

INACTIVE MINE LAND REUSE

Summit County, Colorado

2003 National Site Assessment Symposium

Pittsburgh, Pennsylvania

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Project Overview

- EPA, the Colorado Department of Public Health and Environment (CDPHE), Summit County Open Space and Trails Department, and the town of Breckenridge have coordinated to evaluate the feasibility of purchasing 1800 acres of property containing inactive and abandoned mines for the purpose of conserving the property as open space and wildlife habitat.

Site Description

- Area consists of approximately 1,800 acres of undeveloped land near the resort town of Breckenridge in Summit County, Colorado.
- Isolated segments of the property are heavily impacted by historic mining operations.

Site Ownership

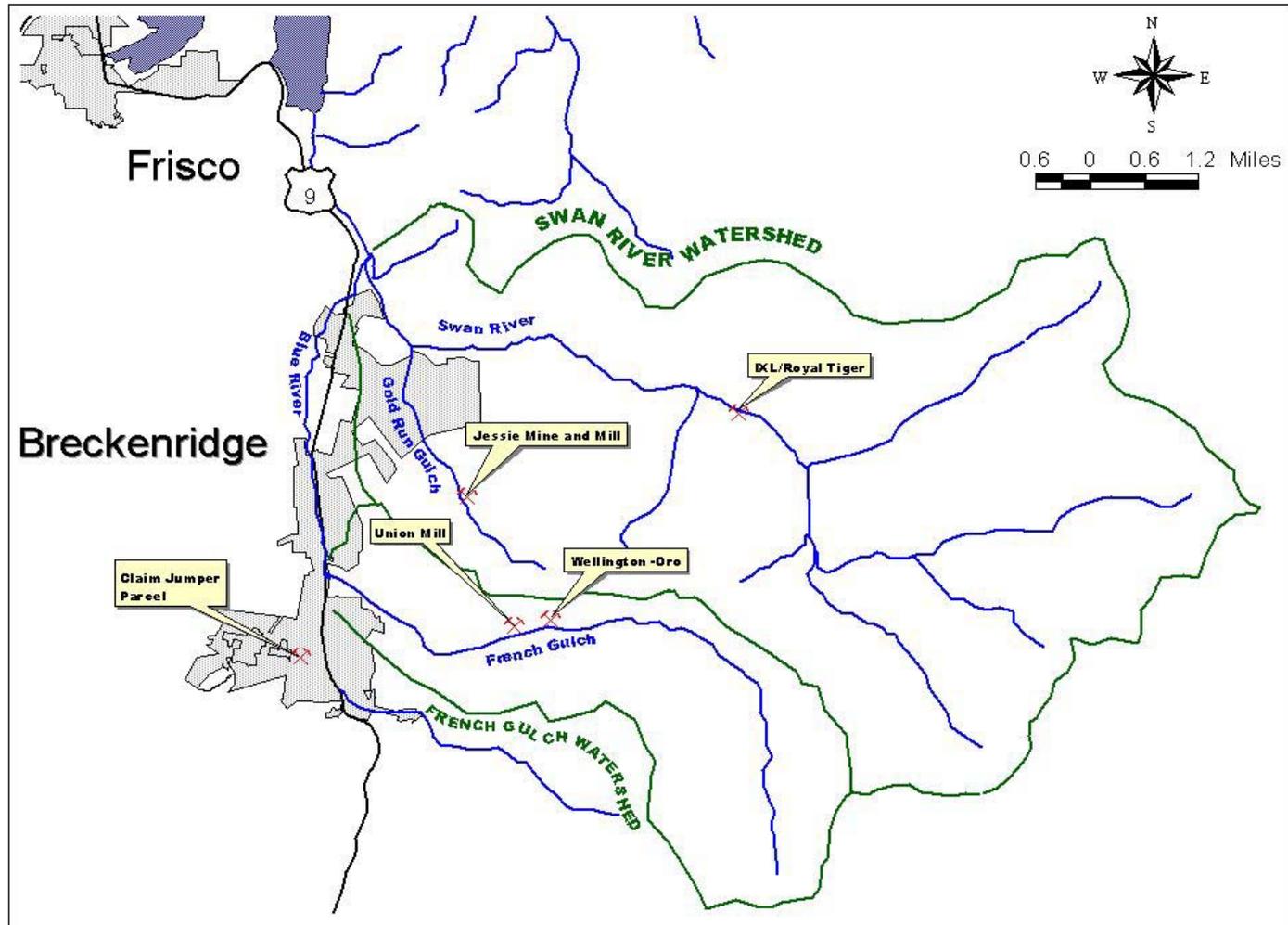
B&B Mines Sites: (Property that is the primary focus of investigations)

- Wellington-Oro
- IXL/Royal Tiger
- Jessie Mine and Mill

USDA Forest Service Sites:

- Union Mill Site
- Claim Jumper Parcel

Site Locations



Impacts of Mining Operations

- Acid mine drainage from hard rock mines.
- Tailings and waste rock materials contaminated with heavy metals.
- Habitat destruction in stream valleys from gold dredging (large-scale placer mining).

