

# Midwest Oil Refinery & Laramie Yttrium Plant cleanup project in Laramie, WY

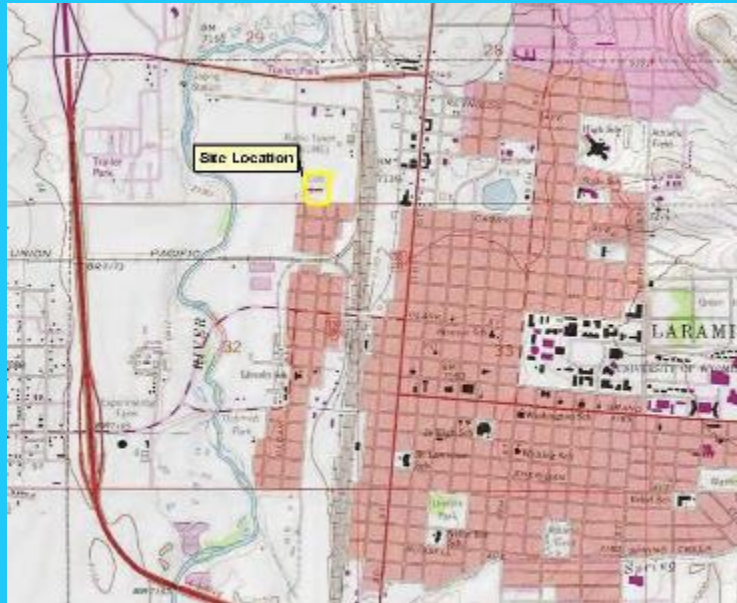


*Tony Hoch, Director*



# The property

- 5.6 acres
- Abandoned/neglected for over 20 yrs
- Unfenced
- Crime-ridden
- Eyesore
- Attractive nuisance



# History:

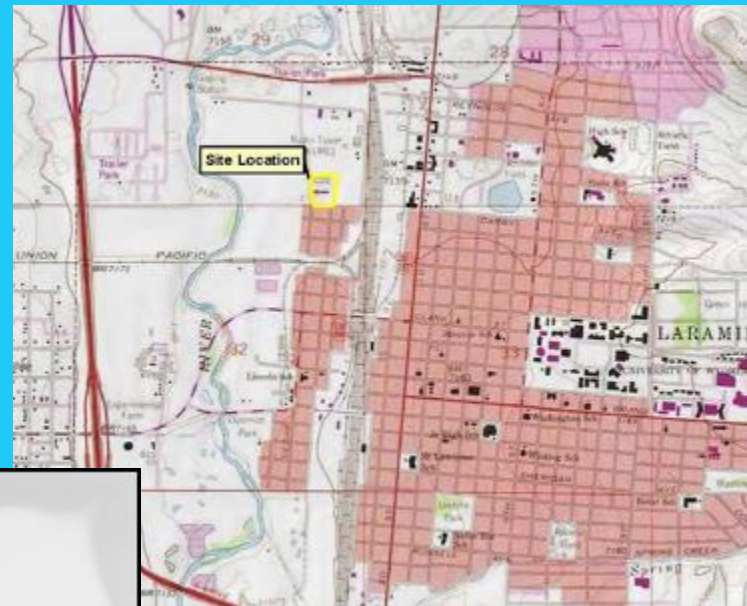
- 1921-1932 Midwest/Standard Oil refinery  
(originally a 236 acre site)
- 1955-1957 US Yttrium processing plant – green three story building built on top of refinery works.
- 1972 private individual purchased Yttrium/Refinery main industrial site
- 70s-80s Various uses: Logging yard, auto paint shop, trash disposal shop
- 1989 EPA removes 44 drums of low-level radioactive ore from metals plant
- 2011 Property had been vacant since EPA cleanup = Attractive Nuisance!
- 2011: LRCD purchased option to buy.
- 2011: LRCD Received \$54,500 EPA “Targeted Brownfield Assessment” grant
- 2012 Purchase completed on January 18
- February 2012: Enrolled in WyDEQ – Volunteer Remediation Program DEQ spent over \$150K in further characterization.
- 2014: \$330,000 CDBG grant to clean up the surface Grant handled by CITY
- 2015 – LRCD awarded EPA Brownfield Cleanup Grant (\$200,000) to deal with soils – LRCD spent an additional \$200,000 “out of pocket”
- 2016 LRCD hires contractor who excavated contaminated soils, backfilled
- 2017 Contractor caps clean fill with bentonite and compacts, topsoil, reseeding
- Dec 30, 2017 LRCD receives letter from DEQ saying soils cleanup is complete.







