Site Inspection Report for Abandoned and Inactive Mines in Southern Idaho:
Volume III:
Miscellaneous Properties,
Owyhee County, Idaho

Earl H. Bennett, John Kauffman, and
Victoria E. Mitchell

Idaho Geological Survey
Morrill Hall, Third Floor
University of Idaho
Moscow, Idaho 83844-3014

Staff Report 10-3
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OWYHEE COUNTY - 2000 AML
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1.0 PROJECT OVERVIEW

1.1 INTRODUCTION

In order to identify and characterize the abandoned and inactive mines with environmental, health, and/or safety problems that are on or that could impact federal and state lands, the U.S. Environmental Protection Agency (EPA), the U.S. Bureau of Land Management (BLM), the Idaho Department of Lands (IDL), and the Idaho Geological Survey (IGS) have undertaken to evaluate the mines in Owyhee County, Idaho. This report describes work that was done on properties outside the major mining areas of Owyhee County. As the lead state agency for the collection, interpretation, and distribution of information about the geology and mineral resources of Idaho, the state geological survey is keenly interested in cooperative projects that will expand our knowledge of current and historic mining areas. Major funding for the work discussed in this report came from the U.S. Bureau of Land Management, Idaho State Office. Additional support came from the IDL in conjunction with an ongoing revision of the state’s mines and prospects database.

1.2 PROJECT OBJECTIVES

The overall objectives of this inventory and preliminary characterization process are to:

1. Systematically identify all mine sites with possible human health, environmental, and/or safety related problems.

2. Identify the human health and environmental risks at each location based on site characterization factors (see Section 1.5), including screening-level soil and water samples collected and analyzed in accordance with Environmental Protection Agency (EPA) protocols and quality control procedures.

3. Cooperate with other state and federal agencies, and integrate these data with their programs.

4. Develop and maintain a data file of site information that will enable federal and state agencies to pro-actively respond to governmental and public interest groups.

In addition to the above objectives, the IGS is interested in gathering new information associated with these abandoned and inactive mines. This is an outgrowth of the Survey’s enabling legislation (Sections 47-201–47-204 of the Idaho Code), which designates the IGS as the lead state agency for the collection, interpretation, and distribution of all geologic and minerals data for Idaho.

1.3 ABANDONED AND INACTIVE MINES DEFINED

For the purposes of this study, mines, mills, or other processing facilities related to mineral extraction and/or processing are defined as abandoned or inactive as follows:
A mine is considered *abandoned* if there are no identifiable owners or operators for the facilities, or if the facilities have reverted to federal ownership.

A mine is considered to be *inactive* if there is an identifiable owner or operator of the facility, but the facility is not currently operating and there are no approved plans or permits to operate.

### 1.4 HEALTH AND ENVIRONMENTAL PROBLEMS AT MINES

A variety of safety, health, and environmental problems may occur at abandoned and inactive mines. These include metals that contaminate ground water, surface water, and soils; airborne dust from abandoned tailings impoundments; eroding mine and mill wastes that contribute excessive amounts of sediment to surface waters; unstable waste piles with the potential for catastrophic failure; and physical hazards associated with mine openings and dilapidated structures.

Metals are often transported from a mine by water (ground water discharge or surface runoff) and may be dissolved, suspended, or carried as part of the bedload. When sulfides are present, acid water can form; this, in turn, increases the solubility of metals. This condition, known as acid mine drainage (AMD), is a significant source of metal releases at some mine sites in Idaho. The most important environmental hazard is the contamination of both surface and subsurface water by metals, acid mine drainage, or sediment loading.

#### 1.4.1 Acid Mine Drainage

Trexler and others (1975) identified six factors that govern the formation of metal-laden acid mine waters. They are:

1. availability of acid-producing minerals, particularly pyrite,
2. presence of oxygen,
3. moisture in the atmosphere,
4. availability of leachable heavy metals,
5. availability of water to transport the dissolved constituents, and
6. mine characteristics, which affect movement of air and water through the mine workings.

These factors occur not only within the mines themselves, but also within mine dumps and mill tailings piles, making these wastes potential sources of contamination as well. Formation of acid mine drainage can be reduced if minerals such as calcite, which can neutralize acidity, are present (Trexler and others, 1975; Marvin and others, 1995).

Acid mine drainage is formed by the oxidation and dissolution of sulfides, particularly pyrite (FeS$_2$) and pyrrhotite (Fe$_{1-x}$S). Other sulfides play a minor role in acid generation. Oxidation of
iron sulfides forms sulfuric acid (H$_2$SO$_4$), sulfate ions (SO$_4^{2-}$), and reduced iron (Fe$^{2+}$). When sulfide-bearing rock is mined, the sulfide minerals are exposed to atmospheric oxygen and oxygen-bearing water. Consequently, the sulfide minerals are oxidized, and acid mine waters are produced (Trexler and others, 1975; Marvin and others, 1995).

The oxidation of the reduced iron is the step that limits how much acid will form. The rate of this reaction can be greatly increased by iron-oxidizing bacteria (*Thiobacillus ferrooxidans*). The oxidized iron produced by biological activity promotes further oxidation and dissolution of pyrite, pyrrhotite, and marcasite (FeS$_2$, a dimorph of pyrite) (Trexler and others, 1975; Marvin and others, 1995).

Once formed, the acid can dissolve other sulfide minerals to produce high concentrations of copper, lead, zinc, and other metals. Minerals that can contribute heavy metals to acid mine drainage include arsenopyrite, FeAsS; chalcopyrite, CuFeS$_2$; galena, PbS; tetrathedrite, (CuFe)$_{12}$S$_4$S$_{13}$; and sphalerite, (Zn, Fe)S. Aluminum can be leached by the dissolution of aluminosilicates common in soils and waste material found in Idaho. The dissolution of any given metal is controlled by the solubility of that metal (Trexler and others, 1975; Marvin and others, 1995).

### 1.4.2 Solubility of Selected Metals

The following information is paraphrased from Marvin and others (1995, p. 5-6). This report cites the following references as sources for this material: Lindsay (1979), Stumm and Morgan (1981), Hem (1985), and Maest and Metesh (1993).

At a pH above 2.2, ferric hydroxide [Fe(OH)$_3$] produces a brownish orange color in surface waters and forms a precipitate with a similar color on rocks in affected streams. If other metals, such as copper, lead, cadmium, zinc, and aluminum, are present in the source rock, they may also precipitate with or adsorb onto the ferric hydroxide (Stumm and Morgan, 1981). Alunite [KAl$_3$(SO$_4$)$_2$(OH)$_6$] and jarosite [KFe$_3$(SO$_4$)$_2$(OH)$_6$] will precipitate at a pH of less than 4, depending on SO$_4^{2-}$ and K$^+$ activities (Lindsay, 1979).

Under acidic conditions, the solubility of the metal controls how much will be released into the environment:

**Manganese** solubility is strongly controlled by the redox state and is limited by the presence of minerals such as pyrolusite and manganite; under reducing conditions, pyrolusite [MnO$_2$] dissolves and manganite [MnO(OH)] precipitates. Manganese is found in mineralized environments as rhodochrosite [MnCO$_3$] and its weathering products.
**Aluminum** solubility is most often controlled by alunite \([\text{KAl}_4(\text{SO}_4)_3(\text{OH})_6]\) or by gibbsite \([\text{Al(OH)}_3]\), depending on pH. Aluminum is one of the most common elements in rock-forming minerals such as feldspars, micas, and clays.

**Arsenic** tends to precipitate and adsorb with iron at low pH and de-sorb or dissolve at higher pH. Once oxidized, arsenic will be found in solution in higher pH waters. When the pH is between 3 and 7, the dominant arsenic compound is a monovalent arsenate, \(\text{H}_3\text{AsO}_4\). Arsenic is abundant in metallic mineral deposits as arsenopyrite \([\text{FeAsS}]\), enargite \([\text{Cu}_3\text{AsS}_4]\), tennantite \([\text{Cu}_{12}\text{As}_4\text{S}_{13}]\), and other minerals.

**Cadmium** solubility data are limited. When the pH of soils is above 7.5, the solubility of cadmium is controlled by the carbonate species octavite \([\text{CdCO}_3]\); when the pH of the soil is below 6, cadmium solubility is controlled by strengite \([\text{Cd}_3(\text{PO}_4)_2]\). Octavite is the dominant control on the solubility of cadmium in soils. In water, at low partial pressures of \(\text{H}_2\text{S}\), \(\text{CdCO}_3\) is easily reduced to \(\text{CdS}\).

**Copper** solubility in natural waters is controlled primarily by the amount of carbonate present; malachite \([\text{Cu}_2(\text{OH})_2\text{CO}_3]\) and azurite \([\text{Cu}_3(\text{OH})_2(\text{CO}_3)_2]\) form when \(\text{CO}_3^{2-}\) ions are available in sufficient concentrations. In soil, copper combines readily with iron to form cupric ferrite. Other compounds, such as sulfates and phosphates, may also control copper solubility in soils. Copper is present in many ore minerals, including chalcopyrite \([\text{CuFeS}_2]\), bornite \([\text{Cu}_3\text{FeS}_4]\), chalcocite \([\text{Cu}_2\text{S}]\), and tetrahedrite \([\text{Cu}_{12}\text{Sb}_4\text{S}_{13}]\).

**Mercury** readily vaporizes under atmospheric conditions and thus is most often found in concentrations well below the 25 \(\text{mg/L}\) equilibrium concentration. The most stable form of mercury in soil is its elemental form. Mercury is found in low temperature hydrothermal ores as cinnabar \([\text{HgS}]\), in epithermal (hot springs) deposits as native mercury, and as native mercury in man-made deposits where mercury was used to process gold ores.

**Lead** concentrations in natural waters are controlled by the formation of lead carbonate, which has an equilibrium concentration of 50 \(\text{mg/L}\) when the pH is between 7.5 and 8.5. As with other metals, concentrations in solution increase with decreasing pH. In sulfate soils with a pH of less than 6, the formation of anglesite determines how much lead will remain in solution. The formation of cerussite, a lead carbonate, controls solubility in buffered soils. Lead occurs in the common ore mineral galena \([\text{PbS}]\).
Zinc solubility is controlled by the formation of zinc hydroxide and zinc carbonate in natural waters. When the pH is above 8, the equilibrium concentration of zinc in water with a high bicarbonate content is less than 100 μg/L. Franklinite may control solubility at pH less than 5 in water and soils, and its formation is strongly affected by sulfate concentrations. Thus, production of sulfate from acid mine drainage may ultimately control the solubility of zinc in water affected by mining. Sphalerite [ZnS] is common in mineralized systems.

1.4.3 The Use of pH and Specific Conductivity to Identify Water Quality Problems

Specific conductance (SC) and pH provide a rapid way to distinguish many “problem” mine sites from those that have no adverse water-related impacts. As a rough screening tool, low pH (<6.0) and high SC (variable) usually occur at sites with problems; neutral or higher pH and low SC indicate sites that are less likely to have serious problems.

Limiting data collection only to pH and SC largely ignores the various controls on solubility and can lead to overlooking some types of problems. Arsenic, for example, is most mobile in waters with higher pH values (>7), and its concentration is strongly dependent on the presence of dissolved iron. Cadmium and lead may also exceed standards in waters with pH values within acceptable limits.

Reliance on SC as an indicator of site conditions can also be misleading in certain situations. The SC value of a sample represents 55 to 75 percent of the total dissolved solids (TDS), depending on the concentration of sulfate. Also, it is necessary to have a statistically significant amount of SC data for a study area in order to define what constitutes a high or low SC value.

In some cases, a water sample with a near-neutral pH and a moderate SC could have one or more dissolved metal species that may exceed standards. The complete evaluation of a mine site for adverse impacts on water and soil should include the collection of samples for analysis of metals, cations, and anions.

1.5 METHODOLOGY

1.5.1 Data Sources

The IGS began compiling a database of mining properties in Idaho in 1979. This work has continued to date, and the database (now digital) contains information on some 8,700 mines and prospects. All or parts of the following databases and information sources have been integrated into this digital information system:

1. the Mineral Industry Location Subsystem (MILS) database (U.S. Bureau of Mines)
2. the Mineral Resources Data System (MRDS) database (U.S. Geological Survey)
3. published compilations of mines and prospects data
4. state publications on Idaho mineral deposits
6. IGS mineral property files
7. mines and prospects noted on the appropriate USGS 7.5-minute quadrangle maps
8. data held in private collections or company information
9. mines and prospects examined in the field as part of abandoned mine lands (AML) studies (1994 to date).

Most of the data for this project were collated with existing data in the IGS Mines and Prospects digital database. As noted, this is the most complete compilation available for information on Idaho’s mining properties. The IGS continues to update the database, which now contains an estimated 85-90 percent of the mining properties in the state. During the field visits, the IGS located some (but not many) mines and prospects for which no previous information existed. Also, a very few mines listed in the database were not found.

1.5.2 Pre-field Screening

Field crews visited most of the mine sites in the study area that were on federal land, emphasizing the properties with the potential to release hazardous substances and those without enough information to make that determination without a field visit. The criteria used to evaluate these sites was similar to that developed by the IGS and the U.S. Forest Service for similar work in north Idaho. The screening criteria (Table 1.5-1) were used to determine if a site had the potential to release hazardous substances or posed other environmental or safety hazards. Published information was also used to help evaluate the sites. Mine sites which were not visited were retained in the database along with the data source(s) that were consulted.

Placer mines were not studied as part of this project. Although mercury was used in amalgamating free gold in placer mines, the complex nature of placer deposits makes detection of mercury difficult and is beyond the scope of this inventory.

Table 1.5-1. Screening Criteria (answer Yes or No to each item).

<table>
<thead>
<tr>
<th>Yes/No</th>
<th>Screening Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Mill site or tailings present.</td>
</tr>
<tr>
<td></td>
<td>2. Adits with discharge or evidence of discharge.</td>
</tr>
<tr>
<td></td>
<td>3. Evidence of or strong likelihood for metal leaching or AMD (water stains, stressed or lack of vegetation, waste below water table, etc.)</td>
</tr>
<tr>
<td></td>
<td>4. Mine waste in floodplain or shows signs of water erosion.</td>
</tr>
<tr>
<td></td>
<td>5. Residences, high public use area, or environmentally sensitive area (as listed in HRS) within 200 feet of the disturbance.</td>
</tr>
<tr>
<td></td>
<td>6. Hazardous wastes/materials (chemical containers, explosives, etc.)</td>
</tr>
<tr>
<td></td>
<td>7. Open adits/shafts, highwalls, or hazardous structures/debris.</td>
</tr>
</tbody>
</table>
1.5.3 Field Inspection Procedures

All sites discussed in this report were visited by an IGS geologist. At each site, geologists briefly characterized the geology, described surface workings, and noted if any ore processing facilities were present. Samples for geochemical analysis were collected from selected sites. All site locations were refined using conventional field methods, and each site was located by latitude and longitude and by Township, Range, and Section. If previously determined, these values were checked and corrected, as needed. In addition, Global Positioning System (GPS) readings were taken at a number of the sites visited (Appendix A).

On public lands, sites with ground-water discharge, flowing surface water, or contaminated soils (as indicated by impacts on vegetation) were mapped. Sketch maps show locations of the workings, exposed geology, dumps, tailings, and surface water and geologic sample locations. The site was photographically recorded using both still images and videotape. The videotape record proved especially useful for site description and review, and is recommended for future studies.

1.5.3.1 Soil, Rock, Stream Sediment, and Mine Waste Sampling Procedures

At selected sites identified as having a potential problem, the geologist collected tailings or mine waste samples, as appropriate. Sample locations were selected in areas where waste material was obviously impacting natural areas. In most cases a composite sample was gathered to get as representative a sample as possible. Three types of samples were collected:

1) select tailings or mine waste samples—specimens representing a particular material taken for analysis;

2) composite samples—rock and soil taken systematically from a waste dump or tailings pile for analysis, representing the overall composition of material in the source;

3) leach samples—duplicates of selected composite samples for testing leachable metals.

The three types of samples were used to examine the metal content of dumps and tailings, and to check the availability of metals from leaching when sample sites were exposed to water. Waste materials were not sampled extensively enough to provide reliable estimates of tonnages, grades, or economic feasibility.

1.5.3.2 Water Sampling Procedure

As noted, this project focused on the impacts of mining on surface water, ground water, and soils. The reasoning behind this approach was that a mine disturbance may have high total metal concentrations yet may be releasing few metals into the surface water, ground water, or soil. Conversely, another disturbance could have lower total metal content but be releasing metals in concentrations that adversely impact the environment.
The geologist selected water sample sites based on field parameters (SC, pH, temperature) and observations (such as erosion and staining of soils or stream beds). Sample locations were chosen that would provide the best information on the relative impact of the mine site to surface water and soils. All sample locations were accurately located on topographic base maps. Surface water samples were collected at discharge points.

At each water sampling site, the temperature, specific conductivity, and pH were measured. A unique sample number was affixed to the sample bottle. Two 125-ml samples were collected as required by various EPA analytical protocols. One sample was left raw and the other was acidified with \(0.1N\) nitric acid. Both samples were stored in a secured ice box. The samples remained under constant refrigeration and security until submitted for analysis. Laboratory leach tests were used to determine if metals might be released from mine waste material, which could provide additional insight to possible ground-water contamination.

### 1.5.4 Analytical Methods

The Analytical Sciences Laboratory at the University of Idaho performed all of the laboratory analyses using the following EPA-approved protocols and quality assurance standards:

- **Water Samples**—Total Recoverable Metal Screen (EPA Test 200.7).
- **Water Samples**—Dissolved Heavy Metals Screen (which includes arsenic and lead) and Mercury (EPA Test 200.8).
- **Water Samples**—Dissolved Metal Screen (EPA Test 200.7).
- **Soil and Waste Material**—Element Screen (EPA Test 3050), Leachable Metals (TCLP for Metals) Screen (EPA Test 1311/6010).

### 1.5.5 Standards

EPA and various state agencies have developed human health and environmental standards for various metals. In an attempt to put the metal concentrations that were measured into some perspective, they were compared to these developed standards. However, it is understood that the background metal concentrations in mineralized areas may exceed these standards.

#### 1.5.5.1 Water-Quality Standards

The Safe Drinking Water Act (SDWA) directs EPA to develop standards for potable water. Some of these standards are mandatory (primary) and some are desired (secondary). The standards established under the SDWA are often referred to as primary and secondary maximum contaminant levels (MCLs). Similarly, the Clean Water Act (CWA) directs EPA to develop water-quality standards (acute and chronic) that will protect aquatic organisms. These standards may vary with water hardness and are often referred to as the Aquatic Life Standards. The primary and secondary MCLs along with the acute and chronic Aquatic Life Standards for selected metals are listed in Table 1.5-2. As these standards can vary with water hardness, a range of values is given for some elements. Hardness was not measured for this study.
Table 1.5-2. Standards for contaminants in water.

<table>
<thead>
<tr>
<th>Element</th>
<th>Primary MCL (mg/L)</th>
<th>Secondary MCL (mg/L)</th>
<th>Aquatic Life, Acute (mg/L)</th>
<th>Aquatic Life, Chronic (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>---</td>
<td>0.05-0.2</td>
<td>0.75</td>
<td>0.087</td>
</tr>
<tr>
<td>Arsenic</td>
<td>0.05</td>
<td>---</td>
<td>0.36</td>
<td>0.19</td>
</tr>
<tr>
<td>Barium</td>
<td>2</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Cadmium</td>
<td>0.005</td>
<td>---</td>
<td>0.004/0.009</td>
<td>0.001/0.002</td>
</tr>
<tr>
<td>Chromium</td>
<td>0.1</td>
<td>---</td>
<td>1.7/3.1</td>
<td>0.21/0.37</td>
</tr>
<tr>
<td>Copper</td>
<td>1.3</td>
<td>1</td>
<td>0.018/0.034</td>
<td>0.012/0.021</td>
</tr>
<tr>
<td>Iron</td>
<td>---</td>
<td>0.3</td>
<td>---</td>
<td>1</td>
</tr>
<tr>
<td>Lead</td>
<td>0.015</td>
<td>---</td>
<td>0.082/0.2</td>
<td>0.003/0.008</td>
</tr>
<tr>
<td>Manganese</td>
<td>---</td>
<td>0.05</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Mercury</td>
<td>0.002</td>
<td>---</td>
<td>0.0024</td>
<td>0.000012</td>
</tr>
<tr>
<td>Nickel</td>
<td>0.1</td>
<td>---</td>
<td>1.4/2.5</td>
<td>0.16/0.28</td>
</tr>
<tr>
<td>Zinc</td>
<td>---</td>
<td>5</td>
<td>0.12/0.21</td>
<td>0.11/0.19</td>
</tr>
</tbody>
</table>

1.5.5.2 Soil and Rock Background Standards

It is useful to have some idea about the natural background values of rocks and soils when interpreting geochemical data. Although no whole rock or soil samples were run for this study, an estimate can be made from the analyses presented by Bennett and Galbraith (1975). This study analyzed stream sediment samples collected from active stream channels in the 500-square-mile area surrounding Silver City and South Mountain. The results from these analyses are presented in Table 1.5-3, which shows the data for catchment areas of four different sizes. These samples were analyzed by atomic absorption spectrophotometry, whereas the current samples were analyzed by Inductively Coupled Plasma (ICP) mass spectrometry. However, these values give an indication of the level of contaminants present in various samples.

There are no federal standards for concentrations of metals and other constituents in soils; acceptable limits for such are often based on human and/or environmental risk assessments for an area. Since no assessments of this kind have been done, concentrations of metals in soils were compared to the limits postulated by the U.S. EPA for the Clark Fork Superfund site (Table 1.5-4). The proposed upper limit for lead in soils is 1,000 mg/Kg to 2,000 mg/Kg, and 80 to 100 mg/Kg for arsenic in residential areas.
Table 1.5-3. Mean and threshold values for elements in stream sediment samples for catchment basins of different sizes in the Silver City-South Mountain area, Owyhee County (data from Bennett and Galbraith, 1975; ppm = mg/Kg). Values higher than the threshold may be considered anomalous.

<table>
<thead>
<tr>
<th>Elements (in ppm)</th>
<th>Group 1: All samples (n=450)</th>
<th>Group 2: Catchment area 3 square miles (n=369)</th>
<th>Group 3: Catchment area &gt; 3 square miles (n=81)</th>
<th>Group 4: Catchment area &gt; 3 square miles; contaminated samples removed (n=308)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Threshold</td>
<td>Mean</td>
<td>Threshold</td>
</tr>
<tr>
<td>Copper</td>
<td>19.5</td>
<td>72.6</td>
<td>19.8</td>
<td>69.2</td>
</tr>
<tr>
<td>Manganese</td>
<td>555.9</td>
<td>1,531.0</td>
<td>569.0</td>
<td>1,589.0</td>
</tr>
<tr>
<td>Zinc</td>
<td>70.8</td>
<td>169.8</td>
<td>70.3</td>
<td>182.4</td>
</tr>
<tr>
<td>Chromium</td>
<td>18.4</td>
<td>62.5</td>
<td>18.4</td>
<td>61.4</td>
</tr>
<tr>
<td>Nickel</td>
<td>18.9</td>
<td>78.2</td>
<td>18.9</td>
<td>77.5</td>
</tr>
<tr>
<td>Lead</td>
<td>15.1</td>
<td>35.2</td>
<td>15.3</td>
<td>35.6</td>
</tr>
<tr>
<td>Silver</td>
<td>0.69</td>
<td>3.24</td>
<td>0.64</td>
<td>2.50</td>
</tr>
<tr>
<td>Molybdenum</td>
<td>1.85</td>
<td>5.27</td>
<td>1.90</td>
<td>5.56</td>
</tr>
<tr>
<td>Gold</td>
<td>12.4</td>
<td>39.8</td>
<td>12.0</td>
<td>33.5</td>
</tr>
<tr>
<td>Copper (cold extractable)</td>
<td>2.5</td>
<td>6.1</td>
<td>2.5</td>
<td>5.9</td>
</tr>
<tr>
<td>Heavy metals (cold extractable)</td>
<td>11.8</td>
<td>20.1</td>
<td>11.7</td>
<td>19.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elements (in ppm)</th>
<th>Group 1: All samples (n=450)</th>
<th>Group 2: Catchment area 3 square miles (n=369)</th>
<th>Group 3: Catchment area &gt; 3 square miles (n=81)</th>
<th>Group 4: Catchment area &gt; 3 square miles; contaminated samples removed (n=308)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Threshold</td>
<td>Mean</td>
<td>Threshold</td>
</tr>
<tr>
<td>Copper</td>
<td>18.4</td>
<td>59.4</td>
<td>18.5</td>
<td>87.2</td>
</tr>
<tr>
<td>Manganese</td>
<td>525.0</td>
<td>1,230.0</td>
<td>569.0</td>
<td>1,589.0</td>
</tr>
<tr>
<td>Zinc</td>
<td>64.6</td>
<td>147.1</td>
<td>74.5</td>
<td>270.8</td>
</tr>
<tr>
<td>Chromium</td>
<td>18.3</td>
<td>58.2</td>
<td>18.3</td>
<td>58.2</td>
</tr>
<tr>
<td>Nickel</td>
<td>17.9</td>
<td>68.4</td>
<td>18.8</td>
<td>81.1</td>
</tr>
<tr>
<td>Lead</td>
<td>14.3</td>
<td>29.0</td>
<td>14.3</td>
<td>29.0</td>
</tr>
<tr>
<td>Silver</td>
<td>0.54</td>
<td>1.15</td>
<td>0.88</td>
<td>7.65</td>
</tr>
<tr>
<td>Molybdenum</td>
<td>1.81</td>
<td>5.06</td>
<td>1.66</td>
<td>3.99</td>
</tr>
<tr>
<td>Gold</td>
<td>10.6</td>
<td>15.8</td>
<td>14.4</td>
<td>73.1</td>
</tr>
<tr>
<td>Copper (cold extractable)</td>
<td>2.3</td>
<td>4.2</td>
<td>2.8</td>
<td>6.6</td>
</tr>
<tr>
<td>Heavy metals (cold extractable)</td>
<td>11.1</td>
<td>16.1</td>
<td>12.0</td>
<td>21.3</td>
</tr>
</tbody>
</table>
Table 1.5-4. Clark Fork Superfund background levels for selected elements.

<table>
<thead>
<tr>
<th>Material</th>
<th>As (mg/Kg)</th>
<th>Cd (mg/Kg)</th>
<th>Pb (mg/Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Mean Soil</td>
<td>6.7</td>
<td>0.7</td>
<td>20.0</td>
</tr>
<tr>
<td>Helena Valley Mean Soil</td>
<td>16.5</td>
<td>0.2</td>
<td>11.5</td>
</tr>
<tr>
<td>Missoula Lake Bed Sediments</td>
<td>n.a.</td>
<td>0.2</td>
<td>34.0</td>
</tr>
<tr>
<td>Blackfoot River</td>
<td>4.0</td>
<td>&lt;0.1</td>
<td>n.a.</td>
</tr>
<tr>
<td>Phytotoxic Concentration</td>
<td>100.0</td>
<td>100.0</td>
<td>1,000.0</td>
</tr>
</tbody>
</table>

1.5.6 Analytical Results

The results of the sample analyses were used to estimate the nature and extent of potential impacts to the environment and human health. Selected results for each site are presented in the discussion; a complete listing of water quality, soil chemistry, and leach test results are presented in Appendix C. It should be noted that the sampling for this study was of a reconnaissance nature only, sufficient for outlining possible problem areas for future study. Sampling density was not sufficient to provide a statistically valid description of any specific site.

The data fields in the current database are presented in Appendix B, and the format (dBase IV) is compatible with the widely used ARC/INFO Geographical Information System (GIS).

1.5.7 Sample and Site Identification Numbers

All water, tailings, and dump samples were assigned unique numbers. These were determined according to the following system: 1) an initial letter code identifying the person who took the sample (usually the first letter of the last name); 2) one digit for the month; 3) two digits for the day on which the sample was taken; 4) the last two digits in the year in which the sample was taken (i.e., “00” if the sample was taken in 2000); and 5) two digits, including a leading zero, identifying the individual sample. Site numbers for properties that did not have a database identification number assigned to them were generated in the same manner.
2.0 MISCELLANEOUS PROPERTIES, OWYHEE COUNTY, IDAHO

2.1 INTRODUCTION

This report describes fifty-one sites in various parts of Owyhee County, Idaho. Twelve of these properties have produced some ore since 1900, and five had over 1,000 tons of total output between 1900 and 1982. One property reported placer production in addition to lode output, and another property reported only placer production. The study area covers Owyhee County (Figure 2.1-1) outside the major mining areas on War Eagle Mountain, along Flint Creek, and in the South Mountain mining district. These three areas were discussed in previous volumes.

The U.S. Bureau of Land Management administers the federal lands in this area, and most of the mines discussed in this volume are on federal land. A few of the mines are on patented mining claims or on land owned by the State of Idaho.

The fifty-one sites in this report, some of which are discussed together, are on twelve 7.5-minute topographic maps (U.S. Geological Survey). Locations are shown on Figure 2.1-1. Elevations in the study area range from about 8,400 feet on Hayden Peak near the center of the study area to about 3,450 feet near the eastern edge of the area. Much of the area is covered with sparse patches of sagebrush and desert scrub. Willows occur along the water courses, and thickets of mountain mahogany are found at the higher elevations. The topography varies from gentle at the lower elevations to generally steep at the higher elevations.

2.1.1 Summary of the Owyhee County Study Area

There were fifty-one mining sites (Table 2.1.1-1) examined outside the major mining areas in Owyhee County. Of these, eight have the potential for an environmental impact on adjacent waterways. Six of these have water discharges that exceed one or more water quality standards, three have mill tailings near active waterways, and one site has waste rock impinging on an active waterway. Of the fifty-one sites, twenty-two have open adits or shafts. One of these sites has a gated opening, and eleven of the properties have multiple open workings.

2.2 GEOLOGY

The most recent references describing the geology of Owyhee County are Ekren and others (1981, 1984). The geology and ore deposits of the area are discussed in Piper and Laney (1926), Asher (1968), Salman (1972), Walker (1965), and unpublished reports on individual deposits. Bennett and Galbraith (1975) discuss the geochemistry of the area between Silver City and South Mountain. A brief description of the geologic framework of the area follows.

Granitic rocks of Cretaceous age, which host many of the mineral deposits in the study area, and roof pendants on these granitic rocks are the oldest rocks in most of Owyhee County (Figure 2.2-1). These rocks are principally biotite-muscovite granodiorite, with lesser amounts of albite granite and quartz monzonite. Other major rock units include basalt and welded, flow-layered
Table 2.1-1. List of miscellaneous mines and prospects visited in Owyhee County, Idaho, in July 2000. Properties are listed by site number.

**Explanation:**

**Site Number:** Idaho Geological Survey file number, or field designation number.

**Surface Owner:** S = State; P = Private or Patented claims; BLM = Bureau of Land Management; ? = ownership uncertain.

**Environmental Concerns:** W = water; D = waste dump; T = mill tailings. Environmental concerns are noted as follows: W - samples of adit water that exceed one or more water quality standards in the Dissolved Metals Screen, the Total Recoverable Metals Screen, or the arsenic, lead, or mercury tests; T or D - tailings or waste rock samples that exceed background or environmental standards for one or more elements in the Element Screen, and/or dump or tailings samples that show significant leaching of one or more metals in the TCLP for Metals Screen. Sites with environmental concerns are highlighted.

**Samples:** numbers indicate the number of samples collected.

**Physical Conditions:** AO = open adit; AG = gated adit; AC = caved or otherwise closed adit; SO = open shaft; SC = caved shaft; StO = open stope; P = pit; T = trench; C = bulldozer cut. Numbers indicate how many of each are at the site.

