CITY OF
JACKSON
CALIFORNIA

"Preserving Our Past, Enriching Our Present, Building Our Future"

33 Broadway, Jackson, California 95642-2301 • voice (209) 223-1646 • fax (209) 223-3141
E-mail: cinfo@ci.jackson.ca.us • Web site: http://ci.jackson.ca.us

September 27, 2013

Sierra Nevada Conservancy
11521 Blocker Drive, Suite 205
Auburn, CA 95603

Re: Proposition 84 Grant Application – Category 2

To Whom it May Concern:

The City of Jackson is pleased to submit the attached application for $75,000 in funding from the Sierra Nevada Conservancy's Proposition 84 Grant program in the area of pre-planning for the clean-up of abandoned mine lands, a Category 2 grant in this program.

Working with Brandon Sanders, the City has compiled the information we believe is relevant to this project. Ultimately, clearance from the State Department of Toxic Substances Control (DTSC) will result in the addition of 159 acres of recreational parkland to the City's current inventory of approximately ten acres, a significant addition by any means.

All application materials are attached. Due to timing of the invitation to apply and the City Council's meeting schedule, a draft of the resolution is included at this time. After the resolution is adopted on October 15, 2013, a certified copy will be mailed to the Conservancy.

This project provides critical funding necessary for the intermediate step of developing a Removal Action Workplan (RAW) with DTSC to allow for any necessary clean-up of arsenic that was deposited on the property during the gold mining era of the Kennedy Mine. Tied in with previous assessment grants, incredible support from the community, and a successful clean-up of the property, the City can achieve its goal it had when obtaining this amazing property back in December 2006.

Thank you for your consideration of this request and if any additional information is needed, please do not hesitate to contact me at (209) 223-1646.

Sincerely,

Michael Daly
City Manager

/attachments

City of Jackson
Application for the Sierra Nevada Conservancy
Proposition 84 Grant Program
ID Number 791

Project Description

The City of Jackson is applying for a $75,000 Category 2 grant from the Sierra Nevada Conservancy's Proposition 84 Grant Program to complete a Removal Action Workplan for contaminants from Abandoned Mine Lands property once used by the Kennedy Gold Mine for a tailings disposal area. This property is now owned by the City of Jackson.

Consistent with the goals of Proposition 84, a Removal Action Workplan is the next step for the City to protect the potential watershed issues that could be created by this former gold mine tailings dumpsite.

The purpose of the Removal Action Workplan (RAW) is to present pertinent information for evaluating removal/management alternatives and for recommending a removal/ management alternative for the mine waste tailings sand that is protective of human health and the waters of the State. The project will be designed and implemented, as necessary, to promote surface water runoff, and prevent surface water run-on which could infiltrate into mine waste materials. All appropriate best management practices will be evaluated for implementation to minimize the potential for runoff carrying eroded mine waste materials offsite and from entering surface waters. A RAW includes a site investigation, health based risk assessment, removal action goals, removal action alternatives and analysis, and final recommendations for any required clean-up of the property. It will also consider alternatives which may include locating media of concern away from drainage courses and placing the material above the groundwater table to protect the waters of the state.

The Oro De Amador property is located in Jackson, California, but does not currently have a physical address. The 159-acre property, consisting of four parcels (APNs 020-070-031, 020-070-037, 020-070-038, 020-070-040 and 020-020-040), is located between North Main Street and New York Ranch Road, north of Main Street Jackson, in close proximity to downtown, and is easily spotted when entering Jackson via Highway 49/88 from the north. The north fork of Jackson Creek runs just on the other side of North Main Street from the Oro De Amador property.

The City obtained 159 acres of open space "abandoned mine lands" property in December 2006 after the previous owner, a subsidiary of Chubb Insurance Group, determined that it was not cost-effective to retain the property for residential or commercial development. It was a great opportunity to have complete control over a piece of property with enormous potential for open space and recreation purposes, but also with the potential to improve water quality by removing toxins associated with historic abandoned mine lands from waters and waterways and/or preventing them from entering waters and waterways. Located in the northern area of the City, it is easily seen when entering the City from the north and played a key environmental role in the

mine's continued operation in the early 1900s. City ownership also protects the open space values and water shed attributes of the area.

Before obtaining the property, the City conducted a Phase I Environmental Assessment and determined that there weren't any "red flags" that could not be overcome. During this evaluation, the City developed a positive working relationship with the California Department of Toxic Substances Control (DTSC) and they assisted the City with two additional soil sample project to help determine where arsenic concentrations were the highest. When the Chubb subsidiary owned the property, DTSC had designated the property as "trespasser only" and public access was restricted.

Since the City has obtained the property, it has actively worked with DTSC to continue to identify potential hazards on the property, as well as mine waste issues that could impact the local water ways. In addition, some areas of the property have former mine sites themselves, such as the Bellwether Mine, that are in need of additional fencing or other means to protect the public from entering areas where hazards exist.

One of the significant public safety issues on the property is the old tailings dam on the property, which is nearly 100 years old. Though the removal of most of the tailings behind this dam has prevented any potential hydraulic failures of the dam, storm water does still collect behind the dam and a method of preventing the public from accessing this area needs to be determined. The City of Jackson has a Storm Water Pollution Prevention Plan that requires testing of storm water run-off from the site, which have shown elevated levels of toxic materials – primarily arsenic.

As noted, the "trespasser only" status of the property is currently designated by DTSC on the property. Unfortunately, some of the "trespassers" on the property tend to have intent to vandalize the property where possible (mainly tagging the dam with spray paint), and also setting up tents in areas that can be difficult to see from traveled ways. These squatters have also set fires and other potentially hazardous activities often associated with homeless establishments.

The Targeted Brownfield Assessment report, completed by the EPA in 2008, and the Targeted Site Investigation report, completed by DTSC in 2009, identified various areas where the arsenic concentrations were higher than accepted levels. The City has applied for the EPA's Brownfield Grant program in the past, however, without a Removal Action Workplan (RAW) for the clean-up activities to begin, the City has fallen between the "assessment" and "clean-up" categories. The Removal Action Workplan will provide the link between the previously completed assessments and set a path for any clean-up work that might be necessary on the property to allow for the future recreational development as envisioned when the property was obtained.

Workplan and Schedule Narrative

The workplan and schedule for this planning project is not too complicated. Assuming a start date of June 1, 2014, the following is the timetable for the project:

Detailed Project Deliverables	Timetable
Issue Request for Qualifications - The City will issue an RFQ to select the most qualified contractor to complete the Removal Action Workplan. The City has previously had good success finding soils engineers within the Sierra Nevada Conservancy boundaries.	June 1, 2014
Select Contractor/Begin RAW - Selection approval by City Council. A kickoff meeting will be held with DTSC, the City and its selected contractor to set the parameters for the project.	July 14, 2014
Draft Removal Action Workplan to CA Dept. of Toxic Substances Control (DTSC) - DTSC will review the plan and provide feedback to the City for any possible changes needed in the document.	January 1, 2015
Removal Action Workplan Approval - Final approval from DTSC of the completed document.	April 1, 2015

The requested funding of $75,000 would be used to compensate the firm hired to complete the RAW and to reimburse DTSC for their time required to review the project as it progresses and provide final approval. The funding split will be approximately $50,000 to the City's consulting firm and $25,000 to DTSC. These numbers were obtained from a contractor with experience preparing these documents and from DTSC. In addition, the City estimates that $5,000 of in-kind funding will be required to support this project and complete the CEQA paperwork required for the exemption. If over budget, the City will fund the additional costs from its General Fund reserve.

Funding from the Sierra Nevada Conservancy for this project is key to the clean-up and future recreational development of this property. Both of these activities are consistent with the program goals of the SNC for this grant and will provide great exposure of SNC to the general public in Jackson and Amador County, for helping to open a piece of Abandoned Mine Lands property they have seen for years but not been able to access.

Restrictions, Technical/Environmental Documents and Agreements

The primary property restriction of a "trespasser only" access to the property is the reason for this project and the City's effort to clean-up the areas where arsenic concentrations exceed the limits established by DTSC. The goal is that the RAW will clear the way for any required clean-up funding, and then the property can begin its recreational use after funding is identified for this type of use.

Organizational Capacity

The City of Jackson is a relatively small city. The capacity of the organization, however, has been very successful in obtaining and managing grants from a variety of sources. This has included the State's Housing and Community Development Department, Caltrans, and the Natural Resources Agency. Over the past few years, this has included a HOME First Time Homebuyer grant, several Hazardous Bridge Replacement projects, and a grant to place a building over the historic Kennedy Tailing Wheel #4 that is directly adjacent to this property. In addition, a project to upgrade the Vista Point to highlight the mining history of the area and other Sierra Nevada attractions was also completed with an Environmental Enhancement Mitigation Program grant.

The City has also been very involved with the cooperative relationship with DTSC to obtain to grants for evaluation of the contaminants on the property. In addition, the privately organized "Oro De Amador Study Group" is comprised of local professionals, recreation advocates and engineers who have volunteered to assist the City with this project.

Key staff members involved in this project for the City will be the City Manager, City Planner and City Inspector (public works projects). In addition, the City's finance staff will be involved with the financial due diligence required for proper accounting of all funds spent and received.

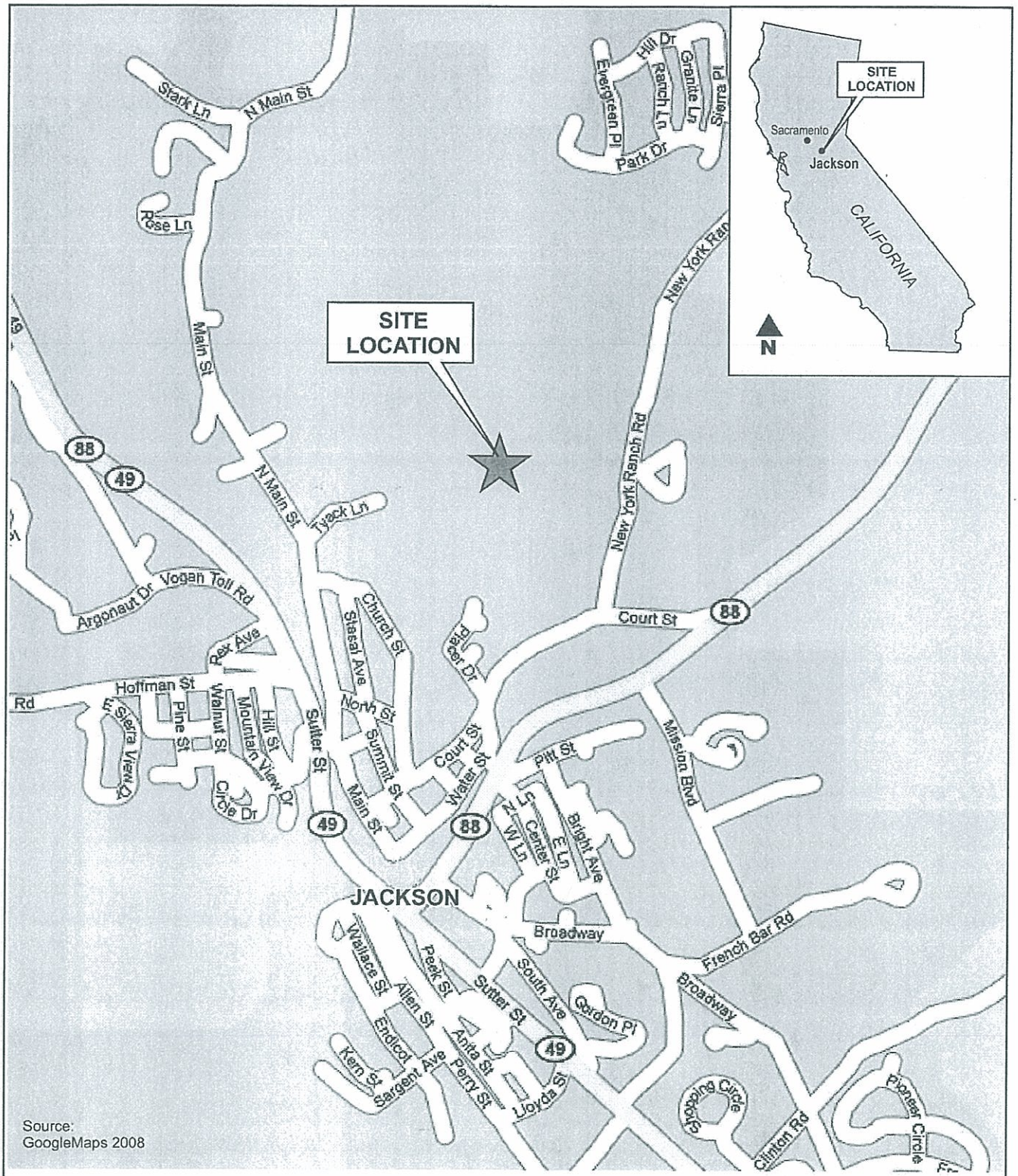
Cooperative and Community Support

When the City obtained the property in 2006, there was great enthusiasm from the community for transforming this abandoned mine land area into a recreational area. There was no opposition to the acquisition of this property or the use of it for recreational purposes. In addition to the privately organized Oro De Amador Study Group, the City has received great support from the Amador County Recreation Agency, a joint powers authority for all cities and the county in Amador County. They have been very helpful with previous grant applications and other meeting and public opinion surveying related to the property.

