Atlantic Richfield Company

Anthony R. Brown
Project Manager, Mining

4 Centerpointe Drive, 2nd Floor Suite 200
La Palma, CA 90623-1066
Office: (714) 228-6770
Fax: (714) 228-6749
E-mail: Anthony.Brown@bp.com

December 4, 2015

Lynda Deschambault
Remedial Project Manager, Superfund Division
U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street, 10th Street (SFD 7-1)
San Francisco, California 94105

Subject: Response to Comments on Proposed Remedial Investigation / Feasibility Study Schedule
Leviathan Mine Site
Alpine County, California

Dear Ms. Deschambault:

Atlantic Richfield Company (Atlantic Richfield) submits this letter in response to comments[1] provided by U.S. Environmental Protection Agency (U.S. EPA) on November 4, 2015, and to comments[2] provided by the Regional Water Quality Control Board – Lahontan Region (LRWQCB) dated March 23, 2015; U.S. EPA provided the LRWQCB comments to Atlantic Richfield on November 4, 2015. Both U.S. EPA's comments and LRWQCB's comments pertain to Atlantic Richfield's March 13, 2015 response[3] to U.S. EPA's January 15, 2015 comments[4] on the Summary Table of Contents and Approximate Schedule for Remedial Investigation/ Feasibility Study[5], dated December 12, 2014. Atlantic Richfield addressed many of these same schedule-related issues in the letter submitted to U.S. EPA on August 24, 2015. U.S. EPA should again direct its attention to that letter in addition to the responses provided here.

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[1] U.S. EPA, 2015. EPA Comments on Atlantic Richfield's Response to US EPA Comments on the Proposed Remedial Investigation/Feasibility Study Schedule, Leviathan Mine Site, Alpine County, California, Dated March 13, 2015. Letter from Lynda Deschambault, Remedial Project Manager, to Anthony R. Brown, Environmental Manager, Atlantic Richfield Company. November 4.

[2] LRWQCB, 2015. Comments on Atlantic Richfield Company's Response to U.S. EPA Comments on the Proposed Remedial Investigation/Feasibility Study Schedule, Leviathan Mine Site, Alpine County, California. Letter from Douglas Carey, Senior Engineering Geologist, Leviathan Mine, to Lynda Deschambault, U.S. EPA, Region 9. March 23.

[3] Atlantic Richfield, 2015. Response to U.S. EPA Comments on the Proposed Remedial Investigation/Feasibility Study Schedule, Leviathan Mine Site, Alpine County, California. Letter from Anthony R. Brown, Project Manager, Mining, to Lynda Deschambault, Remedial Project Manager, U.S. Environmental Protection Agency, Region 9. March 13.

[4] U.S. EPA, 2015. EPA Comments on the Proposed RI/FS Schedule, Dated December 12, 2014. Letter from Lynda Deschambault, Remedial Project Manager, to Anthony R. Brown, Environmental Manager, Atlantic Richfield Company. January 15.

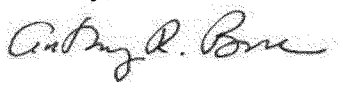
[5] Atlantic Richfield, 2014. Summary Table of Contents and Approximate Schedule for Remedial Investigation/Feasibility Study, Leviathan Mine Site, Alpine County, California. Letter from Anthony R. Brown, Project Manager, Mining, to Lynda Deschambault, Remedial Project Manager, U.S. Environmental Protection Agency, Region 9. December 12.

The subject RI/FS table of contents and schedule were submitted in partial fulfillment of the requirements of the Statement of Work attached to the Administrative Order for Remedial Investigation and Feasibility Study (Unilateral Administrative Order), Comprehensive Environmental Response, Compensation, and Liability Act Docket No. 2008-18, issued by the U.S. Environmental Protection Agency on June 23, 2008.

U.S. EPA's November 4, 2015 comment letter requested a written response within 14 days or by November 18, 2015. Atlantic Richfield requested that the schedule for submittal of the responses be extended to December 4, 2015 in a letter to the U.S. EPA dated November 13, 2015. This letter transmits Atlantic Richfield's responses to U.S. EPA comments Dated November 4, 2015 (Table 1) and to LRWQCB comments dated March 23, 2015 (Table 2). We look forward to discussing these and other issues relating to the RI/FS schedule during the meeting between U.S. EPA and Atlantic Richfield scheduled for December 11, 2015.

If you have any questions or comments, please feel free to contact me at (714) 228-6770 or anthony.brown@bp.com.

Sincerely,



Anthony R. Brown
Project Manager, Mining

Attachments:

Table 1 – Response to U.S. EPA Comments Dated November 4, 2015
Table 2 – Response to LRWQCB Comments Dated March 23, 2015

cc: Gary Riley, U.S. Environmental Protection Agency, Region 9 – via electronic copy
John Hillenbrand, U.S. Environmental Protection Agency, Region 9 – via electronic copy
Caleb Shaffer, U.S. Environmental Protection Agency, Region 9 – via electronic copy
Douglas Carey, Lahontan Regional Water Quality Control Board – via electronic copy
Ronald Halsey, Atlantic Richfield Company – via electronic copy
Nathan Block, Esq., BP – via electronic copy
Adam Cohen, Esq., Davis Graham & Stubbs, LLP – via electronic copy
Sandy Riese, EnSci, Inc. – via electronic copy
Marc Lombardi, Amec Foster Wheeler – via electronic copy
Grant Ohland, Ohland HydroGeo, LLC – via electronic copy
Dave McCarthy, Copper Environmental Consulting – via electronic copy
Cory Koger, U.S. Army Corps of Engineers – via electronic copy
Greg Reller, Burleson Consulting – via electronic copy
Lynelle Hartway, Esq., Washoe Tribe of california and Nevada – via electronic copy

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TABLE 1
RESPONSE TO U.S. EPA COMMENTS DATED NOVEMBER 4, 2015
Leviathan Mine Site
Alpine County, California

