OFFICE OF MINE RECLAMATION

DEPARTMENT OF CONSERVATION
OFFICE OF MINE RECLAMATION

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May 30, 2014

Ms. Linda Hansen
Sierra Nevada Conservancy
11521 Blocker Drive, Suite 205
Auburn, CA 95603

Subject: Proposition 84 Grant Application – Category 2

Dear Ms. Hansen:

The California Department of Conservation (DOC), in cooperation with the United States Forest Service Region 5 (USDA FS), wishes to apply for a $75,000 Category 2 grant from the Sierra Nevada Conservancy (SNC) for a Preliminary Assessment and Site Inspection (PA/SI) leading to an Engineering Evaluation (EE) and Cost Analysis (EE/CA) for the legacy Robinson Mine. The Robinson mine site is being remediated under the (USDA FS) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) program.

The Robinson Mine was a gold drift mine that started operation in 1894, and was improved in 1936 with a mill. In 2009, USDA FS contracted with Weston Solutions Inc. (WSI) for sampling and a Preliminary Site Characterization (PSC) of possible mercury contamination at the Robinson Mine site. In the resulting soil and sediment samples, mercury was detected in all soil samples at maximum concentration of 47.7 mg/kg. These contamination levels pose a potential threat to human health and the environment.

This project is the next phase in the CERCLA process, to conduct the in-depth (PA/SI) to determine the extent of on and off-site contamination from the historic mining operations. Staff from the Abandoned Mine Lands Unit (AMLU) of DOC will perform a full surface inventory of the mine features onsite to ensure all possible points of contamination are accounted for, including mine features that may be draining and contributing to metal contamination. From the PA/SI assessment the DOC and USDA FS can develop the EE/CA for assessment, development, and evaluation of site remediation alternatives to select the appropriate site remedy and cleanup to insure both the heath of humans and the environment along the Feather River.

As the DOC's representative, I am authorized to submit this application on behalf of DOC. Thank you for the consideration of this request and if any additional information

is needed, please contact Dave Tibor at (916) 322-1232, or by email at david.tibor@conservation.ca.gov.

Sincerely,

Glenda Marsh
Environmental Program Manager
Abandoned Mine Lands Unit

Enclosure

CEQA/NEPA COMPLIANCE FORM

(CALIFORNIA ENVIRONMENTAL QUALITY ACT & NATIONAL ENVIRONMENTAL POLICY ACT)

Instructions: All applicants, including federal agencies, must complete the CEQA compliance section. Check the box that describes the CEQA status of the proposed project. You must also complete the documentation component and submit any surveys, and/or reports that support the checked CEQA status. NOTE: There is no page limit requirement on this form. You may use the space you need to fully describe the CEQA/NEPA status of this project.

If NEPA is applicable to your project, you must complete the NEPA section in addition to the CEQA section. Check the box that describes the NEPA status of the proposed project. Complete the documentation component and submit any surveys, and/or reports that support the NEPA status.

For both CEQA and NEPA, submittal of permits is only necessary if they contain conditions providing information regarding potential environmental impacts.

CEQA STATUS

(All applicants must complete this section)

Check the box that corresponds with the CEQA compliance for your project. The proposed action is either "Not a Project" under CEQA; is Categorically Exempt from CEQA; or requires a Negative Declaration, Mitigated Negative Declaration, or an Environmental Impact Report per CEQA.

X☐ "Not a Project" per CEQA

1. Describe how your project is "Not a Project" per CEQA:
   Although funds from the State of California will be used for conducting the site investigation and evaluation of clean up action alternatives, no discretionary action on the part of a state or local government agency is part of this project and thus this project is not a project under CEQA.

2. If appropriate, provide documentation to support the "Not a Project" per CEQA status.
   Click here to enter text.

☐ **Categorical Exemption or Statutory Exemption**

If a project is categorically exempt from CEQA, all applicants, including public agencies that provide a filed Notice of Exemption, are required to provide a clear and comprehensive description of the physical attributes of the project site, including potential and known special-status species and habitat, in order for the SNC to make a determination that the project is

exempt. A particular project that ordinarily would fall under a specific category of exemption may require further CEQA review due to individual circumstances, i.e., it is within a sensitive location, has a cumulative impact, has a significant effect on the environment , is within a scenic highway, impacts an historical resource, or is on a hazardous waste site. Potential cultural/archaeological resources must be noted, but do not need to be specifically listed or mapped at the time of application submittal. Backup data informing the exemption decision, such as biological surveys, Cultural Information Center requests, research papers, etc. should accompany the full application. Applicants anticipating the SNC to file an exemption are encouraged to conduct the appropriate surveys and submit an information request to an office of the California Historical Resources Information System (CHRIS).

1. Describe how your project complies with the requirements for claiming a Categorical or Statutory Exemption per CEQA:
   Click here to enter text.

2. If your organization is a state or local governmental agency, submit a signed, approved Notice of Exemption (NOE) documenting the use of the Categorical Exemption or Statutory Exemption, along with any permits, surveys, and/or reports that have been completed to support this CEQA status. The Notice of Exemption must bear a date stamp to show that it has been filed with the State Clearinghouse and/or County Clerk, as required by CEQA.
   Click here to enter text.

3. If your organization is a nonprofit or federal agency, there is no other California public agency having discretionary authority over your project, and you would like the SNC to prepare a NOE for your project, let us know that and provide any permits, surveys, and/or reports that have been completed to support the CEQA status.
   Click here to enter text.

☐ **Negative Declaration OR**

☐ **Mitigated Negative Declaration**

If a project requires a Negative Declaration or Mitigated Negative Declaration, then applicants must work with a qualified public agency, i.e., one that has discretionary authority over project approval or permitting, to complete the CEQA process.

1. Describe how your project complies with the requirements for the use of a Negative Declaration or a Mitigated Negative Declaration per CEQA:
   Click here to enter text.

   Submit the approved Initial Study and Negative Declaration/Mitigated Negative Declaration along with any Mitigation Monitoring or Reporting Plans, permits, surveys, and/or reports that have been completed to support this CEQA status.

The IS/ND/MND must be accompanied by a signed, approved Notice of Determination, which must bear a date stamp to show that it has been filed with the State Clearinghouse and/or County Clerk, as required by CEQA.

Click here to enter text.

☐ **Environmental Impact Report**

If a project requires an Environmental Impact Report, then applicants must work with a qualified public agency, i.e., one that has discretionary authority over project approval or permitting, to complete the CEQA process.

1. Describe how your project complies with the requirements for the use of an Environmental Impact Report per CEQA:
   Click here to enter text.

Submit the Draft and Final Environmental Impact Report along with any Mitigation Monitoring or Reporting Plans, permits, surveys, and/or reports that have been completed to support this CEQA status. The EIR documentation must be accompanied by a signed, approved Notice of Determination, which must bear a date stamp to show that it has been filed with the State Clearinghouse and/or County Clerk, as required by CEQA.

Click here to enter text.

NEPA STATUS

(Applicable to federal applicants, some tribal organizations, and applicants receiving federal funding or conducting activities on federal lands)

Check the box that corresponds with the NEPA compliance for your project.

☐ **Categorical Exclusion**

1. Describe how your project complies with the requirements for claiming a Categorical Exclusion per NEPA:
   Click here to enter text.

Submit the signed, approved Decision Memo and Categorical Exclusion, as well as documentation to support the Categorical Exclusion, including any permits, surveys, and/or reports that have been completed to support this NEPA status:

Click here to enter text.

☐ **Environmental Assessment & Finding of No Significant Impact**

1. Describe how your project complies with the requirements for the use of an Environmental Assessment and Finding of No Significant Impact per NEPA:
   Click here to enter text.

   Submit the signed, approved Environmental Assessment and Finding of No Significant Impact along with any permits, surveys, and/or reports that have been completed to support this NEPA status.

   Click here to enter text.

☐ **Environmental Impact Statement**

1. Describe how your project complies with the requirements for the use of an Environmental Impact Statement per NEPA:
   Click here to enter text.

   Submit the Draft and approved, Final Environmental Impact Statement, along with the Record of Decision and any permits, surveys, and/or reports that have been completed to support this NEPA status.

   Click here to enter text.

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Project Description

The California Department of Conservation (DOC) is partnering with U.S. Department of Agriculture Forest Service (USFS) to apply for a $75,000 Category 2 grant from the Sierra Nevada Conservancy's Proposition 84 grant program to develop a Preliminary Assessment and Site Inspection (PA/SI) and Engineering Assessment/Cost Evaluation (EE/CA) for the legacy Robinson Mine in Plumas County. The Robinson Mine site is being remediated by USFS under its Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) program.

Passed by Congress in 1980, CERCLA is a federal law that provides broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA is a defined and widely known administrative process and provides legally defensible and Environmental Protection Agency (EPA) accepted standards for sampling and analysis, and involves the community, governments (federal, state, local), federally recognized tribes, and other partners in the decision-making process. CERCLA provides a framework to identify and involve Potentially Responsible Parties. National Environmental Policy Act (NEPA) analysis is not required for CERCLA projects. USFS uses its CERCLA authorities to clean up hazardous substances from abandoned mine lands and other sites on National Forest Systems lands in order to protect human health and the environment, such as soil, sediment, surface water, and groundwater. The PA/SI and EE/CA proposed for Robinson Mine are components required under the USFS CERCLA cleanup process.

The Robinson Mine is located on USFS land in the Feather River Ranger District of the Plumas National Forest, approximately 18 air miles southwest of Quincy, in Plumas County, California (Lat/long: 39°48'39.24"N, 121°14'38.809"W, NAD27). The mine site is immediately adjacent to Frazier Creek, which is located in the Middle Fork Feather River watershed. The mine site appears on United States Geological Survey (USGS) Haskins Valley 7.5' topographic quad map (see Figures 1-5).

In 2009, the USFS contracted with Weston Solutions Inc. (WSI) for on-site sampling and the development of a Preliminary Site Characterization (PSC) of possible mercury or other metals contamination at the Robinson Mine site. The PSC determined that there were cadmium, lead, mercury and zinc concentrations above action levels in individual soil samples, and lead concentrations above action level in a water sample.

Based on the results of the PSC, the next phase in the CERCLA process is to conduct the in-depth Preliminary Assessment / Site Investigation (PA/SI) to determine the presence, extent, and severity of any on or off-site contamination from the historic mining operations. DOC staff, along with necessary contractor assistance, will perform sampling and develop the PA/SI. Following this PA/SI assessment, DOC and USFS will retain a contractor to develop the EE/CA for assessment, development, and evaluation of site remediation alternatives. The purpose of the EE/CA is to address how to clean up the contamination determined by the investigation.

Prior to the start of the PA/SI effort, DOC staff, in coordination with USFS archaeology staff, will perform a full surface inventory of the mine features onsite, including mine workings, mine waste and tailings, structures, and equipment. This survey will be used to inform development of the PA/SI sampling plan.

Environmental Setting and Impacts

Mining History

According to historical literature (CSMB 1918), the Robinson Mine comprised the patented "Morning Star" and "Trenton" claims, initially located in 1876 on both sides of Frazier Creek. In 1890, the claims were purchased by Robinson. By 1896 (CSMB 1896) the workings consisted of a 70' deep shaft with a steam hoisting plant, with tunnels run on both sides of Frazier Creek (which divided the two claims). The tunnels were 400', 260', 300', and 40' long, with much stoping. Another tunnel was 200', with little stoping. A 20-stamp mill was located on the east side of the creek, with 900-pound stamps driven by a Knight wheel under 94' of head from a 1,650' long ditch; only one battery of stamps was reported as being in running order.

In 1918 (CSMB 1918) the mine was reported as having been idle since summer of 1912. At this point, the workings were described as a 100' deep shaft with 150' long drift at the bottom, and three tunnels cut on the vein. A steam and water power hoist was present, along with a 35-year old mill with 20 stamps.

In 1937 (CDM 1937) a 320' deep shaft is mentioned as having been recently pumped out, with 390' of drifts at the 85' level, and plans to immediately begin drifts on the 220' level. The mill at this time is described as 50-ton daily capacity, with a jaw crusher, 10 stamps, and ball mill in closed circuit with a Dorr classifier. Riffles were set below the stamps, and amalgamation plates below the ball mill. Three Fagergren flotation cells were follow by two Kraut cleaner-cells. A 200-hp diesel engine drove a generator to supply electric power, and a 440 cfm compressor was driven by a 100-hp motor; the shaft hoist was driven by compressed air.

It appears that the Robinson Mine was last operated in 1939 (Donna Duncan, USFS, pers. comm.). A preliminary history of the Robinson Mine and nearby area was developed in 2014 by USFS (Moore 2014) primarily focused on mining claim history.

Current Status of Robinson Mine

The site now consists of various underground mine workings, associated mill and habitation ruins, and scattered equipment remains on both sides of the creek. (See Figure 4-5 for maps and Figures 6-15 for photographs.) There are several adits in various states onsite, including collapsed, remediated with culvert gates, and partially open. The presumed location of the main shaft is on the east side of the creek below the millsite, and appears to be collapsed. A large amount of waste rock extracted from the shaft forms a linear, flat-topped waste pile spread up and down canyon from above the shaft collar. A ten-stamp battery is still standing at the mill, though the mill building has completely collapsed around the battery and over the lower mill foundation. No obvious tailings materials were noted at or downslope of the mill site, though the collapsed mill building obscures much of the slope (the creek is located not much further downslope below the ruins). Various concrete footers with engines, compressors, steam boiler, and other equipment are present, and other intact and partially-intact equipment items are scattered about the mine site. The collapsed ruins of several buildings are present, along with other flat areas presumably used for habitation and/or work areas. Various roadbeds, flat areas, and trenches are scattered around the site.

Access to the site is via paved and then dirt USFS roads, ending at a parking area adjacent to a small cemetery (shown on the USGS 7.5' topographic map). The last 0.2 mile of road to the mill location has

been closed by USFS. Thus access is by foot, including crossing Frazier Creek in order to reach all features of the site.

The site receives a fair amount of visitation (Donna Duncan, USFS, pers. comm.). It is a large named mine on the USGS 7.5' topographic map and contains standing mill structures, underground workings, scattered artifacts, and a cemetery – all of which serve to draw visitation from the public. A number of recent beer and other cans were found during a May 2014 site visit, also indicating recent visitation.

