ENGINEERING EVALUATION/COST ANALYSIS

RESPONSE ACTION
UNDER THE
COMPREHENSIVE ENVIRONMENTAL RESPONSE
COMPENSATION AND LIABILITY ACT

UNION PACIFIC RAILROAD
WALLACE-MULLAN BRANCH

January 15, 1999

ENVIRONMENTAL PROTECTION AGENCY
REGION 10

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LIST OF ACRONYMS

ACP - asphalt concrete pavement
AMSL - above mean sea level
AOC - area of contamination
ARARs - Applicable or Relevant and Appropriate Requirements
BHSS - Bunker Hill Superfund Site
BLM - U.S. Bureau of Land Management
BMPs -best management practices
CDR - Coeur d'Alene River
CERCLA - Comprehensive Environmental Response, Compensation and Liability Act
C.F.R. - Code of Federal Register
CIA - Central Impoundment Area
CITU - Certificate of Interim Trail Use
CLCC - Clean Lake Coordinating Council
cy -cubic yard
ea - each
EE/CA - Engineering Evaluation and Cost Analysis
EPA - U.S. Environmental Protection Agency
ICs - Institutional Controls
ICC - Interstate Commerce Commission
IDAPA - Idaho Administrative Procedures Act
IDEQ - Idaho Division of Environmental Quality
KSF - thousand square feet
LDRs - Land Disposal Restrictions
lf - linear foot
MFG - McCulley, Frick & Gilman, Inc.
MP - Milepost
NCP - National Contingency Plan
NFCDR - North Fork of the CDR
NRDA - Natural Resource Damage Assessment
NRRB - National Remedy Review Board
O&M - operation and maintenance
OTM - other track materials
oz/sy - ounces per square yard
PAHs -polycyclic-aromatic-hydrocarbons
PCBs - poly-chlorinated biphenyls
ppm - parts per million
PTM - Principal Threat Materials
QA/QC - Quality Assurance/Quality Control
RAOs - response action objectives
RCRA - Resource Conservation and Recovery Act
RI/FS - Remedial Investigation/Feasibility Study
RME - Reasonable Maximum Exposure
ROD - Record of Decision
ROW - Right-of-Way
SAIC - Science Applications International Corporation

LIST OF ACRONYMS (Continued)

SFCDR - South Fork of the Coeur d'Alene River
STB - Surface Transportation Board
µg/dl - micrograms per decaliter
UPRR - Union Pacific Railroad
U.S.C. - United States Code
USDA SCS - U.S. Department of Agriculture Soil Conservation Service
USDC - U.S. Department of Commerce
USFS - U.S. Forest Service
USGS - U.S. Geological Survey
USHUD - U.S. Department of Housing and Urban Development
WWP - Washington Water Power

EXECUTIVE SUMMARY

This Engineering Evaluation and Cost Analysis (EE/CA) addresses contamination within the approximately 71.5-mile long right-of-way (ROW) for the main line track and related sidings of Union Pacific Railroad's (UPRR) Wallace-Mullan Branch, which extends across the panhandle of northern Idaho. The purpose of the EE/CA is to evaluate alternatives for the purpose of selecting an appropriate response action to address contamination of portions of the ROW with mine waste found at various locations along the ROW. For purposes of this EE/CA the term "Mine Waste" includes jig and flotation tailings, waste rock, concentrates and ores all of which are derived from mining activities.

This EE/CA addresses the main line and related sidings of the Wallace-Mullan Branch ROW. The 7.9 mile section of the ROW within the Bunker Hill Superfund Site (BHSS) has been addressed as part of the BHSS Record of Decision (ROD) (EPA, 1992), and is excluded from this EE/CA. The response action does not address: any spurs or connecting branch lines outside of the Wallace-Mullan ROW; non-siding areas of the Wallace Yard outside a 26-foot-wide corridor bracketing the main line; and areas of the Hecla Mine tailings impoundment and the Morning Mine Rock Dump that may encroach on the ROW. These areas will be addressed within the Bunker Hill Basin Wide Remedial Investigation/Feasibility Study (RI/FS) and/or other response actions.

The response actions described in this EE/CA will be conducted pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 as amended by the Superfund Amendments and Reauthorization Act of 1986 (CERCLA). This EE/CA has been prepared in accordance with the National Contingency Plan (NCP) and the U.S. Environmental Protection Agency's (EPA) *Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA* (EPA, 1993) (the EE/CA Guidance).

