UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street

San Francisco, CA 94105

November 18, 2016

Mr. Anthony R. Brown
Environmental Manager
Atlantic Richfield Company
4 Centerpointe Drive, LPR 4-435
La Palma, CA 90623-1066

Re: EPA Comments on Atlantic Richfield Response to USEPA and LRWRQCB Comments on Draft Final Reference Area Work Plan, dated March 3, 2016

Dear Mr. Brown,

The US Environmental Protection Agency (EPA) has reviewed Atlantic Richfield's March 3, 2016 Response to U.S. EPA, LRWQCB, and Washoe Tribe Comments on the Draft Final Reference Area FRI Work Plan and Technical Memorandum – Preliminary Investigations in Reference Study Areas Leviathan Mine Site, Alpine County, California. This work was submitted to EPA pursuant to Administrative Order for Remedial Investigation and Feasibility Study, Leviathan Mine, Alpine County, California (CERCLA Docket No. 2008-18, June 23, 2008).

Background: Atlantic Richfield Company (ARC) provided the Draft Reference Focused Remedial Investigation (FRI) in September 2011. EPA provided written comments on November 21, 2011. EPA required that ARC address EPA comments prior to approval of the draft reference area work plan. EPA directed ARC to evaluate reference conditions for the East Fork Carson River, develop consistent sampling strategies across the various focused remedial investigations (FRI), and ensure DQOs clearly relate decision consequences to the statistical comparison tests to be used. EPA also directed ARC to consider the stakeholder comments received from the Washoe Tribe of Nevada and California, Lahontan Regional Water Quality Control Board, and US Fish and Wildlife Service.

Atlantic Richfield (ARC) provided a response to EPA's comments on February 3, 2012. EPA provided comments on February 9, 2012, stating the response was incomplete. EPA, noted significant unresolved issues including but not limited to: the approaches described in the draft work plan to benthic macroinvertebrate data, and characterization of non-impacted soil and groundwater. ARC maintained a need to complete the preliminary phase reference investigations and preparation of a revised Reference FRI work plan.

On September 11, 2012 ARC provided an Addendum 1 to the Draft Reference Area work plan describing preliminary phase one-time surface water sampling at up to seven candidate reference

streams, reconnaissance mapping of sediment, floodplain soil, & habitat at the candidate reference streams, and reconnaissance of irrigation features associated with Cottonwood Creek at River Ranch.

EPA conditionally approved Addendum 1 on September 13, 2012, and directed ARC to provide the revised Reference FRI DQOs.

On June 14, 2013 ARC issued Addendum 2 to the Draft work plan. Addendum 2 described collection of sediment quality triad data from two locations along Mountaineer Creek.

EPA approved Addendum 2 on June 26, 2013. EPA's approval was limited to those activities in Addendum 2.

On October 6, 2015, ARC and EPA held a technical meeting to discuss development of the Reference FRI work plan and issues associated with reference streams, East Fork Carson River, soil, groundwater and comparison of reference with site data. On Februar y 28, 2015 ARC provided the revised Draft Final Reference FRI Work Plan, and the March 20, 2015 Reference technical memorandum.

On July 10, 2015, EPA provided comments on these two documents, requesting a written item by item response to address eight general comments and 35 specific comments; as well as EPA comments dated November 21, 2011 and EPA comments dated February 9, 2012 within 30 days or by August 8, 2015.

On August 14, 2015, ARC submitted a response to U.S. EPA and LRWQCB Comments.

On February 4, 2016 EPA provided comments on ARC's August 14, 2015 submittal noting that the ARC response remained incomplete and EPA provided one additional general comment. The Previous comments that remained outstanding were General Comments G4 thru 8, and Specific Comments 1, 8, 18, 20 and 35. Along with a number of comments from the LRWQCB.

In response, on March 3, 2016 ARC provided:

1. Response to U.S. EPA and LRWQCB comments on Atlantic Richfield Responses to Comments on the Draft Final Reference Area Work Plan;
2. Preliminary version of the Final Reference Area Focused Remedial Investigation Work Plan (Leviathan Mine SharePoint Site); and
3. 2016 Drilling Work Plan

EPA has completed its review of these documents. EPA finds nearly all of ARC responses are adequate. EPA conditionally approves this document, pending two outstanding comments:

- **<u>EPA's July 10, 2015 comment G5 Groundwater:</u>** This comment remains outstanding from the last two revisions. EPA noted that the approach to reference groundwater required substantial revision to the discussion, needed to include existing information, include a methodology for assessing suitability of wells and requested that ARC expand the proposed reference groundwater monitoring network. **ARC Response dated August 14, 2015:** ARC proposed to revise the Reference Area FRI Work Plan to provide additional details regarding the site hydrogeology and groundwater conditions in support of the siting of reference groundwater wells along with other details regarding the selection

of reference riparian areas. But this information was not provided in the Response to Comments.
EPA's Response dated February 4, 2016: *The ARC response is incomplete. EPA's comment remains to be addressed. In an email dated February 26, 2016, EPA identified locations for up to 6 additional reference wells. EPA directed ARC to submit a plan and a schedule to install additional reference wells; and also set up a meeting for EPA, LRWQCB and ARC to review and agree on the drilling work to complete during the 2016 field season; within 30 days, or by March 3, 2016, EPA notes that the water balance provided in the work plan does not constrain how groundwater flows off site. Groundwater flow off site could dischar ge to Leviathan Creek as hypothesized, could flow beyond the creek, or could take some other path away from the site. The balance merely constrains the quantity of flow (within the limits of the inputs and assumptions used to evaluate the water balance). Additional information is required to determine how the groundwater flows off the site. ARC's approach to groundwater characterization at Leviathan Mine, is based on untested assumptions about the fate of groundwater flowing off site: As stated in the BHHRA Work Plan: "In the conceptual hydrogeologic model for the site, it is* ***assumed*** *that the majority of shallow groundwater from the Leviathan Mine ultimately discharges to Leviathan and Aspen Creeks." (Emphasis added) Citing a draft work plan as a source for an assumption about groundwater fate is not acceptable. The discharge of groundwater to surface water does not eliminate the need to consider groundwater quality protection criteria, or reference groundwater quality. Reference groundwater quality provides for identification of site effects on groundwater quality, and the baseline risk assessment will require consideration of on-site groundwater. Inappropriately limiting the number and location of reference groundwater samples would likely provide a biased view of ambient groundwater conditions potentially resulting in a less than protective decision.*

The discussion of pit effects on groundwater elevations continues to ignore the volume of remaining in-situ mineralized rock that was affected by mining. Before excavation of the open pit some thickness of this rock was saturated and oxidation of sulfide minerals within this volume of rock occurred at a very low rate. Since excavation of the open pit, the remaining in-situ mineralized rock is now open to the circulation of infiltrating water and oxygen, significantly increasing the rate of sulfide oxidation. Conceptuall y, reference wells need to be located to characterize groundwater before it enters the zone affected by this increased sulfide oxidation. ARC's currently proposed reference well locations do not appear to provide for characterizing groundwater outside of the in-situ mineralized rock.

ARC Response: ARC provided a Draft Final Reference Area Work Plan, dated March 3, 2016.
EPA Response: ARC's response is adequate with the exception of the text in Section 5.3 noted above, and Section 5.3.1. During a March 28, 2016 meeting and other related correspondence and site visits; .EPA and ARC finalized the 2016 Drilling Work Plan. EPA provided conditional approval of that workplan in a separate letter dated May 17, 2016. Please remove the text in Section 5.3 (the first two paragraphs of Page 57, and the last seven lines of paragraph 3 of Page 57) that states the rational will be addressed in another revision of the Reference Area FRI workplan. Please update this final workplan to include the rationale regarding the siting of reference groundwater wells.

- **Previous comment from the Lahontant Regional Water Quality Control Board: Inconsistencies.** EPA finds the responses to Regional Board comments to be adequate, with one exception. ARC must provide a full review and ensure that the inconsistencies between different tables containing similar information are rectified for a final and complete work plan

Please provide a technical data summary report (TDSR) for the reference area data within 120 days of the end of 2016 field season, or March 30, 2016. EPA understands the Reference wells may not be included, but anticipates preliminary discussions as part of the groundwater discussions currently underway.

EPA understand that the reference data summary will not be matrix specific. Ultimately the data will need to be integrated and compared to various data and applied throughout the DRAFT RI/FS report and the various sections and appendices (i.e. the technical data summary reports by media)

As discussed in various meetings, EPA would like to clarify that the intent of the reference data collected is not to eliminate chemicals from the list of chemicals of concern. Rather EPA has been clear and consistent that the Reference Risk is to be calculated and compared to the Site Risk for similar media.

Within 30 days, or by December 19, 2016, EPA directs ARC to provide a line by line response to these comments and the final fully revised Reference Area Work Plan incorporating these comments.

Attached please also find Lahontan Regional Water Quality Control Board comments dated May 24, 2016 for your full consideration.

If you have any questions, please feel free to contact me at (415) 947-4183 or Deschambault.lynda@epa.gov.

Sincerely,

Lynda Deschambault
Remedial Project Manager

Cc by electronic Email:
Douglas Carey, California Regional Water Quality Control Board, Lahontan Region
Diane Vitols, Washoe Tribe of Nevada and California
David Friedman, Nevada Department of Environmental Protection
Kenneth Maas, United States Forest Service
Tom Maurer, United States Fish and Wildlife Service
Toby McBride, United States Fish and Wildlife Service
Steve Hampton, California Department of Fish and Wildlife Marc Lombardi, AMEC