1928



# Issues:

- Barrels of oil
- Metals/hydrocarbons in groundwater
- **Hydrocarbons/metals in surface soils**
- Lots and lots of concrete and rebar
- Guano and squalor
- General safety – sharp rebar, crumbling buildings, catacombs/manholes

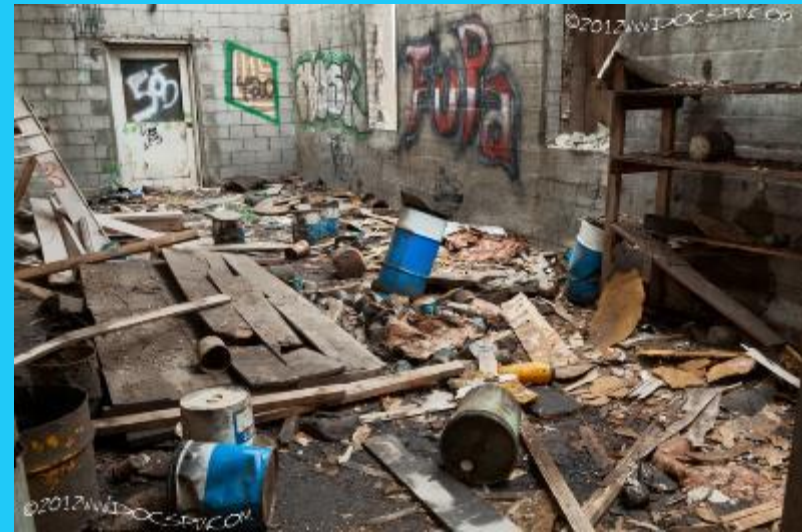
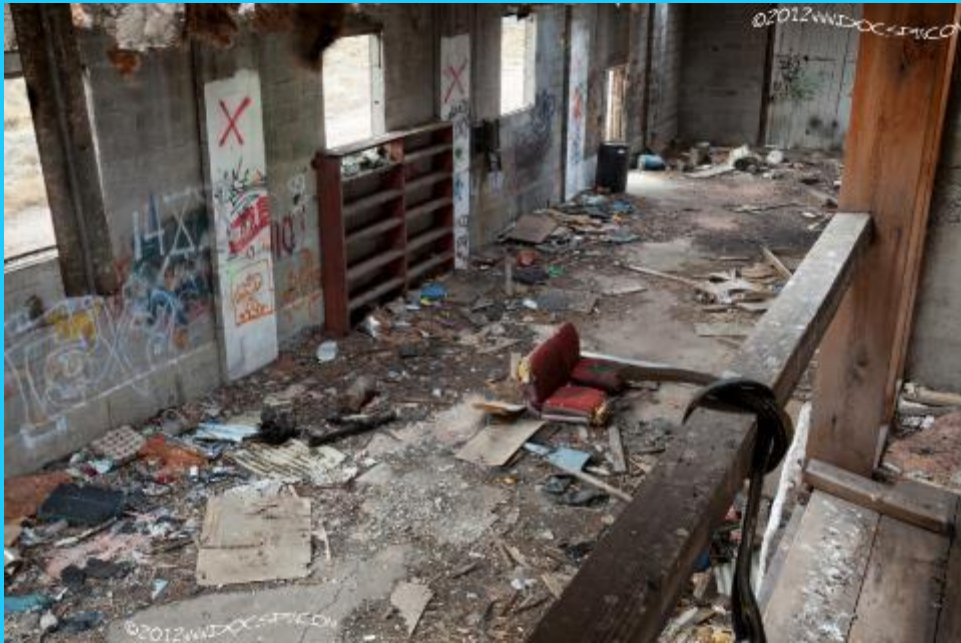


# Good news:

- It could have been a lot worse!
- Asbestos was not a major problem
- Lead based paint not a problem
- EPA, DEQ, City, Public strongly support this project;













