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Ref:Response to Office of Emergency and Remedial Response (OERR) Sediment Team Comments on the Milltown Reservoir Sediments Site Proposed Remedial Action

As part of the Remedy Review Board Package Region 8 submitted information which address the 11 management principals (Chapter 12) outlined in OSWER Directive 9285.6-08, *Principals for managing Contaminated Sediment Risks at Hazardous Waste Sites*. The OERR Sediment Team submitted comments on this information. These comments and responses to these comments are shown below:

A. Control Sources Early

Comment: *For each continuing source of sediment contamination, please provide the expected time to complete the source control actions that will be taken and who will undertake them.*

Response: The upper Clark Fork River delivers the majority of the contaminant loading to the Milltown Reservoir. The reservoir is presently filled to capacity with sediment and is in "dynamic equilibrium" with the upstream input. Sediment accumulates in low flow years (peak flow less than15,000 cubic feet per second (CFS)) and some sediment is scoured during high flow years (peak flow greater than 15,00 CFS). There are many source control actions which have taken place or will take place in the upper Clark Fork Basin which reduce the loading of contaminated sediments to the Milltown Reservoir site. These actions include actions at the the Silver Bow Creek/Butte Area NPL Site; the Anaconda Smelter NPL Site; and the Clark Fork River Operable Unit (OU) of the Milltown Reservoir NPL Site.

Several Silver Bow Creek Site response actions have been completed or are expected to be completed that reduce the metals loading to the Clark Fork River. These various actions including the following: 1) the Warms Springs Ponds/Mill Willow Bypass actions, which were completed in 1995 by the responsible party (RP) (the Atlantic Richfield Company(ARCO)). 2) The Stream Side Tailings OU remedial action is an ongoing state lead action focusing directly on Silver Bow Creek and is expected to take another 10 years to implement 3) The Butte Priority Soils OU actions have included numerous removals and expedited response actions completed by ARCO and EPA. The largest actions have been the Lower Area One removal action and many waste rock dump and smelter site removal and/or reclamation projects. The ROD for the Priority Soils OU is scheduled for FY 2004 with RA completion expected to take about 8 years. The final remedial action is expected to be conducted by ARCO and the other named RPs .

The ROD covering all OUs for the Anaconda Smelter Site has been completed. Several actions have been taken to reduce loadings of metals to tributaries of the Clark Fork River. The largest

action to date that has reduced loadings has been the Old Works - East Anaconda project completed in 1996. The other large ongoing action which will significantly reduce loadings is the Anaconda Regional Water Waste and Soils (ARWWS) OU action which is expected to take 7-10 years to complete. The RP (ARCO) has completed all actions at the Anaconda Site and it is expected that they will implement the actions at the remaining OUs.

The proposed plan for the Clark Fork River OU was issued in 2002 and the ROD is expected in 2003. It primarily addresses the Clark Fork River from Warm Springs Ponds to the end of the Deer Lodge Valley (see map in the proposed plan or in the RRB package.). It will take about 10 years to complete this remedial action and it is unknown at time whether it will be a RP, EPA, or State lead remedial action.

Even with implementation of all of these actions, contaminant loading at the Milltown Site will not be appreciably reduced in the near future. There are considerable residual bed load and bank deposits of contaminated sediments in the 100 miles of river between the Deer Lodge Valley and Milltown. No major remedial actions are planned in this reach of the river and it will provide a source of contaminated sediment for many decades. As discussed above, the dam does not stop contaminated sediments from moving downstream because the reservoir is at it's capacity. The sediments passing through the reservoir do accumulate in downstream reservoirs (primarily the Thompson Falls Reservoir), but do not present a significant risk to human health or the environment because there is significant dilution with clean sediments from other major rivers before the Thompson Falls Reservoir. Removing these sediments from the Milltown Reservoir without removing the dam will allow contaminated sediments to once again accumulate behind the Milltown dam. If the dam is removed contaminated sediments will not accumulate in large enough volumes to cause significant risks to human health and the environment. Removal of the dam also reduces the hydraulic head currently driving arsenic into the alluvial aquifer. It is important, therefore, to remove both sediments and the dam.

