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***PERFORMANCE-BASED  
REMEDiation (PBR) AT FORMER  
GALENA FORWARD OPERATING  
LOCATION (FOL), ALASKA***

**RAB Meeting, 20 October 2015, Galena, Alaska**

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# Former Galena FOL Performance Based Contract

- Parsons - Prime Contractor
- Partnering Team – CH2M and Ahtna Engineering Services
- Remediation of 31 sites contaminated primarily with fuels and solvents
- Installation of remediation systems from 2015 to 2018
- Operation through Summer 2020





# *Field Activities Completed in 2015*

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- **Time Critical Removal Action at DP023 (Disposal Site West of Dike - DSWD)**
- **Excavation at CSS002 (former Building 1812)**
- **Excavation at CST013 (former UST 1770)**
- **Confirm UST Tank abandonment at CAC Building (UST1428)**
- **Installation of four Pilot Test Soil Vapor Extraction (SVE) Systems (SS019, SS025, SS022, and OW024,)**
- **Annual Groundwater Sampling**
- **Sampling for Preliminary Design or Risk Calculations**



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# ***Time Critical Removal Action (TCRA) for Site DP023 (DSWD)***

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- **CERCLA Site contaminated with**
  - **Polychlorinated biphenyls (PCBs),**
  - **Petroleum hydrocarbons,**
  - **Volatile organic compounds (VOCs),**
  - **Polycyclic aromatic hydrocarbons (PAHs), and**
  - **Pesticides**
  
- **Excavation from late August to early October**
  - **Transformers and soil contaminated with PCBs**
  - **Leaking drums filled with tar and used oil**
  - **Metal and wood debris – asphalt processing equipment, vehicle and machinery parts, marsh mats, generator parts, general landfill and construction debris**



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# Location of DSWD Excavation and Staging Areas



- Legend**
- DP023 Site Boundary
  - Winter Storage Areas
  - Clean Debris and Equipment Staging Areas
  - Contingency Soil Stockpile Area
  - Estimated Extent of Constituents in Soil with Concentrations Greater than Human Health Method Two CULs



**Figure 1 (Revision 1)**  
**Site DP023 Excavation and Equipment and Soil Waste Staging Areas**  
 Time Critical Removal Action for Disposal Site West of Disk (Site DP023)  
 Former Galena Forward Operating Location, Alaska  
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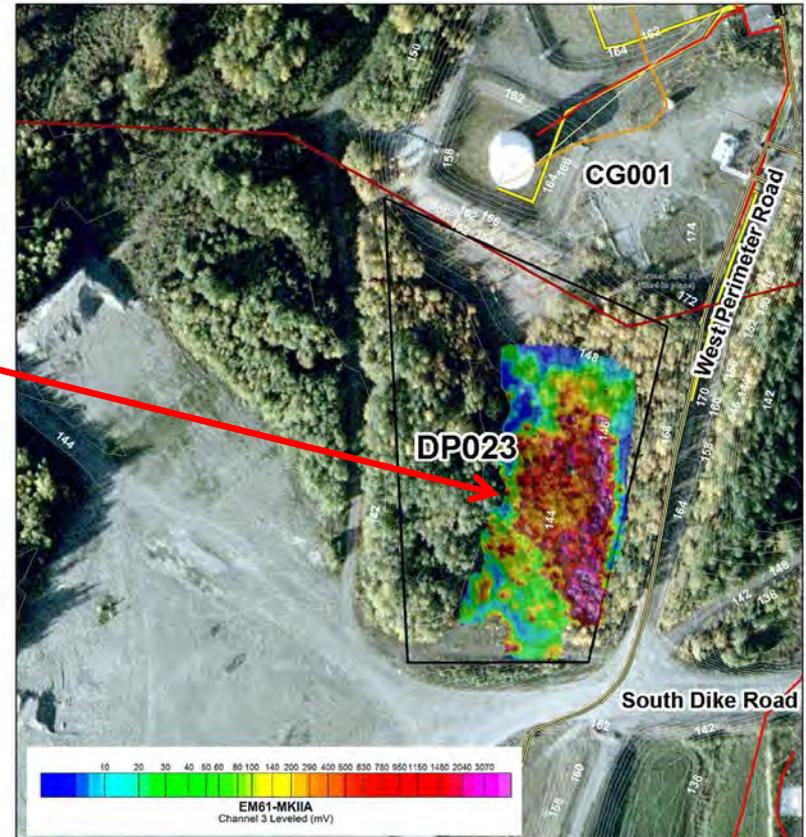
S:\EG\Remed\743386\_Galena\_FOL\_PBR\Delab\Site\Site\DP023\CRA\_WF\_DP023\_SiteLayout\_Fig1.mxd 5/18/2015



