

Atlantic Richfield Company

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May 22, 2009

Ms. Nadia Hollan Burke
Remedial Project Manager
U.S. Environmental Protection Agency - Region 9
75 Hawthorne Street, SFD-8-2
San Francisco, California 94105

Subject: Responses to EPA April 22, 2009 Comments on the January 30, 2009 Revision of the Conceptual Site Model (CSM; Revision 3) for the Yerington Mine Site; Administrative Order for Remedial Investigation and Feasibility Study, EPA Docket No. 9-2007-0005

Dear Ms. Hollan Burke:

The Atlantic Richfield Company (ARC) has prepared the attached responses to comments on the January 30, 2009 revision to the Conceptual Site Model (CSM; Revision 3) for the Yerington Mine Site (Site). Comments were provided by the U.S. Environmental Protection Agency - Region 9 (EPA) and the Yerington Paiute Tribe (YPT) to ARC on April 22, 2009 (e-mail transmittal with follow-up hard copies). Subsequent correspondence between ARC and EPA, including EPA's May 13, 2009 letter, have resulted in a revised submittal date of July 17, 2009 for the updated CSM (Revision 4).

ARC responses to each EPA and YPT comments are provided in italicized font. As suggested by EPA, ARC has indicated those YPT comments that ARC anticipates should be addressed in future CSM updates. In concert with YPT's last CSM comment (page 31 of the attached set of responses), ARC suggests that a meeting or conference call would assist EPA, YPT and ARC in resolving any outstanding issues that may result from the attached responses to comments prior to the current July 17, 2009 submittal date for the updated CSM (Revision 4).

If you have any questions regarding ARC's attached responses to the CSM comments, please contact me at 661-287-3855 or via e-mail (roy.thun@bp.com).

Sincerely,



Roy Thun
Environmental Business Manager



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cc:

Dave Seter (EPA)
Tom Olsen (BLM) - hard copy
Paul Meyer (BLM) - via CD
John Krause (BIA) - via CD
Joe Sawyer (NDEP) - hard copy
Lyon County Library System - hard copy
TetraTech/EPA Anaconda Document Library
Justin Whitesides (YPT)
Edmund Reymus (Walker River Tribe)
John Batchelder (BP)
Jim Chatham (BP)
James Lucari (BP)
Chuck Zimmerman (BC)
Guy Graening (BC)
Linda Henry (BC)
Matt Arno (Foxfire)
Les Williams (Integral)
Rich Curley (Curley and Associates, LLC)
Victor Early (TetraTech)
Ken Greene (CH2MHill)

Response to EPA Comments Dated April 23, 2009 and YPT Comments dated April 3, 2009 on the Conceptual Site Model (Revision 3) dated January 30, 2009

EPA General Comments

EPA Comment 1

The U.S. EPA and ARC have been working on the CSM since 2002. An additional Appendix, Appendix F - Responsiveness Summary, should be added to the final CSM that includes all EPA comments and ARC responses to comments since 2002.

ARC Response 1

An additional Appendix, Appendix F - Responsiveness Summary, will be added to the updated CSM (Revision 4), which will include EPA comments and ARC responses to comments since 2002.

EPA Comment 2

The Walker River adjacent to the site is a priority restoration area for Lahontan cutthroat trout, an endangered species. These two factors need to be stated in the CSM. Possible contaminant exposure scenarios involving off-site migration of dust, surface water and groundwater to the Walker River, potentially impacting Lahontan cutthroat trout, should be considered in the CSM. Impacts that should be considered include (a) dust may reach the river and become sediment and (b) dust could become a transport medium for the contaminants to aquatic insects (part of trout's diet). Lahontan cutthroat trout need to be added to the list of endangered species that could potentially be impacted and fish should be added to the receptor list for assessment of risk.

ARC Response 2

ARC agrees that the Lahontan cutthroat trout can be added to the list of endangered species and that potential exposure pathways will be qualitatively discussed in the revised CSM.

There is substantial evidence, as presented in the Second-Step HFA Data Summary Report, that groundwater underlying the Site is recharged from the Walker River. Therefore, the revised CSM will indicate that no mine-related groundwater recharges the river. Under existing conditions, based on topography and intervening cultural features (e.g., Highway 95A, businesses, residences and agricultural areas), there is limited or no potential for surface water from the Site to directly reach the Walker River, with the possible exception of potential runoff the South Waste Rock Area. There is the potential for runoff from the northern portion of the Sulfide Tailings Area to reach the Wabuska Drain.

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ARC Response 2 – Continued

There is the potential for fugitive dust from the Site to reach the Walker River. However, results presented in the Air Quality Monitoring Data Summary Report (AQM DSR) indicated that it is unlikely that fugitive dust from the Site would increase concentrations of metals off-Site, particularly in the Walker River as the only chemicals that are higher in downwind air quality samples than in the upwind samples are aluminum and copper. The increases in the downwind concentrations of these two metals are small (e.g., copper concentrations were 33 percent higher in the downwind samples).

During the March 19, 2009 Yerington technical meeting (conference call), this issue regarding potential exposure pathways to the Lahontan cutthroat trout was discussed. At that time, participants agreed that there was insufficient information to establish a definitive exposure pathway, but that such a pathway should be included qualitatively.

EPA Comment 3

The Heritage Lyon County database lists six “at risk” plants, two “at risk” insects and three “at risk” mammal species. The Heritage Lyon County database “at risk” species need to be added to the CSM.

ARC Response 3

These species listed as “at risk” in the Heritage Lyon County database will be added to the CSM (Revision 4).

EPA Comment 4

It would be useful to have a legal description and plat maps, as recorded by the county clerk or county assessor, included in the CSM so there is no uncertainty about the identity and boundaries of each land parcel that will be included in the remedial project.

ARC Response 4

Legal descriptions and plat maps for the parcels within the Site boundary will be included in the CSM (Revision 4).

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EPA Comment 5

The CSM omits much of the data presented in the Air Quality Monitoring Program Data Summary Report (dated May 29, 2008). These data indicate four wind patterns that were all quite different from one another. That level of detail will eventually be needed when all parties agree on a final remedial plan and criteria for evaluation of corrective actions.

ARC Response 5

Revision 3 of the CSM contains four pages of findings from the Executive Summary of the AQM DSR report, and the data used to support the findings. The second bullet on Page 4 of Revision 3 of the CSM discusses the variability of the wind direction. If EPA indicates the additional specific information from the AQM DSR to be added, ARC will include that information in the revised CSM.

EPA Comment 6

When laboratory work is performed on samples collected at the site, it should include ^{228}Ra measurements whenever ^{226}Ra measurements are indicated and ^{232}Th measurements whenever uranium measurements are indicated. ARC should propose for EPA acceptance PRGs for both $^{234/235/238}\text{U}$ and ^{232}Th , and ^{226}Ra and ^{228}Ra , and sum their fractional contributions using the "unity rule" when evaluating progress toward a remediation risk target.

