

Koeninger Mine

(aka Koeninger, Silver Bullion No. 2, Maria, Redemption No. 2, and True Friend Patented Mining Claims)

Preliminary Assessment Report

Blaine County
State of Idaho



Idaho Department of Environmental Quality

November 2007

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



STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502

C.L. "Butch" Otter, Governor
Toni Hardesty, Director

November 27, 2007

Mr. Carl Massaro - President
Triumph Mineral, Incorporated
1217 Villa Place
Nashville, TN 37212

RE: Site Assessment of the Koeninger Mine (aka Koeninger, Silver Bullion, Maria, Redemption No. 2, True Friend and Bullion No. 2 Patented Mining Claims).

Dear Mr. Massaro:

The Idaho Department of Environmental Quality (IDEQ) has completed a review of historical mining data and geological information of the above referenced mining claims. Subsequent to that review, IDEQ conducted a site visit of the Koeninger mine and associated claims. During the site visit, mining facilities were mapped and sampled to complete a Preliminary Assessment (PA).

PAs are conducted according to the Federal Comprehensive Environmental Response, Compensation and Liabilities Act (CERCLA). The reasons to complete a PA include:

- 1) To identify those sites which are not CERCLIS caliber because they do not pose a threat to public health or the environment (No Remedial Action Planned (NRAP));
- 2) To determine if there is a need for removal actions or other programmatic management of sites;
- 3) To determine if a Site Investigation, which is a more detailed site characterization, is needed; and/or
- 4) To gather data to facilitate later evaluation of the release through the Hazard Ranking System (HRS)

IDEQ also completed PAs under contract with the U.S. Environmental Protection Agency in order to identify risks to human health and the environment, and make recommendations to land owners regarding how risks might be managed, if necessary.

Based on existing conditions and uses, historic information, background, mine waste and adit discharge samples were collected during the site visit. Subsequent to our analysis IDEQ has

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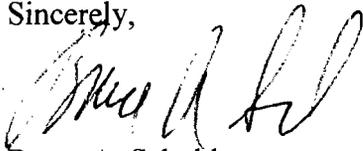
determined that No Remedial Action is Planned (NRAP) for this property. However, based on the historical information regarding mine development and production, and your discussion with us regarding potential residential and other developments of your properties IDEQ recommends that your development plans for this site, if any, should incorporate risk management provisions.

IDEQ did not note any dangerous openings or other physical hazards at the Koeninger Mine which should be managed or closed.

Attached is the Preliminary Assessment Report of the property and mine facilities. The report contains a brief mine history, limited geologic information, maps and additional discussion of observations made at the property. There are also photos of the mine waste dump, and a brief checklist of how IDEQ came to its recommendation that the property status will be NRAP.

IDEQ very much appreciates your cooperation and approval for our access, and looks forward to addressing any questions you may have regarding our findings. Please call me if you have any comments, questions, or I may be of any other assistance. We very much appreciate any feedback you can give us relative to our services.

Sincerely,



Bruce A. Schuld
Mine Waste Projects Coordinator
Waste Management and Remediation Division

Attachments

cc: Ken Marcie – U.S. Environmental Protection Agency
Bruce Wicherski – IDEQ State Office
Megan Stelma – Blaine County
Steve Moore – U.S. Bureau of Land Management
file

Introduction

This document presents the results of the Preliminary Assessment (PA) of the Koeninger Mine, aka Koeninger, Silver Bullion No. 2, Maria, Redemption No. 2, and True Friend patented mining claims. The Idaho Department of Environmental Quality (IDEQ) was contracted by Region 10 of the United States Environmental Protection Agency (EPA) to provide technical support for completion of PAs at various mines within the Mineral Hill Mining District in Blaine County, Idaho.

IDEQ often receives complaints or information about sites that may be contaminated with hazardous waste. These sites can include abandoned mines, rural airfields that have served as bases for aerial spraying, old landfills, illegal dumps, and abandoned industrial facilities that have known or suspected releases.

In February 2002, IDEQ initiated a Preliminary Assessment Program to evaluate and prioritize assessment of such potentially contaminated sites. Due to accessibility and funding considerations, priority is given to sites where potential contamination poses the most substantial threat to human health or the environment. Priority was also given to mining districts where groups or clusters of sites could be assessed on a watershed basis.

For additional information about the Preliminary Assessment Program, see the following:

http://www.deq.idaho.gov/waste/prog_issues/mining/pa_program.cfm

Access to assess the Koeninger Mine was provided by Mr. Carl Massaro in February of 2007.

