

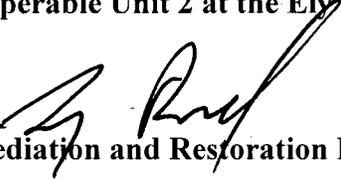


UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1 - NEW ENGLAND
5 POST OFFICE SQUARE - SUITE 100
BOSTON, MA 02109

MEMORANDUM

Date: September 28, 2011

Subject: Early Action for Operable Unit 2 at the Ely Copper Mine Superfund Site,
Brooksville, Maine

From: Larry Brill, Chief 
Office of Site Remediation and Restoration I Branch

To: Site File

SITE NAME AND LOCATION

Ely Copper Mine Superfund Site
Vershire, Orange County, Vermont
VTD988366571
Site ID No: 0102065
Operable Unit 2

STATEMENT OF BASIS AND PURPOSE

This memorandum documents the United States Environmental Protection Agency's (EPA) decision to implement an Early Action for Operable Unit 2 (OU2) at the Ely Copper Mine Superfund Site in Vershire, Vermont (the Site). The Early Action is being implemented in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (CERCLA), 42 USC § 9601 *et seq.*, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300, as amended (NCP). EPA will finalize the Early Action as part of the OU2 Record of Decision (ROD) to be issued at a later date.

The Early Action decision is based on the information contained in the Administrative Record for this OU2 Early Action, which is incorporated into the Administrative Record for the Operable Unit 1 (OU1) Record of Decision. The primary documents that make up the OU2 Early Action Administrative Record are: the OU1 Remedial Investigation (RI), the Site Human Health Risk Assessment (HHRA), the OU1 Feasibility Study (FS), and the OU1 Proposed Plan. The OU2 Early Action Administrative Record was developed in accordance with Section 113(k) of CERCLA, and is available for review at the Vershire Town Office, Vershire, Vermont, and at the EPA Office of Site Restoration and Remediation (OSRR) Records Center in Boston, Massachusetts.

The Vermont Department of Environmental Conservation (VT DEC) supports the implementation of the OU2 Early Action.

A description of EPA's proposed Early Action for OU2 was included in Section 6 of the OU1 FS and the OU1 Proposed Plan, which was issued for public comment. No public comments were received in opposition to the proposed Early Action.

SUMMARY OF SITE CONDITIONS THAT WARRANT EARLY ACTION

EPA has identified the need for an Early Action for the OU2 area. Specifically, since the finalization of the OU2 RI/FS and selection of an OU2 cleanup action is dependent upon the completion of the OU1 Remedial Action, many years may pass before an OU2 cleanup can be implemented. The Site HHRA identified the future exposure to contaminated groundwater and the direct contact and incidental ingestion of soil contaminated with cobalt, copper, and iron at residential exposure levels in the Smelter/Slag Area of OU2 as potential threats to human health. Table 1 presents the human health threats from exposure to soil and groundwater. As an interim measure, prior to the issuance of an OU2 ROD, to address this threat to human health, EPA will implement an Early Action to prevent groundwater use within the portions of the Site where groundwater is not suitable for human exposure. The OU2 Early Action will also prevent residential development of the Smelter/Slag Area.

The Remedial Action Objectives for the Early Action are:

- Prevent residential exposure to soil or waste with concentrations of cobalt, copper, and iron above the Site specific human health risk levels for future residential use within OU2 on-site (primarily in the Smelter/Slag Area) which were identified in the Site HHRA; and
- Prevent exposure to groundwater in excess of federal Safe Drinking Water Act (SDWA), 42 U.S.C. §300f *et seq.*, Maximum Contaminant Levels (MCLs), 40 C.F.R. 141, Subparts B and G; federal SDWA Maximum Contaminant Level Goals (MCLGs), 40 C.F.R. 141, Subpart F; Vermont Groundwater Protection Standards (VTGWPS), Env. Prot. Ch. 12-702 and 703; or EPA risk standards (whichever standards are most protective) within OU2 on-site.

The design for the Early Action will identify the extent of the Ely Copper Mine Site where groundwater exceeds MCLs, MCLGs, VTGWPS, or federal risk based standards, whichever standard is most protective. Figure 1 shows the extent of the area of the Site that would be subject to institutional controls using the existing Site data.

