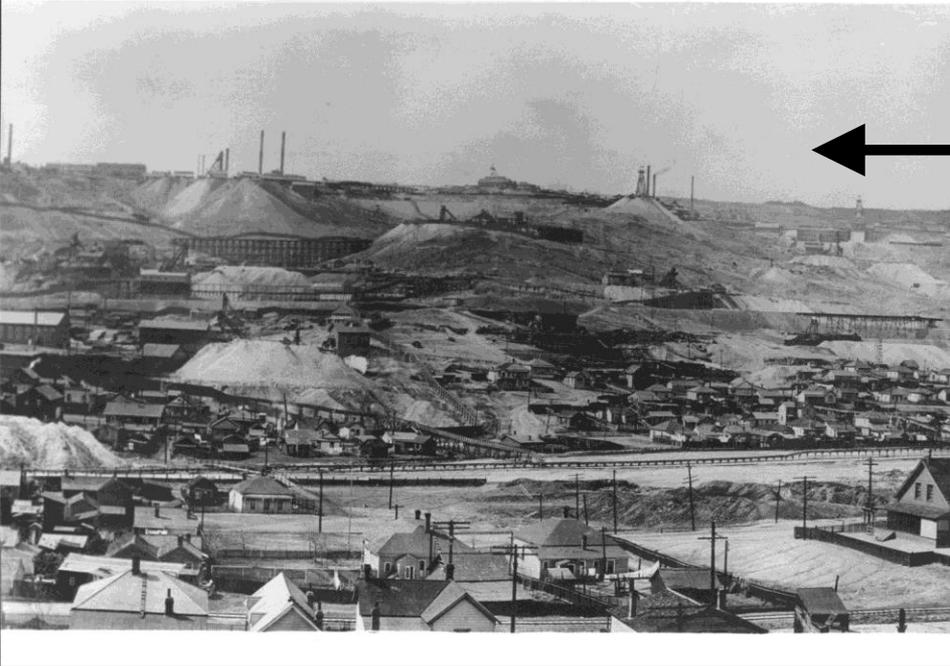
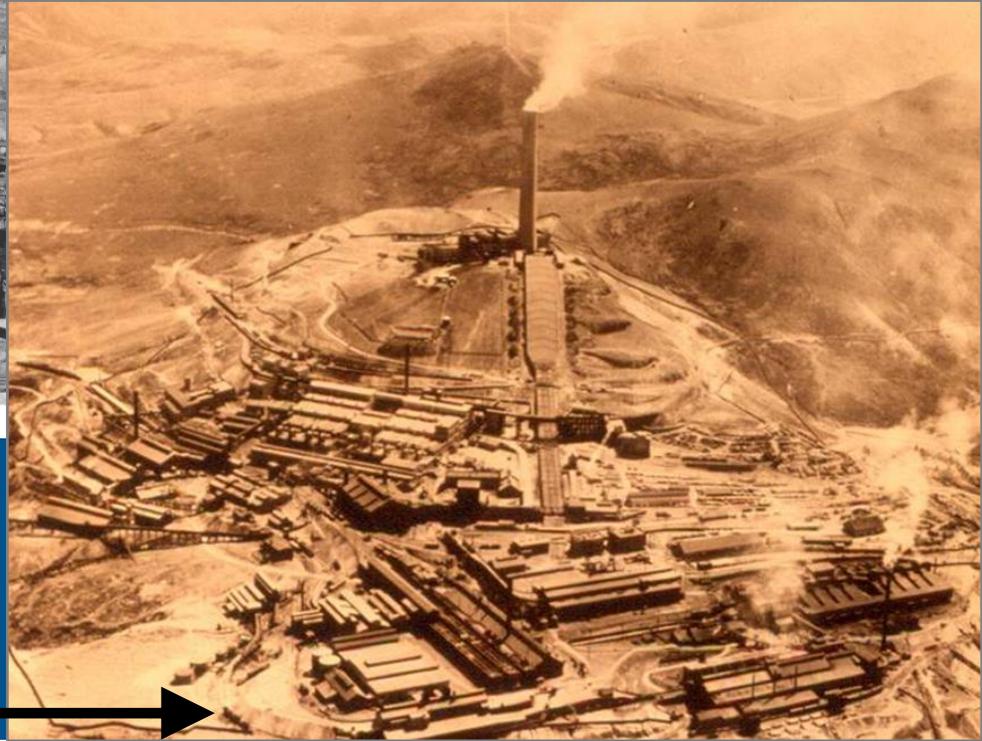


