



Eagle Mine Superfund Site Battle Mountain Proposed Development

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

● REGION 8 ●

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Feasibility Study Report Available for Public Review

Introduction

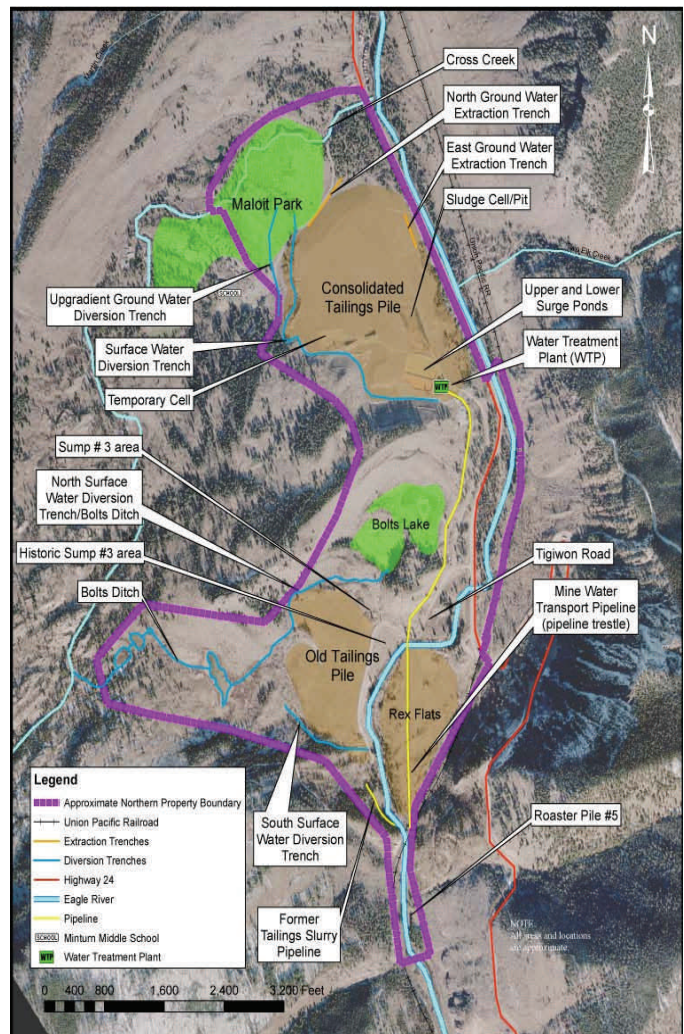
The Feasibility Study Report for the North Property of the Eagle Mine Superfund Site is now available for public review. The Feasibility Study describes how certain alternatives were developed that can be used to remediate areas of the North Property of the Eagle Mine Superfund Site. The North Property is a part of a proposed residential ski and golf development called Battle Mountain and is proposed to be annexed by the town of Minturn.

Ginn Battle North, the current owner of the North Property, and its environmental consultant conducted this Feasibility Study in 2006, based on the extensive testing and site characterization activities they conducted in 2005. The U.S. Environmental Protection Agency (EPA) and the Colorado Department of Public Health and Environment (CDPHE) provided oversight.

Previous cleanup activities on the North Property were not intended to achieve cleanup levels for residential or recreational uses. As a result, Ginn Battle North is taking the steps required in the Superfund process to allow for potential residential and recreational use. This Feasibility Study is an important piece of that process.

EPA requires several key components to be included in a Feasibility Study. The study should develop Remedial Action Objectives and describe General Response Actions and technologies that can meet those remedial action objectives. The study then screens the general response actions to develop remedial alternatives.

The North Property encompasses portions of the Eagle Mine Superfund Site, located south of Minturn, Colorado. The North Property historically received the waste (tailings) from the ore beneficiation (crushing, grinding, washing, extraction) operations during mining operations at the Eagle Mine from the 1880s until 1984. The North Property is referred to as the “Bolts Lake



Eagle Mine Superfund Site North Property Map

Character Area” in the Minturn annexation process.