Gold Dredging



V. 189. Gold Dredge, Breckenridge, Col.

French Creek Dredging



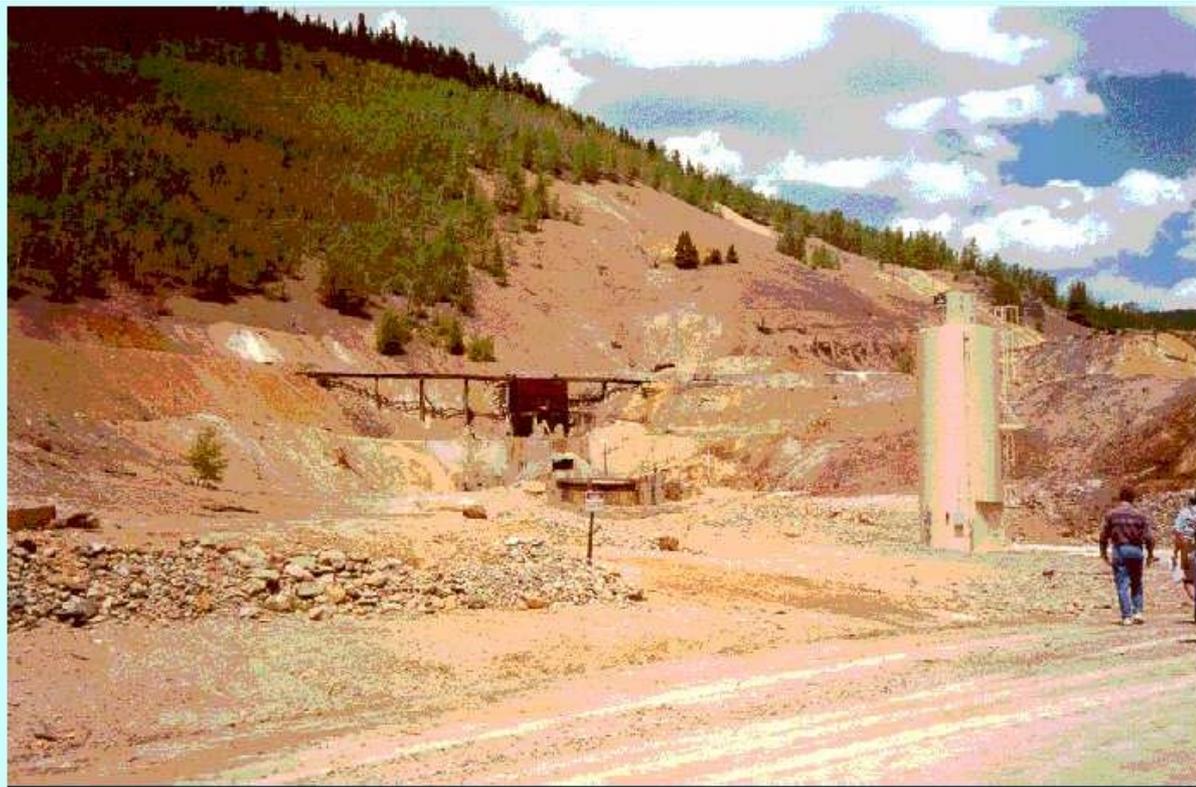
Wellington-Oro



- Lead-Zinc-silver sulfide and gold lode mining.
- Original claim in 1881.
- Operations began 1887.
- Operations ceased in 1973.

