



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 9  
75 Hawthorne Street  
San Francisco, CA 94105-3901

MEMORANDUM

DATE: September 25, 2008

SUBJECT: Request for Approval of Modification to the Removal Action at the Leviathan Mine, Alpine County, CA

FROM: Kevin P. Mayer, RPM, California Site Cleanup Branch *KPM*

TO: Kathleen Salyer, Assistant Director Superfund Division,  
California Site Cleanup Branch

I. PURPOSE

The purpose of this Memorandum is to request and document approval of a modification to the Non-Time Critical Removal Action (NTCRA) described herein for the Leviathan Mine Site, located in Alpine County, CA. This Memorandum is based on the Draft Engineering Evaluation/Cost Assessment (EE/CA) submitted by Atlantic Richfield Company (Atlantic Richfield) to EPA on April 5, 2004, public comments received pursuant to 40 C.F.R. 300.415(n) (4), the NTCRA Memorandum approved on July 12, 2005, planning and construction experiences in implementation of the Removal Action in 2006 and 2007, comments solicited by EPA from all prior commenters on the EE/CA, and the Site administrative record.

EPA had overseen efforts to control and treat known discharges of acidic contamination from the Mine and discovered that most of the standard treatment alternatives could be reliably operated only during the summer. The Draft EE/CA analyzed several approaches to extending the treatment season beyond the summer months. For reasons described in Section V.A. (3) of the July 12, 2005, NTCRA Memorandum, EPA selected a NTCRA at Leviathan Mine to include on-site year-round treatment of known Acid Mine Drainage (AMD) sources. Experience gained in from attempts to design and build such a system has shown that it entails implementation challenges inappropriate for a NTCRA or treatability study. Rather, on-site year-round treatment will be one of the remedial alternatives analyzed in a Long-term Remedial Investigation/ Feasibility Study (RI/FS), which is being implemented concurrently with this NTCRA as required by the Administrative Order signed on June 23, 2008. Meanwhile, the NTCRA continues with the same fundamental goals and a new strategy for achieving these objectives.

The objectives of the NTCRA remain: to expeditiously improve temporary protection of human health and environment from the known AMD discharges while obtaining critical information for selecting a long-term remedy. Based on experience gained and comments received in the past year, EPA has concluded that the best way to further these goals is to modify the NTCRA to implement response action that shall include on-site interception and treatment of AMD from two source areas from early spring through late autumn, when personnel can safely access the site. As described in more detail in Section V of this Memorandum, this NTCRA shall include:

- 1) Design, construction and operation of an improved on-site three-season treatment system to test the effectiveness and reliability of cold-weather treatment of the AMD from the Channel Underdrain (CUD) and the Delta Seep. To minimize untreated discharge to the stream while maintaining operator safety, the system shall be designed to operate during spring, summer and autumn as long as road conditions allow safe personnel access, even if the site is inaccessible to heavy trucks and equipment.
- 2) Continuation of year-round treatment of the Aspen Seep through the Bioreactor, including testing and implementation of system and process improvements as warranted.
- 3) Continued year-round capture and storage of the AMD from the Adit and the Pit Underdrain (PUD) for separate summer treatment.
- 4) Performance of additional treatability studies which may be required to test the effectiveness and reliability of treatment of combined Adit, PUD, CUD and Delta Seeps, particularly to assess sludge characteristics.

It is anticipated that this NTCRA will be conducted by Atlantic Richfield and the Lahontan Regional Water Quality Control Board (LRWQCB).

This site has been the subject of eight earlier removal action memoranda, dated September 24, 1997; July 19, 2000; July 5, 2001; July 27, 2001; July 11, 2002; July 28, 2003; July 29, 2004; and the July 12, 2005 NTCRA Memorandum. Five of these earlier removal actions were conducted by the LRWQCB, and two were conducted by Atlantic Richfield or by its implementing agent, ARCO Environmental Remediation L.L.C. (AERL). The July 27, 2001 Removal Action Memorandum was issued for Early Response Action activities undertaken by Atlantic Richfield. EPA directed both the LRWQCB and Atlantic Richfield to implement portions of the 2005 NTCRA Memorandum. These activities shall continue except as modified by this Memorandum. As with the previous removal actions, close coordination of concurrent site activities will be necessary for the proposed NTCRA.

Conditions presently exist at the site which, if not addressed by implementing the response action documented in this Memorandum, may lead to off-site migration and release of hazardous substances which may pose an imminent and substantial endangerment to the public health or welfare or the environment.

The actions described herein meet the criteria for a removal action under section 300.415 of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

## II. SITE CONDITIONS AND BACKGROUND

Site Status: NPL  
Category of Removal: Non-Time-Critical  
CERCLIS ID: CAD 980673685  
SITE ID: 1A

### A. Description of Site and Releases, National Priority List Status, and the Memorandum of Agreement with Natural Resource Trustees

#### 1. Site description

The 656 acre Leviathan Mine property lies within a remote portion of northeastern Alpine County, California, on the eastern flank of the central Sierra Nevada, near the California-Nevada border, approximately 25 miles southeast of Lake Tahoe, and 6 miles east of Markleeville, California. Of the total property, approximately 253 acres evince visible disturbance by mine related activities. With the exception of approximately 21 acres of disturbance on land managed by the United States Department of Agriculture, Forest Service (U.S. Forest Service), the entire surface disturbance is on the mine site owned by the State of California.

Vehicular access to the mine is provided by unpaved roads from State Highway 89 on the southeast and from U.S. Highway 395 south of Gardnerville, Nevada, on the northeast. Vehicular access to the mine is limited by snowfall, steep grades, narrow roads with sharp turns and muddy and rough road conditions, so that the Site may be inaccessible to heavy equipment, supply delivery trucks, emergency personnel and other vehicles from as early as October to as late as July, depending on weather. The California-Nevada border lies approximately three miles northeast of the mine.

The disturbed areas of Leviathan Mine are sparsely vegetated. Although there is some volunteer vegetation, most existing vegetation is due to localized revegetation efforts carried out by the LRWQCB. No external sources of potable water or power are available at this remote mine.

#### 2. Releases or threatened releases into the environment of a hazardous substance, pollutant, or contaminant

There are several sources of AMD at the Site which may impact Leviathan Creek. When a release from the Site occurs, it may flow into the Leviathan Creek/Bryant Creek watershed, which drains into the East Fork of the Carson River. Unless treated, the releases contain elevated concentrations of metals and metalloids, most notably arsenic, as well as iron, aluminum, chromium, cobalt, copper, nickel, and zinc. The low pH and high metals content of the AMD historically limited most aquatic life in Leviathan Creek and portions of Bryant Creek downstream of the mine, until responses activities were initiated. These releases originate in California and, at times, may have flowed into Nevada and into the East Fork of the Carson River, which serves as a major source of water supplies and a habitat for fish, including a historical habitat for the federally-listed threatened Lahontan cutthroat trout.

