

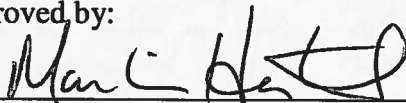
**Second Five-Year Review Report
for the
Milltown Reservoir /Clark Fork River
Superfund Site
EPA ID MTD980717565**

**Milltown
Missoula, Granite, Powell, and Deer Lodge Counties, Montana**

September 2016

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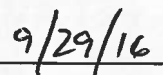


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List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
ARCO	Atlantic Richfield Company
AWQC	Ambient Water Quality Criteria
BMP	Best Management Practice
CaCO ₃	Calcium carbonate
CCC	Criterion Continuous Concentration
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act, as amended
CFR	Code of Federal Regulations
CFROU	Clark Fork River Operable Unit
CMC	Criteria Maximum Concentrations
COC	Contaminant of Concern
CUP	Conditional Use Permit
EPA	United States Environmental Protection Agency
FYR	Five-Year Review
IC	Institutional Control
MCL	Maximum Contaminant Level
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mg/L	micrograms per liter
MCCHD	Missoula City and County Health Department
MDEQ	Montana Department of Environmental Quality
MDL	Method detection limit
MRSOU	Milltown River Sediments Operable Unit
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
NRDP	Natural Resource Damage Program
OU	Operable Unit
O&M	Operation and Maintenance
PEC	Probable Effects Concentration
POC	Point of compliance
PRP	Potentially Responsible Party
RAMP	Remedial Action Monitoring Plan
RAO	Remedial Action Objective
RI/FS	Remedial Investigation and Feasibility Study
RIPes	Riparian Evaluation System
ROD	Record of Decision
RPM	Remedial Project Manager
SAA	Sediment Accumulation Area
TBC	To-Be-Considered
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

Executive Summary

The Milltown Reservoir /Clark Fork River site includes about 120 miles of the Clark Fork River upstream of the former Milltown Dam and Reservoir. The Milltown Dam and Reservoir were located at the confluence of the Clark Fork and Blackfoot Rivers, a few miles upstream of Missoula. From the 1860s until well into the 20th century, mineral- and arsenic-laden waste from mining activities in the region flowed into the headwaters of the Clark Fork River, contaminating the river and its beds and banks from the Warm Springs Ponds to the Milltown Reservoir. As contaminated sediments and mine-mill wastes moved downstream, about 6.6 million cubic yards of these sediments accumulated behind the Milltown Dam over time. These mining activities and the downstream transport of mining-related wastes contaminated floodplains, sediment, surface water and groundwater with heavy metals.

This FYR report addresses all site operable units (OUs). OU2 is the Milltown Reservoir Sediments (MRSOU), including the area encompassed by the former Milltown dam and reservoir. OU1 (the Milltown Drinking Water Supply OU) is now part of OU2. OU3 is the Clark Fork River (CFROU) area upstream of the MRSOU and downstream of the Silver Bow Creek/Butte Area site and the Anaconda Smelter site.

The MRSOU remedy includes construction of a bypass channel at the reservoir; removal of contaminated reservoir sediment; off-site disposal and use of contaminated sediment as vegetative cap material; removal of the Milltown Dam; continuation of a replacement water supply program in the town of Milltown; implementation of temporary groundwater controls until the Milltown aquifer recovers and other institutional controls; and long-term monitoring of surface water and groundwater. Remedy construction began in 2006 and is substantially complete.

The remedy at MRSOU (OU2) currently protects human health and the environment because potential exposure to contaminated groundwater, surface water and sediment is controlled. For the remedy to be protective over the long term, the following actions need to be taken:

- Implement institutional controls for the MRSOU comprehensive institutional control plan and its components.
- Determine if additional measures are needed to reduce arsenic concentrations in groundwater to levels at or below the cleanup goals.

The CFROU remedy includes soil and sediment removal and disposal outside of the OU, some in-place treatment of soils, revegetation of removed or treated areas, streambank stabilization, weed control, institutional controls and monitoring. MDEQ started the remedial action construction with yard removals in Deer Lodge in 2010-2011, the Trestle Project in 2011-2012, and Eastside Road Pastures, 2012-2013, CFR Reach A, Phase 1 remedial construction on the river began in 2013. Remedial implementation is ongoing.

The remedy at CFROU (OU3) is expected to be protective of human health and the environment upon completion of the remedial action. In the interim, exposure pathways that could result in unacceptable risks are being controlled.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Milltown Reservoir /Clark Fork River		
EPA ID: MTD980717565		
Region: 8	State: MT	City/County: Milltown and Missoula, Granite, Powell and Deer Lodge Counties
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	Has the site achieved construction completion? No	
REVIEW STATUS		
Lead agency: EPA If "Other Federal Agency" selected above, enter Agency name:		
Author name: Sara Sparks (EPA) and Ryan Burdge and Treat Suomi (Skeo)		
Review period: 10/01/2015 – 09/23/2016		
Date of site inspection: 11/02/2015 – 11/04/2015		
Type of review: Statutory		
Review number: 2		
Triggering action date: 09/23/2011		
Due date (five years after triggering action date): 09/23/2016		

Five-Year Review Summary Form (continued)

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:

OU3

Issues and Recommendations Identified in the Five-Year Review:

OU(s): OU2	Issue Category: Institutional Controls			
	Issue: Institutional controls for MRSOU are not yet implemented for areas where waste has been left in place and areas where groundwater contamination is above ROD standards.			
	Recommendation: Implement institutional controls for the MRSOU comprehensive institutional control plan and its components.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	Yes	PRP	EPA/State	09/30/2017

OU(s): OU2	Issue Category: Remedy Performance			
	Issue: Groundwater concentrations at MRSOU continue to exceed arsenic cleanup goals and do not appear to be declining			
	Recommendation: Determine if additional measures are needed to reduce arsenic concentrations below the cleanup goals and implement measures determined to be necessary.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	Yes	PRP	EPA/State	09/30/2017

Protectiveness Statements

Operable Unit:
OU2

Protectiveness Determination:
Short-term Protective

Addendum Due Date
(if applicable):

Protectiveness Statement:

The remedy at MRSOU (OU2) currently protects human health and the environment because potential exposure to contaminated groundwater, surface water and sediment is controlled. For the remedy to be protective over the long term, the following actions need to be taken: implement institutional controls for the MRSOU comprehensive institutional control plan and its components and determine if additional measures are needed to reduce arsenic concentrations below the cleanup goals.

Operable Unit:
OU3

Protectiveness Determination:
Will be Protective

Addendum Due Date
(if applicable):

Protectiveness Statement:

The remedy at CFROU (OU3) is expected to be protective of human health and the environment upon completion of the remedial action. In the interim, exposure pathways that could result in unacceptable risks are being controlled.

Second Five-Year Review Report for Milltown Reservoir /Clark Fork River Superfund Site

1.0 Introduction

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is protective of human health and the environment. FYR reports document FYR methods, findings and conclusions. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The United States Environmental Protection Agency (EPA) prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation and Liability Act as amended (CERCLA) Section 121, 42 U.S.C. § 9621, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

EPA interpreted this requirement further in the NCP, 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii), which states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.

Skeo, an EPA Region 8 contractor, conducted the FYR and prepared this report regarding the remedy implemented at the Milltown Reservoir /Clark Fork River Superfund site (the Site) in Milltown and Missoula, Granite, Powell, and Deer Lodge Counties, Montana. EPA's contractor conducted this FYR from October 2015 to September 2016.

EPA is the lead agency for developing and implementing the remedy at OU2 through oversight of the potentially responsible party (PRP)-financed cleanup at the Site, and coordination with the State of Montana Natural Resource Damage Program which is performing certain restoration site activities to, in some cases, accomplish remedial goals and objectives. The Montana Department of Environmental Quality (MDEQ), as the support agency representing the State of Montana at OU2, and has reviewed all supporting documentation and provided input to EPA during the FYR process.

MDEQ is the lead agency for implementation of the Remedial Design, the Remedial Action, and the Operation and Maintenance of the Remedy at the Clark Fork Site, through special account funding obtained by EPA and the State through an enforcement settlement at OU3. The State of Montana Natural Resource Damage program is also performing certain natural resource damage restoration activities at OU3 which in cooperation with MDEQ, to date, have been supplemental to the remedial implementation. EPA is the support agency for OU3. EPA has prepared this Site-wide five year review report, in consultation with MDEQ and the State of Montana Natural Resource Damage Program.

This is the second FYR for the Site. The triggering action for this statutory review is the previous FYR. The FYR is required due to the fact that hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. The Site consists of two operable units (OUs). This FYR report addresses all OUs for the site.

OU2 is the Milltown Reservoir Sediments (MRSOU), including the area encompassed by the former Milltown dam and reservoir. OU1 (the Milltown Drinking Water Supply OU) is now part of OU2. OU3 is the Clark Fork River (CFROU) area upstream of the MRSOU and downstream of the Silver Bow Creek/Butte Area site and the Anaconda Smelter site.

2.0 Site Chronology

Table 1 lists the dates of important events for the Site.

Table 1: Chronology of Site Events

Event	Date
Local public health authorities discovered arsenic contamination in drinking water wells in Milltown, Montana	1981
EPA added the Site to the Superfund program's National Priorities List (NPL)	September 08, 1983
EPA issued interim Record of Decision (ROD) for OUI, requiring construction of a deep well and water tank to serve as an alternative water supply for Milltown residents. This ROD was amended in 1985.	April 14, 1984
Remedial action construction for OU1 completed	1986
Atlantic Richfield Company prepared major portions of the final CFROU remedial investigation and feasibility study (RI/FS). RI/FS work continued for several years after 1987, including the preparation of a baseline human health and ecological risk assessment.	1987
RI/FS order on consent for MRSOU issued to Atlantic Richfield Company (ARCO)	1991
MRSOU RI and baseline human health, ecological and continued release risk assessments completed	September 16, 1993
PRPs complete Final RI Report for MRSOU	February 15, 1995
Draft FS for MRSOU groundwater released by ARCO. The same year, unforeseen climatic conditions caused ice scour event, which sent high levels of metals contamination down river; EPA expanded FS scope and conducted further risk assessments	1996
EPA issued CFROU ROD	April 2004
MRSOU RI/FS completed; EPA issues MRSOU ROD	December 15, 2004

Event	Date
Consent Decree for PRP performance of MRSOU remedy and O&M entered by federal court; this includes requirements for PRP continued funding of water supply operation and maintenance (O&M) activities. The Consent Decree also provided for the performance of natural resource damage actions by the State of Montana at the MRSOU, some of which are intended to fulfill remedial action requirements.	August 2005
Remedial action at MRSOU begins	February 15, 2006
Initial reservoir drawdown (Stage 1) and start of MRSOU remedial action	June 01, 2006
Consent Decree for PRP cashout of CFROU remedy and O&M entered by federal court. This provides for the performance of the CFROU remedy and O&M by the MDEQ using the cashout money, and funding and performance of natural resource damage actions by the State of Montana Natural Resource Damage program.	August 21, 2008
EPA approves Draft Repository O&M Plan and Changes to the Remedial Action Monitoring Plan (RAMP) for MRSOU	March 2010
MDEQ begins remedial action at CFROU, including irrigated land, Deer Lodge residential, and Trestle area work.	October 5, 2010
Transfer of reservoir property to State of Montana	December 2010
Clark Fork River bypass channel removal begins	December 2010
EPA completes first five-year review for MRSOU	September 2011
MRSOU remedial activities construction activities were significantly completed	June 2012
MDEQ begins remedial action at CFROU Reach A, Phase 1.	March 4, 2013
MDEQ completes remedial action at CFROU Reach A, Phase 1. Work at other Phase areas is ongoing.	April 4, 2014
Remedial action begins at CFROU Phase 5 and 6	July 15, 2014
MDEQ submits construction completion report for Phase 1 to EPA	March 25, 2015
EPA and MDEQ release Explanation of Significant Differences for CFROU	June 12, 2015
Remedial action begins at CFROU Phase 2	June 29, 2015

3.0 Background

3.1 Physical Characteristics

The Clark Fork Basin Superfund complex is made up of four contiguous Superfund sites, each broken into separate NPL sites. The four Superfund sites are the Silver Bow Creek/Butte Area site, the Montana Pole site, the Anaconda Smelter site and Milltown Reservoir /Clark Fork River site. The Anaconda Smelter site, the Silver Bow Creek/Butte Area site and the Milltown Reservoir /Clark Fork River site are each broken into several OUs.

EPA originally designated three OUs for the Site. There are currently two site OUs.

- OU2 is the Milltown Reservoir Sediments (MRSOU). It includes about 540 acres in the Clark Fork River and Blackfoot River floodplain (Figure 1). The MRSOU consists of the area encompassed by the former Milltown dam and reservoir and the associated groundwater contamination. OU1, an interim remedy, is now part of the

MRSOU. It focused on providing a safe water supply to Milltown area residents through the establishment of a public water supply system in Milltown, Montana.

- OU3 is the Clark Fork River (CFROU) area upstream of the MRSOU and downstream of the Silver Bow Creek/Butte Area site and the Anaconda Smelter site (Figure 1). CFROU consists of about 120 river miles of the Clark Fork River, including surface water, groundwater, soils, in-stream sediments, sediment deposition and contaminated property, and air located within and adjacent to the 100-year historic floodplain of the Clark Fork River.

MRSOU is located at the confluence of the Clark Fork and Blackfoot rivers in Missoula County, Montana. The Milltown Reservoir was formed by the Milltown Dam, built from 1905 to 1908. It is located approximately 7 miles upstream of downtown Missoula, Montana.

From its headwaters, the Clark Fork River flows north for approximately 43 river miles past the towns of Galen, Deer Lodge and Garrison (this stretch is known as Reach A of CFROU). The river then runs northwest for approximately 77 river miles to the headwaters of the Milltown Reservoir near Bonner.

To better study and evaluate remedial options, EPA divided the CFROU into three reaches based on physical features of the landscape, proximity to historic mining and intensity of impacts:

- *Reach A – Deer Lodge Valley Reach:* Extends from the southeastern tip of the CFROU near river mile 0 at Warm Springs Creek to just upstream of Garrison at river mile 43. Reach A has the broadest extent of the 100-year floodplain and is nearest to historic mining and milling sites in Butte and Anaconda. There are extensive exposed tailings and unstable streambanks as well as stressed vegetation in this area.
- *Reach B – Drummond Valley Reach:* Extends from immediately upstream of Garrison, where the Little Blackfoot River enters the Clark Fork, to downstream of Drummond at river mile 76, for a total of 31 river miles. At the starting point for this reach, the addition of water from the Little Blackfoot River may, under certain flow conditions, nearly double the Clark Fork's flow. The floodplain is more narrow and the gradient higher than Reach A, and exposed tailings are far less extensive.
- *Reach C – Bearmouth Canyon Reach:* Extends 47 river miles from Drummond to the northwest tip of the OU area. Through this reach, the floodplain is constrained by a narrow valley, roads and railroad grades. Here, the flow is augmented by several tributaries and the reach is farther away from historic mining sites. No exposed tailings are evident.

3.2 Land and Resource Use

The former Milltown Dam was owned and operated as a hydroelectric generating facility by North Western Corporation and its predecessors. The community of Milltown is located a half-mile east of the former dam and powerhouse. The community of Bonner borders Milltown to the northeast. About 1,700 people live in Milltown, according to 2010 U.S. Census data. A new

public water supply was developed for Milltown under OU1. Private wells in the area are sampled by the Missoula City and County Health Department (MCCHD).

The MRSOU (OU2) includes the Milltown Reservoir and the adjacent areas of impacted groundwater and contaminated soils and the upland disposal facilities. Land uses along the Clark Fork River riparian zone are primarily recreational and agricultural. The Clark Fork River in the vicinity of MRSOU is used for recreational rafting, kayaking and fishing. The City of Missoula (population 57,000) is located approximately 7 river miles downstream of Milltown, Montana.

Assisted by an EPA Superfund Redevelopment Initiative pilot grant and EPA support, communities near the MRSOU developed a reuse plan. The plan called for the creation of a state park with trails, river access, wildlife habitat and interpretive areas celebrating the region's history and heritage. In 2010, the State of Montana acquired portions of the MRSOU to become a new state park. The state allocated funding for the park's development and land acquisitions. There are several trails in the area and the state has plans to link the new park with the larger community trail network and the newly renovated pedestrian bridge.

About 16,240 people live in the area of CFROU (OU3) according to 2010 U.S. Census data. Approximately 28 percent of the population (4,500 people) lives in or near Reach A. Approximately 89 percent of the land within Reach A is privately owned; the remaining 11 percent of the land is managed by federal and state agencies. Land use in the CFROU consists of residential use, agricultural use and recreational use. The town of Deer Lodge is located within and adjacent to the OU.

3.3 History of Contamination

In the Butte area, mining companies routinely disposed of mining and milling wastes containing various amounts of unrecovered metals and arsenic into local creeks in the headwaters of the Clark Fork River Basin from the late 1860s to well into the 20th century. These streams conveyed the mining and milling wastes downstream to the Clark Fork River. With the introduction of electricity in the early 1900s, milling practices improved and new mining practices significantly increased ore production and metals recovery rates, and substantially increased the volume of annual mine and mill tailings. These wastes subsequently mixed with other stream sediments and were carried down Silver Bow Creek and into the upper Clark Fork.

In 1908, a major flood event mobilized large quantities of metals and arsenic-contaminated sediments from the upper Clark Fork River channel and floodplain, transporting large quantities of waste to the recently constructed Milltown Reservoir. Much of the arsenic and metals contaminated sediment was deposited in the reservoir backwater area created by the dam.

Between 1918 and 1959, a series of settling ponds (known as Warm Springs Ponds, now part of the Silver Bow Creek Superfund site) were built near the end of Silver Bow Creek, to better control the contaminated sediments entering the upper Clark Fork River. As a result, the amount of contaminated sediments from the Butte and Anaconda area reaching the Milltown Dam and reservoir after 1918 significantly lessened. However, substantial quantities of mine waste

continued to be washed downstream towards the reservoir from previously deposited areas downstream of Warm Springs Ponds and the Anaconda area as well as output from the ponds.

In addition to fluvial deposition of metals-contaminated sediments in the historic 100-year floodplain, agricultural fields were irrigated with water from the Clark Fork River that at times contained elevated concentrations of metals in dissolved form and as suspended sediment. This caused ongoing contamination, at low levels, of the fields. In some instances, irrigation ditches overflowed or were breached, flooding and contaminating fields downgradient of the ditches with river water. The irrigated fields are located on terraces above the influence of metals and arsenic impacts associated with flood deposition.