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Mine Name</th>
<th>Surface Owner</th>
<th>Water Samples</th>
<th>Solid Samples</th>
<th>Environmental Concerns</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>BO-190</td>
<td>Great Western Mine</td>
<td>BLM</td>
<td>1</td>
<td>W</td>
<td>1AG</td>
<td></td>
</tr>
<tr>
<td>BO-408</td>
<td>Ida Belle Mine</td>
<td>BLM</td>
<td>none</td>
<td>none</td>
<td>1AO</td>
<td></td>
</tr>
<tr>
<td>BO-410</td>
<td>Berg Mine</td>
<td>BLM</td>
<td>1 D</td>
<td>1AC, several P</td>
<td>1AO</td>
<td></td>
</tr>
<tr>
<td>BO-411</td>
<td>Monarca Mine</td>
<td>BLM</td>
<td>none</td>
<td>2AC, 2P, 1T</td>
<td>1AO, 2AC, 1T</td>
<td></td>
</tr>
<tr>
<td>BO-427</td>
<td>Gold Nugget Group</td>
<td>P</td>
<td>1</td>
<td>W</td>
<td>1AO, 1AC, 1SC</td>
<td></td>
</tr>
<tr>
<td>BO-435</td>
<td>Slacks Mountain Prospects</td>
<td>BLM</td>
<td>none</td>
<td>1AO, 2AC, 1T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BO-436</td>
<td>Nugent Mine</td>
<td>BLM</td>
<td>none</td>
<td>1AO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BO-447</td>
<td>Matteson Mine</td>
<td>BLM</td>
<td>none</td>
<td>5AO, 1AC, several C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JV-41</td>
<td>Rose Quartz Claim(?)</td>
<td>BLM</td>
<td>none</td>
<td>1AO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JV-42</td>
<td>McCall Mine</td>
<td>BLM</td>
<td>none</td>
<td>1AO, 1AC, 1SO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JV-46</td>
<td>Demming Mine</td>
<td>BLM</td>
<td>2 1</td>
<td>W, T</td>
<td>2AO, 1AC, 1SO(?), 1P or SC(?)</td>
<td></td>
</tr>
<tr>
<td>JV-60</td>
<td>Unnamed Prospects</td>
<td>BLM</td>
<td>none</td>
<td>1SO, several T and P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JV-61</td>
<td>Unnamed Prospects</td>
<td>BLM</td>
<td>none</td>
<td>numerous T, P, and C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2.1-1 (continued). List of miscellaneous mines and prospects visited in Owyhee County, Idaho, in July 2000.

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Mine Name</th>
<th>Surface Owner</th>
<th>Water Samples</th>
<th>Solid Samples</th>
<th>Environmental Concerns</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>JV-78</td>
<td>Unnamed Prospect</td>
<td>BLM</td>
<td>none</td>
<td>1 W</td>
<td>2AO, 1AC, 1SO, several C and P</td>
<td></td>
</tr>
<tr>
<td>JV-79</td>
<td>Unnamed Prospect</td>
<td>BLM</td>
<td>none</td>
<td></td>
<td>2AO, 1AC, 1SO, several C and P</td>
<td></td>
</tr>
<tr>
<td>JV-83, JV-84, JV-85</td>
<td>Bluebird Mine and associated prospects</td>
<td>P(?)</td>
<td>1 W</td>
<td></td>
<td>3AO, 4AC, 2SC, numerous T, C, and P</td>
<td>video taken from Bluebird Mine</td>
</tr>
<tr>
<td>JV-86</td>
<td>Unnamed Prospects</td>
<td>BLM(?)</td>
<td>none</td>
<td></td>
<td>video taken from Bluebird Mine</td>
<td></td>
</tr>
<tr>
<td>JV-87</td>
<td>Unnamed Prospects</td>
<td>BLM</td>
<td>none</td>
<td>2AC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JV-88</td>
<td>Unnamed Prospects</td>
<td>BLM</td>
<td>none</td>
<td>1 or 2AC, several C, T, and P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JV-89</td>
<td>Unnamed Prospects</td>
<td>BLM</td>
<td>none</td>
<td>shallow T, bulldozer scrape</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JV-90</td>
<td>Unnamed Prospects</td>
<td>BLM</td>
<td>none</td>
<td>several small T and P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site Number</td>
<td>Mine Name</td>
<td>Surface Owner</td>
<td>Water Samples</td>
<td>Solid Samples</td>
<td>Environmental Concerns</td>
<td>Comments</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------</td>
<td>---------------</td>
<td>---------------</td>
<td>---------------</td>
<td>------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>JV-91</td>
<td>Unnamed Prospects</td>
<td>BLM</td>
<td></td>
<td>none</td>
<td>1AO, 1AC, bulldozer cuts</td>
<td></td>
</tr>
<tr>
<td>JV-92</td>
<td>Silver Rock Mine</td>
<td>BLM</td>
<td>3</td>
<td>1</td>
<td>W, T</td>
<td>2AO, 7AC, tailings impoundments</td>
</tr>
<tr>
<td>JV-93</td>
<td>E. B. Mining Co.</td>
<td>BLM</td>
<td></td>
<td>none</td>
<td>several very minor C</td>
<td></td>
</tr>
<tr>
<td>JV-94</td>
<td>Unnamed Prospect</td>
<td>S</td>
<td></td>
<td>none</td>
<td>1AC, several very shallow P</td>
<td></td>
</tr>
<tr>
<td>JV-95</td>
<td>Unnamed Prospects</td>
<td>BLM(?)</td>
<td></td>
<td>none</td>
<td>several minor P and C</td>
<td></td>
</tr>
<tr>
<td>JV-96</td>
<td>Unnamed Prospects</td>
<td>BLM</td>
<td></td>
<td>none</td>
<td>2P (shallow) and 1C</td>
<td></td>
</tr>
<tr>
<td>JV-97</td>
<td>Unnamed Prospects</td>
<td>BLM</td>
<td></td>
<td>none</td>
<td>20 P and C, 1T (30 ft. long, 10 ft. headwall)</td>
<td></td>
</tr>
<tr>
<td>JV-98</td>
<td>Unnamed Prospects</td>
<td>BLM</td>
<td></td>
<td>none</td>
<td>3C (shallow)</td>
<td></td>
</tr>
<tr>
<td>JV-99</td>
<td>Payette Claims</td>
<td>P(?), BLM(?)</td>
<td></td>
<td>none</td>
<td>1 T and C into outcrop; 1C (shallow)</td>
<td></td>
</tr>
<tr>
<td>JV-100</td>
<td>Lucky Day Group</td>
<td>BLM, P(?)</td>
<td>1</td>
<td>W</td>
<td>1AO, 1SC, 2P (deep)</td>
<td></td>
</tr>
<tr>
<td>JV-104</td>
<td>Unnamed Prospects</td>
<td>BLM(?), P(?)</td>
<td></td>
<td>none</td>
<td>several C and P in devitrified vitrophyre</td>
<td></td>
</tr>
<tr>
<td>B7160001</td>
<td>Unnamed Prospect</td>
<td>BLM</td>
<td></td>
<td>none</td>
<td>1AC, several P and T</td>
<td></td>
</tr>
<tr>
<td>K7150002</td>
<td>Unnamed Prospects</td>
<td>BLM</td>
<td></td>
<td>none</td>
<td>several T and P</td>
<td></td>
</tr>
<tr>
<td>K7150003</td>
<td>Unnamed Prospect</td>
<td>BLM</td>
<td></td>
<td>none</td>
<td>1AC, P, 2C</td>
<td></td>
</tr>
<tr>
<td>Reference Sample</td>
<td>---</td>
<td>1</td>
<td>W</td>
<td></td>
<td>on Castle Creek, ½ mi. south of Golden Crown Mine</td>
<td></td>
</tr>
<tr>
<td>Reference Sample</td>
<td>---</td>
<td>1</td>
<td>W</td>
<td></td>
<td>on Alder Creek where old jeep road crosses creek just west of homestead</td>
<td></td>
</tr>
</tbody>
</table>
Figure 2.2-1a. Geology of the northern part of the Owyhee County study area (Ekren and others, 1981). Kg = Cretaceous granitic rocks; Td = Oligocene dike rocks; Tab = Oligocene andesite and basalt of Upper Salmon Creek; Tlb = Miocene basalt; Tli = Miocene latite flows and associated clastic rocks; Tbi = Miocene basaltic intrusive masses; Tbb = Miocene higher basalt; Trs = Miocene sedimentary basin fill in Reynolds Basin; Ttc = Miocene tuff of Flint Creek; Tms = Miocene tuff of the millsite; Tr = Miocene rhyolite dikes and plugs; Tsp = Miocene plagioclase rhyolite; Tsc = Miocene rhyolites of the Silver City Range, undivided; Tbm = Miocene rhyolite of Black Mountain; Tbc = Miocene tuff of Browns Creek; Tbb = Miocene Banbury Basalt and interbedded sediments; Tmb = Miocene basalt of Murphy area; Tch, Tpcr, Tbpc = Pliocene and Miocene Chalk Hills and Poison Creek Formations and associated volcanic rocks; QTg = Tertiary and Quaternary fan and terrace gravel deposits; Qbb = Pleistocene Bruneau Formation; Qf = Quaternary fan alluvium and fanglomerate; Qp = Quaternary pediment gravels; Qls = Quaternary landslide deposits; Qa = Quaternary alluvium.
Figure 2.2-b Geology of the southern part of the Owyhee County study area (Ekren and others, 1981). Kgd = Cretaceous porphyritic quartz diorite and granodiorite; Kg = Cretaceous granite rocks; Tev = Eocene Chaffis Volcanics; Td = Oligocene dike rocks; Thb = Miocene basalt; Ti = Miocene latite flows and associated clastic rocks; Tr = Miocene rhyolite dikes and plugs; Tsc = Miocene rhyolites of the Silver City Range, undivided; Tbr = Miocene biotite tuff or lava; Tbn = Miocene rhyolite of Black Mountain; Tas = Miocene arkose sedimentary rocks; Ts = Miocene sedimentary rocks beneath the tuff of Swisher Mountain, Tsr = Miocene tuff of Swisher Mountain; Tjb = Miocene tuff of the Badlands; Tbc = Miocene tuff of Browns Creek; Tlj = Miocene tuff of Little Jack Creek; Tb, Tbs, Tth = Miocene Basalt Basalt and interbedded sediments; Tbd = Miocene basalt dike complex; Tmb = Miocene basalt of Murphy area; Tch = Pliocene and Miocene Chalk Hills Formation, QTgf = Pleistocene (?) and Pliocene Glenns Ferry Formation, QTg = Tertiary and Quaternary fan and terrace gravel deposits; Qbb, Qbg = Pleistocene Bruneau Formation and related sediments; Qf = Quaternary fan alluvium and fanglomerate, Qbs = Quaternary landslide deposits; Qa = Quaternary alluvium.
rhyolite, both of Miocene age (Ekren and others, 1981, 1984; Piper and Laney, 1926). A number of north-northwest-trending faults cross the study area (Ekren and others, 1981, 1984).

2.3 ECONOMIC GEOLOGY

2.3.1 General Characteristics of the Ore

Most of the mineral deposits in the study area are hosted by granitic rocks of Cretaceous age (Ekren and others, 1981, 1984; Piper and Laney, 1926; Salman, 1972; Walker, 1965). The mines exploited silver-gold veins, some of which contained base metals or antimony. Placer deposits are associated with a few of the lode mines.

Even though the mines examined for this report are outside the major mining districts in Owyhee County, twelve of these properties reported production between 1900 and 1982, and five properties reported over 1,000 tons of production during that period. All of the properties produced silver and gold, and many of them also produced lesser amounts of lead, copper, or zinc.

2.3.2 Summary of Mill Development

The location and history of ore processing mills in the study area are important because a major source of environmental problems in many mining camps is old mill tailings disposal sites. These problems include high metal loadings, which could be available to waterways, and fine sediment, which could increase stream loadings or provide a source of fine wind-blown material. At one time or another, mills were present at the following properties (ranked by decreasing quantity of mill tails noted at the site):

- Overall Mine — flotation and jig(?) tailings
- Silver Rock Mine — flotation tailings
- Demming Mine — flotation tailings
- Bluebird Mine
- Berg Mine
- Ida Belle Mine
- Golden Crown Mine
- Lucky Day Group
- Gold Nugget Group

The two tailings impoundments at the Overall Mine consist of finer material (flotation tailings) on top of coarser material that may be jig tails.

Two tailings impoundments are present at the Silver Rock Mine. The upper impoundment contains fine flotation tailings about 1 foot thick covering $\frac{1}{2}$-b of the impoundment. The lower impoundment contains only a thin veneer of fine tailings.
In 1917, the Demming Mine had a 100-tons-per-day (tpd) flotation plant, which consisted of a crusher, a tube mill, classifier flotation machines, and a filter. In 1919, a roaster and cyanide tanks were added to the mill. In 1921, the Demming mill processed ore from the Flint district. The Demming mine operated sporadically until 1940. There was apparently no tailings impoundment at the site.

A 30-tpd flotation mill was completed at the Bluebird in November 1925. However, by 1930, the company could not make the property pay. It is not known how later operators processed their ore. No tailings were found at the site.

In 1924, the Berg Mine had a 30-tpd mill that consisted of a Chilean mill, amalgamating plates, and concentrating tables. This mill probably did not operate for very long. Plans were made in the late 1920s to install flotation equipment in the mill, but this may not have been done.

A mill was installed at the Ida Belle in 1930. By 1933, a larger mill was being planned. The mine closed in 1939.

The Golden Crown Mine had a three-stamp mill with cyanide tanks in 1913. In the 1960s, milling equipment consisted of a jaw crusher and amalgamation barrels.

The ten-stamp mill at the Lucky Day Group may never have operated. No tailings were found at the site.

Parts of a stamp mill, but no tailings, were found at the Gold Nugget Group.

2.4 HYDROLOGY AND HYDROGEOLOGY

Most of the drainages in the study area flow northeastward and eventually empty into the Snake River. However, in the southern part of the study area, the streams flow southward into Nevada, and the western part of the study area includes streams that are tributaries to Jordan Creek (Figure 2.1-1).

To test how the metal content of the country rock was impacting stream waters, four reference water samples were collected. The chemical analyses for these samples are shown in Tables 2.4-1 and 2.4-2, along with water quality standards suggested by the Environmental Protection Agency (EPA). The following reference water samples were collected:

- B7130003—Dobson Creek
- B7150001—Jordan Creek
- K7160001—Castle Creek
- K7170002—Alder Creek

All four of these samples exceed the Aquatic Life Chronic standard for mercury. In addition, sample K7160001 exceeds the Secondary MCL for iron and sample K7170002 exceeds all standards for iron and manganese in the total recoverable metals screen.
Table 2.4-1. Dissolved metals in reference water samples in Owyhee County, Idaho, Summer 2000. Numbers in bold-face type exceed one or more water quality standards.

<table>
<thead>
<tr>
<th>Field No.</th>
<th>Location</th>
<th>Al (ppm)</th>
<th>As (ppm)</th>
<th>Ba (ppm)</th>
<th>Cd (ppm)</th>
<th>Cr (ppm)</th>
<th>Cu (ppm)</th>
<th>Fe (ppm)</th>
<th>Pb (ppm)</th>
<th>Mn (ppm)</th>
<th>Hg (ppm)</th>
<th>Ni (ppm)</th>
<th>Zn (ppm)</th>
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<td>B 713003</td>
<td>Dobson Creek, reference sample</td>
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<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.00110</td>
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<tr>
<td>B 715001</td>
<td>Jordan Creek, reference sample</td>
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<td>0.00140</td>
<td>0.039</td>
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<td>---</td>
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<tr>
<td>K 716001</td>
<td>Castle Creek, reference sample</td>
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<td>0.00440</td>
<td>0.043</td>
<td>---</td>
<td>---</td>
<td>0.071</td>
<td>---</td>
<td>0.0074</td>
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EXPLANATION

Blank space equals no analysis

Below Detection Limit is ---

mg/L = ppm

WATER QUALITY STANDARDS

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<th>Al  (mg/L)</th>
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<th>Cd  (mg/L)</th>
<th>Cr  (mg/L)</th>
<th>Cu  (mg/L)</th>
<th>Fe  (mg/L)</th>
<th>Pb  (mg/L)</th>
<th>Mn  (mg/L)</th>
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<td>0.100</td>
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<td>Secondary MCL</td>
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<td>0.08-0.2</td>
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<td>0.360</td>
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<td>1.7-3.1</td>
<td>0.018-0.034</td>
<td>1.000</td>
<td>0.08-0.2</td>
<td>0.0024</td>
<td>1.4-2.5</td>
<td>0.12-0.21</td>
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<tr>
<td>Aquatic Life, Chronic</td>
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<td>0.003-0.008</td>
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<td>0.11-0.19</td>
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<tr>
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Table 2.4-2. Total recoverable metals in reference water samples in Owyhee County, Idaho, Summer 2000. Numbers in bold-face type exceed one or more water quality standards.

<table>
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<tr>
<th>Field No.</th>
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<th>Al (ppm)</th>
<th>As (ppm)</th>
<th>Ba (ppm)</th>
<th>Cd (ppm)</th>
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<th>Cu (ppm)</th>
<th>Fe (ppm)</th>
<th>Pb (ppm)</th>
<th>Mn (ppm)</th>
<th>Hg (ppm)</th>
<th>Ni (ppm)</th>
<th>Zn (ppm)</th>
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<td>B 7130003</td>
<td>Dobson Creek, reference sample</td>
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<td>---</td>
<td>---</td>
<td>0.140</td>
<td>0.0078</td>
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<tr>
<td>B 7150001</td>
<td>Jordan Creek, reference sample</td>
<td>0.034</td>
<td>---</td>
<td>---</td>
<td>0.200</td>
<td>0.0320</td>
<td>---</td>
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<tr>
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<td>Castle Creek, reference sample</td>
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<td>K 7170002</td>
<td>Alder Creek, reference sample</td>
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<td>1.500</td>
<td>0.0540</td>
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**EXPLANATION**

Blank space equals no analysis

mg/L = ppm

Below Detection Limit is ---

**WATER QUALITY STANDARDS**

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<th></th>
<th>Al (mg/L)</th>
<th>As (mg/L)</th>
<th>Ba (mg/L)</th>
<th>Cd (mg/L)</th>
<th>Cr (mg/L)</th>
<th>Cu (mg/L)</th>
<th>Fe (mg/L)</th>
<th>Pb (mg/L)</th>
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<th>Hg (mg/L)</th>
<th>Ni (mg/L)</th>
<th>Zn (mg/L)</th>
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<tr>
<td>Primary MCL</td>
<td>0.0500</td>
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<td>0.100</td>
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<tr>
<td>Secondary MCL</td>
<td>0.05-0.2</td>
<td>0.004-0.09</td>
<td>0.004-3.1</td>
<td>0.018-0.034</td>
<td>0.008-2.0</td>
<td>0.0024</td>
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<td>0.12-0.21</td>
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</tr>
<tr>
<td>Aquatic Life, Acute</td>
<td>0.750</td>
<td>0.3600</td>
<td>0.004-0.09</td>
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<td>0.008-2.0</td>
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<td>0.12-0.21</td>
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<tr>
<td>Aquatic Life, Chronic</td>
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<tr>
<td>Estimated Detection Level (33% confidence)</td>
<td>0.0007</td>
<td>0.020</td>
<td>0.020</td>
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<td>0.00025</td>
<td>0.05</td>
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<td>0.02</td>
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2.5 SUMMARY OF THE OWYHEE COUNTY STUDY AREA

2.5.1 Summary of Environmental Observations

2.5.1.1 Water Samples

All the water samples collected for this study exceeded EPA water standards for one or more elements (Tables 2.5-1 and 2.5-2). Water quality variances include significant amounts of mercury in all water samples, iron from the Silver Rock Mine, iron and manganese from the Demming Mine and the Lucky Day Group, and copper from the Great Western Mine. Arsenic is present in most of the samples and exceeds one or more standards in the samples from the Great Western and Silver Rock mines.

The presence of mercury in all samples may be due to high background values of this element in the rhyolite flows and tuffs that cover much of the study area. A reconnaissance study of rock background mercury values would confirm or negate this hypothesis.

2.5.2.2 Waste Dump and Tailings Samples

Samples were collected from properties where the mill tailings or waste rock impinged on an active waterway (Tables 2.5-3 and 2.5-4). As expected, these samples contain high metal loadings, particularly of arsenic, cadmium, and lead.
Table 2.5-1. Dissolved metals in water samples from Owyhee County, Idaho, Summer 2000. Numbers in bold-face type exceed one or more water quality standards.

<table>
<thead>
<tr>
<th>Field No.</th>
<th>Location</th>
<th>Al (ppm)</th>
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<th>Cr (ppm)</th>
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<th>Fe (ppm)</th>
<th>Pb (ppm)</th>
<th>Mn (ppm)</th>
<th>Hg (ppm)</th>
<th>Ni (ppm)</th>
<th>Zn (ppm)</th>
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<tbody>
<tr>
<td>B 7170004</td>
<td>Demming Mine (JV-46), downstream</td>
<td>---</td>
<td>0.00083</td>
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<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
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<td>0.00091</td>
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<td>B 7160002</td>
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<td>---</td>
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<td>---</td>
<td>0.075</td>
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EXPLANATION

Blank space equals no analysis
mg/L = ppm
Below Detection Limit is ---

WATER QUALITY STANDARDS

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<tr>
<th></th>
<th>Al (mg/L)</th>
<th>As (mg/L)</th>
<th>Ba (mg/L)</th>
<th>Cd (mg/L)</th>
<th>Cr (mg/L)</th>
<th>Cu (mg/L)</th>
<th>Fe (mg/L)</th>
<th>Pb (mg/L)</th>
<th>Mn (mg/L)</th>
<th>Hg (mg/L)</th>
<th>Ni (mg/L)</th>
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<tr>
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<td>0.750</td>
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<td>0.087</td>
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<td>0.020</td>
<td>0.025</td>
<td>0.005</td>
<td>0.00025</td>
<td>0.050</td>
<td>0.020</td>
<td></td>
</tr>
</tbody>
</table>
Table 2.5-2. Total recoverable metals in water samples from Owyhee County Idaho, Summer 2000. Numbers in bold-face type exceed one or more water quality standards.

<table>
<thead>
<tr>
<th>Field No.</th>
<th>Location</th>
<th>Location Details</th>
<th>Al (ppm)</th>
<th>As (ppm)</th>
<th>Ba (ppm)</th>
<th>Cd (ppm)</th>
<th>Cr (ppm)</th>
<th>Cu (ppm)</th>
<th>Fe (ppm)</th>
<th>Pb (ppm)</th>
<th>Mn (ppm)</th>
<th>Hg (ppm)</th>
<th>Ni (ppm)</th>
<th>Zn (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B 7140004</td>
<td>Demming Mine (JV-46), downstream</td>
<td></td>
<td>0.022</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.150</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>B 7160002</td>
<td>Demming Mine (JV-46), seep from dump</td>
<td></td>
<td>0.034</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>2.200</td>
<td>0.0630</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>B 7170001</td>
<td>Great Western Mine (BO-190), Adit 1</td>
<td></td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.022</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.029</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>K 7130001</td>
<td>Silver Rock Mine (JV-92), Adit 1</td>
<td></td>
<td>0.051</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.500</td>
<td>0.0490</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>K 7130003</td>
<td>Silver Rock Mine (JV-92), downstream</td>
<td></td>
<td>0.042</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.470</td>
<td>0.0057</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>K 7130004</td>
<td>Silver Rock Mine (JV-92), upstream</td>
<td></td>
<td>0.049</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.620</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>K 7140001</td>
<td>Lucky Day Group (JV-100), adit</td>
<td></td>
<td>0.065</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>5.700</td>
<td>0.0810</td>
<td>---</td>
<td>---</td>
<td>0.061</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>K 7150001</td>
<td>Bluebird Mine (JV-84), Adit 1</td>
<td></td>
<td>0.056</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.075</td>
<td>0.0280</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

**EXPLANATION**

Blank space equals no analysis  
mg/L = ppm  
Below Detection Limit is ---

**WATER QUALITY STANDARDS**

<table>
<thead>
<tr>
<th>Standard Type</th>
<th>Al (mg/L)</th>
<th>As (mg/L)</th>
<th>Ba (mg/L)</th>
<th>Cd (mg/L)</th>
<th>Cr (mg/L)</th>
<th>Cu (mg/L)</th>
<th>Fe (mg/L)</th>
<th>Pb (mg/L)</th>
<th>Mn (mg/L)</th>
<th>Hg (mg/L)</th>
<th>Ni (mg/L)</th>
<th>Zn (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary MCL</td>
<td>0.0500</td>
<td>2.000</td>
<td>0.005</td>
<td>0.100</td>
<td>0.0500</td>
<td>0.002</td>
<td>0.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary MCL</td>
<td>0.05-0.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aquatic Life, Acute</td>
<td>0.750</td>
<td>0.3600</td>
<td>0.004-0.009</td>
<td>1.7-3.1</td>
<td>0.018-0.034</td>
<td>1.000</td>
<td>0.0.8-2.0</td>
<td>2.5</td>
<td>0.12-0.21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aquatic Life, Chronic</td>
<td>0.087</td>
<td>0.1900</td>
<td>0.001-0.002</td>
<td>0.21-0.37</td>
<td>0.012-0.021</td>
<td>0.003-0.008</td>
<td>0.000012</td>
<td>0.16-0.28</td>
<td>0.11-0.19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated Detection Level (33% confidence)</td>
<td>0.0007</td>
<td>0.020</td>
<td>0.020</td>
<td>0.020</td>
<td>0.05</td>
<td>0.0025</td>
<td>0.00025</td>
<td>0.05</td>
<td>0.02</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2.5-3. Element screen for dump and tailings samples from Owyhee County, Idaho, Summer 2000.

<table>
<thead>
<tr>
<th>Field No.</th>
<th>Location</th>
<th>Al (ppm)</th>
<th>As (ppm)</th>
<th>Ba (ppm)</th>
<th>Cd (ppm)</th>
<th>Cr (ppm)</th>
<th>Cu (ppm)</th>
<th>Fe (ppm)</th>
<th>Pb (ppm)</th>
<th>Mn (ppm)</th>
<th>Hg (ppm)</th>
<th>Ni (ppm)</th>
<th>Zn (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dump samples</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B7130002</td>
<td>Berg Mine (BO-410), waste dump</td>
<td>180</td>
<td>410.00</td>
<td>9.00</td>
<td>46.0</td>
<td>68.0</td>
<td>47,000</td>
<td>300.0</td>
<td>1,600.0</td>
<td>54.0</td>
<td>400.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tailings Samples</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B7140003</td>
<td>Demming Mine (JV-46), mill tailings</td>
<td>1,100</td>
<td>520.00</td>
<td>2.90</td>
<td>15.0</td>
<td>27.0</td>
<td>38,000</td>
<td>51.0</td>
<td>210.0</td>
<td>12.0</td>
<td>68.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K7130002</td>
<td>Silver Rock Mine (JV-92), mill tailings</td>
<td>1,200</td>
<td>180.00</td>
<td>2.30</td>
<td>21.0</td>
<td>24.0</td>
<td>14,000</td>
<td>94.0</td>
<td>230.0</td>
<td>18.0</td>
<td>65.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K7170001</td>
<td>Overall Mine (JV-64), mill tailings</td>
<td>42,000</td>
<td>56.00</td>
<td>6.60</td>
<td>7.4</td>
<td>22.0</td>
<td>38,000</td>
<td>1,200.0</td>
<td>88.0</td>
<td>12.0</td>
<td>180.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clark Fork Superfund Background Levels (mg/Kg) = ppm</th>
<th>As</th>
<th>Cd</th>
<th>Pb</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Mean Soil</td>
<td>6.7</td>
<td>0.7</td>
<td>20.0</td>
</tr>
<tr>
<td>Helena Valley Mean Soil</td>
<td>16.5</td>
<td>0.2</td>
<td>11.5</td>
</tr>
<tr>
<td>Missoula Lake Bed Sediments</td>
<td>NA</td>
<td>0.2</td>
<td>34.0</td>
</tr>
<tr>
<td>Blackfoot River</td>
<td>4.0</td>
<td>&lt;0.1</td>
<td>NA</td>
</tr>
<tr>
<td>Phytotoxic Concentration</td>
<td>100.0</td>
<td>100.0</td>
<td>1000.0</td>
</tr>
</tbody>
</table>

**Explanation**

Below Detection Limit is ---
Not analyzed equals NA
Table 2.5-4. Toxicity Characteristic Leaching Procedure (TCLP) for dump and tailings samples from Owyhee County, Idaho, Summer 2000.

<table>
<thead>
<tr>
<th>Field No.</th>
<th>Location</th>
<th>As (ppm)</th>
<th>Cd (ppm)</th>
<th>Cr (ppm)</th>
<th>Pb (ppm)</th>
<th>Hg (ppm)</th>
<th>Se (ppm)</th>
<th>Ag (ppm)</th>
<th>Ba (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dump Samples</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B7130002</td>
<td>Berg Mine (BO-410), waste dump</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.00047</td>
<td>---</td>
<td>---</td>
<td>1.200</td>
</tr>
<tr>
<td><strong>Tailings Samples</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B7140003</td>
<td>Demming Mine (JV-46), mill tailings</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.00060</td>
<td>---</td>
<td>---</td>
<td>1.500</td>
</tr>
<tr>
<td>K7130002</td>
<td>Silver Rock Mine (JV-92), mill tailings</td>
<td>0.430</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.00043</td>
<td>---</td>
<td>---</td>
<td>1.800</td>
</tr>
<tr>
<td>K7170001</td>
<td>Overall Mine (JV-64), mill tailings</td>
<td>0.460</td>
<td>0.091</td>
<td>---</td>
<td>1.100</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

**EXPLANATION**
- Blank space equals no analysis
- mg/L = ppm
- Not Detected is ND
- Below Detection Limit is ---

**WATER QUALITY STANDARDS**

<table>
<thead>
<tr>
<th></th>
<th>As (mg/L)</th>
<th>Cd (mg/L)</th>
<th>Cr (mg/L)</th>
<th>Pb (mg/L)</th>
<th>Hg (mg/L)</th>
<th>Se (mg/L)</th>
<th>Ag (mg/L)</th>
<th>Ba (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary MCL</td>
<td>0.050</td>
<td>0.005</td>
<td>0.100</td>
<td>0.050</td>
<td>0.002</td>
<td>0.050</td>
<td>2.000</td>
<td></td>
</tr>
<tr>
<td>Secondary MCL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.100</td>
</tr>
<tr>
<td>Aquatic Life, Acute</td>
<td>0.360</td>
<td>0.004 -</td>
<td>1.7-</td>
<td>0.082 -</td>
<td>0.002</td>
<td>0.00012</td>
<td>0.00012</td>
<td>0.00041-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.009</td>
<td>3.1</td>
<td>0.2 -</td>
<td></td>
<td></td>
<td></td>
<td>0.0134</td>
</tr>
<tr>
<td>Aquatic Life, Chronic</td>
<td>0.190</td>
<td>0.001 -</td>
<td>0.21 -</td>
<td>0.003 -</td>
<td>0.000012</td>
<td>0.00012</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.002</td>
<td>0.37</td>
<td>0.008</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated Detection Level (33% confidence)</td>
<td>0.250</td>
<td>0.02</td>
<td>0.250</td>
<td>0.250</td>
<td>0.00025</td>
<td>0.500</td>
<td>0.200</td>
<td>0.100</td>
</tr>
</tbody>
</table>

28
3.0 OWYHEE COUNTY 2000 AML MINE DESCRIPTIONS

3.1 SILVER ROCK MINE (Site No. JV-92)

Alternate name—North American Silver Corp.; Probable alternate names—E. B. Mining Co; Bain Mine; Blue Bell Claims; Illinois Mine.