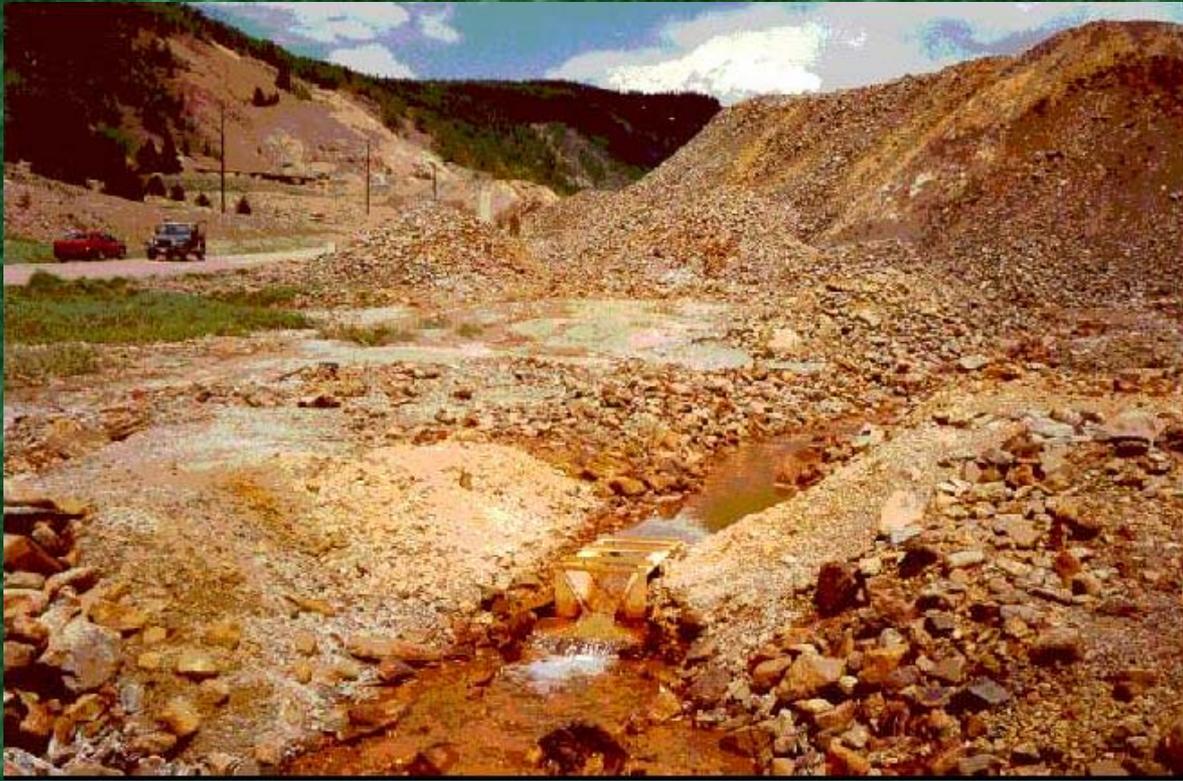
Wellington-Oro

(Legacy)



- Waste rock and tailings containing inorganic contaminants
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- Over twelve miles of flooded mine tunnels.

Wellington-Oro Mine Pool



- Flooded mine workings surface via faults and fractures and migrate to French Creek.
- Acutely toxic concentrations of zinc and cadmium impact French Creek.
- Contamination has decimated all aquatic life in French Creek and resulted in fish kills in Blue River.

