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Office of
Emergency and
Remedial Response

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April 1984

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Superfund Record of Decision:

Milltown Site, MT

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

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16. ABSTRACT

The Milltown Reservoir Sediments site is located in Missoula County, Montana. The site is adjacent to the Milltown Dam where the Big Blackfoot River joins the Clark Fork River. Constructed in 1906, this hydroelectric dam formed a reservoir that trapped sediments from mining, milling, and smelting operations in the upper Clark Fork Valley. During the years since construction, the reservoir storage has been almost totally filled with arsenic contaminated sediments. In [illegible]town's four community water supply wells were found to be contamin[illegible] other heavy metals. The highest arsenic levels measured have been [illegible] to 0.90 milligrams per liter (mg/l).

The selected remedial alternative consists of: construction of a new well from a hydraulically separate aquifer; construction of a new distribution system; flushing the plumbing system of each house to remove suspended materials from the water system and plumbing and testing the water quality in each house to assure that the arsenic standard has been met. The capital cost for the selected alternative is estimated to be $262,714 and annual O&M costs are $4,238.

Key Words: Alternate Water Supply, Community Services Enhancement, Fire Protection, Shared Cost, Arsenic, Drinking Water Standards, Internal Plumbing, Mining Wastes, Supplemental ROD, Water Quality

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Record of Decision: Milltown Reservoir Sediments, MT Contaminated media: gw, soil Key contaminants: metals, arsenic		

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
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	None	

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ROD ISSUES ABSTRACT

Site: Milltown Reservoir Sediments, Montana

Region: VIII

AA, OSWER
Briefing Date: March 21, 1984

SITE DESCRIPTION

The Milltown Reservoir Sediments site is located in Missoula County, Montana. The site is adjacent to the Milltown Dam where the Big Blackfoot River joins the Clark Fork River. Constructed in 1906, this hydroelectric dam formed a reservoir that trapped sediments from mining, milling, and smelting operations in the upper Clark Fork Valley. During the years since construction, the reservoir storage has been almost totally filled with arsenic contaminated sediments. In May, 1981, Milltown's four community water supply wells were found to be contaminated with arsenic and other heavy metals. The highest arsenic levels measured have been between 0.54 to 0.90 milligrams per liter (mg/l).

SELECTED ALTERNATIVE

The selected remedial alternative consists of: construction of new well from a hydraulically separate aquifer; construction of a ne distribution system; flushing the plumbing system of each house to remove suspended materials from the water system [illegible] flushing and testing the water quality in each house to assure that the arsenic standard has been met. The capital cost for the selected alternative is estimated to be $262,714 and annual O&M costs are $4,238.

ISSUES AND RESOLUTIONS

1. The affected community requested EPA to develop a new water supply system with increased capacity to accommodate fire protection demands in addition to normal domestic uses. EPA considered the proposal but decided that the increased cost of fire protection was beyond the scope to remedy a contaminated water supply. The reason for this decision was that there was no previously existing fire protection system. It was recommended

KEY WORDS

- Alternate Water Supply
- Community Services Enhancement
- Fire Protection
- Shared Cost

ISSUES AND RESOLUTIONS

KEY WORDS

that the community solicit bids for a combined domestic supply/fire protection system. With this information, the community could decide if they wanted to have the fire protection capacity installed at their own expense.

2. The EPA agreed to develop a new water supply for a community with arsenic concentrations exceeding the EPA's drinking water standard (0.050 mg/l). The new system was planned to connect with the existing plumbing at each residence. The community requested that the internal plumbing of existing houses be replaced as well. This request was made because of their concern with the possibility of residual arsenic, in the plumbing and the hot water tank, becoming mobile and contaminating the new supply. The possibility of residual arsenic contaminating the new supply after flushing was remote.

   In the unlikely event the water supply in individual homes did not meet the arsenic drinking water standard after extended flushing, a supplemental ROD would be prepared to consider minimal measures to provide safe drinking water.

