

Water Temperature: No changes in Water Temperature would occur because 1) there would be no activity in the channel or on the stream banks which would alter channel width and therefore change flow depths for a given discharge, and 2) no trees are proposed for removal.

Water temperatures were monitored continuously for 3 years along Elk Creek (see Table 2 and Figure 3). Elk 3 was the highest elevation site, had groundwater like water temperatures and met both DEQ and INFISH standards. Elk 2 is about 0.75 miles upstream of Elk 1, but downstream of irrigation diversions that remove all of the streamflow from Elk Creek. Site visits for evaluating mining impacts walked this segment of Elk Creek and made this observation. Groundwater begins recharging Elk Creek around the site of Elk 2 and more groundwater, along with streamflows from Wilson Creek reduce water temperatures more at Elk 1 than Elk 2, for the two consistent years. Elk 1 met DEQ standards for redband trout beneficial uses two of the three years and Elk 2 met those standards one in three years.

Table 2. Water Temperature seven day average daily max with standards and dates for Elk Creek

<table>
<thead>
<tr>
<th>Site name</th>
<th>Survey year</th>
<th>State Standard (based on DEQ map Figure 260A: Fish Use Designations Powder Basin, OR)</th>
<th>7-day average daily maximum water temperature (°F)</th>
<th>Meets or exceeds state temperature standard</th>
<th>7-day Maximum temperature date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elk Creek 1</td>
<td>1995</td>
<td>68</td>
<td>66.0</td>
<td>Meets</td>
<td>8/6/1995</td>
</tr>
<tr>
<td>Elk Creek 1</td>
<td>1996</td>
<td></td>
<td>70.1</td>
<td>Exceeds</td>
<td>7/27/1996</td>
</tr>
<tr>
<td>Elk Creek 1</td>
<td>1997</td>
<td></td>
<td>65.7</td>
<td>Meets</td>
<td>8/12/1997</td>
</tr>
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<td>Elk Creek 2</td>
<td>1996</td>
<td></td>
<td>75.7</td>
<td>Exceeds</td>
<td>8/15/1996</td>
</tr>
<tr>
<td>Elk Creek 2</td>
<td>1997</td>
<td></td>
<td>66.6</td>
<td>Meets</td>
<td>8/8/1997</td>
</tr>
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<td>1998</td>
<td></td>
<td>68.9</td>
<td>Exceeds</td>
<td>7/19/1998</td>
</tr>
<tr>
<td>Elk Creek 3</td>
<td>1997</td>
<td></td>
<td>57.5</td>
<td>Meets</td>
<td>8/8/1997</td>
</tr>
</tbody>
</table>
Large Woody Debris: No changes would occur in Large Woody Debris recruitment or existing wood in the stream because 1) no trees are proposed for removal and 2) there would be no activity in the channel to alter existing amounts and distributions.

Substrate Sediment: No changes in Substrate Sediment because 1) no suction dredging is proposed, 2) no other inchannel activity is proposed, and 3) the sediment impacts from mining activities are expected to flush through the system.

Bank Stability: No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.

Lower Bank Angle: No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.

Width/Depth ratio: No changes in Width/Depth ratio would occur because there would be 1) no change to Bank Stability and therefore channel widths and 2) no instream activity would occur which could trigger a headcut and alter channel depths.

Wetlands and Floodplains
National Wetlands Inventory illustrates a riverine wetland present along Elk and Wilson Creeks through the project area. The PoO proposals call for avoidance of this immediate riparian and floodplain area. Therefore, alternative 2 is consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

Reclamation

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.

Site #2

Mining Activity

No potential for a discharge as a result of mining activity because the area to be mined is further away than 50 feet from Elk Creek and has adequate ground cover between the unit and Elk Creek to capture any fine sediment.

Ponds

Source water pond

No potential for a discharge from source water pond construction because the pond would be dug into the ground and separated from the creek by more than 50 feet.

Settling ponds

No potential for a discharge from source water pond construction because the pond would be dug into the ground and separated from the creek by a minimum of 50 feet.

Fords

There is an existing ford that crosses Elk Creek adjacent to the mining site on FS Road 7225 that will be used to transport gravel to the mineral processing site. No potential for a discharge because the existing ford approaches are already rocked, sloped, and stable.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

The miner proposes to use Temporary Access road 7225-E1A; Constructed of both tailings and native materials.

Clean Water Act, Section 303(d) (antidegradation)

Elk Creek is 303(d) listed for water temperature by ODEQ. Elk Creek is 303(d) listed for water temperature by ODEQ. A water temperature standard of 68 degrees Fahrenheit during the summer for redband trout is listed by ODEQ.

The activities proposed in this Plan would not change the water quality condition for which this stream is listed due to distance from creek and lack of impacts to streamside shade and channel dimensions.

Suction Dredging
None proposed

**INFISH: Riparian Management Objective (RMO) Parameters**

Pool Frequency: No changes in Pool Frequency would occur as a result of the proposed activities for the following reasons: 1) There would be no sediment inputs related to the activities, 2) no changes to large woody recruitment are expected (see below), and 3) no suction dredging is proposed.

Water Temperature: No changes in Water Temperature would occur because 1) there would be no activity in the channel or on the stream banks which would alter channel width and therefore change flow depths for a given discharge, and 2) no trees are proposed for removal.

Large Woody Debris: No changes would occur in Large Woody Debris recruitment or existing wood in the stream because 1) no trees are proposed for removal and 2) there would be no activity in the channel to alter existing amounts and distributions.

Substrate Sediment: No changes in Substrate Sediment because 1) no suction dredging is proposed, 2) no other inchannel activity is proposed, and 3) no potential for a discharge of sediment from mining activities on land.

Bank Stability: No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.

Lower Bank Angle: No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.

Width/Depth ratio: No changes in Width/Depth ratio would occur because there would be 1) no change to Bank Stability and therefore channel widths and 2) no instream activity would occur which could trigger a headcut and alter channel depths.

**Wetlands and Floodplains**

No activity proposed in floodplains or wetlands. Therefore, the project’s specifications for Site 2 are consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

**Reclamation**

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.

**Site #3**

**Mining Activity**

There is a potential for a discharge as a result of mining activity. The proposed Plan of Operation states that area to be excavated will be a minimum of 20 feet from Wilson Creek. The hillslope is high gradient and is composed of fine grained materials that are easily erodible.

**Ponds**

Source water pond
No potential for a discharge from source water pond construction because the pond would be dug into the ground and separated from the creek by 50 feet.

Settling ponds

No potential for a discharge from source water pond construction because the pond would be dug into the ground and separated from the creek by 50 feet.

Fords

There is an existing ford that crosses Wilson Creek. No potential for a discharge because the existing ford approaches are already rocked, sloped, and stable.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

The miner proposes to use Temporary Access road 7225-M1B; Constructed of native materials.

Clean Water Act, Section 303(d) (antidegradation)

Elk Creek is 303(d) listed for water temperature by ODEQ. Elk Creek is 303(d) listed for water temperature by ODEQ. A water temperature standard of 68 degrees Fahrenheit during the summer for redband trout is listed by ODEQ.

The activities proposed in this Plan would not change the water quality condition for which this stream is listed due to distance from creek and lack of impacts to streamside shade and channel dimensions.

Suction Dredging

None proposed

INFISH: Riparian Management Objective (RMO) Parameters

Pool Frequency: Potential changes in Pool Frequency would occur as a result of having an insufficient buffer from mining activities to adjacent creeks, the magnitude of sediment generated at these sites from mining activities and risk of sedimentation via both surface flows. There are no changes to pool frequency concerning large woody recruitment (see below) and no suction dredging is proposed.

Water Temperature: No changes in Water Temperature would occur because 1) there would be no activity in the channel or on the stream banks which would alter channel width and therefore change flow depths for a given discharge, and 2) no trees are proposed for removal.

Large Woody Debris: No changes would occur in Large Woody Debris recruitment or existing wood in the stream because 1) no trees are proposed for removal and 2) there would be no activity in the channel to alter existing amounts and distributions.

Substrate Sediment: Potential changes in Substrate Sediment because an insufficient buffer from mining activities to adjacent creek and risk of sedimentation through surface flows.

Bank Stability: No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.
Lower Bank Angle: No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.

Width/Depth ratio: No changes in Width/Depth ratio would occur because there would be 1) no change to Bank Stability and therefore channel widths and 2) no instream activity would occur which could trigger a headcut and alter channel depths.

Wetlands and Floodplains

National Wetlands Inventory illustrates a riverine wetland present along Elk and Wilson Creeks through the project area. No activity proposed in floodplains or wetlands. Therefore, Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands) do not apply.

Reclamation

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.

ALTERNATIVE 3

Water Resources

Direct and Indirect Effects

Site #1

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

Different from Alternative 2, because of the implementation of watershed resource protection measures (RPMs) and general requirements (GRs) that function similar to best management practices. Under Alternative 3, the discharge potential would be eliminated with the addition of the Forest Service RPM (See Appendix 1B and Figures 1B-2 and 1B-3 for explanations of this feature) which clarifies the starting point of the buffer width measurement.

Ponds

Same as Alternative 2. No potential for a discharge.

Fords

Same as Alternative 2. No potential for a discharge.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

The miner proposes to use Temporary Access road 7225-E1A; Constructed of both tailings and native materials.

Clean Water Act, Section 303(d) (antidegradation)
Same as Alternative 2. Elk Creek is 303(d) listed for water temperature. However, the activities proposed in this Plan would not alter the existing water quality conditions for which this stream is listed for the same reasons as noted under Alternative 2.

**Suction Dredging**

None proposed

**INFISH: Riparian Management Objectives (RMOs)**

Same as Alternative 2. No changes in the RMOs.

**Wetlands and Floodplains**

Same as Alternative 2. National Wetlands Inventory illustrates a riverine wetland present along Elk and Wilson Creeks through the project area. No activity proposed in floodplains or wetlands. Therefore, project activities are consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

**Reclamation**

Same as Alternative 2. No potential for discharge.

**Site #2**

**Clean Water Act, Section 401 (potential for a discharge)**

**Mining Activity**

Same as Alternative 2. No potential for a discharge.

**Ponds**

Same as Alternative 2. No potential for a discharge.

**Fords**

Same as Alternative 2. No potential for a discharge.

**Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads**

The miner proposes to use Temporary Access road 7225-E1A; Constructed of both tailings and native materials.

**Clean Water Act, Section 303(d) (antidegradation)**

Same as Alternative 2. Elk Creek is 303(d) listed for water temperature. However, the activities proposed in this Plan would not alter the existing water quality conditions for which this stream is listed for the same reasons as noted under Alternative 2.

**Suction Dredging**
None proposed

**INFISH: Riparian Management Objectives (RMOs)**

Same as Alternative 2. No changes in the RMOs.

**Wetlands and Floodplains**

Same as Alternative 2. No activity proposed in floodplains or wetlands. Therefore, project activities are consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

**Reclamation**

Same as Alternative 2. No potential for discharge.

**Site #3**

**Clean Water Act, Section 401 (potential for a discharge)**

**Mining Activity**

Different from Alternative 2. Under Alternative 3, the discharge potential would be eliminated with the addition of the Forest Service RPM (Appendix 1A) which clarifies the starting point of the buffer width measurement. The RPM clarifies a Plan-specific buffer and an added barrier of straw bales/coils between the activity and the stream. Therefore, there would be sufficient sediment trapping mechanisms in place (ground cover and straw bales/coils) to prevent sediment from reaching the creek.

**Ponds**

Source water pond and settling ponds

Same as Alternative 2. No potential for a discharge.

**Fords**

Same as Alternative 2. No potential for a discharge.

**Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads**

The miner proposes to use Temporary Access road 7225-M1B; Constructed of native materials.

**Clean Water Act, Section 303(d) (antidegradation)**

Same as Alternative 2. Elk Creek is 303(d) listed for water temperature. However, the activities proposed in this Plan would not alter the existing water quality conditions for which this stream is listed for the same reasons as noted under Alternative 2.

**Suction Dredging**

None proposed
INFISH: Riparian Management Objectives (RMOs)

Same as Alternative 2 for all RMOs, except pool frequency and substrate sediment. Under Alternative 3, the discharge potential would be eliminated with the addition of the Forest Service RPM (Appendix 1A) which clarifies the starting point of the buffer width measurement. The RPM clarifies a Plan-specific buffer and an added barrier of straw bales/coils between the activity and the stream. Therefore, there would be sufficient sediment trapping mechanisms in place (ground cover and straw bales/coils) to prevent sediment from reaching the creek and filling into pools.

Wetlands and Floodplains

Same as Alternative 2. National Wetlands Inventory illustrates a riverine wetland present along Elk and Wilson Creeks through the project area. No activity proposed in floodplains or wetlands. Therefore, the project activities are consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

Reclamation

Same as Alternative 2. No potential for discharge.

Bald Mt. Ponds

Plan type: Lode
Subwatershed: McCully Creek (HUC 170502030102)
Subwatershed size: 13,347 acres
Analysis area: 0.5 acres
Creek: McCully Fork
303(d) listed: No
Suction Dredging: No
Designated Critical Habitat: No

ALTERNATIVE 2

Water Resources
Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

The mining activity for Bald Mountain Ponds occurs on private land and will not be included for analysis. However, the project components occurring on public lands will be analyzed. This includes the use of mining ponds and road network.

Ponds

Settling ponds

Three existing ponds exist on Forest Service lands. Past documentation shows that piping infrastructure failed on the settling ponds and the adit discharge overflowed these, potentially depositing heavy metals downstream. In 2000, an EPA contracted report found several 55 gallon drums and smaller drums in a motor shop on private property that were on their side with the metal corroded and seeping into the
ground. They also noted that some of the ore that was processed historically was processed with cyanide in ponds. Water quality was sampled at the Bald Mountain mine portal and arsenic, barium, chromium, lead, and nickel were detected in the water samples. These studies went on to examine the public risk associated with soil pathways, surface water pathways, groundwater pathways and air pathways. They concluded that the surface water pathway is not complete due to the lack of a direct connection for surface streamflow from the ponds to McCully Forks. However, they suggested that groundwater pathways are likely being impacted by water discharges from the mine which accumulate in unlined settling ponds. Therefore, there is the potential for heavy metals to be discharged to McCully Forks through subsurface pathways.

**Fords**

None Proposed

**Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads**

The miner proposes to use FS road 73700-100 and TA road 7370-M1A for their operations. The temporary road is approximately 150 feet away from an unnamed perennial stream at its closest point and this distance is adequate to filter sediment from being discharged into waters of the state.

**Clean Water Act, Section 303(d) (antidegradation)**

McCully Creek is not 303(d) listed.

**Suction Dredging**

None proposed

**INFISH: Riparian Management Objective (RMO) Parameters**

- **Pool Frequency:** No changes in Pool Frequency would occur as a result of the proposed activities for the following reasons: 1) There would be no sediment inputs related to the activities, 2) no changes to large woody recruitment are expected (see below), and 3) no suction dredging is proposed.

- **Water Temperature:** No changes in Water Temperature would occur because 1) there would be no activity in the channel or on the stream banks which would alter channel width and therefore change flow depths for a given discharge, and 2) no trees are proposed for removal.

- **Large Woody Debris:** No changes would occur in Large Woody Debris recruitment or existing wood in the stream because 1) no trees are proposed for removal and 2) there would be no activity in the channel to alter existing amounts and distributions.

- **Substrate Sediment:** No changes would occur in Sediment because 1) no suction dredging is proposed, 2) no other inchannel activity is proposed, and 3) no potential for a discharge of sediment from mining activities on land.

- **Bank Stability:** No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.
Lower Bank Angle: No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.

Width/Depth ratio: No changes in Width/Depth ratio would occur because there would be 1) no change to Bank Stability and therefore channel widths and 2) no instream activity would occur which could trigger a headcut and alter channel depths.

**Wetlands and Floodplains**

National wetland inventories indicate that a freshwater pond wetland is present in the project area. This is an artificial wetland that was created by past mining activities. These artificially created wetlands could be impacted by mining activities at the ponds. No activity is proposed in floodplains. Therefore, this plan is consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands) could be negatively impacted.

**Reclamation**

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.

**ALTERNATIVE 3**

**Water Resources**

**Direct and Indirect Effects**

**Clean Water Act, Section 401 (potential for a discharge)**

**Mining Activity**

Different than Alternative 2. Heavy metals are known to occur at this adit, but the adit is not located on public lands and these plans do not pertain to operations on private land. However, the miner must ensure that there is no discharge of heavy metals onto Forest Service lands. Under Alternative 3, the discharge potential would be eliminated relative to the lode mining under General Requirement L5. L5 requires that there be testing of the first run of material. If testing of the lode material from any of the adits and potentially subsequent material finds the ore has the potential to release acidity or other contaminates into the ground and into McCully creek via surface or subsurface flow, then based on General Requirement L5, the miner would need to submit a supplement to their Plan that details how they would prevent heavy metals from entering the McCully Creek sub watershed. This supplement to their plan would then be evaluated and additional RPMs would be put into place.

**Ponds**

Settling ponds

Different than Alternative 2. Under Alternative 3, the potential for a discharge of heavy metals would be eliminated as a result of a Forest Service WRPM and General Requirements L3, 4, and 5. The RPM would ensure that the settling pond was properly bermed to prevent sediment from entering the wetland via surface flow. An additional RPM was added to place industrial mining liners on the pond to control groundwater inputs from heavy metals leaching.

**Fords**
None Proposed

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

FS road 73700-100 and TA road 7370-M1A

Different than Alternative 2. Discharge potential would be eliminated as a result of the addition of a Forest Service WRPM (Appendix 1A) that requires that portions of the roads be rocked to prevent rutting which would funnel water and sediment into McCully Fork.

Clean Water Act, Section 303(d) (antidegradation)

McCully Fork is not 303(d) listed.

Suction Dredging

None proposed

INFISH: Riparian Management Objective (RMO) Parameters

Pool Frequency: Same as Alternative 2. No changes in Pool Frequency would occur as a result of the proposed activities for the following reasons: 1) There would be no sediment inputs related to the activities, 2) no changes to large woody recruitment are expected (see below), and 3) no suction dredging is proposed.

Water Temperature: No changes in Water Temperature would occur because 1) there would be no activity in the channel or on the stream banks which would alter channel width and therefore change flow depths for a given discharge, and 2) no trees are proposed for removal.

Large Woody Debris: No changes would occur in Large Woody Debris recruitment or existing wood in the stream because 1) no trees are proposed for removal and 2) there would be no activity in the channel to alter existing amounts and distributions.

Substrate Sediment: There is no change to Sediment because 1) no suction dredging is proposed and 2) no other in-channel activity is proposed. No potential for a discharge of sediment from mining activities on land.

Bank Stability: No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.

Lower Bank Angle: No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.

Width/Depth ratio: No changes in Width/Depth ratio would occur because there would be 1) no change to Bank Stability and therefore channel widths and 2) no instream activity would occur which could trigger a headcut and alter channel depths.

Wetlands and Floodplains

No activity is proposed in floodplains. Therefore, the project is consistent with Executive Orders 11988 (Floodplain Management). National Wetlands Inventory indicate a freshwater pond is present in the
project area and could be impacted for mining. However, the wetlands may have the vegetation impacted during mining and would function similarly after mining activities were completed. The project is consistent with the goals established in Executive Order 11990 (Protection of Wetlands).

Reclamation

Same as Alternative 2. No potential for discharge.

Barbara 1 Lode

Plan type: Lode
Subwatershed: Deer Creek (HUC 170502030205)
Subwatershed size: 21,446 acres
Analysis area: 0.5 acres
Creek: Lake Creek
303(d) listed: No
Suction Dredging: No
Designated Critical Habitat: Yes

ALTERNATIVE 2

Water Resources
Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

Lode mining takes place underground and material is hauled to processing plant on private land. Milled waste material is subsequently stockpiled on site. There is potential for discharge of sediment and heavy metals via surface and subsurface flows into Lake Creek, because of the established gullies that are actively eroding from the fill slopes that intend to be used to stockpile the material.

Ponds
None Proposed

Fords
None Proposed

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

None. Miner would only use open Forest Service roads that are also used by the general public or private roads

Clean Water Act, Section 303(d) (antidegradation)

Lake Creek is not 303(d) listed.

Suction Dredging
INFISH: Riparian Management Objective (RMO) Parameters

Pool Frequency: No changes in Pool Frequency would occur as a result of the proposed activities for the following reasons: 1) The sediment impacts from mining activities are expected to flush through the system, 2) no changes to large woody recruitment are expected (see below), and 3) no suction dredging is proposed.

Water Temperature: No changes in Water Temperature would occur, because 1) there would be no activity in the channel or on the stream banks which would alter channel width and therefore change flow depths for a given discharge, and 2) no trees are proposed for removal. Table 3 has the water temperature datasets that occur around the Barbara Lode. Barbara Lode has a water temperature site upstream (site 2) and one downstream (site 1). Bull trout standards apply for these sites. The reach is designated as spawning and rearing and has a Forest Plan standard of 48° Fahrenheit. This reach is warmer than Forest Plan standards and slightly warmer than the DEQ water temperature standards. Water temperatures did not meet either of the standards for this reach.

