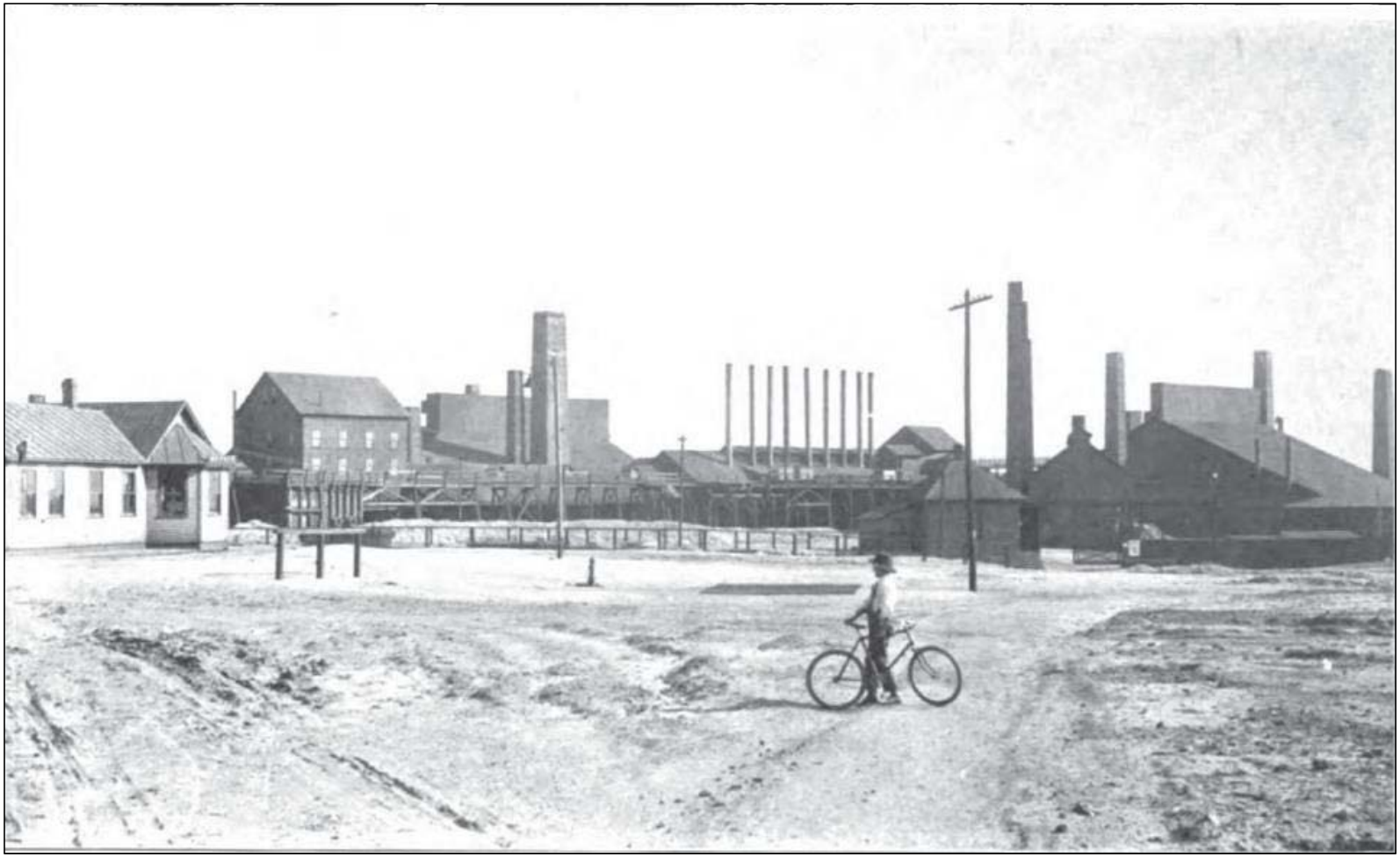
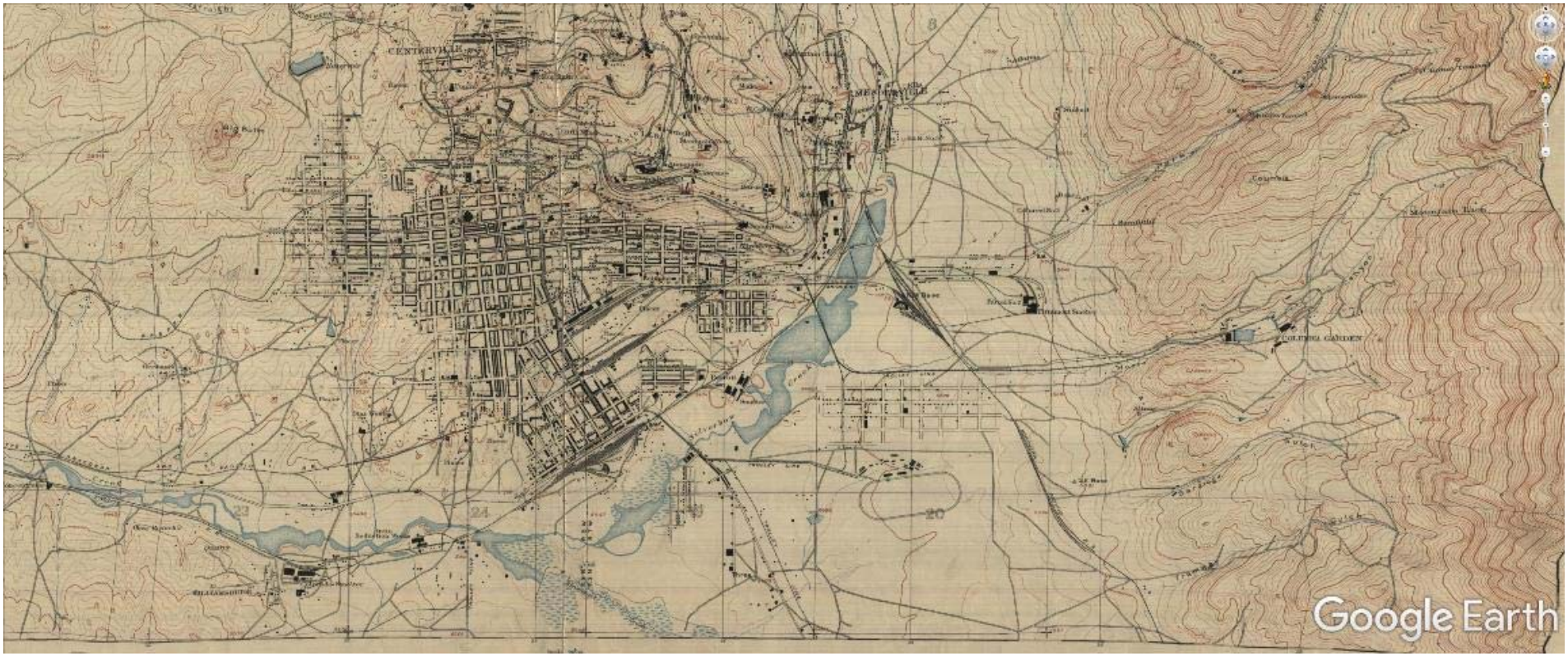