B. Involve the Community Early and Often

Comment 1: *Please provide information on the following: "Did the memo briefly describe how local societal and cultural practices were identified and considered in (1) the human health risk assessment (e.g., local recreational use of the water body, local fishing practices) and (2) the selection or development of the proposed remedy (e.g., current and future uses of the water body)?" (This is quoted from the checklist dated July 2. Throughout the body of this response, you will see other language from the checklist, sometimes in the form of questions.)*

Response: Local societal and cultural practices were taken into account in the human health risk assessment. The community was heavily involved via the broad-based group, the Milltown Endangerment Assessment Committee (MEAC), and actively helped to develop the Human Health and Ecological Risk Assessments (1993) (HHRA). Information on potential exposure behaviors was supplied through a survey of local residents. Based on this survey and EPA guidance, potential exposure pathways were identified. Fishing, shoreline recreation, gardening and collection of edible plants were identified as specific local practices which needed to be assessed as potential exposure pathways. It was found, however, that these activities posed insignificant risk. The only significant exposure risk identified in the HHRA was the ingestion

of groundwater contaminated with arsenic. An increased cancer risk exceeding 1 incidence in 100 was found for this route.

The proposed remedy will impact some local societal practices. This reservoir was used for flat water recreation and, for the last several years, as a northern pike fishery. The proposed action will eliminate these two activities. Northern pike will be, essentially, eliminated from the reservoir area. Montana is, of course, known for it's trout fishery. The proposed action is expected dramatically increase the trout population in the area. The proposed action will also transform the recreational use of the reservoir area from flat water to white water recreation. The feedback from most county residents indicate a preference for white water recreation and an enhanced trout fishery.

Comment 2: *Please provide specifics on the major ways the proposed sediment remedy is expected to affect the local community, including impacts that occur during remedy implementation.*

Response: The proposed remedy to remove the most highly contaminated sediments in the Milltown Reservoir and then remove the dam, would impact the local community as well as others who live elsewhere but use the area recreationally. These impacts include: 1) Changes in the type and quality of fishing opportunities; 2) Changes in the type and quality of boating opportunities; 3) Changes in recreational activities associated with wetland areas; 4) Possible community disruption during transportation of dredged materials; 5) Loss of tax base for the local school district once the Dam is removed; and 6) Location of the repository.

Selection of this remedy would return two important western Montana rivers, the Clark Fork and the Blackfoot, to a free-flowing state. This would vastly improve the recreational fishing opportunities and increase opportunities for rafting, canoeing and kayaking on both rivers. This will mean the loss of the flat water boating and the northern pike fishery at the Reservoir. Western Montana is famous for its fly-fishing and white water recreation, restoration of these two important rivers is likely to improve local business and recreational opportunities related to improved quality of the boating and fishing. The wetlands along the Reservoir were created by the artificial water level of the Reservoir. With the Dam removed, these wetlands would be replaced with higher quality riverine wetlands. Until the wetlands are fully replaced, some recreational activities such as birding may be temporarily affected. EPA, the State, community and local governments are all well aware that the dam currently contributes to the tax base of the local school district. Revenues from the power generated at the dam have been decreasing in recent years and the tax revenues have decreased accordingly. This trend would continue into the future and the dam owner has told EPA, and submitted documents to the Montana Public Service Commission, that the facility is operated at a significant monetary loss. Missoula County officials aware of the school district's concerns and several options exist about how to replace any revenues lost to the school district. A major concern among supporters and opponents alike has been the disposal site location and method for transporting this dredged material. EPA committed to the public and local officials that the Proposed Cleanup Plan would describe, in as much detail as possible, the transportation means and route and repository location. EPA hopes to transport the dredged material in a slurry solution via a pipeline (approximately 4000 feet from the Reservoir) to its disposal location. This form of

transportation will have minimal impact on the local residents. The repository location is near the Reservoir and distant from residential and commercial properties (other than a shooting range). The landowner is supportive of the proposed remedy and no other property owners would be affected in the long-term.

It is important to note that the State, Tribes, other federal agencies, local governments and public interest organizations, as well as the vast majority of the local population all strongly support dam and sediment removal for the Milltown Reservoir Superfund Site.