### 3. Site ownership

Mining began at the Site in the 1860's and continued on an intermittent basis for nearly 100 years. The Site was initially developed as an underground mine for gold, copper and copper sulfate from approximately 1863 to 1873. There is evidence of sporadic mining activity thereafter until 1933, when a private party acquired the site for sulfur production. Between 1933 and 1951 several companies owned and operated the mine and developed a series of underground tunnels and adits and a sulfur mill on Site. Anaconda Copper Mining Company (which later became The Anaconda Company) ("Anaconda") acquired the Site in 1951 and further developed it between 1952 and 1953. Anaconda extracted sulfur ore through open pit mining until 1962, at which time, mining ceased and the Site was sold to another party. In 1977, Atlantic Richfield purchased all of Anaconda's stock, and in 1981 it merged with Anaconda.

In 1984, the state of California acquired approximately 495 acres of the mine property to pursue cleanup and abatement of the water quality problems associated with historic mining. State jurisdiction over the mine property rests with the State Water Resources Control Board which, in turn, has delegated authority over the mine property to the LRWQCB.

### 4. NPL status

On May 11, 2000 (65 Fed. Reg. 30482), pursuant to section 105 of CERCLA, 42 U.S.C. § 9605, EPA listed the Site on the National Priorities List, set forth at 40 CFR Part 300, Appendix B.

### 5. Memorandum of Agreement with Natural Resource Trustees

On April 9, 1998, EPA entered into the Leviathan Mine Site Memorandum of Agreement among the Washoe Tribe of Nevada and California, The United States Environmental Protection Agency, The United States Department of the Interior, and the United States Department of Agriculture (MOA). The Nevada Department of Environmental Protection and the California Department of Fish and Game subsequently joined the MOA. Section VII of the MOA provides for coordination of efforts of these parties regarding collection of data, assessment of risks, evaluation of alternative possible response actions and natural resource restoration actions, and development and implementation of a strategy to seek to have liable parties perform and/or pay for the costs of response, restoration, compensation for natural resources damages, and operation and maintenance of the Site.

In addition to the parties to the MOA, other stakeholders who have participated in discussions that led to the development of the NTCRA include neighboring property owners, community members, academic researchers, and representatives of the Carson Water Subconservancy District, Alpine County, California, and Douglas County, Nevada.

## B. Evaporation Ponds: Construction, Overflow, Treatment, and Enforcement

In an attempt to mitigate releases of AMD, the LRWQCB constructed five lined storage and evaporation ponds and other surface water and groundwater diversion structures on-site between 1983 and 1985. These ponds collect AMD from an adit and a drainage system built by the LRWQCB under the mine pit (“PUD”). From the time of the construction of the ponds until the first successful season of treatment in 1999, evaporation during the dry summer season would decrease the total volume of AMD and concentrate the contaminants within these ponds. However, the combined flow of AMD and direct precipitation (rain and snow) into the ponds exceeded evaporation losses from the ponds in most years between 1985 and 1999, so that the ponds usually reached capacity (approximately 16 million gallons) and then overflowed into Leviathan Creek. Estimates of the overflow from a particularly wet winter range up to 9 million gallons per year. Without annual preventative action, such overflow could reoccur.

In May 1998, EPA issued an Administrative Order on Consent for Removal Action (1998 AOC) to Atlantic Richfield. Under the 1998 AOC, Atlantic Richfield agreed to remove a certain quantity of liquids collected in the evaporation ponds, to collect specified information on Site conditions, and to reimburse EPA, other agencies of the United States, and the Washoe Tribe of Nevada and California for certain response costs incurred by them, not inconsistent with the NCP. While Atlantic Richfield succeeded in removing millions of gallons of liquid from the evaporation ponds in a manner consistent with the NCP, Atlantic Richfield was not able to achieve the total amount of removal required by the 1998 AOC.

EPA and Atlantic Richfield modified the 1998 AOC on February 18, 2000. The modification to the 1998 AOC required Atlantic Richfield to perform a Riparian Conservation Project, and it provided that Atlantic Richfield’s obligations under the 1998 AOC would be terminated after receipt of payment for EPA’s response costs incurred in connection with the 1998 AOC between March 1, 1998 and the effective date of the modification to the AOC, which was February 18, 2000. In November, 2001, Atlantic Richfield performed the required Riparian Conservation Project by spending \$720,000 to purchase 480 acres of undeveloped land in the Bald Mountain Range in Sierra County, California, donating the land to the Washoe Tribe of Nevada and California, and donating a conservation easement to the Nature Conservancy along with funds for the costs of administering the easement in perpetuity. Atlantic Richfield paid the response costs EPA billed under the 1998 AOC or its modification, except for certain cost items that were specifically disputed.

In the summer of 1999, the LRWQCB conducted a treatability study to evaluate a particular process for neutralizing the AMD held in the evaporation ponds. The process tested by the LRWQCB is referred to as biphasic neutralization. The treatability study demonstrated that biphasic neutralization could be used to treat the AMD to a level acceptable for discharge to Leviathan Creek, considering all of the exigencies of the situation prior to design of further response actions. Operation of this system in the summer of 1999 reduced the level of AMD in the ponds to a significant extent. Further activity in the spring of 2000 prevented overflow that year.

On July 19, 2000, EPA issued an Administrative Abatement Action (“AAA”) under Section 106(a) of CERCLA, 42 U.S.C. § 9606(a), to the LRWQCB, pursuant to which the LRWQCB treated the AMD in the evaporation ponds. The LRWQCB successfully treated sufficient quantities of AMD in the summer of 2000 so as to prevent pond overflows in 2001.

The AAA was modified in each of the years 2001, 2002, 2003, and 2004, to provide for the LRWQCB to perform a similar removal action each summer, each of which has succeeded in preventing pond overflows in the following year. EPA, in consultation with the LRWQCB, issued a new AAA in 2005 directing the LRWQCB to provide for treatment of the AMD captured in the evaporation ponds each year until a final remedy is selected and implemented. During each summer from 2001 through 2008, the LRWQCB effectively emptied the ponds of AMD in preparation for capture throughout the subsequent winter and spring. Each year, EPA and the LRWQCB have further developed the treatment system, so as to respond to changing chemistry in the ponds and improve AMD treatment and sludge handling techniques.