Comment	Response
G1 Schedule 1: Sampling in 2015: (a) EPA and ARC concur that significant progress has been achieved with 2015 work planning and the resolution of issues related to NHPA compliance. EPA appreciates the significant progress with the implementation of sampling activities during the 2015 field season. (b) EPA understood that several investigations now suggested for completion during 2016 would instead be completed during 2015. Those specific tasks include: o On-Property Stream Sediment Investigations (Task IDs 183 and 184), Amendment Nos. 8 and 10 to the On-Property FRI Work Plan; o On- and Off-Property Floodplain Soil Investigations (Task IDs 185 and 186), Amend No. 2 to the Off-Property FRI Work Plan; Amendment No's 8 and 10 to the On-Property FRI Work Plan; o On- and Off-Property Fish Surveys and Sampling Field Effort (Task IDs 202, 207, and 208); and o Reference Study Area Fish Survey and Sampling (Task ID 251). Since Off-Property Floodplain Soil investigations, On- and Off-Property Fish Surveys and Sampling, and the Reference Study Area Fish Survey and Sampling were not completed in 2015, EPA expects that ARC will focus on completion of these tasks in a timely manner during 2016 so that the RI/FS report will be developed by 2017. (c) EPA requests that ARC address and respond to the Regional Water Quality Control Board concerns regarding the timing of snowmelt runoff sampling, and the year-round flow monitoring as identified in the attached letter.	(a) Comment acknowledged (b) Atlantic Richfield will provide an update of the status of field activities completed in 2015 and plans for completing specific tasks in the 2016 field season during our upcoming technical meeting scheduled for December 10. Contrary to EPA's suggestion, the listed tasks were not scheduled to be completed in 2015. As set forth in the RI/FS schedule submitted to U.S. EPA on March 13, 2015: • On-property stream sediment investigations (Task IDs 183 and 184) were scheduled for completion in the 2nd and 3rd quarters of 2016. Atlantic Richfield accelerated these tasks and completed the Amendment 8 sampling in October 2015. Amendment 10 sampling in the beaver dam/pond complex began in October but could not be completed because of the onset of winter weather conditions. • On- and off-property floodplain soil investigations (Task IDs 185 and 186) were scheduled for completion in the 2nd and 3rd quarters of 2016. On-property was also accelerated. Similar to stream sediment, the Amendment 8 on-property floodplain sampling was completed in October 2015. Amendment 10 on-property floodplain sampling in the beaver ponds/dam complex and reference area floodplain sampling were partially completed in 2015. Off-property floodplain mapping occurred in 2015, the results of which are currently being used to develop the required TSAP. The remaining floodplain sampling will be completed in 2016. • Task ID 202 consists of the preparation of a Task Sampling and Analysis Plan (TSAP) to be completed during the 2nd quarter of 2016. This TSAP will describe the scope of fish surveys and sampling activities (Task IDs 207 and 208), which are scheduled for completion in the 3rd quarter of 2016. • Reference Study Area Fish Survey and Sampling (Task ID 251) is scheduled for completion in the 3rd quarter of 2016. (c) Responses to the Regional Water Quality Control Board - Lahontan Region's March 23, 2015 comments that pertain to snowmelt runoff sampling and flow monitoring are addressed in the attached Table 2 – Response to LRWQCB Comments Dated March 23, 2015. In addition, Atlantic Richfield provided responses to U.S. EPA's comments regarding storm water and snowmelt runoff assessment in a letter dated April 24, 2015.
G2: Technical Meetings to Focus on Data Usability: (a) EPA concurs with periodic (perhaps annual) submittal of data sets for the various work plans and the various media (i.e. for example but not limited to, mine waste data, groundwater data, surface water data etc.) Please refer to individual comments on those submittals. (b) ARC and EPA should both agree that the data sets are complete, an appropriate quality assurance/quality control summary review is completed, and the data is usable. ARC should also ensure the data is visualized on figures, all data gaps are identified, and there is a proposed plan for addressing additional sample and data needs. (c) As discussed, rather than technical memos, PowerPoint presentations, and/or meeting minutes; full reports should be provided and those later be included in the RI/FS as attachments or appendices.	(a) Atlantic Richfield discussed the content and format of interim data submittals in technical meetings with U.S. EPA representatives held on July 13 and September 22, 2015. At that time, the concept of submitting media-specific interim Technical Memorandums was discussed. As a follow up to this discussion, Atlantic Richfield provided an outline for a Technical Memorandum to present the results of mine waste characterization in a letter to U.S. EPA dated September 18, 2015. Atlantic Richfield is proceeding with the preparation of this Technical Memorandum but is still awaiting U.S. EPA's comments on the content of this interim submittal. Atlantic Richfield indicated in their September 18, 2015 letter that it was their intent to use this outline as an example for other media-specific interim data submittals.

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	(b) The aforementioned media-specific Technical Memorandums and the Risk Assessment Data Usability Reports are intended to confirm the appropriateness of quality assurance/quality control reviews, identify data gaps or document that data sets are complete, and document that the data are usable for the purposes of risk assessment and RI/FS reporting. In addition to the media-specific interim data submittals, Atlantic Richfield's September 18, 2015 letter also indicated that it planned to submit a "Risk Assessment Data Usability Report" prior to the completion of Baseline Human Health and Ecological Risk Assessments. The intent of this report is to present the following information for U.S. EPA review prior to the preparation of the risk assessments: • Evaluate data usability for the purpose of risk assessment • Statistical summary of data (min/max, detection limits) • Comparison to reference concentrations • Comparison to published screening criteria • Identification of chemicals of potential concern • Develop exposure areas • Develop exposure point concentrations (c) As described in the technical meetings with the U.S. EPA on September, 22, 2015, the interim data submittals consisting of the media-specific Technical Memoranda and Risk Assessment Data Usability Reports will be used to support the Remedial Investigation (RI), Baseline Human Health Risk Assessment (BHHRA) and Baseline Ecological Risk Assessments (BERA), and the Feasibility Study (FS), and will be included as attachments or appendices, as appropriate. Atlantic Richfield has already submitted several such media specific interim data submittals to U.S. EPA summarizing investigations surface water, East Fork Carson River sediment quality, and groundwater.
G3: Risk Assessment Included in the Remedial Investigation. (a) EPA and ARC seem to be in agreement that the RI/FS submittal schedule in the 2009 schedule is generally still appropriate with respect to timing of report delivery with respect to field work. (b) EPA again refers to our Jan 15, 2015 comments and believes that schedule is reasonable. (c) The ongoing monthly groundwater monitoring activities (Task ID 21 and 36 on the 2009 Schedule) has been underway since 2011, and more than sufficient information has been completed for preparing a draft RI Report appendix concerning groundwater. (d) As the media specific reports are completed and data usability is determined, the risk assessments can be completed in an iterative manner and in parallel to the other RI work, resulting in one complete submittal.	(a) Atlantic Richfield refers U.S. EPA to our August 24, 2015 letter. As stated at that time: "[T]the "2009 schedule" is not a workable compliance framework for current and pending RI activities, as Atlantic Richfield noted in its March 13 letter to EPA. The 2009 schedule was, by its terms, conceptual, approximate, and contingent on multiple factors. On November 16, 2009, Atlantic Richfield submitted Addendum #1 to the PWP, which included a schedule for RI activities. We prepared this schedule early in the RI/FS process in response to EPA's October 15, 2009 comments on the PWP. In light of existing uncertainties about the nature and scope of the RI/FS, we specifically clarified that: The actual schedule for completion of the RI/FS is contingent upon EPA approval of the RI/FS work plans, the complexity of the data collection, and consensus on adequate completion of the RI characterization to the level necessary to prepare the RI and risk assessment reports. **The RI/FS schedule will be updated periodically over time**. (emphasis added).

