

# Background/History:

## A New Model for Reclamation in the American West

“With ownership of the pollution and control of the land...comes the power to shape the post-mining landscape in a way that goes far beyond just cleaning it up.”

-KIRK JOHNSON, 2006

*Denver Bureau Chief, The New York Times*

Historically, in the western United States, mineral mining has been a temporary use of the land. After the economically recoverable minerals had been removed, mines were abandoned, impacting the characteristics of the surrounding property and environmental systems well beyond their footprint. The alterations included waste-rock piles, mineral-recovery processing waste piles, and continuous discharges of acidic metal-laden water, known as acid-mine drainage.

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Quoted from “Out of Old Mines’ Muck Rises New Reclamation Model for West.” The New York Times 4 March 2006: National Section A8

They often result in adverse environmental or human-health impacts. The number of abandoned mining sites in the United States is technically unknown, but estimates range in the three-to-five hundred thousand range.<sup>1</sup> The cleanup of environmental problems at abandoned mine sites is a multi-faceted combination of technical, financial, and liability challenges. Without successfully addressing every issue, cleanup moves very slowly, if at all. This is certainly true at the French Gulch site, a century-old metals-mining district, located just outside Breckenridge, Colorado: the mine owners and operators either no longer exist or have limited resources, and those wishing to help voluntarily fix the problem have been scared off by laws that would hold them responsible if the cleanup were insufficient or cleanup standards changed.

## French Gulch and FROG

The impacts from abandoned mining in French Creek were significant enough that EPA was considering the site to be included in the Superfund Program in the early 1990s. However, local government officials resisted this due to their concern over the effect that EPA Superfund involvement would have on their community and tourist economy. A community-based approach was proposed by EPA to resolve these issues. This led to the formation of the French Gulch Remedial Opportunities Group (FROG), a stakeholders group formed to develop plans to address mining related environmental impacts within French Gulch. This common vision

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<sup>1</sup> See Berger, Alan, editor. *Designing the Reclaimed Landscape*. London: Taylor & Francis, 2008. Especially see Victor Ketellapper’s essay pp. 77-86 for the detailed history of FROG. Also see Kirk

Johnson. “Out of Old Mines’ Muck Rises New Reclamation Model for West.” The New York Times 4 March 2006: National Section A8

provides a foundation for a unique multiparty settlement that defined environmental liability, provided funding for mine reclamation projects, and allowed the purchase of abandoned mines and adjacent properties for open space, outdoor recreation, habitat preservation, historical preservation and affordable housing. In order to promote stakeholder involvement and a collaborative process for environmental decision making at the French Gulch Site, FROG was formed in the spring of 1995. The participants included citizens, county commissioners, Breckenridge town-council members, the Breckenridge town manager, county and city open-space managers, ski-area representatives, landowners, and state and federal regulatory and land-management agency representatives. B&B Mines, the company that owned the Wellington-Oro Mine, as well as more than 1,800 acres of mining claims in French Gulch and the adjacent Swan River watershed, also participated in the FROG.

## **French Gulch Mining History and Water Treatment**

The French Gulch site is a watershed impacted by abandoned mines in the Rocky Mountains east of the Town of Breckenridge, Colorado. The two primary environmental concerns associated with the district's mine sites are the aquatic-life impacts from acid mine drainage discharging from the abandoned Wellington-Oro Mine and the potential human-health impacts from long-term

exposure to mine wastes with elevated levels of lead and arsenic.

Extensive placer and underground lode mining occurred in French Gulch from the late 1850s to the 1960s. Placer-gold mining began in French Gulch in 1859 with small gravity-separation operations; the dredging operations that followed continued until the 1940s. The dredging operations resulted in forty to fifty foot high piles and ridges of cobbles and gravel-size placer tailings throughout the valley floor. Underground lode mining began in 1889 and continued through the 1960s. The underground mines typically produced high-grade zinc-lead-silver ores, as well as some gold ores. Underground mining left numerous shafts, adits, waste rock, and tailings throughout the Gulch.

The Wellington-Oro Mine and Mill Complex was the largest mining operation on the site. Producing lead-zinc-copper-sulfide and gold ores, it operated from the 1880s to the 1930s. The underground mine workings consisted of more than twelve miles of tunnels, adits, drifts, stopes, and crosscuts and extending more than a thousand feet below the ground surface. Major portions of these mine workings are now flooded. As water migrates through the mine workings it reacts with the mineralized rock generating sulfuric acid. The acidic water then draws metals into solution. At the Wellington-Oro Mine, the water migrating through the mine becomes contaminated with zinc and cadmium. Eventually, this contaminated water reaches and

mixes with water in French Creek, causing French Creek to become toxic to aquatic life.