Ownership

Triumph Mineral, Incorporated
Carl Massaro – President
1217 Villa Place
Nashville, TN 37212

United States of America
Department of Interior
U.S. Bureau of Land Management

Claims

Koeninger, Silver Bullion No. 2,
Maria, Redemption No. 2,
True Friend

Internal Unpatented Claim Fractions
and adjoining Unpatented Claims

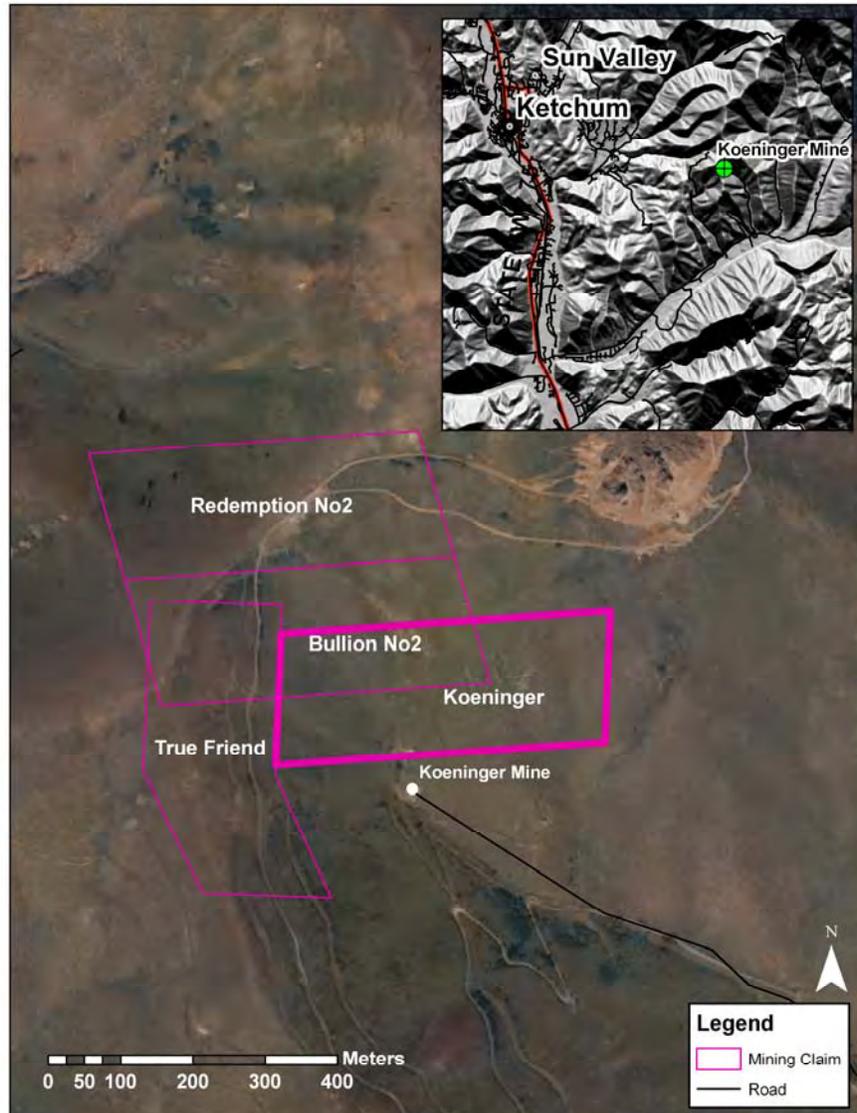
Although it appears that the mine workings are beneath patented mining claims, some of the waste dump materials and the entire road access to the site are on lands administered by the Department of Interior, Bureau of Land Management (BLM). Furthermore, the entire patented claims block is surrounded by BLM lands.

Patented Claims evaluated for this PA were selected because of their proximity to the surface expression of the mine workings and their location in the Courier Gulch sub-watershed. Parts of these claims extend over ridgelines and are also in the adjoining watersheds of North Star Gulch and Independence Gulch and will be discussed in PAs for those watersheds.

Site Background

Location

The Koeninger Mine is located near the head of Courier Gulch approximately 1 mile north north east of the Village of Triumph, Idaho, in Sections 14 & 23 Township 4 North, Range 18 East of the Boise Meridian, at Latitude 43 40' 00.08"N, and Longitude 114 16' 08.98"W. The mine is located in an ephemeral drain in the headwaters of Courier Gulch.