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Alpine County, California

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	In February 2010, EPA responded, acknowledging that the proposed schedule was for planning purposes and was subject to change based on subsequent developments: > The schedule provided with the Addendum shows a reasonable projection for the RI/FS based on the current planning status and should be viewed as subject to change as discussed in the Addendum transmittal letter. Neither Atlantic Richfield nor EPA expected that the 2009 schedule would remain fixed. Although substantial progress on the RI has been achieved, the document preparation, review and approval process has taken longer than expected, the complexity of data collection has increased, complete consensus on the adequacy of site characterization has not been achieved, and other unanticipated circumstances, including a lengthy National Historic Preservation Act ("NHPA") survey and consultation process, have caused delays—all as predicted in 2009. Further, as EPA acknowledges in its January 15, 2015 letter, numerous work plans and work plan amendments, many containing revised schedules or scheduling assumptions, have been prepared, submitted, and approved since 2009. Each one pertains to multiple field activities and the collection of substantial amounts of data. It is unreasonable to suggest that a conceptual schedule set out more than five years ago for planning purposes, prior to all of this intervening activity, would remain applicable now, or that it should set a compliance timeline for additional RI/FS field work and reporting tasks going forward. All parties understood that the 2009 planning schedule was subject to change and that revised timelines more reflective of current conditions, priorities, and the intervening circumstances (all as discussed in Atlantic Richfield's March 13 letter) would need to be developed for ensuing work. As to the draft RI Report, we disagree that it can or should be submitted within one month of completing data collection. As explained in our March 13 letter, even the conceptual 2009 schedule had proposed an interval of 15 months between the completion of discrete sampling activities and submission of the draft RI Report. This length of time is appropriate, given the effort that will be required to compile, validate, and analyze the RI data." Atlantic Richfield and U.S. EPA have both stated that the 2009 schedule still provides reasonable guidelines for the sequencing of data collection efforts and RI/FS reporting. However, we disagree as to what those guidelines are and how the 2009 schedule should be applied to present-day deliverables. As noted in our March 13, 2015 response to U.S. EPA's January 15, 2015 Comment G3, > "Atlantic Richfield agrees that the conceptual sequence of the RI/FS submittals outlined in the 2009 schedule is generally still appropriate. This sequence consisted of the submittal of the Draft RI report approximately 15 months after the completion of data collection by the submittal of the Draft HHRA and ERA reports approximately six months thereafter. The Draft FS report was to be completed six months after the completion of the HHRA and the ERA Report, or about 1 year after the submittal of the Draft RI Report."

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	The Updated Conceptual RI/FS Schedule (Attachment A to our March 13, 2015 response) is consistent with this sequence. Atlantic Richfield believes this is an aggressive but realistic schedule for completing the RI/FS. Atlantic Richfield cannot commit to a more aggressive schedule for completion of the RI/FS, including the final risk assessments. Atlantic Richfield certainly cannot agree to a January 2018 target completion date as suggested by U.S. EPA. Finishing all of the required data analysis and assessment tasks in such a short period of time after completing the scheduled field work (not to mention additional sampling that may be required to fill yet-to-be identified data gaps) is impracticable for multiple reasons as stated in responses below and in prior written correspondence and face-to-face meetings with U.S. EPA. (b) The RI/FS schedule suggested by U.S. EPA and provided as Attachment A to its January 15, 2015 letter with the subject line *EPA Comments on the Proposed RI/FS Schedule, Dated December 12, 2014* is not consistent with the conceptual sequence of RI/FS submittals outlined in the 2009 schedule (discussed in the response to Part (a) above). U.S. EPA's proposed schedule dramatically shortens the time between completing RI characterization and submittal of the RI, risk assessment, and FS reports, and it does not allow sufficient time for logically sequencing reports that depend on the results of antecedent activities. As stated, the schedule suggested by U.S. EPA is unrealistic and impracticable. Although we agree that RI, risk assessment, and FS activities can be conducted concurrently to some degree to shorten the overall schedule, these major activities cannot be completed until the RI data collection, laboratory sample analysis, QA/QC reviews, and the interpretation of the nature and extent of Chemicals of Potential Concern (COPCs) and the data usability report have been completed to assess and confirm the adequacy of the data sets for risk assessments and the evaluation of remedial alternatives. In addition, there will be a lag between completing the RI, risk assessment, and FS documents, since the latter documents depend on analyses presented in part on the former documents. EPA's proposed schedule does not provide sufficient time to complete these aforementioned steps and analyses between the completion of the RI, risk assessments and the FS. In contrast, the Updated Conceptual RI/FS Schedule (Attachment A to our March 13, 2015 response) incorporates a short time period between successive documents and is therefore a more realistic and practicable schedule for completing the RI/FS. U.S. EPA's August 21, 2015 email with the subject line *EPA Big Picture Comments on the RIFS Schedule* refers to "the timeline that we laid out in our January 15, 2015 letter", but it did not acknowledge the schedule Atlantic Richfield provided in our March 13, 2015 letter. Atlantic Richfield responded via letter on August 24, 2015, reiterated that U.S. EPA's January 2015 proposed schedule is impracticable, and referred to the schedule we provided to U.S. EPA on March 13, 2015. In short, Atlantic Richfield has communicated to U.S. EPA on multiple occasions that the schedule it proposed in January 2015 is impracticable. Yet, U.S. EPA appears to be disregarding Atlantic Richfield's input and continues to state that the schedule it proposed in January 2015 is reasonable. Atlantic Richfield will endeavor to expeditiously perform the RI/FS in order to complete the RI/FS report as soon as reasonably possible, but again, it is not possible to meet U.S. EPA's proposed schedule. (c) Atlantic Richfield agrees that the groundwater characterization data collected to date will be useful for preparing a draft RI report. However, there are currently significant data gaps related to the completion of the on-property