During the winters of 2004-5 and 2005-6, total precipitation exceeded 29 and 27 inches of water content respectively. This is somewhat higher than the average over the last 16 years on record but still less than the 37 inches measured in the wet year of 1995. In the spring of 2005 and 2006, the LRWQCB mobilized a portable temporary lime treatment system to the Site in early spring to respond to near-overflow conditions in the evaporation ponds. For several days in mid-April 2006, an uncontrolled overflow of untreated or partially treated pond water discharged to Leviathan Creek before the temporary treatment system was able to draw down the pond water levels sufficiently.

### C. Other AMD Releases, Early Response Actions, and Remedial Investigation/Feasibility Study

In addition to the contaminated water collected in the evaporation ponds, other sources of AMD from the Site may contribute year round to the contamination of the Leviathan Creek/Bryant Creek watershed unless they are captured and treated prior to discharge. The CUD collects subsurface water from beneath a portion of the concrete Leviathan Creek diversion channel that was built by the LRWQCB. The CUD usually discharges roughly 15 to 30 gallons per minute (“gpm”) into Leviathan Creek, although flows exceeded 40 gpm for several months in 2006 following a second wet winter.

The Delta Seep is an area where surface discharges of AMD exit the lowest portion of the mine waste rock in Leviathan Canyon, known as the Delta Slope, approximately 600 feet downstream from the end of the diversion channel. Prior to 2005, the Delta Seep flow had been typically measured at approximately 10 gpm. The LRWQCB’s actions to stabilize the Delta Slope in 2005 added a rudimentary system for subsurface dewatering and drainage of the face of the slope. Prior to 2007, flows from the discharge pipe of these drains and the surface seepage from the toe of the slope were not adequately collected, and flow rates can only be estimated. In 2005 and 2006, the Delta Seep flows appeared to have increased over the flows during the earlier, drier years.

Aspen Seep is a series of surface flows, which at times totals more than 10 gpm from low points of the waste rock in the Aspen Creek drainage. Water quality measurements taken by the LRWQCB and Atlantic Richfield indicate that these sources are somewhat less acidic and less highly concentrated in arsenic and metals than water collected in the evaporation ponds.

On November 22, 2000, EPA issued an administrative order requiring Atlantic Richfield to submit work plans for a phased RI/FS for developing a long-term response to releases from Leviathan Mine (“Administrative Order”). Additionally, the Administrative Order required Atlantic Richfield to plan and implement Early Response Actions (“ERAs”) to address known releases from Leviathan Mine that are not captured in the evaporation ponds.

Atlantic Richfield has implemented ERAs since 2001. The ERAs have emphasized treatment of known sources of AMD, both to develop feasible methods of addressing these releases and to allow examination of whether there are other sources of contamination originating at the Site by measuring how the creeks respond to treatment of the known releases.

During 2001 through 2008, Atlantic Richfield captured and treated flows from the CUD for a portion of each year.

During 2001 and 2002, the LRWQCB conducted a geotechnical analysis of the stability of the mine wastes near the Delta Seep. In 2003 and 2004, Atlantic Richfield captured the Delta Seep flows and pumped them uphill for treatment along with CUD flows. However, slope instability issues and mudflows from rain storms hampered Delta Seep efforts in both 2003 and 2004, and the Delta Seep effort ended early in the 2004 season. A major project sponsored by the LRWQCB to reconfigure and stabilize the Delta Slope was completed during the 2005 field season. Atlantic Richfield resumed partial capture and treatment of the Delta Seep in 2007 consistent with the 2007 -08 Treatability Studies and Interim Treatment Work Plan.

In 1996, University of Nevada - Reno researchers began to partially address the seep of AMD into Aspen Creek by a demonstration biological treatment project. This project was funded by the LRWQCB until June 30, 2001, when Atlantic Richfield assumed the project funding. The Aspen Creek treatment utilizes a biological process to reduce sulfate to sulfide and precipitate metal sulfides which are relatively insoluble. Pursuant to the Administrative Order, Atlantic Richfield expanded and improved this biological treatment system, which began capturing and treating all AMD flowing into the Aspen Creek by the summer of 2003. This system operates through the winter. Development and testing of improvements to the bioreactor process are important components of this early response action and treatability study. In 2007 and 2008, Atlantic Richfield made additional improvements to the Aspen Seep treatment system consistent with the 2007 -08 Treatability Studies and Interim Treatment Work Plan.

An integral part of past and future pond water treatment and other response actions includes assessment of the effectiveness of the action through water quality monitoring at the Site and in downstream waters as well as measurement of streamflow and meteorological conditions throughout the year. The LRWQCB has monitored water quality since its first involvement, and has increased the intensity of the investigation of site characteristics since 1998.

The ERAs to date have demonstrated effective technologies for seasonal treatment of the AMD discharges at the Site and confirmed that the known releases contribute the majority of contaminants affecting the streams during the dry season. Based on what has been learned over the past few years through ERAs performed by Atlantic Richfield, the removal actions performed by the LRWQCB, the initial stages of RI/FS activity, and discussions with the stakeholders, EPA, on November 13, 2003, directed Atlantic Richfield to prepare an EE/CA to evaluate options for capturing and treating the AMD year round to specified discharge criteria.

Atlantic Richfield developed the Draft EE/CA with input from EPA and other stakeholders, and submitted the Draft EE/CA on April 2, 2004. The LRWQCB had a reasonable opportunity to review and comment on the proposed EE/CA pursuant to Section 106(a) of CERCLA, 42 U.S.C. §9606(a), and 40 C.F.R. § 300.500. EPA received comments from the public, in writing and in a public meeting held on May 4, 2004.

EPA signed a NTCRA Memorandum on July 12, 2005, selecting a phased program for testing the effectiveness and reliability of on site year-round AMD treatment. EPA and other stakeholders identified uncertainties of winter treatment at this remote site with no existing power source and without reliable personnel access during periods of deep snow and muddy roads. At the time, active treatment of AMD at an elevation of approximately 7,000 feet, under harsh winter conditions and without day-to-day access, had not been implemented anywhere else in the nation. Consequently the new efforts during the initial years were to focus on flows from the CUD and Delta Seep, which had been allowed to discharge untreated except during the summer treatment season. Subsequent incorporation of the Adit and PUD into a combined year-round treatment system was postponed until the winterized treatment system for the CUD and Delta Seep could be proven reliable, although the pond system did not provide sufficient storage capacity for a year of particularly high precipitation.

An additional objective of the NTCRA was to eliminate untreated AMD discharge to the watershed to provide an opportunity to determine the scope of the subsequent phases of the RI/FS, given that such interception and treatment can be expected to substantially alter the nature and extent of the threats posed by the Site. The elimination of the major known discharges was expected to allow quantification of the effect of sediments and any other remaining sources without the confounding effect of replenishment of contaminated sediments for most of the year, particularly during the start of the lower flow conditions in late spring.