Clark Fork River Cleanup Update





Butte - 1890's



**Smelter Hill and Stack
Anaconda 1902-1980**





Tailings next to Silver Bow Creek



Former Milltown Dam - 1908



Mine waste along
Silver Bow Creek



Mine waste along
the Clark Fork River



Clark Fork River

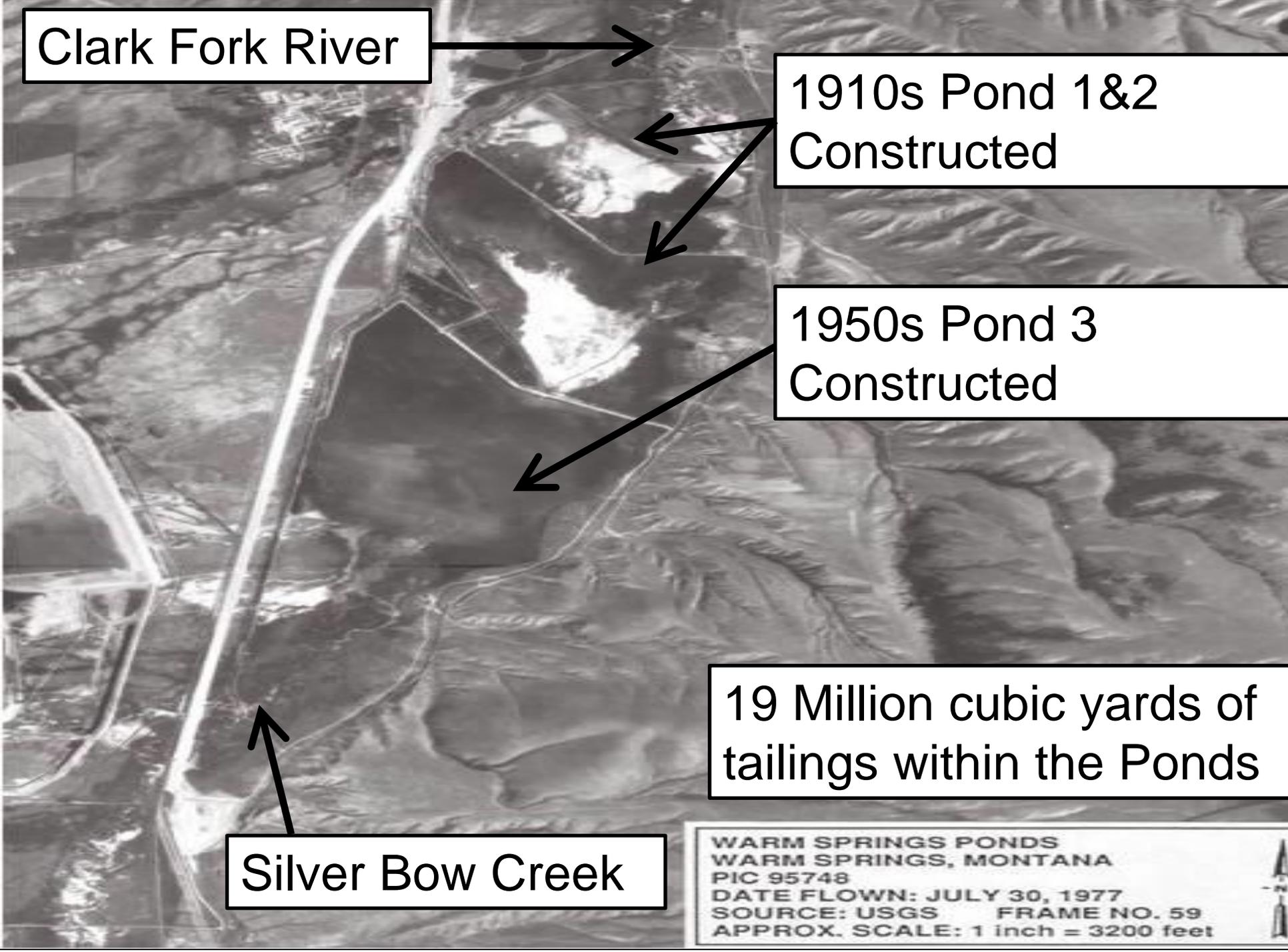
1910s Pond 1&2
Constructed

1950s Pond 3
Constructed

19 Million cubic yards of
tailings within the Ponds

Silver Bow Creek

WARM SPRINGS PONDS
WARM SPRINGS, MONTANA
PIC 95748
DATE FLOWN: JULY 30, 1977
SOURCE: USGS FRAME NO. 59
APPROX. SCALE: 1 inch = 3200 feet



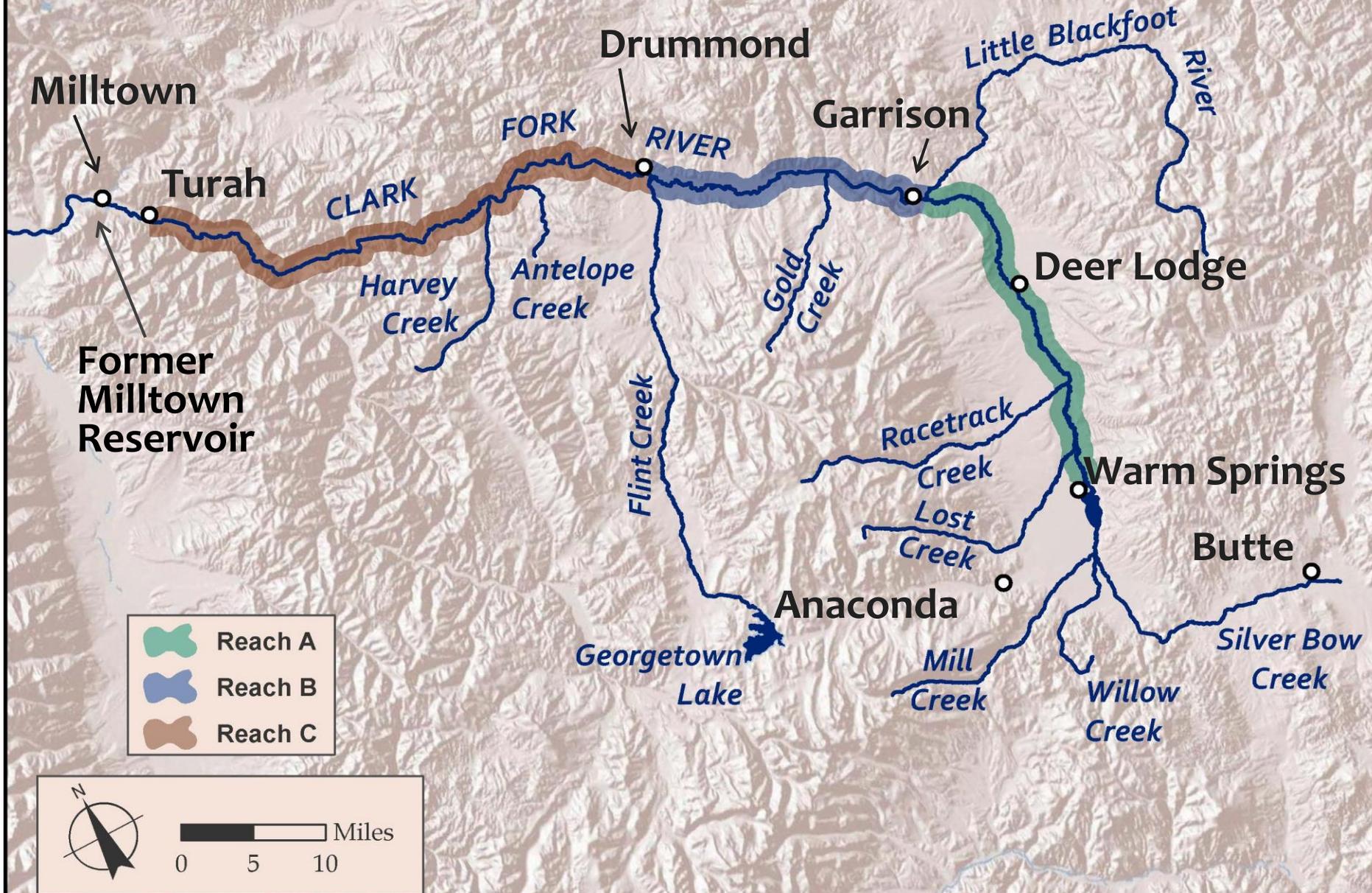
Clark Fork River Remediation & Restoration Activities

Remediation - Protect public health and welfare and the environment through implementation of the cleanup

Restoration - Restore, replace or acquire the equivalent of injured natural resources covered under the lawsuit