# DP023 (Disposal Site West of Dike)

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- The DP023 TCRA removal action removed 48 truck loads of debris and approximately 500 cy of contaminated soil in the disposal area identified by a geophysical survey and soil sampling



**FIGURE 1**  
**Site DP023 Layout and Geophysical Survey Results**  
 Time Critical Removal Action for Disposal Site West of Dike (Site DP023) Former Gakona Forward Operating Location, Alaska  
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# *Excavation from DP023*

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**Clean debris taken to landfill**



**Placing contaminated soil in super sacks for off-site disposal**



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# ***DP023 Site Status***

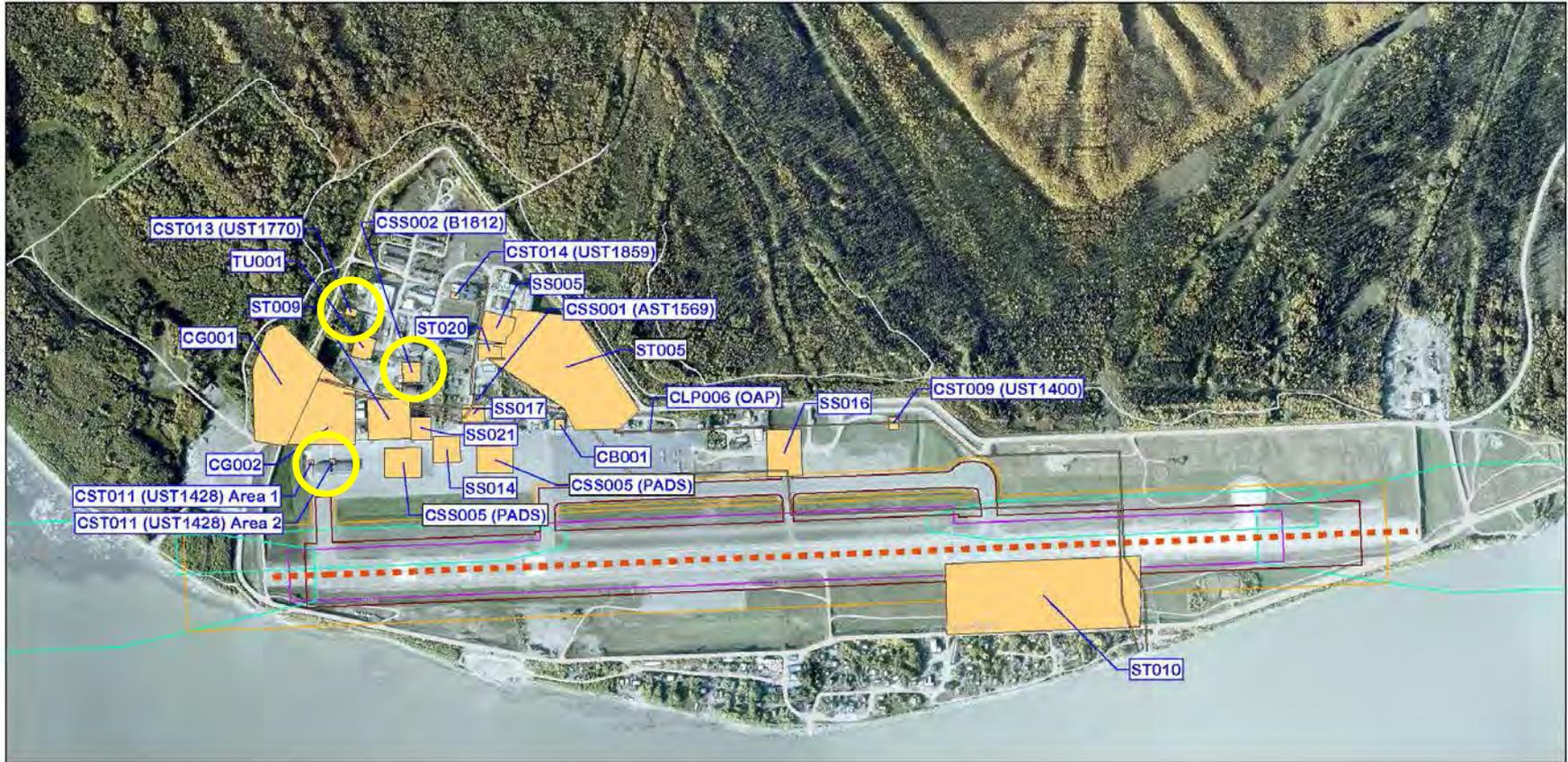
- **The majority of debris and contaminated soil was removed**
- **Not all debris could be removed during the 2015 field season**
- **Areas that were not excavated were covered with clean soil to prevent accidental exposure**
- **Cleanup will follow the CERCLA process with a Feasibility Study, Proposed Plan and Record of Decision**
- **Future excavation of additional debris is anticipated to complete cleanup actions**





