SECTION 2

Physical and Ecological Characteristics

This section includes summaries of geology, groundwater conditions, surface water conditions, the site conceptual model, climate, ecology, and demographics in the Lava Cap Mine vicinity. Much of the data presented was adopted from documents previously prepared by others (these documents are listed in Section 8).

2.1 Demography and Land Use

Nevada County covers a land area of 978 square miles, and its 1998 population was 91,117 (California Department of Finance, 1999). Communities near the Lava Cap Mine project site include Nevada City (population 2,880) and Grass Valley (population 9,475). The major regional population and industrial centers in the general vicinity of the Grass Valley / Nevada City area include Reno (91 miles northeast), South Lake Tahoe (94 miles, southeast), and Sacramento (60 miles, southwest).

Over the past 20 years, Nevada County has transitioned from a traditional, predominantly resource-based rural county to a much more varied and diverse population and economic base. This is reflected in the changing land-use pattern, with increased commercial, industrial, and residential uses (Nevada County, 1995).

The Grass Valley / Nevada City area has been the focal point of most of the County's commercial, industrial, and residential growth and development (Nevada County, 1995). Grass Valley and Nevada City have had a combined increase of nearly 3,000 residences during the past 20 years. In addition, a majority of the commercial and industrial development in Nevada County is located in or around Grass Valley and Nevada City. Since 1983, approximately 8,500 new jobs have been created in Nevada County, with 2,000 new manufacturing jobs, 1,700 jobs in services, 1,400 in retail, 700 in construction, and 2,700 jobs in other categories. New commercial development was substantial in the 1980s, and retail sales since 1986 have increased at a rate of about 10 percent annually. The amount of land use for commercial and industrial purposes in relation to population has remained consistent with typical ratios for rural communities (Nevada County, 1995).

Historically, Nevada County's ethnic composition has had a Caucasian majority. In 1998, Caucasians accounted for 93.22 percent of the population. African Americans made up 0.20 percent of the population, Asians or Pacific Islanders composed 0.84 percent, persons of Hispanic origin composed 4.86 percent, and American Indians made up 0.88 percent (California Department of Finance, 1999). The county does not expect the ethnic distribution in Nevada County to change dramatically through 2020 (Nevada County, 1995). The county's population distribution by age in 1998 was as follows:

- Under age 12 13,013 16.57 percent
- Age 12-18 6,719 8.56 percent
- Age 19-24 3,545 4.52 percent
- Age 25-34 9,741 12.41 percent

- Age 35-44 14,306 18.22 percent
- Age 45-54 8,771 11.17 percent
- Age 65 and up 14,281 18.19 percent

Only a small percentage of the total population could potentially be affected by Lava Cap Mine Site activities. In 1994, an estimated 1,776 people lived within 1 mile of the site and 24,091 lived within 4 miles of the site (EPA, 1997a).

There are currently four residences on the mine property. One residence is within 200 feet of the waste rock pile. A second residence is approximately 200 yards from the waste rock and mine tailings piles. The third and fourth residences are further away from the wastes and historic mining operations. The locations of the residences in relation to other features at the mine are shown on Figure 1-2.

2.2 Topography

Lava Cap Mine is on the southern slope of Banner Ridge at approximately 2,840 feet above mean sea level (msl). Topography for the area is shown on Figure 2-1 and Plates 1 through 4 (included at the end of the text following Section 8). Across the mine, the elevation drops from approximately 2,870 feet above msl at the historic mine buildings to 2,710 at the base of the log dam, approximately 1,400 feet away.

The LCC drainage between the log dam and the confluence of LCC / CC has a 240-foot elevation change over a 1-mile distance. The confluence of LCC / CC is at approximately 2,468 feet above msl. The Deposition Area ranges in elevation from 2,464 to 2,470 feet above msl. The water surface in the middle of the northern lobe of Lost Lake was at an elevation of 2,461.7 above msl during spring 2000. At that same time, the southern lobe of Lost Lake was at an elevation of 2,461.4. The elevation at the base of the Lost Lake Dam is approximately 2,420 feet above msl, more than 40 feet lower than the lake surface.

2.3 Surface Water

The Lava Cap Mine property is located entirely within the LCC drainage basin. LCC is the dominant surface water drainage leading south away from the mine. The upper reaches of LCC above the mine are seasonally dry (ephemeral) and become perennial (year-round flow) below the log dam at the mine where LCC is fed by mine discharge. During the RI, the upstream reaches of LCC were dry during Round 1 (October / November 1999) and flowing during Rounds 2 and 3 (January and May 2000, respectively).

Rainfall and mine drainage percolate through the Lava Cap Mine waste rock / tailings pile prior to flowing into LCC. Stream diversions constructed around the tailings pile in 1997 restrict upgradient LCC flow to the far eastern edge of the waste rock / tailings pile area, then into a culvert that discharges LCC flow back into the primary channel immediately south of the log dam. A diversion was also constructed to divert mine discharge from the adit into a culvert that carries the discharge around the waste rock / tailings pile and releases it to flow into LCC below the log dam.

Insert Figure 2-1

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LCC flows downstream from the Lava Cap Mine log dam for approximately 1 mile to the confluence with CC in the Deposition Area above Lost Lake. The combined LCC and CC flow continues downstream in CC through the Deposition Area and into Lost Lake. Deposition of tailings-impacted sediment in the CC delta has separated Lost Lake into a northern and southern lobe (Figure 1-4). The total area of the lake is now about 5 acres (approximately 3.6 acres in the northern lobe and 1.3 acres in the southern lobe, depending on the season). Lost Lake is contained by the Lost Lake Dam, which is approximately 45 to 50 feet high, with a concrete spillway. There is constant seepage beneath the Lost Lake Dam into the CC channel below the dam. In addition, during most of the year, there is at least some flow over the spillway on the dam. CC continues for less than a quarter of a mile below Lost Lake before it enters Little Greenhorn Creek (LGC). LGC eventually (after approximately 2 miles) joins Greenhorn Creek, which flows into Rollins Reservoir (Figure 2-1). Water from Rollins Reservoir discharges into the Bear River, which flows into Lake Combie approximately 11 miles downstream of Rollins Reservoir.

Historically, access to Lava Cap Mine during mining operations was possible through an adit connected to a horizontal tunnel that bisected the central mine shaft. At some point after the mine ceased operations, the adit caved in and is no longer usable for mine access. The discharge of groundwater into the mine during the mining operation was reported to have been about 35 gallons per minute (gpm) (Cole / Mills Associates, 1985). Currently, water discharges continuously from the mine near the caved-in adit in the waste rock pile area (Figure 1-2). In a 1984 study, the caved-in adit discharge was measured at rates, ranging from 130 gpm in early April 1984 to 47 gpm in August 1984 (Cole / Mills Associates, 1985). In another study conducted in this same general time frame, the adit flow reportedly declined to about 20 gpm by the end of the dry season (September –October) (Hydrosearch, 1984).

