

**BEARDSLEY-EXCELSIOR MINE  
PRELIMINARY ASSESSMENT REPORT  
CUSTER COUNTY, IDAHO**

**STATE OF IDAHO  
DEPARTMENT OF ENVIRONMENTAL QUALITY**

October 2003

Submitted To:  
U.S. Environmental Protection Agency  
Region 10  
1200 Sixth Avenue  
Seattle, WA 98101



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10  
1200 Sixth Avenue  
Seattle, WA 98101

January 30, 2004

Reply To  
Attn Of: ECL-115

Robert C. Cummings  
Attorney at Law  
336 S. Main Street  
Garland, Utah 84312

Dear Mr. Cummings:

The Idaho Department of Environmental Quality (DEQ) has completed a report summarizing the findings of a visit conducted at the Beardsley-Excelsior Mine site in July, 2003. A copy of the report, called a Preliminary Assessment, is enclosed.

Based on a review of this assessment, EPA has determined that no further action is warranted at the site. A no further action designation means that no additional steps under the Federal Superfund Program will be taken at the site unless new information warranting further Superfund consideration is discovered. EPA's no further action designation does not relieve your facility from complying with appropriate Idaho state regulations.

In accordance with EPA's decision regarding the tracking of no further action sites, the above named site will be removed from the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) data base and placed in a separate archival data base as a historical record. Archived sites may be returned to the CERCLIS site inventory if new information necessitating further Superfund consideration is discovered.

We appreciate your cooperation during the site visit. If you have any questions, please feel free to contact me at (206)553-2782.

Sincerely,

A handwritten signature in black ink, appearing to read "Ken Marcy".

Ken Marcy  
Site Assessment Manager

Enclosure

cc: Bruce Schuld, Idaho Department of Environmental Quality  
Monica Lindeman, US EPA, ECL-115  
Craig Conant, EPA SF Records Center, ECL-076

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## LIST OF ACRONYMS

<u>Acronym</u>	<u>Definition</u>
amsl	above mean sea level
ATV	All Terrain Vehicle (a.k.a. 4-wheeler)
bgs	below ground surface
DEQ	Idaho Department of Environmental Quality
EPA	United States Environmental Protection Agency
gpm	gallons per minute
PPE	Probable Point of Entry
ppm	parts per million
TDL	Target Distance Limit
TMDL	Total Maximum Daily Load
303 (d)	Section of the Clean Water Act in Idaho

## 1. INTRODUCTION

The Department of Environmental Quality (DEQ) was contracted by Region 10 of the United States Environmental Protection Agency (EPA) to provide technical support for completion of a preliminary assessment (PA) at the Beardsley-Excelsior Mine site located near Challis, Idaho, in Custer County. DEQ completed PA activities in accordance with the goals listed below.

The specific goals for the Beardsley-Excelsior Mine PA, identified by the DEQ, are:

- Determine the potential threat to public health or the environment posed by the site.
- Determine the potential for a release of hazardous constituents into the environment.
- Determine the potential for placement of the site on the National Priorities List.

Conducting the PA included reviewing existing site information, collecting receptor information within the site's range of influence, determining regional characteristics, and conducting a site visit. This document includes a discussion of site background information (Section 2), a discussion of migration/exposure pathways and potential targets (Section 3), and a list of pertinent references. Photographic documentation is included in Appendix A.

2. SITE BACKGROUND

2.1 SITE LOCATION

Site Name: Beardsley-Excelsior Mines

CERCLIS ID No.:

Location: Custer County, Idaho

Latitude: 44° 24' 10"N

Longitude: 114° 18' 27"W

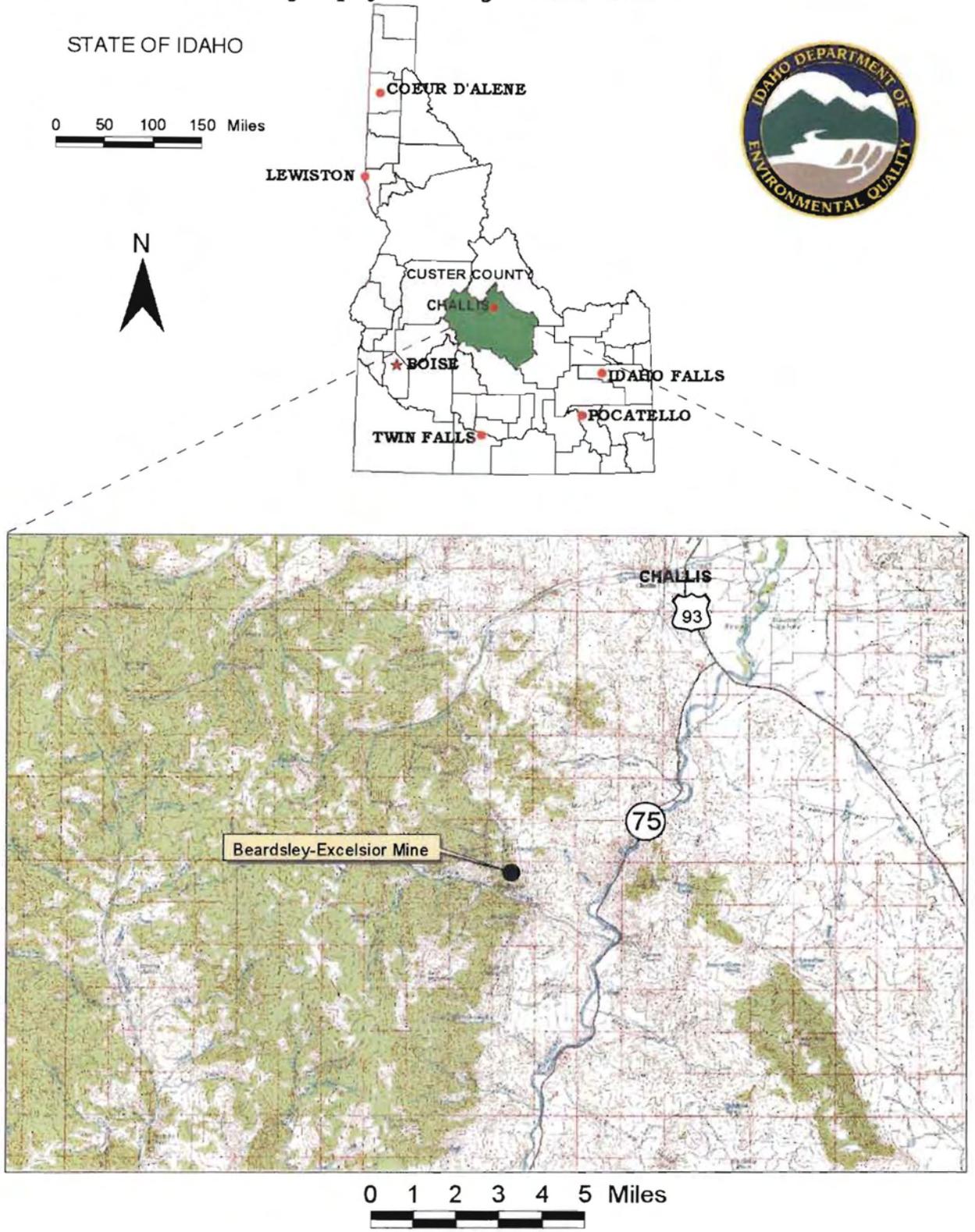
Legal Description: Section 2, Township 12N, Range 18E, Boise Meridian

Congressional District: Idaho

Site Owner: Estate of Richard S. Johnson  
Richard C. Cummings

Site Contact: Robert C. Cummings,  
Attorney at Law  
336 S. Main Street  
Garland, Utah 84312  
(810) 257-0325

**FIGURE 2-1. Site Vicinity Map of Beardsley-Excelsior Mine**



## 2.2 SITE DESCRIPTION/OWNERSHIP HISTORY

The Beardsley-Excelsior Mines are located within the Bayhorse Mining District in Custer County, Idaho, approximately 34 miles northeast of Stanley, Idaho, 10 miles southwest of Challis, Idaho, and 0.50-1.0 miles north of the former townsite of Bayhorse, Idaho (Figure 2-1). The Beardsley and Excelsior mines share the ore body, but the Beardsley had extensive development and was a major producer in the Bayhorse mining district. The Excelsior resides upon a single patented claim along the eastside of Beardsley Gulch. The Beardsley is comprised of four patented claims, located approximately 0.10 miles north from the Excelsior on the eastside of Beardsley Gulch and lies approximately 0.6 miles southeast of the Pacific Mine. Both properties are accessed from Forest Road 052, the former Challis Wagon Road.

Though both mines were probably discovered in the 1870s and began producing in 1880, but historical records do not reveal the original owner(s) of either mine. Both properties were acquired by the Ramshorn Mines Company in 1920 (Mitchell, 1999). From 1920 to 1926, the Ramshorn Mining Company consolidated the Beardsley and Excelsior workings into one operation. Lessees operated the mine after 1926 with ore production recorded in 1948 (ibid.).