Specifically, the North Property includes the following areas: The Old Tailings Pile, Rex Flats, Maloit Park, Roaster Pile #5, and the Consolidated Tailings Pile areas, which were all part of the Eagle Mine Superfund Site. The North Property also includes Bolts Lake and the Highlands Area, which are located adjacent to features of the Eagle Mine Superfund Site. Please refer to the site map on page 1.

Nature and Extent of Contamination

The 2006 Remedial Investigation Report detailed the nature and extent of the residual mining contamination in the soil, water and certain other features of the North Property. A brief summary of the findings from the remedial investigation is presented here:

- **Soil** - Overall, arsenic, lead and manganese-contamination in the soil, tailings, and boulders throughout the North Property pose a risk to residential users. The soil also leaches metals into the subsurface soil and groundwater, and water running through the soil delivers heavy metals into the Eagle River during snow melt and precipitation events.
- **Surface Water** - Zinc is the primary metal of concern in surface water on the North Property, particularly in the Eagle River, due to its negative impact on the brown trout population.
- **Groundwater, Seeps, and Trenches** - Groundwater contaminated with various combinations of dissolved cadmium, zinc, manganese, arsenic, iron, copper, and other metals is found throughout the site, particularly in areas including the Old Tailings Pile, Rex Flats, and the Consolidated Tailings Pile.

Human Health Risk Assessment

Risk assessors from EPA and CDPHE used data from the Remedial Investigation to conduct a Human Health Risk Assessment (HHRA) for the

North Property. The HHRA describes the potential for site-related risks to humans.

The HHRA identified future long-term residents of the proposed development, recreationalists (hikers, anglers, rafters, golfers), and construction/golf course workers as best representing the range of potential users of the site. The HHRA determined that the greatest risk to human health at the North Property resulted from inhaling, ingesting, or touching metals in impacted soil, tailings, and boulders at the Consolidated Tailings Pile, Old Tailings Pile, Rex Flats, and Roaster Pile #5.

All areas demonstrate excess noncancer and cancer risks for at least one potential user group. The major contributors to noncancer risk are arsenic, iron, manganese, and thallium. The major contributor to cancer risk is arsenic. Lead causes excess risk levels at all locations except Bolts Lake and the Old Tailings Pile.

As stated above, a Feasibility Study develops site-specific Remedial Action Objectives and General Response Actions. To do so, information from the Remedial Investigation and the Human Health Risk Assessment is combined with other information, including preliminary remediation goals, statistical background concentrations, general soil screening levels, Applicable or Relevant and Appropriate Requirements (ARARs), media of concern, contaminants of concern, and future land-use considerations.

ARARs

Applicable or Relevant and Appropriate Requirements (ARARs), are legally enforceable State and Federal requirements. The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) requires that remedial actions comply with the substantive requirements of ARARs, which are developed on a site-specific basis. There are 46 currently identified ARARs for the North Property, including the Colorado surface and groundwater standards, solid waste regulations, endangered species protection, wetlands regulations and historic preservation requirements, among others.

Media of Concern:

The Remedial Investigation identified soil, tailings, boulders, surface water, and groundwater as media of concern at the Consolidated Tailings Pile, Old Tailings Pile, Rex Flats, and Roaster Pile #5. Air quality is not currently impacted at the site due to the prior remedial activities conducted by the potentially responsible party, CBS Operations, Inc., formerly Viacom International. The Remedial Investigation showed that metals contamination poses risks to humans and ecological receptors in all identified media of concern in the above areas.

Chemicals of Concern

The Remedial Investigation, coupled with information on the former use of the North Property, identified several chemicals of concern (COCs): arsenic, cadmium, chromium, copper, lead, manganese, and zinc.

