Abbreviated Preliminary Assessment for Landore Mines

(aka Arkansaw-Decorah-Marguerite Mine [Arkansas Mine], Helena Mine, Blue Jacket Mine, Queen Mine, Calumet Prospect, and Lucky Strike Prospect)

Adams County

State of Idaho
Department of Environmental Quality

December 2012

Acknowledgments

DEQ would like to thank Milton and Ann Meyers, Clinton Jones, James Peart, Kathleen Norton, George H. Davenport, and Judy Gregory for permitting access to the mine site. DEQ would also like to thank Mr. Jones for accompanying DEQ during the site visit and providing information.

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

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

C.L. "Butch" Otter, Governor
Curt Fransen, Director

February 20, 2013

Mr. Ken Marcy
U.S. Environmental Protection Agency
12928 SW 276th Street
Vashon, WA 98070

Subject: Abbreviated Preliminary Assessment (APA) Report for the Landore Mines (aka Arkansaw-Decorah-Marguerite Mine [Arkansas Mine], Helena Mine, Blue Jacket Mine, Queen Mine, Calumet Prospect and Lucky Strike Prospect), Adams County, Idaho

Dear Mr. Marcy:

The Department of Environmental Quality (DEQ) has a cooperative agreement with Region 10 of the United States Environmental Protection Agency (EPA) to provide technical support for completion of preliminary assessments at various mines on private or state lands.

The Landore mines are located on patented, private property. The property was investigated by DEQ on August 9, 2012, for potential releases of heavy metals by airborne, surface water, or ground water pathways. The assessment was conducted on a watershed basis as permission was only granted on a few parcels. The landowners who granted permission will be sent copies of this report. A copy will also be sent to Idaho Power who denied access because Materials Testing and Inspection, Inc. (MTI) conducted a Phase I Environmental Assessment for Idaho Power's claims and did not identify any known or suspected recognized environmental conditions on the property. Therefore, MTI recommended no additional investigation based on their findings. Idaho Power provided a copy of the report (APA Appendix A).

A site inspection involving direct observations confirmed that contaminants of concern, including hazardous materials and petroleum products, do not exist in concentrations that present a threat to human health or the environment. The Landore mines are not located near any occupied dwellings, towns, or inhabitants. No hazardous materials were evident during the site visit. There were remnants of a reverberatory furnace at the town site; however, there is no evidence of migration to Indian Creek from the town site or furnace.

As a result of DEQ's research and observations, **DEQ has made a No Remedial Action Planned (NRAP) determination for the Landore mines.**

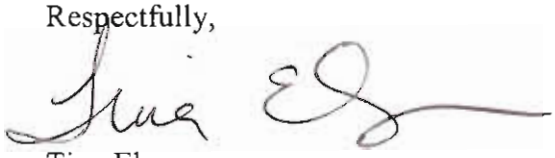
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A link to the Abbreviated Preliminary Assessment report for the site can also be found on DEQ's Preliminary Assessment Web page at:

http://www.deq.idaho.gov/waste-mgmt-remediation/remediation-activities/mining-preliminary-assessments.aspx

If you have any questions about these sites, the report, or DEQ's recommendations, please do not hesitate to call me at (208) 373-0563.

Respectfully,



Tina Elayer
Mine Waste Program Specialist

attachment

cc: Mr. Clinton Jones c/o Mr. & Mrs. Milton Meyer
Mr. James Peart/Ms. Kathleen Norton
Mr. George H. Davenport/Ms. Judy Gregory
Mr. Les Hogg, Idaho Power

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Introduction

This is an abbreviated preliminary assessment (APA) for the Landore mines (Arkansaw-Decorah-Marguerite Mine [Arkansas Mine], Helena Mine, Blue Jacket Mine, Queen Mine, Calumet Prospect, and Lucky Strike Prospect) near Cuprum, Idaho. This document provides the rationale for the No Remedial Action Planned (NRAP) determination and that no additional analysis or site investigation is necessary for the above listed mines. Section 1 provides the APA checklist filled out by the assessor to determine that an APA was warranted and that no further action is required from the Idaho Department of Environmental Quality (DEQ). The following sections contain additional relevant information and evidence to support the APA, including historical and geologic information (Section 2), photographs (Section 3), maps (Section 4), and references generated during the site visit or desktop research (Section 5).

Preparer: Tina Elayer **Date:** 12/27/2012
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Site Names: Arkansas-Decorah-Marguerite Mine, Helena Mine, Blue Jacket Mine, Queen Mine, Calumet Prospect, Lucky Strike Prospect

Previous Names (aka): Arkansas Mine: Arkansas-Decorah, Marguerite, Decorah
Lucky Strike Prospect: Walter James
Patented Claims: Edith Patent; Etta, Lucy, and Josie Consolidated Lodes; Margaret Patent; Gladys Patent
Idaho Power Claims: Admiral Dewey, Hobson, and Schuley Consolidated Lode; and Captain Group Lode

Site Owners (granting access): Mr. Clinton Jones
c/o Mr. and Mrs. Milton Meyer
2004 Granger Road
Indian Valley, ID 83632

Mr. James Peart
Ms. Kathleen Norton
2345 Spring Creek Road
Council, ID 83612

Mr. George H. Davenport
Ms. Judy Gregory
19861 Deulle Circle
Huntington Beach, CA 92648

Site Owners (access denied): Idaho Power Company

Idaho Power denied access because they previously conducted a Phase I Environmental Site Assessment and provided DEQ with the report. The Landore town site is on private property. There were many other land owners who were sent access request letters multiple times and either never responded or denied access to DEQ.

Site Location: There are two ways to access the mine site. The first way is from the town of Cuprum located approximately 4.5 southwest of the mine site on the Council Cuprum road which turns into NFD105. The second way is from the community of Bear located approximately 10 miles south of the mine site on the Landore road which also turns into NFD105.

Township 21 North, Range 2 West, Section 30

Latitude: 45.12773°N **Longitude:** -116.62782°W

Description of release (or potential release) and its probable nature:

The Landore mines were investigated by DEQ on August 9, 2012, for potential releases of heavy metals by airborne, surface water, or ground water pathways. The assessment was conducted on a watershed basis as permission was only granted on a few parcels. Additionally, DEQ investigated potential discharges of other deleterious materials, such as petroleum products and ore processing chemicals. No deleterious materials, petroleum products, or ore processing chemicals were evident at the site.

Section 1. APA Checklist

Task 1—Superfund Eligibility Evaluation

Assessor, if all answers are "no," continue to task 2; otherwise, explain any "yes" answers below and then skip to task 3.	**YES**	**NO**
1. Is the site currently in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) or an "alias" of another site?	☐	☒
2. Is the site being addressed by some other remediation program (i.e., federal, state, or tribal)?	☐	☒
3. Are the hazardous substances that may be released from the site regulated under a statutory exclusion (e.g., petroleum, natural gas, natural gas liquids, synthetic gas usable for fuel, normal application of fertilizer, release located in a workplace, naturally occurring, or regulated by the Nuclear Regulatory Commission, Uranium Mill Tailings Radiation Control Act, or Occupational Safety and Health Administration)?	☐	☒
4. Are the hazardous substances that may be released from the site excluded by policy considerations (i.e., deferred to Resource Conservation and Recovery Act corrective action)?	☐	☒

5. Is there sufficient documentation to demonstrate that there is no potential for a release that constitutes risk to human or ecological receptors (e.g., comprehensive remedial investigation equivalent data showing no release above applicable or relevant and appropriate requirements (ARARs), completed removal action, documentation showing that no hazardous substance releases have occurred, or an EPA-approved risk assessment)?	☐	☐

Assessor, please explain all "yes" answer(s):

Regarding question 5: A site inspection involving direct observations confirmed that contaminants of concern, including hazardous materials and petroleum products, do not exist in concentrations that present a threat to human health or the environment. No contaminants or hazardous substances remain on the site. No airborne pathways exist to any residences. The closest residence to the Landore mines is downstream approximately four miles in the community of Cuprum. There are no public water systems located within the 15-mile target distance limit (TDL). There are two public water systems (PWS) in the four mile radius but they are located in different drainages.

Task 2—Initial Site Evaluation

If information is not available to make a "yes" or "no" response below, further investigation may be needed. In these cases, the assessor should determine whether an APA is appropriate.

If the answer is "no" to *any* of questions 1, 2, or 3, proceed directly to task 3.	**YES**	**NO**
1. Does the site have a release or a potential to release?	☐	☒
2. Does the site have uncontained sources containing CERCLA-eligible substances?	☐	☒
3. Does the site have documented on-site, adjacent, or nearby targets?	☐	☒

If the answers to questions 1, 2, and 3 above were *all* "yes," then answer questions 4–7 before proceeding to task 3.	**YES**	**NO**
4. Does documentation indicate that a target (e.g., drinking water wells, drinking surface water intakes, etc.) has been exposed to a hazardous substance released from the site?	☐	☐
5. Is there an apparent release at the site with no documentation of exposed targets, but targets are on site or immediately adjacent to the site?	☐	☐
6. Is there an apparent release and no documented on-site targets or targets immediately adjacent to the site, but targets are nearby (e.g., within 1 mile)?	☐	☐
7. Are there uncontained sources containing CERCLA hazardous substances, a potential to release with targets present on site or in proximity to the site, but no indication of a hazardous substance release?	☐	☐

Notes:

The Landore mines are not located near any occupied dwellings, towns, or inhabitants. No hazardous materials were evident during the site visit. Any human health risks or ecological health risks associated with this mine site are unlikely.

The area is considered critical bull trout habitat and Idaho Power purchased a 125 acre property on Landore Road to help protect bull trout habitat. Materials Testing and Inspection, Inc. (MTI) conducted a Phase I Environmental Assessment for Idaho Power and did not identify any known or suspected recognized environmental conditions on the property. Therefore, MTI recommended no additional investigation based on their findings. (The MTI report is included in Appendix A.)

During the site assessment, DEQ used references from several different documents, including United States Geological Survey (USGS) maps, county tax rolls, and historical reports. These documents often have different spellings for claim names, town sites, and/or geographic features. DEQ has retained the spelling from the original source document.

Table 1 parallels the questions above and should be used by the assessor to make decisions during task 3.Table 1 identifies different types of site information and provides some possible recommendations for further site assessment activities based on that information. The assessor should use Table 1 in determining the need for further action at the site, based on the answers to the questions in task 2. Assessors should use professional judgment when evaluating a site. An assessor's individual judgment may be different from the general recommendations for a site given below.

Table 1. Site assessment decision guidelines for a site.

Suspected/Documented Site Conditions	EPA-Recommended Site Assessment Activities
1. There are no releases or potential to release.	APA
2. No uncontained sources with CERCLA-eligible substances are present on site.	APA
3. There are no on-site, adjacent, or nearby targets.	APA
4. There is documentation indicating that a target (e.g., drinking water wells, drinking surface water intakes, etc.) has been exposed to a hazardous substance released from the site.	APA → SI or PA/SI
5. There is an apparent release at the site with no documentation of exposed targets, but there are targets on site or immediately adjacent to the site.	APA → SI or PA/SI
6. There is an apparent release and no documented on-site targets and no documented targets immediately adjacent to the site, but there are nearby targets. Nearby targets are those targets that are located within 1 mile of the site and have a relatively high likelihood of exposure to a hazardous substance migration from the site.	Full PA
7. There is no indication of a hazardous substance release, and there are uncontained sources containing CERCLA hazardous substances, but there is a potential to release with targets present on site or in proximity to the site.	Full PA

Task 3—DEQ Site Assessment Decision

When completing task 3, the assessor should use task 2 and Table 1 to select the appropriate decision. For example, if the answer to question 1 in task 2 was "no," then an APA is appropriate

and the "NRAP" box below should be checked. Additionally, if the answer to question 4 in task 2 is "yes," then two options are available (as indicated in Table 1): (1) proceed with an APA and check the "Lower Priority SI" or "Higher Priority SI" box below or (2) proceed with a combined PA/SI.

