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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

164460
SDMS 164460

MEMORANDUM

DATE: SEP . 9 2003

SUBJECT: Request for a Time-Critical Removal Action at the Gambonini Mercury Mine Site, Marin County, California

FROM: Bret Moxley, On-Scene Coordinator
Emergency Response Section (SFD-9-2)

TO: Daniel Meer, Chief
Response, Planning & Assessment Branch (SFD-9)

THROUGH: Peter Guria, Chief
Emergency Response Section (SFD-9-2)

I. PURPOSE

The purpose of this Action Memorandum is to obtain approval to spend up to \$354,000 to mitigate threats posed to human health and the environment posed by the presence of sediment with elevated levels of mercury located at the Gambonini Mercury Mine ("Site") in Marin County, California. The proposed removal of hazardous substances would be taken pursuant to Section 104(a)(1) of the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), 42 U.S.C. § 9604(a)(1), and Section 300.415 of the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"), 40 CFR § 300.415.

II. SITE CONDITIONS AND BACKGROUND

Site Status: Non-NPL

Category of Removal: Time-Critical

CERCLIS ID: **CA0002322469**

SITE ID: 09EJ

Latitude: 38 10' 14.61" N

Longitude: 122 46' 45.89" W

A. Site Description

1. Physical Location

The Site is located at 1403 Marshall-Petaluma Road, in northwest Marin County, California, approximately 40 miles north of San Francisco. The Site is located 0.5 miles up a dirt road on the north side of Marshall-Petaluma Road. The area surrounding the Site is largely used for grazing purposes, and the Site itself is located entirely within a family-owned ranch. Tomales Bay is approximately 8 miles west of the Site.

2. Site characteristics

The Site consists of an abandoned mine encompassing approximately 16 acres, including a two acre mine pit and 11 acres of mining waste piles. The area around the Site is characterized by very steep topography, with elevation ranging from 250 feet to more than 1,000 feet. Minerals exploration in the vicinity of the Site began in 1945, but a producing mine did not exist until 1964. Buttes Gas and Oil operated the Site from 1964 to 1970.

During mining operations, the mining wastes (including waste rock, tailings and mercury extraction wastes) were dumped in the canyon and Gambonini Creek adjacent to the pit. Gambonini Creek is situated at, and partially covered by, the toe of the mining waste pile. The material in the waste pile was stabilized in an United States Environmental Protection Agency (U.S. EPA) removal action conducted in 1998/1999. The Gambonini Ranch Creek is a tributary to Walker Creek, which in turn flows into Tomales Bay. In 1972, Buttes Gas and Oil constructed an earthen dam in Gambonini Creek just downstream of the waste pile. In 1982, during what has been estimated to be a 500 year storm event, the dam was breached, and a large amount of sediment entered Gambonini Creek. The response action described in this action memorandum will stabilize the remaining sediment along the banks of Gambonini Creek.

3. Removal site evaluation

U.S. EPA, U.S. Fish and Wildlife Service (USFWS, the natural resource damage trustee) and U.S. Department of Justice met at site on 11/18/02 to discuss natural resource damage matters and the need for additional removal work in Gambonini Creek. U.S. EPA, USFWS and the Regional Water Quality Control Board (RWQCB) met on 12/9/02 to further discuss a removal action in Gambonini Creek and whether the existing data supported the need for such a removal. It then became apparent that more specific data about the mercury content of the hypothesized tailings banks was needed. Conveniently, the U.S. EPA Region 9 Preliminary Investigation/Site Investigation (PA/SI) team was planning near-term sampling work at the Site as part of

an overall National Priority List (NPL) listing evaluation by U.S. EPA. The PA/SI team agreed to amend their sample plan to include samples that would serve the removal assessment objectives.

On 4/16/03, U.S. EPA and RWQCB walked Gambonini Creek to evaluate possible sample locations. Sample locations were selected to include stream banks that were thought to contain mercury tailings and are prone to bank erosion as described in a RWQCB memo titled "Preliminary Geomorphic Assessment of Gambonini Creek." The PA/SI team collected 17 surface sediment samples in Gambonini Creek on 4/22/03.