The Early Action will consist of the implementation of Institutional Controls, that will include the placement of land use restrictions to effectively prevent future residential use and the installation of wells within areas of OU2 on the Site where such use could result in exposure to soils that pose a residential use risk and to groundwater contamination exceeding the Early Action ARAR or risk-based standards. Restrictive covenants/environmental easements will be developed that will be in accordance with and enforceable under the laws of the State of Vermont, including but not limited to Title 27, Vermont Statutes Annotated, Chapter 5,

Conveyance of Real Estate, and Chapter 7, the Marketable Title Act. These covenants shall be the primary mechanism to achieve this objective, with local and/or state ordinances or zoning potentially supplementing the property restrictions.

Because the only RAOs are to prevent the groundwater or residential use of certain portions of the Site and not restore groundwater or contain/remove contaminated soil, no other technologies or alternatives were considered, other than No Action. The OU2 FS will develop and analyze technologies with respect to any groundwater restoration, migration control, or soil remediation (in areas of contaminated soils not addressed under OU1). A very simplified NCP criteria analysis was performed in Section 6 of the OU1 FS for No Action and Institutional Controls for the Early Action for OU2 and is presented below.

Overall Protection of Human Health and the Environment

Will the alternative protect human health and plant and animal life from the contamination released by the Site? The chosen cleanup plan must meet this criterion.

The Early Action would provide overall protection of human health and the environment by preventing a change in land use that could result in an exposure that was identified as unacceptable from a human-health perspective. The OU2 FS and ROD will determine whether additional response measures are necessary in addition to institutional controls. The No Action alternative would allow land use changes that could result in an unacceptable threat to human health from direct contact with cobalt, copper, and iron contaminated soil and ingestion of contaminated groundwater.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Does the alternative meet all pertinent federal and state environmental statutes, regulations, and requirements? Is a waiver required? The chosen cleanup plan must meet this criterion.

The No Action alternative only has chemical-specific ARARs and TBC standards which the alternative does not satisfy, because the No Action alternative does not address risks from exposure to contaminated groundwater and soil (see Table 2-1). The Early Action alternative will meet risk standards by preventing use of contaminated groundwater and residential development in areas of OU2 where residential soil risk is present. There are no location-specific standards under the Early Action, since the establishment of institutional controls does not include any physical activities in protected resource areas. There are chemical-specific groundwater protection standards and human health, risk-based soil standards that pertain to the Early Action, along with limited action-specific standards for preventing well installation and requirements for establishing land use restrictions. (see Tables 2-2 and 2-3).

Long-Term Effectiveness and Permanence

How reliable will the alternative be at long-term protection of human health and the environment? Is contamination likely to present a potential risk again?

The long-term effectiveness of the Early Action would be dependent upon the successful implementation and maintenance of the land use restrictions that would prevent residential use or the installation of water supply wells. The Early Action would not reduce the level of contamination or contain the contamination; therefore, the OU2 FS and ROD will need to determine whether additional response measures are necessary in addition to institutional controls. The No Action alternative does not provide any long-term effectiveness or permanence.

Reduction of Toxicity, Mobility, or Volume through Treatment

Does the alternative incorporate treatment to reduce the harmful effects of the contaminants, their ability to spread, and the amount of contaminated material present?

The Early Action does not address any principal threat waste. Neither the Early Action nor the No Action alternative will reduce the toxicity, mobility, or volume of contamination through treatment.

Short-Term Effectiveness

How soon will the risks be adequately reduced? Are there short-term hazards to workers, the community, or the environment that could occur during the cleanup process?

There are no short term hazards from implementing either the Early Action or the No Action alternative. The Early Action could be implemented within one year of the approval of the Early Action as a component of the OU2 remedy.

Implementability

Is the alternative technically and administratively feasible? Are the materials and services needed to implement the cleanup alternative (e.g., treatment machinery, space at an approved disposal facility) readily available?

There are no implementation issues for the No Action alternative. The Early Action has a high degree of implementability. The Early Action is dependent, however, on landowner, as well State and local officials', cooperation to achieve the implementation of the Early Action in the shortest time frame.