3.4 Initial Response

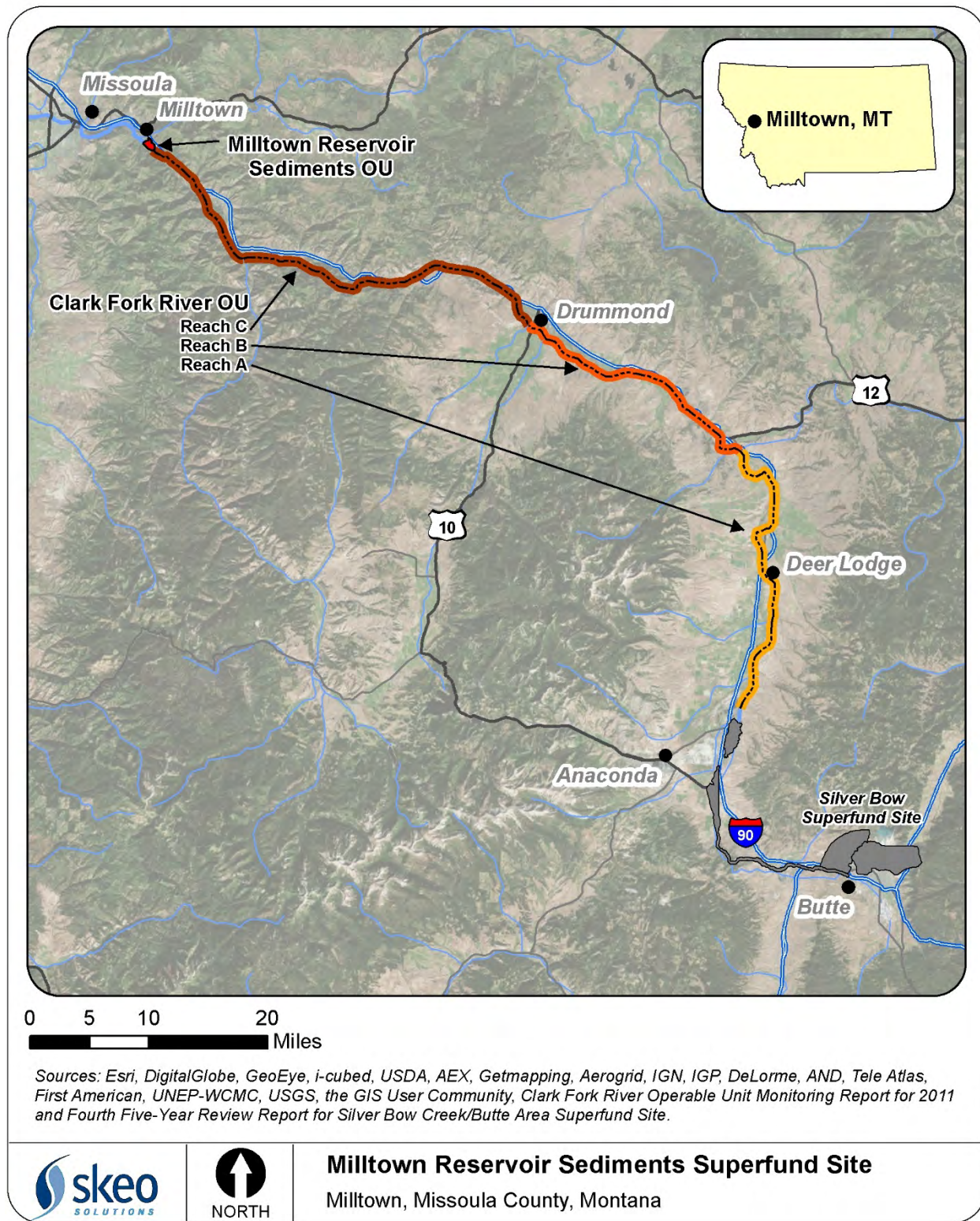
In 1981, local public health authorities found arsenic in drinking water wells in the Milltown area at concentrations exceeding the federal drinking water standard. EPA added the Site to the National Priorities List (NPL) in 1983. Also in 1983, the Atlantic Richfield Company (ARCO) suspended its mining activity in Butte after shutting down the Anaconda smelter.

In 1984, EPA issued an interim record of decision (ROD) for OU1. A resulting fund-lead response action installed a new drinking water system for Milltown (i.e., a water supply well). However, no institutional controls were put in place at that time. The Montana Power Company, a predecessor of the NorthWestern Corporation, implemented rehabilitation and upgrades to the Milltown spillway and dam from 1986 through 1990, and 14,500 cubic yards of reservoir sediments and debris were transported and encapsulated in the Upland Disposal site (near MW 913A, Figure 2). An earlier disposal site had also been constructed on site by the Montana Power Company.

In 1989, the United States sued ARCO for reimbursement of response costs at three of the NPL sites listed above. In 1991, EPA issued an Administrative Order on Consent to ARCO initiating the remedial investigation and feasibility study (RI/FS) process for the MRSOU.

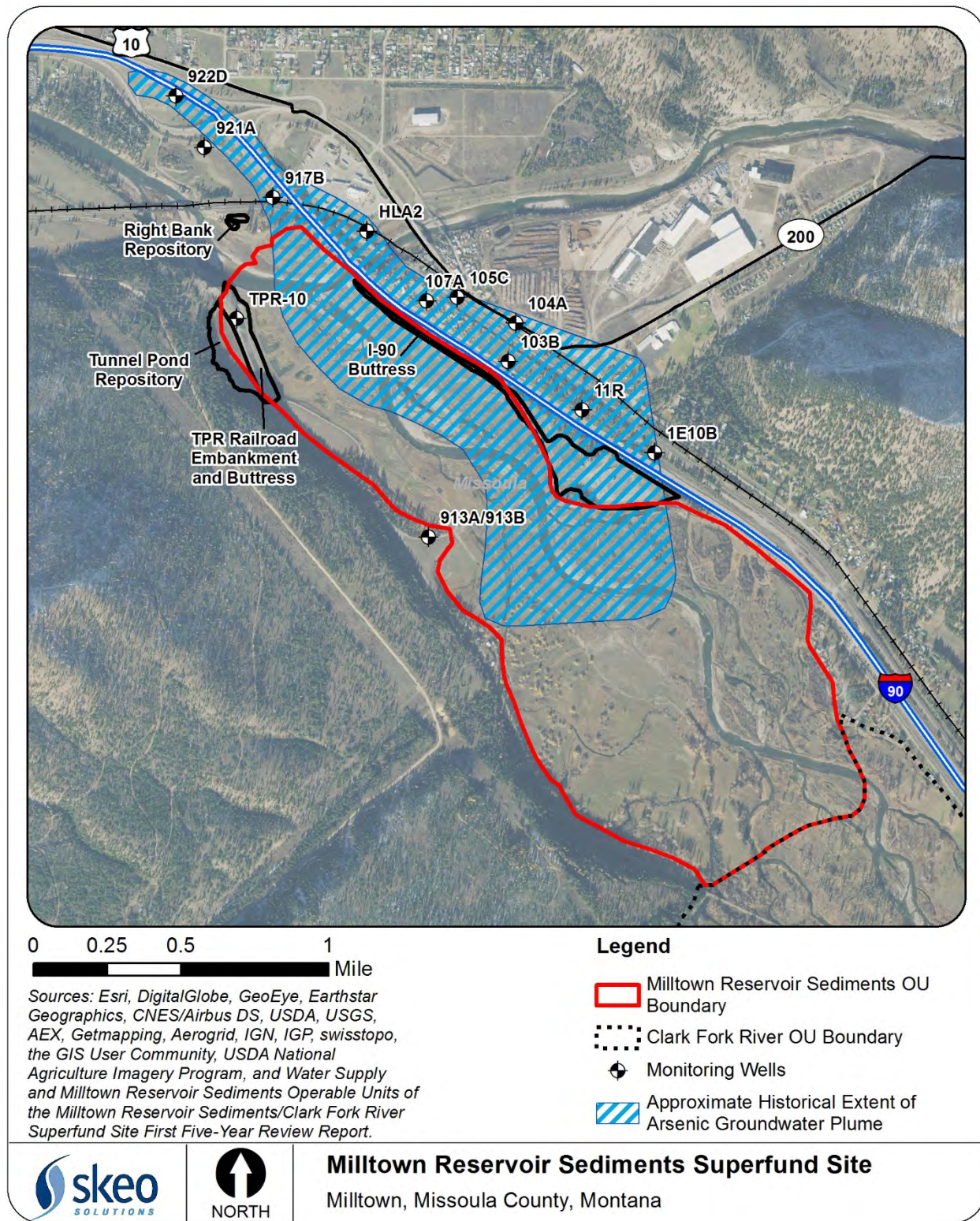
From 1994 to 1995, EPA issued an Administrative Order on Consent to ARCO initiating the RI/FS process for the CFROU. In 2000, EPA issues a time-critical removal action memorandum and a Unilateral Administrative Order to ARCO to address immediate human health risks for residents of Eastside Road in Deer Lodge, in response in part to an Agency for Toxic Substances and Disease Registry health consultation and EPA Human Health Risk Assessment action levels.

Figure 1: Site Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Figure 2: Detailed Site Map – MRSOU



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

3.5 Basis for Taking Action

MRSOU

EPA, in consultation with MDEQ, provided oversight of the MRSOU RI/FS activities conducted by ARCO. The 1993 baseline human health risk assessment for the MRSOU was prepared to assess potential risks at the Site using standard EPA health risk assessment methods for residential and recreational uses. EPA determined that the non-carcinogenic and carcinogenic risks associated with consuming groundwater contaminated with arsenic were unacceptable. Other exposure pathways for humans – including residential use for existing homes near the reservoir and recreational use of land surrounding the reservoir – were considered not significant. If residential use of land immediately surrounding the reservoir occurred, it would be unacceptable. The analysis of a potential detoxification threshold for ingestion of arsenic suggested that long-term exposures at the Site, other than through consumption of impacted groundwater, would not be associated with a greatly increased non-cancer and cancer risk.

The ecological risk assessment determined the water quality downstream exceeded the water quality criteria and that copper caused an unacceptable acute risk to aquatic life. Additionally, the ecological risk assessment determined that normal high-flow events may pose an intermittent low-level chronic risk to fish because of the combined impacts of copper and other metals in the water column and copper in ingested macroinvertebrates.

CFROU

The primary sources of contamination are tailings and tailings mixed with soil in streambanks and the historic floodplain. Contaminants move from tailings and impacted soils through the process of erosion, directly into the river and other surface waters. In addition to erosion of tailings and impacted soils, metals and arsenic can be leached directly from the tailings and contaminated soils into groundwater and surface water.

The CFROU 1998 human health risk assessment identified arsenic as the contaminant of concern (COC) for potential human health risks in Reach A. The RBCs for residential, recreational, and agricultural exposure are listed below. These RBCs are for arsenic concentrations in soils, as averaged over exposure units. EPA considers acceptable exposure levels to be concentration levels that represent an excess upper bound lifetime cancer risk to an individual of between 10^{-4} (1 in 10,000 probability) to 10^{-6} (1 in 1,000,000 probability), with 10^{-6} as the point of departure. EPA proposed the following arsenic concentrations, which represent a 10^{-4} excess cancer risk:

Residential	150 mg/kg
Recreational	680 mg/kg (children at Arrow Stone Park and other recreational scenarios)
	1,600 mg/kg for fishermen, swimmers and tubers along the river
Rancher/Farmer	620 mg/kg

On historically irrigated lands, however, where residential development has occurred or where it may occur in the future, the risk assessment concluded that risks may be unacceptable.

The CFROU ecological risk assessment found unacceptable risks from the metals contamination to plants and aquatic life within the several reaches of the CFROU. Soils and vegetation areas most clearly show the impacts from these risks. In addition, United States Geological Survey (USGS) studies found excessive rates of erosion along streambanks in the upper reaches of the CFROU. The studies also identified the possibility of severe erosion of the upper river in large floods that would cause large inputs of contaminants and sediment into the river.

4.0 Remedial Actions

In accordance with CERCLA and the NCP, remedial actions are required to protect human health and the environment and to comply with applicable or relevant and appropriate requirements (ARARs). A number of remedial alternatives were considered for each OU at the Site, and final selection was made based on an evaluation of each alternative against nine evaluation criteria that are specified in Section 300.430(e)(9)(iii) of the NCP. The nine criteria are:

1. Overall Protection of Human Health and the Environment
2. Compliance with ARARs
3. Long-Term Effectiveness and Permanence
4. Reduction of Toxicity, Mobility or Volume through Treatment
5. Short-Term Effectiveness
6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance

4.1 Remedy Selection

Milltown Water Supply OU1

EPA issued an interim ROD in 1984, and amended this action in 1985. A resulting response action installed a new drinking water system for Milltown. This OU1 was combined with OU2.

MRSOU2

In December 2004, EPA signed the final ROD for the MRSOU. Media-specific remedial action objectives (RAOs) include:

Groundwater

- Return contaminated groundwater to its beneficial use within a reasonable timeframe and prevent ingestion until drinking water standards are achieved.
- Comply with state groundwater standards, including non-degradation standards.
- Prevent groundwater discharge containing arsenic and metals that would degrade surface waters.

Surface Water

- Achieve compliance with surface water standards, unless a waiver is justified.
- Prevent ingestion of or direct contact with water posing an unacceptable human health risk.
- Achieve acute and chronic federal Ambient Water Quality Criteria (AWQCs), as well as State water quality standards.

The selected remedy for the MRSOU consists of the following measures:

- Initiating the process of progressively dewatering Milltown Reservoir Sediment Accumulation Area (SAA) I sediments by lowering reservoir surface water levels through use of the existing radial gate and spillway with panels removed (see Appendix H for map of SSAs).
- Isolating SAA I sediments from flowing surface water by excavating a bypass channel through SAA I and armoring the existing embankment along the Blackfoot River boundary of SAA I and converting powerhouse inlets to low level outlets removing the spillway section of the Milltown Dam.
- Removing the radial gate, powerhouse, dividing block, shop and right abutment gravity wall sections of Milltown Dam as part of integration with the Natural Resource Damage Program (NRDP) Trustee Restoration Plan.
- After a period of dewatering and consolidation, remove down to a predetermined contour surface the sediments in SAA I through the use of mechanical excavation techniques, hauling the waste (approximately 90 miles via rail cars), and placing the sediments removed from SAA I in the Opportunity Ponds at the Anaconda Smelter site.
- Reconstructing the Blackfoot River and Clark Fork River channels and banks, including protection of certain infrastructure and regrading/revegetating the Clark Fork River/Blackfoot River floodplain to provide stability.
- Replacement of any drinking water supply that exceeds the drinking water standard for arsenic of 10 micrograms per liter ($\mu\text{g/L}$) due to remedial action implementation (if appropriate, a temporary controlled groundwater area will be established until the Milltown aquifer recovers using monitored natural attenuation).
- Replacement or retrofitting of domestic wells which are deemed unusable by EPA because of the lowering of the groundwater table.

- Conducting long-term operation, maintenance and monitoring of the areas identified as the dam rehabilitation sediment/debris repositories established by the Montana Power Company, the portions of the new Interstate-90 embankment outside the Montana Department of Transportation's right-of-way, and the area in the lower Clark Fork River channel (SAA III-b) where sediments with elevated concentrations of arsenic and metals will remain after the remedial action and any other on-site repositories established during the remedial action and any other waste repositories established on site.
- Bridge stability mitigation for certain bridges near the MRSOU.
- Monitoring and maintenance of borrow and staging areas revegetated during remedial action.
- Surface water and groundwater monitoring.
- Implementation of additional best management practices or engineering controls as detailed in a contingency plan to be approved by EPA or as otherwise required by EPA, in consultation with MDEQ, if temporary construction-related surface water quality standards are exceeded.
- Implementation of the terms and conditions of the incidental take statement in the United States Fish and Wildlife Service's (USFWS's) Biological Opinion, and wetlands mitigation as necessary to meet the no-net-loss requirement as determined by USFWS.

The OU2 2004 ROD indicates that groundwater standards are expected to be met within four to 10 years following completion of dam and sediment removal. The remedial action construction was significantly completed in June 2012. Cleanup goals are listed in Tables 2 and 3.

Table 2: MRSOU Groundwater COC Cleanup Goals

Groundwater COC	ROD Cleanup Goal (µg/L) ^a
Arsenic	10
Cadmium	5
Copper	1,300
Lead	15
Zinc	2,000
<i>Notes:</i>	
a. Based on the more stringent of federal or state standards.	

Table 3: MRSOU Surface Water COC Cleanup Goals

COC	Aquatic Life		Human Health
	Acute (µg/L)	Chronic (µg/L)	Standard (µg/L)
Arsenic	340	150	10 – federal 18 – state
Cadmium	2.10	0.27	5
Copper	13	9	1,300 ¹
Lead	81	3.2	15
Zinc	119	119	2,000

The ROD also identified the need for groundwater institutional controls for the MRSOU. The institutional controls would include:

- Continued funding for maintaining the existing replacement water supply for Milltown residents (installed under the OU1 remedy).
- Make contingency funds available to reconfigure, expand or update replacement water supplies.
- If needed, establish a controlled groundwater area to ban future wells within or immediately adjacent to the arsenic plume.
- The ROD also identified the need for institutional controls to prevent residential use of the MRSOU and to protect disturbance on-site remedial elements such as disposal units.

CFROU3

In April 2004, EPA signed the final ROD for the CFROU. The 2004 RAOs for floodplain tailings and impacted soils are:

- Prevent or inhibit ingestion of arsenic-contaminated soils/tailings where ingestion or contact would pose an unacceptable health risk.
- Prevent or reduce unacceptable risk to ecological (including agricultural, aquatic, and terrestrial) systems degraded by contaminated soils/tailings.

The groundwater RAOs are:

- Return contaminated shallow groundwater to its beneficial use within a reasonable period.
- Comply with state groundwater standards, including nondegradation standards (Table 4).
- Prevent groundwater discharge containing arsenic and metals that would degrade surface waters.

¹ The MRSOU ROD acknowledges that a waiver of the State standard for copper in the upstream operable unit, and allows for consideration of upstream input into the MRSOU in determining compliance with the copper ARAR.

For surface waters, the RAOs are:

- Reduce or eliminate “pulses” of metals to the river, including those caused by snowmelt and thunderstorm events.
- Achieve compliance with surface water standards, unless a waiver is justified (Table 5).
- Prevent ingestion of, or direct contact with, water posing an unacceptable human health risk.
- Achieve trout toxicity reference values and acute and chronic federal AWQCs.
- Comply with stormwater ARARs.

The selected remedy will be implemented along the erosive streambanks and the historic 100-year floodplain of all of Reach A and small, localized areas of Reach B. The remedy for Reach C is no action.

The remedy is currently under construction (see Section 4.2). The remedial actions will proceed in localized efforts and require about 15 construction seasons to complete. The sequence of properties to be remediated throughout Reach A and localized areas of Reach B will be carefully planned and prepared. While the general approach will be to work from the headwaters down, EPA and MDEQ believes remediation can be done more quickly and effectively and with less threat to river stability by working on discontinuous stretches of the river. Thus, properties will be engaged in a discontinuous manner to prevent jeopardizing the integrity of the floodplain, should a flood event greater than the annual flood occur during the 15-season remedial action period. Affected landowners will be involved in setting these schedules and clearly informed of the sequencing of the work.

Specific components of the remedy, as described in the 2004 ROD, include:

- In most instances, impacted soils and vegetation, also referred to as impacted areas, will be treated in place, using careful lime addition and other amendment as appropriate, soil mixing and revegetation.
- Some impacted areas will be removed, where depth of contamination prevents adequate and effective treatment in place, where saturated conditions make in-situ treatment unimplementable, or where post treatment arsenic levels, after one retreatment attempt, remain above the human health cleanup level for the current or reasonably anticipated land use. Severely impacted soils, also known as slickens, will be removed and revegetated.
- Residential soils above residential action levels will be removed.
- The Riparian Evaluation System (RipES) process will be used in remedial design to identify severely impacted areas and impacted areas, and areas where the exceptions to removal or in-situ treatment will apply.
- Streambanks will be stabilized primarily by “soft” engineering (with limited hard engineering where conditions warrant) for those areas classified and an approximate, flexible 50-foot riparian buffer zone will be established on both sides of the river.
- Opportunity Ponds will be used for disposal of all removed contamination.
- Weed control for in-situ treatment, streambank stabilization, and removal areas is required.

- Best management practices (BMPs) throughout Reach A and in limited areas of Reach B are required to protect the remedy and ensure land use practices are compatible with the long-term protection of the selected remedy.
- Institutional controls and additional sampling, maintenance and possible removal or in-situ treatment of contamination, including the Trestle Area, will be required to protect human health.
- Monitoring during construction, construction BMPs and post-construction environmental monitoring are required.
- The remedy is also modified and expanded for the Grant-Kohrs Ranch National Historic Site, located in Reach A.

Table 4: CFROU Groundwater COC Cleanup Goals

Groundwater COC	ROD Cleanup Goal (µg/L)
Arsenic	10
Cadmium	5
Copper	1,300
Iron	300
Lead	15
Zinc	2,000

Table 5: CFROU Surface Water COC Cleanup Goals

Surface Water COC	Aquatic Life - Acute (µg/L)	Aquatic Life - Chronic (µg/L)	Human Health (µg/L)
Arsenic	340	150	10 – federal 18 – state
Cadmium	2	0.25	5
Copper	13	9	1,300
Lead	81	3.2	15
Zinc	119	119	2,000

The risk-based soils cleanup goals for arsenic at residential, recreational and agricultural areas are listed in Table 6. These goals are for arsenic concentrations in soils, as averaged over exposure units.