For the RI, crest gauges were installed at four locations to help estimate peak discharges in surface water channels. These locations are the adit discharge, LCC at the base of the log dam, LCC just above the confluence with CC, and CC just above the confluence with LCC. All four crest gauge locations are illustrated on Figure 2-2. The crest gauges can only be used to estimate peak flow rates that occurred at the gauge between each observation date. Table 2-1 presents the estimated peak discharges for each surface water channel in multiple time periods between November 1999 and September 2000. As the data shown in Table 2-1 demonstrate, normal flows in LCC and CC are fairly low (typically no more than between 5 and 15 cubic feet per second [cfs] for much of the year), but these creeks can experience significant increases in flow during winter storm events. Estimated peak flows in the winter of 2000 exceeded 300 cfs in both LCC and CC.

The flow rate in LCC just below the log dam consists of seeps from the tailings / waste rock pile and seasonal flow down LCC from above the mine. The flow rate is much lower than that observed just above the CC confluence, but these flows are still significant. In February 2000, an estimated peak discharge rate of 181 cfs flowed past the gauge below the log dam. During non-storm periods, flow rates below the log dam are typically less than 5 cfs.

Estimated peak discharges from the crest gauge at the adit were highest during February 2000, with a maximum estimated flow of just under 4 cfs (almost 1,800 gpm). Much of this peak discharge is not likely coming from the adit, but rather is the result of surface run-off directed into the pond at the adit discharge. As part of EPA's drainage

TABLE 2-1
Approximate Peak Surface Water Discharges Based on Crest Gauge Data (cfs)
Lava Cap Mine, Nevada County California

Time Period	Adit	Seep[1]	Base of Log Dam	Little Clipper Creek	Clipper Creek
11/20/99 - 12/17/99	< 1	< 1	< 5	15	< 5
12/18/99 - 01/28/00	2.2	<0.1	43	255	265
01/29/00 - 02/22/00	3.9	< 1	181	> 300	> 360
02/23/00 - 03/29/00	2.6	3	45	> 300	49[2]
03/30/00 - 05/02/00	< 1	3	< 5	< 5	< 5
05/03/00 - 06/22/00	< 1.5	<1	< 5	16	24
06/23/00 - 07/31/00	< 1	<0.5	< 5	< 5	12
08/01/00 - 09/14/00	< 1	<0.5	< 5	< 5	12

[1] Seep flow rates estimated from visual observations, not a crest gauge
[2] Potentially anomalous reading
< means that peak flow during the time period was lower than the crest gauge
> means that peak flow during the time period was greater than the crest gauge

improvements during the removal action, one of the smaller drainages coming from the vicinity of the mine buildings was modified and now enters the pond at the adit discharge and flows out through the culvert. Under normal, non-storm conditions, the flow rate from the adit was estimated to range from a low of around 50 gpm (approximately 0.1 cfs) to a high of about 200 gpm (or around 0.5 cfs). These flow rates are generally consistent with the flow measured during the earlier studies referenced previously.

Surface flow estimates from the primary tailings pile seep are also shown in Table 2-1 for comparison. As shown, peak flow from the seep occurred during late winter / early spring and was observed to be no more than 3 cfs.

2.4 Soils

Information on types and distribution of soils in the Lava Cap Mine Site vicinity is derived from published soil survey reports by the National Resource Conservation Service (NRCS) and a review of national soil database information (NSSC, 2000). Site-specific evaluation of soil types is limited to select field description of materials (texture and color) at soil and sediment sample locations, including soil borings.

Detailed descriptions of the mapped soil unit types, according to the soil survey information (NRCS, 1993), are included in Appendix C3. The soil survey map for the area that encompasses the LCC and CC watersheds is shown in Appendix C3. Published soil maps are useful for predicting general soil characteristics anticipated for a given area; however, they may not be definitive when interpreting conditions at a specific site. The remainder of this section briefly summarizes the most extensive soil units mapped in the Site vicinity.

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Insert Figure 2-2 (8.5x11 B&W)

Within the LCC watershed, the primary soil unit mapped is the Josephine-Mariposa complex. This unit is mapped over most of the Lava Cap Mine area and extends above and below the mine on either side of LCC. The Josephine-Mariposa and Josephine-Rock outcrop complexes both have a moderate to high water erosion hazard rating. Aerial photographs of these areas taken as part of the RI (Plates 1 through 4) show considerable logging and land-clearing activities that could exacerbate erosive conditions in the watershed.

The upper reaches of the LCC watershed are composed primarily of Cohasset cobbly loam soil units with Aiken loam soil units on the higher slopes. Moderate to high water erosion hazards can also be expected on the steeper slope classes for both of these soil map units.

The soil mapping suggests significant loamy sediment deposition along CC extending upstream from the confluence with LCC to Greenhorn Road. In addition, the mapping indicates that a significant part of the upper CC watershed may have been previously impacted by mining activities, as indicated by the mapping of placer diggings. The occurrence of historic mining activities and the presence of mining wastes in the upper reaches of the CC watershed are not confirmed as part of the RI. However, elevated concentrations of metals were not detected in surface water or sediment samples collected in reference areas along CC above LCC.

In the lower half of the CC watershed, the slopes on either side of CC are mapped primarily as the Josephine-Mariposa complex. A Rock land unit (Rn) is indicated for the CC corridor between Lost Lake dam and LGC.

2.5 Geology

The Lava Cap Mine Site is located in the Sierra Nevada physiographic province, which is characterized by intrusive and volcanic igneous rocks as well as metamorphosed sedimentary rocks that are faulted and fractured. In general, these rocks are highly weathered at the surface.

The sequence of rock types in the Lava Cap Mine area, in order of increasing age, includes (Cole / Mills Associates, 1985):

- Mine deposits, including waste rock and tailings
- Tertiary volcanic breccias (Tvb) commonly referred to as lava
- Zones of Tertiary conglomerates or gravels
- Cretaceous igneous intrusive rocks, including diorites and granodiorites
- Jurassic to Triassic metamorphosed volcanic rocks
- Paleozoic to Upper Jurassic metasedimentary rocks (Pms), including argillites, slates, conglomerates, thin-bedded cherts and other metasediments

Overlying these rocks in selected areas are localized stream alluvium, slope colluvium, and surface soils.