Impacts

There are several possible impacts to the environment present at underground hardrock mine sites such as the Robinson Mine. Metals (e.g. cadmium, lead, zinc) can be released by waste rock, mill tailings, or draining adits; mercury used in the milling process can escape to the environment, and disturbed ground can contribute to sediment loads in surface waters. The environmental contamination can affect soil, sediment, and surface and ground water, which in turn can affect individual plants and animals, local ecology, and human visitors to the site, or users of the water downstream.

Previous Work at Robinson Mine

Abandoned Mine Mercury Assessment (2009)

In 2009, USFS contracted with Weston Solutions Inc. (WSI) to perform an Abandoned Mine Mercury Assessment (AMMA) of eight sites in three watersheds located on Plumas National Forest (Weston 2009). The Robinson Mine was one of the sampled sites, due to the stamp mill and associated mercury amalgamation. WSI took both soil and sediment samples from the mine area, along with surface water samples. Mercury was detected in all three of the sediment samples collected exhibiting a maximum estimated concentration of 0.03 mg/kg. Mercury was detected in all six of the soil samples collected at a maximum concentration of 47.7 mg/kg. Mercury was detected in three of the soil samples at concentrations above the Bureau of Land Management (BLM) Risk Management Criteria (RMC) soil action level. Mercury was not detected in any of the surface water samples collected. One sediment sample contained the following California Title 22 Metals at concentrations above RMC values: cadmium at 3.7 mg/kg, lead at 1,290 mg/kg, and zinc at 614 mg/kg. Mercury was not detected in any surface water samples. Lead was detected in surface water sample RM-SW-5 above the Freshwater "chronic" Criterion Continuous Concentration (CCC) value at 5.2 µg/L.

The AMMA report found that

> "… mercury was detected in the highest concentrations in soil at Robinson Mine site. Mercury was not detected above the action level in soil samples at any other AMMA sites. The Robinson Mine is the most viable site for a removal action as it is a drift mine and it is possible to delineate the soil contamination. Additional soil sampling can be conducted at the Robinson Mine site in order to fully delineate soils that are above the action values for mercury and other metals. Additionally, the debris remaining at the Robinson Mine, including the stamp mill, may be removed in order to reduce mercury contamination below action levels."

Workplan and Schedule Narrative

The workplan and schedule for this project are as below. DOC will provide six-month progress reports to SNC throughout the term of the contract, including a final progress report at the conclusion of the project

Task 1: DOC Site Inventory

Task / Deliverable	Schedule
DOC Site Inventory	August 2014

DOC will conduct a full surface inventory of the mine features onsite, including mine workings, structures, and equipment. The features will be cataloged with GPS location, photographs, measurements, and written descriptions. All data will be incorporated into the DOC's abandoned mine database. This work will be completed in mid-summer of 2014.

Task 2: PA/SI

Task / Deliverable	Schedule
Sample Plan Development	January 2015
Soil & Water Sample Collection	April, September, and November 2015
Laboratory Sample Analysis	December 2015
Analysis & Draft Written Report	January-February 2016
USFS Review & Approval of Report	March 2016

DOC will obtain contracts under the State of California's competitive bid process, and conduct contractor bid walks before access to site is restricted due to weather. DOC and the contractor will perform all aspects of the PA/SI. Contractor support will be focused on development of the sample plan and laboratory analysis of sediment, soil, and water samples, including a results document. DOC will perform soil, sediment, and water sampling, and prepare a draft PA/SI report for USFS. This work will require a site visit(s), which will be weather dependent. The sampling plan will determine the schedule for sampling events; the proposed schedule provides for post-snowmelt, low flow, and "first flush" (first post-fall rain) sampling. USFS will be responsible for reviewing and approving the report prior to its use in Task 3, the EE/CA.

Task 3: EE/CA

Project Work Plan Development	June 2016
Field Investigation Work	July 2016
Data Analysis and Risk Assessment	August - September 2016
Identification & Report of Removal Alternatives	October - November 2016
USFS Review & Approval of Report for Public Notification	December 2016-March 2017

30-day Public Comment Period, Response to Comments, and Adoption Of Final Report	April– July 2017

The contractor selected through DOC's competitive bid process will perform all aspects of the EE/CA. USFS will review the EE/CA report, issue the draft report for a 30-day public comment period, respond to comments, revise the report as necessary, and finally adopt the final report. DOC will coordinate with contractor and USFS in finalizing the report as needed. This will conclude the EE/CA component of the CERCLA process.

Project Timing

This workplan represents a typical schedule for this type of work based on prior projects conducted by USFS and DOC. The timelines may be adjusted based on a number of factors:

- Access to site for specific tasks due to weather (e.g. heavy rain, persistent snowfall)
- Sampling schedule as determined by the sampling plan (e.g. multiple sampling events)
- Speed of contracting

Budget

The Detailed Budget (see form) contains the budget for the grant funds and also shows the contributions from the cooperating partners in this project, DOC and USFS Region 5. The total project cost, including DOC overhead and administrative costs for the project, is $177,000. The grant will be directed to fund the PA/SI component of the project in its entirety, the 15% DOC overhead and administrative costs for initiating and managing the project contracts, and a portion of the second component of the project – the EE/CA. Funds from DOC and USFS will provide for the balance of the estimated cost for the EE/CA and administrative costs for the project. In Year 1 of the project, the grant will provide for the administrative costs of initiating and managing a contract for performing the PA/SI, and in Year 2 provide for a portion the EE/CA project funds, including initiating and managing the contract for performing the EE/CA. The EE/CA is scheduled to begin in Year 2 of the grant following completion of the PA/SI.

Restrictions, Technical/Environmental Documents and Agreements

The mine site is wholly located on property owned by USFS.

USFS knows of mining claims in the area of the Robinson Mine (e.g. upstream near the cemetery), but do not have any under Notices or Plans. Sampling work at the Robinson Mine will not be an issue (Donna Duncan, pers. comm.).

USFS has performed a preliminary Potentially Responsible Parties search to determine if there might be any individual or company potentially responsible for any contamination at the Robinson Mine. This preliminary search has resulted in no viable PRPs for the mine site (Donna Duncan, pers. comm.).

Partners / Roles / Organizational Capacity

Partner / Roles

As outlined in the workplan and schedule, this project will include a combination of work by DOC, USFS, and contractors.

- *DOC*: Site inventory, project management, contracting, coordination of onsite work for PA/SI including sampling, analysis, reporting (in conjunction with contractor), drafting PA/SI report and review of EE/CA report. Performed by DOC Abandoned Mine Lands Unit (AMLU).
- *USFS*: Coordination of onsite work, review of sampling plan and results, review and approval of PA/SI and EE/CA reports.
- *Contractors (environmental):* PA/SI – sampling plan, sampling, analysis, reporting (in conjunction with AMLU), EE/CA – all phases.
- *Contractors (laboratory):* Sample analysis and reporting.

DOC/AMLU Organizational Capacity

<u>AMLU Project Manager: David Tibor, Senior Environmental Scientist (Specialist)</u>

Mr. Tibor has managed complex projects and significant contracts related to remediation of historic mine sites for seven years. From 2010 - 2013, he was the Project Manager for a $2.1 million, three-year inventory of abandoned mines on all National Park Service lands in California, for which he oversaw a dozen staff and contractors conducting field work and making hazard risk assessments, and he directed the quality control and delivery of data for over 25,000 mine features to the NPS. DOC awarded Mr. Tibor its 2013 Sustained Superior Achievement Award for his leadership in completing the project. In addition, he has completed training in HAZWOPR, hazardous waste sampling, and abandoned mine safety. He has extensive data management, data analysis, technical report writing, and contract and project management experience.

<u>AMLU Program Manager: Glenda Marsh, Environmental Program Manager I</u>

Ms. Marsh has experience in water quality monitoring programs, implementing water quality regulations and standards, collecting and managing water quality samples, managing water quality data sets, and designing and conducting biological and hydrological studies. As manager of AMLU she is responsible for oversight of all contracts and projects conducted by the Unit.

<u>AMLU Program Qualifications and Experience</u>

In August 2009, AMLU completed a multi-year, $1,000,000 project at the direction of the Governor's Office and California's Natural Resources Agency to inventory and complete a preliminary assessment of physical and chemical hazards at abandoned mines on State owned lands. The final technical report was submitted to the Governor's Office and Natural Resources Agency. The AML inventory-assessment is also consistent with the Sierra Fund (2008) *Mining's Toxic Legacy* report recommendation that called for a complete inventory of state lands impacted by mining toxins, including parks, wildlife refuges, reservoirs, and other properties. As a result of this effort, Natural Resources Secretary Mike Chrisman directed DOC to take the lead role in prioritizing and coordinating abandoned mine remediation efforts

on inventoried State-owned sites. AMLU is currently developing soil, sediment, and surface water sampling plans for site characterization and endangerment assessments at five historic mine sites on land owned by the California State Lands Commission (CSLC). The sampling and final report will be conducted by AMLU engineering and scientific staff in 2014-2015. This work is similar to the scope of tasks for a PA/SI.

AMLU has also conducted or participated in a number of remediation strategies to mitigate chemical hazards associated with abandoned mines, including projects at Spenceville Copper Mine in Nevada County, Walker Copper Mine in Plumas County, Gambonini Mercury Mine in Marin County, Sulphur Bank Mercury Mine in Lake County and Leviathan Mine in Alpine County In addition, in 2000-2001, DOC California Geological Survey (CGS) managed a contract for assessment of mercury contamination and mercury sources in the Cache Creek Watershed, contributing to a report entitled *Cache Creek Group Summary and Synthesis of Mercury Studies in the Cache Creek Watershed*. CGS experience and technical expertise is available to AMLU for any project that we undertake.

Finally, since 2002, AMLU has remediated 1,300 features that posed physical hazards in 24 counties in collaboration with 36 federal, state, and local partners—including multiple U.S. Bureau of Land Management Field Offices, USFS , the National Park Service, State Parks, and California State Lands Commission.

USFS Region 5 CERCLA Program Qualifications and Experience

USFS has managed numerous investigations and remediations of abandoned mine sites involving mercury in its forests in the Sierra Nevada using its CERCLA authorities and process. Sites have ranged from hydraulic mine pits to underground mines along with associated mineral processing facilities. USFS has on-the-ground staff in the Plumas National Forest (NF) who are available to assist with site access, historical documentation, and cultural resource management during this project.

Cooperative and Community Support

See section of **Evaluation Criteria** entitled *Community support, consistent with similar efforts nearby, part of larger plans and partnerships* for discussion.

Letters of Support

Several letters in support of this project have been received; full copies of letters are included in this application.

- California Department of Toxic Substances Control
- Plumas County Planning and Building Services
- The Sierra Fund
- Trout Unlimited

Long-Term Management and Sustainability

As the landowner, USFS will retain responsibility for all long-term management of the site, including oversight and maintenance of remediation actions to ensure remediation continues to prevent pollution from the site according to the terms of its obligations under CERCLA. There are no restrictions or encumbrances on access to the site for conduct of this project or for future management of the site (see *Restrictions, Technical/Environmental Documents and Agreements* section for more information).

Performance Measures

Performance Measure	Target	Methodology
Number and Type of Jobs Created (*see table below for FTE specifics)	1 Project Manager (DOC) 1 Environmental Scientist (DOC) 1 Contract Administrator (DOC) 1 Environmental Consultant 1 Laboratory Scientist Consultant	The project will require a manager, a project staff member, administrative support, and consultant and laboratory services for the life of the project. The table below estimates the FTE created for each job during the SNC funded project. All jobs supported at the Department of Conservation will result in increasing the capacity and knowledge of DOC staff in carrying out additional legacy mine remediation projects in the future.
Resources Leveraged for the Sierra Nevada	US Forest Service CA Department of Conservation	The USFS is committing up to $46,270 in a direct cash contribution and approximately $3,000 in staff time as in-kind services. The DOC is committing up to $42,730 in a direct cash contribution and approximately $10,000 in staff time as in-kind services.
Number and Value of New, Improved, or Preserved Economic Activities	Plumas National Forest visitors	Robinson Mine is an informal recreation site in the Plumas NF. The site is accessible to the public and the project is anticipated to identify and reduce currently unknown threats to human health at the site. This will improve the safety and security of the site for visitors. There is no current data on the number of visitors to the site and no data regarding the potential for increased visitation or value of tourist dollars spent in the local area due to the existence of the mine site.

*Occupational Group	Number of people employed	Length of employment (weeks)	Average number of hours worked per week	Total FTEs	Employment season
Project Manager (DOC)	1	5	40	.10	All seasons
Environmental Scientist (DOC)	1	4	40	.08	All seasons
Contract Administrator (DOC)	1	2	40	.04	All seasons
Environmental Consultant	1	32	40	.61	All seasons
Laboratory Scientist Consultant	1	1	40	.019	All seasons

Evaluation Criteria

Tangible results that further Proposition 84 and SNC program areas

The Robinson Mine project directly addresses several goals of the SNC and Prop 84, most prominently to improve water quality by addressing existing threats of mercury and other harmful metals, which will improve the water quality of Frazier Creek and downstream waterways of the Feather and Sacramento Rivers for human health and natural resources.

This project provides community benefits to recreational users of the Plumas National Forest who may be exposed to contaminants when visiting the site, as well as addresses potential contamination in a watershed close to the population center of Quincy. The Sierra Fund (TSF), a non-profit organization focused on addressing community well-being and environmental issues in the Sierra Nevada, has made mercury clean up at historic mine sites a high priority.

Design and readiness of the project, including budget and funding sources

Prior investigations at the Robinson Mine site were conducted as part of USFS CERLCA cleanup process and lead directly to the PA/SI and EE/CA steps. USFS has a national CERCLA program with a dedicated budget, authorized by Congress, for legacy mine sites in its forests located in the Sierra Nevada. DOC has a dedicated fund, based on annual fees assessed on gold and silver production in the state, for remediating legacy abandoned mine sites in the state with the goal of protecting the public and environment from the impacts of the state's legacy mines. Both agencies anticipate having the necessary funds available to complete the project during the term of the grant.