Check the box that applies based on the conclusions of the APA checklist:

- ☒ No Remedial Action Planned (NRAP)
- ☐ Higher Priority SI
- ☐ Lower Priority SI
- ☐ Defer to RCRA Subtitle C
- ☐ Defer to NRC
- ☐ Refer to Removal Program
- ☐ Site is being addressed as part of another CERCLIS site
- ☐ Other: _____

DEQ Reviewer:

Tina Elayer — December 27, 2012

Please explain the rationale for your decision:

A site inspection involving direct observations confirmed that contaminants of concern, including hazardous materials and petroleum products, do not exist in concentrations that present a threat to human health or the environment. The Landore mines are not located near any occupied dwellings, towns, or inhabitants. No hazardous materials were evident during the site visit. There were remnants of a reverberatory furnace at the town site; however, there is no evidence of migration to Indian Creek from the town site or furnace.

The closest residence to the Landore mines is approximately four miles downstream.

As a result of DEQ's research and observations, the department recommends an NRAP designation for the Landore mines. Sections 2 through 5 provide further support for this determination.

Section 2. Historical and Geologic Information

Numerous sources were used during desktop research prior to visiting the site. DEQ could not improve or expand upon these reports by writing additional historical or geological text, so they are directly quoted below.

Mine History: Livingston and Laney (1920) described the Seven Devils Mining District and mines identified in this APA as follows:

> The Seven Devils Mining District is situated along the western border of Idaho near the middle of the State... It lies in about the center of a mineralized belt which extends from the south end of the Hitt mountains in Washington County to Craig Mountain in Lewis County and runs parallel to the Snake River for a distance of about 120 miles. This mineralized area might be termed the Snake River copper belt, as this metal is found thruout the region, associated with a series of andesite rocks of supposed Triassic age.
>
> There are several small towns, or rather villages, in the Seven Devils District, the most important is Cuprum, which lies in the valley of Indian Creek. Two others, Landore and Helena, were at once

prosperous camps, the former particularly, as it is reported to have had at one time a population of about 1500 people but both of these places are now practically deserted.

Owing to the fact that the Seven Devils District is almost deserted at the present time it is a difficult matter to get a concise statement of its history. The following has been pieced together from descriptions given by some of the old timers whose memories in regards to dates are somewhat uncertain.

Like many another mining camp in the west the discovery of the district was due to placer mining. About 50 years ago the Simpson brothers were washing for gold on Copper Creek, a tributary of Deep Creep (sic), and discovered the Peacock mine which outcrops close to this creek. Apparently they did not stake it, or if they did they must have allowed their title to lapse as it was located by Levi Allen in 1894. The claim had to be recorded in Lewiston, the nearest office at that time, over 100 miles distant.

Shortly after this other claims were discovered and located, such as the Arkansaw, Bluejacket, Queen, and several more by Chas. Wagner, who was in partnership with Arthur David, or “Frenchy” as he is commonly called.

There was practically no activity in the district for about 20 years following this but in 1883 patent was obtained for the Peacock, White Monument and Helena claims.

The first ore shipped from the district was in 1888 from the Bluejacket mine and following this from the Peacock mine in 1889. This ore was taken on pack horses to Bear Creek and shipped from there to Weiser by wagons, a total distance of approximately 130 miles.

The year of 1900 seems to have seen the greatest activity in the camp. At this time the Kleinschmidt grade from Ballard’s Ferry to Helena was built. This road was well located, and of all the mountain wagon roads built before the days of highway construction this is by far the best graded road that the writers have seen in the state. It rises from about 1500 feet in elevation at the Snake River to about 7200 on the divide above Helena and there are only one or two really steep pitches in the whole of this distance, and with a little repairing trucks could be operated over it without any particular difficulty.

About this same time the Pacific and Idaho Northern Railroad (known locally as the “Pin” road) began building from Weiser up the Weiser River, with Helena as the final objective. It is locally reported that Mr. Louis Hall of Boston, who was building this road took options on a number of the more promising claims of the district but was unable to stand by the heavy expense entailed in the building of the road and was forced to abandon the project. Railroad grading from the Helena end of the line was actually commenced and the grades around White Monument Mountain are still prominent land marks.

During 1900 practically all the more important properties in the district were shipping ore. From this time there was a gradual decline with the shutting down of one property after another until in the summer of 1919 the only property in operation in the lime-garnet belt was the Arkansaw.

A smelter was erected at Weiser and a reverberatory furnace at Landore by the Ladd Metals Co., but both of these have long been idle. The one at Landore is now dismantled.

During the last few years activity has been confined almost entirely to the Red Ledge on Deep Creek and at the time of writing active development work is in progress on this property.

The short lived activity of the bornite mines in the lime-garnet zone is due chiefly to the irregular manner in which these rich pockets of ore occur and the difficulty of finding new ore bodies by underground development. Litigation in the earlier days of the camp was also an important factor in the curtailment of development and production, and transportation is an expensive item.

It is difficult to estimate the amount and value of the ore shipped from the camp. Geological Survey reports did not segregate the different counties of the state during the first few years of production in the Seven Devils, and the State Mine Inspector’s reports, (first issued in 1898) give the figures for the counties only and not for the individual districts. Prior to 1898 there are no reliable figures available but since that time

Washington and Adams Counties (which were one county up to 1911) have produced about a million two hundred thousand dollars in copper, gold and silver, the copper constituting about 70 per cent of the total value.

The ore that was shipped from the Seven Devils assayed between 20 to 50 per cent in copper with from 0.1 to 0.2 oz. of silver and about 5 cents in gold to every unit of copper.

How much of this total of $1,200,000 came from the Seven Devils cannot be stated definitely as there were other places in the county, such as the Mineral district, from which copper was also shipped. It should, however, be safe to assume that 80 per cent of this came from the Seven Devils, which would give the camp a production since 1898 of approximately one million dollars.

MINES AND PROSPECTS

As stated in the preceding chapter, the contact metamorphic deposits of the Seven Devils district occur at and near the contacts between bodies or masses of limestone and a batholith of hornblende granite or granodiorite in which the bodies of limestone were engulfed at the time of the intrusion of the igneous rock and in which they now occur as islands of more or less metamorphosed limestone in a sea of granodiorite. So far as known all the mineralization of any commercial importance occurs on the limestone side of the contacts and by far the most part is in the zone of heavy silicate minerals which was formed at different places in the limestone at and near the contacts with the igneous rock. As shown on the map, page 28 [Appendix B of this APA], two of the largest islands of limestone occur near the southern boundary of granodiorite. At the contacts of these bodies of limestone are found the most important ore deposits thus far developed in the district. The easternmost of the two contains the Arkansaw, the Decorah, the Marguerite, and the Calumet ore bodies, while at the contacts of the larger mass to the west occur the Helena, the Blue Jacket, the Queen, the Alaska, and the Lockwood deposits. The other ore bodies, so far as known, occur in smaller isolated bodies of engulfed limestone which have suffered at their contacts varying degrees of metamorphism. In one instance, the Peacock ore body, the mass of limestone was small in comparison with the others and appears to have been entirely altered into contact metamorphic minerals, garnet largely predominating.

The different ore bodies resemble each other so closely as regards gangue minerals, relation of mineralization to igneous rocks, the position of the ore and the metamorphic zones in relation to the contacts, that a description of one deposit, will, by simply changing the name and a few details, apply to any other. The most important difference is in the original copper-bearing sulphides. In the Arkansaw-Decorah-Marguerite, and the Calumet ore bodies the copper mineral is almost wholly chalcopyrite, while in all the others bornite is by far the most important mineral. Of course there is more or less variation in the relative abundance of different gangue minerals, but the same minerals in the same relation to each other and to the unaltered rocks are present in all the deposits.

Arkansaw-Decorah-Marguerite Mine

The Arkansaw ground was located in the late eighties by Charles Walker and “Frenchy” David. Nothing, however, beyond the necessary location and assessment work was done and the property was soon sold.

The first real development work was done in 1900 and 1901 by the Boston and Seven Devils Copper Company which acquired the property in 1899. This work was almost wholly in the Decorah-Marguerite claims which adjoin the Arkansaw. During this period operation it is reported that several thousand tons of ore were taken out and shipped. The Kleinschmidt grade was extended to the mine and the town of Landore was established and attained the height of its glory, viz. 300 inhabitants, a newspaper, and an adequate supply of saloons and dance halls. The company failed in 1901 and the mine was closed. With the coming of the Ladd smelter the mine was reopened by lessees and worked during 1904 and part of 1905. With the closing of the smelter the work in the mine was stopped. Later it was taken under lease by John Arthur and two associates, the tunnel was extended from the Decorah into the Arkansaw ground, and a good ore body exposed. As a result of this work the mine was taken over in 1908 by the Seven Devils Copper Co. under management of Fred D. Smith. Work was carried on actively, cross-cuts driven through the granodiorite toward the ore body. During the beginning of the work the company mortgaged the property to the

Lewisohn interests. It was soon unable to meet the payments as they came due, the mortgage was foreclosed in 1910, and the mine was again closed.

In 1915 the mine was again reopened by the Arkansaw Leasing Corporation, under management of Fred D. Smith who was formerly with the Seven Devils Copper Company. The Iowa tunnel was driven 600 feet farther, and reached the ore body. Raises and stopes were run and a few hundred tons of high-grade ore were taken out and shipped. The scheme was not successful, and the mine was again closed, January 1917. The last work consisted of a raise from the Iowa to the upper tunnel 100 feet above, and was done in the fall of 1919. This raise is said to have passed thru 60 feet of a mineralized zone.

Development. The development work in the Arkansaw-Decorah mine consists of an upper tunnel about 700 feet long with cross-cuts, drifts, raises and stopes, a lower tunnel, known as the Iowa tunnel, 100 feet vertically below the upper tunnel and about 1200 feet long with a little drifting, and a raise connecting with the upper tunnel. On the surface is a caved shaft and a big open cut. Three-fourths of the development work has been done in the granodiorite and has only served as a means of access to the ore zone. [See Map 70A, Appendix B of this APA.]

Occurrence of the Ore. The ore deposits occur in a zone of contact metamorphic silicates, epidote, garnets, and pyroxenes with smaller amounts of quartz, calcite, tremolite, zoisite, hornblende, and a few other minerals. This zone was developed at and near the contact of a body of limestone with the granodiorite. Most of the ore is said to have occurred on the limestone side of the metamorphic zone in irregularly distributed shoots and chimneys. Much of the ore, however, occurs in the midst of, and is intimately intermixed with, the silicates, and in the silicate mass it was common to find stringers and veinlets of the sulphides extending toward both limestone and igneous rock. The metamorphic zone is very irregular in size and shape, however, and is rarely more than 75 feet thick. In some places no silicate minerals were formed at the immediate contact of the limestone with the igneous rock, while a few feet away in the limestone a band of silicates from 25 to 50 feet wide would be found. All the silicate masses seem to contain at least a small amount of ore, but the workable deposits were always found in disconnected masses scattered here and there thru, and also bordering, the silicate zone. In these shoots or chimneys the ore was usually so rich that it could be readily raised to shipping grade by handpicking. However, much of it is too lean—from 5% to 7% copper—to be so graded. It is therefore at best only a concentrating ore. Many thousand tons of such material are said to be available.