In 2003 EPA conducted an engineering feasibility study to evaluate alternatives for the collection and treatment of the readily collectable contaminated seepage. The findings were presented to the public in May 2004. The public was supportive of EPA's proposed cleanup plan that included the collection and treatment of acid mine drainage seeping from the Wellington Oro Mine spring. The estimated cost to implement the plan including long-term operations was \$5 million.

## **From Waste to Place: Wellington Neighborhood**

People who work in the historic resort town of Breckenridge are being forced to live out of the area by median costs of \$725,000 for a single-family home. For many workers, affordable single-family homes were only available across Hoosier Pass, a forty-five-minute commute over treacherous mountain roads. A developer, David O'Neil, proposed to the FROG an eighty-five-acre site in French Gulch, on the town's outskirts, as an ideal location for the development of an affordable-housing community.

This property, however, was impacted by historic placer-mining activities and by the adjacent Union Mine and Mill site. Elevated levels of lead and arsenic in soils on a small portion of the property

would be a hazard to human health if the property were developed into a residential community. The developer proposed to construct affordable housing and conduct mine reclamation on the property. The proposal was accepted by the town and the mining company. The community was named the Wellington Neighborhood.

Approval of the subdivision prompted the U.S. Forest Service to reclaim the Union Mine and Mill site that was located on land it managed. The U.S. Forest Service was concerned that the mining wastes bearing elevated levels of lead and arsenic would pose an unnecessary health risk to residents of the Wellington Neighborhood. To address the environmental liability concerns raised by the residential development, a Prospective Purchaser Agreement was negotiated and signed by the developer, EPA, and Colorado Department of Public Health and Environment (CDPHE). This agreement described the mine reclamation work that the developer agreed to conduct on the property, and established lead and arsenic soil-action levels of five hundred parts per million (ppm) and fifty ppm, respectively. The developer had to deal with the placer tailings (piles of waste rock) strewn throughout the valley floor. Placer tailings do not pose a public or environmental health risk in their current form. However, the placer mining and dredging of the valley floor destroyed the natural ecosystem by removing soil and plant life.

Since the property was being purchased from B&B Mines, the company responsible for a portion of the mine reclamation work in French Gulch, \$850,000 generated from the sale of the property was set aside for future investigation, design, and reclamation of mining sites throughout French Gulch. The first phase of the Wellington Neighborhood affordable-housing development was completed in 2006.

Eighty percent of the homes constructed were reserved for purchase by people who work in Summit County at about one-third the cost of the median home-purchase price in Breckenridge. These homes have a deed restriction that limits the appreciation of the resale price of the property to 3 percent per year or the annual percentage increase of the “area medium income”, whichever is greater. Homeowners include the town manager, government employees, shop owners, teachers, and police officers.

In 2002, the Wellington Neighborhood was recognized by EPA with a National Smart Growth Award as a model for resort communities where affordable housing for permanent residents is scarce. In November 2001, through negotiations independent of the FROG, the Open Space Departments of the Town of Breckenridge and Summit County signed a sales agreement with the mining company for the purchase of its more than 1,800 acres in French Gulch and in the adjacent Swan River watershed for \$9 million.

The properties consisted of 170 mining claims, including the Wellington-Oro Mine. As part of the sales agreement, Summit County and the Town of Breckenridge agreed to construct and operate the water-treatment remedy at the Wellington-Oro Mine. The buyers also agreed to conduct surface reclamation at an additional two mine sites.

## **From Waste to Place: Open Space Preservation**

As part of this real estate transaction, two additional agreements were negotiated in order to resolve environmental-liability issues. First, Summit County and the Town of Breckenridge negotiated a bonafide Brownfields Agreement with EPA and the State of Colorado. This agreement defines the specific mine-reclamation activities to be conducted by the town and county, and limits their cleanup liability on other abandoned mine sites purchased. The second agreement resolves B&B Mines Superfund environmental liability, including past and future environmental cleanup costs. This agreement allowed the mining company to dissolve and distribute its assets to its stockholders. Although the negotiations among the multiple parties to finalize these agreements were complex, these settlements were successfully completed in March 2006.

In 2006, the Town of Breckenridge and Summit County completed the surface reclamation of the two abandoned mining sites. The construction of the

water treatment plant at the Wellington-Oro Mine was completed in November 2008 (please refer to *Project A: Water Treatment Plant*, in Booklet Two). In 2007, EPA, the Town of Breckenridge and Summit County initiated a new conceptual landscape plan for the neighborhood and its immediate environment, utilizing the landscape architectural services of The Project for Reclamation Excellence (P-REX, [www.theprex.net](http://www.theprex.net)). This concept plan will integrate mine reclamation, expansion of aquatic habitats for threatened species, integration of the recreational use plan, and preservation of historic mining artifacts.