Cost

What is the cost of constructing and maintaining the cleanup alternative? Capital costs and the present value of all costs over the anticipated life of the cleanup alternative are presented?

There are no costs associated with the No Action alternative (other than Five-Year Reviews that will commence five years after initiation of the OU1 remedial action). For the Early Action there are some costs that will be associated with the transaction costs to establish a restriction that meets State property recording standards, as well as the cost to record the land use restriction. There will also be costs associated with inspections and enforcement of the land use restrictions.

State Acceptance

Do state environmental agencies agree with the recommendations?

The State of Vermont supports the implementation of the OU2 Early Action.

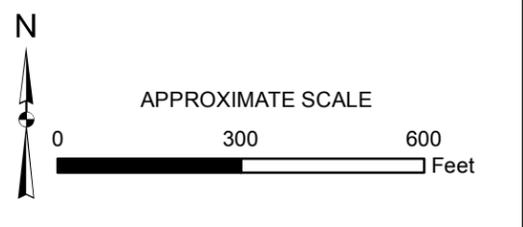
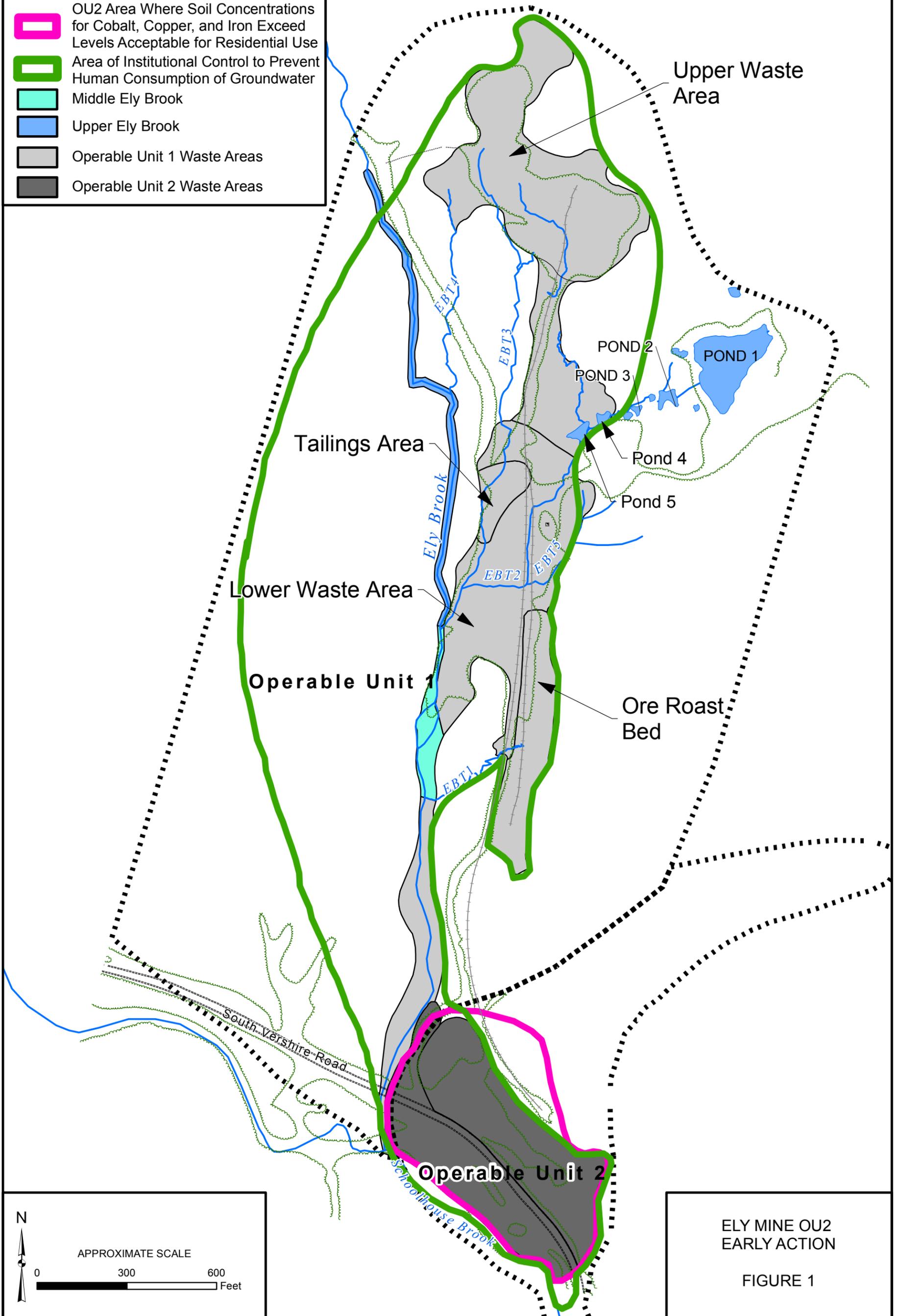
Community Acceptance