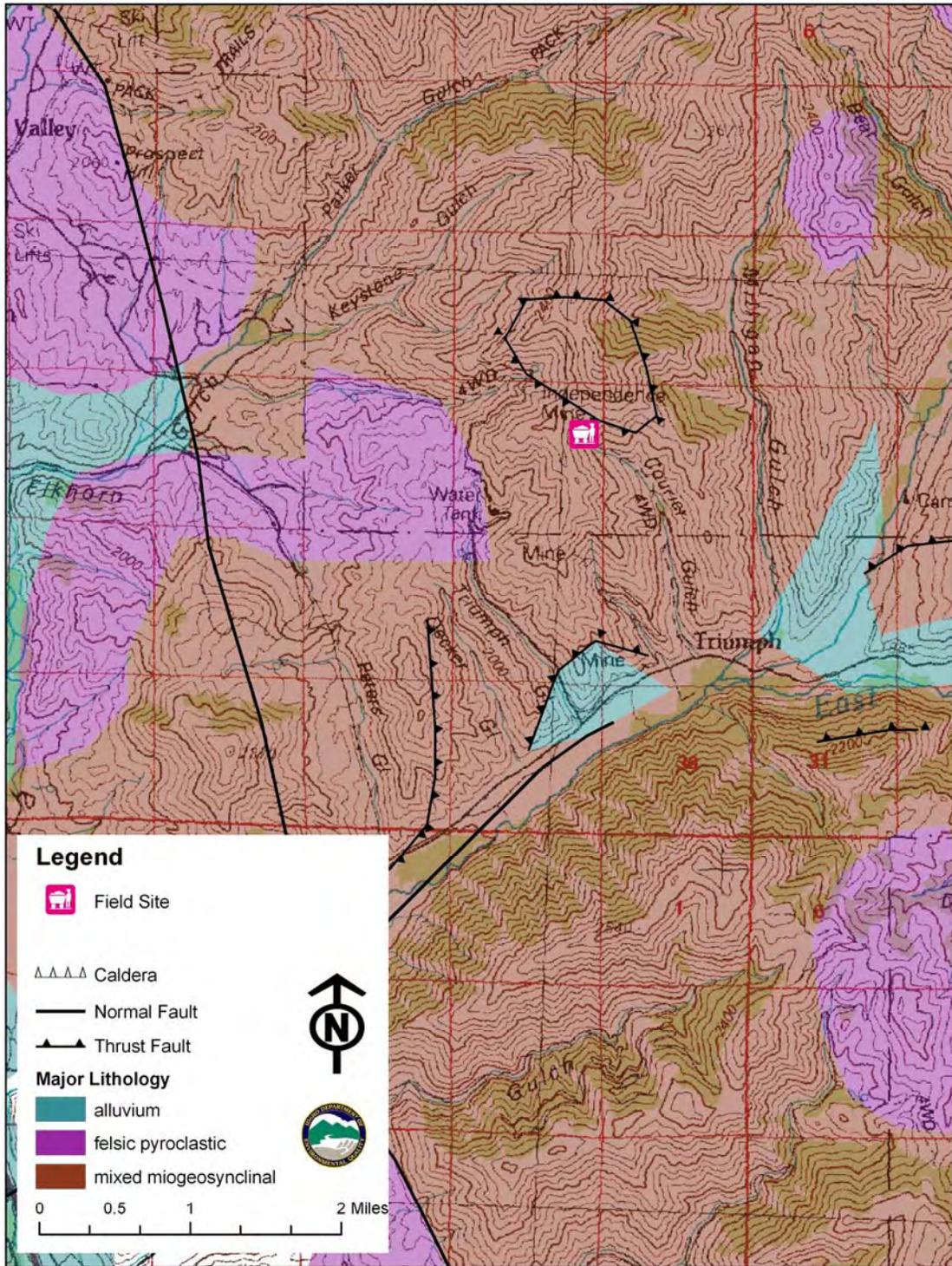


History

IDEQ did not find any historic references for the Koeninger Mine site or activities there.

Geology

Generally speaking, the mines in the Triumph area are hosted by rocks of the Devonian Milligen Formation. Ore occurs as mineralized fissures or shear zones, most of which strike west-northwest and dip to the southwest at moderate angles, and as replacement deposits at the intersection of mineralized shear zones and susceptible limestone beds. There are three main types of ore in the nearby Triumph and North Star mines. The fissure ores occur in pods and lenses ranging from a few inches to many feet in width; the ore minerals are galena, sphalerite, arsenopyrite and sulphantimonides (tetrahedrite and boulangerite) in a gangue of siderite and quartz. The bedded siliceous ores, which generally occur as replacement of limestone beds in the host rock, consist of galena and sphalerite in a gangue of quartz, siderite, and unmineralized country rock. The “complex” ores consist largely of sphalerite and galena in a pyrite gangue (the term “complex” referred to the metallurgical problems initially found in processing this ore). There is almost a complete replacement of the limestone beds by sulfides in the complex ore. This type of ore constituted the major production from the Triumph. The Independence ores were primarily in mineralized shear zones (Kiilsgaard et al, (1950).