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# Location of CSS002, CST013 and CST011 Excavations in 2015 (fuels)



### Legend

- ADOT Runway Control Areas
  - Approach (TERPS)
  - OFA
  - OFZ
  - Safety Area
  - Runway Centerline
- Site Characterization Areas
- Building

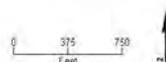


Figure 1

Investigation Areas for Site Characterization

Former Galena Forward Operating Location, Alaska

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# CSS002 (B1812) Phase I Cleanup Excavation

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- Approximately 2,800 cubic yards of soil was removed to a depth of 15 feet
- Petroleum-contaminated soil went to landfarm for treatment
- TCE-contaminated soil transported to Million Gallon Hill for treatment
- Small amount of PCB-contaminated soil was placed in super sacks for off-site disposal
- Chemical oxidizer (persulfate) added to base of excavation to treat residual contamination
- Excavation backfilled with clean soil and river gravel
- Phase II Cleanup of deeper soil below 15 feet planned for 2016/2017





# CST013 (UST1770) Excavation

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- Excavated approximately 500 cubic yards of soil
- Petroleum-contaminated soil went to landfarm for treatment
- Excavation backfilled with clean soil and river gravel
- Preliminary data from excavation indicates the CST013 excavation will achieve cleanup complete





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# CST011 (UST1428) Underground Storage Tank Investigations

- Objective was to determine if three USTs had been properly abandoned for closure
- Two USTs at the NW corner of the CAC Building were found to have been previously excavated
- One UST at the north central side of the CAC Building was found abandoned in place and filled with sand
- ADEC officially closed the USTs in their database

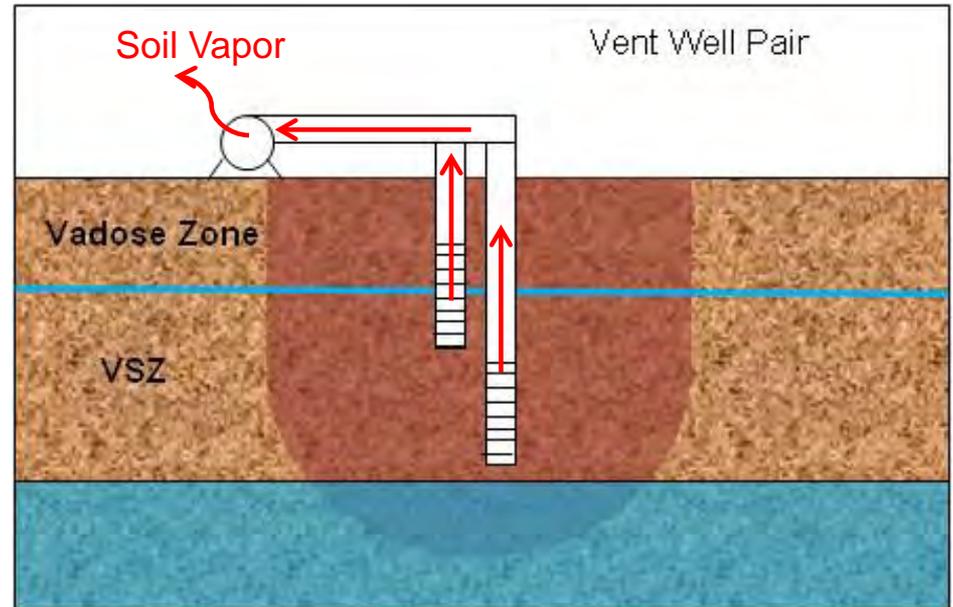




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# Soil Vapor Extraction (SVE) Pilot Tests