Does the public agree with the proposed remedial action?

A description of the proposed OU2 Early Action was included in the OU1 Proposed Plan. No community comments were received in opposition to the Early Action.

Legend

-  Treeline
-  Stream
-  Former Tramway
-  OU2 Area Where Soil Concentrations for Cobalt, Copper, and Iron Exceed Levels Acceptable for Residential Use
-  Area of Institutional Control to Prevent Human Consumption of Groundwater
-  Middle Ely Brook
-  Upper Ely Brook
-  Operable Unit 1 Waste Areas
-  Operable Unit 2 Waste Areas



ELY MINE OU2
EARLY ACTION
FIGURE 1

**ELY MINE OU2 EARLY ACTION
TABLE 1
HUMAN HEALTH RISK ASSESSMENT SUMMARY**

Exposure Point	RME																		
	Current				Future						Current/Future								
	Resident				Construction Worker		Resident				Recreational Visitor			Swimmer/Wader					
	Child		Adult		Adult		Child		Adult		Adolescent		Adult		Adolescent		Adult		
ILCR	HI	ILCR	HI	ILCR	HI	ILCR	HI	ILCR	HI	ILCR	HI	ILCR	HI	ILCR	HI	ILCR	HI		
Ely Copper Mine Surface Soil	4.9E-06	3.1 GI HI = 1.6 (Fe = 1.2); Thyroid HI = 1.0 (Co)	2.2E-06	0.34								6.7E-07	0.32	1.8E-06	0.29				
Ely Copper Mine Total Soil					7.4E-07	2.3 Nervous system HI = 1.1 (Mn = 0.85)	4.1E-06	4.5 Thyroid HI = 2.1 (Co); GI HI = 1.8 (Fe = 1.2)	1.9E-06	0.49									
Ely Brook Sediment																1.1E-07	0.050	2.7E-07	0.037
Ely Brook Surface Water																6.3E-09	0.12	1.5E-08	0.098
Schoolhouse Brook Sediment																4.4E-08	0.021	1.0E-07	0.015
Schoolhouse Brook Surface Water																NC	0.0074	NC	0.0059
Ompompanoosuc River Sediment																1.6E-07	0.019	3.7E-07	0.015
Ompompanoosuc River Surface Water																NC	0.00041	NC	0.00035
Overburden Groundwater								6.3E-05	274 (see table below)	1.1E-04 (due to arsenic)	117								
Shallow Bedrock Groundwater								4.0E-05	141 (see table below)	6.9E-05	60								
Deep Bedrock Groundwater								2.2E-05	55 (see table below)	3.8E-05	24								
Residential Groundwater								NC	0.32	NC	0.13								

Notes:

Geometric mean blood lead levels were below 10 µg/dL for all exposure points.

ILCR = Incremental lifetime cancer risk.

GI = gastrointestinal

HI = Hazard index.

NC = No carcinogens evaluated for this exposure point.