The Arkansaw ore body differs from all the other contact metamorphic deposits of the district in that the primary or hypogene ore mineral is almost exclusively chalcopyrite, while in all the others it is bornite. None of the development work has reached the limits of secondary enrichment and it is probable that all the sulphide ore so far taken out has been materially increased in value by this process. The rich secondary sulphides, chalcocite, covellite, and bornite occur as replacements in and along fractures in the chalcopyrite. The most important oxidized copper mineral is chrysocolla, the common green silicate of copper. In many places in the upper portion of the lodes it was abundant and constituted a valuable ore. In many places in the abandoned working it is today being deposited by water dripping from the roof or seeping from the walls of the tunnels and drifts. Along with the chrysocolla occurs a black silicate of copper, malachite, azurite, and a minute amount of cuprite. None of these except the silicates and the malachite are of any importance as ores. Erosion is rapid in the district, and as a result the altered sulphides are always found at very shall depths, in some instances in the outcropping garnet zones.

Blue Jacket Mine

The Blue Jacket claims, two in number, were located in the late eighties by Charles Walker, who did only location and development work and sold them at the first favorable opportunity. In the early nineties they were acquired and patented by the Kleinschmidt interests. The first important development was done by the pioneer mining organization in the district, the American Mining Company about 1895 and 1896. This company failed and the leases et cetera were acquired by the Northwest Copper Company which took out considerable ore. With the failure of the Cuprum smelter in 1898, the company went out of existence and the mine was closed. In 1899 the property was taken by the Blue Jacket Mining Company, Frank French, manager, and preparations were made for more extensive operations than had previously been attempted. The Kleinschmidt grade had been extended to the mine in the summer of 1899, thus making the property

more readily accessible. The mine was worked actively during 1900 and the summer of 1901 and several thousand tons of high-grade ore, some of which is said to have carried more than 40% copper, were taken out and shipped. Transportation facilities were inadequate, the long haul to Council, 45 miles away, was very expensive, the company failed, and the mine was closed. With the coming of the Ladd smelter in 1904, work in the mine was resumed under a lease by John Rogers who operated it two summers until the closing of the smelter in 1905. From 1909 until 1912 it was operated in a small way by F. H. Kleinschmidt and P. H. Miller, and several hundred tons of high grade ore were taken out and shipped. In 1914 and 1915 F. H. Kleinschmidt came back, reopened the mine, and took out a small amount of good ore. The last work was done in the summer of 1917 by John Rogers who is said to have taken out and shipped two cars of high-grade ore. As a result of all this work on the part of leasers who were looking only for high-grade ore and not toward the future of the mine, practically every pound of developed ore has been taken out, and as the property stands today it cannot be regarded as anything more than a favorable prospect.

The property is opened by a short upper tunnel, a lower tunnel 350 feet long with portal about 15 feet below the level of the Kleinschmidt road, and a shaft 310 feet deep. From the lower tunnel there are drifts, crosscuts, and raises one of which reaches the surface. A number of stopes, varying in width from 6 to perhaps 20 feet and up to 100 feet in length, have been run. Much of the work is in bad condition, and the careless work on the part of the different lessees has caused the shaft to cave.

The Blue Jacket deposit occurs near the east end of the large body of limestone which is included in the mass of granodiorite near its southern boundary, and along the contacts of which occur the Queen, the Alaska, and the Lockwood mines, and is at the south contact of the limestone and the igneous rock. The ore while occurring in varying amounts thruout the large body of contact minerals, is, for the most part, in the limestone side of the metamorphic zone. Garnet is by far the most abundant metamorphic mineral and the ore is often found intimately intermixed with it and the other heavy silicates. From the main masses of ore there were often found veinlets or stringers of ore extending thru the garnet zone across the contact and a few inches into the granodiorite, thus indicating that the ore, for the most part, was deposited after the contact metamorphic minerals had been formed. Microscopic study of thin sections of the gangue and ore minerals and of polished sections of the ore shows that much of the ore has replaced the silicate minerals and thus confirms the assumption that the ores are younger than the silicate minerals.

The strike of the granodiorite-limestone contact which appears to conform with the strike of the limestone beds, is about 50 degrees west of north. The beds dip steeply, perhaps 70 degrees toward the northeast. A few stringers or veins of quartz which carry varying amounts of chalcopyrite are found cutting thru both the masses of rich ore and the bodies of lean silicates. The ore is not so intimately intermixed with the silicates as in the Arkansaw-Decorah mines and unlike the ore from these mines, the Blue Jacket—primary ore—consists almost wholly of bornite, there being only small and insignificant amounts of chalcopyrite.

None of the work has extended below the limits of supergene or secondary enrichment and it is probable that all the ore thus far taken out has been materially enriched by such processes. The enrichment consists of chalcocite and covellite which have developed in and along fractures in the bornite. The usual oxidized ore minerals, chrysocolla, malachite, azurite, cuprite and melaconite, are present, the last two only sparingly. Chrysocolla is apparently not so abundant as in the Arkansaw-Decorah mine, while cuprite appears to be more abundant. All the ore carries low values in both gold and silver. The gold seems to occur in the metallic state, and while some of the silver occurs in tetrahedrite which is found occasionally, part is believed to occur as argentite, altho this mineral was not positively identified. So far as information was available, no definite ratio seemed to exist between the amounts of the previous metals and the copper content of the ores.

Calumet Prospect

The Calumet prospect consists of an outcrop of ore-bearing metamorphics at the northeast end of the body of limestone in which the Arkansaw-Decorah ore body occurs. The outcrop is on the east-facing slope of the hill about 200 feet from Indian Creek and perhaps 200 yards above the remains of the Ladd smelter. The development work consists of a tunnel about 100 feet long and a shallow shaft--little more than a surface pit--which have exposed a small body of oxidized ore similar in all respects to the ore from the upper portions of the Arkansaw-Decorah ore body. So far as developed the ore body, while otherwise

favorable, appears to be small--not more than 100 feet across. However, the prospect is probably worthy of more extensive exploration than it has received.

Helena Mine

The Helena claim was located about the same time the Blue Jacket was staked out. Nothing but location and assessment work was done upon it until in the late nineties it was taken over and operated in a small way by the American Mining Company, which shortly afterwards failed. It was operated in a small way, and for a short time, by the Northwest Copper Company, but closed when the Cuprum smelter failed in 1898. In 1899 it was taken over by the Boston and Seven Devils Copper Co. and worked in a desultory way until the company failed in 1901. It was worked by lessees intermittently afterwards, but the last important work was done in 1905 by C. W. Jones, who is said to have shipped a few cars of high-grade ore.

Development. Two tunnels have been run, the lower one about 300 feet long, the upper an unknown length, with cross-cuts, several prospecting drifts, and some surface pits. From the lower tunnel an overhead stope about 60 feet high and a small amount of underhand stoping below the tunnel level, constitute the development work as it was reported to the writers. The portals of the tunnels are caved and the underground work is all inaccessible. Near the portal of the upper tunnel a small outcrop of what appears to be workable ore is exposed at the surface. In fact several hundred pounds of this surface ore has been sacked, apparently for shipment, and lies beside the trail, the work of “high graders,” it is said, who were frightened away before completing their “haul”.

Occurrence of the Ore. Little or nothing could be learned in regard to the position of the ore in the metamorphic zone. Such ore as was seen in place occurred in irregular bunches intimately intermixed with the usual heavy silicate minerals, especially garnet and pyroxene, epidote being less plentiful than in the Arkansaw-Decorah claims. The original or primary copper-bearing mineral is bornite, and so far as could be determined its mode of occurrence and its surficial alterations are similar in all respects to those of the bornite in the Blue Jacket mine.

In a way the metamorphism of both limestone and granodiorite has been more extensive at the Helena than at the other ore deposits in the vicinity. The limestone contains many narrow argillaceous beds, and these show much alteration for more than 150 feet from the igneous contact. Scapolite, which is rare in the other deposits, is abundant in the altered impure bands. The granodiorite shows both the results of hydrothermal alterations, and the effects of pneumatolytic processes. It contains much zoisite, some of which is pink (probably thulite), it has suffered considerable sericitization, and in many places contains open vugs or spaces lined with drusy, well terminated plagioclase crystals, largely albite. These alterations are perfectly evident in the granodiorite over 75 feet from the limestone contact. Small amounts of bornite and chalcopyrite were noted in the igneous rock, but nothing even approaching commercial ore was seen. In all the deposits the workable ore is confined to the limestone side of the contact.

Queen Mine

The Queen mine was located in the late eighties by Charles Walker. Little work other than that necessary for location and assessment was done before 1896 or 1897, when the property was acquired by the Northwest Copper Company. Between 1897 and the failure of the Cuprum smelter the mine was opened and some ore taken out but was closed in 1898. It was operated actively by the Blue Jacket Mining Co. from 1899 to 1901 when it was again closed. It lay idle until the Ladd smelter at Landore was built, when it was operated by John Rogers who took out considerable ore. In 1906 it was operated under lease, by a Dr. Peacock formerly superintendent of the Ladd smelter. He took out a good body of rich ore in the stope between the two tunnels. It was operated again in 1909, 1910, 1911, 1912, by F. H. Kleinschmidt and P. H. Miller. A considerable amount of good ore was taken out, in 1914-1915 by F. H. Kleinschmidt and in 1917 by John Rogers.

The workings of the Queen mine are situated on Garnet Gulch above the wagon road. There are three separate and distinct garnet zones upon the property two of which have been opened up by extensive tunnelling. These lie on the east side of the gulch. Another garnet zone parallels the gulch on the west side and has been opened up by a few open cuts and short tunnels.

The garnet zone which lies at the end of the short branch wagon road has been opened by two tunnels about fifty feet apart. From the upper tunnel considerable stoping was done which is evidence of the fact that a good-sized ore body was extracted. There is no evidence that the same ore body was encountered in the lower tunnel, which may possibly connect with a shaft sunk in the garnet zone on the hill above.

The other garnet zone is on the hillside on the east side of the gulch and about 200 feet vertically above it and there are other small garnet areas in this vicinity. The greater part of the development work on the Queen property was for the purpose of developing this particular zone and the lime-granodiorite contact.

The lower tunnel starts in limestone and runs 640 feet N. 48° E., with a drift toward the northwest at the granodiorite contact, and a raise at a point 200 feet in the drift. This tunnel cuts the main contact 420 feet from the portal, and to this point is in limestone with a few granodiorite masses. Little ore was taken from this level, but the raise itself is in ore. The garnet zone is about six feet wide at the main contact. The garnet zone on the surface is 20 feet wide in one place and about 40 in another. Many solution cavities occur in the limestone, one about 300 feet from the tunnel portal is two sets wide and is filled with stratified lime-sand and clay surrounding boulders of limestone.

The intermediate tunnel is a crooked tunnel about 600 feet long which starts in limestone and passes thru a fault or crushed zone with about five feet of garnet and other silicates on a hanging wall of limestone. At this point there is a winze and nearby the raise that extends from the lower tunnel. Here is also a fault striking No. 60° E. and dipping perhaps 20° toward the southeast. This fault offsets the contact 30 feet to the south on the hanging wall side, but the striations are inclined only 15° from the dip; hence there is a considerable throw. It seems to be a reverse fault.

Croppings on Queen Claims. Ore shoot No. 2 is about 900 feet east of shoot No. 1 and consists of a garnet and silicate zone 100 by 20 feet. In the central part of this was fine shipping ore. The garnet zone at this place is cut by quartz veinlets two to four inches thick, and by lenses up to 18 inches wide, these are later than the silicates. In the central part of the face of the open cut the ore was in veinlets or “floor” similar to the quartz, but widened with depth to a considerable body.