- Installed four SVE Pilot Test Systems
  - SS019
  - SS025
  - OW024 (OWS1833)
  - SS022 (B400)
- Pilot Tests to determine how best to design remediation systems for TCE and volatile fuel hydrocarbons in unsaturated soil



Note: VSZ = variably saturated zone



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# SVE Pilot Test Locations



- Legend**
- ADOT Runway Control Areas
    - Approach (TERPS)
    - CF A
    - CF Z
    - Safety Area
    - Runway Centerline
  - Remedial Investigation Areas
  - Building

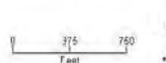


Figure 2

Investigation Areas  
for Remedial Investigation

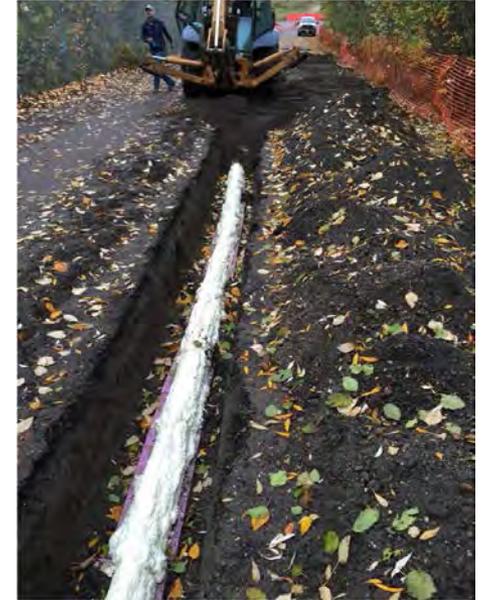
Former Galena Forward Operating Location, Alaska  
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# ***Soil Vapor Extraction***

- **Soil Vapor Extraction (SVE) –**  
extracts air to remove volatile  
compounds like trichloroethene (TCE)  
or benzene
- **Common elements:**
  - **Blower in above-ground shed**
  - **Buried piping between blower and  
vent wells**
  - **Operated from August to April  
with maintenance in May/July  
when groundwater levels are high**





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# ***Method Three Risk Evaluations***

- **Method Three Risk Evaluations are procedures approved by the Alaska Department of Environmental Conservation (ADEC) to determine if remaining contamination levels are below a threshold that would cause risks to human health and would meet the ADEC site cleanup levels**
- **The evaluations also help target what areas require remediation**
- **Site CST009 (UST1400) was approved by ADEC in September for Cleanup Complete status based on risk calculations performed by CH2M, and the site is now closed**
- **Method Three risk calculations will be used to close out other sites as additional data are collected or remediation is completed**



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# Galena PBR Schedule: 2016 Overview

- **2016 Field Work (June through September)**
  - Install 4 SVE Systems (ST009, ST020, SS006, SS015)
  - Install 4 Air Sparge/SVE Systems (CSS011, CST014, SS005, TU001)
  - Install 4 Bioventing Systems (ST010, SS016, CPL006, SS014/SS017)
  - Remediation at sites to be determined (CSS002, SS018, ST005 Area C)
  - Annual Groundwater Monitoring and Landfarm Maintenance
  
- **2017 to 2018 – Implement remaining remedies**







- **Public Review Period for Proposed Plans (SS015, SS022, OW024)**
  - Review Period October 20 through November 20, 2015
  - Updated DVDs of the Administrative Record have been placed at the Galena library
- **Semi-annual RAB Meetings (April/October)**
- **Air Force maintains Administrative Record for Final Documents at:**  
<http://afcec.publicadmin-record.us.af.mil/>



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# Questions?