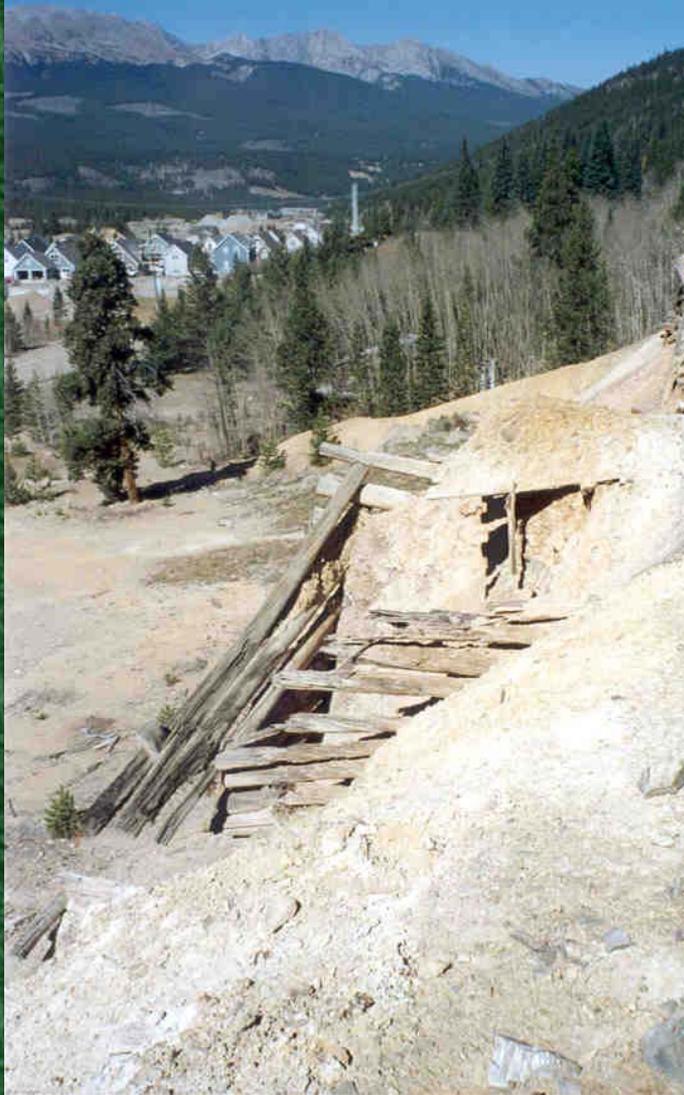
Wellington-Oro Removal Actions

- EPA Region 8 conducted a Preliminary Assessment in 1995, and Site Inspection in 1997.
- B&B Mines conducted subsequent removal activities under order from EPA.
- B&B Mines performed surface reclamation and consolidation and capping of wastes at the Wellington-Oro Mine in 1998.

Prospective Purchaser Agreement

- Interest in development resulted in a Prospective Purchaser Agreement (PPA) between EPA, CDPHE, and a local residential housing developer, and for purchase of B&B Mines property downstream of the Wellington-Oro Mine site.
- The PPA required the proceeds from sale of the property for the Wellington Neighborhood development to be placed in escrow for use in cleanup of the Wellington-Oro site.

Wellington Neighborhood



- Affordable housing project established to assist local residents in purchasing a home.
- Constructed on B&B property with proceeds from sale of property going into an escrow account for use in funding cleanup at the Wellington-Oro site.
- Development has received numerous “Smart-growth” Awards.

Relationships/Negotiated Agreements

Sales Agreement

**Summit County/
Breckenridge**

B&B Mines

**Prospective
Purchaser
Agreement (PPA)**

**Consent Decree
(CD)**

**EPA/CDPHE
DOJ/AGO**



Cleanup for Land Transaction

- B&B Mines is a cash-poor/land-rich entity with large property holdings in Summit County.
- Summit County and Breckenridge became interested in purchasing B&B Mines property for recreation and open space preservation.

Open Space Acquisition

- Summit County and the Town of Breckenridge would purchase the B&B Mines in-holdings for the purpose of Open Space preservation.
- Purchase Price would be discounted based on the estimated cost of cleanup for B&B mines properties.

Nature of Investigations

- CDPHE, through its grant with EPA, conducted initial investigations of identified mine sites present on the property under the PA/SI program.
- The data collected during these investigations were utilized to evaluate cleanup alternatives and costs for site remediation.

CDPHE Investigations

- Under the Site Assessment program, CDPHE conducted SI's at the Jessie and IXL/Royal Tiger mine and mill sites.
- These investigations were conducted to determine potential CERCLA eligibility and assist Summit County and Breckenridge in determining potential environmental remediation costs associated with property purchase.