Current Site Conditions

The “Koeninger” Mine was so designated by IDEQ after the central patented claim under which the workings are located. The mine workings are located in the SE ¼ of the NE ¼ of Section 23 T4N R18E BM, at approximately N 43 40’ 01.02”, W 114 16’ 9.56”. It is also located near the head of Courier Gulch approximately two miles north of the Village of Triumph.



The Koeninger Waste Dump (May 2007) contains approximately 4,500 yd³ of waste. It appears that the waste is primarily country rock, but minor amounts (<10 cubic yards) of ore are present. The ore was probably derived from free quartz veins along which massive sulfides were noted (in float). Sample KMWDSS1 was collected from a low grade area of waste representing the bulk of the dump.



Two caved adits were identified on top of the dump (May 2007). Both had significant development as indicated by the rail protruding from the caved workings, and the volume of drainage flowing from each of them. The flow has no visible indications of acid generation or metals precipitates, but was sampled (KMSW-1).



A small pond surrounded by lush riparian and wetlands vegetation was developed a number of years ago by a local rancher who grazed the area (verbal, Carl Massaro, May 2007). The wetlands, including the pond, are less than 20 feet in diameter.



Massive sulfide in a stock work quartz vein appears to have been the target of the miners. (May 2007)

Current and Potential Future Uses

This site is private property, but the land surrounding the site is public and currently used for recreation (bike riding, hiking and hunting) and grazing. The road access is shared with operators of an ornamental stone quarry on the ridge above Courier Gulch. However there is little evidence that the site is frequently visited by people, even during hunting season.

Although access to the mine is across BLM administered lands there is a potential for residential development at the site of the dump.

A third potential land use or change could be that of a land trade between the private land owner and the federal government. A land trade might result in the site's reverting back to public lands and public multiple-use.

SOURCES

The Koeninger Waste Dump (May 2007) contains approximately 4,500 yd³ of waste. It appears that the waste is primarily country rock that that minor amounts of ore are present. The ore was probably derived from free quartz veins along which massive sulfides were noted (in float). Sample KMWDSS1 was collected from a low grade area of waste representing the bulk of the dump.

The soils background sample KMBGSS-1 consisted of dark brown soil that was 100% minus 1 ½ inch rock and greater than 50% passed a 10 mesh sieve. There is also less than 10% organic material in the sample.

The majority of the Koeninger Mine Waste Dump appears similar to local diorite with little or no evidence of massive sulfide sample. However, a small amount (<10 cubic yards) of metaliferous waste was identified and sampled. Sample KMWDSS-01 was taken in dark brown to reddish brown coarse sandy soils, that contained very few (<10%) fines or organic material.

Two caved adits were identified on top of the dump (May 2007). Although flows from the adits weren't measurable, both appeared significant. The flow has no visible indications of acid generation or metals precipitates, but was sampled (KMSW-1).

Sample Analysis

Essentially, the mine waste concentrations for total arsenic, total cadmium, total chromium, total lead, total mercury, total silver and total zinc exceed Idaho's *Initial Default Target Levels* (IDTLs). These IDTLs are risk-based target levels for certain chemicals that have been developed by IDEQ using conservative input parameters, a target acceptable risk of 10^{-6} , and a *Hazard Quotient* of 1. An exceedence of the IDTLs indicates that if pathways are complete, and receptors can get a prolonged exposure to contaminants from the site, then additional site assessment work may be necessary to qualify true risk under current site conditions. An exceedence of the IDTLs may also be indicative of risks that may evolve under new site conditions if the site conditions change such as development for residential uses.

Total arsenic, total copper, total lead, total mercury, total silver and total zinc also exceed background levels by greater than three (3) times. Furthermore, waste rock concentrations of arsenic, cadmium and lead exceed removal benchmark values established for the Triumph Mine Site Cleanup of 300 ppm, 5 ppm and 1000 ppm respectively. Generally speaking these would trigger removal and or other remedial action if there were a connection to residential receptors or if this was located on a community roadway.