The ROW passes through a wide variety of settings, terrain and conditions. Through approximately 80 percent of its length, the ROW generally follows the Coeur d'Alene River and is mostly within the flood plain. For the remaining 20 percent of its length, the ROW is adjacent to Lake Coeur d'Alene or in the upland areas of the Coeur d'Alene Indian Reservation. These various settings can generally be characterized into three sections: (1) the upper South Fork of the Coeur d'Alene River Basin (the Upper Basin) which includes the western portion of the Mullan Branch extending from Mullan (Milepost [MP 7]) to Wallace (MP 0) and the eastern most portion of the Wallace Branch extending from Wallace (MP 80) to west of Enaville (MP 62); (2) the lower Coeur d'Alene River Basin (the Lower Basin) which starts downstream of the confluence of the South and North Forks of the Coeur d'Alene River west of Enaville (MP 62) to Harrison (MP 31); and (3) the east shoreline of Lake Coeur d'Alene beginning at Harrison (MP 31) and the upland rolling hills west of Lake Coeur d'Alene to Plummer Junction (MP 6).

The rail line was constructed in the late 1800s to serve the mining industry in the Silver Valley. In some locations within the Upper Basin, the line was constructed on top of a pre-existing mantle of fluvially deposited tailings, and in other areas mine waste rock was used as fill material to elevate the line above the river level. Tailings and waste rock were also used as a component of the rail bed ballast throughout the length of the line. Originally, approximately 168,000 cubic yards of ballast were placed along the rail bed. The original ballast was comprised of a mixture of tailings, waste rock and locally available gravels. Most of the original ballast is still in place, isolated by the track structure and ballast material that was subsequently placed during the active life of the line. In the Upper Basin, waste rock and tailings were used as fill to construct portions of the railroad subgrade. In the Lower Basin, subgrade materials were obtained from local quarries.

The rail line primarily served the mining industry in the Silver Valley, transporting ores and concentrates to and from the mines and mining process facilities. At various locations along the rail line, and in particular at sidings and loading/unloading areas, there is evidence of spillage of these ores and concentrates (which have higher concentrations of lead and other heavy metals than the tailings and waste rock).

Lead-bearing tailings are pervasive throughout the river flood plain and, thus, throughout much of the lateral zones of the ROW. It is reported that more than 72 million tons of tailings have been transported down the river from upstream source areas as a result of more than 80 years of mining activities (Tetra Tech et al, 1987). Analytical data from representative soil sampling along the ROW verify the existence of tailings in the flood plain, including a layer beneath the railroad subgrade embankment in some locations. The data also confirm the use of tailings and waste rock in the original ballast and portions of the subgrade embankment in the Upper Basin.

The goals of the EE/CA are to effectively address the identified contamination within the ROW in a manner that is protective of human health and the environment and in compliance with Applicable or Relevant and Appropriate Requirements (ARARs) to the extent practicable. The objectives of the response actions considered within the EE/CA are to minimize the potential for direct exposure to Mine Waste, and limit the potential for the environmental transport of contaminants. The analysis presented herein builds upon the knowledge gained through investigation, design and implementation of remedial actions within the 7.9-mile segment of the ROW that passes through the BHSS.

The ROW and many of the areas that would be accessed from the ROW are already being used, to some extent, for recreational purposes. Contamination throughout the ROW and adjacent areas is extensive. In addition, the ROW between Enaville and Harrison is subject to potentially significant recontamination due to flood events until complete, non-ROW, source control measures are implemented in upstream areas. Appropriate response actions combined with appropriate management of the ROW corridor offers the opportunity to reduce the risks associated with potential exposures to these contaminants.

The ROW is a long, narrow corridor that passes through a variety of settings, conditions, and terrain. Accordingly, several alternative response actions have been identified for consideration within the EE/CA. It was expected that no single response action alternative would be universally applicable to the entire length of the ROW. The categories of response actions considered are as follows:

- No action (baseline),
- Institutional controls (ICs),
- Protective barriers,
- Removal and disposal/consolidation, and
- Treatment.

In accordance with the EE/CA Guidance, all of the potential response actions were evaluated and screened with respect to implementability, effectiveness, and cost. The following response action categories survived the initial screening and were retained for further evaluation:

- Institutional controls (ICs),
- Protective barriers, and
- Removal and disposal/consolidation.

The surviving categories of potential response actions were further evaluated for their applicability, either individually or in combination, to the specific settings and conditions found along the ROW. Again, each category was evaluated individually with respect to implementability, effectiveness, and cost.