Table 3. Water temperature seven day average daily max with standards and dates for Lake Creek

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Survey Year</th>
<th>State Standard (based on DEQ map Figure 260A: Fish Use Designations Powder Basin, OR)</th>
<th>7-day moving average max temperature (°F)</th>
<th>Meets or exceeds State temperature Standard</th>
<th>7-day Maximum temperature date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake 1</td>
<td></td>
<td>53.6</td>
<td>58.0</td>
<td>Exceeds</td>
<td>8/6/1995</td>
</tr>
<tr>
<td></td>
<td>1995</td>
<td></td>
<td>59.4</td>
<td>Exceeds</td>
<td>8/15/1998</td>
</tr>
<tr>
<td></td>
<td>1998</td>
<td></td>
<td>57.3</td>
<td>Exceeds</td>
<td>8/2/1999</td>
</tr>
<tr>
<td></td>
<td>1999</td>
<td></td>
<td>60.2</td>
<td>Exceeds</td>
<td>8/10/2005</td>
</tr>
<tr>
<td></td>
<td>2005</td>
<td></td>
<td>60.2</td>
<td>Exceeds</td>
<td>7/17/2014</td>
</tr>
<tr>
<td></td>
<td>2014</td>
<td></td>
<td>61.0</td>
<td>Exceeds</td>
<td>7/3/2015</td>
</tr>
<tr>
<td></td>
<td>2015</td>
<td></td>
<td>59.3</td>
<td>Exceeds</td>
<td>7/31/2016</td>
</tr>
<tr>
<td></td>
<td>2016</td>
<td></td>
<td>56.5</td>
<td>Exceeds</td>
<td>7/22/1998</td>
</tr>
<tr>
<td>Lake 2</td>
<td>1998</td>
<td></td>
<td>53.6</td>
<td>Exceeds</td>
<td>8/2/1999</td>
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<td>1999</td>
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<td>57.6</td>
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<td>58.5</td>
<td>Exceeds</td>
<td>7/3/2015</td>
</tr>
<tr>
<td></td>
<td>2016</td>
<td></td>
<td>56.6</td>
<td>Exceeds</td>
<td>7/31/2016</td>
</tr>
</tbody>
</table>

Large Woody Debris: No changes would occur in Large Woody Debris recruitment or existing wood in the stream, because 1) no trees are proposed for removal and 2) there would be no activity in the channel to alter existing amounts and distributions.

Substrate Sediment: No changes would occur to substrate sediment as a result of potential for inputs of fine sediment related to mining activity because inputs would move through the system as suspended load, or settle out within 300 feet, depending on the size of the sediment that enters (clay, silt vs. sand, gravel or cobbles).
Bank Stability: No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.

Lower Bank Angle: No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.

Width/Depth ratio: No changes in Width/Depth ratio would occur because there would be 1) no change to Bank Stability and therefore channel widths and 2) no instream activity would occur which could trigger a headcut and alter channel depths.

Wetlands and Floodplains

No activity is proposed in floodplains or wetlands. Therefore, project activities are consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

Reclamation

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.

ALTERNATIVE 3

Water Resources
Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

Different than Alternative 2. Under Alternative 3, the discharge potential would be eliminated relative to the lode mining under General Requirement L5 requires that there be testing of the first run of material. If testing of the lode material potentially subsequent material finds the ore has the potential to release acidity or other contaminates into the ground and into Lake Creek via surface or subsurface flow, then based on General Requirement L5, the miner would need to submit a supplement to their Plan that details how they would prevent heavy metals from entering Lake Creek. This supplement to their plan would then be evaluated and additional RPMs would be put into place.

Other WRPMs that would decrease discharge potential for sediment, if heavy metals are not present include placing straw bales/coils/dirt across the compromised berm that is the sediment transport pathway from Barbara Lode to Lake Creek. Runoff will be diverted around tailings and waste rock to prevent future gullying from potentially occurring. Settling ponds will not be located on mine dumps and compromise the hillslope stability of the waste rock.

Ponds

None Proposed

Fords

None Proposed
Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

Same as Alternative 2. No potential for a discharge.

Clean Water Act, Section 303(d) (antidegradation)

Lake Creek is not 303(d) listed.

Suction Dredging

None proposed

INFISH: Riparian Management Objective (RMO) Parameters

Same as Alternative 2. No impacts to RMOs.

Wetlands and Floodplains

No activity is proposed in floodplains or wetlands. Therefore, project activities are consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

Reclamation

Same as Alternative 2. No potential for discharge.

Blue Jay, David #1, Hi Bar

Plan type: Placer and Suction dredge
Subwatershed: Cracker Creek (HUC 170502030101)
Subwatershed size: 21,645 acres
Analysis area: 31.5 acres
Creek: Cracker Creek, Slim Creek, Pole Creek and unnamed perennial Creek
303(d) listed: Yes – Cracker Creek
Suction Dredging: Yes
Designated Critical Habitat: Yes
Note: This analysis represents three plans that were combined together due to proximity.

ALTERNATIVE 2

Water Resources
Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

The miner proposes within the PoO to mine old tailings adjacent to Cracker Creek. There are some areas of spotty and mature riparian vegetation with low pockets of tailings between the proposed mining site and the adjacent Cracker Creek. The dredge tailings begin to stop as the valley conditions narrow approximately half way through the Blue Jay site.
There is a potential for a sediment discharge into Cracker Creek from mining activity proposed for Blue Jay and David 1, because the area proposed for mining operation has not outlined a functional setback buffer distance from Cracker Creek.

### Ponds

Source water pond

No potential for a discharge via surface or subsurface flow, because withdrawing water directly from Cracker Creek. The Plan proposes to use withdraw water from Cracker Creek and use as source water for processing placer material. Based on the equipment proposed for use, the pump would withdraw approximately under 100 gallons per minute or a maximum of 0.2 cfs. Blue Jay and David 1 would withdraw water, but not the Plan for High Bar.

### Settling ponds

Under Alternative 2, the potential exists because of the soil and landform characteristics of the site that the use of the settling pond will have the potential to discharge sediment into Cracker Creek via surface and subsurface flow and the potential for groundwater reversal from ponds during periods of low instream flows. The ponds are in old placer tailings which typically have a high permeability and large pores which would allow both sediment and water to transfer through the subsurface more easily.

### Fords

There are two existing fords that cross Cracker Creek adjacent to the mining site that is unusable. Potential for a sediment discharge, because the existing fords are not rocked, sloped, and stable in accordance with FS guidelines.

### Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

No potential for a discharge. Miner would primarily use county road 553. Access into mine sites includes TA road 553-M4A and 553-M1A which is primarily made of native material.

### Clean Water Act, Section 303(d) (antidegradation)

Cracker Creek is 303(d) listed for dissolved oxygen by DEQ. Dissolved oxygen is defined by DEQ as: Not less than 11.0 mg/L or 95% saturation between January 1 and May 15th. Grab sampled data has been collected for dissolved oxygen at two water quality monitoring locations on Cracker Creek from 2014-2018. Monitoring site Cracker 1 is located downstream of Blue Jay, David 1 and High Bar and monitoring site Cracker 2 is located upstream. Sampling dates for dissolved oxygen initially occurred from June to October and this sampling period does not capture the period from January to May 15 (see Figure 1). However, we do have one grab sample from April for the two sites in 2018, with the lower site having a measurement at 10.61 mg/L and the upper site of 10.76 mg/L. It appears as streamflows increase in spring and fall and the dissolved oxygen levels correspond.

The activities proposed in this Plan would negatively impact dissolved oxygen levels and change the water quality condition for which this stream is 303(d) listed, because of the potential to have water withdrawals prior to May 15th, during the redband spawning season. Reducing water discharges has the potential to increase solar radiation inputs to the stream and the temperature of the water and thereby impact dissolved oxygen.
Suction Dredging

In evaluating suction dredging on Cracker Creek in the area of the proposed operation, impacts to the following parameters were considered: pool frequency and distribution, habitat complexity (e.g. log jams, instream wood, beaver dams), stream temperatures, turbidity, and substrate, and channel bed stability (Appendix 3A, 3B).

Site Characteristics

The channel bed in this area is predominantly cobbles with some gravels mixed with sands and highly stable given the abundance of cobbles. Cracker Creek was historically placer mined and therefore, the percentage of the silts and clays in the channel bed is expected to be limited. The only source of abundant fine-grained material would be the stream banks.

Water Quality and Channel Morphology analysis

Pool frequency and distribution: Localized changes would occur in pool frequency and locations related to suction dredging as dredging will create pools and loosen the substrate. The pool created by suction dredging is likely to be permanent, because the amount of bedload moving through the stream is limited, and the sediment disturbed by suction dredging would be redistributed downstream during high flow events.

Habitat complexity: Potential local changes would occur in habitat complexity because boulders and habitat structures may be moved around in the stream but not removed. Therefore, the impacts of suction dredging on in-channel habitat complexity may occur but should be limited to small areas. The changes would be permanent.

Schedule C.8 prohibits removing or disturbing boulders, rooted vegetation, or embedded woody plants and other habitat structures from the stream banks. Habitat connected to the stream banks (beaver dams, undercuts, root wads etc.) therefore would remain intact thereby ensuring that some key habitat types would not be modified.

Stream temperatures: There is not a potential to measurably increase stream temperatures as a result of suction dredging. The water used for processing will be recirculated quickly from the stream back into the stream as the materials are processed directly on the water surface.

Turbidity: Local change would occur in water clarity as represented by changes in turbidity. Turbidity could extend beyond the immediate area that is dredged and changes in water clarity are not allowed to extend beyond 300 feet downstream. However, given the past history of placer mining in this stream, fines are expected to be limited in the channel bed, and therefore the turbidity plume is expected to dissipate much sooner than 300 feet downstream. In addition, the turbidity plume would only occur when dredging is occurring. Therefore, the temporal impact is limited to the when the miner is suction dredging.

Substrate: Local changes in channel bed substrate are expected as a result of suction dredging. Dredging would pull sediment from the channel bed, pass it up through a suction hose, and run it across a recovery system (sluice box) floating at the surface. The gravel and other material, which washes through the recovery system, would then be washed back into the stream. Pools would be created where the sediment was pulled from and small dredge tailings piles created where the gravel and other material was deposited. In some cases the gravel and other material would be put back into the pool and in other cases deposited in the channel but not in the pool. These dredge tailings would be mobilized during the spring
high flow and redistributed downstream. The changes in substrate at the dredge pool location would be permanent but highly localized.

Channel bed stability: No changes to channel bed stability would occur, even though dredging will create pools because the channel bed is composed of cobbles, sand and gravel. Therefore, no headcutting and bed destabilization is expected to occur.

**Summary of Effects**

The analysis found that suction dredging would have negative impacts on channel bed stability for the reasons stated above. Suction dredging would have a local impact on 1) pool frequency and distribution, 2) habitat complexity, 3) turbidity and 4) substrate for the reasons stated above. The changes to pool frequency, habitat complexity and substrate are expected to be permanent but limited to the area worked and therefore would not have a measurable impact on channel complexity or channel stability. Changes in turbidity would impact less than 300 feet of stream and not be permanent but limited to the period of time that the miner is suction dredging.

**INFISH: Riparian Management Objective (RMO) Parameters**

Pool Frequency: No changes in Pool Frequency would occur as a result of the proposed activities for the following reasons: 1) No changes as a result of potential for inputs of fine sediment related to mining activity because inputs would move through the system as suspended load, or settle out within 300 feet, depending on the size of the sediment that enters (clay, silt vs. sand, gravel or cobbles), 2) no changes to large woody recruitment are expected (see below).

Water Temperature: **Potential** for increase in Water Temperature exists because of 1) flow reversal from settling ponds during periods of low instream flows, 2) instream withdrawals during low flows could increase stream temperatures downstream, 3) decrease water depths downstream. Figure 2 and Table 1 illustrate the 7 day average of the maximum daily stream temperatures for the years with data for Cracker Creek. These three plans are located in the middle of the two water temperature monitoring sites. The available data show that stream temperatures on Cracker Creek flowing into the mines meets DEQ temperature standard and flows away from water temperature site Cracker 1 did not meet 3 in 9 years. The removal of water for processing could have the potential to 1) increase stream temperatures downstream, 2) decrease water depths downstream, and/or 3) dry up the stream below the operation. This impact would not be permanent, but would occur until the storage capacity was full in the excavated floodplain sections or until water withdrawals ceased. This could affect streamflows and meeting the Forest Plan temperature standards on the scale of a few hours for these sites.

Large Woody Debris: No changes would occur in Large Woody Debris recruitment or existing wood in the stream because 1) no trees are proposed for removal and 2) there would be no activity in the channel to alter existing amounts and distributions.

Substrate Sediment: No changes would occur to substrate sediment as a result of potential for inputs of fine sediment related to mining activity because inputs would move through the system as suspended load, or settle out within 300 feet, depending on the size of the sediment that enters (clay, silt vs. sand, gravel or cobbles).

Bank Stability: No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.
Lower Bank Angle: No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.

Width/Depth ratio: No changes in Width/Depth ratio would occur because there would be no change to Bank Stability as a result of mining activity or suction dredging because, 1) no mining activity is proposed on the stream banks and 2) suction dredging would occur under the requirements FS General Requirements and RMO parameters. In addition, the existing channel bed is composed of a mix of cobbles, sands and gravels and highly stable. Therefore, there would be no potential for suction dredging to trigger a headcut and increase channel depth.

Wetlands and Floodplains

These proposed activities occur in floodplains and wetlands. The floodplains have been artificially constrained due to past mining activities for most of the reach. The project does not have buffers to avoid placing structures in the active floodplain. Therefore, floodplains would not be managed for under Executive Order 11988 through this alternative. Riverine and freshwater pond wetlands occur within the planned mining areas. The ponds may be used for processing water and/or sediment and will not be negatively altered in a manner that will degrade their wetland values. Therefore, this alternative is not consistent with Executive Orders 11988 (Floodplain Management) and is consistent with 11990 (Protection of Wetlands).

Reclamation

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.

ALTERNATIVE 3

Water Resources
Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

Different from Alternative 2. Under Alternative 3, the discharge potential would be eliminated with the addition of the Forest Service RPM (Appendix 1A) which clarifies the starting point of the buffer width measurement. The RPM clarifies a Plan-specific buffer and an added barrier of straw bales/coils between the activity and the stream. Therefore, there would be sufficient sediment trapping mechanisms in place (ground cover and straw bales/coils) to prevent sediment from reaching Cracker Creek.

Ponds

Source water pond

Same as Alternative 2. No potential for a discharge

Settling ponds

Different from Alternative 2. Under Alternative 3, both the discharge and increase in temperature potential would be decreased with the addition of the Forest Service RPM (See Appendix 1B and Figures
1B-2 and 1B-3 for explanations of this feature) which clarifies the starting point of the buffer width measurement. Furthermore as specified in Appendix 1A, settling ponds would need to be located with input from the minerals administrator and district hydrologist and appropriate WRPMs identified and implemented. Another RMP states that if Cracker Creek is dry below where the miner is working prior to August 15th, then the miner must cease withdrawing water from the creek until the streamflow exceeds the amount withdrawn. The period of impacts has been decreased as well with no water withdrawals are permitted in Cracker Creek after August 15.

Fords

Different from Alternative 2. Under Alternative 3, the discharge potential would be eliminated with the addition of the Forest Service RPM (Appendix 1A) where ford approaches are required to be rocked, sloped, and stable. Furthermore, the miner will need to provide the Forest Service with advanced notification of ford construction so that a fisheries biologist or minerals administrator can monitor these fords to ensure that they do not create a fish barrier during low flows.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

Same as Alternative 2. No potential for a discharge

Clean Water Act, Section 303(d) (antidegradation)

Cracker Creek is 303(d) listed for dissolved oxygen by ODEQ. Dissolved oxygen is defined by ODEQ as: Not less than 11.0 mg/L or 95% saturation between January 1 and May 15th.

Different from Alternative 2. The activities proposed in this Plan would not change the water quality condition for which this stream is listed, because of the addition of RPM that delays water withdrawals until after May 15th. Minimizing water reductions in Cracker Creek from January 1 through May 15th will ensure that dissolved oxygen will not be impacted by the projects activities.

Suction Dredging

Same as Alternative 2.

INFISH: Riparian Management Objective (RMO) Parameters

Pool Frequency: Same as Alternative 2.

Water Temperature: Under Alternative 3, the potential for increase in stream temperatures would be decreased with the addition of the Forest Service RPM (Appendix 1A) where no water withdrawals are permitted in Cracker Creek after August 15 and if Cracker Creek is dry below where the miner is working prior to August 15, then the miner must cease withdrawing water from the creek until flow exceeds the amount withdrawn. This could still impact streamflows and meeting the Forest Plan temperature standards on the scale of a few hours for these sites, but the time period is reduced. Table 1 illustrates that 10 of the 16 years has the warmest water temperatures occurred for that year before August 15 and 6 occurred after.

Large Woody Debris: Same as Alternative 2.

Substrate Sediment: Same as Alternative 2.
Bank Stability: Same as Alternative 2.

Lower Bank Angle: Same as Alternative 2.

Width/Depth ratio: Same as Alternative 2.

Wetlands and Floodplains

These proposed activities occur in floodplains and wetlands. The floodplains have been artificially constrained due to past mining activities for most of the reach. Alternative 3 would implement a 25 foot setback avoidance buffer from the edge of the terrace/active floodplain and would be adequate to buffer the active floodplain. Therefore, Alternative 3 is consistent with Executive Order 11988.

Riverine and freshwater pond wetlands occur within the planned mining areas, as identified through the National Wetlands Inventory. The ponds may be used for processing water and/or sediment and will not be negatively altered in a manner that will degrade their wetland values. Three general requirements for working in wetlands and floodplains have been designed to minimize impacts for alternative 3 and exist in appendix 2. These include timing restrictions after these areas have adequately dried out after July 1. If wetland vegetation is approved to be removed, it shall be kept wet and used for reclamation purposes. The third RPM talks about the size, location and most importantly, the function of the wetland will be reclaimed to what exists now. Therefore, this alternative is consistent with Executive Order 11990 (Protection of Wetlands).

Reclamation

Same as Alternative 2. No potential for discharge.

Buster #1 and #3 Placers

Plan type: Placer
Subwatershed: Blue Canyon Creek- Powder River (HUC 170502030207)
Subwatershed size: 19,128 acres
Analysis area: 9.5 acres
Creek Unnamed stream
303(d) listed: No
Suction Dredging: No
Designated Critical Habitat: No

ALTERNATIVE 2

Water Resources
Direct and Indirect Effects

Buster #1

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

Site visits indicate that this area has an ephemeral draw and there are not many indications of a defined stream channel with enough scour to maintain a continuous stream channel. No potential for a discharge as a result of mining activity, because the area to be mined is approximately 1.5 stream miles away from a
downstream perennial waterbody. This distance provides for a functional filter strip to dissipate and capture any pollutants before flowing into a downstream waterbodies.

**Ponds**

Source water pond

No potential for a discharge via surface or subsurface flow because withdrawing water directly from a well.

**Settling ponds**

No potential for a discharge. There are three existing ponds extending downhill from one another. No potential for a discharge via surface or subsurface flow because the mining site is an adequate distance to capture any pollutant from being discharged to a water body.

**Fords**

No fords on closed or decommissioned Forest Service roads or temporary mine access roads proposed for use.

**Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads**

No potential for discharge. The miner proposes to use Temporary Access road 7220043 accessed from FS road 7240042; constructed of native materials.

**Clean Water Act, Section 303(d) (antidegradation)**

An ephemeral draw is located in the area proposed for activity. There is an adequate distance to buffer any pollutants from being discharged to waterbodies. There is no potential with the projects activities impacting a 303(d) stream.

**Suction Dredging**

None proposed.

**INFISH: Riparian Management Objective (RMO) Parameters**

The plan takes place in an ephemeral draw. RMOs from INFISH generally apply on 3-6th order streams and not a 1st or 2nd order stream like this riparian area. Therefore, the RMOs do not apply for this plan of operation.

**Wetlands and Floodplains**

No activity proposed in floodplains or wetlands. Therefore, the projects activities are consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

**Reclamation**

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.
Buster #3

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

Site visits indicate that this area has an ephemeral draw and there are not many indications of a defined stream channel with enough scour to maintain a continuous stream channel this high in the watershed. No potential for a discharge as a result of mining activity, because the area to be mined is approximately 1.5 stream miles away from a downstream perennial waterbody. This distance provides for a functional filter strip to dissipate and capture any pollutants before flowing into a downstream waterbodies.

Ponds

Source water pond

No potential for a discharge via surface or subsurface flow because withdrawing water directly from a well.

Settling ponds

No potential for a discharge. There are three existing ponds extending downhill from one another. No potential for a discharge via surface or subsurface flow because the mining site is an adequate distance to capture any pollutant from being discharged to a water body.

Fords

No fords on closed or decommissioned Forest Service roads or temporary mine access roads proposed for use.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

None. Miner would only use open Forest Service roads that are also used by the general public or private roads

Clean Water Act, Section 303(d) (antidegradation)

An ephemeral draw is located in the area proposed for activity. There is an adequate distance to buffer any pollutants from being discharged to waterbodies. There is no potential with the projects activities impacting a 303(d) stream.

Suction Dredging

None proposed

INFISH: Riparian Management Objective (RMO) Parameters

The plan takes place in a category 4 stream. RMOs from INFISH generally apply on 3-6th stream order watersheds and not a 1st or 2nd order stream like this riparian area. Therefore, the RMOs do not apply for this plan of operation.
Wetlands and Floodplains

No activity proposed in floodplains or wetlands. Therefore, the projects activities are consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

Reclamation

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.