#### D. Attempts to Implement the 2005 NTCRA Memorandum.

During the latter part of the 2005 construction season, Atlantic Richfield successfully tested a common lime treatment system known as High Density Sludge (“HDS”). This method is often preferred since the treatment solids or sludge form denser particles that more easily dewater than sludge generated from conventional lime treatment, producing significantly lower volumes of waste solids that are easier to handle.

On May 4, 2006, Atlantic Richfield submitted a draft work plan for a winter treatability study to test the effectiveness and reliability of the HDS system for year-round treatment of CUD and Delta Seep flows (“High Density Sludge Treatment System Design and 2006/2007 Winter Operations Work Plan”). EPA approved this work plan with comments on June 2, 2006, and directed Atlantic Richfield to implement the work plan. Atlantic Richfield submitted a second work plan on May 26, 2006, for HDS treatment during the summer of 2006 prior to full implementation of the winterized treatability study. EPA approved and directed implementation of this work plan on July 14, 2006, commenting that EPA expected that Atlantic Richfield would plan to continue to capture flows from the CUD and Delta Seep during the conversion period, even if the summer treatment system would not be able to operate for a number of days.

The design of the winterized treatment system became more complex than initially had been anticipated, including a much larger and more elaborate building than had been envisioned, due in part to the need to enclose and heat more sludge-handling facilities, more power generation, more operator health and safety features and additional snow- and wind-load structural features. The HDS process has not been tested under conditions where operator access is limited for days or possibly weeks at a time. Atlantic Richfield became quite concerned over operator health and safety issues that arose over the need to have personnel present at this remote site for much of the winter.

Construction of the winterized system began on-site in July 2006. Although a great deal of work was done including preparing foundations and routing some of the transmission piping, by October it became clear to Atlantic Richfield that concerns about access and worker safety would prevent the project from being completed during 2006, and the effort was terminated for that year.

On November 17, 2006, EPA sent Atlantic Richfield a letter stating that Atlantic Richfield had failed to comply with EPA directives under the Administrative Order to implement the schedule and AMD capture requirements of the approved work plans, and that EPA intended to seek penalties and punitive damages.

During the following autumn and winter, Atlantic Richfield met with EPA and technical representatives of stakeholder groups to present its analysis of the feasibility of year-round treatment at Leviathan Mine. Atlantic Richfield’s mine treatment experts present at the meeting explained that HDS was the preferred option for lime treatment due to the reduced volume of waste solids and simplified handling of this sludge. Because of the remote conditions of Leviathan Mine, it became apparent during the 2006 attempt that the level of design and robustness of construction required for year-round treatment was significantly greater than had

previously been anticipated. EPA determined that any year-round treatment would be more appropriate following a thorough RI/FS and formal Record of Decision (“ROD”). As on-site winterized treatment is now envisioned, it would require capital investment and lasting effects on land use more appropriate to consider as a final remedy. Such a remedy will be analyzed in the RI/FS, where it would be compared to other potential remedies, such as increased biological treatment, off-site treatment or additional pond storage, which were determined by EPA in the NTCRA Memorandum to be inappropriate to implement as interim remedies due to similar challenges.

EPA invited all interested stakeholders including representatives of all commenters on the EE/CA to participate in the November 2006 Technical Advisory Committee meeting, at which difficulties with the year-round treatment were discussed. Thirty-nine individuals - representing 12 tribal, state, federal and local government agencies as well as several businesses - attended this meeting. At that meeting and in subsequent communication, EPA invited participation of the stakeholders in a January 2007 technical meeting to explore the problems encountered with implementation of year-round HDS treatment and possible solutions to the challenges. Seventeen individuals participated, representing tribal, state, federal and private entities.

EPA considered Atlantic Richfield’s presentation, comments of other stakeholders, and the advice of experienced engineers and researchers at EPA. EPA has determined that safe and daily availability of winter access for personnel is necessary for reliable operation of an HDS lime treatment system at this time. EPA has determined not to require implementation of such a system on a year-round basis prior to a thorough RI/FS and ROD process.

Personnel have been able to access the Site by four-wheel drive vehicles at certain times when early spring and late autumn conditions preclude access by large delivery vehicles and other heavy equipment. Although EPA has determined that the requirements for implementing on-site winterized treatment of CUD and Delta Seep flows exceed the scope of the NTCRA, treatment during such limited access periods, to the extent practicable, may provide watershed protection from AMD and accumulation of contaminated sediment during critical low-flow stream conditions. Equally important, treatment during spring and autumn will provide information about operations during cold weather, which can negatively affect treatment chemistry, plant operations and the physical conditions for sludge handling.

Accordingly, EPA has concluded that the best way to further these goals is to modify the NTCRA to stress the importance of lengthening the period for collecting and treating flows from the CUD and Delta Seep and acknowledging that the design and implementation of on-site winterized treatment of CUD and Delta Seep flows are more appropriate for consideration as a long term remedy. The modified NTCRA shall include on-site interception and treatment of AMD from CUD and Delta Seep areas from spring (June 1) through autumn (September 30). During this period weather and road conditions typically permit safe personnel travel to the Site and also allow delivery of the types and quantities of supplies needed to operate a reliable lime treatment system such as the HDS system currently under construction. Capture and treatment of the other three known sources of AMD (Adit, Pit Underdrain and Aspen Seep) shall continue as described.

During the limited access season from October through May, and particularly during the spring and autumn, weather and road conditions may allow some personnel and reduced quantities of supplies and equipment to reach the site safely for limited treatment trials. Under such conditions, the NTCRA shall include capture and treatment of CUD and Delta Seep flows in cold weather trials of the HDS system or a smaller scale alternative such as a portable treatment system.

The remaining tasks for the RI/FS shall continue as required by the Administrative Order issued on June 23, 2008. This early response action shall continue until the final site remedy is fully implemented or as directed by EPA.

#### E. State and Local Authorities' Roles

##### 1. State and local actions to date

The state of California obtained title to the Leviathan Mine Site in 1984 in order to facilitate access during its efforts to address contamination at the site. The LRWQCB manages the Site, and has undertaken pollution abatement projects described above. In addition to the pond water treatment project, the LRWQCB continues to take other action at the Site, researching AMD treatment methods, monitoring water quality and flow, and conducting site maintenance. There have been no substantive cleanup efforts by other state or local agencies. The states of California and Nevada and the Washoe Tribe of Nevada and California, as well as county and local agencies in both California and Nevada, have expressed their strong desire to see the contamination from Leviathan Mine addressed, and have participated in the cleanup process by attending meetings and submitting written comments.