3.1.1 Site Location and Access (Figure 2.1-1b)

The Silver Rock Mine is on the South Fork of Castle Creek in the southeast corner of section 8, the southwest corner of section 9, and the northwest corner of section 16, T. 8 S., R. 1 W., on the Clover Mtn. 7.5-minute quadrangle (Figure 3.1-1). Access is on a dirt road that branches northwest from the Mud Flat Road about 1 mile to Magpie Creek, then west and northwest along the South Fork of Castle Creek about 4 miles to the mine. A short section of private land with a locked gate, belonging to Mr. J. Cox, must be crossed about 2 miles from the mine, which is on BLM land. Mr. Cox gave permission to cross his land.

3.1.2 Geologic Features (Figure 2.2-1b)

The rocks in the vicinity of the Silver Rock Mine are Cretaceous porphyritic quartz diorite and granodiorite intruded by Oligocene dikes ranging in composition from gabbro to rhyolite (Ekren and others, 1981). Rocks on the waste dumps include altered and silicified examples of these rock types.

3.1.3 Site History

The Silver Rock was active and shipped ore in the late 1930s and in the late 1940s. North American Silver Corporation (incorporated in 1968) held the property from 1968 to about 1971 and shipped a small amount of ore. North American Silver was dissolved in 1990.

Based on the general location (“near the head of Castle Creek”) and the number of workings described in reports by several companies to the Idaho Inspector of Mines, the following information from IGS’s mineral property files is believed to describe the early history of the Silver Rock Mine. However, it has not been possible to unequivocally link this information to the Silver Rock Mine.

The United States Silver Mining Company was incorporated in 1919. The company held eight claims, and development on the property consisted of three tunnels and a number of crosscuts. The company forfeited its corporate charter in 1921.

The Illinois Mining Company was incorporated in 1923, and by the following year, the company had acquired some of United States Silver’s claims, in addition to staking claims of its own. In 1924, the property had six tunnels (80 feet, 750 feet, 125 feet, 75 feet, 50 feet, and 300 feet long). A four-room boarding house was

29
constructed in 1924. Only assessment work was done after 1925, and the company forfeited its corporate charter in 1930.

The E. B. Mining Company was incorporated in 1929. This company restaked Illinois Mining’s claims as the Blue Bell Group. In early 1930, the tunnels were caved and the new owners were cleaning out the main tunnel (said to be 1,500 feet long) to prepare for development work in the spring. After working on a raise to connect the tunnels, E. B. Mining forfeited its corporate charter in 1932.

3.1.4 Environmental Conditions

3.1.4.1 Site Features

The Silver Rock Mine was visited by John Kauffman on July 13, 2000. A video segment describing the site is on Owyhee County 2000 Videotape (Tape 1, index 0:09:40-0:34:00). Documenting photographs are Roll 00K4, frames 5-26.

Nine adits were found at this property (Figure 3.1-2). All but two are completely caved. Most are shown on the topographic map by either adit or prospect symbols. Adits 1 through 5 appear to be the main workings, whereas Adits 6 through 9 were most likely only short prospect adits. In addition to the adits, there are several shallow trenches and bulldozer cuts. No remnants of a mill building were found, but two tailings impoundments are along the south side of the creek several hundred yards northwest of the mine. Several buildings are along the creek near the main workings.

Adit 1 is caved and has a seep of about 2 gallons per minute. A thick mat of moss and grass is growing on the dump (Figure 3.1-3), and low shrubs have taken hold where the seep flows down the side of the dump (Figure 3.1-4). The dump measures 30 feet long, about 25 feet at its widest part, and is 30 feet thick.

Adit 2 is also caved, and some of the old portal timbers protrude through the rubble (Figure 3.1-5). Part of a wooden trestle that supported the rails and an ore chute are on the face of the dump (Figure 3.1-6) directly above a wooden ore bin. The dump for this adit is about 60 feet long and 12 feet wide; it extends down the slope about 30 feet to the access road.

Adits 3, 4, and 5 are about 40 feet above Adit 2. Adit 3 is directly above Adit 2 and probably is on the same vein. Although the boards and timbers at the entrance are collapsing (Figure 3.1-7) and some material has sloughed around the beams, there is a small opening about 1½ feet high and 2-3 feet wide that leads into the adit (Figure 3.1-8). Rails extending out from the portal split in front of the adit, with one branch going to a short trestle and ore slide above Adit 2 and the other turning to the northwest parallel to the slope. Adit 4, about 30-40 feet northwest of Adit 3, is completely caved. Adit 5, another 30-50 feet further to the northwest, is nearly caved but has a narrow opening 1 foot high and 5 feet wide (Figure 3.1-9). A scarp about 6-7 feet high is on the
slope above the opening (Figure 3.1-10). The waste dumps for these three adits are more or less combined (Figure 3.1-11), although individual portions are apparent. Overall, the dump measures 90 feet long, 10-30 feet wide, and about 40 feet thick. The toe of the dump extends down to Adit 2.

Adit 6 is uphill and east of Adit 3. This adit is caved, forming a small scarp on the slope (Figure 3.1-12). The waste dump is 35 feet long, 6-15 feet wide, and about 15 feet thick (Figure 3.1-13).

Adit 7 is slightly farther uphill and east from Adit 6. It also is caved and has a 4-5 foot headwall scarp (Figure 3.1-14). The waste dump is 15 feet long, 10-12 feet wide, and 10 feet thick (Figure 3.1-15).

Adits 8 and 9, both caved, are minor prospect adits along the creek south of the main workings. Adit 8 is on the northeast side of the creek along the access road. Its waste dump is 35 feet long, 8 feet wide, and 30 feet down the face, although the material is only about 5-8 feet thick perpendicular to the slope (Figure 3.1-16). Adit 9 is on the southwest side of the creek and also forms a minor scarp on the slope (Figure 3.1-17). The waste dump is small and irregular; it possibly has been modified by bulldozer work.

About 500 feet northwest of Adit 1 are two tailings impoundments on the west side of the creek (Figure 3.1-18). The upper, or southern, impoundment is about 200 feet long and 60-80 feet wide. It has about 1 foot of gray to white fine-grained tailings in the lower 135 feet; the upper end is overgrown with grasses and small plants (Figures 3.1-19 and 3.1-20). The lower, northern impoundment is 250 feet long, 75-90 feet wide, and has a minimal amount of tailings. The entire impoundment is overgrown with grasses, other small plants, and some sagebrush (Figure 3.1-21).

The disturbed area at the Silver Rock Mine covers 7-10 acres.

### 3.1.4.2 Sample Locations

#### 3.1.4.2.1 Solid Samples

Grab sample K7130002 was collected from the light-colored tailings in the upper impoundment.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K7130002</td>
<td>Silver Rock Mine, tailings</td>
<td>Yes</td>
</tr>
</tbody>
</table>

#### 3.1.4.2.2 Water Samples

Sample K7130001 was collected from the seep at Adit 1. Sample K7130003 was collected from the South Fork of Castle Creek about 150 feet downstream from the lower tailings impoundment. Sample K7130004 was collected about 1¾ miles upstream from the mine on the South Fork.
<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Specific Conductivity (Fs)</th>
<th>Temperature (°F)</th>
<th>pH</th>
<th>Flow (gpm)</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K7130001</td>
<td>Silver Rock Mine, Adit 1</td>
<td>295</td>
<td>61</td>
<td>6.6</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>K7130003</td>
<td>downstream on the South Fork of Castle Creek</td>
<td>57</td>
<td>60</td>
<td>8.2</td>
<td>5-10 ft. wide, 0.5-1 ft. deep</td>
<td>Yes</td>
</tr>
<tr>
<td>K7130004</td>
<td>upstream on the South Fork of Castle Creek</td>
<td>48</td>
<td>66</td>
<td>7.7</td>
<td>5 ft. wide, 0.5 ft. deep</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.1.4.2.3 Analytical Results

Solid Samples (Tables 2.5-3 and 2.5-4)

In sample K7130002 from the tailings, metals in excess of expected background values in the element screen include arsenic, cadmium, copper and lead. In the TCLP for metals test, arsenic and mercury are leaching from the sample.

Water Samples (Tables 2.5-1 and 2.5-2)

Sample K7130001 from Adit 1 at the Silver Rock Mine exceeds all standards for arsenic in the dissolved heavy metal screen, and in the EPA 200.8 test for mercury, the sample exceeds the Aquatic Life Chronic standard. In the total recoverable metal screen, iron exceeds the Secondary MCL.

In the EPA 200.8 test for mercury, downstream sample K7130003 and upstream sample K7130004 both exceed the Aquatic Life Chronic standard for mercury. In the total recoverable metal screen, both samples exceed the Secondary MCL for iron. Arsenic was detected in the downstream sample, but does not exceed any water quality standards.

3.1.5 Structures

Buildings at the site (Figure 3.1-22) include an old house, two intact sheds, one shed with a collapsed roof, and an ore bin. A considerable amount of scrap metal, old boards, and other debris is scattered at the site, especially near the buildings and on the dumps of Adit 2 and Adits 3-5. There is also a large propane tank near the house.
3.1.6 Safety

The two small openings at Adit 3 and Adit 5 could easily be enlarged to gain entry into the workings. Other minor hazards include nails protruding from old boards and sharp edges on metal scrap.
Figure 3.1-1. Location of the Silver Rock Mine, Owyhee County, Idaho (U.S. Geological Survey Clover Mtn. 7.5-minute topographic map).
Figure 3.1-2. Sketch of the Silver Rock Mine.
Figure 3.1-3. Looking east at caved Adit 1, showing the moss and grass growing on the dump where the water seeps from the adit (Roll 00K4, frame #5).
Figure 3.1-4. Looking southeast at the Silver Rock workings from the west side of the South Fork of Castle Creek. The waste dump for Adit 1 is at the left. The green brush down the far side of the dump marks the location of the adit seep. The green brush along the base is growing along the creek. Most of the other workings can be seen in the background (Roll 00K4, frame #26).

Figure 3.1-5. Looking east at caved Adit 2 of the Silver Rock Mine. A metal pipe is lying on the slope next to the old portal timbers (Roll 00K4, frame #10).
Figure 3.1-6. Remains of the trestle and ore chute on the face of the waste dump for Adit 2, looking southeast (Roll 00K4, frame #11).

Figure 3.1-7. Collapsing portal timbers at Adit 3 of the Silver Rock Mine, looking southeast. Note the branching rails extending from the adit (Roll 00K4, frame #12).
Figure 3.1-8. Small opening into Adit 3 at the Silver Rock Mine. The rock is intensely sheared and altered (Roll 00K4, frame #13).

Figure 3.1-9. Narrow opening into Adit 5 at the Silver Rock Mine. The opening measures about 1 foot high and 5 feet wide (Roll 00K4, frame #16).
Figure 3.1-10. Scarp on the slope above the opening at Adit 5 of the Silver Rock Mine. Old support timbers are barely visible in the sagebrush below the right edge of the scarp. View is to the east (Roll 00K4, frame #15).

Figure 3.1-11. Looking down on the dumps for Adits 3, 4, and 5 at the Silver Rock Mine. The dumps coalesce on the slope, although individual portions are apparent. The rails are on the dump for Adit 3, and the ore bin is below Adit 2. The waste dump for Adit 1 and the upper tailings impoundment are at the upper right (Roll 00K4, frame #18).
Figure 3.1-12. Small, shallow scarp marking the location of caved Adit 6 at the Silver Rock Mine, looking southeast (Roll 00K4, frame #17).

Figure 3.1-13. Looking south at the waste dump for Adit 6 at the Silver Rock Mine (Roll 00K4, frame #19).
Figure 3.1-14. Headwall scarp at Adit 7 of the Silver Rock Mine, looking southeast (Roll 00K4, frame #20).

Figure 3.1-15. Looking northward at the side of the small waste dump for Adit 7 at the Silver Rock Mine (Roll 00K4, frame #21).
Figure 3.1-16. Looking southeast up the South Fork of Castle Creek at the waste dump for caved Adit 8 along the access road to the Silver Rock Mine (Roll 00K4, frame #23).

Figure 3.1-17. Looking southwest across the South Fork of Castle Creek at the small waste dump for caved Adit 9 of the Silver Rock Mine. The hillside has slumped above the adit (Roll 00K4, frame #22).
Figure 3.1-18. Sketch of the Silver Rock tailings impoundments.
Figure 3.1-19. Looking northwest at the upper tailings impoundment at the Silver Rock Mine (right-center part of picture) along the South Fork of Castle Creek (Roll 00K4, frame #9).

Figure 3.1-20. Mud-cracked white tailings on the upper impoundment at the Silver Rock Mine, looking southeast (Roll 00K4, frame #24).
Figure 3.1-21. Looking northwest at the grass-covered lower tailings impoundment at the Silver Rock Mine. The line of sagebrush along the edge is growing on the impoundment dam (Roll 00K4, frame #25).

Figure 3.1-22. Small house and two sheds, one with a collapsed roof, at the Silver Rock Mine. The ore bin below Adit 2 is in the shadows to the left of the truck. The view is to the southeast up the South Fork of Castle Creek, marked by the line of trees and shrubs (Roll 00K4, frame #7).
3.2 UNNAMED PROSPECT (Site No. JV-91)

3.2.1 Site Location and Access (Figure 2.1-1b)

This prospect is on BLM land about ½ mile southeast of the Silver Rock Mine in the NE¼ of the NW¼ of section 16, T. 8 S., R. 1 W., on the Clover Mtn. 7.5-minute quadrangle (Figure 3.2-1). Access is the same as for the Silver Rock Mine. The prospect is in a dry gully on the northeast side of the South Fork of Castle Creek, just north of where the access road splits; one branch of the road heads northeast and the other northwest to the Silver Rock Mine.

3.2.2 Geologic Features (Figure 2.2-1b)

The workings are in thin quartz veins and silicified shear zones in rocks similar to those at the Silver Rock Mine, probably rhyolite or rhyodacite. Rocks mapped in the area by Ekren and others (1981) include Cretaceous porphyritic quartz diorite and granodiorite, the Tuff of Swisher Mountain, and Oligocene dike rocks of varying composition.

3.2.3 Site History

Nothing is known about the history of this site, although it may be related to the Silver Rock Mine.

3.2.4 Environmental Conditions

3.2.4.1 Site Features

This site was visited by John Kauffman on July 13, 2000. A video segment describing the property is on Owyhee County 2000 Videotape (Tape 1, index 0:34:02-0:38:57). Documenting photographs are Roll 00K5, frames 1-4.

This property consists of two adits and several bulldozer cuts and trenches (Figure 3.2-2). Adit 1 was driven west from the gully and is open (Figures 3.2-3 and 3.2-4). A section of mine rail is in front of the adit. Adit 2 was driven east from the gully and is caved. Waste rock is piled on a common dump that spans the gully (Figure 3.2-5). The dump measures 65 feet long, 40 feet wide, and 10 feet thick. A glass jar at the site contained a claim notice filed by Bill and John Harrison in July 1996. No claim name or address of the locators was given. One long bulldozer cut is on the slope west of Adit 1, and several cuts and trenches are on the west and east flanks of the low ridge south of Adit 2. The disturbed area at the site covers about 1 acre.

3.2.4.2 Sample Locations

3.2.4.2.1 Solid Samples

No solid samples were collected.
3.2.4.2.2 Water Samples
    No water samples were collected.

3.2.5 Structures
    There are no structures at the site.

3.2.6 Safety

    Adit 1 is open and can easily be entered.
Figure 3.2-1. Location of the Unnamed Prospect, Site No. JV-91, Owyhee County, Idaho (U.S. Geological Survey Clover Mtn. 7.5-minute topographic map).
Figure 3.2-2. Sketch of Site No. JV-91.
Figure 3.2-3. Looking west toward open Adit 1 at Site No. JV-91 (Roll 00K5, frame #1).

Figure 3.2-4. Close-up of the opening into Adit 1 at Site No. JV-91 (Roll 00K5, frame #2).
Figure 3.2-5. Looking northwest at the face of the waste dump for Adits 1 and 2 in the gully at Site No. JV-91 (Roll 00K5, frame #4).
3.3 UNNAMED PROSPECTS (Site Nos. JV-89 and JV-90)

3.3.1 Site Location and Access (Figure 2.1-1b)

Site No. JV-89 is near the center of the S½ of the S½ of section 4, T. 8 S., R. 1 W., on the Pixley Basin 7.5-minute quadrangle; Site No. JV-90 is in the W½ of section 9, T. 8 S., R. 1 W., on the Clover Mtn. 7.5-minute quadrangle (Figure 3.3-1). Several prospect symbols are shown on the topographic map at these locations, all of which are on BLM land. Access is the same as for the Silver Rock Mine to the drainage just northwest of Clover Creek where the road splits. From the split in the road, these prospects are northeast, then north along the dirt road. JV-89 is about 2 miles north of the split, and the prospects at Site No. JV-90 are between ¾ and 1¾ miles north of the split.

3.3.2 Geologic Features (Figure 2.2-1b)

These prospects are along silicified shear zones in altered rocks similar to those at the Silver Rock Mine. Rocks mapped in the area by Ekren and others (1981) include Cretaceous porphyritic quartz diorite and granodiorite, and Oligocene dike rocks of varying composition.

3.3.3 Site History

Nothing is known of the history of this site.

3.3.4 Environmental Conditions

3.3.4.1 Site Features

Both of these sites were visited by John Kauffman on July 13, 2000. No video or photographs were taken at either site.

The prospects at Site No. JV-89 consist of one shallow trench, which is about 50 feet long and 3 feet deep, and one bulldozer scrape. At Site No. JV-90, there are several shallow prospect pits at the sites shown by prospect symbols on the map, and a trench and several small pits not shown on the map are along the access road near the south edge of section 9. None of these are significant. The total disturbed area amounts to less than 1 acre.

3.3.4.2 Sample Locations

3.3.4.2.1 Solid Samples

No solid samples were collected.

3.3.4.2.2 Water Samples

No water samples were collected.
3.3.5 Structures
   There are no structures at either site.

3.3.6 Safety
   No safety hazards were found at either site.
Figure 3.3-1. Location of Unnamed Prospects at Site Nos. JV-89 and JV-90, Owyhee County, Idaho (U.S. Geological Survey Pixley Basin and Clover Mtn. 7.5-minute topographic maps).
3.4 UNNAMED PROSPECT (Site No. JV-93)

Note: This prospect was originally named the E. B. Mining Co. prospect in the database, based on that company’s location of their property. However, there are not enough workings present at this site to match that company’s annual reports to the Idaho Inspector of Mines. It is believed, based on the number of openings, that the E. B. Mining Co.’s property became the Silver Rock Mine. Consequently, this site is now unnamed.

3.4.1 Site Location and Access (Figure 2.1-1b)

This prospect is about ¾ mile south of Clover Mountain in the NE¼ of the SE¼ of section 14, T. 8 S., R. 1 W., on the Clover Mtn. 7.5-minute quadrangle (Figure 3.4-1). Access is from the Mud Flat Road northwest to Magpie Creek, where the road splits. One branch goes west to the Silver Rock Mine. The other branch is gated and becomes a poor jeep trail beyond the gate. The jeep trail continues northward along Magpie Creek. The prospects are along a very poor jeep trail that splits from the Magpie Creek jeep trail and follows the nose of the ridge to Clover Mountain. Two prospect symbols are shown on the topographic map on the north side of the jeep trail. This minor prospect is on BLM land.

3.4.2 Geologic Features (Figure 2.2-1b)

The trenches are on skarn zones in altered metasedimentary rocks containing a few thin granitic intrusions. The metasediments are probably xenoliths in the Cretaceous granitic intrusions mapped by Ekren and others (1981).

3.4.3 Site History

Nothing is known of the history of this site.

3.4.4 Environmental Conditions

3.4.4.1 Site Features

This site was visited by John Kauffman on July 13, 2000. A video segment describing the prospect, which is identified as the E. B. Mining Co. Prospect on the videotape, is on Owyhee County 2000 Videotape (Tape 1, index 0:39:20-0:42:11). Documenting photograph is Roll 00K5, frame 5.

Two minor bulldozer trenches were found at the sites of the prospect symbols on the map. One of these is shown in Figure 3.4-2. This trench is about 30-40 feet long, 6 feet wide, and 2½ feet deep. The other trench is slightly smaller. The disturbed area covers less than 0.25 acre.
3.4.4.2 Sample Locations

3.4.4.2.1 Solid Samples
   No solid samples were collected.

3.4.4.2.2 Water Samples
   No water samples were collected.

3.4.5 Structures
   There are no structures at this site.

3.4.6 Safety
   There are no safety hazards at this site.
Figure 3.4-1. Location of Unnamed Prospect, Site No. JV-93, Owyhee County, Idaho (U.S. Geological Survey Clover Mtn. 7.5-minute topographic map).
Figure 3.4-2. One of the short, shallow cuts at Site No. JV-93 (Roll 00K5, frame #5).
3.5 UNNAMED PROSPECT (Site No. JV-94)

3.5.1 Site Location and Access (Figure 2.1-1b)

Several minor prospect pits are in the northeast corner of section 23 and the NW¼ of section 24, T. 8 S., R. 1 W., on the Clover Mtn. 7.5-minute quadrangle (Figure 3.5-1). Access is the same as for the E. B. Mining Co. prospect (Section 3.4). Two of the prospects are shown on the topographic map, but several other prospects are not. The prospects in section 23 are on state land; those in section 24 are on private land.

3.5.2 Geologic Features (Figure 2.2-1b)

The prospect pits and bulldozer cuts are on skarn zones in altered metasedimentary rocks containing a few thin granitic intrusions, similar to the rocks at Site No. JV-93 (Section 3.4.2).

3.5.3 Site History

Nothing is known of the history of this site.

3.5.4 Environmental Conditions

3.5.4.1 Site Features

This site was visited by John Kauffman on July 13, 2000. No video was taken. Documenting photograph is Roll 00K5, frame 6.

The two prospects shown on the topographic map were found. The one along the jeep trail is a shallow bulldozer cut 30-40 feet long, 6-12 feet wide, and a maximum of 4 feet deep. The other prospect to the west may have been a short adit driven on a white quartz vein. It is now expressed as a very shallow trough on the slope (Figure 3.5-2) with a small dump measuring 25 feet long, 12 feet wide and 7 feet thick. Several additional prospects, not shown on the topographic map, are further to the south along the trail. One has minor malachite staining on a small skarn pod. The total disturbed area is less than 1 acre.

3.5.4.2 Sample Locations

3.5.4.2.1 Solid Samples

No solid samples were collected.

3.5.4.2.2 Water Samples

No water samples were collected.

3.5.5 Structures

There are no structures at the site.
3.5.6 Safety

There are no safety hazards at the site.
Figure 3.5-1. Location of the Unnamed Prospect, Site No. JV-94, Owyhee County, Idaho (U.S. Geological Survey Clover Mtn. 7.5-minute topographic map).
Figure 3.5-2. Very shallow trough on the slope of what may be a short, caved adit at Site No. JV-94 (Roll 00K5, frame #6).
3.6 UNNAMED PROSPECT (Site No. JV-95)

Note: This site was originally identified as the Lucky Day Group. However, the description of that property more closely matched the features at Site JV-100. Therefore, this site was relabeled as an unidentified prospect.

3.6.1 Site Location and Access (Figure 2.1-1b)

Several shallow pits and bulldozer cuts are in the SW¼ of section 24, T. 8 S., R. 1 W., on the Clover Mtn. 7.5-minute quadrangle (Figure 3.6-1). Access is similar to that of the previous sites (JV-93 and JV-94) as far as the gate where the road splits at Magpie Creek. One pit is about ¼ mile north of the gate along the old jeep trail following Magpie Creek, and another pit is on the east side of the knob above the first pit. These two prospects are on private land. Two shallow trenches, one near the split in the road and one about ¼ mile east of the split, are on BLM land.

3.6.2 Geologic Features (Figure 2.2-1b)

The pits at this site are on skarn zones in altered metasedimentary rocks similar to those at Sites JV-93 and JV-94.

3.6.3 Site History

Nothing is known of the history of this site.

3.6.4 Environmental Conditions

3.6.4.1 Site Features

This prospect was visited by John Kauffman on July 13, 2000. A video segment describing the site, which is identified as the Lucky Day Group on the videotape, is on Owyhee County 2000 Videotape (Tape 1, index 0:42:14-0:45:13). Documenting photographs are Roll 00K5, frames 7-8.

Two small prospect pits are on either side of a small knoll on the east side of Magpie Creek. The one on the west side of the knoll, just above Magpie Creek, has a small pile of excavated material above the creek embankment (Figure 3.6-2). This pit was dug on a skarn pod in metamorphosed sedimentary rocks. The small pit on the east side of the knoll was also excavated in a skarn (Figure 3.6-3). Two other prospects noted on the map are shallow bulldozer cuts of little significance. Total disturbed area covers less than 0.5 acre.

3.6.4.2 Sample Locations

3.6.4.2.1 Solid Samples

No solid samples were collected.
3.6.4.2.2 Water Samples
   No water samples were collected.

3.6.5 Structures
   There are no structures at the site.

3.6.6 Safety
   There are no safety hazards at the site.
Figure 3.6-1. Location of Unnamed Prospect, Site No. JV-95, Owyhee County, Idaho (U.S. Geological Survey Clover Mtn. 7.5-minute topographic map).
Figure 3.6-2. Looking east at a prospect cut into an outcrop at Site No. JV-95. View is from the west side of Magpie Creek (Roll 00K5, frame #7).

Figure 3.6-3. Shallow pit on the east side of the ridge at Site No. JV-95 (Roll 00K5, frame #8).
3.7 UNNAMED PROSPECTS (Site No. JV-96)

3.7.1 Site Location and Access (Figure 2.1-1b)

These prospects are on the ridge west of Bill De Alder Draw near the center and south edge of the S½ of the S½ of section 24, T. 8 S., R. 1 W., on the Clover Mt. 7.5-minute quadrangle (Figure 3.7-1). Access is by foot from the Mud Flat Road or from a jeep trail that follows the west side of Bill De Alder Draw. The three prospects, noted by prospect symbols on the topographic map, are on BLM land.

3.7.2 Geologic Features (Figure 2.2-1b)

Oligocene dikes of variable composition, Eocene Challis Volcanics, and Cretaceous granitic rocks are found near the prospects (Ekren and others, 1981). The pits are on skarn zones in metasedimentary rocks and, probably, on silicified zones in altered volcanic rocks.

3.7.3 Site History

Nothing is known of the history of this site.

3.7.4 Environmental Conditions

3.7.4.1 Site Features

This prospect was visited by John Kauffman on July 14, 2000. A video segment describing the site is on Owyhee County 2000 Videotape (Tape 1, index 0:45:14-0:47:39). A photograph taken at the site did not turn out.

Two small prospect pits and a bulldozer cut are shown by prospect symbols on the topographic map near the top of a knoll. The two pits are on the north end of the knoll, and the cut is on the southeast end. The largest of the two pits is 8 feet in diameter and 5 feet deep, with a small mound of excavated material. The disturbed area covers less than 0.5 acre.

3.7.4.2 Sample Locations

3.7.4.2.1 Solid Samples

No solid samples were collected.

3.7.4.2.2 Water Samples

No water samples were collected.

3.7.5 Structures

No structures are at the site.
3.7.6 Safety
There are no safety hazards at the site.
Figure 3.7-1. Location of Unnamed Prospects at Site No. JV-96, Owyhee County, Idaho (U.S. Geological Survey Clover Mtn. 7.5-minute topographic map).
3.8 UNNAMED PROSPECTS (Site No. JV-97)

3.8.1 Site Location and Access (Figure 2.1-1b)

Approximately 20 shallow pits and bulldozer trenches are along Bill De Alder Draw in the SE corner of section 24 and the NE corner of section 25, T. 8 S., R. 1 W., and the SW corner of section 19 and the NW corner of section 30, T. 8 S., R. 1 E., on the Clover Mtn. 7.5-minute quadrangle (Figure 3.8-1). All of the prospects are easily accessible by foot from the Mud Flat Road or from jeep trails along the draw. Most are on the east side of the draw and north of Mud Flat Road, although one of the deeper pits is just south of the road. All are on BLM land.

3.8.2 Geologic Features (Figure 2.2-1b)

The prospects explore thin quartz veins in granite. The quartz is typically white, sugary to vuggy, and commonly has iron oxide staining and disseminated sulfides. A minor amount of malachite was noted on some dumps.

3.8.3 Site History

Nothing is known about the history of the site.

3.8.4 Environmental Conditions

3.8.4.1 Site Features

These prospect were visited by John Kauffman on July 14, 2000. A video segment describing the site is on Owyhee County 2000 Videotape (Tape 1, index 0:47:42-0:51:30). Documenting photograph is Roll 00K5, frame 10.

None of these prospects are very significant. One trench on the west side of Bill De Alder Draw is about 30 feet long with a 10-foot-high headwall (Figure 3.8-2). The pit on the south side of Mud Flat Road is about 8 feet in diameter and 7 feet deep with near vertical walls. Although the prospects are scattered over a large area, the actual disturbed area is no more than an acre or two.

3.8.4.2 Sample Locations

3.8.4.2.1 Solid Samples

No solid samples were collected.

3.8.4.2.2 Water Samples

No water samples were collected.

3.8.5 Structures

There are no structures at the site.
3.8.6 Safety

The pit on the south side of Mud Flat Road is only a few feet from the road and easily accessible. Although the pit is only 7 feet deep, the steep side walls constitute a minor hazard.
Figure 3.8-1. Location of Unnamed Prospects at Site No. JV-97, Owyhee County, Idaho (U.S. Geological Survey Clover Mtn. 7.5-minute topographic map).
Figure 3.8-2. One of the trenches at Site No. JV-97. This trench is on the west side of Bill De Alder Draw. Excavated material from another pit is on the slope above the head of this trench (Roll 00K5, frame #10).
3.9 UNNAMED PROSPECTS (Site No. JV-98)

3.9.1 Site Location and Access (Figure 2.1-1b)

Three prospects are shown on the topographic map just north of the Mud Flat Road in the NE¼ of the NW¼ of section 30, T. 8. S., R. 1 E., on the Clover Mtn. 7.5-minute quadrangle (Figure 3.9-1). The prospects can be reached easily by foot from the Mud Flat Road. All three are on BLM land.

3.9.2 Geologic Features (Figure 2.2-1b)

The prospects were dug on thin quartz veins in granite.

3.9.3 Site History

Nothing is known about the history of this site.

3.9.4 Environmental Conditions

3.9.4.1 Site Features

The prospects were visited by John Kauffman on July 14, 2000. No video or photographs were taken at the site.

The three prospects are very shallow cuts on the slope east of a dry gully. None are of any significance, and they disturb less than 0.1 acre.

3.9.4.2 Sample Locations

3.9.4.2.1 Solid Samples

No solid samples were collected.

3.9.4.2.2 Water Samples

No water samples were collected.

3.9.5 Structures

There are no structures at the site.

3.9.6 Safety

There are no safety hazards at the site.
Figure 3.9-1. Location of Unnamed Prospects at Site No. JV-98, Owyhee County, Idaho (U.S. Geological Survey Clover Mtn. 7.5-minute topographic map).
3.10 PAYETTE CLAIMS (Site No. JV-99)

3.10.1 Site Location and Access (Figure 2.1-1b)

This prospect is in the SE¼ of the SW¼ of section 19, T. 8 S., R. 1 E., on the Clover Mtn. 7.5-minute quadrangle (Figure 3.10-1). The prospect is the southern of three noted on the topographic map and is on BLM land. The northern two prospects on the map are on private land and were not visited. Access is by foot north from the Mud Flat Road about ½ mile.