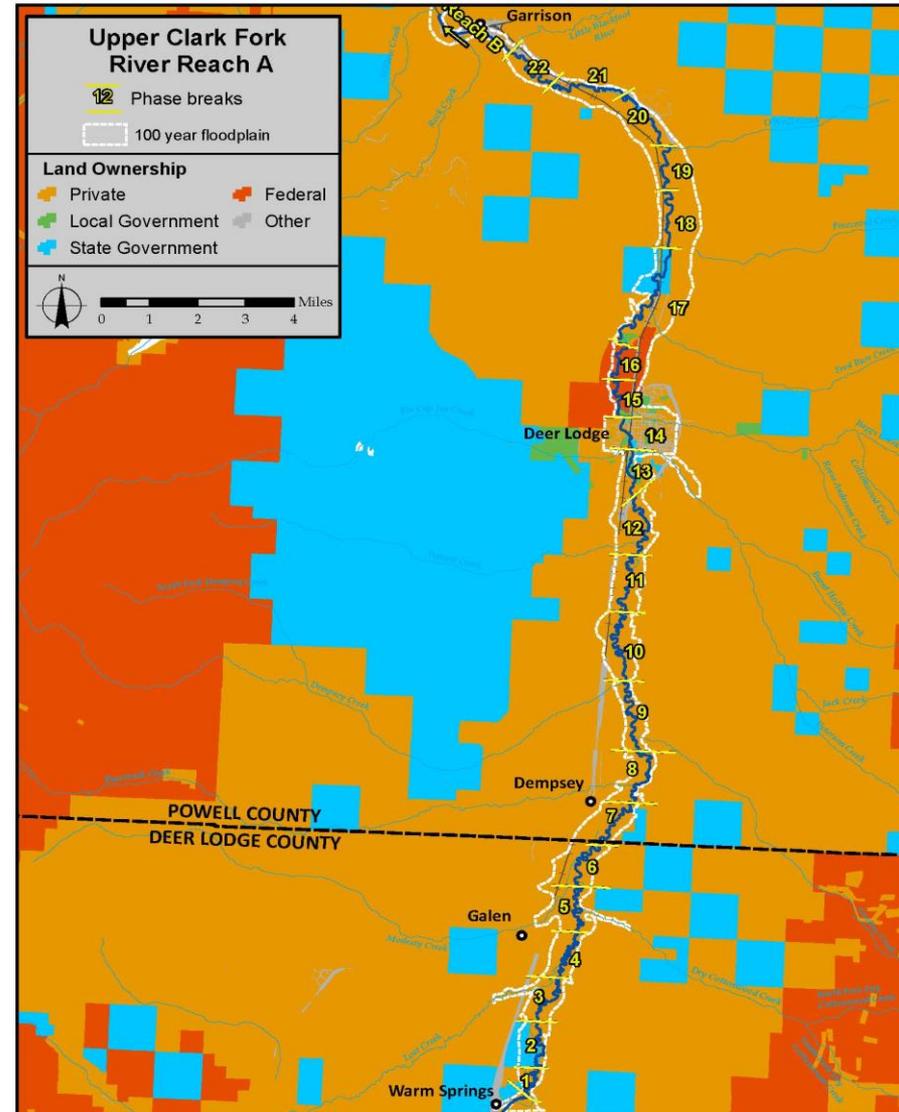
- Aquatic Resources
- Terrestrial Resources

Upper Clark Fork River



Reach A

- 22 phases, ~47 river miles
- Over 300 landowners
- 14 landowners own 70% of Reach A
- National Historic Site - Grant Kohrs Ranch
- 1 City - Deer Lodge



What is the problem?