The City owns only very limited park space. The centrally located Detert Park includes one Little League sized baseball diamond, one tennis court, the City swimming pool, play structures and some bar-be-cue and picnic areas totally about 7 acres. Another park in a subdivision built in the mid-2000s includes a play structure, half-court basketball area and some picnic areas. That is the extent of public recreation areas within the City of Jackson, except for the school grounds within the City.

Long-Term Management and Sustainability

The City of Jackson is committed to managing this project and the property for the known future. The long term value of this former gold mining property relates back to the heritage of Amador County and its prosperous mining days. The sustainability of the project once the recreation is developed with require additional revenues to be generated, however, the community support for this project is tremendous. DTSC is also a strong supporter and looks forward to seeing the property opened to the public.

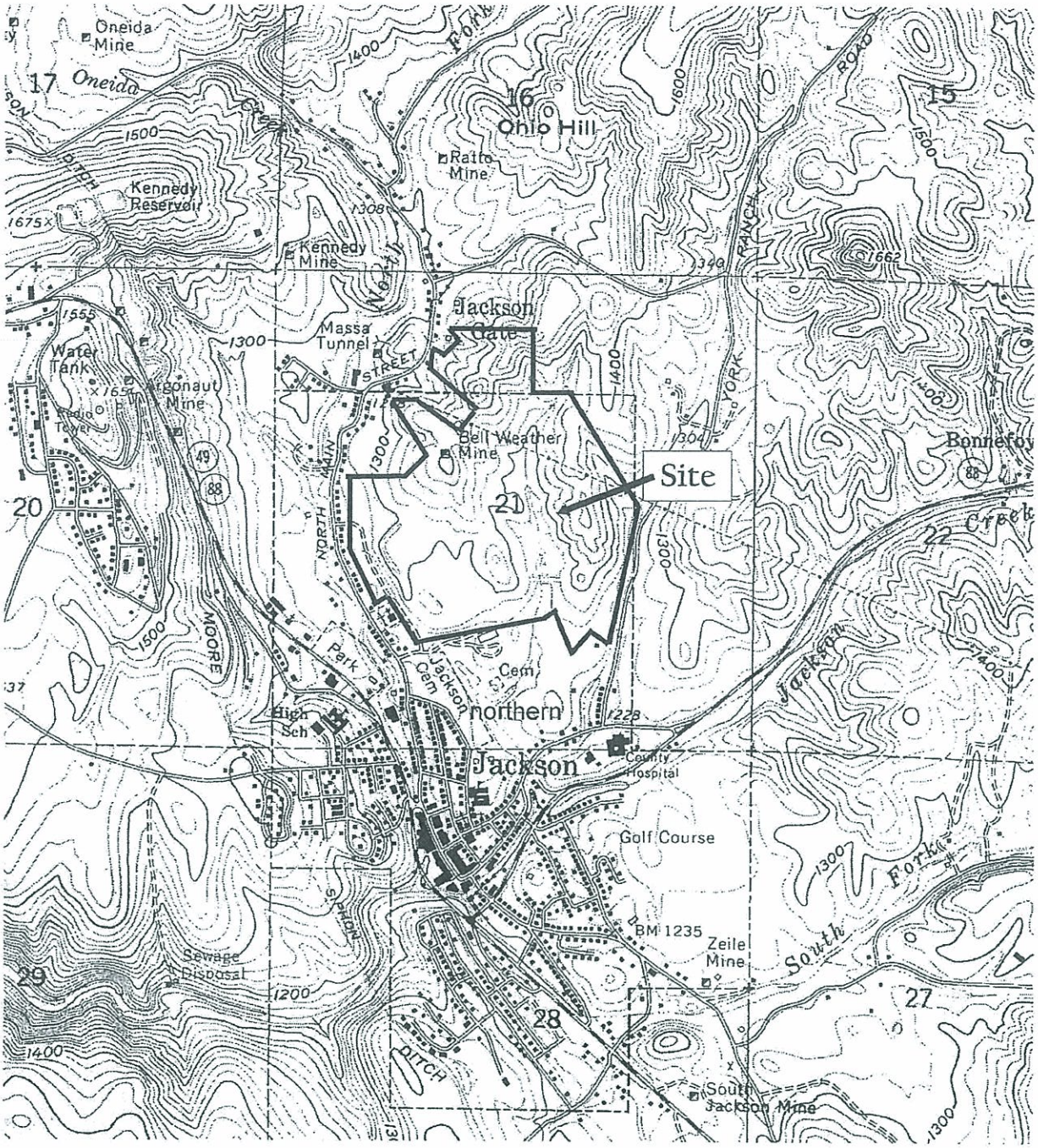


SITE LOCATION

Oro de Amador
Targeted Brownfields Assessment
September 2008 Jackson, California

FIGURE 1

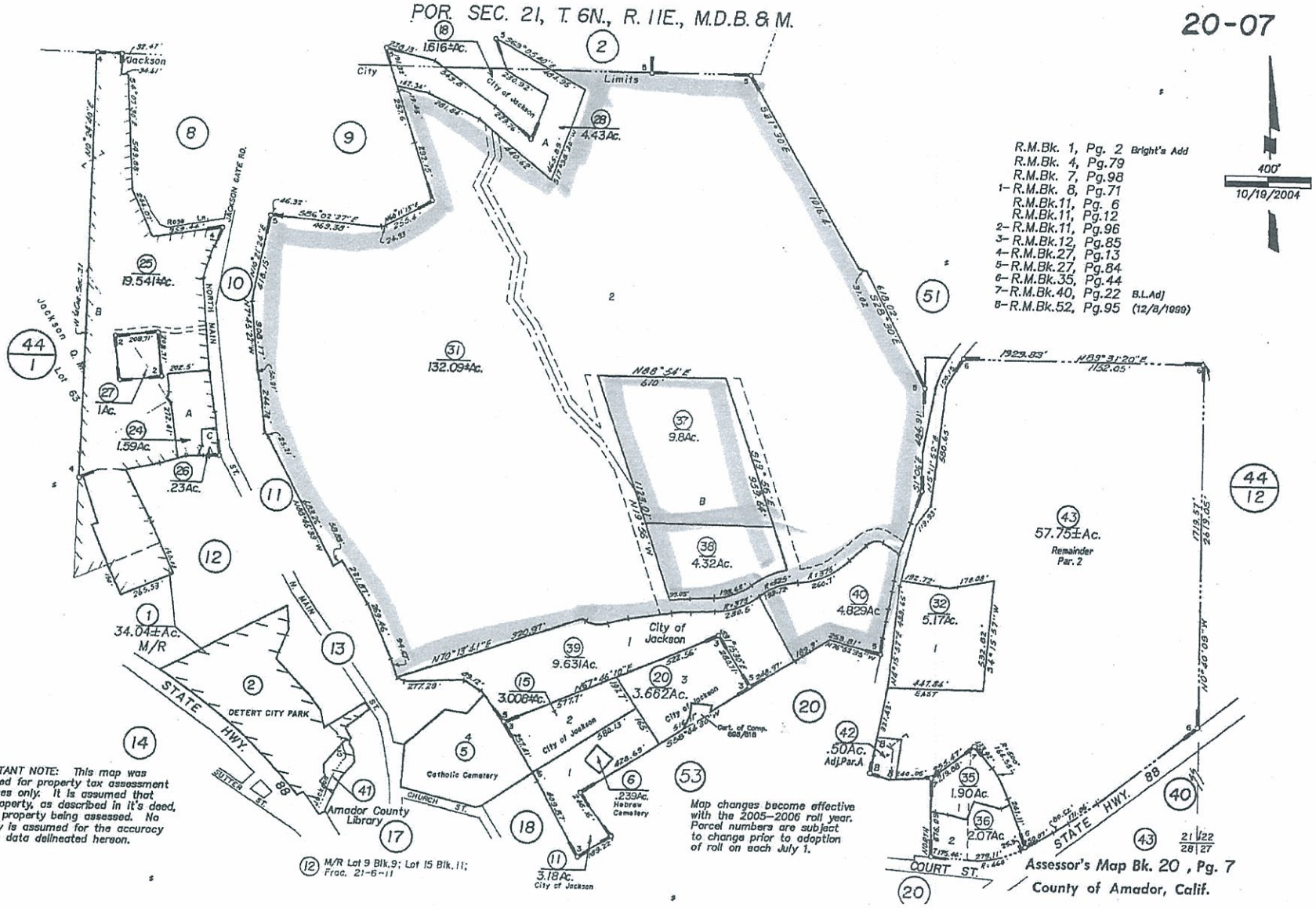
9/03/08 vsa ..T:\28067397 Jackson\F1_site loc.cdr



Jackson, CA, U.S.G.S. Topographic Quadrangles, 7.5 min. series
T6N, R11E, Sec. 21