3.10.2 Geologic Features (Figure 2.2-1b)

This prospect is underlain by the Eocene Challis Volcanics (Ekren and others, 1981). The prospect is on an altered zone in rhyolite. The altered zone is silicified and contains pyrite and other sulfides.

3.10.3 Site History

The Metals and General Development Company was incorporated in 1917. The following May, the total development on the property was “shallow shafts.” The company forfeited its corporate charter in 1923.

3.10.4 Environmental Conditions

3.10.4.1 Site Features

The prospect was visited by John Kauffman on July 14, 2000. No video was taken at the site. Documenting photographs are Roll 00K5, frames 12-13.

The prospect is a long, shallow trench that ends as a cut into a large outcrop of altered rhyolite (Figure 3.10-2). The waste dump for the trench and cut is 30 feet long, 20 feet wide, and about 5 feet thick (Figure 3.10-3). Not far south of the trench is a shallow bulldozer cut and a small sagebrush-covered pile of excavated material. The disturbed area covers less than 0.25 acre.

3.10.4.2 Sample Locations

3.10.4.2.1 Solid Samples

No solid samples were collected.

3.10.4.2.2 Water Samples

No water samples were collected.

3.10.5 Structures

There are no structures at the site.
3.10.6 Safety

There are no safety hazards at the site.
Figure 3.10-1. Location of the Payette Claims, Owyhee County, Idaho (U.S. Geological Survey Clover Mtn. 7.5-minute topographic map).
Figure 3.10-2. Long, shallow trench ending in a cut into a large outcrop of altered rhyolite at the Payette Claims. The view is to the northeast (Roll 00K5, frame #12).

Figure 3.10-3. Waste dump at the mouth of the long trench at the Payette Claims, looking northwest (Roll 00K5, frame #13).
3.11 LUCKY DAY GROUP (Site No. JV-100)
Alternate name—Owyhee Silver Mines Co.

Note: This site was originally described as an unnamed prospect. However, a comparison of the features at this site with the workings on the Lucky Day Group suggested that this site was actually the Lucky Day, even though the location for that property indicates that it is on Castle Creek and about 3 miles from the head of the creek.

3.11.1 Site Location and Access (Figure 2.1-1b)

This prospect is just east of Summit Spring and on the south side of Mud Flat Road, in the southern part of the E½ of section 20, T. 8 S., R. 1 E., on the Snow Creek 7.5-minute quadrangle (Figure 3.11-1). The property is easily accessible by foot from the Mud Flat Road. An old jeep trail, overgrown with sagebrush in places, leads to the shaft and several prospects, most of which are shown on the topographic map. An adit, also shown on the map, is along Mud Flat Road. The shaft and prospects are on a patented claim surrounded by BLM land. The adit is on BLM land.

3.11.2 Geologic Features (Figure 2.2-1b)

The adit was driven in unaltered dacite or rhyodacite porphyry. The pits and the caved shaft are in altered volcanic rocks. According to Ekren and others (1981), the rocks in this area are Eocene Challis Volcanics.

3.11.3 Site History

Owyhee Silver Mines Company was incorporated in 1928. At that time, the mine had one 300-foot tunnel, one 70-foot inclined shaft, and a total development of 370 feet. By the following year, the total development had increased to 532 feet. The equipment for a ten-stamp mill was on the property. Little work was done after that, and the company forfeited its corporate charter in 1931.

3.11.4 Environmental Conditions

3.11.4.1 Site Features

This property was visited by John Kauffman on July 14, 2000. A video segment describing the site, which is identified as an unnamed prospect, is on Owyhee County 2000 Videotape (Tape 1, index 0:52:04-0:59:37). Documenting photographs are Roll 00K5, frames 14-20.

The principal workings include a caved shaft, two large conical pits (possibly caved exploratory shafts), and an open adit (Figure 3.11-2). Other workings include relatively insignificant shallow pits and bulldozer cuts on the slope east of the shaft and south of the adit.
The caved shaft is on top of a bench on the slope south of Mud Flat Road. The old, square timbers of the headframe have collapsed into the pit (Figure 3.11-3). Most of the dump (measuring 115 feet long, 20 feet wide, and 10 feet thick) is overgrown with sagebrush (Figure 3.11-4). Along the old access road on the south side of the shaft are four concrete footings, probably for the headframe or hoist works (Figure 3.11-5). Other concrete footings, probably for a small stamp mill, are on the slope below the waste dump on the northwest side of the shaft (Figure 3.11-6). No tailings were found in the vicinity of the footings.

About 200 feet east of the shaft are two conical pits, both about 20 feet in diameter and 10-15 feet deep. Excavated material is piled around the northern rim of both pits. These may be shallow caved exploratory shafts.

The open adit (Figure 3.11-7) is about 100 feet from the edge of Mud Flat Road and is hidden behind a stand of willow trees (Figure 3.11-8). A seep of about 1 gallon per minute trickles from the adit. The waste dump measures 100 feet long, 30 feet wide, and 7-10 feet thick (Figure 3.11-9). The north edge of the dump forms the road embankment.

The disturbed area at the site totals about 1 acre.

3.11.4.2 Sample Locations

3.11.4.2.1 Solid Samples

No solid samples were collected.

3.11.4.2.2 Water Samples

Sample K7140001 was collected from the water flowing from the open adit.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location (JV-100), adit</th>
<th>Specific Conductivity (F$\text{s}$)</th>
<th>Temperature (°F)</th>
<th>pH</th>
<th>Flow (gpm)</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
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<td>Lucky Day Group</td>
<td>234</td>
<td>50</td>
<td>7.87</td>
<td>1</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.11.4.2.3 Analytical Results

Water Samples (Tables 2.5-1 and 2.5-2)

Sample K7140001 from the adit is within the range of the Aquatic Life Chronic standard for lead in the dissolved heavy metal screen and exceeds the Aquatic Life Chronic standard for mercury in the EPA 200.8 test. Arsenic was detected, but does not exceed any water quality standards. In
the total recoverable metal screen, iron exceeds all standards and manganese exceeds the Secondary MCL.

3.11.5 Structures

Only the concrete footings for the headframe and for the mill building remain at the site.

3.11.6 Safety

The open adit is easily accessible from Mud Flat Road, although the opening is not obvious because of the willows. The shaft appears to be completely caved and should not be a hazard. Although the two pits east of the shaft are 10-15 feet deep, the sides are not overly steep and should not be a hazard.
Figure 3.11-1. Location of the Lucky Day Group, Owyhee County, Idaho (U.S. Geological Survey Snow Creek 7.5-minute topographic map).
Figure 3.11-2. Sketch of the workings at the Lucky Day Group.
Figure 3.11-3. Headframe timbers collapsed into the caved shaft at the Lucky Day Group (Roll 00K5, frame #14).

Figure 3.11-4. Looking east at part of the waste dump for the shaft at the Lucky Day Group, which is surrounded by sagebrush (Roll 00K5, frame #16).
Figure 3.11-5. Concrete footings for the hoist works for the shaft at the Lucky Day Group (Roll 00K5, frame #15).

Figure 3.11-6. Concrete mill footings below the shaft at the Lucky Day Group, looking north (Roll 00K5, frame #17).
Figure 3.11-7. Opening into the adit at the Lucky Day Group (Roll 00K5, frame #19).

Figure 3.11-8. Looking south at the willows growing in front of the open adit at the Lucky Day Group (Roll 00K5, frame #18).
Figure 3.11-9. Looking north across the waste dump for the adit at the Lucky Day Group. Mud Flat Road is along the edge of the dump (Roll 00K5, frame #20).
3.12 UNNAMED PROSPECTS (Site No. JV-104)

3.12.1 Site Location and Access (Figure 2.1-1b)

This minor prospect is about 1 mile southeast of the Mud Flat Road on a divide between the West Fork of Shoofly Creek and Poison Creek, in the NW¼ of the NE¼ of section 14, T. 8 S., R 1 E., on the Snow Creek 7.5-minute quadrangle (Figure 3.12-1). The prospects are accessible by foot from the Mud Flat Road. A jeep trail off the road crosses a block of private land and passes near the prospects. The land was not posted, but the access across Poison Creek was eroded and nearly impassible. The prospects are on BLM land east and north of the private enclaves.

3.12.2 Geologic Features (Figure 2.2-1b)

The prospects are along a devitrified zone in a massive, flow-banded vitrophyre that forms cliffs on the north sides of the ridges northeast and southwest of the prospects. The vitrophyre also forms the canyon walls of Perjue Canyon to the south and east. The devitrified zone does not appear to be mineralized with sulfides. The prospectors may have been searching for opal or may have erroneously assumed the devitrified zone was equivalent to the hydrothermally altered zones in the nearby granitic rocks. The vitrophyre is part of the tuff of Swisher Mountain, which Ekren and others (1981) included with the rocks of the Miocene Juniper Mountain Volcanic Center.

3.12.3 Site History

Nothing is known of the history of this site.

3.12.4 Environmental Conditions

3.12.4.1 Site Features

The site was visited by John Kauffman on July 14, 2000. A video segment describing the prospect is on Owyhee County 2000 Videotape (Tape 1, index 0:59:44-1:02:43). Documenting photograph is Roll 00K5, frame 21.

The prospect consists of a series of bulldozer cuts on yellowish-green devitrified zones in the red and black vitrophyre (Figure 3.12-2). The red vitrophyre has a jasperoid-like appearance, and the black vitrophyre is glassy and banded. No mineralization was noted in any of the cuts. The disturbed area covers less than 1 acre.

Nearby unnamed prospects, Sites JV-102 and JV-103, were not visited but are probably similar. Both are in the vitrophyre to the north (JV-102) and northeast (JV-103) of this site.

3.12.4.2 Sample Locations

3.12.4.2.1 Solid Samples

No solid samples were collected.
3.12.4.2.2 Water Samples
   No water samples were collected.

3.12.5 Structures
   There are no structures at the site.

3.12.6 Safety
   There are no safety hazards at the site.
Figure 3.12-1. Location of Unnamed Prospects at Site No. JV-104, Owyhee County, Idaho (U.S. Geological Survey Snow Creek 7.5-minute topographic map).
Figure 3.12-2. Greenish-yellow devitrified zone at Site No. JV-104. Several trenches have been dug along this zone. The outcrop in the valley consists of banded black vitrophyre, and the cliff-forming unit on the ridge is banded red vitrophyre (Roll 00K5, frame #21).
3.13 UNNAMED PROSPECT (Site No. JV-78)

3.13.1 Site Location and Access (Figure 2.1-1b)

This minor prospect is beside a jeep trail between Vinson Wash and Poison Gulch in the SW¼ of the SW¼ of section 13, T. 7 S., R. 1 E., on the Rough Mountain 7.5-minute quadrangle (Figure 3.13-1). The jeep trail can be reached from the Poison Creek Cutoff road. The prospect, shown by a prospect symbol on the topographic map, is on BLM land.

3.13.2 Geologic Features (Figure 2.2-1b)

The prospect appears to be in altered volcanic rocks, probably rhyolite.

3.13.3 Site History

Nothing is known about the history of this site.

3.13.4 Environmental Conditions

3.13.4.1 Site Features

The prospect was visited by John Kauffman on July 14, 2000. No video or photographs were taken at the site.

This is a very minor prospect consisting of a series of bulldozer cuts along the low saddle between Vinson Wash and Poison Gulch. A fence line passes beside the cuts. No sulfides were noted in the altered zones exposed in the trenches. The disturbed area covers less than 0.5 acre.

3.13.4.2 Sample Locations

3.13.4.2.1 Solid Samples

No solid samples were collected.

3.13.4.2.2 Water Samples

No water samples were collected.

3.13.5 Structures

There are no structures at the site.

3.13.6 Safety

There are no safety hazards at the site.
Figure 3.13-1. Location of Unnamed Prospect, Site No. JV-78, Owyhee County, Idaho (U.S. Geological Survey Rough Mountain 7.5-minute topographic map).
3.14 UNNAMED PROSPECT (Site No. JV-79)

3.14.1 Site Location and Access (Figure 2.1-1b)

This prospect is on the east side of Poison Gulch in the N½ of section 23, T. 7 S., R. 1 E., on the Rough Mountain 7.5-minute quadrangle (Figure 3.14-1). It is about 4 miles west of the Poison Creek Cutoff road on an old jeep trail. The site is shown on the topographic map by a shaft, an adit, and several prospect symbols. All of the workings are on BLM land.

3.14.2 Geologic Features (Figure 2.2-1b)

The prospects explore silicified zones in altered volcanic rocks. Iron oxides are common in the silicified zones. Ekren and others (1981) mapped the rocks as Eocene Challis Volcanics.

3.14.3 Site History

Nothing is known about the history of this site.

3.14.4 Environmental Conditions

3.14.4.1 Site Features

The prospect was visited by John Kauffman on July 14, 2000. A video segment describing the site is on Owyhee County 2000 Videotape (Tape 1, index 1:03:02-1:11:22). Documenting photographs are Roll 00K5, frames 22-25, and Roll 00K6, frames 1-5.

A shaft, three adits, and at least eight bulldozer trenches comprise this prospect (Figure 3.14-2). The shaft, at the southern end of a U-shaped bend in the jeep trail, is open to a depth of about 20 feet (Figure 3.14-3), but probably was originally deeper. The dump measures 25 feet long, 10 feet wide, and about 7 feet thick. It forms a crescent-shaped rim around the northern part of the shaft (Figure 3.14-4).

Adit 1, shown by an adit symbol on the map east of the shaft, is caved and dry. The waste dump is 25 feet long, 18 feet wide, and 8 feet thick (Figure 3.14-5). Bulldozer cuts cross the slope above the adit.

Adits 2 and 3 are in the gully west of the shaft. Adit 2 is open but short, about 10 feet in length (Figure 3.14-6). The opening is nearly hidden by weathered debris sloughed in front of the adit (Figure 3.14-7). From a distance, Adit 3 also appears to be caved (Figure 3.14-8), but it too is open (Figure 3.14-9) and about 10 feet long. A shaft that is at least 10 feet deep descends from the south side of the adit. A large pack rat nest is built on timbers just inside the adit adjacent to the shaft. Most of the excavated material from both adits has been washed from the narrow gully.
Several shallow trenches are on the gentle slope between the shaft and Adits 2 and 3, and additional trenches are west of the adits. Typically, these trenches are 20-40 feet in length, 2 feet deep, and about as wide as a bulldozer. An old crawler with a scoop-type scraper is at the mouth of the gulch below Adit 3 (Figure 3.14-10).

The total disturbed area at the site covers about 2 acres.

3.14.4.2 Sample Locations

3.14.4.2.1 Solid Samples
No solid samples were collected.

3.14.4.2.2 Water Samples
No water samples were collected.

3.14.5 Structures
There are no structures at the site.

3.14.6 Safety

The open shaft is a significant hazard, as is the internal shaft inside Adit 3. Adit 2, although open, is relatively short. These prospects are well off the “main” road in the area, the Poison Creek Cutoff, but the area is easily accessible to all-terrain vehicles.
Figure 3.14-1. Location of Unnamed Prospect, Site No. JV-79, Owyhee County, Idaho (U.S. Geological Survey Rough Mountain 7.5-minute topographic map).
Figure 3.14-2. Sketch of the workings at Site No. JV-79.
Figure 3.14-3. Open shaft at Site No. JV-79 (Roll 00K5, frame #23).

Figure 3.14-4. Waste dump for the shaft at Site No. JV-79, looking northwest (Roll 00K5, frame #22).
Figure 3.14-5. Looking southeast at caved Adit 1 and its waste dump at Site No. JV-79. Bulldozer cuts cross the slope above the adit (Roll 00K5, frame #25).

Figure 3.14-6. View into short Adit 2 at Site No. JV-79 (Roll 00K6, frame #2).
Figure 3.14-7. Weathered debris sloughed in front of the opening to Adit 2 at Site No. JV-79. The rock is intensely fractured and altered (Roll 00K6, frame #1).

Figure 3.14-8. Scarp and sloughed debris at Adit 3 of Site No. JV-79, looking west (Roll 00K6, frame #3).
Figure 3.14-9. View inside Adit 3 at Site No. JV-79. Upright posts and crossbeams support the rock. A large pack rat’s nest is on the lower crossbeams next to a shaft that is at least 10 feet deep (Roll 00K6, frame #4).

Figure 3.14-10. Old crawler at the mouth of the gulch below Adit 3 at Site No. JV-79 (Roll 00K6, frame #5).
3.15 UNNAMED PROSPECT (Site No. JV-73)

3.15.1 Site Location and Access (Figure 2.1-1b)

This prospect is along the gravel road connecting State Highway 78 with the Poison Creek Cutoff, in the SE¼ of section 19, T. 6 S., R. 2 E., on the Rough Mountain NE 7.5-minute quadrangle (Figure 3.15-1). The prospect shown on the topographic map is about ¼ mile west of the gravel road. Several additional prospects are beside the road where it cuts through a low ridge. All are on BLM land.

3.15.2 Geologic Features (Figure 2.2-1b)

These may be diatomite prospects. Ekren and others (1981) mapped small outcrops of the Pleistocene(?) and Pliocene Glenns Ferry Formation (covered by Quaternary fan alluvium and fanglomerate) in this area, although the rocks more closely resemble the Pliocene and Miocene Chalk Hills Formation.

3.15.3 Site History

Nothing is known about the history of this site.

3.15.4 Environmental Conditions

3.15.4.1 Site Features

The prospect was visited by John Kauffman on July 14, 2000. No video was taken at the site. Documenting photographs are Roll 00K6, frames 6-7.

The prospect shown on the topographic map consists of two perpendicular trenches, one trending east-west and the other about north-south (Figure 3.15-2). Sections of 4-inch white PVC pipe were used as claim corners or discovery posts. The east-west trench is about 150 feet long, 10 feet wide, and 5 feet deep along most of its length (Figure 3.15-3). The excavated material is piled into several mounds at the east end. The second trench is about north-south where it crosses the first trench. North of the first trench, the second trench curves slightly to the northeast. The north-south trench extends 50 feet south of and at least 200 feet north of the east-west trench. Most of the second trench is no more than 2 feet deep. A rim of excavated material is piled along the west side of the northern part of the trench (Figure 3.15-4). The disturbed area covers about 0.5 acre.

Three additional prospects are about a mile to the east along the gravel road. The shallow cuts are on both sides of the road. The total disturbed area at these covers less than 0.25 acre.
3.15.4.2 Sample Locations

3.15.4.2.1 Solid Samples
   No solid samples were collected.

3.15.4.2.2 Water Samples
   No water samples were collected.

3.15.5 Structures
   There are no structures at this site.

3.15.6 Safety
   There are no safety hazards at this site.
Figure 3.15-1. Location of Unnamed Prospect, Site No. JV-73, Owyhee County, Idaho (U.S. Geological Survey Rough Mountain NE 7.5-minute topographic map).
Figure 3.15-2. Sketch of the main trenches at Site No. JV-73.
Figure 3.15-3. Looking east along the deeper trench at Site No. JV-73. The section of PVC pipe was a claim post (Roll 00K6, frame #6).

Figure 3.15-4. Looking north along the north-south-trending shallow trench at Site No. JV-73. The trench curves to the northeast (Roll 00K6, frame #7).
3.16 BLUEBIRD MINE (Site Nos. JV-83, JV-84, and JV-85)
Alternate name—Castle Creek Mine; Blue Bird; Castle Creek Mining & Milling; Pixley Basin Mining Co.; Texas-Owyhee Mining & Development Co.

Note: Site No. JV-84 covers the main Bluebird Mine workings. Site No. JV-83 consists of two prospect adits east of the main workings. Site No. JV-85 includes numerous trenches and pits west and southwest of the main workings. Site No. JV-86 covers a group of prospects shown on the topographic map about 1 mile southwest of the Bluebird main workings. This property was not visited, but one of the prospects, which had a waste pile estimated to be 25 feet in diameter and 10 feet thick, was observed from the ridge above the Bluebird Mine.

3.16.1 Site Location and Access (Figure 2.1-1b)
The Bluebird Mine is along a tributary of Pixley Creek in the NE¼ of section 23, T. 7 S., R. 1 W., on the Pixley Basin 7.5-minute quadrangle (Figure 3.16-1). A few associated workings are in the NW¼ and SE¼ of section 23, and in the NW¼ of adjoining section 24. Access from the Poison Creek Cutoff road is about 8-9 miles southwest on a dirt road. This road passes south of Doyle Mountain and leads to Pixley Basin and Pixley Creek. Private land belonging to Mr. J. Cox has a locked gate across the road about 1 mile from the mine. We would like to thank Mr. Cox for granting permission to cross his land. Most of the Bluebird workings appear to be on patented claims surrounded by BLM land.

3.16.2 Geologic Features (Figure 2.2-1b)
The rock at the Bluebird is weathered granite with shear zones containing quartz veins and veinlets. Most of the altered zones are stained with iron oxides. Hershey (1923, p. 2) reported:

A large area of granite is bordered on the south by a belt of gneisses and schists that usually dip southward at low angles. In the contact zone the banded rocks are intruded and much broken up by the granite so that the dips are in various directions. The vein runs east-west in this contact zone and dips southward 60°.

This area is underlain by Cretaceous granitic rocks that are locally capped by the rhyolitic tuff of Little Jacks Creek. Large xenoliths and small roof pendants of schist, gneiss, and quartzite are found in the granitic rocks (Ekren and others, 1981).

3.16.3 Site History
The Castle Creek Mining & Milling Company (which was not incorporated) was operating the Bluebird property by 1922. At that time, the mine had three tunnels (150 feet, 350 feet, and 800 feet) and a 210-foot, two-compartment, inclined shaft, with total development of about 2,000 feet of workings. A 30-tons-per-day flotation mill was completed in November 1925. By July of 1926, the mill had processed 630 tons of ore, which yielded 9,568 ounces of silver. However, by
1930, the company secretary reported to the Idaho Inspector of Mines that Castle Creek Mining could not make the Bluebird pay because the ore was too low in grade.

The Pixley Basin Mining Company was incorporated in 1930. The new company took over the Bluebird on a lease and bond. In 1930, the mine had three tunnels (150 feet, 250 feet, and 866 feet), a 240-foot inclined shaft, and 2,623 feet of total workings. After developing the property for the next couple of years, Pixley Basin forfeited its corporate charter in 1933.

According to the 1936 Idaho Inspector of Mines annual report, the Texas-Owyhee Mining and Development Company (incorporated in 1936) reopened the property and did some development work. How much work was done in succeeding years is not known. Texas-Owyhee forfeited its corporate charter in 1940.

3.16.4 Environmental Conditions

3.16.4.1 Site Features

The Bluebird Mine was visited by John Kauffman on July 15, 2000. A video segment describing the site is on Owyhee County 2000 Videotape (Tape 1, index 1:11:44-1:37:24). Documenting photographs are Roll 00K6, frames 8-21 and frame 26.

The main workings at the Bluebird Mine (Site No. JV-84) consist of five adits, two shafts, and two possible declines (Figure 3.16-2). Additional prospect adits are east of the main workings, and numerous trenches and pits are southwest of the main workings. All of these are on the slope south of the east-west-trending tributary to Pixley Creek.

Adit 1, the lowest and largest of the workings, is open and flooded with several feet of water. Material sloughed in front of the opening forms a dam, and a steady stream of water, estimated at 2 gallons per minute, flows from the opening (Figures 3.16-3 and 3.16-4). The water runs down along the west edge of the large waste dump, supporting a thick stand of cottonwoods and brush before seeping into the ground. The dump measures 220 feet long, a maximum of 100 feet wide, and about 25 feet thick (Figure 3.16-5). The north end of the dump is bare, as are areas where there has been recent bulldozer work; otherwise, the dump is overgrown with sagebrush.

Adits 2 and 3 are in the gully above Adit 1. Adit 2 was driven southwest into the hill through colluvium and into rock. There is a fresh scarp on the slope above the adit (Figure 3.16-6), which is open (Figures 3.16-6). Adit 3, driven southeast into the hill, is completely caved. The location of the adit is marked by a long trough and a headwall scarp (Figure 3.16-8). The waste dumps for the two adits are combined and extend across the dry gully. This combined dump measures 75 feet long, 30 feet wide, and 25 feet thick. A western lobe of the dump, probably from Adit 2, has the remains of a trestle and some rails.
Adit 4 is about 30-50 feet east of the headwall of the trough at Adit 3 and slightly higher on the slope (Figure 3.16-9). A recent slump has nearly closed the adit (Figure 3.16-10), but a small opening remains behind a block of dirt and vegetation that has broken from the top of the scarp. The dump is about 30 feet long, 20 feet wide, and 12 feet thick.

Adit 5, on the slope above Adit 2, is completely caved. Rails are on the surface of the narrow dump, and a wood and metal slide, probably an ore chute, extends down the slope beside the dump (Figure 3.16-11). The dump is about 25-30 feet long, 12 feet wide, and about 40 feet down the face. Thickness on the slope is no more than 10-12 feet.

Shaft 1 is just above Adit 5 and is also caved, although there is an opening in the scarp above the shaft that appears to be the entrance to a decline. The dump for the shaft (above and to the left of the ore chute at Adit 5 in Figure 3.16-11) is relatively small; most of the material was probably removed through Adit 5.

Shaft 2, on the slope east of the gully above Adits 3 and 4, is caved, forming a shallow pit (Figure 3.16-12). The waste dump, measuring 25 feet long, 12 feet wide, and 10 feet thick, is barely visible in the sagebrush (Figure 3.16-13). A few feet north of the shaft is a steep-walled pit about 6 feet in diameter and 7 feet deep, probably a collapsed stope above Adit 4 (Figure 3.16-14).

Another opening, about 12 feet long on a 15-degree decline, is west of Shaft 1 at the head of a prospect cut. Further to the west are numerous pits and trenches (Site No. JV-85). Several of the trenches are 150 feet long, 15 feet wide, and 6 feet deep, while others are short and shallow.

Approximately ½ mile east of the main workings are two short, caved adits (Site No. JV-83) on the west side of the gully below Slide Spring (Figure 3.16-15). The dump for the lower adit is 20 feet long, 20 feet wide, and 10 feet thick. The dump for the upper adit is 15 feet long, 10 feet wide, and about 30 feet down the face, but only 5 feet thick on the slope. No video was taken at these workings.

The mill reported at the site was not found, and no tailings were noted at the site. The disturbed area at the Bluebird, including the main workings and the associated prospects, covers 10-20 acres.

3.16.4.2 Sample Locations

3.16.4.2.1 Solid Samples
No solid samples were collected.

3.16.4.2.2 Water Samples
Sample K7150001 was collected from the water at Adit 1.
### Analytical Results

Water Samples (Tables 2.5-1 and 2.5-2)

Sample K7150001 exceeds the Aquatic Life Chronic standard for mercury in the EPA 200.8 test. Arsenic was detected, but does not exceed any water quality standards.

### Structures

A small building, probably a cabin, and an outhouse are along the creek north of Adit 1. A considerable amount of boards, scrap metal, barrels, and miscellaneous junk is in the vicinity of the old cabin. An ore chute is on the side of the dump at Adit 5. No remnants of the reported flotation mill were found.

### Safety

Several of the adits are open and could easily be entered. The collapsed stope near Shaft 2 is steep walled and deep enough to be a hazard. Because of the locked gate on the private land, the mine probably has relatively few visitors, although access by all-terrain vehicle may be possible from the north without crossing private land.
Figure 3.16-1. Location of the Bluebird Mine, Owyhee County, Idaho (U.S. Geological Survey Pixley Basin 7.5-minute topographic map).
Figure 3.16-2. Sketch of the main workings at the Bluebird Mine.
Figure 3.16-3. Adit 1 at the Bluebird Mine, looking south (Roll 00K6, frame #8).

Figure 3.16-4. Close-up of the opening into Adit 1 at the Bluebird Mine. Water flows over a low dam of sloughed material, and the adit floor is covered with about 2 feet of water (Roll 00K6, frame #9).
Figure 3.16-5. Looking northwest at the toe of the waste dump for Adit 1 at the Bluebird Mine (Roll 00K6, frame #10).

Figure 3.16-6. Looking southwest at the scarp above Adit 2 at the Bluebird Mine. An ore chute for Adit 5 is above the scarp (Roll 00K6, frame #12).
Figure 3.16-7. View of the opening into Adit 2 at the Bluebird Mine. Rock debris has filled about half of the entrance (Roll 00K6, frame #13).

Figure 3.16-8. Trough and headwall scarp of Adit 3 at the Bluebird Mine, looking southeast (Roll 00K6, frame #14).
Figure 3.16-9. Looking at the workings on the east side of the gully at the Bluebird Mine. Adit 4 is just above the deep trough of Adit 3 (lower part of picture). The waste dump for Shaft 2 is above and to the right of Adit 4. An old access road crosses over the dump of Adit 4 and traverses the slope above Adit 3 (Roll 00K6, frame #16).

Figure 3.16-10. Adit 4 at the Bluebird Mine, looking southeast. A small opening into the adit is behind the sloughed block of soil and vegetation below the center of the scarp (Roll 00K6, frame #15).
Figure 3.16-11. View to the west, showing Adit 5, small prospects, and the waste dump for Shaft 1 at the Bluebird Mine. A wood and metal slide extends down the slope over the side of the dump for Adit 5 (Roll 00K6, frame #19).

Figure 3.16-12. Looking into the shallow pit of caved Shaft 2 at the Bluebird Mine (Roll 00K6, frame #18).
Figure 3.16-13. Looking northeast at the side of the waste dump for Shaft 2 at the Bluebird Mine, nearly hidden by the surrounding sagebrush (Roll 00K6, frame #17).

Figure 3.16-14. Collapsed stope (?) near Shaft 2 at the Bluebird Mine (Roll 00K6, frame #20).
Figure 3.16-15. Waste dumps of two caved adits at Site No. JV-83 of the Bluebird Mine (Roll 00K6, frame #26).
3.17 UNNAMED PROSPECT (Site No. K7150002; JV-178)

3.17.1 Site Location and Access (Figure 2.1-1b)

This minor prospect is north of the Bluebird Mine in the SE¼ of the SE¼ of section 14, T. 7 S., R. 1 W., on the Pixley Basin 7.5-minute quadrangle (Figure 3.17-1). Access is the same as for the Bluebird Mine. The prospect is on BLM land just north of the Bluebird claim group.

3.17.2 Geologic Features (Figure 2.2-1b)

The prospect pits are on quartz veins and altered zones in granite. The geology is similar to that at the Bluebird Mine.

3.17.3 Site History

Nothing is known of the history of this prospect.

3.17.4 Environmental Conditions

3.17.4.1 Site Features

The prospect was visited by John Kauffman on July 15, 2000. A video segment describing the site is on Owyhee County 2000 Videotape (Tape 1, index 1:37:29-1:39:48). Documenting photograph is Roll 00K6, frame 22.

The prospect consists of a several shallow trenches and small pits on the slope north of a west-flowing tributary to Pixley Creek. The largest trench is 30 feet long, 10 feet wide, and 6 feet deep at the headwall (Figure 3.17-2). The excavated material has been pushed out the lower end and down the slope. The disturbed area covers less than 1 acre.

3.17.4.2 Sample Locations

3.17.4.2.1 Solid Samples

No solid samples were collected.

3.17.4.2.2 Water Samples

No water samples were collected.

3.17.5 Structures

There are no structures at this site.

3.17.6 Safety

There are no safety hazards at this site.
Figure 3.17-1. Location of Unnamed Prospect, Site No. K7150002, Owyhee County, Idaho (U.S. Geological Survey Pixley Basin 7.5-minute topographic map).
Figure 3.17-2. Largest of the trenches at Site No. K7150002, looking north (Roll 00K6, frame #22).
3.18 UNNAMED PROSPECT (Site No. JV-87)

3.18.1 Site Location and Access (Figure 2.1-1b)

This prospect is on Pixley Creek near the center of the S½ of the S½ of section 22, T. 7 S., R. 1 W., on the Pixley Basin 7.5-minute quadrangle (Figure 3.18-1). The road to the Bluebird Mine continues down the west-flowing tributary of Pixley Creek about 2 miles, then turns south along Pixley Creek about 1 mile to the prospect. The road continues to the south and eventually connects with the road to the Silver Rock Mine. The prospect is on BLM land.