ARC Response 6

Radium-228 measurements are typically made whenever radium-226 measurements are made, as is the case for uranium and thorium. The CSM does not discuss specific analytes for any specific operable units (OUs) for the Site, given that: 1) the Quality Assurance Project Plan is the more appropriate document for such information; and 2) specific analyte lists are proposed by ARC for individual remedial investigation (RI) work plans for each OU (e.g., the analyte list for the Process Areas OU RI work plan may differ from that of the Waste Rock OU RI work plan).

As part of the completion of the remedial investigation/feasibility study (RI/FS) process, ARC will propose remedial goals (RGs) or remediation guidelines for EPA approval, which may or may not be the same as the generic PRGs published by the EPA. The proper document for such information would be in the FS report rather than the CSM. Once the RGs and remediation risk targets have been established, ARC will sum the contributions of both radiological and non-radiological risks using the unity rule (i.e., sum of fractions approach, to ensure compliance with the remediation risk target.

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EPA Comment 7

Historically, some of the waste rock and mine tailings generated during mining have been used for a variety of purposes in the local community. The waste rock and tailings were available at no charge to the locals and were widely used as rip-rap in irrigation ditches, as an enhancement to local landscaping, in foundations for homes and other buildings and as road base, and deposited proximal to the historic movie theater. The CSM should mention this widespread use and the potential for regional impacts. Further, the CSM should describe how these potential mine-related impacts to the local community will be evaluated as part of the overall sitewide RI/FS process.

ARC Response 7

ARC is aware that anecdotal information exists regarding the use of waste rock and oxide tailings for a variety of purposes in the local community. However, to date, ARC has not seen any specific information regarding the off-Site placement or use of these materials (a recent visit to the Site files did not reveal any specific information about the materials being used in irrigation ditches, landscaping, building foundations, road base, etc.).

EPA's 2005 scanner van survey was performed to evaluate radiometric signatures both on and off the Site (off-Site survey transects investigated potential areas that may have received waste rock and oxide tailings from the Site). Off-Site areas included the MacArthur pit and haul road, the Wabuska rail spur, the Yerington Paiute Tribe reservation, a number of residential areas (e.g., Sunset Hills, Luzier Lane, Penrose, Valley View Estates), the City of Yerington and the communities of Mason and Schurz. Scanner van survey results indicated: 1) minor radioactivity along the MacArthur haul road and in the MacArthur pit; and 2) no activity more than 2 times background in any of the other areas. These results, along with the current understanding of waste rock and oxide tailings material chemistry, indicate no or limited off-Site potential for human health risk.

Other sources of mineralized bedrock and alluvial materials may have been locally used in addition to waste rock and tailings from the Site (e.g., mineralized bedrock and rock from the MacArthur Mine). ARC has documented in the Background Soils Data Summary Report (Revision 1) that the alluvial fan materials, derived from variably mineralized bedrock, within the background reference areas west of the Site have elevated concentrations of chemicals consistent with regional mineralization and hydrothermal alteration haloes in a large mining district (i.e., the Yerington District).

The revised CSM will include a brief discussion of the anecdotal information mentioned in this comment. However, ARC does not anticipate that this information can be quantitatively addressed in the Site-wide RI/FS process.

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EPA Comment 8

When evaluating tribal life ways (Appendix D), ARC is expected to respect the agreements reached during the March 30, 2009 meeting between ARC and the YPT. EPA anticipates that Appendix D will continue to evolve as discussions between ARC and YPT continue and that ARC will submit a revised version of Appendix D at an appropriate time to be agreed to after subsequent discussions between ARC, YPT and EPA. In the current revision of the CSM, Appendix D should include the animals discussed in the March 30th meeting and the expanded plant list included with the attached YPT comment letter.

ARC Response 8

Table 1 included in the YPT comments will be included in Appendix D of Revision 4 of the CSM as a “Draft List of Plants Associated with the Yerington Paiute Tribe”. During the meeting on March 30, 2009 between ARC and the YPT, ARC agreed to support the creation of a list of animals and plants that are important to the Tribe. At this time, ARC and the YPT are discussing the best way to prepare this list and have it go through appropriate review by the Tribe.

EPA Comment 9

Numerous comments to the CSM have been provided by the YPT (Attachment 1), the intent of these comments are to further improve the interpretation of the existing data collected at the Mine Site and suggest alternatives for the proposed investigation. Although EPA has determined that most of the comments provided in the attached YPT letter do not need to be incorporated into the current CSM revision, EPA is requesting that ARC prepare a formal response to the YPT comments that either provides direct responses or indicates how each comment will be addressed in future revisions to the CSM or other relevant technical documents.

ARC Response 9

As requested by EPA, ARC has prepared a formal response to each of the YPT comments and has proposed changes to a future CSM, as appropriate. ARC notes that some of the YPT comments request information that will be collected during the RI/FS process for specific OUs, and suggests that such information be included in the RI report for each OU, with subsequent incorporation in a future revised CSM, as appropriate.

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Yerington Paiute Tribe Comments

YPT Comment 1

Page 3, 1.2 Physical Setting (not addressed from previous comments)

The statement “Vegetative communities in the area vary from relatively dense associations along the Walker River immediately east of the Site to sparse brush found on the alluvial fans derived from Singatse Range, immediately west of the Site.” requires clarification. Questions such as: Dense by what metric? What is dense? Associations of what? and what species of brush? should be considered.

ARC Response 1

This paragraph is intended to give a very broad overview of the physical setting of the Site. ARC is not aware of research that has measured the densities of vegetation in the vicinity of the Site, and believes that it is appropriate to use relative and qualitative descriptors to indicate that there is more vegetation along the riparian corridor of the Walker River than on the foothills of the Singatse Range. No change to a future CSM is proposed based on this comment.

YPT Comment 2a

Page 4, 12 Physical Setting, Meteorological Data (not addressed from previous comments)

The statement “EPA’s literature indicated that speeds greater than 20 mph are needed for continual particulate emissions from material storage areas” should include a citation as well as more discussion on the application of that concept to the type of measurements taken and the terrain at the site. Otherwise, the statement could be misleading in this context. *If data specifically supports this oddly generally statement, it should be described and well documented.*

ARC Response 2a

The following response was provided in the February 27, 2009 ARC Responses to EPA and YPT Comments on the AQM DSR dated May 29, 2008 and the HHRA Work Plan dated June 19, 2008: “Section 13.2.5 of the EPA’s Compilation of Air Pollution Emission Factors for Stationary Sources AP-42 (EPA, 1995) presents information for wind erosion from open storage piles and exposed areas. AP-42 field testing has shown that typical threshold wind speeds at 10 m above the surface must exceed approximately 20 mph for particulate emissions to occur.” This is a general observation (not intended to be applicable to all sites or misleading) based on an EPA (1995) reference. Actual wind speed thresholds and emission rates can be affected by site-specific conditions (e.g., topography and the surface material characteristics). The first bullet on Page 4 stated that EPA’s finding applies to tailing and waste rock piles, and other surface materials. The sentence that reads “EPA literature (e.g., EPA 1995) indicates that wind speeds greater than 20 mph are needed for continual particulate emissions from material storage areas (i.e., tailing and waster rock piles, and other surface material at the Site)” will be deleted.