Table 6: Arsenic Soil Cleanup Goals

Land Use	ROD Cleanup Goal (mg/kg)
Residential	150
Recreational	680 for children at Arrow Stone Park and other recreational scenarios
	1,600 for fishermen, swimmers and tubers along the river
Rancher/Farmer	620
<i>Notes:</i> mg/kg = milligrams per kilogram	

2015 Explanation of Significant Differences (ESD)

A review of post-ROD sampling of the CFROU and the results of EPA's 2007 RipES mapping for the floodplain tailings and soils component of the remedy led to an ESD for the CFROU in 2015. The ESD provides for the use of the RipES process as a tool in development of the remedial design. However, sampling and field observations relating to vegetation health and other factors (groundwater, riparian vegetation, contaminant sampling, ownership, infrastructure, land use and site specific remedy requirements), showed that use of RipES determination alone would not lead to implementation of ROD requirements or fully meeting RAOs. This ESD changed the scope of the floodplain tailings and soils component of the remedy described in the ROD by adding factors that will be considered during remedial design to determine whether removal, in-situ treatment or other remediation (e.g., best management practices, institutional controls) is appropriate for a given area.

4.2 Remedy ImplementationMilltown Water Supply (OU1)

OU1 is now part of the MRSOU (OU2). The Milltown Water Supply OU focused on providing a safe water supply to area residents through establishment of a public water supply system for the town of Milltown. EPA funded the replacement of one public water supply used by Milltown residents as part of the OU1 remedy and provided funding for maintenance of this water supply well. The PRPs eventually provided permanent maintenance funding to the Milltown Water User's Association for this system. EPA also funded the MCCHD to distribute arsenic test kits to interested residents who wanted to test their private well water. If tests showed exceedance of standards, the Settling Defendants provided for the hookup by these residents to the replacement water supply. The 2004 MRSOU ROD continued funding for maintaining the existing replacement water supply for Milltown residents and made contingency funds available to reconfigure, expand or update replacement water supplies.

MRSOU (OU2)

Reservoir Drawdown and Dam Removal

Remedial design began on July 18, 2005. In August 2005, the PRPs signed a Consent Decree, allowing the project to move out of the planning phase and into remedial action. Remedial action began on February 15, 2006. The initial remedial activity was to lower the water level in the reservoir to dewater the SAA I sediments, facilitate dam removal and ultimately enable the use of mechanical excavation techniques for sediment removal. Removal of the Milltown Dam spillway and ultimate removal of the rest of the dam took place concurrently with reservoir drawdown. PRP contractors completed final dam removal in March 2009.

Dam removal lowered the groundwater table in the Milltown area, which raised the possibility that shallow water supply wells in the Milltown area could go dry. Therefore, EPA managed a well-replacement program as part of the remedial action starting in 2006. Based on the modeling results, EPA replaced 82 private and small public water supply wells in the Milltown area and reconfigured numerous additional wells.

Sediment Dewatering, Removal and Relocation

The RI/FS phase of the project evaluated metals contaminant concentrations in sediments in the Milltown reservoir. Only those sediments shown to be contributing directly to existing groundwater degradation (sediments with the highest pore water contaminant concentrations), and with the potential to contribute to future surface water degradation were removed to meet remedial objectives. Reservoir sediments were divided into two sections: the upper and lower reservoir SAAs. These two reservoir sections were further divided into sub-areas based on sediment accumulation features. The lower reservoir consists of SAAs I, II and III. The upper reservoir encompasses SAAs IV and V. In 2007, sediments in SAA I were removed and isolated from the Clark Fork River channel.

To facilitate reservoir sediment removal, EPA required a bypass channel for the Clark Fork River along the northern boundary of SAA I. Beginning in May 2007, approximately 584,000 cubic yards of reservoir sediment, 40,000 cubic yards of underlying soil material and 57,000 cubic yards of underlying alluvium were excavated to form the bypass channel. Excavated reservoir sediment was relocated by rail transport to Opportunity Ponds. The bypass channel was completed in early 2008. The excavation of SAA I sediments finished in September 2009; a total of 2,331,956 cubic yards of sediment was removed and disposed of at the Opportunity Ponds disposal area at the Anaconda Smelter site. The Clark Fork River was re-diverted to the reconstructed channel in December 2010. EPA funded or performed bridge stability actions for three bridges, and a fourth bridge was addressed by its owner.

The PRPs constructed two repositories to contain debris from the demolition of the dam and SAA III-b and SAA IV sediments. One repository is located just downstream of the removed right abutment of the dam (the Right Bank Repository). The other is the Tunnel Pond Repository. Groundwater monitoring of the Tunnel Pond Repository will entail sampling one well, located downgradient of the repository, at the same frequency and for the same analyte list

as the other point of compliance (POC) wells. No groundwater monitoring is required for the Right Bank Repository.

In addition to the two constructed repositories, two other repositories were present prior to remedial action. Disposal Site No. 1 was removed as part of the work to place SAA III-b sediments in the Tunnel Pond Repository. At the second, the Upland Disposal site, the State of Montana built a new repository on top of the Upland Disposal site in which to store a portion of the sediment excavated during implementation of restoration actions from SAA IV and V. Maintenance and monitoring of disposal areas remains the responsibility of the PRPs, according to the 2013 long-term monitoring plan.

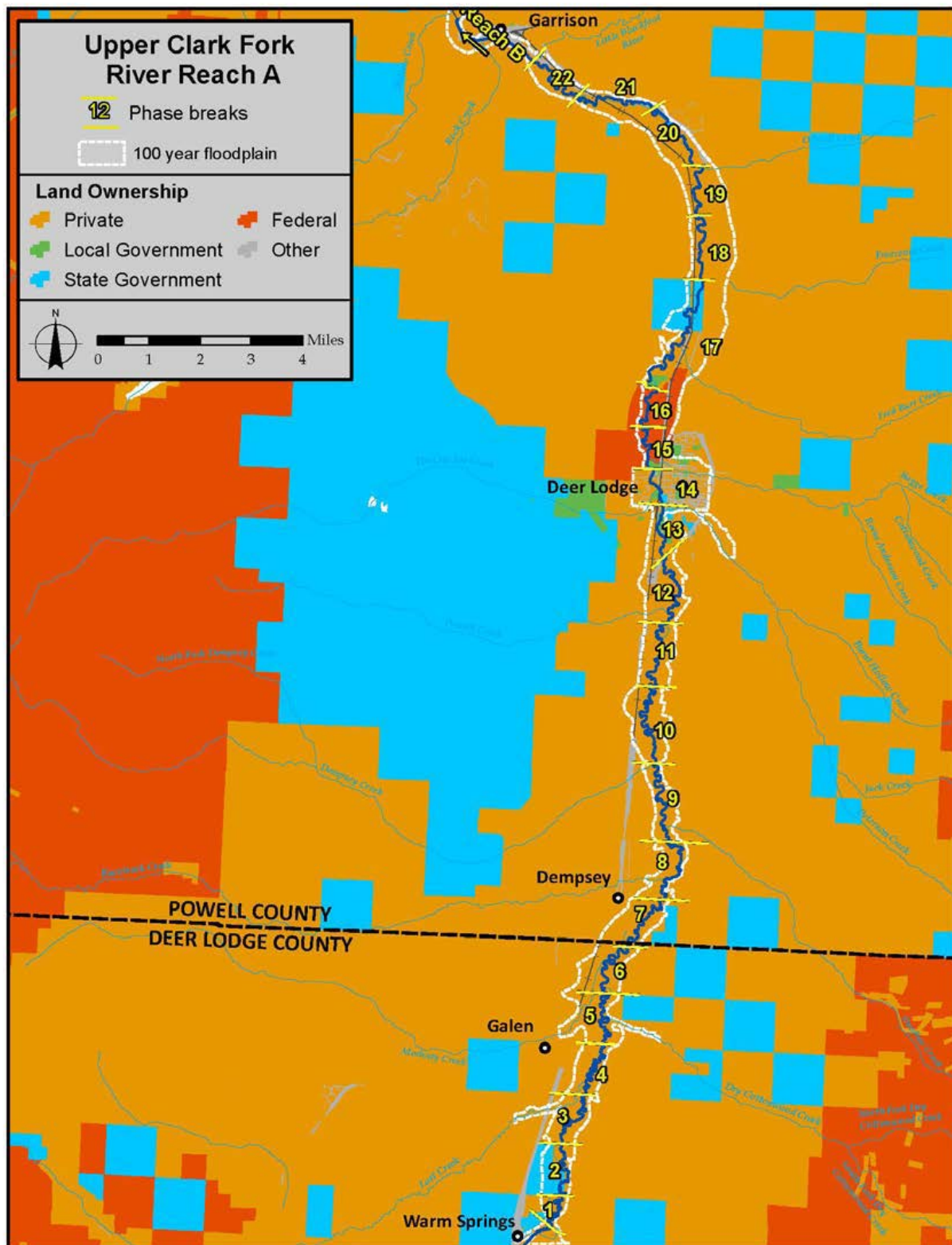
Compliance wells are located within the current arsenic plume and were monitored during the remedial action to track progress in restoring the Milltown alluvial aquifer. A series of early warning wells located around the fringe of the plume and along the Clark Fork River downstream of the MRSOU are also monitored to ensure that groundwater in existing drinking water wells was not unacceptably impacted by construction activities. Finally, MCCHD monitors certain existing public and private water supply wells as public health monitoring wells. Data available for this FYR (2013) consistently indicate no arsenic exceedances in sampled wells.

The State of Montana Natural Resource Damage Program followed PRP construction activities with channel construction, revegetation and reconstruction of the floodplain, revegetation, and development of wetlands. Some of these actions are required to meet certain remedial goals and objectives. Operation and Maintenance of this work is ongoing.

CFROU3

The majority of the CFROU is Reach A, a 43-mile stretch of the river from Warm Springs in Anaconda/Deer Lodge County downstream to Garrison in Powell County. In accordance with the 2004 ROD, in 2006 and 2007, while Consent Decree discussions were in progress, EPA performed RipES mapping for the floodplain tailings and soils component. MDEQ began its remedial design activities in 2008, following entry of the Consent Decree, which designated MDEQ as lead agency for remedy and O&M implementation using cashout funds received from the PRP. MDEQ focused its first remedial actions on immediate human health and irrigated lands concerns and are now proceeding with geographically-defined phases (Figure 3).

Figure 3. CFROU Reach A Phase Breaks



MDEQ, in consultation with EPA, and in accordance with Consent Decree requirements, performed residential yard removals, necessitated by elevated levels of arsenic and lead, in the fall of 2010 through the summer of 2011. Confirmation sampling were collected to ensure all contamination was removed. MDEQ, in consultation with EPA and in accordance with Consent Decree requirements, performed the Trestle Area cleanup within Reach A in the fall and winter of 2011-2012, with planting in the spring of 2012. The trestle cleanup involved removal of residential soils with elevated levels of arsenic and reconstruction and revegetation of 1,000 feet of streambank. In the fall and winter of 2012, MDEQ performed the remedial action for the pasture areas historically irrigated with Clark Fork River water.

The Reach A Phase 1 Remedial Action Project began on March 4, 2013, and finished on April 4, 2014. MDEQ, NRDP and EPA performed a pre-final inspection of the project on May 9, 2014. Additional vegetation was planted in April, May and the fall of 2014. Revegetation activities are ongoing. Monitoring plans for vegetation and streambanks have been developed to ensure that the remedy is successful over the long term. MDEQ has prepared the Construction Completion Reports for Phase 1.

Additional activities underway in Reach A include:

- *Phases 5 and 6 – In Progress*
MDEQ submitted the final Reach A, Phase 5 & 6 Data Summary Report to EPA on March 14, 2014. Remedial actions began on July 15, 2014, and are ongoing. Phase 5 and 6 involve two private landowners and cleanup on working ranches. The remediation project will consist of tailings removal on 4.5 river miles. The work is scheduled to be completed in the spring of 2016, with revegetation activities in the spring of 2016 and fall of 2016.
- *Phase 2 – In Progress*
MDEQ submitted the Preliminary Design Plan for Reach A, Phase 2 to EPA on July 1, 2014. Construction began in the summer of 2015. Phase 2 involves two private landowners and State of Montana land. The privately-owned property is actively farmed and ranched. The remediation project will consist of tailings removal on 1.9 river miles and is scheduled to be completed by the fall of 2016 with revegetation activities to follow.
- *Phases 3 and 4 – Preliminary Design*
Sampling and characterization of the Phases 3 and 4 project areas, located between Perkins Lane and Galen Road, was completed in the winter of 2015. The Preliminary Design Plan has been developed and remedial activities are anticipated to start in fall of 2016.
- *Phases 7, 15 and 16 – Preliminary Design*
MDEQ is currently working with private landowners, Montana Fish, Wildlife and Parks, and the Grant-Kohrs Ranch on design plans. These plans begin to lay out the details of the design and how and where remedial work will be conducted. MDEQ will continue to provide updates as designs progress.
- *Phase 8 – Sampling and Analysis*
Phase 8 is currently in the site characterization phase. Crews are digging test pits and sampling material to determine the extent and depth of contamination along the river and

surrounding corridors. Sampling should be completed in early 2016, and the design team will then begin the design process for remedial action.

- *Eastside Road Pastures*

Remedial Action for the Eastside Road Pastures began on November 5, 2012. The majority of work finished on December 6, 2012; fencing finished in the spring of 2013. MDEQ conducted additional sampling of this area during the spring and summer of 2014. After a year of little growth in the Eastside Road pastures south of Deer Lodge, MDEQ implemented additional revegetation measures in the spring of 2015. Sugar beet lime and top soil was deep tilled into the existing soil. The area was then reseeded and straw was crimped into the ground for erosion control. Monitoring of this area is ongoing.

Reach C was determined to require no further action. Remedial design work on Reach B is expected to occur after work is completed on Reach A. Institutional controls for the CFROU are discussed in Section 6.3.

MDEQ will develop appropriate operation and maintenance plans and best management practice ranch plans on a parcel-specific basis as the cleanup proceeds. An Institutional Control Implementation and Assurance Plan will also be developed.

4.3 Operation and Maintenance (O&M)

MRSOU

The Long-Term Post Remedial Action Construction Monitoring Plan, which is the MRSOU operation and maintenance plan, was finalized in 2013. The plan outlines the groundwater and surface water monitoring requirements as well as the long-term maintenance and monitoring for the constructed repositories and buttress areas. Prior to the 2013 plan, monitoring was performed under the 2007 Remedial Action Monitoring Plan. Groundwater is to be sampled twice each year, during high and low flow.

Surface water sampling occurs at three sites, six-to-eight times per year on a USGS schedule designed to take seasonal and hydrologic variability into account. Suspended-sediment samples are collected by an observer two to 14 times per week, depending on season and flow conditions. Bed sediment data is collected once annually during low, stable flow conditions (typically around August). Biological data is collected once annually, on the same dates as the bed sediment data collection.

The PRPs are responsible for annual maintenance and monitoring of two repositories – Tunnel Pond and Right Bank. Annual monitoring and maintenance of the buttress and railroad berm adjacent to the Tunnel Pond Repository and the Interstate-90 slope and buttress are also the responsibility of the PRPs. Operation and maintenance costs for MRSOU were not available for review during this FYR.

CFROU

The Interim Comprehensive Long-Term Monitoring Plan for the CFROU established monitoring activities for sediment, surface water and groundwater that will determine the environmental effectiveness of remediation and restoration actions within the Site as they are implemented over the next 15 years. The CFROU remedy is intended to remove threats to human health and the environment posed by mining related contaminants within the floodplain of the upper Clark Fork. Monitoring under the Interim Comprehensive Long-Term Plan began in the spring of 2010 at each of six Clark Fork monitoring stations, this was prior to initiation of any remediation and restoration actions within the CFROU. This plan has been updated yearly.

Eventually, a long term operation and maintenance plan will be developed and implemented by MDEQ.

A breakdown of CFROU costs from 2008 to 2014 were provided and reviewed. Since remedial actions are still being designed and implemented at the CFROU, separate O&M costs are not presented. The remedial action at Phase 1 was completed in fiscal year 2014. The next FYR may examine O&M costs for ongoing maintenance at this phase and any others completed at that time.

5.0 Progress Since the Last Five-Year Review

The protectiveness statement from the 2011 FYR for the Site stated:

The remedy at the MRSOU is expected to be protective of human health and the environment upon completion, and in the interim, exposure pathways that could result in unacceptable risks are being controlled. The Water Supply Operable Unit is fully implemented and funded, and is protective of human health and the environment. The long-term protectiveness of the remedial action will be verified through review and approval of remedial action completion documents, a comprehensive O&M Plan, an Institutional Control Plan, and through monitoring of groundwater for all of the ARARs, and periodic evaluation of the O&M results and the institutional controls. Streambank reconstruction and area revegetation efforts should be evaluated in the next FYR Report.

The 2011 FYR included five issues and recommendations for the MRSOU². This report summarizes each recommendation and its current status below.

² Because work at the CFROU was in its initial stages, that OU was not evaluated in the 2011 FYR.

Table 7: Progress on Recommendations from the 2011 FYR

Recommendations	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
Implement institutional controls for the MRSOU comprehensive institutional control plan and its components.	PRP/State/EPA	September 2014	Ongoing.	Not completed and carried over to the 2016 FYR
Develop and implement O&M requirements through a comprehensive O&M plan. This plan should add a requirement for routine surveying of the Tunnel Pond Repository berm to verify that lateral movement is not occurring over time. Other requirements may also be necessary.	EPA/PRP	September 2013	Completed. Envirocon completed the Long-Term Post-Remedial Action Construction Monitoring Plan for MRSOU.	03/15/2013
Include monitoring for all of the groundwater ARARs, and in a long-term groundwater and surface water monitoring plan.	EPA/PRP	2012	Completed. Monitoring of all of the groundwater ARARs began in 2013 and additional parameters included in the long-term groundwater and surface water monitoring plan.	03/29/2013
Remove and appropriately dispose of contaminated wood timbers left after dam removal (currently scheduled for the fall of 2011).	EPA/PRP	Fall 2011	Completed. Timbers removed.	05/03/2012
Reclaim and revegetate borrow area in accordance with the requirements of the statement of work. The adequacy of vegetation at the other borrow area and the Tunnel Pond Repository should also be reviewed.	EPA/PRP	September 2012	Completed. Areas reseeded in the spring of 2012.	07/20/2012

6.0 Five-Year Review Process

6.1 Administrative Components

EPA Region 8 initiated the FYR in October 2015 and scheduled its completion for September 2016. EPA remedial project manager (RPM) Sara Sparks led the EPA site review team, and contractor support was provided to EPA by Skeo. In August 2015, EPA held a scoping call with the review team to discuss the Site and items of interest as they related to the protectiveness of the remedy currently in place. The review schedule established consisted of the following activities:

- Community notification.
- Document review.
- Data collection and review.
- Site inspection.
- Local interviews.
- FYR Report development and review.

6.2 Community Involvement

On November 1, 2015, EPA participated in a radio interview that was broadcast on KQRV in Deer Lodge, Montana. This interview announced the commencement of the FYR process for the Site and invited community participation in the FYR process. In June 2016, EPA published a public notice in the *Missoulian* and the *Missoula Independent* newspapers providing contact information for EPA RPM Sara Sparks and inviting community participation in the FYR process for the Site. The press notice is available in Appendix B. No one contacted EPA as a result of the advertisement.

EPA will make the final FYR Report available to the public. EPA will place copies of the document in the designated site repositories: Grant-Kohrs Ranch National Historic Site, 266 Warren Lane, Deer Lodge, Montana 59722 and Missoula City/County Library, 301 East Main Street, Missoula, Montana 59802. Upon completion of the FYR, EPA will place a public notice in the *Silver State Post*, *Missoulian* and *Missoula Independent* newspapers to announce the availability of the final FYR Report in the Site's document repositories.

6.3 Document Review

This FYR included a review of relevant site-related documents. Appendix A provides a complete list of the documents reviewed.

ARARs Review

Section 121 (d)(2)(A) of CERCLA specifies that Superfund remedial actions must meet any federal standards, requirements, criteria or limitations that are determined to be ARARs. ARARs are those standards, criteria or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location or other

circumstance at a CERCLA site. To-Be-Considered criteria (TBCs) are non-promulgated advisories and guidance that are not legally binding, but should be considered in determining the necessary level of cleanup for protection of human health or the environment. While TBCs do not have the status of ARARs, EPA's approach to determining if a remedial action is protective of human health and the environment involves consideration of TBCs along with ARARs.