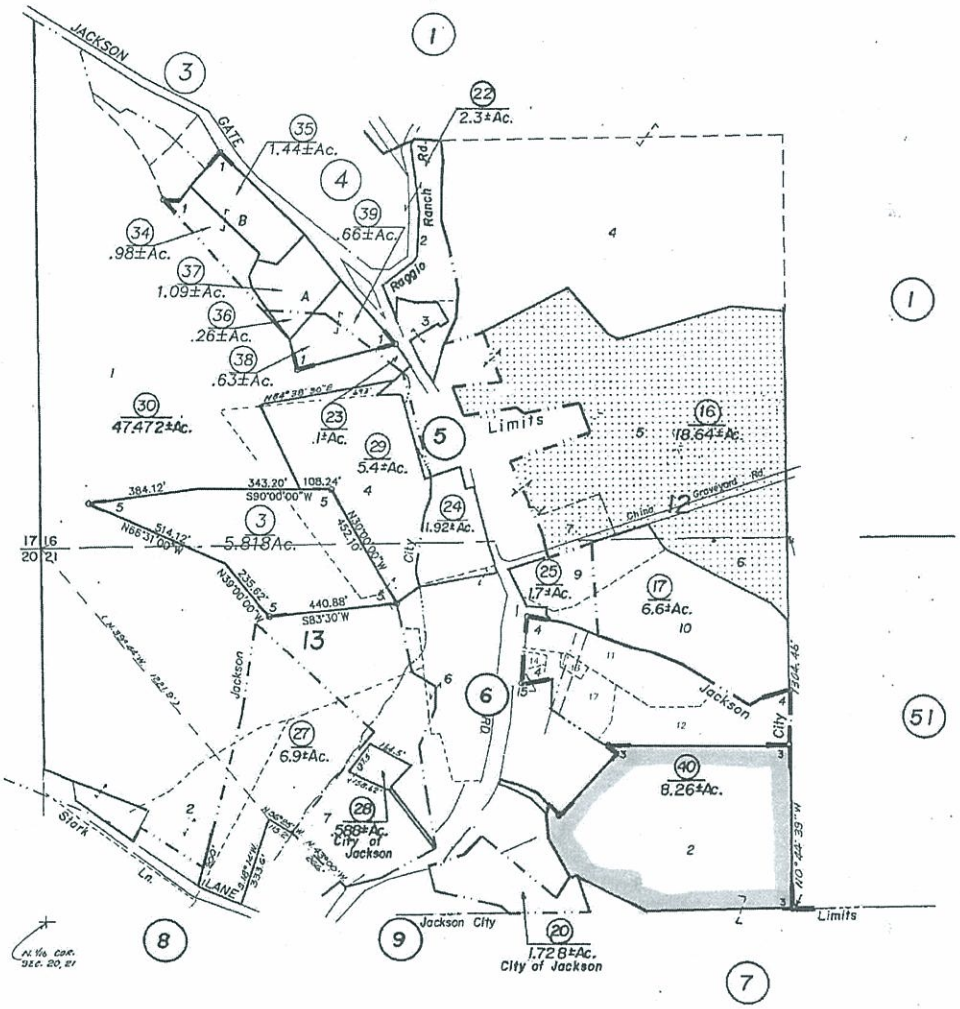
N

PROJECT 5881-03-07	July 2007		
CARLTON Engineering Inc.	Carlton Engineering, Inc. 3883 Ponderosa Road Shingle Springs, California 95682	Location Map Oro De Amador Property City of Jackson Jackson, Amador County, California	FIGURE 1


POR. SEC. 21, T. 6N., R. 11E., M.D.B. & M.
20-07
R.M.Bk. 1, Pg. 2 Bright's Add
R.M.Bk. 4, Pg.79
R.M.Bk. 7, Pg.98
1- R.M.Bk. 8, Pg.71
R.M.Bk.11, Pg. 6
R.M.Bk.11, Pg.12
2- R.M.Bk.11, Pg.96
3- R.M.Bk.12, Pg.85
4- R.M.Bk.27, Pg.13
5- R.M.Bk.27, Pg.84
6- R.M.Bk.35, Pg.44
7- R.M.Bk.40, Pg.22 B.L.Adj
8- R.M.Bk.52, Pg.95 (12/8/1999)
400'
10/19/2004
1.616±Ac.
4.43Ac.
19.541±Ac.
1Ac.
1.59Ac.
.23Ac.
132.09±Ac.
9.8Ac.
4.32Ac.
34.04±Ac. M/R
9.631Ac.
3.008±Ac.
3.662Ac.
4.829Ac.
57.75±Ac. Remainder Par. 2
5.17Ac.
.50Ac. Adj.Par.A
1.90Ac.
2.07Ac.
.239Ac. Hebrew Cemetery
3.18Ac.
Jackson
City Limits
City of Jackson
JACKSON GATE RD.
NORTH MAIN
N. MAIN
STATE HWY. 88
SUTTER ST.
DETERT CITY PARK
Catholic Cemetery
Amador County Library
CHURCH ST.
COURT ST.
Cert. of Comp. 608/818
IMPORTANT NOTE: This map was prepared for property tax assessment purposes only. It is assumed that the property, as described in it's deed, is the property being assessed. No liability is assumed for the accuracy of the data delineated hereon.
(12) M/R Lot 9 Blk.9; Lot 15 Blk.11; Frac. 21-6-11
Map changes become effective with the 2005-2006 roll year. Parcel numbers are subject to change prior to adoption of roll on each July 1.
Assessor's Map Bk. 20, Pg. 7
County of Amador, Calif.

POR. SEC. 16 & 21, T.6N., R.11E., M.D.B.& M.

20-02



400'

12/18/2008

Map changes become effective with the 2004–2005 roll year. Parcel numbers are subject to change prior to adoption of roll on each July 1.

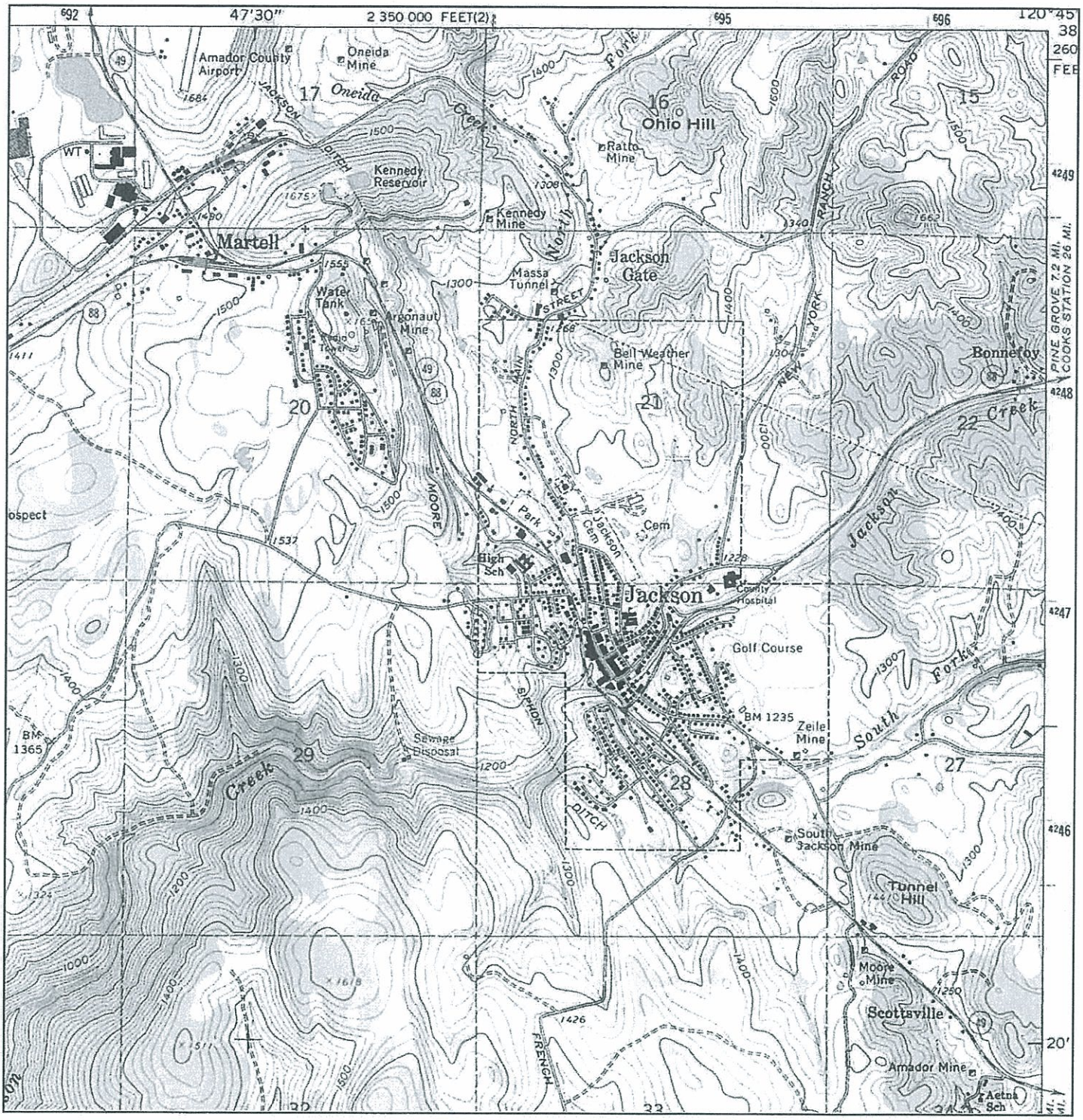
IMPORTANT NOTE: This map was prepared for property tax assessment purposes only. It is assumed that the property, as described in it's deed, is the property being assessed. No liability is assumed for the accuracy of the data delineated hereon.

R.M. Bk. 6, Pg. 96
R.M. Bk. 7, Pg. 98
5- R.M. Bk. 8, Pg. 32
R.M. Bk. 11, Pg. 69
1 - R.M. Bk. 15, Pg. 82
2 - R.M. Bk. 17, Pg. 42
3 - R.M. Bk. 27, Pg. 84
4 - R.M. Bk. 45, Pg. 78 (9/3/91)

41

Assessor's Map Bk. 20, Pg. 02
County of Amador, Calif.

Historical Topographic Map



N	TARGET QUAD NAME: JACKSON MAP YEAR: 1973 PHOTOINSPECTED FROM: 1962 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Oro De Amador ADDRESS: North Main Street/New York Ranch Road Jackson, CA 95642 LAT/LONG: 38.3599 / 120.77	CLIENT: URS Corporation CONTACT: Craig Tiballi INQUIRY#: 2275288.4 RESEARCH DATE: 07/23/2008

Aerial View of Property

Looking east near Tailings Dam

Looking south towards tailings dam from middle of property

Looking Southeast towards City across tailings pile area (now flattened)

Center area of property where tailing processing plant was located

AMADOR CITIZENS
FOR TRANSPORTATION OPTIONS

211 Hoffman Street
Jackson, CA
209-223-0600

November 9, 2012

oda support ltr

I am the Amador County representative for multi-modal interests in the Regional Traffic Plan update process. It is my job to solicit from Amador County residents their concerns and hopes for facility improvements to allow for improved running, bicycle and running opportunities.

Everyone familiar with the possibilities of a park on the Oro De Amador property is excited about the prospects. It will allow us to get off the roads to safely bike, run and walk on a beautiful piece of property very close to downtown Jackson. It is large enough to provide needed sport facilities and still allow for an extensive trail system through varied terrain.

The running, pedestrian and biking community in Amador County strongly support the park concept for Oro De Amador and hope we can obtain the needed funds to make this happen.

Bob Devlin
ACTO President

ORO DE AMADOR STUDY GROUP

211 Hoffman St.
Jackson, CA 95642
209-223-0600/FAX 209-223-9236
bobkat211@comcast.net
September 25, 2013

oda sg support ltr

Our organization is composed of engineers, scientists, physicians, planners and other Amador County citizens who volunteer our time to assist the City of Jackson with their ownership responsibilities of the Oro De Amador property.

We have helped analyze and coordinate studies by EPA and DTSC on the toxicity concerns arising from storage of mine tailings from the Kennedy Mine and area utlized by the Bellweather Mine.

After numerous studies assessing the risk, this property is ready to move forward to becoming a very needed park facility. However, we need completion of remedial work on the property to ensure that it is safe for occupancy.

The Oro De Amador Study Group strongly supports efforts to obtain grant monies so this work can be accomplised.

Bob Devlin

Robert C. Devlin
Group Chairman

Amador County Recreation Agency
10877 Conductor Blvd., Suite 100
Sutter Creek, CA 95685
www.goacra.org
Phone: (209) 223-6349 • Fax: (209) 257-1409 • Email: ACRA@amadorgov.org

September 25, 2013

To: Mike Daly, City Manager
33 Broadway
Jackson, CA 95642

RE: Oro de Amador Project

Dear Mr. Daly,

The Amador County Recreation Agency is pleased to offer support for the Oro de Amador Project. We are happy to help with technical assistance, grant writing, publicity, and any other area that you might deem our services necessary.