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YPT Comment 2b

(additional comment)

The first bulleted item “Wind speed at the Site was observed to be light to moderate with 85 percent of measurements less than 10 mph” should be restated to “Wind speed at the Site was observed to be less than 10 mph for 85 percent of the measurements” or the statement removed.

ARC Response 2b

The first bulleted item will be restated as: “Wind speed at the Site was observed to be less than 10 mph for 85 percent of the measurements”.

YPT Comment 3a

Page 5, 1.2 Physical Setting, Particulate Data (not addressed from previous comments)

The document states “A variety of potential dust emission sources occur in the vicinity of the Site, including wind blown Site emissions, dust emissions from other mine sites, agricultural activities, and paved and unpaved road emission sources. The emission rates from these sources are variable and can be functions of ambient wind speed, precipitation, agricultural production levels, vehicular traffic patterns, and other variables. In addition, more widespread or regional conditions affect the occurrence of wind-blown dust at the Site.” Although other sources are likely in this area, this appears to be an attempt to confound the conclusions regarding site dust emissions with unknowns regarding local dust sources. It is the RP and the consultant's responsibility to define these potential sources and quantify them, not to speculate. This may indicate that additional studies are required and should be indicated in the following discussion. An emissions inventory for the area would be an expected activity or may even be currently available.

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ARC Response 3a

The following information was provided in the February 27, 2009 ARC Responses to EPA and YPT Comments on the AQM DSR dated May 29, 2008 and the HHRA Work Plan dated June 19, 2008:

The text cited in this comment from the CSM provides a general condition of observed Site conditions, and is not speculative. The goals of the AQM program and associated HHRA Work Plan for the inhalation pathway, respectively, have been to characterize air quality conditions associated with the Site, and to evaluate potential risks associated with the inhalation of chemicals in fugitive dust emissions from the Site. ARC suggests that the appropriate next step is to allow the results of the HHRA to determine what, if any, further evaluation of chemical sources on the Site are needed based on any risk posed by the metals and radiochemicals present in fugitive dust sourced from the Site.

For this specific response, ARC adds the following information:

Upwind concentrations of chemicals from other sources have been determined from the upwind/downwind statistical analyses. Quantification of the sources that contribute to the upwind concentrations is not needed to quantify any human health or environmental effects associated with the Site. Section 6.3 of the AQM DSR dated February 27, 2009 presents regional data on dust concentrations from five air monitoring stations in Nevada. The table on Page 47 of this report shows that the upwind and downwind average and maximum concentrations of PM10 are within the range found at these other stations. This indicates that the sources of background dust at the Site are consistent with other locations in Nevada.

Information on the consistency between upwind and downwind air concentrations at the Site with other locations in Nevada will be added to a future CSM.

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YPT Comment 3b

Page 5, 1.2 Physical Setting, Particulate Data (additional comment)

The fourth bulleted item should state “Hourly PM₁₀ measurements ranged from zero to 1200” instead of “Hourly PM₁₀ concentrations ranged from zero to 1200”.

ARC Response 3b

The fourth bulleted item will be change to read “Hourly PM₁₀ concentrations ranged from zero to 120”.

YPT Comment 3c

Page 5, 1.2 Physical Setting, Particulate Data (additional comment)

R² values should be only one of many methods used to determine correlation and otherwise interpret and discuss this data. Considering the type of data as well as the size of this project, more sophisticated statistical interpretation should be utilized in this discussion. R² values are typically only general, relative measures and an empty measure without further analysis/discussion.

ARC Response 3c

A more sophisticated statistical interpretation was provided in Appendix O of the AQM DSR to determine the difference between the upwind and downwind concentrations and quantify any releases of mine-related chemicals. In addition, Appendix E-2 of the AQM DSR presents summary statistics and concentrations based on upper bound confidence limits. Given that the CSM should present an overview of key Site information, ARC believes that the CSM adequately summarizes the results of the AQM DSR. No change to a future CSM is proposed based on this comment.

YPT Comment 4a

General Comment, 1.2 Physical Setting, Particulate Data (not addressed from previous comments)

The spray-on materials recently used by EPA for dust control at the site have reached the end of their service life. Previous measurements regarding dust emissions may no longer be applicable to site conditions. This variable is significant and should be added to this discussion.

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ARC Response 4a

Air quality data were collected for one and a half years prior to the June 2006 EPA application of the spray-on materials (palliative) and continued for one and a half years after that action (see Section 3.2.2, page 16 and Figure 10 of the AQM DSR report). The AQM data obtained before the palliative application is, therefore, considered to be representative of a worst-case or degraded condition. No change to a future CSM is proposed based on this comment.

YPT Comment 4b

General Comment, 1.2 Physical Setting, Particulate D (additional comment)

The “Dust Events” section discusses the source of the dust in the first bulleted item and possible causes in the last item. The suggestion that “other background sources appear to contribute about equally to windblown dust in the area” is misleading since “site emissions contributed most of the measured downwind concentrations of arsenic, cobalt, copper and a radio chemicals” (page 8, same document). The statement that “unusual combination of high winds during the event (above 50 mph), and extended dry conditions before the event, caused the ‘dust event’” is also an unsupported statement used to downplay the risk that may be represented by these events.

ARC Response 4b

The second sentence containing the phrase “other background sources appear to contribute about equally to windblown dust in the area” will be deleted.

ARC respectfully disagrees with the second part of this comment and reiterates that the June 5, 2007 dust event was unusual in several ways. As described in Section 5.2 of the AQM DSR (Revision 1), five dust events (including the June 5 event) were recorded on Site in 2007 based on the numerical criterion of hourly PM10 at AM-6 greater than or equal to 300 ug/m3. Excluding the June 5 event, the other four dust events lasted only two hours, had average hourly wind speeds up to 27 mph, and had hourly PM10 concentrations up to 435 ug/m3 (which is near the trigger criterion for a dust event of 300 ug/m3). In comparison, the June 5 dust event lasted four hours with average hourly wind speeds up to 45 mph and hourly PM10 concentrations that exceeded 1,200 ug/m3. An analysis of Site meteorological data and hourly PM10 data indicated that high wind speed days did not correlate well with high PM10 concentration days, suggesting other meteorological factors may be important. An analysis of precipitation data revealed that for the four dust events in 2007 (excluding the June 5 event), precipitation had typically occurred within the prior 10 days. The June 5 dust event was different from these other events in that there was no precipitation for 30 days prior to June 5.