**Mine waste within the floodplain
and banks of the river**



- **Human Health -Arsenic, Lead**
- **Ecological - Copper, Zinc**

Human Health- Residential Yards

During Cleanup



Completed





Recreational areas within the City of Deer Lodge

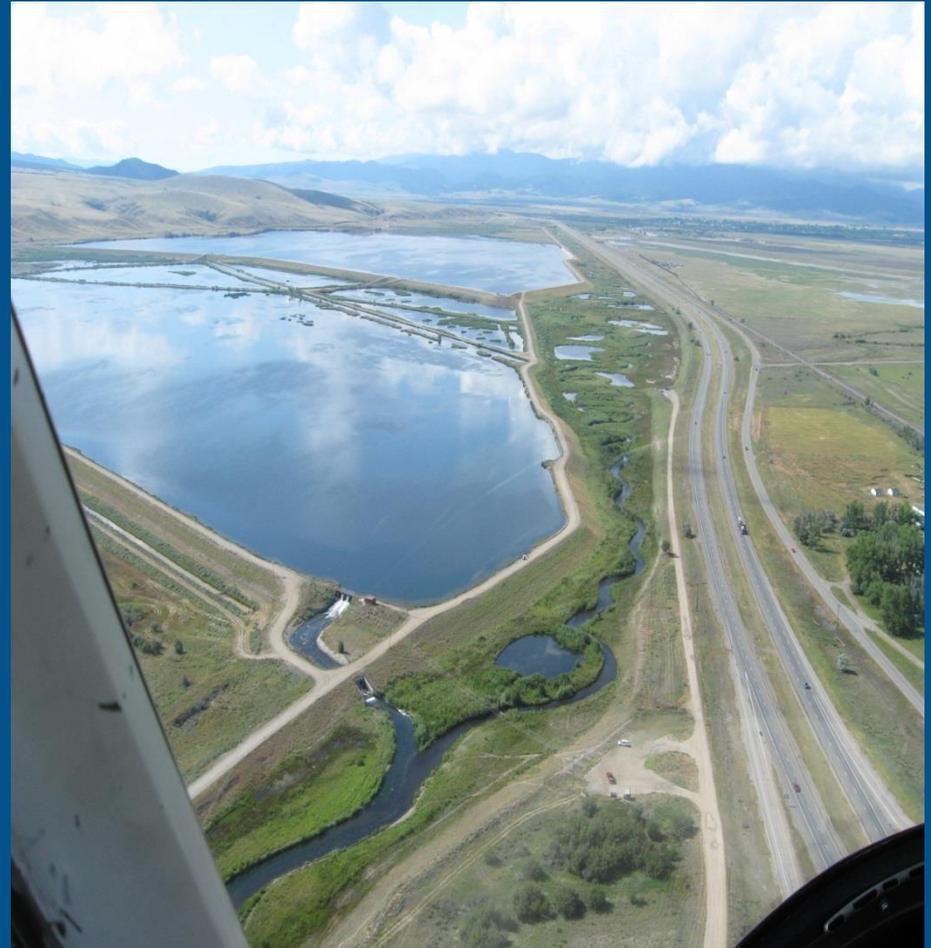
Geomorphology

- Highly sinuous
- Variably entrenched
- Bed – coarse gravel and cobbles

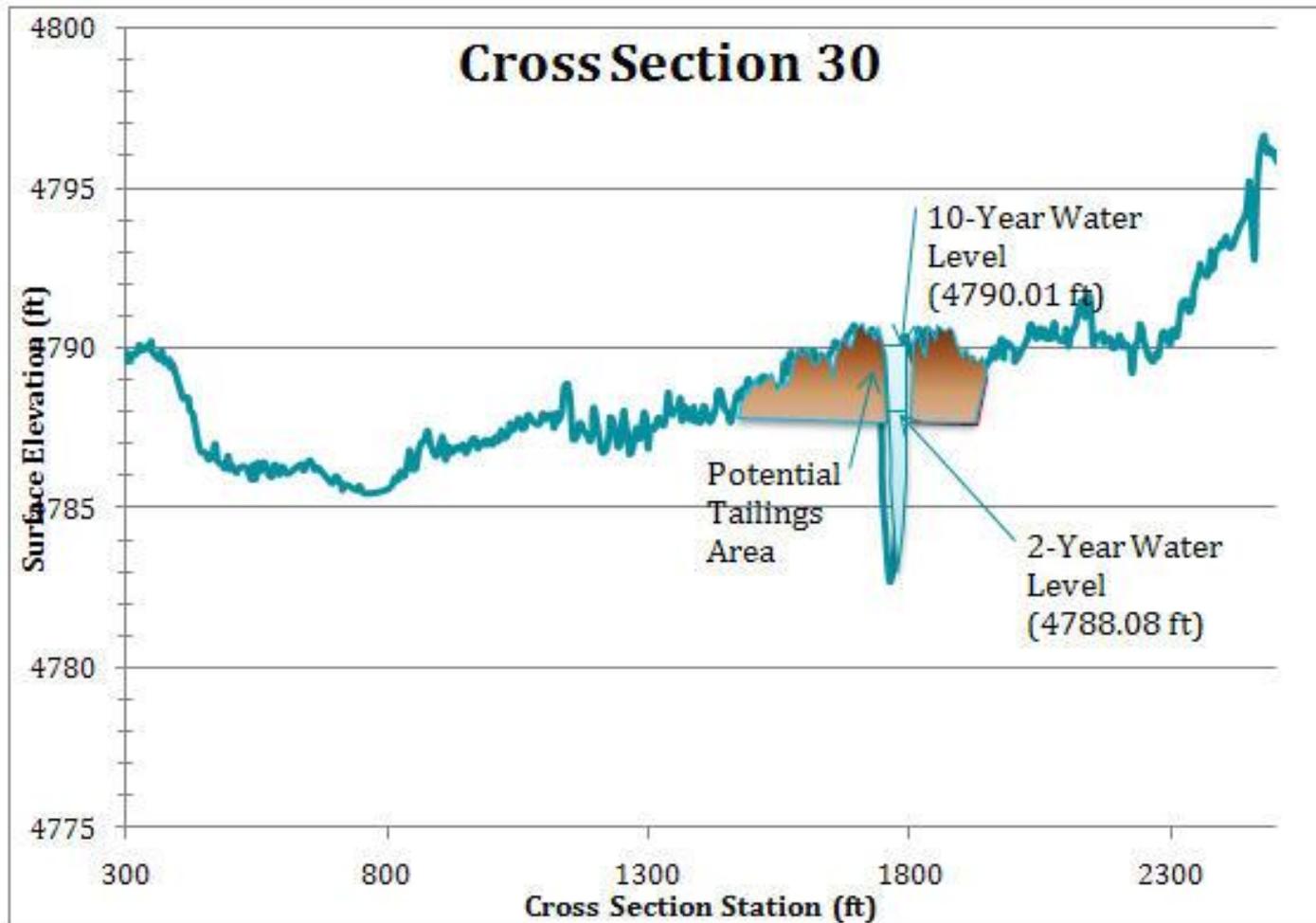


Effects of Warm Spring Ponds

- 2,400 acres of ponds
- Significant reductions in flood flows – reduces flood peaks
- Reduction of sediment loading to the Clark Fork River