Chemical-specific ARARs are specific numerical quantity restrictions on individually listed contaminants in specific media. Examples of chemical-specific ARARs include the maximum contaminant levels specified under the Safe Drinking Water Act as well as the ambient water quality criteria enumerated under the Clean Water Act. The remedy selected for the Site was designed to meet or exceed all chemical-specific ARARs and meet location- and action-specific ARARs.

Groundwater ARARs

The decision documents established federal Maximum Contaminant Levels (MCLs) and Montana Water Quality Standards as ARARs for groundwater at the Site. Numerical values listed in decision documents were compared to current federal and state standards to identify any changes that could affect protectiveness of the remedy (Table 8). The state standard for arsenic is now the same as the federal standard, which was selected in the 2004 ROD.

Table 8: Previous and Current ARARs for Groundwater COCs

	Standards Identified in 2004 ROD		2016 Standards	
Compound	State (µg/L)	Federal (µg/L)	State (µg/L) ^a	Federal (µg/L) ^b
Arsenic	20	10	10	10
Cadmium	5	5	5	5
Copper	1,300	1,300	1,300	1,300
Lead	15	15	15	15
Zinc	2,000	N/A	2,000	N/A
<i>Notes:</i> a. Montana Numeric Water Quality Standards – Circular DEQ-7. February 2012. b. Safe Drinking Water Act contaminants and federal MCLs.				

Surface Water ARARs

The decision documents established federal AWQCs and Montana Water Quality Standards as ARARs for surface water at the Site. Numerical values listed in decision documents were compared to current federal and state standards to identify any changes that could affect protectiveness of the remedy (Table 9). At the time of the ROD, the State of Montana's surface water quality standard for arsenic was 18 µg/L, based on human health, and 20 µg/L for groundwater as a drinking water supply. The state standard for arsenic for surface water and groundwater is now 10 µg/L, matching the federal standards. No other changes were identified in this review.

Table 9: Previous and Current ARARs for Surface Water COCs

	2016 Surface Water Standards					2004 ROD Standards				
	State (1)			Federal (2)		State (1)			Federal (2)	
	Aquatic Life		Human Health (µg/L)	CMC (Acute) (3)	CCC (Chronic) (4)	Aquatic Life		Human Health	CMC (Acute) (3)	CCC (Chronic) (4)
Compound	Acute (µg/L)	Chronic (µg/L)		(µg/L)	(µg/L)	Acute (µg/L)	Chronic (µg/L)	Standard (µg/L)	(µg/L)	(µg/L)
Arsenic	340	150	10	340	150	340	150	18	340	150
Cadmium	0.52*	0.097*	5	2***	0.25***	0.52*	0.097*	5	2***	0.25***
Copper	3.79*	2.85*	1,300	N/A	N/A	3.79*	2.85*	1,300	2.337#	1.45#
Iron	N/A	1,000	N/A	N/A	N/A	N/A	1000	300a	N/A	N/A
Lead	13.98*	0.545*	15	65***	2.5***	13.98*	0.545*	15	65***	2.5***
Zinc	37*	37*	2,000	120***	120***	37*	37*	2,000	120***	120***
<p><i>Notes:</i></p> <p>* = value indicated is for a hardness of 25 milligrams per liter (mg/L) as calcium carbonate (CaCO₃).</p> <p>** = value indicated is for a hardness of 50 mg/L as CaCO₃.</p> <p>*** = value indicated is for a hardness of 100 mg/L as CaCO₃.</p> <p>**** = value indicated is for a hardness of 150 mg/L as CaCO₃.</p> <p># = standards are hardness dependent. Value indicated is for a hardness of 84.6 mg/L as CaCO₃. Source: http://www.epa.gov/waterscience/criteria/copper/2007/criteria-full.pdf.</p> <p>a = indicates value is a secondary MCL based on aesthetics (taste, odor, staining).</p> <p>1. Montana Numeric Water Quality Standards – Circular DEQ-7. February 2012.</p> <p>2. Current National Recommended Water Quality Criteria, EPA, http://www.epa.gov/waterscience/criteria/wqtable/#mm.</p> <p>3. CMC = Criteria Maximum Concentration is an estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed briefly without resulting in an unacceptable effect.</p> <p>4. CCC = Criterion Continuous Concentration is an estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect.</p>										

Institutional Control Review

MRSOU

The ROD identified that institutional controls, dealing primarily with groundwater but also addressing residential use and protection of waste repositories, were required at the Site. To date, a controlled groundwater area or similar institutional control has not been implemented. Site regulatory agencies are continuing to discuss the need for this institutional control. A Missoula County ordinance currently in place appears to preclude installation of new public water wells in the vicinity of the MRSOU arsenic plume. However, these ordinances do not preclude private well installation in the plume area (Figure 2). Additional institutional controls may be needed to control private well installation in the arsenic plume, prevent residential use and protect the waste repositories and the sediments left in place.

An institutional control preventing river access during certain time periods has been necessary in the past, and may be needed in the future. The majority of the MRSOU has been designated as a future Montana State Park. Institutional controls dealing with water consumption, residential use and the waste repositories will need to be incorporated into the future park design and planning documents.

CFROU

Institutional controls for the CFROU may include county zoning regulations, deed restrictions, permanent funding for Arrow Stone Park, and groundwater sampling and use controls. Environmental monitoring is required during all activities.

The Powell County Overlay District covers the area contaminated by mining and smelting wastes from operations further upstream in the Butte and Anaconda areas (Figure 4).³ The Overlay District is intended to ensure that future land use in the Superfund Overlay District is compatible with the presence of potential contaminants and the various remedial actions required to remove or isolate those potential contaminants from the environment. Requirements include:

- *Property Development:* All use changes and development in the Superfund Overlay Zone are subject to the securing of a Conditional Use Permit (CUP). All applications for a CUP or variance in the Superfund Overlay Zone shall include the following additional information beyond that which is required for any CUP or variance. Where no remedial structures exist on a site, the application materials shall include arsenic tests, as required by Powell County, and detailed plans (if necessary) for achieving compliance with the maximum arsenic level allowed for the proposed use.
- *Groundwater Wells:* A development certificate shall be required to drill or dig a well in the Superfund Overlay Zone. Prior to the issuance of a completion certificate of any well in this overlay district, the well is required to be tested for coliform bacteria, arsenic, barium, cadmium, chromium, copper, lead, mercury and nitrate, and the results of the tests submitted to Powell County. No certificate of compliance shall be

³ <http://powellcountymt.gov/cz/inner.php?PageID=1501>.

issued for any well in which the water exceeds state water quality standards for the proposed use.

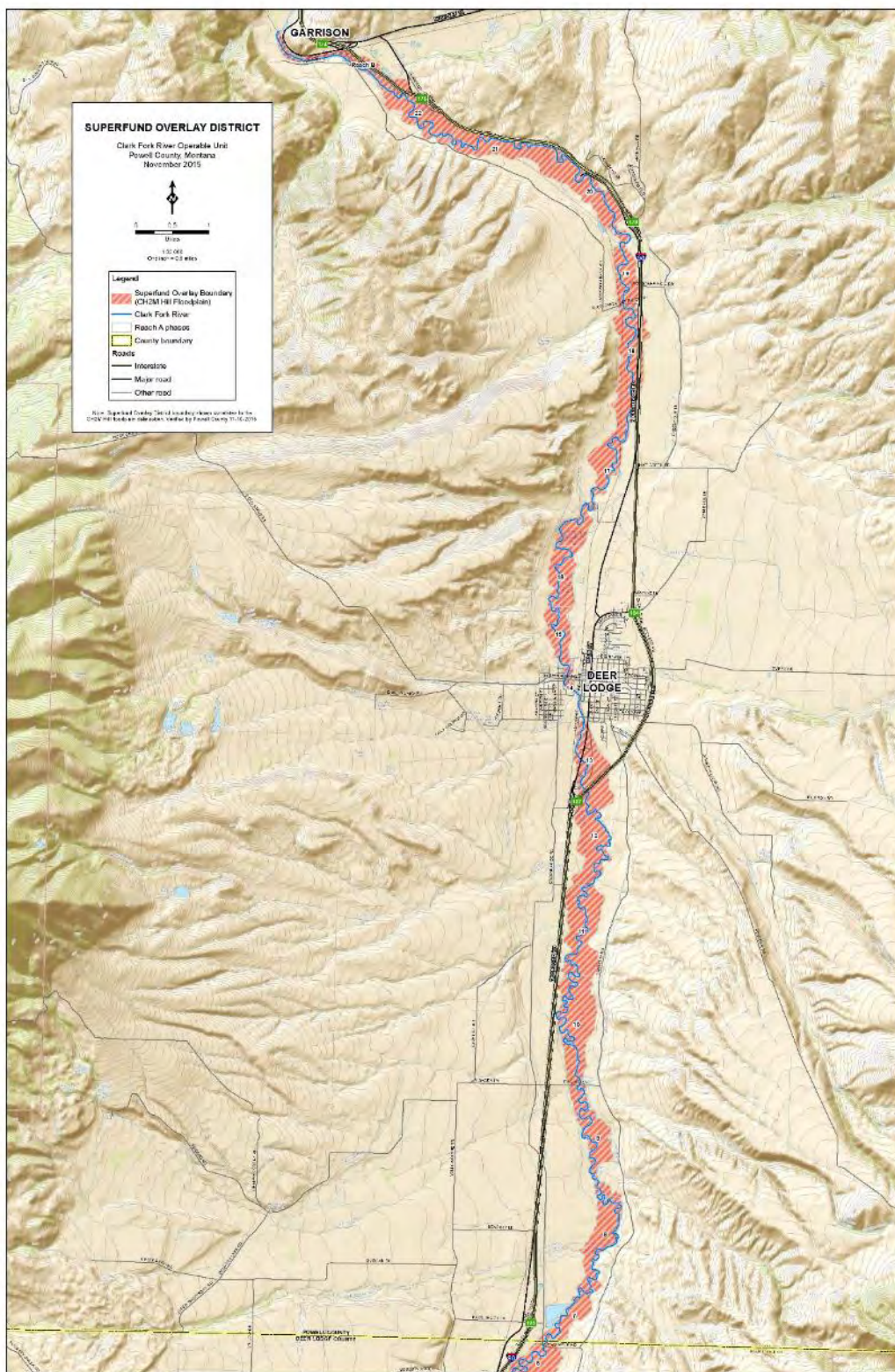
- *Notice to Purchasers:* Before any parcel or any interest in any parcel in the Superfund Overlay Zone is conveyed, the following statement shall be placed on the deed, contract for sale or other instrument of conveyance: “This parcel is within a Superfund site. A permit must be obtained before any development or construction covered by these regulations is initiated.”

Table 10 lists the institutional controls associated with areas of interest at the Site.

Table 10: Institutional Control (IC) Summary Table

Media	ICs Needed	ICs Called for in the Decision Documents	Impacted Area (s)	IC Objective	Instrument in Place	Notes
MRSOU Groundwater	Yes	Yes	area of delineated arsenic plume	Prevent consumption of contaminated groundwater.	Missoula County zoning ordinances in place preclude installation of new public water wells in the vicinity of the arsenic plume.	Additional controls may be needed to prohibit private well installation.
MRSOU Soil	Yes	No	repository and sediment areas	Prevent activities that could affect the integrity of the remedy. Prevent residential use.	None	None
CFROU Groundwater	Yes	Yes	to be determined during each Phase	Prevent consumption of contaminated groundwater, if necessary.	Powell County Overlay District	ICs could include county zoning regulations, deed restrictions, permanent funding for Arrow Stone Park, and groundwater sampling and use controls.
CFROU Soil	Yes	Yes	To be determined during each Phase	Prevent activities that could affect the integrity of the remedy or cause unacceptable human health exposures.	Powell County Overlay District	ICs could include county zoning regulations, deed restrictions, permanent funding for Arrow Stone Park.

Figure 4: Powell County Overlay District (CFROU)



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

6.4 Data Review

MRSOU

Groundwater Monitoring

Groundwater monitoring at the MRSOU is designed to meet three objectives: 1) ensure that the remedy is performing as designed; 2) ensure that the remedy complies with applicable performance standards; and 3) evaluate the need for additional remedial or O&M activities. In 2013, MRSOU long-term post-remedial action monitoring began, replacing the prior remedial action monitoring plan. The 2013 monitoring plan revised the number of wells to be monitored to 12 wells and revised the list of dissolved metals requiring analysis.

Data available for the 10 compliance wells (104A, 921A, 917B, 922D, 105C, 107A, 110B, HLA2, 11R and 103B), the Upland Disposal Site monitoring well 913A, and the Tunnel Pond Repository monitoring well (TPR10) were sampled during high-flow conditions in June 2015 and low-flow conditions in January 2016. The 2015 and 2016 well samples were only analyzed for dissolved arsenic in accordance with EPA's April 20, 2015 correspondence, which approved dropping analysis for the other COCs due to two years of data showing no exceedances of state standards.

Arsenic concentrations in the compliance wells ranged from 0.867 µg/L to 67.4 µg/L in the most recent annual monitoring, with nine (during the June monitoring 2015) and eight (during the December 2015 monitoring event) of the 12 compliance wells continued to exceed the 10 µg/L groundwater standard. Overall, arsenic concentrations in all wells are lower than historic levels years (Figures 5-7). The ROD indicates that groundwater standards are expected to be met within approximately four to 10 years following completion of dam and sediment removal. A waiver of groundwater standards is not currently proposed. However, the PRPs may seek a waiver of groundwater cleanup standards if compliance is not achieved and is technically impracticable.

Groundwater monitoring of the Tunnel Pond Repository will entail sampling one well, located downgradient of the repository, on the same frequency and for the same analyte list as the other POC wells. No groundwater monitoring is required for the right bank repository. The 2013 monitoring plan identifies that the POC well for the Repository was left as "to be determined" because some of the past sampling results in the existing monitoring well, TPR10, were above the pertinent ARAR and the state's 10 ug/L groundwater arsenic performance standard. In a September 16, 2013 letter, the PRPs proposed using well TPR10 as the Tunnel Pond Repository POC and evaluating its data using a two-part statistical test to assess potential impacts to groundwater quality from repository construction and use. The statistics were proposed to determine if:

1. The rolling average concentration in the last four samples exceeds the state groundwater standard.
2. The Mann-Kendall analysis shows a statistically significant increasing trend in concentrations in the last eight samples.

The results show the rolling average concentration in the last four samples does exceed the arsenic groundwater standard; the Mann-Kendall analysis does not show a significant increasing trend in concentrations in the last eight samples. The PRPs continue to recommend statistical analysis of TPR10 as the Tunnel Pond Repository POC with assessment of potential impacts to groundwater from repository construction and use.