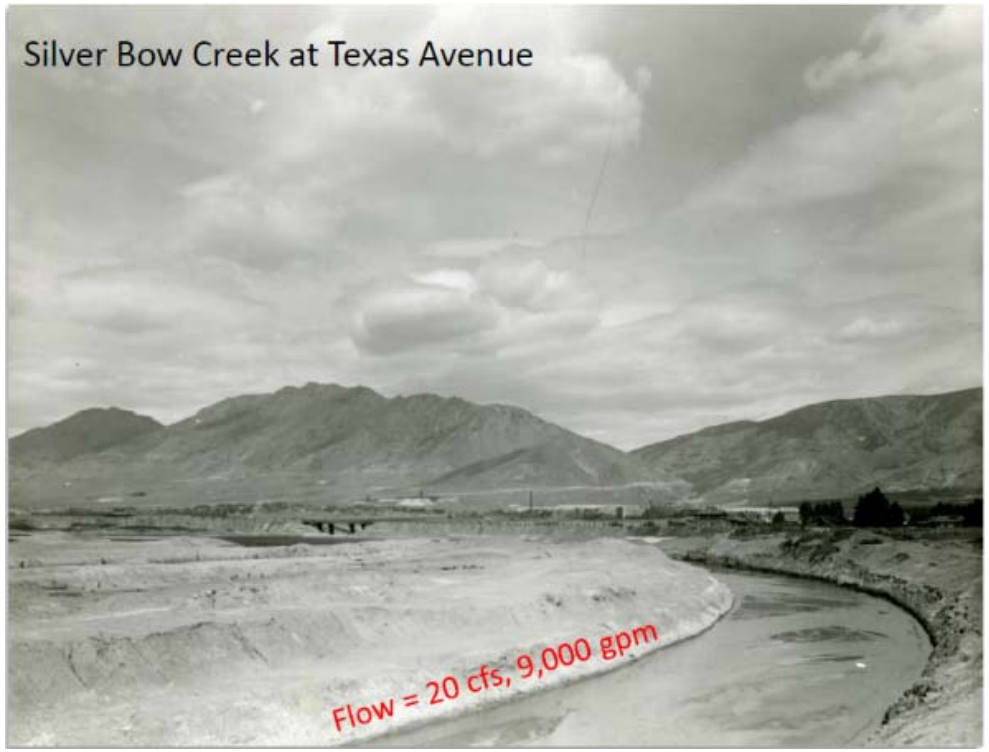
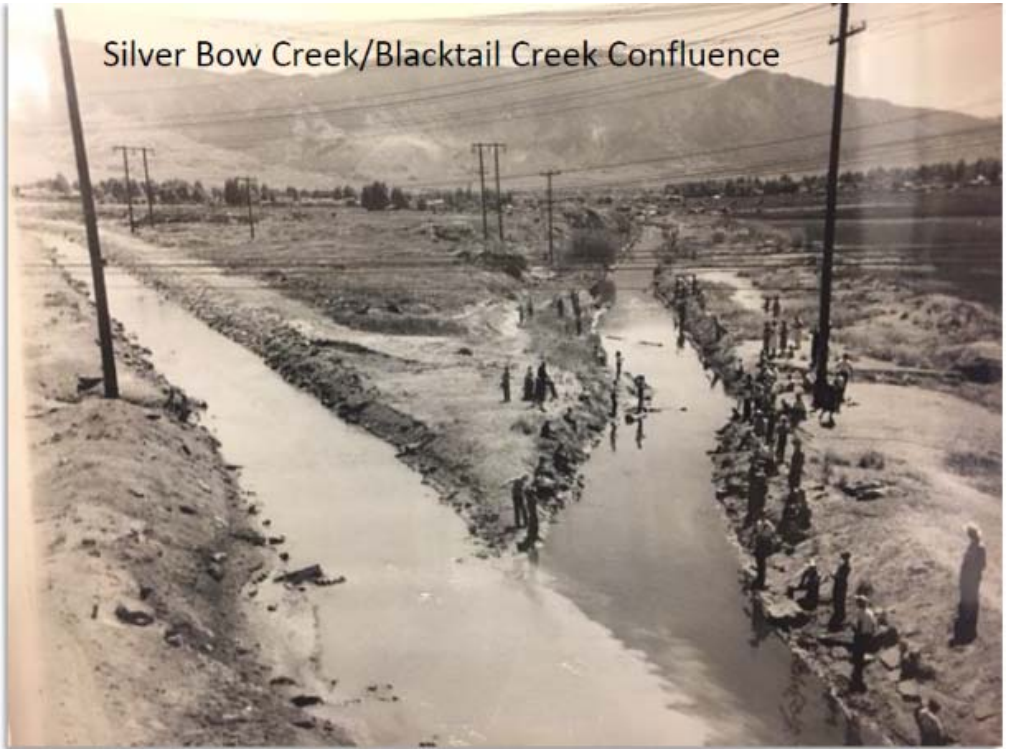

