FINAL

Data Submittal
Phase 1 and Phase 2 Remedial Investigations
Klau and Buena Vista Mines Superfund Site,
San Luis Obispo County, CA

Prepared for

Contract No. 68-W-98-225/WA No. 242-RICO-09FM
U.S. Environmental Protection Agency
Region 9

75 Hawthorne Street
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September 26, 2008

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Project Number 349863

DATA SUBMITTAL PHASE 1 AND PHASE 2 REMEDIAL INVESTIGATIONS

KLAU AND BUENA VISTA MINES SUPERFIND SITE SAN LUIS OBISPO COUNTY, CALIFORNIA

EPA CONTRACT NO. 68-W-98-225
EPA WORK ASSIGNMENT NO. 242-RICO-09FM
CH2M HILL PROJECT NO. 349863.DE.01

Prepared for
United States Environmental Protection Agency
Region 9
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1.0 Introduction

The U.S. Environmental Protection Agency (USEPA) is conducting a Remedial Investigation (RI) to address releases of chemicals at and from the Klau and Buena Vista (KBV) Mines Superfund Site (USEPA ID: CA1141190578). The USEPA is conducting this work under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA).

This document is a Preliminary Data Submittal Report that presents the analytical results of sampling and analysis performed as Phase 1 and Phase 2 Remedial Investigations in October 2007 and April 2008, respectively. The Sampling and Analysis Plan (SAP) dated October 2007 and Addendum #1 to the SAP dated March 2008 describe the methods and procedures applicable to the collection and analysis of soil, mining process and waste material, sediments, surface water and biological materials. Investigations at the KBV Mines were conducted in phases, primarily to obtain information on site conditions during the dry and wet seasons. Additional phases may also consist of sampling further downstream and away from the mine properties, and sampling that may be needed to fill in data gaps identified based on evaluation of the initial phases of remedial investigation. Phasing of investigations along with dynamic sampling strategies will reduce the overall cost and shorten the timeline for the combined RI/Feasibility Study (FS).

The overall goals of these investigation activities were to characterize the nature and extent of chemicals at the KBV Mines that may be attributed to the former mining activities and provide data to evaluate risk to human health and ecological receptors resulting from the former mining activities. An evaluation of the data contained in this data package along with an evaluation of risk to human health and the environment and identification and evaluation of remedial alternatives will be compiled in a Remedial Investigation/Feasibility Study. The RI/FS process for the KBV Mines site will eventually lead to a Record of Decision (ROD) that will identify the selected remedy and the remedial action objectives (RAOs).

The USEPA is making this data available in order to assist other stakeholders and regulatory agencies with their activities and investigations. This data submittal also includes available data from recent investigations by the County of San Luis Obispo Department of Public Works and the U.S. Geological Survey (USGS) for the Bureau of Land Management (BLM). Reports by the County of San Luis Obispo and USGS are complete or forthcoming.

1.1 Description of Phase 1 and Phase 2 Remedial Investigation Study Area

The KBV Mines are located in San Luis Obispo County near Paso Robles, California (Figure 1-1). The KBV Mines properties consist of two adjacent, abandoned, mercury mines. The two mines include common ownership, similar operation histories, sources, target

populations, and water bodies. The Phase 1 and Phase 2 RI Study Area (henceforth, "the KBV Mines Study Area") included:

- The Klau and Buena Vista Mine properties as defined by San Luis Obispo County assessor parcel numbers 014-341-001, 014-341-003 and 014-341-004 and the former mine features within these parcels
- The U.S. Bureau of Land Management (BLM) reservoir area described as the BLM reservoir and dam and the portion of the Klau Branch between the reservoir and Cypress Mountain Drive
- Streams adjacent to the mine properties including the Klau Branch and the South Fork of Las Tablas Creek along the southern boundary of the Klau Mine and the North Fork of Las Tablas Creek along the northern boundary of the Buena Vista and Klau mine properties
- The extension of the South and North Fork of Las Tablas Creek beyond the Klau property up to the confluence of these two forks approximately 0.5 miles northwest of the mine properties
- The unpaved portion of Cypress Mountain Drive that is adjacent to the mine properties

The KBV Mines Study Area is shown on Figure 1-2.

The purpose of the RI sampling and analysis activities is to determine the nature and extent of mercury and other chemicals and support the development of human health and ecological risk assessments and remedial alternatives for the KBV Mines. The Phase 1 and Phase 2 remedial investigations included samples from the following media:

- Surface water including water from seeps, creeks, and ponds;
- Creek and pond sediments;
- Surface and near surface soil;
- Mine waste including mill tailings, waste rock, waste ore, calcines, and ash;
- Road surface material;
- Upland vegetation including grasses and plants;
- Fish and invertebrates; and
- Terrestrial invertebrates.