**ALTERNATIVE 3**

Water Resources

Direct and Indirect Effects

**Buster #1**

**Clean Water Act, Section 401 (potential for a discharge)**

**Mining Activity**

Same as Alternative 2. No potential for a discharge.

**Ponds**

Same as Alternative 2. No potential for a discharge.

**Fords**

Same as Alternative 2. No potential for a discharge.

**Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads**

Same as Alternative 2. No potential for a discharge.

**Clean Water Act, Section 303(d) (antidegradation)**

An ephemeral draw is located in the area proposed for activity. There is an adequate distance to buffer any pollutants from being discharged to waterbodies. There is no potential with the projects activities impacting a 303(d) stream.

**Suction Dredging**

None proposed

**INFISH: Riparian Management Objective (RMO) Parameters**

The plan takes place in a category 4 stream. RMOs from INFISH generally apply on 3-6th stream order watersheds and not a 1st or 2nd order stream like this riparian area. Therefore, the RMOs do not apply for this plan of operation.

Wetlands and Floodplains
No activity proposed in floodplains or wetlands. Therefore, the projects activities are consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

**Reclamation**

Same as Alternative 2. No potential for discharge.

**Buster #3**

**Clean Water Act, Section 401 (potential for a discharge)**

**Mining Activity**

Same as Alternative 2. No potential for a discharge.

**Ponds**

Same as Alternative 2. No potential for a discharge.

**Fords**

Same as Alternative 2. No potential for a discharge.

**Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads**

Same as Alternative 2. No potential for a discharge.

**Clean Water Act, Section 303(d) (antidegradation)**

An ephemeral draw is located in the area proposed for activity. There is an adequate distance to buffer any pollutants from being discharged to waterbodies. There is no potential with the projects activities impacting a 303(d) stream.

**Suction Dredging**

None proposed

**INFISH: Riparian Management Objective (RMO) Parameters**

The plan takes place in a category 4 stream. RMOs from INFISH generally apply on 3-6th stream order watersheds and not a 1st or 2nd order stream like this riparian area. Therefore, the RMOs do not apply for this plan of operation.

**Wetlands and Floodplains**

No activity proposed in floodplains or wetlands. Therefore, the projects activities are consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

**Reclamation**

Same as Alternative 2. No potential for discharge.
California Gulch

Plan type: Placer
Subwatershed: Lake Creek- Powder River (HUC 170502030201)
Subwatershed size: 15,567 acres
Analysis area: 9.5 acres
Creek: California Gulch
303(d) listed: Yes
Suction Dredging: No
Designated Critical Habitat: No

ALTERNATIVE 2

Water Resources
Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity
Past mining has occurred at this location and has altered the landforms and changed the water and soils conditions at this site. No potential for discharge associated with following the PoO. The buffer outlined in PoO states there will be a minimum distance of mining activity to the stream’s edge will be 50 feet. Site visits illustrate exploration mining in the area and this fine grained sediment is not showing any flowpaths of sediment that connect mining with California Gulch, because of the existing ground cover present on the floodplain surface.

Ponds
Source water pond
No potential for a discharge via surface or subsurface flow because withdrawing water directly from an existing spring fed pond. The pond is more than 25 feet away from California Gulch and adequate ground cover exists between the two.

Settling ponds
No potential for a discharge via surface or subsurface flow from the settling ponds because the ponds are old dredge ponds and are capable of holding volumes of water much greater then proposed by the operation.

Fords
No potential for a discharge of sediment. Mining Plan of Operation states that a temporary bridge will be installed to avoid current stream crossing in project site.

Bridges
Proposed temporary bridge
One temporary bridge would be used to access both sides of mine site. This temporary bridge is for ATVs and will be placed on temporary ATV trail 7220-M2A. There would be a potential for discharge of
sediment via surface flows due to temporary bridge installation, usage (approach and bridge exit), and removal activities under Alternative 2.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

No potential for a discharge. The miner proposes to use Temporary Access road 7220-M1A accessed from FS road 7220-300. The miner proposes to use Temporary Access road 7220-M2A for his ATV to access the southern portion of the mining claim.

Clean Water Act, Section 303(d) (antidegradation)

California Gulch is 303(d) listed for water temperature by DEQ. A water temperature standard of 68 degrees Fahrenheit during the summer for redband trout is listed by DEQ.

The activities proposed in this Plan would not change the water quality condition for which this stream is listed due to the PoO’s specifications, including the 1) distance from creek for activities, 2) lack of impacts to streamside shade and 3) lack of impacts to channel dimensions.

Suction Dredging

None proposed

INFISH: Riparian Management Objective (RMO) Parameters

Pool Frequency: No changes in Pool Frequency would occur as a result of the proposed activities for the following reasons: 1) No changes as a result of potential for inputs of fine sediment related to mining activity because inputs would move through the system as suspended load, or settle out within 300 feet, depending on the size of the sediment that enters (clay, silt vs. sand, gravel or cobbles), 2) no changes to large woody recruitment are expected (see below).

Water Temperature: No changes in Water Temperature would occur because 1) there would be no activity in the channel or on the stream banks which would alter channel width and therefore change flow depths for a given discharge, and 2) no trees are proposed for removal.

Large Woody Debris: No changes would occur in Large Woody Debris recruitment or existing wood in the stream because 1) no trees are proposed for removal and 2) there would be no activity in the channel to alter existing amounts and distributions.

Substrate Sediment: No changes in Substrate Sediment because 1) no suction dredging is proposed and 2) no other inchannel activity is proposed. There is the potential for a discharge of sediment from the temporary bridge use, but the amount of sediment from this area is not enough to alter the RMO levels downstream across the reach.

Bank Stability: No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.

Lower Bank Angle: No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.
Width/Depth ratio: No changes in Width/Depth ratio would occur because there would be 1) no change to Bank Stability and therefore channel widths and 2) no instream activity would occur which could trigger a headcut and alter channel depths.

Wetlands and Floodplains

Riverine wetlands are mapped through the national wetland inventory as being adjacent to the mining site. No activity proposed in the active floodplains or wetlands, except for the location of the temporary bridge. California Gulch is slightly incised into its terrace at this location and no wetland area will be impacted by the placement, use or removal of the temporary bridge. Therefore, the PoO would be consistent with the Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

Reclamation

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.

**ALTERNATIVE 3**

Water Resources
Direct and Indirect Effects

**Clean Water Act, Section 401 (potential for a discharge)**

**Mining Activity**

Same as Alternative 2. No potential for a discharge.

**Ponds**

Same as Alternative 2. No potential for a discharge.

**Fords**

Same as Alternative 2. No changes in the RMOs.

**Bridges**

Different from Alternative 2. Under Alternative 3, the discharge potential would be eliminated with the addition of the Forest Service WRPM (Appendix 1A) which clarifies that the approach where the bridge will be placed will be rocked and that rock will be added as needed at the beginning of each season. The third WRPM specifies that this bridge will be removed at the end of the work season each fall. Rocking road approaches to streams on native surface routes is a common best management practice that increases surface roughness and breaks up any flowpaths from delivering sediment to the waterbody through the road.

**Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads**

Same as Alternative 2. No changes in the RMOs.
Clean Water Act, Section 303(d) (antidegradation)

California Gulch is 303(d) listed for water temperature by DEQ. A water temperature standard of 68 degrees Fahrenheit during the summer for redband trout is listed by DEQ.

The activities proposed in this Plan would not change the water quality condition for which this stream is listed due to the PoO’s specifications, including the 1) distance from creek for activities, 2) lack of impacts to streamside shade and 3) lack of impacts to channel dimensions.

Suction Dredging

None proposed

INFISH: Riparian Management Objectives (RMOs)

Same as Alternative 2. No changes in the RMOs.

Wetlands and Floodplains

Riverine wetlands are mapped through the national wetland inventory as being adjacent to the mining site. No activity proposed in the active floodplains or wetlands, except for the location of the temporary bridge. California Gulch is slightly incised into its terrace at this location and no wetland area will be impacted by the placement, use or removal of the temporary bridge. Therefore, the PoO would be consistent with the Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

Reclamation

Same as Alternative 2. No potential for discharge.

Dead Horse Placer

Plan type: Placer
Subwatershed: McCully Creek (HUC 170502030102)
Subwatershed size: 13,347 acres
Analysis area: 8.6 acres
Creek: Buck Gulch
303(d) listed: No
Suction Dredging: No
Designated Critical Habitat: No

ALTERNATIVE 2

Water Resources
Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

An unnamed tributary flows intermittently into Buck Gulch through the mining site. No potential for a discharge as a result of mining activity because the area to be mined is further away than 300 feet from Buck Gulch, there is a moderate level of ground cover and has adequate distance to filter fine sediments.
However, there are springs that have wetland vegetation in the proposed mining areas above the source water pond. There is the potential for impacts to wetlands and this discontinuous stream channel through this segment.

Ponds

Source water pond

No potential for a discharge via surface or subsurface flow because withdrawing water directly from an existing spring fed pond.

Settling ponds

There are two existing ponds currently on the site. No potential for a discharge as a result of mining activity because the area to be mined is further away than 300 ft from drainage.

Fords

None proposed.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

No potential for a discharge. Miner would primarily use FS road 7390-337. Access into mine sites includes TA road 553-M3A which is primarily made of native material.

**Clean Water Act, Section 303(d) (antidegradation)**

Buck Gulch is not 303(d) listed.

**Suction Dredging**

None proposed

**INFISH: Riparian Management Objective (RMO) Parameters**

The plan takes place in a category 4 stream. RMOs from INFISH generally apply on 3-6th order streams and not a 1st or 2nd order stream like this riparian area. Therefore, the RMOs do not apply for this plan of operation.

**Wetlands and Floodplains**

National Wetlands Inventory does not have any wetlands mapped within the project area. However, on the ground data observed springs and wetland vegetation in areas to be mined above the source water ponds. There is the potential for these wetlands to be impacted under Alternative 2. Floodplains are present in limited extents in the proposed disturbed areas and have a limited role. Therefore, Executive Orders 11988 (Floodplain Management) do not apply and 11990 (Protection of Wetlands) could be impacted under Alternative 2.

**Reclamation**

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.
ALTERNATIVE 3
Water Resources
Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

Same as Alternative 2. No potential for a discharge. The mining activity will be setback 25 feet from the stream with the addition of the Forest Service RPM (See Appendix 1B and Figures 1B-2 and 1B-3 for explanations of this feature) which clarifies the starting point of the buffer width measurement. This RPM will setback any mining activity from disturbing the wetland areas and stream channels.

Ponds

Same as Alternative 2. No potential for a discharge.

Fords

Same as Alternative 2. No potential for a discharge.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

Same as Alternative 2. No potential for a discharge.

Clean Water Act, Section 303(d) (antidegradation)

Buck Gulch is not 303(d) listed.

Suction Dredging

None proposed

INFISH: Riparian Management Objectives (RMOs)

Same as Alternative 2. Not applicable.

Wetlands and Floodplains

Different than Alternative 2. The mining activities will have a 25 foot setback from the stream (See Appendix 1B and Figures 1B-2 and 1B-3 for explanations of this feature) and this will maintain the groundwater source areas and wetland vegetation in the unnamed tributaries and will result in consistency with 11990 (Protection of Wetlands).

No activity proposed in floodplains. Executive Orders 11988 (Floodplain Management) does not apply.

Reclamation

Same as Alternative 2. No potential for discharge.
Fine Gold
Plan type: Placer and Suction Dredge
Subwatershed: Cracker Creek (HUC 170502030101)
Subwatershed size: 21,645 acres
Analysis area: 3.3 acres
Creek: Cracker Creek
303(d) listed: Yes
Suction Dredging: Yes
Designated Critical Habitat: Yes

ALTERNATIVE 2
Water Resources
Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

The miner proposes within the Plan of Operation to mine a steep hillslope (slopes ranging up to 90% with most averaging around 55%) adjacent to Cracker Creek. Large ash accumulations occur at the base with larch, spruce, and pine in the overstory and big huckleberry and other shrubs in the understory. There are some areas of spotty and mature vegetation with low pockets of tailings located on the road side of the valley (river right side).

There is a potential for a discharge through the surface flow of sediment into Cracker Creek from excavation activity, because of 1) the gradient of the hillslope, 2) potential for removal of ground cover to mine and 3) proximity to Cracker Creek. The location of the placer material to be processed is not clearly identified in the Plan of Operations, the potential exists that soil and landform characteristics of the site might necessitate a larger buffer to prevent surface flow from overburden and that the ponds are in old placer tailings which typically have a high permeability and large pores which would allow both sediment and water to move through the subsurface.

Ponds
Source water pond and Settling ponds

There is potential for sediment discharge into Cracker Creek. There are two existing ponds currently on the site that will be used for both source water and settling; initial filling of these will be through drafting water from Cracker Creek. Under Alternative 2, use of the settling pond has the potential to discharge sediment into Cracker Creek via surface and subsurface flow due to the past mining activities at the site and the high permeability rates through the floodplain. During periods of low instream flow, the ponds have the potential to alter the direction of groundwater through the floodplain and cause a pulse of decreased streamflow down Cracker Creek that could increase water temperatures.

Fords
None Proposed

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads
The miner proposes to use two existing temporary access roads 553-M2A and 553-M3A; both composed of native material.

Since the precise location of TA roads was not clearly identified in the Plan of Operations; the TA roads has the potential to discharge sediment into Cracker Creek.

**Clean Water Act, Section 303(d) (antidegradation)**

Cracker Creek is 303(d) listed for dissolved oxygen by DEQ. Dissolved oxygen is defined by DEQ as: Not less than 11.0 mg/L or 95% saturation between January 1 and May 15th. Grab sampled data has been collected for dissolved oxygen at two water quality monitoring locations on Cracker Creek from 2014-2018. Monitoring site Cracker 2 is located downstream of Fine Gold. Sampling dates for dissolved oxygen initially occurred from June to October and this sampling period does not capture the period from January to May 15 (see Figure 1). However, we do have one grab sample from April for the two sites in 2018, with the lower site having a measurement at 10.61 mg/L and the upper site of 10.76 mg/L. The data suggests as streamflows increase in spring and fall and the dissolved oxygen levels correspond.

The activities proposed in this Plan would not impact dissolved oxygen levels, because the miner would not begin mining until July.

**Suction Dredging**

In evaluating suction dredging on Cracker Creek in the area of the proposed operation, impacts to the following parameters were considered: pool frequency and distribution, habitat complexity (e.g. log jams, instream wood, and beaver dams), stream temperatures, turbidity, and substrate, and channel bed stability (Appendix 3A, 3B).

**Site Characteristics**

The channel bed in this area is predominantly cobbles with some gravels and sands and highly stable given the abundance of cobbles. Cracker Creek was historically placer mined and therefore, the percentage of the silts and clays in the channel bed is expected to be limited. The only source of abundant fine-grained material would be the stream banks.

**Water Quality and Channel Morphology analysis**

Pool frequency and distribution: Localized changes would occur in pool frequency and locations related to suction dredging as dredging will create pools and loosen the substrate. The pool created by suction dredging is likely to be permanent because the amount of bedload moving through the stream is limited, and the sediment disturbed by suction dredging would be redistributed downstream during high flow events.

Habitat complexity: **Potential** local changes would occur in habitat complexity because boulders and habitat structures may be moved around in the stream but not removed. Therefore, the impacts of suction dredging on in-channel habitat complexity may occur but should be limited to small areas. The changes would be permanent.

Schedule C.8 prohibits removing or disturbing boulders, rooted vegetation, or embedded woody plants and other habitat structures from the stream banks. Habitat connected to the stream banks (beaver dams, undercuts, root wads etc.) therefore would remain intact thereby ensuring that some key habitat types would not be modified.
Stream temperatures: There is not a potential to measurably increase stream temperatures as a result of suction dredging. The water used for processing will be recirculated quickly from the stream back into the stream as the materials are processed directly on the water surface.

Turbidity: Local change would occur in water clarity as represented by changes in turbidity. Turbidity could extend beyond the immediate area that is dredged and changes in water clarity are not allowed to extend beyond 300 feet downstream. However, given the past history of placer mining in this stream, fines are expected to be limited in the channel bed, and therefore the turbidity plume is expected to dissipate much sooner than 300 feet downstream. In addition, the turbidity plume would only occur when dredging is occurring. Therefore, the temporal impact is limited to the when the miner is suction dredging.

Substrate: Local changes in channel bed substrate are expected as a result of suction dredging. Dredging would pull sediment from the channel bed, pass it up through a suction hose, and run it across a recovery system (sluice box) floating at the surface. The gravel and other material, which washes through the recovery system, would then be washed back into the stream. Pools would be created where the sediment was pulled from and small dredge tailings piles created where the gravel and other material was deposited. In some cases the gravel and other material would be put back into the pool and in other cases deposited in the channel but not in the pool. These dredge tailings would be mobilized during the spring high flow and redistributed downstream. The changes in substrate at the dredge pool location would be permanent but highly localized.

Channel bed stability: No changes to channel bed stability would occur, even though dredging will create pools because the channel bed is composed of cobbles, sand and gravel. Therefore, no headcutting and bed destabilization is expected to occur.

Summary of Effects

The analysis found that suction dredging would have negative impacts on 1) stream temperature and/or 2) channel bed stability for the reasons stated above. Suction dredging would have a local impact on 1) pool frequency and distribution, 2) habitat complexity, 3) turbidity and 4) substrate for the reasons stated above. The changes to pool frequency, habitat complexity and substrate are expected to be permanent but limited to the area worked and therefore would not have a measurable impact on channel complexity or channel stability. Changes in turbidity would impact less than 300 feet of stream and not be permanent but limited to the period of time that the miner is suction dredging.

INFISH: Riparian Management Objective (RMO) Parameters

Pool Frequency: Potential changes in Pool Frequency would occur as a result of the proposed activities due to 1) an unspecified buffer distance to the Cracker Creek from excavation activities, 2) due to the source water and settling ponds being conveyors for sediment transport to the water of the state and 3) the temporary access road has the potential to deliver sediment directly to the stream.

Water Temperature: Potential for increase in Water Temperature exists because of 1) groundwater reversal from settling ponds during periods of low instream flows, 2) instream withdrawals during low flows could increase stream temperatures downstream, 3) decrease water depths downstream, and/or 4) dry up the stream below the operation. Fine Gold is located upstream a considerable distance from Cracker 2 in Table 1 and met DEQ water temperature standards. This impact should still meet DEQ standards.
Large Woody Debris: No changes would occur in Large Woody Debris recruitment or existing wood in the stream because 1) no trees are proposed for removal and 2) there would be no activity in the channel to alter existing amounts and distributions.

Substrate Sediment: **Potential** for Substrate Sediment impacts due to 1) an unspecified buffer distance to the Cracker Creek from excavation activities, 2) due to the source water and settling ponds being conveyors for sediment transport to Cracker Creek and 3) the temporary access road has the potential to deliver sediment directly to the stream. The sedimentation inputs would be expressed in changes in turbidity. A plume of fine sediment from these activities could extend downstream further than 300 feet and may have the **potential** to change turbidity levels by up to 15%.

Bank Stability: No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.

Lower Bank Angle: No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.

Width/Depth ratio: No changes in Width/Depth ratio would occur because there would be 1) no change to Bank Stability and therefore channel widths and 2) no instream activity would occur which could trigger a headcut and alter channel depths.

Wetlands and Floodplains

These proposed activities occur in floodplains and wetlands. The floodplains have been artificially constrained due to past mining activities for most of the reach. The project does not have buffers to avoid placing structures in the active floodplain. Therefore, floodplains would not be managed for under Executive Order 11988 through this alternative. Riverine wetlands occur within the planned mining areas. The ponds may be used for processing water and/or sediment and will not be negatively altered in a manner that will degrade their wetland values. Therefore, this alternative is not consistent with Executive Orders 11988 (Floodplain Management) and is consistent with 11990 (Protection of Wetlands).

Reclamation

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.

**ALTERNATIVE 3**

**Water Resources**

Direct and Indirect Effects

**Clean Water Act, Section 401 (potential for a discharge)**

**Mining Activity**

Under Alternative 3, there is still a **potential** for a sediment discharge due to mining a steep slope directly adjacent to Cracker Creek. The addition of the Forest Service RPM (Appendix 1A) which clarifies the starting point of the buffer width measurement will be functional for the downstream looking right valley, but not the steep slope that occurs on the left. The RPM clarifies a Plan-specific buffer and an added barrier of straw bales/coils between the activity and the stream. Therefore, there would be sufficient
sediment trapping mechanisms in place (ground cover and straw bales/coils) to prevent sediment from reaching the creek on the river right side of the valley, but not on the steep hillslope.

**Ponds**

Source water pond

Same as Alternative 2. No potential for a discharge

**Settling ponds**

Different from Alternative 2. Under Alternative 3, the discharge potential would be eliminated with the addition of the Forest Service RPM (Appendix 1A) which clarifies the starting point of the buffer width measurement. Also, the settling ponds will be located with input from the district hydrologist to minimize sedimentation issues.

**Fords**

Same as Alternative 2. No potential for a discharge

**Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads**

Different from Alternative 2. Under Alternative 3, the discharge potential would be eliminated with the addition of the Forest Service GR Z6 (Appendix 2) which clarifies the operator shall be responsible for reducing water flow concentrations resulting in road erosion on closed and temporary access roads.