Initially, the Beardsley-Excelsior mines consist of several tunnels, two inclines, and a winze that extended 500 feet (Umpleby, 1913). In 1957-58, when the Bunker Hill Company conducted exploration activities, underground workings had extended to 2,380 feet. Though minor amounts of lead-zinc minerals were identified, no further commercial grade ore was delineated at the Beardsley-Excelsior (Chambers, 1966).



**Photo 1**

View to southeast from Pacific Mine road, prospects (2) at top right, Excelsior adit at right center, Beardsley adit to the right of shed, and collapsed ore chute on waste rock dump.

## 2.3 SITE OPERATIONS AND WASTE CHARACTERISTICS

The Bayhorse anticline is “one of the largest and longest anticlines in this part of Idaho” (Ross, 1937, p.75). The northern portion of the anticline encompasses the Bayhorse district and includes the Ramshorn Slate (Ordovician), the Bayhorse Dolomite (lower Ordovician-Cambrian) and the Garden Creek Phyllite (Cambrian) formations. The Beardsley-Excelsior was developed entirely within the Bayhorse Dolomite (Chambers, 1966). The ore deposits in the Bayhorse district appear as elongated lenses or ovoid pipe-like bodies, occurring as veinlets, disseminations, breccia fillings, and massive or discontinuous replacements (Worl, et al, 1989). Chambers noted that the Beardsley-Excelsior’s suite of ore minerals is the same as the Pacific’s, forming as “breccia-filling deposit traversed by veinlets that have followed small strike-slip faults which the ore has spread out to fill portions of the breccia zone” (1966, pp.125-26). Contrarily, Ross (1937) suggests the Beardsley-Excelsior’s ore be best described as a replacement deposit.

The mineral deposits of the Beardsley-Excelsior consist chiefly of lead and silver with lesser copper values. The principal ore mineral is argentiferous galena which occurs in tabular bunches “range from lumps the size of baseballs to masses 14 to 15 feet across” (Umpheby, 1913, p.60). Zinc minerals appear more oxidized than the lead minerals and smithsonite and calamine (cadmium) are more abundant than sphalerite (Chambers, 1966). Quartz, calcite and siderite are the chief gangue minerals with fluorite subordinate and tetrahedrite, sphalerite, pyrite and chalcopyrite quantities are limited (ibid.).

Bell (1901) reported production from 1880 until 1901 at the Beardsley-Excelsior as 15,000 tons of lead and 1,500,000 ounces of silver. Umpheby (1913) described that the high-grade ore ran 40 to 60% lead, 2 to 3% copper, and 50 to 60 ounces silver per ton. Mitchell (1999, p.26) notes: “Total recorded production for the Beardsley Mine between 1880 and 1948 was 25,188 tons of ore which yielded 8 ounces of gold, 1,506,936 ounces of silver, 2,274 pounds of copper, and 30,057,006 pounds of lead”. Chambers (1966, p.139) suggests “The value of this production was \$2,500,000, the largest of any of the mines in the dolomite near Bayhorse”.

One of the Beardsley-Excelsior’s adits was open. However, the adit appeared to be collapsed beyond the portal. An excavated area of dolomite north of this adit appears to be the collapsed remains of two adits. The Excelsior adit is collapsed and partially obscured by vegetation. Two prospects located approximately 400 feet above the Excelsior’s adit, appear to be shallow adits or possibly air shafts, as the associated waste rock dumps were small. An iron grating covers the southernmost prospect. Tan to light gray colored dumps lie immediately down slope from each of these adits (see Photo 1).

The U. S. Geological Survey (USGS) conducted the only previous known work near the Bayhorse townsite between 1965 and 1988. Unconsolidated sediments survey data was compiled by the USGS for the Rock Analysis Storage System (RASS) database, at several locations within the Bayhorse Mining District. The data represent geochemical analyses of sediment samples.

One RASS sample was collected along Beardsley Gulch approximately 0.5 miles upstream from the mine site near the intersection of Forest Roads 052 and 378 (northeast of the Pacific Mine). Metals analysis indicated 50 ppm silver, 500 ppm arsenic, 50 ppm cadmium, 200 ppm chromium, 200 ppm copper, 7,000 ppm lead, and 500 ppm zinc.

## 2.4 DEQ ACTIONS

DEQ conducted a site visit on July 8, 2003. The owner of the property, Umont Mining Co., was not present during the site visit, though DEQ discussed the site visit with Kirk Hansen, employed by the Umont Mining Company as caretaker for the old Bayhorse town site. Mr. Hansen granted DEQ access through the Bayhorse town site to Beardsley Gulch. The mine lies approximately 0.6 miles north from the Bayhorse Mill and lies along the eastern slope of Beardsley Gulch.