Parrot Tailings Waste Removal Project
Phase I & IIA
Butte, Montana
Josh Vincent PE, WET
Jim Ford, NRDP
Water & Environmental
TECHNOLOGIES
Morrison
Maierle




CENTERVILLE
MEADOWVILLE
COLUMBIA GARDEN
Google Earth

Source of Aquifer & Stream Contamination





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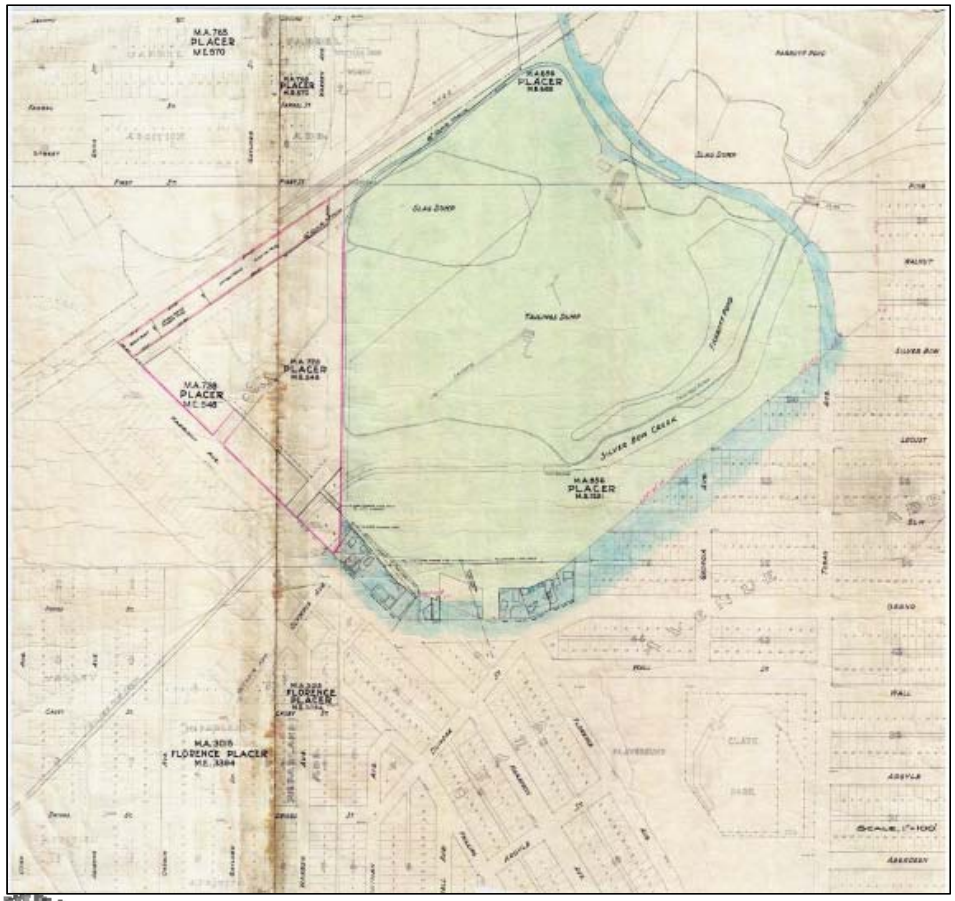
Source of Aquifer and Stream Contamination