The conclusions of the detailed analysis are generally as follows:

- ICs, if properly established and enforced in conjunction with other physical response actions, can effectively increase the protectiveness and durability of the physical response actions. The benefits of ICs would likely be maximized if implemented uniformly throughout the length of the ROW, consistent with the setting and anticipated future use at a given location.

- In-situ containment of contaminated materials beneath a suitable protective barrier is an efficient and cost-effective means of protecting human health and the environment along the ROW. Selection of an appropriate barrier material must reflect consideration of the setting, conditions, and anticipated future use of that particular area of the ROW where the barrier is to be applied.

- Selective removal with disposal and/or consolidation of contaminated soils from key areas of the ROW, particularly in preparation for implementation of other response actions, will serve to enhance the effectiveness and acceptability of those response actions.

In addition to the individual evaluations, a comparative analysis of the potential response actions was also made. The comparative analysis builds upon the detailed analyses by examining the performance of each alternative relative to the other response actions within the context of each of the evaluation criteria (implementability, effectiveness and cost). The findings of the comparative analysis are as follows:

- Response actions involving selective removals and disposal/consolidation of contaminated material, placement of protective barriers, and ICs are implementable with certain constraints. The relative implementability of each will depend upon appropriately matching one or more of the various possible response actions to the particular settings and conditions that are found along the ROW.

- Selective removals of contaminated materials will provide effective long-term protection for human health and the environment; however, the practicality of wide-spread removal of large quantities of contaminated materials varies within some portions of the ROW, particularly in flood plain areas. The long-term effectiveness of removals in the flood plain areas may be reduced due to possible recontamination of the areas prior to completion of source control actions upstream.

- Placement of clean soil barriers in selected areas, to contain and isolate contaminated materials, will be an effective response action, provided that the barrier materials are chosen appropriately and ICs are implemented to ensure the long-term integrity of the barriers.

- ICs are generally of limited effectiveness when implemented in the absence of other actions, such as removals or barrier placement; however, they are useful to complement or supplement the effectiveness of the physical response actions. In

some situations, however, ICs may be effective as stand-alone actions, such as use of fencing and signs to restrict access to small areas of particular concern.

- The relative unit costs of the possible response action alternatives will vary depending upon the materials used (such as physical components of ICs or protective barrier materials) and the relative location of the work area (which affects the cost of disposal of excavated materials). In order of increasing range of unit costs, ICs are the least expensive response actions, with a significant jump in cost for protective barriers and removal actions. The total costs of response actions will vary depending upon the scope of the actions implemented throughout the entire length of the ROW.

An additional important consideration in the evaluation of the response action alternatives is the potential future use and ownership status of the ROW. In 1992, the Interstate Commerce Commission (ICC) determined that UPRR could discontinue rail service on the Wallace-Mullan Branch. In a 1994 decision the ICC clarified that UPRR could not engage in track salvage activities (the first step in implementation of the response actions) and thereby complete abandonment of the Wallace-Mullan Branch until compliance with certain conditions relating to the environmental impact of the proposed salvage were achieved and reviewed by the ICC. Since 1992, UPRR has, with various parties, discussed the possibility of the line being converted to non-rail use through an application for a Certificate of Interim Trail Use (CITU). Under a CITU, the UPRR ROW would be transferred to a third party for interim recreational or conservation purposes. In 1992 an application for a CITU was filed by the TransContinental Trails Association. A second application for issuance of a CITU was filed by the Rails-to-Trails Conservancy in 1995. The Surface Transportation Board (STB), the successor agency to the ICC, denied the Rails-to-Trails Conservancy application without prejudice to a subsequent applicant that would assume responsibility for the ROW and the trail.

The State of Idaho and Coeur d'Alene Tribe are contemplating entering into a joint arrangement to have the CITU and control of the right of way transferred to them. Because a CITU is deemed by statute to preserve the ROW as a potential rail corridor and not to constitute an abandonment of the line, any reversionary interests in the ROW property are not effected. Alternatively, if a CITU is not issued by the STB and UPRR completes the abandonment process, the property may revert to persons or entities holding the reversionary property interest; thus, breaking the property up among potentially many land owners.

The issuance of the CITU is an action to be taken by the STB and not part of the CERCLA decision process addressed by this EE/CA. However, since this EE/CA has been prepared to determine what response actions are needed to address human health and environmental concerns along the ROW, the potential issuance of a CITU for the ROW affects the control of and consequently the types of exposures to contamination that residents of the Coeur d'Alene Basin and others coming onto the ROW may experience in the future. The human health risk assessment incorporated into this EE/CA has taken such potential impacts on human health into consideration. Furthermore, while conversion of the ROW to recreational purposes under a CITU is not in of itself a CERCLA response action, the EE/CA evaluation has determined that the response actions under consideration may be more readily implemented in the context of such a conversion. Additionally, as previously stated, if a CITU transfer of the ROW for recreational or conservation purposes were not implemented, the ROW may revert to persons or entities holding the reversionary property interest. The effects of such a reversion of the ROW on the implementability and effectiveness of response actions under consideration are also discussed, as relevant, in this EE/CA.