Between the mine and Lost Lake, the geology is dominated by alluvium and recent mine deposits on the surface, underlain by the Pms unit. The other units listed occur to the north

of the mine. Figure 2-3 is a general geologic map of the Lava Cap Mine vicinity that shows geologic contacts. Locations of geologic contacts are also illustrated on the cross-section of mine workings (Cross Section A-A') presented on Figure 1-3.

In the vicinity of the historic mining activities at the Lava Cap Mine, the surface is covered by waste rock, underlain by tailings at the southern end of the mining area. The waste rock is a gravel mixture of the Pms, igneous intrusives, and metavolcanic rocks. The tailings range from fine sand to (more commonly) clay, which is dark gray when wet and unoxidized. In the borings drilled for this study, the underlying Pms was observed to be a greenish-gray argillite with evidence of quartz, feldspar, and sulfide minerals present in small amounts (likely associated with the intruded ore bodies). This Pms characterization is limited to borings at the mine, but is likely representative of the area extending southward toward Lost Lake. A map showing boring locations in the source area, along with a cross-section line for this area, is included on Figure 2-4. A cross section of the waste rock/tailings pile source area at the mine is provided on Figure 2-5.

The mine workings are located entirely within the Pms unit. Gold-bearing quartz veins averaging 5 feet in width occur along inactive reverse faults that are oriented north northwest and dip about 51 degrees to the east (Cole/Mills Associates, 1985). The ore material also contains abundant carbonate material cut by igneous dikes of varying origin (U.S. Geological Survey, personal communication with Roger Ashley, October 2000). The silver- and gold-rich ore also contains relatively high concentrations of sulfides rich in iron and arsenic. The processing of this ore at the mine produced tailings enriched with these elements. The surface material in the LCC drainage contains some natural alluvium but is dominated by mine deposits. The slopes above the drainage display only a shallow, poorly developed soil horizon, underlain by the Pms formation.

Groundwater flow in geologic units depends on porosity and permeability. In the Lava Cap Mine area, the Tvb contains a relatively high degree of porosity and permeability compared to the underlying Pms. Groundwater occurrence in the Tvb unit appears to be distributed throughout the unit. On the other hand, in the Pms unit, groundwater appears to occur only in the joints and fractures. This is evident by physical characteristics of the units themselves and in difference in yield from wells completed in each of the units. This difference in porosity and permeability suggests that little flow occurs from the Tvb into the Pms. Groundwater tends to perch on the Pms/Tvb contact, inducing lateral flow that exits as a spring. Figure 2-3 illustrates that several springs are present along or near the contact between Tvb and Pms. Flow from the Tvb to the Pms could occur through joints or fractures in the Pms that intersect the Tvb. Likewise, groundwater occurrence in the mine deposits (Md), which are generally porous and permeable, would be similar to the Tvb in that perching and lateral flow would occur with only a small fraction likely flowing into the Pms through joints and laterals.

Faulting and Seismicity

There are no active faults present in the vicinity of Lava Cap Mine, but the site is located in the northern Foothills Fault System. Ancient fractures, joints, and inactive faults are common in this region. The main walls of the Lava Cap Mine workings have reportedly been weakened by fracturing. There are two possibly active faults located in the area, one 4 miles east and one 4 miles west of the Lava Cap Mine Site. To the east, there is the

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Figure 2-3 (backside)

Insert Figure 2-4 (8.5 x 11 color)

Figure 2-4 backside

Insert Figure 2-5 (11x17 color)

Figure 2-5 backside

northeast trending Cement Hill fault that may have had Late Cenozoic movement of greater than 5 feet vertical. To the west, there is a 1.5 mile-long north-trending Greenhorn Creek lineament (with no observed displacement noted) near the major Pre-Cenozoic northern Melones fault (Cole / Mills Associates, 1985).

There are no earthquake epicenters reported in the Lava Cap Mine area. However, seismicity data within a 30-mile radius indicate that moderate earthquakes were reported in 1867, 1888, and 1909. In the Foothills Fault System, calculations for the Cement Hills fault indicate the maximum earthquake magnitude would be 5.5, with a maximum surface displacement of 4 inches. Similarly, the Greenhorn Creek lineament could result in a maximum earthquake magnitude of 5.6, with a maximum surface displacement of 6 inches. The active Little Grass Valley fault zone 40 miles north of Lava Cap Mine is capable of generating the maximum credible earthquake for the area, resulting in a magnitude of 6 to 6.5 and a 0.02 to 0.1g ground acceleration at Lava Cap Mine (Cole / Mills Associates, 1985).

2.6 Hydrogeology

Groundwater flow is primarily to the south-southeast between the mine and the Lost Lake area (Cole / Mills Associates, 1985), based on data from a regional domestic well survey (Hydrosearch, 1984). Shallow domestic wells, less than 200 feet deep, have an average yield of 18 gpm. Deep domestic wells generally penetrate 300 to 570 feet, producing from 0.25 to 140 gpm (Cole / Mills Associates, 1985).

Potable groundwater throughout the Lava Cap Mine Site is contained in secondary openings (fractures and joints) of the Pms. This aquifer is the source of domestic water supply throughout the Site vicinity. The degree of fracturing in the Pms is an important factor in assessing groundwater conditions. Inactive thrust faults and associated lineaments trend north-south to slightly northwest-southeast (Cole / Mills Associates, 1985), which generally match the estimated southward groundwater flow between the Lava Cap Mine and Lost Lake. An approximate, estimated groundwater potentiometric surface map is provided on Figure 2-6. The groundwater contours reflect groundwater level measurements from the RI field effort combined with those presented in the Cole / Mills Associates report (1985). The southward direction of groundwater flow is inferred perpendicular to the contours if the fractured groundwater system behaves as an isotropic porous media. This is an approximation because it is not known whether the assumption of isotropic porous media is valid and because there are only a small number of reliable groundwater level measurements in the area.

Monitoring Wells 5E and 5I were installed within 30 feet of one another on the waste rock / tailings pile at the mine. Both wells were screened in the Pms at different depths (Figure 2-5). The measured water levels in these wells suggest there is a downward hydraulic gradient in the area Pms aquifer. The downward gradient indicates the potential for impacted water in the shallowest portions of the Pms aquifer beneath the tailings pile to migrate downward and deeper into the Pms aquifer.

Groundwater also occurs in the fractured volcanic breccia (lava or Tvb), that overlies the Pms north of the mine. Upgradient Monitoring Well 1B was completed at the base of the

Tvb formation. Several springs are identified at the surface contact between the Tvb and Pms (Figure 2-3). Their presence suggests that groundwater may be perched in the Tvb and that hydraulic communication between the Tvb and the underlying Pms is limited. However, there are no direct measurements to verify the potential.