AML project aligns with SNC Abandoned Mine Initiative

This project aligns well with the SNC Abandoned Mine Lands Initiative by 1) promoting collaborative efforts, 2) promoting use of available federal and state funds, and 3) addressing threats to state's water

supply. First, under this partnership with USFS, DOC will enhance its organizational and technical capacity to partner on more of these types of projects in the future, applying its seasoned and recognized legacy mine project management skills. This will put more legacy mine sites into the clean up process, a key goal under DOC's mission in addressing the state's legacy mines. Secondly, the partnership between DOC and USFS on this project allows USFS to spread their limited CERLCA AML remediation funds to additional AML projects in the Sierra Nevada, putting more historic mine sites into the clean up process. Finally, Frazier Creek is a tributary to the Feather River and thus forms part of the state's water supply. One of the factors that can limit water supply is water quality. Across the Sierra, sediment and metals attached to those sediments, flow from legacy mine sites into rivers and reservoirs in the Sierra Nevada. Investigation and remediation at Robinson Mine is part of the overall effort to address an important point in this pollution pathway and learn more about what techniques are the most effective to prevent further impacts.

Likelihood of successful implementation

DOC and USFS are confident that the PA/SI and EE/CA can be completed as proposed. This is a routine course of action at a legacy mine site where pollutants have already been determined present as a result of the past mining activity. USFS has numerous CERCLA sites at various stages of cleanup in the Sierra Nevada including in Plumas NF and Tahoe NF. DOC has managed several legacy mine remediation projects and performed investigations for chemical hazards with DTSC, the state Department of Parks and Recreation, and USFS under the CERCLA process, as well. In addition, both DOC and USFS programs have experience in integrating protection of cultural resources and recreational users' needs and safety into site assessment and remediation projects.

Community support, consistent with similar efforts nearby, part of larger plans and partnerships

The Robinson Mine project enhances important partnerships and community goals around addressing the impacts of legacy mines in the Sierra Nevada. The project will further the partnership between DOC's AMLU and USFS along with establishing a new relationship with the Sierra Nevada Conservancy. AMLU is the clearinghouse for abandoned mine lands (AML) data throughout the state and is currently taking a more active role in chemical hazard remediation. AMLU has worked with USFS on physical hazard remediations for many years and has also conducted or participated in a number of remediation strategies to mitigate chemical hazards associated with abandoned mines with other state and federal agencies. The Robinson mine project will be the second CERCLA chemical hazard remediation, including the Walker Copper Mine tailings in Plumas County, that AMLU and USFS have partnered on to complete. Partnering on these projects has allowed both agencies to establish a process and means to collaborate, a goal shared by the Sierra Nevada Conservancy. In addition, non-profit community organization TSF has made mercury clean up at mine sites, reservoirs, and rivers a high priority, and aims to increase public funding for cleanup of mercury from legacy mines and bringing solutions to the environmental problems caused by the legacy of pollution from historic mining. As a community non-profit, TSF is also pursuing on-the-ground clean up of legacy mines and bringing new intellectual and financial resources to address such mines in the region. Clean up at Robinson Mine contributes to these community goals.

Leverages resources of other agencies and funding sources

The partnership between DOC and USFS on this project leverages funding from SNC, DOC, and USFS to perform two critical steps in the CERCLA process. This allows USFS to spread their limited CERLCA AML

remediation funds to additional AML projects in the Sierra Nevada, putting more historic mine sites into the clean up process.

Detailed Budget Form

SECTION ONE: DIRECT COSTS	Year One	Year Two	Total
Preliminary Assessment & Site Investigation			
Contract & Project Administration	$4,000		$4,000
Project & Sampling Plans	$10,500		$10,500
Field work: site inventory, sample collection	$5,000		$5,000
Travel	$1,000		$1,000
Lab analysis of samples	$10,500		$10,500
Report preparation		$7,000	$7,000
Engineering Estimate & Cost Analysis			
Contract & Project Administration		$3,300	$3,300
Project Work Plan Development		$13,000	$13,000
DIRECT COSTS SUBTOTAL:	$31,000	$23,300	$54,300

SECTION TWO: INDIRECT COSTS	Year One	Year Two	Total
	0	0	
INDIRECT COSTS SUBTOTAL:	0	0	$0
PROJECT TOTAL:	$31,000	$23,300	$54,300

SECTION THREE **Administrative Costs (Costs may n*ot to exceed 15% of total Project Cost*) :**			**Total**
Department of Conservation Overhead	$15,700	$5,000	$20,700
ADMINISTRATIVE TOTAL:	$15,700	$5,000	$20,700
SNC TOTAL GRANT REQUEST:	$46,700	$28,300	$75,000

SECTION FOUR **OTHER PROJECT CONTRIBUTIONS**	**Year One**	**Year Two**	**Total**
United States Forest Service		$49,270	$49,270
Department of Conservation	$3,460	$49,270	$52,730
Total Other Contributions:	$3,460	$98,540	$102,000

Cost Allocation Plan

Section 1 - Direct Costs

Contract & Project Administration Costs

Classification	Personnel Cost	Percent (based on one month)	Amount Allocated
Associate Government Program Analyst - Contract & Grant Administration	$ 106,942	0.8	$ 7,129
Office Technician	$ 74,287	0.27	$ 1,671
Environmental Program Manager I	$ 142,212	0.3	$ 3,555
Total			$ 12,356

Maps

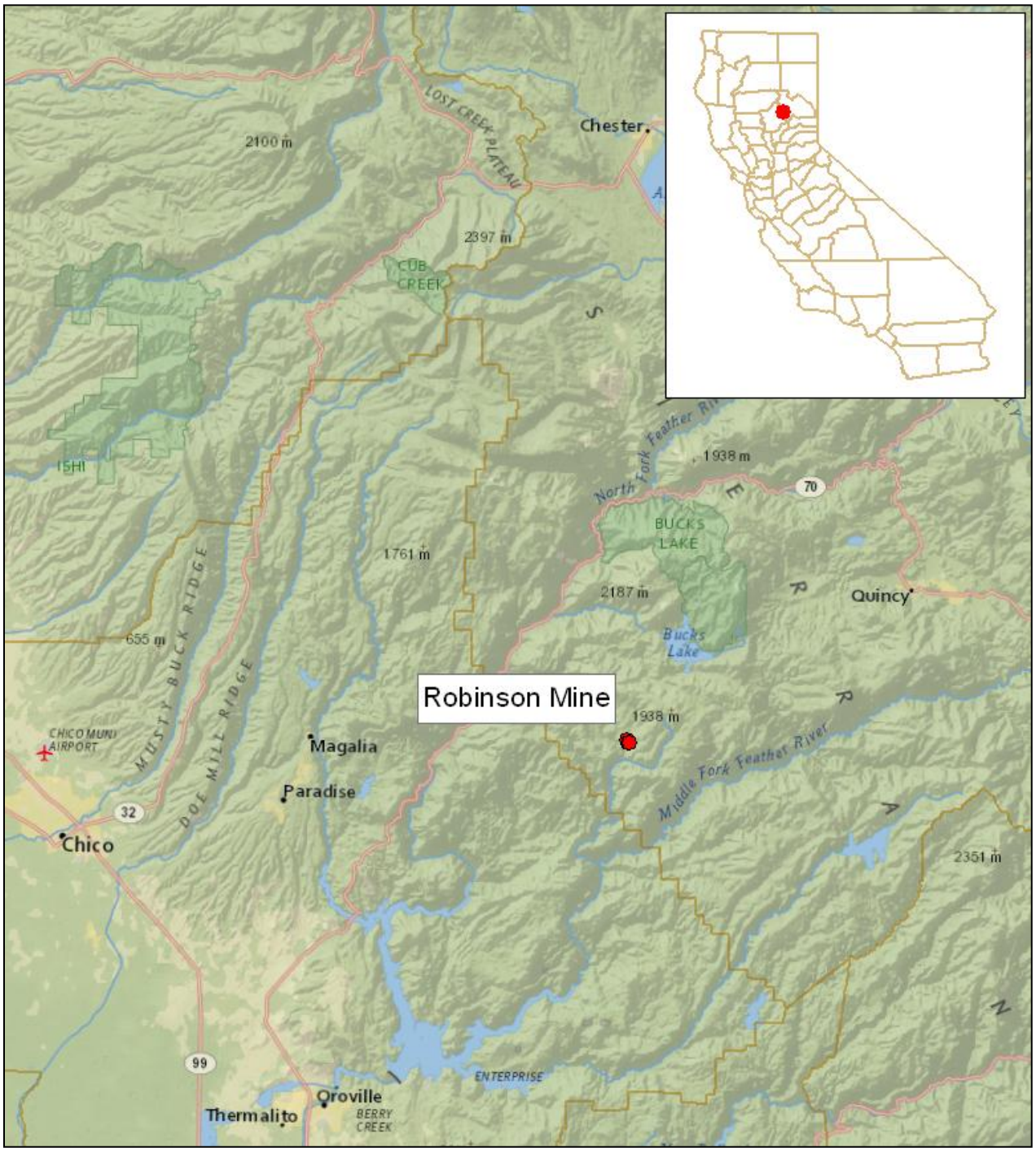

Figure 1. Project location map, showing Robinson Mine located between Chico and Quincy in Plumas County, California.

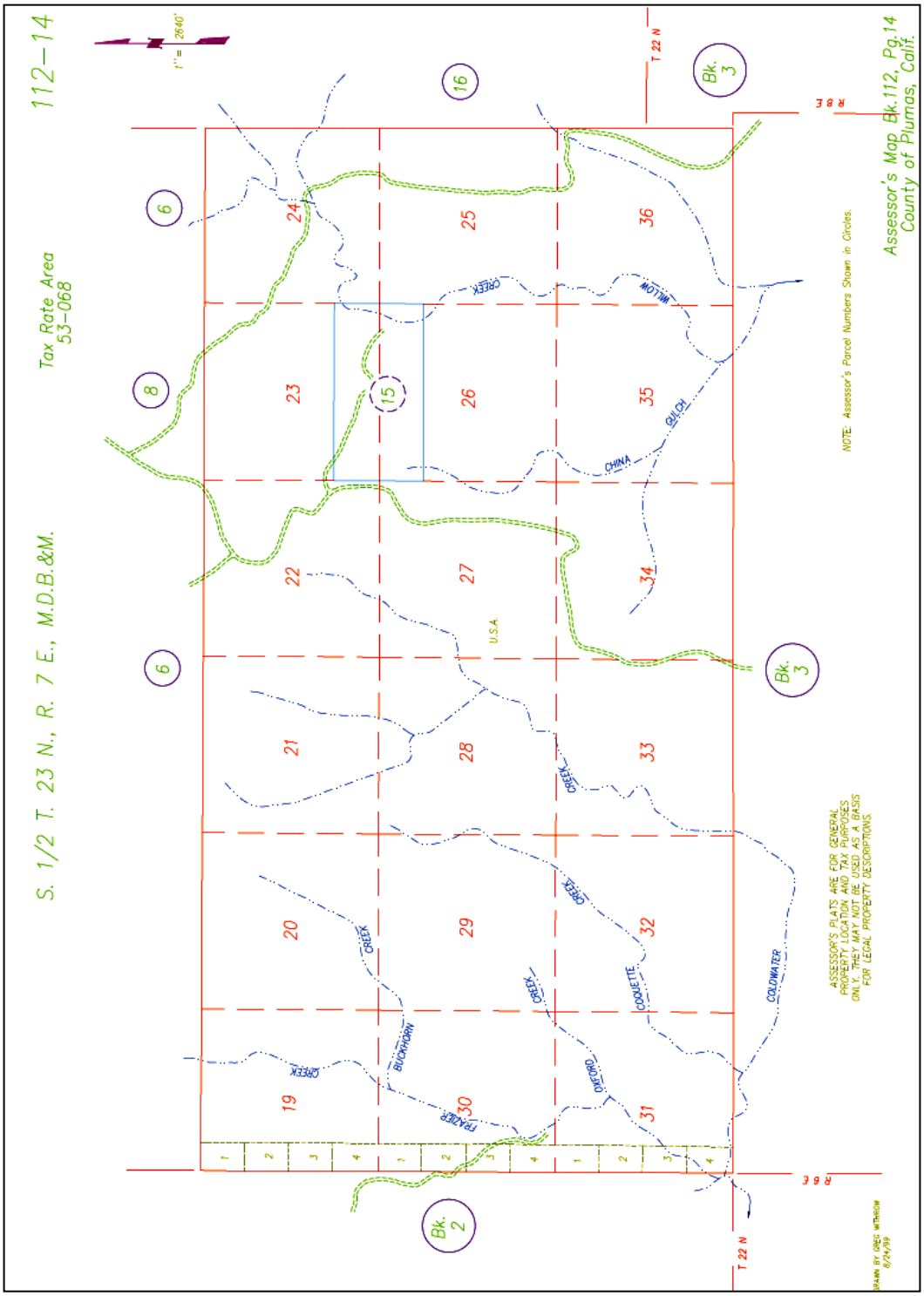

Figure 2. Plumas County Assessor's parcel map. The large USFS parcel which contains the Robinson Mine area is APN #112-014-USA. Source: Plumas County Assessor's webpage.