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	groundwater characterization data including the nature of groundwater/surface water interactions near the acidic pond and the characterization of reference groundwater conditions. These data, particularly the reference data, will be critical for evaluating the on-property groundwater results in the proper context and developing conclusions for the requested groundwater characterization technical memorandum. Therefore, "a draft RI Report appendix concerning groundwater" would have significant gaps until the outstanding characterization is complete. We anticipate that the remaining groundwater characterization will be completed in 2016. If U.S. EPA believes, as stated in this comment, that groundwater information for the existing network of monitoring wells is "more than sufficient" for completing the groundwater characterization with respect to those wells, Atlantic Richfield requests that U.S. EPA authorize Atlantic Richfield to discontinue sample collection and analysis from those wells. (d) Some portions of the human health and ecological risk assessments can be conducted in parallel with RI characterization activities but the process and benefit of performing iterative risk assessments is unclear. It appears that the U.S. EPA is requesting that risk calculations be performed repeatedly in an iterative fashion during the implementation of the RI/FS. This implies that risk calculations would be conducted on incomplete datasets as additional data are collected during the completion of the RI. This process would be highly inefficient and provide little benefit toward the goal of completing the RI/FS because the evaluation of remedial alternatives in the FS could not be completed until datasets are deemed complete and risk calculations are finalized. Atlantic Richfield has committed to performing screening-level human health and ecological risk assessments as part of the implementation of the RI. These screening-level risk assessments will be performed by comparing results from data sets for various media to available screening levels for a specific medium. However, the baseline risk assessments require an evaluation of potential risks across multiple media for both human and ecological receptors. A cumulative risk assessment can only be performed after <u>all</u> media and study area investigations are complete. The screening process will help prepare for this activity, but there will still be a final step of developing cumulative assessments that will be more complex than simply compiling screening assessments. The final human health and ecological risk assessments, which require site-specific concentration data, can be conducted only after the RI characterization data sets have been completed, including data from reference areas, their quality validated, data evaluation units (exposure areas) defined, exposure point concentrations agreed upon, and spatial exposure scenarios evaluated. These steps most efficiently occur after RI characterization has been completed so that they do not need to be revised based on changes to RI data sets.

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G4: Iterative Approach to the Risk Assessments. (a) ARC notes that they will have to work with the U.S. EPA to reach early consensus on appropriate screening levels for decision making during implementation of the RI/FS. Further, ARC supports the use of media-specific screening level risk evaluations to expedite decision making prior to the completion of the Baseline Human Health and Ecological Risk Evaluations. As described in our response to Comment G2 above, EPA believes that technical summary reports can be compiled and later appended to the RI/FS. The screening-level risk evaluations will be integrated into this same type of collaborative data review process along with comparisons to applicable media-specific reference concentrations, as soon as they are available. (b) EPA continues to request that the risk assessments be conducted in an iterative manner with screening assessments followed by quantitative assessment of risks so that the risk assessment can be completed to support timely development of remedial action objectives and still ensure a completion date of January 2018. (c) ARC notes that the conceptual site models previously developed for human health and ecological risk assessment and the current and reasonably anticipated future land use for the different portions of the site will need to be properly accounted for in this process. (d) EPA saw a presentation of the latest proposed Conceptual Site Model at our September 22, 2015 meeting. Please provide EPA with a formal submittal of the conceptual site model for full review and consideration.	(a) Reaching consensus on media-specific screening levels and comparing characterization data as they become available to those screening levels will expedite identification of contaminated media and the chemicals of concern requiring further evaluation in the quantitative phases of the risk assessment. Comparison of measured concentrations to screening levels can be done and documented concurrently with preparation of interim media-specific Technical Memorandums described in our response to Comment G2. (b) See response to Comment G3 above regarding the proposed iterative approach to risk assessments and Atlantic Richfield's commitment to performing screening-level risk evaluations. Conducting initial screening-level human health and ecological risk assessments based on incomplete characterization data sets may accelerate the FS by providing a basis for preliminary identification of contaminated media and constituents that have to be addressed in response actions, and for identifying RAOs. Assumptions made based on the initial assessments will have to be checked when the complete data sets become available, and thus revisions may be necessary. This effort could not be considered complete until the risk assessments are completed. As noted in our response to Comment G3, it will not be possible to complete the RI/FS by January 2018. (c) The conceptual site models for human health and ecological risk assessment define the current and reasonably anticipated future land use as described in the baseline human health and ecological risk assessment work plans. The BHHRA Work Plan and BERA Work Plan were conditionally approved with comment by the U.S. EPA in March 2011 and November 2015, respectively. The NCP Preamble and other U.S. EPA RI/FS and risk assessment guidance clearly instruct that reasonably anticipated future land use and realistic exposure scenarios and assumptions should be considered during the baseline risk assessment and in identifying remedial action objectives. (d) The updated conceptual site model presented at the September 22, 2015 meeting will be provided under separate cover. The slides presented at the meeting along with meeting notes were distributed to U.S. EPA on November 2, 2015. A formal submittal describing the updated conceptual site model for groundwater is in preparation and is targeted for submittal to U.S. EPA in the second quarter of 2016.
G5: Integration of RI and FS: (a) ARC states that they will submit FS comments under separate cover. AR also notes that they *assume that the U.S. EPA agrees with the FS approach as outlined in ARC's August 27, 2014 letter.* Please refer to the comments that EPA provided on that document dated January 1, 2015. (b) EPA requests that ARC develop and submit a schedule for the tasks outlined in the FS approach. Please incorporate the FS schedule into one comprehensive revised schedule for concurrent completion of both an RI and FS report for submittal at the same time by December 31, 2017. The RI/FS schedule and Table of Contents is intended to ensure a comprehensive document for completion as one final complete RI/FS.	(a) Atlantic Richfield complied with the requests identified in U.S. EPA's January 15, 2015 letter with the Subject line *EPA Comments on the Proposed Leviathan Mine Site Feasibility Study Approach, Alpine County, California, Dated August 27, 2014,* which were: (1) to set up a conference call to discuss the overall RIFS approach, (2) provide an updated RI/FS schedule, and (3) provide a Table of Contents. The requested conference call took place on February 9, 2015, and the updated RI/FS schedule and a table of contents for each component of the RI/FS report (RI, human health risk assessment, ecological risk assessment, and feasibility study) were provided to U.S. EPA on March 13, 2015. Atlantic Richfield considered the comments provided in a January 15, 2015 letter (we assume that the cited date of January 1 is incorrect) during preparation of the RI/FS table of contents and schedule. (b) Atlantic Richfield submitted a combined RI/FS schedule on March 13, 2015. Subject to the assumptions specified at that time, and for the reasons described in our letter, the March 13, 2015 schedule projected completion of the final RI Report at the end of 2017 and completion of the final FS report at the end of 2018. As

