

# When The Bill Comes Due:

UNDERSTANDING AND MANAGING TAILINGS INFLUENCED  
GROUNDWATER AT THE BUTTE SUPERFUND SITE.

A HISTORICAL PERSPECTIVE

2019 Mine Design, Operations  
and Closure Conference

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Butte, MT

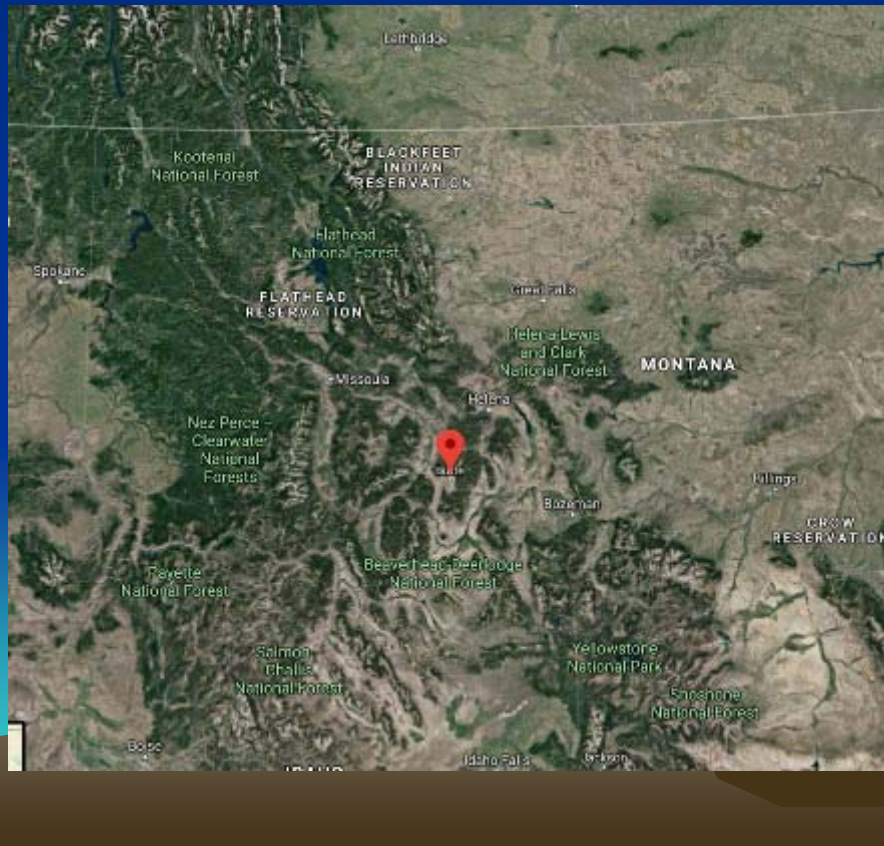


MINE DESIGN, OPERATIONS & CLOSURE

**CONFERENCE**

# Butte Montana

- The richest hill on Earth



# Butte today



# History of Parrot Mine and Tailings

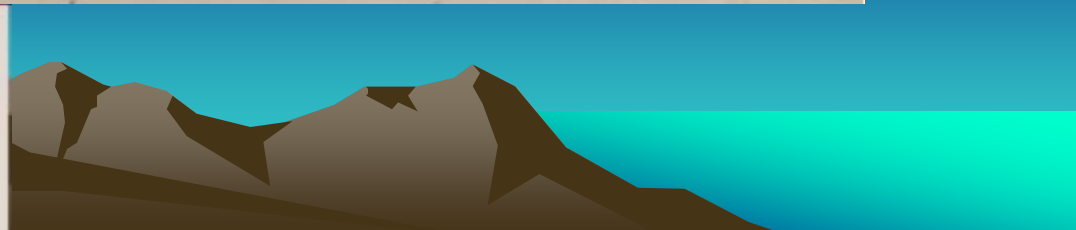
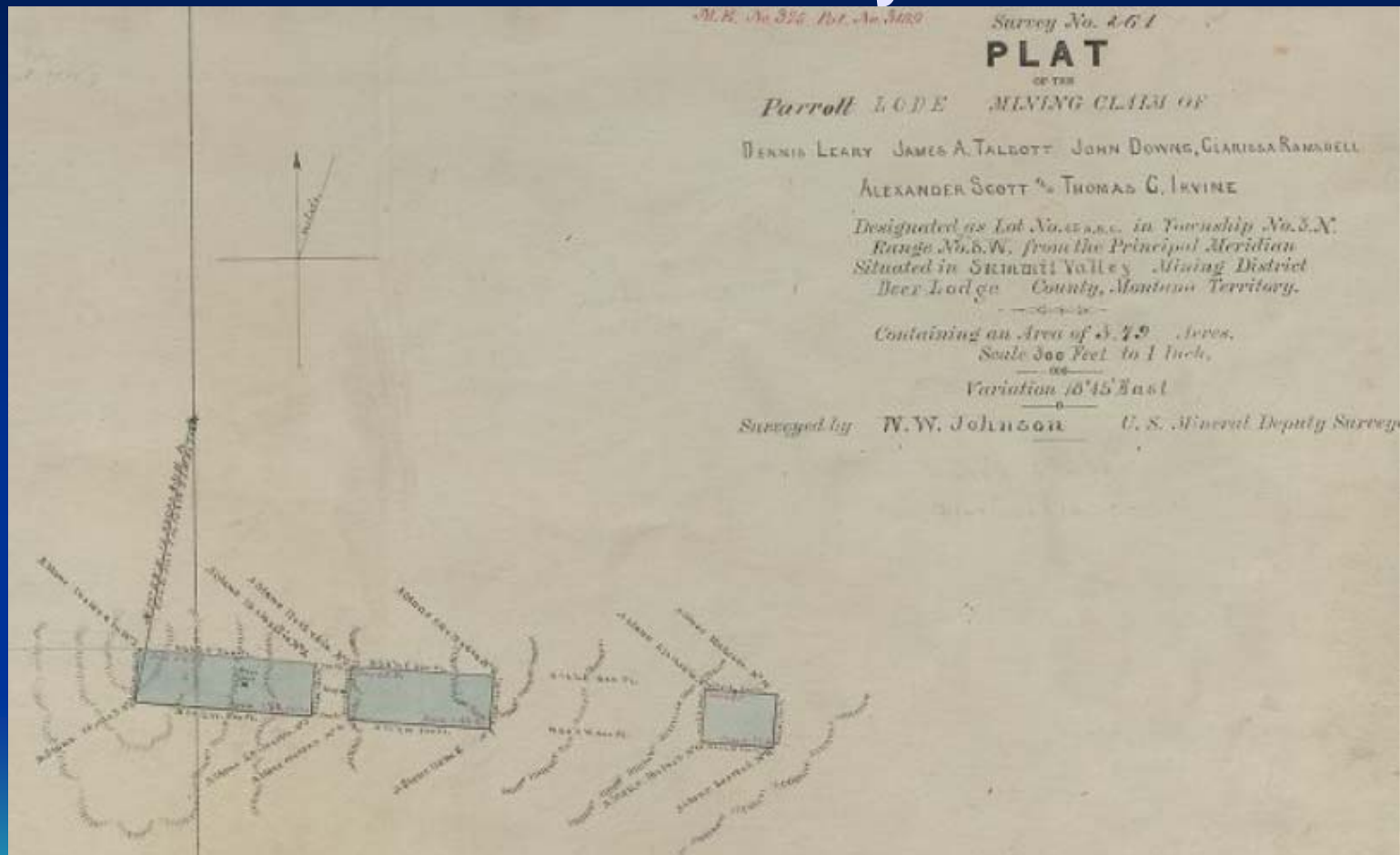
- 1864: Placer gold discovered in Silver Bow Creek