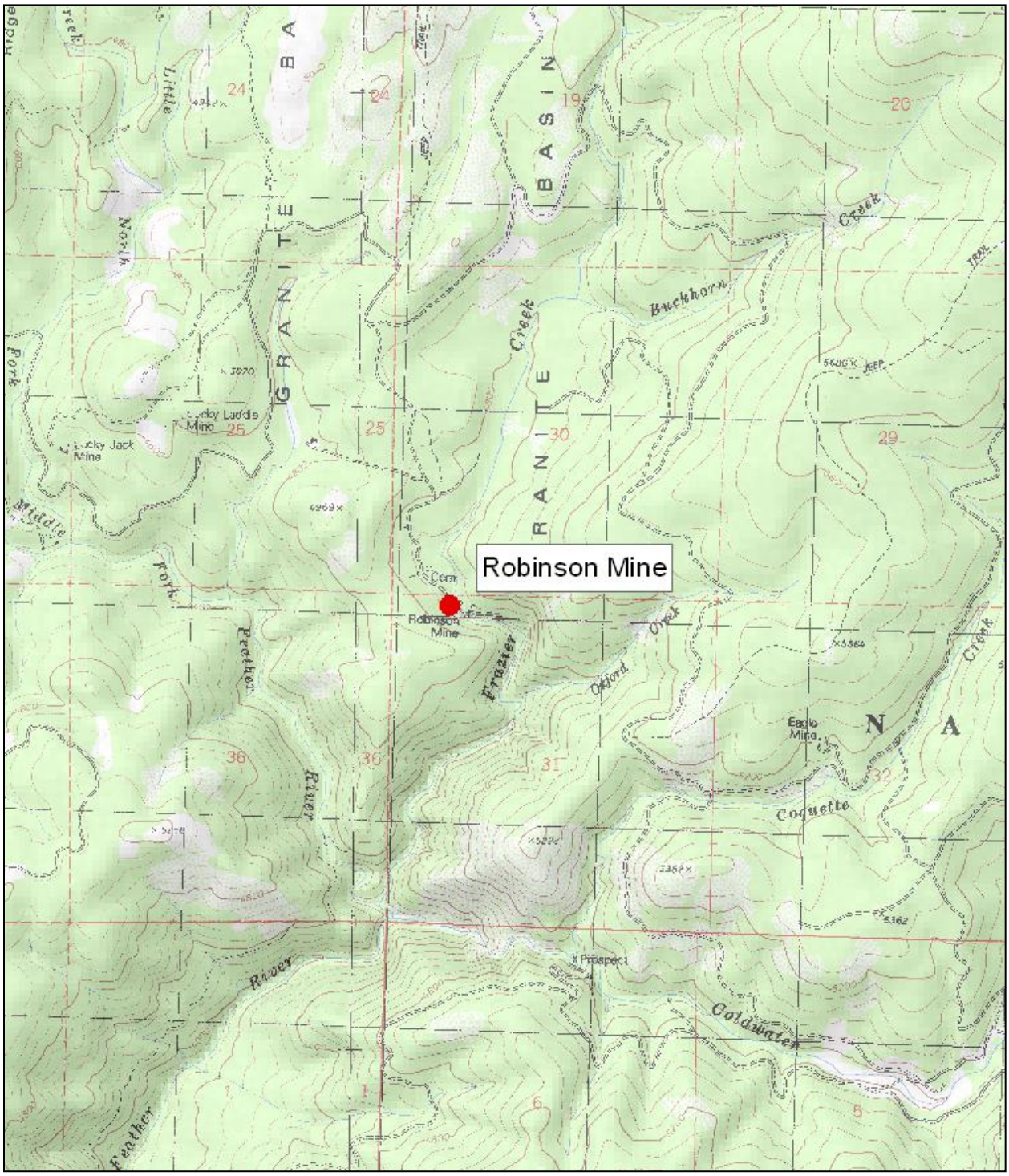

Figure 3. USGS 7.5' map series topographic map showing the location of the Robinson Mine, along Frazier Creek in Granite Basin.

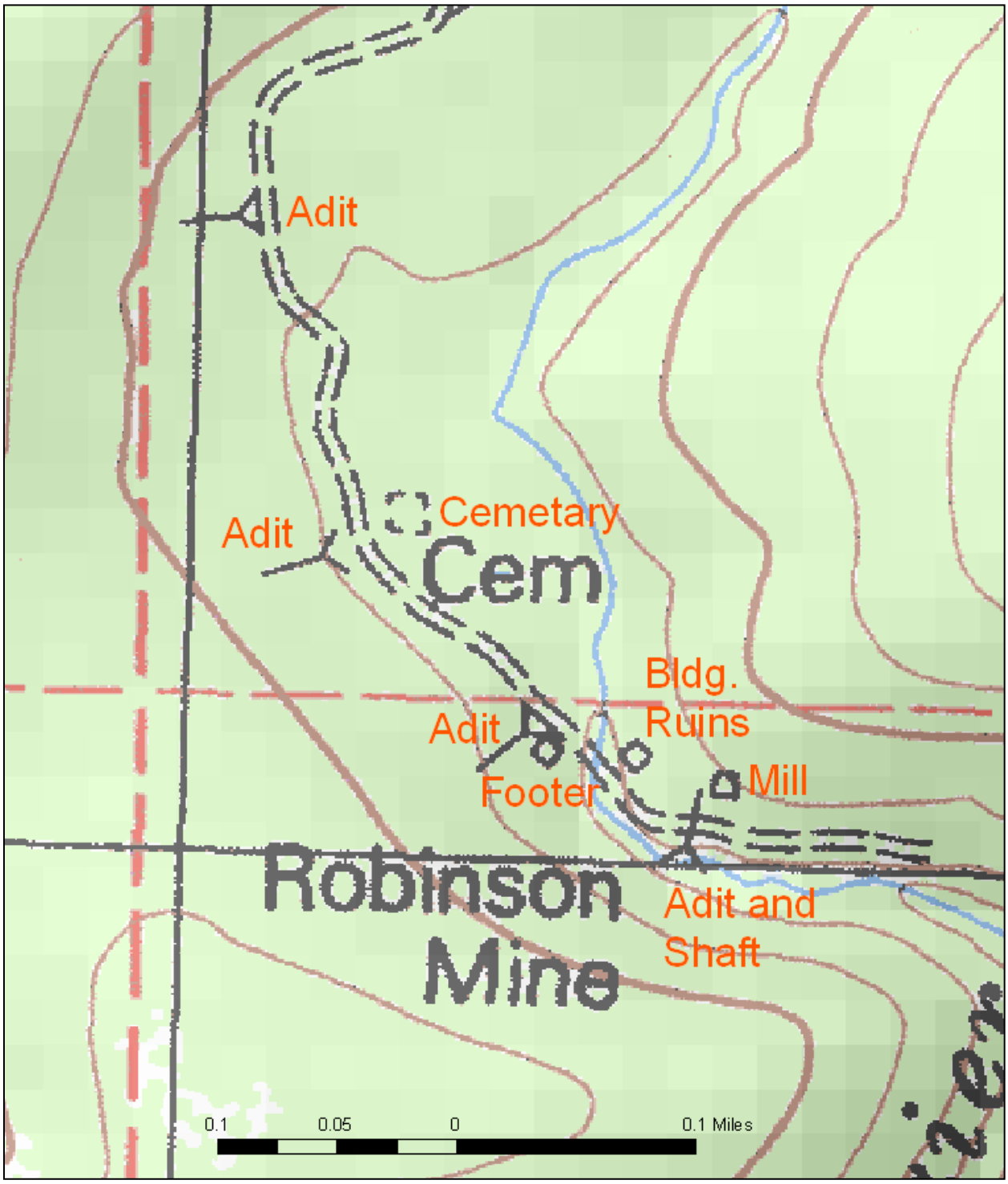

Figure 4. Detail view of the USGS 7.5' topographic map. Mine features (e.g. cemetery, adit, ruin) shown on the 7.5' map are labeled as to what is actually present; see photographs for more detail on some.

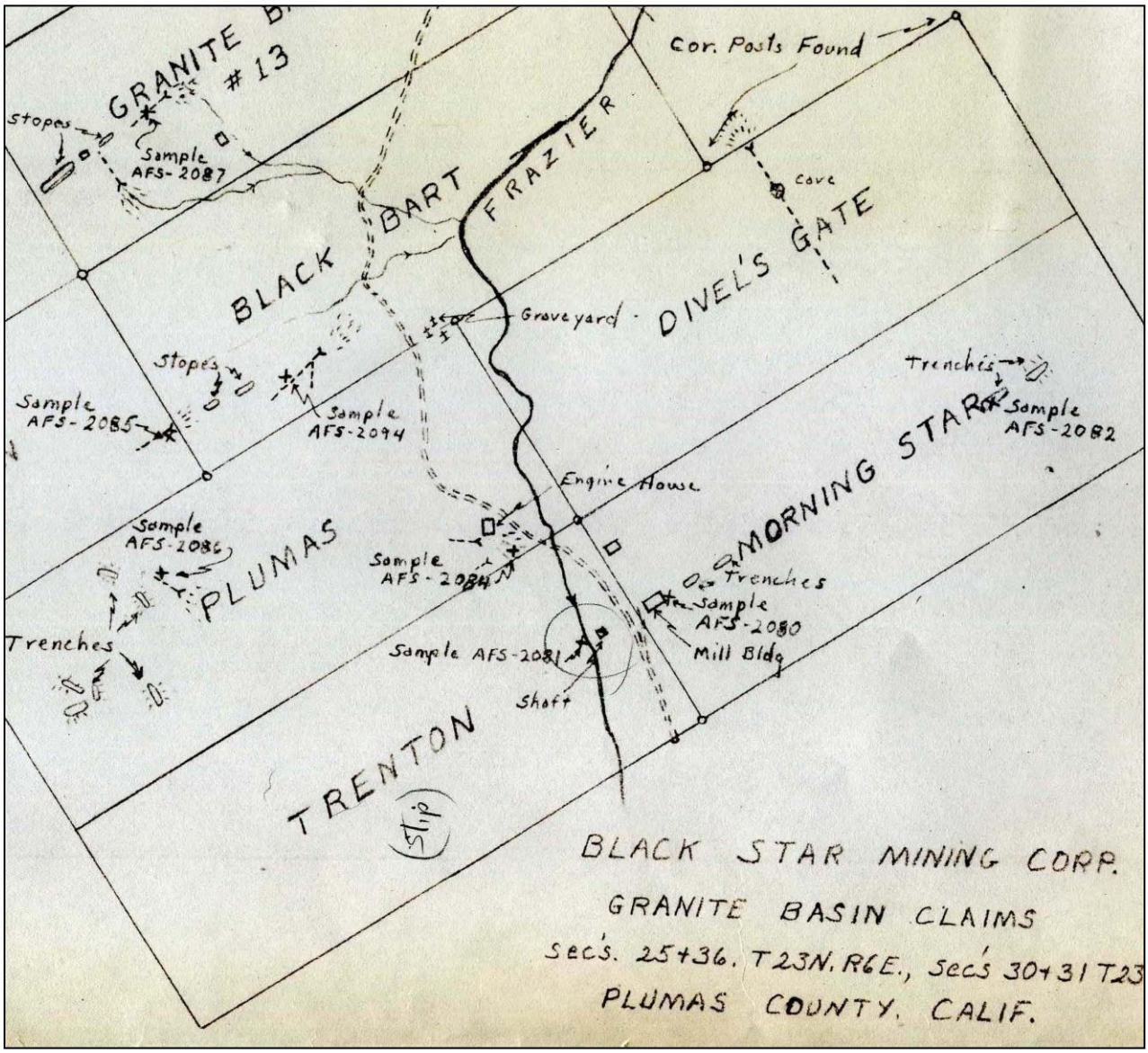

Figure 5. Detail of claim map for Robinson Mine area (including Plumas, Trenton, and Morning Star claims). Map indicates locations for graveyard, several adits, shaft, engine house, mill building, and unnamed building.

Photographs

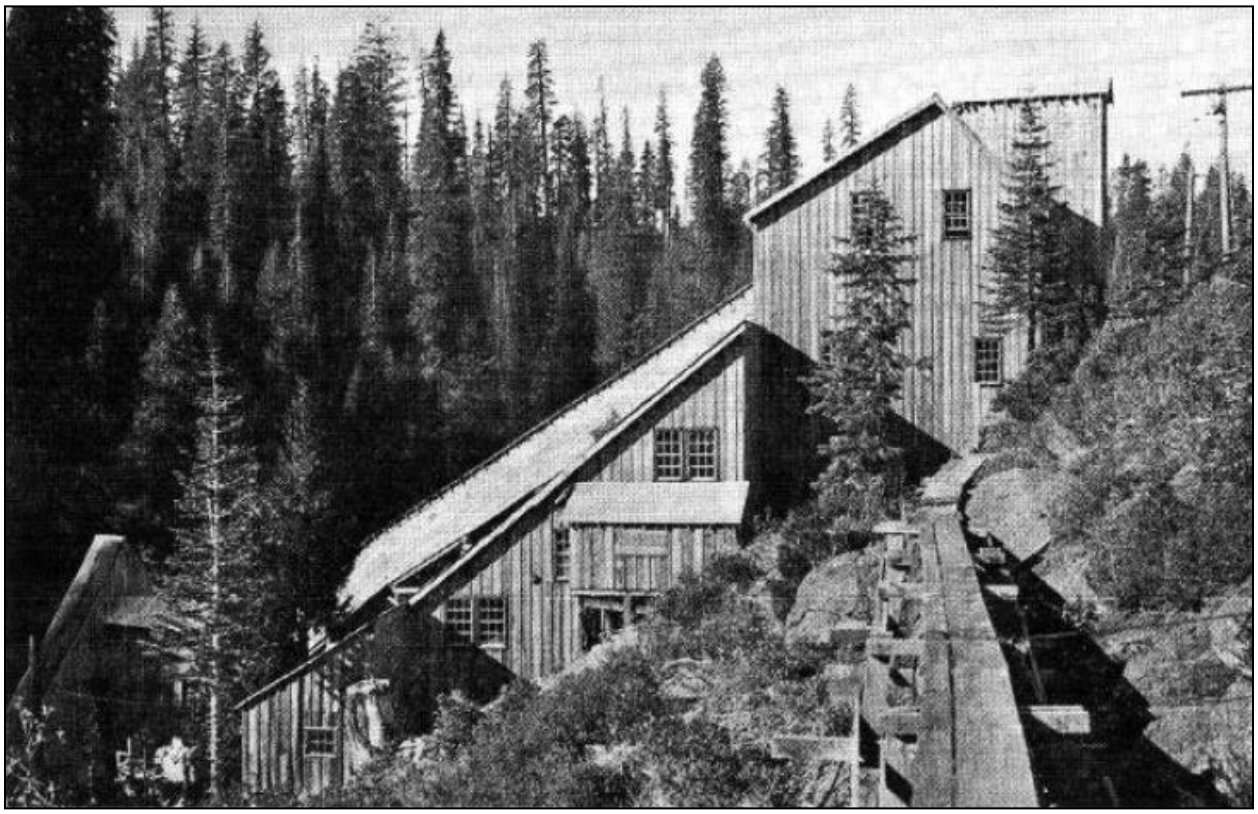

Figure 6. Historic view of the Robinson Mill building. Shaft house is visible in lower left corner. From *California Journal of Mines and Geology* (1937).