The Oro de Amador Project would be an excellent addition to the community. It would benefit citizens and visitors to Jackson for generations to come, providing a site for a number of recreation opportunities. ACRA anticipates a wonderful partnership with the City of Jackson in providing future recreation activities on this site.

Thank you for the opportunity to serve the City in this capacity. We look forward to this project with great hope and expectation.

Sincerely,

Carolyn Fregulia

Carolyn Fregulia
ACRA Administrator

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

September 27, 2013

Mr. Michael Daly
City Manager
City of Jackson
33 Broadway
Jackson, California 95642

LETTER OF SUPPORT FOR SIERRA NEVADA CONSERVANCY GRANT

Dear Mr. Daly:

The Department of Toxic Substances Control (DTSC) of the California Environmental Protection Agency is honored to offer its support on behalf of the City of Jackson in their efforts to secure a Proposition 84 Grant from the Sierra Nevada Conservancy for development of a Removal Action Workplan (RAW) for the Oro de Amador property. DTSC is one of the lead regulatory agencies with responsibility for investigation and remediation of hazardous substances release sites in California.

Through our partnership with the City of Jackson, begun in 2006 prior to the City's acquisition of the property, we have collectively endeavored to investigate the environmental conditions at Oro de Amador in order to develop a cleanup plan for the property. DTSC has utilized over $150,000 of its funding resources and arranged for an additional $75,000 in U.S. Environmental Protection Agency (USEPA) funding to complete the investigations needed prior to development of the RAW. If the City is able to secure the Prop 84 grant that will provide additional leverage which will greatly assist the City in seeking USEPA funding for the actual cleanup of the property which will allow for its full use as a recreational resource for the area.

We appreciate this opportunity to support local agency programs because they play a critical role in California's efforts to protect the environment and public health.

Please do not hesitate to contact Ms. Sandy Karinen at (916) 255-3745 or by email at Sandy.Karinen@dtsc.ca.gov if you have any questions or need additional information.

Sincerely,

Charles Ridenour

Charles Ridenour
Branch Chief
Cleanup Program – Sacramento Office

cc: Ms. Sandy Karinen (via email)

AMADOR COUNTY EAST LITTLE LEAGUE

P.O. Box 743
Jackson, CA 95642

Dear Sirs,

My name is Steve Oneto. I am the president of Amador County East Little League. I want to take a moment to write to you on how important this piece of land that the City of Jackson has inquired is to Little League. I have been involved in this league for 15 years. The one thing that we have lacked is ball fields. Being a long time resident and native of the City of Jackson and knowing the history of the land that was mining property. I have been in contact with the City of Jackson Manager, Mike Daly. I have been asking about the progress of this property. I also have been asking about the results of the dirt and soil. At this time we do not have enough fields for our youth. With a sports complex we would be able to enrich the lives of our children in the community. At this time we just do not have enough fields for them to practice on let alone play games on. With this complex we would be able to host tournaments, play offs and so much more. This would also bring more revenue into the city. Please accept this letter for review for the future of our children and their children to come.

Sincerely,

Steve Oneto

Steve Oneto

President

Amador County East Little League

SIERRA NEVADA CONSERVANCY
PROPOSITION 84 - DETAILED BUDGET FORM

Project Name: _Oro De Amador Removal Action Workplan (RAW)

Applicant: __City of Jackson___

SECTION ONE DIRECT COSTS	Year One	Year Two	Year Three	Year Four	Year Five	Total
Consulting Firm RAW Preparation	$50,000.00					$50,000.00
DTSC Monitoring, Reviewing	$25,000.00					$25,000.00
and approval						$0.00
						$0.00
						$0.00
						$0.00
						$0.00
DIRECT COSTS SUBTOTAL:	$75,000.00	$0.00	$0.00	$0.00	$0.00	$75,000.00

SECTION TWO INDIRECT COSTS	Year One	Year Two	Year Three	Year Four	Year Five	Total
Monitoring	$0.00					$0.00
Publications, Printing, Public Relations	$0.00					$0.00
						$0.00
						$0.00
INDIRECT COSTS SUBTOTAL:	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
PROJECT TOTAL:	$75,000.00	$0.00	$0.00	$0.00	$0.00	$75,000.00

SECTION THREE Administrative Costs (Costs may n*ot to exceed 15% of total Project Cost*) :						Total
						$0.00
						$0.00
						$0.00
						$0.00
						$0.00
ADMINISTRATIVE TOTAL:	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
SNC TOTAL GRANT REQUEST:	$75,000.00	$0.00	$0.00	$0.00	$0.00	$75,000.00

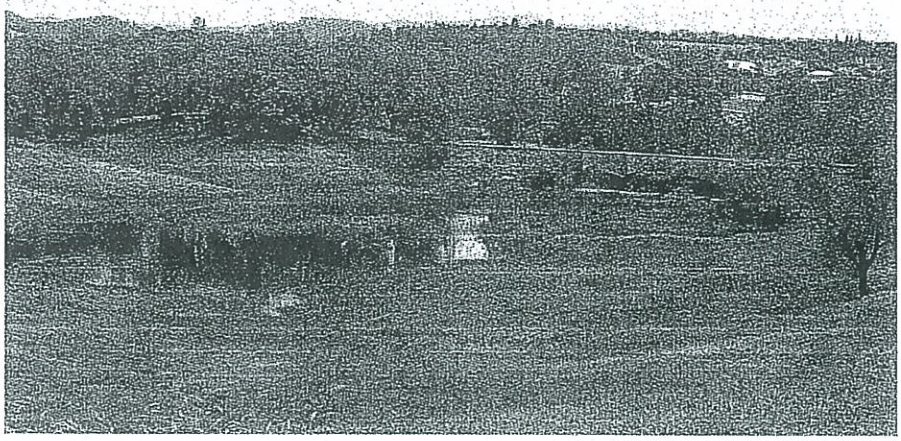
SECTION FOUR OTHER PROJECT CONTRIBUTIONS	Year One	Year Two	Year Three	Year Four	Year Five	Total
City of Jackson Costs- In-Kind	$5,000.00					$5,000.00
including CEQA						$0.00
						$0.00
						$0.00
						$0.00
						$0.00
Total Other Contributions:	$5,000.00	$0.00	$0.00	$0.00	$0.00	$5,000.00

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.

Phase I Environmental Site Assessment

CARLTON

Engineering Inc.



For

Oro de Amador, Inc. Property
Jackson, California

Project No. 5881-01-06
January 2007

Prepared for:
City of Jackson
c/o Mike Daly, City Manager
33 Broadway
Jackson, CA 95642

3932 Ponderosa Road, Suite 200, Shingle Springs, CA 95682 Tel: (530) 677-5515 Fax: (530) 677-6645 E-mail: inform@ceiengr.com

8.0 FINDINGS

8.1 DISCUSSION

Carlton's assessments, Site reconnaissance, agency review, and aerial photography review indicate the following:

- Record review and interview information indicates that the past Site use has included underground mining, storage and processing of mine mill tailings sand, and most recently livestock grazing.
- Fill materials were noted on the Site consisting primarily of earth materials (mine mill tailings, soil capping fill over the tailings, mine waste rock dump piles), and no obvious surface indications were observed and no reports or records were reviewed during this assessment regarding petroleum product impacted materials likely being in the fill materials. The origin or nature of the fenced fill in the southern portion of the site property was not ascertained during this assessment.
- No visible evidence of materials that would present an environmental impairment of the Site, such as soil staining and stressed vegetation (excepting the presence of the mine mill tailings sand), was observed during the Site reconnaissance.
- No evidence of underground or aboveground petroleum-product storage tanks was observed, and none were reported on the Site property.
- Fenced and unfenced open mine shafts and trenches were observed on the Site and are considered a physical safety hazard.
- Evidence suggesting the presence of one mine tunnel (caved at the portal) was observed, and could indicate the presence of an undetermined extent and depth of underground workings, presenting a possible caving hazard.
- Two areas of mine mill tailings sand were observed outside the documented lake bed and tailings pile areas, the estimated volume of the sand is less than 300 cubic yards.

Based on our reconnaissance of the Site and near vicinity, the hydrogeologic characteristics of the area, results of archival records and database searches and reviews, distances from the Site property to potential sources of contamination, and interviews with persons knowledgeable of the Site area, it is Carlton's opinion that contamination of the subject Site resulting from identified past activities on nearby properties is unlikely. Although unlikely, the possibility of contamination migrating to the Site from offsite sources and practices must be recognized. Additional studies regarding off-site sources do not appear justified based on the data available to date.

None of the records reviewed during this assessment revealed *recognized environmental conditions* on the adjoining properties.

None of the information reviewed or received from interviews with public agency personnel during this assessment revealed records of, or strong enough evidence for soil or water impacts from past or present Site uses (other than the storage and processing of the existing mine mill tailings) to conclude that *recognized environmental conditions* exist or previously existed on the Site.

8.2 CONCLUSIONS

Carlton has performed this Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527-05 for the property described in Section 2.0 of this assessment. The property is identified as Amador County Assessor's Parcel Numbers 020-070-031, -037, - 040, and 020-020-040, and consists of approximately 155 acres. Any exceptions to, or deletions from this practice are described in Section 2.2 of this report. This assessment has revealed no evidence of *recognized environmental*

conditions in connection with the Site, with the exception that mining and mineral processing wastes exist on the Site upstream of the tailings dam and in the tailings pile areas that have the potential to contain metals and processing chemicals at concentrations that could cause the materials to be classified as designated or hazardous waste

8.3 RECOMMENDATIONS

Carlton has concluded that the likelihood of contamination not related to the existing mining waste at this Site is low, and no recommendations for additional site testing are presented here. Carlton does however recommend the City of Jackson consider evaluation of the undocumented fill observed in the fenced area near the southern boundary access road possibly including environmental laboratory analysis, considering no information regarding its origin could be obtained during this assessment.

Carlton has, concurrent with this ESA, conducted additional studies for the City of Jackson regarding the mining waste remaining on the Site. The studies and their accompanying reports are: *Monitoring Well Sampling and Evaluation*, and *Oro De Amador Document Review for Environmental Sampling Data*. Those studies summarize the previous and current testing and evaluation of the groundwater and mine mill tailings on the property, and the conclusions reached regarding the potential for impacts to the environment or human health resulting from the presence of the tailings. The studies also present conclusions regarding the likely regulatory status of the mine wastes on the Site, and if regulatory action for the material would be required, or if the materials are considered to be toxic.

The open mine shafts and cuts observed on the Site are considered to present a physical safety hazard in their present condition. We recommend that fencing or other means of protection for the public be implemented around the open excavation features.

We also recommend investigation in the area of the suspected mine tunnel in the northern end of the Lake Bed valley to determine if a tunnel exists in the area prior to any earthwork or structural improvement/development that may be planned for that area

Final
Targeted Site Investigation
Summary Report for the
Oro de Amador Property located
between N. Main Street and New York Ranch Road
City of Jackson, California

April 7, 2009
003-09438-00-003

Prepared for
California Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, California 95826-3200

FINAL

LFR an ARCADIS company

April 7, 2009 003-09438-00-003

Perry Myers
Project Manager
Brownfields and Environmental Restoration Program
Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, California 95826-3200

Subject: Final Targeted Site Investigation Summary Report for the Oro de Amador Property, City of Jackson, California

Dear Mr. Myers:

LFR Inc. (LFR) is pleased to submit the enclosed Targeted Site Investigation Summary Report ("Summary Report") for the Oro de Amador property located in Jackson, California. The Summary Report was prepared in accordance with the scope of work set forth in the California Department of Toxic Substances Control (DTSC) Contract Agreement No. 07-T3473 and Work Order No. 1-473-1.0-101960.