# Environmental Evaluation

## EPA Targeted Brownfield Assistance Program



### Literature Search

Metals in soils/groundwater

SVOCs/PAH's in soils/groundwater

DRO, GRO in Groundwater

Asbestos in structures & soils

Geophysics for tunnels

Lead based paint leaching tests



# Groundwater issues



12 monitoring wells

Water table aquifer of river sediments

Depth to bedrock = 10' to 12'

About 6' to water table

Depth to Casper aquifer <1000'

Metals to be monitored continually

Iron, Magnesium, Manganese Boron

Arsenic, Cobalt, Thallium



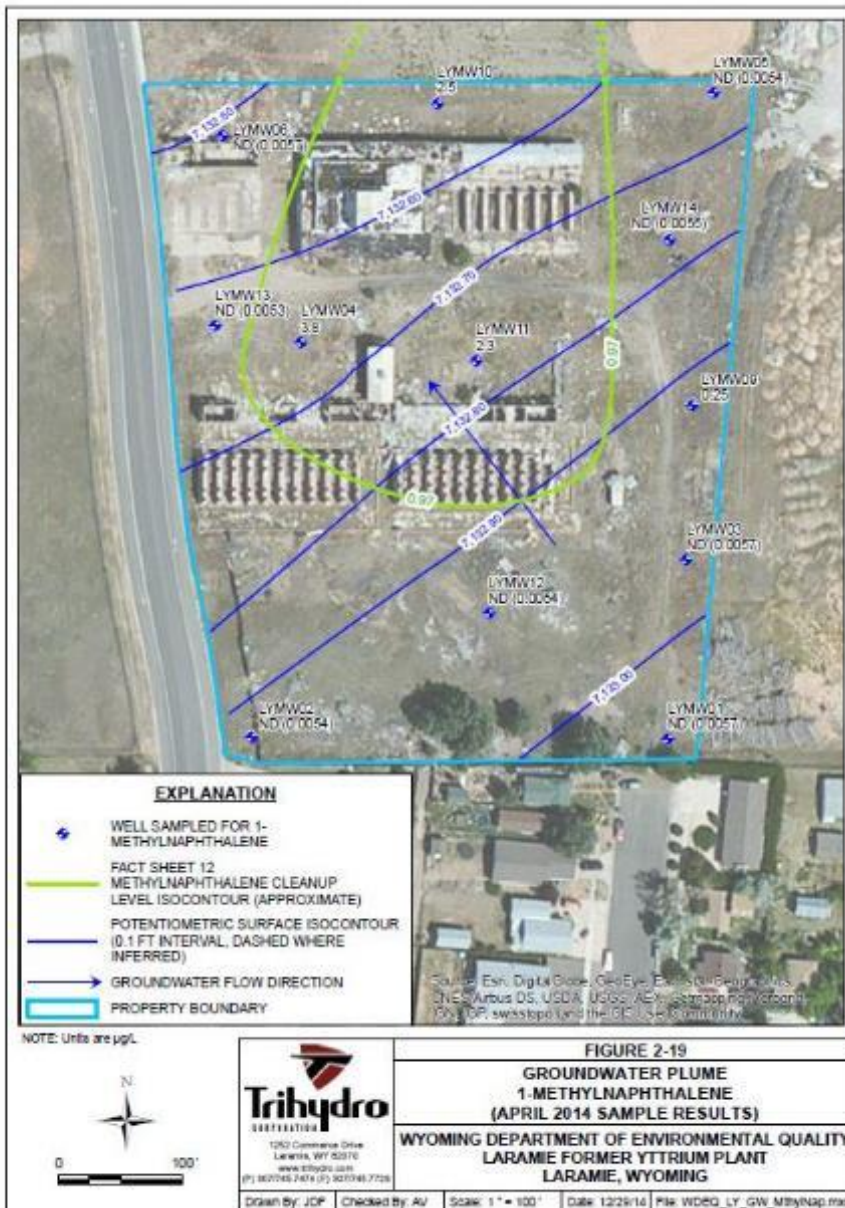


# PAH Plume

## PAH Plume –

Byproducts of coal burning getting into shallow groundwater

This is the main problem our cleanup addressed by removing the source and stopping groundwater infiltration