Geomorphology



Clark Fork River 10-year Flood Inundation Map Phase 1

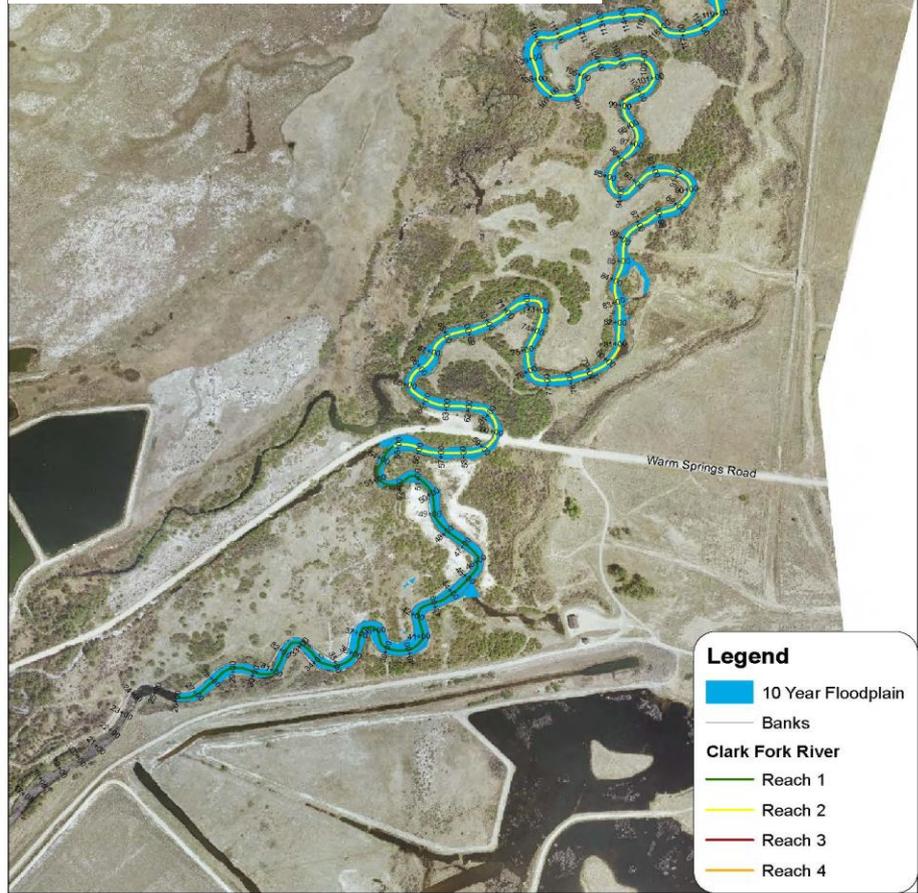


Figure D-1
Plate 1

Scale of Feet
0 187.5 375 750 1,125 1,500

1 in = 400 feet

Clark Fork River 100-year Flood Inundation Map Phase 1

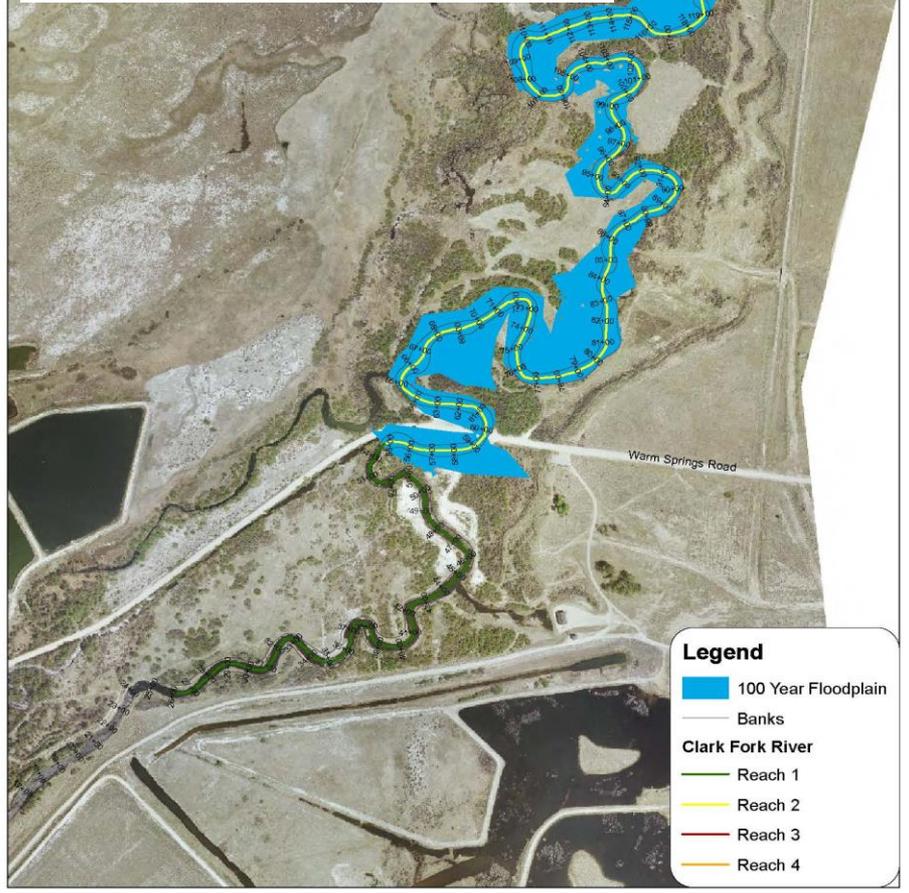


Figure D-2
Plate 1

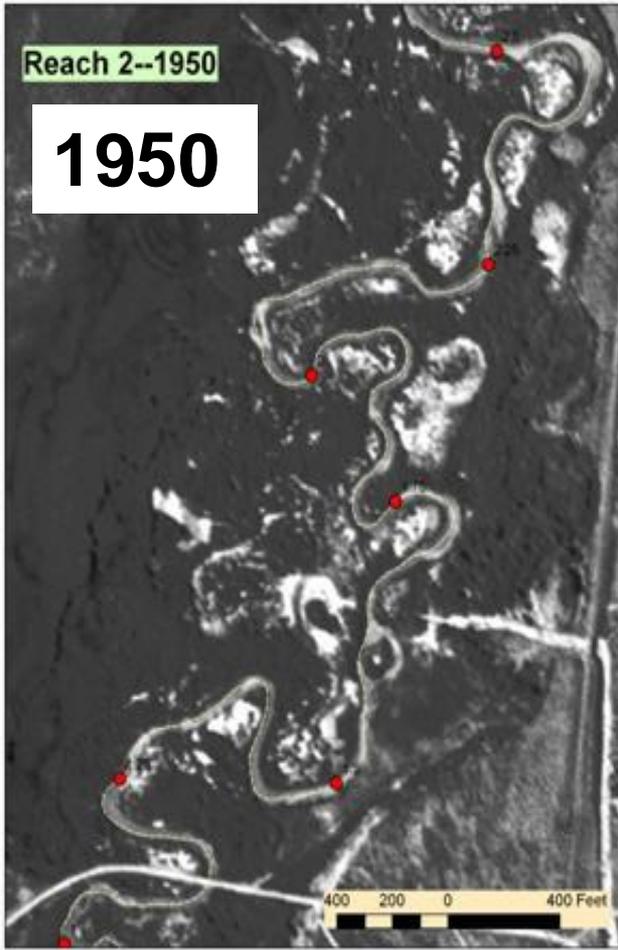
Scale of Feet
0 187.5 375 750 1,125 1,500

1 in = 400 feet

Geomorphology

Reach 2--1950

1950



Reach 2--1977

1977



Reach 2--2006

2006



We are **NOT**:

- Removing all contamination from the floodplain
- Removing streambed sediment
- Altering the plan form of the River



We are **NOT**:

- Removing all contamination from the floodplain
- **Removing streambed sediment**
- Altering the plan form of the River



We are **NOT**:

- Removing all contamination from the floodplain
- Removing streambed sediment
- **Altering the plan form of the River**



We **are**:

- Removing the worst of the contamination
- Lowering the floodplain
- Using bioengineered streambank treatment and native vegetation



We **are**:

- Removing the worst of the contamination
- **Lowering the floodplain**
- Using bioengineered streambank treatment and native vegetation



We **are**:

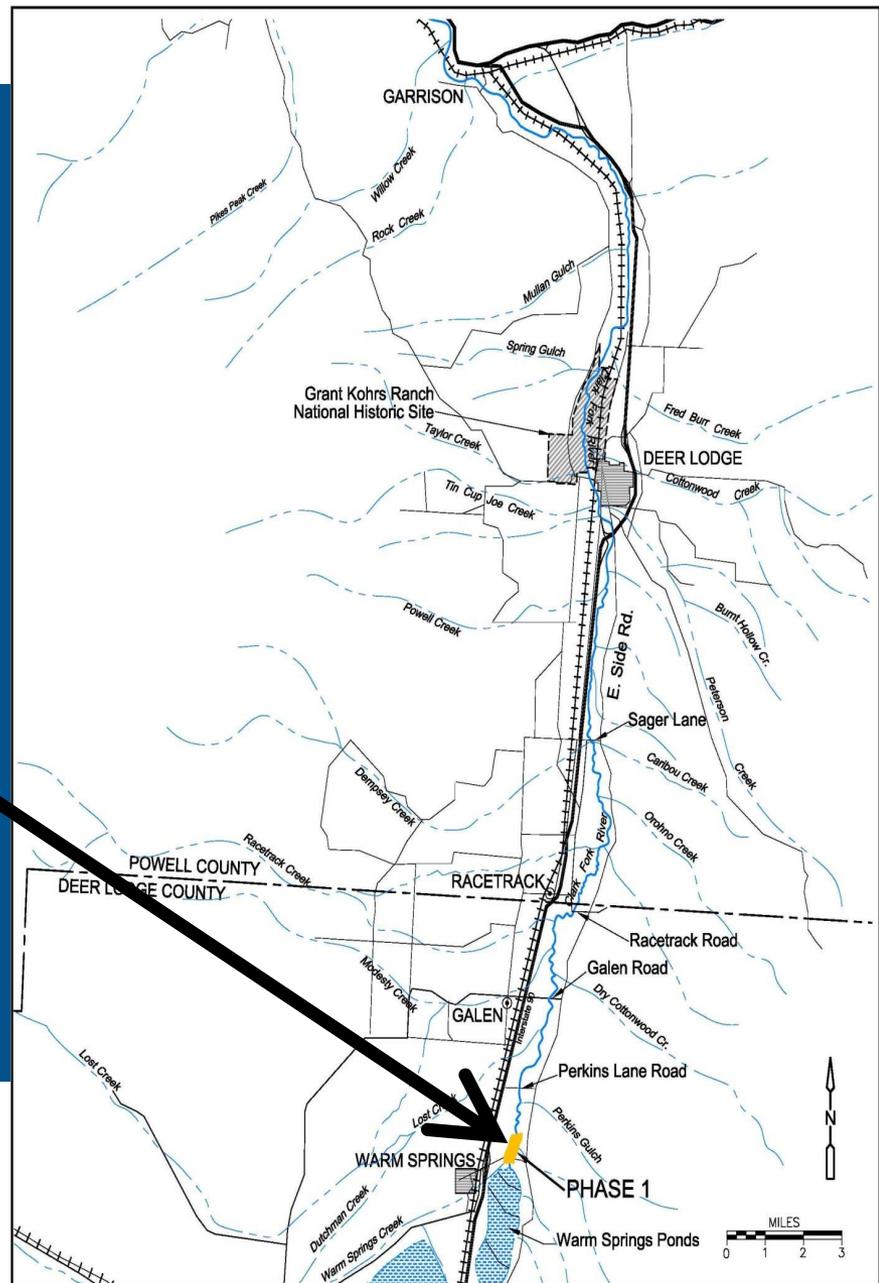
- Removing the worst of the contamination
- Lowering the floodplain
- **Using bioengineered streambank treatment and native vegetation**



Phase 1 Project Site



Phase 1 Project Site



Reach A, Phase 1

- Start of construction – March 4, 2013
- 1.6 river miles
- 64 acres of floodplain
- Removed 331,821 cubic yards of mine waste
- Rebuilt with 214,842 cubic yards of backfill (vegetative material and alluvium rock)
- 111,723 containerized plants and seeding
- Construction completed April 4, 2014
- Plantings in fall 2013, spring 2014, and fall 2014