C. Coordinate with States, Local Governments, Tribes, and Natural Resource Trustees

Comment 1: *For the sediment remedy, if there were any aspects that are expected to be of most concern to State and local governments, please describe how those concerns have been addressed or considered.*

Response: The main concern of the State and Local governments (and the local population) has been to remove the contaminated sediments behind the Milltown Dam and then to remove the Dam itself. Their concerns include: 1) desire to restore the local drinking water supply (aquifer), 2) restore the local fishery of the Clark Fork and Blackfoot Rivers; 3) improve recreational boating opportunities along those same rivers; 4) fear of catastrophic dam failure which would send metals-contaminated water downstream to the major population center and county seat, Missoula; 5) a desire to see the Clark Fork and Blackfoot Rivers restored to their natural, free-flowing state; 6) loss of local tax base; and 7) impacts on downstream water supplies during construction activities. EPA's preferred alternative addresses these concerns except loss of tax base and the restoration of the two rivers. EPA is committed to working closely with the trustees, governments and stakeholders to try to address the tax loss issues and incorporate redevelopment and restoration activities into remedial design.

Several issues have been expressed by local government related to the impacts of implementing a sediment/dam removal during the feasibility study process. The two major implementation issues expressed were the potential downstream groundwater resources and potential impacts on the fishery due to releases during the sediment/dam removal activities. Region 8 believes that there is insignificant risk of contaminating downstream groundwater resources and the technical memorandums addressing this issue will be issued after the release of the proposed plan. Region 8 does believe that there is some risk to fish during sediment and dam removal especially from dissolved copper and total suspended solids (TSS). An sheet pile system isolating the area to be dredged from active river is part of the preliminary design for the project. This should greatly reduce the release of TSS and metals to the river and risks to downstream aquatic life. Best Management Practices (BMPs) that could further reduce releases deal are discussed in the RRB package. As discussed in the RRB package the total mass release of sediment from the reservoir area during the sediment/dam removal activities will not be of sufficient volume to have any long term effects on downstream aquatic life.

Comment 2: *It is not clear from the document that TMDLs were considered in selecting the proposed remedy. Please clarify this and if TMDLs were being or are being developed, please describe the coordination efforts with the State and with EPA's water program.*

Response: Because the majority of the metals loading associated with the upper Clark Fork River is generated from NPL sites and the fact that the Silver Bow Creek and the Clark Fork River are Superfund sites for the 120 miles from Butte to below Milltown Dam, the Superfund program has taken the lead in the reduction of metals in the upper Clark Fork system. An extensive long-term metals monitoring program, operated by the USGS through the Superfund program, has been in place for the upper Clark Fork basin, including the Milltown area, since 1985. All of this metals monitoring information and remedial action decision information generated by the Superfund program is forwarded to the TMDL program.

The most recent approved 303(d) list (2002) reports that the Clark Fork River, in the vicinity of Milltown Dam, is impaired as a result of metals (unspecified), other habitat alterations, riparian degradation, nutrients, and algal growth/Chlorophyll a. The 1996 303(d) list reports impairments associated with metals, siltation and suspended solids. Probable sources reported on both the 2002 and 1996 lists include dam construction, mill tailings, agriculture, channelization, resource extraction, hydromodification, municipal point sources, and mine tailings. In accordance with a court imposed schedule (Friends of the Wild Swan, Inc. et.al. vs. U.S. Environmental Protection Agency, CV 97-35-m-DWM) all necessary TMDLs for all pollutants appearing on the 1996 303(d) list must be completed for this section of the Clark Fork River by 2007.

The Tri-State Implementation Council, in coordination with the Montana Department of Environmental Quality (DEQ) completed a TMDL for the Clark Fork River in 1998. Water quality endpoints were set for algae, nitrogen and phosphorus. Since that time, the primary TMDL focus has been twofold: 1) implementing the nutrient TMDL through voluntary point source and nonpoint source nutrient reductions and, 2) developing a better understanding of Clark Fork River nutrient dynamics and nutrient source identification. While a number of Clean Water Act Section 319 Grants have been funded to address a host of issues related to TMDLs on the Clark Fork River, little direct work has been completed to date regarding the other pollutants on both the 1996 and 2002 303(d) lists. Because of the lead the Superfund program has taken for metals reduction, the TMDL program has focused on the nutrient issues in the upper Clark Fork while currently deferring the metals impacts to the Superfund program.

The Montana Department of Environmental Quality is the lead agency responsible for completion of TMDLs on the Clark Fork River. As indicated previously, all necessary TMDLs must be completed by 2007. Work specifically addressing the other listed pollutants, including metals, will be initiated by DEQ in the next few years. It is anticipated that the completed and anticipated Superfund work to be done in the upper basin will provide the majority of TMDL actions to address metals impacts in the upper Clark Fork River. There may be additional TMDL work associated with metals loading reduction conducted in the basin in areas outside of the NPL sites.