## TPH-DRO Plume (petroleum/diesel)

Plume appears to be flowing through the property with no obvious source; this will be monitored for natural attenuation (degradation)



FIGURE 2-20

GROUNDWATER PLUME, TOTAL PETROLEUM  
HYDROCARBONS AS DIESEL RANGE ORGANICS  
(APRIL 2014 SAMPLE RESULTS)

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY  
LARAMIE FORMER YTTRIUM PLANT  
LARAMIE, WYOMING



Drawn By: JDF | Checked By: AV | Scale: 1" = 100' | Date: 12/31/14 | File: WDEQ\_LY\_GW\_DRO.mxd



# Metals in Soils

Cr, Fe, Mn exceed MTGW for all samples

B exceeds MTGW in 6 subsurface samples

Cd exceeds MTGW in 3 samples

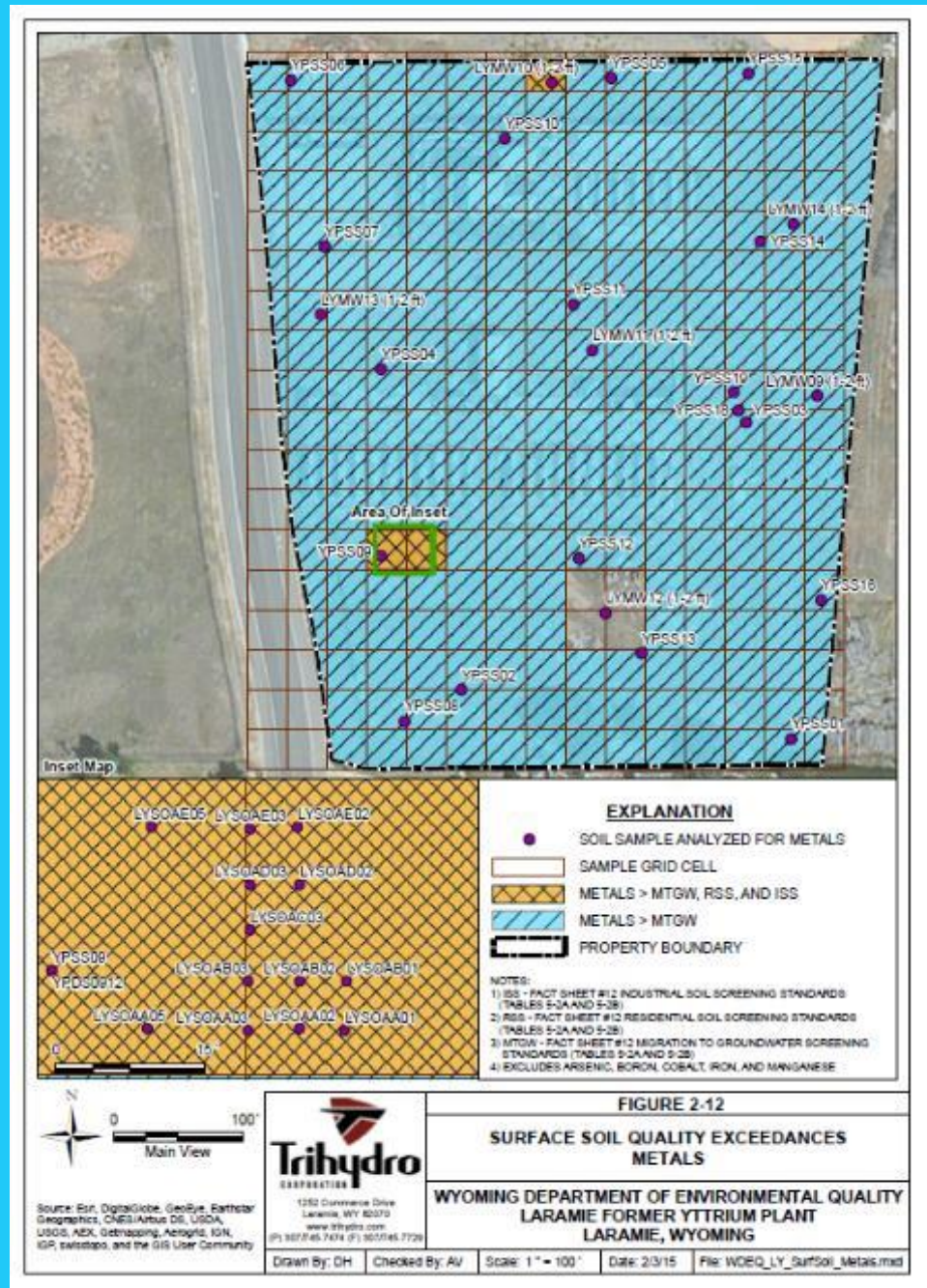
Pb exceeds MTGW in 4 samples

Hg exceeds MTGW and RSS in samples at LYMW 10

Se exceeds MTGW in 4 samples

Th exceeds MTGW in 3 samples

Areas of LYWM 9, 10, 11, 13, 14 are where most exceedances are found



# Structure Cleanup - HUD-CDBG Grant

March 2011



July 9, 2014











## Final cleanup – Soils - EPA Brownfield Cleanup Grant:



- Excavate soil to 1' or 6' to meet Industrial Site Standards as required
- Backfill with “clean soil”
- Disc in bentonite clay and compact to create a very low permeability “cap”
- Haul in topsoil and seed with a native grass mix

# WYDOT and the modified scope of our project



- WYDOT purchased the southern ~ half of the property in 2015