3.18.2 Geologic Features (Figure 2.2-1b)

The prospect pits are on quartz veins and altered zones in granite.

3.18.3 Site History

Nothing is known of the history of this site.

3.18.4 Environmental Conditions

3.18.4.1 Site Features

The site was visited by John Kauffman on July 15, 2000. A video segment describing the prospect is on Owyhee County 2000 Videotape (Tape 1, index 1:39:52-1:43:18). Documenting photographs are Roll 00K6, frames 23-24.

This prospect consists of two caved adits, one on the east side and one on the west side of the creek (Figure 3.18-2). Both are shown by prospect symbols on the topographic map. Caved Adit 1 (Figure 3.18-3), on the east side, has a small dump measuring 30 feet long, 15 feet wide, and about 6 feet thick. A short bulldozer cut extends north from the adit. Caved Adit 2 to the west (Figure 3.18-4) has a dump of a similar size, indicating Adit 2 also is relatively short. The disturbed area covers less than 0.25 acre.

3.18.4.2 Sample Locations

3.18.4.2.1 Solid Samples

No solid samples were collected.

3.18.4.2.2 Water Samples

No water samples were collected.

3.18.5 Structures

There are no structures at the site.
3.18.6 Safety
   There are no safety hazards at the site.
Figure 3.18-1. Location of Unnamed Prospect, Site No. JV-87, Owyhee County, Idaho (U.S. Geological Survey Pixley Basin 7.5-minute topographic map).
Figure 3.18-2. Sketch of the workings at Unnamed Prospect, Site No. JV-87.
Figure 3.18-3. Caved Adit 1 at Site No. JV-87, looking east (Roll 00K6, frame #23).

Figure 3.18-4. Looking west toward Adit 2 on the west side of Pixley Creek at Site No. JV-87 (Roll 00K6, frame #24).
3.19 UNNAMED PROSPECT (Site No. JV-88)

3.19.1 Site Location and Access (Figure 2.1-1b)

This prospect is on the west side of Goodman Gulch, a headwater tributary of Pixley Creek, in the SW¼ of section 27, T. 7 S., R. 1 W., on the Pixley Basin 7.5-minute quadrangle (Figure 3.19-1). This site is about 1 mile south of Site No. JV-87 along the same dirt road and is on BLM land.

3.19.2 Geologic Features (Figure 2.2-1b)

The prospect pits are on quartz veins and altered zones in granite.

3.19.3 Site History

Nothing is known of the history of this site.

3.19.4 Environmental Conditions

3.19.4.1 Site Features

This prospect was visited by John Kauffman on July 15, 2000. A video segment describing the site is on Owyhee County 2000 Videotape (Tape 1, index 1:43:20-1:46:54). Documenting photograph is Roll 00K6-25.

The prospect consists of one or two caved adits, several pits, and bulldozer cuts and trenches (Figure 3.19-2). One caved adit is on the south side of a gully west of the road at an elevation of about 5,440 feet. The waste dump, measuring 50 feet long, 15 feet wide, and 10 feet thick, extends into the gully (Figure 3.19-3). A few rails were found in the sagebrush on the dump. On the west side of the dump is a sloughed cut into the slope that may have been a second short adit. Several shallow pits and bulldozer trenches are on the slopes north and south of the gully. The disturbed area covers less than 1 acre.

3.19.4.2 Sample Locations

3.19.4.2.1 Solid Samples

No solid samples were collected.

3.19.4.2.2 Water Samples

No water samples were collected.

3.19.5 Structures

There are no structures at the site.
3.19.6 Safety

There are no safety hazards at the site.
Figure 3.19-1. Location of Unnamed Prospect, Site No. JV-88, Owyhee County, Idaho (U.S. Geological Survey Pixley Basin 7.5-minute topographic map).
Figure 3.19-2. Sketch of Unnamed Prospect, Site No. JV-88.
Figure 3.19-3. Trough and waste dump for the caved adit at Site No. JV-88 (Roll 00K6, frame #25).
3.20 UNNAMED PROSPECT (Site No. K7150003; JV-179)

3.20.1 Site Location and Access (Figure 2.1-1b)

This prospect is on the southeast slope of Doyle Mountain in the NE¼ of section 18 and the NW¼ of section 17, T. 7 S., R. 1 E., on the Pixley Basin and Rough Mountain 7.5-minute quadrangles (Figure 3.20-1). Access is by foot from the dirt road that goes to the Bluebird Mine and Pixley Basin. The prospect is about 6 miles southeast of the junction of the dirt road with the Poison Creek Cutoff road and is on BLM land.

3.20.2 Geologic Features (Figure 2.2-1b)

The prospects at the site are in altered zones and on quartz veins in granite.

3.20.3 Site History

Nothing is known of the history of this site.

3.20.4 Environmental Conditions

3.20.4.1 Site Features

This property was visited by John Kauffman on July 15, 2000. A video segment describing the site is on Owyhee County 2000 Videotape (Tape 1, index 1:47:00-1:49:58). Documenting photographs are Roll 00K7, frames 1-2.

This prospect consists of a short caved adit, a pit, and a bulldozer cut along the steep gully trending southeast from Doyle Mountain (Figure 3.20-2). Another minor bulldozer cut is around the slope to the east and about 80-100 feet above the road. The caved adit is near the bottom of the gully about ¼ mile north of the road (Figure 3.20-3). The waste dump is small and overgrown with sagebrush. The pit and bulldozer cut are further up the gully and higher on the slope. The pit forms a bare scarp on the slope (Figure 3.20-4). A shallow trench extends up the slope above the pit, and a bulldozer cut goes northwest from the pit to the gully. The disturbed area covers less than 0.5 acre.

3.20.4.2 Sample Locations

3.20.4.2.1 Solid Samples

No solid samples were collected.

3.20.4.2.2 Water Samples

No water samples were collected.
3.20.5 Structures
There are no structures at the site.

3.20.6 Safety
There are no safety hazards at the site.
Figure 3.20-1. Location of Unnamed Prospect, Site No. K7150003, Owyhee County Idaho (U.S. Geological Survey Pixley Basin and Rough Mountain 7.5-minute topographic maps).
Figure 3.20-2. Sketch of the prospects at Site No. K7150003.
Figure 3.20-3. Two of the prospects at Site No. K7150003, looking north. The waste dump for the caved adit is in the bottom of the gully, just below the stand of willows. The dump for the pit is high on the slope farther up the gully (Roll 00K7, frame #1).

Figure 3.20-4. Scarp of the prospect pit at Site No. K7150003 (Roll 00K7, frame #2).
3.21 MAYDAY GROUP (Site Nos. JV-74, JV-75, JV-76, JV-77, and K7150004)
Alternate names—Mayday Claims; Recycle Claims; Birch Creek Claims.

3.21.1 Site Location and Access (Figure 2.1-1b)

Prospects on this group of claims are in sections 2, 3, 4, 5, and 9, T. 7 S., R. 1 E., and section 35, T. 6 S., R. 1 E., on the Rough Mountain 7.5-minute quadrangle (Figure 3.21-1). All of the prospects are in the vicinity of an old homestead, the Doyle Place, along Birch Creek, and most are on BLM land.

3.21.2 Geologic Features (Figure 2.2-1b)

Smith (1982, p. 1) reported:

The geology of the area consists of four basic rock types. These are an intrusive granite, a pegmatite gneiss, quartz, biotite schist, and quartzite. All rock types have been crosscut by quartz veins and veinlets locally. These later quartz veins have altered the host rocks locally and are usually mineralized to some degree. Large pods or lenses of light-to-medium gray quartz are found locally within the pegmatitic gneiss rock unit. These quartz bodies are believed to be more closely associated with the pegmatite gneiss than to a later mineralizing event. The gray color of the quartz is due to inclusions of biotite. These quartz pods are widespread and may be confused with the true epigentic [sic] quartz veins.

U.S. Borax examined the property for a large-tonnage, low-grade gold-silver deposit, but concluded the likelihood of finding such a deposit was low. However, but property had potential for a high-grade, small-tonnage deposit (Smith, 1982).

This area is underlain by Cretaceous granitic rocks. Large xenoliths and small roof pendants of schist, gneiss, and quartzite are found in the granitic rocks (Ekren and others, 1981).

3.21.3 Site History

It is not known when these sites were first prospected. In 1982, when examined by U.S. Borax, the property consisted of about 90 unpatented claims. The principal owners were Bud Swindler, Rex Steiner, and Anton (Tony) Feist (Smith, 1982). In 1987, Feist (1987a) reported 81 unpatented claims. Feist (1987b) described the property as: Mayday Claims (25); Recycle Claims (24); and Birch Creek Claims (32).
3.21.4 Environmental Conditions

3.21.4.1 Site Features

The Mayday Group was visited by John Kauffman on July 15, 2000. A video segment describing the site is on Owyhee County 2000 Videotape (Tape 1, index 1:50:01-1:59:31). Documenting photographs are Roll 00K7, frames 3-4 (JV-77); frames 5-7 (JV-75 and JV-76); and frames 8-9 (JV-74).

The first site visited was Site No. JV-77, located in the southwest corner of section 9, T. 7 S., R. 1 E. This prospect is along a jeep trail that goes southwest up the nose of a gradual slope between two branches of Birch Creek. It is at an elevation of 4,600 feet and is shown on the topographic map by a prospect symbol. The jeep trail then cuts back to the northeast down the slope and connects with the dirt road along Birch Creek. This prospect consists of an open, shallow shaft and a bulldozer trench (Figure 3.21-2). The shaft is about 10 feet in diameter and 15 feet deep with steep side walls (Figure 3.21-3). The small pile of excavated material indicates the shaft was never much deeper. Surrounding the shaft is square-net wire fencing (Figure 3.21-4). A trench 25 feet long, 3 feet wide, and 4 feet deep has been dug along the north side of the shaft outside the fencing. The disturbed area covers less than 0.5 acre.

Site No. JV-75 is in the SW¼ of section 4, T. 7 S., R. 1 E. This prospect consists of several bulldozer cuts and scrapes, and a long trench with the start of a decline near the center (Figure 3.21-5). The trench is about 75 feet long, 10 feet wide, and 4-10 feet deep, tapering up to the surface at both ends (Figure 3.21-6). At the deepest part of the trench is the start of a decline, about 3-5 feet in length, on silicified, bleached granite enclosing pods of schist and altered metasedimentary rocks (Figure 3.21-7). There is a significant amount of scrap metal, boards, and miscellaneous junk at this site. The disturbed area covers about 1 acre.

Site No. JV-76 is on the slope west of JV-75, in the NE¼ of the SE¼ of section 5, T. 7 S., R. 1 E. The site consists of a long bulldozer cut around the ridge. Additional minor prospect pits and cuts probably are nearby. A prospect symbol is shown on the topographic map at this location. The disturbed area covers less than 0.5 acre.

Site No. JV-74, shown on the topographic map in the NW¼ of section 3, T. 7 S., R. 1 E., consists of two bulldozer trenches and a shallow, open shaft surrounded by a scraped area (Figure 3.21-8). The vertical-walled shaft is 10 feet deep and 7 feet in diameter (Figure 3.21-9). The excavated material forms a mound 10 feet in diameter and 4 feet high (Figure 3.21-10). The two trenches, east of the shaft, are 75-100 feet long and shallow. Each has a small pile of excavated material at the downhill end.

Site No. K7150004 is east of JV-74 on the south side of the road, in the NE¼ of section 3, T. 7 S., R. 1 E. This site consists of a long bulldozer cut or trench parallel to the slope. The disturbed area is less than 0.5 acre.
In addition to these prospects, Smith’s (1982) map of the area shows additional trenches and pits that were not visited during this inventory. The area disturbed by these additional prospects is estimated to be a maximum of several acres.

3.21.4.2 Sample Locations

3.21.4.2.1 Solid Samples
   No solid samples were collected.

3.21.4.2.2 Water Samples
   No water samples were collected.

3.21.5 Structures

There are no buildings associated with these prospects, although some remnants of the homestead at the Doyle Place remain.

3.21.6 Safety

The open shaft at JV-77 is a hazard, although it is fenced and relatively shallow. The shallow shaft at JV-74 is potentially more of a hazard because there is no fence and no warning notice. All of the sites are relatively close to the Pixley Basin road, and most can be reached by vehicle.
Figure 3.21-1. Location of the Mayday Prospects, Site Nos. JV-74, JV-75, JV-76, JV-77 and K7150004, Owyhee County, Idaho (U.S. Geological Survey Rough Mountain 7.5-minute topographic map).
Figure 3.21-2. Sketch of the workings at Site No. JV-77 of the Mayday Prospects.
Figure 3.21-3. View into the steep-walled shaft at Site No. JV-77 of the Mayday Prospects (Roll 00K7, frame #4).

Figure 3.21-4. Looking south at fencing around the shaft at Site No. JV-77 of the Mayday Prospects. A trench is on the northeast side of the shaft (Roll K7, frame #3).
Figure 3.21-5. Sketch of the prospects at Site No. JV-75 of the Mayday Property.
Figure 3.21-6. Looking east down the trench at Site No. JV-75 of the Mayday Prospects (Roll 00K7, frame #6).

Figure 3.21-7. Start of an incline in the bottom of the trench at Site No. JV-75 of the Mayday Prospects (Roll 00K7, frame #7).
Figure 3.21-8. Sketch of the prospects at Site No. JV-74 of the Mayday Property.
Figure 3.21-9. Looking down into the 10-foot-deep pit or shaft at Site No. JV-74 of the Mayday Prospects. The sides of the pit are nearly vertical (Roll 00K7, frame #9).

Figure 3.21-10. Looking northeast at the scraped area and waste pile for the pit or shaft at Site No. JV-74 of the Mayday Prospects (Roll 00K7, frame #8).
3.22 GOLDEN CROWN MINE (Site No. JV-71)
Alternate name—Dandy Jim.

3.22.1 Site Location and Access (Figure 2.1-1b)

The Golden Crown Mine is on Castle Creek in the S½ of the SE¼ of section 34, T. 6 S., R. 1 W., on the Pixley Basin 7.5-minute quadrangle (Figure 3.22-1). Access from Highway 78 is through the small town of Oreana, then south about 2 miles to the road that follows the plateau between Browns Creek and Castle Creek. This road continues south about 9-10 miles to the confluence of Alder and Castle creeks. The road then becomes narrow and rocky, in places nearly impassible except with an all-terrain vehicle. The mine is about 4-4½ miles south of the confluence and is on BLM land. Some private land with cattle gates must be crossed, but the gates are not locked and the road is not posted.

3.22.2 Geologic Features (Figure 2.2-1b)

The mine is in a shear zone or zones in granite that has inclusions of altered metasedimentary rock. The Miocene tuff of Little Jacks Creek caps the granitic rocks on the ridge to the east of Castle Creek (Ekren and others, 1981). Green (1967, p. 1) noted “pyrite and quartz along shear zone in granite.”

3.22.3 Site History

Green (1967, p. 2) noted that production from the property was “Reportedly $ 40,000 in 1905.” The Golden Crown Mining Company, Limited, was incorporated in 1906. In 1913, the company reported to the Idaho Inspector of Mines that “this property was sold at Sheriffs sale May 27th 1913 so the Company has practically no assets.” The mill consisted of a “3 stamp battery with 4 cyanide tanks - capacity about 10 tons per day.” Golden Crown forfeited its corporate charter in 1913.

Until 1916, the mine was apparently operated by the Castle Falls Mining Company (USBM files). This company was incorporated in 1913 and forfeited its corporate charter the following year. However, U.S. Bureau of Mines records show this company producing ore from the mine in 1915 and 1916.

In 1967, the property was owned by Mr. Don Scott of Homedale, Idaho. The mine had a 60-foot inclined shaft, several levels of stopes, and two caved drifts [adits(?)] below the shaft. The milling equipment included a jaw crusher, a bucket elevator, and amalgamation barrels (Green, 1967). No recent work appears to have been done on the property.
3.22.4 Environmental Conditions

3.22.4.1 Site Features

The Golden Crown Mine was visited by John Kauffman on July 16, 2000. A video segment describing the property is on Owyhee County 2000 Videotape (Tape 2, index 0:00:40-0:05:15). Documenting photographs are Roll 00K7, frames 10-15.

Although Green (1967) reported two “drifts” below the shaft, only one caved adit (the one shown on the topographic map) was found on the west side of the access road. The shaft is on the nose of the ridge above the adit (Figure 3.22-2). If a second adit is present, it is most likely on the slope above the existing adit.

The caved adit is expressed as a trough on the slope on the south side of a small gully (Figure 3.22-3). The waste dump extends out to the northeast across the gully, and the toe of the dump nearly reaches the access road (Figure 3.22-4). The dump measures 70 feet long, 25 feet wide, and 15 feet thick at the nose. Directly across Castle Creek from the adit, about 10 feet above the valley floor, is a minor prospect cut into the hillside (Figure 3.22-5). This site is shown by a prospect symbol on the topographic map. Although this prospect adit has a small opening, it is only a few feet in length. The waste dump is equally small.

Around the nose of the ridge south of the caved adit is an old jeep trail, partly overgrown with sagebrush, that goes up the slope to the shaft and several open stopes. The jeep trail and the shaft are shown on the topographic map. The shaft is an open decline (Figure 3.22-6). Green (1967) reported the attitude of the shear zone as N. 45º E., 40º NW., although the decline appears to trend about 25-30º NW. Some old support timbers are still intact along the decline. Southwest of the shaft along the strike of the shear zone are several openings that appear to be stopes along the structure (Figure 3.22-7). The waste dump is relatively large, with a wide northeast end and a long, narrow southwest end. The maximum length is about 90-100 feet. The dump is 50 feet at its widest and 20 feet thick at the southwest end (Figure 3.22-8). Surrounding the shaft, stopes, and dump is an old barbed-wire fence, which has fallen down in several places. A pile of old boards are on the northeast end of the dump near the shaft.

The disturbed area at the Golden Crown covers about 1 acre.

3.22.4.2 Sample Locations

3.22.4.2.1 Solid Samples

No solid samples were collected.

3.22.4.2.2 Water Samples

A reference water sample (K7160001) was collected from Castle Creek on BLM land about ½ mile upstream from the Golden Crown Mine.
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<th>Flow (gpm)</th>
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<td>8.1</td>
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### 3.23.4.2.3 Analytical Results

Water Samples (Tables 2.5-1 and 2.5-2)

Reference sample K7160001 from Castle Creek exceeds the Aquatic Life Chronic standard for mercury. Arsenic was detected in the dissolved heavy metal screen, but does not exceed any water quality standards. In the total recoverable metals screen, iron exceeds the Secondary MCL.

### 3.22.5 Structures

There are no structures at the site.

### 3.22.6 Safety

The shaft and stopes are open and could easily be entered. The rock is fractured, sheared, and prone to caving. Although the decline is only moderately steep, some internal sections may be steeper or connected to the irregular, open stopes. The access road crosses a few enclaves of private land and ends several miles to the south, factors which may deter visits to the area, although no part of the road was posted. For the last several miles, much of the road is in poor condition. This may also deter visitors, except for those on all-terrain vehicles.
Figure 3.22-1. Location of the Golden Crown Mine, Owyhee County, Idaho (U.S. Geological Survey Pixley Basin 7.5-minute topographic map).
Figure 3.22-2. Sketch of the Golden Crown Mine workings.
Figure 3.22-3. Caved adit at the Golden Crown Mine, looking southwest (Roll 00K7, frame #10).

Figure 3.22-4. Looking northwest at the waste dump for the caved adit at the Golden Crown Mine (Roll 00K7, frame #12).
Figure 3.22-5. Small prospect at the Golden Crown Mine on east side of Castle Creek, looking east (Roll 00K7, frame #11).

Figure 3.22-6. Looking west at the opening of the shaft at the Golden Crown Mine. The shaft is a decline along a shear zone and an associated quartz vein (Roll 00K7, frame #14).
Figure 3.22-7. Open stopes to the south of the shaft along the vein at the Golden Crown Mine (Roll 00K7, frame #15).

Figure 3.22-8. Waste dump for the shaft at the Golden Crown Mine, looking west (Roll 00K7, frame #13).
3.23 UNNAMED PROSPECT (Site No. JV-72)

Note: This site is identified as the Texas Owyhee Mining and Development Co. Prospect on the videotape and was originally identified as such in the database. However, it was later learned that the Texas Owyhee Mining and Development Co. operated the Bluebird Mine (Section 3.16) in the late 1930s. It seems likely that, even though the Idaho Mine Inspector placed the Texas Owyhee property on Castle Creek, that the company’s activities were confined to the Bluebird Mine.

3.23.1 Site Location and Access (Figure 2.1-1b)

This prospect is about ½ mile south of the Golden Crown Mine near the center of the E½ of the NW¼ of section 3, T. 7 S., R. 1 W., on the Pixley Basin 7.5-minute quadrangle (Figure 3.23-1). Access is the same as for the Golden Crown Mine. The site is on a strip of private land surrounded by BLM land.

3.23.2 Geologic Features (Figure 2.2-1b)

The shaft is in metasedimentary rocks, some of which are gneissic, cut by granitic sills and dikes. The bedding has a general east to northeast strike and dips northerly 20-25°. Thin quartz veins and minor pyrite were noted in the walls of the decline.

3.23.3 Site History

Nothing is known about the history of this site.

3.23.4 Environmental Conditions

3.23.4.1 Site Features

The prospect was visited by John Kauffman on July 16, 2000. A video segment describing the site, which identifies it as the Texas Owyhee Mining & Development Company prospect, is on Owyhee County 2000 Videotape (Tape 2, index 0:05:20-0:08:06). Documenting photograph is Roll 00K7, frame 16.

The prospect, noted on the topographic map by a shaft symbol, consists of an open decline driven northward into the hill (Figure 3.23-2). The decline is approximately 50 feet long and follows the general dip of the bedding. The opening is about 6 feet high and 5 feet wide. The waste dump is small, measuring 35-40 feet long, 8 feet wide, and 10-12 feet thick, about the size expected for an opening of this length. The disturbed area is minimal.

3.23.4.2 Sample Locations

3.23.4.2.1 Solid Samples

No solid samples were collected.
3.23.4.2.2 Water Samples

Reference water sample K7160001 was collected from Castle Creek on BLM land about ½ mile northeast of the decline. Water quality parameters and analytical results for this sample are discussed in Section 3.22 (Golden Crown Mine).

3.23.5 Structures

Several old buildings remain at the site of the Gordy Ranch just south of the decline. A metal-sided cabin or small house near the creek east of the decline is probably also related to the ranch. The prospect may not be associated with any of these buildings.

3.23.6 Safety

Although open, the decline is at a low to moderate angle and the rock is relatively competent, showing little evidence of caving or collapse.
Figure 3.23-1. Location of Unnamed Prospect, Site No. JV-72, Owyhee County, Idaho (U.S. Geological Survey Pixley Basin 7.5-minute topographic map).
Figure 3.23-2. Looking north into the open decline at Site No. JV-72 (Roll 00K7, frame #16).
3.24 BADGER PROSPECT (Site No. JV-67)
Alternate name—Mammot.

3.24.1 Site Location and Access (Figure 2.1-1b)

The Badger Prospect is at the confluence of Alder Creek and Castle Creek, in the SE¼ of the SE¼ of section 15, T. 6 S., R. 1 W., on the Antelope Spring 7.5-minute quadrangle (Figure 3.24-1). Access from Highway 78 is through the small town of Oreana, then south about 2 miles to the road that follows the plateau between Browns Creek and Castle Creek. This road continues south about 9-10 miles to the confluence of Alder and Castle creeks. The workings appear to be on a block of private land, although a few small pits may be on adjoining BLM land.

3.24.2 Geologic Features (Figure 2.2-1b)

The workings are along silicified shear zones in altered granite. Minor amounts of sulfides were noted in silicified fragments on the waste dumps.

3.24.3 Site History

A small amount of silver-lead ore was shipped from this property in the late 1930s.

3.24.4 Environmental Conditions

3.24.4.1 Site Features

The Badger Prospect was visited by John Kauffman on July 16, 2000. A video segment describing the site is on Owyhee County 2000 Videotape (Tape 2, index 0:08:12-0:12:58). Documenting photographs are Roll 00K7, frames 17-19.

Two adits and several small prospect pits are on the west and east sides of the ridge north of the confluence of the creeks (Figure 3.24-2). Both adits and two of the prospects are shown on the topographic map. Adit 1, on the west side of the ridge, is open and dry. It was driven northeast into the hillside. The entrance is about 4-5 feet wide and 3 feet high (Figure 3.24-3). The waste dump is 40 feet long, 25 feet wide, and 10 feet thick (Figure 3.24-4).

Adit 2, on the east side of the ridge, is completely caved (Figure 3.24-5). It was driven northwest into the hill and probably connects with Adit 1. The dump is 30 feet long, 10 feet wide, and 50 feet down the face, although the thickness on the slope is probably no more than 10-12 feet.

There are several shallow pits and short cuts on the silicified shear zone on the ridge above both adits. The total disturbed area covers about 0.5 acre.
3.24.4.2 Sample Locations

3.24.4.2.1 Solid Samples
No solid samples were collected.

3.24.4.2.2 Water Samples
No water samples were collected.

3.24.5 Structures
There are no structures at the site.

3.24.6 Safety

Adit 1 is open and could easily be entered.
Figure 3.24-1. Location of the Badger Prospect, Owyhee County, Idaho (U.S. Geological Survey Antelope Spring 7.5-minute topographic map).
Figure 3.24-2. Sketch of the Badger Prospect workings.
Figure 3.24-3. Open Adit 1 at the Badger Prospect, looking east (Roll 00K7, frame #17).

Figure 3.24-4. The waste dump for Adit 1 at the Badger Prospect, looking southeast (Roll 00K7, frame #18).
Figure 3.24-5. Caved Adit 2 at the Badger Prospect, looking northwest. An old claim post is in the foreground (Roll 00K7, frame #19).
3.25 FRIDAY CLAIMS (Site No. JV-66)

Note: Although this was an unnamed prospect in the IGS database, a claim notice at the site identified it as the Friday Claims, filed by T. H. Elliot, Baylis L. Lake, Clifford McElhanon, and William Russell in 1959.

3.25.1 Site Location and Access (Figure 2.1-1b)

This property is on the east side of Castle Creek in the SW¼ of section 14, T. 6 S., R. 1 W., on the Antelope Spring 7.5-minute quadrangle (Figure 3.25-1). Access is the same as for the Badger Prospect as far as the confluence of Alder and Castle creeks. The road forks at the confluence, with one fork continuing south along Castle Creek and the other turning northeast along Castle Creek. The workings are about ½ mile northeast of where the road forks and are all on BLM land.

3.25.2 Geologic Features (Figure 2.2-1b)

The prospects are in sheared, altered granite. Pyrite was noted in some of the silicified fragments on the waste dumps.

3.25.3 Site History

In 1959, these claims were staked by T. H. Elliot, Baylis L. Lake, Clifford McElhanon, and William Russell.

3.25.4 Environmental Conditions

3.25.4.1 Site Features

This property was visited by John Kauffman on July 16, 2000. A video segment describing the site is on Owyhee County 2000 Videotape (Tape 2, index 0:13:00-0:25:01). Documenting photographs are Roll 00K7, frames 21-25, and Roll 00K8, frames 1-5.

Eight dry adits and several small prospects were found at this site (Figure 3.25-2). All are on the steep slope on the southeast side of Castle Creek, and range in elevation from about 3,450 feet to 3,850 feet. A prospect shown on the topographic map at an elevation of about 4,080 feet was not visited.

Adits 1 and 2 are about 25 feet above the flood plain of Castle Creek and about 50 feet apart; the waste dumps are combined. Adit 1 is open but only about 10 feet in length (Figures 3.25-3 and 3.25-4). Rock debris has sloughed in front of Adit 2, leaving a small opening 3 feet wide by 2 feet high (Figure 3.25-5). Inside, however, the adit is open with little rubble on the floor (Figure 3.25-6). Two large, cut-out sign letters (an “A” and an “N”) have been stored (or possibly
hidden) in the adit. The common dump measures 35 feet long, 10-20 feet wide, and about 12 feet thick (Figure 3.25-7).

Three small prospects, two of which may be very short caved adits, are along the gully above Adits 1 and 2 and below Adits 3 and 4.

Adits 3 and 4, which are both driven southwest into the slope, are about 25 feet apart and open (Figure 3.25-8). Adit 4, the upper of the two, has a small amount of rock rubble on the slope in front of the opening, but some of the material may have been combined with that from Adit 3. The dump is somewhat irregular, but measures about 20 feet long, 8 feet wide, and 10 feet thick.

Adit 5, slightly above and east of Adits 3 and 4, is also open (Figure 3.25-9). The dump is small, measuring 6 feet long, 6 feet wide, and 15 feet down the face, but only 5 feet thick on the slope, indicating a short tunnel. A minor prospect pit is in the gully about due south of Adit 5.

Adit 6 is still further up the gully and is completely caved. The dump is smaller than that at Adit 5, again indicating a very short, minor tunnel.

Adits 7 and 8 are approximately 1,000 feet southwest of the other workings at an elevation of about 3,700 feet. Adit 7 is open, although some rock debris has again sloughed in front of the entrance, leaving an opening 3-4 feet wide and 2-3 feet high (Figure 3.25-10). Inside, the rock is competent and there are no support timbers (Figure 3.25-11). The waste dump is about 30 feet long but very narrow. It forms a thin veneer on the slope below (Figure 3.25-12). Caved Adit 8 is offset slightly above and to the southwest of Adit 7. The dump is small and also forms a thin veneer on the slope, seen just above the dump for Adit 7 in Figure 3.25-12.

The total disturbed area covers less than 2 acres.

3.25.4.2 Sample Locations

3.25.4.2.1 Solid Samples
No solid samples were collected.

3.25.4.2.2 Water Samples
No water samples were collected.

3.25.5 Structures
There are no structures at the site.

3.25.6 Safety
Several of the adits are open and could be entered, although the rock appears to be relatively competent and not prone to caving. The access road crosses some private land which may be a
deterrent for some visitors. However, the road is not posted, and all-terrain-vehicle enthusiasts can easily reach the property.
Figure 3.25-1. Location of the Friday Claims, Owyhee County, Idaho (U.S. Geological Survey Antelope Spring 7.5-minute topographic map).
Figure 3.25-2. Sketch of the workings at the Friday Claims.
Figure 3.25-3. Open Adit 1 at the Friday Claims, looking southeast (Roll 00K7, frame #21).

Figure 3.25-4. View into short Adit 1 at the Friday Claims (Roll 00K7, frame #22).
Figure 3.25-5. Open Adit 2 at the Friday Claims, looking southeast (Roll 00K7, frame #23).

Figure 3.25-6. View into Adit 2 at the Friday Claims. Two large letters (an “A” and an “N”) cut from Styrofoam or plastic are just inside the entrance (Roll 00K7, frame #24).
Figure 3.25-7. Common waste dump for Adits 1 and 2 at the Friday Claims, looking northeast. The green brush is growing along Castle Creek (Roll 00K7, frame #25).

Figure 3.25-8. Open Adits 3 and 4 at the Friday Claims, looking southwest (Roll 00K8, frame #1).
Figure 3.25-9. Open Adit 5 at the Friday Claims, looking southeast (Roll 00K8, frame #2).

Figure 3.25-10. Open Adit 7 at the Friday Claims, looking south. An opening 3-4 feet wide and 2-3 feet high is at the base of the rock scarp (Roll 00K8, frame #3).
Figure 3.25-11. View into Adit 7 at the Friday Claims. Although the entrance is nearly closed by rock debris, the rock inside the adit appears relatively competent. There is only a minor amount of rubble on the floor (Roll 00K8, frame #4).