Before Cleanup



During Construction



Point Bars



Preserve Vegetation



Single Vegetated Soil Lift (SVSL)



Double Vegetated Soil Lift (DVSL)



Planting Species List

Sedges

wheat, beaked, lakeshore, inflated, small winged), spikerush, arctic rush, hardstem bulrush, paniced bulrush

Shrubs

Willows (sandbar, yellow, geyer, booth, pacific, plane-leaf), red osier dogwood, water bog birch, alder, Wood rose, shrubby cinquefoil, swamp currant, stinking currant, golden currant, silver buffalo berry

Trees

Aspen, cottonwood





















Phase 1 Plants



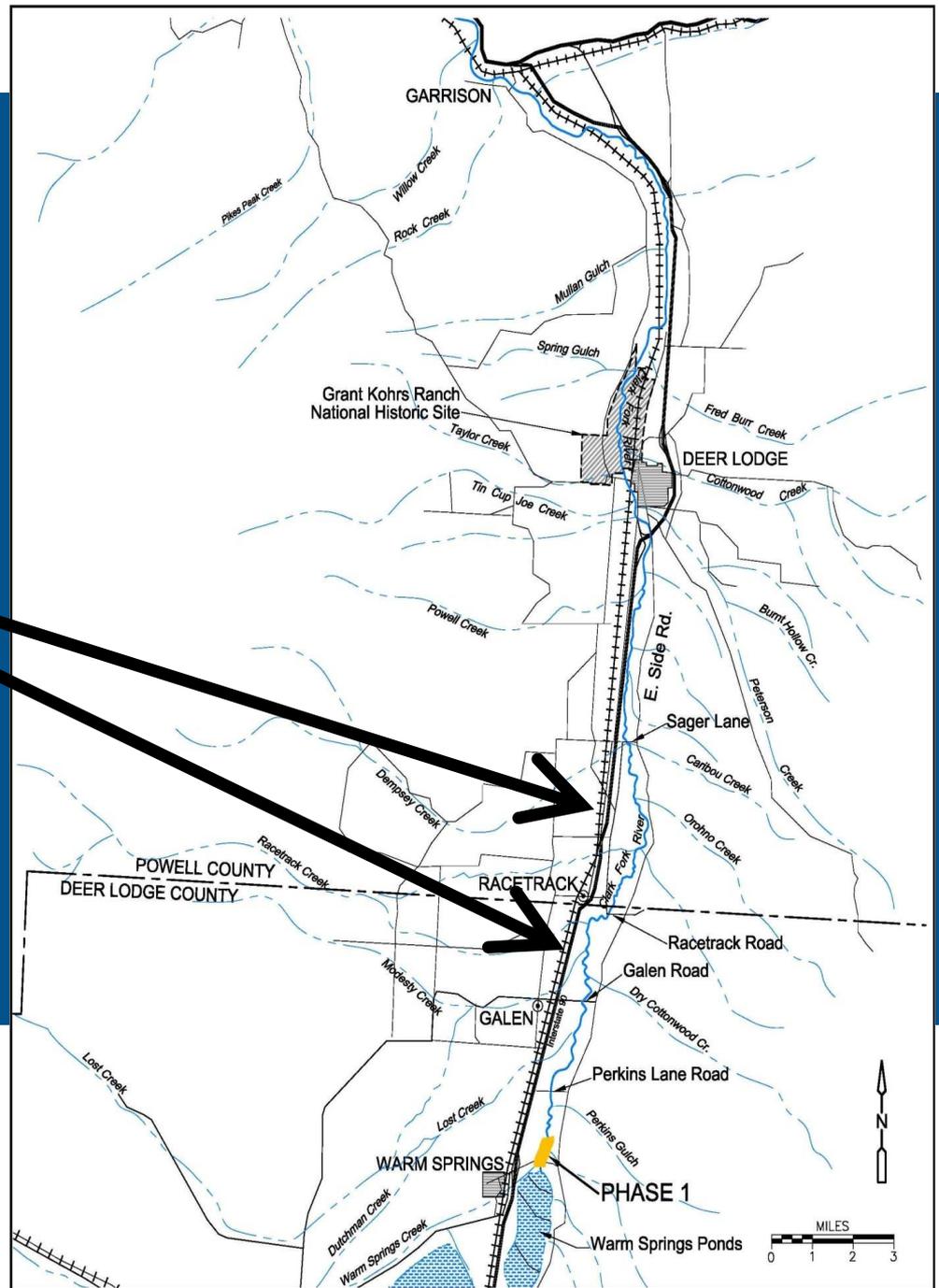
Stakeholder and Landowner Tours



Phase 5 & 6 Project Site



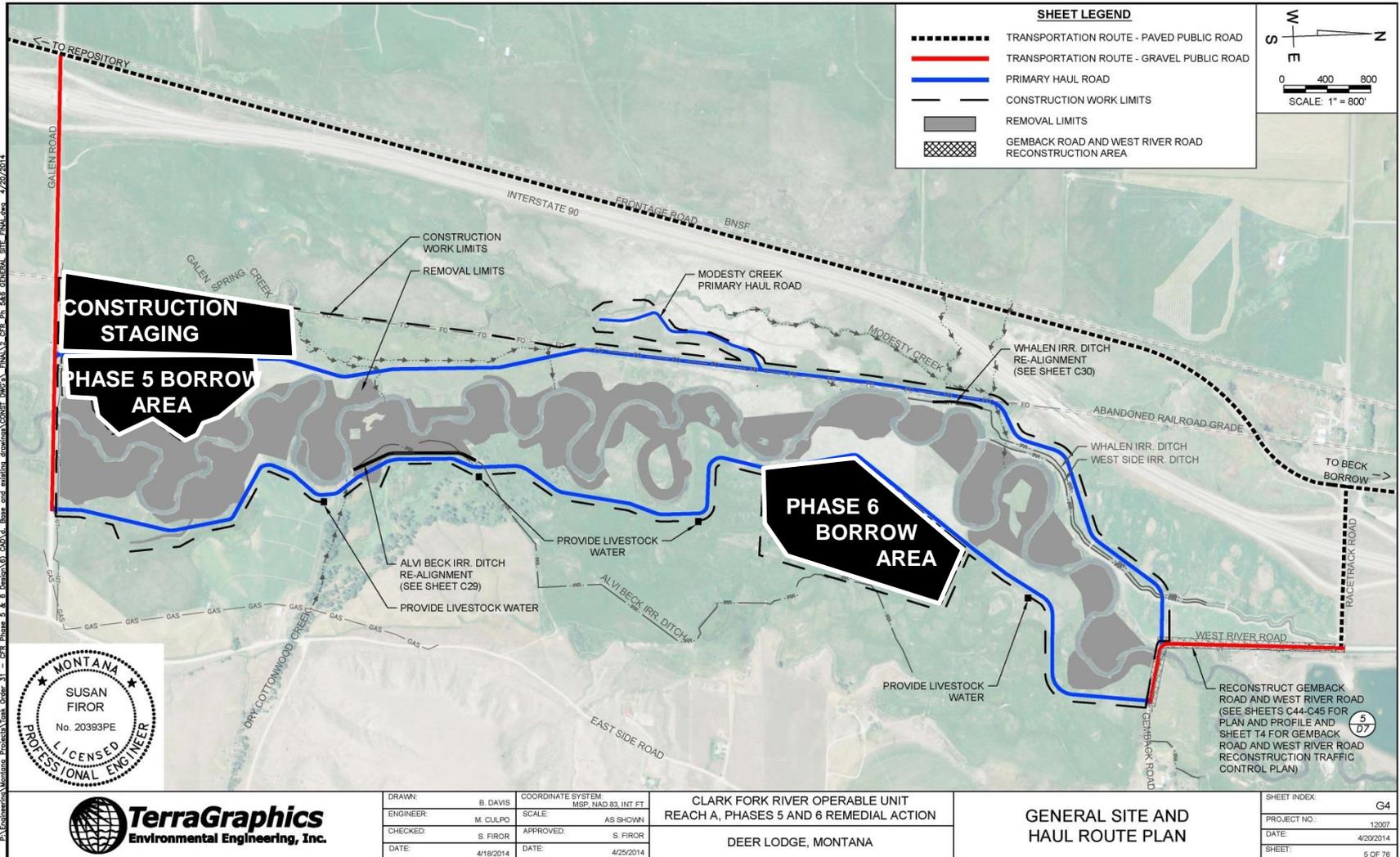
Phase 5 & 6 Project Site



Moving Downstream - Phases 5 & 6

- **Start of construction – July 15, 2014**
- **4.5 river miles**
- **136 acres of floodplain**
- **Removing 532,000 cubic yards of mine waste**