The Summary Report was prepared by LFR for the DTSC in a manner consistent with the level of care and skill ordinarily exercised by professional engineers, geologists, and environmental scientists in the geographic area of the Site. LFR provides no other warranties, either express or implied, concerning the contents of the Summary Report, which was prepared under the technical direction of the undersigned.

Please contact either of the undersigned at (916) 786-0320 if you have any questions or comments concerning this Summary Report.

Sincerely,

James E. Eisert, P.G., C.HG.
Senior Associate Hydrogeologist
CA P.G. No. 7000, C.HG. No. 779

Alan D. Gibbs, P.G., C.HG., R.E.A. II
Vice President, Principal Hydrogeologist
CA P.G. No. 4827, C.HG. No. 196

Enclosure (1 original)

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ACRONYMS AND ABBREVIATIONS

BS/BSD	blank spike/blank spike duplicate
Cal-EPA	California Environmental Protection Agency
CHG	Certified Hydrogeologist
CHHSLs	California Human Health Screening Levels
C&T	Curtis & Tompkins Laboratories, Ltd.
DQO	data quality objective
DI WET	deionized water waste extraction test
DTSC	Department of Toxic Substances Control
D&M	Dames & Moore
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency
GPS	global positioning satellite
MCL	maximum contaminant level
mg/kg	milligrams per kilogram
mgl/l	milligrams per liter
MS/MSD	matrix spike/matrix spike duplicate
P.G.	professional geologist
PPE	personal protective equipment
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RPD	relative percent difference
S/D	spike duplicate
toc	top of casing
TSI	targeted site investigation
USCS	Unified Soils Classification System
U.S. EPA	United States Environmental Protection Agency
USGS	U.S. Geological Survey
μg/L	microgram per liter

CERTIFICATIONS

All hydrogeologic and geologic information, conclusions, and recommendations in this document have been prepared under the supervision of and reviewed by the undersigned California Professional Geologists.

4-7-2009

James E. Eisert, P.G., C.HG. Date
Senior Associate Hydrogeologist
California Professional Geologist No. 7000
Certified Hydrogeologist No. 779

4-7-2009

Alan D. Gibbs, P.G., C.HG., R.E.A. II Date
Vice President, Principal Hydrogeologist
California Professional Geologist No. 4827
Certified Hydrogeologist No. 196

1.0 INTRODUCTION

This document presents a Targeted Site Investigation (TSI) Summary Report for the Oro de Amador property located in the City of Jackson, County of Amador, California ("the Site"; Figures 1 and 2). This TSI Summary Report was prepared by LFR Inc. (LFR) for the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC).

This TSI Summary Report provides a brief site description, project background, objectives and rationale, summary of work conducted, data validation, sampling results, and a summary.

The work conducted at the Site was performed in accordance with the, "Final Targeted Site Investigation Work Plan for the Oro de Amador Property," prepared by LFR and, dated January 30, 2009 ("the Work Plan"; LFR 2009). The Work Plan was approved by the U.S. Environmental Protection Agency (U.S. EPA) and DTSC. Information regarding the U.S. EPA TSI program, project organization, regulatory agency involvement, site historical activities, property ownership information, geology, hydrogeology, Work Plan development, and previous investigations are provided in the Work Plan.

1.1 Objective

The overall objective of the TSI was to evaluate whether hazardous materials are present at the Site that may pose unacceptable human health and environmental risks in the context of future use plans.

The overall objective was met by conducting the following scope of work:

- Evaluated available information for indications of past use, storage, disposal, release, and/or threatened release of hazardous substances at the Site.
- Evaluated through the field sampling and analysis program the nature, concentrations, and general extent of hazardous materials that were indicated to be present in soil and groundwater at the Site.

1.2 Summary Report Organization

This TSI Summary Report is organized as follows:

Section 1.0 presents an introduction and the overall objectives of the TSI process.

Section 2.0 presents a general description of the Site.

Section 3.0 provides a summary of the TSI scope of work that was completed.

Section 4.0 presents a summary of investigation-derived waste (IDW) management procedures.

Section 5.0 presents deviations from the Work Plan.

Section 6.0 presents validation of the data generated during the TSI sampling event.

Section 7.0 presents soil and groundwater sampling results.

Section 8.0 presents a summary of sampling results.

Section 9.0 presents the references used in preparation of this TSI Summary Report.

Appendix A presents a copy of the field forms generated during the field sampling event.

Appendix B presents a copy of the boring logs prepared during the field sampling event.

Appendix C presents copies of the laboratory data sheets and chain-of-custody documentation

Appendix D presents a photo log of field activities

Appendix E presents key human and ecological health soil screening levels developed for the Oro de Amador Property by the DTSC

Appendix F presents a copy of the completed EPA Property Profile Form.

(Note: Appendices A through F are provided on the attached CD)

2.0 SITE DESCRIPTION

The Site is located directly north of downtown Jackson in Amador County, California, and consists of approximately 159 acres of open space (Figures 1 and 2). The Site is bounded to the east and west by residential properties, to the north by mixed open space and residential, and to the south by mixed residential and City of Jackson commercial property. The Site consists of a generally open grassy area, with native trees and slightly rolling hills.

2.1 Site Topography

The Site is located within the foothills of the Sierra Nevada. The foothills represent the transition between the relatively flat lying topography of the Central Valley (located to the west) and the rugged and relatively steep terrain of the Sierra Nevada mountain range. The Site consists primarily of rolling hills and valleys with mostly open grassland. The ground surface elevation at the Site ranges in elevation from 1,270 feet to 1,410 feet above mean sea level (msl; Dames & Moore [D&M] 1995). Portions of the Site have been filled with mine tailings or cut and graded for access roads.

2.2 Site Geology and Soil Types

Amador County is located in the rich mineral-bearing Mother Lode region of the Sierra Nevada Foothills. This area has been divided into two geologic series referred to as the Subjacent Series and the Superjacent Series (D&M 1995).The Subjacent Series consists of folded and faulted metasedimentary and metavolcanic rocks of Paleozoic and Mesozoic age. The Superjacent Series consists of Tertiary volcanic conglomerates and tuff beds, which form isolated erosional remnants that overlie the Subjacent Series. Only the Subjacent Series has been observed in the vicinity of the Site according to D&M 1995.

Three geologic units (the Calaveras Formation, the Mariposa Formation, and the mineralized zone of the Melones Fault Zone [the "mineralized zone"]) were observed by D&M staff during their investigation (D&M 1995). The Calaveras Formation is present in the eastern part of the Site. The Mariposa Formation is present in the western part of the Site. The mineralized zone is present in the central portion of the Site.

2.3 Site Hydrogeologic Setting

Groundwater within the Sierra Foothills typically occurs within fractured bedrock due to the limited quantity of alluvial material (D&M 1995). Groundwater accumulation and production rates vary greatly on a regional scale due to differences in fracture networks and type of rock present.

Five groundwater wells were previously installed at the Site to evaluate the groundwater quality, depth, and flow direction (D&M 1995). Wells MW-1 (Lakebed Area) and MW-2 (Tailings Pile Area) were installed in the tailings to assess the potential presence of perched groundwater, and wells MW-3 through MW-5 were installed in the local bedrock beneath the Site. During drilling, groundwater was encountered at 30 feet below ground surface (bgs; MW-3), 60 feet bgs (MW-4), and 43 feet bgs (MW-5). The groundwater stabilized at approximately 10 feet bgs (MW-3), 14 feet bgs (MW-4), and 42 feet bgs (MW-5). These observations indicate that groundwater encountered in the bedrock is under semi-confined conditions within the fractures (D&M 1995). Also according to D&M 1995, perched water exists within the Lakebed Area and Tailings Pile Area.

Based on depth-to-groundwater measurements documented during February and June of 1993, the groundwater flows to the south with a calculated horizontal gradient of 0.0086 (D&M 1995).

3.0 SCOPE OF WORK CONDUCTED

The TSI field investigation consisted of collecting surface soil, shallow subsurface soil, and groundwater samples to assess environmental conditions at suspect areas identified by the DTSC. Figure 3 shows locations where samples were collected during previous

investigations. Figure 4 shows where samples were collected during the TSI field sampling event.

The following sections describe the soil and groundwater sampling strategies, rationale, investigative methods and procedures, and sample analyses.

3.1 Soil Sampling Strategy and Analyses

Soil sampling locations are provided on Figure 4. Generally, the rationale for conducting the soil sampling was to supplement previous sampling activities for assessing the potential risk to future users of the property based on the planned uses.

The number of samples, spacing between the samples, and selected analytes were sufficient to meet the objectives of this TSI. Each sampling grid was designed to fill data gaps from previous investigations.

The following text provides rationale for the collected soil samples:

- Eight surface soil sampling locations (HA-1 through HA-8) were sampled to assess soil along the southwestern boundary. These surface soil samples were analyzed for total arsenic. The eight sampling locations were selected to assess the surface soil between the Tailings Pile Area and the property boundary to the south and west. Previous sampling activities conducted in this area were insufficient to determine if arsenic concentrations potentially extend beyond the property boundary.
- Sixteen surface soil sampling locations (HA-9 through HA-24) were sampled to assess soil north-northwest of the Tailings Pile Area. These surface soil samples were analyzed for total arsenic. The 16 surface soil sampling locations were selected to assess the surface soil northwest of the Tailings Pile Area. There was no soil sampling previously conducted in this area.
- Five surface and five subsurface soil sampling locations (HA-25 through HA-29) were sampled to assess the surface and subsurface soil in the Tailings Pile Area. The surface soil samples were analyzed for Title 22 total metals. The subsurface soil samples were analyzed for leachable concentrations of arsenic and magnesium using the deionized water (DI) Waste Extraction Test (WET) and total metals (arsenic, manganese, and magnesium). The five surface and subsurface soil samples were selected to assess the imported fill and the tailings beneath the fill. The imported fill material has not been sampled previously. This area has been documented to be relatively well defined so a limited number of samples were selected to supplement previous analyses of the tailings material. This was recommended to assess the surface soil fill that was imported to cover the graded tailings pile.
- Twelve surface soil sampling locations (HA-30 through HA-41) were sampled to assess the surface soil in the area of the Bell Weather Mine. These surface soil samples were analyzed for total arsenic. The twelve sampling locations were selected to assess the surface soil in the area of the Bellweather Mine because no sampling activities were previously conducted in this area.

- Sixteen surface soil sampling locations (HA-42 through HA-57) were sampled to assess the surface soil in the area south of the Bellweather Mine, east of the Tailing Processing Area, and north-northwest of the Lakebed Area. These surface soil samples were analyzed for total arsenic. The sixteen surface soil locations were selected to assess surface soil because no sampling activities were previously conducted in this area.
- Five surface and five subsurface soil sampling locations (HA-58 through HA-62) were sampled to assess the surface and subsurface soil in the Tailings Processing Area. The surface soil samples were analyzed for total metals (arsenic, manganese, and magnesium). The subsurface soil samples were analyzed for leachability of arsenic and manganese by DI WET and arsenic, manganese, and magnesium total concentrations. The five surface and subsurface soil sampling locations were selected to assess the soil to supplement previous sampling results.
- Eighteen surface soil sampling locations (HA-63 through HA-80) were sampled to assess the surface soil around the perimeter of the Lakebed Area. These surface soil samples were analyzed for total arsenic. The eighteen surface soil sampling locations were selected to supplement previous sampling results and to assess soil where sampling was not previously conducted.
- Five surface and three subsurface soil sampling locations (HA-81 through HA-85) were sampled to assess the soil within the Lakebed Area. Subsurface soil samples were not collected from HA-83 or HA-84 due to encountered bedrock. The surface soil samples were analyzed for total metals (arsenic, manganese, and magnesium). The subsurface soil samples were analyzed for leachability of arsenic and manganese by DI WET and arsenic, manganese, and magnesium total concentrations. The surface and subsurface soil sampling locations were selected to supplement previous sampling results.
- Six surface soil sampling locations (HA-86 through HA-91) were sampled to assess the surface soil south of the Tailings Processing Area and the Lakebed Area. These surface soil samples were analyzed for total arsenic. The six surface soil sampling locations were selected to supplement the limited number of previous sampling locations.
- Five surface soil samples locations (HA-92 through HA-96) were sampled to assess background concentrations of surface soil east of the Lakebed Area. These surface soil samples were analyzed for total arsenic, manganese, and magnesium. The five surface soil sampling locations were selected to supplement the previous background sampling locations.