Koeninger Mine Soil Samples

| | IDEQ IDTL Values | Koeninger Mine Background | Koeninger Mine Waste Dump |
|-------------|------------------|---------------------------|---------------------------|
| | IDTLs | | |
| Description | | KMBGSS1 | KMWDSS1 |
| Aluminum | | | |
| Antimony | 4.77 | | |
| Arsenic | 0.391 | 16.2 | 1470 |
| Barium | 896 | 489 | 260 |
| Beryllium | 1.63 | | |
| Cadmium | 1.35 | 5.49 | 10.90 |
| Calcium | | | |
| Chromium | 7.9 | 29.4 | 20.8 |
| Cobalt | | | |
| Copper | 921 | 30 | 278 |
| Iron | | | |
| Lead | 49.6 | 120 | 9750 |
| Magnesium | | | |
| Manganese | 223 | | |
| Mercury | 0.00509 | < 0.033 | 1.6 |
| Nickel | 59.1 | | |
| Potassium | | | |
| Selenium | 2.03 | < 4 | < 4 |
| Silver | 0.189 | < 0.50 | 113 |
| Vanadium | | | |
| Zinc | 886 | 520 | 1300 |

Concentrations of metals in adit discharge meet the water quality criteria for those metals analyzed in the sample.

| Koeninger | Mine | Water | Sample | | Koeninger Mine Water Discharge | | |
|-------------|-------|-------------|----------------------------|------------------------------|--------------------------------|--------------------------------|--------------------------------|
| | | | IDEQ Ground Water Standard | IDEQ Drinking Water Standard | | IDEQ Cold Water Biota Standard | IDEQ Cold Water Biota Standard |
| | | | Acute | | | Chronic | |
| Description | | | | | KMSW1 | | |
| Aluminum | 0.05 | | | | | | |
| Antimony | | | | | | | |
| Arsenic | 0.05 | 0.00002 (D) | 0.36 (D) | 0.19 (D) | <0.025 | | |
| Barium | | | | | 0.0677 | | |
| Beryllium | | | | | | | |
| Cadmium | 0.01 | | 0.0037 (D) | 0.001 (D) | <0.002 | | |
| Calcium | | | | | | | |
| Chromium | 0.05 | | 0.157 (D) | 0.18 (D) | <0.0060 | | |
| Cobalt | | | | | | | |
| Copper | 1 | | 0.017 (D) | 0.0106 (D) | | | |
| Iron | 0.3 | | | | | | |
| Lead | 0.05 | | 0.065 (D) | 0.0025 (D) | | | |
| Magnesium | | | | | | | |
| Manganese | 0.05 | | | | | | |
| Mercury | 0.002 | 0.00014 (D) | 0.00204 (D) | 0.000012 (T) | | | |
| Nickel | | 0.61 (D) | 1.4 (D, H) | 0.16 (D, H) | | | |
| Potassium | | | | | | | |
| Selenium | 0.01 | | 0.02 (T) | 0.005 (T) | | | |
| Silver | 0.05 | | 0.0034 (D) | | <0.005 | | |
| Vanadium | | | | | | | |
| Zinc | 5 | | 0.11 (D) | 0.10 (D, H) | | | |

PATHWAYS AND RECEPTORS

Air

Concentrations of metals in wind borne fugitive dust have been the driving force behind cleanups in the area particularly at the Triumph Mine Site and Minnie Moore tailings Impoundment. However there are several factors which rendered insignificant the Koeninger Mine waste dump as a source for air borne delivery of contaminants. First and foremost; the Koeninger Mine waste dump is almost completely covered by deeply rooted native vegetation, and it is wet by adit drainage that provides and maintains high soil moisture content. This prevents even the most forceful of afternoon thermals from suspending contaminated particulate matter. Second; the Koeninger is well removed from residential receptors which short circuits this pathway.

Groundwater

During the Triumph cleanup the first concerns were related to potential human health risks as a result of contamination of public and private drinking water supplies. Generally speaking sources of contamination of drinking water systems was thought likely to occur along two types of sources and three pathways. The first pathway is when heavy metals are leached from mine waste piles, enter ephemeral or perennial drains and then contaminate the area's shallow ground water system. The second pathway is when heavy metals leach from the local ore bodies and are transported through the geologic structure to the shallow ground water. Lastly, heavy metals could leach out of the ore bodies, and be discharged from the underground workings as adit water, that is then conveyed through ephemeral and perennial drains to the shallow ground water systems.

For the purposes of completing Preliminary Assessments, Source Water Assessments (completed for local public drinking water supplies) were used to identify any known affects to those systems. Furthermore, because the wells employed in these systems use the same shallow aquifer, and are located very close to the numerous private wells, the results of the source water assessments have to be used to evaluate the probability that contaminants that enter public drinking water supplies also enter private water supplies.