- The Viaduct effectively serves as a cap
- At the edges of the Viaduct an additional 1' of soil will be hauled in and reseeded
- WYDOT ownership ensures the soil will not be disturbed or developed





DATE: December 2016  
 DESIGNED BY: C. MOORE  
 DRAWN BY: D. AITOG



**TASMAN**  
 GEOSCIENCES

Tasman Geosciences, Inc.  
 6859 Pecos Street - Unit C  
 Denver, CO 80221

**Former Laramie Yttrium Site**  
**Laramie Rivers Conservation District**  
 Section 29, Township 16 North, Range 73 West  
 Albany County, Wyoming

Approximate Excavation  
 Extents

**Figure**  
**3**









DATE: December 2016  
 DESIGNED BY: S. EWING  
 DRAWN BY: D. ARNO

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 GEOSCIENCES  
 Tasman Geosciences, Inc.  
 6099 Pecos Street - Unit C  
 Denver, CO 80221

Former Yttrium Site  
 Laramie Rivers Conservation District  
 Section 29, Township 16 North, Range 73 West  
 Albany County, Wyoming

Initial Soil Confirmation  
 Sample Results

Figure  
 4





DATE: Apr 2017  
 DESIGNED BY: T. Johansen  
 DRAWN BY: D. Arnold

**TASMAN** GEOSCIENCES  
 Tasman Geosciences, Inc.  
 6899 Pecon Street - Unit C  
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**Former Laramie Yttrium Site**  
**Laramie Rivers Conservation District**  
 Section 29, Township 16 North, Range 73 West  
 Albany County, Wyoming