3.2 Groundwater Sampling Strategy and Analyses

One groundwater sample was collected from each of the five on-site groundwater monitoring wells (MW-1 through MW-5). The groundwater samples were filtered by the laboratory for analysis of dissolved arsenic and manganese using U.S. EPA Method 6010B (or 6020B) and cyanide by U.S. EPA Method 9010B. Arsenic, manganese, and cyanide were analyzed to supplement previous sampling results and to further assess the groundwater quality beneath the Site.

3.3 Sampling Methods and Procedures

This section describes the methods and procedures used to collect soil and groundwater samples. Samples were handled in accordance with approved procedures specified in the Work Plan.

3.3.1 Soil Sampling

Surface soil sampling was conducted by collecting samples from approximately 3 to 6 inches bgs by use of a steel hand trowel. If vegetation was present, it was cleared with a decontaminated hand trowel tool prior to collecting the surface soil into the sample container. Soil was collected into a sealable plastic bag through a stainless steel wire mesh screen ("sieve") when possible. When soil was too wet due to precipitation and/or snowfall, soil was collected directly into the plastic bag without using the sieve. Rocks and gravel were then manually removed from the sample. The intent of sieving the soil through the stainless steel wire mesh screen was to remove gravel and/or rocks from the samples and reduce heterogeneity. The bag was then turned over several times to thoroughly mix the soil (in an attempt to homogenize the sample). After the soil was mixed thoroughly, a sufficient amount of soil was transferred into a quart size plastic bag (then placed inside another quart size plastic bag) for shipment to the laboratory. The samples were labeled for identification and stored in a cooler for transportation to the laboratory. Chain-of-custody protocol was maintained throughout the sample handling process.

Subsurface soil sampling was conducted by collecting soil samples from 2 feet bgs using a hand auger. The subsurface soil was collected from the prescribed depth and sieved (if possible) into a plastic bag in the same fashion as the surface soil samples. The subsurface soil samples were labeled for identification and stored in a cooler for transportation to Curtis & Tompkins Laboratories, Ltd. (C&T; ELAP-certified laboratory). Chain-of-custody protocol was maintained throughout the sample handling process.

The subsurface soil borings were backfilled with soil and the area was restored to natural grade by smoothing the surface soil and lightly tamping the area.

3.3.2 Groundwater Monitoring Well Sampling

Groundwater was encountered at varying depths (approximately 11 to 43 feet bgs) across the Site due to the undulating topography.

Groundwater samples were collected from the five on-site monitoring wells (MW-1 through MW-5) by using either a new disposable bailer (at MW-2) or a down-hole pump (MW-1, MW-3, MW-4, and MW-5).

Before groundwater sampling activities were conducted, depth-to-groundwater measurements were documented at each well using an electronic water-level meter.

Depth to groundwater was measured to the nearest 0.01 foot from a surveyed surface measuring point at each well location (north side of the well casing).

Monitoring wells were purged using either a submersible pump or a new, unused, disposable bailer. When the pump was used, the purging rate was started at the pump controller's lowest setting (approximately ½ gallon per minute [gpm]) and was increased slowly without dewatering the well. The pumping rate did not exceed 5 gpm. Groundwater parameters used to measure stability were electrical conductivity, pH, and temperature. Instrument readings were obtained at regular intervals during the evacuation process. Nondisposable sampling equipment (e.g., water-level meter, submersible pumps) was decontaminated before and after each use.

Stabilization standards for this Site included the following:

- Temperature - considered stable when successive readings did not fluctuate more than +/- 1 degree Celsius
- Electrical conductivity - considered stable when successive readings were within 10 percent
- pH - considered stable when successive readings remained constant or varied no more than 0.2 pH units

Normal evacuation removes at least three casing volumes of water from the well. However, less water was removed from well MW-1 due to the well dewatering after removal of one well casing. The well was allowed to recharge then it was sampled.

Upon completion of well purging, a depth to water measurement was recorded to ensure that the well recharged to within 80 percent of its static, pre-purge level prior to sampling. Wells that did not indicate 80 percent recharge (or dewatered wells) were allowed up to 2 hours to recharge prior to sampling. The water level at time of sampling was noted in the field forms (Appendix A).

Groundwater sample containers were labeled, placed in sealable plastic bags, and delivered in properly chilled coolers to C&T for analysis. The groundwater samples were filtered by the laboratory before analysis.

3.3.3 Field Quality Control Samples

Field Equipment Rinsate Blanks (for soil and groundwater sampling)

Field equipment rinsate blanks were collected by pouring deionized, laboratory grade distilled water through and over cleaned sampling equipment. The water was then collected and submitted to the laboratory for analysis.

Field equipment rinsate blanks were collected at a minimum frequency of one per set of sampling equipment per sample matrix per day that non-dedicated sampling equipment was used. The field equipment rinsate blanks were submitted to the laboratory for analysis. The field equipment rinsate blanks were analyzed by the same method and for

the same analytes as the samples collected with the sampling equipment. Additionally, a sample of the provided rinsate water was sent to the laboratory for analysis to confirm the water had no elevated analytes.

Field Duplicates (for soil and groundwater sampling)

Field duplicates were collected at a minimum frequency of 10 percent of the primary samples collected. The field duplicates were submitted to the laboratory "blind" (i.e., given a fictitious name so that the laboratory will not recognize them as duplicates). The field duplicates for groundwater samples were selected in the field based on selecting a well that produced sufficient volume for the primary and duplicate samples.

3.3.4 Laboratory Quality Control Samples

As part of the standard laboratory QC protocols, C&T monitored the precision and accuracy of the results of their analytical procedures through analysis of laboratory QC samples. These included samples designated for blanks, blank spike/blank spike duplicate (BS/BSD) and matrix spike/matrix spike duplicate (MS/MSD) analysis for the same parameters that the field samples were analyzed.

BS/BSD analysis was performed on a blank standard at a frequency of 5 percent (i.e. one per 20 samples). MS/MSD analysis was performed on an aliquot (portion) of a field sample selected by the laboratory at a frequency of 5 percent also. One spike (with a known concentration) analysis was conducted at the same 5 percent frequency in accordance with U.S. EPA protocol for definitive-level data.

4.0 INVESTIGATION-DERIVED WASTE MANAGEMENT

In the process of collecting environmental samples during the soil and groundwater sampling activities, different types of investigation-derived waste was generated including the following:

- Used personal protective equipment (PPE; e.g. nitrile gloves)
- Disposable sampling equipment (e.g. plastic bailers, bailing string, plastic baggies etc.)
- Decontamination fluids (distilled water, Liquinox™, etc.)
- Purged groundwater and excess groundwater collected for sample container filling
- Soil cuttings from subsurface hand auger locations

Used PPE was disposed of in a plastic garbage bag and then into a sanitary waste disposal receptacle. Other waste such as disposable sampling equipment was also disposed of in garbage bags and then into a sanitary waste disposal receptacle. Field sampling equipment was decontaminated on site over the native soil based on historical analytical data and low concentrations of chemicals of potential concern. Purge water

from groundwater monitoring wells was discharged directly onto the ground surface approximately 50 feet away from each well head in an attempt to allow the discharged water to flow away from the work area. Soil cuttings derived from surface and subsurface soil sampling was replaced into the soil sampling locations after soil samples were collected.

5.0 EXCEPTIONS TO THE WORK PLAN

The following bullets identify exceptions to the Work Plan and summarize how the objectives were met regardless of the deviations. Modifications to the Work Plan were implemented due to unanticipated field conditions. Field personnel notified the LFR project manager and the project manager directed the field crew with alternative actions. The alternative actions were communicated to the DTSC Project Manager during field activities.

- During soil sampling activities, an attempt was made to sieve each soil sample through a wire mesh screen to remove gravel and/or rocks as described in Section 3.2.3.1 of the Work Plan. However, due to unavoidable precipitation and snowfall, the soil moisture caused the soil to be more excessively cohesive. The field crew was unable to successfully sieve the soil through the provided sieve screens. The objective was met by manually removing gravel and/or rocks by mixing the soil within a large sealed plastic bag before transferring the soil sample into a quart-size plastic bag that was submitted to the laboratory for analysis.
- Subsurface soil samples were not collected from sampling locations HA-83 or HA-84 in the Lakebed Area due to encountered bedrock at approximately 6 inches bgs. In both cases, the subsurface soil samples were attempted to be sampled by relocating the sampling location; however, after three attempts for each location, no further attempts were made. The relocated sampling locations were 50 to 75 feet away from the original sampling location in an attempt to obtain the subsurface soil samples; however, bedrock was encountered and could be observed at the surface in most areas surrounding HA-83 and HA-84. The objective was met by successfully collecting subsurface soil samples from the other three sampling locations (HA-81, HA-82, and HA-85) located in the Lakebed Area.
- Proposed contingency samples were not collected due to lack of time and sufficient budget for additionally required field labor hours, laboratory fees, and reporting requirements.

6.0 DATA VALIDATION

A summary of the analytical data results are provided in Tables 1 through 3. Table 1 provides a summary of soil sampling results. Table 2 provides a summary of leachable metal concentrations in soil samples. Table 3 provides a summary of groundwater sampling results.

LFR performed a Level III quality assurance/ quality control (QA/QC) data validation evaluation of the analytical data, which was in accordance with the "U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review," dated February 1994 ("the U.S. EPA Guidance"; U.S. EPA 1994).

The sample delivery groups evaluated for this report were 209950, 209992, 209993, 209994, 209995, 209996, 210079, 210080, 210081, 210082, 210086, and 210250[1] (per C&T's designation). The following U.S. EPA methods were used for the analysis:

- Total metals using U.S. EPA Method 6010B and EPA 7470A
- Total magnesium using U.S. EPA Method 6010B
- Total manganese using U.S. EPA Method 6010B
- DI Wet arsenic using U.S. EPA Method 6010B
- DI Wet manganese using U.S. EPA Method 6010B
- Cyanide using SM4500CN-E

The data were evaluated based on the following parameters according to the U.S. EPA Guidance for level III data validation:

- data completeness
- holding times
- field duplicate relative percent differences
- method blanks
- blank spikes/blank spike duplicates recoveries (BS/BSD)
- matrix spikes/matrix spike duplicates recoveries (MS/MSD)
- serial dilutions

Several MS/MSD exceedances and serial dilution QA/QC limit RPD differences for serial dilutions were reported in the analytical laboratory QC report. Specifically:

- responses exceeding the instrument's linear range were observed for mercury in the MS/MSD of HA-25-0.5
- responses exceeding the instrument's linear range were observed for magnesium in the MS/MSD of HA-92-0.5
- relatively high percent difference was observed for manganese in the serial dilution of HA-92-0.5

[1] CT Report Number 210250 is a rerun of samples MW-1 through MW-5 and MW-Dup for arsenic using US EPA Method 6020 with a lower reporting limit than originally reported by US EPA Method 6010 within CT Report Number 209950. The reporting limit in the original report was 0.005 µg/l which is greater than the CHHSL of 0.004 µg/l. The samples were rerun using a reporting limit of 0.001 µg/l for arsenic.