**Clean Water Act, Section 303(d) (antidegradation)**

Same as Alternative 2. No changes to dissolved oxygen.

**Suction Dredging**

Same as Alternative 2.

**INFISH: Riparian Management Objective (RMO) Parameters**

Water Temperature: Under Alternative 3, the potential for increase in stream temperatures would be decreased with the addition of the Forest Service RPM (Appendix 1A) where no water withdrawals are permitted in Cracker Creek after August 15 and if Cracker Creek is dry below where the miner is working prior to August 15, then the miner must cease withdrawing water from the creek until flow exceeds the amount withdrawn. However, there is still a potential impact to water temperature in Cracker Creek. This impact will still meet DEQ water temperature standards.

Substrate Sediment: Under Alternative 3, a large volume of sediment could still be discharged to Cracker Creek from the mining activities at the site and overwhelm Cracker Creek’s ability to process this fine sediment. The other components of the Plan with substrate impacts would be eliminated with the addition of the Forest Service RPM (Appendix 1A) which clarifies the starting point of the buffer width measurement. The RPM identifies an added barrier of straw bales/coils between the activity and the stream. Therefore, there would be sufficient sediment trapping mechanisms in place (ground cover and straw bales/coils) to prevent sediment from reaching the creek from the non-steep portion of the valley. The temporary roads would have a reduction in sediment production and delivery to Cracker Creek.
through Road RPMs that reduce water flow concentrations on the road prism. The settling pond would be located with input from the minerals administrator and hydrologist for controlling sediment impacts from the pond to Cracker Creek.

Pool Frequency: Impacts in Pool Frequency may still occur as a result of the proposed activities because of the large volume of sediment that could be discharged to Cracker Creek from the mining operations.

Large Woody Debris: Same as Alternative 2.

Bank Stability: No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.

Lower Bank Angle: No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.

Width/Depth ratio: Same as Alternative 2.

Wetlands and Floodplains

These proposed activities occur in floodplains and wetlands. The floodplains have been artificially constrained due to past mining activities for most of the reach. Alternative 3 would implement a 25 foot setback avoidance buffer from the edge of the terrace/active floodplain and would be adequate to buffer the active floodplain. Riverine wetlands occur within the planned mining areas, as identified through the National Wetlands Inventory. Wetland may form around the pond that are used for processing water and/or sediment and will not be negatively altered in a manner that will degrade their wetland values. Three general requirements for working in wetlands and floodplains have been designed to minimize impacts for alternative 3 and exist in appendix 2. These include timing restrictions after these areas have adequately dried out after July 1. If wetland vegetation is approved to be removed, it shall be kept wet and used for reclamation purposes. The third RPM talks about the size, location and most importantly, the function of the wetland will be reclaimed to what exists now. Therefore, this alternative is consistent with Executive Orders 11988 (Floodplain Management) and Executive Order 11990 (Protection of Wetlands).

Reclamation

Same as Alternative 2. No potential for discharge.

J & J Placer

Plan type: Placer
Subwatershed: Blue Canyon Creek- Powder River (HUC 170502030207)
Subwatershed size: 19,128 acres
Analysis area: 0.7 acres
Creek: Unnamed Creek
303(d) listed: No
Suction Dredging: Yes
Designated Critical Habitat: No

ALTERNATIVE 2

Water Resources
Direct and Indirect Effects

**Clean Water Act, Section 401 (potential for a discharge)**

**Mining Activity**

No potential for a discharge as a result of mining activity in Sites 2 and 4, because the area to be mined is further away than 50 feet from the unnamed perennial creek and has a berm separating surface processes. The distance, berms, ground cover and past mining all influence the sediment transport distances and 50 feet will be adequate within this localized area to filter sediment and disconnect the proposed PoO from impacting the adjacent waterbody. The area proposed for mining in Site 3 is adjacent to perennial stream channel and the PoO would buffer the stream by 20 feet. The mining activities in Site 3 would have the potential for a sediment discharge, because of the proximity.

**Ponds**

Source water pond

No potential for a discharge via surface or subsurface flow related to use of the large pond as a source pond, because only withdrawing water.

Settling ponds

No potential for a discharge from the use of existing settling ponds into the associated unnamed tributary, because the ponds are dug into the ground and are behind an old tailings berm that separates the work site from the adjacent creek.

**Fords**

There are two fords associated with this mining site. One is on FS road 7225-020 across a perennial channel and the other is the mine access road 7225-020 M1A across an ephemeral creek bed. Potential for a discharge at FS road 7225-020, because the creek is routed down the road under the existing conditions. The M1A road has ford approaches that are rocked, sloped, and stable.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

No potential for discharge. The miner proposes to use closed FS road 7225-020 and mine TA road 7225-020-M1A. Both made from native material.

**Clean Water Act, Section 303(d) (antidegradation)**

Blue Canyon Creek is not 303(d) listed. The closest 303(d) stream, Powder River is approximately 8 river miles from this project site and will not impact the stream.

**Suction Dredging**

In evaluating suction dredging on Blue Creek in the area of the proposed operation, impacts to the following parameters were considered: pool frequency and distribution, habitat complexity (e.g. log jams, instream wood, beaver dams), stream temperatures, turbidity, and substrate, and channel bed stability (Appendix 3A, 3B).
Site Characteristics

The channel bed in this area is predominantly gravels with some patches of silt that have formed meadow riparian areas. Blue Creek was historically placer mined and therefore, the percentage of the silts and clays in the channel bed is expected to be limited, aside from the meadow pockets. Sources of abundant fine-grained material would be the stream banks and in the meadows.

Water Quality and Channel Morphology analysis

Pool frequency and distribution: Localized changes would occur in pool frequency and locations related to suction dredging as dredging will create pools and loosen the substrate. The pool created by suction dredging is likely to be permanent because the amount of bedload moving through the stream is limited, and the sediment disturbed by suction dredging would be redistributed downstream during high flow events.

Habitat complexity: Potential local changes would occur in habitat complexity because boulders and habitat structures may be moved around in the stream but not removed. Therefore, the impacts of suction dredging on in-channel habitat complexity may occur but should be limited to small areas. The changes would be permanent.

Schedule C.8 prohibits removing or disturbing boulders, rooted vegetation, or embedded woody plants and other habitat structures from the stream banks. Habitat connected to the stream banks (beaver dams, undercutts, root wads etc.) therefore would remain intact thereby ensuring that some key habitat types would not be modified.

Stream temperatures: There is not a potential to measurably increase stream temperatures as a result of suction dredging. The water used for processing will be recirculated quickly from the stream back into the stream as the materials are processed directly on the water surface.

Turbidity: Local change would occur in water clarity as represented by changes in turbidity. Turbidity could extend beyond the immediate area that is dredged and changes in water clarity are not allowed to extend beyond 300 feet downstream. However, given the past history of placer mining in this stream, fines are expected to be limited in the channel bed, and therefore the turbidity plume is expected to dissipate much sooner than 300 feet downstream. If the meadow riparian areas are suction dredged, impacts could extend further than 300 feet downstream. In addition, the turbidity plume would only occur when dredging is occurring. Therefore, the temporal impact is limited to the when the miner is suction dredging.

Substrate: Local changes in channel bed substrate are expected as a result of suction dredging. Dredging would pull sediment from the channel bed, pass it up through a suction hose, and run it across a recovery system ( sluice box) floating at the surface. The gravel and other material, which washes through the recovery system, would then be washed back into the stream. Pools would be created where the sediment was pulled from and small dredge tailings piles created where the gravel and other material was deposited. In some cases the gravel and other material would be put back into the pool and in other cases deposited in the channel but not in the pool. These dredge tailings would be mobilized during the spring high flow and redistributed downstream. The changes in substrate at the dredge pool location would be permanent but highly localized.

Channel bed stability: No changes to channel bed stability would occur, even though dredging will create pools because the channel bed is composed of cobbles, sand and gravel. Therefore, no headcutting and bed destabilization is expected to occur.
Summary of Effects

The analysis found that suction dredging would have no impact on 1) stream temperature or 2) channel bed stability for the reasons stated above. Suction dredging would have a local impact on 1) pool frequency and distribution, 2) habitat complexity, 3) turbidity and 4) substrate for the reasons stated above. The changes to pool frequency, habitat complexity and substrate are expected to be permanent but limited to the area worked and therefore would not have a measurable impact on channel complexity or channel stability. Changes in turbidity suction dredging in meadow sections could have potential plumes that are greater than 300 feet of stream, however, most would be less than 300 feet and not be permanent but limited to the period of time that the miner is suction dredging.

INFISH: Riparian Management Objective (RMO) Parameters

Pool Frequency: No changes in Pool Frequency would occur as a result of the proposed activities for the following reasons: 1) The sediment impacts from mining activities are expected to flush through the system, 2) no changes to large woody recruitment are expected (see below), and 3) no suction dredging is proposed.

Water Temperature: No changes in Water Temperature would occur because 1) there would be no activity in the channel or on the stream banks which would alter channel width and therefore change flow depths for a given discharge, and 2) no trees are proposed for removal.

Large Woody Debris: No changes would occur in Large Woody Debris recruitment or existing wood in the stream because 1) no trees are proposed for removal and 2) there would be no activity in the channel to alter existing amounts and distributions.

Substrate Sediment: No changes in Substrate Sediment because 1) no suction dredging is proposed, 2) no other inchannel activity is proposed, and 3) there is a potential for a discharge of sediment from mining activities on land, but it is not enough of a source to change this indicator through the downstream reach.

Bank Stability: No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.

Lower Bank Angle: No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.

Width/Depth ratio: No changes in Width/Depth ratio would occur because there would be 1) no change to Bank Stability and therefore channel widths and 2) no instream activity would occur which could trigger a headcut and alter channel depths.

Wetlands and Floodplains

Riverine wetlands are mapped through the work site 3, the other work sites are setback from the stream or have a dry channel with limited water to support a wetland. Site visits observed a perennial stream channel with grass, snowberry, alder and conifer plant communities. Mining activity for work site 3 does not identify mitigation measures for protection of wetlands through the work site. Floodplains are limited in extent for this reach and will not be meaningfully impacted due the gradient of the area. Therefore, Executive Orders 11988 (Floodplain Management) and does not apply and the PoO at this site is not consistent with 11990 (Protection of Wetlands).
Reclamation

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.

ALTERNATIVE 3

Water Resources

Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

Different from Alternative 2, because of the implementation of watershed resource protection measures (RPMs) and general requirements (GRs) that function similar to best management practices. Under Alternative 3, the discharge potential would be eliminated with the addition of the Forest Service RPM (See Appendix 1B and Figures 1B-2 and 1B-3 for explanations of this feature) which clarifies the starting point of the buffer width measurement. This RPM will setback any mining activity from being placed into the active floodplain or within the area of sediment transport in which a discharge of sediment could occur.

Ponds

Same as Alternative 2. No potential for a discharge.

Fords

Different from Alternative 2, because of the implementation of watershed resource protection measures (RPMs) and general requirements (GRs) that function similar to best management practices. Under Alternative 3, the discharge potential would be eliminated with the addition of the road rocking on FS road 7225-020. This road maintenance action will minimize water flowing down the road at the ford crossing and minimize fine sediment inputs to waters of the state from project activities.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

Same as Alternative 2. No impacts from project activities to waters of the state or RMOs.

Clean Water Act, Section 303(d) (antidegradation)

Blue Canyon Creek is not 303(d) listed. The closest 303(d) stream, Powder River is approximately 8 river miles from this project site and will not impact the stream.

Suction Dredging

Impacts will be mostly similar with Alternative 2, except for inclusion of RPM to not suction dredge the meadow riparian areas that have pockets of silt along the streambed. This will eliminate the sediment plume from extending beyond 300 feet during dredging activities.

INFISH: Riparian Management Objectives (RMOs)
Appendix 5 Powder River Mining DEIS

Same as Alternative 2. No changes in the RMOs.

**Wetlands and Floodplains**

Same as Alternative 2. No activity proposed in floodplains or wetlands. Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands) do not apply.

Different than Alternative 2. Riverine wetlands are mapped through the work site 3, the other work sites are setback from the stream or have a dry channel with limited water to support a wetland. Site visits observed a perennial stream channel with grass, snowberry, alder and conifer plant communities. Mining activity for work site 3 under Alternative 3 would have a 25 foot setback from the active floodplain as described in the Mining Activity section for J & J Placer. This mitigation measures would avoid the wetlands along the stream channel and would protect the wetlands present. Floodplains are limited in extent for this reach and will not be meaningfully impacted due the gradient of the area. Therefore, Executive Orders 11988 (Floodplain Management) and does not apply and Alternative 3 would be consistent with 11990 (Protection of Wetlands).

**Reclamation**

Same as Alternative 2. No potential for discharge.

**Medic Placer Group**

Plan type: Placer and Suction Dredge  
Subwatershed: McCully Creek (HUC 170502030102)  
Subwatershed size: 13,347 acres  
Analysis area: 5.0 acres  
Creek: Placer Mining: O’Farrell Gulch  
303(d) listed: No  
Suction Dredging: Yes  
Designated Critical Habitat: No

**ALTERNATIVE 2**

**Water Resources**

Direct and Indirect Effects

**Clean Water Act, Section 401 (potential for a discharge)**

**Mining Activity**

Proposed processing site is located on a ten foot wide bench between the hillslope and the O’Farrell Gulch, a perennial channel. **Potential** for a sediment discharge due to proximity and lack of a functional buffer.

**Ponds**

Source water pond

No potential for a discharge via surface or subsurface flow related to use of the large pond as a source pond, because only withdrawing water. The Plan proposes to use withdraw water from O’Farrell Gulch
and use as source water for processing placer material. Water withdrawals would slightly decrease streamflows in O’Farrell Gulch.

Settling ponds

No potential for a discharge. The buffer between the settling ponds and O’Farrell Gulch is more than 50 feet and adequate ground cover to filter sediment from discharging into waterbody.

Fords

No fords associated with this site.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

There is a potential for a discharge of sediment for the use of roads associated with mining activities. The miner proposes to use FS closed road 2200-900. Currently there is a spring draining onto the road near the mining site. Under Alternative 2, the FS closed road has the potential to discharge sediment directly into O’Farrell Gulch

Clean Water Act, Section 303(d) (antidegradation)

McCully Creek is not 303(d) listed.

Suction Dredging

In evaluating suction dredging on McCully Fork in the area of the proposed operation, impacts to the following parameters were considered: pool frequency and distribution, habitat complexity (e.g. log jams, instream wood, beaver dams), stream temperatures, turbidity, and substrate, and channel bed stability (Appendix 3A, 3B).

Site Characteristics

The channel bed in this area is predominantly cobbles with some gravels and sands and highly stable given the abundance of cobbles. McCully Creek was historically placer mined and therefore, the percentage of the silts and clays in the channel bed is expected to be limited. The only source of abundant fine-grained material would be the stream banks.

Water Quality and Channel Morphology analysis

Pool frequency and distribution: Localized changes would occur in pool frequency and locations related to suction dredging as dredging will create pools and loosen the substrate. The pool created by suction dredging is likely to be permanent because the amount of bedload moving through the stream is limited, and the sediment disturbed by suction dredging would be redistributed downstream during high flow events.

Habitat complexity: Potential local changes would occur in habitat complexity because boulders and habitat structures may be moved around in the stream but not removed. Therefore, the impacts of suction dredging on in-channel habitat complexity may occur but should be limited to small areas. The changes would be permanent
Schedule C.8 prohibits removing or disturbing boulders, rooted vegetation, or embedded woody plants and other habitat structures from the stream banks. Habitat connected to the stream banks (beaver dams, undercutts, root wads etc.) therefore would remain intact thereby ensuring that some key habitat types would not be modified.

Stream temperatures: There is not a potential to measurably increase stream temperatures as a result of suction dredging. The water used for processing will be recirculated quickly from the stream back into the stream as the materials are processed directly on the water surface.

Turbidity: Local change would occur in water clarity as represented by changes in turbidity. Turbidity could extend beyond the immediate area that is dredged and changes in water clarity are not allowed to extend beyond 300 feet downstream. However, given the past history of placer mining in this stream, fines are expected to be limited in the channel bed, and therefore the turbidity plume is expected to dissipate much sooner than 300 feet downstream. In addition, the turbidity plume would only occur when dredging is occurring. Therefore, the temporal impact is limited to the when the miner is suction dredging.

Substrate: Local changes in channel bed substrate are expected as a result of suction dredging. Dredging would pull sediment from the channel bed, pass it up through a suction hose, and run it across a recovery system (sluice box) floating at the surface. The gravel and other material, which washes through the recovery system, would then be washed back into the stream. Pools would be created where the sediment was pulled from and small dredge tailings piles created where the gravel and other material was deposited. In some cases the gravel and other material would be put back into the pool and in other cases deposited in the channel but not in the pool. These dredge tailings would be mobilized during the spring high flow and redistributed downstream. The changes in substrate at the dredge pool location would be permanent but highly localized.

Channel bed stability: No changes to channel bed stability would occur, even though dredging will create pools because the channel bed is composed of cobbles, sand and gravel. Therefore, no headcutting and bed destabilization is expected to occur.

Summary of Effects

The analysis found that suction dredging would have no impact on 1) stream temperature or 2) channel bed stability for the reasons stated above. Suction dredging would have a local impact on 1) pool frequency and distribution, 2) habitat complexity, 3) turbidity and 4) substrate for the reasons stated above. The changes to pool frequency, habitat complexity and substrate are expected to be permanent but limited to the area worked and therefore would not have a measurable impact on channel complexity or channel stability. Changes in turbidity would impact less than 300 feet of stream and not be permanent but limited to the period of time that the miner is suction dredging.

INFISH: Riparian Management Objective (RMO) Parameters

Pool Frequency: No changes in Pool Frequency would occur as a result of the proposed activities for the following reasons: 1) There would be sediment inputs related to the activities, however, it is expected to flush through the system and not impact pools, 2) no changes to large woody recruitment are expected (see below).

Water Temperature: No changes in Water Temperature would occur because 1) there would be no activity in the channel or on the stream banks which would alter channel width and therefore change flow depths for a given discharge, and 2) no trees are proposed for removal. O'Farrell Gulch had a continuous
water temperature probe monitor hourly stream temperatures in 2007. The seven day average daily max was slightly higher than the INFISH standard for adult holding habitat of 59 degrees Fahrenheit, although it does not have bull trout that require that cold water temperature (see Table 4). It does meet DEQs standard for redband trout of 68 degrees Fahrenheit. Water withdrawals could decrease streamflows and reduce stream depths of the water column downstream in O'Farrell Gulch, however, water temperatures will not be meaningfully impacted and will still continue to meet water temperature standards.

Table 4. Water temperature seven day average daily max with standards and dates for O'Farrell Gulch

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Survey Year</th>
<th>State Standard (based on DEQ map Figure 260A: Fish Use Designations Powder Basin, OR)</th>
<th>7-day moving average max temperature (°F)</th>
<th>Meets or exceeds State Temperature Standard</th>
<th>7-day Maximum temp date</th>
</tr>
</thead>
<tbody>
<tr>
<td>O'Farrell Gulch 1</td>
<td>2007</td>
<td>68</td>
<td>59.52</td>
<td>Meets</td>
<td>7/11/2007</td>
</tr>
</tbody>
</table>

Large Woody Debris: No changes would occur in Large Woody Debris recruitment or existing wood in the stream because 1) no trees are proposed for removal and 2) there would be no activity in the channel to alter existing amounts and distributions.

Substrate Sediment: Potential changes in Substrate Sediment, because there is potential for a surface discharge of sediment from mining activities due to the proximity of work on O’Farrell Gulch. The mining activity with the use of the closed road may also discharge sediment. The other activities in this plan would not have an impact to sediment, because there are no in-channel activities proposed to O’Farrell Gulch.

Bank Stability: No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.

Lower Bank Angle: No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.

Width/Depth ratio: No changes in Width/Depth ratio would occur because there would be 1) no change to Bank Stability and therefore channel widths and 2) no instream activity would occur which could trigger a headcut and alter channel depths.

Wetlands and Floodplains

These proposed activities occur in floodplains and wetlands. The Plan does not have buffers to avoid impacting the active floodplain along O’Farrell Gulch. Therefore, floodplains would not be managed for under Executive Order 11988 through this alternative. Riverine wetlands occur within the planned mining areas. It is unclear if wetlands will be identified and mitigated in a manner that will degrade their wetland values. Therefore, this alternative is not consistent with Executive Orders 11988 (Floodplain Management) or 11990 (Protection of Wetlands).

Reclamation

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.

Other Potential Water Resource Impacts
ALTERNATIVE 3
Water Resources
Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity
Different from Alternative 2. Under Alternative 3, the discharge potential would be eliminated with the addition of the Forest Service RPM (Appendix 1A) which clarifies the buffer distance required at the mine processing site to prevent sediment from reaching the creek. Straw bales will be staked on O'Farrell Gulch at the proposed processing site and mining activity areas to filter fine sediment from being delivered to O'Farrell Gulch.

Ponds
Same as Alternative 2. No potential for a discharge. Water withdrawals would decrease streamflows in O'Farrell Gulch.