At the mine, shallow saturated zones are found in the waste rock / tailings pile and discharging from the mine adit. Shallow saturated zones are also present in the upper portions of the Pms unit, immediately beneath the waste rock / tailings pile. This shallow water was sampled at several locations during the RI field effort, including the mine discharge from the adit, seeps from the tailings pile, and shallow monitoring wells completed beneath the waste rock / tailings pile in the upper Pms unit. Elevated concentrations of arsenic are found in the mine discharge, tailings pile seeps, and shallow monitoring wells suggesting that the two systems may be interconnected, however additional hydraulic evidence is needed to determine whether this groundwater is in direct communication with the underlying Pms groundwater or whether it represents a perched system. Water quality analyses of tailings pile seeps and mine discharge in the source area are generally similar to analyses of shallow Pms groundwater (Table 2-2), indicating that hydraulic connection is possible. In particular, the calcium and magnesium concentrations shown in Table 2-2 are generally similar to each other and different (higher) than those detected in the downgradient domestic wells screened deeper in the Pms. The fact that the shallow mine area samples are slightly, yet consistently, different in chemistry from the regional groundwater suggests, but does not prove, different sources of calcium and magnesium between the two systems. It also supports the possibility that the two shallow systems are connected. More complete analysis of domestic wells along with hydraulic testing in the source area would more clearly define whether such a connection exists at the site. Water quality is described in more detail in Sections 4 and 5.

TABLE 2-2
Comparison of Arsenic and Major Ion Concentrations Between Various Waters in the Lava Cap Mine Source Area – Samples From January 2000 (mg/L)
Lava Cap Mine, Nevada County, California

Location	Source	Arsenic	Na	Ca	Mg	Cl	Bicarbonate	Sulfate
3A	Adit Discharge	0.199	2.09	60	17.5	<0.9	65	192
3B	Tailings Pile Seep	0.05	3.23	51.5	10.9	1.2	110	85.1
3C	Tailings Pile Seep	0.0741	1.9	46.4	9.09	<0.9	71	106
5A	Shallow Pms Groundwater	0.262	10.7	132	46.8	1.8	115	483
5D	Shallow Pms Groundwater	0.0153	5.02	43.3	15.5	2	112	91.2
5E	Shallow Pms Groundwater	0.448	5.47	63.7	13.5	1.5	231	44.1

Notes: See Figure 2-4 for sample locations.
Na sodium
Ca calcium
Mg magnesium
Cl chloride

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Figure 2-6 backside

2.7 Site Conceptual Model

Figure 2-7 depicts the conceptual model for the Lava Cap Mine site. This figure illustrates the mechanisms under which Lava Cap Mine contaminant sources can be released to the environment and the potential pathways that contaminants could follow that would result in exposure to various receptors.

A generalized geologic cross-section of the area between Monitoring Well 1B, located above the mine, and the log dam at the bottom of the tailings pile is provided on Figure 2-8. Its purpose is to illustrate the conceptual site model of groundwater / surface water interaction in the mine area. Subsurface flow directions are inferred and not based on actual data.

Several springs are near the surface contact of the Tvb and Pms units, suggesting that groundwater is perched on the Tvb / Pms contact (Figure 2-8). This is supported by observations of the Pms Formation as being far less porous than the Tvb (Cole / Mills Associates, 1985). The spring discharge feeds LCC, which flows southwardly toward the mine. This flow path is only active for about half the year because LCC is dry above the mine between approximately July and January (depending on the quantity and timing of winter rainfall). It is reasonable to assume that some of the Tvb groundwater infiltrates to the Pms, though insufficient monitoring exists to quantify this infiltration.

Where Little Clipper Creek first comes into contact with the mine deposits (waste rock / tailings) from the north, it is directed into a partially-lined diversion ditch running along the eastern edge of the mine deposits (Figure 2-4). It is expected that a considerable volume of water infiltrates the mine deposits as LCC flows in this ditch for approximately 400 feet before entering the diversion culvert that transports LCC past the log dam. As noted, for much of the year, LCC is dry above the mine, and no water is flowing in the ditch or diversion. It may be beneficial to monitor surface water flow rates in LCC entering the mine area, perhaps with another crest gauge, to help evaluate the water balance.

Infiltration into the mine deposits also comes from the adit discharge, which represents the drainage of Pms (and potentially some Tvb) groundwater from the extensive mine workings *(*Figure 1-3*).* Adit discharge occurs year-round (peak flow rates estimated during the RI are shown in Table 2-1). The visible portion of the adit discharge is also diverted around the tailings / waste rock to the west in a culvert labeled "Adit Diversion" on Figure 2-4. It is not known if a significant portion of the adit discharge stays below ground and infiltrates directly into the mine deposits. However, Monitoring Well 5A is adjacent to the adit and has a depth to water of approximately 10 feet, indicating the shallow formation is saturated in this area. Groundwater in the mine deposits discharges to the surface in the form of seeps (Sample Locations 3B and 3C shown on Figure 2-4) and as leakage through the tailings dam into LCC. The estimated flow rates observed at the primary seep are shown in Table 2-1.

Estimated peak flow rates observed below the log dam are also shown in Table 2-1. The flow observed below the log dam is composed of surface seeps, leakage through the log dam, and LCC flow from above the mine (for about 6 months a year). There is also some flow downward into the Pms formation, though it is not quantifiable. A downward vertical groundwater gradient was observed in the Pms Formation beneath the waste rock / tailings

pile (between Wells 5E and 5I), and water quality constituents of tailings seeps and shallow Pms groundwater are similar (Table 2-2). Both of these observations support the idea of infiltration of mine deposit groundwater into the shallow Pms. These inferred flows are illustrated on Figure 2-8.

South of the log dam, Little Clipper Creek and the Pms groundwater have an unknown relationship. It is likely they are in hydraulic communication to some degree, but no nested piezometers exist in or around the creek bed with which to verify this assumption. Natural sediments in the creek are very few; the only areas of significant sedimentation are in deposition areas dominated by tailings carried downstream during past releases from the mine area. Groundwater in the large Deposition Area above Lost Lake is monitored using shallow Monitoring Wells 13R and 13Q (see Figure 2-6 for the locations of these wells), but the underlying Pms has not been sampled in this area.

2.8 Air

Nevada County is in the Northern Sierra Air Quality Management District, which makes up part of the Mountain Counties Air Basin. Air quality in the district currently meets all federal standards. However, the district is not in compliance with the state standard for particulate matter less than 10 microns diameter (PM10) and ozone. The district's non-attainment designation from the state for ozone is currently deemed to be due to transport of ozone and its precursors from upwind areas, such as the Bay Area and the Sacramento Valley. Within the district, most of the air pollution is generated by motor vehicles.