- Arsenic
- Drinking Water Standards
- Internal Plumbing
- Mining Wastes
- Supplemental ROD
- Water Quality

RECORD OF DECISION
REMEDIAL ALTERNATIVE SELECTION
REPLACEMENT POTABLE WATER SUPPLY

Site: Milltown Reservoir Sediments, Milltown, Montana

Analysis Reviewed:

I have reviewed the following documents describing the analysis of cost-effectiveness of alternatives for a replacement water supply at the Milltown site.

- Milltown Water Supply and Distribution System Study
  Robert A. Peccia and Associates, December 1983.

- Fire Protection System - Milltown Study
  Robert A. Peccia and Associates, February 1984.

- Staff summaries and recommendations; and

- Recommendation by the Montana Department of Health and Environmental Sciences (MDHES).

Description of Selected Option:

- Abandonment of existing Milltown ground water supply and distribution system that has been affected by leaching of heavy metals from reservoir sediments.

- Replacement and relocation of Milltown Wa[illegible] Association water supply and transmission [illegible] with a capacity of 0.29 MGD.

Declarations:

Consistent with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), and the National Contingency Plan, I have determined that an alternative water supply for the Milltown Reservoir Sediments site is a cost-effective remedy, and that it is a key action which is necessary to effectively mitigate and minimize damage to public health, welfare and the environment. I have determined that this action is appropriate when balanced against the need to use Trust Fund money at other sites. Should individual houses not meet the arsenic standard after flushing and testing, a Supplemental Record of Decision may be considered.

A Supplemental Record of Decision will be submitted for consideration upon the completion of the State of Montana's technical analysis and evaluation of source control remedial actions.

Lee M. Thomas
Assistant Administrator
Office of Solid Waste and Emergency Response

7/14/87
Date

REMEDIAL ALTERNATIVE SELECTION
MILLTOWN RESERVOIR SEDIMENTS SITE
MILLTOWN, MONTANA

HISTORY

The Milltown Reservoir Sediments site is located in Missoula County, Montana. The site is adjacent to the Milltown Dam where the Big Blackfoot River joins the Clark Fork River. Constructed in 1906, this hydroelectric dam formed a reservoir that trapped sediments from mining, milling, and smelting operations in the upper Clark Fork Valley. During the years since construction, the reservoir storage has been almost totally filled with these sediments.

In May 1981, Milltown's four community water supply wells located between Interstate 90 and the Burlington Northern railway tracks were found by local health officials to be contaminated with arsenic and other heavy metals. The highest arsenic levels measured have been between 0.54 to 0.90 milligrams per liter (mg/l), up to 20 times the maximum contaminant level established by EPA in the National Interim Primary Drinking Water Regulations. Ingestion of arsenic in sufficient quantities can lead to abdominal pain, vomiting, coma or death.

Residents were advised by State health officials on August 20, 1981, not to use waters from the affected wells for potable purposes. Initially, the thirty-three residences supplied from these wells were without a temporary water supply; the affected populace obtained water from neighbors or businesses with uncontaminated wells. During the summer of 1983, volunteers using National Guard equipment began supplying residents with potable water from a tank truck, driven door-to-door bi-weekly. No source of bottled water exists in the area.

In July 1983, the remedial investigation (RI) was formally begun through a Cooperative Agreement with Montana Department of Health and Environmental Services (MDHES). An initial task of the RI was to determine the source and extent of contamination to the existing drinking water supply. In December 1983, the consultant identified the sediments as the cause of ground water contamination as well as identifying the present distribution and likely future disposition of the contaminants in the water supply. A focused feasibility study (FS) was begun in October 1983 which examined alternative water supplies to Milltown. The feasibility study recommended a replacement ground water system and extending an existing fire protection system into the affected area.

COMMUNITY RELATIONS

On December 20, 1983 and January 4, 1984, at public meetings held in Missoula and Bonner, Montana, the findings and recommendations of the focused feasibility study were presented. The community urged the expeditious implementation of the selected alternative.

Comment

All comments received supported the selected alternative and stressed the need for inclusion of fire protection in the final design and construction.

Response

See discussion below on fire protection.