Total Overburden HI = 274 Thyroid HI = 142 (Co) GI HI = 98 (Cu = 80) Nervous system HI = 22 (Mn = 12) Kidney HI = 6.4 (Cd = 5.3) Skin HI = 1.6 (As) Systemic HI = 1.3 (Ni)	Total Shallow Bedrock HI = 141 Thyroid HI = 57 (Co) GI HI = 46 (Fe = 28) Nervous system HI = 32 (Al = 23) Kidney HI = 3.1 (Cd = 1.9) Blood HI = 1.1 (Sb = 0.72) Skin HI = 1.0 (As)	Total Deep Bedrock HI = 55 Thyroid HI = 33 (Co) GI HI = 16 (Cu = 14) Nervous system HI = 4.9 (Mn = 4.4)
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Green shading indicates ILCR less than 1E-06 and/or HI less than 1.
 Blue shading indicates ILCR between 1E-06 and 1E-04.
 Red shading indicates ILCR greater than 1E-04 and/or target organ HI greater than 1.

**Table 2-1
Ely Mine OU2 Early Action
Chemical-specific ARARs and TBCs
Alternative EA1 - No Action**

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TAKEN TO COMPLY WITH ARARs
STATE ARARs and TBCs			
Vermont Groundwater Protection Act, 10 VSA §§ 1390-94; Vermont Groundwater Protection Rule and Strategy, Env. Prot. Ch. 12-702 and 703	Applicable	Establishes standards for groundwater quality. Management criteria for each groundwater class are established as well as primary and secondary standards for groundwater protection. These are the primary groundwater standards if they are more stringent than federal standards.	The No Action alternative does not address risks from consuming drinking water within OU2 exceeding these human health standards.
Vermont Department of Health Drinking Water Guidance (October 2000).	To Be Considered	Lists the Vermont Health Advisories (VHAs) for chemicals of concern in drinking water. Vermont Health Advisories are researched and calculated concentrations of chemicals in drinking water in instances where the chemicals do not have a promulgated federal or state standard, or more stringent federal risk-based standard.	The No Action alternative does not address human health risks from drinking water within OU2 exceeding the standards derived from using this guidance.
FEDERAL ARARs AND TBCs			
EPA Risk Reference Doses (RfDs)	To Be Considered	Risk reference doses (RfDs) are estimates of daily exposure levels that are unlikely to cause significant adverse non-carcinogenic health effects over a lifetime.	The No Action alternative does not address non-carcinogenic risks from exposure to contaminated soil and groundwater within OU2 derived from using this guidance.
EPA Carcinogen Assessment Group, Cancer Slope Factors (CSFs)	To Be Considered	CSFs are used to compute the incremental cancer risk from exposure to contaminants and represent the most up-to-date information on cancer risk from EPA's Carcinogen Assessment Group.	The No Action alternative does not address carcinogenic risks from exposure to contaminated soil and groundwater within OU2 derived from using this guidance.
Guidelines for Carcinogen Risk Assessment EPA/630/P-03/001F (March 2005)	To Be Considered	Guidance for assessing cancer risk. Used to establish risk-based standards for managing waste rock at the Site.	The No Action alternative does not address carcinogenic risks from exposure to contaminated soil and groundwater within OU2, derived from using this guidance.
Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens EPA/630/R-03/003F (March 2005)	To Be Considered	Guidance of assessing cancer risks to children. Used to establish risk-based standards for managing waste rock at the Site.	The No Action alternative does not address carcinogenic risks to children from exposure to contaminated soil and groundwater within OU2, derived from using this guidance.
Safe Drinking Water Act, 42 U.S.C. §300f <i>et seq.</i> ; Maximum Contaminant Levels (MCLs), National primary drinking water regulations, 40 C.F.R. 141, Subparts B and G	Relevant and Appropriate	Establishes MCLs for common organic and inorganic contaminants applicable to public drinking water supplies. Used as relevant and appropriate standards for aquifers and surface water bodies that are potential drinking water sources.	The No Action alternative does not address risks from consuming drinking water within OU2 exceeding these human health standards.
Safe Drinking Water Act, 42 U.S.C. §300f <i>et seq.</i> ; Maximum Contaminant Level Goals (MCLGs), National Primary Drinking Water Regulations, 40 CFR Parts 141, Subpart F	Relevant and Appropriate for non-zero MCLGs only; MCLGs set as zero are To Be Considered	Establishes maximum contaminant level goals (MCLGs) for public water supplies. MCLGs are health goals for drinking water sources. These unenforceable health goals are available for a number of organic and inorganic compounds. Used as relevant and appropriate standards for aquifers and surface water bodies that are potential drinking water sources.	The No Action alternative does not address risks from consuming drinking water within OU2 exceeding these human health standards.
Health Advisories (EPA Office of Drinking Water)	To Be Considered	Health Advisories are estimates of risk due to consumption of contaminated drinking water; they consider non-carcinogenic effects only. To be considered for establish federal risk-based drinking water standards where the standard is more conservative than either federal or state statutory or regulatory standards. The Health Advisory standard for manganese is 0.3 ppm.	The No Action alternative does not address human health risks from drinking water within OU2 exceeding the standards derived from using this guidance.