Figure 3.25-12. Waste dump for Adits 7 and 8 at the Friday Claims, looking northeast. The waste dump for Adit 7 extends diagonally down from the center of the picture. The waste dump for Adit 8 is the lighter material coming down the slope and ending at the top of the dump for Adit 7 (Roll 00K8, frame #5).
3.26 AMIE MINE (Site No. JV-63)
Alternate names—Little Amie; Pick and Shovel Group.

3.26.1 Site Location and Access (Figure 2.1-1b)

The workings of the Amie Mine are north of the confluence of Castle and Alder creeks in the northern part of the E½ of section 15, T. 6 S., R. 1 W., on the Antelope Spring 7.5-minute quadrangle (Figure 3.26-1). Access is by foot up a gully from the Oreana-Castle Creek road, or from the end of old jeep trails on the ridge above the mine that connect with the Oreana-Castle Creek road to the north. All of the workings are on BLM land.

3.26.2 Geologic Features (Figure 2.2-1b)

The Amie workings are in quartz veins and silicified zones in granite. Sulfides and malachite staining were noted on some rock fragments on the waste dumps. Iron oxides are commonly associated with the altered zones.

3.26.3 Site History

A small amount of production was recorded from this property in the 1930s and early 1940s.

3.26.4 Environmental Conditions

3.26.4.1 Site Features

The Amie Mine was visited by John Kauffman on July 16, 2000. A video segment describing the property is on Owyhee County 2000 Videotape (Tape 2, index 0:25:02-0:40:03). Documenting photographs are Roll 00K8, frames 6-19.

The southernmost of the workings, Adit 1, is noted by an adit symbol on the topographic map at an elevation of about 3,660 feet along a gully at the base of a steep slope. Rock rubble has sloughed into the entrance under the portal timbers, but the adit is open and dry (Figure 3.26-2). The waste dump is 20 feet long, 15 feet wide, and 15 feet down the face (Figure 3.26-3). A bulldozer cut goes northward from the dump to Adit 2.

Farther up the gully, two adit and two prospect symbols are shown on the topographic map. The northern of the two adit symbols marks what is probably a shallow, caved shaft. This shaft is now a dry pit about 5 feet deep with a waste pile 10 feet in diameter and 15 feet thick (Figure 3.26-4). The other adit symbol marks the location of Adit 2, a dry opening that is partly a stope along a vein that strikes N. 45º E. and dips 45º NW. (Figure 3.26-5). The waste dump is somewhat irregular, but is about 30 feet long, 8 feet wide, and 15 feet down the face. Some material is also piled on the slope above the dump beside the opening (Figure 3.26-6). The two
prospect symbols mark the locations of Adits 3 and 4, both of which are caved and dry. Both dumps measure about 15 feet long, 8 feet wide, and 10 feet thick.

Adit and shaft symbols further to the northeast on the topographic map are the sites of Adit 5 and the Amie No. 2 shaft (Figure 3.26-7). Adit 5, also dry, is open and has a warning sign posted at the entrance (Figure 3.26-8). The rock inside the adit is competent, and there are no support timbers. A wooden bench stands just inside the entrance in a cutout to the left (Figure 3.26-9). The waste dump is built out to the west along the side of the slope and measures 190 feet long, 45 feet wide at the west end, and 30 feet thick at the west end (Figure 3.26-10). A small amount of material is on the south side of the dry gully that parallels the edge of the dump. The shaft is about 60 feet in elevation directly above the adit and has a warning sign posted on the waste dump. The shaft is open to the surface and has a short side tunnel that enters from the southeast side (Figure 3.26-11). A wooden plank inside the short tunnel spans the shaft opening (Figure 3.26-12). The depth of the shaft below the plank was not determined. A small amount of waste rock is piled on the slope west of the shaft, and another pile is south of the short tunnel.

North of these workings, adit and shaft symbols mark the sites of Adit 6 and the Amie No. 1 shaft (Figure 3.26-13). The dry adit is about 20-30 feet lower on the slope than the shaft and was driven east-southeast into the hill. The adit is open and again has a warning sign posted at the entrance (Figure 3.26-14). The waste dump is 25 feet long, 20 feet wide, and about 15 feet thick (Figure 3.26-15). The shaft is open to a depth of about 20 feet and has a wooden ladder from the surface to the shaft floor (Figure 3.26-16). Several open stopes extend south from the shaft and may connect with the adit below. The shaft waste dump is 15 feet long, 12 feet wide, and 8 feet thick (Figure 3.26-17).

The total disturbed area at the site covers several acres.

3.26.4.2 Sample Locations

3.26.4.2.1 Solid Samples
No solid samples were collected.

3.26.4.2.2 Water Samples
No water samples were collected.

3.26.5 Structures
There are no structures at the site.

3.26.6 Safety

Several of the adits are open and could be entered. The shafts are also open. The shafts probably connect with the adits and possibly with underground stopes. Several of the open stopes near the Amie No. 1 shaft have steep sides and are obscured by sagebrush. Although the workings are not
directly accessible by vehicle, the waste dumps are obvious on the open slopes and easy to reach on foot from nearby jeep trails.
Figure 3.26-1. Location of the Amie Mine, Owyhee County, Idaho (U.S. Geological Survey Antelope Spring 7.5-minute topographic map).
Figure 3.26-2. Portal of Adit 1 at the Amie Mine, looking east (Roll 00K8, frame #6).

Figure 3.26-3. Waste dump for Adit 1 at the Amie Mine, looking southeast (Roll 00K8, frame #7).
Figure 3.26-4. Pit or caved shaft below Adit 2 at the Amie Mine (Roll 00K8, frame #8).

Figure 3.26-5. Open Adit 2 at the Amie Mine, looking northeast (Roll 00K8, frame #9).
Figure 3.26-6. Looking northwest down at the waste dumps for Adit 2 and the nearby pit (probable caved shaft) at the Amie Mine (Roll 00K8, frame #10).
Figure 3.26-7. Sketch of Adit 5 and the Amie No. 2 shaft.
Figure 3.26-8. Open Adit 5 at the Amie Mine, looking northeast (Roll 00K8, frame #12).

Figure 3.26-9. View inside Adit 5 at the Amie Mine. A wooden bench is in a cutout on the left (Roll 00K8, frame #13).
Figure 3.26-10. Waste dumps for the upper Amie workings. The large dump across the left center of the picture is for Adit 5. The Amie No. 2 shaft is on the ridge at the right side of the picture. The Amie No. 1 shaft and Adit 6 are on the skyline of the ridge, just left of center of the picture (Roll 00K8, frame #11).

Figure 3.26-11. Looking north at the short tunnel leading to the Amie No. 2 shaft (Roll 00K8, frame #14).
Figure 3.26-12a. View inside the tunnel with a plank across the shaft. Most of the plank is covered with rock debris (Roll 00K8, frame #15).

Figure 3.26-12b. Sketch highlighting features shown in Figure 3.26-12a.
Figure 3.26-13. Sketch of Adit 6 and the Amie No. 1 shaft.
Figure 3.26-14. Open Adit 6 at the Amie Mine, looking east (Roll 00K8, frame #16).

Figure 3.26-15. Looking south at the waste dump for Adit 6 at the Amie Mine (Roll 00K8, frame #17).
Figure 3.26-16. Looking down into the Amie No. 1 shaft. A wooden ladder (lower right) provides access into the shaft (Roll 00K8, frame #19).

Figure 3.26-17. Looking east at the waste dump for the Amie No. 1 shaft. Note the warning sign on the skyline (Roll 00K8, frame #18).
3.27 UNNAMED PROSPECTS (Site Nos. JV-60 and JV-61)

3.27.1 Site Location and Access (Figure 2.1-1b)

Site No. JV-60 is in the SE¼ of the NE¼ of section 10 and the SW¼ of the NW¼ of section 11, and Site No. JV-61 consists of numerous prospects across the central portion of section 11, T. 6 S., R. 1 W., on the Antelope Spring 7.5-minute quadrangle (Figure 3.27-1). The prospects are along the Oreana-Castle Creek road and on jeep trails that turn south and east off the road. All of the prospects at both sites are on BLM land.

3.27.2 Geologic Features (Figure 2.2-1b)

The prospects are in quartz veins and silicified shear zones in granite.

3.27.3 Site History

Nothing is known about the history of these sites.

3.27.4 Environmental Conditions

3.27.4.1 Site Features

These sites were visited by John Kauffman on July 16, 2000. A video segment describing the prospect at Site No. JV-60 is on Owyhee County 2000 Videotape (Tape 2, index 0:40:07-0:42:58). Documenting photographs of JV-60 are Roll 00K8, frames 20-22. No video or photographs were taken of the prospects at Site No. JV-61.

At Site No. JV-60, there are several shallow trenches and pits. All of the workings are dry. One deeper trench with a shaft is near the junction of the Oreana-Castle Creek road and a jeep trail that heads east (Figure 3.27-2). At the west end of the trench is a wooden platform above the shaft (Figure 3.27-3). The platform probably served as a winch frame for excavating the shaft. Boards and planks have collapsed into the shaft (Figure 3.27-4), and its depth could not be determined. Mounds of excavated material from the trench and shaft, and from other nearby pits, stand above the surrounding sagebrush-covered flat (Figure 3.27-5). The disturbed area covers less than 1 acre.

The prospects at Site No. JV-61 are spread over a large area nearly 1 mile in length and ¼ mile in width. Not all of the prospects were visited, but those that were are bulldozer trenches, cuts, and shallow pits, typically from 2-6 feet deep. Small piles of excavated material stand above the sagebrush, similar in appearance to those at Site No. JV-60. The total disturbed area probably amounts to several acres.
3.27.4.2 Sample Locations

3.27.4.2.1 Solid Samples
   No solid samples were collected.

3.27.4.2.2 Water Samples
   No water samples were collected.

3.27.5 Structures

   The wooden platform over the shaft at Site No. JV-60 is the only structure in the area.

3.27.6 Safety

   The shaft at Site No. JV-60 is the only potential safety hazard. It probably is not more than 10-20 feet deep, and the collapsed boards should prevent a fall into the pit.
Figure 3.27-1. Location of Unnamed Prospects, Sites No. JV-60 and No. JV-61, Owyhee County, Idaho (U.S. Geological Survey Antelope Spring 7.5-minute topographic map).
Figure 3.27-2. Sketch of the prospects at Site No. JV-60.
Figure 3.27-3. Wooden platform over the shaft at Site No. JV-60 (Roll 00K8, frame #21).

Figure 3.27-4. Boards and planks collapsed into the shaft under the platform at Site No. JV-60 (Roll 00K8, frame #22).
Figure 3.27-5. Looking east at the piles of material excavated from the prospects at Site No. JV-60 (Roll 00K8, frame #20).
3.28 OVERALL MINE (Site No. JV-64)
Alternate names—Lucky Boy; Big Shot.

3.28.1 Site Location and Access (Figure 2.1-1b)

The Overall Mine is on the ridge west of Castle Creek in the W½ of the NE¼ of section 14, T. 6 S., R. 1 W., on the Antelope Spring 7.5-minute quadrangle (Figure 3.28-1). The upper workings are accessible from the north along old jeep trails and bulldozer roads that connect with the Oreana-Castle Creek road. The jeep trails can be driven to where the bulldozer roads break over the steeper slopes above Castle Creek. The bulldozer roads can be traversed by foot or all-terrain vehicle. The lower workings can be reached via the jeep road that turns northeast along Castle Creek from the confluence with Alder Creek. All of the workings are on BLM land bordered on the east by private land.

3.28.2 Geologic Features (Figure 2.2-1b)

The workings are in altered shear zones in granite or are associated with pods of sheared, altered gneissic metasedimentary rocks within the granite.

3.28.3 Site History

Lead, silver, and gold were produced from this site in the middle and late 1930s and the early 1940s.

3.28.4 Environmental Conditions

3.28.4.1 Site Features

The Overall Mine was visited by John Kauffman on July 17, 2000. A video segment describing the property is on Owyhee County 2000 Videotape (Tape 2, index 0:43:03-0:54:36). Documenting photographs are Roll 00K8, frames 23-25, and Roll 00K9, frames 1-11.

The upper workings are at an elevation of about 3,850 feet in a deep gully on the slope west of Castle Creek (Figure 3.28-2). Features at this site include an open shaft, open stopes off the shaft, a large waste dump, old mill footings, and two tailings impoundments (Figure 3.28-3). The open shaft and stopes are along a steeply inclined shear zone and have numerous cross support timbers, many of which have collapsed into the workings (Figure 3.28-4). Beside the shaft is a collapsed headframe platform (Figure 3.28-5) and a rusty winch (Figure 3.28-6). The waste dump, seen in Figure 3.28-2, measures 75 feet long, 20-25 feet wide, and 25 feet thick. At the base of the dump is an ore bin (Figure 3.28-7), and old stone walls that probably supported the mill. Below the stone walls are two triangular tailings impoundments (Figure 3.28-8). The maximum dimensions for the impoundments are: upper impoundment — 20 feet long, 15 feet wide, and 8 feet thick; lower impoundment — 35 feet long, 30 feet wide, and 15 feet thick.
Although built in the center of the gully, little erosion is evident on the surface of the
impoundments. Only the steep east faces of the impoundments are eroded into deep rills. Most
of the material is very fine, probably flotation tails. Some of the deeper material is coarser and
may be jig tails.

The lower workings are around the ridge to the south of the shaft and also are along a deep gully
on the steep slope at elevations between 3,550 feet and 3,720 feet. These workings include four
open, dry adits and a few minor prospects and bulldozer cuts (Figures 3.28-9). Adit 1, the
lowest, is open and was driven northeast into the hill (Figure 3.28-10). Steel I-beams frame the
entrance, although the interior has no support timbers (Figure 3.28-11). A large pile of rock
rubble has collapsed onto the floor not far inside. The triangular waste dump has been built out
across the dry gully and measures 40 feet long, 40 feet wide, and 20 feet thick (Figure 3.28-12).

Adits 2, 3, and 4 are on the southwest side of the gully not far above Adit 1 (Figure 3.28-13).
These are along a steep northeast-trending shear zone and may be connected by stopes. Adit 2,
the lowest of the three, has a large opening, about 6 feet high by 5 feet wide (Figure 3.28-14).
The waste dump measures 45 feet long, 40 feet wide, and 15 feet thick, and is built across the
gully. Adit 3, about 20 feet above and offset slightly to the southwest, is also open and has a
steel I-beam frame at the entrance (Figure 3.28-15). The waste dump, built out along the slope
above and south of Adit 2, has a plywood chute down the face (Figure 3.28-16). The dump
measures 30 feet long, 8 feet wide, and 10 feet thick. Adit 4, the highest of the three, is about 20
feet above Adit 3 and offset to the southwest. It is open (Figure 3.28-17) but only 15-20 feet
long. The waste dump is minimal. A bulldozer cut on the slope above Adit 4 apparently did not
cut the structure or there was no mineralization, because no adits were started from that cut as
they were from the cuts below.

Several minor prospects were noted on the slope above Adit 1 near the ridge top. A claim notice
high on the slope above the lower workings identified it at the Scott Claim. Adjoining claims
were noted as the Overall 62, Chuckar, and Chuckar #3, filed in 1983 by Noble Enterprise Co.,
Boise, Idaho. The original location date is given as June 2, 1964, by Clifford McElhanon.

The disturbed area at the upper workings covers about 1 acre. At the lower workings, the
disturbed area covers several acres.

3.28.4.2 Sample Locations

3.28.4.2.1 Solid Samples

Sample K7170001 was collected from the flotation tails in the lower tailings impoundment.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K7170001</td>
<td>Overall Mine, flotation tails</td>
<td>Yes</td>
</tr>
</tbody>
</table>
3.28.4.2.2 Water Samples
   No water samples were collected.

3.28.4.2.3 Analytical Results

Solid Samples (Tables 2.5-3 and 2.5-4)

In the element screen for sample K7170001 from the tailings impoundment, copper and iron are near or slightly above background values; elements with significantly elevated values include arsenic, cadmium, lead, and zinc. In the TCLP for metals test, arsenic, cadmium, and lead are leaching from the sample.

3.28.5 Structures

The collapsed headframe and the ore bin at the shaft are the only structures at the site.

3.28.6 Safety

Although the property is not visible from any of the main roads in the area, many of the workings are marked on the topographic map. All-terrain vehicles can traverse the old bulldozer roads to the site, although foot travel is not overly difficult or far from the jeep trails on the ridge above the mine. The shaft and associated stopes are open and steep. Many of the support beams have collapsed into the workings. All of the adits are open and could easily be entered. Collapsed debris on the floor of Adit 1 indicates unstable rock conditions.
Figure 3.28-1. Location of the Overall Mine, Owyhee County, Idaho (U.S. Geological Survey Antelope Spring 7.5-minute topographic map).
Figure 3.28-2. Looking southeast at the shaft and waste dump, with the overturned headframe, at the upper workings of the Overall Mine (Roll 00K8, frame #23).
Figure 3.28-3. Sketch of the upper workings at the Overall Mine.
Figure 3.28-4. View down into the shaft at the Overall Mine. Some of the support timbers have collapsed into the opening (Roll 00K9, frame #1).

Figure 3.28-5. Collapsed headframe platform beside the shaft at the Overall Mine. Open stopes connected to the shaft are behind the platform (Roll 00K8, frame #24).
Figure 3.28-6. Old winch beside the shaft at the Overall Mine (Roll 00K8, frame #25).

Figure 3.28-7. Ore bin near the base of the waste dump for the shaft at the Overall Mine. Footings for the mill building (not visible in this picture) are at the base of the dump beside the ore bin (Roll 00K9, frame #3).
Figure 3.28-8. Looking east at the two triangular tailings impoundments below the waste dump for the shaft at the Overall Mine (Roll 00K9, frame #2).
Figure 3.28-9. Sketch of the lower workings at the Overall Mine.
Figure 3.28-10. Open Adit 1 at the Overall Mine, looking north (Roll 00K9, frame #5).

Figure 3.28-11. View inside Adit 1 at the Overall Mine. A pile of collapsed rock rubble is on the adit floor (Roll 00K9, frame #6).
Figure 3.28-12. Adit 1 at the Overall Mine and waste dump built out across the gully, looking north (Roll 00K9, frame #7).

Figure 3.28-13. Looking west at open Adits 2, 3, and 4 of the Overall Mine. Adit 2 is the lowest and largest opening, Adit 3 is in the middle, and Adit 4 is the smallest and uppermost (Roll 00K9, frame #4).
Figure 3.28-14. Open Adit 2 at the Overall Mine, looking south (Roll 00K9, frame #8).

Figure 3.28-15. Open Adit 3 at the Overall Mine, looking south (Roll 00K9, frame #10).
Figure 3.28-16. Adit 2 (lower right), Adit 3 (just right of center), and the waste dump for Adit 3 at the Overall Mine, looking south. A plywood slide is on the side of the dump (Roll 00K9, frame #9).

Figure 3.28-17. Open Adit 4 at the Overall Mine, looking south (Roll 00K9, frame #11).
3.29 ROADSIDE PROSPECT (Site No. JV-62)
Alternate names—Alder Creek; Alter Creek Mining Co.

Note: Some of the individual prospects included with this site may actually be part of the Amie Mine or part of some other, unnamed prospect for which the IGS had no site number.

3.29.1 Site Location and Access (Figure 2.1-1b)

The prospects included with this site are in the SE¼ of section 10 and the extreme southwest corner of section 11, T. 6 S., R. 1 W., on the Antelope Spring 7.5-minute quadrangle (Figure 3.29-1). The prospects in section 10 are along both sides of the Oreana-Castle Creek road. The others are at the end of a jeep road that diverges from the Oreana-Castle Creek road in the north part of section 11 near the old corral noted on the topographic map. All of the features are on BLM land.

3.29.2 Geologic Features (Figure 2.2-1b)

The prospects are in a mixture of altered granite and gneissic metasedimentary rocks intruded by granitic dikes and sills.

3.29.3 Site History

A small amount of ore was produced from this property in the mid-1960s. The Alter Creek Mining Company, Inc., was incorporated in 1964. By the following year, the Idaho Mine Inspector reported that the company held an unnamed property in the Castle Creek district. Although the company was not mentioned in the Mine Inspector’s reports for all the intervening years, Alter Creek held the Roadside Prospect in 1979. In 1988, Alter Creek changed its name to Apple Corp., a company that described its business as “oil and gas producer” on its annual report to the Idaho Secretary of State’s office. In 1994, Apple Corp. merged with Trans Energy, Inc., with the latter as the surviving company.

3.29.4 Environmental Conditions

3.29.4.1 Site Features

The Roadside Prospect was visited by John Kauffman on July 17, 2000. A video segment describing the site is on Owyhee County 2000 Videotape (Tape 2, index 0:54:41-1:06:52). Documenting photographs are Roll 00K9, frames 12-20.

A shaft symbol and several prospect symbols are shown on the topographic map in the southwest corner of section 11 and the southeast corner of section 10. Two shafts and several prospect cuts were found. Old boards and timbers have collapsed into Shaft 1 (Figure 3.29-2), but it is open to a depth of at least 25 feet. The small, oxidized waste dump contains enough material for 25-50
feet of workings. Some large fragments of altered granite and vein material are scattered on the
dump, barely visible on the sagebrush-covered flat (Figure 3.29-3). About 200 feet (slope
distance) below the shaft is a north-south trench about 75 feet long, 5 feet wide, and 4-7 feet deep
(Figure 3.29-4). On the low saddle north of Shaft 1 is a second shaft, noted by a prospect symbol
on the topographic map. Shaft 2 is also open and is at least 15-25 feet deep (Figure 3.29-5). At
the surface, the opening is 10 feet long and 5 feet wide, with no warning signs or fence to
indicate its presence. The dump forms a thin pad among the sagebrush (Figure 3.29-6). Other
nearby prospects are small and insignificant. The disturbed area covers no more than 1 acre.

Farther to the northwest, the prospects along the Oreana road consist of numerous trenches and
pits. The main trenches are cut perpendicular to an east-west-trending structure on both sides of
the road (Figure 3.29-7). Piles of the excavated material are scattered along the road (Figure
3.29-8). The deepest trench, which also has a small opening into an old adit or stope, is along the
west edge of the road. The trench is about 125 feet long, 15 feet wide, and 8-20 feet deep (Figure
3.29-9). Several north-south trenches, ranging from 5-20 feet deep and 50-70 feet long, are east
of the road (Figures 3.29-10 and 3.29-11). Numerous other shallow trenches and pits in the
vicinity are of little significance. The total disturbed area covers several acres.

3.29.4.2 Sample Locations

3.29.4.2.1 Solid Samples
   No solid samples were collected.

3.29.4.2.2 Water Samples
   No water samples were collected.

3.29.5 Structures
   There are no structures at the site.

3.29.6 Safety

Both shafts are hazardous, although boards and timbers in the first shaft fill most of the opening.
The second shaft is a fairly significant hazard because of its abrupt drop-off and lack of warning
signs or fences. The opening in the deep trench along the Oreana road is small, but may provide
access into an old adit or stope. The other trenches have steep, abrupt side walls, but the ends
taper to the surface. The road probably receives a moderate amount of recreational use, although
the main branch and side branches of the road terminate within a few miles, either at private land
or along Castle and Alder creeks.
Figure 3.29-1. Location of the Roadside Prospect, Owyhee County, Idaho (U.S. Geological Survey Antelope Spring 7.5-minute topographic map).
Figure 3.29-2. Timbers in the mouth of open Shaft 1 at the Roadside Prospect (Roll 00K9, frame #13).

Figure 3.29-3. Looking north toward Shaft 1 and its waste dump at the Roadside Prospect (Roll 00K9, frame #12).
Figure 3.29-4. Trench about 200 feet downslope from Shaft 1 at the Roadside Prospect, looking south (Roll 00K9, frame #14).

Figure 3.29-5. Open Shaft 2 at the Roadside Prospect, looking north (Roll 00K9, frame #15).
Figure 3.29-6. Waste dump for Shaft 2 at the Roadside Prospect, looking northwest (Roll 00K9, frame #16).
Figure 3.29-7. Sketch of the main trenches along the Oreana-Castle Creek road at the Roadside Prospect.
Figure 3.29-8. Numerous piles of excavated rock along the Oreana-Castle Creek road, looking northeast (Roll 00K9, frame #17).

Figure 3.29-9. Looking down into the largest excavation on the west side of the road at the Roadside Prospect. A small opening into an adit or stope (not visible in this picture) is behind the small patch of sagebrush at the upper right (Roll 00K9, frame #18).
Figure 3.29-10. One of the deep trenches east of the road at the Roadside Prospect, looking north (Roll 00K9, frame #19).

Figure 3.29-11. A second deep trench east of the road at the Roadside Prospect, looking north (Roll 00K9, frame #20).
3.30 LAST CHANCE PROSPECT (Site No. JV-69)

Note: In the IGS database, Site No. JV-68 was identified as the Last Chance, and Site No. JV-69 was identified as an unnamed prospect farther to the west. However, the description for Site No. JV-68 matches the features found at Site No. JV-69. The location given in the report on the Last Chance (Vernon, 1953) is in error, as noted below. Since the evidence indicates that both site numbers were for the same property, the two database entries have been combined.

3.30.1 Site Location and Access (Figure 2.1-1b)

The Last Chance Prospect is on a north-flowing tributary to Alder Creek in the NW¼ of the NE¼ of section 20, T. 6 S., R. 1 W., on the Antelope Spring 7.5-minute quadrangle (Figure 3.30-1). An adit symbol is shown at this location on the topographic map. Vernon (1953) incorrectly gave the location as section 21. Access from State Highway 78 is via the Oreana-Castle Creek road to where the road splits at a Y-shaped junction, with one branch going south to the confluence of Castle and Alder creeks and the other going southwest. The southwest branch ends on Alder Creek at an old homestead about two miles from the Y-shaped junction. From the end of road at the homestead on Alder Creek, a four-wheel-drive vehicle trail, shown on the topographic map, continues to the southwest. Several hundred yards from the creek along this trail, an old, somewhat obscure road turns south up the tributary creek (Vernon (1953) called this tributary the East Fork of Alder Creek). The mine is at the end of this old road, about ½ mile south of Alder Creek, and is on BLM land.

3.30.2 Geologic Features (Figure 2.2-1b)

The prospect is on a thick, white quartz vein and altered zone in granite. The vein is 4-15 feet thick, striking N. 55-60° E. and dipping of 45° NW. There is little continuity of mineralization in the persistent quartz vein (Vernon, 1953). In addition, Vernon (1953, p. 2) noted:

Several sulfide-bearing quartz veins cut the granite. The two most persistent vein outcrops trending northeast and dipping northwest, are separated by a lava-covered interval several hundred feet long. Three large, north-trending, quartz outcrops near the western edge of the property may either be parallel veins or dislocated segments of a single vein structure.

In most places the vein outcrops are nearly barren of metallic minerals except iron oxides. Galena and sphalerite occur in the northeasterly-trending vein near the edge and near the bottom of the East Fork ravine in pea to dime-size sulfide masses distributed across 4 feet of quartz vein material. Sphalerite is more abundant than galena. In the most westerly bulldozer cut, specks of copper oxides and galena were noted.
On the east side of the tributary creek, the granite is either overlain by or abuts a thick Tertiary basalt unit. Vernon (1953) assumed this was a fault contact, although it may be erosional instead.

3.30.3 Site History

The property consisted of six unpatented claims owned by A. J. Shaw of Middleton, Idaho (Vernon, 1953). Vernon (1953, p. 1) further noted:

Early-day prospectors investigated the prominent quartz vein outcrops by several small pits and a shallow shaft. These workings were abandoned long before Mr. Shaw staked the ground in 1948. Since 1948, several pits, a 16 foot shaft, and bulldozer cuts have been excavated. Considerable sphalerite and galena found in one of the pits has encouraged the present owner to plan additional exploratory work. No ore has been produced from the property.

In 1979, the property was held by the Alter Creek Mining Company. See Section 3.29.3 for the history of this corporation.

3.30.4 Environmental Conditions

3.30.4.1 Site Features

The Last Chance Prospect was visited by John Kauffman on July 17, 2000. A video segment describing the site is on Owyhee County 2000 Videotape (Tape 2, index 1:06:56-1:10:28). Documenting photographs are Roll 00K9, frames 21-22.

A caved working with a small waste dump and a bulldozer cut are on the west side of the drainage (Figure 3.30-2). The caved working is probably the 16-foot shaft reported by Vernon (1953). The bulldozer cut zig-zags across the slope above the shaft(?). The thick quartz vein is exposed on the west side of the drainage north of the caved shaft(?) (Figure 3.30-3). The disturbed area is less than 0.25 acre.

3.30.4.2 Sample Locations

3.30.4.2.1 Solid Samples

No solid samples were collected.

3.30.4.2.2 Water Samples

No water samples were collected at the prospect, but a reference water sample (K7170002) was collected from Alder Creek where the old jeep road crosses the creek west of the homestead.
### Analytical Results

**Water Samples (Tables 2.5-1 and 2.5-2)**

Reference sample K7170002 exceeds the Aquatic Life Chronic standard for mercury in the EPA 200.8 test. In the total recoverable metals screen, iron exceeds all standards and manganese exceeds the Secondary MCL.

### Structures

There is an old building at the homestead, but it is probably unrelated to the prospect.

### Safety

There are no safety hazards at the site.
Figure 3.30-1. Location of the Last Chance Prospect, Owyhee County, Idaho (U.S. Geological Survey Antelope Spring 7.5-minute topographic map).
Figure 3.30-2. Looking west at the altered, sheared granite, the caved shaft(?) and the small waste dump at the Last Chance Prospect. This is probably the 16-foot shaft reported by Vernon (1953) (Roll 00K9, frame #21).

Figure 3.30-3. Thick white quartz vein just north of the caved shaft(?) at the Last Chance Prospect (Roll 00K9, frame #22).
3.31 MATTESON MINE (Site No. BO-447)

3.31.1 Site Location and Access (Figure 2.1-1a)

The Matteson Mine is near Point of Rocks Spring near the center of the north edge of section 30, T. 3 S., R. 2 W., on the Murphy 7.5-minute quadrangle (Figure 3.31-1). Access from Murphy, Idaho, is via the old Silver City road south about 6 miles to a jeep road that turns to the west. About 2 miles west of the turnoff, the road passes Point of Rocks Spring, where a poor jeep trail heads to the north and passes below the mine. A bulldozer road leads to some of the workings from this rough jeep trail. The mine is on the east slope of Federal Butte and is on BLM land.

3.31.2 Geologic Features (Figure 2.2-1a)

The mine is in an altered shear zone or zones in granite. The uppermost adit is at the erosional contact of the granite with an overlying, thick, flow-banded rhyolite (Figure 3.31-2).

3.31.3 Site History

Asher (1968) reported several old adits at this site. When this property was worked is not known.

3.31.4 Environmental Conditions

3.31.4.1 Site Features

The Matteson Mine was visited by John Kauffman on July 17, 2000. A video segment describing the property is on Owyhee County 2000 Videotape (Tape 2, index 1:10:31-1:22:47). Documenting photographs are Roll 00K9, frames 23-25, and Roll 00K10, frames 1-8.

Six adits and several bulldozer cuts comprise the Matteson workings (Figure 3.31-3). Most are shown on the topographic map by adit or prospect symbols.

Adit 1, the lowest of the workings, is open but only 20-25 feet in length (Figure 3.31-4). The waste dump is 25-30 feet long, 6-8 feet wide, and 7 feet thick. Old boards are strewn down the dump face (Figure 3.31-5).

Adit 2 is just south of Adit 1 and is caved. The dump is very small, measuring 10 feet long, 6 feet wide, and 5 feet thick.