D. Use an Iterative Approach in a Risk-Based Framework

Comment 1: *Chapter 12 did not describe any early or interim actions (other than the alternate water supply) planned or implemented at the site that address threats from contaminated*

sediments. Clearly, this may not apply in the situation at Milltown Reservoir. If it does, please provide this information.

There are no reasonable interim actions which can be performed at the site to reduce groundwater contamination. The site is already managed to minimize scouring of sediments from the reservoir by maintaining the reservoir elevation at a homeostatic level. Keeping the level at a homeostatic level is very difficult during ice scour events given the present design of the dam spillway system. Replacement of the flash board system with a pneumatic crest would allow would reduce the impact due to scouring but would not reduce groundwater contamination problems. The action proposed by Region 8 would remove the dam thereby eliminating any need for a pneumatic crest. Given the time frame for removal of the dam (6-8 years) and the occurrence interval for ice scouring events (every 5-10 years), Region 8 does not believe an interim action of installing the pneumatic crest is cost effective in reducing the risk to aquatic life.

Comment 2: *It is unclear if the proposed remedy will be implemented in phases or is part of a larger phased approach to the site as a whole. Please clarify whether or not the action on the reservoir will be done in phases, and if so, please provide a description of the phased approach.*

Response: The remedy will be implemented in phases and a detailed work breakdown structure (WBS) has been developed for the proposed action. The following summarizes the phases and time frames for this action.

Phase 1 -	Design	Year 1
Phase 2 -	Site Preparation, Haul Road, Rail Spur, Repository and Slurry Pipeline Construction, Sheet Pile Installation	Year 2
Phase 3 -	Sediment Excavation, Transport, and Placement	Years 3-6
Phase 4 -	Repository and Sediment Removal Area Closure	Years 5-7
Phase 5 -	Spillway Removal, Channel Stabilization, Areas 2 and 3 Regrading/Revegation, Site Cleanup	Years 7-8

All sediment removal would be done in years 3 – 6. The surface vegetation and materials would be removed through mechanical excavation methods (about 15% of the volume) and the remaining 85% would be removed using a hydraulic dredging methods.

Comment 3: *What is the plan for addressing contaminants that will be moved downstream after dam removal?*

Response: Because of the amount (mass) of contaminants expected to be released during the project and the type of contaminants that would be released no plan is necessary to address the contaminants which would be released. The project is designed to minimize releases so that the mass of contaminants which moves downstream does not create long-term problems. The main contaminants of concern at this site are arsenic, copper and total suspended solids. Using a dredging resuspension model developed by USACE Engineer Research and Development Center

(ERDC) personnel in Vicksburg, the expected total sediment release from the dredging operation is less than 45,000 tons. Additionally the arsenic and copper discharge will not be in masses large enough to reaccumulate and cause long-term problems downstream. This amount should even be less than predicted by the USACE because of the sheet pile system expected to be employed around the dredge area. Some additional sediments will be discharged in association with the dam removal, however any remaining sediments will be stabilized in place using engineered controls or vegetation to minimize this potential release. USGS has gathered extensive sediment discharge data at the reservoir. This data shows that between 1991 an 1997, normal sediment discharge through the reservoir was approximately 148,000 tons per year with 317,000 tons and 445,000 tons discharged from the reservoir in 1996 and 1997 respectively. We do not expect the total discharge of sediments from the sediment and dam removal activities during any year of this project to exceed the discharge of sediment seen in 1995 and 1997.

E. Carefully Evaluate the Assumptions and Uncertainties Associated with Site Characterization Data and Site Models

Comment : *Please provide the name of the model(s) that were used, and whether or not the model is a new one. Additionally, regardless of the model used, please provide information on the peer review status of the model.*

Response: Site characterization efforts over an approximate seven year period was completed for this project and can be found in the Draft Final Remedial Investigation Report , Arco, 1995. Pertinent site characterization data included site surface, geologic and reservoir channel mapping, extensive surface water flow and chemical data, monitor well installation, logging and groundwater chemical composition and flow data, sediment lithologic logging , sediment chemical composition and geochemical characterization data, cone penetrometer data and various other related site information.