Near the center of the Queen claim is an 18-inch quartz vein striking N. 30° E., dipping about 30° toward the northwest which carries considerable chalcopyrite.

The Queen ore as shipped is reported to have carried $6 in gold and silver, principally silver, and approximately 30% copper.

The ore is bornite with the usual surficial alterations, the enriched ore is chalcocite, and covellite in and along fractures in the bornite. The full depth of the secondary enrichment has not been reached by the present development.

Lucky Strike (Walter James) Prospect

The Lucky Strike prospect is located on the west bank of Indian Creek about one-fourth mile above the bridge on the Camp Creek road, and about one-half mile northeast of Landore. It consists of two short tunnels driven thru the hornblende granite to intersect some narrow copper-bearing quartz veins which occur in fissures, evidently joint planes in the granite. The mineralization consists of copper-bearing sulphides, largely chalcopyrite in true fissure veins in the granite, the vein matter consisting of quartz and a little feldspar, which for the most part is orthoclase. The veins thus resemble true pegmatites. So far as developed the veins are all narrow, from 6 inches to perhaps 2 feet wide. The sulphides are not uniformly distributed throughout the vein, but occur in small bunches in various places in it. A small amount of mineralization is occasionally found in the country rock at the contact with the vein. Much of the vein is apparently barren. Very little pyrite was noticed. Small amounts of bornite are occasionally intimately intergrown with the chalcopyrite. The workings are all within 50 feet of the surface and consequently the usual oxidized minerals of copper, malachite, chrysocolla, a black silicate of copper, and a little azurite are present, but only in small amounts. The chalcopyrite shows the customary enrichment of chalcocite and a little covellite, both of which occur as replacements along fractures in the chalcopyrite. There are no data available as to the percentage of copper and silver carried by the veins, but judging from the general

appearance of the prospect, the veins when taken as a whole, as they must be in mining, will be found to be very low grade.

Geologic Features: The following is the geologic history of the Hells Canyon region from Simmons et al. (2007):

The geologic history of the Hells Canyon region includes several periods of volcanic activity, major orogenic movements, intrusion, and metamorphism. The sequence of events has been determined to the extent that much of the history can be reconstructed. During the Permian, volcanic and volcaniclastic rocks were deposited. Toward the end of that period, or in the Early Triassic, the rocks were uplifted, deformed, and intruded by plutonic rocks ranging in composition from gabbro to granite. Following the uplift, in the Middle and Late Triassic, volcanic and volcaniclastic rocks were again deposited, and in places temporarily unaffected by volcanism, limestone was deposited. The volcanic and volcaniclastic rocks and the interbedded limestone make up the Lower Permian and Middle and Upper Triassic Seven Devils Group. Volcanism ceased during the Late Triassic and was followed by the deposition of the Upper Triassic Martin Bridge Limestone, in a thick layer presumably throughout the region.

From the time of deposition of the Martin Bridge Limestone until the Middle Jurassic, the Hells Canyon region was uplifted, concurrent with the emplacement of plutonic rocks similar to those emplaced during the earlier uplift, and older rocks were eroded. In the Middle and Late Jurassic, black mudstone, the Coon Hollow Formation, was deposited on deformed rocks of Triassic age. A major orogeny then folded and faulted the pre-existing rocks, metamorphosed volcanic rocks into greenstones, and emplaced another group of plutonic rocks.

At the end of the Jurassic, plutonic rocks were thrust northwestward in the central part of the study area, and limestone and greenstone were thrust in the same direction into the eastern part of the study area. The thrusting was followed in the Early Cretaceous by the intrusion of granitic plutons, notably in the southern part of the study area. Later during the Early Cretaceous, low- to high-grade metamorphism, most effective east of the study area, transformed volcanic and sedimentary rocks into slate, marble, schist, and gneiss, and shortly thereafter these foliated metamorphic rocks were thrust eastward into the southeastern part of the study area.

The region was subsequently uplifted and an erosion surface of mixed relief developed; mountains probably existed in the southeast and a few canyons were present in the north. Then, in the middle Miocene, basalt erupted from numerous fissures and inundated the older rocks with the possible exception of the peaks in the south; these flows are part of the Miocene Columbia River Basalt Group, which is now widespread in the western part of the study area. During the late Miocene and Pliocene, the region was subjected to warping and block faulting. This was followed in the latest Pliocene and Pleistocene by the erosion of Hells Canyon. The canyon attained nearly its present depth prior to Wisconsin glaciation.

During the Pleistocene, the mountainous southern part of the study area was glaciated, producing morainal deposits; some gravels were probably deposited then also. During the Holocene, alluvium was deposited along the Snake River and its tributaries, and colluvium and landslide debris were deposited at a few places.

The following is a description of the type of rock found between Landore and Helena mining areas from Livingston and Laney (1920):

The oldest rock in the district is limestone which is exposed in two or three places only… The best example of invasion of one of these limestone areas by the granodiorite is between Landore and Helena. In this locality great limestone blocks were engulfed in the granodiorite and entirely crystallized to a white marble, accompanied in some instances by the formation of contact metamorphic minerals as garnet and epidote.

The fact that this limestone has been invaded and intruded by igneous rocks more than once has an economic bearing which might be briefly stated as follows. The contact metamorphic deposits between Landore and Helena occur associated with this highly altered limestone. Contact metamorphic deposits are

known to be of an irregular character even when they occur along a contact of limestone of considerable area and extent but when this metamorphic action has taken place along scattered and disconnected masses of limestone this irregularity is naturally greatly increased.

Section 3. Site Conditions and Photographs

All of the Landore mine photographs in this section were taken by DEQ on August 9, 2012. DEQ was accompanied on the site visit with one of the property owners, Mr. Clinton Jones. It was a hot and sunny day. The site visit began with the group walking up the road past the Idaho Power Company gate located at Lat. 45.12773°N and Long. -116.62782°W. The road is blocked from any vehicle entry (Photo 1).



Photo 1. Idaho Power Company gate.

Photo 2 and Photo 3 show that the area along Indian Creek and the road is heavily vegetated with mature trees.



Photo 2. View facing south at the fork in the road looking downstream along Indian Creek.

Photo 3 shows how vegetated the area is on the Lucy Lode claim and there are no signs of mining activity (Lat. 45.13308°N and Long. -116.62356°W).



Photo 3. View facing northeast on the Lucy Lode claim with the bank of Indian Creek in foreground.

Photo 4 and Photo 5 show the other side of the ford is heavily vegetated on both sides of Indian Creek (Lat. 45.13314°N and Long. -116.62376°W).



Photo 4. View facing south of road looking downstream of Indian Creek on opposite side.



Photo 5. View of the northeast hillside across Indian Creek.

The Lucky Strike Prospect is located high on the hillside and appears to be well-vegetated. Photo 6 and Photo 7 were taken from the road looking across Indian Creek to Lucky Strike Prospect (Lat. 45.131165°N and Long. -116.62595°W).



Photo 6. View facing east of Lucky Strike Prospect.



Photo 7. Close-up view of Lucky Strike Prospect.

Photo 8 and Photo 9 show an unknown open adit (UKAD1) observed at approximately 1300 feet on the hillside above the Landore town site (Lat. 45.12907°N and Long. -116.63175°W). The coordinates place the adit on the Edith patented claim. It is located in a difficult area to access on the west side of Indian Creek. The adit is open, dry, and there is no surface water in this area.



Photo 8. View facing west at unknown open adit (UKAD1).



Photo 9. Close-up view of unknown open adit (UKAD1).

The only mining related structure observed at the time of the site visit was a pile of bricks from a reverberatory furnace on the southwest side of Indian Creek (Photo 10). The brick pile is located approximately 300 feet west of Indian Creek. The vegetation in the area between the pile of bricks and Indian Creek is lush and there is no evidence of migration to Indian Creek from the furnace.



Photo 10. View facing northeast of the bricks from a reverberatory furnace.

The abandoned Landore town site shown in Photo 11 is well vegetated (Lat. 45.12735°N and Long. -116.62949°W).



Photo 11. View facing north at abandoned Landore town site.

There were some workings observed in the area on the hillside west of the remains of the reverberatory furnace. The vegetation appears healthy along the toe of the possible waste dump

shown in Photo 12 below. The material is a thin veneer of country rock. No oxidation was observed on this dump.



Photo 12. View facing west at hillside above the reverberatory furnace.

Section 4. Maps

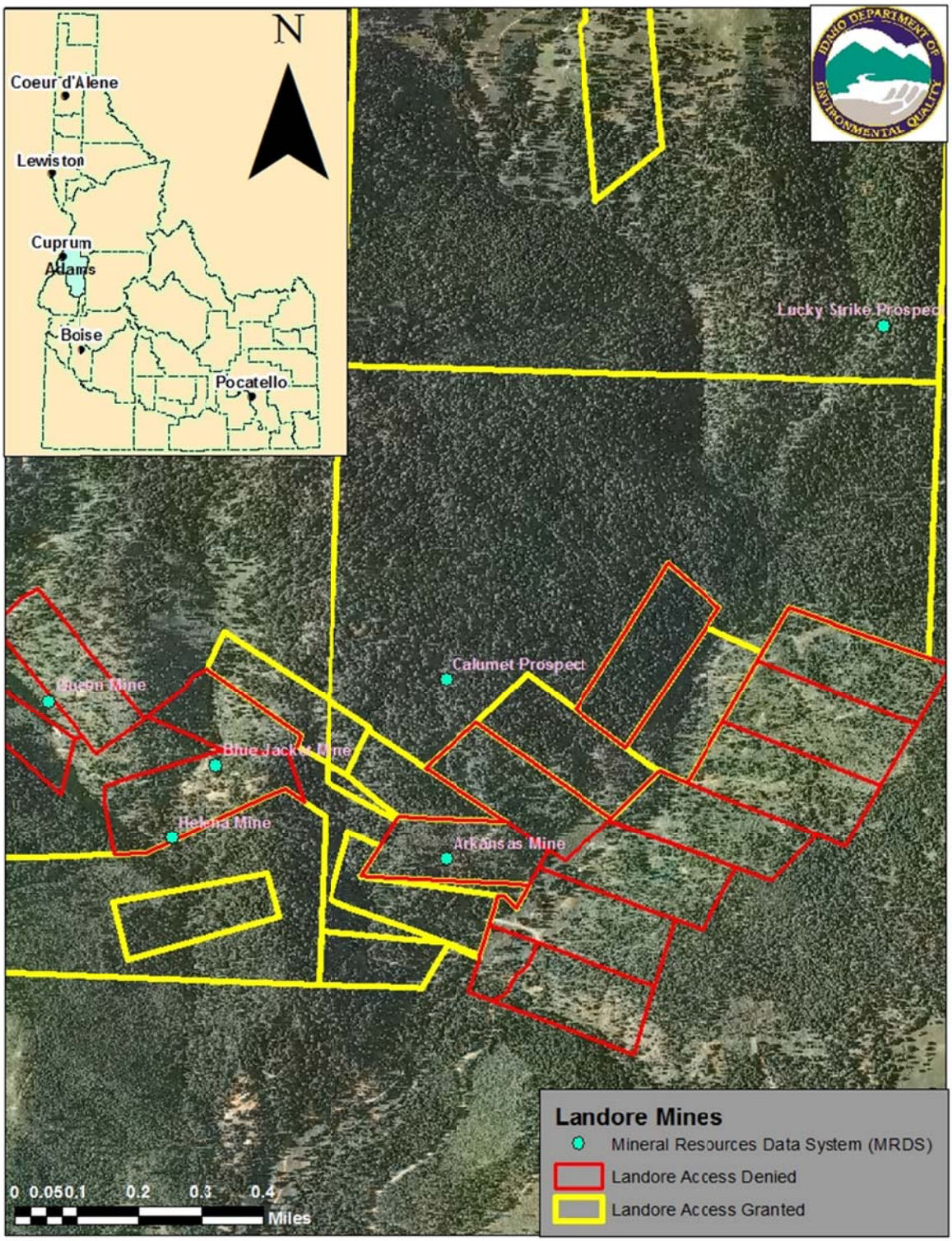


Figure 1. Location of the Landore mines in Adams County, Idaho.
(Source: 2009 Natural Color 1-meter National Agriculture Imagery Program [NAIP] Idaho)