UNITS = (ug/l)	As	Cd	Cu	Pb	Zn
Drinking Water Standard	10	5	1,300	15	2,000
Berkeley Pit Water (3/14/09)	,80	1,833	71,174	19	551,154
Well GS-41S Water (8/17/09)	103	4,060	1,005,218	93	483,891

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2015 - Governor Bullock Announces Removal

Goal of Parrot Tailings Waste Removal

1. Protect Silver Bow Creek and Blacktail Creek's aquatic resources (surface water and in-stream sediment) from contaminated groundwater discharge while improving the quality of the creeks.
2. Eliminate known sources of inorganic contamination to the alluvial aquifer and surface water.
3. Enhance the Silver Bow and Blacktail Creek area riparian corridors.

Parrot Tailings - Waste Removal Design

- Soil Removal Design (Excavation, Transport/Disposal, Dewatering, Backfill)
- Evapotranspiration (ET) Cover systems
- Facility Demolition/Utility Coordination
- Traffic Detouring/Access
- Post-Removal Land Use
- Well Abandonment/Replacement
- Bid Sequencing/Scheduling
- Health and Safety

Fairly standard stuff until you drop the site in the middle of Butte.

Parrot Tailings – Design

- Volumes estimated using mostly existing soil boring/well data, some newer borings
- Limited by existing infrastructure (RR's, Civic Center, Silver Lake Water, HSB, SBC remedy, Shields Ave, NW, etc.)
- Generally consistent with previous studies (MBMG, EPA, NRDP)
- Soil Types: Overburden (BQM, Berkeley Pit fill, etc.), Slag, Tailings, Organic Clay, Alluvium
- Removed using combination of lithology and soil screening levels (QAPP)

Parrot Tailings – Design

- Slag: Could it be excavated using conventional equipment?
- Dewatering: Saturated wastes in both phases, mostly second phase – pipeline to MR Dredge Pond
- Haul Road: Designed to avoid public roads – allow larger off-road trucks (across BNSF and MR property)
- Disposal:
  - Original Location: T&D - Berkeley Pit Ramp
  - Final Location: Transport-Stockpile area, Disposal - Pittsmont Dump (MR Haul)
- ET Cover Systems: Will be constructed during Phase II – eliminate infiltration of non-groundwater saturated waste
- Health and Safety: workers, public, dust, etc.