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ARC Response 4b - Continued

Also, based on an analysis of long-term weather records for Reno and Carson City (the closest locations to the Site where adequate data are available), the combination of high winds and no precipitation for 30 days or longer is a relatively rare occurrence. In addition, as presented in Figure 14 of the revised AQM DSR, the June 5, 2007 event was part of a large regional dust event that included the area near Pahrump, Nevada. ARC reiterates that the combination of high winds and very dry conditions throughout Nevada on June 5, 2007 contributed to a regional dust event, and the Site-specific observations and measurements (summarized above) reported in the revised AQM DSR are relevant and supported by recorded meteorological data. No change to a future CSM is proposed based on this comment.

YPT Comment 5

Page 8, 1.2 Physical Setting, Upwind/Downwind Evaluation (not addressed from previous comments)

The report states "The upwind/downwind evaluation indicated that, during peak short-term periods: 1) background and site emission sources contributed about equally to measured downwind concentrations of PM₁₀, aluminum, cadmium, nickel, and sulfate" It is unclear if the report is attempting to state if the ratio and arithmetic average are essentially the same for these constituents, or if the site doubles the ambient concentrations for these constituents.

ARC Response 5

This comment was addressed previously. The quotation in the YPT comment is not a correct replication of the text in the second bullet on Page 8, Section 1.2. The text was changed based on the previous YPT comment as presented in the February 27, 2009 ARC Responses to EPA and YPT Comments on the AQM DSR dated May 29, 2008 and the HHRA Work Plan dated June 19, 2008 as follows:

"The upwind/downwind evaluation indicated that, considering ratios of average concentrations during peak short-term periods: 1) background and Site emission sources contributed about equally to measured downwind concentrations of PM₁₀, aluminum, cadmium, nickel, and sulfate; 2) Site sources contributed most of the measured downwind concentrations of arsenic, cobalt, copper, and radiochemicals; and 3) background sources contributed most of the measured concentrations of manganese."

No change to a future CSM is proposed based on this comment.

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YPT Comment 6

Page 12, Conceptual Hydrogeologic Model (additional comment)

Recharge to alluvial groundwater beneath the site was indicated to include more than direct percolation of meteoric water in the latest groundwater data sets from the site. This was the topic of extended discussion in the previous Groundwater Technical Working Group Meeting. This should be noted in the section instead of the opposite being stated. This will also require corrections on page 13 “a spur of the Singatse Range likely impedes recharged from the Walker River”. This can no longer be presumed as was indicated by EPA and YPT technical support at that and previous meetings and comments.

ARC Response 6

The text on page 12 will be modified to indicate that “Recharge to alluvial groundwater beneath the Site occurs as a result of direct percolation of meteoric water (as precipitation and runoff) through native alluvial fan and disturbed materials and as discharge from bedrock to the overlying alluvium.”

The text on page 13 will be modified to indicate that the large difference in water levels on either side of the Singatse Spur suggest that recharge through the bedrock is limited, and that additional characterization activities are anticipated to confirm and quantify this condition (to be proposed in the next version of the Site-Wide Groundwater Remedial Investigation Work Plan).

YPT Comment 7

Page 12, Conceptual Hydrogeologic Model (additional comment)

The statement “Toward the northern margin of the site, recharge from the agricultural area creates a groundwater mound that strongly influences the groundwater flow regime” should be corrected to “Toward the northern margin of the site, recharge from the agricultural area creates a *seasonal* groundwater mound that strongly influences the groundwater flow regime.”

ARC Response 7

The text will be modified to indicate that recharge due to agricultural irrigation occurs seasonally, and that the effect of the mounding on groundwater flow during 2008 was evident throughout most, if not all, of the year, as evidenced in monthly potentiometric surface maps provided in Appendix E of the 2008 Annual Groundwater Monitoring Report, Yerington Mine Site.

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YPT Comment 8

Page 14, Conceptual Hydrogeologic Model (additional comment)

The numbered list in the second paragraph requires the following corrections; Item 1 should include seasonal agricultural practices, and irrigation water transport (ditches) should be included as an item affecting the alluvial aquifer. In addition, historic agricultural practices should be considered as well as a stored groundwater extraction by Anaconda.

ARC Response 8

The text on page 14 will be modified to indicate that seasonal agricultural practices currently influence the groundwater flow regime throughout most of the calendar year, and that irrigation water conveyances (ditches) may also locally affect groundwater flow. In addition, the text will be modified to indicate that historic agricultural practices may have influenced historic groundwater conditions and that Anaconda extracted groundwater for ore beneficiation and stored groundwater in above-ground storage tanks. Additional research on the historical files may provide details on the locations, storage volumes, and construction details of the storage features that can be described in a future revised CSM.

YPT Comment 9

Page 17, 1.3 Past Mining Operations and Current Conditions (not addressed from previous comments). The time line should include the NDEP removal actions and more of the EPA actions including emergency response actions for dust control.

ARC Response 9

This comment was addressed in Revision 3 of the CSM (seven line items were added to the list on Page 17 to address NDEP and EPA removal actions and responses for dust control). No change to a future CSM is proposed based on this comment.

YPT Comment 10

Page 32, *Pit Lake*, (additional YPT Comment)

Potential hazards at the pit lake also include chemical hazards; for example selenium concentrations toxic to fish and other aquatic life have been measured. These same types of chemical hazards that exist in more extreme levels are also understated for other areas at the site such as the evaporation ponds.

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ARC Response 10

This section of the CSM is intended to provide a general overview of potential physical and chemical hazards at the Site and will be updated given the current understanding of Site conditions. ARC believes it is premature to make assumptions about potential ecological risk until Pit Lake OU RI activities are completed, which can then be incorporated into a future revised CSM.

YPT Comment 11a

Pg. 34. 1.4 Human Population Areas (not addressed from previous YPT Comments). This section also typically identifies the distance to the nearest occupied dwelling. The number of homes located adjacent to the site such as those on Locust should be clearly stated Figure 1-1 as provided does not adequately illustrate the proximity of homes to the site, there is no indication of the lots adjacent to the site, along Luzier, Sunset Hills, etc.

ARC Response 11a

The distance of the closest residence to the Site boundary will be added as well as indicating residences along Luzier, Sunset Hill and other roads on Figure 1-1.