##### 2. Potential for continued State/local response

In each season since 1999, the LRWQCB has successfully treated the AMD in the evaporation ponds. Continued improvement, optimization and documentation of the treatment process remain objectives for use in decision making for long-term response. This nine year record of successful treatment by the LRWQCB shows a strong potential for a continued State response to the release. It is anticipated that the LRWQCB will continue to capture the Adit and PUD flows in the evaporation ponds and treat this AMD each summer until the final site remedy is fully implemented or as directed by EPA. Work plans for the portion of the NTCRA addressing capture and treatment of Adit and PUD flow by the LRWQCB shall continue to include contingencies for springtime treatment, as needed to prevent pond overflow in wet years.

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

The threats to public health, welfare, or the environment are those identified in Section III of the Leviathan Mine Hazard Ranking System Documentation Record Review.

### IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances, if not addressed by implementing the response action selected in this Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment. Preliminary monitoring results of biological indicators and stream water quality indicate that a reduced treatment season during 2005 and 2006 has likely resulted in conditions detrimental to ecosystem recovery.

### V. PROPOSED ACTIONS AND ESTIMATED COSTS

#### A. Proposed Actions

The NTCRA at Leviathan Mine shall consist of on-site interception and treatment of Acid Mine Drainage (AMD) originating at two source areas, CUD and Delta Seep, from June 1 through September 30 when the site typically can be safely accessed by personnel, vehicles and equipment. The collection and treatment system shall be designed, constructed and operated to test treatment methods that could be considered for the final site remedy. Additionally, spring and autumn treatment trials shall be conducted as weather and road conditions safely permit.

Development and operation of the Aspen Seep treatment system and the Pond collection and treatment system for the Adit and PUD shall continue throughout the NTCRA.

The objectives of the NTCRA can be summarized as:

- Improve temporary protection of human health and environment from the known AMD discharges to the extent practicable. EPA remains committed to selecting a protective long-term remedy based on a complete RI/FS.

- Obtain critical information for selecting a long-term remedy.

- 1) Eliminate gross discharge during critical low flow periods of the spring, and as much of the summer and autumn as practicable, to allow a more thorough Risk Assessment for long-term risks.

- 2) Gain experience in operating systems to capture and/or treat the AMD at Leviathan at low temperatures.

- Implement the Response Action in a timely manner both to optimize health and environmental protection and to allow the Risk Assessment and Feasibility Study data gathering to proceed to the next stage.

The primary activity of this NTCRA will be to design, construct and operate capture systems and a neutralization treatment system during the summer months (June through September) to treat the AMD discharged at the CUD and Delta Seep at Leviathan Mine by raising the pH, reducing the dissolved concentrations of metals in the AMD, and separating the resulting solids from the water. The treated effluent will be discharged to the Leviathan Creek system. The method of treatment and the placement of sludge generated from the treatment shall be addressed in Work Plans for site work at Leviathan Mine submitted by Atlantic Richfield and the LRWQCB to EPA for approval.

In addition, supplementary capture and treatment of the AMD from these two sources shall be implemented during as much of the spring and autumn as EPA determines to be safe and practicable.

Other site activities such as site maintenance and continued monitoring are also elements of this NTCRA, which will be described in more detail in Work Plans which will be submitted for the implementation of this NTCRA.

1. Proposed action description

The major anticipated tasks that will be involved in the proposed response actions include:

- a. Continue summer treatment of flows from the CUD.
- b. Continue summer treatment of surface flows from the Delta Seep.
- c. Design, construct and operate an on-site treatment system to test the effectiveness and reliability of treating the CUD and Delta Seeps from June through September, consistent with NTCRA objectives.
- d. Design and implement a supplementary capture and treatment system for CUD and Delta Seep during as much of the spring and autumn as EPA determines to be safe and practicable. Primary factors in this determination will be the judgment of weather and road conditions sufficient for safe access and egress for personnel and equipment.
- e. Design and construct capture and transmission pipes for the CUD and Delta Seep appropriate for cold weather conditions expected.
- f. Monitor the existing capture systems for the CUD and Delta Seep and propose improvements as necessary and appropriate for a removal action.

g. Continuing Actions - The following activities will continue through implementation of the NTCRA:

- i. Continue the existing summer treatment of the flows from the Adit and PUD, captured year round in the existing ponds,
- ii. Continue to operate and develop the existing Aspen Seep bioreactor,
- iii. Evaluate on-site and off-site solids disposal options,
- iv. Develop contingency plans for potential treatment system failure, and
- v. Sampling, as described in the following paragraph.

Environmental sampling of water quantity and quality for intake and discharges into Leviathan Creek from the treatment system shall be performed. In addition to monitoring water quality and system performance data collection, sampling will be performed as described in the applicable Work Plans submitted to and approved by EPA, to assure that each treatment system's effluent is in conformance with the standards set forth in Table 1, below, or other standards identified in writing by EPA.

## 2. Contribution to long-term cleanup performance

The proposed NTCRA will contribute to the RI/FS required by the Administrative Order issued on June 23, 2008. The NTCRA will address the imminent threat posed by the identified sources of AMD discharge, including the overflow of the AMD evaporation ponds. The information gathered pursuant to the NTCRA will be used to inform the long-term RI/FS, and extended treatment of the identified sources of AMD discharges will assist EPA to identify remaining impacts to be addressed in the long-term RI/FS.

The immediate threats of pond overflow and other direct AMD discharges that are addressed in this NTCRA require attention prior to, or concurrent with, the start of a long-term cleanup. To ensure that the immediate threats are adequately abated, the removal action will address only the immediate hazards of untreated AMD discharges from the identified sources, namely the Adit, PUD, CUD, Delta Seep and Aspen Seep. The information that will be gathered to assess the effectiveness and reliability of the action will be used for developing future responses, including long-term response actions.

## 3. Description of alternative technologies, response to comments, and discussion of decision

The analysis of alternative technologies and response to comments in Section V.A.(3) of the July 12, 2005 NTCRA Memorandum, remains applicable to this modified NTCRA. In the 2005 NTCRA Memorandum, EPA commented:

EPA agrees that technical and administrative hurdles face the successful implementation of a combined flow, year-round system at Leviathan Mine. Any winterized treatment of AMD at Leviathan Mine presents challenges that have not previously been surmounted elsewhere, because of the remoteness of the Site.

Atlantic Richfield's attempt to design and construct a year-round treatment system in 2006 encountered challenges that called into question many of the assumptions inherent in the EE/CA. For example, EPA had expected that the need for on-site personnel would be greatly minimized through a system of remote operation and control. During the design effort in 2006, major issues of assuring operator safety became paramount. At a January 25, 2007 technical meeting, Atlantic Richfield discussed the rationale for designing an HDS lime treatment system for Leviathan and the need for operator access for a greater on-site presence than had been assumed. EPA determined that the level of construction necessary for operation throughout the winter is beyond the scope of the effort anticipated in the 2005 NTCRA Memorandum.