## ■ Please send comments to:

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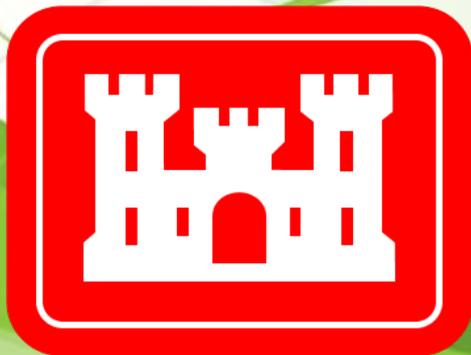
**Attachment 3**  
**Small Arms Firing Range Time Critical Removal Action**

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# Small Arms Firing Range (SAFR) Time Critical Removal Action (TCRA)

## Former Galena FOL, AK RAB Meeting

20 October 2015



# SAFR Time Critical Removal Action

Goal: Characterize and remove contaminated soil impacted by SAFR activities and decommission the range



# SAFR Site Characterization

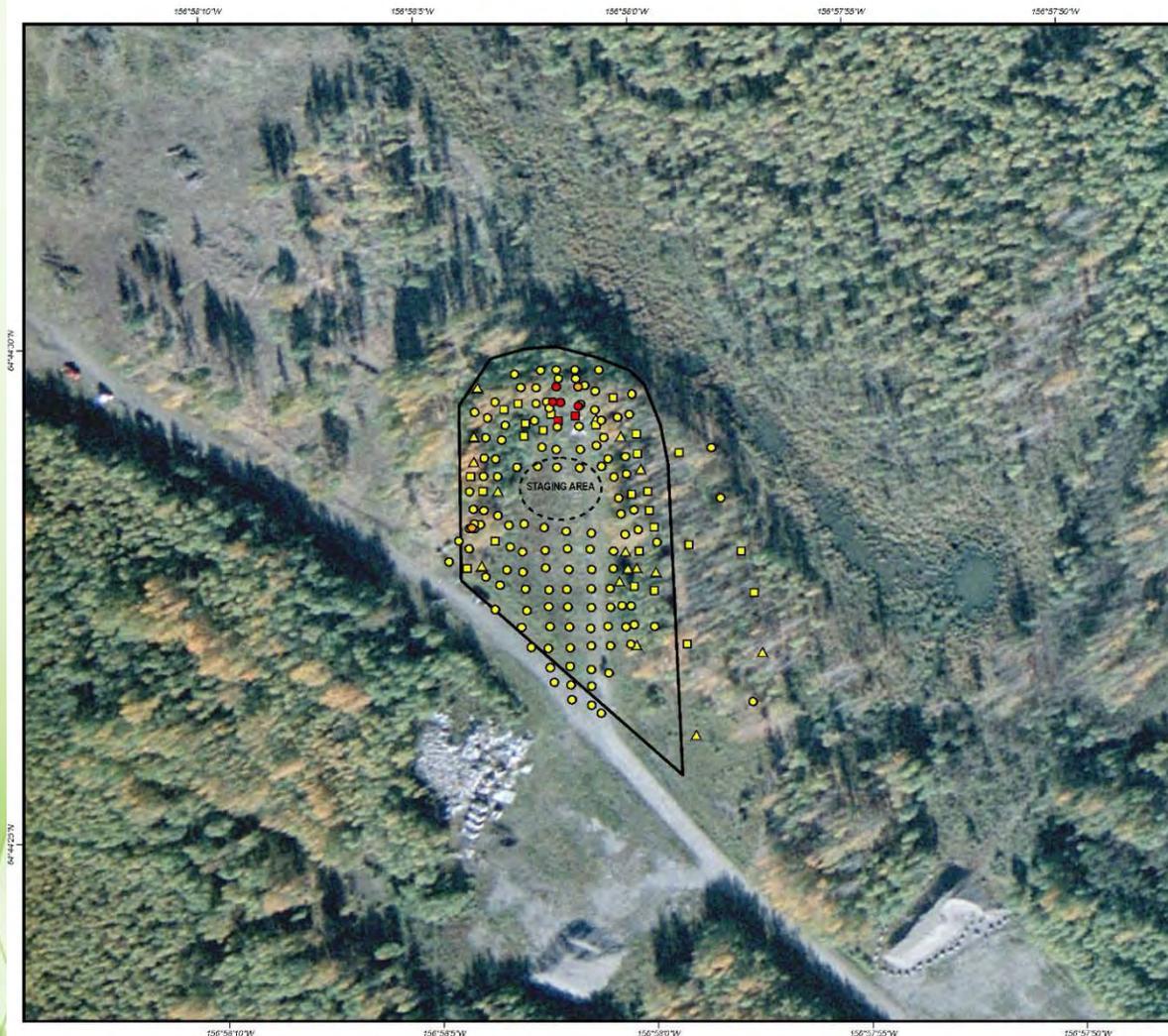
Site Characterization: Determine the extent of lead and antimony impact to soil