Samples results showed mercury concentrations in sediment from a low of 0.24 parts per million (ppm) to a high of 37 ppm, and showed that all mercury sediment sample concentrations taken from priority areas in Gambonini Creek were above anthropogenic aerial depositional background of 0.15 ppm mercury. Additionally, 15 of the 17 mercury sediment samples were above the National Oceanographic and Atmospheric Administration (NOAA) Apparent Effects Thresholds for synoptic biologic injury as described in the Screening Quick Reference Table for freshwater sediment of 0.56 ppm mercury, and saltwater sediment of 0.41 ppm mercury. As such, these levels represent the mercury concentrations above which adverse biological impacts would always be expected as indicated by microtox bioassay.

Using the mean mercury concentrations for each priority area sampled in Gambonini Creek and the geomorphic preliminary estimate of soil mass in each respective area, the RWQCB estimates that approximately 69.5 kilograms of mercury is present in the creek banks, which threatens release if this action is not implemented.

4. Release or threatened release into the environment of a hazardous substance, or pollutant or contaminant

Mercury is a hazardous substance as defined by Section 101(14) of CERCLA. A continued and/or unmitigated release of mercury of the Site could constitute a threat to the local human and animal populations, as well as to surface waters including the Gambonini Ranch Creek, Walker Creek and Tomales Bay. Tomales Bay is used extensively for commercial oyster farming (many of the beds are located at the mouth of Walker Creek), fishing, crabbing and clamming. Tomales Bay is also a significant stop over for migratory waterfowl.

In November 2000, the Marin County Department of Health and Human Services, in cooperation with the state Office of Environmental Health Hazard Assessment, issued an Interim Public Health Advisory for Sport Fish from Tomales Bay. This advisory applied to 7 species of sport fish and is based on methyl mercury concentrations found in fish tissue. The advisory recommends zero consumption of two species and very limited consumption of five species. The Gambonini Mercury mine is the only known source of mercury in the Tomales Bay watershed.

5. NPL status

This site is not currently on the NPL or proposed for the NPL. However, U.S. EPA recently conducted sampling to support a PA/SI for remedial consideration.

B. Other Actions to Date

The U.S. EPA Region 9 Emergency Response Office conducted a time-critical removal action during the 1998 and 1999 construction seasons. The goal of the U.S. EPA response action was to minimize the volume of mercury-contaminated sediments entering the Gambonini Ranch Creek. Construction activities completed during the first field season (July 1998 - November 1998) included the following:

- More than 200,000 cubic yards of material were removed from the upper half of the project area. Much of this material was used to construct a gravity buttress, and the remainder of the material was placed in the mine pit.
- A gravity buttress was constructed in the lower half of the project area in order to stabilize the toe of the landslide.
- Over 3,000 lineal feet of subdrains were installed. These subdrains were installed to capture groundwater within the engineered hillside.
- A surface water drainage system was constructed in order to prevent surface water erosion of the gravity buttress and to minimize sediment discharge.

During the winter of 1998-1999, a landslide occurred in the upper section of the engineered hillside. U.S. EPA field activities during the second field season (July 1999 - September 1999) focused on the repair of this landslide. The RWQCB played an active role during design and construction of the engineered hillside. In addition, the RWQCB conducted an extensive revegetation program and performed channel restoration in the lowest reach of Gambonini Creek.

The On Scene Coordinator (OSC) Report (excerpted below) was prepared subsequent to the 1998/1999 removal action and raised the issue of the remaining mine waste in Gambonini Creek.

"It should be noted that the U.S. EPA response action focused entirely on stabilization of the mining waste pile. During the course of geologic mapping..., it became apparent that there is a significant volume of mining waste present along the approximately quarter mile stretch of the Gambonini Ranch Creek which extends from the base of the waste pile to the rear of the family ranch house. While the U.S. EPA action was aimed at stabilizing the waste pile, it is

acknowledged that there is still a source of mercury contamination which was not addressed by the response action. Much of this source lies within a canyon that is largely inaccessible." (OSC Report, 1998/1999 Gambonini Mercury Mine Removal)

It is this source in Gambonini Creek that the current removal action will address.