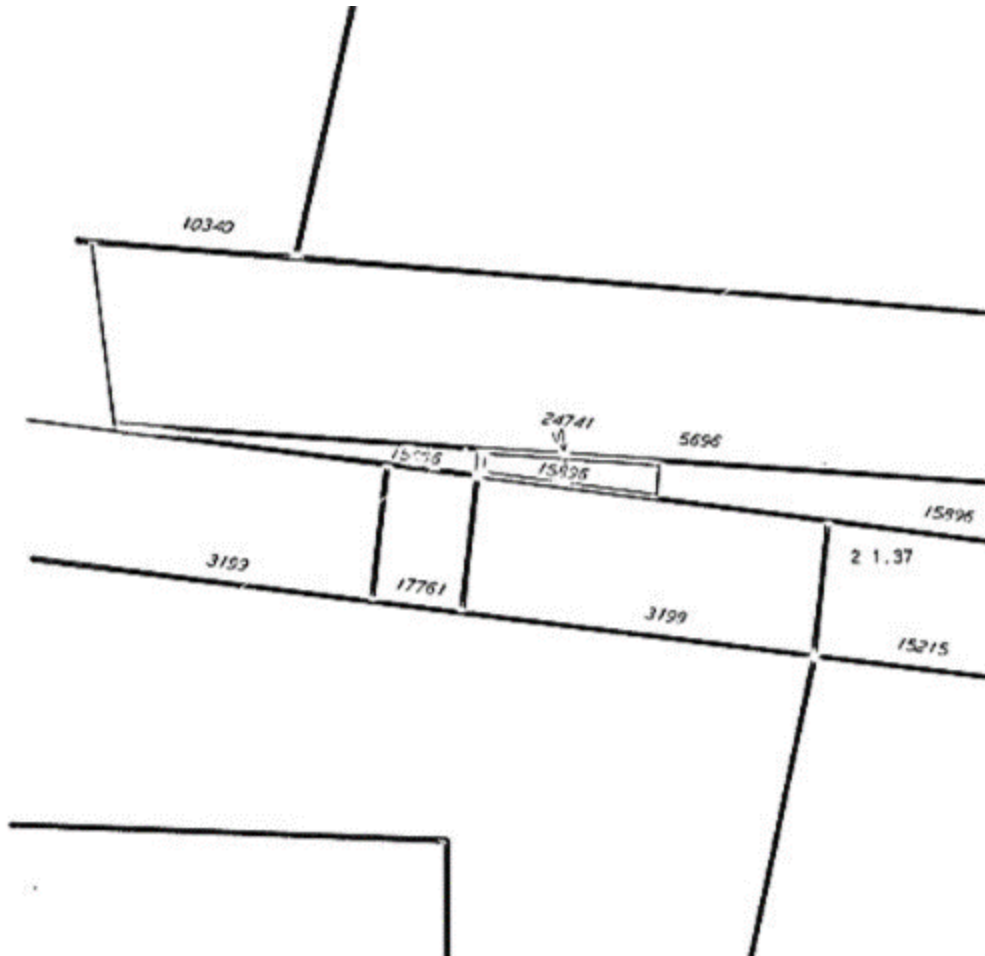


Barker, Ruff and McMahon on Silver Bow Creek in July 1864



# Fall 1864: Location of the Parrott Lode Claim Mineral Survey 261





MTMTAA 047747

- P RAMSDELL, CLARISA,
- P SCOTT, ALEXANDER,
- P TALBOTT, JAMES A,
- P DOWNS, JOHN,
- P ERVINE, THOMAS C,