- **Rebuilding with 394,000 cubic yards of backfill (vegetative material and alluvium rock)**
- **~93,000 containerized plants and seeding**
- **Over 400 calendar days of construction**

General Site and Haul Route



P:\Engineering\Montana Branch\Gen. Oper. 31 - CFS Phase 5 & 6 Design\CD\CD\Bases and routing drawings\CONSTR.DWG'S\DRAWING\GEN. SITE PLAN.dwg 4/20/2014



Working on private lands



Phases 5 & 6 – Filling the “gap”



Phases 5 & 6 – Filling the “gap”



Phases 5 & 6 Restoration

- Additional tailings removal
- Realignment of two streams to create a place for fish

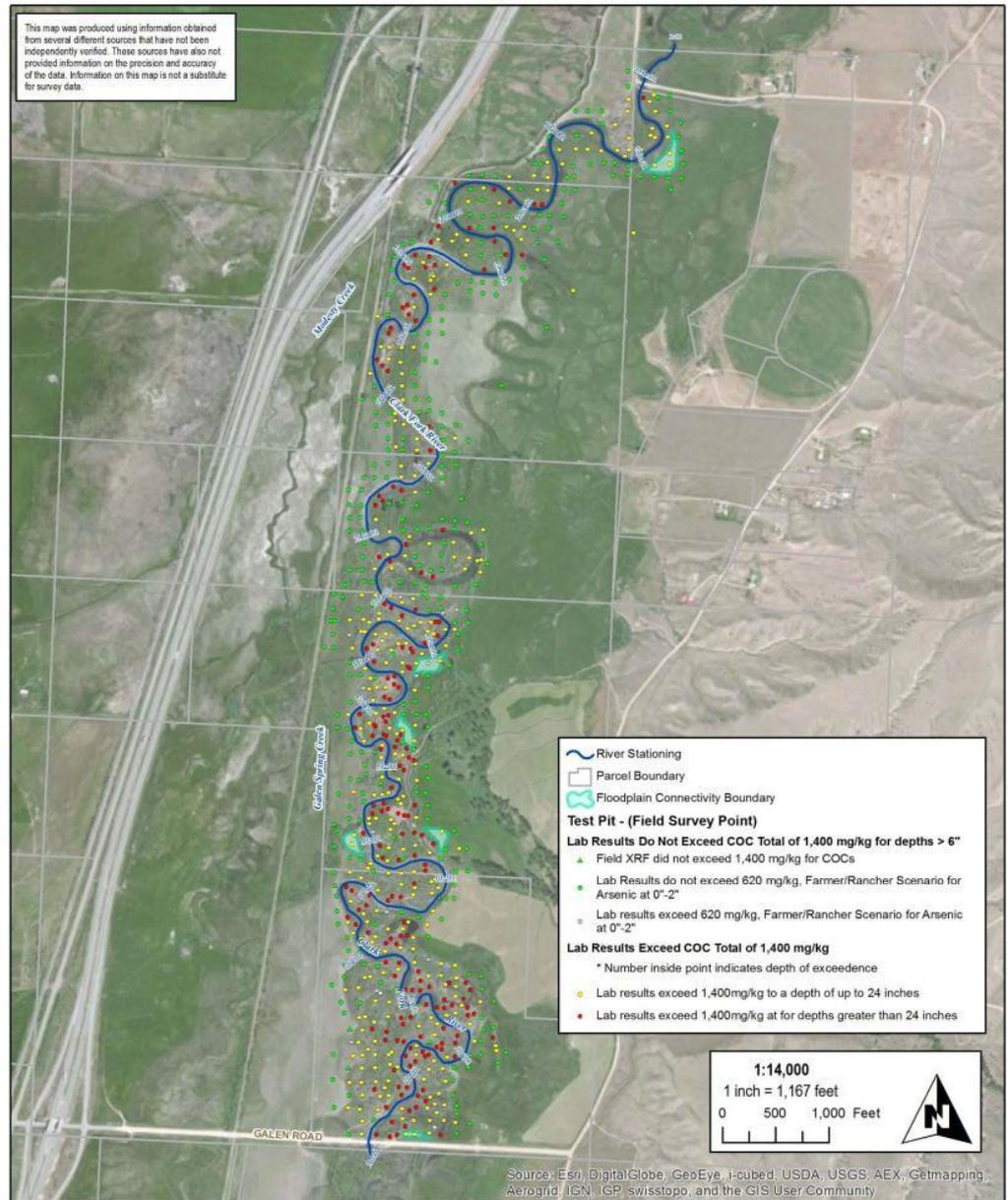


Three Separate Proposed Restoration Actions:

- 1) Additional tailings removal that is outside of areas expected to be addressed by remedy;
- 2) A conservation easement covering the areas of expected remedy and restoration actions; and
- 3) Reconstruction of two tributary channels at their confluence with the Clark Fork River (CFR)