Figure 5: Arsenic Concentrations in Wells 905, 103B, 917B and 107C

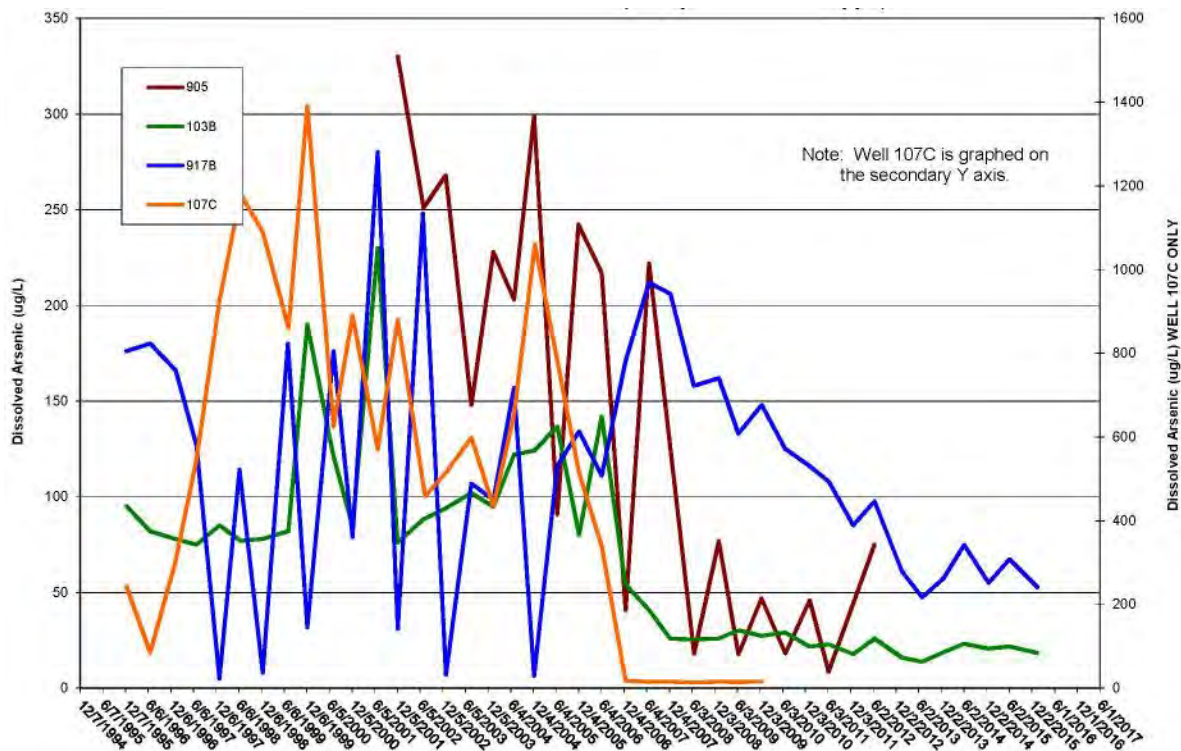


Figure 6: Arsenic Concentrations in Wells 105C, 11, HLA2, 107A and 11R

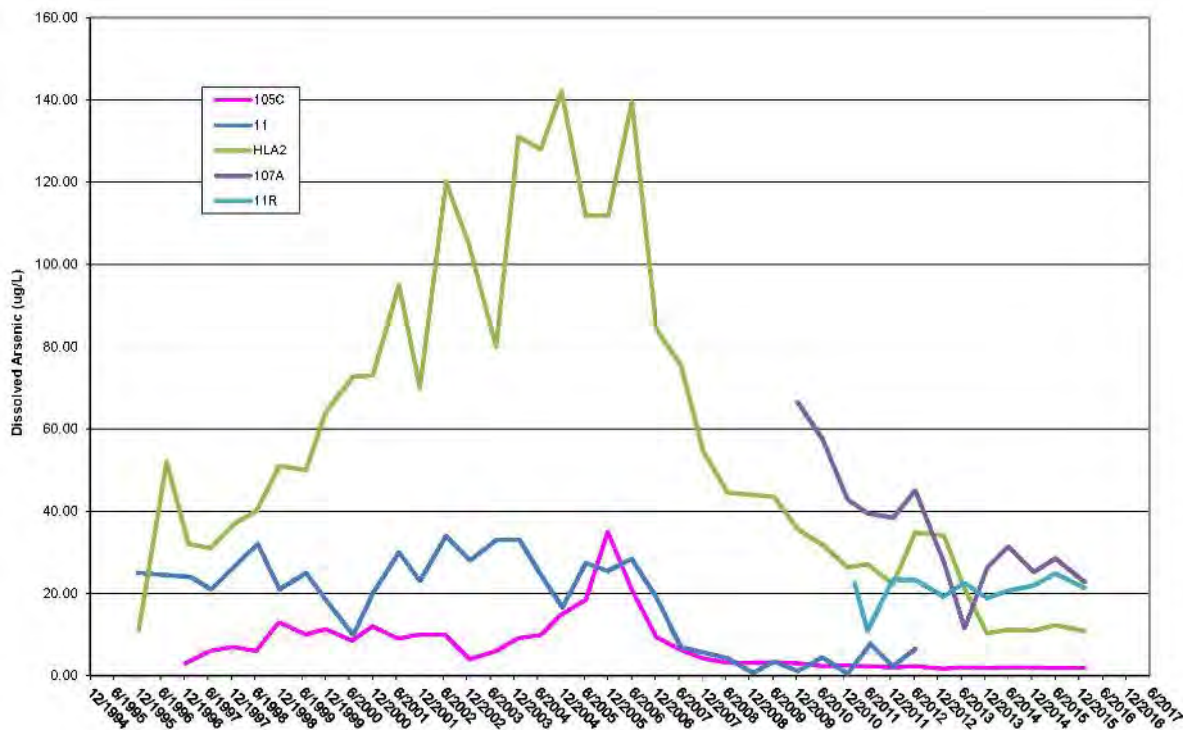
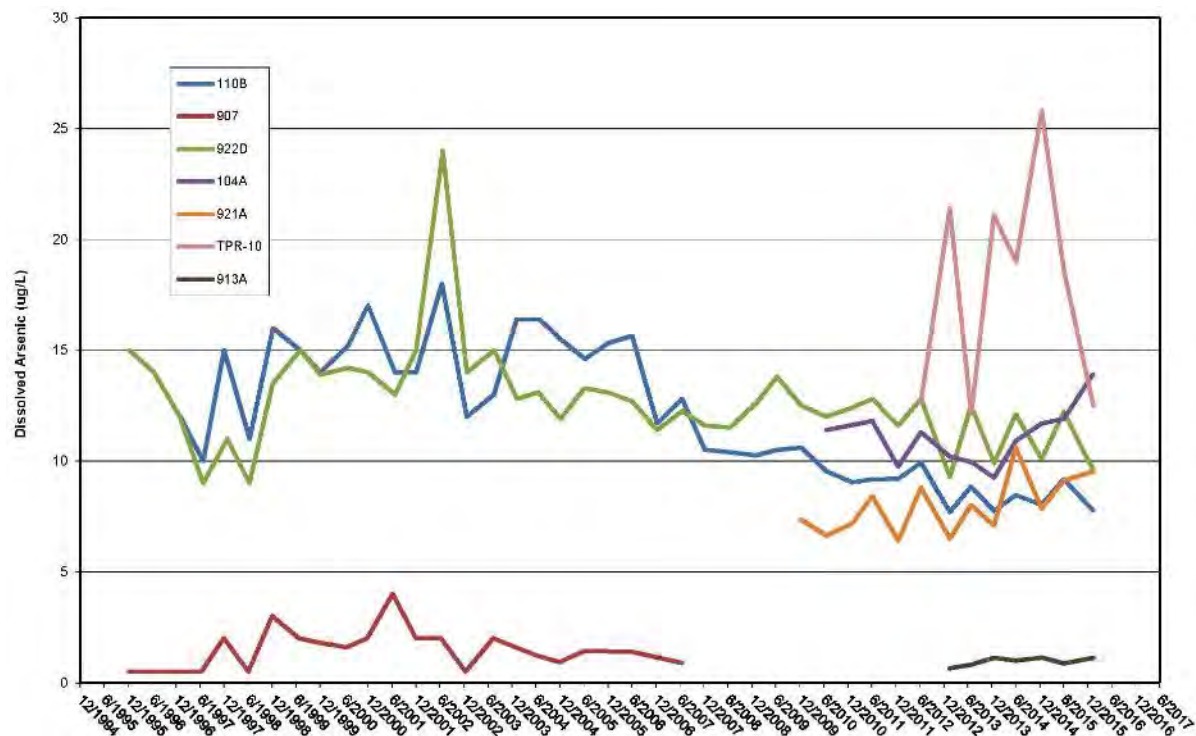


Figure 7: Arsenic Concentrations in Wells 110B, 907, 922D, 104A, 921A, TPR-10 and 913A



Surface Water Monitoring

In 2015, surface water quality samples were collected at all three stations six to eight times on a USGS schedule designed to describe seasonal and hydrologic variability. Flow was monitored continuously. An observer collected suspended-sediment samples two to 14 times per week, depending on season and flow conditions. Bed sediment and biota samples were collected once in August 2015.

The 2015 surface water quality sample results at the three stations for the five COCs are summarized on Appendix F. At the downstream Clark Fork River near Missoula station, there were no exceedances of federal standards and the only exceedances of state standards were for total recoverable copper in the June 10 sample. Total recoverable copper concentration on this date was significantly higher at the Clark Fork River at Turah station sample, showing the Site was not causing the downstream exceedance of state standards. The Consent Decree provides for the consideration of upstream contamination entering the MRSOU to determine compliance with surface water standards.

To assist with surface water data evaluation, EPA asked the U.S. Geological Survey (USGS) to conduct a trends analysis for the Site, using the ongoing data collected by USGS at the Site. The analysis, title “Water-Quality Trends and Constituent-Transport Analysis for Selected Sampling Sites in the Milltown Reservoir/Clark Fork River Superfund Site in the Upper Clark Fork Basin, Montana, Water Years 1996 – 2015” is included as Appendix I.

The primary purposes of this report are to characterize temporal trends in flow-adjusted concentrations (filtered and unfiltered) of mining-related contaminants and assess those trends in the context of source areas and transport of those contaminants through the Milltown/Clark Fork River Superfund Site in the upper Clark Fork Basin. Trend analysis was done on specific conductance, selected trace elements (arsenic, copper and zinc), and suspended sediment for seven sampling sites for water years 1996-2015. This report provides an update and supersedes the trend results reported by Sando and others (2014) for seven sampling sites in the Milltown/Clark Fork River Superfund Site. This report presents the results and information on trend-analysis methods, streamflow conditions, and various data-related factors that affect trend results. This information is presented to assist in evaluation trend results; however, it is beyond the scope of this report to provide detailed explanations of all observed temporal changes.

Vegetation Inspection and Maintenance

The performance standard for vegetation is to establish on the reclaimed areas a “diverse, effective and permanent vegetative cover of the same seasonal variety native to the area of land to be affected and capable of self-regeneration and plant succession at least equal in extent of cover to the natural vegetation of the area except that introduced species may be used in the revegetation process where desirable and necessary to achieve the approved post-mining land use plan. Vegetative cover must be capable of:

- Regenerating under the natural conditions prevailing at the site, including occasional drought, heavy snowfalls and strong winds.

- Preventing soil erosion to the extent achieved prior to the operation.”

Another performance standard for vegetation is to control noxious weeds consistent with weed management criteria developed under MCA 7-22-2109 (2)(b) and to meet the <10 percent guideline for the amount of cover by noxious weeds.

On June 18, 2015, vegetation performance was assessed on the reclaimed areas for which the PRPs retain O&M responsibility. The inspection covered over 17 acres and included estimation of percent vegetative cover, determination of species present (including weed species) and recommendations for maintenance.

In their approval of the 2014 Annual Report, EPA agreed that vegetation performance standards had been met for two consecutive years at the Right Bank Repository, the Tunnel Pond Repository and the Interstate-90 buttress. Observations during the 2015 inspection suggest that vegetation performance standards for remaining areas (the Bonner Development Group Parcel and the Sheriff Posse Grounds Parcel) have now also been met for two consecutive years. Based on this data, the PRPs requested that EPA approve completion of the vegetation performance monitoring responsibilities, and EPA, in consultation with MDEQ and the State NRD Program approved of this request.

Repository Inspection and Maintenance

The PRPs visually inspected both repositories, the buttress and railroad berm adjacent to the Tunnel Pond Repository and the Interstate-90 buttress on June 18, 2015. The PRPs also visually inspected the Tunnel Pond Repository stormwater conveyance system on May 13, 2015. Overall, the inspections found the stormwater conveyance systems were clean and functioning and the repository caps and the Tunnel Pond and Interstate-90 buttresses were in good condition and, with the exception of a few small subsidence holes observed in the Tunnel Pond railroad embankment and Right Bank Repository cover, did not show visible impacts from settlement, subsidence or erosion. Pioneer Technical Services did a geotechnical review of the Tunnel Pond subsidence holes which determined “these features are not anticipated to impact the geotechnical stability of the tunnel pond embankment” but they should continue to be observed as part of annual monitoring.

In addition to the inspections described above, the PRPs also installed settlement monuments in the crest and toe of the Tunnel Pond Repository embankment in April 2014 as required by the Monitoring Plan. To support this FYR, the monuments were surveyed on October 28, 2015, to identify any lateral movement in the embankment. Comparison between the 2014 and 2015 survey results were below the 1-inch trigger for initiating additional review assessment.

Community Well Monitoring

MCCHD monitors certain existing public and private water supply wells as public health monitoring wells. Data available for this FYR (2013) consistently indicate the groundwater in these areas remained below the arsenic standard of 10 µg/L.

CFROU

Remediation performance standards were established for the CFROU ROD for surface water, groundwater and vegetation. No performance standards were established in the CFROU ROD for aquatic biota (e.g., macroinvertebrates and periphyton), instream sediments or geomorphology. However, the Sampling and Analysis Plan identifies benchmarks for those environmental media which may serve to evaluate biological conditions and instream sediment toxicity (Appendix G). The CFROU monitoring network in 2014 included 14 sites; six mainstem sites and eight tributary sites. Not all sites were sampled for each environmental medium or for each analyte of each environmental medium. All of the environmental media monitored in 2014 was to be monitored in 2015, with the addition of monitoring for birds. Data from 2015 sampling were not available for this FYR.

Arsenic and copper are the COCs in surface water with regular exceedances. Of 30 samples collected in the mainstem Clark Fork River in 2014, no samples had zinc concentrations exceeding the performance goal. One sample had cadmium concentrations exceeding the performance goal. Four samples had lead concentrations exceeding the performance goal. However, arsenic commonly exceeded performance goals, particularly in Reach A. Of 24 samples collected in the CFROU in Reach A, 96 percent of them exceeded the dissolved arsenic performance goal and 46 percent of them exceeded the total recoverable arsenic performance goal. Mill-Willow Creek and Silver Bow Creek through the Warm Springs Ponds are sources of arsenic to the Clark Fork River.

Total recoverable copper concentration exceeded the state of Montana chronic aquatic life standard in the mainstem Clark Fork River sites in 95 percent of the samples collected in the first and second quarters, but only at Deer Lodge in the third and fourth quarters. The Clark Fork River reach upstream from Deer Lodge is a major source of copper loading and copper concentrations throughout the river are strongly related to streamflows.

The highest instream sediment COC concentrations in the mainstem of the Clark Fork River were typically observed in the uppermost sample sites in Reach A. The lowest concentrations were typically observed at the downstream-most site at Turah. Concentrations of arsenic, copper, and zinc exceeded the probable effect concentration (PEC) at all Clark Fork River mainstem monitoring stations during both sample periods in 2014. Among all sites in the CFROU, arsenic most commonly exceeded the PEC (88 percent) followed by copper (83 percent), lead (79 percent), zinc (75 percent) and cadmium (50 percent).

6.5 Site Inspection

MRSOU

Site inspection participants included Keith Large from MDEQ, Sara Sparks from EPA, and Treat Suomi and Claire Marcussen from Skeo. The inspection took place on November 2, 2015. See Appendix D-1 and E-1 for the site inspection checklist and photographs.

The inspection began at the Milltown Bluff, providing an overall view of the MRSOU remedial components, including the Tunnel Repository and associated embankment and buttress, Railroad Grade and Main Repository, the Right Bank Repository, the Interstate-90 slope and buttress, the Bonner Development Group Parcel and the Sheriff Posse Grounds Parcel. From the bluff, participants observed areas of sparse vegetation along the gravel road near the Buttress slope; the area has recently been regraded and seeded to promote growth of vegetation and is flagged for ongoing monitoring of vegetative growth. The stormwater diversion ditch along the Tunnel Repository was well maintained. Participants saw that most timber debris from the Milltown Dam demolition has been removed. However, there were still some timbers near the former dam area on the north side of the Clark Fork River. EPA later determined that these timbers were brought in by the Montana Fish, Wildlife and Parks Department for use in park construction.

Participants visited the Right Bank Repository where a relative small area of subsidence was observed (about 2 square feet) and flagged for ongoing monitoring to ensure the subsidence does not expand. Participants walked along the Blackfoot River to observe the riprap stabilizing the banks of the river, and used inclinometers to measure the Interstate-90 bridge settlement. The riprap was intact. However, a number of timbers were observed below the Interstate-90 bridge along the banks of the Blackfoot River. These salvaged timbers belong to the Montana Fish, Wildlife and Parks and will be used for the construction of a State Park near this area. Participants also viewed monitoring wells 917B and 921A; both wells were secured with locks.

The participants visited the Bonner Development Group Parcel and the Sheriff Posse Grounds Parcel. Both parcels appear to have established vegetation. Vegetation was also beginning to become established along the Clark Fork River southwest of the two parcels. The Sheriff Posse Grounds Parcel consists of about 3 acres of reclaimed areas. It includes a community park with picnic tables and trails, a rodeo ground, and a cultural slope area. Apart from the rodeo ground, all were covered with vegetation. The rodeo ground is currently used for rodeo activities.

CFROU

Site inspection participants included Brian Bartkowiak from MDEQ, Sara Sparks from EPA, and Treat Suomi and Claire Marcussen from Skeo. The inspection took place on November 3, 2015. See Appendix D-2 and E-2 for the site inspection checklist and photographs.

The inspection began immediately north of the town of Warm Springs below the Warm Springs Ponds, the beginning of the Clark Fork River Phase 1 remediation area. The riverbanks have been remediated and are vegetated. An 8-foot fence was observed; it is intended to keep wildlife away from the new growth along the riverbank until the vegetation is well established. The inspection proceeded by car. MDEQ staff noted the location of the Phase 2 remediation area where remedy construction started on June 2015. Participants observed the Beck Borrow area where clean fill material is obtained and then mixed with compost for use in filling the excavated floodplain areas (located west of the Phase 10 area).

Participants proceeded to the town of Deer Lodge to view Arrow Stone Park, which is owned by the City of Deer Lodge and leased to Powell County. Two removal actions there addressed arsenic-contaminated soils during installation of utility poles and an outhouse. The park is

located in the Phase 13 and Phase 14 remediation areas. Parts of the riverbank were eroded where the Clark Fork River meanders. The park includes picnic areas and a walking trail system.

The site inspection continued in Deer Lodge where residential and streambank remediation of arsenic-contaminated areas were observed in the Trestle Area. Participants then visited the large area of pastureland east of the Phase 13 and 14 areas historically irrigated by a ditch that brought water from the Clark Fork River to the area. The pastures visited included the Eastside Pastures/Road area and the Windy Mountain Ranch (also known as the Broken Circle Ranch) area where large areas of contaminated pasture land were remediated in 2011. The pastures were vegetated with grass. The inspection proceeded to the Phase 7 remediation area, where Race Track Pond was observed. Participants then visited the Phase 5 and 6 active remediation area. Trucks and earthmoving equipment were observed removing contaminated floodplain soils and filling in excavated areas with soil and compost from the Beck borrow area. The tour ended with a visit to the Opportunity Pond repository where contaminated soils and sediment are placed.

6.6 Interviews

The FYR process included interviews with parties affected by the Site, including the current landowners and regulatory agencies involved in site activities or aware of the Site. The purpose was to document the perceived status of the Site and any perceived problems or successes with the phases of the remedy implemented to date. EPA reached out to multiple stakeholders to invite them to participate in the interview process. The interviews with those that were interested took place in person, over the phone and in writing. All interviews are summarized below. Appendix C provides the complete interviews.

MRSOU

Jeffrey Johnson: Jeffrey Johnson represents the National Park Service at the Grant-Kohrs Ranch National Historic Site in Phase 15. Overall, he believes that the remedial activities at the Milltown Reservoir were completed efficiently and that maintenance activities are sufficient. He mentioned the current performance of the remedy is performing as expected. He is not aware of any complaints from residents, new state laws that might affect the protectiveness of the remedy or any changes in projected land uses at the Site. He is comfortable with the status of institutional controls at the Site.

Chris Brick: Chris Brick is the director of a local community organization, Clark Fork Coalition Sciences. Overall, she believes site cleanup has been successful. Vegetation at the former bypass channel is not coming in very well, leading her to believe the cleanup might not be complete. Another area of concern is an on-site repository adjacent to the bluff where a waste monitoring well has had arsenic exceedances. As far as maintenance, the repository has reasonably good grass but Ms. Brick mentioned that there should be more native shrubs. Ms. Brick is satisfied with the reuse plans for a park on site. However, there are access issues and these need to be resolved in order to move forward with redevelopment. Ms. Brick mentioned she has seen mostly positive effects on the community. There were positive effects from the construction work and the people like that they can continue to float and fish on the river. Lastly, Ms. Brick commented that EPA did a great job keeping involved parties informed of site activities while

cleanup was ongoing. However, now most of the information comes from Powell County and applies to the CFROU. She is interested in using the former email list to update the community.

Michael Kustudia: Michael Kustudia is the manager of the Milltown State Park located on the MRSOU. He has been involved with the MRSOU in various capacities over the last 15 years. Overall he feels well informed and works closely with other involved agencies. He did not provide any information regarding issues that might affect the protectiveness of the Site. He had a few suggestions to keep community members informed on a continual basis, including creating a fact sheet for area residents and users of the park updating people on the status of the arsenic in groundwater at the Site and the results of the FYR. He also would like to see growth media brought in for the top of the buttress near the tunnel pond repository. In addition, Mr. Kustudia identified a small area of slickens at the site that he will show to EPA on their next field visit. He indicated this is in a remote, hard to find area of the park.

CFROU

Resident 1: Resident 1 is a nearby resident of the CFROU and represents the local community. He is aware of the former issues at the Site and believes that cleanup, maintenance and reuse activities are coming along well. He mentioned the Site has had a positive economic effect on the community by bringing in outside businesses. He commented that EPA has done a very good job at keeping involved parties informed of site activities. EPA, MDEQ and the Clark Fork River Technical Assistance Committee work well together in order to do this. He mentioned they should keep informing local media of site activities. EPA is also putting him on an email list. Resident 1 owns a private well south of town near Phases five and 6, which he tests regularly and has never contained site-related contaminants. Resident 1 wants to be sure communication between parties stays open.

Jeffrey Johnson: Jeffrey Johnson represents the National Park Service at the Grant-Kohrs Ranch National Historic Site in Phase 15. Overall, he believes the remedial activities and maintenance are being conducted efficiently and commented that the remedy is performing as expected. He is aware that some nearby private landowners have submitted comments to MDEQ. He mentioned that the National Park Service has provided support for MDEQ in site investigations, the preliminary design plan and the remedial design. He is not aware of any changes in state laws or any changes in projected land use at the Site. He is comfortable with the status of institutional controls at the Site.

Brian Bartkowiak: Brian Bartkowiak represents MDEQ. Overall, he believes MDEQ is completing the cleanup in an efficient, cost-effective and protective manner, while also ensuring protection of human health and the environment. As far as the remedy, MDEQ has designed plans consistent with the requirements of the ROD and Consent Decree and is currently monitoring completed projects. He commented that some residents are concerned regarding the scale of cleanup activities and the large-scale disturbances of the floodplain. As lead agency, MDEQ oversees, manages, coordinates, designs and implements the remedial action for the Site in collaboration with EPA. The agency also coordinates with Montana's NRDP and the National Park Service for restoration components of the remedy. He commented that MDEQ also provides public outreach for the Site, providing newsletter updates, weekly ads in the local newspaper,

radio segments providing the public with information on current activities, outreach at various local events, and providing documents to information repositories. He is not aware of any changes to state laws or projected land uses at the Site. Institutional controls will be developed as phases of the cleanup are completed.

Brian Bender: Brian Bender is the Powell County Planning Director. Overall he states that he is well-informed about the activities at the CFROU by the MDEQ staff. He is not aware of any land use changes or changes in local regulations that would affect the protectiveness of the remedy. Mr. Bender indicated that the overlay district works well, even if occasionally it catches something after work in the area is completed. At that point they involve MDEQ and the situation is quickly resolved. He thinks information about the overlay district could be better communicated with the community so they understand they need to get things investigated before the start a project. Mr. Bender would like both EPA and MDEQ administrators to have more of a presence in Powell County. He suggested they visit with County officials on a quarterly, or more regular basis.