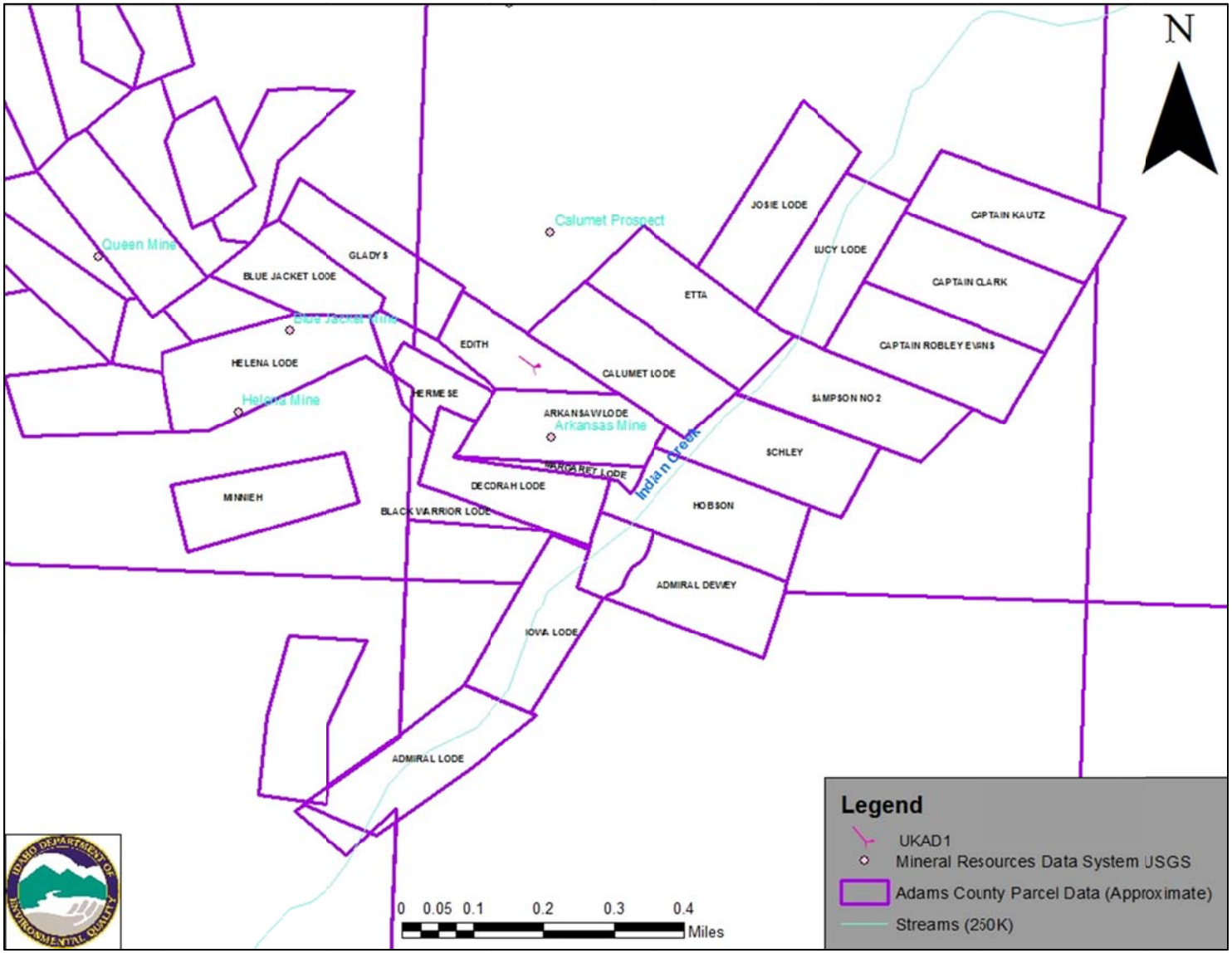


Figure 2. Location and names of patented claims for the Landore mines using United States Bureau of Land Management General Land Office (BLM GLO) records.

Not all patented claims were available on the BLM GLO web site. (Source: Land Patent Details—BLM GLO Records)

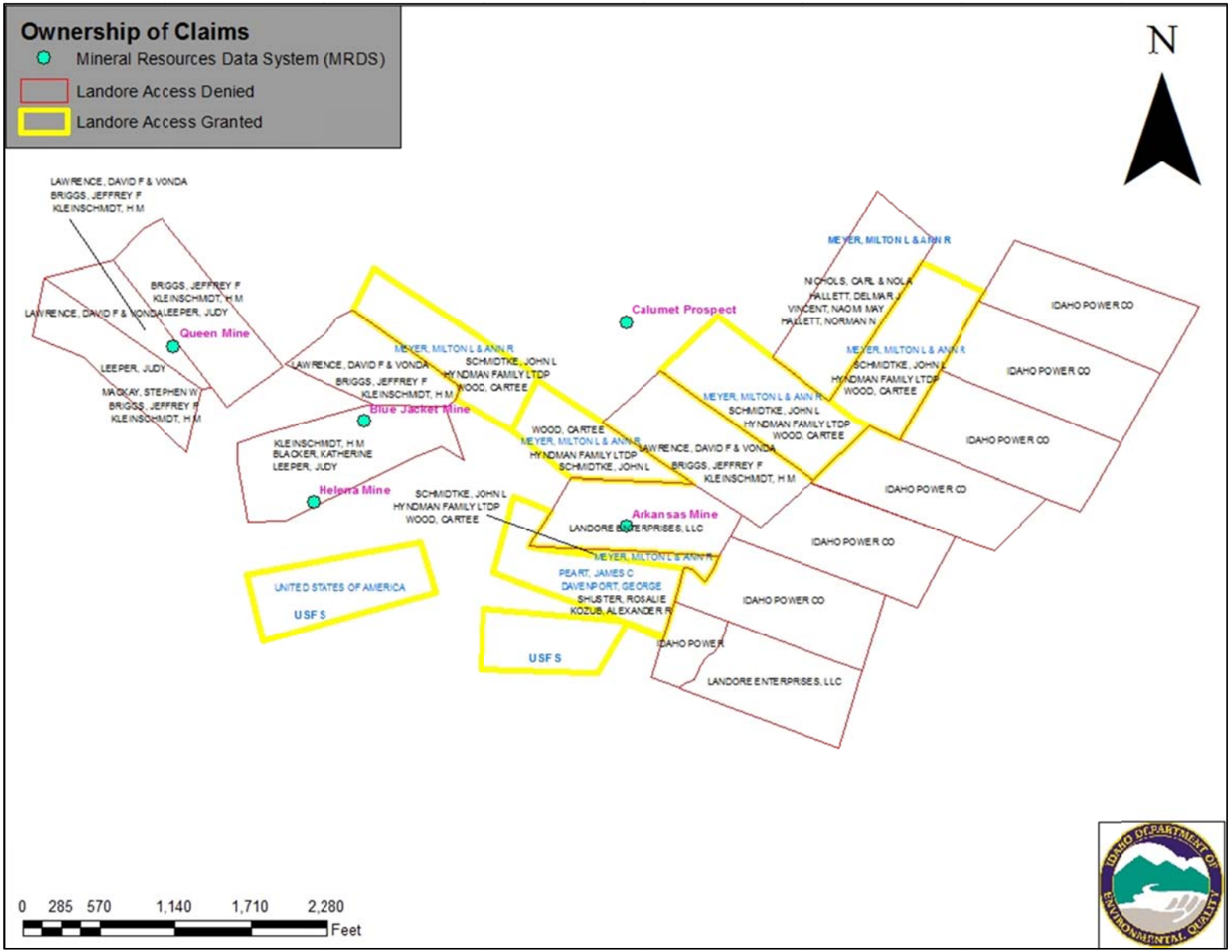


Figure 3. Ownership of patented claims for the Landore mines using Adams County parcel data.

The names in blue permitted access; the names in black denied access or never responded to requests for access.

(Source: Adams County parcel data 2012)

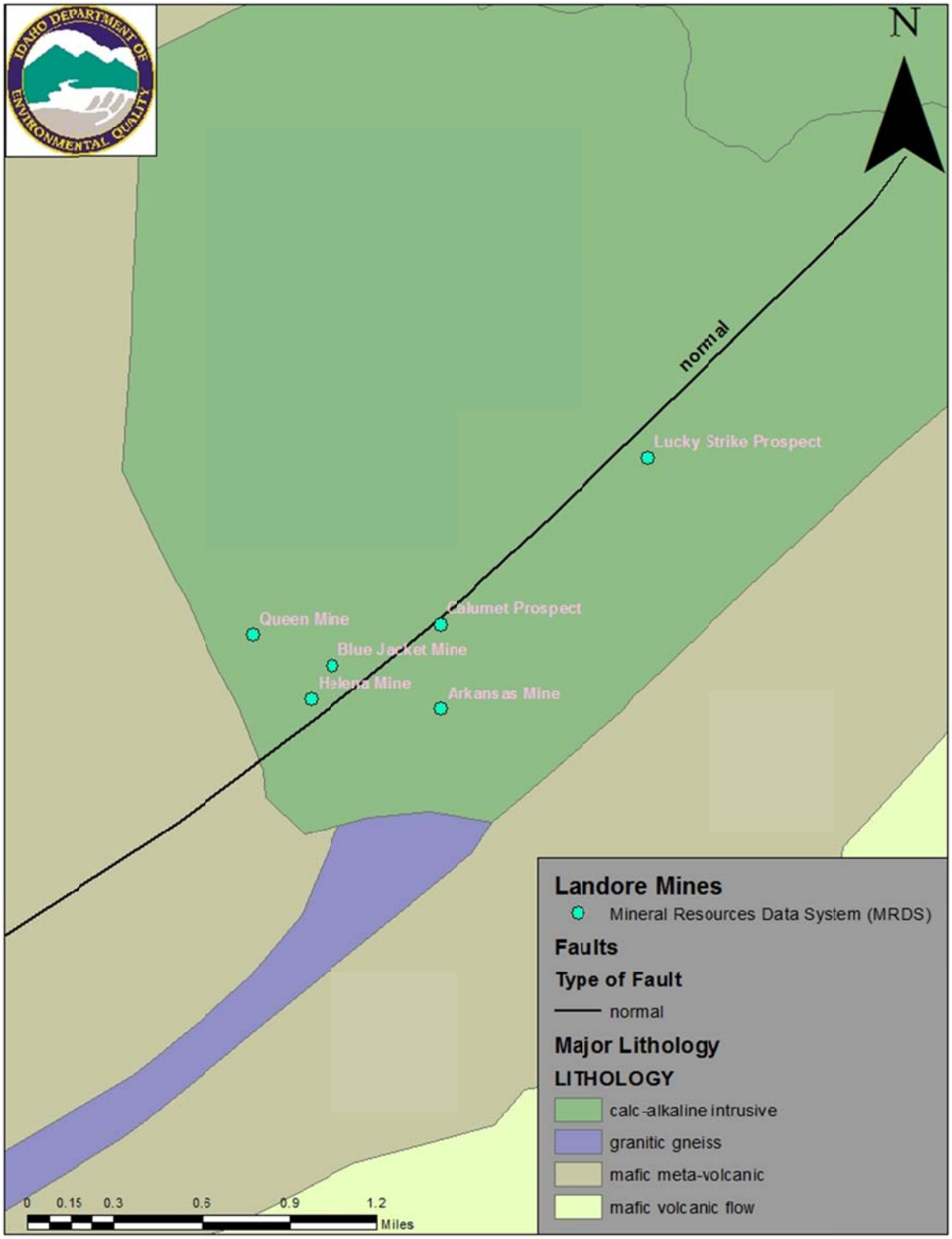


Figure 4. Map of major lithology in the vicinity of the Landore mines.
(Source: SDE Feature Class, USGS 1995. Idaho GIS ArcSDE 9.2 Geodatabase)