In most of the district, air quality appears to be stabilizing, partly due to flat growth. However, in the case of both PM10 and ozone, efforts to achieve the state standard will be a long-term challenge, requiring continued emissions reductions (information obtained from the Northern Sierra Air Quality Management District website at http://www.nccn.net/~nsaqmd/about_nsaqmd.html).

2.9 Climate

Nevada County generally has warm, dry summers and mild, wet winters. Most of the precipitation comes during the 6 months extending from fall through early spring (November through April). The seasonal total rainfall ranges from 26 inches at the lower elevations to almost 60 inches at the higher elevations (NRCS, 1993). Annual precipitation is approximately 53 inches (based on 100-year average) in Nevada City, California, which is located approximately 3 miles west and north of Lava Cap Mine. Because the Lava Cap Mine Site is about 700 feet higher in elevation than Nevada City, the annual precipitation at the site may be approximately 10 percent higher (approximately 58 inches a year) (Cole/Mills Associates, 1985).

The average temperature in the Nevada County area ranges from about 60 degrees Fahrenheit (F) at the lower elevations to about 55 degrees F at higher elevations in the eastern part of the County. Minimum temperatures are more affected by local variations in the terrain. The January average minimum temperature ranges from about 36 degrees F at the lower elevations to about 30 degrees F at about 4,500 feet of elevation. Average

Figure 2-7

Figure 2-7 (Backside)

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Figure 2-8 (backside)

maximum readings in July are in the 90s, and they range from about 92 degrees F at the higher elevations to nearly 98 degrees F at the lower elevations.

In general, prevailing winds in Nevada County blow from a southwesterly direction most of the year with a wind speed of less than 10 miles an hour. In summer, scattered thundershowers generally come from a south or southwesterly direction. At times they are accompanied by high winds. The winter storms also generally come from a south or southwesterly direction. Most of the precipitation falls when a southwest wind is blowing.

Winds from the north and east occasionally blow over the lower western slopes of the Sierra Nevada. In winter, these winds bring cold, dry weather. In spring and summer, however, these winds are warm and dry. As a result, they quickly remove moisture from the soil surface and dry out plants.

Relative humidity in the Nevada County vicinity ranges from about 90 percent at night to about 70 percent in the day during winter. In summer, the average relative humidity ranges from 80 percent at night to 25 percent during the day (NRCS, 1993).

2.9 Ecological Setting

General ecological assessments were conducted during the RI field program based on the observed habitats in the project area, including the reference areas, mine site, and downgradient areas to the confluence of CC with LGC. The habitat observed in the project area is classified using the classification system described by Mayer and Laudenslayer (1988). Habitats observed and mapped in the project area are represented on Figure 2-9.

2.9.1 Vegetation

The predominant vegetation type throughout the project area is the Ponderosa Pine vegetation type (Mayer and Laudenslayer, 1988). This vegetation type is characterized by a dominant overstory tree species of ponderosa pine (*Pinus ponderosa*) with lesser amounts of Douglas fir (*Pseudotsuga menziesii*), incense cedar *(Calocedrus decurrens*), and scattered interior live oak (*Quercus wislizenii*). Timber resources are a primary component of the vegetation within the Tahoe and Toiyabe National Forests, which account for 28 percent of Nevada County's land area. The shrub layer in the project area includes poison oak (*Toxicodendron diversilobum*), silk tassel bush (*Garrya elliptica*), manzanita (*Arctostaphylos* spp.), honeysuckle (*Lonicera hispidula*), and the invasive Scotch broom (Cystisus scoparius). Typical ground cover species included bear clover (*Chamaebatia foliosa*), bunchberry (*Cornus canadensis*), vetch (*Vicia* spp.), prickly lettuce (*Lactuca serriola*), and soap plant (*Chlorogalum pomeridianum*).

A review of current land cover conditions (based on field observations and reflected in the aerial photograph used for Figure 2-9) indicates numerous areas in the LCC and CC watersheds, where previous logging or land-clearing activities have occurred. Where logged timber stands have been allowed to regenerate, the forest types would be expected to consist of similar species but with uniformly young-age saplings with scattered site trees not harvested. Invasive (pioneer) species would also be expected in formerly logged areas until forest tree species are well established.

Insert Field surveys indicate that riparian corridors associated with LCC, CC, and LGC are representative of the Valley Foothill Riparian vegetation type described in Mayer and Laudenslayer (1988) and have similar overstory trees as described for the Ponderosa Pine type, except for the area between Lost Lake and LGC. This stream corridor has additional tree species, including Oregon ash (*Fraxinus latifolia*) and white alder (*Alnus rhombifolia*) in the overstory. The Deposition Area just upstream from Lost Lake (also a riparian zone) has a scattered tree overstory of cottonwood (*Populus fremontii*) along with Douglas fir and incense cedar. Major floristic differences between upland areas and riparian corridors were observed in the shrub and ground cover layers. The riparian shrubs are characterized by various willow species (*Salix* spp.), blackberry (*Rubus* sp.), Pacific dogwood (*Cornus nuttallii*), and bigleaf maple (*Acer macrophyllum*). Ground cover along the creeks consists of various hydrophytic ferns, grasses, rushes (*Juncus* spp.), and sedges (*Cyperus* spp.).

Along the Lost Lake-facing edge of the Deposition Area and at limited locations along the north side of the lake, there are small Freshwater Emergent Wetland vegetation type (see Mayer and Laudenslayer, 1988) areas. Field surveys indicate these areas are characterized by dense stands of cattail (*Typha latifolia*) and tule (*Scirpus acutus*).

A limited occurrence of Mixed Chaparral (as described in Mayer and Laudenslayer, 1988) is on the hill slopes above CC near the confluence with LGC and along Raccoon Mountain Road within the Site vicinity but outside of areas potentially affected by the releases from the Lava Cap Mine. These areas are floristically rich but are outside of the affected zone, so only cursory vegetation observations were made. These are characterized by predominantly shrub vegetation, including manzanita, silk tassel bush, scrub oak (*Quercus berberidifolia*), leather oak (*Quercus durata*), chamise (*Adenostoma faciculatum*), and toyon (*Heteromeles arbutifolia*).

Other areas where vegetation is not specifically mapped are the landscaped plantings associated with residential properties and disturbed or bare soil areas. Disturbed areas, such as the waste rock/tailings pile area and the areas around the abandoned mine buildings, contain a number of native and non-native (weedy) plant species that are associated with the habitat types already described. However, specific observations and mapping of plants in these highly variable areas were not completed as part of this assessment.