The primary chemicals for all media are metals. Methyl mercury concentrations are reported for selected sediment, surface water and aquatic organisms. Additional chemical data on selected samples included pH, anions, and physical and geochemical parameters.

2.0 Organization of Data

Data in this package includes data collected under contract with the U.S. EPA (Tabs 1 through 5) during October 2007 and April 2008, data collected by the USGS for BLM (Tab 6) and data collected by the County of San Luis Obispo under a grant from the California Water Quality Control Board (Tab 7). The data is organized as follows:

Tab 1: Phase 1 Data

This data package is revised from the earlier data submittal of February 2008. The revisions reflect USEPA validation of the data and inclusion of the biological sample results which were not available in February 2008. The Phase 1 data consists primarily of soil sampling throughout the mine properties including x-ray fluorescence field measurements with a proportion of samples submitted for laboratory analysis. In addition, samples of sediment, water and biological organisms were collected from mine ponds and adjacent streams. Phase 1 data is organized as follows:

- Table 1. A summary of all samples collected during the Phase 1 sampling event along with a short description of the samples.
- Table 2. A summary of metals results XRF readings and corresponding laboratory soil sample results for the mine properties. This summary includes the undisturbed and disturbed areas of Klau and Buena Vista Mine, all grid locations and judgmental soil sample locations. Note that laboratory analysis was performed on a subset of the XRF locations.
- Table 3. A summary of all laboratory soil sample results that are identified as "preliminary background" results. This table includes all undisturbed area soil samples and grid sample locations within the disturbed areas of Klau and Buena Vista Mine. The data is organized by undisturbed area name and undisturbed area mine name. Note that there are several disturbed area grid samples that may be removed from the "background" data set but at this time the sample location was not judged to be at a discernible feature such as a waste pile. This table also includes a circle around values that exceed the project goals presented in the SAP, (Table 3-2, generally these goals are ecological screening levels) and a red box around values that exceed EPA Region IX PRGs for residential use.
- Table 4. A summary of all laboratory soil samples collected at identifiable features (judgmental samples) within the disturbed area of the mine properties. These samples include soil near the Klau Western Retort, the Buena Vista Rotary Furnace, etc. The samples are organized by feature and mine.
    - Table 5. A summary of all sediment and surface water sample results. The data is organized by stream, seeps and pond features. Portions of the Klau Branch were dry including locations upstream and immediately downstream of the BLM

reservoir and in the Klau Branch downstream of the Klau Mine Disturbed Area and before the confluence with the South Fork of Las Tablas Creek.

- Table 6. A summary of all biota samples collected in Phase 1 and submitted to the USACE contracted laboratory, Brooks Rand.
- Figure 1. A large aerial of the Phase 1 sampling area with posted mercury results in mg/kg for the field XRF measurements. For all metals analyzed by XRF see Table 2. The "X" on the map indicates XRF location and a solid dot at the center of the "X" indicates that a corresponding soil sample was submitted for laboratory analysis (see Figure 2 and Table 2). The results of the laboratory analyses are also included in Table 2.
- Figure 2. A large aerial of the Phase 1 with posted total mercury laboratory analysis results for soil and sediment.
- Figures 3 and 4. Close-ups of the soil and sediment laboratory results for total mercury for the Klau Mine and Buena Vista Mine, respectively.
- Figure 5: A large aerial of the Phase 1 water and sediment laboratory analysis results. The figure includes posted results for dissolved mercury, methyl mercury, and dissolved trace mercury results for water samples and total mercury and methyl mercury in sediment. The units are indicated on the figure.
- Figure 6: A large aerial of the Phase 1 biota results for mercury and methyl mercury in biota samples. Note that the biota results are not referenced to a sample point but samples for aquatic invertebrates may be considered co-located with a sediment and surface water when there sample ID matches a location of water and/or sediment samples (e.g. KBC-130-INV is matched with sediment and water with location KBC-130).

Tab 2: Phase 2 Data

The Phase 2 data consists of water sampling conducted during a rainfall event in the first week of April 2008 (storm event) and water, sediment and biota samples collected offsite and downstream of the mine properties along the North and South Fork of Las Tablas Creek and just downstream of the confluence of the North and South Fork of Las Tablas Creek. Stream samples were collected at locations that were dry during the October 2007 investigation. The data is organized as follows:

- Table 1. A summary of all samples collected during the Phase 2 sampling event along with a short description of the sample.
- Table 2. A summary of co-located surface water and sediment samples. Note that stream and sediment samples are identified with an "s" to indicate that it was collected during the early April storm (rainfall) event and "w" to indicate that the sample was collected as a "wet" season sample in late April 2008. Samples are identified with these added letters to denote that they are not in the same location as the dry season sample, although they are in the vicinity of the 2007 sample.