- P LEARY, DENNIS

5/29/1879

3199

MT

Montana PM

003N - 007W

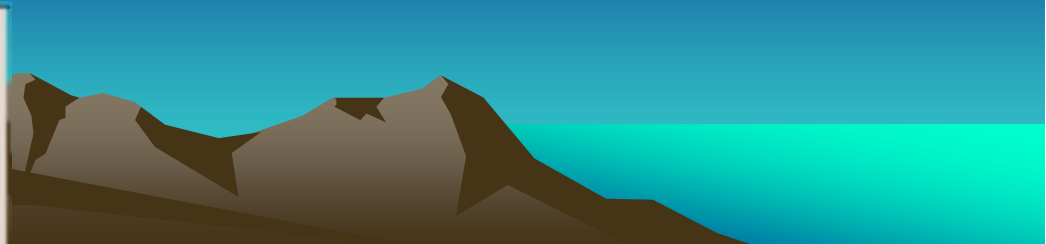
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Silver Bow

003N - 008W

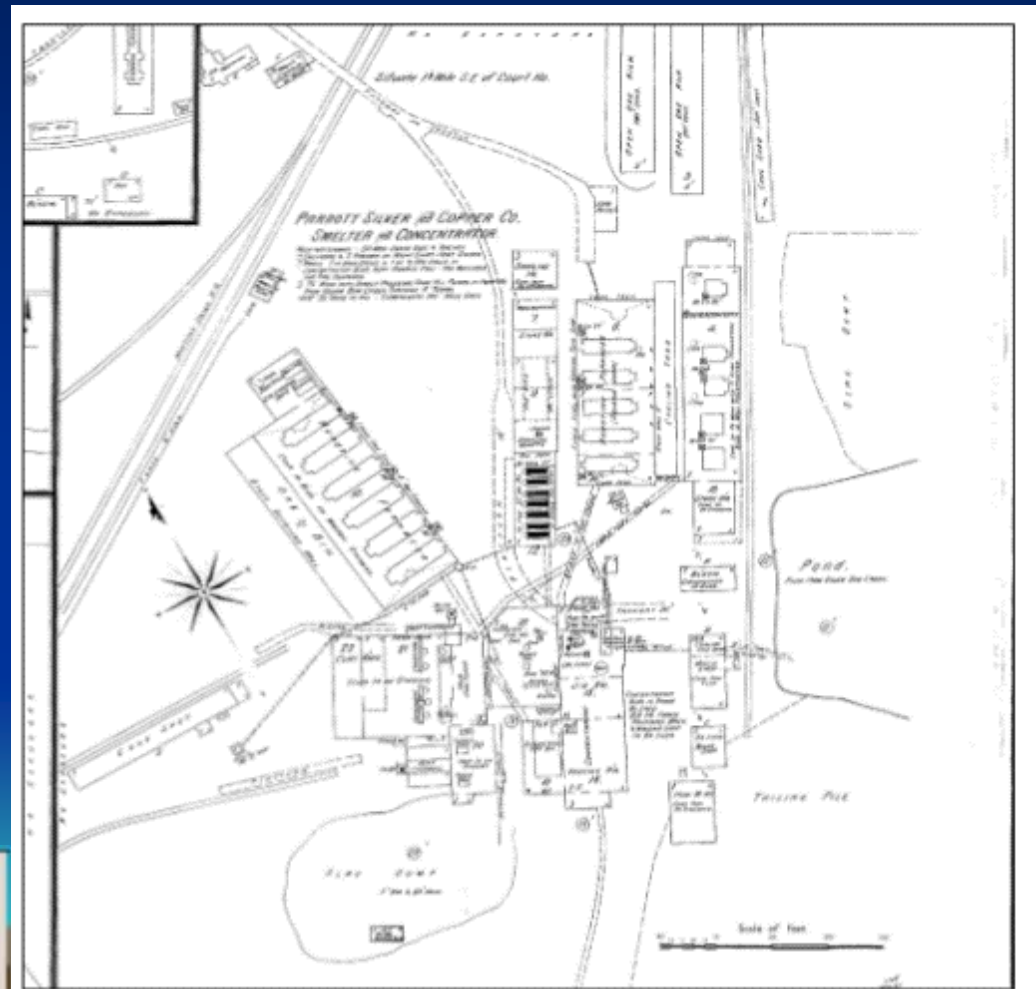
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Silver Bow