Fords
Same as Alternative 2. No changes in the RMOs.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads
Different from Alternative 2. Under Alternative 3, the discharge potential would be eliminated with the addition of the Forest Service GR Z6 (Appendix 2) which clarifies the operator shall be responsible for ensuring that Forest Service road 2200-900 will have a drain ditch on the uphill side of the road constructed from where the small spring enters the road downslope to the existing culvert to prevent sedimentation.

Clean Water Act, Section 303(d) (antidegradation)
McCully Creek is not 303(d) listed.

Suction Dredging
Same as Alternative 2.

INFISH: Riparian Management Objective (RMO) Parameters

     Pool Frequency, water temperature, large woody debris, streambank stability, lower bank angle and width/depth ratio: Same as Alternative 2. No changes in the RMOs.

     Substrate Sediment: Different from Alternative 2. There is no impact to the substrate of O'Farrell Gulch due to addition of RPM's because the sediment would be minimized from the mining activities and road use. These RPMs are similar to best management practices. Other reasons why sediment will not be impacted include no other in-channel activity is proposed.
Wetlands and Floodplains

Different than Alternative 2. These proposed activities occur in floodplains and wetlands. The proposed action under Alternative 3 does have a setback buffer of 25 feet along O’Farrell Gulch. This buffer will protect the active floodplain from being impacted. Three general requirements for working in wetlands and floodplains have been designed to minimize impacts for alternative 3 and exist in appendix 2. These include timing restrictions after these areas have adequately dried out after July 1. If wetland vegetation is approved to be removed, it shall be kept wet and used for reclamation purposes. The third RPM talks about the size, location and most importantly, the function of the wetland will be reclaimed to what exists now. Therefore, this alternative is consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

Reclamation

Same as Alternative 2. No potential for discharge.

Native Spirit

Plan type: Placer
Subwatershed: McCully Creek (HUC 170502030102)
Subwatershed size: 13,347 acres
Analysis area: 2.5 acres
Creek: McCully Fork
303(d) listed: No
Suction Dredging: No
Designated Critical Habitat: No

ALTERNATIVE 2

Water Resources
Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

No potential for discharge. Buffer outlined in mining Plan states the minimum distance to creek edge will be 50 feet. Previous mining activities have created berms separating the mining areas from the McCully Fork.

Ponds

Source water pond

No potential for a discharge via surface or subsurface flow related to use of the large pond as a source pond because only withdrawing water. Wetland plants occupy the location of the source water pond.

Settling ponds

Potential for a discharge through surface flow. Under Alternative 2, there is a potential discharge to McCully Fork due to construction and use of the settling pond, because there is uncertainty of pond’s distance to stream.
Fords

No fords associated with this site. No potential for discharge.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

The miner proposes to use FS closed road 7390-000 and TA mining road 7390-M1A; roads are made of native material with no potential for discharge. Wetland vegetation is present along the road surface for approximately 50 feet that will be driven over to take materials from the mining site to the processing site.

Clean Water Act, Section 303(d) (antidegradation)

McCully Fork is not 303(d) listed.

Suction Dredging

None proposed.

INFISH: Riparian Management Objective (RMO) Parameters

Pool Frequency: No changes in Pool Frequency would occur as a result of the proposed activities for the following reasons: 1) There would be no sediment inputs related to the activities, 2) no changes to large woody recruitment are expected (see below), and 3) no suction dredging is proposed.

Water Temperature: No changes in Water Temperature would occur because 1) there would be no activity in the channel or on the stream banks which would alter channel width and therefore change flow depths for a given discharge, and 2) no trees are proposed for removal.

Table 5 illustrates the 7 day average of the maximum daily stream temperatures for the years with data for McCully Fork. This plan is located just upstream of a water temperature monitoring sites. The available data show that stream temperatures on McCully Fork flowing from the mine site meets DEQ temperature standards for the 2 of the 3 years monitored. Water temperatures do not meet Forest Plan standards for Bull Trout as identified in INFISH (Maximum water temperature below 59°F Fahrenheit within adult holding habitat).

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Survey Year</th>
<th>State Standard (based on DEQ map Figure 260A: Fish Use Designations Powder Basin, OR)</th>
<th>7-day moving average max temperature (F°)</th>
<th>Meets or exceeds State Temperature Standard</th>
<th>7-day Maximum temp date</th>
</tr>
</thead>
<tbody>
<tr>
<td>McCully 1</td>
<td>1998</td>
<td>68</td>
<td>66.8</td>
<td>Meets</td>
<td>8/15/1998</td>
</tr>
<tr>
<td></td>
<td>1999</td>
<td></td>
<td>62.4</td>
<td>Meets</td>
<td>8/2/1999</td>
</tr>
<tr>
<td></td>
<td>2003</td>
<td></td>
<td>68.6</td>
<td>Exceeds</td>
<td>7/24/2003</td>
</tr>
</tbody>
</table>

Large Woody Debris: No changes would occur in Large Woody Debris recruitment or existing wood in the stream because 1) no trees are proposed for removal and 2) there would be no activity in the channel to alter existing amounts and distributions.
Substrate Sediment: No changes in Substrate Sediment because 1) no suction dredging is proposed, 2) no other inchannel activity is proposed, and 3) no potential for a discharge of sediment from mining activities on land.

Bank Stability: No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.

Lower Bank Angle: No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.

Width/Depth ratio: No changes in Width/Depth ratio would occur because there would be 1) no change to Bank Stability and therefore channel widths and 2) no instream activity would occur which could trigger a headcut and alter channel depths.

Wetlands and Floodplains

The national wetland inventory has mapped riverine wetlands adjacent to the project’s activity areas. Berms separate the mining activities from floodplains. Site visits observed a spring complex and adjacent wetland in a portion of the temporary road and within the mining activity area that can’t be avoided. This wetland is approximately 50 feet long by 50 feet wide before the soil moisture goes away and transitions the wetland area back to a dry hillslope. There will be impacts to this spring complex and wetland from road use and mining activity. This plan is not consistent with Executive Order 11990 (Protection of Wetlands), because it’s not clear how the miner intends to reclaim this wetland to ensure no net loss of wetland area or function is lost in McCully Fork. However, the plans specifications are consistent with Executive Order 11988 (Floodplain Management).

Reclamation

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.

ALTERNATIVE 3

Water Resources

Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

Same as Alternative 2.

Ponds

Source water pond

Same as Alternative 2, except this Alternative will use the General Rules for minimizing impacts to Wetlands while working at this site. These include 1) placing equipment in dry areas located outside of wetlands, using these are areas and reclaiming them after July 1st, 2) removing wetland vegetation and stockpiling it for reclamation after mining has been accomplished and 3) reclaiming the wetland at the
source water pond so that the size and function are similar to what now exist. This may lead to short term impacts in wetlands, but there will be no net loss of wetlands after the project has been accomplished.

Settling ponds

Different from Alternative 2. Under Alternative 3, the discharge potential would be eliminated with the addition of the Forest Service RPM (Appendix 1A), buffer distance determined at the mine processing ponds with input from the minerals administrator or district hydrologist.

Fords

Same as Alternative 2. No discharge potential.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

Same as Alternative 2. No discharge potential. The wetland may still be impacted through access use.

Clean Water Act, Section 303(d) (antidegradation)

McCully Fork is not 303(d) listed.

Suction Dredging

None proposed

INFISH: Riparian Management Objectives (RMOs)

Same as Alternative 2. No changes in the RMOs.

Wetlands and Floodplains

Different from Alternative 2. Activities will still occur within wetlands, however they will be mitigated for through implementing GRs and WRPMs. These WRPMs include mining in the wetlands by placing equipment in dry areas located outside of the wetlands, mining and reclaiming them after July 1, reclaiming the meadow by late fall and stockpiling vegetation in ponds or standing water while the area is mined and reclaimed. These mitigation requirements will eliminate long term impacts to the condition of these wetlands within the project area. Alternative 3 would be consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

Reclamation

Same as Alternative 2. No potential for discharge.

Partners

Plan type: Lode and Placer
Subwatershed: Blue Canyon Creek- Powder River (HUC 170502030207)
Subwatershed size: 19,128 acres
Analysis area: 0.7 acres
Creek: Unnamed Creek
303(d) listed: No
Suction Dredging: No
Designated Critical Habitat: No

**ALTERNATIVE 2**

Water Resources
Direct and Indirect Effects

**Clean Water Act, Section 401 (potential for a discharge)**

**Mining Activity**

This site has an ephemeral stream channel that flows through the site seasonally, following snowmelt or thunderstorm runoff. The site has been mined historically with tailing piles and ponds present.

**Lode Mining**

Lode mining would take place underground and material will be hauled to processing plant on private land. Milled waste material is subsequently stockpiled on site. The PoO calls for casting excess materials across the ground, filling in surface holes. There is potential for discharge of heavy metals via surface flows through the stockpiled waste material, because there is no avoidance of spreading waste rock across areas that may undergo saturated conditions annually and could leach heavy metals into the groundwater.

**Placer Mining**

There is a potential for a sediment discharge from placer mining. The placer mining area of interest surrounds the ephemeral stream channel and would be impacted.

**Ponds**

Source water pond

No potential for a discharge via surface or subsurface flow related to use of the pond as a source pond because only withdrawing water.

Settling ponds

Potential for a discharge through surface flow. Under Alternative 2, construction and use of the settling pond could have the potential to discharge sediment into unnamed Creek due to uncertainty of pond’s distance to adjacent stream.

**Fords**

None Proposed

**Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads**

No potential for discharge. The miner proposes to use two existing temporary gated access roads 7220-020 and 7220-021; both composed of native material.

**Clean Water Act, Section 303(d) (antidegradation)**
The project area is approximately 5 miles away from Powder River, the first 303(d) listed stream encountered. Powder River is listed for arsenic. If the waste rock materials from the lode mine is placed near the stream channel, then there is the potential for the project’s activities to degrade the 303(d) listed stream, Powder River for its designation of arsenic.

**Suction Dredging**

None proposed

**INFISH: Riparian Management Objective (RMO) Parameters**

The plan takes place in a category 4 stream. RMOs from INFISH generally apply on 3-6th order streams and not a 1st or 2nd order stream like this riparian area. Therefore, the RMOs do not apply for this plan of operation.

**Wetlands and Floodplains**

Riverine wetlands are mapped through the national wetland indicator. Site visits illustrated that the site was primarily a warm and dry ponderosa pine stand. However, a couple of willows were observed at the bottom of an old mining pond. No activity is proposed in floodplains or wetlands. Therefore, mining actions will be consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

**Reclamation**

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.

**ALTERNATIVE 3**

**Water Resources**

Direct and Indirect Effects

**Clean Water Act, Section 401 (potential for a discharge)**

**Mining Activity**

Different from Alternative 2. Under Alternative 3, the discharge potential would be eliminated with the addition of the Forest Service RPM (Appendix 1A), buffer distance determined at the mine processing ponds with input from the minerals administrator or district hydrologist.

**Lode Mining**

Different than Alternative 2. Under Alternative 3, the discharge potential would be eliminated relative to the lode mining under General Requirement L4 and L5. This general requirement (L4) requires testing of the first run of material to be mined. If testing of the lode material finds the ore can release acidity or other contaminates, then General Requirement (L5) would be triggered. L5 directs the miner to submit a supplemental Plan that provides specifications on how they would prevent heavy metals from entering waters of the state.

If testing comes back with a negative for acidity, these WRPMs will still be followed to ensure later impacts do not occur. Water and snowmelt runoff will not flow through waste rock piles or tailings piles.
Further, tailings and waste rock will be placed a sufficient distance from any nearby surface waters such that no surface discharge from the waste rock will enter a stream channel.

A waste rock disposal site will be designated by the Minerals Administrator, mining permittee and District Hydrologist.

**Placer Mining**

There will be a setback, avoidance area buffer 25 feet away from the ephemeral stream channel to filter sediment and prevent a discharge to the water body.

**Ponds**

Different from Alternative 2. The potential for discharge would be eliminated with the setback buffer. Ponds will be 25 back from the active floodplain.

**Fords**

Same as Alternative 2. No potential for discharge.

**Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads**

Same as Alternative 2. No potential for discharge.

**Clean Water Act, Section 303(d) (antidegradation)**

The project area is approximately 5 miles away from Powder River, the first 303(d) listed stream encountered. No heavy metals are expected to leach from the site downstream through proper management of the waste rock piles. The placement of the waste rock from the lode source will be designated in a dry, convex hillslope.

**Suction Dredging**

None proposed

**INFISH: Riparian Management Objectives (RMOs)**

The plan takes place in a category 4 stream. RMOs from INFISH generally apply on 3-6th order streams and not a 1st or 2nd order stream like this riparian area. Therefore, the RMOs do not apply for this plan of operation.

**Wetlands and Floodplains**

Riverine wetlands are mapped through the national wetland indicator. Site visits illustrated that the site was primarily a warm and dry ponderosa pine stand. However, a couple of willows were observed at the bottom of an old mining pond. No activity is proposed in floodplains or wetlands. Therefore, mining actions will be consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

**Reclamation**

Same as Alternative 2. No potential for discharge.
Other Potential Water Resource Impacts

None

Return Group Placer

Plan type: Placer
Subwatershed: Deer Creek (HUC 170502030105)
Subwatershed size: 21,446 acres
Analysis area: 104.6 acres
Creek Deer Creek
303(d) listed: Yes
Suction Dredging: No
Designated Critical Habitat: Yes

ALTERNATIVE 2

Water Resources
Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

There is a potential for a large sediment discharge through surface flow of sediment into Deer Creek from mining activity along Deer Creek and the portions that overlap the intermittent channel. There are many sites identified to be mined with a 25 foot buffer distance from Deer creek (minimum buffer identified is 25 feet to the stream edge). Portions of the active floodplain are 25-35 feet wide in this valley segment of Deer Creek and this could put mining activities in areas that are right next to landforms that are frequently flooded. Side channels extend across the valley and connect back to Deer Creek. A stormwater runoff plan is missing and does not account for the magnitude of sediment runoff potential from mining in the intermitted channel and its catchment up to its channel head. The areas proposed for mining activities are located in the RHCA areas of a category 1 stream channel and have trees that would be recruited to the stream. The PoO proposes to remove the trees and use them for reclamation purposes. This could impact large wood recruitment, because many of these trees are in an old age class and would take a long time (150 years) for trees to get established that could be recruited to Deer Creek.

Ponds

Source Water Ponds and Settling Ponds

There are two existing ponds currently on the site. No potential for a discharge as a result of pond activities, because the ponds are further away than 100 feet from the Deer Creek. The existing ponds have stable water elevations.

Fords

The Plan of operation identifies that within the mining site there is a degraded ford to cross Deer Creek. Both of the approaches for the crossing have become impacted and washed out by recent floodwaters. Under Alternative 2, the mining activity would use this ford for mining activities and would have the potential to discharge sediment into Deer Creek through surface flow pathways.
Bridges

Proposed temporary bridge

One temporary bridge would be used to access both sides of mine site. This temporary bridge is for vehicles to transport mined materials to processing areas along an existing temporary road. There would be a potential for discharge of sediment via surface flows due to bridge operations of installing, usage (approach and bridge exit), and removal activities under Alternative 2. Sediment could enter Deer Creek from the temporary roads at the bridge location.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

FS Staff has worked with miner to identify 1,523 feet of new road to bypass private land on existing FS road 7240-400, 7240-M1A. The first 1,000 feet is currently highly disturbed from previously logging activities. These occur in upland areas and are approximately 1,000 feet from Deer Creek.

TA 7240-400-M2A is also proposed as a route in the Plan and is currently unusable and the road prism will need to be maintained for equipment access prior to initial mobilization. This road is 500 feet away from the intermittent channel and 1,100 feet from Deer Creek in the upland environment.

The miner proposes to mine existing roadbed of FS road 7240-415 and build new road adjacent to mining site. This road segment is approximately 20 feet away from the intermittent channel and approximately 100 feet away from Deer Creek. There is a potential for a sediment discharge to an intermittent channel with the rerouting of the 7240-415 road.

Clean Water Act, Section 303(d) (antidegradation)

Deer Creek is not 303(d) listed.

Suction Dredging

None proposed.

INFISH: Riparian Management Objective (RMO) Parameters

Pool Frequency: Potential for changes in Pool Frequency would occur as a result of the proposed activities for the following reasons. There may be large pulses of sediment inputs related to the mining activities following snowmelt or thunderstorm runoff that could fill in pools and diminish pool quality and frequency.

Water Temperature: The mining activity areas overlap portions of trees that are providing secondary streamside shade to Elk Creek. The alder and cottonwood community provide the first line of primary shade to Deer Creek and the conifer stands provide the secondary shading functions. However, there are gaps between the cottonwoods and alders where the conifers are important for short segments or to block southwestern aspects where the river and valley trend southwest. The majority of mining impacts would occur to the conifer stands and along the second line of shading. The extent of the impact would occur along 1,800 feet along one side of Deer Creek in the 7 acre unit to the southwest of Deer Creek and about 900 feet along both sides of Deer Creek where two mining activity units straddle the stream. There is about 13 miles of stream (both sides of stream) that are 3rd-6th order streams that could still continue to provide streamside shade to Deer Creek within the public lands portion of Deer Creek’s immediate catchment. There will be an impact to shade and water temperature from the project’s activities, but it will
be localized and not retard attainment of water temperatures at the watershed scale, because of the length of impacts in comparison to the watershed area for streamside shade. Table 6 highlights water temperatures from about 1 mile upstream of the Return Group’s project area, Lake 1 is located by the confluence of Lake and Deer Creek. Lake Creek is managed by DEQ for Bull Trout (7DADM of 53.6° Fahrenheit), whereas Deer Creek is managed by DEQ for redband trout (7DADM of 68° Fahrenheit). Water temperatures will continue to meet DEQ requirements at the site. Water temperatures do not meet Forest Plan standards for Bull Trout (5 out of 7 years did not meet) as identified in INFISH (Maximum water temperature below 59° Fahrenheit within adult holding habitat).

Table 6. Water Temperature seven day average daily max with standards and dates for Lake Creek

<table>
<thead>
<tr>
<th>Site Name</th>
<th>SURVEY YEAR</th>
<th>State Standard (based on DEQ map Figure 260A: Fish Use Designations Powder Basin, OR)</th>
<th>7-day moving average max temperature (F°)</th>
<th>Meets or exceeds State Temperature Standard</th>
<th>7-day Maximum temp date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake 1</td>
<td>1995</td>
<td>53.6</td>
<td>58.0</td>
<td>Exceeds</td>
<td>8/6/1995</td>
</tr>
<tr>
<td></td>
<td>1999</td>
<td></td>
<td>57.3</td>
<td>Exceeds</td>
<td>8/2/1999</td>
</tr>
<tr>
<td></td>
<td>2005</td>
<td></td>
<td>60.2</td>
<td>Exceeds</td>
<td>8/10/2005</td>
</tr>
<tr>
<td></td>
<td>2014</td>
<td></td>
<td>60.2</td>
<td>Exceeds</td>
<td>7/17/2014</td>
</tr>
<tr>
<td></td>
<td>2015</td>
<td></td>
<td>61.0</td>
<td>Exceeds</td>
<td>7/3/2015</td>
</tr>
<tr>
<td></td>
<td>2016</td>
<td></td>
<td>59.3</td>
<td>Exceeds</td>
<td>7/31/2016</td>
</tr>
</tbody>
</table>

Large Woody Debris: Similar to the impacts identified in the water temperature section just above, large woody debris could be impacted along 1,800 feet along one side of Deer Creek in the 7 acre unit to the southwest of Deer Creek and about 900 feet along both sides of Deer Creek where two mining activity units straddle the stream. The miner proposes to remove the trees while mining and place the trees on the reclaimed ground after operations. These trees are likely 120 years old and the impacts will take that long before future recruitment becomes established. However, these impacts are localized to the length of streams being impacted. There is about 13 miles of stream (both sides of stream) that are 3rd-6th order streams that could still continue to provide large woody debris to Deer Creek within the public lands portion of Deer Creek’s immediate catchment. There will be an impact to large wood from the project’s activities, but it will be localized and not retard attainment of large woody debris at the watershed scale, because of the length of impacts in comparison to the watershed area for wood recruitment.

Substrate Sediment: Potential changes in Substrate Sediment due to the mining activities within the intermittent catchment and along Deer Creek. There could be localized erosion and runoff along Deer Creek that could connect mining activities to Deer Creek. The mining activities in the intermittent catchment have the potential to produce a lot of fine sediment that could be a chronic fine sediment source that could inhibit Deer Creek’s biological health, particularly the macroinvertebrate communities and could negatively affect gravel patches present for spawning. Thunderstorm runoff or snowmelt runoff would be the times in which the sediment could be transferred from these areas to being discharged directly to Deer Creek. The FS road 7240-415 could deliver some sediment to Deer Creek during construction activities.

Bank Stability: No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.
Lower Bank Angle: No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.

Width/Depth ratio: No changes in Width/Depth ratio would occur because there would be 1) no change to Bank Stability and therefore channel widths and 2) no instream activity would occur which could trigger a headcut and alter channel depths.

Wetlands and Floodplains

The national wetland inventory has identified riverine wetlands along Deer Creek and along the intermittent catchment within this plan’s area. Site visits indicate that the intermittent catchment is too dry to support wetland plant communities. PoO specifications identify a 25 foot setback from the Deer Creek’s stream edge that will avoid wetlands and active floodplains. Therefore, the PoO is consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

Reclamation

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.