Source water assessments provide information on the potential contaminant threats to public drinking water sources. In the Big Wood River Valley Idaho, most of those sources (>95%) are [ground water](#) (IDEQ 2000). Each source water assessment:

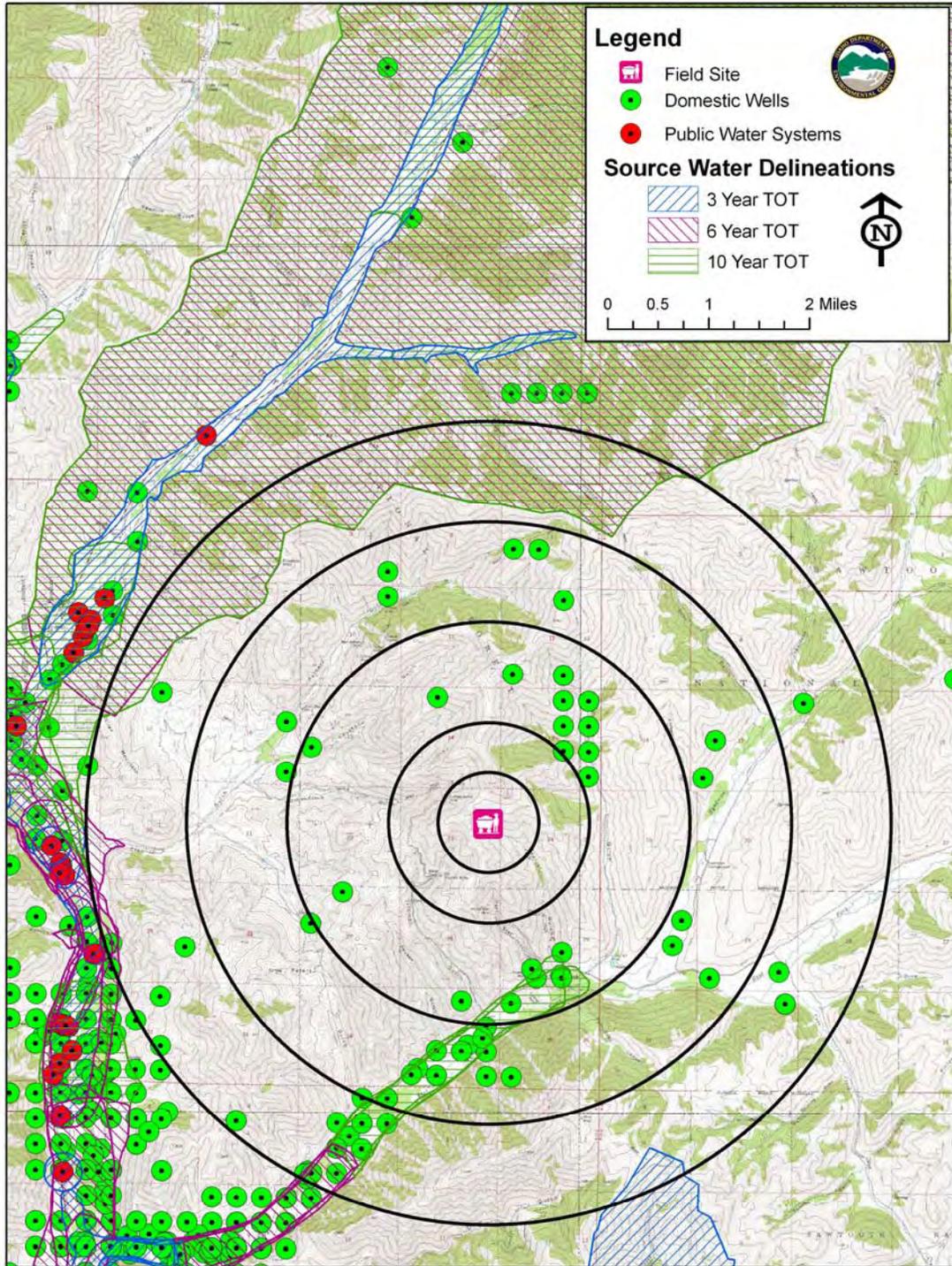
- Defines the zone of contribution, which is that portion of the watershed or subsurface area contributing water to the well or surface water intake (**source area delineation**).
- Identifies the significant potential sources of drinking water contamination in those areas (**contaminant source inventory**).
- Determines the likelihood that the water supply will become contaminated (**susceptibility analysis**).