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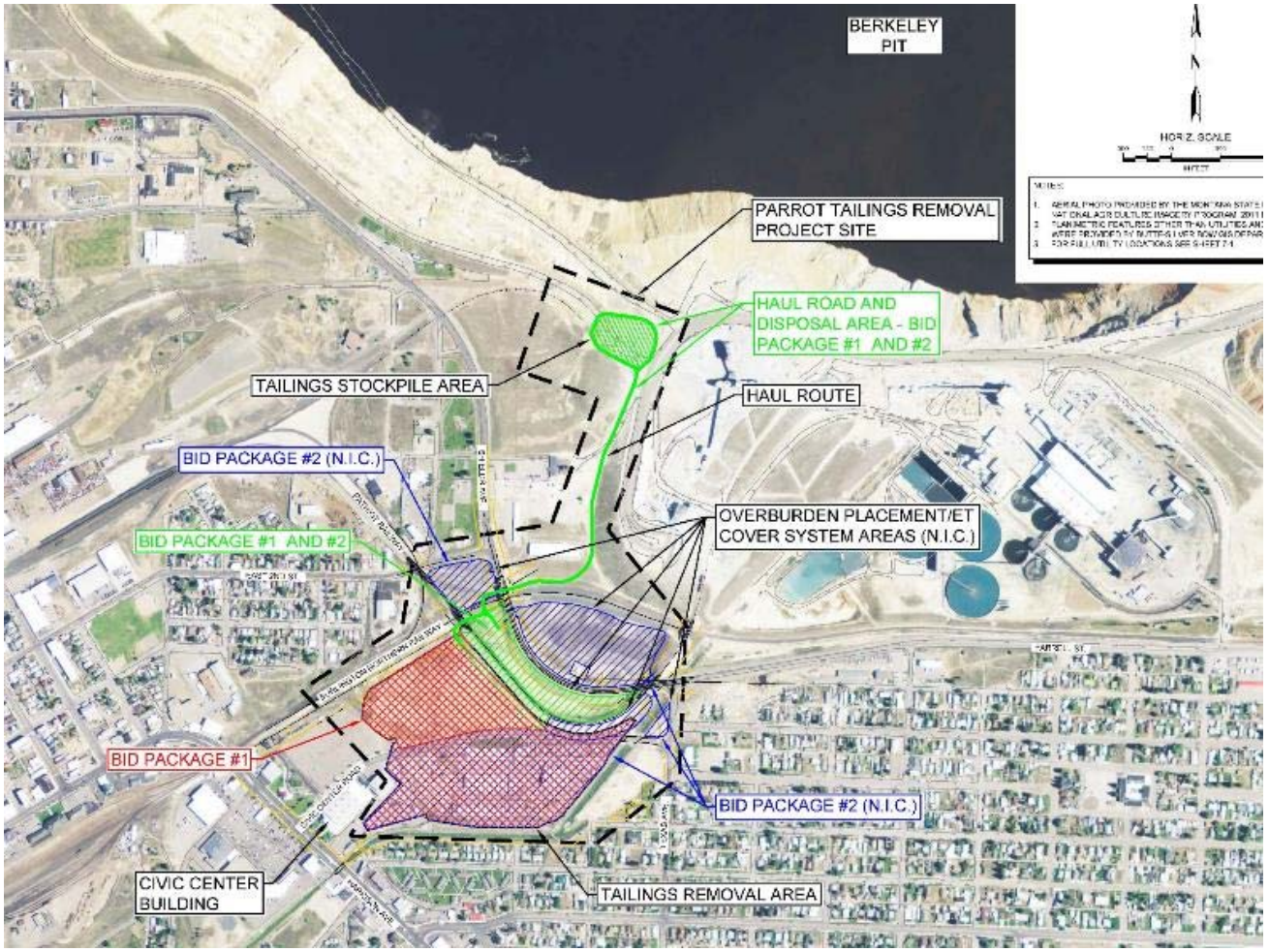
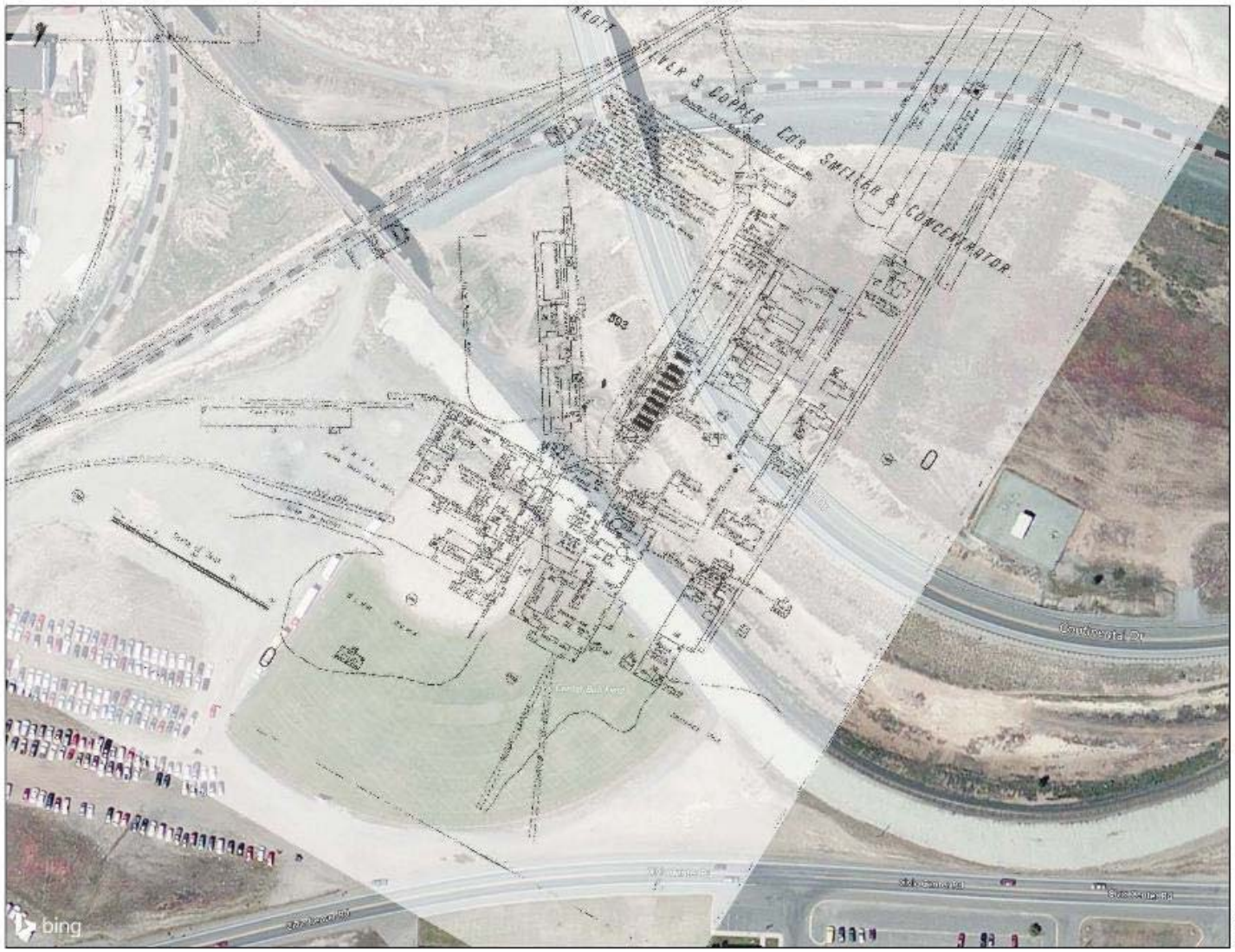
Parrot Tailings - Bidding