- low recovery was observed for arsenic in the MS of HA-63-0.5; the BS/BSD was within limits, and the associated RPD was within limits.

Similarly, several MS/MSD results were outside of QC limits and flagged "NM or not meaningful by the laboratory as the sample concentrations was greater than 4X the spike concentration. In these instances, the BS/BSD QC criteria was evaluated and found to be within QC limits.

The holding times, method blanks, BS, and BSD samples were within the laboratory's QA/QC criteria. Furthermore, the MS, MSD, and serial dilution percent difference for the remainder of the samples were within the acceptable QA/QC criteria range.

Field and Equipment Rinsate Blanks

One field blank (FB-sample) and five equipment rinsate blanks (EQ-samples) were collected during the five day field sampling event; one field blank was collected during the project while one equipment rinsate blank sample was collected during each of the five days of sampling.

A field blank is a sample of the laboratory provided de-ionized water used for cleaning equipment which was collected to ensure the integrity of the water. Equipment rinsate blanks are prepared by pouring the provided water through and over cleaned sampling equipment into laboratory supplied sample containers for analysis. The equipment rinsate blank provides an indication of potential contamination from field procedures (e.g., improperly cleaned sampling equipment or cross-contamination). The following field and equipment rinsate blanks were collected and submitted for the described analyses:

- EQ-1 – collected February 9, 2009 and was submitted for analysis of the 17 Title 22 metals by EPA Method 6010B.
- EQ-2 -- collected February 10, 2009 and was submitted for analysis of arsenic by EPA Method 6010B.
- EQ-3 -- collected February 11, 2009 and was submitted for analysis of dissolved arsenic and manganese by EPA Method 6010B and dissolved cyanide by SM4500CN-E.
- EQ-4 -- collected February 12, 2009 and was submitted for analysis of arsenic, magnesium, and manganese by EPA Method 6010B.
- EQ-5 -- collected February 13, 2009 and was submitted for analysis of arsenic, magnesium, and manganese by EPA Method 6010B.
- FB-1 – collected February 11, 2009 and was submitted for analysis of Title 22 metals, magnesium, and manganese by EPA Method 6010B and cyanide by SM4500CN-E.

With one exception, analytes were not detected above the reporting limit in the equipment rinsate blanks. The single exception was a detection of dissolved manganese

in EQ-3 (0.011 mg/l). It is noted that the field blank (FB-1), a sample of the deionized water used for cleaning sampling equipment, was submitted for the same analysis on the same date and also contained a detectable concentration of manganese (0.0079 mg/l) at a concentration which was slightly above the laboratory reporting limit (0.005 mg/l).

Primary samples collected on February 11, 2009 include MW-1 through MW-5, MW-DUP and EQ-3. Due to the detection of the analytes just above the reporting limit, the result of manganese from MW-4 (0.0077 mg/l) and MW-5 (0.01 mg/l) may be below the reporting limit when the results of the field blank are considered. The data are flagged in Table 3. The detected results are not anticipated to interfere with evaluation of data from these two wells because the detected concentrations are well below the comparison criteria.

Given the presence of manganese in the field blank collected on February 11, 2009 and the concentration just above the reporting limit (well below the comparison criteria: the secondary MCL of 0.05 mg/l), the detection of dissolved manganese in the equipment rinsate blank is not considered to indicate field contamination for the February 11, 2009 equipment rinsate blank.

The field blank samples was non-detect for all analytes with two exceptions; the manganese exception noted above as well as a detection of barium at 0.0097 mg/l which is slightly above the reporting limit of 0.005 mg/l. The detection of barium is not expected to affect data quality for this project because barium was not considered a target analyte for this sampling investigation and the residential and commercial California Human Health Screening Levels (CHHSLs; Cal-EPA 2005) are orders of magnitude higher. Similarly, as discussed above, the detection of manganese in the field blank at a concentration slightly above the detection limit is not expected to affect data quality for this sampling investigation.

In summary, a review of the analytical results revealed one issue which caused a datum to be qualified (i.e. MW-4 and MW-5 on Table 3).

Duplicate Samples

One field duplicate sample was collected for every ten primary samples. Field duplicates help evaluate the precision of analytical procedures and methods employed by the laboratory. Duplicate soil samples were collected from the same aliquot of soil that was mixed in the plastic bag before being placed in the sample containers.

Twelve duplicate soil samples were collected from the Site; these samples are designated DUP-1 through DUP-12 (Table 1) and DUP-10 and DUP-11 (Table 2).

The following duplicate soil samples correlate with the following primary soil samples:

- DUP-1 with HA-3-0.5 (analyzed for arsenic)
- DUP-2 with HA-11-0.5 (analyzed for arsenic)

- DUP-3 with HA-26-0.5 (analyzed for metals)
- DUP-4 with HA-37-0.5 (analyzed for arsenic)
- DUP-5 with HA-42-0.5 (analyzed for arsenic)
- DUP-6 with HA-5-0.5 (analyzed for arsenic)
- DUP-7 with HA-60-0.5 (analyzed for arsenic)
- DUP-8 with HA-96-0.5 (analyzed for arsenic, magnesium, and manganese)
- DUP-9 with HA-77-0.5 (analyzed for arsenic)
- DUP-10 with HA-85-2.0 (analyzed for arsenic, magnesium, and manganese and dissolved arsenic and manganese)
- DUP-11 with HA-61-2.0 (analyzed for arsenic, magnesium, and manganese and dissolved arsenic and manganese)
- DUP-12 with HA-86-0.5 (analyzed for arsenic)

Duplicate soil samples were discretely analyzed for total arsenic, total magnesium, total manganese, dissolved arsenic, dissolved manganese and/or total metals (as indicated above) using EPA Method 6010B.

Relative percent differences (RPD) between the primary sample and duplicate sample are presented in Tables 1 and 2 for total and leachable concentrations, respectively. The RPD was calculated as follows:

$$RPD = 100 \times \frac{|X_2 - X_1|}{\frac{X_2 + X_1}{2}}$$

where:

X_1 and X_2 are the two observed values.

The RPD goal for soil samples on this project was 30 percent.

A summary of RPDs by analyte is presented as follows:

- Total Arsenic (0 to 25 percent)
- Total Magnesium (3 to 33 percent)
- Total Manganese (9 to 23 percent)
- Leachable Arsenic (9 to 12 percent)
- Leachable Manganese (4 to 31 percent)
- Remaining Metals (0 to 32 percent [barium]):

Although the RPD goal of 30 percent was slightly exceeded for total magnesium, total barium, and leachable manganese, the exceedances are not expected to impact data quality due to the heterogeneity of soil sample results. Consistent analytical data (within a 33 percent difference) for the primary and duplicate soil samples indicate that laboratory analytical procedures were adequate for the sampling program.

One duplicate groundwater sample was collected from the Site; this sample was designated MW-DUP in Table 3 which corresponded with groundwater sample MW-3 which was analyzed for arsenic, manganese and cyanide. The RPD goal for groundwater samples on this project was 20 percent. The RPD for the three analytes between the primary sample and the duplicate was zero percent. Consistent analytical data (0 percent difference) for the primary and duplicate groundwater sample indicate that laboratory analytical procedures were adequate for the sampling program.

Based upon this QA/QC review of the project data, it appears that the data are valid and available for use in the site characterization.

7.0 TSI RESULTS

7.1 Groundwater Elevations and Gradient

Groundwater elevations calculated from depth-to-groundwater measurements recorded from the groundwater monitoring wells during the sampling event are shown in Table 4.

Table 4 – Calculated Groundwater Elevations

Well ID	TOC Elevation (north side of well casing)	Date Gauged	Depth To Water (feet below TOC)	Groundwater Elevation (feet msl)
MW-1	1279.23	2/11/09	13.48	1265.75
MW-2	1294.10	2/11/09	40.10	1254.00
MW-3	1253.96	2/11/09	11.49	1242.47
MW-4*	1285.88	2/11/09	29.55	1256.33
MW-5	1362.17	2/11/09	42.81	1319.36

Notes:

* = not used in contouring (well screened deeper than others)

TOC = top of casing

msl = mean sea level

Measured depth to groundwater ranged from 11.49 feet below top of casing (toc) in MW-3 to 42.81 feet toc in MW-5. Estimated groundwater contours are shown in Figure 5. Well MW-4 was not used for contouring because it is screened significantly deeper than the other wells.

Groundwater elevation data indicate that the groundwater flows horizontally to the south with a calculated horizontal hydraulic gradient of approximately 0.05 (Figure 5).

7.2 Soil and Groundwater Sampling Results

Table 1 provides a summary of the soil sampling results, Table 2 provides a summary of the leachable metal soil sampling results, Table 3 provides a summary of the groundwater sampling results, and Table 5 provides a summary of the global positioning satellite survey results (longitude and latitude).

7.2.1 Total Metal Concentrations in Soil Samples

HA-1 through HA-8

Eight surface soil sampling locations (HA-1 through HA-8) were sampled to assess soil along the southwestern boundary. These surface soil samples were analyzed for total arsenic. As shown in Table 1, arsenic concentrations ranged from 8.2 milligrams per kilogram (mg/kg; HA-1-0.5) to 59 mg/kg (HA-2-0.5). Four of the eight surface soil samples exceeded the ecological screening value (18 mg/kg) but none of the samples exceeded the human health screening value (400 mg/kg).

HA-9 through HA-24

Sixteen surface soil sampling locations (HA-9 through HA-24) were sampled to assess soil north-northwest of the Tailings Pile Area. These surface soil samples were analyzed for total arsenic. As shown in Table 1, arsenic concentrations ranged from 6.1 mg/kg (HA-23-0.5) to 15 mg/kg (HA-22-0.5). None of the sixteen surface soil samples exceeded the screening criteria for arsenic (ecological - 18 mg/kg; human health - 400 mg/kg).

HA-25 through HA-29

Five surface and five subsurface soil sampling locations (HA-25 through HA-29) were sampled to assess the surface (imported fill) and subsurface soil (mine tailings) in the Tailings Pile Area. The surface soil samples, representing the approximately 1-foot thick cover layer, were analyzed for Title 22 total metals. The subsurface soil samples, representing mine tailings waste soil, were analyzed for total arsenic, manganese, and magnesium.

As shown in Table 1, antimony, barium, beryllium, chromium, copper, lead, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc concentrations in the surface and subsurface soil samples were not detected above their respective screening criteria. Magnesium and manganese were detected; however, screening criteria have not been developed for this assessment.

Also as shown in Table 1, arsenic, cadmium, cobalt, and mercury concentrations in the surface and/or subsurface soil samples exceeded their respective ecological screening criteria; however, these metals did not exceed their respective human health screening criteria.

Although the metals detected in the surface and subsurface soil samples did not exceed human health screening criteria, the results between the surface and subsurface soil samples indicate the top soil (reported 1 foot thick cover layer) has apparently mixed with the subsurface mine tailings waste soil. The surface soil samples' arsenic concentrations range from 9.9 to 110 mg/kg and the subsurface soil samples' arsenic concentrations range from 3.6 to 230 mg/kg. This indicates that the top layer of imported soil may not be uniformly placed over the previously placed mine tailing waste soil. It was anticipated that the mine tailing waste soil would exhibit relatively elevated concentrations of arsenic and the top soil would exhibit relatively lower concentrations of arsenic, which does not appear to be the case.

HA-30 through HA-41

Twelve surface soil sampling locations (HA-30 through HA-41) were sampled to assess the surface soil in the area of the Bell Weather Mine. These surface soil samples were analyzed for total arsenic. As shown in Table 1, arsenic concentrations ranged from 11 mg/kg (HA-30-0.5) to 550 mg/kg (HA-41-0.5). Ten of the twelve surface soil samples exceeded the ecological screening criteria for arsenic (18 mg/kg) and one of the twelve soil samples exceeded the human health screening criteria (400 mg/kg).