Comment

Since the public meeting some residents have requested that their pipes within their homes be replaced. There is concern that the pipes are contaminated with arsenic.

Response

As necessary, the water system will be flushed and tested. If water within the house does not meet the arsenic [illegible], a Supplemental Record of Decision may be prepared by [illegible] EPA to consider various options to provide safe drinking [illegible]. The State and EPA expect that after flushing each house will meet the arsenic standard and no further action will be required.

ENFORCEMENT

In December 1983, the remedial investigation contractor conclusively identified the Milltown Reservoir sediments as the cause of the contaminated drinking water in Milltown, Montana. These sediments have been historically deposited over the last 78 years, since the construction of Milltown Dam. Metal mining, milling, and smelting discharges upstream have undoubtedly contributed heavy metals to this sediment buildup. EPA Region VIII determined ownership of mining activities upstream of Milltown. This effort identified 18 separate areas where ownership records showed historical activity that could have contributed discharges to Clark Fork drainage. No further efforts have been undertaken attempting to substantiate this information.

There have been no previous State or Federal enforcement actions regarding this site.

CURRENT STATUS

The contaminated reservoir sediments continue to pollute Milltown's wells. Remedial investigation testing indicates this contamination appears to be hydraulically confined to the presently contaminated area. Lower aquifers do not appear to be contaminated. Ongoing monitoring will determine the extent and direction of the plume.

ALTERNATIVES SCREENING

The feasibility study initially considered five alternatives (see Table 1). Implementation of any one of the five alternatives would result in a potable water system that would provide residents with uncontaminated water. The alternatives were screened on the basis of technical feasibility and costs of implementation. No alternative was considered that would have involved ingestion of untreated water from the Milltown reservoir, due to health hazards.

The no action alternative would continue to provide bottled water as a long term remedy. There is no local source of bottled water available. Bottled water is currently being supplied by the National Guard and is a very inconvenient and insufficient supply for bathing. Because of the public health and welfare considerations, this option is rejected. The remaining alternatives were all judged effective in protecting health, welfare, and the environment. Alternative 1 was to connect the area to the municipal supply of the City of Missoula. The cost of this action is over twice the capital and twice the O&M costs of the recommended alternative and was therefore rejected. Alternative 2 was to provide a new surface water treatment plant to the area. The costs of this action are over twice the capital costs and five times the O&M costs and was therefore rejected. Alternative 3 would treat the source of contamination at each existing well head with a small treatment facility. The capital costs were twice that of the recommended alternative and five times the cost for O&M and was therefore rejected. Alternative 5 was to buy-out the community and relocate the residents. This alternative was not only costly (3 times the capital costs of the recommended alternative) but disruptive to the community and not necessary. This alternative was therefore rejected.

Should houses not meet the arsenic standard after flushing, further remedial measures would be studied and may be recommended. At this time there is insufficient information to determine how many houses would be affected and the extent of action required. (The State and EPA do not expect any of the houses to fail the arsenic standard but this cannot be guaranteed in advance.) Even if substantial remedial work is required to provide taps or replace plumbing, Alternative 4 is clearly cost effective when compared to buy-out of the community (Alternative 5). Alternative 4 costs $270,751 compared to $829,000 for Alternative 5.

Alternative 4 was found to be the least expensive alternative to alleviate the threat to public health and welfare. Alternative 4 involves construction of a new well and appurtenances, construction of a new distribution system, and connection of this distribution system to individual residences. This alternative is considered the most cost-effective. Total capital and long-term operation costs are summarized in Table 1.

Locations of existing distribution piping are unknown as these lines were never mapped and records were not kept of changes in the systems. The various systems apparently have been in use more than 30 years, with maintenance performed on an as needed basis. The existing water systems are undersized. Consequently, tie-ins to the existing distribution systems are not feasible.

In addition to providing a safe, potable supply of water, providing fire protection was also evaluated. Two options were considered. First, a separate fire protection line connected to Champion's existing fire protection system was examined (Option 4A). The incremental cost of this system is estimated at $76,950. The second fire protection system examined (Option 4B) was to upgrade Alternative 4. A new pump, and larger pipes, valves and pump house would be required. In addition elevated storage would also be needed for adequate water pressure and storage. This system would cost at least $130,000. Therefore, connection to the Champion fire protection system is the recommended option of the State.