Figure 7. View southeast (downstream) across Frazier Creek, with west end of main mine waste pile visible. All photographs by David Tibor (DOC) unless noted.

Figure 8. USFS and DOC staff atop main mine waste pile from shaft. Shaft collar located in wood and metal debris pile in lower left corner.

Figure 9. View down from top of waste pile towards Frazier Creek. Shaft collar located in wood and metal debris pile, and adit portal located higher upslope, near pipe and small conifer.

Figure 10. Location of main shaft, now collapsed closed. Presumed ruins of shaft house (see Photograph 1) form debris pile on slope of waste rock.

Figure 11. USFS and DOC staff at 10-stamp battery of Robinson Mill.

Figure 12. View looking up at 10-stamp battery and other equipment at Robinson Mill. Mill building (see Figure 6) is fully collapsed.

Figure 13. Large equipment footer on west side of Frazier Creek, northwest of main mine waste pile.

Figure 14. Steam boiler leaning against tree trunk above Frazier Creek. Numerous other equipment remains are located onsite.

Figure 15. Ruins of building on east side of Frazier Creek, just west of main mine waste pile. There are several collapsed buildings and other platforms onsite.

Letters of Support

Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
Environmental Protection

Deborah O. Raphael, Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Edmund G. Brown Jr.
Governor

May 23, 2014

Ms. Glenda Marsh
Program Manager
Abandoned Mine Lands Unit
Department of Conservation
801 K Street, MS 09-06
Sacramento, California 95814
Glenda.Marsh@conservation.ca.gov

LETTER OF SUPPORT FOR SIERRA NEVADA CONSERVANCY GRANT FOR ROBINSON MINE

Dear Ms. Marsh:

Through various initiatives, the Department of Toxic Substances Control (DTSC), California Environmental Protection Agency works cooperatively with state, federal, and local agencies; tribes, communities, private entities; and nonprofit organizations to facilitate investigation and remediation of hazardous substances release sites, including legacy mine sites. DTSC offers its support on behalf of the Abandoned Mine Lands Unit, Department of Conservation, in cooperation with the United States Department of Agriculture, Forest Service Region 5 in its efforts to secure a Proposition 84 Grant from the Sierra Nevada Conservancy (SNC) for additional assessment and characterization of the Robinson Mine located on Fraizer Creek, a tributary to the Feather River, upstream of Lake Oroville, approximately 18 miles southwest of Quincy, Plumas County, California.

The Robinson mine is a legacy gold drift mine and associated mill that operated from approximately 1894 to 1936. Previous preliminary assessment and characterization indicates that heavy metals including cadmium, lead, and zinc pose a potential threat to human health and the environment. The SNC grant funding will help achieve additional assessment and characterization leading to the development of a remediation approach that is effective in safeguarding human health and the environment.

We appreciate this opportunity to support other state agency programs because of the important role they have in California's efforts to protect the human health and the environment.

Please contact Mr. Randy Adams at (916) 255-3591 or by email Randy.Adams@dtsc.ca.gov. If you have any questions or need additional information.

Sincerely,

Mr. William Ryan, P.E., Chief
San Joaquin Branch - Sacramento Office
Brownfields and Environmental Restoration Program
Bill.Ryan@dtsc.ca.gov

cc: Mr. Steven R. Becker, P.G., Chief
Site Evaluation and Remediation Unit
San Joaquin Branch - Sacramento Office
Brownfields and Environmental Restoration Program
Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, California 95826
Steven.Becker@dtsc.ca.gov

Mr. Randy S. Adams, C.E.G.
Senior Engineering Geologist
San Joaquin Branch, Sacramento Office
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Randy.Adams@dtsc.ca.gov

PLUMAS COUNTY PLANNING & BUILDING SERVICES

555 Main Street
Quincy, CA 95971-9366
(530) 283-7011

www.plumascounty.us

May 20, 2014

Glenda Marsh
Program Manager
Abandoned Mine Land Unit
Department of Conservation
801 K Street, MS 09-06
Sacramento, CA 95814

Subject: Sierra Nevada Conservancy Grant Application by Abandon Mine Lands Unit, Department of Conservation for grant funds to produce a Preliminary Assessment/Site Inspection for the Robinson Mine in Plumas County.

Dear Glenda

Plumas County supports the grant application to address clean up of the abandoned Robinson Mine in Plumas County. The project will address the needed clean up of the mine and protect health and safety.

Randy Wilson

Randy Wilson

Planning Director
Plumas County, California

THE SIERRA FUND

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Suite 101
Nevada City, CA 95959
P: 530.265.8454
F: 530.265.8176
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May 20, 2014

Glenda Marsh
Program Manager
Abandoned Mine Lands Unit
Department of Conservation
801 K Street, MS 09-06
Sacramento, CA 95814

Subject: Support Robinson Mine Project

Dear Ms. Marsh,

The Sierra Fund is pleased to support the United States Department of Agriculture, Forest Service Region 5 and Department of Conservation's application to the Sierra Nevada Conservancy to conduct a more in-depth Preliminary Assessment and Site Inspection (PA/SI) and Engineering Evaluation and Cost Analysis (EE/CA) at the Robinson Mine to better pinpoint locations of mercury and other harmful metals.

The Robinson Mine site is located in the Plumas National Forest's Feather River Ranger District adjacent to Frazier Creek in the Little North Fork of the Middle Fork Feather River watershed, approximately 18 miles southwest of Quincy, CA in Plumas County, California. The Robinson Mine site, which includes a mill structure, tailings piles and underground openings, is accessible to the public via an open forest service road and may be draining metals into Frazier Creek, including mercury.

Addressing sites like Robinson Mine continues progress in meeting public safety and environmental clean up goals at legacy mine sites in the Sierra Nevada. The Sierra Fund is working to bring more attention to the environmental and health impacts of historic mining, through our Mining Initiative (you can learn more about this effort at our website, www.sierrafund.org). We are currently engaged in a Sierra-wide effort to raise public awareness of the problems presented by abandoned mines, tailings piles, mercury, and other toxins left over from mining in the Gold Country, and to involve all stakeholders in designing workable solutions to these problems.

Thank you for considering this important project.

Sincerely,

Elizabeth J. Martin

Elizabeth Martin
CEO
The Sierra Fund

Mike Caltagirone
Nevada Abandoned Mines Project Manager

May 14, 2014

Glenda Marsh
Program Manager
Abandoned Mine Lands Unit
Department of Conservation
801 K Street, MS 09-06
Sacramento, CA 95814

Dear Ms. Marsh:

Trout Unlimited is very pleased to support your application, in conjunction with the US Forest Service District 5, to The Sierra Nevada Conservancy for funding of the initial steps in the remediation of the Robinson Mine in Plumas County, CA.

The rich mining history of the area has shaped the character of Plumas County both positively and negatively. Responsible stewardship requires that we actively seek to reduce the ongoing negative impact of these historic locations so that future generations can enjoy the beauty of the creeks, rivers, mountains and lakes and of the myriad wildlife that live in them for years to come.

Trout Unlimited's mission is to conserve, protect, preserve and restore the coldwater fisheries of North America. In furtherance of that mission, we fully support efforts to remove current toxins and eliminate further contamination of watersheds due to legacy mining artifacts.

Regards,

Mike Caltagirone
Nevada Abandoned Mines Project Manager
720 Tahoe St. Suite 1
Reno, NV 89509
775-232-9697

Weston Solutions Inc. (2009) report

Abandoned Mine Mercury Assessment
Plumas National Forest, California
Abandoned Mine Site Characterization
Final Report

USDA Forest Service Contract Number: 53-91S8-03-PUF13
Weston Work Order Number: 12238.026.001

August 2009

Prepared for:
USDA Forest Service
Sierra Cascade Province
Susanville, California

Prepared by:
Weston Solutions, Inc.
1340 Treat Blvd., Suite 210
Walnut Creek, California 94597

SECTION 1

INTRODUCTION

The United States Department of Agriculture (USDA) Forest Service has tasked Weston Solutions, Inc. (WESTON) to conduct an assessment of several mercury mines in Plumas National Forest. This work was conducted under Activity VII, Task 5 of the Forest Service Regional Environmental Response Action Contract # 53-91S8-03-PUF13.

The Abandoned Mine Mercury Assessment (AMMA) sites are located on Plumas National Forest lands, in Plumas and Sierra Counties, California. A majority of the sites are abandoned hydraulic mines.

The AMMA has been divided into watersheds, with three different groups of sites. Group I - Slate Creek Watershed is comprised of the following five sites: Nugget Bowl, Secret Diggings, Poverty Hill Mine, Slate Creek Debris Dam, and Slate Creek Tunnel. Group II - Little North Fork Watershed consists of one site, the Robinson Mine. Group III - Spanish Creek Watershed consists of two sites: Bean Hill Mines and Gopher Mine.

The objectives of this assessment are:

1. To identify areas at the various mine sites, such as tailing piles, sluices, and drainage tunnels that may contain deposits of mercury that are serving as sources of contamination to the Sacramento River watershed.

2. To determine if there has been a release of mercury and/or other metals to the surface water pathway that is attributable to these sites.

This final report summarizes the field activities conducted by WESTON on September 11 through September 14, 2006, the Primary Sampling Event, and February 24 through February 25 2009, the Precipitation Event. The results are presented from the two sampling events. The WESTON sampling team was accompanied by Joe Hoffman of the USDA Forest Service during this event. Sampling was conducted in accordance with the WESTON Work Plan for the AMMA Site, dated September 2006.

The site is a large hydraulic mine site (approximately 50 acres) that operated in the late 1800s. The site includes a single partially collapsed drain tunnel, which drains the majority of the site. The drainage feeds into Slate Creek.

Slate Creek Tunnel

The Slate Creek Tunnel site is located approximately 2.5 miles northeast of the community of La Porte, in Plumas County, California (39° 41' 33.97" N/ 120° 56' 22.20" W), as shown in Figure 2-1a.

Slate Creek Tunnel is located immediately adjacent to Slate Creek. It is likely that the tunnel was constructed to divert the flow of Slate Creek to mine the historic creek for gold. There is no evidence that the tunnel was ever used as a sluice-way; however it is possible. Water flows through Slate Creek Tunnel into Cedar Grove Ravine, a tributary to Slate Creek.

2.2 Group II – Little North Fork Watershed Location and Description

Robinson Mine

The Robinson Mine site is located on the Feather River Ranger District, approximately 5 miles southwest of Bucks Lake in the Little North Fork of the Middle Fork Feather River watershed, and 18 miles southwest of Quincy, in Plumas County, California (39° 49' 5.54" N/ 121° 14' 49.08" W), as shown in Figure 2-1b. The site can be accessed from the Oroville-Quincy Highway (Butte County Road # 27562 and Plumas County Road #414).

The Robinson Mine site was a gold drift mine site at which a stamp mill and mercury amalgamation process was used. The Robinson Mine site is located adjacent to Frazier Creek. Historically, stamp mills were used to crush and break down ore. The resulting fines were then directed into sluices and drainage tunnels, where a gold-mercury amalgamation process would separate the gold from the fines. Robinson Mine operated from 1894 to 1936. A single, empty mercury flask was recently discovered on site.

Runoff from the Robinson Mine enters Frazier Creek, which is a tributary to Little North Fork of the Middle Fork Feather River. The Middle Fork Feather River feeds into the Feather River. The Feather River is a tributary to the Sacramento River which, runs into the San Pablo Bay.

2.3 Group III – Spanish Creek Watershed Location and Description

The sites located within the Spanish Creek Watershed are located west of the community of Quincy, California, on the Forest's Mount Hough Ranger District. These sites can be accessed via the Oroville-Quincy Highway (Butte County Road #27562 and Plumas County Road #414) near the community of Meadow Valley, California. Spanish Creek is a major tributary to the North Fork of the Middle Fork Feather River, which is a tributary to the Feather River. The Feather River is a major tributary to the Sacramento River which is, in turn, a tributary to the San Pablo Bay.

Slate Creek Tunnel

In order to characterize areas that may contain deposits of mercury at the Slate Creek Tunnel area, WESTON collected five sediment samples. Samples were analyzed for mercury. One sediment sample was also analyzed for Title 22 Metals.

The sample location prefix "SCT" was used to identify the Slate Creek Tunnel samples. Both surface soil and sediment samples were designated by an "S" suffix. All surface soil and sediment samples were collected from 0 to 6 inches bgs using dedicated plastic trowels.

To determine the extent of contaminant migration from possible hydraulic mine deposits, WESTON collected five surface water samples from the Slate Creek Tunnel and downstream from the tunnel in a tributary to Slate Creek, which flows water into Cedar Grove Ravine Creek. Surface water samples were analyzed for total mercury. In addition, surface water analyzed for dissolved mercury and filtered in the field. One surface water sample was also analyzed for Title 22 Metals. Three surface water samples were also analyzed for TSS. A duplicate sample (SCT-SW-7) was collected at sample location SCT-SW-6. Sediment samples were collocated with surface water samples assigned the same number. Thus, sediment sample SCT-S-2 was collected in the same location as surface water sample SCT-SW-2.

WESTON collected one background sediment and surface water sample in Cedar Grove Ravine Creek that was upstream of the Slate Creek Tunnel. The background surface water sample was also analyzed for TSS. WESTON collected a total of six sediment and six surface water samples, including background samples, from the Slate Creek Tunnel area.

3.2 Primary Sampling Event – Group II – Little North Fork Watershed

Robinson Mine

In order to characterize areas that may contain deposits of mercury at the Robinson Mine, WESTON collected six soil samples. Soil samples were analyzed for mercury. One soil sample was also analyzed for Title 22 Metals.

The sample location prefix "RM" was used to identify the Robinson Mine samples. Both surface soil and sediment samples were designated by an "S" suffix. All surface soil and sediment samples were collected from 0 to 6 inches bgs using dedicated plastic trowels.