- Lead Field Screening using XRF
  - 401 field screening samples from various depths
- Laboratory Analytical Sample Collection
  - 21 samples collected from the highest XRF screening results
  - 25 samples collected for use in comparing XRF to laboratory results

# Lead Field Screening Activities

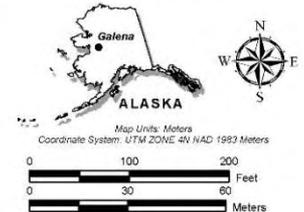


# Lead Field Screening Locations and Results



**Figure 2**  
**Lead XRF Screening Locations and Results**

**Former Galena Forward Operating Location**  
**Galena, Alaska**



**Legend**  
**XRF Sample Locations**

**Depth**

- 0-1 ft
- 1-2 ft
- △ 2-3 ft

**Results**

- 0 - 200 ppm
- 200 - 400 ppm
- > 400 ppm

▭ Current Small Arms Firing Range Footprint

**Notes:**

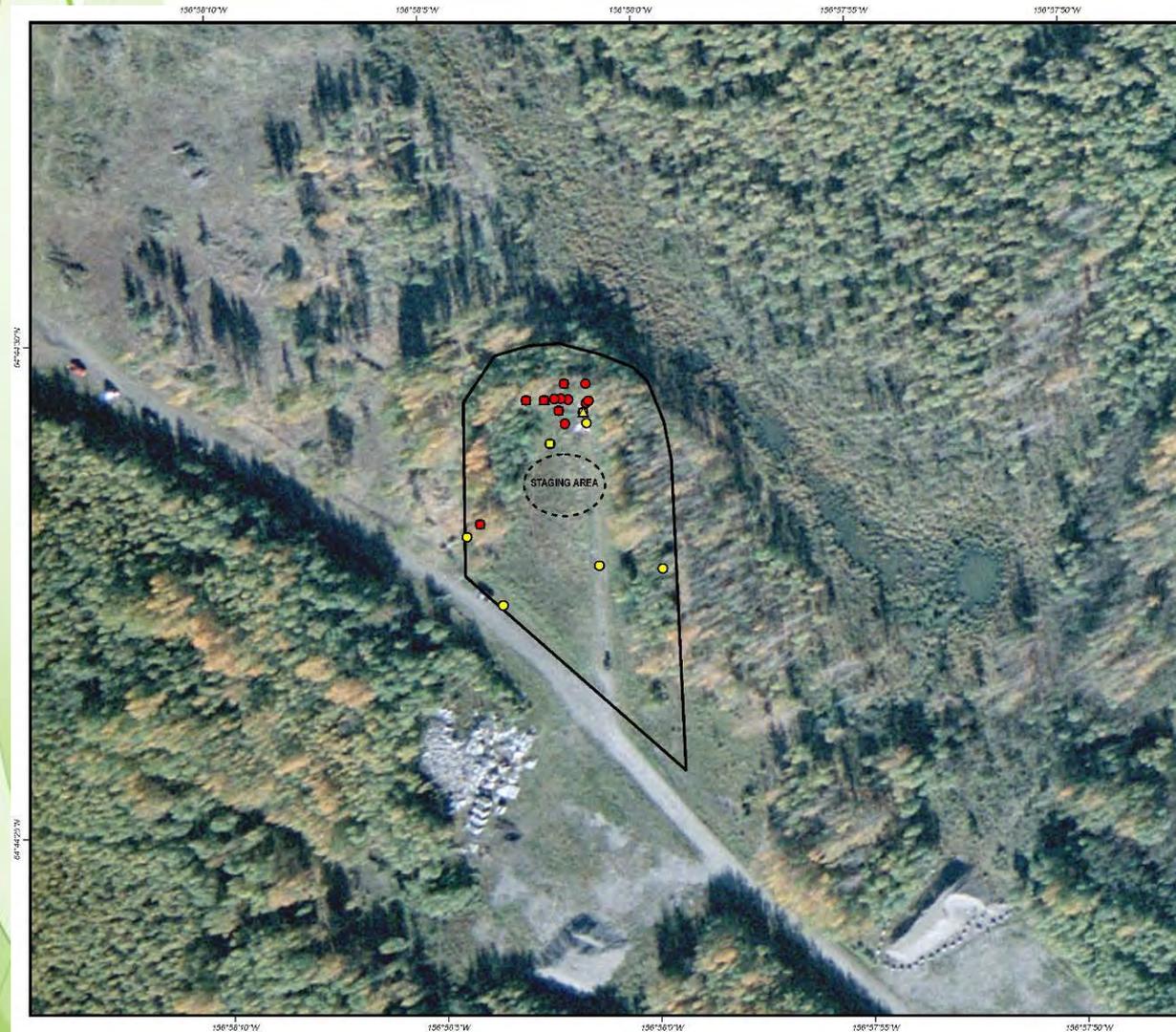
1. Image credit: Aerometric, 2012.
2. Maximum XRF reading displayed for each sampling location