Adit 3 is about 200 feet uphill from Adit 2 and offset to the southwest from Adit 1. The opening into the adit is beneath a huge granite boulder (Figure 3.31-6). The dump is 20 feet long, 6-8 feet wide, and 15-20 feet down the face, but only 5-8 feet thick on the slope.
Adit 4 is about 40 feet above Adit 3 and offset slightly to the north. This adit is open and about 40 feet long (Figure 3.31-7 and 3.31-8). The waste dump is small on top, but spreads out to about 30 feet across on the slope below. The thickness on the slope is less than 10 feet.

Adit 5 is directly above Adit 4 and is nearly caved (Figure 3.31-9). A small triangular opening 2 feet wide and 1½ feet high provides access into the adit (Figure 3.31-10). The waste dump is similar in size to that of Adit 4, so Adit 5 is probably no more than 50 feet in length.

Adit 6, along a bulldozer road above Adit 5, has a small opening and slopes downward about 15 feet (Figure 3.31-11) in the vesicular, rubbly base of the rhyolite flow (Figure 3.31-12). The decline is at an angle of about 20º. The contact with the underlying granite is exposed about 15 feet west of the opening (Figure 3.31-13).

The total disturbed area at the site is about 1 acre.

### 3.31.4.2 Sample Locations

#### 3.31.4.2.1 Solid Samples

No solid samples were collected.

#### 3.31.4.2.2 Water Samples

No water samples were collected.

### 3.31.5 Structures

There are no structures at the site.

### 3.31.6 Safety

Adits 1, 3, 4, and 5 could easily be entered. Adit 1 is short and the rock is competent, as is the rock inside Adit 4. Conditions inside Adits 3 and 5 could not be determined. Adit 6 has a small, irregular, short opening that would not likely be entered. The workings are fairly obvious on the open slope and are in an area frequented by outdoor enthusiasts, particularly those on all-terrain vehicles, so some visitors to the mine are likely.
Figure 3.31-1. Location of the Matteson Mine, Owyhee County, Idaho (U.S. Geological Survey Murphy 7.5-minute topographic map).
Figure 3.31-2. View from below of the Matteson workings, looking west. Rhyolite forms the dark outcrops at the top of the ridge, while granite forms the large outcrops across the center of the picture. The granite-rhyolite contact is just above the granite outcrop at the base of the open slope. The Matteson workings are near the center of the picture (Roll 00K9, frame #23).
Figure 3.31-3. Sketch of the Matteson Mine workings.
Figure 3.31-4. Open Adit 1 at the Matteson Mine, looking west (Roll 00K9, frame #24).

Figure 3.31-5. Waste dump for Adit 1 at the Matteson Mine, looking north (Roll 00K9, frame #25).
Figure 3.31-6. Opening at Adit 3 at the Matteson Mine, looking west. A huge granite boulder is above the opening (Roll 00K10, frame #1).

Figure 3.31-7. Open Adit 4 at the Matteson Mine, looking west (Roll 00K10, frame #2).
Figure 3.31-8. View into Adit 4 at the Matteson Mine (Roll 00K10, frame #3).
Figure 3.31-9. Scarp above Adit 5 at the Matteson Mine, looking southwest (Roll 00K10, frame #4).
Figure 3.31-10. Small triangular opening into Adit 5 at the Matteson Mine (Roll 00K10, frame #5).

Figure 3.31-11. Small opening of Adit 6 at the Matteson Mine. This adit is a short decline (Roll 00K10, frame #7).
Figure 3.31-12. Vesicular, rubbly base of the rhyolite at Adit 6 at the Matteson Mine, looking west (Roll 00K10, frame #6).

Figure 3.31-13. Rhyolite-granite contact just south of Adit 6 at the Matteson Mine. The rock hammer is on the distinct contact, with granite below and rhyolite above (Roll 00K10, frame #8).
3.32 MONARCA MINE (Site No. BO-411)

3.32.1 Site Location and Access (Figure 2.1-1a)

The Monarca Mine is on a tributary to Succor Creek in the SE¼ of section 20 and the SW¼ of section 21, T. 3 S., R. 4 W., on the Rooster Comb Peak 7.5-minute quadrangle (Figure 3.32-1). Access is via the Rabbit Creek Road from Murphy to Reynolds Basin. This road eventually goes west to China Flat at the north end of Whiskey Mountain. A dirt road that branches to the south then goes to the Ida Belle, Berg, and Monarca mines. The Monarca is the southern of the three mines and is just northwest of Rooster Comb Peak. The mine is on BLM land.

3.32.2 Geologic Features (Figure 2.2-1a)

The Monarca Mine is in Cretaceous granitic rocks (Ekren and others, 1981). The main trench follows a shear zone in granite, and Adits 1 and 2 are in iron-stained granite. A few xenoliths of metasedimentary rocks are in the granite. According to Asher (1968), the vein consisted of massive sulfides in a sparse quartz gangue. The sulfide minerals included pyrite, galena, sphalerite, and minor chalcopyrite.

3.32.3 Site History

The Monarca Mining Corporation was incorporated in 1959. In 1960, the company reported one 80-foot tunnel and an open cut at the property. The company forfeited its corporate charter in 1963.

In 1982, Ayerock Petroleum, Ltd., of Vancouver, British Columbia, and Key Properties, Ltd., with Key Milling Company of San Francisco announced a joint venture to open the Berg, Monarca, and Ida Belle mines. The combined properties covered about 10,000 acres. Ore from the mines was to be shipped to the Keyrock vat leach cyanide mill near Riggins.

In 1985, Big Turtle Mines leased the Monarca and Berg mines. Big Turtle’s plans called for putting the mines into production in 1986 at 50 tons per day. A sulfide concentrate was to be made and shipped from the mine site.

3.32.4 Environmental Conditions

3.32.4.1 Site Features

The Monarca Mine was visited by Earl Bennett on July 13, 2000. A video segment describing the site is on Owyhee County 2000 Videotape (Tape 2, index 1:22:51-1:42:44). Documenting photographs are Roll 00B1, frames 1-13.
The first sign of the mine on the main access road is a red cabin on the east side of the road. The mine workings and prospects are south and west of the cabin (Figure 3.32-2). Uppermost at the site is a large trench and waste dump that are easily visible from miles away. The trench is 100 feet long, 20 feet wide, and 30 feet deep (Figure 3.32-3). The waste dump for the trench is 70 feet long, 60 feet wide, and 50 feet thick on the nose (Figure 3.32-4). The access road continues past the trench to the top of the ridge. A few shallow pits were noted about 200 feet uphill from the trench.

North of the trench and across the access road is a smaller pit with a waste dump measuring 50 feet in diameter and 12 feet thick (Figure 3.32-5). Part of an old truck frame is on this dump, which is very close to a tributary to the branch of Succor Creek.

At the base of the dump for the main pit is another small pit and a waste dump. This dump measures 115 feet in diameter and 20 feet thick (Figure 3.32-6). Rails on the dump indicate this pit may have been an adit at one time.

The base of the dump for this second pit is close to a spur road that goes north from the main access road. Along the spur road is caved, dry Adit 1 (Figure 3.32-7) with a waste dump measuring 170 feet long, 20 feet wide, and 80 feet thick on the nose (Figure 3.32-8). Heavy gauge rails are on the waste dump. The adit is caved behind a relatively recent timbered, covered portal. A length of PVC pipe goes into the portal.

The spur road continues north past the adit to an open area that appears to have been leveled, but the purpose is not obvious (Figure 3.32-9). A spring flows from near the toe of the dump for the second pit and around the north side of the flat area. The spur road goes over the flat area, continues downhill, and eventually reconnects with the main access road.

Adit 2, near the main access road about 100 feet south of the red cabin, was driven into iron-stained granite. A large slump on the slope surrounds the portal, but a few of the portal timbers are still showing (Figure 3.32-10). There is no visible dump for this adit. A powder shack and another small building are across the road from the adit.

The disturbed area at the site covers about 10 acres.

3.32.4.2 Sample Locations

3.32.4.2.1 Solid Samples
No solid samples were collected.

3.32.4.2.2 Water Samples
No water samples were collected.
3.32.5 Structures

Several buildings are at the site. The red cabin, mentioned above, is on the east side of the access road a short distance north of Adit 2. Two outhouses, one old and one newer, are in the trees behind the cabin (Figure 3.32-11). The powder house and another small shed are across the road from Adit 2 in an aspen thicket (Figure 3.32-12).

3.32.6 Safety

The side walls of the main trench are nearly vertical in places and could be a hazard. No other significant hazards were found.
Figure 3.32-1. Location of the Monarca Mine, Owyhee County, Idaho (U.S. Geological Survey Rooster Comb Peak 7.5-minute topographic map).
Figure 3.32-2. Sketch of the Monarca Mine.
Figure 3.32-3. Long trench at the Monarca Mine (Roll 00B1, frame #1).

Figure 3.32-4. Waste dump for the trench at the Monarca Mine, looking north (Roll 00B1, frame #2).
Figure 3.32-5. Waste dump for the pit north of the trench at the Monarca Mine (Roll 00B1, frame #3).

Figure 3.32-6. Pit and associated waste dump below the dump for the trench at the Monarca Mine (Roll 00B1, frame #4).
Figure 3.32-7. Framed portal of caved Adit 1 at the Monarca Mine, looking southwest (Roll 00B1, frame #8).

Figure 3.32-8. Waste dump for Adit 1 at the Monarca Mine (Roll 00B1, frame #7).
Figure 3.32-9. Flat area north of the trench and pit waste dumps at the Monarca Mine (Roll 00B1, frame #9).

Figure 3.32-10. Slump around the portal of Adit 1 at the Monarca Mine. The horizontal beam of the portal timbers is just below the dead tree at the center of the picture (Roll 00B1, frame #11).
Figure 3.32-11. Two outhouses behind the red cabin at the Monarca Mine (Roll 00B1, frame #13).

Figure 3.32-12. Powder house and small shed (in aspen thicket) at the Monarca Mine (Roll 00B1, frame #12).
3.33 BERG MINE (Site No. BO-410)
Alternate names—Bergh Mine; Bergh-Sunnyside Group; Baker Property; Sunnyside Mine; Hathaway Co.; Rooster Comb-Sunnyside Mining Corp.; Victory Mining & Milling Co.; Gold Standard Mining Corp.

3.33.1 Site Location and Access (Figure 2.1-1a)

The Berg Mine is on the north side of Succor Creek in the NE¼ of the NW¼ of section 21, T. 3 S., R. 4 W., on the Rooster Comb Peak 7.5-minute quadrangle (Figure 3.33-1). Prospect pits associated with the Berg Mine extend into section 16 to the north. Access is the same as for the Monarca Mine, which is about ¼ mile south of the Berg Mine. The property is on BLM land.

3.33.2 Geologic Features (Figure 2.2-1a)

The adit at the Berg Mine is in a shear zone in granite. Prospect pits in the area are on thin quartz veins in granite.

3.33.3 Site History

The Bergh Mining & Milling Company was incorporated in 1909. This company apparently leased the mine to Oregon-Idaho Leases (incorporated in 1911) before forfeiting its corporate charter in 1912. A second Bergh Mining & Milling Company was incorporated in 1915. In 1916, Oregon-Idaho noted that it had formerly been operating under a lease and bond from Bergh Mining, but that Oregon-Idaho’s claims against Bergh were then in court. Bergh Mining forfeited its corporate charter in 1916, and Oregon-Idaho forfeited its charter in 1917.

Victory Mining and Milling Company (incorporated in 1924) next acquired a lease and bond on the mine. In 1924, the mine had one caved tunnel and one 50-foot, two-compartment shaft. The property had a 30-tpd mill that consisted of a Chilean mill, amalgamating plates, and concentrating tables. During the next year, the company did 137 feet of tunnel work, but Victory’s lease expired by the middle of 1926. The company forfeited its corporate charter in 1929.

Rooster Comb Mining Company (incorporated in 1926) leased the mine that year. The mine had one 534-foot tunnel and a 50-foot shaft, and the company did 300 feet of development during the year. Rooster Comb forfeited its corporate charter in 1928. The Rooster Comb-Sunnyside Mining Corporation was incorporated in 1929. This company made plans to open the mine with a second shaft and to install flotation equipment in the mill. Rooster Comb-Sunnyside forfeited its corporate charter in 1931.

The next lessee was the Gold Standard Mining Corporation (incorporated in 1930). In 1931, the mine had two tunnels (1,380 feet and 550 feet) and two shafts (50 feet and 150 feet). Gold Standard forfeited its corporate charter in 1933.
In 1982, Ayerock Petroleum, Ltd., of Vancouver, British Columbia, and Key Properties, Ltd., with Key Milling Company of San Francisco announced a joint venture to open the Berg, Monarca, and Ida Belle mines. The combined properties covered about 10,000 acres. Ore from the mines was to be shipped to the Keyrock vat leach cyanide mill near Riggins.

In 1985, Big Turtle Mines leased the Monarca and Berg mines. Big Turtle’s plans called for putting the mines into production in 1986 at 50 tons per day. A sulfide concentrate was to be made and shipped from the mine site.

3.33.4 Environmental Conditions

3.33.4.1 Site Features

The Berg Mine was visited by Earl Bennett on July 13, 2000. A video segment describing the property is on Owyhee County 2000 Videotape (Tape 2, index 1:42:48-1:50:06). Documenting photographs are Roll 00B1, frames 14-18.

Features at the Berg Mine include a dry adit with a large waste dump, some mining equipment and other materials (Figure 3.33-2). Minor prospect pits are north and west of the adit as noted on the topographic map. The portal of the adit at the Berg Mine is well timbered and was the site of work done in the early 1980s. The new timbers have steel braces and the portal is open, but the adit is totally caved about 30 feet inside (Figure 3.33-3). A relatively new, but vandalized, diesel-powered IMCO underground front-end loader is just inside the portal. The main road to the Berg and Monarca passes over the dump in front of the adit. The dump measures about 170 feet long, 30 feet wide, and 15 feet thick. Succor Creek is about 100 feet south of the dump. A barrel-shaped steel-covered hut and a semi trailer are just west of the adit (Figure 3.33-4). On the east side of the adit is a woodpile, and a few feet east of the woodpile are a mucking machine, a blue 55-gallon barrel, and a compressor tank (Figure 3.33-5). Next to these is an empty fuel barrel and farther to the east is a yellow-painted compressor (Figure 3.33-6). A loading chute is on the east end of the waste dump, and a pile of boards is just west of the chute. A drill hole was collared about halfway between the board pile and the chute. The disturbed area covers about 1 acre.

3.33.4.2 Sample Locations

3.33.4.2.1 Solid Samples

Sample B7130002 was collected from the adit waste dump.

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<th>Analyzed (Yes/No)</th>
</tr>
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<td>Berg Mine, adit waste dump</td>
<td>Yes</td>
</tr>
</tbody>
</table>
3.33.4.2.2 Water Samples
   No water samples were collected.

3.35.4.2.3 Analytical Results

   Solid Samples (Tables 2.5-3 and 2.5-4)

   Sample B7130002 from the adit waste dump has elevated levels of arsenic, cadmium, chromium, copper, iron, manganese, nickel, lead, and zinc in the element screen. In the TCLP for metals test, mercury is leaching from the sample.

3.33.5 Structures

   The loading chute and barrel-shaped metal hut are the only structures at the site.

3.33.6 Safety

   The open part of the adit has relatively new timbers and is reinforced with steel braces. It does not appear to be in danger of collapsing. No significant hazards were found at the site.
Figure 3.33-1. Location of the Berg Mine, Owyhee County, Idaho (U.S. Geological Survey Rooster Comb Peak 7.5-minute topographic map).
Figure 3.33-2. Sketch of the Berg Mine.
Figure 3.33-3. Timbered portal of the Berg adit, reinforced with steel braces. A diesel-powered ore loader stored inside the portal has been vandalized (Roll 00B1, frame #16).

Figure 3.33-4. Looking west along the access road in front of the Berg adit (just off the right edge of the picture). A semi trailer is parked along the road, and a barrel-shaped steel hut is behind the trailer (Roll 00B1, frame #15).
Figure 3.33-5. Looking northwest toward the Berg adit. The trailer from the previous figure is at the far left. A mucking machine, a compressor tank, and a blue 55-gallon barrel are next to the adit (Roll 00B1, frame #14).

Figure 3.33-6. View to the southeast from the Berg adit. The road crosses the waste dump. The top of the yellow compressor is above the mucking machine, and the loading chute is at the far end of the dump near the center of the picture (Roll 00B1, frame #17).
3.34 IDA BELLE MINE (Site No. BO-408)
Alternate names—Ida Bell; Idaho Exploration, Inc.

3.34.1 Site Location and Access (Figure 2.1-1a)

The Ida Belle Mine is about ½ mile south of China Flat on the northeast flank of Whiskey Mountain in the NW¼ of the SW¼ of section 10, T. 3 S., R. 4 W., on the Rooster Comb Peak 7.5-minute quadrangle (Figure 3.34-1). As with the Berg and Monarca mines, access is by the Rabbit Creek Road from Murphy to Reynolds, then west on the road to China Flat. The Ida Belle is on a side road that connects with the road to the Berg Mine and is on BLM land.

3.34.2 Geologic Features (Figure 2.2-1a)

The adit at the Ida Belle was driven in granite.

3.34.3 Site History

The Ida Belle Mine produced lead, gold, and silver throughout the 1930s. Ida Bell Gold Mines, Inc., was incorporated in 1930 and acquired a lease and bond on the mine soon after that. A mill was installed on the property in 1930. In 1931, the mine had two tunnels (150 feet and about 600 feet) and a 75-foot inclined shaft. By 1933, the company apparently had purchased the mine and was announcing plans for a larger mill and extensive development. Total development in 1935 equaled 1,231 feet of workings, and considerable new equipment was purchased. In 1936, Ida Bell leased the property to Idaho Exploration, Inc. (incorporated in 1936). By mid-1937, the mine had two tunnels (900 feet and 300 feet), an 80-foot vertical shaft, a 230-foot inclined shaft, and 1,710 feet of total development. In 1938, Idaho Exploration sold all its property to Western Gold Corporation (incorporated in 1936) and went out of business. (However, the company did not forfeit its corporate charter until 1944.) Ida Bell Gold forfeited its corporate charter in 1940, and Western Gold forfeited its corporate charter in 1945.

In 1982, Ayerock Petroleum, Ltd., of Vancouver, British Columbia, and Key Properties, Ltd., with Key Milling Company of San Francisco announced a joint venture to open the Berg, Monarca, and Ida Belle mines. The combined properties covered about 10,000 acres. Ore from the mines was to be shipped to the Keyrock vat leach cyanide mill near Riggins.

3.34.4 Environmental Conditions

3.34.4.1 Site Features

The Ida Belle Mine was visited by Earl Bennett on July 13, 2000. A video segment describing the site is on Owyhee County 2000 Videotape (Tape 2, index 1:50:10-1:54:18). Documenting photographs are Roll 00B1, frames 19-20.
The mine has one open adit with a large waste dump. The portal is framed with square-cut timbers, and mine rails extend out in front of the portal (Figure 3.34-2). A seep from the adit feeds a small pond that serves as a stock watering hole. The waste dump measures 95-100 feet long, 85 feet wide, and 30 feet thick (Figure 3.34-3). A few mine rails and timbers are piled on the dump. The disturbed area covers about 0.5 acre.

3.34.4.2 Sample Locations

3.34.4.2.1 Solid Samples
   No solid samples were collected.

3.34.4.2.2 Water Samples
   No water samples were collected.

3.34.5 Structures
   There are no structures at the site.

3.34.6 Safety

The adit is open and can be entered. The site is marked on the topographic map, and access is relatively easy.
Figure 3.34-1. Location of the Ida Belle Mine, Owyhee County, Idaho (U.S. Geological Survey Rooster Comb Peak 7.5-minute topographic map).
Figure 3.34-2. Looking west at the open, timbered portal at the Ida Belle Mine. Rails extend out almost to the small pond (Roll 00B1, frame #19).

Figure 3.34-3. Looking east across the waste dump for the Ida Belle adit (Roll 00B1, frame #20).
3.35 GOLD NUGGET GROUP (Site No. BO-427)

Note: In the field, this site was identified as an unnamed prospect and designated Site No. B7130003. It was later discovered that it was the Gold Nugget Group (BO-427).

3.35.1 Site Location and Access (Figure 2.1-1a)

This prospect is on Dobson Creek in the northwest corner of section 2 and the northeast corner of section 3, T. 4 S., R. 4 W., on the De Lamar 7.5-minute quadrangle (Figure 3.35-1). Access is via the Rabbit Creek Road from Murphy to Reynolds, then south on the Reynolds Creek Road to the confluence of Reynolds Creek with Dobson Creek. There is a locked gate at Dobson Creek. The mine, which is on private land, is about 1¼ miles southwest of the gate along an old road that follows Dobson Creek.

3.35.2 Geologic Features (Figure 2.2-1a)

This prospect is in Cretaceous granitic rocks. Miocene basalt caps the top of the ridge (Ekren and others, 1981).

3.35.3 Site History

The Co-operative Mining and Development Company of Washington was incorporated in 1909. By 1913, the company’s property on Dobson Creek had 1,025 feet of total development, including a tunnel and a shaft. By 1915, the property had a total of about 1,500 feet of workings. The company forfeited its corporate charter in 1915.

3.35.4 Environmental Conditions

3.35.4.1 Site Features

This prospect was visited by Earl Bennett on July 13, 2000. A video segment describing the site, which is identified on the video as an unnamed prospect, is on Owyhee County 2000 Videotape (Tape 3, index 0:00:33-0:07:28). Documenting photographs are Roll 00B1, frames 21-25, and Roll 00B2, frames 1-2.

As shown on the topographic map, the property contains an adit and a shaft (Figure 3.35-2). The adit along Dobson Creek is caved and has a minor seep (Figure 3.35-3). The substantial waste dump, overgrown with sagebrush and other scrub brush, measures 102 feet long, 90 feet wide, and 15 feet thick (Figure 3.35-4). The toe of the dump is close to the creek. A claim marker was noted on the ridge above and east of the adit. The adit site covers about 0.5 acre.

The shaft is on top of the ridge about 200 feet uphill from the adit and is caved, forming a cone-shaped pit about 10 feet deep (Figure 3.35-5). A few old timbers with bolts through them are in
the pit. The dump for the shaft is about 50 feet long, 50 feet wide, and 10 feet thick; it is heavily overgrown with sagebrush and other vegetation. Fragments of iron-stained bull quartz are near the shaft. Most interesting are parts of a small stamp mill also found near the shaft (Figure 3.35-6 and 3.35-7). Why a mill would have been erected on the ridge top is curious. No tailings were noted in the vicinity of the mill parts. The shaft site covers about 0.75 acre.

3.35.4.2 Sample Locations

3.35.4.2.1 Solid Samples
No solid samples were collected.

3.35.4.2.2 Water Samples
Sample B7130003 was collected from Dobson Creek downstream from the adit waste dump.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Specific Conductivity (Fs)</th>
<th>Temperature (°F)</th>
<th>pH</th>
<th>Flow (gpm)</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B7130003</td>
<td>Dobson Creek, downstream</td>
<td>84</td>
<td>not taken</td>
<td>8.5</td>
<td>3 ft. wide, 0.4 ft. deep</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.35.4.2.3 Analytical Results

Water Samples (Tables 2.5-1 and 2.5-2)

Sample B7130003 from Dobson Creek exceeds the Aquatic Life Chronic standard for mercury in the EPA 200.8 test. No other water quality standards are exceeded in either the dissolved metals or the total recoverable metals screens.

3.35.5 Structures

There are no structures at the site, although parts of a small stamp mill are near the shaft.

3.35.6 Safety
There are no safety hazards at the site.
Figure 3.35-1. Location of the Gold Nugget Group, Owyhee County, Idaho (U.S. Geological Survey De Lamar 7.5-minute topographic map).
Figure 3.35-2. Sketch of the Gold Nugget Group.
Figure 3.35-3. Caved adit at the Gold Nugget Group (Roll 00B1, frame #24).

Figure 3.35-4. Waste dump for the adit at the Gold Nugget Group (Roll 00B2, frame #1).
Figure 3.35-5. Caved shaft at the Gold Nugget Group. Several beams with bolts through them are in the pit (Roll 00B1, frame #21).

Figure 3.35-6. Cam shaft and drive wheel for small stamp mill near the shaft at the Gold Nugget Group (Roll 00B1, frame #23).
Figure 3.35-7. Another piece of what was probably a stamp mill at the Gold Nugget Group (Roll 00B1, frame #22).
3.36 ROSE QUARTZ CLAIM(?) (Site No. JV-41)

Note: In the field, this site was identified as an unnamed prospect and designated Site No. B7140001. It was later tentatively identified as the Rose Quartz Claim (JV-41).

3.36.1 Site Location and Access (Figure 2.1-1b)

This prospect, possibly the Rose Quartz, is on the southeast flank of Boone Peak in the SW¼ of the SW¼ of section 11, T. 6 S., R. 3 W., on the Cinnabar Mountain 7.5-minute quadrangle (Figure 3.36-1). The property can probably be reached via several routes off of the Flint Creek Road that goes from Murphy through Toy Pass and past Spencer Reservoir to Jordan Valley. The route taken was the North Boulder Creek Road. One needs permission to go through a locked gate on this road (a rancher who lives ¼ mile southeast of the gate has the key). Once through the gate, access is north past the Demming Mine to a cabin. Just past the cabin is another locked gate and just past the gate is a four-wheel-drive road that goes east and connects to other four-wheel-drive roads which eventually lead to the Meadow Creek four-wheel-drive road and then northwest to the mine. The spur road off the Meadow Creek Road is rough and overgrown. Although blocks of private land must be crossed to reach the site, the mine is on BLM land.

3.36.2 Geologic Features (Figure 2.2-1b)

The adit is in granite with thin quartz stringers.

3.36.3 Site History

Minor production from a sluice was reported from this property in the late 1940s.

3.36.4 Environmental Conditions

3.36.4.1 Site Features

This prospect was visited by Earl Bennett on July 14, 2000. A video segment describing the property is on Owyhee County 2000 Videotape (Tape 3, index 0:07:31-0:10:39). Documenting photographs are Roll 00B2, frames 3-4.

The mine contains a single dry adit with no framing at the portal. Weathered granitic debris blocks part of the opening (Figure 3.36-2). The small waste dump measures 20 feet long, 10 feet wide, and 20 feet thick, and is overgrown with low bushes (Figure 3.36-3). A few small prospect pits were noted, as shown on the topographic map. A spring east and downhill from the adit has been developed for watering livestock. A cabin below the spring, also noted on the map, is well maintained and has equipment parked nearby. It is not known if the cabin is related to the mining activity. The disturbed area at the mine site covers less than 0.5 acre.
3.36.4.2 Sample Locations

3.36.4.2.1 Solid Samples
No solid samples were collected.

3.36.4.2.2 Water Samples
No water samples were collected.

3.36.5 Structures

A cabin is near the spring nearly ¼ mile east of the adit, but may not be related to the mining activity.

3.36.6 Safety

Although partially blocked by weathered granitic debris, the adit opening is large enough to enter. The site is relatively remote and frequent visitors to the mine are unlikely.
Figure 3.36-1. Location of the Rose Quartz Claim(?), Owyhee County, Idaho (U.S. Geological Survey Cinnabar Mountain 7.5-minute topographic map).
Figure 3.36-2. Opening into the adit at the Rose Quartz Claim(?). Granitic debris partially blocks the opening (Roll 00B2, frame #3).

Figure 3.36-3. Brush-covered waste dump for the adit at the Rose Quartz Claim(?) (Roll 00B2, frame #4).
3.37 McCALL MINE (Site No. JV-42)

Note: In the field, this site was identified as an unnamed prospect and designated Site No. B7140002. It was later identified as the McCall Mine (JV-42).

3.37.1 Site Location and Access (Figure 2.1-1b)

The McCall Mine is near the head of Meadow Creek in the NE¼ of the NE¼ of section 14, T. 6 S., R. 3 W., on the Cinnabar Mountain 7.5-minute quadrangle (Figure 3.37-1). Access is the same as for the previous property (Rose Quartz Claim) to the four-wheel-drive road up Meadow Creek. A spur off the Meadow Creek road leads to this property, shown on the topographic map with a shaft and two adit symbols. The mine is on BLM land.

3.37.2 Geologic Features (Figure 2.2-1b)

The workings at the mine are in granite. One adit was driven along an iron-stained shear zone in altered granite.

3.37.3 Site History

This mine was originally developed by someone named McCall in the 1880s. The old workings consisted of a 50-foot vertical shaft and a 70-foot adit. In 1963, the property was purchased by the McCall Mining and Exploration Company. This company extended the adit about 500 feet and drove a second, 230-foot adit between the shaft and the old adit. In 1971, the shaft was dewatered and plans were made to connect the shaft to the lower workings (Salman, 1972).

3.37.4 Environmental Conditions

3.37.4.1 Site Features

The McCall Mine was visited by Earl Bennett on July 14, 2000. A video segment describing the site is on Owyhee County 2000 Videotape (Tape 3, index 0:10:41-0:19:00). Documenting photographs are Roll 00B2, frames 5-11.

There are two adits, a shaft, and several collapsed buildings at the site (Figure 3.37-2). The first thing encountered along the spur road to the mine is a pile of hose and wire beside a tree. About 200 feet north of the hose and wire is an open, untimbered adit (Adit 2 on the videotape) driven in granite (Figures 3.37-3 and 3.37-4). A minor seep flows from the adit, and PVC pipe in the adit probably feeds a small stock-watering pond. The waste dump measures about 70 feet long, 30 feet wide, and 8 feet thick (Figure 3.37-5), and has been severely eroded by the creek. The access road has also been eroded at this location. An old barrel, scrap rails and pipe, and pieces of timbers are on the dump.
About 100 feet northeast of Adit 2 is an open shaft or decline, which is filled with water and has timbers above the opening (Figure 3.37-6). The waste dump for the shaft measures about 30 feet in diameter and 15 feet thick.

About 60 feet farther up the access road is a collapsed log cabin with sheet-metal roofing. A second collapsed building is just to the west of the cabin. Not far southwest of the second building is a collapsed, dry adit (Adit 1 on the videotape) (Figure 3.37-7). The dump for this adit measures 40 feet long, 20 feet wide, and about 15 feet thick.

The disturbed area at the McCall Mine covers about 2 acres.

3.37.4.2 Sample Locations

3.37.4.2.1 Solid Samples
    No solid samples were collected.

3.37.4.2.2 Water Samples
    No water samples were collected.

3.37.5 Structures

The two collapsed log cabins near Adit 1 are the only buildings at the site (Figure 3.37-8). Some timbers, possibly part of a headframe, are built over the shaft.

3.37.6 Safety

The shaft is open and filled with water. Adit 2 is also open and can easily be entered. The site is relatively remote, however, so frequent visitors to the site are unlikely.
Figure 3.37-1. Location of the McCall Mine, Owyhee County, Idaho (U.S. Geological Survey Cinnabar Mountain 7.5-minute topographic map).
Figure 3.37-2. Sketch of the McCall Mine.
Figure 3.37-3. Open Adit 2 at the McCall Mine (Roll 00B2, frame #9).

Figure 3.37-4. Close-up of the opening into Adit 2 at the McCall Mine (Roll 00B2, frame #10).
Figure 3.37-5. Scrap metal on the waste dump for Adit 2 at the McCall Mine (Roll 00B2, frame #11).

Figure 3.37-6. Timbers over the open, water-filled shaft at the McCall Mine (Roll 00B2, frame #6).
Figure 3.37-7. Caved Adit 1 at the McCall Mine (Roll 00B2, frame #7).