C. State and Local Authorities' Roles

For the three years prior to the first removal action, and for the three years since the completion of the action, the RWQCB has been collecting and analyzing data from the Site, the Gambonini Ranch Creek, Walker Creek and Tomales Bay in order to determine the extent of mercury contamination. Additionally, the RWQCB will continue collecting mercury data at the site and in the watershed.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

Conditions at the Site present a release, or potential threat of release, of a CERCLA hazardous substance threatening to public health, or welfare, or the environment based on the factors set forth in the NCP, 40 CFR § 300.415(b)(2). These factors include:

1. Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby populations or the food chain

Transport of mercury-laden sediment from the mining waste in the Gambonini Ranch Creek, Walker Creek and Tomales Bay has been documented by the RWQCB. In addition, biological data collected by the RWQCB indicates that biological receptors within Tomales Bay are accumulating mercury. Tomales Bay is used extensively for commercial oyster farming (many of the beds are located near the mouth of Walker Creek), fishing, crabbing and clamming. Tomales Bay also is a significant stop over for migratory waterfowl. As a result of its tendency to bioaccumulate in the food chain, methylmercury concentrations tend to be higher in upper trophic level species. Because the principle pathway for the uptake of methyl mercury by humans and wildlife is through the consumption of fish and seafood where methyl mercury has bioaccumulated, the Marin County Health Department, in November 2000, issued an Interim Fish Consumption Advisory for Sport Fish from Tomales Bay.

Methylmercury is the form of mercury most easily adsorbed through the gastrointestinal tract (about 95% of consumed methylmercury is absorbed). When fish contaminated with methylmercury are eaten, methylmercury enters the bloodstream and is easily and rapidly transported to other organs. Methylmercury in the blood of a pregnant woman will easily enter the blood of the developing fetus and reach its brain and other tissue. Consumption of large doses of methylmercury can affect the nervous system, and can cause behavioral and developmental damage.

Animals exposed orally to long term high levels of methylmercury in laboratory studies experienced damage to the kidneys, stomach and large intestine; changes in blood pressure and heart rate; adverse effects on the developing fetus, sperm and male reproductive organs; and increases in the number of spontaneous abortions and stillbirths. Animal studies also provide evidence of damage to the nervous system from exposure to methylmercury during development, and evidence suggests that the effects worsen with age, even after the exposure stops.

2. High levels of hazardous substances or pollutants or contaminants in soils at or near the surface, that may migrate

Elevated levels of mercury are present in sediments in the Gambonini Ranch Creek. The EPA PA/SI team collected 18 surface sediment samples in Gambonini Creek on 4/22/03. Sample results showed mercury concentrations in sediment from a low of 0.24 ppm to a high of 37 ppm, all of which are above the background concentration of 0.15 ppm. Earlier sampling by the RWQCB showed that mercury concentrations are highest in the finer-grained fractions, which are most susceptible to transport via the Gambonini Ranch Creek and Walker Creek. Sampling conducted by the RWQCB also has demonstrated that such transport has occurred in the past and is continuing to occur.

3. Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released

Currently, during high flow winter storm events the channel widens by undercutting the bank, which is comprised of mercury bearing tailings, and the bank sloughs into the channel dispersing the mine tailings into the creek and then down stream to Tomales Bay.

4. Availability of other appropriate Federal or State response mechanisms to respond to the release

The RWQCB has stated that due to the current state budget shortfalls it does not have any funds available for response at the Site. Funds previously intended for work at the Site have been rescinded due to state budget problems. In a letter dated

July 16, 2003, the RWQCB has requested U.S. EPA Region 9 assistance to conduct the removal action described herein.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed action description

The proposed response action involves creek channel modification in areas where the banks of the creek are comprised of mercury bearing mine tailings, and where these tailings banks are prone to undercutting and sloughing into the creek during high flow events. The action will, in effect, accelerate the natural geomorphic channel equilibrium process, but will do so in a controlled manner that will greatly reduce the off-Site migration of mercury.