**Dimensions:**

Current Small Arms Firing Range: 1.56 Acres  
 Current and Historical Small Arms Firing Range: 2.29 Acres  
 Side Berms: 12 feet tall  
 Backstop: 45 feet long, 20 feet wide, 12 feet tall  
 Firing Line: 250 feet long



# Lead and Antimony Analytical Laboratory Sample Results and Locations

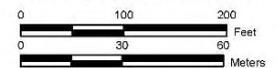


**Figure 3**  
**Lead and Antimony Analytical Sample**  
**Locations and Results**  
**Former Galena Forward**  
**Operating Location**

Galena, Alaska



Map Units: Meters  
 Coordinate System: UTM ZONE 4N NAD 1983 Meters



## Legend

### Laboratory Analysis

#### Results

- Does Not Exceed Soil Cleanup Level
- Exceeds Soil Cleanup Level

#### Depth

- 0-1 ft
- 1-2 ft
- △ 2-3 ft

  Current Small Arms Firing Range Footprint

#### Notes:

1. Image credit: Aerometric, 2012.
2. Exceedances based on Alaska Department of Environmental Conservation Method Two, Table B1 Soil Cleanup Level:  
 (Lead = 400 mg/kg, Antimony = 3.6 mg/kg)

#### Dimensions:

Current Small Arms Firing Range: 1.56 Acres  
 Current and Historical Small Arms Firing Range: 2.29 Acres  
 Side Berms: 12 feet tall  
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# SAFR Site Characterization