**Table 2-2
Ely Mine OU2 Early Action
Chemical-Specific ARARs and TBCs
Alternative EA-2: Institutional Controls**

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TAKEN TO COMPLY WITH ARARs
STATE ARARs and TBCs			
Vermont Groundwater Protection Act, 10 VSA §§ 1390-94; Vermont Groundwater Protection Rule and Strategy, Env. Prot. Ch. 12-702 and 703	Applicable	Establishes standards for groundwater quality. Management criteria for each groundwater class are established as well as primary and secondary standards for groundwater protection. These are the primary groundwater standards if they are more stringent than federal standards.	While the Early Action alternative does not include cleanup to these groundwater protection standards, the alternative's institutional controls will prevent use of groundwater within OU2 until any exceedances can be addressed through an OU2 ROD.
Vermont Department of Health Drinking Water Guidance (October 2000).	To Be Considered	Lists the Vermont Health Advisories (VHAs) for chemicals of concern in drinking water. Vermont Health Advisories are researched and calculated concentrations of chemicals in drinking water in instances where the chemicals do not have a promulgated federal or state standard, or more stringent federal risk-based standard.	While the Early Action alternative does not include cleanup to the risk-based drinking water standards derived from this guidance, the alternative's institutional controls will prevent use of drinking water within OU2 until any exceedances can be addressed through an OU2 ROD.
FEDERAL ARARs AND TBCs			
EPA Risk Reference Doses (RfDs)	To Be Considered	Risk reference doses (RfDs) are estimates of daily exposure levels that are unlikely to cause significant adverse non-carcinogenic health effects over a lifetime.	While the Early Action alternative does not include cleanup to the non-carcinogenic risk-standards for OU2 contaminated soil and groundwater derived from using this guidance, the alternative's institutional controls will prevent residential exposure to soils and exposure to contaminated groundwater until any exceedances can be addressed through an OU2 ROD.
EPA Carcinogen Assessment Group, Cancer Slope Factors (CSFs)	To Be Considered	CSFs are used to compute the incremental cancer risk from exposure to contaminants and represent the most up-to-date information on cancer risk from EPA's Carcinogen Assessment Group.	While the Early Action alternative does not include cleanup to the carcinogenic risk-standards for OU2 contaminated soil and groundwater derived from using this guidance, the alternative's institutional controls will prevent residential exposure to soils and exposure to contaminated groundwater until any exceedances can be addressed through an OU2 ROD.
Guidelines for Carcinogen Risk Assessment EPA/630/P-03/001F (March 2005)	To Be Considered	Guidance for assessing cancer risk. Used to establish risk-based standards for managing waste rock at the Site.	While the Early Action alternative does not include cleanup to the carcinogenic risk-standards for OU2 contaminated soil and groundwater derived from using this guidance, the alternative's institutional controls will prevent residential exposure to soils and exposure to contaminated groundwater until any exceedances can be addressed through an OU2 ROD.
Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens EPA/630/R-03/003F (March 2005)	To Be Considered	Guidance of assessing cancer risks to children. Used to establish risk-based standards for managing waste rock at the Site.	While the Early Action alternative will not attain the carcinogenic child risk-standards for OU2 contaminated soil and groundwater derived from using this guidance, the alternative's institutional controls will prevent residential exposure to soils and exposure to contaminated groundwater until any exceedances can be addressed through an OU2 ROD.
Safe Drinking Water Act, 42 U.S.C. §300f <i>et seq.</i> ; Maximum Contaminant Levels (MCLs), National primary drinking water regulations, 40 C.F.R. 141, Subparts B and G	Relevant and Appropriate	Establishes MCLs for common organic and inorganic contaminants applicable to public drinking water supplies. Used as relevant and appropriate standards for aquifers and surface water bodies that are potential drinking water sources.	While the Early Action alternative does not include cleanup to these groundwater protection standards, the alternative's institutional controls will prevent use of groundwater within OU2 until any exceedances can be addressed through an OU2 ROD.
Safe Drinking Water Act, 42 U.S.C. §300f <i>et seq.</i> ; Maximum Contaminant Level Goals (MCLGs), National Primary Drinking Water Regulations, 40 CFR Parts 141, Subpart F	Relevant and Appropriate for non-zero MCLGs only; MCLGs set as zero are To Be Considered	Establishes maximum contaminant level goals (MCLGs) for public water supplies. MCLGs are health goals for drinking water sources. These unenforceable health goals are available for a number of organic and inorganic compounds. Used as relevant and appropriate standards for aquifers and surface water bodies that are potential drinking water sources.	While the Early Action alternative does not include cleanup to these groundwater protection standards, the alternative's institutional controls will prevent use of groundwater within OU2 until any exceedances can be addressed through an OU2 ROD.