- Bid Package #1 (Phase I and IIA) published in March 2018
- Seven bids received
- Range: $2.66M - $5.53M
- Major Items
  - Slag: Low Bid: $2.50/CY; Range was $2.50 - $8.01/CY
  - Tailings: Low Bid: $3.00/CY; Range was $3.00 - $5.50/CY
- Use of rigid frame vs. articulated trucks
- Difficult insurance requirements

Parrot Tailings Excavation Removal

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SITE LOCATION
1900 Sandborn Way
FIGURE 1
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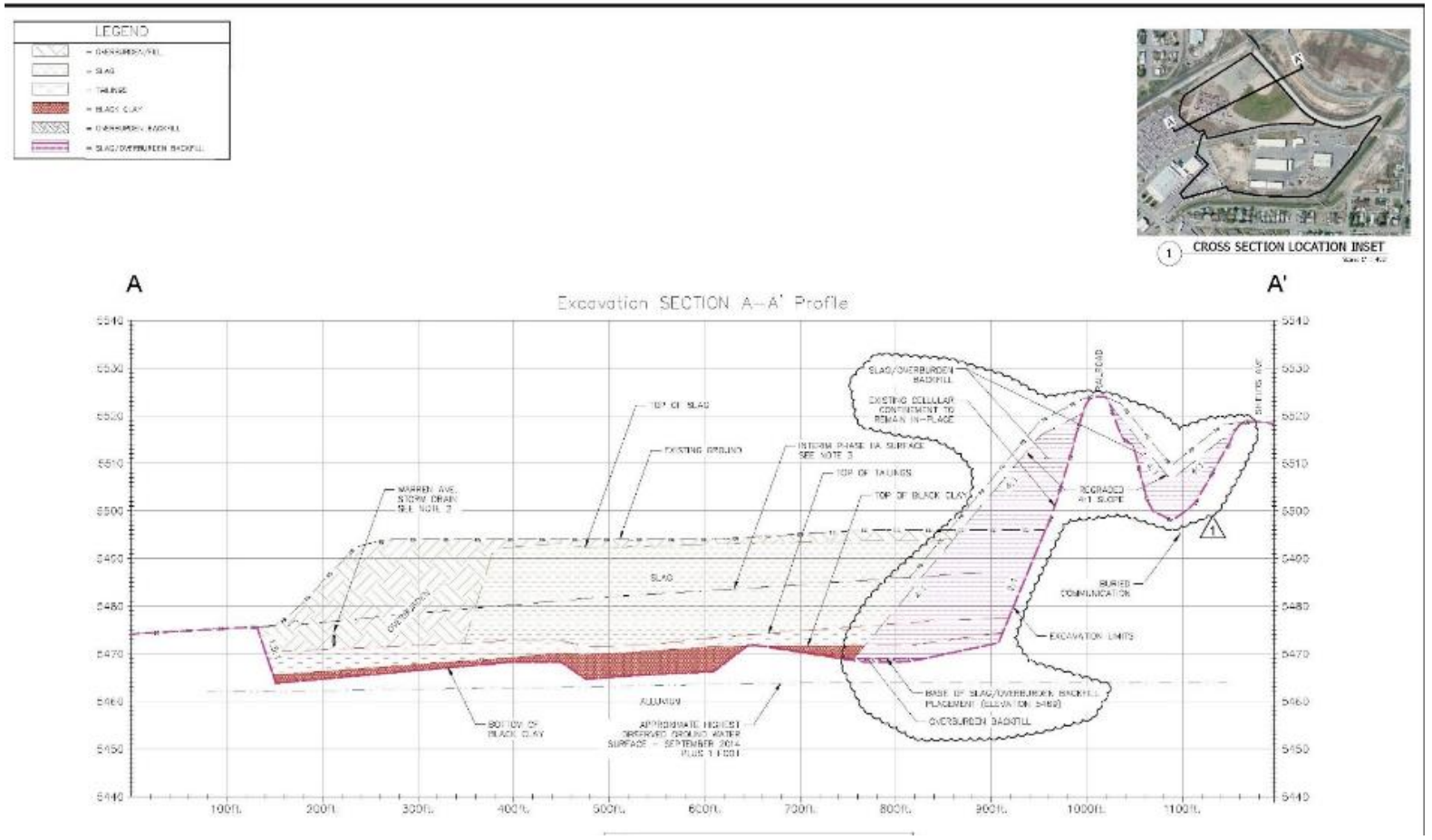
Parrot Tailings Excavation Removal