The site can be accessed from the north via Forest Road 052, which branches off Forest Road 264, the Keystone Mine road. However, the southern approach is blocked from the Bayhorse Creek Road (Forest Road 051) at the Bayhorse townsite and is posted with "Private Property" and no trespassing signage. Approximately 0.25 miles above Bayhorse, Forest Road 052, is gated to contain livestock.

Site features include a maintenance shed containing a 200-gallon diesel fuel tank, a 500-gallon steel-riveted pressure tank, the remnants of an ore chute, four adits, two prospects and associated dumps, and a newly constructed elevated haul track. However, this haul track does not appear to connect to Beardsley-Excelsior workings, but to an unknown property located on the west slope of Beardsley Gulch. The adit's construction appears more recent, corresponding to that of the haul track. The adit was driven into the Bayhorse Dolomite formation and may be caved beyond the portal. The remains of a portal shed and maintenance building lie adjacent to the adit. Historically, the Hood Prospect was located approximately 300 feet in elevation above this adit. Perhaps, the tunnel was driven to intersect the ore body associated with the Hood Prospect?



**Photo 2**

Maintenance shed, diesel fuel tank (center background) generator (left & center)



**Photo 3**  
Collapsed ore chute on waste rock dump, pressure tank (left, center)

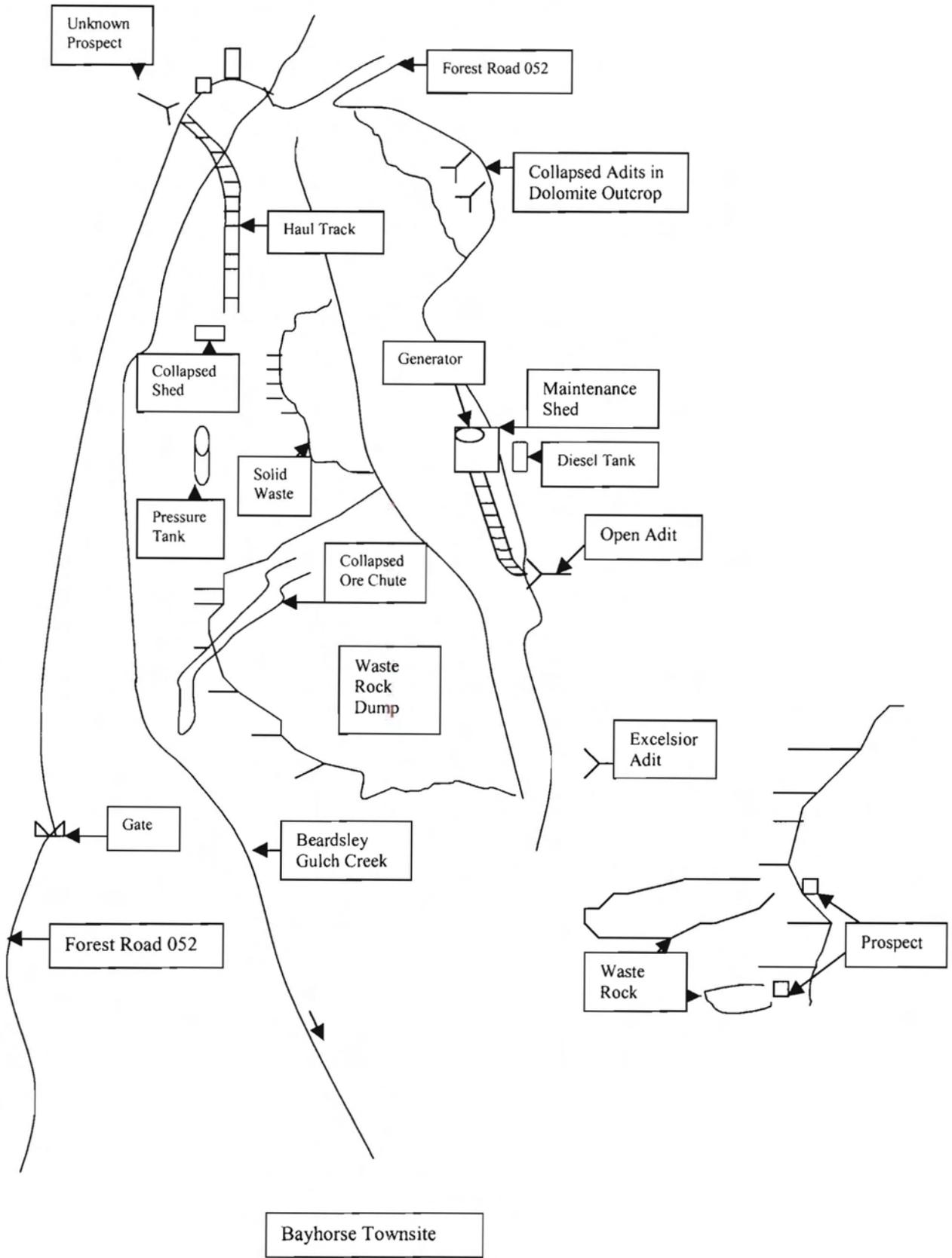


**Photo 4**  
Open adit (right center), maintenance shed (background)



**Photo 5**  
Ore haul track from unnamed prospect, shed remains (left)

**SITE MAP**  
**Figure 2-2**



### 3. MIGRATION/EXPOSURE PATHWAYS AND TARGETS

The following sections describe migration/exposure pathways and potential targets within the site's range of influence (Figures 3-1 and 3-2). Receptors in the area have been identified as seasonal recreationists including occasional tourists, hikers, campers, hunters and snowmobilers.

#### 3.1 GROUND WATER MIGRATION PATHWAY

The Beardsley-Excelsior ore body is located high on the eastside of the Bayhorse anticline and is confined by an upper slate formation and interbedded slate member (Chambers, 1966). The country rock is calcareous or dolomitic and contains various amounts of sand or silt. The impervious shale zones, now metamorphosed as slates, “trapped ascending ore-forming solutions in the underlying carbonate strata” (Worl, et al, 1989, p.62). Post-mineral silicification cemented the brecciated ore zones, thus limiting subsequent solution movement.

“The Beardsley-Excelsior Mine is in a rotated fault block low on the eastern flank of the Bayhorse anticline. In response to compressive forces, the fault block was rotated in a counterclockwise direction, and strong northeasterly-trending faults were developing. A complimentary set of faults, striking northwesterly and dipping southwest, is less strongly developed” (Chambers, 1966, p.139).