Future Land Use Considerations

In its current condition, soil and groundwater contaminants remain on the North Property that could pose a chronic human health risk. Ginn Battle North has proposed reuse of the North Property as a residential, commercial, and recreational development. Additionally, a water storage reservoir complex is proposed for the site.

Development of Remedial Action Objectives

Remedial Action Objectives (RAOs) are general cleanup objectives designed to protect human health and the environment. Based on all of the above information, the following four Remedial Action Objectives were developed in the Feasibility Study specifically for the North Property:

RAO 1: Restrict, to the extent necessary, the potential contact of water onsite with contaminated materials, which may result in unacceptable risk to human health or the environment.

RAO 2: Protect the health of persons who live on, work at, or recreationally use the North Property

from exposures to chemicals of concern that exceed protective concentrations; and

RAO 3: Prevent, to the extent practicable, further degradation of surface water quality in the Eagle River. Assure shallow groundwater discharges into the Eagle River do not present unacceptable risks to human health or the environment.

RAO 4: Avoid or minimize adverse impacts to the existing remedial features of the Eagle Mine Superfund Site that are situated on the North Property.

Development of General Response Actions

General Response Actions (GRAs) describe categories of remedial actions that eliminate, reduce, or control risks and provide a basis for identifying specific remediation technologies. Eight GRAs were identified and evaluated in the Feasibility Study. The GRAs must meet the Remedial Action Objectives and the ARARs. The GRAs were evaluated based on the contaminants on site, media in which they exist, exposure pathways, and future use objectives. The GRAs identified for the North Property include:

- **GRA 1**—No Action
- **GRA 2**—Containment Technologies
- **GRA 3**—Excavation Technologies
- **GRA 4**—Solids Treatment Technologies
- **GRA 5**—Water Management Technologies
- **GRA 6**—Water Treatment and Discharge Technologies
- **GRA 7**—Demolition and Debris Treatment Technologies
- **GRA 8**—Institutional Controls and Monitoring

Identifying Remedial Technologies

Potential remedial technologies that fall within the categories of the General Response Actions were identified by drawing on a variety of sources including EPA guidance documents, standard engineering texts, documented experience at sites of similar scope and size, and consistency with the planned development.

Following identification, the technologies were evaluated and screened. CERCLA requires that the remedial technologies identified must:

- Attain or waive ARARS;
- Be protective of human health and the environment;
- Be cost effective;
- Use permanent solutions and alternative technologies or resources to the maximum extent practicable; and
- Satisfy the preference for treatment that reduces the toxicity, mobility, and volume of hazardous constituents on site.

The following GRAs and associated remedial action technologies were retained in the Feasibility Study and considered for the North Property:

A. No Action

B. Soil Cover with Associated Cap

1. Soilcover with single flexible membrane liner (FML)

2. Evapotranspiration soil cover

3. Soil cover with geosynthetic clay liner (GCL)

4. Engineered concrete cap– placement of 10 inch (minimum) concrete mat foundation or footing underlain by 6 to 12 inches of clean soil

5. Engineered concrete cap –placement of concrete slab foundation underlain with 1-meter (minimum) of clean soil

C. Reservoir Complex Liners

1. Synthetic single-liner system with down-gradient ground water interceptor trench

2. Synthetic double-liner system with primary GCL liner and secondary FML with interstitial leak detection and collection

D. Surface Water Control

1. Shallow ground water interceptor trenches

2. Surface Grading

E. Selected Excavation with removal to on-site disposal areas

F. Demolition of structures, excavation of foundation, and disposal

G. Institutional Controls and Monitoring

Remedial Alternatives for the North Property

The following remedial action alternatives are comprised either solely or as some combination of the above GRAs and technologies retained and described above.