To determine the extent of contaminant migration from the Robinson Mine, WESTON collected three sediment and three surface water samples downstream from the Robinson Mine. Surface water samples were analyzed for total mercury. In addition, surface water analyzed for dissolved mercury and filtered in the field. One surface water sample was also analyzed for Title 22 Metals. Two surface water samples were also analyzed for TSS. A duplicate sample (RM-SW-7) was collected at sample location RM-SW-5. Another duplicate sample (RM-SW-8) was collected at sample location RM-SW-6. Sediment samples were collocated with surface water samples assigned the same

number. Thus, sediment sample RM-S-5 was collected in the same location as surface water sample RM-SW-5.

WESTON collected one background sediment and surface water sample upstream from possible runoff from the Robinson Mine. The background surface water sample was also analyzed for TSS. WESTON collected a total of four sediment, six soil, and three surface water samples, including background samples, from the Robinson Mine area.

3.3 Primary Sampling Event – Group III – Spanish Creek Watershed

Gopher Hill

In order to characterize areas that may contain deposits of mercury at the Gopher Hill area, WESTON collected six sediment samples during the September 2006 sampling event. Samples were analyzed for mercury. One sediment sample was also analyzed for Title 22 Metals.

The sample location prefix "GH" was used to identify the Gopher Hill samples. Sediment samples were designated by an "S" suffix. A duplicate sediment sample (GH-S-8) was collected at sample location GH-S-5. All samples were collected from 0 to 6 inches bgs using dedicated plastic trowels.

To determine the extent of contaminant migration from the Gopher Hill area, WESTON collected five surface water samples downstream from the Gopher Hill mine workings. Surface water samples were analyzed for total mercury. In addition, surface water analyzed for dissolved mercury and filtered in the field. Five surface water samples were also analyzed for TSS. Sediment samples were collocated with surface water samples assigned the same number. Thus, sediment sample GH-S-3 was collected in the same location as surface water sample GH-SW-3.

WESTON collected one background sediment and surface water sample in Spanish Creek upstream from possible runoff from the Gopher Hill hydraulic mine workings. The background surface water sample was also analyzed for TSS. WESTON collected a total of six sediment, and six surface water samples, including background samples, from the Gopher Hill area during the Primary Sampling Event.

SECTION 4

RESULTS

Soil, sediment, and surface water samples from the AMMA sites were collected and sent to Test America laboratory (formerly Severn Trent Laboratories), an analytical laboratory in West Sacramento, California. All samples were analyzed for mercury using EPA Method 7471A.Selected samples were analyzed for California Title 22 Metals using EPA Method 6010B. Selected surface water samples were also analyzed for TSS using EPA Method 160.2.

The soil action level for mercury is established using a combination of the U.S. Department of Interior, Bureau of Land Management (BLM) Risk Management Criteria (RMC) for metals at mining sites and background soil concentrations. The BLM has established a set of RMC for both human and ecological receptors. Due to the location of the AMMA sites, the human RMC (e.g., resident, camper, ATV, driver, worker, surveyor, boater, and swimmer) are not applicable. Several species of wildlife are more likely to be present and potentially impacted by contamination at the sites. BLM has established a median wildlife RMC for mercury. The BLM wildlife RMC for mercury is 8 milligrams per kilogram (mg/kg). In addition, the median BLM wildlife RMCs for arsenic, cadmium, copper, lead, and zinc was used as reference values to assist in data interpretation of soil samples analyzed for California Title 22 metals. Exceedance of the BLM wildlife RMC in soils indicates that wildlife may experience toxic effects from the ingestion of soil and plants located in the area.

Sediment and surface water action levels for mercury are established using a combination of the National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQuiRTs) and background sediment analyte concentrations. NOAA established a set of screening concentrations for inorganic and organic contaminants in various environmental locations for the Coastal Protection & Restoration Division (CPR) of NOAA. For establishing sediment action levels, the NOAA SQuiRTs Table for Inorganics in Solids was used. WESTON used The Threshold Effects Level (TEL) for mercury of 0.174 mg/kg as the action level for mercury in sediment samples. In addition, the TEL for arsenic, cadmium, chromium, copper, nickel, lead, and zinc was used as reference values to assist in data interpretation of sediment samples analyzed for California Title 22 metals. A TEL value represents the concentration of a contaminant in sediment below which adverse effects to aquatic life rarely occur. Values above the TEL are concentrations of contaminants in sediment in which adverse effects occasionally occur.

To establish surface water action levels, the NOAA SQuiRTs Table for Inorganics in Water was used. WESTON used the Freshwater "chronic" Criterion Continuous Concentration (CCC) value for mercury of 0.77 micrograms per liter (µg/L). In addition, the Freshwater "chronic" CCC values for arsenic, cadmium, chromium, copper, nickel, lead, selenium, and zinc were used as reference values to assist in data interpretation of surface water samples analyzed for California Title 22 metals. The CCC value is an estimate of the highest concentration of a material in surface water to which an

aquatic community can be exposed indefinitely without resulting in an unacceptable effect. The CCC value represents.a four-day average exposure not to be exceeded more than once every three years.

4.1 Group I - Slate Creek Watershed Sample Results

4.1.1 Slate Creek Debris Dam

Sample results for the Slate Creek Debris Dam are presented in Tables 4-1 through 4-2. Sample locations are shown in Figure 4-1. Mercury was detected in all three sediment samples collected exhibiting a maximum concentration of 0.099 mg/kg. Mercury was detected in both soil samples collected exhibiting a maximum concentration of 0.11 mg/kg. Mercury was not detected in any surface water sample. Mercury was not detected in any of the samples above the sample matrix action levels. Nickel was detected above the TEL in one sediment sample analyzed for Title 22 Metals at a concentration of 18.7 mg/kg.

4.1.2 Poverty Hill

Sample results for the Poverty Hill site are presented in Tables 4-3 through 4-4. Sample locations are shown in Figure 4-1. Mercury was detected in all five sediment samples exhibiting a maximum concentration of 0.062 mg/kg. One soil sample was collected at the Poverty Hill site, and mercury was detected at a concentration of 3.4 mg/kg. Mercury was detected in three of five surface water samples collected at a maximum concentration of 0.24. µg/L. TSS values were measured at concentrations of 74,000 and 106,000 µg/L, respectively, in two of the three surface water samples that contained mercury. The third surface water sample that contained mercury was not analyzed for TSS. TSS was measured at a concentration of 40,000 µg/L in the background sample for the Poverty Hill site. µg/L. Chromium, copper, and nickel were detected in sediment sample PH-S-2 at concentrations above the TEL value. Chromium was detected at 72.4 mg/kg, copper was detected as 54.3 mg/kg ,and nickel was detected at a concentration of 37.7 mg/kg in the sediment sample analyzed for Title 22 metals.

4.2 Group II –Little North Fork Watershed Sample Results

4.2.1 Robinson Mine

Sample results for the Robinson Mine site are presented in Tables 4-11 through 4-12. Sample locations are shown in Figure 4-3. Mercury was detected in all three of the sediment samples collected exhibiting a maximum estimated concentration of 0.03 mg/kg. Mercury was detected in all six of the soil samples collected at a maximum concentration of 47.7 mg/kg. Mercury was detected in three of the soil samples at concentrations above the RMC value. Mercury was not detected in any of the surface water samples collected. Sediment sample RM-S-2 contained the following California Title 22 Metals at concentrations above RMC values: cadmium at 3.7 mg/kg, lead at 1,290 mg/kg, and zinc at 614 mg/kg. Mercury was not detected in any surface water samples. Lead was detected in surface water sample RM-SW-5 above the Freshwater "chronic" CCC value at 5.2 µg/L.

4.3 Group III –Spanish Creek Watershed Sample Results

4.3.1 Gopher Hill

Sample results for both the Primary Sampling and Precipitation Event for the Gopher Hill site are presented in Tables 4-13 through 4-14. Locations of samples collected during the Primary Sampling Event are shown in Figure 4-4. Mercury was detected in all five of the sediment samples collected. Mercury was detected above the TEL value in one sediment sample at a maximum of 0.22 mg/kg. The following metals were detected above TEL values in the two sediment samples that were analyzed for Title 22 Metals: arsenic at a maximum concentration of 13.3 mg/kg, chromium at a maximum concentration of 42.8, and nickel at a maximum concentration of 36.8 mg/kg. Mercury was detected in one surface water sample at an estimated concentration of 0.17 µg/L. TSS was measured in the surface water sample containing mercury at a concentration of 581,000 µg/L. TSS was measured at a concentration of 148,000 µg/L in the background sample for Gopher Hill..

Locations of samples collected during the Precipitation Event are shown in Figure 4-5. During the Precipitation Event mercury was detected in all five samples at a maximum concentration of 0.48 mg/kg. Mercury was detected in three samples above the TEL value. Mercury was not detected in the surface water samples collected during the Precipitation Event.

Background concentrations of mercury in sediment samples collected upstream of the Gopher Hill site in Wapansi Creek during the Primary Sampling and Precipitation Event were 0.10 mg/kg and 0.13 mg/kg, respectively.

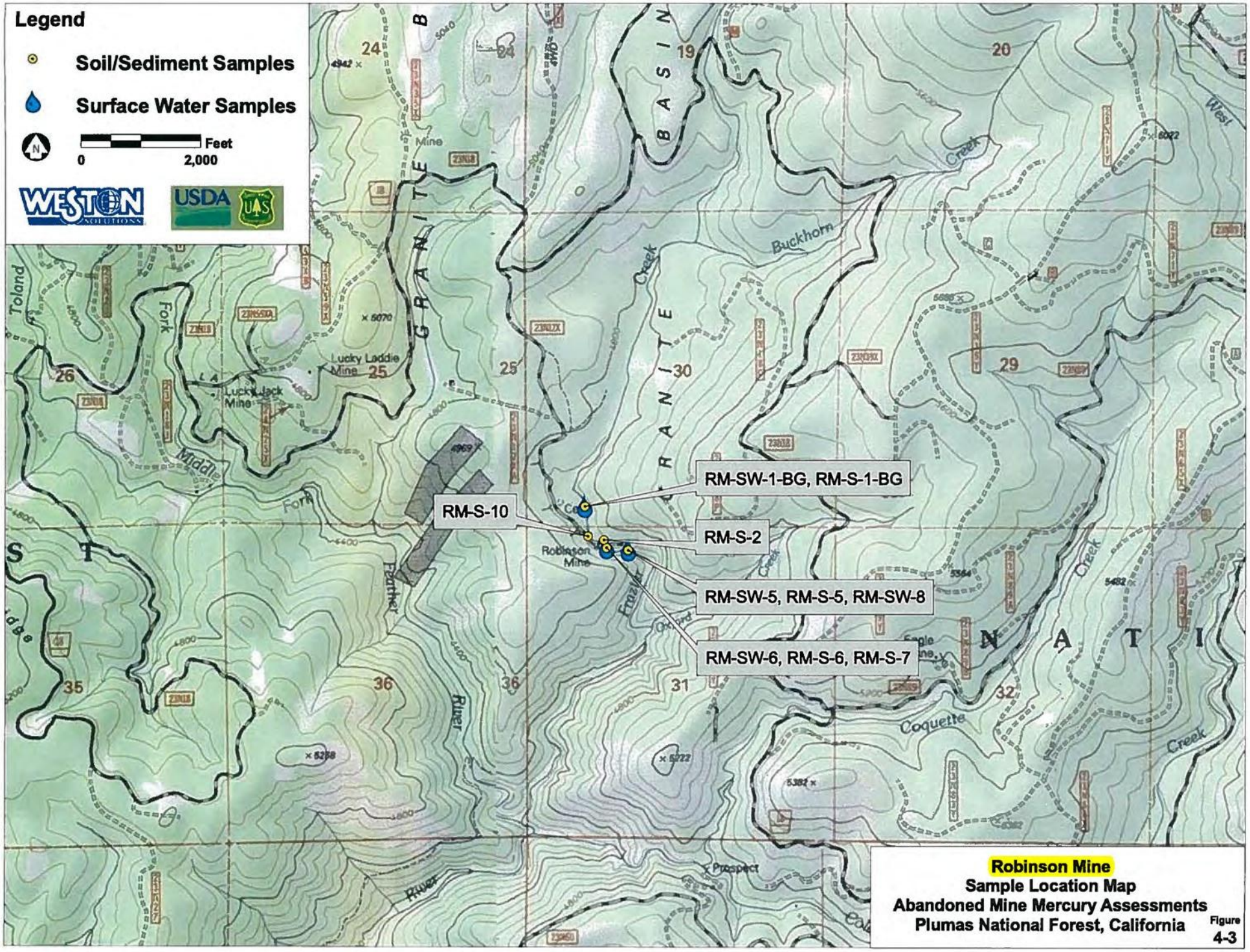
SECTION 5

SUMMARY AND RECOMMENDATIONS

5.1 Abandoned Mercury Mine Assessment Summary and Recommendations

Analytical results indicate that mercury and/or other metals are present in sediment and soils at the AMMA sites above the action level. Mercury was detected in the highest concentrations in soil at Robinson Mine site. Mercury was not detected above the action level in soil samples at any other AMMA sites. Robinson Mine is the most viable site for a removal action as it is a drift mine and it is possible to delineate the soil contamination. Additional soil sampling can be conducted at the Robinson Mine site in order to fully delineate soils that are above the action values for mercury and other metals. Additionally, the debris remaining at the Robinson Mine, including the stamp mill, may be removed in order to reduce mercury contamination below action levels.

In the case of the hydraulic mine sites, although mercury was not detected above the action level in soil, it was detected in sediment samples collected downstream of the Secret Diggings, Nugget Bowl, Slate Creek Tunnel, Gopher Hill, and Bean Hill sites. Precipitation Event sample results for the Gopher Hill and Bean Hill sites show an increase in the mercury concentrations in several of the sediment samples. Mercury was not detected in any filtered water samples. In the surface water samples that contained mercury, the TSS was significantly higher than other samples and/or background samples, indicating that mercury is transported away from AMMA sites via sediment load and not the surface water itself. In order to reduce continued releases of mercury from the hydraulic sites, sediment release to waterways could be reduced. Specifically, stabilizing the sloped areas at the Gopher Hill and Lower Bean Hill mine sites, discussed in Section 2.3, would reduce the sediment load to Spanish Creek and, therefore, the mercury release from the Gopher Hill and Bean Hill sites.