- Table 3. A summary of other water samples collected during the Phase 2 event including seeps, surface water runoff, sumps, and wells.
- Table 4. A summary of biological sample results for samples collected during Phase 2 event.
- Figure 1. A large aerial of the Phase 2 Sampling area illustrating the site features and mapping of surface water runoff as observed in April 2008.
- Figure 2: A large aerial of the Phase 1 water and co-located sediment laboratory analysis results. The figure contains dissolved mercury, methyl mercury, and dissolved trace mercury results for water samples and total mercury and methyl mercury in sediment. The units are indicated on the figure.
- Figure 3: A large aerial of the Phase 1 biota results for mercury and methyl mercury in biota samples.
- Figure 4: Mercury and Methyl Mercury in Groundwater and Seeps in the Buena Vista Mine Disturbed Area
- Figure 5: Mercury and Methyl Mercury in Groundwater and Seeps in the Klau Mine Disturbed Area

Tab 3: Graphs of concentration versus distance from the downstream sample location LTC-90

Bar graphs of mercury concentrations in surface water and sediment compared to distance along the creek from the common downstream location LTC-090. The graphs illustrate the relationships between surface and subsurface sediment and water concentrations at sample locations along each of the three creeks in the mine area. The graphs are:

- Figure 1: Klau Branch
- Figure 2: South Fork of Las Tablas Creek
- Figure 3: Las Tablas Creek (North Fork)

Tab 4. Air Monitoring Results

A memorandum that summarizes the results of field vapor screening for mercury within selected buildings, mine equipment and in outdoor air within the breathing zone and at the ground surface. This activity was performed as part of the Phase 1 investigation in 2007.

Tab 5. Results of X-Ray Fluorescence Screening Phase 1 Remedial Investigation.

A memorandum that summarizes the results of a comparison of Phase 1 XRF measurements with laboratory analysis results for the same soil sample.

Tab 6. United States Geological Survey Data from Sampling at BLM Reservoir

This section summarizes data collected by the U.S. Geological Survey for an investigation conducted at the BLM Reservoir on behalf of the BLM.

- Table 1:
- Table 2
- Table 3
- Figure 1: Mercury and Methyl Mercury in Groundwater, Effluent, Sediment, and Soil BLM Reservoir Area
- Figure 2: Mercury and Methyl Mercury in Tissue, BLM Reservoir Area

Tab 7: San Luis Obispo County Soil Sampling Along Cypress Mountain Drive.

The table and figure included under this section presents the results of surface and shallow soil sampling conducted by the County of San Luis Obispo Department of Public Works. This sampling was performed along the section of Cypress Mountain Drive between Klau Mine Road and Chimney Rock Road. The road was paved with asphalt following collection of these soil samples. The results of this sampling were used to evaluate the future risk to human health presuming that the road remained unpaved. The County has prepared a report of their sampling that provides further information.

Tab 8: Geologic, Topographic and Land-Use Maps for Klau and Buena Vista Mines

This section includes the following selected figures from the SAP that may be of interest in relation to the data presented in this submittal:

- Geologic map
- Topographic map
- Land-use map

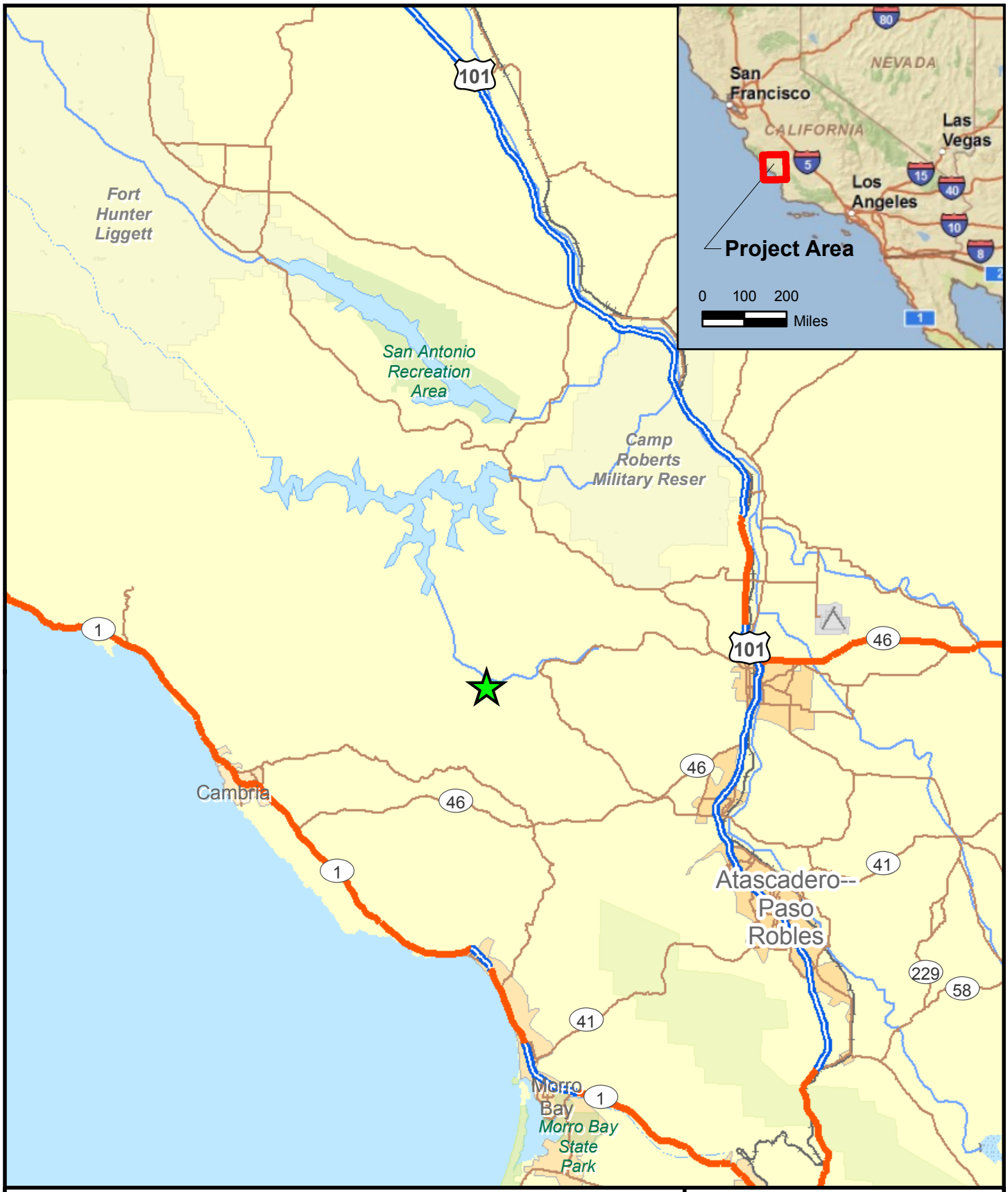
3.0 Data Quality

Samples were analyzed by the Region 9 laboratory, by laboratories in the USEPA Contract Laboratory Program (CLP), and Brooks and Rand Laboratory. All data was reviewed and validated. The data was validated as follows:

- All results from the Region 9 laboratory were reviewed and flagged according to Region 9 procedures
- Results from the CLP were reviewed using USEPA automated data reviewing and flagging software application.
- Selected results from both the CLP and Brooks and Rand were validated by the USEPA.

The data presented in this deliverable are flagged based on the findings of these review and validation activities. While there were a number of quality control outliers that resulted in estimation of both sample results and reporting limits, there are no significant negative quality trends observed. This data is considered of sufficient quality to meet the project objectives.

Figures



LEGEND

Project Location

Source:
- USGS 250k Topo

N

0 2.5 5 Miles

FIGURE 1
GENERAL AND LOCAL AREA MAP

KLAU AND BUENA VISTA MINES
SAN LUIS OBISPO COUNTY, CALIFORNIA

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LEGEND

- Approximate Location of Seeps
- Tunnel Adit
- Water Flow Direction
- Approximate boundaries of surface feature
- Approximate boundaries of remediated features
- Approximate extent of underground workings
- Approximate Extent of Study Area
- Klau and Buena Vista Mine Parcel Boundaries
- Approximate Boundary of Disturbed Area

N

0 100 200 400 Feet

1:2,400

Note:
The extent of underground workings for the Klau and Buena Vista Mines is based on July 1935 map contained in California Journal of Mines and Geology Vol. 31 No. 4. Additional post-1935 workings may be present.

Data sources:
1. Ecology and Environment, Figure 3-1, January 25, 2001.
2. SECOR, Figure 3, July 23, 1999.
3. SECOR, "Report of Reclamation and Removal Actions Buena Vista/Klau Mine Superfund Removal," January 11, 2000.
4. Tetra Tech, "Environmental Assessment of the Buena Vista and Klau Mines, San Luis Obispo County, California," June, 1998.
5. Division of Mines. California Journal of Mines and Geology. Vol. 31. October 1935.
6. Aerial Source: National Agricultural Imagery Program August, 2005

FIGURE 2
STUDY AREA
SURFACE FEATURES
KLAU AND BUENA VISTA MINES
SAN LUIS OBISPO COUNTY, CA

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