YPT Comment 11b

Pg. 34. 1.4 Human Population Areas (additional YPT Comment)
There is no mention of the trailer park located on the eastern perimeter of the site.

ARC Response 11b

A reference to the trailer park located on the eastern perimeter of the Site will be added to the revised CSM.

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YPT Comment 12

1.5 Site Ecological Conditions (not addressed from previous comments)

This section discusses habitats and species likely present at the Site and its surrounding environment. A preliminary overview of local ecological conditions is presented recognizing that no qualitative or quantitative habitat surveys or vegetative surveys are known to have been conducted at the Site. The surveys should be a priority and could have been conducted to support this document. It is recommended to start these surveys as part of the next (*this*) revision.

ARC Response 12

The habitat and related surveys will be conducted in support of the screening level ecological risk assessment for each OU and will be coordinated with other field activities pursuant to EPA approval of each OU-specific work plan. Survey results will be incorporated into a future revised CSM, as appropriate or recommended by EPA.

YPT Comment 13

Page 36, 1.5 Site Ecological Conditions (not addressed from previous comments)

Site features provide sources of drinking water for wildlife at the Site, resting areas for migratory birds and a source of emergent vegetation for feeding and cover for both migrating and resident wildlife has been established. The documentation demonstrates use as “may provide” and “could” which infers unwarranted ambiguity.

ARC Response 13

The language in this section will be modified to state, more definitively, that wildlife observations have been made in selected portions of the Site. However, the type and extent of Site use by wildlife has not yet been evaluated and ARC suggests that it is not appropriate to make definitive statements about the nature and extent of specific activities being conducted by wildlife on a Site-wide basis.

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YPT Comment 14

Page 37, 1.5 Site Ecological Conditions (not addressed from previous comments)

The document states that “The topographic diversity at the Site and surrounding area provides potential habitat for species that are native to the Great Basin. Plant communities have been discussed in the preceding sections on habitat.” No plant communities were identified, other than a gross oversimplified reiteration of a shrub-steppe biome. Which vegetation habitat types? Using who's classification? It is also likely that many non-native species also occupy the site and should be discussed in these sections. Again, the surveys required preliminary to this document were not done and should be done before the document is finalized.

ARC Response 14

This broad statement was intended to provide general information about vegetation that can support wildlife habitat within and adjacent to the Site. The summary provided in the CSM (Revision 3) relied on available information for plant communities in the Great Basin portion of Nevada. ARC agrees that non-native plants may well be present in the vicinity of, and on, the Site. However, ARC is not aware of data for on- or off-Site vegetative communities that can be used to identify and quantify non-native plant species. As noted in the response to YPT Comment 12, surveys will be conducted on an OU-specific basis and will provide the appropriate level of detail.

YPT Comment 15

Page 38, 1.5.2 Species (not addressed from previous comments)

As with the YPT Comment above, there is no need to speculate as to which species may or may not occupy the site, standard biological sampling methods can provide a very high level of confidence. The subsequent avian and mammal sections are finally taking shape, but still suffer from the lack of adequate surveys.

Page 38, Table 1-3

ID species on Nevada Natural Heritage List. ID US BLM and FS listed species. Also correct; eagle is ESA Delisted.

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ARC Response 15

As explained in the response to YPT Comments 12 and 14, surveys will be conducted as part of the RI for each OU and appropriate local and regional data sources have been compiled for species in the vicinity of the Site. ARC agrees that biological sampling methods to identify plant and animal species present on the Site are appropriate and will be developed for specific OU RI work plans.

Regarding the identification of listed species, please see the response to EPA Comment 3, indicating that listed species will be identified. ARC assumes the comment about bald eagle delisting is relevant to Table 1-4 and will correct the table as requested.

YPT Comment 16

Section 3, General comment. (not addressed from previous comments)

The human health receptors and exposure routes should include agricultural workers. Property adjacent to the mine includes agricultural use in addition to residential areas. Exposure would be similar to a future construction worker in exposure to soils and potentially contaminated surface water and groundwater. The period of exposure would be similar to estimates for current and future outdoor workers.

ARC Response 16

There is no need to evaluate an agricultural worker separately because residents are likely to have higher levels of exposure to soil and groundwater for longer periods of time than an agricultural worker and, therefore, will provide a more conservative evaluation for the human health risk assessments. Although exposure assumptions have not been agreed upon with EPA for the Site, EPA's standard approach is to assume that residents are in contact with the soil and groundwater for 350 days a year for 30 years. No change to a future CSM is proposed based on this comment.

YPT Comment 17

Page 62, Section 3 (not adequately addressed from previous comments)

“Therefore, an on-site residential scenario is included in this CSM as low probability and potentially incomplete.” Although residential areas are not on the site, they are adjacent to the site. In addition, many residential areas adjacent to the site and in the community utilized mine waste for fill material around and underneath homes and in other commercial and industrial construction. Adding to this, the plan does not provide adequate reference to any institutional controls that may prohibit continued development adjacent to the site or even on the site itself.

What is the distance to the nearest receptor?

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ARC Response 17

Residential exposure adjacent to the Site is currently included in the CSM under “Off-Site Resident”. In previous responses to EPA comments on the CSM, ARC has presented the rationale for excluding residential use on-Site. EPA has agreed that residential use on-Site is a low probability and potentially incomplete exposure pathway. It is correct that the CSM does not include reference to any institutional controls to restrict residential use on-Site. Remedial actions, such as institutional controls, are not typically discussed in a CSM, as they are normally discussed in the FS.

The distance to the nearest receptor will be added to Revision 4 of the CSM.

YPT Comment 18

Page 63, Section 3.1

Construction workers are often in confined spaces, such as utility trenches, and inhalation of radiation in addition to mechanical particulate aspiration should be described.

ARC Response 18

Text will be added to the revised CSM to explain that the radiation risk model does consider the contribution of internal radiation exposure from inhalation of particulates.

YPT Comment 19

Page 64, Section 3.1

Again, construction workers, and supervisors do spend considerable time indoors. This is a complete pathway.

ARC Response 19

Language will be added to Section 3.1 to explain that the combination of an indoor worker and outdoor worker can be used to determine the impact of time spent indoors for an outdoor worker. An indoor worker is assumed to spend all working hours indoors while an outdoor worker is assumed to spend all working hours outdoors. The indoor air and outdoor air pathway risks will be assessed separately so that it will be possible to determine if an outdoor worker’s risk would increase or decrease for any time spent indoors.

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YPT Comment 20

Page 65, Section 3.1

Appears to be a gross mistake missing remedial activities and earthmoving for construction, please clarify.

ARC Response 20

A future construction worker was included in the CSM (Revision 3) to consider exposure during earthmoving activities. Regarding remedial activities, the definition of a baseline HHRA is to assess the risk in the absence of remedial action. Any risk associated with remedial activities is addressed in feasibility studies or remedial action plans. No change to a future CSM is proposed based on this comment.