Figure 3.37-8. One of the collapsed log cabins near Adit 1 at the McCall Mine (Roll 00B2, frame #8).
3.38 DEMMING MINE (Site No. JV-46)
Alternate names—Boulder Creek Mine; Lucky Friday.

3.38.1 Site Location and Access (Figure 2.1-1b)

The main workings of the Demming Mine are on North Boulder Creek in the SW¼ of section 28 and the NW¼ of the NW¼ of section 33, T. 6 S., R. 3 W., on the Triangle Flat 7.5-minute quadrangle; an additional adit is about ½ mile to the northeast of the main workings in the NE¼ of section 28 (Figure 3.38-1). Access is on the road up North Boulder Creek that joins with the main Flint Creek Road that goes west, eventually reaching Jordan Valley, Oregon. The North Boulder Creek Road has a locked gate at the junction with the Flint Creek Road (a rancher who lives ¼ mile southeast along the main road has the key). The mine is about 1½ miles up North Boulder Creek from the gate. The northern adit and the main workings are on small blocks of BLM land surrounded by private land.

3.38.2 Geologic Features (Figure 2.2-1b)

The northern adit is in Cretaceous granitic rocks. The main workings are in an area overlain by Tertiary and Quaternary fan and terrace gravels (Ekren and others, 1981). Company reports indicate the workings were on quartz veins in granite (IGS mineral property files). The quartz veins contained silver, gold, and iron-, arsenic-, and antimony-bearing sulfides (Walker, 1965).

3.38.3 Site History

The Demming Mines Company was incorporated in 1916. In 1917, the company controlled 38 claims and the property had about 540 feet of workings. The workings included at least two tunnels (200 feet and 25 feet long), a 30-foot winze, and seven crosscuts and drifts. A 100-ton flotation plant, consisting of a crusher, a tube mill, classifier flotation machines, and a filter, was built to treat gold-silver ore. Additional machinery, sufficient to increase the capacity to 200 tons per day, was at the property. The mill processed 3,000 tons of ore in 1918, and the resulting concentrates, which contained gold, silver, and zinc, were shipped to Utah. Development at the mine had been done by hand until power machine tools were added to the mine’s equipment in February 1918. The total development was about 1,200 feet of workings.

In 1919, final construction of the flotation mill was completed, and a roaster and cyanide tanks were added to the mill. However, the mill only operated for ten days during the year, with the concentrate being shipped to the smelter at Midvale, Utah. Development totaled about 2,800 feet of workings. By the following year, the company reported 6,000 feet of total workings. In 1921, silver ore from the Flint mines was tested at the Demming mill, and a small quantity of rich concentrates was shipped to Murray, Utah. The mine was inactive in 1922. The workings included three tunnels (3,500 feet, 1,500 feet, and 1,000 feet long), two vertical shafts (160 feet deep and, apparently, 200 feet deep [the depth of the second shaft is not reported]), five raises, one crosscut, and three drifts.
In late 1921, the Demming Exploration Company Trustees (a common law business trust) was organized, apparently to liquidate the indebtedness of Demming Mines Company. During 1922, the stockholders and other creditors apparently exchanged their interests for “interest bearing beneficial units” in the new trust. Demming Mines forfeited its corporate charter in late 1923.

In 1923, the Demming mine was active, and a significant amount of development work was done. The milling plant was rebuilt, changing the treatment from flotation to cyanidation. The mine had 8,035 feet of total development, which was reported to include sixteen tunnels, three shafts, eight raises, nine crosscuts, and four drifts. The Demming Exploration Company Trustees were apparently out of business by the end of the year.

One car of gold ore was shipped from the mine in 1933. In 1934, nearly 550 tons of ore containing gold and silver was mined from this property by the Rowland Mining Co. and shipped to a smelter in Utah. A little crude gold-silver ore was shipped from the Demming Mine in 1940.

### 3.38.4 Environmental Conditions

#### 3.38.4.1 Site Features

The Demming Mine was visited by Earl Bennett on July 14 and 16, 2000. A video segment describing the property is on Owyhee County 2000 Videotape (Tape 3, index 0:19:03-0:40:43). Documenting photographs are Roll 00B2, frames 12-21, and Roll 00B3, frames 10-18.

The northern adit, about ½ mile north of the main workings and on the east side of the creek, is along the road and just past a cabin occupied by Tandy Gilbert. The adit is hidden behind willows and at first appears to be caved (Figure 3.38-2), but there is a small opening at the head of the trough of the collapsed section of the adit (Figure 3.38-3). There is a minor seep from the opening, and plastic pipe carries water to a concrete tank for stock watering. The waste dump consists of white granite and is 30 feet long, 20 feet wide, and 50 feet thick. The toe of the dump reaches the road (Figure 3.38-4).

The main part of the Demming Mine has two large, adjacent, iron-stained waste dumps, another smaller dump, several collapsed buildings, at least two adits, a shaft, and the ruins of a large mill (Figure 3.38-5). The banks of North Boulder Creek contain spot areas of mill tailings.

The southermost of the workings, just north of the ford across North Boulder Creek, is caved Adit 1 (Figure 3.38-6). The waste dump is split by the road. The part of the dump west of the road measures 85 feet long parallel to the road, 12 feet wide, and 25 feet thick (Figure 3.38-7). The part east of the road is 40 feet long, 8 feet wide, 20 feet thick, and is overgrown with junipers, sagebrush, and other scrub brush (Figure 3.38-8). North of the adit are the remains of two large buildings, one totally and the other partially collapsed.
North of the two buildings is Adit 2, driven in iron-stained, decomposed granite. The adit has caved for over 100 feet, forming a trough or trench up the slope. At the upper end of the trough is an opening into the adit (Figure 3.38-9). The slope above the opening is undercut, causing a dangerous situation when approached from above because the drop-off is not obvious from this direction. Below the east end of the trough of Adit 2 and beside the road is the shaft, hidden beneath the collapsed timbers of the headframe (Figure 3.38-10). It was not determined if the shaft is open beneath the timbers. Across the road from the shaft and Adit 2 are two large dumps separated by a gap about 30 feet across (Figure 3.38-11). The northern dump, along the edge of the road, measures 90 feet long, 10 feet wide on top, and 40 feet thick (Figure 3.38-12). The southern dump, set back slightly from the road, is roughly triangular in shape and measures 115 feet long, 30 feet wide, and 40 feet thick (Figure 3.38-13).

On the west side of the road to the north of the shaft and Adit 2 is the mill building. The only remaining parts of the mill are the concrete footings and some timbers (Figure 3.38-14). The footings extend up the slope for more than 100 feet. There is no road to the top of the mill, where there is a large pit with a concrete hoist footing on the upper lip (Figures 3.38-15 and 3.38-16). This may have been another shaft used to supply ore to the mill. North of the mill is what appears to be another dump, although it may be fill rock used to retain part of an overgrown road. If the pit at the top of the mill is a shaft, it may be the source for the rock.

The disturbed area at the adit north of the main workings covers less than 0.5 acre. The main Demming Mine site covers 5 acres.

3.38.4.2 Sample Locations

3.38.4.2.1 Solid Samples

Sample B7140003 was collected from tailings (Figures 3.38-17 and 3.38-18) on the west bank of North Boulder Creek east of the two large dumps.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B7140003</td>
<td>Demming Mine, tailings</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.38.4.2.2 Water Samples

Sample B7140004 was collected from North Boulder Creek just downstream from the tailings sample site and near the south end of the southernmost large waste dump across from the shaft and Adit 2. Sample B7160002 was collected from a seep from the northern of the two large waste dumps across from the shaft and Adit 2.
<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Specific Conductivity (Fs)</th>
<th>Temperature (°F)</th>
<th>pH</th>
<th>Flow (gpm)</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
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<td>B7140004</td>
<td>downstream on N. Boulder Creek</td>
<td>37</td>
<td>65</td>
<td>8.4</td>
<td>&gt;100</td>
<td>Yes</td>
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<tr>
<td>B7160002</td>
<td>Demming Mine, dump seep</td>
<td>34</td>
<td>not taken</td>
<td>7.42</td>
<td>seep</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### 3.38.4.2.3 Analytical Results

**Solid Samples (Tables 2.5-3 and 2.5-4)**

Tailings sample B7140003 has elevated levels of arsenic, cadmium, copper (slightly), lead, and iron in the element screen. In the TCLP for metals test, mercury is leaching from the sample.

**Water Samples (Tables 2.5-1 and 2.5-2)**

Sample B7140004 (B7170004 in the chemistry database for dissolved metals and dissolved heavy metals screens, and the mercury test) exceeds only the Aquatic Life Chronic standard in the EPA 200.8 test for mercury.

Sample B7160002 from the dump seep does not exceed any standards in the dissolved metals screen. In the total recoverable metals screen, iron exceeds the Secondary MCL and the Aquatic Life Acute standard, and manganese exceeds the Secondary MCL. The sample also exceeds the Aquatic Life Chronic standard in the EPA 200.8 test for mercury.

### 3.38.5 Structures

Two log buildings, one totally collapsed and one partially collapsed, are on the west side of the road between Adits 1 and 2. Boards and timbers of the collapsed headframe for the shaft are along the road across from the two large waste dumps. Footings for the mill, as well as some of the boards and timbers from the structure, extend up the slope west of the road. The base for a hoist, possibly for a second shaft, is directly above the mill.

### 3.38.6 Safety

The drop-off above the opening at Adit 2 is not obvious when approached from the uphill direction. The shaft along the road may be open and is filled with water, but boards and timbers from the collapsed headframe prevent close inspection. If the pit at the top of the mill foundation is a shaft, it is completely caved, although there is a fairly steep drop-off from the hoist foundation on the upper lip of the pit.
Figure 3.38-1. Location of the Demming Mine, Owyhee County, Idaho (U.S. Geological Survey Triangle Flat 7.5-minute topographic map).
Figure 3.38-2. Caved part of the northern adit. This adit is on the east side of North Boulder Creek and north of the main Demming Mine workings. Willows growing in the trough are fed by a minor seep (Roll 00B2, frame #13).

Figure 3.38-3. Small opening into the northern adit, which is probably related to the Demming Mine (Roll 00B2, frame #12).
Figure 3.38-4. Waste dump for the adit north of the main Demming workings. The road up North Boulder Creek is at the base of the dump in the lower left part of the picture (Roll 00B2, frame #14).
Figure 3.38-5. Sketch of the main workings at the Demming Mine.
Figure 3.38-6. Collapsed, dry Adit 1 at the main Demming workings (Roll 00B3, frame #10).

Figure 3.38-7. West part of the dump for Adit 1 at the Demming Mine, looking south (Roll 00B3, frame #11).
Figure 3.38-8. East part of the dump for Adit 1 at the Demming Mine. Juniper bushes and other scrub brush cover much of the dump (Roll 00B3, frame #12).

Figure 3.38-9. Opening into Adit 2 at the head of the collapsed part of the adit (Roll 00B3, frame #13).
Figure 3.38-10. Collapsed headframe of the shaft along the road at the Demming Mine (Roll 00B2, frame #17).

Figure 3.38-11. Two large waste dumps along the North Boulder Creek road at the Demming Mine. The collapsed headframe for the shaft is at the lower right corner of the picture (Roll 00B3, frame #15).
Figure 3.38-12. Looking south across the top of the northern of the two large dumps at the Demming Mine. The headframe for the shaft is at the center right edge of the picture (Roll 00B2, frame #15).

Figure 3.38-13. Looking southeast across the top of the southern of the two large dumps at the Demming Mine. The top of the northern dump is at the lower right (Roll 00B2, frame #16).
Figure 3.38-14. Concrete footings for the Demming mill. Little remains of the building except some boards and timbers (Roll 00B2, frame #18).
Figure 3.38-15. Large pit above the Demming mill. A concrete foundation and some of the hoist timbers are at the upper lip of the pit, indicating it may be a collapsed shaft (Roll 00B3, frame #17).
Figure 3.38-16. Looking down on the concrete footings for the hoist above the large pit at the top of the Demming mill (Roll 00B3, frame #18).

Figure 3.38-17. Some of the mill tailings along North Boulder Creek (Roll 00B2, frame #20).
Figure 3.38-18. More of the mill tailings along North Boulder Creek (Roll 00B2, frame #21).
3.39 NUGENT MINE (Site No. BO-436)

3.39.1 Site Location and Access (Figure 2.1-1a)

The Nugent Mine is on the southeast flank of Slacks Mountain near the head of Gray Eagle Creek in the SE¼ of the SE¼ of section 18, T. 4 S., R. 3 W., on the Silver City 7.5-minute quadrangle (Figure 3.39-1). Access is via a dirt road (Black Mountain Road) that turns northward off the Silver City-Murphy Road at New York Summit, goes past Avondale Basin and on to Slacks Mountain, and eventually reaches Black Mountain. A spur road turns east off the Black Mountain Road at the south end of Slacks Mountain, then splits, with the northeast branch ending at the mine. The property can also be reached from the west on the road that goes north up Cunningham Creek to Glass Hill, then heads east on a connecting road to the Black Mountain Road. The mine is on BLM land.

3.39.2 Geologic Features (Figure 2.2-1a)

The Nugent Mine is in Cretaceous granitic rocks (Ekren and others, 1981). Asher (1968) found excellent specimens of stibnite on the dump, but noted that mineralization in the adit was sparse and did not follow a continuous vein structure.

3.39.3 Site History

Asher (1968) reported one adit on the property.

3.39.4 Environmental Conditions

3.39.4.1 Site Features

The Nugent Mine was visited by Earl Bennett on July 15, 2000. A video segment describing the site is on Owyhee County 2000 Videotape (Tape 3, index 0:40:46-0:43:28). Documenting photographs are Roll 00B2, frames 22-25.

The mine has an open adit in granite with no support timbers at the portal, although several square beams and other boards are just in front of the opening among some rock rubble (Figure 3.39-2). Rails extend from the adit, and a minor seep flows out of the opening. A collapsed, metal-sided building with a wooden frame is next to the adit (Figure 3.39-3). The waste dump measures 20 feet long, 20 feet wide, and about 80 feet thick, and is densely overgrown. The disturbed area covers no more than 0.5 acre.

3.39.4.2 Sample Locations

3.39.4.2.1 Solid Samples

No solid samples were collected.
3.39.4.2.2 Water Samples
   No water samples were collected.

3.39.5 Structures
   The collapsed, metal-sided building is the only structure at the site. Other pieces of metal scrap are among the ruins of the building (Figure 3.39-4).

3.39.6 Safety
   The adit is open and can easily be entered. Access is relatively easy on an all-terrain vehicle.
Figure 3.39-1. Location of the Nugent Mine, Owyhee County, Idaho (U.S. Geological Survey Silver City 7.5-minute topographic map).
Figure 3.39-2. Open adit at the Nugent Mine, looking west. A few square timbers and other old boards are in the rock rubble in front of the opening (Roll 00B2, frame #22).

Figure 3.39-3. Collapsed, metal-sided building next to the adit at the Nugent Mine (Roll 00B2, frame #23).
Figure 3.39-4. Other scrap metal in the ruins of the metal-sided building (Roll 00B2, frame #24).
3.40 SLACKS MOUNTAIN PROSPECTS (Site No. BO-435)

3.40.1 Site Location and Access (Figure 2.1-1a)

A number of prospects are shown on the topographic map on the west flank of Slacks Mountain, mostly in the S½ of section 18, T. 4 S., R. 3 W., on the Silver City 7.5-minute quadrangle (Figure 3.40-1). Access is the same as for the Nugent Mine to Slacks Mountain. A poor four-wheel-drive road or trail goes to the prospects from the spur road that leads to the Nugent Mine. The prospects are easily visible from the Black Mountain Road and are on BLM land.

3.40.2 Geologic Features (Figure 2.2-1a)

The upper adit was driven in granite. The lower two are in volcanic rocks. Asher (1968) noted that no structure was visible on the surface, but that the adits appeared to follow a structure that had abundant pyrite. Specimens from some of the dumps contained minor amounts of stibnite.

3.40.3 Site History

Asher (1968) recorded the presence of a number of workings in this area.

3.40.4 Environmental Conditions

3.40.4.1 Site Features

Several of the Slacks Mountain Prospects were visited by Earl Bennett on July 16, 2000. A video segment describing the property is on Owyhee County 2000 Videotape (Tape 3, index 0:43:31-0:49:41). Documenting photographs are Roll 00B3, frames 1-6.

Three adits and a trench were visited on Slacks Mountain (Figure 3.40-2). The trench, about 25 feet long, is at the end of the access road on top of the mountain. Other prospect symbols are noted near here on the topographic map, so other minor prospect pits or trenches may be in the vicinity of this trench.

Adit 1, along the access road and the farthest up the mountain, is open and dry. It has no supporting timbers and was driven in granite (Figure 3.40-3). The dump measures 50 feet long, 8 feet wide, and 80 feet thick (Figure 3.40-4). The light-colored granite makes the dump visible for miles.

Adit 2, about 200 yards south from Adit 1, is also on the access road. The adit is in volcanic rock and is caved, although barely, and dry (Figure 3.40-5). The waste dump measures 60 feet long, 30 feet wide, and 20 feet thick (Figure 3.40-6).
Adit 3, also in volcanic rock, is downhill from Adit 2. It is also caved and dry (Figure 3.40-7). The waste dump measures 50 feet long, 25 feet wide, and 20 feet thick. A few large trees and some scrub brush are growing on the dump (Figure 3.40-8).

Several other prospect symbols are noted on the map in the Slacks Mountain area. The total disturbed area covers a few acres.

3.40.4.2 Sample Locations

3.40.4.2.1 Solid Samples
   No solid samples were collected.

3.40.4.2.2 Water Samples
   No water samples were collected.

3.40.5 Structures
   No structures were found at the site.

3.40.6 Safety

Adit 1 is open and can be entered. The rock appears to be relatively competent. Access to the site on all-terrain vehicles is relatively easy, and the mine dumps are easily visible from the Black Mountain Road and other vantage points to the west, so some visitors are likely.
Figure 3.40-1. Location of the Slacks Mountain Prospects, Owyhee County, Idaho (U.S. Geological Survey Silver City 7.5-minute topographic map).
Figure 3.40-2. Map of the prospects on Slacks Mountain (Asher, 1968, Figure 46).
Figure 3.40-3. Open Adit 1 at the Slacks Mountain Prospects, looking east (Roll 00B3, frame #1).

Figure 3.40-4. Waste dump for Adit 1 at the Slacks Mountain Prospects, looking northwest (Roll 00B3, frame #2).
Figure 3.40-5. Caved Adit 2 at the Slacks Mountain Prospects, looking east (Roll 00B3, frame #3).

Figure 3.40-6. Waste dump for Adit 2 at the Slacks Mountain Prospects, looking northwest (Roll 00B3, frame #4).
Figure 3.40-7. Caved Adit 3 at the Slacks Mountain Prospects (Roll 00B3, frame #5).

Figure 3.40-8. Waste dump for Adit 3 at the Slacks Mountain Prospects. Several large trees are growing on the dump (Roll 00B3, frame #6).
3.41 UNNAMED PROSPECT (Site No. B7160001; BO-466)

3.41.1 Site Location and Access (Figure 2.1-1b)

This prospect, noted by an adit and several prospect symbols on the topographic map, is on the west side of Deer Creek in the central part of the E½ of the SW¼ of section 18, T. 6 S., R. 3 W., on the Cinnabar Mountain 7.5-minute quadrangle (Figure 3.41-1). A short jeep road leads to the mine from the four-wheel-drive road that goes up Deer Creek. The road up Deer Creek joins the main Flint Creek Road about 3 miles to the south. The property is on private land just north of BLM land.

3.41.2 Geologic Features (Figure 2.2-1b)

This prospect is in granitic rocks of Cretaceous age (Ekren and others, 1981).

3.41.3 Site History

Nothing is known about the history of this site.

3.41.4 Environmental Conditions

3.41.4.1 Site Features

The site was visited by Earl Bennett on July 16, 2000. A video segment describing the property is on Owyhee County 2000 Videotape (Tape 3, index 0:49:44-0:52:05). Documenting photographs are Roll 00B3, frames 7-9.

The prospect consists of a caved dry adit in granite with rails leading to a small, densely overgrown waste dump (Figures 3.41-2 and 3.41-3). A few old timbers are on the dump, which measures 70 feet long, 3 feet wide, and 6 feet thick. A short distance above the adit are a number of small prospect pits and trenches (Figure 3.41-4). The disturbed area covers less than 0.5 acre.

3.41.4.2 Sample Locations

3.41.4.2.1 Solid Samples

No solid samples were collected.

3.41.4.2.2 Water Samples

No water samples were collected.

3.41.5 Structures

No structures were found at the site.

3.41.6 Safety

There are no safety hazards at the site.
Figure 3.41-1. Location of Unnamed Prospect, Site No. B7160001, Owyhee County, Idaho (U.S. Geological Survey Cinnabar Mountain 7.5-minute topographic map).
Figure 3.41-2. Caved adit at Site No. B7160001, looking west. Mine rails can be seen under the tree just below the center of the picture (Roll 00B3, frame #7).

Figure 3.41-3. Overgrown waste dump for the adit at Site No. B7160001 (Roll 00B3, frame #8).
Figure 3.41-4. Series of pits and trenches on the ridge above the adit at Site No. B7160001 (Roll 00B3, frame #9).
3.42 GREAT WESTERN MINE (Site No. BO-190)

Alternate names—Great Western #1; Quaker Group; Chapman; Oro Fino Vein; Orogrande Gold, Inc.; Tango Group; Great West Prospect.

Note: on the video segment, this property is misidentified as the Sinker Tunnel, which is actually about 1 mile east of the location of this property.

3.42.1 Site Location and Access (Figure 2.1-1a)

The Great Western Mine is on the upper reaches of Scotch Bob Creek and east of Linehan Flat, in the NE¼ of the NW¼ of section 4, T. 5 S., R. 3 W., on the Silver City 7.5-minute quadrangle (Figure 3.42-1). Access is via a jeep road that turns westerly off of the road to the Sinker Tunnel, which in turn connects with the Murphy-Silver City Road about 3 miles east of the site of Ruby City. The jeep road to the mine eventually climbs the ridge to the west, passes through Linehan Flat, and connects with the War Eagle Mountain Road at the head of Slaughterhouse Gulch. This is an active prospect on BLM land. A sign at the mine notes the contact is Brian Scherer, P.O. Box 27, Murphy, ID.

3.42.2 Geologic Features (Figure 2.2-1a)

The Great Western is the northernmost property on the Oro Fino-Golden Chariot vein, a north-south-trending quartz vein in granite. Piper and Laney (1926) noted numerous faults in the underground workings. At the time of their visit, only a small amount of gold ore had been found on the property.

3.42.3 Site History

This property was acquired by the Great Western Mines Company in 1920 (Piper and Laney, 1926). This company was incorporated in 1920. By 1921, the property had 1,334 feet of development. In 1922, development included two tunnels (1,100 feet and 500 feet) and three shafts (all apparently about 80 feet deep). The company owned some of the claims and leased the rest. According to Piper and Laney (1926), the property had over 4,000 feet of workings on one level by 1925. Also in 1925, the company had to replace some buildings and equipment that had been destroyed by fire. In 1926, the property had 5,000 feet of workings, including two tunnels (2,800 feet and 1,900 feet), but by 1928, the company was reporting only 2,680 feet of total development. The company claimed to have done over 1,000 feet of development in 1929, but apparently did little more than assessment work after that. Great Western forfeited its corporate charter in 1934.

Orogrande Gold, Incorporated, was incorporated in 1935. The initial holdings of this company were three of the claims formerly held by Great Western. The workings on these claims in 1936 included one tunnel (150 feet) and two vertical shafts (30 feet and 40 feet). By 1938, the total development was about 650 feet of workings. The following year, the company acquired a number of additional claims, including more from the old Great Western Mines Company’s holdings. By 1943, Orogrande Gold’s property had 3,760 feet of workings, including three tunnels (2,600 feet, 1,000 feet, and 120 feet long), but the mine was closed because of the
restrictions on gold mining during World War II. About 100 feet of development was done on the property in 1950, and Orogrande Gold forfeited its corporate charter in 1951.

3.42.4 Environmental Conditions

3.42.4.1 Site Features

The Great Western Mine was visited by Earl Bennett on July 17, 2000. A video segment describing the site (identified as the Sinker Tunnel on the video) is on Owyhee County 2000 Videotape (Tape 3, index 0:52:08-0:56:00). Documenting photographs are Roll 00B3, frames 19-21.

This active prospect contains a gated adit, a good building at the portal, and a few small storage buildings (Figure 3.42-2). The lower part of the tall building at the portal has a gate, which is apparently the entrance to the adit (Figure 3.42-3). A steady stream of clear water, approximately 20-30 gallons per minute, flows in a ditch that goes under the gate. The dump is extensive (about 180 feet long, 85 feet wide, and 60 feet thick on the nose) and predates the current activity. An old concrete footing with protruding bolts is on the dump beside the adit. There are also piles of new timbers and supplies, including PVC pipe, at the site, (Figure 3.42-4). A small concrete block building (Figure 3.42-5) and a lean-to wood shed are also on the dump. A second adit noted on the topographic map at the site was not found. The disturbed area covers about 1 acre.

3.42.4.2 Sample Locations

3.42.4.2.1 Solid Samples

No solid samples were collected.

3.42.4.2.2 Water Samples

Sample B7170001 was collected from the adit water.

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<th>Flow (gpm)</th>
<th>Analyzed (Yes/No)</th>
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<td>50</td>
<td>5.9</td>
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3.42.4.2.3 Analytical Results

Water Samples (Tables 2.5-1 and 2.5-2)

Sample B7170001 exceeds the Aquatic Life Chronic standard for mercury in the EPA 200.8 test and exceeds the Primary MCL for arsenic in the dissolved heavy metals screen. In the total recoverable metals screen, sample B7170001 equals or exceeds both Aquatic Life standards for copper.
3.42.5 Structures

As noted previously, a building in good condition has been constructed over the portal of the adit. The small concrete block building and the lean-to wood shed are the only other structures at the site.

3.42.6 Safety

The adit is adequately secured by a gated portal beneath the building. No other hazards were found.
Figure 3.34-1. Location of the Great Western Mine, Owyhee County, Idaho (U.S. Geological Survey Silver City 7.5-minute topographic map).
Figure 3.42-2. Sketch of the Great Western Mine site.
Figure 3.42-3. Building constructed over the adit at the Great Western Mine. Water flows out of the adit in the ditch beneath the building (Roll 00B3, frame #19).

Figure 3.42-4. Piles of new supplies at the Great Western Mine. The lean-to wood shed is behind the piles of boards and timbers (Roll 00B3, frame #21).
Figure 3.42-5. Small concrete block building on the waste dump for the Great Western Mine (Roll 00B3, frame #20).
REFERENCES


Appendix A
GPS Locations
Table A-1. GPS readings for miscellaneous abandoned mine sites in the Owyhee County examined during the summer of 2000.

<table>
<thead>
<tr>
<th>Site No.</th>
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<th>Longitude</th>
<th>Comments</th>
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Appendix B
Database Fields
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ORANGENUM 451
MAPLOC 1
DEPOSIT Eagle Creek Mine

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MILSREF 0160790528
PERIODPROD

ORE
COMMOD Au

LATITUDE 474325
LONGITUDE 1154916
HARDFILE N
MLA
NAME EAGLE CREEK MINE
SEC 33
SUBSEC NESE
TWN 051 N
RNG 005 E
DDMMSS 474325
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OPTYP SURFAC
STATUS PAST PRO
COMMO1 GOLD
COMMO2
COMMO3
COMMO4
COMMO5
MAPNAME BURKE
QUAD WALLACE
POP 1KM
TOE M
YFC
MPF
SITENAME
DISTRICT
COUNTY
SECQUAD
SECQUADSCl
UTMNORTH
UTMEAST
UTMZONE
COMMODIT
LAT
LON
TOWN
SECTION
RANGE
Appendix C
Geochemical Data
ACCURACY OF GEOCHEMICAL DATA

The following information was received on the subject of the accuracy and the detection limits for the geochemical data presented in this report:

Date: Fri, 24 Oct 1997 10:48:23 PST8PDT
From: Kim Anderson <kanderson@asl.fs.uidaho.edu>
To: Ruth E Vance <rvance@uidaho.edu>
Subject: Re: detection limit accuracy

That is something I put together some years ago for another client. Also Greg Moller [ Technical Director, Analytical Sciences Laboratory] had input. Other than that, the refs are included in the discussions I sent [discussion titled “Practical Quantitation Limits”; see next page].

Good Luck
Kim,

Kim A. Anderson, Ph.D.
Asst. Prof. / Food Science and Toxicology Dept.
Chief Chemist / Analytical Sciences Laboratory
University of Idaho
Moscow, Idaho 83844-2201
208-885-7900/FAX 209-885-8937
Practical Quantitation Limits

Sensitivity of an analytical method is often based on its ability to reproducibly detect target analytes above the method noise level. Several similar definitions of this Minimum Detection Level or Limit (MDL) or Limit of Detection (LOD) are currently used. According to the American Chemical Society (ACS) (Principles of Environmental Analysis, p 9):

**Limit of detection (LOD)** "is defined as the lowest concentration level that can be determined as statistically different from the blank".

**Instrument detection limit (IDL)** "is the smallest signal above background noise that an instrument can detect reliably and is often equivalent to the LOD".

**Method detection limit (MDL)** "is the lowest concentration of analyte that can that a method can detect reliably in either a sample or a blank".

ACS recommends the value of LOD to be $3\sigma$ for a 99% confidence level, where $\sigma$ is the standard deviation of the measurement.

**Limit of Quantitation (LOQ)** "is defined as the level above which quantitative results may be obtained with a specified degree of confidence".

ACS recommends an LOQ of $10\sigma$ and this imparts a quantitative measurement uncertainty of +/-30% in the measured value at this 99% confidence level. ACS contends "quantitative interpretation, decision-making and regulatory actions should be limited to data at or above the limit of quantitation". In particular, ACS states: "Analytical chemists must always emphasize to the public that the single most important characteristic of any result obtained from one or more analytical measurements is an adequate statement of its uncertainty level. Lawyers usually attempt to dispense with uncertainty and try to obtain unequivocal statements; therefore, an uncertainty interval must be clearly defined in cases involving litigation and/or enforcement proceedings. Otherwise, a value of 1.001 without a specified uncertainty, for example, may be viewed as legally exceeding a permissible level of 1."

EPA Methods used for regulatory enforcement use the same definition of MDL. "The method detection limit is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the value is above zero". Since performance of analytical methodology and therefore detection limits vary significantly with non-controllable laboratory to laboratory variables such as the exact type of analytical instrumentation, EPA promulgates the concept of Practical Quantitation Limits (PQL). A PQL is equal to the MDL multiplied by a factor of ten or greater and are published as a general guide to laboratory method performance. The factors can range from ten to ten thousand depending on sample matrix and are intended to allow the laboratory the flexibility to determine the relative performance of an analytical method in a more complex sample matrix. In confirmation of laboratory variability, EPA methods as
well as other published analytical methods often estimate detection limits and quantitation limits using a bench-level expert, performance estimate.

Recognition of the 'average performance' nature of the PQL guidelines, EPA states that PQL's "are the lowest concentrations of analytes in (samples) that can be reliably determined within specified limits of precision and accuracy by the indicated methods under routine laboratory operating conditions. The PQL's listed are generally stated to one significant figure. CAUTION: The PQL values in many cases are based only on a general estimate for the method and not on a determination for the individual compounds; PQL's are not a part of the regulation (40 CFR Part 264 Appendix IX, Footnote 6)."
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.; Bain Mine

160730267 1936-1940 D ton Au: A oz; Ag: G oz
160730184 Ag

160730190 1926, 1927 A ton Au: A oz; Ag: D oz

Au Ag

160730202 1919, 1926 A ton Au: B oz; Ag: E oz

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