7.0 Technical Assessment

7.1 Question A: Is the remedy functioning as intended by the decision documents?

MRSOU

Yes. Review of the data collected during the FYR period and supporting documentation indicates that the MRSOU remedial action continues to be operating and functioning as designed. The primary objectives of the remedial action are to reduce or eliminate the groundwater arsenic plume, and reduce a threat to aquatic life below the dam from the release of contaminated sediments. The Milltown Dam has been completely removed, contaminated sediments have been excavated or capped, and the Clark Fork River is flowing in the new channel with no sedimentation or erosion issues identified. Floodplain vegetation is expected to achieve performance standards. The SAA III-b sediments have been excavated and placed in the Tunnel Pond Repository, which has been filled and the cover completed. The on-site repositories, Interstate-90 bank improvements, removal and re-grading of the Bypass Channel, bridge replacements and strengthening of the Interstate-90 Bridge abutments on the Blackfoot River are completed and functioning as designed.

Vegetation performance standards have now been met for all areas where the PRPs retained responsibility for revegetation. The PRPs expect to submit a Construction Completion Report in 2016. EPA and the State NRD program will continue to work cooperatively regarding other vegetation areas and performance standards. Monitoring of the repositories and groundwater will continue.

The ROD anticipated the dam removal would restore the aquifer by complying with ARARs for groundwater approximately four to 10 years after dam removal and construction completion. However, at the time this report was being drafted, it had only been four years since substantial construction was completed. Groundwater monitoring indicates arsenic concentrations continue to exceed the arsenic groundwater standard. However, the statistical analysis does not show a

significant increasing trend in concentrations in the last eight samples. This issue requires further investigation at a minimum until the 10-year period has passed.

The PRPs continue to recommend using statistical analysis of TPR10 as the Tunnel Pond Repository POC with assessment of potential impacts to groundwater from repository construction and use.

At the time of this FYR, permanent institutional controls have not been put in place for the groundwater plume, for the waste repositories, for contaminated sediments left in place or for site access control/residential use. Site regulatory agencies are continuing to discuss the need for additional institutional controls. A Missoula County ordinance currently in place appears to preclude installation of new public water wells in the vicinity of the MRSOU arsenic plume. However, these ordinances do not preclude private well installation in the plume area. Additional institutional controls may be needed to control private well installation in the arsenic plume and with respect to the management of the waste repositories and the sediments left in place. Wells monitored by MCCHD are consistently below the arsenic standard of 10 µg/L.

An institutional control preventing river access during certain time periods has been necessary in the past, and may be needed in the future. The majority of the MRSOU has been designated as a future Montana State Park. Institutional controls dealing with water consumption, residential use and the waste repositories will need to be incorporated into the future park design and planning documents.

CFROU

Yes. Remedy implementation is ongoing. Remediation of Phase 1 of Reach A finished in April 2014. Revegetation activities are still ongoing. Long-term monitoring is underway to assess groundwater, surface water and vegetation during and after remediation. Additional monitoring efforts include streambed sediments, macroinvertebrates, periphyton, nutrients and fish populations.

Institutional controls for CFROU to be implemented may include additional county zoning regulations, deed restrictions, permanent funding for Arrow Stone Park, and groundwater sampling and use controls. Environmental monitoring is required during all activities. Institutional controls currently in place include the Powell Creek Overlay District. The Overlay District, an existing institutional control, is intended to ensure that future land uses in affected areas are compatible with the presence of potential contaminants and the remedial actions required to isolate those potential contaminants from the environment.

7.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels and remedial action objectives (RAOs) used at the time of remedy selection still valid?

Yes. The exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of remedy selection remain valid for both the MRSOU and the CFROU.

The MRSOU ROD indicates that groundwater standards are expected to be met within approximately four to 10 years following completion of dam and sediment removal. A waiver of groundwater standards is not currently proposed. However, the PRPs may seek a waiver of groundwater cleanup standards if compliance is not achieved and is technically impracticable.

At the time of the ROD, the State of Montana's surface water quality standard for arsenic was 18 µg/L, based on human health, and 20 µg/L for groundwater as a drinking water supply. As reflected in the August 2010 version of DEQ-7 (MDEQ2010), the state standard for arsenic for surface water and groundwater is now 10 µg/L, matching the federal standards. This revision to the state standards does not impact the performance standards for the MRSOU, as the more stringent federal standards were established in the 2004 ROD. Other groundwater and surface water cleanup goals are based on federal and state standards that have not changed.

The MRSOU remedy is not expected to achieve compliance at all times with the State's WQB-7 standard for copper because of continued contaminant loading originating upstream of the reservoir primarily from the CFROU. The ROD confirmed that a waiver of the copper standard, based on technical impracticability, for the upstream CFROU will carry over into and be applied to the MRSOU ambient surface water. The Consent Decree provides for the consideration of upstream contamination in determining surface water ARAR compliance.

The risk-based soil cleanup goals for arsenic in the CFROU remain valid, as the toxicity characteristics of arsenic have not changed since EPA issued the ROD. Land use in affected areas has not changed in such a way as to affect the exposure assumptions applied in the development of these site-specific cleanup goals.

7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No. No other information has come to light that could call into question the protectiveness of the remedy.

7.4 Technical Assessment Summary

MRSOU

Yes. Review of the data collected during the FYR period and supporting documentation indicates that the MRSOU remedial action continues to be operating and functioning as designed. The Milltown Dam has been completely removed, contaminant sediments have been excavated or capped, and the Clark Fork River is flowing in the new channel with no sedimentation or erosion issues identified. Vegetation performance standards have now been met at area for which the PRPs are responsible, and are being monitored and improved in areas where the State NRD program is responsible. Groundwater monitoring indicates arsenic concentrations continue to exceed the arsenic groundwater standard. However, compliance may still be possible and monitoring and further analysis should continue.

Permanent institutional controls have not been put in place for the groundwater plume, for the waste repositories, for contaminated sediments left in place or for site access control. Site regulatory agencies are continuing to discuss the need for additional institutional controls. Missoula County zoning ordinances are in place that preclude installation of new public water wells in the vicinity of the arsenic plume. Additional institutional controls may be needed to control private well installation in the arsenic plume and with respect to the management of the waste repositories and the sediments left in place.

CFROU

Yes. Remedy implementation is ongoing. Remediation of Phase 1 of Reach A finished in April 2014. Long-term monitoring is underway to assess groundwater, surface water and vegetation during remediation.

Institutional controls currently in place include the Powell County Overlay District. The Overlay District is intended to ensure that future land use in affected areas are compatible with the presence of potential contaminants and the various remedial actions required to isolate those potential contaminants from the environment. Additional institutional controls for CFROU areas may include county zoning regulations, deed restrictions, permanent funding for Arrow Stone Park, and groundwater sampling and use controls.

8.0 Issues

Table 11 summarizes the current site issues.

Table 11: Current Site Issues

Issue	Affects Current Protectiveness?	Affects Future Protectiveness?
Institutional controls for MRSOU are not yet implemented for areas where waste has been left in place and areas where groundwater contamination is above ROD standards.	No	Yes
Groundwater concentrations at MRSOU continue to exceed arsenic cleanup goals and do not appear to be declining.	No	Yes

9.0 Recommendations and Follow-up Actions

Table 12 provides recommendations to address the current site issues.

Table 12: Recommendations to Address Current Site Issues

Issue	Recommendation / Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Institutional controls for MRSOU are not yet implemented for areas where waste has been left in place and areas where groundwater contamination is above ROD standards.	Implement institutional controls for the MRSOU comprehensive institutional control plan and its components.	PRP/ State/EPA	EPA/MDEQ	09/30/2017	No	Yes
Groundwater concentrations at MRSOU continue to exceed arsenic cleanup goals and do not appear to be declining.	Determine if additional measures are needed to reduce arsenic concentrations below the cleanup goals.	PRP	EPA/MDEQ	09/30/2017	No	Yes

The following additional item, though not expected to affect protectiveness, warrants additional follow up:

MRSOU

- Two areas of the Tunnel Pond Repository showed subsidence of the cover. There was also some minor erosion of the cover material in spots. Inspection of the one downgradient monitoring well indicated that a locking well cap had not been put in place. Envirocon indicated that these areas would be re-graded after the spring runoff was over.

10.0 Protectiveness Statements

The remedy at MRSOU (OU2) currently protects human health and the environment because potential exposure to contaminated groundwater, surface water and sediment is controlled. For the remedy to be protective over the long term, the following actions need to be taken:

- Implement institutional controls for the MRSOU comprehensive institutional control plan and its components.
- Determine if additional measures are needed to reduce arsenic concentrations below the cleanup goals.

- Continue monitoring GW for at least six more years and tracking the arsenic trends to see if concentrations are going down per the discussion in the ROD.

The remedy at CFROU (OU3) is expected to be protective of human health and the environment upon completion of the remedial action. In the interim, exposure pathways that could result in unacceptable risks are being controlled.

11.0 Next Review

The next FYR will be due within five years of the signature/approval date of this FYR.

Appendix A: List of Documents Reviewed

2010 Milltown Transformation Retrospective, Diane Hammer, U.S. EPA. December 2010.

2011 Milltown Vegetation Monitoring Report. Geum Environmental Consulting, Inc. July 2012.

2011 Trestle Area Remedial Action Project Remedial Action Monitoring Plan. TerraGraphics Environmental Engineering, Inc. October 2011.

2012 Milltown Vegetation Monitoring Report. University of Montana & Geum Environmental Consulting, Inc. April 2013.

Clark Fork River Biomonitoring Macroinvertebrate Community Assessments, 2006. McGuire Consulting. April 2007.

Clark Fork River Cleanup Phase 1 Continued River Closure Factsheet and Map. Montana Department of Environmental Quality & Montana Department of Justice – Natural Resource Damage Program. February 2014.

Clark Fork River Cleanup Upcoming Proposed River Closure Areas Factsheet and Map. Montana Department of Environmental Quality & Montana Department of Justice – Natural Resource Damage Program. February 2014.

Clark Fork River Closure Memo. Geum Environmental Consulting, Inc. January 30, 2014.

Clark Fork River Consent Decree Quarterly Report No. 25. U.S. EPA. February 2015.

Clark Fork River Consent Decree Quarterly Report No. 26. U.S. EPA. May 2015.

“Clark Fork River Flows into New Channel in Life after Milltown Dam.” *Missoulian*. December 16, 2010.

Clark Ford River Operable Unit (OU#3) Explanation of Significant Differences. U.S. EPA. June 2015.

Clark Fork River Operable Unit Wildlife Monitoring. U.S. EPA. March 2012.

Clark Fork River Review. Montana Department of Environmental Quality & Montana Department of Justice- Natural Resource Damage Program. October 2011.

Clark Fork River Review. Montana Department of Environmental Quality & Montana Department of Justice- Natural Resource Damage Program. December 2012.

Construction Quality Assurance Plan Remedial Action Clark Fork River Operable Unit of the Milltown Reservoir/Clark Fork River Superfund Site. Montana Department of Environmental Quality. February 2009.

Cost Estimate for Clark Fork River Operable Unit Explanation of Significant Differences. Bartkowiak, B. April 19, 2013.

Draft Conceptual Redevelopment Plan for the Confluence of the Clark Fork and Blackfoot rivers and adjacent communities. Milltown Superfund Site Redevelopment Working Group. February 2005.

Draft Final Construction Quality Assurance Project Plan (CQAPP) Reach A, Phase 1 Clark Fork River Operable Unit Milltown Reservoir/Clark Fork River NPL Site Deer Lodge County, Montana. Tetra Tech. July 2012.

Draft Interim Comprehensive Long Term Monitoring Plan for the Clark Fork River Operable Unit – 2013 with SAP and QAPP. Atkins. March 2013.

EPA Superfund Record of Decision: Milltown Reservoir Sediments, EPA ID: MTD980717565, OU 1, Milltown, MT. U.S. EPA. April 14, 1984.

EPA Superfund Record of Decision: Clark Fork River, EPA ID: MTD980717565, OU 3, Milltown, MT. U.S. EPA. April 29, 2004.

EPA Superfund Record of Decision Amendment: Milltown Reservoir Sediments, EPA ID: MTD980717565, OU 1, Milltown, MT. U.S. EPA. August 7, 1985.

Final Clark Fork River Reach A, Phase 1 Geomorphology and Vegetation Monitoring Plan. Geum Environmental Consulting, Inc., Applied Geomorphology, Inc. October 2012.

Final Community Involvement Plan, Clark Fork River Operable Unit, Milltown Reservoir/ Clark Fork River, Superfund Site. Montana Department of Environmental Quality. November 2012.

Final Construction Completion Report Deer Lodge and Eastside Road Residential Remedial Action Project. TerraGraphics Environmental Engineering, Inc. May 2013.

Final Construction Quality Assurance Plan (CAP) Grant-Kohrs Ranch Bank Stabilization Project. Tetra Tech. April 2013.

Final Construction Quality Assurance Project Plan (CQAPP) Reach A, Phase 1 Clark Fork River Operable Unit Milltown Reservoir/Clark Fork River NPL Site Deer Lodge County, Montana. Tetra Tech. October 2012.

Final Long-Term, Post Remedial Action Construction Monitoring Plan, Milltown Reservoir Sediments Operable Unit. Envirocon. March 2013.

Final Remedial Action Work Plan Eastside Road Pastures Project Powell County, Montana. TerraGraphics Environmental Engineering, Inc. October 2012.

First Five-Year Review Report: Milltown Reservoir Sediments, Missoula County, Montana. Pacific Western Technologies Ltd. September 2011.

Instream Sediment Metal Concentrations in the Clark Fork River Operable Unit. EPA. 2012.

Integrating the “3 R’s”: Remediation, Restoration and Redevelopment, Milltown Reservoir Sediments Site Case Study. U.S. EPA. April 2011.

Invitation for Bid. Montana Department of Environmental Quality. January 2015.

Milltown Dam Removal Monitoring- Fisheries Investigations in 2012. Montana Fish, Wildlife and Parks. March 2013.

Milltown Reservoir Sediments Operable Unit of the Milltown Reservoir/Clark Fork River Superfund Site Record of Decision. U.S. Environmental Protection Agency, Region 8. December 2004.

Missoula Valley Water Quality Ordinance. Missoula County. 13.26.090 Protection of water supply wells. http://www.ci.missoula.mt.us/DocumentCenter/Home/View/1033#PublicServices_13_26_090

Monitoring Report for 2011, Clark Fork River Operable Unit. Atkins, Rhithron Associates, Inc. & Montana Fish, Wildlife and Parks. August 2012.

Monitoring Report for 2012, Clark Fork River Operable Unit. Atkins, Rhithron Associates, Inc. & Montana Fish, Wildlife and Parks. December 2013.

Montana Department of Environmental Quality Letter to Stakeholders. Montana Department of Environmental Quality. 2014.

November 2012 Notification of Clean-Up Eastside Road Adjacent Form Letter. Montana Department of Environmental Quality. November 2012.

Opening of Clark Fork River Press Release. Governor Steve Bullock, State of Montana. April 30, 2013.

Post-Construction Notification. 89 Sleepy Hollow Lane. Montana Department of Environmental Quality. January 2012.

Post-Construction Notification. 90 Sleepy Hollow Lane. Montana Department of Environmental Quality. January 2012.

Post-Construction Notification. 218 Milwaukee Avenue. Montana Department of Environmental Quality. January 2012.

Post-Construction Notification. 220 Milwaukee Avenue. Montana Department of Environmental Quality. January 2012.

Post-Construction Notification. 325 Milwaukee Avenue. Montana Department of Environmental Quality. January 2012.

Post-Construction Notification. 401 Mitchell Street. Montana Department of Environmental Quality. January 2012.

Post-Construction Notification. 621-619 Mitchell Street. Montana Department of Environmental Quality. January 2012.

Post-Construction Notification. 711 Railroad Street. Montana Department of Environmental Quality. January 2012.

Post-Construction Notification. 1518 Eastside Road. Montana Department of Environmental Quality. January 2012.

Post-Construction Notification. 1744 Eastside Road. Montana Department of Environmental Quality. January 2012.

Post-Construction Notification. 1748 Eastside Road. Montana Department of Environmental Quality. January 2012.

Public Health Well and Domestic Early Warning Well Monitoring Data, Groundwater Compliance Monitoring Well Results, Milltown Reservoir Sediments Operable Unit. Missoula City-County Health Department. May 2013.

Public Health Well and Domestic Early Warning Well Monitoring Data, Public Health Groundwater Results, Milltown Reservoir Sediments Operable Unit. Missoula City-County Health Department. 2014.

Quarterly Report of Activities for the Long-Term Clark Fork Monitoring Program (January through March, 2007). U.S. Geological Survey. April 2007.

Quarterly Report of Activities for the Long-Term Clark Fork Monitoring Program (October through December, 2006). U.S. Geological Survey. January 2007.

Residential Yard Data Summary for Select Historically Irrigated Areas, Clark Fork River Operable Unit. Hydrometrics, Inc. January 1999.

Residential Yard Data Summary for Select Historically Irrigated Areas, Clark Fork River Operable Unit. Hydrometrics, Inc. Revised May 1999.

Restoration of the Clark Fork River and Blackfoot River Near Milltown Dam, Revegetation As-built Report, 2009-2012. Geum Environmental Consulting, Inc. June 2012.

Results of the December 2011 Analysis of 1750 Eastside Road Domestic Water Supply. Montana Department of Environmental Quality. March 2012.

Return to Use Initiative, 2010 Demonstration Project. U.S. EPA. March 2014.

Soil Data Summary Report for the Eastside Road Pastures, Powell County, Montana, Clark Fork River Operable Unit of the Milltown Reservoir/Clark Fork River Superfund Site. TerraGraphics Environmental Engineering, Inc. December 2010.

Water-Quality, Bed-Sediment, and Biological Data (October 2007 through September 2008) and Statistical Summaries of Long-Term Data for Streams in the Clark Fork Basin, Montana. Dodge, K.A., Hornberger, M.I., and Dyke, J.L., U.S. Geological Survey. 2009.

Water-Quality, Bed-Sediment, and Biological Data (October 2008 through September 2009) and Statistical Summaries of Long-Term Data for Streams in the Clark Fork Basin, Montana. Dodge, K.A., Hornberger, M.I., and Dyke, J.L., U.S. Geological Survey. 2010.

Water-Quality, Bed-Sediment, and Biological Data (October 2009 through September 2010) and Statistical Summaries of Long-Term Data for Streams in the Clark Fork Basin, Montana. Dodge, K.A., Hornberger, M.I., and Dyke, J.L., U.S. Geological Survey. 2011.

Appendix B: Press Notice



EPA Five-Year Review Planned for the Milltown Reservoir/ Clark Fork River Superfund Site

The U.S. Environmental Protection Agency (EPA) is conducting the second Five-Year Review of remedial actions performed under the Superfund program at the Milltown Reservoir/ Clark Fork River Superfund site in Butte, Montana. The purpose of the Five-Year Review is to make sure the selected cleanup actions remain protective of human health and the environment. The Five-Year Review is scheduled for completion by September 2016.

The Site consists of three operable units. Operable unit 1 was focused on providing a safe water supply to Milltown area residents through establishment of a public water supply system for the town of Milltown. The Milltown Reservoir Sediments operable unit (MRSOU) is operable unit 2 and includes approximately 540 acres in the Clark Fork River and Blackfoot River floodplain. MRSOU consists of the area encompassed by the former Milltown Dam and Reservoir and the area where arsenic contamination exists in groundwater. The Clark Fork River Operable Unit consists of approximately 120 river miles of the Clark Fork River and extends from the confluence of the old Silver Bow Creek channel with the reconstructed lower Mill-Willow bypass, near Anaconda, to the maximum former Milltown Reservoir pool elevation east of Missoula. The Milltown Reservoir/ Clark Fork River site is one of four contamination areas, jointly known as the Clark Fork Basin Sites.

More information is available at the site's information repository and on EPA's website:

EPA Superfund Records Center
Montana Office
10 West 15th Street, Suite 3200
Helena, MT 59626
(406) 457-5046
(866) 457-2690 (toll free)

<http://www2.epa.gov/region8/milltown-reservoir-sediments-clark-fork-river>

EPA invites community participation in the Five-Year Review process: Community members are encouraged to contact EPA staff with any information that may help the Agency make its determination regarding the protectiveness and effectiveness of the remedies at the site.