In the springs of 2005 and 2006, the LRWQCB has successfully mobilized a temporary treatment system to the site to prevent pond overflow, using standard 4 wheel drive vehicles for personnel and equipment transport. EPA has determined that it is reasonable to design and operate a supplementary capture and treatment system for CUD and Delta Seep during as much of the spring and autumn as EPA determines to be safe and practicable. Primary factors in this determination will be the judgment of weather and road conditions sufficient for safe access and egress for personnel and equipment.

EPA has determined that NTCRA objectives can best be addressed through a treatment approach for CUD and Delta Seep that provides certain operation during the summer and extends operation into the spring and autumn as safe and practicable. Protectiveness of the downstream ecological and human receptors will increase during biologically important periods and periods when lower creek flows magnify the impact of AMD discharge. Safe access for personnel via standard 4-wheel drive vehicles typically coincides with the later stages of high spring runoff flows in the Leviathan Creek Drainage. As the flow rate declines in the spring, we have observed increasing water quality degradation and precipitation of contaminated sediment due to untreated AMD releases from CUD and Delta Seep. The same phenomenon has been observed at the end of the summer treatment system when untreated AMD is allowed to discharge when the creeks are in a relatively low flow condition.

Additionally, operators with experience at Leviathan Mine have pointed out that low-temperatures can negatively affect treatment effectiveness. Extending the treatment system into periods of cold weather will develop information on reliability, effectiveness and cost of lime treatment systems critical to analyzing long-term remedial options.

#### 4. Applicable or relevant and appropriate requirements

A removal action shall, to the extent practicable, considering the exigencies of the situation (e.g., the urgency of the situation and the scope of the removal action to be performed), attain applicable or relevant and appropriate requirements (ARARs) under federal or state environmental laws. 40 C.F.R. § 300.415 (j). Potential ARARs include the Clean Water Act (CWA), state water quality laws, RCRA requirements, the California Hazardous Waste Control Law, and state water quality laws for sludge disposal. Other federal and state advisories, criteria, or guidance may, as appropriate, be considered in formulating the removal action.

This Section of the Memorandum explains the extent to which it is practicable to meet ARARs and establishes Discharge Criteria for the effluent which will be released pursuant to the NTCRA. These Discharge Criteria, which are listed in Table I, are based on current exigencies and information, and they may be modified, as necessary, as the situation changes and as more information becomes available. Previous removal action memoranda for the Site have included the same criteria for the same substances, and these criteria were attained for effluent from treatment systems operated at the Site through the most recent treatment season in 2006. Final long-term remediation goals will be determined during the remedy selection process as described in 40 C.F.R. § 300.340. Long-term remediation goals establish acceptable site-specific exposure levels that are protective of human health and the environment.

**Water Quality in Receiving Waters.** A primary adverse environmental impact from the Leviathan Mine discharges is on surface waters and the species which live in those waters. The CWA and the California Water Code contain requirements for control of discharges into surface waters. In setting the goals for any final remedy, EPA will consider whether any discharge from the mine to surface waters should comply with the water quality objectives, including those set forth in the Lahontan Regional Water Quality Control Basin Plan and the Numeric Criteria for Priority Toxic Pollutants for the State of California (Numeric Criteria), promulgated by EPA for the state of California in 40 C.F.R. § 131.38(b)(2) (May 18, 2000).

The NTCRA is intended to respond to all identified releases of AMD from the Site into Leviathan, Bryant and Aspen Creeks while the site is safely accessible to operators, including those collection and treatment systems that are capable of running through the winter months. Until a final remedy to capture and treat all sources throughout the year can be selected and implemented, unmitigated releases during portions of the year will prevent reliable attainment of water quality standards in Leviathan and Bryant Creeks. Furthermore, during significant portions of the year, streamflow originating upstream of Leviathan Mine is minimal and the water quality of Leviathan and Bryant Creeks may be dominated by the discharge of treated water from the treatment systems. Also, during periods when the site is inaccessible, it may not be possible to safely detect or undertake timely corrective actions to address any system failures. Thus, under all of the exigencies of the situation, it is not practicable by this NTCRA to attain compliance with all ARARs for the water quality of receiving waters. However, Discharge Criteria for the effluent are either based on or in addition to the Numeric Criteria.

Effluent standards. The CWA regulates, among other matters, the discharge of pollutants from point sources into navigable waters of the United States. The discharge of effluent from a treatment system at Leviathan Mine into Leviathan Creek is a discharge of pollutants from a point source into navigable waters of the United States.

Clean Water Act controls are imposed on industries through National Pollutant Discharge Elimination System (NPDES) permits, or Waste Discharge Requirements, which are permitted on a case by case basis. No permit is required for this NTCRA since the discharges from the treatment systems will occur on-site pursuant to a removal action selected and carried out under CERCLA. 42 U.S.C. § 9621(e)(1). However, to the extent practicable under all the exigencies of the situation, a discharge must meet the substantive requirements of such a discharge permit.

In establishing discharge limits for a point source, the permitting agency considers guidelines based on both the technology available to control the pollutants for the specific industrial category of the discharger, as well as standards that are protective of the water quality. NPDES permits must include conditions necessary to achieve water quality standards established under Section 303 of the CWA, where these are more stringent than promulgated effluent limitation guidelines. 40 C.F.R. § 122.55(d). In the event there are no specific effluent limitation guidelines for the type of discharge at issue, the CWA provides that the permit shall contain “such conditions as the Administrator determines are necessary to carry out the provisions of this chapter.” 33 U.S.C. § 1342(a)(1)(B). EPA uses “best professional judgment” to establish the effluent limitations if there is no effluent guideline regulation for the specific discharge category.

There are no technology-based effluent limitations specifically identified for inactive sulfur or copper mines. There are technology-based limitations for active metal mines, including copper mines (40 C.F.R. §§ 440.102 and 440.103), iron mines (40 C.F.R. §§ 440.12 and 440.13), and aluminum mines (40 C.F.R. §§ 440.22 and 440.23). Because the problems of AMD from historic mining at the Site are similar to the problems of existing active metal mines, the effluent limitation guidelines for such mines may be relevant and appropriate at the Site. However, for the relevant metals classified under the CWA as Priority Toxic Pollutants, the Numeric Criteria are more stringent than the effluent limitations guidelines for active metal mines. Consequently, the Discharge Criteria for the Priority Toxic Pollutants are based on the Numeric Criteria, while other Discharge Criteria are derived from the effluent limitations guidelines for active metal mines and EPA’s best professional judgment based on the results from the last four years of operation of the treatment systems at Leviathan Mine.