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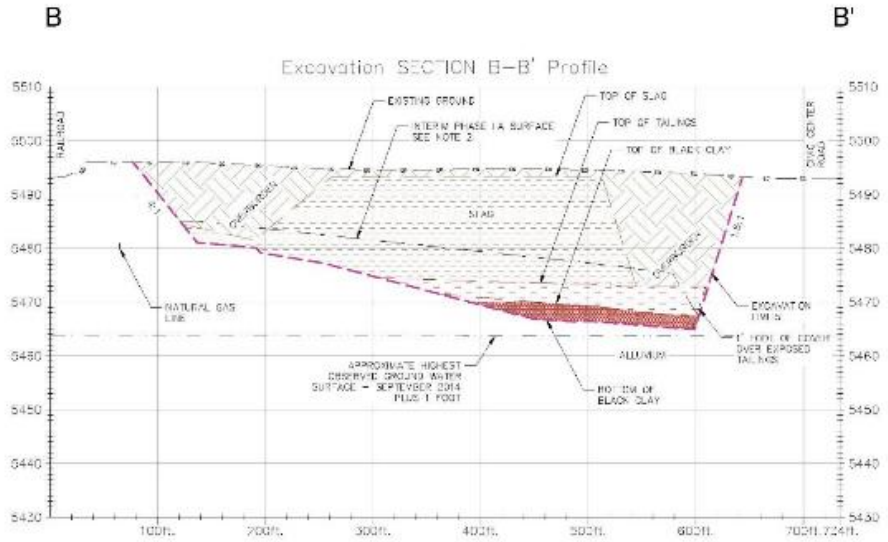
Parrot Tailings Excavation Removal



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Phase I Excavation

Phase I Excavation

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Phase I Excavated Material Volumes

Material Type	Bid Specification Estimate (bcy)	Volume (bcy)
Clean Overburden	167,000	113,000
Contaminated Slag	117,000	100,000
Contaminated Mine Waste (tailings, clay, etc.)	76,000	170,000
Total =	360,000	383,000

- Contaminated mine waste volumes increased by 124% (more contaminated OB, slag/waste mix, contaminated unsaturated alluvium)
- Total volume of all materials was within 6%

Parrot Performance Monitoring Program Objectives & Implementation

- Develop and implement a monitoring network, sampling methodology, and evaluation criteria to characterize existing hydrologic and geochemical "baseline" conditions that will be used to **assess the efficacy and performance of the Parrot Tailings removal** and ensure removal activities **do not interfere with CERCLA remediation infrastructure**.