Based on the findings of the individual and comparative analyses, three categories of response actions were identified as being protective and compliant with ARARs and therefore

appropriate for implementation at various locations along the ROW. These response action categories include:

- Institutional controls,
- Protective barriers, and
- Removal and on-site disposal or consolidation.

The selection of specific actions within the recommended response action categories considered the configuration of the ROW, its position within and between various communities, and the historic and probable future use of the ROW as a recreational trail, as well as the probable influence of off-ROW conditions including possible future flood impacts. The recommended actions, grouped by response action category, are generally as follows:

- Institutional Controls
    - Restrictions to regulate access to and use of the ROW, and to ensure that the physical components of the response action remain intact and function as intended.
    - Educational programs and health monitoring, as necessary, to increase public awareness of conditions and potential hazards and to alert ROW users of location-specific issues and concerns.
    - Signs to provide location-specific warnings to ROW users of potential exposures beyond the portions of the ROW where Mine Waste has been removed or capped.
    - Fencing/barricades to provide a physical barrier against access to potentially hazardous areas where Mine Waste has not been removed or capped.
- Protective Barriers
    - Asphalt concrete pavement (ACP) barrier, complete with an appropriate clean gravel base layer and shoulder caps, will be constructed over the main line ballast material throughout the length of the ROW in the Upper and Lower Basin areas. The ACP will provide for durable containment of ballast material containing Mine Waste, as well as a desirable traffic surface for the contemplated future use of the ROW as a trail.
    - Gravel and/or vegetated soil barriers in residential and other areas to provide protection against direct contact with potentially contaminated materials. The gravel and/or vegetated soil barriers will provide protection in areas where the frequency and duration of activities within the ROW would be expected to be highest due to the proximity of dwellings and the ease of access to the ROW.
    - Gravel and/or vegetated soil barriers in former siding areas due to considerations of potential use and contaminant concentrations. Sidings represent areas where the potential for elevated concentrations of contaminants is highest due to past loading/unloading activities. The siding locations represent natural stopping points for ROW users because of their intermittent location between communities and their wider, more level topography.

- Removal and Disposal/Consolidation

    - Selective removals are recommended from: sidings and other areas where the potential for the presence of concentrates is greatest; areas where the ballast material and/or identifiable accumulations of concentrates are the primary sources of Mine Waste within the ROW (e.g., the mainline and siding ballast along the east shore of Lake Coeur d'Alene and within the upland areas west of the lake); and areas where protective barrier layers must be recessed into the native soils so that the finished surface grade will be compatible with adjacent areas (transitional areas within residential and siding areas, as necessary) or to preserve existing surface drainage paths.

    - The recommended disposal alternatives for these removals are on-site consolidation and containment and/or disposal.

The recommended response actions were also evaluated within a streamlined risk assessment to determine the protectiveness of the actions relative to human health. The risk assessment evaluated the incremental human health risks associated with the contemplated future use of the ROW as a trail under the no-action scenario as compared to the use of the ROW after the implementation of the recommended response actions. The streamlined risk assessment determined that there are three primary exposure scenarios and resulting categories of risk management required for the ROW. These risk management categories are: (1) residential exposure management; (2) recreational exposure management; and (3) occupational exposure management. The risk assessment determined that the removal/disposal and protective barrier response actions combined with long-term maintenance of the barriers effectively provides for the necessary residential risk management. Although these physical response actions will reduce risks in the recreational and occupational categories, the institutional control program is a critical component for managing risks associated with these two exposure scenarios.

The EE/CA analysis, including the streamlined risk assessment, has determined that the above recommended response actions for the ROW will mitigate the identified human health concerns and are compliant with ARARs. The EE/CA has also determined that the conversion of the ROW to a recreational trail will enhance the implementability and effectiveness of the response actions.

The EE/CA has not made a detailed evaluation of ecological risks; however, the recommended response actions are expected to be beneficial in mitigating ecological risks that may be associated with contaminants found within the ROW. Ecological risks that may exist throughout the Coeur d'Alene Basin will be evaluated and appropriately addressed as part of the ongoing Bunker Hill Basin Wide RI/FS and/or other response actions.