EPA determines that it is practicable for all discharges to meet the Discharge Criteria set forth in Table 1 during periods when the Site typically is fully accessible from June 1 through September 30, except during the initial implementation of the treatment (start-up period) or during optimization trials intended to ultimately improve treatment performance. EPA recognizes that it currently may not be practicable to attain these Discharge Criteria at other times and during cold weather.

Table 1 presents both Maximum and four-day Average Discharge Criteria for the protection of aquatic life from acute and chronic exposure effects, respectively. The Maximum concentration equals the highest concentration of a pollutant to which aquatic life can be exposed for a short period of time without deleterious effects. The Average concentration equals the highest concentration of a pollutant to which aquatic life can be exposed for an extended period of time (4 days) without deleterious effects. Effluent meets the Discharge Criteria when no sample exceeds a Maximum criterion and the average of samples taken over a four day period does not exceed an Average criterion.

When the Site is accessible, the effluent shall be sampled and analyzed according to the methods and schedule provided in the footnotes of Table I, unless and until EPA determines that a less intensive monitoring program provides adequate and protective process control. The relevant Work Plans shall describe sampling and analysis techniques appropriate for cold weather operations. Both Maximum and Average Discharge Criteria in Table 1 are to be measured at a point before the treated water is discharged.

There are eight minerals released from the Site which are Priority Toxic Pollutants for which Numeric Criteria are established in 40 C.F.R. § 131.38(b)(2): arsenic, cadmium, chromium, copper, lead, nickel, selenium and zinc. For these Priority Toxic Pollutants, the Discharge Criteria in Table 1 are derived from the Numeric Criteria, which are more stringent than any effluent limitations guidelines for discharges of these minerals from active metal mines, as provided in 40 C.F.R. Part 440.

Freshwater Aquatic Life Numeric Criteria for some metals are a function of the total hardness of the receiving water body. Hardness is a measure of dissolved calcium and magnesium expressed in mg/L. The presence of these minerals in water tends to decrease the toxicity of certain metals, such that a concentration of metals that are toxic to aquatic life when the hardness is 50 mg/L might not be toxic in water at 400 mg/L of hardness.

The Discharge Criteria in Table 1 are calculated for receiving water with a hardness of 200 mg/L (Ca CO<sub>3</sub>). The hardness measured in Leviathan and Bryant Creeks below the mine during July and August of 2000 during low flow conditions ranged from well above 400 mg/L (very hard) to approximately 200 mg/L (moderately hard, in Bryant Creek). Hardness values in Leviathan and Bryant Creeks also tend to decrease with dilution from snowmelt during higher flow periods. Although a specific point of compliance has not been formally established, it is EPA's goal to protect aquatic life that has been observed in Bryant and Leviathan Creeks in recent years. Given all the exigencies of the situation, it will not be practicable to fully restore the aquatic community in Bryant and Leviathan Creeks until year-round capture and treatment is successfully implemented at all known sources of AMD. Therefore EPA's best professional judgment is to use the moderate hardness value of 200 mg/L, as measured in the upper reaches of Bryant Creek, to calculate the Discharge Criteria for this NTCRA.

TABLE I  
DISCHARGE CRITERIA

Water Quality	Parameter	Maximum f2	Average f4
	pH	Between 6.0 and 9.0 SU f1	
Arsenic	(dissolved)	0.34 mg/l	0.15 mg/l f3
Aluminum	(dissolved)	4.0 mg/l	2.0 mg/l f3
Cadmium	(dissolved)	0.009 mg/l	0.004 mg/l f3
Chromium	(dissolved)	0.97 mg/l	0.31 mg/l f3
Copper	(dissolved)	0.026 mg/l	0.016 mg/l f3
Iron	(dissolved)	2.0 mg/l	1.0 mg/l f3
Lead	(dissolved)	0.136 mg/l	0.005 mg/l f3
Nickel	(dissolved)	0.84 mg/l	0.094 mg/l f3
Selenium	(total recoverable)	Not Promulgated	0.005 mg/l f3
Zinc	(dissolved)	0.21 mg/l	0.21 mg/l f3

f1 pH measurement based on 24-hour (single day) average discharge.

f2. Concentrations based on daily grab samples, each grab sample field-filtered and acid fixed promptly after collection.

f3 Concentrations based on four daily grab samples, each grab sample field-filtered and acid fixed promptly after collection.

f4 If the concentration detected by the contract laboratory is less than the detection limit, ½ the detection limit shall be used in calculating the Average concentration.

For water quality parameters that are not Priority Toxic Pollutants, the Discharge Criteria are based on the effluent limitations guidelines provided in 40 C.F.R. Part 440 or on EPA's best professional judgment based on experience at the Site. The range for pH in Table 1 is equal to the range for pH for effluent from active copper mines set forth in 40 C.F.R. §§ 440.102(a) and 440.103(a). The Discharge Criteria in Table 1 for dissolved iron are consistent with those provided for effluent from active iron mines set forth in 40 C.F.R. §§ 440.12 and 440.13, and also consistent with guidance for water quality from Quality Criteria for Water, EPA 440/5\_86\_001 (Washington, D.C. 1986).

The Discharge Criteria for aluminum in Table 1 are based on results from the LRWQCB's Leviathan Mine treatment system operational data for six years (1999-2004). These Discharge Criteria for aluminum are not as protective as the limits for effluent from active aluminum mines set forth in 40 C.F.R. §§ 440.22 and 440.23, which may be relevant and appropriate. In past trials, efforts to maintain low aluminum concentrations resulted in less efficient removal of nickel, and higher standards were necessary to ensure the promulgated aquatic life standards for nickel were achieved. Future discharge criteria for aluminum will consider treatment system effectiveness and risk-based goals in light of site-specific operating experience.

Sludge disposal. Sludge produced from the treatment of AMD at Leviathan is excluded from regulation under RCRA Subtitle C pursuant to the Beville Amendment. 42 U.S.C. § 6921(b)(3)(A)(ii). Additionally, any sludge produced as part of this removal action is not expected to exceed any federal hazardous waste characteristics. Wastes from the extraction, beneficiation, and processing of ores and minerals that are not subject to regulation under Subtitle C are exempt from regulation as hazardous waste under California's Hazardous Waste Control Act. H&SC § 25143.1.

The sludges will be regulated under section 13172 of the California Water Code, which specifically covers mining waste, and the Code's implementing regulations found at 27 CCR 22470 et seq.

Should any sludge that exhibits hazardous waste characteristics be disposed of off-site, the disposal will comply with CERCLA's Off-Site Rule found in section 300.440 of the NCP.