In the absence of groundwater monitoring wells in the area, ground water is assumed to exist within fractures and joints in the bedrock and within the unconsolidated deposits. In the arid and the semiarid parts of the Basin and Range, which includes the Beardsley-Excelsior, most precipitation replenishes soil moisture, evaporates, or is transpired by vegetation. Little is left to maintain streamflow or to recharge aquifers (Whitehead, 1994).

No precipitation data is available for the Beardsley-Excelsior. Therefore, precipitation data, maintained from 1931 through 1996, was used from Challis located 7 miles northeast and at an elevation of 5,288 feet amsl. The mean annual precipitation is 7.40 inches, and the 100-year, 24-hour event is 1.85 inches (WRCC, 2003).

There are nine domestic water wells located within the 4-mile Target Distance Limit (TDL).

<u>Distance from Site (miles)</u>	<u>Direction</u>	<u>Water Table Depth (feet)</u>
2.5	southeast	4
2.7	southeast	12
3.0	southeast	10
3.6	southeast	25 & 27
4.0	southeast	0, 30, 35 & 48

It is estimated that 12.5 people are served by these wells, based upon the average number of persons per household in Custer County (DOC, 2002).

### 3.2 AIR MIGRATION PATHWAY

DEQ observed three (3) employees of The Rocks Works operating a slate excavation enterprise near the Upper Ramshorn adit, approximately 3.25 miles west from the site. The Rocks Works mines the slate during a 40 hour per week schedule and expects to operate from June through September.

The site is situated within a steep-walled canyon, comprised of unconsolidated sediments and rock detritus. Vegetation is sparse, mainly sagebrush and grasses, while cottonwood, conifer and aspen trees dot the intermittent stream channel of Beardsley Gulch.

The waste rock dumps appear moderately compacted, though sloughing along the steeper slopes is expected. The likelihood of aerial dispersal from the dumps appears remote.

### 3.3 SOIL EXPOSURE PATHWAY

The Beardsley-Excelsior is easily accessible from the adjacent Forest Road 052, though only from the north. The site is only fenced along the southern boundary of Beardsley Gulch where the barrier limits livestock grazing and protects private property rights of the townsite of Bayhorse. There are no workers or residences within 200 feet from the site. No schools or day-care facilities are located within 200 feet from the site.

At the time of the site visit, DEQ observed cattle grazing near the creek and deer on the slopes above the mine site. Direct observation did not reveal recent activity by recreationists, though spent ammunition cartridges were noted (i.e., hunters).

### 3.4 SURFACE WATER MIGRATION PATHWAY

Direct observation indicated fine to medium grained silty-sand exists in shallow horizons across the slope along Beardsley Gulch. Beardsley Gulch is a V-shaped, moderate gradient intermittent stream littered with semi-angular slate and dolomite boulders. The stream was observed to cease flowing above the streambed at several locations within the gulch. Based upon direct observation of flow within Beardsley Gulch, a moderate to high infiltration rate is expected.