Each assessment is summarized in a [report](#) that describes the above information and provides maps of the location of the public water system, the source area delineation, and the locations of potential contaminant sources. Idaho began developing source water assessments in 1999, and in May 2003 met its obligation under the amendments of the Safe Drinking Water Act by completing delineations for all 2100+ public water systems that were active in Idaho as of August 1999 (IDEQ 2000). Source water assessments for new public drinking water systems are being developed as those systems come online. Each public water system is provided with two copies of its final assessment report. Four source water assessments for drinking water supplies have been used in this Preliminary Assessment Process to evaluate the potential impacts to both public and private drinking water supplies in and around Sun Valley, Ketchum, Hailey and Bellevue.

The information extrapolated from these reports is based on data that existed at the time of their writing, and the professional judgment of IDEQ staff. Although reasonable efforts were made to present accurate information, no guarantees, including expressed or implied warranties of any kind are made with respect to these reports or this Preliminary Assessment by the State of Idaho or any of its agents who also assume no legal responsibility for accuracy of presentation, comments or other information in these publications or this Preliminary Assessment report. The results should not be used as an absolute measure of risk, and they should not be used to undermine public confidence in public drinking water systems.

The Source Area delineation process establishes the physical area around a well or surface water intake that becomes the focal point of the source water assessment. The process includes mapping the boundaries of the zone of contribution (the area contributing water to the well or to the surface water intake) into time of travel zones (TOT) indicating the number of years necessary for a particle of water to reach a well or surface water intake (IDEQ 2000). The size and shape of the source water assessment area depend on the delineation method used, local hydrogeology, and volume of water pumped from the well or surface water intake.

IDEQ used a refined computer model approved by EPA to determine the 3-year (Zone 1B), 6-year (Zone 2), and 10 year (Zone 3) time of travel associated with the Big Wood River Aquifer and its sources (IDEQ 2000).



This process involves collecting, recording, and mapping existing data and geographical information system (GIS) coverage to determine potential contaminant sources (e.g., gas stations) within the delineated source water assessment area. The potential contaminant source inventory is one of three factors used in the susceptibility analysis to evaluate the overall potential risk to the drinking water supply (IDEQ 2000). The inventory process

goal is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water or surface water contamination.

This susceptibility analytical process determines the susceptibility of each public water system well or surface water intake to potential contamination within the delineated source water assessment area. It considers hydrogeologic characteristics, land use characteristics, potentially significant contaminant sources, and the physical integrity of the well or surface water intake. The outcome of the process is a relative ranking into one of three susceptibility categories: high, moderate, and low. The rankings can be used to set priorities for [drinking water protection](#) efforts (IDEQ 2000).

There are numerous public and private drinking water supplies in the Big Wood River Basin. The Sun Valley Water and Sewer District operates and maintains nine wells in two groupings (IDEQ 2000). The City of Ketchum drinking water system consists of seven wells in two groupings. The City of Hailey's drinking water system consists of six wells and a spring (IDEQ 2000). The City of Bellevue drinking water system consists of two wells and three springs (IDEQ 2000).

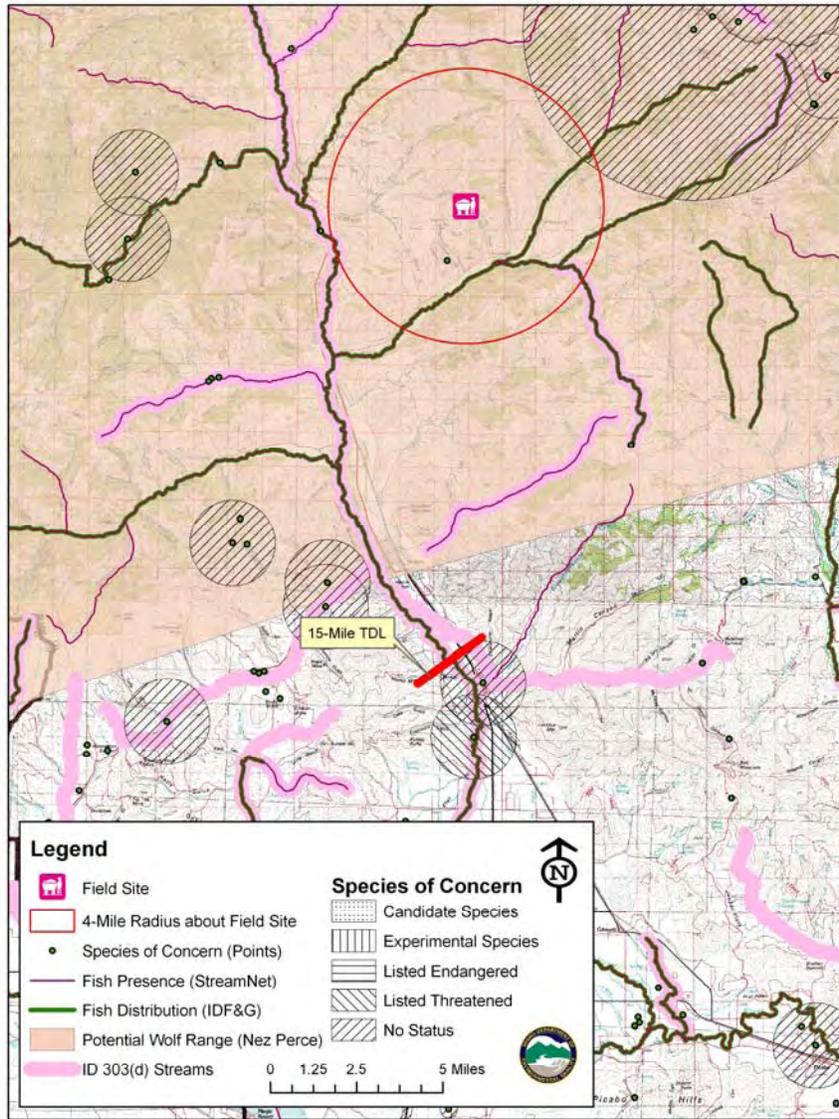
Generally speaking, public drinking waters systems in the Big Wood River Valley are rated as moderate to high (IDEQ 2000). Multiple factors affect the likelihood of movement of contaminants from the sources to the aquifer, which lead to this moderate to high score. Soils in the area are poorly to moderately drained. The vadose zone is predominantly gravel, which increases the score. On the valley floors the average depth to ground water is twenty to fifty feet.