**Table 2-2
Ely Mine OU2 Early Action
Chemical-Specific ARARs and TBCs**

Health Advisories (EPA Office of Drinking Water)	To Be Considered	Health Advisories are established for contaminated drinking water; they consider non-carcinogenic effects only. To be considered for establish federal risk-based drinking water standards where the standard is more conservative than either federal or state statutory or regulatory standards. The Health Advisory standard for manganese is 0.3 ppm.	While the Early Action alternative does not include cleanup to the risk-based drinking water standards derived from this guidance, the alternative's institutional controls will prevent use of drinking water within OU2 until any exceedances can be addressed through an OU2 ROD.
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THERE ARE NO LOCATION-SPECIFIC ARARS FOR ALTERNATIVE EA-2: INSTITUTIONAL CONTROLS

**Table 2-3
Ely Mine OU2 Early Action
Action-Specific ARARs and TBCs
Alternative EA-2: Institutional Controls**

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TAKEN TO COMPLY WITH ARARs
STATE ARARs			
Vermont Groundwater Protection Act, 10 VSA §§ 1390-93; Vermont Groundwater Protection Rule and Strategy, Env. Prot. Ch. 12-803 and 804	Applicable	When monitoring groundwater quality pursuant to the Rules, if the concentration of a substance in groundwater reaches or exceeds a preventive action level or an enforcement standard these Rules permit the prohibition or closure and abandonment of an activity	Under the Early Action installation of wells within OU2 where groundwater exceeds state groundwater standards will be prohibited (including establishment of any required buffer zone to prevent contaminated groundwater being drawn from the contaminated area)
Vermont Water Supply Rule: Construction and Isolation Standards for Wells, Env. Prot. Ch. 21-12, Appendix A	Applicable	Establishes isolation distances between any water supply wells and any waste disposal sites. The rules also regulate the installation and abandonment of monitoring wells.	Under the Early Action no drinking water wells will be permitted within the isolation distance established under these rules from any waste area within OU2.
Vermont Solid Waste Management Rules (VSWMR), Management of Mining and Mineral Processing Waste, Env. Prot. R. § 6-1305,	Applicable	These substantive requirements under these Rules regulate the slag/tailings wastes that were produced as part of the processing of ore at the Site, but the rules do not apply to unprocessed waste rock. Section 6-1305 establishes the closure and post-closure performance standards that are applicable to the remedial action. Under these closure standards residences should not be within 1000 feet of regulated waste material. In addition, the Rules authorize any measures that are necessary to protect human health and safety, the environment, or to prevent the creation of a nuisance.	Under the Early Action residential development will be prohibited within any areas of regulated mine material within OU2.
FEDERAL ARARs - None			