Beardsley Gulch enjoins Bayhorse Creek in the old townsite of Bayhorse near the eastern flank of the former smelter's slag pile. Bayhorse Creek is a V-shaped, steep gradient stream littered with boulders in its upper reaches while its lower reaches traverse grazing and agricultural fields and feature beaver dammed ponds.

Commercial and subsistence fishing are not conducted within the surface water Target Distance Limit (TDL). Sport fishing may occur on Bayhorse Creek, as rainbow trout were observed in the stream. However, direct observation did not illuminate the presence of fishing activity. Direct observation revealed sports fishing activity down stream on the Salmon River. Fish catch data, however, could not be determined.

Known to populate the Salmon River, the bull trout (*Salvelinus confluentus*) are listed as a threatened species, while sockeye (*Oncorhynchus (=Salmo) nerka*) and Chinook salmon (*Oncorhynchus (=Salmo) tshawytscha*) are listed as both threatened and endangered species (FWS, 2003).

The gray Wolf (*canis lupus*) is listed as a threatened species and known to populate 95% of the area within a 4-mile radius of the mine. The North American Wolverine (*Gulo gulo luscus*) is listed as a watch specie and known to populate the area 3.25 miles west from the mine (ibid.). Botanical species of concern include the Wavy-Leaf Thelypody (*Thelypodium repandum*), located at 2.3 and 2.5 miles east, 1.89, 2.07, 2.89 and 3.83 miles southeast, and the Challis Milkvetch (*Astragalus amblytropis*), located at 2.3 miles east and 3.83 miles southeast from the mine (IDF&G, 2003).

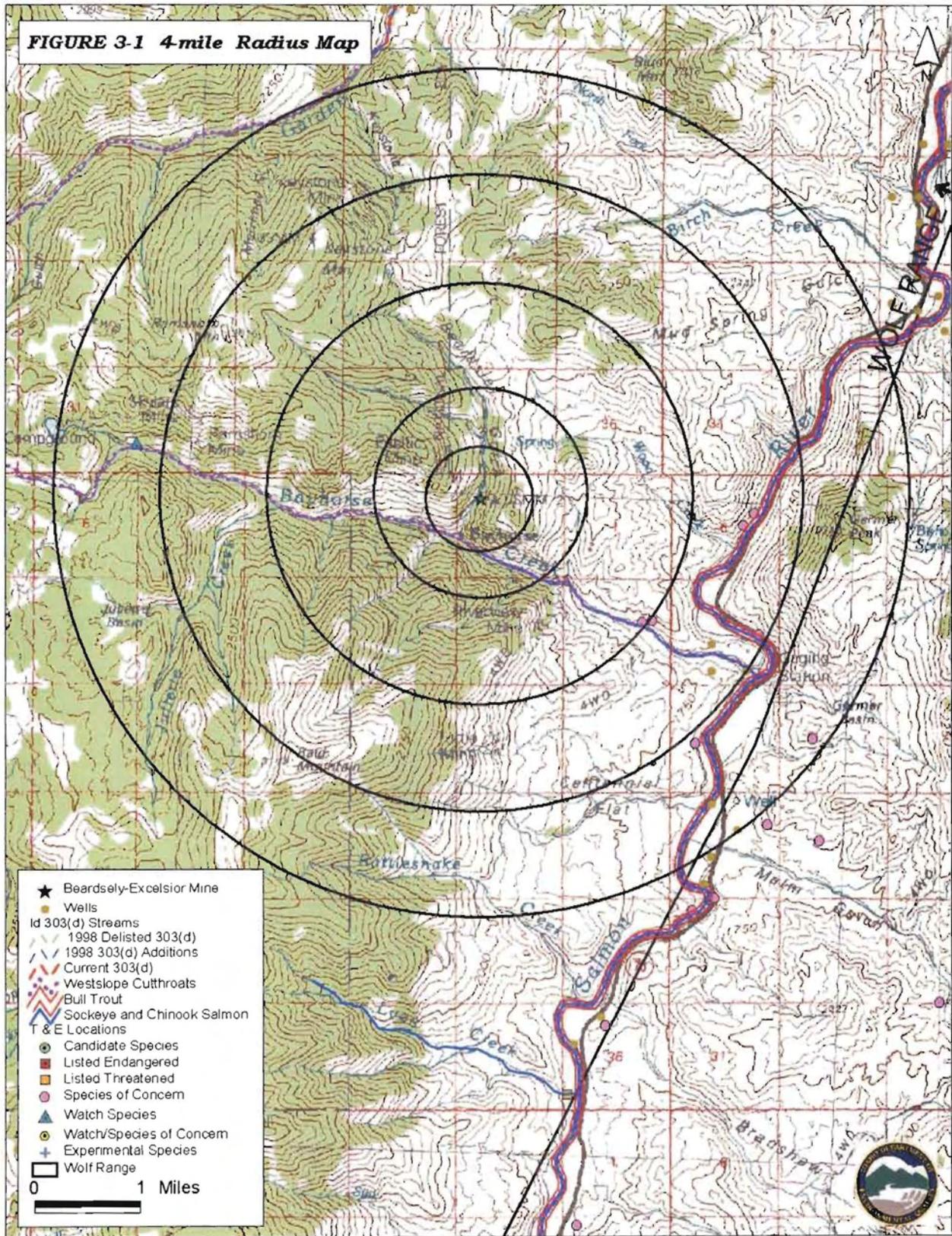
The use of surface water for watering of livestock and irrigation is evident below the old townsite of Bayhorse. Elk, deer and golden eagles were noted by direct observation.