ALTERNATIVE 3

Water Resources

Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

Different from Alternative 2. Under Alternative 3, the discharge potential would be eliminated with the addition of the Forest Service RPM (Appendix 1A) which clarifies the starting point of the buffer width measurement. The RPM clarifies a Plan-specific buffer and an added barrier of straw bales/coils between the activity and the stream. Therefore, there would be sufficient sediment trapping mechanisms in place (ground cover and straw bales/coils) to prevent sediment from reaching the creek. Stormwater runoff from mining in the intermittent drainage catchment would be managed for with the RPM to divert the drainage across the floodplain before flowing back into Deer Creek to filter sediment in ground cover and straw bales/coils. Mining activities under Alternative 3 also would mandate that there will be no removal of shade bearing trees and that overburden would not be put into the riparian zone.

Ponds

Source Water Ponds and Settling Ponds

Under Alternative 3, the settling ponds would need to be pre-identified as a result of the addition of the Forest Service RPM (Appendix 1A). This RPM requires that the ponds be located with input from the Forest Service and protection measures identified and implemented prior to construction and use. Also, water levels must stay at consistent elevation in both the processing and overflow settling ponds and must maintain the existing difference in water surface elevations between ponds to prevent a change in subsurface water elevation through the fill.

Fords
Different than Alternative 2. Under Alternative 3, the discharge potential would be eliminated as a result of the addition of the Forest Service GR (G7; Appendix 2); where “Mining equipment shall cross creeks only at pre-approved sites, as authorized by the District Ranger with FS, and USFWS mitigations, and 2012 BMPs. All fords shall be sloped and armored with rock, based on a site-specific evaluation. Bridges shall be installed so as not to result in continued sediment delivery to the stream, and shall be removed upon final cessation of mining operations.”

Bridges

Different from Alternative 2. Under Alternative 3, the discharge potential would be eliminated with the addition of the Forest Service WRPM (Appendix 1A) which clarifies that the approach where the bridge will be placed will be rocked and that rock will be added as needed at the beginning of each season. The third Fisheries WRPM specifies that this bridge will be preidentified, pre-engineered prior to installation.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

Different than Alternative 2. Under Alternative 3, the discharge potential would be eliminated as a result of the addition of the Forest Service GR (Z1-Z9, Z11; Appendix 2).

Clean Water Act, Section 303(d) (antidegradation)

Deer Creek is not 303(d) listed.

Suction Dredging

None proposed

INFISH: Riparian Management Objective (RMO) Parameters

Pool Frequency: Different from Alternative 2. No changes in Pool Frequency would occur as a result of the proposed activities for the following reasons: 1) meaningful contributions of sediment that could fill in pools would be minimized through the development of RPMs, 2) no changes to large woody recruitment are expected, and 3) no suction dredging is proposed.

Water Temperature: Reduced from Alternative 2. No changes in Water Temperature would occur because 1) there would be no activity in the channel or on the stream banks which would alter channel width and therefore change flow depths for a given discharge, and 2) the trees proposed for removal would undergo a shade analysis and only the trees necessary for mining operations would be removed. If needed to be removed, these stream shade trees would be replanted immediately after the localized area was reclaimed.

Large Woody Debris: Same as Alternative 2.

Substrate Sediment: Different than Alternative 2. No changes in Substrate Sediment because of the RPMs that will be incorporated as part of Alternative 2. The reduction in impacts to sediment are discussed above in the mining activity, fords and road sections. The largest amount of sediment reduction is from managing the stormwater runoff from the intermittent drainage catchment area.

Bank Stability: No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.
Lower Bank Angle: No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.

Width/Depth ratio: Same as Alternative 2.

Wetlands and Floodplains

The national wetland inventory has identified riverine wetlands along Deer Creek and along the intermittent catchment within this plan’s area. Site visits indicate that the intermittent catchment is too dry to support wetland plant communities. PoO specifications identify a 25 foot setback from the Deer Creek’s stream edge that will avoid wetlands and active floodplains. Therefore, the PoO is consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

Reclamation

Same as Alternative 2. No potential for discharge.

Salmon Creek Placers

Plan type: Placer
Subwatershed: Upper Salmon Creek (HUC 170502030401)
Subwatershed size: 16,035 acres
Analysis area: 0.6 acres
Creek: Upper Salmon Creek
303(d) listed: No
Suction Dredging: No
Designated Critical Habitat: No

ALTERNATIVE 2

Water Resources
Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

There is potential for a discharge as a result of mining activity because the area to be mined has flow paths that could connect to Salmon Creek. An old road or mining feature extends from the work site 2 that could deliver sediment from the mining activities directly into Salmon Creek. A small berm of rocks and dirt, or sump partially blocks this flowpath, but likely would not be adequate to filter the sediment from being completely blocked.

Ponds

Source water ponds and settling ponds

No potential for a discharge. There is one existing and one proposed to be constructed. No potential for a discharge as a result of mining activity because the area to be mined is further away than 25 feet from Salmon Creek and will be adequate to disperse any sediment runoff.

Fords
None Proposed

**Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads**

None Proposed

**Clean Water Act, Section 303(d) (antidegradation)**

Upper Salmon Creek is not 303(d) listed.

**Suction Dredging**

None proposed

**INFISH: Riparian Management Objective (RMO) Parameters**

- **Pool Frequency:** No changes in Pool Frequency would occur as a result of the proposed activities for the following reasons: 1) There would be very minimal sediment inputs related to the activities, 2) no changes to large woody recruitment are expected (see below), and 3) no suction dredging is proposed.

- **Water Temperature:** No changes in Water Temperature would occur because 1) there would be no activity in the channel or on the stream banks which would alter channel width and therefore change flow depths for a given discharge, and 2) no trees are proposed for removal.

- **Large Woody Debris:** No changes would occur in Large Woody Debris recruitment or existing wood in the stream because 1) no trees are proposed for removal and 2) there would be no activity in the channel to alter existing amounts and distributions.

- **Substrate Sediment:** No changes in Substrate Sediment because 1) no suction dredging is proposed, 2) no other inchannel activity is proposed, and 3) no potential for a measureably meaningful discharge of sediment from mining activities on land.

- **Bank Stability:** No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.

- **Lower Bank Angle:** No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.

- **Width/Depth ratio:** No changes in Width/Depth ratio would occur because there would be 1) no change to Bank Stability and therefore channel widths and 2) no instream activity would occur which could trigger a headcut and alter channel depths.

**Wetlands and Floodplains**

No activity is proposed in floodplains or wetlands. Therefore, project activities are consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

**Reclamation**

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.
ALTERNATIVE 3

Water Resources
Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity
Different from Alternative 2. No potential for a discharge.

Ponds
Same as Alternative 2. No potential for a discharge.

Fords
Same as Alternative 2. None proposed.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads
Same as Alternative 2. None proposed.

Clean Water Act, Section 303(d) (antidegradation)

Upper Salmon Creek is not 303(d) listed.

Suction Dredging
None proposed

INFISH: Riparian Management Objectives (RMOs)
Same as Alternative 2. No changes in the RMOs.

Wetlands and Floodplains
Same as Alternative 2. No activity is proposed in floodplains or wetlands. Therefore, project activities are consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

Reclamation
Same as Alternative 2. No potential for discharge.

Slow Poke
Plan type: Placer
Subwatershed: McCully Creek (HUC 170502030102)
Subwatershed size: 13,347 acres
Analysis area: 13.5 acres
Creek: Buck Gulch
303(d) listed: No
Suction Dredging: No
Designated Critical Habitat: No

**ALTERNATIVE 2**

Water Resources
Direct and Indirect Effects

**Clean Water Act, Section 401 (potential for a discharge)**

**Mining Activity**

No potential for a discharge. The mining activity sites are approximately 320 feet from Buck Gulch, the nearest perennial channel. The distance and ground cover is adequate to filter any sediment from being discharged into a waterbody.

**Ponds**

Source water ponds and settling ponds

No potential for a discharge. There is one existing and one proposed to be constructed. No potential for a discharge as a result of the ponds because these areas to be mined is further away than 25 feet from McCully Creek.

**Fords**

None Proposed

**Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads**

Potential for a sediment discharge related to use of existing temporary mine-access road 7390-M2A and proposed temporary mine-access road 7390-M2B, because both roads trend to the streams and are composed of a mix of fines and coarser material.

**Clean Water Act, Section 303(d) (antidegradation)**

Buck Gulch is not 303(d) listed.

**Suction Dredging**

None proposed

**INFISH: Riparian Management Objective (RMO) Parameters**

Pool Frequency: No changes in Pool Frequency would occur as a result of the proposed activities for the following reasons: 1) There would be no sediment inputs related to the activities, 2) no changes to large woody recruitment are expected (see below), and 3) no suction dredging is proposed.

Water Temperature: No changes in Water Temperature would occur because 1) there would be no activity in the channel or on the stream banks which would alter channel width and therefore change flow depths for a given discharge, and 2) no trees are proposed for removal.
Large Woody Debris: No changes would occur in Large Woody Debris recruitment or existing wood in the stream because 1) no trees are proposed for removal and 2) there would be no activity in the channel to alter existing amounts and distributions.

Substrate Sediment: No changes in Substrate Sediment because 1) no suction dredging is proposed, 2) no other inchannel activity is proposed, and 3) no potential for a discharge of sediment from mining activities on land. There may be some sediment generated from the road activities, however, it is expected to flush through the system.

Bank Stability: No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.

Lower Bank Angle: No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.

Width/Depth ratio: No changes in Width/Depth ratio would occur because there would be 1) no change to Bank Stability and therefore channel widths and 2) no instream activity would occur which could trigger a headcut and alter channel depths.

Wetlands and Floodplains

No activity is proposed in floodplains or wetlands. Therefore, project activities are consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

Reclamation

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.

**ALTERNATIVE 3**

Water Resources

Direct and Indirect Effects

**Clean Water Act, Section 401 (potential for a discharge)**

Mining Activity

Same as Alternative 2. No potential for discharge.

Ponds

Same as Alternative 2. No potential for discharge.

Fords

Same as Alternative 2. No potential for discharge.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads
Different than Alternative 2. Discharge potential would be eliminated as a result of the addition of a Forest Service WRPM (Appendix 1A) that requires that portions of the roads be rocked to prevent rutting which would funnel water and sediment into Buck Gulch.

**Clean Water Act, Section 303(d) (antidegradation)**

Buck Gulch not 303(d) listed.

**Suction Dredging**

None proposed

**INFISH: Riparian Management Objectives (RMOs)**

Same as Alternative 2. No changes in the RMOs.

**Wetlands and Floodplains**

Same as Alternative 2. No activity proposed in floodplains or wetlands. Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands) do not apply.

**Reclamation**

Same as Alternative 2. No potential for discharge.

**Struggler Lode and Placer**

Plan type: Lode/Placer  
Subwatershed: Blue Canyon Creek- Powder River (HUC 170502030207)  
Subwatershed size: 19,128 acres  
Analysis area: 0.7 acres  
Creek: Project activities occur along three different tributaries: Willow Creek, Unnamed Creek and French Gulch  
303(d) listed: No  
Suction Dredging: No  
Designated Critical Habitat: No

**ALTERNATIVE 2**

Water Resources  
Direct and Indirect Effects

**Clean Water Act, Section 401 (potential for a discharge)**

**Mining Activity**

**Lode Mining**

Lode mining takes place underground and material is processed on site. Milled waste material is subsequently stockpiled on site. Potential for discharge of heavy metals through surface and subsurface flows into the adjacent unnamed tributary from processed mining spoils. There are no mitigations for sampling the rock materials that will be processed for ensuring there will not be any heavy metals exposed.
Placer mining

Proposed PoO does not identify where the placer mining processing site will be located and thus, there is a potential for discharge. Mining activities are an adequate distance from any waterbodies to have not have any impacts. Also, all activities flow into a channel that is bermed and disconnected from downstream waterbodies.

Ponds

Source water pond

No potential for a discharge via surface or subsurface flow related to use of source water pond, because only withdrawing water.

Settling pond

There are two existing ponds currently on the site. No potential for a discharge as a result of mining activity because the area to be mined is further away than 300 feet from the drainage and the area has adequate ground cover to filter sediment from being discharge across the surface.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

The Miner proposes to use Closed FS roads 7225: 200, 210, 217 and temporary access mining road 7225-M1A. The proposed PoO identifies 600 feet of temporary access mining road will need to access the mining site.

Fords

Potential for a sediment discharge through surface runoff associated with the ford stream crossing of French Gulch along the temporary road 7225-M1A.

Clean Water Act, Section 303(d) (antidegradation)

Streams in the general area are not 303(d) listed. Powder River is listed for arsenic and occurs about 6 miles downstream from the Struggler lode and placer mining sites. If the waste rock materials from the lode mine is placed near the stream channel, then there is the potential for the project’s activities to degrade the 303(d) listed stream, Powder River for its designation of arsenic.

Suction Dredging

None proposed

INFISH: Riparian Management Objective (RMO) Parameters

The plan takes place in headwater stream channels. RMOs from INFISH generally apply on 3-6th order streams and not a 1st or 2nd order stream like these areas. Therefore, the RMOs do not apply for this plan of operation.

Wetlands and Floodplains

National wetland inventory identifies riverine wetlands along Willow Creek, overlapping the projects activities, but not for the other sites. Two portals will be mined, but no placer operations will take place in
Willow Creek. Continuous floodplains are not common in these headwater stream reaches. Therefore, the project activities are consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

Reclamation

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.

ALTERNATIVE 3

Water Resources
Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

Lode Mining

Different than Alternative 2. Under Alternative 3, the discharge potential would be eliminated relative to the lode mining under General Requirement L4 and L5. This general requirement (L4) requires testing of the first run of material to be mined. If testing of the lode material finds the ore can release acidity or other contaminants, then General Requirement (L5) would be triggered. L5 directs the miner to submit a supplemental Plan that provides specifications on how they would prevent heavy metals from entering waters of the state.

If testing comes back with a negative for acidity, these WRPMs will still be followed to ensure later impacts do not occur. Water and snowmelt runoff will not flow through waste rock piles or tailings piles. Further, tailings and waste rock will be placed a sufficient distance from any nearby surface waters such that no surface discharge from the waste rock will enter a stream channel.

A waste rock disposal site will be designated by the Minerals Administrator, mining permittee and District Hydrologist.

Placer Mining

Different from Alternative 2. Under Alternative 3, the discharge potential would be eliminated with the addition of the Forest Service GR (Appendix 2) and consultation with FS staff to identify and authorize the mine processing site.

Ponds

Same as Alternative 2. No potential for discharge.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

Same as Alternative 2. No potential for discharge.

Fords
Different from Alternative 2, because of the implementation of watershed resource protection measures (RPMs) and general requirements (GRs) that function similar to best management practices. Under Alternative 3, the discharge potential would be eliminated with the addition WRPMs of the road rocking and properly sloping the road approach on temporary access road 7225-M1A (Z1-Z9, Z11; Appendix 2). This road maintenance action will minimize potential water impacts at the ford crossing and minimize fine sediment inputs to waters of the state from project activities.

**Clean Water Act, Section 303(d) (antidegradation)**

Streams in the general area are not 303(d) listed. Powder River is listed for arsenic and occurs about 6 miles downstream from the Struggler lode and placer mining sites. Alternative 3 would not impact 303(d) listed parameters because of the mitigation measures identified in Appendix 1a and 2, also described in more detail above.

**Suction Dredging**

None proposed

**INFISH: Riparian Management Objectives (RMOs)**

The plan takes place in headwater stream channels. RMOs from INFISH generally apply on 3-6th order streams and not a 1st or 2nd order stream like these areas. Therefore, the RMOs do not apply for this plan of operation.

**Wetlands and Floodplains**

National wetland inventory identifies riverine wetlands along Willow Creek, overlapping the projects activities, but not for the other sites. Two portals will be mined, but no placer operations will take place in Willow Creek. Continuous floodplains are not common in these headwater stream reaches. Therefore, the project activities are consistent with Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

**Reclamation**

Same as Alternative 2. No potential for discharge.

**Tough Luck Charley**

Plan type: Placer  
Subwatershed: Union Creek- Powder River (HUC 170502030401)  
Subwatershed size: 17,606 acres  
Analysis area: 10.7 acres  
Creek: Bridge Creek  
303(d) listed: No  
Suction Dredging: No  
Designated Critical Habitat: No

**ALTERNATIVE 2**

Water Resources  
Direct and Indirect Effects
Clean Water Act, Section 401 (potential for a discharge)

Mining Activity

Potential for discharge through surface flows, because processing site is within 25 foot from Bridge Creek. Potential for discharge from excavation area on hillslope.

Ponds

Source water pond

No potential for a discharge via surface or subsurface flow related to use of the source water pond because only withdrawing water.

Settling ponds

Potential for discharge of sediment through surface flow from construction and use of the settling pond into Bridge Creek.

Fords

FS decommissioned road 7240-E1A has a ford that crosses Bridge Creek. A site visit confirms that the Road is functional, however, the ford is not. Under Alternative 2, mining use of the road has the potential to discharge sediment into Bridge Creek through surface flow.

FS Temporary Access road 7240-E1B has a proposed ford to cross Bridge Creek. Under Alternative 2, mining use of the road has the potential to discharge sediment into Bridge Creek through surface flow.

FS Temporary Access road 7240-E1C has a ford that crosses Bridge Creek. A site visit confirms that although the Road is functional, the ford is not. Under Alternative 2, mining use of the road has the potential to discharge sediment into Bridge Creek via surface flow.

Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads

The proposed Plan of Operation outlines the use of FS decommissioned road 7240-E1A and FS Temporary Access roads 7240-E1B and E1C.

Clean Water Act, Section 303(d) (antidegradation)

Bridge Creek is not 303(d) listed.

Suction Dredging

None proposed

INFISH: Riparian Management Objective (RMO) Parameters

Pool Frequency: Potential changes in Pool Frequency would occur as a result of the proposed activities influencing sedimentation for the following reasons: 1) mining activities of excavation and processing site are located within the sediment transport buffer zone of Bridge Creek, 2) specifications on the road fords does not include best management practices for controlling sediment at these locations, and 3) the construction and use of the settling ponds has the potential to deliver sediment to Bridge Creek.
The fine sediment generated from the PoO under Alternative 2 has the potential to fill in pools and decrease the quality of pools downstream of the site.

Water Temperature: No changes in Water Temperature would occur because 1) there would be no activity in the channel or on the stream banks which would alter channel width and therefore change flow depths for a given discharge, and 2) no trees are proposed for removal.

Large Woody Debris: No changes would occur in Large Woody Debris recruitment or existing wood in the stream because 1) no trees are proposed for removal and 2) there would be no activity in the channel to alter existing amounts and distributions.

Substrate Sediment: Potential changes in Substrate Sediment because 1) mining activities of excavation and processing site are located within the sediment transport buffer zone of Bridge Creek, 2) specifications on the road fords does not include best management practices for controlling sediment at these locations, and 3) the construction and use of the settling ponds has the potential to deliver sediment to Bridge Creek. The fine sediment generated from the PoO under Alternative 2 has the potential to settle on the streambed and negatively influence water quality, macroinvertebrate health and could impact redband spawning areas downstream of the PoO.

Bank Stability: No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.

Lower Bank Angle: No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.

Width/Depth ratio: No changes in Width/Depth ratio would occur because there would be 1) no change to Bank Stability and therefore channel widths and 2) no instream activity would occur which could trigger a headcut and alter channel depths.

Wetlands and Floodplains

Riverine wetlands are present within the areas identified for mining. No activity is proposed directly in these floodplains or wetlands zones. Therefore, Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands) would be managed for under this PoO.

Reclamation

There is no potential for a discharge because the Plan had sufficient water resource protection measures outlined to prevent a discharge of sediment for both Interim and final reclamation activities.

Other Potential Water Resource Impacts

None

ALTERNATIVE 3

Water Resources
Direct and Indirect Effects

Clean Water Act, Section 401 (potential for a discharge)
**Mining Activity**

Different from Alternative 2. Under Alternative 3, the discharge potential would be eliminated with the addition of the Forest Service WRPMs to 1) setback mining activities from Bridge Creek from the edge of terrace by 25 feet with an avoidance area, 2) place straw bales or waddles between the proposed processing site and Bridge creek, 3) consult with FS staff to identify and authorize location of the mine processing and settling ponds for the site. These mitigation measures would provide for a filter strip of no activities between Bridge Creek and the mining activity areas.

**Ponds**

Source water pond

Same as Alternative 2. No potential for discharge.

**Settling ponds**

Different from Alternative 2. Under Alternative 3, the discharge potential would be eliminated with the addition of the Forest Service WRPMs to place straw bales or waddles between the proposed processing site and Bridge creek and consult with FS staff to identify and authorize location of the mine processing and settling ponds for the site.

**Fords**

Different than Alternative 2. Under Alternative 3, the discharge potential would be eliminated as a result of the addition of the Forest Service GR (G7; Appendix 2); where “Mining equipment shall cross creeks only at pre-approved sites, as authorized by the District Ranger with FS, NMFS and USFWS mitigations, and 2012 BMPs. All fords shall be sloped and armored with rock, based on a site-specific evaluation.”

**Use of Forest Service Closed and Decommissioned Roads and Creation and/or Use of Temporary Access Roads**

Same as Alternative 2. No potential for discharge.

**Clean Water Act, Section 303(d) (antidegradation)**

Bridge Creek is not 303(d) listed.