EPA Region 8

Sara Sparks
Remedial Project Manager
Phone: (406) 782-7415
Email: sparks.sara@epa.gov

Appendix C: Interview Forms

Milltown Reservoir/ Clark Fork River Superfund Site

Five-Year Review Interview Form

Site Name: Milltown Reservoir Sediments EPA ID No.: MTD980717565
OU
Interviewer Name: Self Affiliation: Skeo
Subject Name: Jeffrey Johnson Affiliation: National Park Service
Subject Contact jeffrey_g_johnson@nps.gov
Information:
Time: Not Applicable Date: 01/28/2016
Interview Grant-Kohrs Ranch NHS 266 Warren Lane Deer lodge, MT 59722
Location:
Interview Format (circle one): In Person Phone Mail Other Email
Interview Category: Federal Agency

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

The remedial activities at the Milltown Reservoir were done efficiently. The maintenance is good.

2. What is your assessment of the current performance of the remedy in place at the Site?

The remedy in place is performing within expectations.

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years?

No.

4. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities.

Not for the Milltown Reservoir OU.

5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy?

No.

6. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?

Yes.

7. Are you aware of any changes in projected land use(s) at the Site?

No.

8. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

No.

**Milltown Reservoir/ Clark Fork River
Superfund Site**

**Five-Year Review Interview
Form**

Site Name: Milltown Reservoir Sediments EPA ID No.: MTD980717565
OU
Interviewer Name: Treat Suomi Affiliation: Skeo
Subject Name: Chris Brick Affiliation: Clark Fork Coalition
Sciences

Subject Contact Director: (406) 542-0539

Information:

Time: 2:00 p.m. Date: 11/02/2015

Interview 140 South 4th Street West, Suite 1 Missoula, MT

Location:

Interview Format (circle one): In Person Phone Mail Other:

Interview Category: Local Community Organization

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

Yes.

2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

Overall, I think it has been successful. I would rate the cleanup an eight out of 10. The vegetation at the former bypass channel is not coming in very well. The NRDP has done testing and my understanding is that the area still has some high metals so the substandard vegetation leads to a belief that the cleanup might not be complete. So, I think it is 80 to 90 percent effective.

The other area is an on-site repository adjacent to the bluff where 3B waste monitoring well downstream has had arsenic exceedances. At the AR repository, there are questions about what to do. I think that this is a red flag and that is one area of concern.

Maintenance: that same repository is getting reasonably good grass but I argued for a long time that there should be more native shrubs. The Interstate-90 bridge piers are the same concerns that have been previously voiced.

Reuse: there are great plans for a park. There are access problems for the FWP and International Paper, though. Last I heard, they might be working on that. The state has money and plans to do park construction and it has been blocked by the access issue. This needs to be resolved. This has prevented complete redevelopment.

Great job on the bluff, mainly the side and the former reservoir and the area below.

3. What have been the effects of the Site on the surrounding community, if any?

There have been a lot of A's in the community. There were positive effects from the construction work. It is also beneficial that people have been able to continue to float and fish. And I understand fish move up the Black Foot and Upper Clark Rivers to spawn. But any beneficial effects to the community have been stalled due to access issues and slowed redevelopment. It is beneficial that people have been able to float and fish. I understand fish move up Black Foot and the Upper Clark Fork in order to spawn.

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?

Not that I am aware of.

5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?

EPA did a great job while project was ongoing, but now there is not much to report. Most of the information comes from Powell County now. I am interested in the vegetation of the bypass channel and water quality. I am also interested in the using the former email list and allowing people to opt in for future updates.

6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used?

There are not any near the Site.

7. Are you aware of any changes in projected land use(s) at the Site?

No, I am not aware of any.

8. Do you have any comments, suggestions or recommendations regarding any aspects of the project?

No, other than making sure the issues at the former bypass channel with the revegetation are solved and the water quality issues resulting from issues with the repository. There may be other issues I am currently unaware of.

**Milltown Reservoir/ Clark Fork River
Superfund Site**

**Five-Year Review Interview
Form**

Site Name: Milltown Reservoir Sediments **EPA ID No.:** MTD980717565

OU

Interviewer Name: Treat Suomi

Affiliation: Skeo

Subject Name: Resident 1

Affiliation: Nearby Resident

Time: 10:00 a.m.

Date: 11/04/2015

Interview Location: 7956 East Side Road

Interview Format (circle one): In Person **Phone** **Mail** **Other:**

Interview Category: **Residents**

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

Yes.

2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

I think it is coming along well.

3. What have been the effects of the Site on the surrounding community, if any?

Economically, it has helped. It has brought some outside businesses here.

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?

Not to my knowledge.

5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?

I think they have done a very good job at this. I serve on CFRTAC and together, EPA, DEQ and CFRTAC have done a good job; the three organizations work well together. They should continue to keep it coming to the local media. They have done a good job. EPA is putting me on an email list, too.

6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used?

I own a private well south of town, near Phases five and six. I test regularly and have never seen site-related contaminants.

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project?

Keep the lines of communication open.

**Milltown River/ Clark Fork River
Superfund Site**

**Five-Year Review Interview
Form**

Site Name: Clark Fork River OU

EPA ID No.: MTD980717565

Interviewer Name: Self

Affiliation: Skeo

Subject Name: Jeffrey Johnson

Affiliation: National Park Service

Subject Contact Information: jeffrey_g_johnson@nps.gov

Time: Not Applicable

Date: 01/28/2016

Interview Location: Grant-Kohrs Ranch NHS 266 Warren Lane Deer lodge, MT 59722

Interview Format (circle one): In Person Phone Mail Other: Email

Interview Category: Federal Agency

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

The remedial activities at the Clark Fork River are being conducted efficiently. The maintenance is good.

2. What is your assessment of the current performance of the remedy in place at the Site?

The remedy in place is performing within expectations.

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years?

I am aware that some private landowners have commented to MDEQ.

4. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities.

MDEQ has completed investigations and prepared the Preliminary Design Plan. They are currently completing the remedial design. Grant-Kohrs Ranch has supported these activities.

5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy?

No.

6. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?

Yes.

7. Are you aware of any changes in projected land use(s) at the Site?

No.

8. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

No.

**Milltown River/ Clark Fork River
Superfund Site**

**Five-Year Review Interview
Form**

Site Name: Clark Fork River OU **EPA ID No.:** MTD980717565
Interviewer Name: Treat Suomi **Affiliation:** Skeo
Subject Name: Brian Bartkowiak **Affiliation:** MDEQ
Subject Contact Information: 1225 Cedar Street
P.O. Box 200901
Helena, MT 59620-0901
(406) 444-0214

Time: Not Applicable

Date: 12/16/2015

Interview Format (circle one): In Person Phone Mail Other: Email

Interview Category: State Agency

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

MDEQ is implementing the project in an efficient, cost-effective and protective manner while ensuring the protection of human health and the environment and emphasizing worker and public safety.

2. What is your assessment of the current performance of the remedy in place at the Site?

MDEQ design teams have developed designs consistent with the requirements of the ROD and Consent Decree. MDEQ is currently monitoring performance of completed project to ensure performance metrics, performance targets and performance standards are being met.

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years?

Some residences have concerns regarding the scale of the cleanup activities. Residents have expressed concerns over the large-scale disturbances of the floodplain.

4. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities.

MDEQ, as lead agency, oversees, manages, coordinates, designs and implements the remedial action for the Site in consultation with EPA. MDEQ coordinates with the State of Montana's NRDP and the U.S. National Park Service for the implementation and integration of restoration components into the work. Four primary functions of consultation and coordination among the agencies for the Site are to: 1) understand and receive the information to be collected; 2) understand how that information is to be analyzed; 3) provide review and comment; and 4)

maximize the use of the resources available for and the environmental benefits to the Site in the successful and cost-effective completion of the work.

MDEQ also conducts significant public outreach, including, but not limited to: monthly stakeholder and landowner tours during construction, periodic newsletter updates, weekly ads in the local newspaper and radio providing the public with information on current activities, design review meetings, outreach at local events, and providing key documents at site information repositories.

5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy?

No.

6. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?

Yes. The cleanup is underway and individual institutional control plans will be developed as project phases are completed.

7. Are you aware of any changes in projected land use(s) at the Site?

No.

8. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

No.

**Milltown River/ Clark Fork River
Superfund Site**

**Five-Year Review Interview
Form**

Site Name: Clark Fork River OU
Interviewer Name: Treat Suomi
Subject Name: Brian Bender

EPA ID No.: MTD980717565
Affiliation: Skeo
Affiliation: Powell County Planning
Director

Subject Contact Information: bbender@powellcountymt.com | 406-846-9795

Time: 2:30 p.m.

Date: 06/14/2016

Interview Location: Phone

Interview Format (circle one): In Person Phone Mail Other:

Interview Category: Local Government

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

Yes.

2. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future?

Yes, I feel well informed. We get quarterly reports anything site-specific from MDEQ staff. However, EPA has not communicated with us in over three years. County staff would appreciate regular communications from EPA on the status of the project.

3. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?

Nothing that was critical. MDEQ staff have indicated that there is an occasional incident of trespassing but they have not indicated that it has been a serious situation.

4. Are you aware of any changes to state laws or local regulations that might affect the protectiveness of the Site's remedy?

No.

5. Are you aware of any changes in projected land use(s) at the Site?

No. I am not aware of any and I do not believe any are being proposed. Through the Powell County Planning Department, we have a Superfund Overlay District. Someone would have to initiate any changes they wanted. Occasionally, the Overlay District catches something after the fact, so maybe information about the Overlay District could be better communicated with the community so they know they need to have things investigated earlier. However, MDEQ has been good to communicate with and they come in and haul away waste if needed.

6. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site?
How can EPA best provide site-related information in the future?

MDEQ puts weekly notices in the paper and on the radio. EPA does not really have much of a local presence. EPA is supposed to help residents and now that work in Powell County has started, we have not really heard from EPA. We used to have a funding mechanism in place to help fund the Powell County Planning Department and that was abruptly taken away.

7. Do you have any comments, suggestions or recommendations regarding the project?

EPA needs more presence with property owners and county officials, both formally and informally. It would also be good if MDEQ could meet quarterly or every six weeks with county officials. Now that work is in Deer Lodge, the same regular, in-person updates could be given to City Council. Specifically, it would be good to have MDEQ administrators or senior officials visit on a regular, maybe quarterly, basis.

**Milltown River/ Clark Fork River
Superfund Site**

**Five-Year Review Interview
Form**

Site Name: Milltown Reservoir OU
Interviewer Name: Treat Suomi
Subject Name: Michael Kustudia

EPA ID No.: MTD980717565
Affiliation: Skeo
Affiliation: Milltown State Park,
Montana Fish, Wildlife &
Parks, Region Two

Subject Contact Information: MKustudia@mt.gov

Time: 11:00 a.m.

Date: 07/26/2016

Interview Format (circle one): In Person Phone Mail Other:

Interview Category: Local Government

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

Yes. I am the manager of Milltown State Park. And before that I was involved in the TAG. So I have been involved for the last 15 years.

2. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future?

I feel like I am well informed. Through EPA, NRD and other sister agencies I feel well informed.

3. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?

The site has become part of a state park now. WE are working on transferring it from the NRD program. Tunnel that gets vandalized but nothing that would affect the protectiveness of the remedy.

4. Are you aware of any changes to state laws or local regulations that might affect the protectiveness of the Site's remedy?

I am not.

5. Are you aware of any changes in projected land use(s) at the Site?

Aside from developing the state park as planned.

6. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?

EPA (Sara has kept me informed reasonably well. This interview is an example of that. As far as the community goes, the remedy is largely complete and there really isn't a need for the public meetings we used to have.

7. Do you have any comments, suggestions or recommendations regarding the project?

I have a couple of suggestions. In the spring we went out for an annual visit. This has been one of my continuing messages. The buttress to the buttress for the tunnel pond repository – it never got any growth media put down on the top. Getting some growth media on the top would be my wish. We are pretty good at mobilizing volunteers for plantings and such so if we could get some topsoil there we could get it planted but it is beyond our budget to bring in the growth media. I am relatively pleased with the vegetation in the area. The surrounding areas look great but there are too many weeds for my liking. We are likely to have a Mullen weed pulling event soon.

There is a small area of slickens upstream from the confluence, approximately 5 – 10 feet across and 3-4 feet wide (15 – 30 square feet). It is an isolated spot. It is hard to find. Right below the confluence there is a red spot/stain with a trickle of water. I did a ph test on it and it was practically neutral. It does seem seasonal. I noticed the trickle before peak runoff and by the time the runoff came it was gone and I haven't seen it since.

Now that the work is largely done. In terms of the monitoring that goes on in the wells, where do we stand? Are we on the right trajectory in terms of the arsenic in groundwater? I think the public would like to hear an update about that as well. Even a one-page fact sheet after the Five Year Review would be good. There might not be enough for an actual meeting but some sort of outreach might be helpful as progress is made.

Appendix D-1: MRSOU Site Inspection Checklist

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST																							
I. SITE INFORMATION																							
Site name: Milltown Sediments OU		Date of inspection: 11/02/2015																					
Location and Region: Milltown, Missoula County, Montana, EPA Region 8		EPA ID: MTD980717565																					
Agency, office, or company leading the five-year review: EPA		Weather/temperature: mostly cloudy, low 40s																					
Remedy Includes: (Check all that apply) <table border="0" style="width: 100%;"> <tr> <td><input checked="" type="checkbox"/> Landfill cover/containment</td> <td><input type="checkbox"/> Monitored natural attenuation</td> </tr> <tr> <td><input checked="" type="checkbox"/> Access controls</td> <td><input type="checkbox"/> Groundwater containment</td> </tr> <tr> <td><input checked="" type="checkbox"/> Institutional controls</td> <td><input type="checkbox"/> Vertical barrier walls</td> </tr> <tr> <td><input type="checkbox"/> Groundwater pump and treatment</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Surface water collection and treatment</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Other _____</td> <td></td> </tr> </table>				<input checked="" type="checkbox"/> Landfill cover/containment	<input type="checkbox"/> Monitored natural attenuation	<input checked="" type="checkbox"/> Access controls	<input type="checkbox"/> Groundwater containment	<input checked="" type="checkbox"/> Institutional controls	<input type="checkbox"/> Vertical barrier walls	<input type="checkbox"/> Groundwater pump and treatment		<input type="checkbox"/> Surface water collection and treatment		<input type="checkbox"/> Other _____									
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<input type="checkbox"/> Surface water collection and treatment																							
<input type="checkbox"/> Other _____																							
Attachments: <input checked="" type="checkbox"/> Inspection team roster attached <input checked="" type="checkbox"/> Site map attached (See Figure 2)																							
II. INTERVIEWS (Check all that apply)																							
1. O&M staff <table border="0" style="width: 100%;"> <tr> <td style="width: 30%;">Name</td> <td style="width: 30%;">Title</td> <td style="width: 20%;">Date</td> <td style="width: 20%;"></td> </tr> <tr> <td></td> <td>Title</td> <td>Date</td> <td></td> </tr> <tr> <td colspan="4">Name</td> </tr> <tr> <td>Interviewed <input type="checkbox"/> at site</td> <td><input type="checkbox"/> at office</td> <td><input type="checkbox"/> by phone</td> <td>Phone no. _____</td> </tr> <tr> <td colspan="4">Problems, suggestions; <input type="checkbox"/> Report attached _____</td> </tr> </table>				Name	Title	Date			Title	Date		Name				Interviewed <input type="checkbox"/> at site	<input type="checkbox"/> at office	<input type="checkbox"/> by phone	Phone no. _____	Problems, suggestions; <input type="checkbox"/> Report attached _____			
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	Title	Date																					
Name																							
Interviewed <input type="checkbox"/> at site	<input type="checkbox"/> at office	<input type="checkbox"/> by phone	Phone no. _____																				
Problems, suggestions; <input type="checkbox"/> Report attached _____																							
2. Local regulatory authorities and response agencies (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.). Fill in all that apply. Agency: Contact <table border="0" style="width: 100%;"> <tr> <td style="width: 30%;">Name</td> <td style="width: 30%;">Title</td> <td style="width: 20%;">Date</td> <td style="width: 20%;">Phone No.</td> </tr> <tr> <td colspan="4">Problems; suggestions; <input type="checkbox"/> Report attached</td> </tr> </table>				Name	Title	Date	Phone No.	Problems; suggestions; <input type="checkbox"/> Report attached															
Name	Title	Date	Phone No.																				
Problems; suggestions; <input type="checkbox"/> Report attached																							
4. Other interviews (optional) <input type="checkbox"/> Report attached																							
Jeffrey Johnson, National Park Service; Chris Brick, Clark Fork Coalition Sciences																							
III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)																							
1. O&M Documents <table border="0" style="width: 100%;"> <tr> <td><input checked="" type="checkbox"/> O&M manual</td> <td><input checked="" type="checkbox"/> Readily available</td> <td><input checked="" type="checkbox"/> Up to date</td> <td><input type="checkbox"/> N/A</td> </tr> <tr> <td><input type="checkbox"/> As-built drawings</td> <td><input type="checkbox"/> Readily available</td> <td><input type="checkbox"/> Up to date</td> <td><input checked="" type="checkbox"/> N/A</td> </tr> <tr> <td><input checked="" type="checkbox"/> Maintenance logs</td> <td><input checked="" type="checkbox"/> Readily available</td> <td><input checked="" type="checkbox"/> Up to date</td> <td><input type="checkbox"/> N/A</td> </tr> </table> Remarks:				<input checked="" type="checkbox"/> O&M manual	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A	<input type="checkbox"/> As-built drawings	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A	<input checked="" type="checkbox"/> Maintenance logs	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A								
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<input checked="" type="checkbox"/> Maintenance logs	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A																				

2.	Site-Specific Health and Safety Plan	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	<input type="checkbox"/> Contingency plan/emergency response plan	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____				
3.	O&M and OSHA Training Records	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____				
4.	Permits and Service Agreements			
	<input type="checkbox"/> Air discharge permit	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	<input type="checkbox"/> Effluent discharge	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	<input type="checkbox"/> Waste disposal, POTW	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	<input type="checkbox"/> Other permits _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____				
5.	Gas Generation Records	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____				
6.	Settlement Monument Records	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
Remarks: _____				
7.	Groundwater Monitoring Records	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
Remarks: _____				
8.	Leachate Extraction Records	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____				
9.	Discharge Compliance Records			
	<input type="checkbox"/> Air	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	<input type="checkbox"/> Water (effluent)	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____				
10.	Daily Access/Security Logs	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____				
IV. O&M COSTS				
1.	O&M Organization			
	<input checked="" type="checkbox"/> State in-house	<input type="checkbox"/> Contractor for State		
	<input type="checkbox"/> PRP in-house	<input checked="" type="checkbox"/> Contractor for PRP		
	<input type="checkbox"/> Federal Facility in-house	<input type="checkbox"/> Contractor for Federal Facility		
	<input type="checkbox"/> _____			

2.	O&M Cost Records	<input type="checkbox"/> Readily available <input type="checkbox"/> Up to date	<input type="checkbox"/> Funding mechanism/agreement in place <input checked="" type="checkbox"/> Unavailable
3.	Unanticipated or Unusually High O&M Costs During Review Period Describe costs and reasons: <u>None</u>		
V. ACCESS AND INSTITUTIONAL CONTROLS <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
A. Fencing			
1.	Fencing damaged	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Gates secured <input checked="" type="checkbox"/> N/A	
Remarks: <u>Fencing is present in areas where public can get to river only. There are also locked gates on roads that lead to the remedial action construction areas.</u>			
B. Other Access Restrictions			
1.	Signs and other security measures	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A	
Remarks: <u>Signage is currently present near the river across from the Site. Primarily concerned with protecting revegetation areas.</u>			
C. Institutional Controls (ICs)			
1.	Implementation and enforcement		
Site conditions imply ICs not properly implemented		<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Site conditions imply ICs not being fully enforced		<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Type of monitoring (e.g., self-reporting, drive by) _____			
Frequency _____			
Responsible party/agency			
Contact _____		<u>mm/dd/yyyy</u> _____	
Name		Title	Date Phone no.
Reporting is up-to-date		<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Reports are verified by the lead agency		<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Specific requirements in deed or decision documents have been met		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Violations have been reported		<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Other problems or suggestions: <input type="checkbox"/> Report attached			
<u>IC Plan is still in development.</u>			