Beardsley Gulch, Bayhorse Creek and the Salmon River are located within the site's TDL. Approximately 2.1 miles down stream from the Beardsley-Excelsior, beaver ponds were constructed within the channel of Bayhorse Creek. Though direct observation failed to identify a beaver population, the ponds appeared fresh and encompassed approximately 2.5 acres.

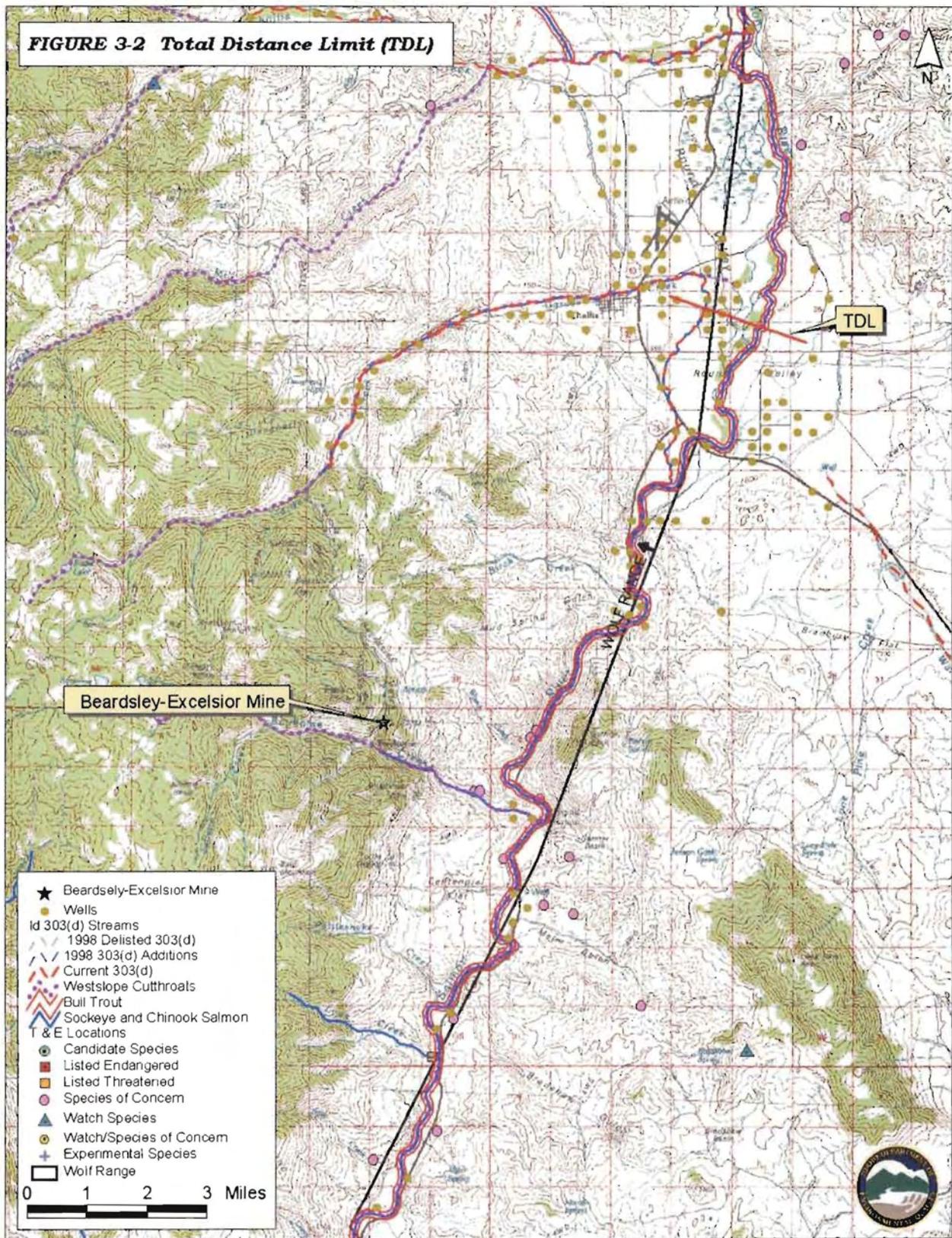
There are no drinking water intakes within the TDL. Traversing south, the surface water pathway merges with Bayhorse Creek at 0.6 miles. Traversing southeast, several unnamed creeks enjoin Bayhorse Creek before it merges with the Salmon River at 4.3 miles. Traversing north-northeast, the Salmon River continues within the TDL where it is enjoined by Wood Creek at 5.6 miles and by Birch Creek at 9.5 miles from the site. The Salmon River continues within the TDL for another 5.5 miles.