HA-42 through HA-57

Sixteen surface soil sampling locations (HA-42 through HA-57) were sampled to assess the surface soil in the area south of the Bell Weather Mine, east of the Tailing Processing Area, and north-northwest of the Lakebed Area. These surface soil samples were analyzed for total arsenic. As shown in Table 1, arsenic concentrations ranged from 18 mg/kg (HA-43-0.5) to 350 mg/kg (HA-42-0.5). The twelve soil samples exceeded the ecological screening criteria for arsenic (18 mg/kg) but none of the samples exceeded the human health screening criteria (400 mg/kg).

HA-58 through HA-62

Five surface and five subsurface soil sampling locations (HA-58 through HA-62) were sampled to assess the surface and subsurface soil in the Tailings Processing Area. The surface soil samples were analyzed for arsenic, manganese, and magnesium.

As shown in Table 1, arsenic concentrations ranged from 7.5 mg/kg (HA-60-2.0) to 410 mg/kg (HA-62-0.5). Nine of the ten surface and subsurface soil samples exceeded the ecological screening criteria for arsenic (18 mg/kg) and only one soil sample (HA-62-0.5; 410 mg/kg) exceeded the human health screening criteria (400 mg/kg).

Magnesium concentrations ranged from 2,400 mg/kg (HA-58-2.0) to 18,000 mg/kg (HA-62-2.0) and manganese concentrations ranged from 110 mg/kg (HA58-2.0) to 940 mg/kg (HA-59-2.0). Screening criteria for magnesium and manganese have not been developed for this project.

HA-63 through HA-80

Eighteen surface soil sampling locations (HA-63 through HA-80) were sampled to assess the surface soil around the perimeter of the Lakebed Area. These surface soil samples were analyzed for total arsenic. As shown in Table 1, arsenic concentrations ranged from 4.3 mg/kg (HA-78-0.5) to 230 mg/kg (HA-74-0.5). Eleven of the 18 surface soil samples exceeded the ecological screening criteria for arsenic (18 mg/kg) but none of the 18 soil samples exceeded the human health screening criteria (400 mg/kg).

HA-81 through HA-85

Five surface and three subsurface soil sampling locations (HA-81 through HA-85) were sampled to assess the soil within the Lakebed Area. Subsurface soil samples were not collected from HA-83 or HA-84 due to encountered bedrock. The surface and subsurface soil samples were analyzed for arsenic, manganese, and magnesium.

As shown in Table 1, arsenic concentrations ranged from 39 mg/kg (HA-83-0.5) to 320 mg/kg (HA-21-2.0). The eight surface and/or subsurface soil samples exceeded the ecological screening criteria (18 mg/kg) but none of the sampling results exceeded the human health screening criteria (400 mg/kg).

Magnesium concentrations ranged from 2,600 mg/kg (HA-84-0.5) to 6,400 mg/kg (HA-81-2.0) and manganese concentrations ranged from 240 mg/kg (HA-82-2.0) to 950 mg/kg (HA-84-2.0). Screening criteria for magnesium and manganese have not been developed for this project.

HA-86 through HA-91

Six surface soil sampling locations (HA-86 through HA-91) were sampled to assess the surface soil south of the Tailings Processing Area and the Lakebed Area. These surface soil samples were analyzed for total arsenic. As shown in Table 1, arsenic concentrations ranged from 33 mg/kg (HA-91-0.5) to 120 mg/kg (HA-89-0.5). The six soil samples exceeded the ecological screening criteria for arsenic (18 mg/kg) but none of the six soil samples exceeded the human health screening criteria (400 mg/kg).

HA-92 through HA-96

Five surface soil samples locations (HA-92 through HA-96) were sampled to assess background concentrations of surface soil east of the Lakebed Area. These surface soil samples were analyzed for total arsenic, manganese, and magnesium.

As shown in Table 1, arsenic concentrations ranged from 5.1 mg/kg (HA-94-0.5) to 23 mg/kg (HA-93-0.5). Only one of the five surface soil samples exceeded the ecological screening criteria (18 mg/kg) but none of the sampling results exceeded the human health screening criteria (400 mg/kg).

Magnesium concentrations ranged from 1,200 mg/kg (HA-94-0.5) to 5,400 mg/kg (HA-92-0.5) and manganese concentrations ranged from 160 mg/kg (HA-93-0.5) to 1,100 mg/kg (HA-95-0.5). Screening criteria for magnesium and manganese have not been developed for this project.

7.2.2 Leachable Metal Concentrations in Soil Samples

HA-25 through HA-29

Five subsurface soil sampling locations (HA-25 through HA-29) were sampled to assess the subsurface soil in the Tailings Pile Area. The subsurface soil samples were analyzed for leachable concentrations of arsenic and manganese using the DI WET.

As shown in Table 2, leachable arsenic was detected in two of the five subsurface soil samples at 0.0068 mg/l (HA-29-2.0) and 0.0081 mg/l (HA-28-2.0). Neither concentration of leachable arsenic exceeded the screening criteria (0.05 mg/l).

Leachable manganese was detected in one of the five subsurface soil samples at 0.34 mg/l (HA-28-2.0). This one detection of dissolved manganese exceeded the screening criteria (0.05 mg/l).

HA-58 through HA-62

Five subsurface soil sampling locations (HA-58 through HA-62) were sampled to assess the subsurface soil in the Tailings Processing Area. The subsurface soil samples were analyzed for leachability of arsenic and manganese by DI WET.

As shown in Table 2, leachable arsenic was detected in the five subsurface soil samples at concentrations ranging from 0.0083 mg/l (HA-61-2.0) to 0.094 mg/l (HA-59-2.0). Two of the leachable arsenic concentrations exceeded the screening criteria (0.05 mg/l).

Leachable manganese was detected in the five subsurface soil samples at concentrations ranging from 0.039 mg/l (HA-58-2.0) to 0.13 mg/l (HA-59-2.0). Four of the five detections exceeded the screening criteria (0.05 mg/l).

HA-81, HA-82, and HA-85

Three subsurface soil sampling locations (HA-81, HA-82, and HA-85) were sampled to assess the subsurface soil within the Lakebed Area. Subsurface soil samples were not

collected from HA-83 or HA-84 due to encountered bedrock. The subsurface soil samples were analyzed for leachability of arsenic and manganese by DI WET.

As shown in Table 2, leachable arsenic was detected in one of the three subsurface soil samples at 0.0089 mg/l (HA-85-2.0), below the leachable arsenic screening criteria (0.05 mg/l). Leachable manganese was detected in one of the three subsurface soil samples at 0.0068 mg/l (HA-85-2.0), below the leachable manganese screening criteria (0.05 mg/l).

7.2.3 Dissolved Metal Concentrations in Groundwater Samples

One groundwater sample was collected from each of the five on-site groundwater monitoring wells (MW-1 through MW-5). The groundwater samples were filtered by the laboratory for analysis of dissolved arsenic and manganese using U.S. EPA Method 6010B (or 6020B) and cyanide by U.S. EPA Method 9010B.

As shown in Table 3, arsenic was detected in four of the five groundwater samples at concentrations ranging from 0.0012 mg/l (MW-4) to 0.061 mg/l (MW-2). Two of the four detected concentrations exceeded the screening criteria (0.004 mg/l).

Manganese was detected in the five groundwater samples at concentrations ranging from 0.0077 mg/l (MW-4) to 1.7 mg/l (MW-3). Two of the five detected concentrations exceeded the screening criteria (0.05 mg/l).

Cyanide was detected in only one of the five groundwater samples at 0.19 mg/l (MW-2) which exceeded the screening criteria (0.15 mg/l).

8.0 SUMMARY

A total of 121 soil samples were collected from 96 sampling locations and five groundwater samples were collected from the five on-site groundwater monitoring wells during February 2009.

The following general observations were made regarding the total concentrations of metals detected in soil samples:

- None of the soil samples collected from the southwest boundary (HA-1 through HA-8) exceeded the arsenic human health screening criteria.
- None of the soil samples collected from the north-northwest area (HA-9 through HA-24) exceeded the arsenic human health screening criteria for arsenic.
- None of the surface or subsurface soil samples collected from the Tailings Pile Area (HA-25 through HA-29) exceeded the human health screening criteria for Title 22 metals. Magnesium and manganese were detected, but screening criteria have not been developed for these two metals. The 1-foot thick imported soil layer may not be uniformly placed over the mine tailing waste soil as indicated by the soil sampling results for arsenic.

- Only one of the twelve soil samples collected from the Bell Weather Mine Area (HA-30 through HA-41) exceeded the human health screening criteria for arsenic.
- None of the soil samples collected from the area between the Bell Weather Mine Area, the Tailings Processing Area, and the Lakebed Area (HA-42 through HA-57) exceeded the human health screening criteria.
- Only one of the ten surface and subsurface soil samples (HA-58 through HA-62) exceeded the human health screening criteria for arsenic. Magnesium and manganese were detected, but screening criteria have not been developed for these two metals.
- None of the 18 soil samples collected from the perimeter of the Lakebed Area (HA-63 through HA-80) exceeded the human health screening criteria for arsenic.
- None of the eight surface and subsurface soil samples collected from the Lakebed Area (HA-81 through HA-85) exceeded the arsenic human health screening criteria. Magnesium and manganese were detected, but screening criteria have not been developed for these two metals.
- None of the six soil samples collected south of the Tailings Processing Area (HA-86 through HA-91) exceeded the arsenic human health screening criteria.
- None of the five soil samples collected along the eastern boundary of the Site (HA-92 through HA-96) exceeded the arsenic human health screening criteria.

The following general observations were made regarding the leachable concentrations of metals detected in soil samples:

- Leachable arsenic was detected in two of the five subsurface soil samples collected from the Tailings Pile Area (HA-25 through HA-29) but neither concentration exceeded the arsenic screening criteria. Only one of the five soil samples exceeded the manganese screening criteria.
- Leachable arsenic was detected in the five subsurface soil samples collected from the Tailings Processing Area (HA-58 through HA-62) but only two of the samples exceeded the arsenic screening criteria. Four of the five samples exceeded the screening criteria for manganese.
- Leachable arsenic and manganese were detected in the three subsurface soil samples collected from the Lakebed Area; however, none of the results exceeded their respective screening criteria.

The following general observations were made regarding the groundwater sampling results:

- Arsenic was detected in four of the five groundwater samples. Two of the four detected concentrations exceeded the arsenic screening criteria.
- Cyanide was detected in only one of the five groundwater samples and that one sample only slightly exceeded the cyanide screening criteria.
- Manganese was detected in the five groundwater samples. Two of the five detected concentrations exceeded the manganese screening criteria.

The current use of the property as open space appears to be appropriate with regard to human health risk based on the soil and groundwater sampling and screening results. The human health screening levels used in this evaluation were used for screening purposes only and are derived from CHHSLs (Cal-EPA 2005) and criteria developed by the DTSC Human and Ecological Risk Division (HERD; DTSC 2008, provided in Appendix E). The HERD stresses that chemicals of potential concern for both human and ecological health should be chosen based on comparison to ambient or background concentrations rather than on comparison to their screening concentrations. Also, the screening levels recommended by the HERD are intended to help guide future site investigation activities but are not necessarily recommended as target cleanup goals. Finally, the HERD should be consulted prior to developing site-specific cleanup goals.

Groundwater beneath the site should not be used as a drinking water resource based on detections of arsenic, cyanide, and manganese above their respective screening levels.

If the City plans on developing the property further, a soil management plan is recommended (particularly in the Tailings Pile Area) to outline management of excavated soil that may contain elevated concentrations of arsenic (or other chemicals of potential concern) and to provide a safe working environment to site construction workers.

9.0 REFERENCES

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