Interpretations and interactions of these various surface water, groundwater and sediment media were presented in the development of the Conceptual Site Model, noted in Chapter 5 of the RI. This interpretive conceptual model describes, in summary format, the multi-media interactions occurring between the surface water inflows and outflows (including sediment deposition and channel scour) of Milltown Reservoir, groundwater recharge flow paths to and through the reservoir sediments containing mine wastes, and the resulting arsenic contaminated groundwater plume within the reservoir and under the community of Milltown adjacent to the reservoir. This interpretive site-specific model received the intense scrutiny from ARCO and its consultants, EPA and their scientific advisors and consultants, the state of Montana, as well as from various personnel associated with the University of Montana.

Several other models were subsequently developed and utilized in the RI Report as well. These included: 1) a site-specific geochemical model of the reservoir sediments found on pages 5-45 through 5-52 in the RI Report, which defined the sediments in Area I as the primary arsenic source area contributing to the plume under Milltown; 2) a mass balance estimate involving the use of a site-specific flow tube model which indicated that both dilution and adsorption are mechanisms involved with arsenic leaving the flow system (noted on pages 6-17 through 6-24; and 3) use of the one dimensional model, HEC-6 (USACE) , to estimate the quantity of

scour/deposition of sediments at select locations on the river as part of the Continued Releases Risk Assessment, referred to in the RI Report. Again, these models received the intense scrutiny of ARCO and its consultants, EPA and their scientific advisors (including USGS and USACE) and consultants, the State of Montana, as well as from various personnel associated with the University of Montana.

In the subsequent Focused Feasibility Study, and the draft Final Combined Feasibilty Study published March 2002, certain pertinent data and information from the RI were subsequently updated with additional surface water and groundwater data collected after the RI was published. This additional information was utilized in the development of an Ecological Risk Assessment Addendum (EPA, April 2000) and in the development and analysis of detailed alternatives that were subsequently considered and analyzed. Included was information from a high flow-ice scour event that occurred within Milltown Reservoir in February 1996 which supplemented the existing hydrologic record with a wider range of flow data. For the alternatives considering dredging the reservoir sediments, a conceptual model for predicting impacts to downstream surface water quality was developed and analyzed by the USACE using resuspension model developed by the USACE Vicksbrg ERDC. This model used a Monte Carlo simulation, considering dredging with and without BMPs. Again, as with the RI, this model received the intense scrutiny of ARCO and its consultants, EPA and their scientific advisors (including USGS and USACE) and consultants, the State of Montana, as well as from various personnel associated with the University of Montana.

In the subsequent period from March 2002 through November 2002, EPA conducted additional fieldwork to expand the various data bases regarding1) reservoir channel sediment scour during reservoir lowering, channel sediments chemistry , physical properties and size distribution, and sediment volume; 2) Area 1 sediment chemistry, physical properties, dewaterability, and sediment volumes; and 3) conduct additional USACE specified testing and modeling on specific sediment samples to determine downstream dredging impacts, dredge water quality and treatment needs, and dredge pond sizing. The field work was conducted to better understand the engineering characteristics of the sediments as they relate to mechanical and hydraulic dredging methods and to determine dredging alternative cost estimates critical in negotiations between Department of Justice, EPA, ARCO, Northwestern Energy (owner of the reservoir), the State of Montana and the other trustees.

F. Select Site-specific, Project-specific, and Sediment-specific Risk management Approaches that will Achieve Risk-based Goals

Comment 1: *More information needs to be provided as to the reasons why capping and monitored natural recovery were screened out early during the FS process and did not make it to the detailed analysis stage.*

Response: The two objectives of this remedial action are: 1) to eliminate the human health risk associated with the release of arsenic from the sediments at the site which contaminates the local aquifer; and 2) to mitigate the risks to downstream aquatic life from high concentrations of copper generated during ice scouring events or, potentially, during catastrophic releases due to dam failure. A cap would isolate the sediments from ice scour and reduce the potential acute

impacts on aquatic life which now exist at the site but it would not address the aquatic risks due to a potential dam failure. Capping would not address the groundwater problem in any way. The hydraulic connection between the sediments and the local aquifer could not be physically isolated by a cap. A positive head from the river would continue to drive arsenic at the same rate into the aquifer. Natural depletion of the arsenic source and natural attenuation of the arsenic would allow the aquifer to remain contaminated and unusable for thousands of years.