Robinson Mine
Sample Location Map
Abandoned Mine Mercury Assessments
Plumas National Forest, California

Figure 4-3

Table 4-11
Robinson Mine - Primary Sampling Event Sampling Results for Soil and Sediment Samples (mg/kg)
(results above action levels are bolded and underlined)

Sample Location	Sample Type	Location Description	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Sediment Samples Action Level - Threshold Effects Level			–	5.9	–	–	0.596	37.3	–	35.7	–	–	0.174	18.0	–	–	–	–	123
Soil Samples Action Level - Risk Management Criteria			–	275.0	–	–	3.0	–	–	–	125.0	–	8.0	–	–	–	–	–	307.0
Background Sample																			
RM-S-1-BG	Sediment	Upstream of Robinson Mine	–	–	–	–	–	–	–	–	–	–	0.048J	–	–	–	–	–	–
Sediment Samples																			
RM-S-5	Sediment	Downstream of Robinson Mine	–	–	–	–	–	–	–	–	–	–	0.017J	–	–	–	–	–	–
RM-S-6	Sediment	Downstream of Robinson Mine	–	–	–	–	–	–	–	–	–	–	0.030J	–	–	–	–	–	–
RM-S-7 (duplicate)	Sediment	Duplicate of RM-S-6	–	–	–	–	–	–	–	–	–	–	0.015J	–	–	–	–	–	–
Soil Samples																			
RM-S-2	Soil	Below stamp mill	3.5	3.7	189	0.24	**3.7**	33.3	10.9	168	**1,290**	1.3J	**18.8**	23.4	ND (1.0)	5.7	ND (1.0)	53.2	**614**
RM-S-3	Soil	Sluice near stamp mill	–	–	–	–	–	–	–	–	–	–	6.7	–	–	–	–	–	–
RM-S-4	Soil	Sluice near stamp mill	–	–	–	–	–	–	–	–	–	–	**44.4**	–	–	–	–	–	–
RM-S-8	Soil	Mill wash	–	–	–	–	–	–	–	–	–	–	2.6	–	–	–	–	–	–
RM-S-9	Soil	Second sluice away from stamp mill	–	–	–	–	–	–	–	–	–	–	**47.7**	–	–	–	–	–	–
RM-S-10	Soil	Mine debris	–	–	–	–	–	–	–	–	–	–	0.28	–	–	–	–	–	–

Table 4-11 Notes:

– = Analysis not performed on sample
mg/kg = milligrams per kilogram
ND ( ) = Analyte not detected above the reported sample quantitation limit. The number in parentheses represents the associated contract required quantitation limit.

Table 4-12
Robinson Mine - Primary Sampling Event Sampling Results for Surface Water Samples (µg/L)
(results above action levels are bolded and underlined)

Sample Location	Location Description	TSS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Mercury	Mercury, filtered *	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Surface Water Samples Action Level - Freshwater "chronic" CCC		–	–	150	–	–	0.25	74	–	9	2.5	–	0.77	0.77	52	5	–	–	–	120
Background Sample																				
RM-SW-1-BG	Upstream of Robinson Mine	46,000	–	–	–	–	–	–	–	–	–	–	ND (0.20)	ND (0.20)	–	–	–	–	–	–
Samples																				
RM-SW-5	Downstream of Robinson Mine	22,000	ND (10)	ND (10)	30	ND (2.0)	ND (2.0)	ND (8.0)	4.1J	ND (10)	**5.2**	ND (20)	ND (0.20)	ND (0.20)	34	ND (10)	ND (5.0)	ND (10)	2.9J	7.8J
RM-SW-8 (duplicate)	Duplicate of RM-SW-5	39,000	–	–	–	–	–	–	–	–	–	–	ND (0.20)	ND (0.20)	–	–	–	–	–	–
RM-SW-6	Downstream of Robinson Mine	–	–	–	–	–	–	–	–	–	–	–	ND (0.20)	–	–	–	–	–	–	–
RM-SW-7 (duplicate)	Duplicate of RM-SW-7	–	–	–	–	–	–	–	–	–	–	–	ND (0.20)	–	–	–	–	–	–	–

Table 4-12 Notes:

CCC = Criterion Continuous Concentration
– = Analysis not performed on sample
µg/L = micrograms per liter
ND ( ) = Analyte not detected above the reported sample quantitation limit. The number in parentheses represents the associated contract required quantitation limit.
* = The values located in the "Mercury, filtered' row are for the filtered sample taken at the sampling location in the column. For example, the value located in the "Mercury, filtered" column and the SCD-SW-2 row is the sample result for the filtered sample SCD-SW-2F.
TSS = Total Suspended Solids

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CALIFORNIA STATE MINING BUREAU,

J. J. CRAWFORD, State Mineralogist.

THIRTEENTH REPORT

(THIRD BIENNIAL)

OF THE

STATE MINERALOGIST

FOR THE

TWO YEARS ENDING SEPTEMBER 15, 1896.

SACRAMENTO:
A. J. JOHNSTON, : : : : : : SUPERINTENDENT STATE PRINTING.
1896.

side to what was supposed to be the lowest point, and an upraise of 30′ made to the gravel; this has lately been cleaned out, retimbered, and a 4′ flume placed in the bottom, on an 8″ grade. Radial bedrock cuts will lead to the upraise, to permit all the gravel being handled through this tunnel, which furnishes a 60′ dump into a flat formed by a curve of Rock Creek. By extending the tunnel the Quigley Ravine side will also be passed through to the Rock Creek dump. This arrangement will permit of a much larger area of gravel being handled each season. One half mile below the dump in Rock Creek is a stone restraining dam, 30′ wide at the base, 17′ at the crest, 20′ high, and 85′ long from bank to bank. A good wagon road has been constructed up Slate Creek, connecting the mine with the county road between Quincy and Spanish Ranch. To the present time only one giant, with 7½″ nozzle, has been used. The gravel carries gold throughout, though coarsest and best near the bedrock; some of this gold is black and rusty. Eighteen men are employed at present around the mine, ditches, and flumes, but later only seven men, working two shifts, will be required. C. D. Hazzard, of Minneapolis, Minnesota, owner; — McGillvray, of Quincy, superintendent.

Quincy Mining and Water Co.'s Mines (Hydraulic).—See our XIIth Report, p. 219. This property is situated on Gopher Hill and Shores Hill, along the north bank of Spanish Creek, about 3 miles W. of Quincy, at 3,800′ elevation on bedrock, and comprises 2,200 acres. Five giants, supplied with 6″ and 8″ nozzles, are used in the three different pits. At Gopher Hill the bank is from 80′ to 100′ in height; at the City Point claim, gravel is 10′ to 12′ deep on the north end and 50′ on the south end; on the N.E. side there is 15′ of reddish quartz gravel. Last season 200,000 cu. yds. of gravel were moved. There are three radiating branch sluices 3,000′ long, 4′ wide, set on a 6″ grade, paved with rock riffles, and cleaned up every twenty days. It is said 1,000 miner's inches of water move 1,000 cu. yds. of gravel in thirteen hours. The gold is coarse and nuggety, and is found mostly on the bedrock. The bedrock is cleaned twice, one season after the other. The company have built four restraining dams, the upper one of gravel, across Wanponsey Creek. The debris drops in a lake 12′ to 15′ deep, and after settling passes over a spillway to the second and third dams. These dams are 300′, 800′, and 200′ apart. The upper dam is 22′ and the second 20′ high. The company's water-supply is obtained from Gold and Silver lakes on Spanish Peak, and from Bean and Spanish creeks. The main ditches are 24 miles long, carrying about 2,000 miner's inches, and the branch ditches 54 miles long, carrying from 500 to 1,000 miner's inches. The pressure from the main reservoir is 350′, and gives ten hours piping. The pipeline, 22″ and 11″, made out of No. 12 iron, is between 5,000′ and 6,000′. Twenty men are employed. An incorporated company, of Quincy, owner; A. B. White, of San Francisco, superintendent.

Rattlesnake Mine (Drift).—See Ding Dong.

Rich Gulch Mine (Quartz).—See Halsted.

Richmond Hill Mine (Hydraulic and Drift).—See Good Hope.

Riverdale Mine (Drift).—See Elizabethtown Gravel Channel.

Robinson (Morning Star and Trenton) Mine (Quartz).—It is situated in Granite Basin, 8 miles N.E. from Merrimac, Butte County, and contains two locations, designated the *North Star* and the *Trenton*, at 4,750′ elevation. The vein, 2′ to 4′ wide, trends N.E. and S.W., and dips 80°

S.E., between a granite and diorite contact. Frazier Creek divides the two claims. Developments consist of a 3½'x 6' shaft, 70' deep, with steam hoisting plant. The quartz in the bottom of the shaft carries 3% of high-grade sulphurets. A No. 3 Hooker pump is driven, with a speed of 30 strokes per minute, by a 14 H.P. engine. The 20-stamp water-mill (with only one battery in running order) is situated on Frazier Creek, a short distance from the shaft, and is connected with it by a tram-road. The mill has 900-lb. steel-shod stamps and one Johnston concentrator driven by a 5' Knight wheel, under 94' pressure. The water is diverted from Frazier Creek, through 1,650' of ditch of 200 miner's inches capacity. Tunnels have been run on the vein from both sides of the creek, the four on the North Star being 400', 260', 300', and 40' long, respectively, with the intervening ground mostly stoped out. The tunnel on the Trenton is 200' long, with some little stoping. The shaft on this vein is the deepest of any mine in the basin. Seven men are employed. E. C. Robinson, of Merrimac, Butte County, owner.

Round Valley Consolidated (Arcadian) Mining Co.'s Mine (Quartz).—It is on the E. side of North Cañon, 2 miles S.E. of Greenville, at 3,900' elevation, and contains four locations and a mill site. There is a main N. and S. vein and two E. and W. feeders, 6' wide, dipping nearly vertically. The developments consist of a main cross-cut tunnel (at present inaccessible) 700' long to the vein, near the south end of the claim; thence a drift 500' to the north country with a shaft; the John Taylor tunnel, 450' long, striking one of the feeders, and developing three pay-shoots between where the vein is tapped and where it connects with the N. and S. vein; pay-shoots have likewise been cut on the other veins. The quartz is low-grade. The 10-stamp steam-mill, with 750-lb. stamps, is furnished, besides the plates, with two rubbers, but no concentrators. Timber is abundant. Idle. An incorporated company, of Greenville, owner; D. NcIntyre, of Greenville, manager.

Russian Mine (Drift).—This is a prospect on the course of the old Dutch Hill channel, 11 miles from Prattville, at 4,025' elevation, and comprises 60 acres, on which a bedrock tunnel has been started. B. Piazzonia and J. Borsini, of Butte Valley, owners.

Salmon Falls Mine (Drift).—See our XIIth Report, p. 220. Assessment work only. D. McIntyre et al., of Greenville, owners.

Savercool Mine (Quartz).—See our Xth Report, p. 493. It is situated 4 miles E. of Butte Valley, on the North Fork of Feather River, at 4,000' elevation. Idle. Savercool Bros. et al., of Butte Valley, owners.

Sawpit Flat Mine (Hydraulic and Drift).—See Good Hope.

See & Seren Mine (Quartz).—See Specimen.

Senator Perkins Mine (Quartz).—It is 5 miles N.E. of Merrimac, Butte County, at 4,750' elevation. The vein courses N.E. in the granite. The developments consist of a 30' tunnel and a 20' open cut. The quartz carries high-grade sulphurets. Two men are at work. — Blazel, of Oakland, owner.

Shenandoah Mine (Quartz).—See our XIth and XIIth Reports, pp. 324 and 220. It is at the head of French Ravine, 12 miles N.W. of Spanish Ranch, at 2,350' elevation, and comprises three quartz and two placer claims. The developments include three tunnels on the vein, 160', 50', and 100' long, and a 45' winze from tunnel No. 1 sunk on the pay-shoot. The large percentage of sulphurets found in the ores interferes with the successful milling; at least the tailings are found to carry a high per-

CALIFORNIA STATE MINING BUREAU
FERRY BUILDING, SAN FRANCISCO
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OF

PLUMAS COUNTY

By ERROL MAC BOYLE

CALIFORNIA STATE PRINTING OFFICE
SACRAMENTO
1920

46902

The Mountain House drift mine owned by the Plumas Investment Company adjoins.

Moreno Randolph Claim. Owner, Barbee.

Morning Star Mine. (Robinson Mine.) Owner, E. C. Robinson, First National Bank Building, Oakland, California.

Location: Granite Basin Mining District, Secs. 30 and 31, T. 23 N., R. 7 E.; Quincy is 30 miles northeast via Letter Box, Buck's Ranch and Meadow Valley; good automobile road to property.
Bibliography: Cal. State Min. Bur. Report XIII, page 304. U. S. Geol. Survey Folio 43, Bidwell Bar.

This property comprises two patented claims, the Morning Star and Trenton. There is a total area of 40 acres with a length along the lode of 3000′. Frazier Creek divides the property, cutting across the strike of the vein. There is an easy slope from the creek to the top of the ridges.

The claims were located in 1876 by O'Brien and Sullivan. In 1890 the property was purchased by Robinson, bonded in 1905 by Trowbridge and in 1912 by Holbrooke and Cohn, San Francisco, who, it was reported, spent $10,000 and only succeeded in sinking the shaft 10′ before work was abandoned. Chas. Lyser was superintendent. It has been idle since the summer of 1912.

Development work consists of a shaft 100′ deep near the portal of the lower tunnel on the east side of Frazier Creek and a drift on the vein 150′ to the northeast from the bottom of the shaft. There are also three tunnels on the vein—the upper tunnel, 75′; middle tunnel, 300′; and lower tunnel, 300′, northeast of the creek and 300′ southwest of the creek. All ground is stoped from the lower tunnel to the surface, and a small amount from the 100′ level in the shaft.

The deposit consists of a fissure vein near the contact between granite and diorite. The vein filling is quartz and in some cases decomposed granite and glass quartz crystals. The vein varies from 2′ to 4′ in width, strikes N 41° E., and dips 80° E. The foot-wall is granite, the hanging wall diorite, and there is a proven length on the surface of 2000′. Several pay shoots 40′ to 50′ in length developed in the 600′ opening. The ore is said to average $10 per ton, 2% sulphides being worth $60 to $75 per ton.