1876: Discovery of a rich vein of Chalcocite, Butte's first Copper Mine

1879: Parrot Concentrator and Smelter built



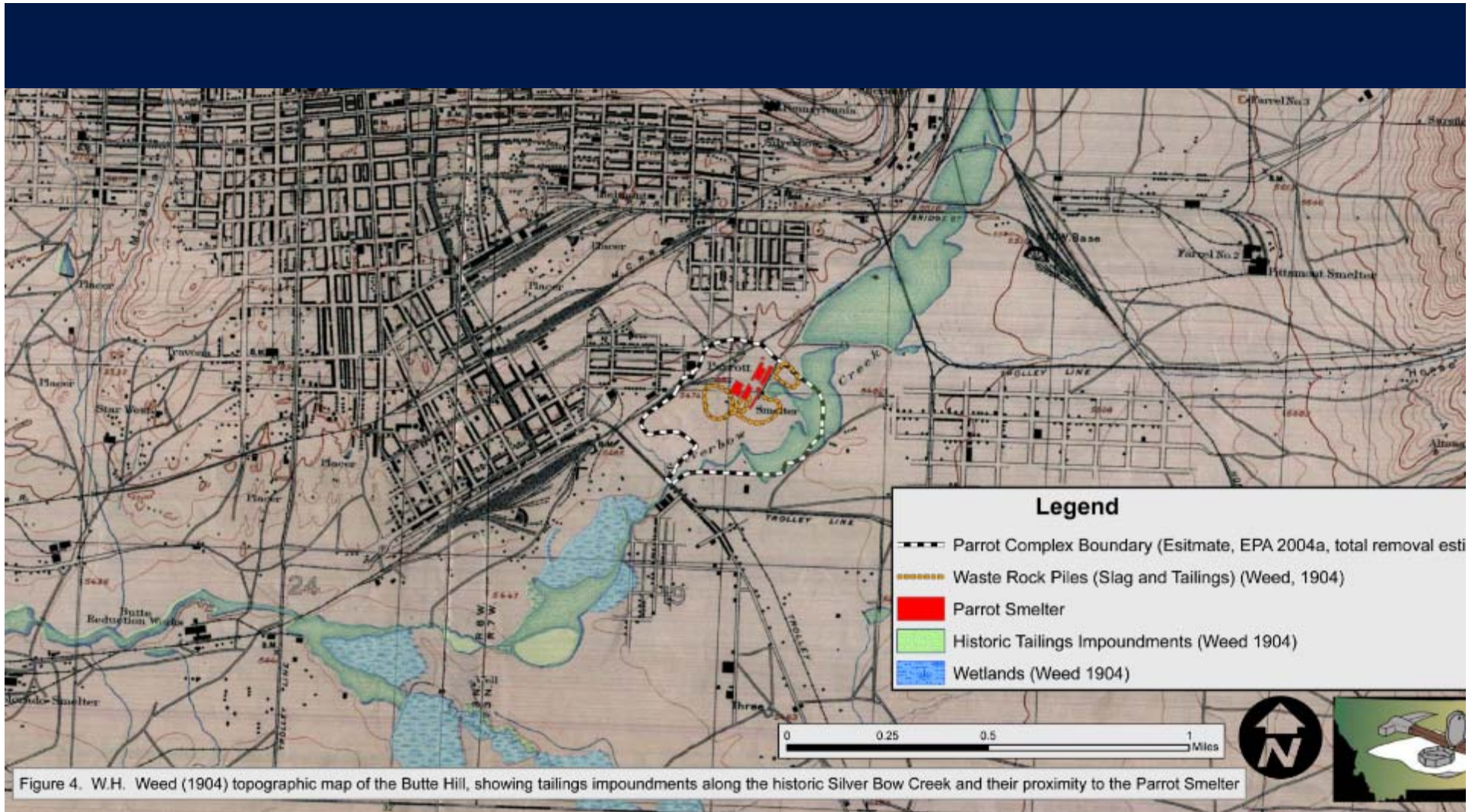


Figure 4. W.H. Weed (1904) topographic map of the Butte Hill, showing tailings impoundments along the historic Silver Bow Creek and their proximity to the Parrot Smelter