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	noted in our response to Comment G3, it will not be possible to complete the RI/FS by December 31, 2017. There are simply too many data-intensive and time-consuming steps that will need to be performed in the interim (both by Atlantic Richfield and U.S. EPA) to allow for preparation of the final RI/FS report, including final risk assessments, within that timeframe. The table of contents for each component of the RI/FS report is organized to provide a comprehensive RI/FS document consistent with U.S. EPA guidance for the preparation of RI/FS documents.
G6: Gantt Chart for Revised RI/FS Schedule: EPA has reviewed the Gantt chart illustrating the conceptual schedule for the completion of various components of the RI/FS Report (Attachment A). [Sic] And provides the following additional comments below.	Please refer to the following responses to individual comments below.
G6.1 General RI/FS Schedule: EPA appreciates the detailed breakdown schedules, but understands that these feed into one overall schedule that ARC should also provide, as suggested in ARC's August 25, 2015 letter.	Atlantic Richfield will provide a RI/FS schedule in tabular format after reaching consensus on the sequencing and timing of the various RI/FS activities discussed in these responses. As described in our August 24, 2015 letter, the updated schedule will be presented in the form of an amendment to the Programmatic Work Plan.
G6.2 Schedule 2: RI Reporting Schedule: (a) As EPA recommends in comment G1, the timely completion of RI field investigations during 2015 and 2016 will ensure the RI/FS schedule more closely matches the schedule in EPA's January 5, 2015 comment letter. (b) After review of ARC's "Conceptual RI/FS Schedule as of 3/13/2015," EPA finds that the following tasks scheduled for submittal in 2017 should be completed and submitted in 2016: · Ore Piles and Road Data Summary Submittal · On- & Off-Property Stream Sediment Data Summary Submittal · On- & Off-Property Floodplain Data Summary Submittal · Fish Surveys/Tissue Data Summary Submittal (c) Two of the documents scheduled for 2017 do not hinder preparation of the RI: · Leviathan Mine Road Data Summary · Storm Water/Snowmelt Data Summary (d) Data sets for mine waste, stream sediment, surface water, and groundwater are likely sufficient to support drafting the RI/FS report (especially in consideration of ongoing efforts to install reference groundwater wells, and continue to collect additional surface water and reference information). In addition, substantial progress was made with collection of On-Property and Reference floodplain soil data during 2015. With additional information from the 2016 field season, sufficient information to prepare a draft RI/FS report by early 2017.	(a) Substantial progress in RI characterization activities was made in 2015, and a substantial amount of characterization remains to be conducted in 2016. As noted in our response to Comment G3, the schedule proposed by U.S. EPA in January 2015 is not feasible even if all RI characterization is successfully completed in 2016. If the key scheduling assumptions stated in Attachment A to our March 13, 2015 letter are not met, further delays may result. (b) Atlantic Richfield is planning to complete RI characterization field activities by mid-Q4 2016, provided that necessary work plan approvals are provided by the U.S. EPA, sampling constraints related to National Historic Preservation Act requirements are resolved, and no new significant investigations are added to the RI. Atlantic Richfield will attempt to complete the associated data summary submittals as soon as possible after finishing the field work, but it is unreasonable to expect that all of those submittals will be available by December 31, 2016. Analytical data will need to be received, reviewed, validated, compiled, assessed for data quality and data usability, interpreted, and evaluated for potential data gaps before the data summary reports can be submitted in draft form. Based on past experience, this entire process for a single medium takes at least 6 months. U.S. EPA review and approvals will require additional time. (c) Atlantic Richfield does not understand this comment. If U.S. EPA suggesting that characterization of Leviathan Mine Road and storm water/snowmelt is already complete, that is incorrect. No chemical characterization of materials along Leviathan Mine Road has been performed to date. Consequently, it is premature to prepare the RI report for this study area. Data collection for storm water/snowmelt runoff must be completed and then prepared for reporting as described in (b) above. If, on the other hand, U.S. EPA is suggesting that that the RI report can be completed without addressing the information to be presented in the data summaries for the Leviathan Mine Road and Storm Water/Snowmelt, Atlantic Richfield requires further clarification and direction on this issue. (d) U.S. EPA is oversimplifying the RI/FS reporting process. Although development of a draft RI report can begin while data sets are still incomplete, substantial progress on the RI report cannot be made until all characterization data sets, including Reference Area data sets, are complete and have been prepared for reporting as described in