In each of the five areas where work will be performed: 1) survey work will provide a longitudinal profile of the creek and creek cross sections necessary for design; 2) the affected bank slopes will be partially excavated and the slope angles will be reduced; 3) where feasible, the creek channel will be widened to accommodate a specific sized storm event flow; 4) where necessary, rip-rap check dams will be constructed to provide a step pool morphology for flow energy dissipation; 5) the excavated material will be stabilized up slope and out of the channel; 6) excavated slopes and stabilized spoils will be revegetated; and, 7) the new bank toe will be reinforced with rip rap and/or bioengineered willow walls.

Where possible this work will be done with small excavation equipment, but due to the restricted access in Gambonini Creek, much of this work will need to be done with hand labor. Similar work, though smaller in scope, has been performed at the Site by the Marin Conservation Corps.

2. Contribution to remedial performance

Long term remedial action at this Site is not currently planned. EPA anticipates that this removal action will complete all source control work at the Site.

The long-term cleanup plan for the Site:

There is no current plan for any off-Site clean up in the Tomales Bay estuary. It should be noted that mercury bearing sediments released from the Site are still present in Walker Creek and in Tomales Bay. As clean sediment enters the estuary and covers the mercury bearing sediments, the bioavailability of the mercury in these sediments should decrease and concentrations of methyl mercury in the biota should attenuate.

Threats that will require attention prior to the start of a long-term cleanup:

There is no long-term cleanup currently planned for this Site.

The extent to which the removal will ensure that threats are adequately abated:

The proposed removal action will control and stabilize the mercury source at the Site to the extent practicable. However, bioavailable mercury will still be present in the estuary until adequate volumes of clean sediment deposit over the mercury bearing sediments. Unless mercury releases from the Site are adequately controlled, new mercury bearing sediment will continue to be deposited at the top of the sediment column in the estuary and biotic concentrations of mercury will be unlikely to decrease.

Consistency with the long-term remedy:

As described above, U.S. EPA expects this action will complete source control measures at the Site. Even if sediment controls were contemplated in the estuary, the source control measures proposed in this Action Memorandum would be a necessary action.

3. Description of alternative technologies

Alternative technologies are not considered for the proposed response action.

4. Applicable or relevant and appropriate requirements (ARARs)

Section 300.415(j) of the NCP provides that removal actions must attain ARARs to the extent practicable, considering the exigencies of the situation.

Section 300.5 of the NCP defines applicable requirements as cleanup standards, standards of control, and other substantive environmental protection requirements, criteria or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location or other circumstances at a CERCLA site.

Section 300.5 of the NCP defines relevant and appropriate requirements as cleanup standards, standards of control and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, or contaminant, remedial action, location, or other circumstances at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site.

Because CERCLA on-site response actions do not require permitting, only substantive requirements are considered as possible ARARs. Administrative requirements such as approval of, or consultation with administrative bodies, issuance of permits, documentation, reporting, record keeping, and enforcement are not ARARs for the CERCLA actions confined to the Site.

The following ARARs have been identified for the proposed response action. This removal action will, to the extent practicable considering the exigencies of the situation, attain applicable or relevant and appropriate requirements under federal environmental or state environmental or facility siting laws.

Federal ARARs:

Potential federal ARARs are the Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions, 40 CFR 268.40 Subpart D implemented through Title 22 Section 66268.40; the CERCLA Off-Site Disposal Rule OSWER Directive 9347.3-8FS; and the U.S. Department of Transportation of Hazardous Materials Regulations 49 CFR Part 171, 172 and 173. Certain sections of the federal Clean Water Act and Safe Drinking Water Act also may be ARARs for the Site.

State ARARs:

ARARs include RCRA standards as implemented through California's federally authorized RCRA program and RCRA Land Disposal Restrictions as set forth at 22 CCR Chapter 12-18. All waste handling, storage, packaging, transportation and disposal will be conducted in accordance with RCRA.