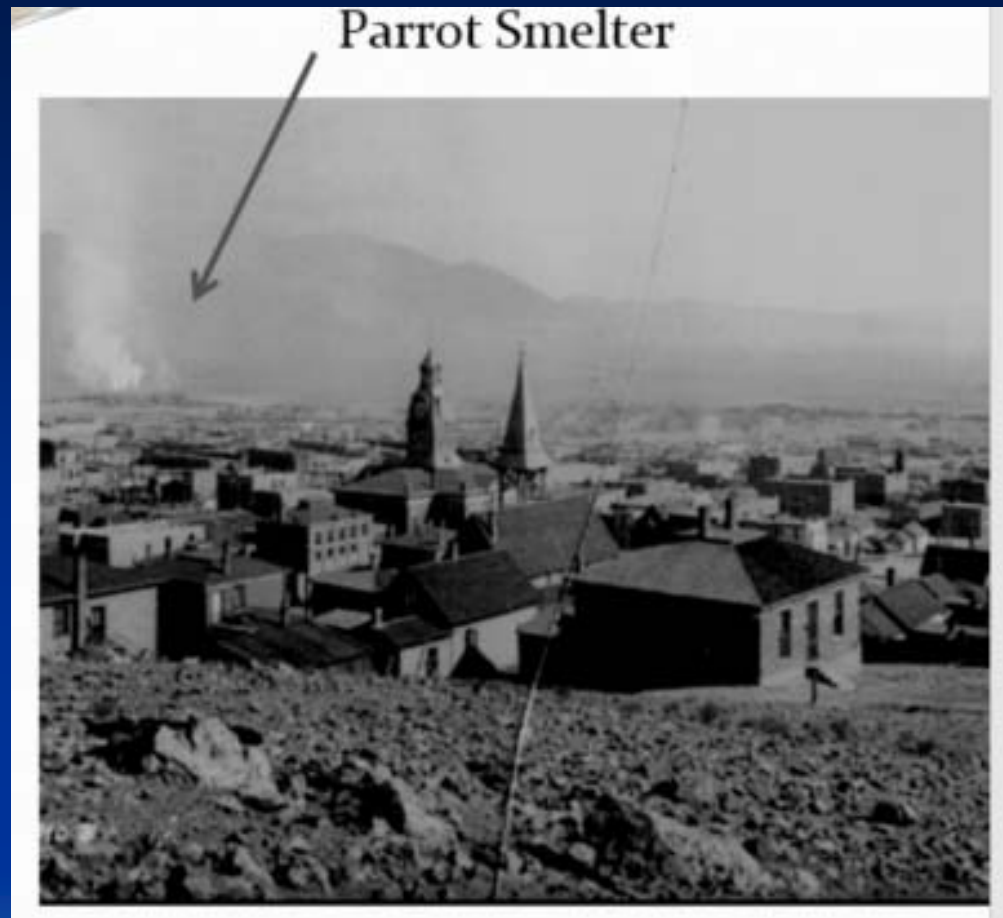
**1885: Various dams constructed on Silver Bow Creek to contain mine/mill tailings**



Parrott smelter looked like this:



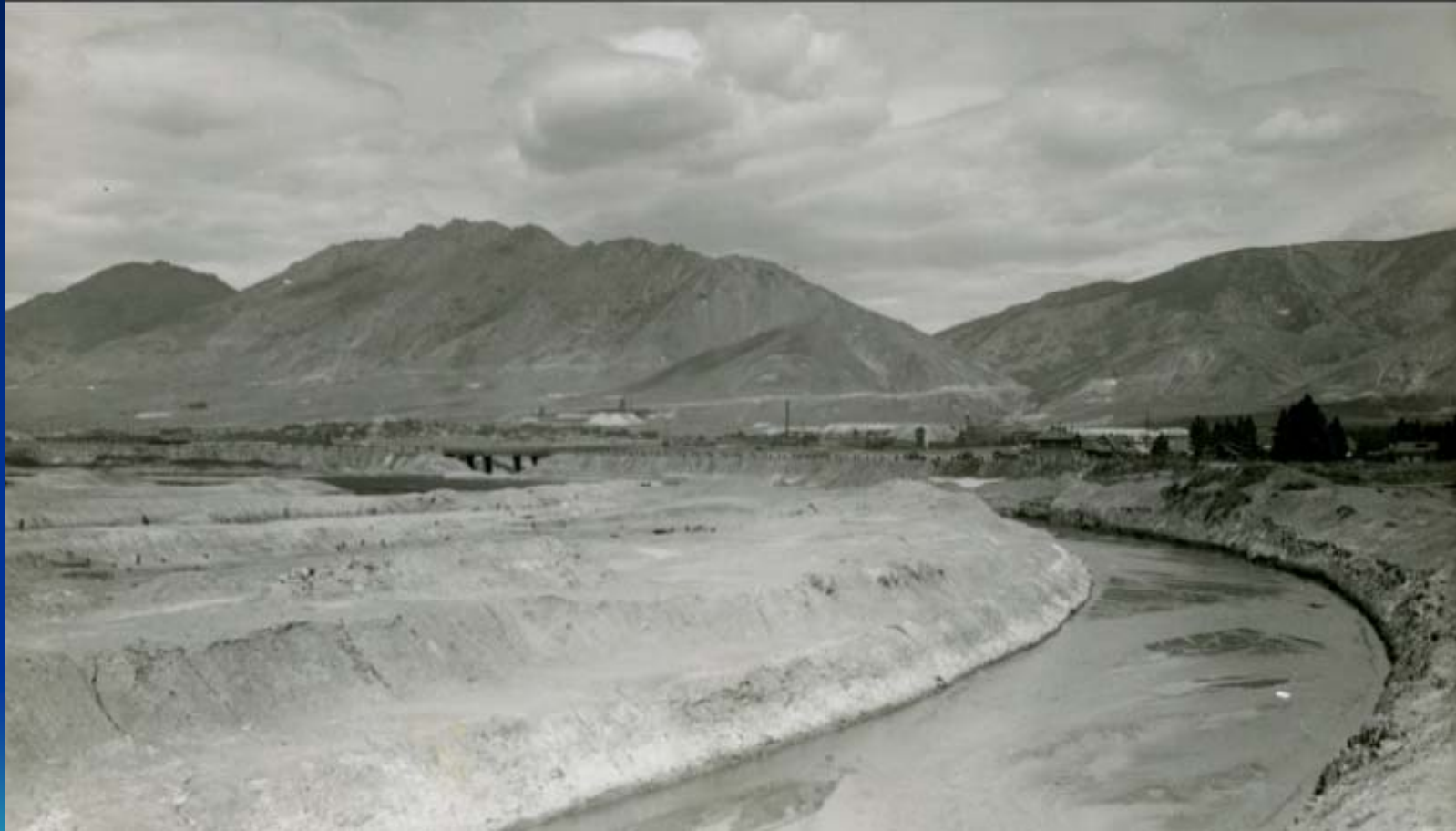
## 1890: Smelters throughout Butte render Butte's air quality as suffocating



In 1899 Judge Lindsay ordered smelters to take additional steps to prevent smelter smoke to prevent smoke from “deluging the said city of Butte and smothering the inhabitants thereof. In May of 1899 the Parrot Smelter closed, having lost a “t” somewhere along the line.

**1899: May, Parrot Smelter closes, later in the year a fire destroys the buildings**

**Through much of the 20<sup>th</sup> Century the Parrot Tailings looked like:**



**1957: Anaconda Mining Company began work on the Berkeley pit, one of the first large open pit metal mines. Overburden was placed on top of the Parrot Tailings.**

1977: Arco (Atlantic Richfield) acquired the Anaconda Mining Company

1978: The Butte-Silver Bow County government constructed the county shops on top of the south half of the Parrot Tailings.

1980: Superfund Law (Comprehensive Environmental Response, Compensation, and Liability Act) was passed.

1983: **The Bill comes due:** September 18<sup>th</sup> EPA lists the Butte site as a Superfund site.



**2004: EPA Initiated Remedial Investigation/Feasibility Studies (RI/FS) to evaluate sources of contaminants and possible clean-up alternatives**

**2005: Professional scientists in Butte compile a letter to EPA detailing the following items in bullet form:**



- **The Parrot tailings have not been adequately characterized**
- **The lateral and vertical extent of the contaminant plume in Metro Storm Drain (MSD) has not been delineated**
- **Contamination from the Parrot tailings has migrated farther than expressed in the Remedial Investigation (RI) and the Focused Feasibility Study (FFS)**
- **Operations and Maintenance (OM) costs for both the lagoon treatment system and general storm water management are likely to be underestimated because of the lack of characterization associated with portions of the operable unit**
- **Lower Area One remains a persistent source of contamination and additional wastes could be removed and/or stabilized**
- **Economic development and the future of Butte may be hindered by leaving waste in place**

# Cut and Run:

## EPA Betrays Another Montana Town

A Tale of Butte, the Largest Superfund Site in the United States

AUGUST 2005

# Which lead to:



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For Immediate Release: Aug 18, 2005  
Contact: Kirsten Stude (202) 265-7337

### EPA WALKING AWAY FROM NATION'S LARGEST SUPERFUND SITE

Deal With BP/ARCO Will Leave Butte Contaminated for Centuries

Posted on Aug 18, 2005 | tags: EPA, Montana

Washington, DC — The U.S. Environmental Protection Agency is prepared to walk away from the nation's largest Superfund site, located in Butte, Montana, according to a report issued today by Public Employees for Environmental Responsibility (PEER). As a result, millions of cubic yards of mine tailings, smelting slag and other wastes will drain in perpetuity into the headwaters of the Clark Fork and Columbia Rivers, thus relegating the Butte-Silver Bow area into an industrial dead zone with dim economic prospects.