2.9.2 Fish

The aquatic habitats of the Lava Cap Mine Site vicinity are characteristic of the Central Valley foothills environment in being able to support both coldwater and warmwater fish. The creeks (Clipper, Little Clipper, and Little Greenhorn) are all dominated by trout. Most individuals are small rainbow trout (*Oncorhynchus mykiss*), with occasional larger brown trout (*Salmo trutta*) also present. Clipper Creek below Lost Lake has a small number of bluegills (*Lepomis macrochirus*) in addition to trout, showing the influence of warmwater flows or fish washed from the lake. Lost Lake is dominated by introduced warmwater fish species. Mosquitofish (*Gambusia affinis*), bluegill, and green sunfish (*Lepomis cyanellus*) dominate the shore zone and weedbeds, while largemouth bass (*Micropterus salmoides*) are found in deeper water and next to overhanging tree cover.

Figure 2-9 (11x17 color)

Figure 2-9 (backside)

2.9.3 Amphibians and Reptiles

The California red-legged frog, a federal threatened species and a California species of special concern, was observed in an onsite wetland by a biologist in 1985 (EPA, 1994). Other amphibians observed in the project area include California newt and bullfrog. Other amphibians that may occur onsite, but were not observed during the sampling period, include long-toed salamander, ensatina, and yellow-legged frog. Common reptiles observed during the sampling were western skink and gopher snake. Other reptiles that may occur onsite include western pond turtle, rubber boa, ringneck snake, striped racer, California mountain kingsnake, and common and western aquatic garter snake.

2.9.4 Birds

A variety of bird species can be found in different habitat types in the project area. Water-associated birds in the reservoir and riparian areas include wading birds, such as great blue heron and great egret; waterfowl, such as wood duck, mallard, cinnamon teal, hooded and common mergansers, and ruddy duck; and fish-eating birds, such as osprey and bald eagles. Other birds that may occur in the forested habitats are sharp-shinned hawks, Cooper's hawk, northern goshawk blue grouse, mountain quail, band-tailed pigeon, mourning dove, long-eared owl, northern flicker, willow flycatcher, yellow warbler, California towhee, dark-eyed junco, and others. Many birds use open areas in the forests for foraging. These species include merlin, California quail, loggerhead shrike, and song sparrow.

2.9.5 Mammals

The project area is in the range of many small and large mammals. Little brown myotis, Yuma myotis, western red bat, spotted bat, Townsend's big-eared bat, pallid bat, and western mastiff bat are seven species of bats that may occur in the site vicinity. Common small mammals include Virginia opossum, vagrant and ornate shrews, broad-footed mole, black-tailed jackrabbit, western gray squirrel, Douglas' squirrel, deer mouse, dusky-footed woodrat, California vole, and common muskrat. Small and large mammal predators that may use the project area include coyote, gray fox, black bear, ringtail, American martin, fisher, ermine, long-tailed weasel, American mink, western spotted skunk, striped skunk, mountain lion, and bobcat. Wild pig and mule deer may also occur in the area.

2.9.6 Potential Special Status Species

The Wildlife Habitat Relationships System database (CDFG, 1999a) was reviewed to determine the potential wildlife species that could be associated with habitats observed in the project area. Potential special-status wildlife species in habitats in the project area are summarized in Table 2-3. The California red-legged frog, a federal threatened species and a California species of special concern, was observed in an onsite wetland by a biologist in 1985 (EPA, 1994b). Potential special-status plant species found in habitats observed in the project area are summarized in Table 2-4. Non-listed (i.e., not special-status) wildlife species in the project area are summarized in Table 2-5.

TABLE 2-3
Summary of Special-Status Wildlife Species Potentially Occurring at or Near the Lava Cap Mine Site
Lava Cap Mine, Nevada County, California

Name	Scientific Name	Federal Status	State Status	Associated Habitat
Pacific fisher	*Martes pennanti pennanti*	FSC	CSC	Mature forest, snags
California horned lizard	*Phrynosoma coronatum frontale*	FSC	CSC	Mixed conifer, ruderal/barren
Northern goshawk	*Accipiter gentilis*	FSC	CSC	Mature forest, riparian
Long-toed salamander	*Ambystoma macrodactylum*	FE	CE	Forests
California newt	*Taricha torosa*		CSC	Riparian, cattail/bulrush
Ensatina	*Ensatina eschscholtzii*		CSC	Mixed conifer, cattail/bulrush
Western spadefoot	*Spea hammondii*		CSC	Cattail/bulrush
Red-legged frog	*Rana aurora*	FT	CSC	Lacustrine, cattail/bulrush
Foothill yellow-legged frog	*Rana boylii*		CSC	Lacustrine, cattail/bulrush
Mountain yellow-legged frog	*Rana muscosa*		CSC	Montane riparian, wet meadows
Western pond turtle	*Clemmys marmorata*		CSC	Lacustrine, cattail/bulrush
Western skink	*Eumeces skiltonianus*		CSC	Mixed conifer
Rubber boa	*Charina bottae*		CT	Montane forest
Striped racer	*Masticophis lateralis*	FT	CT	Chaparral, riparian
Gopher snake	*Pituophis melanoleucus*		CSC	Mixed conifer, cattail/bulrush
California mountain kingsnake	*Lampropeltis zonata*		CSC	Mixed conifer
Common garter snake	*Thamnophis sirtalis*	FE	CE	Cattail/bulrush
Western aquatic garter snake	*Thamnophis gigas*	FT	CT	Cattail/bulrush
Common loon			CSC	Lacustrine
American white pelican	*Pelecanus erythrorhynchos*		CSC	Ruderal/barren
Double-crested cormorant	*Phalacrocorax auritus*		CSC	Cattail/bulrush, ruderal/barren
Canada goose	*Branta canadensis*	FT		Lacustrine, cattail/bulrush
Osprey	*Pandion haliaetus*		CSC	Mixed conifer, cattail/bulrush, ruderal/barren
White-tailed kite	*Elanus leucurus*		CFP	
Bald eagle	*Haliaeetus leucocephalus*	FT	CE	Mixed conifer, cattail/bulrush, ruderal/barren
Northern harrier	*Circus cyaneus*		CSC	Mixed conifer, cattail/bulrush, ruderal/barren
Sharp-shinned hawk	*Accipiter striatus*		CSC	Mixed conifer, ruderal/barren

TABLE 2-3
Summary of Special-Status Wildlife Species Potentially Occurring at or Near the Lava Cap Mine Site
Lava Cap Mine, Nevada County, California