The lower 6 miles of the Salmon River within the TDL has been designated by DEQ under the Total Maximum Daily Load (TMDL) program as a 303(d) listed stream. The TMDL pollutants of concern are sediment and temperature.

**FIGURE 3-1 4-mile Radius Map**



**FIGURE 3-2 Total Distance Limit (TDL)**



## REFERENCES

- Bell, R.N., 1903 & 1917, *Report of Inspector of Mines*, Mining Industry of Idaho, Custer County
- Chambers, A.E., 1966, *Geology and Mineral Deposits of Part of the Bayhorse Mining District, Custer County, Idaho*, University of Arizona Ph.D. dissertation, 151 p.
- DEQ, Idaho Department of Environmental Quality, 2003, Personal Communication from R. Taylor, Technical Services Division.
- DOC, United States Department of Commerce, 2002. <http://eire.census.gov>
- FWS, United States Fish and Wildlife Service, 2003.  
[https://ecos.fws.gov/tess\\_public/E](https://ecos.fws.gov/tess_public/E)
- IDF&G, Idaho Department of Fish & Game, 2003.  
<http://www2.state.id.us/fishgame/info/cdc/plant.htm>
- IDWR, Idaho Department of Water Resources, 2003, *Well Construction Data*.  
<http://www.idwr.state.id.us/>
- Mitchell, V.E., August, 1999, *History of the Mines in the Bayhorse Area, Custer County, Idaho*, Idaho Geological Survey, Staff Report 99-8, 39 p.
- Ross, C.P., 1937, *Geology and Ore Deposits of the Bayhorse Region, Custer County, Idaho*, U.S. Geological Survey Bulletin 877, 161 p.
- Umpleby, J.B., 1913, *Some Ore Deposits in Northwestern Custer County, Idaho*, U.S. Geological Survey Bulletin 539, 104 p.
- U.S. Geological Survey, 2001, *Geochemistry of unconsolidated sediments in the US from the RASS database*: U.S. Geological Survey, Reston VA.
- Wells, M.W., 1983, *Gold Camps & Silver Cities*, Idaho Bureau of Mines and Geology, Bulletin No. 22, 2<sup>nd</sup> Edition, pp. 103-106
- Whitehead, R.L., 1994, *GROUND WATER ATLAS of the UNITED STATES Idaho, Oregon, Washington*, HA 730-H
- Worl, Ronald G, et al, 1989, *Mineral Resource Potential and Geology of the Challis National Forest, Idaho*, U.S. Geological Survey Bulletin No. 1873
- WRCC (Western Regional Climate Center), 2003.  
<http://www.wrcc.dri.edu/htmlfiles/id/id.ppt.ext.html>

## APPENDIX A

### PHOTO LOG

#### BEARDSLEY-EXCELSIOR MINE

- Photo 1 View to southeast from Pacific Mine road, prospects (2) at top right, Excelsior adit at right center, Beardsley adit to the right of shed, and collapsed ore chute on waste rock dump.
- Photo 2 View to east, maintenance shed, diesel fuel tank (center background) generator (left & center)
- Photo 3 View to north-northwest, collapsed ore chute on waste rock dump, pressure tank on lower waste rock bench (left, center).
- Photo 4 View to north-northeast, Beardsley adit (open) at right center, maintenance shed (background).
- Photo 5 View to northwest, ore haul track from unnamed prospect, Forest Road 052 (old Challis Wagon Road) in background at left.