Water is obtained from Frazier Creek by a 1650′ ditch under 94′ head. Steam is also used.

Equipment consists of steam and water power hoist capable of sinking to a depth of 500′ and a 35 year old 20-stamp mill.

Adjoining mines are the Frazier and Black Bart.

Mother Lode Group. Owner, M. J. Calnan, Genesee.

Location: Genesee Valley Mining District, Secs. 14 and 15, T. 25 N., R. 11 E., 3 miles southeast of Genesee, thence 18 miles, by good wagon road, to Keddie. Elevation 4000′.
Bibliography: Diller, J. S., U. S. Geol. Survey Bull. 353, pages 111–121. Diller, J. S., U. S. Geol. Survey Bull. 260, pages 45–49. U. S. Geol. Survey Topo. sheet Indian Valley, Genesee, Honey Lake.

35714

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES
GEORGE D. NORDENHOLT, Director

DIVISION OF MINES
FERRY BUILDING, SAN FRANCISCO

WALTER W. BRADLEY State Mineralogist

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QUARTERLY CHAPTER
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STATE MINERALOGIST'S REPORT XXXIII

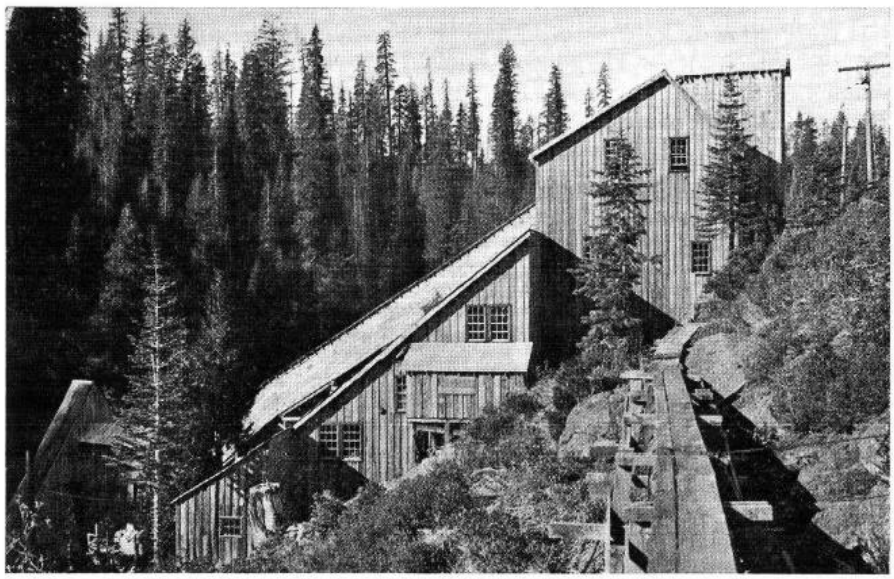
STATE DIVISION OF MINES
FERRY BUILDING, SAN FRANCISCO
CALIFORNIA

40819

part of the same group as the patented claims now held by Mrs. Hamilton and the entire group was known by the name "Gold Stripes." However, when the claims were patented, the Gold Stripe claim was not included in the patent and was later allowed to lapse.

B. K. Melville is president of *Peerless Development Company,* a California corporation, which he has organized to work a group of seven claims adjoining the patented ground owned by Mrs. Hamilton. The address of Peerless Development Company is Room 304, 333 Kearney Street, San Francisco. This property was idle when visited in the summer of 1936.

Granite Basin Mining Co. holds some 50 mining claims in Sec. 30, T. 23 N., R. 7 E., and adjoining sections. C. F. Tolman of Palo Alto is president, and H. F. Lynn of Grass Valley is manager. At the mine John Tolman is superintendent and Jack Murray is assistant superin-



Mill of Granite Basin Mining Co. Shaft house in lower left corner.

tendent. The property is reached over five miles of dirt road from Letterbox on the Oroville-Bucks Ranch road.

Some of these claims have been known in the past as *Robinson Mine, Morning Star Mine,* and *Black Bart Mine,* and they were described by MacBoyle [1] under those names. Both the Morning Star and the Black Bart were equipped with mills in 1895, according to State Mineralogist's Report XIII. The mineralization is associated with the contact between granite and an igneous rock of granitic grain, made up largely of ferromagnesian minerals. Turner has mapped this with his "amphibolite," but at the mine it is known as meta-andesite or porphyrite. Geological conditions are probably more complicated than could be mapped by Turner [2] on the small scale that he used, and the possi-

[1] MacBoyle, *op. cit.*
[2] Turner, H. W., U. S. Geol. Survey Atlas, Bidwell Bar folio (No. 43), 1890-94.

bility of a basic igneous intrusion here, that preceded the granitic intrusion, should be considered. Some mineralization is found on this contact, and some mine-workings have followed it, but the chief mineralization seems to be in the granite. Near the shaft of Granite Basin Mining Co. are five parallel fissures in a width of a few hundred feet, on which old adits have been driven.

The 320-ft. shaft, which has recently been pumped out, develops a nearly vertical quartz vein with an average width of 18 inches, striking easterly and westerly. On the lower levels the dip changes slightly and departs a few degrees from vertical toward the south. On the 85-ft. level, drifts run out 200 ft. easterly and 190 ft. westerly. Ore is being stoped above this level. Drifts on the 220-ft. level are to be started immediately.

The mill of 50 tons rated daily capacity contains a jaw crusher 9 by 14 inches, 10 stamps, and a 4-ft. by 3-ft. ball mill in closed circuit with a Dorr classifier. Riffles are set below the stamps, and plates for amalgamation below the ball mill to recover free gold, which amounts to 40% of the total. Grinding is to 50-mesh. Gold in the sulphides is recovered in three Fagergren flotation cells followed by two Kraut cleaner-cells. The mill was started on Nov. 1, 1936. A 200-hp. Fairbanks Morse diesel engine driving a generator furnishes electric power for all machinery. The 440 cfm. compressor is driven by a 100-hp. motor. The hoist on the shaft is operated by compressed air.

Green Mountain, see Jackson.

Hallsted Group is assessed to Y. H. & Frank Hallsted, Virgilia. It is in Sec. 12, T. 25 N., R. 7 E. and Sec. 7, 18, T. 25 N., R. 8 E. The group is now controlled by Virgilia Mining Corp., which see. References to earlier reports on the Hallsted are contained in the accompanying table of mines.

Imperial Mine comprises the T. C. & O. K. patented claims in Sec. 34, T. 25 N., R. 9 E., which are owned by Vincent E. Bayless, Spokane, Washington, or c/o David J. Heisey, 805 Federal Bank Bldg., Dubuque, Iowa. Ernest V. Grant, of Quincy, has a lease and option, and in 1935 had 16 men at work for a part of the year. A 130-ft. shaft, 4 ft. by 8 ft. was cleaned out and retimbered, and 90 ft. of drifting was done at the 100-ft. level. According to Grant, he made a 300-ton test run from this drift, breaking an 8-ft. width of vein, and the ore ran $9 per ton in gold. The vein strikes N. 17° W. and has a vertical dip. Walls are slate. Grant is now planning to sink the shaft to the 200-ft. level.

The new mill is of 30 tons rated daily capacity, and consists of a crusher, ball mill, Dorr-type classifier, plates for amalgamation, and a Simpson 5-cell, pneumatic type flotation machine.

Indian Valley Mine in Sec. 10, 11, T. 26 N., R. 9 E., one mile south of the town of Greenville, is assessed to J. W. Prentiss, 42 Broadway, New York City, later changed to 40 Wall Street, New York City. It is one of the oldest mines in Plumas County and was described in State Mineralogist's Report X, for 1890. The mine had been very active during a period ten years earlier than that date, having been developed by a tunnel 2000 ft. long and a shaft 700 ft. deep on a pay-shoot.

On June 1, 1934, the mine was reopened by the owner, with whom were associated Phillip J. FitzGerald, 913 Russ Building, San Francisco,

Preliminary history of the mines collectively known as Robinson Mine

By Jamie Moore
District Archaeologist
Plumas National Forest
May 2014

The **Robinson Mine** was a cluster of thirteen mining claims, each twenty acres in size. These claims were adjacent to each other and located in T23N R6E Sec. 25, 36 and T23N R7E Sec. 30, 31. The two oldest claims, the **Trenton** and **Morning Star**, may date to pre-1863 (Robinson claim notes 1966), this would match the 1875 GLO Map that shows an old quartz mill where these two claims were located.

The oldest claims were the **Morning Star**, and it was recorded for Dennis O'Brien and Michael Sullivan (24 July 1878, Plumas Book 1 page 362); **Trenton Lode** was recorded for P.P. Lyttaker, this claim may latter have been called the **Robinson Claim** (12 August 1878, Plumas Book 1 page 375); **Plumas Quartz Claim** was recorded for Joseph Pippin and abutted the **Ella Mining Claim** to the east (1 January 1897, Plumas Book 4 page 183); and Black Bart Mine was recorded for Joe Pippin and was formerly known as the Frazier Mining Company (3 March 1899, Plumas Book 4 page 382). It appears that this claim was located by Pippin who bonded it to the Frazier Co. and then reverted back to Pippen. In 1913 only assessment work was being done. **Devil's Gate Quartz Mining Claim** was recorded for Joe Pippin and was formerly known as the **Schwale Claim** (12 July 1899, Plumas Book 4 page 420).

The Forest Service concluded in 1967 that the **Trenton Claim** did contain enough minerals of sufficient quantity to constitute a discovery under the mining laws. The Forest Service concluded in 1967 that other claims did not contain minerals of sufficient quantity to constitute a discovery under the mining laws.

The next group of claims was recorded in 1941 for the **Morning Star and Trenton Milling and Mining Company**. These claims were the **Granite Basin No. 3** (8 September 1941, Plumas Book 22 page 471), **Granite Basin No. 12** (8 September 1941, Plumas Book 22 page 471) and **Granite Basin No. 13** (8 September 1941, Plumas Book 22 page 472). The Forest Service concluded in 1967 that the **Granite Basin Claims** did not contain minerals of sufficient quantity to constitute a discovery under the mining laws.

The last group of claims was recorded in 1945 for W.C. Robinson by R.C. Jamison. These claims were the **Willie No. 7** (13 September 1945, Plumas Book 23 page 299), **Willie No. 10** (13 September 1945, Plumas Book 23 page 302), **Willie No. 11** (6 September 1945, Plumas Book 23 page 302), **Willie No. 13** (6 September 1945, Plumas Book 23 page 304) and **Willie No. 14** (2 September 1945, Plumas Book 23 page 305). The Forest Service concluded in 1967 that the Willies claims did not contain minerals of sufficient quantity to constitute a discovery under the mining laws.

As of 1966 the **Willie Claims** were owned by the Granite Basin Gold Development Company (W.C. Robinson was President). All the other claims were owned by Black Star Mining Corporation (W.C.

Robinson was Secretary). Both mining companies shared the same address: 205 Sellwood Building, Duluth, Minnesota. By 1967 all the claims were owned by the Estate of W.C. Robinson, executor: First American National Bank of Duluth, Minnesota, M.W. Whittemore, Trust Officer.

Tentatively structures appear to be spread over several of the original four claims. A cemetery is located on both the **Black Bart** and **Plumas** claims. A 15-hp steam engine appears to have been located on the **Plumas** Claim. A Huntington Mill, Triumph concentrator, and several houses appear to be located on The **Morning Star** Claim. The mill on the **Morning Star** claim and the main shaft on the **Trenton** claim seem to have operated between 1936 and 1939.

SIERRA NEVADA CONSERVANCY
PROPOSITION 84 - DETAILED BUDGET FORM

Project Name: Robinson Mine - Plumas National Forest
Applicant: Department of Conservation

SECTION ONE **DIRECT COSTS**	**Year One**	**Year Two**	**Total**
Preliminary Assessment & Site Investigation			
Contract & Project Management	$4,000.00		$4,000.00
Project & Sampling Plans	$10,500.00		$10,500.00
Field work: site inventory, sample collection	$5,000.00		$5,000.00
Travel	$1,000.00		$1,000.00
Lab analysis of samples	$10,500.00		$10,500.00
Report preparation		$7,000.00	$7,000.00
Engineering Estimate & Cost Analysis			
Contract & Project Management		$4,000.00	$4,000.00
Project Work Plan Development		$10,000.00	$10,000.00
Field Investigation Work		$11,750.00	$11,750.00
DIRECT COSTS SUBTOTAL:	$31,000.00	$32,750.00	$63,750.00

SECTION TWO **INDIRECT COSTS**	**Year One**	**Year Two**	**Total**
	$0.00	$0.00	$0.00
INDIRECT COSTS SUBTOTAL:	$0.00	$0.00	$0.00

SECTION THREE **Administrative Costs (Costs *not to exceed 15% of total Project Cost*) :**			**Total**
Department of Conservation Overhead	$9,000.00	$2,250.00	$11,250.00
ADMINISTRATIVE TOTAL:	$9,000.00	$2,250.00	$11,250.00
SNC TOTAL GRANT REQUEST:	$40,000.00	$35,000.00	**$75,000.00**

SECTION FOUR **OTHER PROJECT CONTRIBUTIONS**	**Year One**	**Year Two**	**Total**
United States Forest Service		$48,807.00	$48,807.00
Department of Conservation	$4,385.00	$48,808.00	$53,193.00
Total Other Contributions:	$4,385.00	$97,615.00	**$102,000.00**

Total Project Cost	**$177,000.00**

NOTE: The categories listed on this form are examples and may or may not be an expense related to the project. Rows may be added or deleted on the form as needed. Applicants should contact the SNC if questions arise.

* Operating Costs should be allocated to the pecentage that is applicable to the grant based on your cost allocation methodology and cannot exceed 15% of your total project costs.

Cost Allocation Plan

Section 1 - Direct Costs

Contract & Project Management Costs

Classification	Personnel Cost	Percent (based on one month)	Amount Allocated
Associate Government Program Analyst - Contract & Grant Administration	$ 106,942	0.8	$ 7,129
Office Technician	$ 74,287	0.27	$ 1,671
Environmental Program Manager I	$ 142,212	0.3	$ 3,555
Total			$ 12,356