To date, routine water quality monitoring of public drinking water indicates that there are no significant volumes of heavy metals migrating through the regional or localized ground water systems. More specifically, there are no long term or recurring water chemistry problems in the Sun Valley Water and Sewer District drinking water sources. One well in the Sun Valley system has had one instance (August 1991) when cadmium exceeded the MCLs (IDEQ 2000). There is no current, long term or recurring water chemistry problems in the City of Ketchum's drinking water sources. Arsenic, nickel, antimony, barium, selenium, chromium, cyanide and nitrate have been detected in Ketchum's wells, but all were well below MCLs (IDEQ 2000). There is no long term or recurring water chemistry problems in the City of Hailey's drinking water sources. Manganese, Zinc, chromium, and mercury have been detected in Hailey's wells, but all were well below MCLs (IDEQ 2001). Currently, there is no data that indicate that any metal concentrations have exceeded MCLs in the Bellevue drinking water systems (IDEQ 2000).

Surface Water

The Koeninger is in the headwaters of an ephemeral drain that falls into the mainstem of Courier gulch, itself an ephemeral drain. Even were Courier Gulch perennial, the adit drainage from the Koeninger falls well below the cold water acute and chronic standards. Furthermore, there are no indications of significant erosion of the Koeninger mine waste

dump, nor are there any indications that any of the sediment generated have entered surface waters. Therefore there is no adverse affects to surface water users evident.



Sensitive Species and Wetlands

The national data base on wetlands inventories indicates that no jurisdictional wetlands exist within a two mile area below the mine site. Although wetland and riparian communities are present adjacent to the East Fork of the Big Wood, no wetlands were observed at the site visit. The wetlands immediately below Courier Gulch do not appear to have suffered any phytotoxic affects, but there are indications of disturbances that may have occurred during residential and agricultural developments along the river. Therefore, there are no indications that adverse affects are the result of developments or drainage from the Koeninger.

Although the site is in the potential wolf range, wolves would most likely only be exposed to the adit water if they used the springs that developed on the dump. Because of the wide range for a wolf the exposure would be limited, and the dose insignificant. Therefore, it does not appear as though the site could cause adverse affects in this sensitive species.

Conclusions and Recommendations

Based on existing conditions and uses, historic information, mine waste and water samples were collected during the site visit. Subsequent to our analysis IDEQ has determined that No Remedial Action is Planned (NRAP) for this property.

However, based on the waste and water data and Triumph Minerals Inc.'s (TMI) discussion with IDEQ regarding potential of future residential or other development of TMI's properties IDEQ recommends that prior to development plans for any residential uses TMI should complete additional site characterization with the objective of determining what risk management provisions should be included in those plans, and what provisions should be included to protect worker health and safety.

IDEQ did not note any dangerous openings or other physical hazards which should be managed or closed. However, if development of this property were to utilize excavations near the adit or above the tunnel, the mine workings could be re-exposed and dangerous.

References

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