Name	Scientific Name	Federal Status	State Status	Associated Habitat
Cooper's hawk	*Accipiter cooperii*		CSC	Mixed conifer
Ferruginous hawk	*Buteo regalis*		CSC	Mixed conifer, cattail/bulrush, ruderal/barren
Golden eagle	*Aquila chrysaetos*		CFP	Mixed conifer, cattail/bulrush, ruderal/barren
Merlin	*Falco columbarius*		CSC	Mixed conifer, cattail/bulrush, ruderal/barren
Peregrine falcon	*Falco peregrinus*	FE	CE	Mixed conifer, cattail/bulrush, ruderal/barren
Prairie falcon	*Falco mexicanus*		CSC	Mixed conifer, cattail/bulrush, ruderal/barren
Sage grouse	*Centrocercus urophasianus*		CSC	Sagebrush chaparral, Mixed conifer
Sandhill crane	*Grus canadensis*		CT	Mixed conifer, cattail/bulrush
Long-billed curlew	*Numenius americanus*		CSC	Mixed conifer, cattail/bulrush, ruderal/barren
Baird's sandpiper	*Calidris bairdii*		CSC	Ruderal/barren
California gull	*Larus californicus*		CSC	Mixed conifer, cattail/bulrush, ruderal/barren
Black tern	*Chlidonias niger*		CSC	Mixed conifer, cattail/bulrush,
Burrowing owl	*Athene cunicularia*		CSC	Mixed conifer, ruderal/barren
Spotted owl	*Strix occidentalis caurina*	FT	CSC	Mature forest, snags
Long-eared owl	*Asio otus*		CSC	Mixed conifer
Short-eared owl	*Asio flammeus*		CSC	Mixed conifer, cattail/bulrush
Black swift	*Cypseloides niger*		CSC	Wet cliffs
Vaux's swift	*Chaetura vauxi*		CSC	Douglas fir, snags
Northern flicker	*Colaptes auratus*		CE	Mixed conifer
Willow flycatcher	*Epidonax traillii*	FE	CE	Willow thicket
Loggerhead shrike	*Lanius ludovicianus*	FE	CSC	Mixed conifer, ruderal/barren
Western scrub jay	*Aphelocoma californica*		CSC	Oak scrub, chaparral
Horned lark	*Eremophila alpestris*		CSC	Mixed conifer, ruderal/barren
Purple martin	*Progne subis*		CSC	Mixed conifer, cattail/bulrush

TABLE 2-3
Summary of Special-Status Wildlife Species Potentially Occurring at or Near the Lava Cap Mine Site
Lava Cap Mine, Nevada County, California

Name	Scientific Name	Federal Status	State Status	Associated Habitat
California thrasher	*Toxostoma redivivum*	FT		Chaparral, blackberry, wild grape
Yellow warbler	*Dendroica petechia brewsteri*		CSC	Woodlands, brushy understory
Common yellowthroat	*Geothlypis trichas*		CSC	Mixed conifer, cattail/bulrush
Yellow-breasted chat	*Icteria virens*		CSC	Willow, riparian thickets
Spotted towhee	*Pipilo maculatus*		CSC	Shrubs, riparian thickets
California towhee	*Pipilo crissalis*	FT	CE	Chaparral, willow thickets
Song sparrow	*Melospiza melodia*		CSC	Cattail/bulrush
Dark-eyed junco	*Junco hyemalis*		CSC	Forests, woodlands
Tricolored blackbird	*Agelaius tricolor*		CSC	Mixed conifer, cattail/bulrush
Vagrant shrew	*Sorex vagrans*		CSC	Mixed conifer
Ornate shrew	*Sorex ornatus*	FC	CSC	Mixed conifer, cattail/bulrush
Broad-footed mole	*Scapanus latimanus*		CSC	Mixed conifer
Little brown myotis	*Myotis lucifugus*		CSC	Chaparral, sagebrush, bitterbrush
Yuma myotis	*Myotis yumanensis*		CSC	Mixed conifer, cattail/bulrush
Spotted bat	*Euderma maculatum*		CSC	Mixed conifer
Townsend's big-eared bat	*Corynorhinus townsendii*		CSC	Mixed conifer, ruderal/barren
Pallid bat	*Antrozous pallidus*		CSC	Mixed conifer, ruderal/barren
Western mastiff bat	*Eumops perotis*		CSC	Woodlands, scrub, Mixed conifer
Brush rabbit	*Syvilagus bachmani*	PE	CE	Mixed conifer
Snowshoe hare	*Lepus americanus*		CSC	Montane riparian, alder, willow
Black-tailed hare	*Lepus californicus*		CSC	Mixed conifer
Mountain beaver	*Aplodontia rufa*	FE	CSC	Montane riparian, thimbleberry, salmonberry
Northern flying squirrel	*Glaucomys sabrinus*		CSC	Mature forests, snags
Deer mouse	*Peromyscus maniculatus*		CSC	Mixed conifer, cattail/bulrush, ruderal/barren
Dusky-footed woodrat	*Neotoma fuscipes*	FC	CSC	Forests, brushy understory

TABLE 2-3
Summary of Special-Status Wildlife Species Potentially Occurring at or Near the Lava Cap Mine Site
Lava Cap Mine, Nevada County, California

Name	Scientific Name	Federal Status	State Status	Associated Habitat
California vole	*Microtus californicus*	FE	CE	Mixed conifer, cattail/bulrush
Red fox	*Vulpes vulpes*		CT	Mixed conifer, ruderal/barren
Ringtail	*Bassariscus astutus*		CFP	Mixed conifer, ruderal/barren
American marten	*Martes americana*		CSC	Dense forests, snags
Wolverine	*Gulo gulo luteus*		CT	Mixed conifer forest
Northern river otter	*Lontra canadensis*		CSC	Cattail/bulrush
Western spotted skunk	*Spilogale gracilus*		CSC	Mixed conifer
Mountain lion	*Puma concolor*		CFP/ CSC	Mixed conifer

Source: CDFG, 2000; CDFG, 1999a

Federal Status Codes

FE federally listed endangered
FT federally listed, threatened
PE federally proposed, endangered
FC federal candidate for listing, enough data on file to support federal listing

FSC – These species were formerly known as Category 2 Candidates. The United States Fish and Wildlife Service (USFWS) does not have enough scientific information to support a listing proposal for these species. As of February 28, 1996, the USFWS no longer maintains a list of species of Category 2 Candidates. The Service is still concerned about these species and continues to gather information about them.