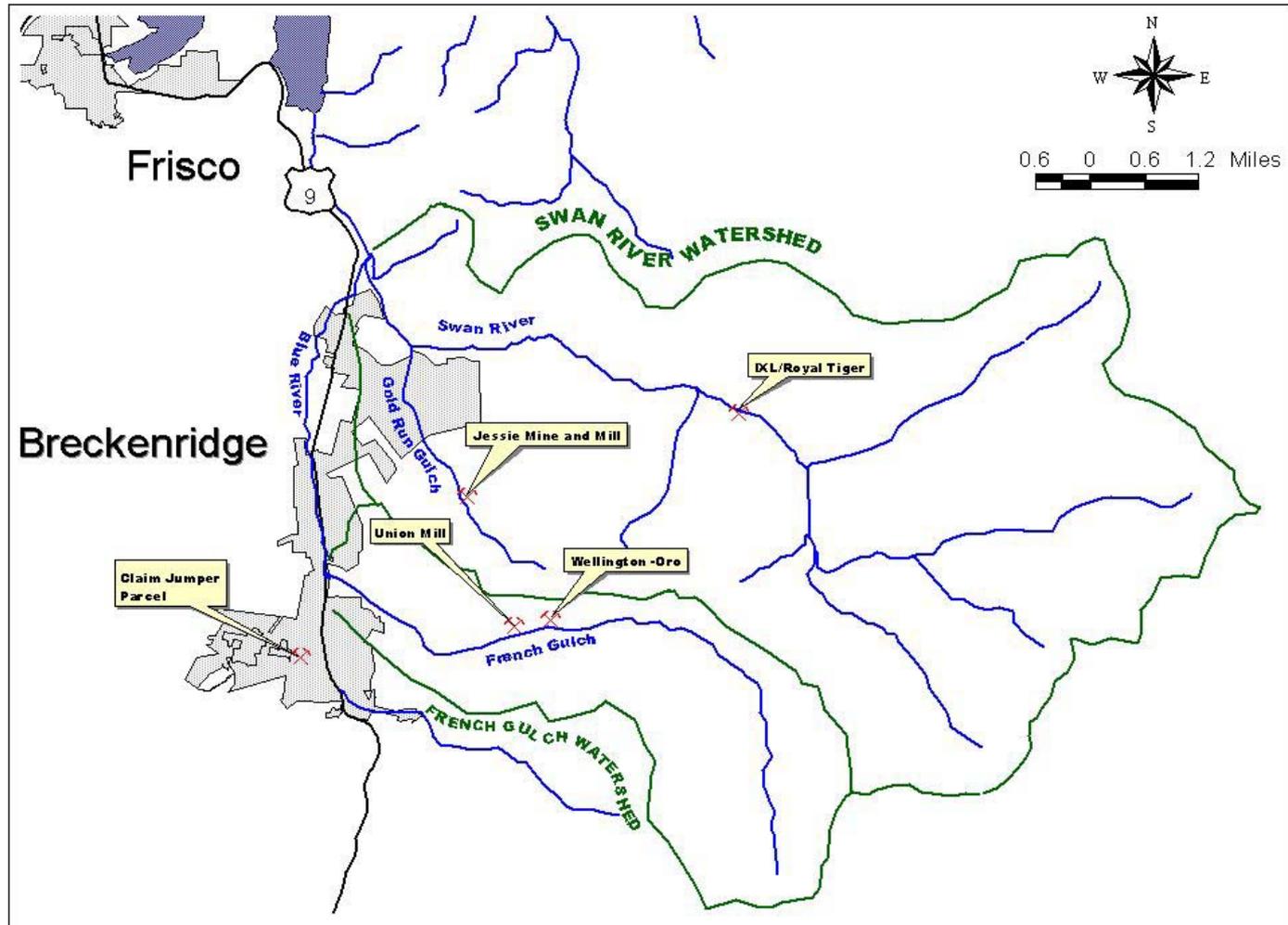
Targeted Brownfields Assessments (TBAs)

- CDPHE conducted TBAs (utilizing previously collected SI data in an EE/CA-type format) to estimate costs associated with various cleanup alternatives.
- The results of the TBAs are intended to assist Summit County and Breckenridge in negotiating a purchase price for the B&B properties that is reflective of the potential environmental liability associated with cleanup of inactive and abandoned mining sites on the B&B Property.

Brownfields

- The Site Inspections on the Jessie and IXL/Royal Tiger Mine and Mill sites were designed to collect additional information that would be useful in evaluating potential cleanup alternatives.
- Using these additional data, CDPHE used Brownfields Site Assessment funding to perform Engineering Evaluations and Cost Analyses on the Jessie and IXL/Royal Tiger sites.
- These TBAs helped determine estimated cleanup costs for the properties for the purposes of negotiating the final price for city and county to purchase the property from B&B Mines.

Site Locations



IXL/Royal Tiger



Colorado Department
of Public Health
and Environment
Hazardous Materials and
Waste Management Division

FIGURE 3

Detailed Sample Location Map

IXL/Royal Tiger
Mine and Mill Site
Summit County, Colorado

- - Soil Sample
- ⬡ - Waste Source Sample
- ▲ - Surface Water/Sediment Sample
- ▲ - Adit Sample Location

Prepared By: Kevin Mackey

Royal Tiger

(Circa 1923)



IXL/Royal Tiger Adit

- Flow – 0.4 cfs
- pH – 5.98
- Zn – 4,000 $\mu\text{g/L}$
- Cd – 18 $\mu\text{g/L}$
- Mn – 1,100 $\mu\text{g/L}$