Additional Removal Areas

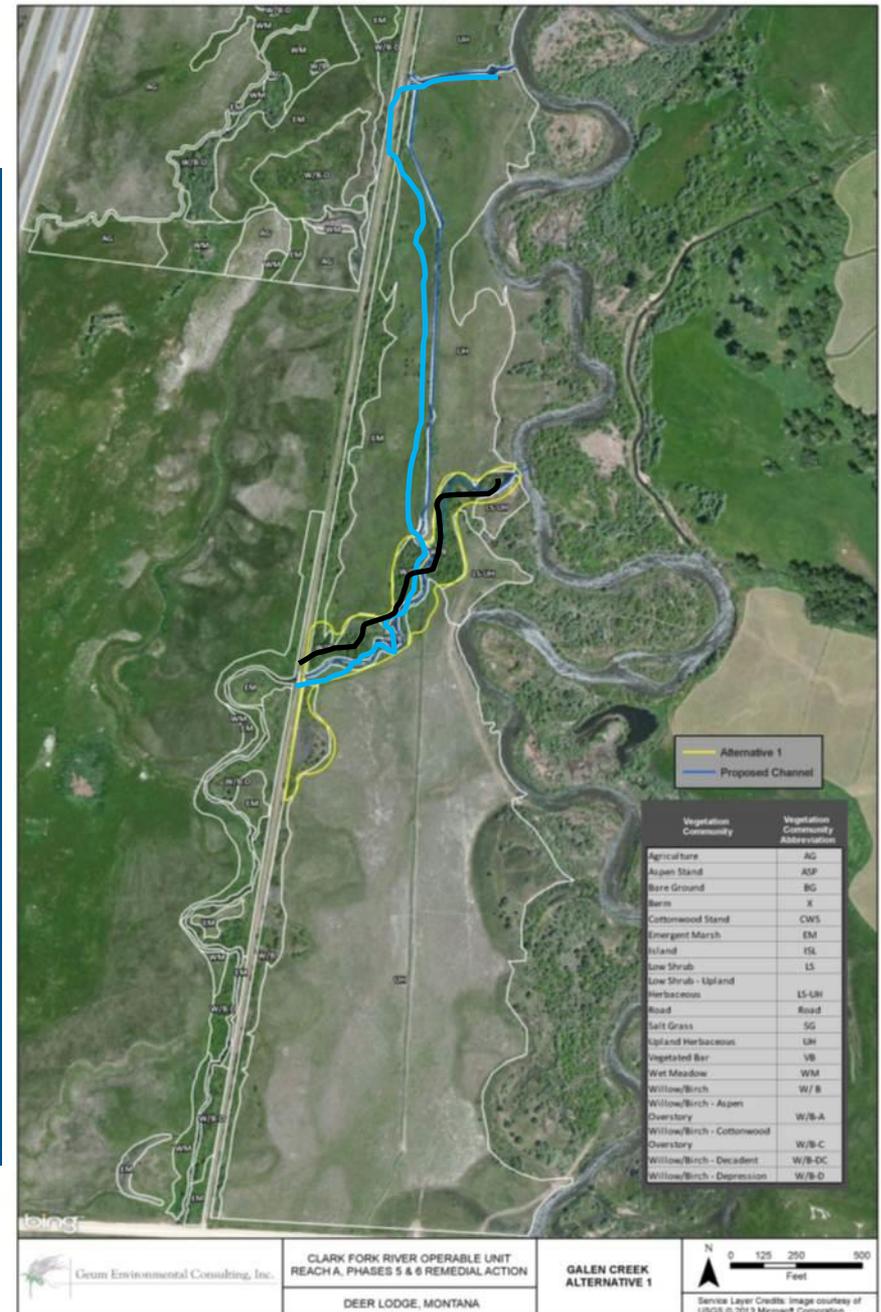
GOAL:
 Increase floodplain connectivity to increase aquatic and terrestrial habitats



Galen Spring Creek Reconnection

GOAL:
Reconnect stream
to allow for cold
water refuge for
trout.

The location is in an
area where the
stream originally
flowed

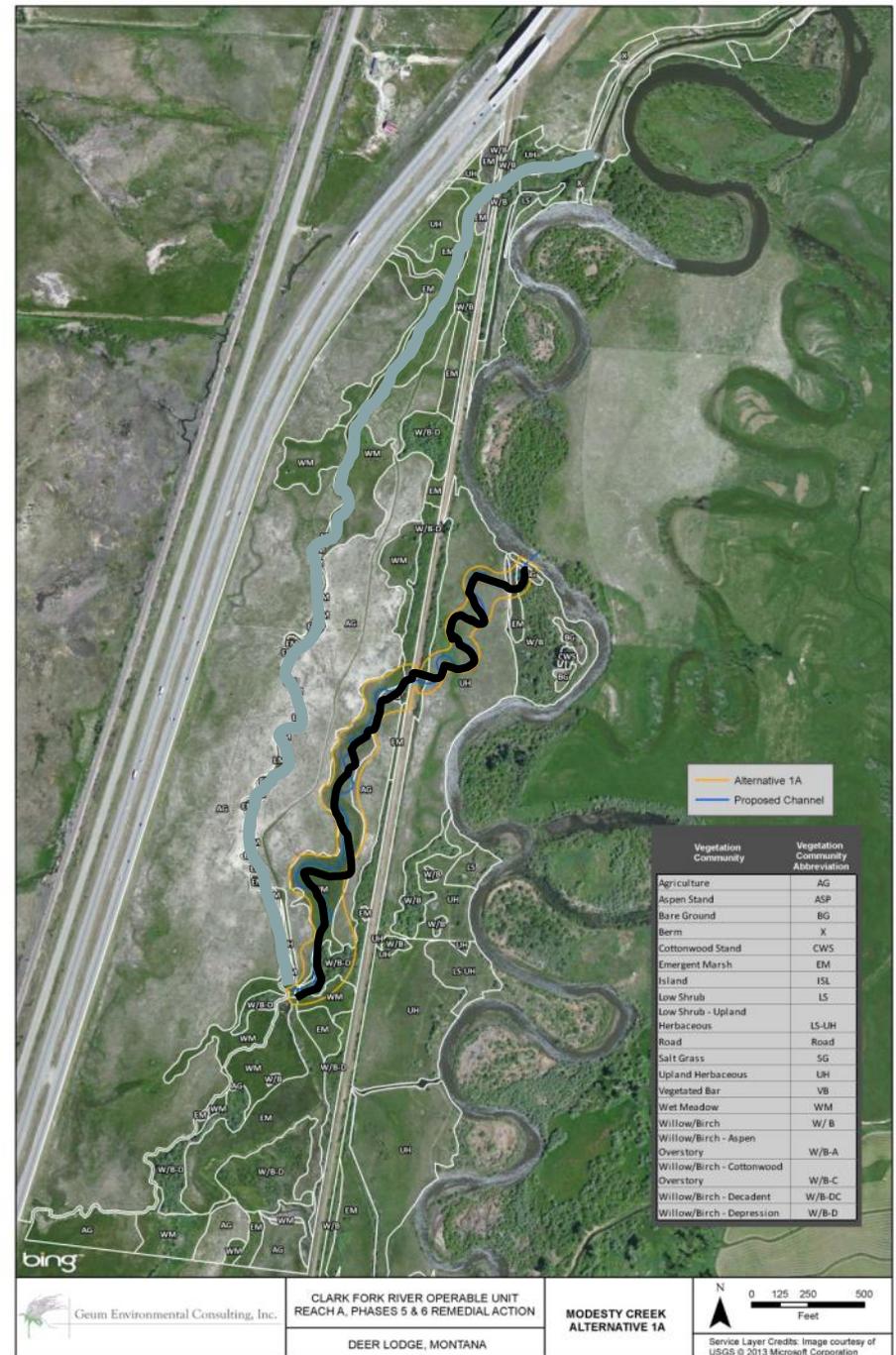


Modesty Creek Reconnection

GOAL:

Reconnect stream to allow for cold water refuge for trout

Transplanting vegetation from the old channel to the new channel



Questions?