**Suction Dredging**

None proposed

**INFISH: Riparian Management Objectives (RMOs)**

Pool Frequency: Change from Alternative 2. Impacts in Pool Frequency would not occur as a result of the proposed activities for the following reasons: 1) There would be no sediment inputs related to the activities, 2) no changes to large woody recruitment are expected (see below), and 3) no suction dredging is proposed. The RPMs associated with alternative 3 would increase the filtering function of sediment to prevent a discharge to Bridge Creek. These RPMs are to increase the buffer distance of an avoidance area between the active floodplain edge and work activities. This buffer along with placement of straw bales and waddles between the proposed processing site and the active floodplain will ensure no transfer of sediment will occur. The 25 foot set back and the monitoring requirements for daily sediment
upstream and downstream of the mining sites will ensure sediment inputs are limited and pools will not fill in.

Water Temperature: No changes in Water Temperature would occur because 1) there would be no activity in the channel or on the stream banks which would alter channel width and therefore change flow depths for a given discharge, and 2) no trees are proposed for removal.

Large Woody Debris: No changes would occur in Large Woody Debris recruitment or existing wood in the stream because 1) no trees are proposed for removal and 2) there would be no activity in the channel to alter existing amounts and distributions.

Substrate Sediment: Change from Alternative 2. Impacts in Substrate Sediment would not occur because of the implementation of the RPMs that are discussed above in the Pool Frequency section. Incorporating the RPMs is analogous to the use of Best Management Practices for minimizing sediment impacts from being delivered to waters of the state and/or US. Other reasons why sediment will not be impacted include no other in-channel activity, or activity within the sediment transport zone are proposed.

Bank Stability: No changes in Bank Stability would occur because 1) no activity would occur on the stream banks and 2) there would be no removal of stream bank vegetation which provides bank stability and resistance to instream erosion.

Lower Bank Angle: No changes in Lower Bank Angle would occur for the same reasons listed under Bank Stability.

Width/Depth ratio: No changes in Width/Depth ratio would occur because there would be 1) no change to Bank Stability and therefore channel widths and 2) no instream activity would occur which could trigger a headcut and alter channel depths.

Wetlands and Floodplains

Riverine wetlands are present within the areas identified for mining. No activity is proposed directly in these floodplains or wetlands zones. Therefore, Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands) would be managed for under this PoO.

Reclamation

Same as Alternative 2. No potential for discharge.
### Table 7. Summarized Plan by Plan Discharge Findings (sorted by Plan)

<table>
<thead>
<tr>
<th>Plan</th>
<th>Type of Mining</th>
<th>Subwatershed</th>
<th>Stream</th>
<th>Discharge Potential</th>
<th>Pollutant</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC Placer</td>
<td>Placer</td>
<td>Cracker Creek</td>
<td>Cracker Creek</td>
<td>Potential discharge of sediment through surface and subsurface flow related to mining activity. Also, potential of increased instream temperatures due to potential subsurface flow reversal from excavation activities.</td>
<td>None, because the discharge potential would be controlled and reduced for sediment and water temperature as a result of the addition of FS general requirements (Appendix 2) and plan-specific protection measures (Appendix 1A).</td>
</tr>
<tr>
<td>Amigo</td>
<td>Placer</td>
<td>Elk Creek</td>
<td>Tributary to Wilson Creek</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Anchor</td>
<td>Placer</td>
<td>Elk Creek</td>
<td>Elk Creek</td>
<td>Potential discharge of sediment through surface flow related to mining activity in Site 1 and 3.</td>
<td>None, because the discharge potential would be controlled and reduced for sediment as a result of the addition of FS general requirements (Appendix 2) and plan-specific protection measures (Appendix 1A).</td>
</tr>
<tr>
<td>Bald Mountain</td>
<td>Lode</td>
<td>McCully Creek</td>
<td>McCully Fork</td>
<td>Potential discharge of heavy metals through subsurface flows from unlined settling ponds to McCully Fork.</td>
<td>None, because the discharge potential would be controlled and reduced for sediment as a result of the addition of FS general requirements (Appendix 2) and plan-specific protection measures (Appendix 1A).</td>
</tr>
<tr>
<td>Barbara Lode</td>
<td>Lode</td>
<td>Deer Creek</td>
<td>Lake Creek</td>
<td>Potential discharge of heavy metals and sediment through surface flows from milled waste materials that are stockpiled on site to Lake Creek.</td>
<td>None, because the discharge potential would be controlled and reduced for sediment and heavy metals as a result of the addition of FS general requirements (Appendix 2) and plan-specific protection measures (Appendix 1A).</td>
</tr>
<tr>
<td>Plan</td>
<td>Type of Mining</td>
<td>Subwatershed</td>
<td>Stream</td>
<td>Discharge Potential</td>
<td>Pollutant</td>
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</tr>
<tr>
<td>Blue Jay, David 1 and High Bar</td>
<td>Suction and Placer</td>
<td>Cracker Creek</td>
<td>Cracker Creek</td>
<td>Potential discharge of sediment through surface and subsurface flow related to mining activity in proximity to Cracker Creek. Settling pond has the potential to discharge sediment from surface or subsurface. Potential for sediment discharge to Cracker Creek from ford road crossings. Potential for flow reversal at settling pond. Also, potential of increased instream temperatures due to potential flow reversal and water temperature impacts from water withdrawals.</td>
<td>Sediment, water temperature, Water temperature</td>
</tr>
<tr>
<td>Buster 1 and Buster 3</td>
<td>Placer</td>
<td>Blue Canyon Creek - Powder River</td>
<td>Unnamed Creek</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>California Gulch</td>
<td>Placer</td>
<td>Lake Creek - Powder River</td>
<td>California Gulch</td>
<td>Potential discharge of sediment through surface flow related to ATV bridge installation, use and removal in proximity to California Gulch.</td>
<td>None, because the discharge potential would be controlled and reduced for sediment and water temperature as a result of the addition of FS general requirements (Appendix 2) and plan-specific protection measures (Appendix 1A).</td>
</tr>
<tr>
<td>Dead Horse</td>
<td>Placer</td>
<td>McCully Creek</td>
<td>Buck Gulch</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Plan</td>
<td>Type of Mining</td>
<td>Subwatershed</td>
<td>Stream</td>
<td>Discharge Potential</td>
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</tr>
<tr>
<td>Fine Gold</td>
<td>Suction and Placer</td>
<td>Cracker Creek</td>
<td>Cracker Creek</td>
<td>Potential discharge of sediment through surface and subsurface flow related to the excavation mining activity. Potential of a sediment discharge through the use of the pond. Potential of a sediment discharge through the use of a two temporary access roads within proximity to Cracker Creek. Ponds have the potential for flow reversal. Also, potential of increased instream temperatures due to potential for flow reversal and water withdrawals decreasing stream depths downstream. Decreased for water temperature, but the potential for a discharge pollutant due to water withdrawals. The water withdrawal impacts to stream temperature will be reduced through RPMs of ceasing water withdrawals if the stream goes dry or by limiting water withdrawals to August 15th. A discharge of sediment will not be eliminated through addition of buffer setbacks from the active floodplain, but will be eliminated by placing straw bales/coils along the low berm on portion of valley with pond and temporary road. Mining areas proposed occur adjacent to Cracker Creek on slopes ranging from 1% up to 90%, with the majority around 60% would still have the potential for a discharge to Cracker Creek.</td>
<td></td>
</tr>
<tr>
<td>J &amp; J Placer</td>
<td>Suction and Placer</td>
<td>Blue Canyon Creek - Powder River</td>
<td>Unnamed Creek</td>
<td>Potential discharge of sediment through surface flow related to the mining activity in Site 3. Potential of a sediment discharge through the use of a FS road 7225-020 at the ford crossing. None, because the discharge potential would be controlled and reduced for sediment as a result of the addition of FS general requirements (Appendix 2) and plan-specific protection measures (Appendix 1A).</td>
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<td></td>
<td>Pollutant</td>
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<td>Alternative 2</td>
<td>Alternative 3</td>
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<td></td>
<td>Sediment</td>
<td>water temperature</td>
</tr>
<tr>
<td>Plan</td>
<td>Type of Mining</td>
<td>Subwatershed</td>
<td>Stream</td>
<td>Discharge Potential</td>
<td>Pollutant</td>
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<tr>
<td>Medic Placer</td>
<td>Suction and Placer</td>
<td>McCully Creek</td>
<td>Placer: O'Farrell Gulch; Suction Dredge: McCully Fork</td>
<td>Potential discharge of sediment through surface flow related to mining activity in proximity to O'Farrell Gulch. Potential of a sediment discharge through the use of a closed road, due to a spring draining onto the road.</td>
<td>Sediment</td>
</tr>
<tr>
<td>Native Spirit Placer</td>
<td>Placer</td>
<td>McCully Creek</td>
<td>McCully Fork</td>
<td>Potential discharge of sediment through surface flow related to not knowing where the settling pond will be located.</td>
<td>None, because the discharge potential would be controlled and reduced for sediment as a result of the addition of FS general requirements (Appendix 2) and plan-specific protection measures (Appendix 1A).</td>
</tr>
<tr>
<td>Pardners</td>
<td>Lode and Placer</td>
<td>Blue Canyon Creek - Powder River</td>
<td>Unnamed Creek</td>
<td>Potential discharge of heavy metals into groundwater from casting waste rock across the ground and filling in holes. Potential for discharge of sediment into unnamed creek from the mining activity area and from the uncertainty of pond's location from creek.</td>
<td>None, because the discharge potential would be controlled and reduced for sediment and heavy metals as a result of the addition of FS general requirements (Appendix 2) and plan-specific protection measures (Appendix 1A).</td>
</tr>
<tr>
<td>Return Group Placer</td>
<td>Placer</td>
<td>Deer Creek</td>
<td>Deer Creek</td>
<td>Potential discharge of sediment through surface flow related to proximity of 1) mining activity along Deer Creek and in intermittent catchment, 2) ford and bridge crossings, and 3) 7240-415 road relocation.</td>
<td>None, because the discharge potential would be controlled and reduced for sediment as a result of the addition of FS general requirements (Appendix 2) and plan-specific protection measures (Appendix 1A).</td>
</tr>
<tr>
<td>Salmon Creek Placer</td>
<td>Placer</td>
<td>Upper Salmon Creek</td>
<td>Upper Salmon Creek</td>
<td>Potential discharge of sediment through surface flow related to mining activity at site 2.</td>
<td>None, because the discharge potential would be controlled and reduced for sediment as a result of the addition of FS general requirements (Appendix 2) and plan-specific protection measures (Appendix 1A).</td>
</tr>
<tr>
<td>Plan</td>
<td>Type of Mining</td>
<td>Subwatershed</td>
<td>Stream</td>
<td>Discharge Potential</td>
<td>Pollutant</td>
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<tr>
<td>Slow Poke</td>
<td>Placer</td>
<td>McCully Creek</td>
<td>Buck Gulch</td>
<td>Potential discharge of sediment through the use of an existing and proposed temporary road. None, because the discharge potential would be controlled and reduced for sediment as a result of the addition of FS general requirements (Appendix 2) and plan-specific protection measures (Appendix 1A).</td>
<td>Sediment, None</td>
</tr>
<tr>
<td>Struggler</td>
<td>Lode and Placer</td>
<td>Blue Canyon Creek - Powder River</td>
<td>Unnamed Creek, French Gulch, Willow Creek</td>
<td>Potential discharge of heavy metals through surface and subsurface flows from processed mining spoils. Potential discharge of sediment from not identifying where the mining processing site is located with proximity to streams. Potential for a sediment discharge through surface runoff associated with the ford stream crossing on temporary access road 7225-M1A. None, because the discharge potential would be controlled and reduced for sediment and heavy metals as a result of the addition of FS general requirements (Appendix 2) and plan-specific protection measures (Appendix 1A).</td>
<td>Heavy Metals, sediment, None</td>
</tr>
<tr>
<td>Tough Luck Charley</td>
<td>Placer</td>
<td>Union Creek - Powder River</td>
<td>Bridge Creek</td>
<td>Potential discharge of sediment through surface flow related to proximity of 1) processing site and Bridge Creek, 2) mining activity areas with excavation of hillslopes adjacent to Bridge Creek and 3) construction and use of the settling pond to Bridge Creek. None, because the discharge potential would be controlled and reduced for sediment as a result of the addition of FS general requirements (Appendix 2) and plan-specific protection measures (Appendix 1A).</td>
<td>Sediment, None</td>
</tr>
<tr>
<td>Plan</td>
<td>Stream</td>
<td>RMO affected</td>
<td>Alternative 2</td>
<td>Alternative 3</td>
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<tr>
<td>AC Placer</td>
<td>Cracker Creek</td>
<td>Pool frequency, water temperature and substrate</td>
<td>Placer Mining: Potential for overburden entering into stream changing the characteristics of pools and the substrate of the streambed. Water temperature increases from excavation below streambed and groundwater flow reversal. Different than Alt 2. Potential for changes would be eliminated through implementation of general requirements and resource protection measures.</td>
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<tr>
<td>Blue Jay, David 1, High Bar</td>
<td>Cracker Creek</td>
<td>Water temperature</td>
<td>Placer Mining: Potential changes to water temperatures increases from water withdrawals for minerals processing or from excavation below streambed and groundwater flow reversal. Suction Dredging: No change to RMO. Different than Alt 2. Potential for changes would be reduced through implementation of general requirements and resource protection measures. However, there is still a temporal impact to water temperatures from water withdrawals up to August 15th for the life of the operating period.</td>
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<tr>
<td>Fine Gold</td>
<td>Cracker Creek</td>
<td>Pool Frequency, water temperature and substrate</td>
<td>Placer Mining: Potential for sediment from mining activities, the use of pond and two temporary access roads could change the characteristics of pools and the substrate of the streambed. Water temperature increases from excavation below streambed and groundwater flow reversal. Suction Dredging: No change to RMO. Different than Alt 2. Potential for sediment would still occur from mining activities and could still impact pool frequency, because the buffer will not be adequate due to slope steepness. However, changes to use of pond and temporary access roads would be reduced through implementation of general requirements and resource protection measures. However, there is still a temporal impact to water temperatures from water withdrawals up to August 15th for the life of the operating period.</td>
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<tr>
<td>Medic Placer</td>
<td>Placer: O'Farrell Gulch; Suction Dredge: McCully Fork</td>
<td>Substrate</td>
<td>Placer Mining: Potential for sediment from excavation within proximity to O'Farrell Gulch and road runoff and deliver to O'Farrell Gulch could change the characteristics of substrate of the streambed. Suction Dredging: No change to RMO. Different than Alt 2. Potential for changes would be eliminated through implementation of general requirements and resource protection measures.</td>
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<tr>
<td>Slow Poke</td>
<td>Buck Gulch</td>
<td>None</td>
<td>None</td>
<td>None</td>
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<tr>
<td>Dead Horse</td>
<td>Buck Gulch</td>
<td>None</td>
<td>None</td>
<td>None</td>
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</tr>
<tr>
<td>Native Spirit</td>
<td>McCully Fork</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td></td>
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<tr>
<td>Plan</td>
<td>Stream</td>
<td>RMO affected</td>
<td>Alternative 2</td>
<td>Alternative 3</td>
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<tr>
<td>Tough Luck Charley</td>
<td>Bridge Creek</td>
<td>Pool frequency, substrate</td>
<td>Placer Mining: Potential for sediment impacts from excavation and processing site within proximity to Bridge Creek, the use of four fords for mining activities, and through construction and use of the settling ponds. These activities within proximity to perennial waterbodies has the potential to deliver fine sediment to Bridge Creek and could change the characteristics of substrate of the streambed and could fill in pools and decrease their ability to provide aquatic habitat.</td>
<td>Different than Alt 2. Potential for changes would be eliminated through implementation of general requirements and resource protection measures.</td>
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<tr>
<td>California Gulch</td>
<td>California Gulch</td>
<td>None</td>
<td>None</td>
<td>None</td>
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<tr>
<td>Pardners</td>
<td>Unnamed Creek</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td></td>
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<tr>
<td>Buster 1 and Buster 3</td>
<td>Unnamed Creek</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>J &amp; J Placer</td>
<td>Unnamed Creek</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Struggler</td>
<td>Unnamed Creek, French Gulch, Willow Creek</td>
<td>None</td>
<td>None</td>
<td>None</td>
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</tr>
<tr>
<td>Anchor</td>
<td>Elk Creek</td>
<td>Pool frequency, substrate</td>
<td>Placer Mining: Potential for sediment impacts from mining activities in Sites 1 and 3 within proximity to Elk and Wilson Creeks. These activities within proximity to perennial waterbodies has the potential to deliver fine sediment to Elk and Wilson Creeks and could change the characteristics of substrate of the streambed and could fill in pools and decrease their ability to provide aquatic habitat.</td>
<td>Different than Alt 2. Potential for changes would be eliminated through implementation of general requirements and resource protection measures.</td>
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</tr>
<tr>
<td>Amigo</td>
<td>Unnamed Creek</td>
<td>None</td>
<td>None</td>
<td>None</td>
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<tr>
<td>Salmon Creek</td>
<td>Upper Salmon Creek</td>
<td>None</td>
<td>None</td>
<td>None</td>
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</tr>
<tr>
<td>Barbara Lode</td>
<td>Lake Creek</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Bald Mountain Ponds</td>
<td>McCully Fork</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td></td>
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<tr>
<td>Plan</td>
<td>Stream</td>
<td>RMO affected</td>
<td>Alternative 2</td>
<td>Alternative 3</td>
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<tr>
<td>Return Group</td>
<td>Deer Creek</td>
<td>Pool frequency and substrate</td>
<td>Placer Mining: Potential for sediment impacts from mining activities within proximity to Deer Creek (particularly the intermittent channel), the use of the fords for mining activities, and through relocating a road in proximity to Deer Creek. These activities within proximity to Deer Creek has the potential to deliver fine sediment to the Creek and could change the characteristics of substrate of the streambed and could fill in pools and decrease their ability to provide aquatic habitat.</td>
<td>Different than Alt 2. Potential for changes would be eliminated through implementation of general requirements and resource protection measures.</td>
<td></td>
</tr>
</tbody>
</table>
Table 9. Floodplain/Wetland Impacts by Plan