Comment 2: *The document describes the proposed remedy. Please provide information as to how the proposed remedy relates to other operable units at the site.*

Response: Please see response to comment A

G. Maximize the Effectiveness of Institutional Controls and Recognize their Limitations

Comment 1: *Did the memo identify any institutional controls that are part of the proposed sediment remedy, and if so, describe how they will be implemented and any plans to maximize their effectiveness (e.g., public education regarding fish consumption advisories)?*

Response: Temporary institutional controls (ICs) to restrict use of the local contaminated aquifer would be put into effect. Missoula County has indicated that they are supportive of these short term ICs but would not support long term ICs if a remedial action was chosen that would restore the aquifer. These IC's would include a well installation ban and groundwater monitoring. Discussions with county officials indicated that they are very interested in implementing these IC's and operating the monitoring program during the implementation of the remedy and until the aquifer recovers (expected to occur within 4-10 years after completion of the sediment/dam removal). As discussed previously, there is a chance for impacts on fish during the implementation of this remedy, primarily because of the sensitivity of trout to copper. There is, however, insignificant risk to humans ingesting fish exposed to these sediments.

Comment 2: *Did the memo briefly describe any plans for monitoring or information collection at the site which will be used to evaluate the effectiveness of institutional controls?*

Response: There is an extensive groundwater monitoring system, which includes both wells designed and completed as monitoring wells and domestic wells, already in place at the site. This monitoring will continue until the aquifer has recovered and the well ban can be removed. Discussions with county officials indicated that they are very interested in implementing the well ban and operating the monitoring program during the implementation of the remedy and until the aquifer recovers.

H. Design Remedies to Minimize Short-term Risks While Achieving Long-term Protection

Comment 1: *Please describe how and when the dredged habitat is expected to recover.*

Response: After completion of the Area 1 removal the channel will be reestablished in the originally cobble bed and backfill for the new floodplain would be placed. After the dam was removed and flow established in the new channel the floodplain would be revegetated to provide

adequate channel stability. Other areas of the reservoir would be regraded and revegetated to provide adequate erosion control in those areas. Additional restoration is likely to be implemented and funded by the trustees and other parties. The trustees have already prepared a draft restoration plan. Region 8 plans to work closely with the trustees and other stakeholders to coordinate the design and remedy implementation process to efficiently integrate the remedial and restoration processes. Similar to new channel establishment in the Lower Area One and the Mill Willow Bypass projects on the Silver Bow Creek/Butte Area Site, dredged habitat is expected to recover very quicky after the dam is removed and the new channel is established and revegetated.

Comment 2: *Please describe the major expected effects of the proposed remedy on societal and cultural practices and how these were considered in remedy selection.*

Response: Please see response to Comments B-1 and B-2

I. Monitor During and After Sediment Remediation to Assess and Document Remedy Effectiveness

Comment: *The following is not clear from the draft document and needs to be clarified: For each medium (e.g., sediment, surface water, biota) that has a cleanup level or remedial action objective, did the memo briefly describe the type of monitoring (including physical, biological, and chemical monitoring) that will be required to determine whether the levels and objectives are met? If sufficient baseline data were not available, were plans for collecting additional data prior to implementing the remedy described?*

Response: Extensive data has been collected at this site and a very well documented baseline has been established concerning the extent of groundwater contamination, groundwater geochemistry, pore water chemistry, aquifer characteristics, physical and chemical properties of sediments, volume of contaminated sediments, distribution of contaminants, reservoir and river sediment transport characteristics, surface water quality, and fish and macroinvertebrate population information. EPA Region 8 does not believe additional baseline information is necessary.

The primary remedial action objectives for this project can be summarized as follows: 1) cleanup of the aquifer; and 2) mitigation of aquatic risks due to ice scouring events and potential catastrophic dam failure. Success in meeting the aquifer cleanup objective will be determined by continued monitoring of the aquifer and ability to show that the primary drinking water standards (arsenic - 10 ug/l dissolved) have been met throughout the usable portion of the alluvial aquifer in the five year review process. The success of meeting the aquatic risk mitigation objective will be measured by continued surface water quality monitoring using the State WQB- 7 acute and chronic total recoverable metals and arsenic standards as well as the federal aquatic water quality criteria (dissolved metals and arsenic) as evaluation criteria in the five year process. Although significant long-term improvement in the fishery is expected because of this remedial action, no specific population improvement criteria will be used as measure of success in meeting the aquatic risk mitigation objective. However, continuation of the ongoing yearly fish and macroinvertebrate surveys are planned to measure the anticipated population improvements.