YPT Comment 21

Page 66, Section 3.1

Assume that the badge detects gamma dose, and of course is insensitive to beta and alpha. Both of which are dose factors from dermal and inhalation.

ARC Response 21

The dosimeter information was provided to demonstrate that measures have been taken at the Site to monitor radiation doses for current workers (results to date indicate that radiation exposure is well below safety limits), and does not relate to how radiation risk will be calculated in the future. This section of the CSM addressed external radiation exposure only (dosimeters are capable of measuring external beta radiation dose), and alpha radiation does not contribute to external dose. Internal dose exposure pathways were addressed in Section 3.2 as part of the discussion on inhalation and ingestion pathways. No change to a future CSM is proposed based on this comment.

YPT Comment 22a

Page 70, 3.5 Practitioner of Traditional Tribal Lifeways (not addressed from previous comments)

Potentially complete primary exposure routes for a practitioner of “tribal lifeways”:

- Incidental ingestion of surface and subsurface soil associated with use of native plants and wild game
- Incidental ingestion of, dermal contact with, and external radiation exposure from surface and subsurface soils associated with use of native plants and wild game.

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ARC Response 22a

Currently the third bullet on Page 71 for Section 3.5 of the CSM (Revision 3) reads as follows:

- Incidental ingestion, dermal contact and external radiation exposure to potentially-impacted surface soil that may be present on native plants and wild game.*

The only difference between the bullets in the YPT comment and the current text is the absence of exposure to subsurface soil. Exposure to subsurface soil (i.e., below 2 feet) was not included in the CSM (Revision 3) for off-Site receptors because of the limited potential for mine-related off-Site impacts to deeper soils. No change to a future CSM is proposed based on this comment.

YPT Comment 22b

Page 70, 3.5 Practitioner of Traditional Tribal Lifeways

This section does not appear to include sweat lodge or contact with contaminated surface water directly during the gathering of plants or indirectly via use of those plants. In addition, animals can be utilized that came in contact with contaminated surface water.

ARC Response 22b

The use of sweat lodges will be referenced in Appendix D in Revision 4 of the CSM. Contact with surface water impacted by mine-related chemicals is not considered a completed exposure pathway for any off-Site receptors in the CSM (Revision 3) because surface water does not leave the Site (possible exceptions may include runoff from the northern margin of the Sulfide Tailings Area and the South Waste Rock Area). The scenario for animals contacting impacted surface water on the Site, followed by ingestion by off-Site residents, members of the Tribe and trespassers was shown on Figure 3-1 in the CSM (Revision 3).

YPT Comment 23

Page 71, Section 3.5

Dermal and ingestion may be a significant pathway for a basket maker.

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ARC Response 23

The practice of making baskets was discussed in Appendix D of the CSM (Revision 3). The ingestion pathway for plants was included in the CSM (Revision 3). As ARC works with the YPT to identify important plants used by the Tribe, plants used for basket making will be identified. Ingestion of these plants will be considered in the HHRA if ingestion of these plants represents a completed exposure pathway for mine-related chemicals. Although there is insufficient science to estimate the transfer of chemicals from dermal contact with plants, the potential that this pathway might pose a concern to human health can be evaluated in the Uncertainty Analysis of the risk assessment.

YPT Comment 24

Page 74, Section 4.2

VOCs vs. radiation available as a gas; the comparison between the low estimates of VOCs and the documented radon products should be distinguished. Pathways may be difficult to verify. It may be appropriate to provide some detail on how these estimates were/are made. Two references that are of interest include:

Wetlands 23(2):459-465. 2003

doi: 10.1672/20-20 [doi:10.1016/j.envpol.2006.05.010](https://doi.org/10.1016/j.envpol.2006.05.010)

<http://www.ehponline.org/members/1981/040/40005.PDF>

ARC Response 24

ARC reviewed the references provided, and no information on inhalation of VOCs or radon was found. ARC assumes this comment requests clarification on potential exposure pathways for radon gas to ecological receptors. Radon emanation from soil and resulting radon concentrations in the air is a potentially complete, but minor exposure route. Based on radium-226 concentrations in Site soils observed to date, and expected low emanation fraction, outdoor ambient radon concentrations are not expected to be elevated above background. No change to a future CSM is proposed based on this comment.

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YPT Comment 25

Page 76, Section 4.2

Identify species and chemicals associated with a risk of bio-concentration.

ARC Response 25

The chemicals and species that might be evaluated for trophic transfer will vary between OUs and this list will be developed on an OU-specific basis.

YPT Comment 26

Page 77, Section 4.2

Please document and define how the consultant actually followed this DOE screening process in an attachment or appendix.

ARC Response 26

DOE screening levels for terrestrial biota for Ra-226 and 228 (DOE 2002) were compared to preliminary radiological data from soils collected in the Process Areas OU. The maximum value of Ra-226 was 18 pCi/g, which is lower than the screening level value for Ra-226 of 50 pCi/g. The maximum value of Ra-228 was 24.4 pCi/g, lower than the screening level value for Ra-228 of 44 pCi/g. This information will be added to Revision 4 of the CSM.

YPT Comment 27

Page 80, Section 4.3

Grasshoppers and Mormon crickets have an extensive belowground life stage. Please revise text for accuracy and calculate the dose over the complete life cycle. Both of these species are edible and specific groups within the study area are known to gather these invertebrates.

ARC Response 27

Text regarding grasshoppers will be modified to indicate they are among invertebrates that spend part of their life cycle below the surface. The fourth bullet below the second paragraph on page 80 already states that soil exposure pathways will be evaluated for invertebrates in contact with soil. Ingestion of grasshoppers and Mormon crickets by humans falls under the HHRA process, and any calculation of dose to humans will be considered in the appropriate HHRA.

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YPT Comment 28

Page 81, Section 4.3

Grooming and preening are an obvious route of exposure that is understated, please clarify in text and analysis.

ARC Response 28

ARC will add a statement to explain that grooming and preening are sources of soil ingestion for animals and birds, but these are not pathways that can be quantified separately from other routes of ingestion (e.g., ingesting soil with food).

YPT Comment 29

Page 82, Section 4.3

Chukar, a popular game bird, eats insects in summer; insects which may have lived and been exposed at deeper soil strata.

ARC Response 29

Chukar will be included in the list of animals important to the Yerington and Walker Tribes as sources of food for the human health component of the risk assessment. The CSM (Revision 3) statement that the Chukar “may seasonally incorporate insects in its diet” is correct, and no change is proposed. Chukar is primarily an herbivore and insects are not considered to be an important part of the diet of this species, however, it will forage opportunistically on insects (Christensen 1996). ARC will add a potentially complete but minor pathway from subsurface soil to chukar to the revised CSM to address this possible route of exposure.