State Status Codes
CE State-listed, endangered
CT State-listed, threatened
CFP California fully protected
CSC California Species of Special Concern

TABLE 2-4
Summary of Special-Status Plant Species Potentially Occurring at or Near the Lava Cap Mine Site
Lava Cap Mine, Nevada County, California

Name	Scientific Name	Federal Status	State Status	Associated Habitat
Scadden flat checkerbloom	*Sidalcea stipularis*	FSC	CE	Marshes
Red-anthered rush	*Juncus marginatus var. marginatus*		CNPS 2	Marshes
Cantelow's lewisia	*Lewisia cantelovii*		CNPS 1B	Broadleaf upland forest, chaparral, lower montane conifer forest
Butte County fritillary	*Fritillaria eastwoodiae*	FSC	CNPS 1B	Chaparral, lower montane conifer forest
Bog club-moss	*Lycpodiella inundata*		CNPS 2	Marshes, lower montane conifer forest

Source: CDFG, 2000; Skinner and Pavlik, 1994

Federal Status Codes

FSC – These species were formerly known as Category 2 Candidates. The United States Fish and Wildlife Service (USFWS) does not have enough scientific information to support a listing proposal for these species. As of February 28, 1996, the USFWS no longer maintains a list of species of Category 2 Candidates. The Service is still concerned about these species and continues to gather information about them.

State Status Codes
CE state listed, endangered

CNPS Status Codes
1B plants rare, threatened, or endangered in California and elsewhere
2 plants rare, threatened, or endangered in California, but more common elsewhere

TABLE 2-5
Summary of Non-Special-Status Wildlife Species Potentially Occurring at or Near the Lava Cap Mine Site
Lava Cap Mine, Nevada County, California

Name	Scientific Name	Associated Habitat
Bullfrog	*Rana catesbeiana*	Mixed conifer, cattail/bulrush
Ringneck snake	*Diadophis punctatus*	Mixed conifer, cattail/bulrush
Great blue heron	*Ardea herodias*	Mixed conifer, cattail/bulrush
Great egret	*Ardea alba*	Mixed conifer, cattail/bulrush
Greater white-fronted goose	*Anser albifrons*	Mixed conifer, cattail/bulrush
Snow goose	*Chen caerulescens*	Mixed conifer, cattail/bulrush
Ross' goose	*Chen rossii*	Mixed conifer, cattail/bulrush
Wood duck	*Aix sponsa*	Cattail/bulrush
Gadwall	*Anas strepera*	Mixed conifer, cattail/bulrush

TABLE 2-5
Summary of Non-Special-Status Wildlife Species Potentially Occurring at or Near the Lava Cap Mine Site
Lava Cap Mine, Nevada County, California

Name	Scientific Name	Associated Habitat
Eurasian wigeon	*Anas penelope*	Mixed conifer, cattail/bulrush
American wigeon	*Anas americana*	Mixed conifer, cattail/bulrush
Mallard	*Anas platyrhynchos*	Mixed conifer, cattail/bulrush
Blue-winged teal	*Anas discors*	Mixed conifer, cattail/bulrush
Cinnamon teal	*Anas cyanoptera*	Mixed conifer, cattail/bulrush
Northern shoveler	*Anas clypeata*	Mixed conifer, cattail/bulrush
Northern pintail	*Anas acuta*	Mixed conifer, cattail/bulrush
Green-winged teal	*Anas crecca*	Mixed conifer, cattail/bulrush
Canvasback	*Aythya valisineria*	Cattail/bulrush
Redhead	*Aythya americana*	Cattail/bulrush
Ring-necked duck	*Aythya collaris*	Cattail/bulrush
Greater scaup	*Aythya marila*	Mixed conifer, cattail/bulrush
Lesser scaup	*Aythya affinis*	Mixed conifer, cattail/bulrush
Bufflehead	*Bucephala albeola*	Cattail/bulrush
Common goldeneye	*Bucephala clangula*	Lacustrine waters
Hooded merganser	*Lophodytes cucullatus*	Cattail/bulrush
Common merganser	*Mergus merganser*	Cattail/bulrush
Ruddy duck	*Oxyura jamaicensis*	Cattail/bulrush
Chukar	*Alectoris chukar*	Mixed conifer, brush/scrub
Ring-necked pheasant	*Phasianus colchicus*	Mixed conifer, cattail/bulrush
Blue grouse	*Dendragapus obscurus*	Mature mixed conifer, brushy or open
Wild turkey	*Meleagris gallopavo*	Mixed conifer
Mountain quail	*Oreortyx pictus*	Mixed conifer
California quail	*Callipepla californica*	Mixed conifer
Common moorhen	*Gallinula chloropus*	Cattail/bulrush
American coot	*Fulica americana*	Mixed conifer, cattail/bulrush
Common snipe	*Gallinago gallinago*	Cattail/bulrush
Band-tailed pigeon	*Columba fasciata*	Oak-conifer woodland
Mourning dove	*Zenaida macroura*	Open woodlands, Mixed conifer
American crow	*Corvus brachyrhynchos*	Mixed conifer
Virginia opossum	*Didelphis virginiana*	Mixed conifer, cattail/bulrush

TABLE 2-5
Summary of Non-Special-Status Wildlife Species Potentially Occurring at or Near the Lava Cap Mine Site
Lava Cap Mine, Nevada County, California

Name	Scientific Name	Associated Habitat
Western red bat	*Lasiurus blossevillii*	Mixed conifer, cattail/bulrush
Mountain cottontail	*Sylvilagus nuttallii*	Sagebrush, montane riparian
Desert cottontail	*Sylvilagus audubonii*	Mixed conifer
Lodgepole chipmunk	*Tamias speciosus*	Open forests, lodgepole pine
Western gray squirrel	*Sciurus griseus*	Mixed conifer, oak
Douglas' squirrel	*Tamiasciurus douglasii*	Mixed conifer, cattail/bulrush, ruderal/barren
American beaver	*Castor canadensis*	Mixed conifer, cattail/bulrush
Common muskrat	*Ondatra zibethicus*	Cattail/bulrush
Coyote	*Canis latrans*	Mixed conifer, cattail/bulrush, ruderal/barren
Gray fox	*Urocyon cinereoargenteus*	Mixed conifer, cattail/bulrush
Black bear	*Ursus americanus*	Mixed conifer
Raccoon	*Procyon lotor*	Mixed conifer, cattail/bulrush
Ermine	*Mustela erminea*	Mixed conifer, cattail/bulrush
Long-tailed weasel	*Mustela frenata*	Mixed conifer
American mink	*Mustela vison*	Cattail/bulrush
American badger	*Taxidea taxus*	Mixed conifer, ruderal/barren
Striped skunk	*Mephitis mephitis*	Mixed conifer, cattail/bulrush
Bobcat	*Lynx rufus*	Mixed conifer, cattail/bulrush
Wild pig	*Sus scrofa*	Mixed conifer
Mule deer	*Odocoileus hemionus*	Mixed conifer, cattail/bulrush

Source: CDFGB, 2000; CDFG, 1999a