In addition to RCRA, the State has identified the following as potential ARARs: California Water Code, Division 7, Section 13000, et seq. (Porter-Cologne Water Quality Control Act); Water Quality Control Plan for Inland Waters of California (Water

Code Section 13170, Clean Water Act Section 303(c)(1)); Water Quality Control Plan for Ocean Water of California (Water Code Section 13170.2); Water Quality Control Plan for the Enclosed Bays and Estuaries of California (Water Code Section 13140); State Board Resolution 68-10 (Policy on Maintaining the High Quality of State Waters); State Board Resolution No. 68-63 (Sources of Drinking Water Policy); State Board Resolution 92-49 (Policies and Procedures for Investigation and Abatement of Discharges Under Water Code Section 13304); Title 27 CCR, Chapter 7 (Discharges of Waste to Land); Title 23 CCR, Division 3, Chapter 15, Article 5, Safe Drinking and Toxic Enforcement Act of 1986 (Prop. 65), California Health and Safety Code Section 21100 et seq.; Title 22 CCR, Division 4, Chapter 15, Section 66401, et seq. (Public Water Supply).

5. Project schedule

It is anticipated that the removal will take approximately 30 on-site working days to complete.

B. Estimated Costs

Regional Removal Allowance Costs

Cleanup Contractor	\$ 354,000
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Extramural Costs Not Funded
from the Regional Allowance

ERT REAC Contractor	25,000
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START Contractor	<u>55,000</u>
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Extramural Subtotal	\$ 434,000
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Extramural Contingency (20%)	<u>\$ 87,000</u>
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TOTAL, Removal Action Project Ceiling \$ 521,000

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Given the Site conditions, the nature of the hazardous substances documented on Site, and the potential exposure pathways to nearby populations described in Sections III and IV above, actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response actions selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

VII. OUTSTANDING POLICY ISSUES

There are no outstanding policy issues with the Site identified at this time.

VIII. ENFORCEMENT

Please see the attached Confidential Enforcement Addendum for a discussion regarding potentially responsible parties. In addition to the extramural costs estimated for the proposed action, a cost recovery enforcement action also may recover the following intramural costs:

Intramural Costs¹

U.S. EPA Direct Costs (including ERT West)	\$ 25,000
U.S. EPA Indirect Costs (35.28%)	<u>\$ 192,629</u>
TOTAL Intramural Costs	\$ 217,629

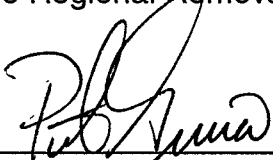
The total U.S. EPA extramural and intramural costs for this removal action, based on full-cost accounting practices, that will be eligible for cost recovery are estimated to be \$738,629.

1 . Direct costs include direct extramural costs and direct intramural costs. Indirect costs are calculated based on an estimated indirect cost rate expressed as a percentage of site-specific direct costs, consistent with the full cost accounting methodology effective October 2, 2000. These estimates do not include pre-judgement interest, do not take into account other enforcement costs, including Department of Justice costs, and may be adjusted during the course of a removal action. The estimates are for illustrative purposes only and their use is not intended to create any rights for responsible parties. Neither the lack of a total cost estimate nor deviation of actual costs from this estimate will affect the United States' right to cost recovery.

IX. RECOMMENDATION

This decision document represents the selected removal action for the Gambonini Mercury Mine, in Marin County, California developed in accordance with CERCLA, as amended, and not inconsistent with the NCP. This decision is based on the Administrative Record for the Site.

Because conditions at the Site meet the NCP criteria for a time-critical removal, I recommend your approval of the removal action proposed in this Action Memorandum. The total project ceiling if approved will be \$ 521,000, of which an estimated \$ 354,000 comes from the Regional Removal Allowance. You may indicate your decision by signing below:

Approve:  9 SEPT 03
for Daniel Meer, Chief Date
Response, Planning and Assessment Branch

Disapprove: _____ Date
Daniel Meer, Chief
Response, Planning and Assessment Branch

Enforcement Addendum

Attachments:

- 1. Index to the Administrative Record

cc: Lisa Boyton, USEPA, OERR, HQ
Director, Regional Water Quality Control Board
Department of the Interior

bcc: Site File
OSC, SFD-9-2
Attorney, ORC-3
C. Temple, SFD-9-2