Specific Tasks of the PMP

- Identify key existing monitoring points
- Evaluate data gaps
- Develop proposed monitoring network
  - 25 new wells and 4 surface water sites
  - 75 existing wells and 7 surface water sites
  - Monthly SWL's, quarterly sampling (December 2017 – Present)
- Formulate an updated Conceptual Site Model (CSM) & 3-D Parrot Plume diagram (EVS)

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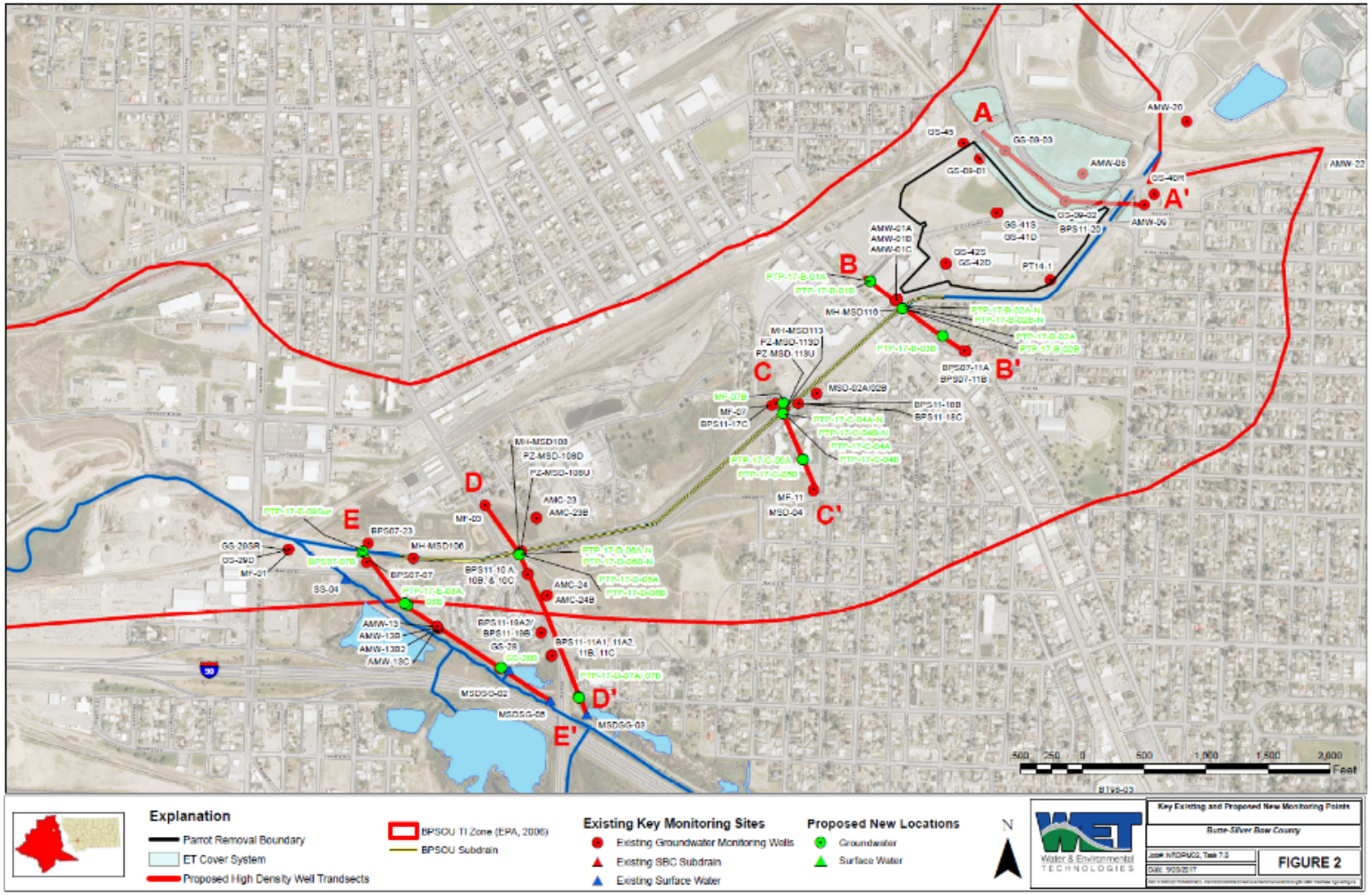
Implemented PMP and Existing Network



Remaining Project Schedule

- Design and Build New BSB County Shops (Present on Phase II Site) – 2019 (Bute-Silver Bow Led)
- Collect additional data on Phase II site, design ET Cover system - 2019
- Phase II Design/Bid Package – Winter/Spring 2020
- Phase IIB, IIC Construction – 2020-2021
- PMP Monitoring Program - Ongoing

Project Coordination

- Complex project with lots of complicating variables:
  - Two Superfund Operable Units
  - An active mine,
  - Multiple landowners,
  - Major infrastructure/utilities
  - Near large public venues (Civic Center, BSB Shops)
- Outstanding cooperation: NRDP, MDEQ, EPA, MR, BNSF, Patriot Rail, BSB, and AR
- Special thanks to MR, BSB, and BNSF


Questions?