2.	Adequacy	<input type="checkbox"/> ICs are adequate	<input checked="" type="checkbox"/> ICs are inadequate	<input type="checkbox"/> N/A
Remarks: A Missoula County ordinance currently in place appears to preclude installation of new public water wells in the vicinity of the MRSOU arsenic plume. However, these ordinances do not preclude private well installation in the plume area. Additional institutional controls may be needed to control private well installation in the arsenic plume, prevent residential use and protect the waste repositories and the sediments left in place. <u>An institutional control preventing river access during certain time periods has been necessary in the past, and may be needed in the future. The majority of the MRSOU has been designated as a future Montana State Park. Institutional controls dealing with water consumption, residential use and the waste repositories will need to be incorporated into the future park design and planning documents.</u>				
D. General				
1.	Vandalism/trespassing	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No vandalism evident	
Remarks: <u>River rafters are not obeying signage and floating down the river in prohibited areas.</u>				
2.	Land use changes on site	<input checked="" type="checkbox"/> N/A		
Remarks: <u>Land formerly owned by NorthWestern Corp. (dam operator) was acquired by the State of Montana for future use as a state park.</u>				
3.	Land use changes off site	<input checked="" type="checkbox"/> N/A		
Remarks: _____				
VI. GENERAL SITE CONDITIONS				
A. Roads <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A				
VII. LANDFILL COVERS <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A				
A. Landfill Surface				
1.	Settlement (Low spots)	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Settlement not evident	
Aerial extent _____		Depth _____		
Remarks: <u>Settlement is evident in the Tunnel Pond Repository. Subsidence is evident at the Right Bank Repository. PRPs are monitoring and have worked on revegetation efforts at the Tunnel Pond Repository area of settlement. Area appears to have grown in size since the last FYR.</u>				
2.	Cracks	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Cracking not evident	
Lengths _____		Widths _____	Depths _____	
Remarks: <u>Cracks are associated with slumping of the ground during settlement. The 2015 Draft Annual Report noted cracks from settlement in the appendix.</u>				
3.	Erosion	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Erosion not evident	
Aerial extent _____		Depth _____		
Remarks: _____				
4.	Holes	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Holes not evident	
Aerial extent _____		Depth _____		
Remarks: <u>Right Bank Repository had evidence of holes. They were flagged for continued PRP monitoring.</u>				

5.	Vegetative Cover	<input checked="" type="checkbox"/> Grass <input type="checkbox"/> Cover properly established	
	<input checked="" type="checkbox"/> No signs of stress <input type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram)		
Remarks: <u>Several minor ruts were observed in the cover where grass has not yet come in.</u>			
6.	Alternative Cover (armored rock, concrete, etc.)	<input checked="" type="checkbox"/> N/A	
Remarks:			
7.	Bulges	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Bulges not evident	
	Arial extent _____	Height _____	
Remarks: _____			
8.	Wet Areas/Water Damage	<input checked="" type="checkbox"/> Wet areas/water damage not evident	
	<input type="checkbox"/> Wet areas <input type="checkbox"/> Location shown on site map Arial extent _____		
	<input type="checkbox"/> Ponding <input type="checkbox"/> Location shown on site map Arial extent _____		
	<input type="checkbox"/> Seeps <input type="checkbox"/> Location shown on site map Arial extent _____		
	<input type="checkbox"/> Soft subgrade <input type="checkbox"/> Location shown on site map Arial extent _____		
Remarks: _____			
9.	Slope Instability	<input type="checkbox"/> Slides <input type="checkbox"/> Location shown on site map	
	<input checked="" type="checkbox"/> No evidence of slope instability Arial extent _____		
Remarks: <u>None noted.</u>			
B. Benches <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
C. Letdown Channels <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1.	Settlement (Low spots)	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No evidence of settlement	
	Arial extent _____	Depth _____	
Remarks: _____			
2.	Material Degradation	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No evidence of degradation	
	Material type _____	Arial extent _____	
Remarks: _____			
3.	Erosion	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No evidence of erosion	
	Arial extent _____	Depth _____	
Remarks: _____			

4.	Undercutting	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of undercutting
	Arial extent _____		Depth _____
	Remarks: _____		
5.	Obstructions	Type _____	<input checked="" type="checkbox"/> No obstructions
	<input type="checkbox"/> Location shown on site map	Arial extent _____	
	Size _____		
	Remarks: _____		
6.	Excessive Vegetative Growth	Type _____	
	<input checked="" type="checkbox"/> No evidence of excessive growth		
	<input type="checkbox"/> Vegetation in channels does not obstruct flow		
	<input type="checkbox"/> Location shown on site map	Arial extent _____	
	Remarks: _____		
D. Cover Penetrations <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
E. Gas Collection and Treatment <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
F. Cover Drainage Layer <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
G. Detention/Sedimentation Ponds <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
H. Retaining Walls <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
1.	Deformations	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Deformation not evident
	Horizontal displacement _____	Vertical displacement _____	
	Rotational displacement _____		
	Remarks: <u>Using a historic railroad grade as a retaining wall or berm for SAA IIIb contaminated sediments. PRPs have bolstered the toe of the grade to prevent movement. In addition, the PRPs also installed settlement monuments in the crest and toe of the Tunnel Pond Repository embankment in April 2014 as required by the Monitoring Plan. .</u>		
2.	Degradation	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Degradation not evident
	Remarks: _____		
I. Perimeter Ditches/Off-Site Discharge <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
1.	Siltation	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Siltation not evident
	Area extent _____	Depth _____	
	Remarks: _____		
2.	Vegetative Growth	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A
	<input checked="" type="checkbox"/> Vegetation does not impede flow		
	Area extent _____	Type _____	
	Remarks: <u>There is some vegetative growth in ditch. It does not appear to impede flow.</u>		

3.	Erosion	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Erosion not evident
	Area extent _____		Depth _____
	Remarks: _____		
4.	Discharge Structure	<input checked="" type="checkbox"/> Functioning	<input checked="" type="checkbox"/> N/A
	Remarks: _____		
VIII. VERTICAL BARRIER WALLS		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
IX. GROUNDWATER/SURFACE WATER REMEDIES		<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
B. Surface Water Collection Structures, Pumps, and Pipelines		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
C. Treatment System		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
D. Monitoring Data			
1.	Monitoring Data		
	<input checked="" type="checkbox"/> Is routinely submitted on time	<input checked="" type="checkbox"/> Is of acceptable quality	
2.	Monitoring data suggests:		
	<input checked="" type="checkbox"/> Groundwater plume is effectively contained	<input type="checkbox"/> Contaminant concentrations are declining	
E. Monitored Natural Attenuation			
1.	Monitoring Wells (natural attenuation remedy)		
	<input checked="" type="checkbox"/> Properly secured/locked	<input checked="" type="checkbox"/> Functioning	<input checked="" type="checkbox"/> Routinely sampled
	<input type="checkbox"/> All required wells located	<input type="checkbox"/> Needs Maintenance	<input checked="" type="checkbox"/> Good condition
			<input type="checkbox"/> N/A
	Remarks: <u>Did not visit all of the compliance wells on site. Those observed were in good condition.</u>		
X. OTHER REMEDIES			
If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction. <u>Not applicable.</u>			
XI. OVERALL OBSERVATIONS			
A. Implementation of the Remedy			
<u>Review of the data collected during the FYR period and supporting documentation indicates that the MRSOU remedial action continues to be operating and functioning as designed. The Milltown Dam has been completely removed, contaminant sediments have been excavated or capped, and the Clark Fork River is flowing in the new channel with no sedimentation or erosion issues identified. Vegetation performance standards have now been met at areas for which the PRPs are responsible and are progressing at other areas. Groundwater monitoring indicates arsenic concentrations continue to exceed the arsenic groundwater standard.</u>			
B. Adequacy of O&M			
<u>The Long-Term Post Remedial Action Construction Monitoring Plan for MRSOU was finalized in 2013. The plan outlines the groundwater and surface water monitoring requirements as well as the long-term maintenance and monitoring requirements for the constructed repositories and buttress areas. Prior to the 2013 plan, monitoring was performed under the 2007 Remedial Action Monitoring Plan.</u>			
C. Early Indicators of Potential Remedy Problems			

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. <u>None identified.</u>
D. Opportunities for Optimization
Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. <u>None identified.</u>

Site Inspection Team:

- Sara Sparks, EPA
- Brian Bartkowiak, MDEQ
- Claire Marcussen, Skeo
- Treat Suomi, Skeo

Appendix D-2: CFROU Site Inspection Checklist

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST													
I. SITE INFORMATION													
Site name: Clark Fork River OU	Date of inspection: 11/03/2015												
Location and Region: Milltown, Missoula County, Montana, EPA Region 8	EPA ID: MTD980717565												
Agency, office, or company leading the five-year review: EPA	Weather/temperature: 30°s Fahrenheit, cloudy, occasional snow												
Remedy Includes: (Check all that apply) <table border="0"> <tr> <td><input checked="" type="checkbox"/> Landfill cover/containment</td> <td><input type="checkbox"/> Monitored natural attenuation</td> </tr> <tr> <td><input type="checkbox"/> Access controls</td> <td><input type="checkbox"/> Groundwater containment</td> </tr> <tr> <td><input checked="" type="checkbox"/> Institutional controls</td> <td><input type="checkbox"/> Vertical barrier walls</td> </tr> <tr> <td><input type="checkbox"/> Groundwater pump and treatment</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Surface water collection and treatment</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Other <u>In-situ treatment of soils and sediments.</u></td> <td></td> </tr> </table>		<input checked="" type="checkbox"/> Landfill cover/containment	<input type="checkbox"/> Monitored natural attenuation	<input type="checkbox"/> Access controls	<input type="checkbox"/> Groundwater containment	<input checked="" type="checkbox"/> Institutional controls	<input type="checkbox"/> Vertical barrier walls	<input type="checkbox"/> Groundwater pump and treatment		<input type="checkbox"/> Surface water collection and treatment		<input checked="" type="checkbox"/> Other <u>In-situ treatment of soils and sediments.</u>	
<input checked="" type="checkbox"/> Landfill cover/containment	<input type="checkbox"/> Monitored natural attenuation												
<input type="checkbox"/> Access controls	<input type="checkbox"/> Groundwater containment												
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<input type="checkbox"/> Surface water collection and treatment													
<input checked="" type="checkbox"/> Other <u>In-situ treatment of soils and sediments.</u>													
Attachments: <input checked="" type="checkbox"/> Inspection team roster attached <input checked="" type="checkbox"/> Site map attached (See Figure 1)													
II. INTERVIEWS (Check all that apply)													
1. O&M site manager/ Local Regulatory Authorities and Response Agencies <table border="0"> <tr> <td>Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone</td> <td>Phone no. _____</td> <td>_____</td> <td><u>mm/dd/yyyy</u></td> </tr> <tr> <td>Problems, suggestions; <input type="checkbox"/> Report attached _____</td> <td></td> <td>Name</td> <td>Title</td> </tr> <tr> <td></td> <td></td> <td></td> <td>Date</td> </tr> </table>		Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone	Phone no. _____	_____	<u>mm/dd/yyyy</u>	Problems, suggestions; <input type="checkbox"/> Report attached _____		Name	Title				Date
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Problems, suggestions; <input type="checkbox"/> Report attached _____		Name	Title										
			Date										
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Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone	Phone no. _____	_____	<u>mm/dd/yyyy</u>										
Problems, suggestions; <input type="checkbox"/> Report attached _____		Name	Title										
			Date										
3. Other interviews (optional) <input type="checkbox"/> Report attached													

Jeffrey Johnson, National Park Service; nearby resident

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1.	O&M Documents	<input type="checkbox"/> O&M manual	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
		<input type="checkbox"/> As-built drawings	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
		<input type="checkbox"/> Maintenance logs	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: <u>A breakdown of costs for the CFROU from 2008 to 2014 were provided and reviewed. Since remedial actions are still being designed and implemented at the CFROU, separate O&M costs are not presented.</u>					
2.	Site-Specific Health and Safety Plan		<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	<input checked="" type="checkbox"/> Contingency plan/emergency response plan		<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: <u>Safety requirements are in bid packages. Contractors have site-specific health and safety plans.</u>					
3.	O&M and OSHA Training Records		<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____					
4.	Permits and Service Agreements				
	<input type="checkbox"/> Air discharge permit	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A	
	<input type="checkbox"/> Effluent discharge	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A	
	<input type="checkbox"/> Waste disposal, POTW	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A	
	<input type="checkbox"/> Other permits _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A	
Remarks: _____					
5.	Gas Generation Records		<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____					
6.	Settlement Monument Records		<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____					
7.	Groundwater Monitoring Records		<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____					
8.	Leachate Extraction Records		<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____					
9.	Discharge Compliance Records				
	<input type="checkbox"/> Air	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A	
	<input type="checkbox"/> Water (effluent)	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A	
Remarks: _____					

10.	Daily Access/Security Logs	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____				
IV. O&M COSTS				
1.	O&M Organization			
	<input checked="" type="checkbox"/> State in-house	<input checked="" type="checkbox"/> Contractor for State		
	<input type="checkbox"/> PRP in-house	<input type="checkbox"/> Contractor for PRP		
	<input type="checkbox"/> Federal Facility in-house	<input type="checkbox"/> Contractor for Federal Facility		
	<input type="checkbox"/> _____			
2.	O&M Cost Records			
	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date		
	<input type="checkbox"/> Funding mechanism/agreement in place	<input type="checkbox"/> Unavailable		
3.	Unanticipated or Unusually High O&M Costs During Review Period			
Describe costs and reasons: <u>None.</u>				
V. ACCESS AND INSTITUTIONAL CONTROLS <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A				
A. Fencing				
1.	Fencing damaged	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Gates secured	<input type="checkbox"/> N/A
Remarks: <u>Fencing is located throughout Reach A to protect revegetation efforts from humans and wildlife.</u>				
B. Other Access Restrictions				
1.	Signs and other security measures	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A	
Remarks: <u>Signs in Reach A notify people of access restrictions. However, there are no warning signs anywhere else (including Reaches B and C).</u>				
C. Institutional Controls (ICs)				

1. Implementation and enforcement			
Site conditions imply ICs not properly implemented		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Site conditions imply ICs not being fully enforced		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Type of monitoring (e.g., self-reporting, drive by) _____			
Frequency _____			
Responsible party/agency			
Contact _____		mm/dd/yyyy _____	
Name	Title	Date	Phone no.
Reporting is up-to-date		<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Reports are verified by the lead agency		<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Specific requirements in deed or decision documents have been met		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Violations have been reported		<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Other problems or suggestions: <input type="checkbox"/> Report attached			
<u>The Powell Creek Overlay District covers the area contaminated by mining and smelting wastes from operations further upstream in the Butte and Anaconda areas. The Overlay District is intended to ensure that future land use in the Superfund Overlay District is compatible with the presence of potential contaminants and the remedial actions required to isolate those potential contaminants from the environment.</u>			
2. Adequacy <input checked="" type="checkbox"/> ICs are adequate <input type="checkbox"/> ICs are inadequate <input type="checkbox"/> N/A Remarks: <u>As additional remedial actions are completed, additional institutional controls may be needed in other areas of the Site.</u>			
D. General			
1. Vandalism/trespassing <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No vandalism evident Remarks: _____			
2. Land use changes on site <input checked="" type="checkbox"/> N/A Remarks: _____			
3. Land use changes off site <input checked="" type="checkbox"/> N/A Remarks: _____			
VI. GENERAL SITE CONDITIONS			
A. Roads <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
1. Roads damaged <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Roads adequate <input type="checkbox"/> N/A Remarks: <u>Roads are kept graded and wet to limit dust.</u>			
B. Other Site Conditions			
Remarks: _____			
VII. LANDFILL COVERS <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
A. Landfill Surface			

1.	Settlement (Low spots)	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Settlement not evident
	Arial extent _____		Depth _____
	Remarks: _____		
2.	Cracks	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Cracking not evident
	Lengths _____	Widths _____	Depths _____
	Remarks: _____		
3.	Erosion	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Erosion not evident
	Arial extent _____		Depth _____
	Remarks: _____		
4.	Holes	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Holes not evident
	Arial extent _____		Depth _____
	Remarks: _____		
5.	Vegetative Cover	<input type="checkbox"/> Grass	<input checked="" type="checkbox"/> Cover properly established
	<input type="checkbox"/> No signs of stress	<input type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram)	
	Remarks: <u>East Side Road pasture was recently revegetated and lined.</u>		
6.	Alternative Cover (armored rock, concrete, etc.)	<input checked="" type="checkbox"/> N/A	
	Remarks: _____		
7.	Bulges	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Bulges not evident
	Arial extent _____		Height _____
	Remarks: _____		
8.	Wet Areas/Water Damage	<input checked="" type="checkbox"/> Wet areas/water damage not evident	
	<input type="checkbox"/> Wet areas	<input type="checkbox"/> Location shown on site map	Arial extent _____
	<input type="checkbox"/> Ponding	<input type="checkbox"/> Location shown on site map	Arial extent _____
	<input type="checkbox"/> Seeps	<input type="checkbox"/> Location shown on site map	Arial extent _____
	<input type="checkbox"/> Soft subgrade	<input type="checkbox"/> Location shown on site map	Arial extent _____
	Remarks: _____		
9.	Slope Instability	<input type="checkbox"/> Slides	<input type="checkbox"/> Location shown on site map
	<input checked="" type="checkbox"/> No evidence of slope instability		
	Arial extent _____		
	Remarks: _____		
B. Benches			
	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A	
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			

C. Letdown Channels	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
D. Cover Penetrations	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
E. Gas Collection and Treatment	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
F. Cover Drainage Layer	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
G. Detention/Sedimentation Ponds	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
H. Retaining Walls	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
I. Perimeter Ditches/Off-Site Discharge	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
VIII. VERTICAL BARRIER WALLS	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
IX. GROUNDWATER/SURFACE WATER REMEDIES	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
B. Surface Water Collection Structures, Pumps, and Pipelines	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
C. Treatment System	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
X. OTHER REMEDIES		
If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.		
XI. OVERALL OBSERVATIONS		
A. Implementation of the Remedy		
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.). <u>Remedy implementation is ongoing. Remediation of Phase 1 of Reach A finished in April 2014. Long-term monitoring is underway to assess groundwater, surface water and vegetation during remediation.</u>		
B. Adequacy of O&M		
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. <u>Not applicable.</u>		
C. Early Indicators of Potential Remedy Problems		
Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. <u>None identified.</u>		
D. Opportunities for Optimization		
Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. <u>None identified.</u>		

Site Inspection Team:

- Sara Sparks, EPA

- Brian Bartkowiak, MDEQ
- Claire Marcussen, Skeo
- Treat Suomi, Skeo

Appendix E-1: Photographs from MRSOU Site Inspection



Information sign overlooking Milltown Reservoir at the Milltown Bluff



Clark Fork river from bluff at Milltown State Park. Includes views of several site repositories, including the Right Bank Repository and the Interstate-90 slope.



View of the Sheriff Posse Grounds Parcel from Milltown Bluff.



The Tunnel Pond Repository.



View of the Interstate-90 slope.



Orange cone marking hole in the Right Bank Repository.



View of the Clark Fork River.



Flagging marking area of subsidence at the Right Bank Repository.



View of the Bonner Development Group Parcel.



Timbers for use in park construction.



"Keep Out" sign at the Milltown Reservoir revegetation area.



Riprap along the banks of the Blackfoot River under the Interstate-90 bridge.



Rodeo grounds at the Sheriff Posse Grounds Parcel.



Milltown Bluff and the Tunnel Pond Repository.



Sundial at Bonner Learning Park.

Appendix E-2: Photographs from the CFROU Site Inspection



CFROU Phase 1 remediation area.



CFROU Phase 1 remediation area.



Sign for river closure at the CFROU.



Phase 2 remediation in progress.



View of Arrow Stone Park.



Riverbank at Arrow Stone State Park



Residential area in Deer Lodge.



Trestle area in Deer Lodge.



KOA property, Clark Fork River and residential trailers.



East Side Road and pasture remediation revegetation.



Downstream of Phase 7.



Racetrack Pond.



Signage along road due to remedial work.



Revegetation crew.



Revegetation area.



Grant-Kohrs Ranch National Historic Site.



Grant-Kohrs Ranch National Historic Site.



USGS gauge station along the Clark Fork River.



View of Clark Fork River along Reach C.