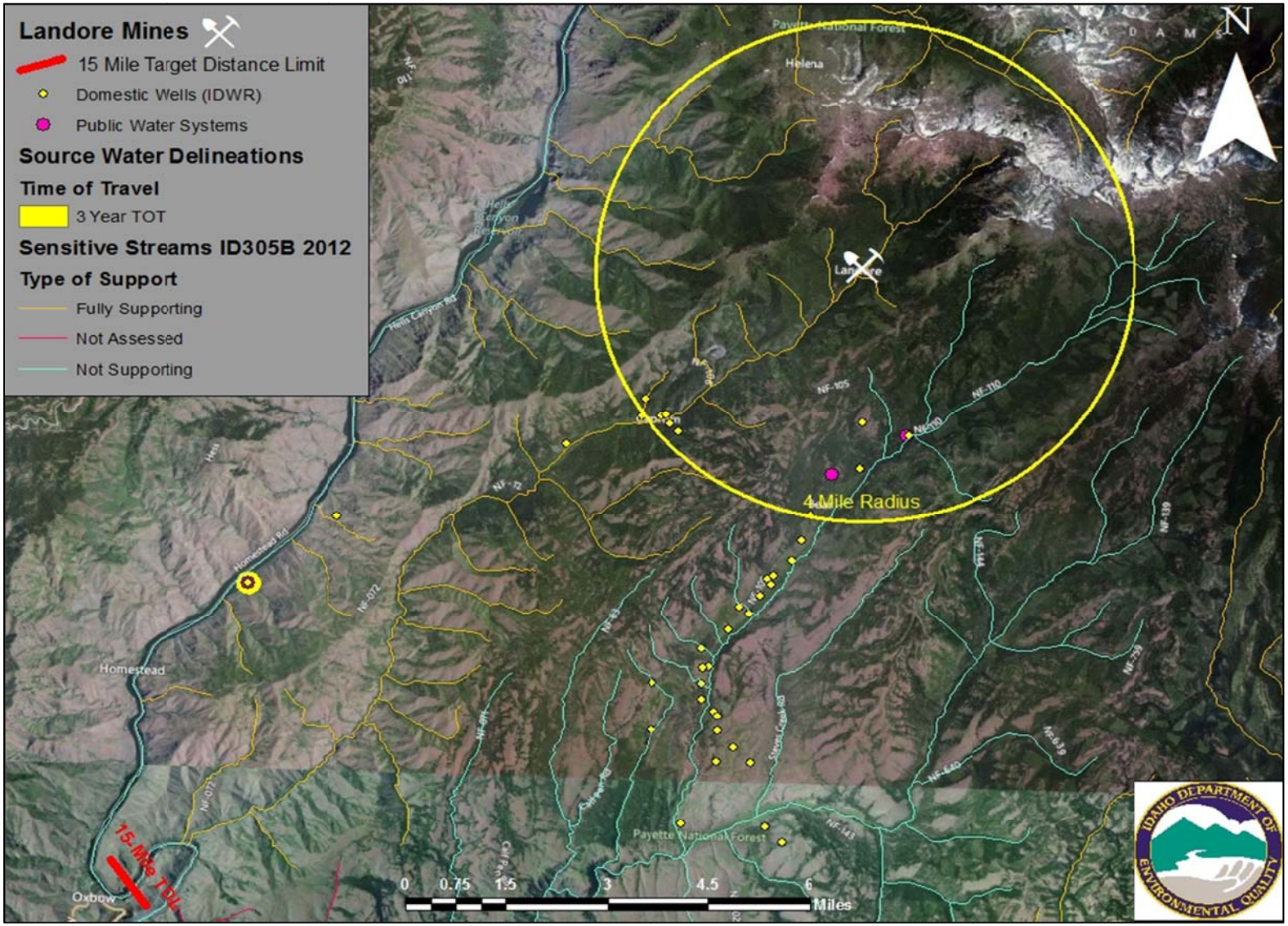


Figure 5. Domestic well and public water system locations.

There are 10 domestic well locations and 2 public water systems within the 4-mile radius, 15-mile TDL. Sensitive streams located in the vicinity of the Landore mines are shown. Indian Creek is listed as "fully supporting."

(Source: Idaho GIS ArcSDE 9.3 Geodatabase, Microsoft Virtual Earth Aerial with Labels 2009)

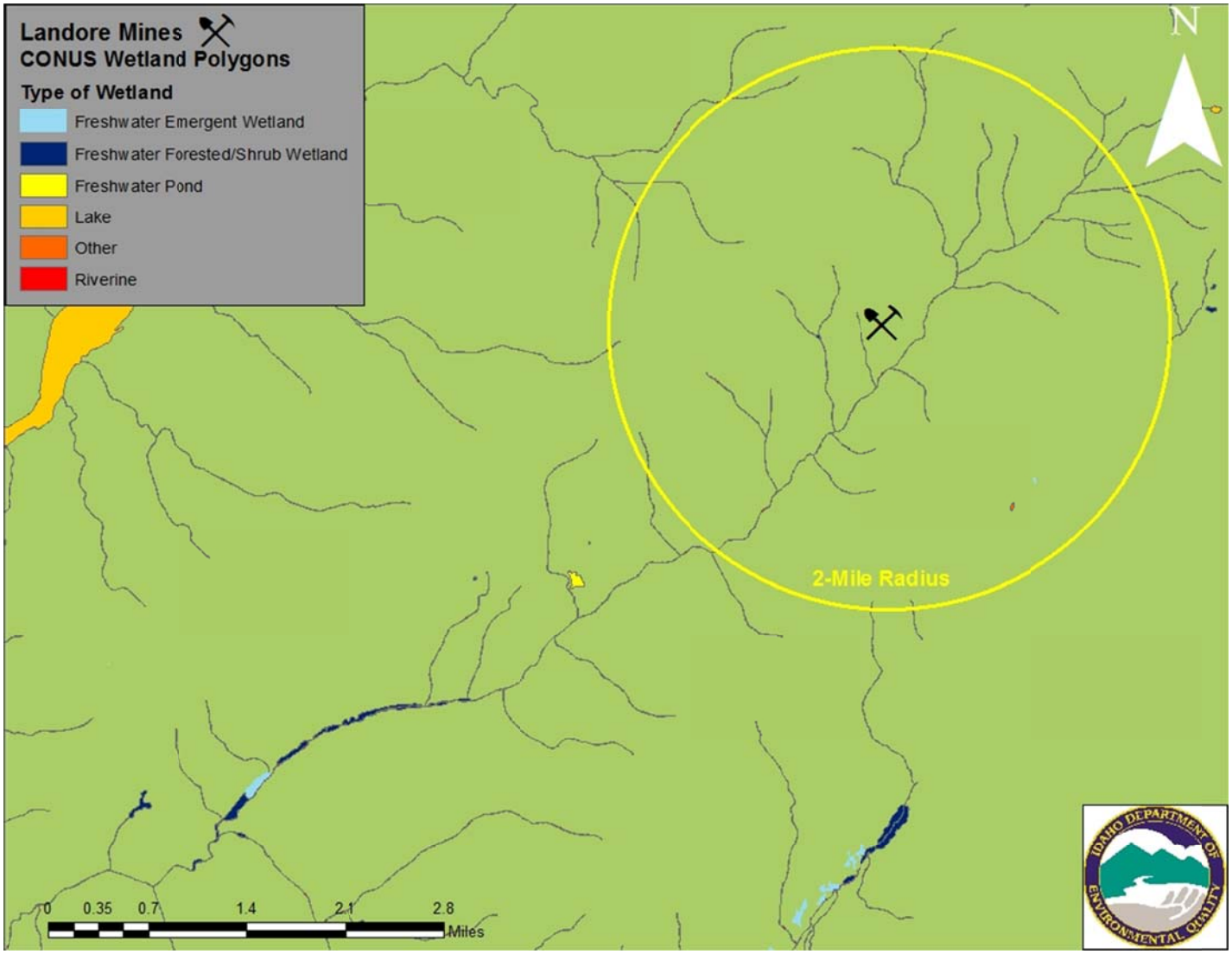


Figure 6. Wetland Locations.

There are significant wetlands within a 2-mile radius and in the general area. The wetland type for Indian Creek is freshwater forested/shrub wetland.

(Source: United States Fish and Wildlife Service [USFWS] CONUS Wetland Polygons)

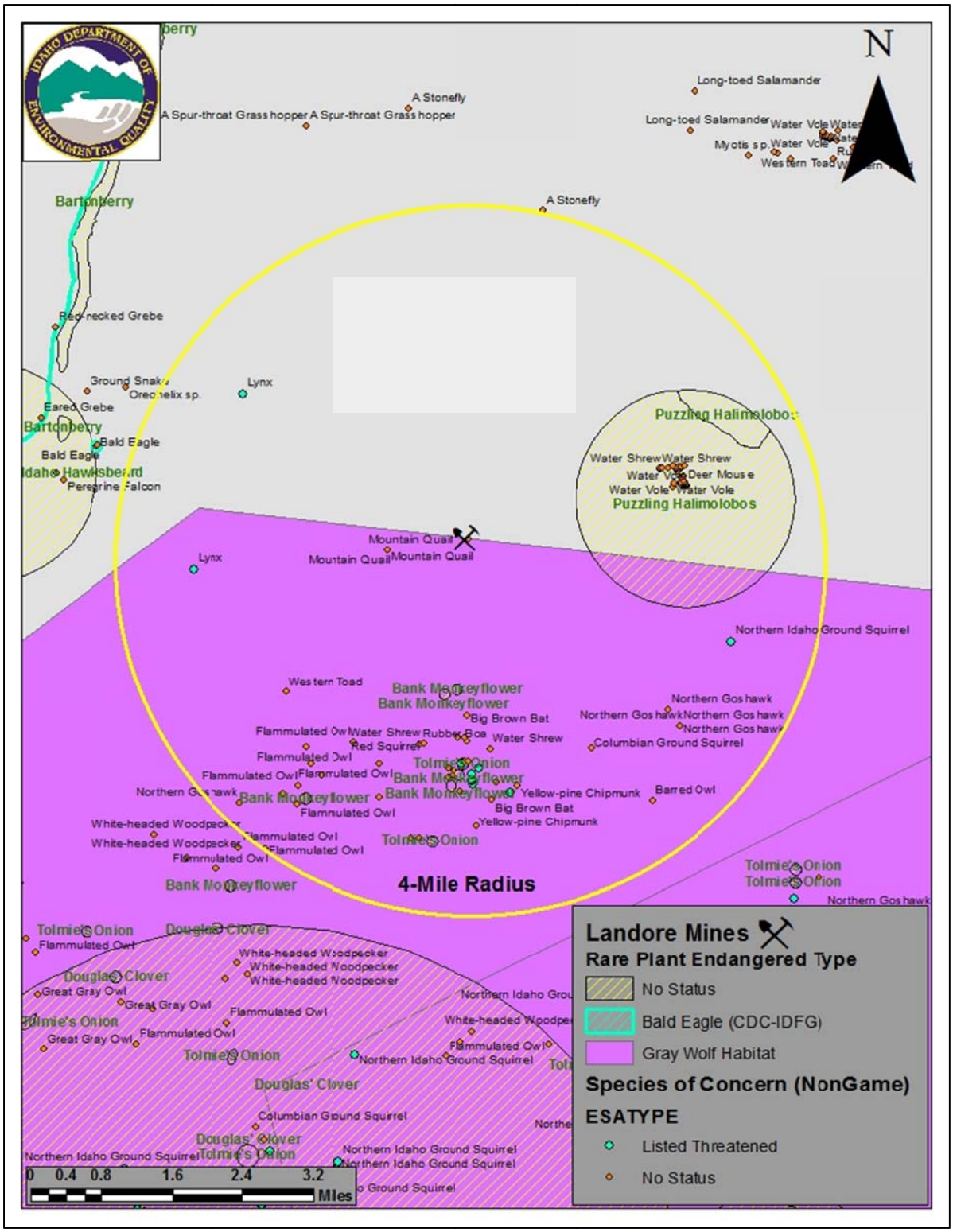


Figure 7. Plant, nongame animal, and fishery sensitive species within 4-mile radius and surrounding area of the Landore mines.