Bentonite Supersack  
 Location Grid

**Figure**  
**6**

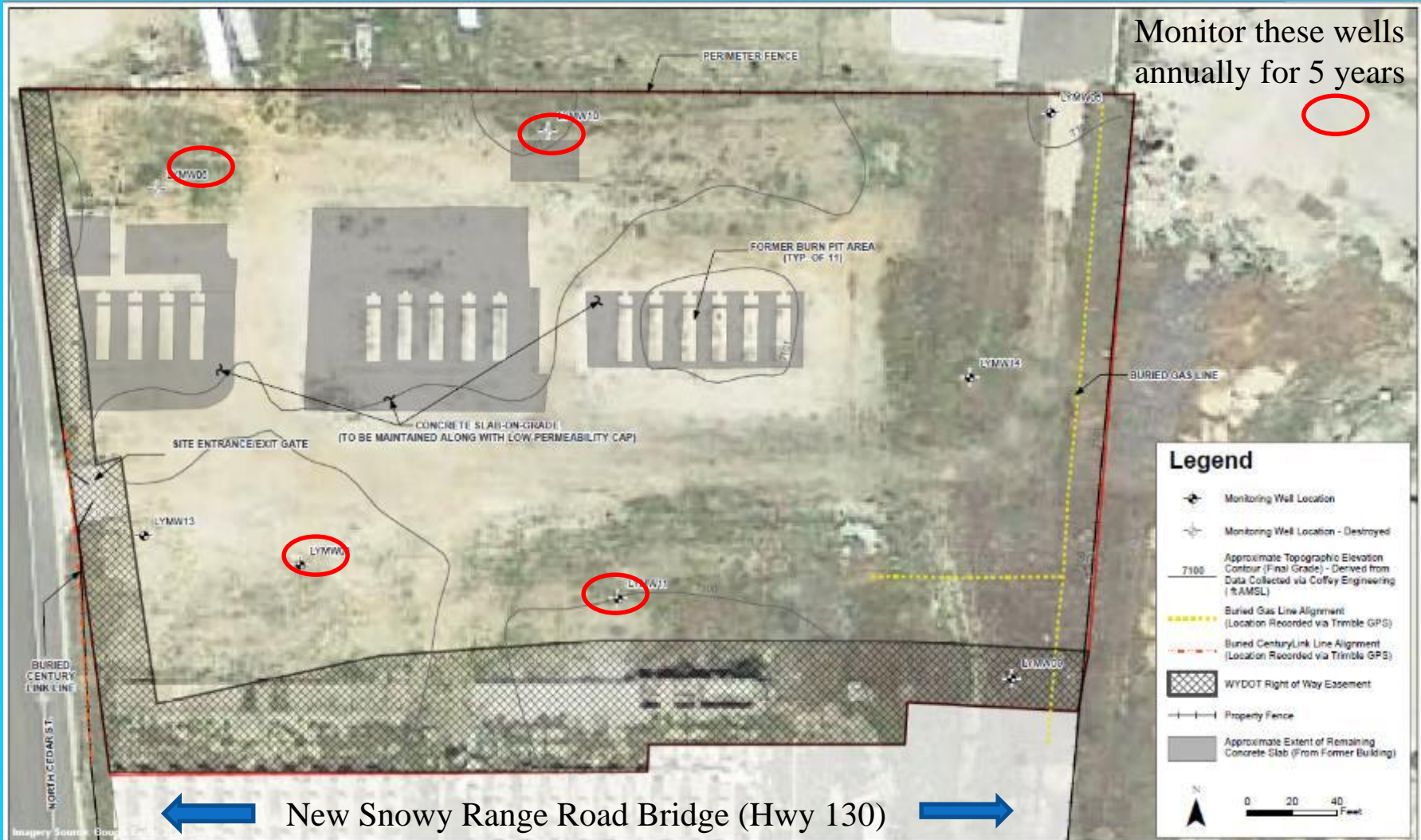






# Final Product – moving forward

Monitor these wells annually for 5 years



## New Snowy Range Road Bridge (Hwy 130)



## Interesting statistics on final cleanup

- 119 truckloads of soil and debris removed (3096 cubic yards or 2580 tons) to the landfill
- 123 truck loads of clean fill was hauled in to replace and bring up to original grade.
- Additionally 177 tons of bentonite was disked in to the top 8” of fill and compacted to create a very low permeability cap from infiltrating water.
- 189 tons of topsoil was then brought in, spread evenly and reseeded.

# What must still be done under WY Volunteer Remediation Program or VRP

- Monitor 4 wells annually for natural attenuation of pollutants in ground water (MNA)
- Follow UCA (**Use Control Area**) attached to deed, tells what uses are prohibited for the property
- Follow RA (**Remedy Agreement**) – Our Agreement with DEQ that says what must be done to call the project completed



# Punch line – overall costs

## Expenses –

- Purchase/Survey/Legal: \$132,983
- Studies/characterization: \$375,089
- Actual cleanup \$817,205
- Total ~\$1.3M

## Income + In kind contributions

- DEQ Study for Remediation alternatives: \$225,000
- EPA Targeted Brownfield assessment: \$150,000
- City/County/local grants: \$37,000
- CDBG “Urban blight” cleanup grant \$330,000
- EPA Brownfield cleanup grant: \$200,00
- WYDOT Purchased 40% of property \$90,000
- Total ~ \$1M

LRCD out of pocket: ~300,000 over 6 years (not counting any staff time)

Hope to recoup ~\$200K with sale of cleaned up property

# Thanks for your time!



[www.lrcd.net](http://www.lrcd.net)

[www.laramiemidwestrefinery.com](http://www.laramiemidwestrefinery.com)