The Butte Priority Soils Operable Unit site covers five square miles, making it the nation's largest Superfund site. The site lies in the upper Silver Bow Creek valley, immediately west of the continental divide, and has for generations received massive amounts of smelter waste. The site also contains the historic city of Butte, the nation's second largest National Historic Landmark District.

Under the pending arrangement, EPA is poised to make a formal finding of "Technical Impracticability" that the tailings and other wastes cannot be feasibly removed and therefore the aquifer on which its sits must be sacrificed. This EPA finding will allow the responsible party, Atlantic Richfield Company (now British Petroleum/ARCO), to walk away without fully cleaning up the site.

EPA's decision is severely criticized in the PEER white paper, entitled Cut and Run and written by geologists, hydrologists, hydrogeologists, soil scientists, and engineers who have worked extensively with mine waste characterization and reclamation in western Montana. These professionals critique the science behind the decision to leave the tailings in place and detail the long-term consequences of that decision.

Cut and Run argues that, contrary to its own procedures, EPA is making this Technical Impracticability finding without proper characterization of the tailings and without knowing how fast the contaminant plume is moving. EPA's lack of careful characterization not only violates its own guidelines but comes



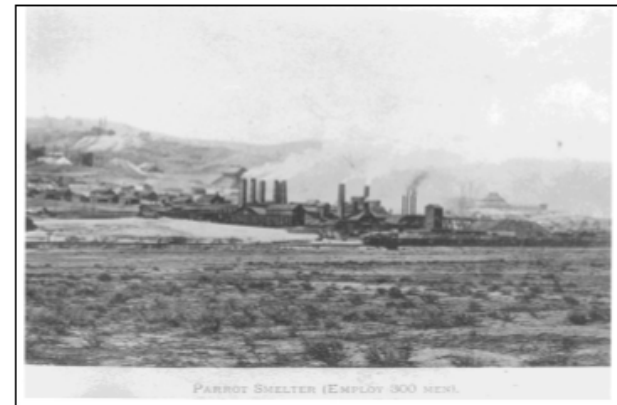
**In 2006 EPA issued a Record of Decision for the BPSOU (US EPA, 2006), largely discounting the concerns of the Butte geoscientists.**

**Which lead to:**

**Numerous studies detailing contamination And Nick and Josh's presentations Coming up.**

Montana Bureau of Mines and Geology  
Open File Report No. 590

**The Parrot complex: A Drilling Investigation of Historic Mine Waste Left In Place; Tailings and Overburden Volumes, Leachability and Economic Feasibility for Recovery, and Water Quality Along the Upper Metro Storm Drain in Butte, Montana**



Photograph: Post Card. World Museum of Mining. Butte, MT



Nicholas J. Tucci  
February, 2010



Figure: 1888 Sanborn Map of Parrot Smelter



The State of Montana did not concur with EPA's decision to leave the Parrot Tailings in place

In 2016 Montana Governor Steve Bullock made a decision for the state to remove the Parrot tailings



Photos by Susan Dunlap

Bureau of Mines and Geology scientist Gary Icopini, not shown, pumps a bucket full of water that is blue due to copper contamination from a well at the ball field behind the Civic Center while representatives from Butte Natural Resource Damage Council, Elizabeth Erickson and Pat Cunneen, look on. Icopini dropped new nails into the bucket of blue water to demonstrate what the copper in the water would do to the nails. After approximately 10 minutes, the nails turned a different color.



**Why does it matter that Montana did not concur  
and decided to remove the Parrot Tailings?**

**\$\$**

**The money to do the work comes from the  
State's Natural Resource Damage settlement:  
\$130,000,000**

**It does not come from remedy \$, so is money  
that is not available for other NRDP  
restoration projects in the Upper Clark Fork  
River basin.**