(Source: SDE Feature Dataset, Animal Conservation Database. Idaho GIS ArcSDE 9.2 Geodatabase)

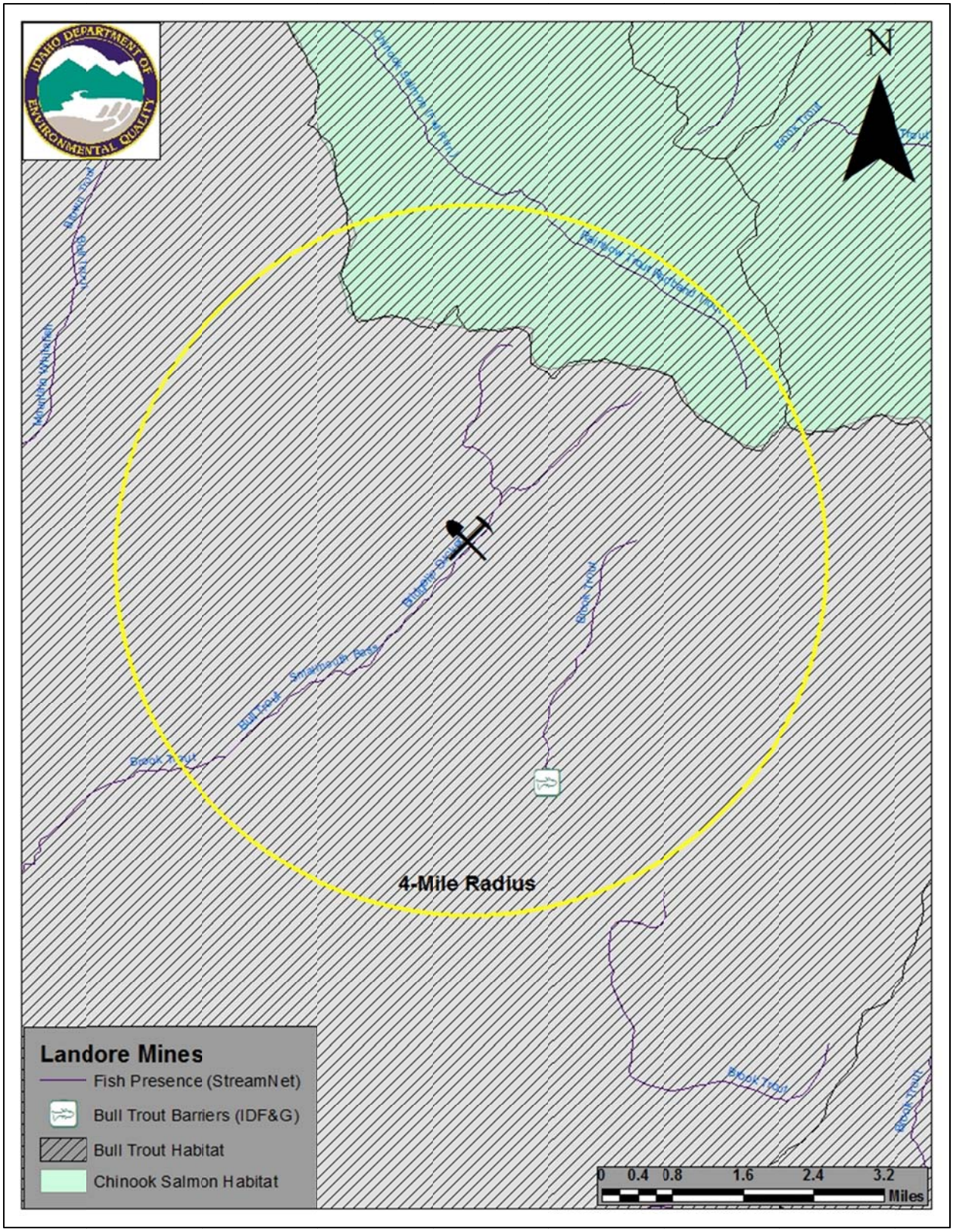


Figure 8. Fishery sensitive species within 4-mile radius and surrounding area of the Landore mines.

(Source: SDE Feature Dataset, Animal Conservation Database. Idaho GIS ArcSDE 9.2 Geodatabase)

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Appendix A. Materials Testing and Inspection, Inc. (MTI) Phase I Environmental Assessment for Idaho Power Company

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IDAHO POWER®
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RECEIVED
DEC 29 2011
DEPT. OF ENVIRONMENTAL QUALITY
WASTE PROGRAM

December 23, 2011

Ms. Tina Elayer
State of Idaho
Department of Environmental Quality
1410 North Hilton
Boise, Idaho 83706

Re: Preliminary Assessment Project

Dear Ms Elayer:

Idaho Power is in receipt of you letter, dated November 21, 2011, wherein the Idaho DEQ has offered to conduct a site assessment on land owned by Idaho Power in Adams County, under the DEQ's Inactive and Abandoned Mined Lands Assessment Project. In your letter, the land is referred to as the Hobson, Captain Clark, Captain Robley Evans, Captain Kautz and Schley Patents. While Idaho Power appreciates the DEQ's offer, the company does not wish to proceed with a DEQ site assessment of the subject property at this time. A Phase I environmental assessment was obtained by Idaho Power prior to its purchase of the property in 2008, and the Phase I report concluded that there were no concerns or reasons noted for further investigation.

If you have questions, or need anything additional, just let me know.

Sincerely,

Les Hogg

{00074505.DOCX; 1}LES HOGG
Real Estate Specialist
phone: (208) 388-2693
fax: (208) 388-6927 e-mail: lhogg@idahopower.com

EXECUTIVE SUMMARY

Materials Testing & Inspection, Inc. (MTI) has conducted a Phase I Environmental Site Assessment in conformance with the scope and limitations of the American Society of Testing and Materials (ASTM) E 2247-08 Standard Practice for Environmental Site Assessments of 125 acres northeast of Cuprum, Idaho, the Property.

The subject Property was located within portions of theNE¼NW¼ of Section 31, SW¼NW¼ of Section 29, SW¼ and SE¼ of Section 30, Township 21 North, Range 2 West of the Boise Meridian. The Property was described by the Client as being approximately 125 acres in a mountainous area northeast of Cuprum, Adams County, State of Idaho. Two mining claims from 1899, Admiral Dewey, Hobson, and Schuley Consolidated Lode and the Captain Group Lode, comprised the 125 acres of the subject Property. Vegetation on the subject Property consisted of forested land. Indian Creek was located along the west property boundary.

The site reconnaissance, conducted on December 4, 2008, encountered no interference to the observance of surface conditions. Since the subject Property is located in a remote area, note that historical records were limited.

At the time of the site reconnaissance, the subject Property was unoccupied. Access to the subject Property was obtained from a national forest dirt road. MTI observed evidence of a former small-scale mining or prospecting activities on the site; however, note that most recent uses appeared to be recreational. However, note that at the time of the site reconnaissance, MTI was not provided access to the two small structures at the subject Property.

MTI has not identified any known or suspect recognized environmental conditions on the Property. MTI recommends no additional investigation based on our findings. As noted in the warranty section, this report is limited to the information available or known to MTI as of the date of the report. If any additional information becomes available, it will be forwarded to you for your evaluation.

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One room cabin located on south property boundary east of river