Additional reference: Christensen, Glen C. 1996. Chukar (Alectoris chukar), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/258>

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YPT Comment 30

Page 85, Section 4.3

Explain how regurgitation doesn't increase risk and load.

ARC Response 30

ARC assumes that the comment refers to nest building by barn swallows in which mud that is often mixed with plant material is collected and held in the beak and used to construct the nest. The third bullet on Page 85 for the barn swallows acknowledges ingestion of soil as part of nest building activities and notes that it is not possible to quantify the amount of soil based on limited science in this area. No change to a future CSM is proposed based on this comment

YPT Comment 31

Page 88, Section 5.0

Formatting incomplete or inconsistent.

ARC Response 31

Section 5 in the updated CSM will be revised to address formatting and inconsistencies.

YPT Comment 32

Figure 3-2 (not addressed from previous comments)

Future agricultural worker scenarios should be considered.

(Other Figures may require an update after these changes)

ARC Response 32

See ARC response to YPT comment 16.

**Appendix B-1: Update to the Site Conceptual Hydrogeologic Model
Review Comments**

Background

The conceptual site model describes the process links for calculating the environmental impacts of the Yerington Mine Site. Much of the document concerns biological interactions with the soil, air, and water in the vicinity of the site. Appendix B-1 presents Update to the Site Conceptual Hydrogeologic Model and this portion of the document is the focus of this review.

ARC Response

No response required.

General Comments

The document describes hydrogeologic processes as individual items and does not attempt to draw out interconnections among processes. At some point in the project, these hydraulic, geologic, hydrogeologic, and geochemical process links must be discussed so that the various elements of the conceptual model are mutually supportive of a preferred site interpretation.

ARC Response

ARC agrees that Hydrogeologic Conceptual Site Model (HCSM) elements should be integrated and has provided up-to-date groundwater information in the CSM (Revision 3). ARC anticipates a complete integration of HCSM elements in the Groundwater OU RI Report.

Specific Comments

Page B-5, Bullet 3. The issue of the groundwater mound north of the site related to agriculture and its effect on water levels deserves a longer section. Of key importance is when did the area first receive recharge from irrigation and how long were waste fluids from the Mine flowing into the groundwater before the mound was seasonally created? Perhaps some of the chemical impairment we see north of the site was caused by groundwater flow occurring before there was seasonal mounding.

ARC Response

The HCSM will continue to be revised to incorporate groundwater investigation and monitoring results, as the data become available (e.g., the ongoing Pumpback Well System and recently completed Shallow Zone investigations), and will address the groundwater mound north of the Site. Historic aerial photos indicate that the Site, and areas north of the Site, received recharge from irrigation prior to mining. Irrigation continued north of the Site during mining and to the present. Historic photos and documents also indicate that waste fluids were disposed in various impoundments during mining. However, insufficient historic information exists to quantitatively describe with certainty the precise timing or amounts of irrigation water or waste fluids from the mine.

**Appendix B-1: Update to the Site Conceptual Hydrogeologic Model
Review Comments**

Comment

Page B-6, Bullet 1. The paragraph contains highly flawed reasoning. Although the site may have a low average precipitation, it is very likely that significant recharge occurs during wet years. The statement that “low average precipitation and high evaporation on the valley floor would limit infiltration and provide **no** (emphasis added) hydraulic head to allow percolation of chemicals through the vadose zone” is not scientifically supportable. If there is any infiltration entering the soil, there are circumstances where some of this water flows through the vadose zone and mobilizes some quantity of waste material.

To apply these broad area concepts to the Wabuska Drain that periodically receives water is completely unsupported.

ARC Response

For clarity, Bullets 1 and 2 on page B-6 will be combined to collectively address large- and small-scale aspects of infiltration, deep percolation, and potential chemical loading to groundwater will be discussed in the revised CSM based on the results presented in the Anaconda Evaporation Ponds Removal Action Characterization Data Summary Report (Brown and Caldwell, 2009). Bullets 1 and 2 on page B-6 of the HCSM appendix will be revised as follows:

- *“On a large, Site-wide scale, long-term chemical loading to groundwater from inactive OUs (i.e., oxide and sulfide tailings, evaporation ponds, waste rock areas, and process areas) is expected to be very low because low average precipitation and high evaporation on the valley floor limit infiltration and prevent significant fluid and chemical fluxes to underlying groundwater. Deep percolation and chemical loading to groundwater may occur locally (e.g., in topographic depressions), temporarily (e.g., during larger precipitation events), or where standing water occasionally accumulates (e.g., beneath the lined Evaporation Ponds). Such conditions will be characterized during the OU-specific RIs, as appropriate (e.g., vadose zone characterization described in the Process Areas RI Work Plan). Given that ongoing fluid management operations are associated with the Arimetco Facilities, sourcing of chemicals to the vadose zone, and potentially to groundwater, may continue to occur from these operations.”*

Comment

Page B-6, Bullet 2. This paragraph is technically correct and fully negates the need for the bullet above.

ARC Response

See response to the previous comment.

**Appendix B-1: Update to the Site Conceptual Hydrogeologic Model
Review Comments**

Comment

Page B-9, Bullets 1, 2, 3. The definition of elevated concentrations of sulfate is presented as 1,000mg/L. The secondary drinking water standard is 250 mg/L and should be used to define the concentrations that are elevated. Setting the **definition of elevated sulfate at four times the secondary drinking water standard** creates the false impression to the public that the water below 1,000 mg/L sulfate is acceptable water quality. The MCL or drinking water standard for each constituent should be presented in the bullets discussing concentration.

ARC Response

ARC believes that it is inappropriate to use the secondary drinking water standard for sulfate of 250 mg/L as the value for defining sulfate concentrations that are elevated. Secondary drinking water standards are based on taste and odor and not on adverse health effects. As stated in the introduction to the HCSM, "The term elevated, as used below, is based on empirical observations and must be subjected to a more rigorous evaluation, including a statistical analysis of background groundwater chemical conditions up-gradient and down-gradient of the Site." Because background chemical concentrations may exceed MCLs, YPT's suggested approach would create a false impression to the public that chemical concentrations in groundwater above the MCL represent mine-impacted water that requires remedial action.

Comment

Page B-9, Bullet 2. The preliminary sulfate map for the intermediate aquifer may have elevated values north of the site that only appear to be discontinuous. The elevated concentrations may be continuous with the shallow aquifer and are the result of a downward hydraulic gradient in the sediments along the eastern front of the Singatse Range. The sulfate data may be indicating a gap in the clay layers.