Alternative 1: No Action

Alternative 2: Selected Excavation/Grading/Soil Cover with Concrete Cap

Alternative 3: Selected Excavation/Grading/Evapotranspiration Cover

Alternative 4: Selected Excavation/Grading/Soil Cover with Synthetic Liner

Alternative 5: Selected Excavation/Grading/Reservoir Complex Single-Liner/Interceptor Trench/Water Treatment

Alternative 6: Selected Excavation/Grading/Reservoir Complex Double-Liner/Leak Detection System

Alternative 7: Interceptor Trench/Water Treatment System

Alternative 8: Demolition of Structures

Maloit Park: 3,4,9

Alternative 9: Institutional Controls and Monitoring

The Old Tailings Pile: 2,3,4,5,8,9

Highlands Area: 3,4,9

Rex Flats: 2,3,7,8,9

Roaster Pile #5: 3,9

Comparative Analysis of Alternatives

The Feasibility Study presents a detailed comparative analysis between the remedial alternatives. Each alternative is assessed against established evaluation criteria, as required by CERCLA. The evaluation criteria includes:

- Overall protection of human health and the environment;
- Compliance with ARARs;
- Long-term effectiveness and permanence;
- Preference for treatment that reduces toxicity, mobility, or volume as a principal element or provide an explanation in the Record of Decision (ROD) as to why it does not;
- Short-term effectiveness;
- Implementability;
- Cost effectiveness; and
- State and community acceptance

Location-Specific Remedial Alternatives

As stated earlier, the North Property comprises several areas which were considered in this FS. Based on the proposed future land uses intended for these areas, the FS recommends the following combinations of remedial alternatives for each area as follows:

AREA	PREFERRED ALTERNATIVES
The Consolidated Tailings Pile:	3,4,9
Bolts Lake:	5,9

Background

EPA first listed the Eagle Mine and its surroundings, including portions of the North Property, on the National Priorities List, or list of Superfund sites, in 1986. EPA and CDPHE continue to oversee an extensive environmental cleanup, a majority of which was completed in 2001.

The purpose of the current remedy for the Eagle Mine site is to control the transport of metals from various sources to the Eagle River. Residential redevelopment was not considered as a future use for the North Property during previous remedial activities.

As a result, portions of the North Property remain a Superfund site primarily due to the presence of residual tailings and metals concentrations in the soil, surface water, and groundwater considered to be potentially harmful to human health.

Ongoing remediation activities on the North Property include groundwater extraction and treatment at the water treatment plant located at the Consolidated Tailings Pile, continued revegetation monitoring, and remediation of an existing seep at the Old Tailings Pile. The water treatment facility is treating water collected from the Eagle Mine.

In 2004, Ginn Battle North approached EPA and CDPHE with a preliminary proposal to redevelop the North Property into a private, residential golf course community. This proposed new use requires additional cleanup actions to ensure that residents, workers and visitors to the proposed redevelopment are protected.

Next Steps

After the public has had time to review the Feasibility Study, EPA and CDPHE will issue a Proposed Plan for cleanup, probably sometime in spring 2007. The Proposed Plan will analyze the alternatives discussed and suggested in the Feasibility Study and will present the alternatives preferred by EPA and CDPHE. The public will be notified of the availability of the Proposed Plan and associated public comment period.

Finally, a Record of Decision will be issued detailing which cleanup alternative presented in the Proposed Plan was selected. The Record of Decision will include a written response to public comments received.

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Or visit one of the Eagle Mine Superfund Site information repositories at any of the following locations:

Colorado Department of Public Health
and the Environment Records Center
4300 Cherry Creek Drive South
Denver, CO 80246-1530
(303) 692-3331
1-888-569-1831, ext. 3331

The Environmental Protection Agency
Records Center
1595 Wynkoop Street
Denver, CO 80202
(303) 312-6473

Minturn Town Hall
Town Manager's Office
302 Pine Street
Minturn, CO 81645
970-827-5645

You can also view information and download documents related to the Eagle Mine Site North Property redevelopment proposal one of the following Web sites:

<http://www.epa.gov/region8/superfund/co/eagle/>

<http://www.cdphe.state.co.us/hm/rpeagle.htm>