<table>
<thead>
<tr>
<th>Plan</th>
<th>Wetlands or Floodplains</th>
<th>Alternative 2</th>
<th>Alternative 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC Placer</td>
<td>Floodplains</td>
<td>Placer Mining: Potential changes to ability of floodplains to function through placing overburden along floodplain areas. Not consistent with Executive Order for Floodplains, but is consistent with wetlands.</td>
<td>Different than Alt 2. Potential for changes would be eliminated through implementation of general requirements and resource protection measures. Consistent with the Executive Orders.</td>
</tr>
<tr>
<td>Blue Jay,</td>
<td>Floodplains</td>
<td>Placer Mining: Potential changes to ability of floodplains to function through placing overburden along floodplain areas. Not consistent with Executive Order for Floodplains, but is consistent with wetlands.</td>
<td>Different than Alt 2. Potential for changes would be eliminated through implementation of general requirements and resource protection measures. Consistent with the Executive Orders.</td>
</tr>
<tr>
<td>David 1, High</td>
<td></td>
<td>Suction Dredging: No impact to floodplains or wetlands.</td>
<td></td>
</tr>
<tr>
<td>Bar</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Fine Gold</td>
<td>Floodplains</td>
<td>Placer Mining: Potential changes to ability of floodplains to function through not avoiding the active floodplain areas. Not consistent with Executive Order for Floodplains, but is consistent with wetlands.</td>
<td>Different than Alt 2. Potential for changes would be eliminated through implementation of general requirements and resource protection measures. Consistent with the Executive Orders.</td>
</tr>
<tr>
<td>Medic Placer</td>
<td>Impacts to both</td>
<td>Placer Mining: Potential changes to ability of floodplains to function through not avoiding the active floodplain areas along O’Farrell Gulch. Not consistent with Executive Order for Floodplains or wetlands.</td>
<td>Different than Alt 2. Potential for changes would be eliminated through implementation of general requirements and resource protection measures. Consistent with the Executive Orders.</td>
</tr>
<tr>
<td>Slow Poke</td>
<td>No activities proposed</td>
<td>Project is consistent with the Executive Orders.</td>
<td>Same as Alternative 2.</td>
</tr>
<tr>
<td></td>
<td>near either</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dead Horse</td>
<td>Wetlands</td>
<td>Placer Mining: Potential changes to springs and wetland vegetation from mining activities.</td>
<td>Different than Alt 2. Potential for changes would be eliminated through implementation of general requirements and resource protection measures. Consistent with the Executive Orders.</td>
</tr>
<tr>
<td>Native Spirit</td>
<td>Wetlands</td>
<td>Placer Mining: Potential changes to springs and wetland vegetation from mining activities.</td>
<td>Different than Alt 2. Potential for changes would be reduced (short term impact for about 10 years) through implementation of general requirements and resource protection measures. Consistent with the Executive Orders.</td>
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</tr>
<tr>
<td>Tough Luck Charley</td>
<td>No activities proposed near either</td>
<td>Project is consistent with the Executive Orders.</td>
<td>Same as Alternative 2.</td>
</tr>
<tr>
<td>California Gulch</td>
<td>No activities proposed near either</td>
<td>Project is consistent with the Executive Orders.</td>
<td>Same as Alternative 2.</td>
</tr>
<tr>
<td>Pardners</td>
<td>No activities proposed near either</td>
<td>Project is consistent with the Executive Orders.</td>
<td>Same as Alternative 2.</td>
</tr>
<tr>
<td>Buster 1 and Buster 3</td>
<td>No activities proposed near either</td>
<td>Project is consistent with the Executive Orders.</td>
<td>Same as Alternative 2.</td>
</tr>
<tr>
<td>J &amp; J</td>
<td>Wetlands</td>
<td>Placer Mining: Potential changes to wetland vegetation from mining activities.</td>
<td>Different than Alt 2. Potential for changes would be eliminated through implementation of general requirements and resource protection measures. Consistent with the Executive Orders.</td>
</tr>
<tr>
<td>Struggler</td>
<td>Lode mining activities take place near wetlands on Willow Creek, but no impacts.</td>
<td>Project is consistent with the Executive Orders.</td>
<td>Same as Alternative 2.</td>
</tr>
<tr>
<td>Anchor</td>
<td>No activities proposed near either</td>
<td>Project is consistent with the Executive Orders.</td>
<td>Same as Alternative 2.</td>
</tr>
<tr>
<td>Amigo</td>
<td>No activities proposed near either</td>
<td>Project is consistent with the Executive Orders.</td>
<td>Same as Alternative 2.</td>
</tr>
<tr>
<td>Salmon Creek</td>
<td>No activities proposed near either</td>
<td>Project is consistent with the Executive Orders.</td>
<td>Same as Alternative 2.</td>
</tr>
<tr>
<td>Barbara Lode</td>
<td>No activities proposed near either</td>
<td>Project is consistent with the Executive Orders.</td>
<td>Same as Alternative 2.</td>
</tr>
<tr>
<td>Bald Mountain Ponds</td>
<td>Wetlands</td>
<td>Lode Mining: Potential changes to wetland vegetation from mining activities.</td>
<td>Different than Alt 2. Potential for changes would be eliminated through implementation of general requirements and resource protection measures. Consistent with the Executive Orders.</td>
</tr>
<tr>
<td>Return Group</td>
<td>No activities proposed near either</td>
<td>Placer Mining: Potential changes to wetland vegetation from mining activities. Stormwater runoff from mining intermittent drainage could runoff to wetland along margins of Deer Creek.</td>
<td>Different than Alt 2. Potential for changes would be eliminated through implementation of general requirements and resource protection measures. Consistent with the Executive Orders.</td>
</tr>
<tr>
<td>Plan</td>
<td>SWS Name</td>
<td>Cumulative Effects</td>
<td>Alternative 2</td>
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<tr>
<td>AC Placer</td>
<td>Cracker Creek</td>
<td>NO cumulative effects to water resources, despite there being potential for a discharge of sediment (direct effect), for the following three reasons. First, the portion of stream potentially impacted by a discharge of sediment would not overlap in time AND space impacts to water quality related to past harvest, mining, grazing, or road building activities. Impacts as a result of these past activities have since stabilized and are no longer contributing new sediment. Second, the portion of stream potentially impacted does not overlap in time AND space impacts from present day activities because there is no current grazing, other mining, logging, road building, or the invasive treatments ongoing in this area. Finally, there are no reasonably foreseeable activities proposed in this area that might alter water quality. Water temperatures may be impacted by flow reversal from excavated mining activities. Ongoing actions of water withdrawals for irrigation and municipal drinking water overlap in time AND space and occur 0.4 miles upstream and 0.8 miles downstream, respectively. The irrigation diversions may be additive to the water temperature impacts of flow reversal. However, the water temperature impact of flow reversal will be short lived and would last until the storage capacity is filled. The reasonably foreseeable mining operation is David #1 which is located about 1 mile upstream of AC Placer. Therefore, there would be no overlap in time AND space because the distance between the areas proposed for activity are much greater (1 mile) than the length of the potential water quality impact (&lt; 300 feet at most).</td>
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<td></td>
<td></td>
<td>NO cumulative effect but for a different reason than Alternative 2. The addition of FS RPMs eliminates the potential for a discharge of sediment and water temperature. Therefore, no direct/indirect effects under this alternative.</td>
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</tr>
<tr>
<td>Amigo</td>
<td>Elk Creek</td>
<td>No cumulative effects to water resources. There would be no direct or indirect effects from Amigo. Therefore, there would be no cumulative effects to water resources.</td>
<td>Same as Alternative 2.</td>
</tr>
<tr>
<td>Anchor #1, Old Crow, Peerless</td>
<td>Elk Creek</td>
<td>NO cumulative effects to water resources, despite there being potential for a discharge of sediment (direct effect), for the following reason. First, the portion of stream potentially impacted by a discharge of sediment would not overlap in time AND space impacts to water quality related to past harvest, mining, grazing, or road building activities. Impacts as a result of these past activities have since stabilized and are no longer contributing new sediment. Second, the portion of stream potentially impacted does not overlap in time AND space impacts from present day activities because there is no other mining, logging, road building, or the invasive treatments ongoing in this area. This Plan does overlap in time AND space impacts from present day activities of grazing in the Elk Creek Pasture in the Blue Canyon Allotment, however, grazing will not deliver sediment since Forest Plan utilization standards will be met. Finally,</td>
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<td>NO cumulative effect but for a different reason than Alternative 2. The addition of FS RPMs eliminates the potential for a discharge. Therefore, no direct/indirect effects under this alternative.</td>
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<tr>
<td>Plan</td>
<td>SWS Name</td>
<td>Cumulative Effects</td>
<td>Alternative 3</td>
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<td><strong>Alternative 2</strong></td>
<td><strong>Alternative 3</strong></td>
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<td>there are no reasonably foreseeable activities proposed in this area that might alter water quality.</td>
<td>Different than Alt. 2. NO cumulative effect as a result of the addition of FS General Requirement L5 (Appendix 2). This requirement would eliminate the potential for a discharge of heavy metals and therefore no direct/indirect effects related to this potential impact.</td>
</tr>
<tr>
<td></td>
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<td><strong>POTENTIAL for a cumulative effect related a discharge of heavy metals into McCully Fork, because the old lode tailings and Adit waters have tested high for heavy metals. As groundwater enters these old lode tailings and moves into McCully Fork, it carries with it heavy metals in solution. Therefore, additional heavy metals would overlap in time AND space with heavy metals currently entering McCully Fork from past mining activities.</strong></td>
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<tr>
<td>Bald Mt.</td>
<td>McCully Creek</td>
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<td>Different than Alt. 2. NO cumulative effect as a result of the addition of FS General Requirement L5 (Appendix 2) and WRPMs (Appendix 1A). L5 would eliminate the potential for a discharge of heavy metals. WRPMs will place manage stormwater runoff by placing straw bales/coils along the area where the fillslope of waste rock material is actively eroding to Deer Creek. Therefore, no direct/indirect effects related to these potential impacts.</td>
</tr>
<tr>
<td>Ponds</td>
<td></td>
<td><strong>POTENTIAL for a cumulative effect related a discharge of heavy metals into Lake Creek, because the old lode tailings and Adit waters have tested high for heavy metals. As groundwater enters these old lode tailings and moves into Lake Creek, it carries with it heavy metals in solution. Therefore, additional heavy metals would overlap in time AND space with heavy metals currently entering Lake Creek from past mining activities.</strong></td>
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<td><strong>POTENTIAL cumulative effects exist for sediment, because the past mining impacts are having gully erosion, are not stabilized and have the potential to be additive with the proposed action at this site.</strong></td>
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<td>Sediment would not overlap in time AND space impacts to water quality related to past harvest, grazing, or road building activities. Impacts as a result of these past activities have since stabilized and are no longer contributing new sediment. Second, the portion of stream potentially impacted does not overlap in time AND space impacts from present day activities because there is no other mining, logging, road building, or the invasive treatments ongoing in this area. This Plan does overlap in time AND space impacts from present day activities of grazing in the Baboon Pasture in the Stovepipe Allotment, however, grazing will not deliver sediment since Forest Plan utilization standards will be met. Finally, there are no reasonably foreseeable activities proposed in this area that might alter water quality.</td>
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<td><strong>POTENTIAL for a cumulative effect if a discharge of silts and clays occurs into Cracker Creek due to mining activity because it could overlap in time AND space with the impacts related to potential sediment input to Fine Gold. This Plan, in addition to Fine Gold’s Plan are within about 1.3 miles of each other and all are on Cracker Creek. Given the lower summer flows and particle sizes, the inputs of these fines has the potential to reduce water clarity for distances greater than 300 feet.</strong></td>
<td>NO cumulative effect to sediment, but for a different reason than Alternative 2. The addition of FS RPMs reduces the potential for a discharge of sediment. Therefore, no direct/indirect effects under this alternative.</td>
</tr>
<tr>
<td>Blue Jay, David 1, Hi Bar</td>
<td>Cracker Creek</td>
<td>No other cumulative effects to sediment would overlap in time AND space impacts to water quality related to past harvest, mining, grazing, or road</td>
<td>POTENTIAL for a cumulative effect for an impact of water temperatures, but at a reduced time period than Alternative 2. The addition of FS RPMs reduces the potential for a discharge of sediment. Therefore, no direct/indirect effects under this alternative.</td>
</tr>
</tbody>
</table>

Appendix 5 Powder River Mining DEIS
<table>
<thead>
<tr>
<th>Plan</th>
<th>SWS Name</th>
<th>Cumulative Effects</th>
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<tbody>
<tr>
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<td></td>
<td><strong>Alternative 2</strong></td>
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<tr>
<td></td>
<td></td>
<td>Building activities. Impacts as a result of these past activities have since stabilized and are no longer contributing new sediment. Second, the portion of stream potentially impacted does not overlap in time AND space impacts from present day activities because there is no other mining, logging, road building, or the invasive treatments ongoing in this area. This Plan does overlap in time AND space impacts from present day activities of grazing in the Pole Creek and Spaulding Pastures in the Bourne Allotment, however, grazing will not deliver sediment since Forest Plan utilization standards will be met. Finally, there are no reasonably foreseeable activities proposed in this area that might alter water quality. Water temperatures may be impacted by flow reversal from excavated mining activities and for water withdrawals to process placer materials. Ongoing actions of water withdrawals for irrigation, domestic, industrial/manufacturing and municipal uses overlap in time AND space and occur 0.2 miles upstream of Blue Jay, a diversion near Blue Jay and another 0.7 miles downstream. The irrigation diversions may be additive to the water temperature impacts of flow reversal and water withdrawals. However, the water temperature impact of flow reversal and water withdrawal will be short lived and would last until the storage capacity is filled. Hi Bar is associated with this grouping of plans, but is not withdrawing water from Cracker Creek.</td>
</tr>
<tr>
<td>Buster 1 &amp; 3 Placer</td>
<td>Blue Canyon Creek-Powder River</td>
<td>No cumulative effects to water resources. There would be no direct or indirect effects from Buster 1 &amp; 3 Placer. Therefore, there would be no cumulative effects to water resources.</td>
</tr>
<tr>
<td>California Gulch</td>
<td>Lake Creek</td>
<td>NO cumulative effects to water resources, despite there being potential for a discharge of sediment (direct effect), for the following reason. First, the portion of stream potentially impacted by a discharge of sediment would not overlap in time AND space impacts to water quality related to past harvest, mining, grazing, or road building activities. Impacts as a result of these past activities have since stabilized and are no longer contributing new sediment. Second, the portion of stream potentially impacted does not overlap in time AND space impacts from present day activities because there is no other mining, logging, road building, or the invasive treatments ongoing in this area. This Plan does overlap in time AND space impacts from present day activities of grazing in the California Gulch Pasture in the Blue Canyon Allotment, however, grazing will not deliver sediment since Forest Plan utilization standards will be met. Finally, there are no reasonably foreseeable activities proposed in this area that might alter water quality.</td>
</tr>
<tr>
<td>Dead Horse Placer</td>
<td>McCully Creek</td>
<td>NO cumulative effects From Mining Activities via surface or subsurface. Therefore, NO overlap in time and space of direct effects.</td>
</tr>
</tbody>
</table>
### Appendix 5 Powder River Mining DEIS

<table>
<thead>
<tr>
<th>Plan</th>
<th>SWS Name</th>
<th>Cumulative Effects</th>
<th>Alternative 2</th>
<th>Alternative 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine Gold</td>
<td>Cracker Creek</td>
<td>POTENTIAL for a cumulative effect if a discharge of silts and clays occurs into Cracker Creek due to mining activity because it could overlap in time AND space with the impacts related to potential sediment input to Blue Jay, David 1 and High Bar. This Plan, in addition to Blue Jay, David 1 and High Bar’s Plan are within approximately 1.3 miles of each other and all are on Cracker Creek. Given the lower summer flows and particle sizes, the inputs of these fines has the potential to reduce water clarity for distances greater than 300 feet. No other cumulative effects to sediment would overlap in time AND space impacts to water quality related to past harvest, mining, grazing, or road building activities. Impacts as a result of these past activities have since stabilized and are no longer contributing new sediment. Second, the portion of stream potentially impacted does not overlap in time AND space impacts from present day activities because there is no other mining, logging, road building, or the invasive treatments ongoing in this area. This Plan does overlap in time AND space impacts from present day activities of grazing in the Pole Creek and Spaulding Pastures in the Bourne Allotment, however, grazing will not deliver sediment since Forest Plan utilization standards will be met. Finally, there are no reasonably foreseeable activities proposed in this area that might alter water quality.</td>
<td>NO cumulative effect to sediment, but for a different reason than Alternative 2. The addition of FS RPMs eliminates the potential for a discharge of sediment. Therefore, no direct/indirect effects under this alternative.</td>
<td></td>
</tr>
<tr>
<td>J &amp; J Placer</td>
<td>Blue Canyon Creek-Powder River</td>
<td>NO cumulative effects to water resources, despite there being potential for a discharge of sediment (direct effect), for the following reason. First, the portion of stream potentially impacted by a discharge of sediment would not overlap in time AND space impacts to water quality related to past harvest, mining, grazing, or road building activities. Impacts as a result of these past activities have since stabilized and are no longer contributing new sediment. Second, the portion of stream potentially impacted does not overlap in time AND space impacts from present day activities because there is no other mining, logging, road building, or the invasive treatments ongoing in this area. This Plan does overlap in time AND space impacts from present day activities of grazing in the Blue Canyon Pasture in the Blue Canyon Allotment, however, grazing will not deliver sediment since Forest Plan utilization standards will be met. Finally, there are no reasonably foreseeable activities proposed in this area that might alter water quality.</td>
<td>NO cumulative effect but for a different reason than Alternative 2. The addition of FS RPMs eliminates the potential for a discharge. Therefore, no direct/indirect effects under this alternative.</td>
<td></td>
</tr>
<tr>
<td>Medic Place Group</td>
<td>McCully Creek</td>
<td>NO cumulative effects to water resources, despite there being potential for a discharge of sediment (direct effect), for the following three reasons. First, the portion of stream potentially impacted by a discharge of sediment would not overlap in time AND space impacts to water quality related to past harvest, mining, grazing, or road building activities. Impacts as a result of these past activities have since stabilized and are no longer contributing new sediment. Second, the portion of stream potentially impacted does not overlap in time AND space impacts from present day activities of grazing in the Pole Creek and Spaulding Pastures in the Bourne Allotment, however, grazing will not deliver sediment since Forest Plan utilization standards will be met. Finally, there are no reasonably foreseeable activities proposed in this area that might alter water quality.</td>
<td>NO cumulative effect but for a different reason than Alternative 2. The addition of FS RPMs eliminates the potential for a discharge. Therefore, no direct/indirect effects under this alternative.</td>
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<tr>
<td>Plan</td>
<td>SWS Name</td>
<td>Cumulative Effects</td>
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<tr>
<td>Native Spirit</td>
<td>McCully Creek</td>
<td>Alternative 2: AND space impacts from present day activities because there is no current grazing, other mining, logging, road building, or the invasive treatments ongoing in this area. Finally, there are no reasonably foreseeable activities proposed in this area that might alter water quality.</td>
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<td>Alternative 3: NO cumulative effect but for a different reason than Alternative 2. The addition of FS RPMs eliminates the potential for a discharge. Therefore, no direct/indirect effects under this alternative.</td>
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</tr>
<tr>
<td>Pardner Group Placer/Lode</td>
<td>Blue Canyon Creek-Powder River</td>
<td>POTENTIAL for a cumulative effect related a discharge of heavy metals into Blue Canyon Creek- Powder River. As groundwater enters these old lode tailings, it carries with it heavy metals in solution. Therefore, additional heavy metals would overlap in time AND space with heavy metals currently entering Blue Canyon Creek- Powder River from past mining activities. NO cumulative effects to water resources, despite there being potential for a discharge of sediment (direct effect), for the following reason. First, the portion of stream potentially impacted by a discharge of sediment would not overlap in time AND space impacts to water quality related to past harvest, mining, grazing, or road building activities. Impacts as a result of these past activities have since stabilized and are no longer contributing new sediment. Second, the portion of stream potentially impacted does not overlap in time AND space impacts from present day activities because there is no current grazing, other mining, logging, road building, or the invasive treatments ongoing in this area. This Plan does overlap in time AND space impacts from present day activities of grazing in the Blue Canyon Pasture in the Blue Canyon Allotment, however, grazing will not deliver sediment since Forest Plan utilization standards will be met. Finally, there are no reasonably foreseeable activities proposed in this area that might alter water quality.</td>
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<td>Alternative 3: Different than Alt. 2. NO cumulative effect as a result of the addition of FS General Requirement L5 (Appendix 2). This requirement would eliminate the potential for a discharge of heavy metals and therefore no direct/indirect effects related to this potential impact.</td>
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<tr>
<td>Return Placer</td>
<td>Deer Creek</td>
<td>NO cumulative effects to water resources, despite there being potential for a discharge of sediment (direct effect), for the following reason. First, the portion of stream potentially impacted by a discharge of sediment would not overlap in time AND space impacts to water quality related to past harvest, mining, grazing, or road building activities. Impacts as a result of these past activities have since stabilized and are no longer contributing new sediment. Second,</td>
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<td>Alternative 3: NO cumulative effect but for a different reason than Alternative 2. The addition of FS RPMs eliminates the potential for a discharge. Therefore, no direct/indirect effects under this alternative.</td>
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</tbody>
</table>
## Salmon

### Upper Salmon Creek

- **Plan:** Alternative 2
- **Cumulative Effects:**
  - The portion of stream potentially impacted does not overlap in time AND space impacts from present day activities because there is no other mining, logging, road building, or the invasive treatments ongoing in this area. This Plan does overlap in time AND space impacts from present day activities of grazing in the Baboon and East Pastures in the Stovepipe Allotment, however, grazing will not deliver sediment since Forest Plan utilization standards will be met. Finally, there are no reasonably foreseeable activities proposed in this area that might alter water quality.

- **Plan:** Alternative 3
  - **Cumulative Effects:**
    - NO cumulative effects but for a different reason than Alternative 2. The addition of FS RPMs eliminates the potential for a discharge. Therefore, no direct/indirect effects under this alternative.

## Slow Poke

### McCully Creek

- **Plan:** Alternative 2
- **Cumulative Effects:**
  - NO cumulative effects to water resources, despite there being potential for a discharge of sediment (direct effect), for the following three reasons. First, the portion of stream potentially impacted by a discharge of sediment would not overlap in time AND space impacts to water quality related to past harvest, mining, grazing, or road building activities. Impacts as a result of these past activities have since stabilized and are no longer contributing new sediment. Second, the portion of stream potentially impacted does not overlap in time AND space impacts from present day activities because there is no current grazing, other mining, logging, road building, or the invasive treatments ongoing in this area. Finally, there are no reasonably foreseeable activities proposed in this area that might alter water quality.

- **Plan:** Alternative 3
  - **Cumulative Effects:**
    - NO cumulative effect but for a different reason than Alternative 2. The addition of FS RPMs eliminates the potential for a discharge. Therefore, no direct/indirect effects under this alternative.

## Struggler

### Blue Canyon Creek-Powder River

- **Plan:** Alternative 2
- **Cumulative Effects:**
  - NO cumulative effects to water resources, despite there being potential for a discharge of sediment (direct effect), for the following reason. First, the portion of stream potentially impacted by a discharge of sediment would not overlap in time AND space impacts to water quality related to past harvest, mining, grazing, or road building activities. Impacts as a result of these past activities have since stabilized and are no longer contributing new sediment. Second, the portion of stream potentially impacted does not overlap in time AND space impacts from present day activities because there is no other mining, logging, road building, or the invasive treatments ongoing in this area. This Plan does overlap in time AND space impacts from present day activities of grazing in the Blue Canyon Pasture in the Blue Canyon Allotment, however, grazing will not...
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<tr>
<th>Plan</th>
<th>SWS Name</th>
<th>Cumulative Effects</th>
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</thead>
<tbody>
<tr>
<td>Tough Luck Charley</td>
<td>Union Creek-Powder River</td>
<td>Alternative 2: deliver sediment since Forest Plan utilization standards will be met. Finally, there are no reasonably foreseeable activities proposed in this area that might alter water quality.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alternative 3: NO cumulative effects but for a different reason than Alternative 2. The addition of FS RPMs eliminates the potential for a discharge. Therefore, no direct/indirect effects under this alternative.</td>
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