ARC Response

The discontinuous distribution of sulfate in the intermediate zone north of the Site is based on routine monitoring data over a period of several years from seven monitoring wells and two domestic wells. Although the data are another line of evidence that the shallow clay layer is laterally discontinuous (a conclusion already stated in the conceptual model), the existing data do not suggest that high sulfate concentrations in the intermediate zone are continuous.

Comment

Page B-9, Bullet 3. The same comment as above applies to the deep aquifer.

ARC Response

See response to the previous comment.

**Appendix B-1: Update to the Site Conceptual Hydrogeologic Model
Review Comments**

Comment

Page B-9, Bullet 3. There is a typo in the last line of the text. I believe the authors meant to say there are no concentrations in excess of 1,000 mg/L and not 100 mg/L.

ARC Response

The HCSM text will be modified to indicate that sulfate concentrations (in the deep zone north of the mine Site) are less than 1,000 mg/L and typically an order of magnitude lower.

Comment

Page B-9, Bullet 4, and Page B-10 Bullet 1 and 2. The definition of elevated concentrations of uranium is presented as 100 mg/L. The U.S. EPA MCL for uranium is 30 mg/L and should be used to define the concentrations that are elevated. Setting the **definition of elevated uranium at three times the MCL** creates the false impression to the public that the water below 100 mg/L is safe to drink. The MCL or drinking water standard for each constituent should be presented in the bullets discussing concentration.

ARC Response

A value of 100 µg/L for uranium is listed on Page B-9, Bullet 4, and values of 50 µg/L and 42 µg/L are listed on Page B-10 in Bullets 1 and 2 as descriptors of the distribution of uranium. These values are not identified as screening levels. As stated above in ARC's response to the Tribe's comment on Page B-9, Bullets 1, 2, 3., the introduction to the HCSM states that "The term elevated, as used below, is based on empirical observations and must be subjected to a more rigorous evaluation, including a statistical analysis of background groundwater chemical conditions up-gradient and down-gradient of the Site." Because background chemical concentrations have not yet been determined for the Site, and may exceed MCLs, YPT's suggested approach would create a false impression to the public that chemical concentrations in groundwater above the MCL represent mine-impacted water that requires remedial action. Until background concentrations of uranium in groundwater are identified, ARC believes that it is inappropriate to set any value for defining uranium concentrations that are elevated including the U.S. EPA MCL of 30 µg/L. Uranium concentrations in groundwater will be evaluated in the HHRA for the Groundwater OU.

**Appendix B-1: Update to the Site Conceptual Hydrogeologic Model
Review Comments**

Comment

Page B-10, Bullets 1 and 2. The paragraph implies that the uranium concentrations north of the site are potentially randomly distributed. The elevated concentrations north of the site are located in the same geographic area in all three aquifers as well as the same area as the elevated sulfate concentrations and along the direction of groundwater flow. These factors strongly suggest that the elevated uranium is not random and is associated with a yet-to-be defined physical process.

ARC Response

Updated chemical distribution maps have been presented in the Second-Step Hydrogeologic Framework Assessment Data Summary Report (HFA DSR) will be included in the revised HCSM (e.g., uranium distribution maps presented as Figures 5-21, 5-22, and 5-23 for the shallow, intermediate and deep hydrostratigraphic zones, respectively). In addition, the HFA DSR discussed factors that may influence the distribution of uranium (e.g., regional and local hydrothermal alteration and mineralization, such as the MacArthur Mine, and hydrogeochemical processes) that will be provided in the updated CSM (Revision 4).

Comment

Page B-10, Bullet 6. The definition of elevated concentrations of iron is presented as 100 mg/L. The Secondary Drinking Water Standard for iron is 0.3 mg/L and should be used to define the concentrations that are elevated. Setting the **definition of elevated iron at 300 times the drinking water standard** creates the false impression to the public that the water below 100 mg/L is acceptable water quality. The MCL or drinking water standard for each constituent should be presented in the bullets discussing concentration.

ARC Response

ARC believes that it is inappropriate to use the Secondary Drinking Water Standard of 0.3 mg/L for iron as the value for defining iron concentrations that are elevated. Secondary Drinking Water Standards are based on a taste and odor thresholds.

As stated above in ARC's response to the Tribe's comment on Page B-9, Bullets 1, 2, 3., the introduction to the CSM states that "The term elevated, as used below, is based on empirical observations and must be subjected to a more rigorous evaluation, including a statistical analysis of background groundwater chemical conditions up-gradient and down-gradient of the Site." Because background chemical concentrations have not yet been determined, and may exceed various standards, YPT's suggested approach could result in the false impression by the public that chemical concentrations in groundwater above the secondary drinking water standard represent mine-impacted water that requires remedial action.

**Appendix B-1: Update to the Site Conceptual Hydrogeologic Model
Review Comments**

Comment

On March 30, 2009, ARC (Roy Thun and Linda Henry) met with the Yerington Paiute Tribe Environmental Director, consultant, Tribal Chairman and NAGPRA expert regarding this section of the CSM. A general plan to develop an acceptable approach was provided using the flowchart in Figure 1. This is supplemented by providing the list of plant species in Table 1.

ARC Response

ARC has agreed to work with the YPT to refine this list. Table 1 will be included in Appendix D of the CSM (Revision 4).

Comment

We would suggest the approach provided in the flow chart and including the plant list in the CSM. This should be expanded to include all animals identified in the literature and during the meeting on the 30th. We will also continue to work with ARC and EPA to address specific cultural practices important to risk/exposure calculations. It should be noted that despite previous comments, sweat lodge use, rabbit drives and other important issues are still not fully reviewed in the CSM.

ARC Response

Recent communication between ARC and YPT includes arranging for direct input from Yerington Paiute and Walker River tribes in creating the list of plants and animals.

A reference to sweat lodges will be added to Appendix D. In Revision 3 of the CSM, rabbit and antelope drives are currently discussed in Section 3 of Appendix D. Appendix D, Section 3 lists fish, water fowl, birds and animals including rabbits, prairie dogs, ground hogs, wood rats, badgers, weasels, raccoons, muskrats, porcupines, chipmunks, mice and wildcats, deer, antelope, mountain sheep and bear as potential sources of food. Other animals listed as important in the area include pocket gophers, voles, shrews and bat species, squirrels, kangaroo rats, and several species of mice, skunks, coyote, foxes and wolves.

ARC does not recall any additional animals mentioned in the meeting with the YPT but is open to further evaluation and consideration of other animals for the CSM (Revision 4).

**Appendix B-1: Update to the Site Conceptual Hydrogeologic Model
Review Comments**

Comment

An additional meeting with the Tribe, EPA and ARC is requested prior to finalizing the CSM.

ARC Response

ARC agrees that a meeting with the Tribe and EPA prior to submittal of the updated CSM (Revision 4) would be beneficial.