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Comment	Response
	(b) above (at least a 6 month process). As noted in our response to Comment G3, the schedule proposed by U.S. EPA in January 2015 that has a draft RI/FS report prepared in early 2017 is not feasible. Given that data collection and study area characterization work will continue through mid-Q4 2016, it is simply not reasonable to expect that all sampling results can be prepared for reporting as described in (b) above by early 2017 as U.S. EPA suggests. Please refer to the RI/FS schedule Atlantic Richfield submitted on March 13, 2015, which has draft RI report submittal in late 2017 and draft risk assessment and FS reports being submitted in 2018.
G6.3 Schedule 3: Risk Assessment Schedule: (a) ARC's proposed schedule shows completion of the human health and ecological risk assessments during 2018. EPA continues to request that the risk assessments be conducted in an iterative manner with screening assessments followed by quantitative assessment of risks so that the risk assessment can be completed to support timely development of remedial action objectives and target a completion date of a full RI/FS that includes the Risks Assessments by January 2018. (b) Please provide a schedule that includes media specific screening assessments as they relate to a January 2018 completion of the RI/FS. Please also include a schedule for the data usability analysis for each media.	(a) As noted in our response to Comment G3, the process and related benefit to performing iterative risk assessments is unclear. While site-specific media concentration data can be iteratively compared to screening levels and certain ARARs as the data comes in, it will not be possible to perform the quantitative risk assessments until all data have been compiled, validated, assessed for data quality and data usability, and interpreted and until after the comparisons to Reference Area concentrations described in the risk assessment work plans are performed. These analyses cannot be performed instantaneously following the completion of data collection as U.S. EPA's proposed schedule would require. As previously stated, the schedule proposed by U.S. EPA in January 2015 that has a draft RI/FS report completed in early 2017 is not practicable. Please refer to the RI/FS schedule Atlantic Richfield submitted on March 13, 2015, which has draft RI report submittal in late 2017, and draft risk assessments and FS reports being submitted in 2018. (b) Atlantic Richfield has proposed completion of RI/FS data collection efforts by mid-Q4 2016, subject to the scheduling assumptions set forth on our May 13, 2015 letter. Even if all data collection occurs according to that schedule, it will not be possible to complete the "media-specific assessments," data quality and usability analyses for each media, and all other required RI/FS and risk assessment tasks prior to January 2018. Please refer to the response to Comment G2 for a discussion of the proposed process for conducting media-specific screening assessments and data usability evaluations.
G6.4 Schedule 4: RI/FS Schedule: (a) The timely completion of RI field investigations recommended in comment G1 and RI Reporting recommended in G2 would expedite the schedule for completing the RI Report, Risk Assessments, and Feasibility Study. ARC states: *"According to the 2009 schedule, the discrete sampling and analysis activities that would be used in preparing the RI Report were to be completed more than 15 months prior to the RI Report submittal date."* (b) EPA requests that the sampling activities recommended in Comment G1 be completed in time to allow for completion of the first Draft RI Report by the end of calendar year 2016, with the Risk Assessments and Feasibility Study Report completed in 2017. And a final RI/FS by January 2018. (c) EPA believes that the necessary Section 106 coordination activities have been completed to support these activities, with the exception of any Floodplain Soil sampling necessary to assess the extent of contamination in East Fork Carson River bed load sediment. The NHPA coordination is documented in correspondence from the California (October 6, 2014) and Nevada (December 9, 2014) State Historic Preservation Officers.	(a) Atlantic Richfield's RI/FS schedule submitted March 13, 2015 is aggressive but realistic, and it allows for the time reasonably needed between completion of RI characterization activities and submittal of the draft RI report to compile, validate, assess for data quality and data usability, interpret, and prepare documents describing the nature and extent of contamination in the RI. (b) Assuming data collection efforts will continue through mid-Q4 2016, it is unreasonable to expect simultaneous completion of the Draft RI Report by December 31, 2016. For the reasons stated elsewhere in these responses, in our March 13, 2015 submittal, and in our August 24, 2015 letter, it will not be possible to finalize the RI/FS by January 2018. (c) The Section 106 coordination activities needed to allow all RI/FS sampling activities to occur have not been completed. As indicated in other correspondence, a Programmatic Agreement is needed to complete on-property reference soil sampling; plant and associated soil sampling the on-property, off-property and reference areas; River Ranch upland soil sampling; River Ranch spatially distributed soil sampling, suspected ore pile sampling, and suspected ore pile reference sampling. If the Programmatic Agreement is not finalized and executed in early 2016, further delays to the RI/FS schedule will likely result.

TABLE 1
RESPONSE TO U.S. EPA COMMENTS DATED NOVEMBER 4, 2015
Leviathan Mine Site
Alpine County, California

Comment	Response
G7: Addressing Data Gaps: EPA concurs that FS data gap collection activities can occur concurrently with other RI sampling activities	Comment acknowledged. Atlantic Richfield plans to initiate FS-related data collection activities during the 2016 field season.
G8: Annotated Table of Contents: EPA appreciates receipt of the Table of Contents and provides the following additional comments:	Please refer to responses to the comments below.
G8.1 TOC G1: The Annotated outline identified four volumes to the RI/FS report (Remedial Investigation, Human Health Risk Assessment, Ecological Risk Assessment, and Feasibility Study). The outline appears to consider that each of the volumes would be a stand-alone documents. EPA directs ARC to ensure all volumes are prepared in parallel with the other documents, without delaying the development of one complete and final RI/FS with four volumes.	The four components of the RI/FS report (RI, BHHRA, BERA, and FS) will be prepared as one comprehensive document, but Atlantic Richfield does intend to produce each component as a separate volume of the RI/FS Report. To the extent practicable, the components will be prepared in parallel. However, as described in the response to Comment G3 above, the BHHRA, BERA, and FS are dependent on results from the RI, and the FS also depends on results from the BHHRA and BERA. As noted in the 2009 conceptual planning schedule and the more detailed schedule presented in the March 13, 2015 RI/FS schedule, there will necessarily be a time period between the completion of RI and the successive documents to allow for risk characterization in the BHHRA and ERA and the evaluation of remedial alternatives in the FS. In order to submit all four components of the RI/FS report concurrently, the RI, BHHRA, and BERA components will be completed as soon as practicable, but will not be submitted as final until the FS component has been completed.
G8.2 TOC G2: Please revise "Current and Potential Receptors" in the Risk Assessment Sections to "Current and Future Receptors".	The description will be revised to "Potential Future Receptors".
G8.3 TOC 1: Starting with Section 3.1 of Volume 4 (Feasibility Study) and throughout the table of Contents (TOC) overburden is considered to be separate from mine waste. Overburden is specifically identified as mine waste in California Title 27 Chapter 7 (§22480). The outline should be revised to reflect this definition.	Atlantic Richfield recognizes that overburden is included in the regulatory definition of mine waste. The terms "overburden" and "waste rock" were used in the Program Work Plan (PWP) (Atlantic Richfield Company, 2009. *Remedial Investigation/Feasibility Study Program Work Plan, Leviathan Mine Site, Alpine County, California. July).* Both materials are derived from mining activities and are considered mine waste in the PWP. They are differentiated based on the location from where they were excavated and where they were disposed on site. The PWP (Section 3.4.1) states "Overburden refers to non-mineralized soils/rock that was removed to obtain access to the mineralized rock" and "Waste Rock refers to mineralized rock that was discarded at the mine property and was not shipped off-site for processing."
G8.4 TOC 2: Section 3.1 of Volume 4 (Feasibility Study) describes Site Physical Features. Leviathan and Aspen Creeks and the EFCR are not identified. Please include Leviathan Creek, Aspen Creek, Bryant Creek and East Fork Carson River as features that are investigated for release from the site.	These features will be added in future updates to the TOC for the FS.
G8.5 TOC 3: In Section 3.4 of Volume 4 (Feasibility Study) the annotation text attempts to differentiate overburden from other mine waste as "largely barren soil/rock." As stated in comment TOC 1, overburden is defined as mine waste under California regulations. Further, there has been no demonstration that Leviathan Mine overburden is barren (presumably this is intended to mean no elevated metals or acid generating potential). Because the overburden is mixed with waste rock at the	FS Section 3.4 in the TOC clearly indicates that overburden, as well as waste rock, is considered to be a potential source material. Use of the term "barren" in this context is meant to indicate general lack of vegetative cover, not absence of elevated metals or acid-generating potential. Please see response to Comment G8.3 for the definitions of overburden and waste rock.