Other Potential ARARs. It is not anticipated that this NTCRA will negatively implicate other potential ARARs, such as the Endangered Species Act, the Archeological and Historic Preservation Act of 1974, the National Historical Preservation Act, or the Hazardous Materials Transportation Act.

## 5. Project schedule

During the summer 2008, CUD and Delta Seep flows have been captured and treated using modifications of existing equipment while the design and construction of a more robust HDS treatment system commences on a parallel schedule. The work plans submitted to EPA shall ensure that treatment will resume in the spring of 2009 as early as the site is safely accessible to personnel. These work plans anticipate that the completed HDS treatment system will be fully operational during 2009. Certain adjustments for system optimization may be expected in subsequent years of operation. Construction schedules at Leviathan Mine are limited by weather-related site access conditions for heavy trucks and equipment, with mobilization typically expected by June and demobilization in October.

The operation of the NTCRA shall continue until selection and implementation of relevant aspects of the long-term Remedial Action. For the purpose of cost estimation, a five year operation period is assumed.

## 6. Exemption from twelve month statutory limit for Removal Actions

Consistent with 42 U.S.C. § 9604(c)(1)(A) and 40 C.F.R. Section 300.415(b)(5)(ii), EPA response staff believe that an exemption from the twelve month statutory limit for removal actions is warranted for the following reasons:

- a. There is an immediate risk to public health or welfare or the environment. The actual or threatened releases of hazardous substances present a threat of exposure to the public from AMD from the Site. The Site continues to present an immediate threat to human health and the environment and an emergency exemption is warranted based on the threats posed by conditions at this Site.
- b. Continued response actions are immediately required to prevent, limit, or mitigate an emergency. If response actions are not continued to reduce, abate, and prevent discharges from the Site, then further damage to the environment will continue, including the continued contamination surface water.
- c. Assistance will not otherwise be provided on a timely basis. An ongoing threat to the public health, welfare, and the environment continues due to the lack of resources available by the state and local governments.

An exemption from the twelve month time limit for removal actions is justifiable under the criteria of 42 U.S.C. § 9604(c)(1)(A) and 40 C.F.R. Section 300.415(b)(5), which provide that the exemption is appropriate when continuation of a response action is immediately necessary to prevent, limit or mitigate an emergency, there is an immediate risk to public health or welfare or the environment and assistance will not otherwise come on a timely basis. As stated above, there is an immediate risk posed by the conditions at the Site and an exemption to the twelve month statutory limit is necessary to abate these threats.

For the reasons described in this Memorandum, immediate response action is necessary to prevent AMD from being released into the creeks, especially during low-flow periods, and continued response action will be necessary to minimize the impacts of AMD releases until implementation of a final remedy. The extent of actions planned by other stakeholders is described also in the Memorandum, and the record indicates that certain releases will not be addressed by other parties absent continued response directed by EPA.

B. Estimated Costs

Cost Projection Summary

Removal Action Implementation Costs \$ 5,300,000  
 These are estimates for Capital costs plus Operation for years 0 through 4, extramural to EPA, based on EE/CA Alternative 1 with off-site disposal (Tables 8A and 8D). Costs included for year round treatment, wind turbine construction and winter plowing are offset by various increased construction costs. Estimates for years 1 through 4 were not discounted for Present Value to allow for inflation since the EE/CA was originally written.

EPA Total	\$ 300,000
(EPA contractor oversight, five year estimate)	
Project Total	\$ 5,600,000

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

Current and past removal actions at the Leviathan Mine have not addressed releases of AMD from CUD and Delta Seep that occur annually during the months of October through June and degrade water quality in the Carson River watershed. If this NTCRA is delayed or not taken, these releases will continue, even if the past removal actions were extended. Furthermore, if no action is taken, the AMD evaporation ponds will continue to collect and concentrate AMD. If the ponds reach their holding capacity, the AMD may overflow and cause an uncontrolled release of AMD to the Carson River watershed. Any such uncontrolled release would adversely impact water quality, potentially threatening biota and humans. Removal of pond water and control of the other identified AMD releases provides flexibility to conduct any engineering studies or field trials of long-term treatment alternatives, which may not be implemented effectively if the action is delayed or not taken. Minimization of the release of AMD or sediment to Leviathan, Bryant and Aspen Creeks allows the final stages of the Remedial Investigation to proceed to assess the remaining risks at the Site, minimizing the confounding effects of the untreated AMD discharges.

## VII. OUTSTANDING POLICY ISSUES

The Draft EE/CA highlighted several outstanding issues which will be addressed during the long-term RI/FS. Among these is the question of whether more of the treatment solids can and should be placed on-site in a properly designed repository in the future. Resolution of this issue requires complete physical and chemical characterization of the solids, analysis of several federal and state requirements, and consideration of questions of land management policy. For purposes of the NTCRA, EPA has concluded that it is appropriate to bring certain wastes to an approved off-site repository. Whether this is the best solution for a long-term remediation is an issue that will require careful consideration during the RI/FS.

Similarly, the Draft EE/CA identified potential advantages of several alternatives including off-site treatment, on-site storage with summer treatment for more of the AMD sources, and biological treatment for more of the AMD sources. While EPA has concluded that such systems could not be implemented as a removal action, EPA will continue to work with the stakeholders including the State of California and U.S. Forest Service in the development of the RI/FS to address challenging technical, administrative, legal, and policy issues presented by these options. The U.S. Forest Service would be a key player in off-site treatment, because it would be necessary to build a pipeline across U.S. Forest Service land to bring the AMD to a low elevation off-site treatment plant. Siting of an off-site treatment plant, extended bioreactors or increased storage ponds plant would also be an issue of concern to the State of California, U.S. Forest Service and other stakeholders. This issue can also be viewed as an example of a larger phenomenon: as EPA reaches the long-term issues of remediation of releases from Leviathan Mine, close coordination with natural resource trustees and the community will become ever more essential.

## VIII. ENFORCEMENT

A confidential Enforcement Addendum is attached.

IX. RECOMMENDATION

This decision document represents a modification to the selected removal action for Leviathan Mine Site, in Alpine County, California, and was developed in accordance with CERCLA, and is not inconsistent with the NCP. This decision is based on the administrative record file for the Site.

Conditions at the Site meet the NCP section 300.415(b)(2) criteria for a removal action and I recommend your approval of the proposed removal action. The total project ceiling, most of which will be incurred by Atlantic Richfield and/or the LRWQCB, will be \$5,600,000. Of this, an estimated \$ 300,000, mostly for oversight, comes from the Regional budget. EPA's costs will be sought through negotiations with potentially responsible parties.

Kathleen Salvo                      9/26/08  
Approval Signature                      Date

\_\_\_\_\_  
Disapproval Signature                      Date