1 → 2

Hill side along western side of claim



Camp trailer with attached one room cabin located along east side of river



3 → 4

Old box spring mattress and misc. trash in trash pit near southern boundary

Photographs taken by Jon Knuck, MTI

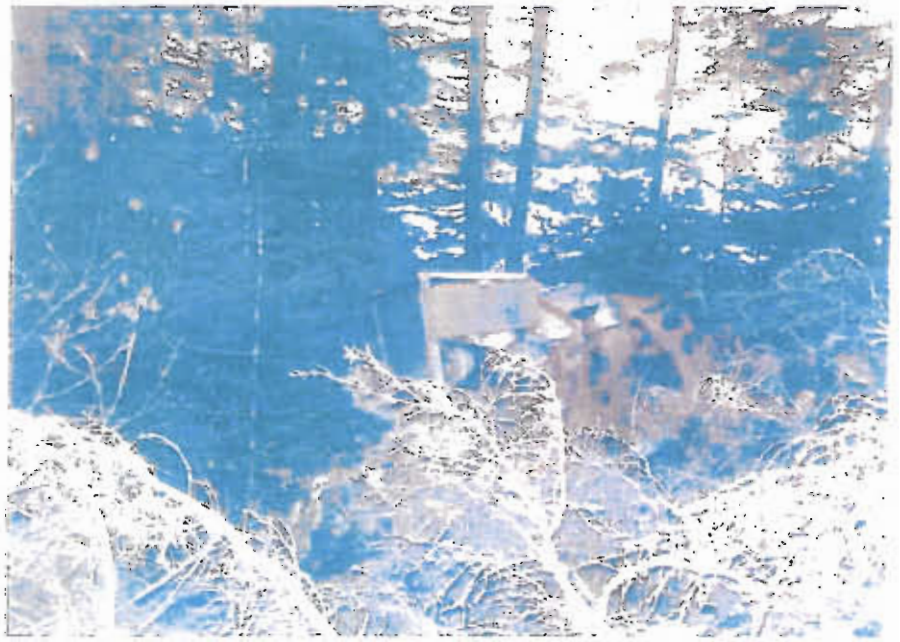


Old mining sluice located near trailer/cabin

5 →
6



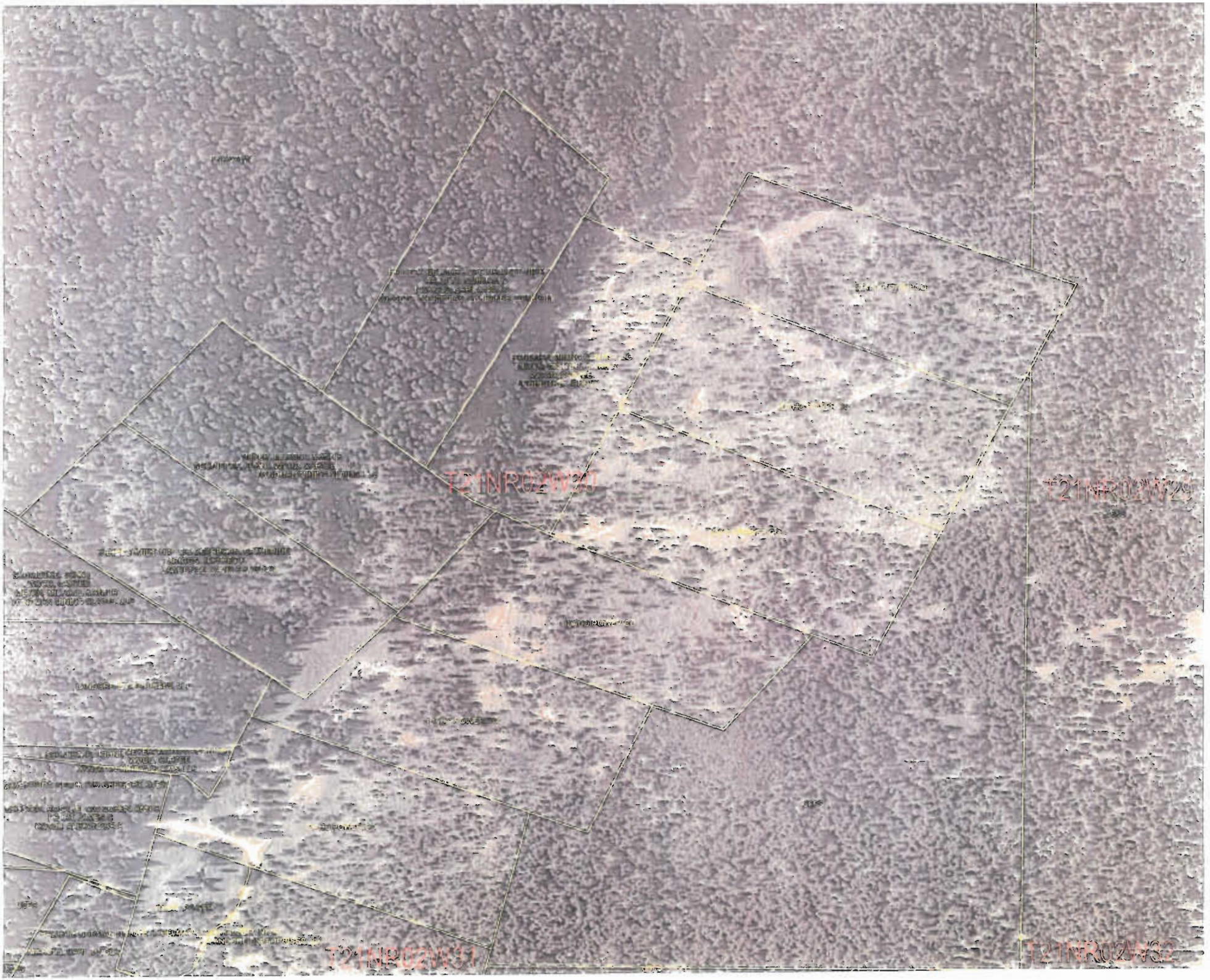
Road/path through site running north along creek



Gasoline engine powered mining trommel located near trailer/cabin

7 ←

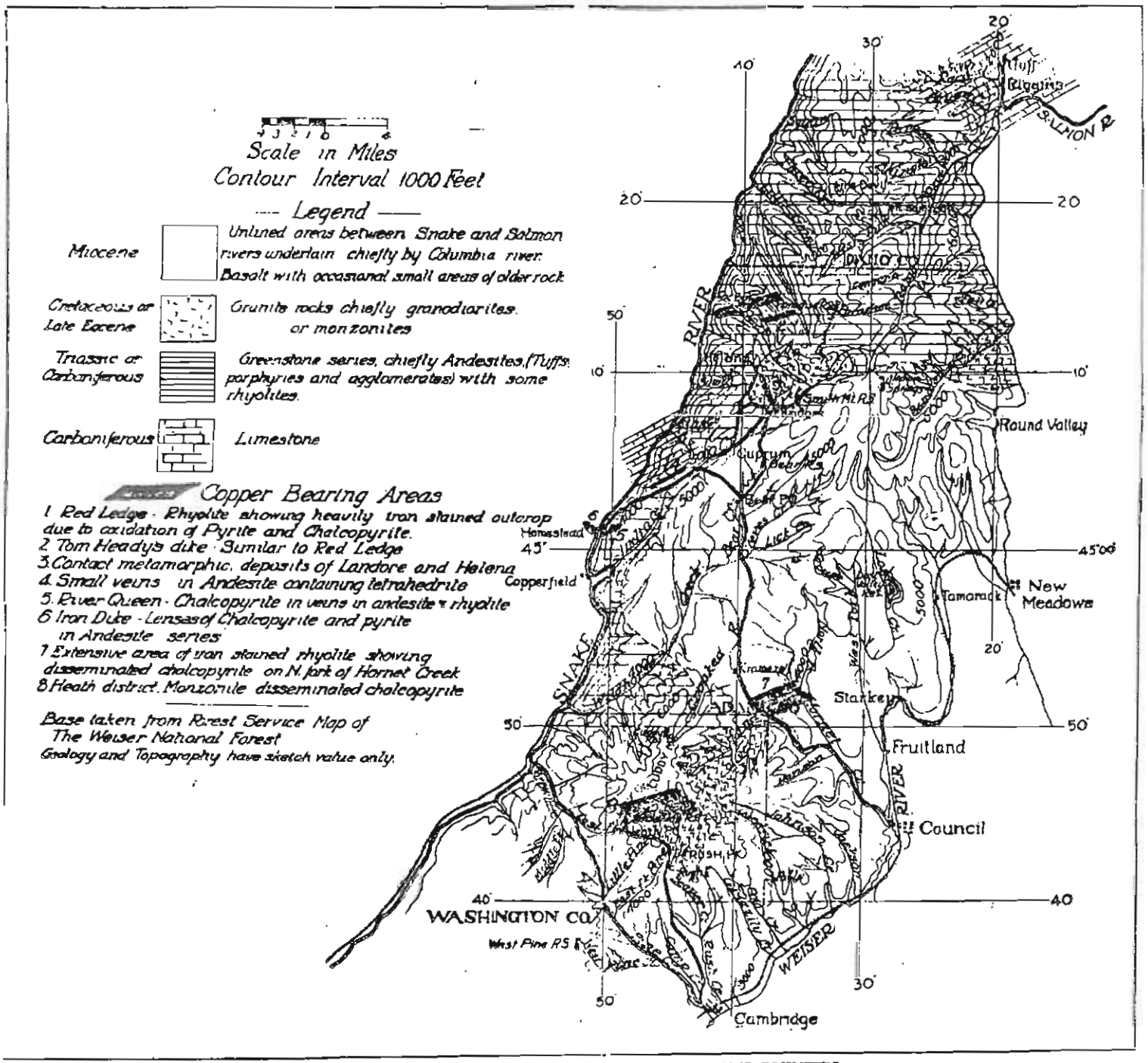
Photographs taken by Jon Knuck, MTI


T21NR02W30
T21NR02W31
T21NR02W32

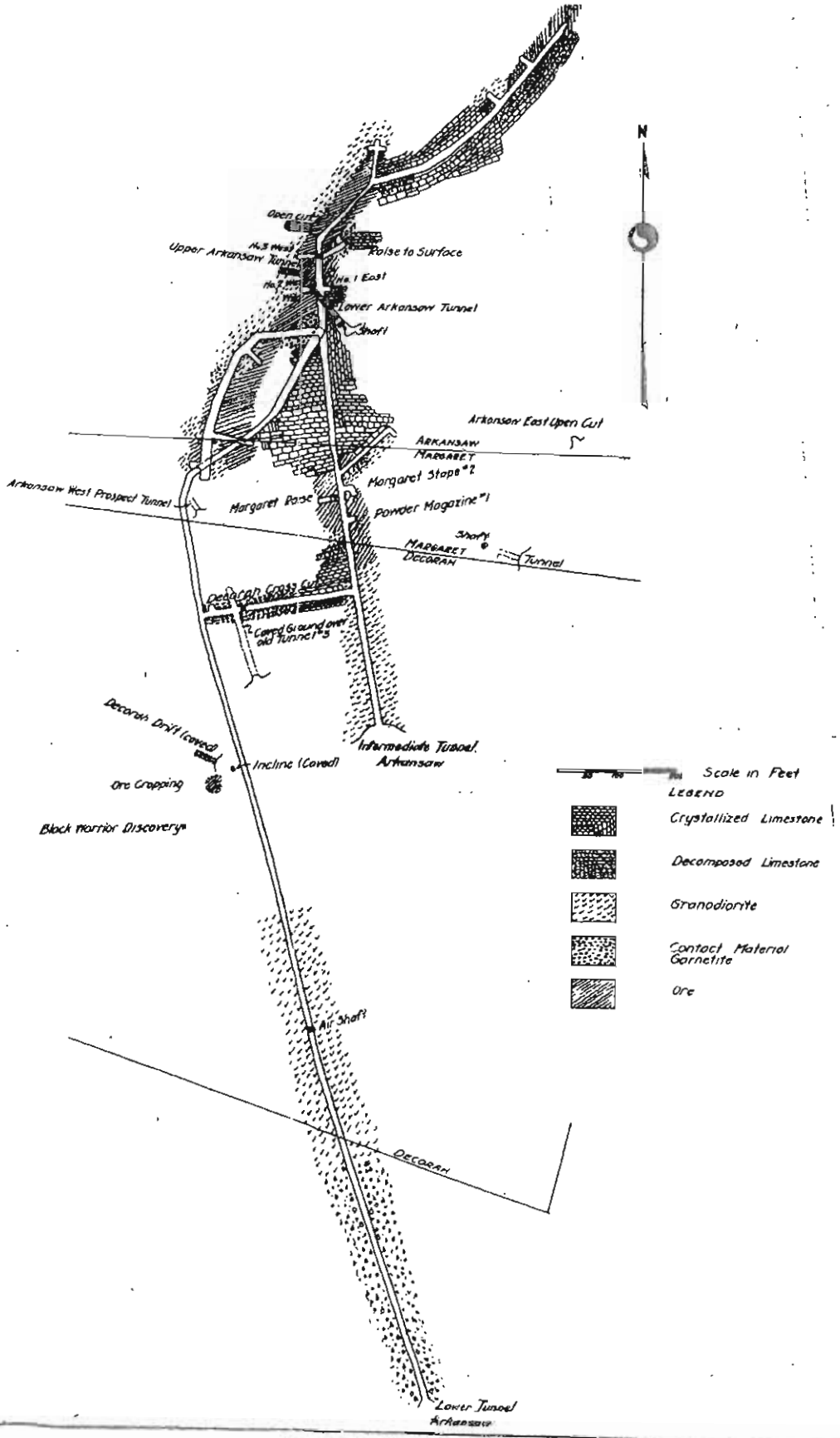
Appendix B. Reference Maps

The maps in this appendix were copied from Livingston, D.C. and F.B. Laney. 1920. *The Copper Deposits of the Seven Devils and Adjacent Districts (Including Heath, Hornet Creek, Hoodoo, and Deer Creek).* Moscow, ID: Bureau of Mines and Geology.

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GEOLOGIC MAP OF PART OF WASHINGTON AND ADAMS COUNTIES



WORKINGS OF ARKANSAW MINE