TABLE 1
RESPONSE TO U.S. EPA COMMENTS DATED NOVEMBER 4, 2015
Leviathan Mine Site
Alpine County, California

Comment	Response
site, and no information has been presented to support this conclusion, the annotation should be revised to remove the focus on overburden and to retain the focus on source materials.	
G8.6 TOC 4: Section 3.4.3 of Volume 4 (Feasibility Study) should be deleted because overburden is mine waste.	Please see response to Comment G8.3 for the definitions of overburden and waste rock. We anticipate that different remedial technologies and different components of remedial alternatives may be identified for overburden and waste rock based on their distinct geochemistry and locations. To provide a logical framework for identifying remedial technologies and developing remedial action alternatives for those different types of mine waste, it is appropriate to maintain separate sections in the FS that provide background information about overburden piles and waste rock. Thus, the title of Section 3.4.2 will be changed to Waste Rock and Section 3.4.3 will be changed to Overburden Piles.
G8.7 TOC 5: (a) The fourth and fifth bullets under Section 3.5 of Volume 4 (Feasibility Study) related to erosion and transport of stream sediment, floodplain soil, chemical precipitates, and the role of Leviathan Basin and Delta landslides in contaminant transport. Please include mine waste in these bullets. (b) Mine waste was eroded from the site from the 1950s through the 1980s and transported downstream. Erosion and sedimentation of mine waste directly in Leviathan and Bryant Creeks and EFCR should also be considered in Section 3.5. (c) In addition, in Section 3.5 please include a summary to identify the most significant contaminant fate and transport processes to support prioritization of future response actions.	(a) The third and fourth bullet items in Section 3.5 of the FS TOC will be revised to explicitly include mine waste. (b) Erosion, transport, and deposition of mine waste will be considered in Section 3.5.5 – Stream Sediment and Floodplain Soil. (c) Section 3.5.8 *Summary of Contaminant Fate and Transport* will be summarized from the RI and added to the FS to identify the most important fate and transport processes.
G8.8 TOC 6: Section 4.3 of Volume 4 (Feasibility Study) for applicable or relevant and appropriate requirements (ARARs) should include Air ARARs in the list of subsections.	ARARs for air will be addressed in Section 4.2 *Potential Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered (TBC) Guidance*.
G8.9 TOC 7: Annotations to Sections 7 and 8 of Volume 4 (Feasibility Study) refer to use of a numerical ranking scheme to support alternative evaluations. EPA does not approve of this method. Numerical ranking is subjective and obscures critical elements of the thought process that should be documented as part of the decision process. Please ensure that the decision process is much more transparent through careful documentation of the considerations in the evaluation process.	Comment acknowledged. As stated in U.S. EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, OSWER Directive 9355.3-01 (October 1988), on page 6-14: "The presentation of differences among alternatives can be measured either qualitatively or quantitatively, as appropriate, and should identify substantive differences (e.g., greater short-term effectiveness concerns, greater cost, etc.). Quantitative information that was used to assess the alternatives (e.g., specific cost estimates, time until response objectives would be obtained, and levels of residual contamination) should be included in these discussions." Numerical ranking will not be used without documentation of the rationale used for the quantitative ranking of remedial alternatives in the FS.
Additional Comment 1: In addition to responding to EPA's January 15 comments, ARC's March 13, 2015 letter correctly describes the need to complete additional consultation with trustees under the Section 106 of the National Historic Preservation Act, and proposes a collaborative data review process be developed between EPA and ARC to allow timely review of RI data and interactive decision making as the RI/FS is implemented. On October 15, 2015 EPA sent an email requesting a Project Area of Potential	Atlantic Richfield made numerous attempts to set up a conference call with U.S. EPA throughout the month of October 2015 to discuss NHPA related items and next steps. On November 6, 2015, Atlantic Richfield provided an email response to U.S. EPAs request for an APE description and additional agenda items. As expressed in our November 6, 2015 email, some of the items and next steps identified in U.S. EPA's request are inconsistent with our understanding of what is needed to satisfy certain provisions in the draft Programmatic Agreement (PA) and with previous National Historic Preservation Act (NHPA) related requests from U.S. EPA. Atlantic Richfield does not think that preparing a "sub-APE" is needed because U.S. EPA-approved work

TABLE 1
RESPONSE TO U.S. EPA COMMENTS DATED NOVEMBER 4, 2015
Leviathan Mine Site
Alpine County, California