The existing distribution system at Milltown is inadequate to provide fire protection, and the community currently has no fire protection system. Providing a fire protection system in these circumstances would be unrelated to the health and environmental hazard for which CERCLA funds are being committed. Therefore, the funds for a separate or combined fire protection system are not included in the final alternative.

RECOMMENDED WATER SUPPLY

The alternative recommended, 4, consists of an 8-inch diameter, 150-foot deep well, pump, well house, piping, appurtenances and controls. The well would be installed adjacent to the Champion C-2 well, which currently supplies potable water to a portion of Milltown residences unaffected by current contamination. This area has been shown through remedial investigation testing to be hydraulically separate from the aquifer affected by sediment leaching, providing water of excellent quality and adequate yield for consumption. Total system capacity, as designed, is 0.29 MGD. During design there will be a final determination of the sizing for the pump, well and appurtenances.

This water supply well is to be connected to a distribution system consisting of 6-inch diameter PVC trunk line and 4-inch PVC mains with 3/4-inch service connections to each residence. The plumbing system of each house will be flushed to remove suspended materials from the water system and plumbing. The houses will be tested to assure that the arsenic standard is met. Faucets should be opened a sufficient period of time prior to sampling to ensure that water is being drawn from the distribution system in the streets.

TABLE 1

Comparison of Milltown Water Supply Alternatives

	Capital Cost*	O&M Cost/yr	Comment
Alternative 0:			
No Action/Bottled Water	0		Ineffective, no long-term remedy
Alternative 1:			
Connection with Missoula System	$572,940	$8,582	Effective but high cost
Alternative 2:			
New Surface Water Treatment Plant	591,300	21,780	Effective but high cost
Alternative 3:			
Treatment of Existing Wells to Remove Arsenic	555,525	22,770	Effective but high cost
ernative 4:			
New Well and Distribution System	270,751	4,238	Good quality water . . Least . . "action" ernative
Alternative 5:			
Buy-out of Community	828,736	5,582	Relocation is disruptive and expensive; does not appear neccessary

FIRE PROTECTION ALTERNATIVES

A	Tie into the Champion Fire Protection System	$ 76,950	-	High degree of reliability
B	Upgrade Alternative 4 to Provide Adequate Fire Protection	129,950	-	Less reliable service. Higher cost

* Includes 10% contingency and 20% engineering design and 5% administration.

Costs of the alternative selected are as follows:

Alternative 4

DESIGN AND CONSTRUCTION
CAPITAL COSTS

Well and Appurtenances		$ 76,930
Domestic Water Distribution System		92,290
	Subtotal	$169,220
Design		34,656
Administrative		30,036
Contingency @20%		36,839
	Subtotal	$270,751
Operation and Maintenance*--for one year		4,238
	Total	$274,989

*Operation and maintenance expenses on the pump and other mechanical equipment are to be provided by the Milltown Water Users Association after the project is accepted by MDHES. An agreement will be signed by the Association and the Montana Department of Health and Environmental Sciences to assume the responsibility.

The State of Montana is prepared to assume 10 percent of the costs of design and construction of this preferred alternative. CERCLA funds would be used to finance 90 percent of these costs. Under the existing Cooperative Agreement, the State of Montana is completing the remedial investigation related to contaminant source characterization. A contract for a source control feasibility study is to be awarded in the near future. A supplemental Record of Decision will be prepared upon completion of the source control feasibility study.

RECOMMENDATION

Staff recommends approval of the final design and construction of a potable drinking water system as described above. The approved systems should be constructed to the size and capacity indicated in the focused feasibility study.

NEXT STEPS

Milestones	Date
Sign ROD	March 1984
Amend CA for Design & Construction	March 1984
Complete Design	May 1984
Award Construction Contract	July 1984
Complete Construction	October 1984
Complete Long-term RI	December 1984
Complete Long-term FS	July 1985