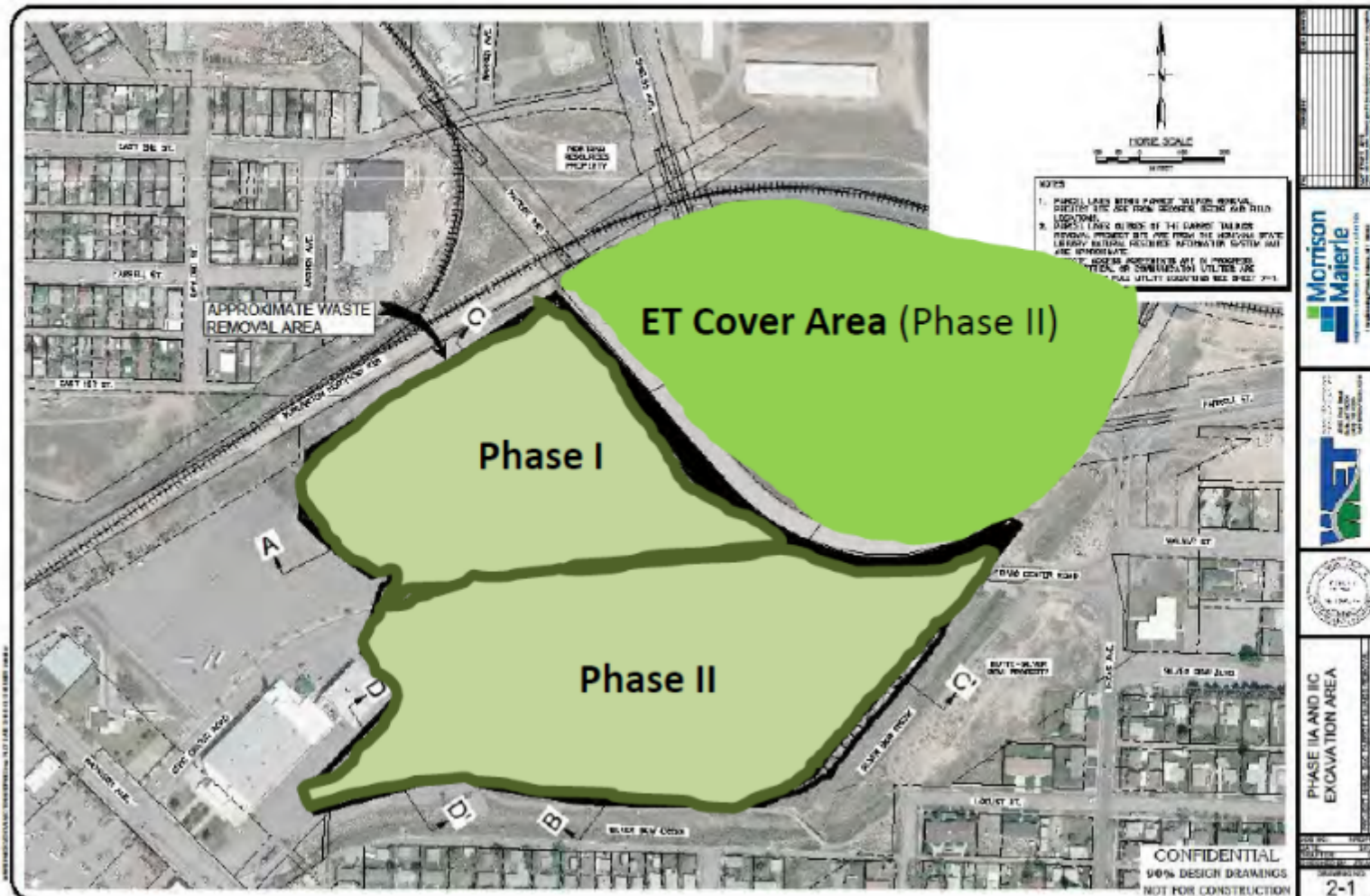


The Butte site is the largest Superfund Complex in the United States extending from Butte down Silver Bow Creek and the Clark Fork River 115 miles to Bonner, just east of Missoula

The Superfund Complex consists of as many as 26 different operable units



# Parrot Tailings Waste Removal Project Phase I and II Removals





9/19/2018

# In the summer of 2018 the State of Montana began Phase 1 removal of the Parrot Tailings



*Governor Bullock shovels the first dirt at the groundbreaking ceremony for the Parrot tailing removal project in Butte, June 2018.*

# Moving dirt!

*Dozer pushing black organic clay toward excavator during Phase I removal action; clean overburden stockpiled behind red truck; yellow tailings in high wall behind dozer.*



# A good cross-section!

*Black slag pile atop a layer of white/yellow tailings. Excavation of contaminated materials continued to groundwater.*





## A good cross-section! Part 2



*Waste Sequence: Slag on top; white/  
yellow tailings middle; black clay below*

# Mine waste characterization is hard

## Materials Volumes for Parrot Phase I

Material Type	Bid Specification Estimate (bank cubic yards)	Final Volumes (bank cubic yards)
Clean Overburden	167,000	113,000
Contaminated Slag	117,000	100,000
Contaminated Mine Waste	76,000	170,000
<b>Totals =</b>	<b>360,000</b>	<b>383,000</b>

Contaminated mine waste volumes increased by 124%  
Total volumes of all materials were 6% more than anticipated

**THE END**

Any Questions??

calvin and hobbes by watson