Comment	Response
Effects (APE) description and agenda items by October 23, 2015. EPA is still waiting for this response so that a conference call can be arranged.	plans will define the specific locations within the Area of Potential Effect (APE) where sampling will occur, and under the PA, only those specific areas (including an appropriate buffer radius) will require a pedestrian survey to clear the area prior to sampling. The expanded APE map and updated project description were submitted to U.S. EPA on July 29, 2015 and used by U.S. EPA to support the August 21 submittal of the Draft PA to the California and Nevada State Historic Preservation Offices (SHPOs). The topographic basemap used for the expanded APE is at the same scale as that used in conducting the pedestrian surveys and in preparation of the Humboldt-Toiyabe National Forest Cultural Resource Narrative Report for the Leviathan Mine Cultural Resources Inventory (August 2014) and in support of the Section 106 Consultation. The expanded APE map is appropriate for use in moving forward in satisfying the requirements in the PA. A conference call was subsequently held with U.S. EPA to discuss NHPA related issues on November 19, 2015. A follow-up call with U.S. EPA and the SHPOs is currently scheduled for December 9, 2015.
Additional Comment 2: In addition to responding to EPA's January 15 comments, ARC provided a response dated August 24, 2015 stating that EPA's January 15, 2015 schedule is impracticable, suggesting that a period of 15 months is required to elapse between RI field sampling and submitting a draft RI/FS report, and suggesting that an amendment to the Program Work Plan be developed that provides a tabular schedule for completion of the RI/FS at Leviathan Mine. As noted in comments above, EPA continues to request that the risk assessments be conducted in an iterative manner with screening assessments followed by quantitative assessment of risks so that the risk assessment can be completed to support timely development of remedial action objectives and target a completion date of a full RI/FS that includes the Risks Assessments by January 2018.	As noted in our response to Comments G3, G5, G6.2, G6.3, G6.4, and in our letters to U.S. EPA dated March 13, 2015 and August 24, 2015, the schedule we provided on March 13, 2015 is aggressive but realistic. For the reasons stated previously, the accelerated schedule provided by U.S EPA on January 15. 2015 is not practicable.
Additional Comment 3: EPA welcomes the opportunity to collaborate with ARC to reduce the duration of the RI/FS at Leviathan Mine, and move on to selection of long term response actions. Development of a collaborative data review process will require ARC to clearly provide and document quality assurance/quality control implemented consistently to support the desired decisions. EPA looks forward to developing a collaborative data review and interpretation process to expedite the Leviathan Mine RI/FS. In addition to the annual Data Summary, EPA requests annual submittals and associated updates to the Groundwater, Surface Water, Sediment (stream and floodplain soil), and SSA tasks through our quarterly technical meetings and other periodic meetings as necessary to ensure that there is focus on each topic/media during at least one of the meetings each year to ensure sufficient progress in key areas across the RI/FS.	Please refer to the response to Comment G2 above for a description of the proposed content and format of interim data submittals and risk assessment data usability evaluations. Atlantic Richfield looks forward to continuing the collaborative data review and interpretation process implemented in technical meetings over the past period with the goal of timely completion of the RI/FS.

TABLE 2
RESPONSE TO LRWQCB COMMENTS DATED MARCH 23, 2015
Leviathan Mine Site
Alpine County, California

Comment	Response
1. Comment Letter, Page 3, last sentence – The text states; "…we anticipate significant progress with the implementation of FRI sampling activities during the 2015 field season." Attachment A, Page 3, Section 1.3 lists "Floodplain Soil Investigations" as a 2015 priority for the Off-Property RI Field Investigation. The Gantt chart included as part of Attachment A, however, shows the Off-Property Floodplain Soil Investigations (line 186) as occurring during the 2016 field season. Please clarify if this Off-Property Floodplain Soil Investigation is a 2015 priority and confirm when this work is scheduled to occur. If this work is not scheduled to occur during the 2015 field season, please clarify how completion of this work during the 2016 field season will impact completion of the final RI report.	Sampling of off-property floodplain soils (Task ID 186 on the Gantt chart) is scheduled for 2016. Mapping of soil characteristics to inform the selection of sampling locations was completed in 2015. This task could not be completed in 2014 as previously planned because of NHPA compliance requirements. A Task Sampling and Analysis Plan for floodplain soil sampling in the Downstream Study Area portion of the Off-Property Study Area is currently in preparation and will be submitted to U.S. EPA in the first quarter of 2016. Sample results will be available in time to support preparation of a draft RI report by December 2017. Sampling of on-property floodplain soil, described in Amendment 8 to the On-Property FRI Workplan, was completed in 2015. Sampling of on-property floodplain soil, stream sediment, and chemical precipitate described in Amendment 10 was conducted at some, but not all, of the planned sample locations because of the onset of winter conditions. The remaining sampling will be completed in 2016.
2. Attachment A, Gantt chart, Line 129, Storm Water and Snowmelt Runoff Sampling – The Gantt chart shows this work taking place during the second, third, and fourth quarters of 2015 and 2016. Given the lower than average precipitation during the 2014 – 2015 winter, it is probable that snowmelt runoff will have ended onsite by the time this task is scheduled to begin. The site is currently accessible by passenger vehicle without the use of four-wheel drive. Water Board staff recommends that the snowmelt runoff sampling be implemented as soon as possible before the limited snow has melted.	Snowmelt runoff was sampled in the Leviathan Creek Study Area in spring 2012 and spring 2013, but not in 2014 or 2015 because of low snowpack. Snowmelt runoff will be sampled in both the Leviathan Creek and Aspen Creek watersheds in spring 2016 if there is sufficient snowpack and the site is safely accessible. In addition, please see Atlantic Richfield's responses to U.S. EPA's comments regarding stormwater and snowmelt runoff assessment in a letter dated April 24, 2015.
3. Attachment A, Gantt chart, Line 135, CUD and Aspen Flow Station Monitoring – The Gantt chart shows this work only occurring during a portion of the year. Table 9-16 of the 2013 Remedial Investigation/Feasibility Study Data Summary Report documents average daily flow rates at these locations for each day of the 2013 calendar year. Please clarify if year-round flow monitoring is continuing at the CUD and Aspen stations.	Flow rate continues to be measured at the CUD and Aspen Seep throughout the year. Task ID 135 of the Gantt chart represents the data downloads and maintenance of the flow stations that are conducted twice per year.
4. Attachment A, Gantt chart, Line 184 (Off-Property Stream Sediment Investigations) and Line 223 (Ore Piles) – A schedule is not included for these work items. Please clarify when these work items will take place.	Stream sediment sampling in the Downstream Study Area portion of the Off-Property Study Area was conducted in 2012 and 2013. A work plan for additional characterization of sediment in the East Fork Carson River is currently being prepared, and sample collection is scheduled to be conducted in 2016. Initial shallow soil sampling of the ore piles to a depth of 1.0 foot below ground surface was completed in 2013. Additional soil sampling of the ore piles and associated reference soil sampling is scheduled for 2016.