## Conclusion

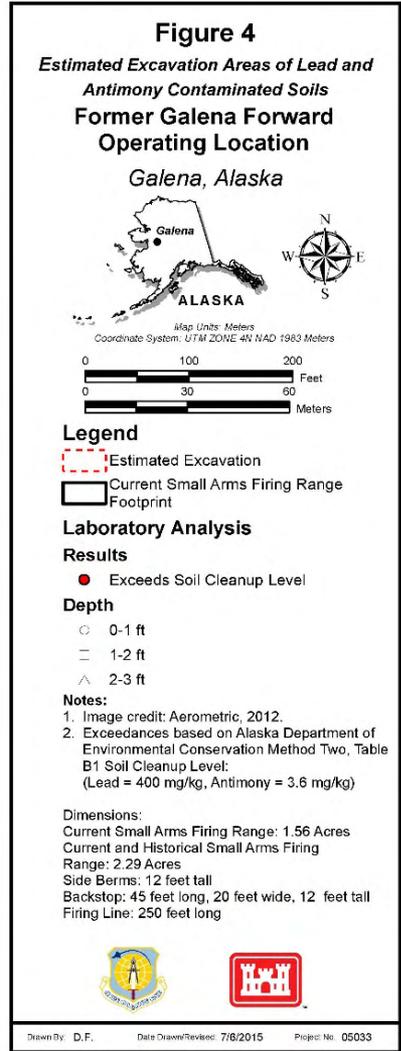
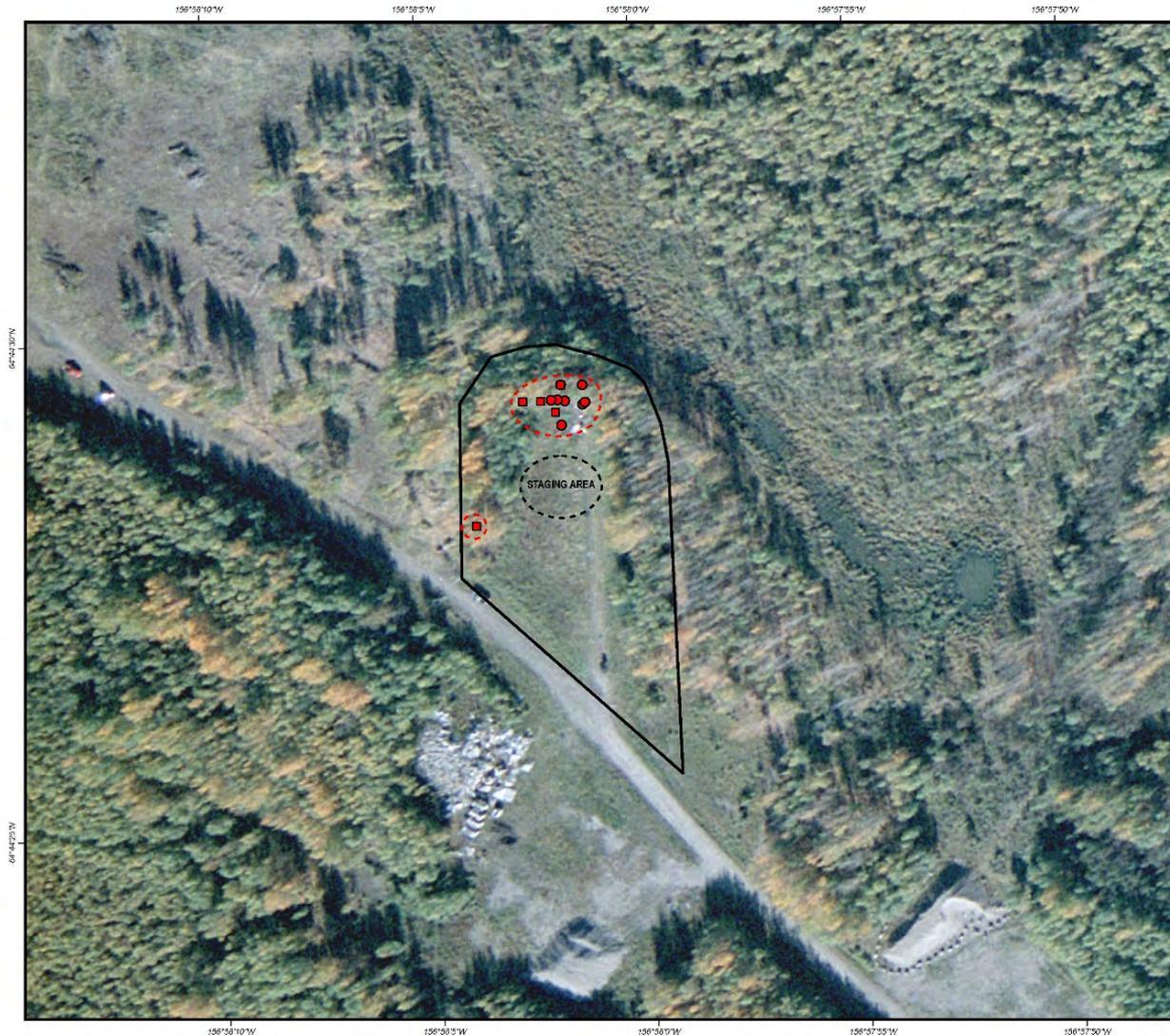
- The majority of lead and antimony contamination above cleanup levels (CULs) is in the south side of the backstop
  - 11 soil samples exceeded the CUL of 400 milligrams per kilogram (mg/kg) for lead (410 – 9,500 mg/kg)
  - 14 soil samples exceeded the CUL of 3.6 mg/kg for antimony (3.7 – 680 mg/kg)
- A portion of the target area and west lateral berm also exceeded CULs for antimony (3.7 – 4.3 mg/kg)

# SAFR Removal Action

Removal Action: Excavate soil that exceeds CULs based on site characterization

- Conducted between July 13 and October 9, 2015
- Consisted of 6 rounds of excavation and confirmation sampling
  - 355 field screening samples for lead screening
  - 87 laboratory analytical samples

# Estimated Excavation Area of Impacted Soil



# SAFR Removal Action - Excavation



# SAFR Removal Action - Supersacks



# SAFR Removal Action - Sampling



# SAFR Removal Action

## Conclusion

- Removed 391 cubic yards of lead and antimony contaminated soil
  - 290 cubic yards was classified as hazardous waste due to high levels of lead (all soil was transported to Oregon for disposal)
  - 101 cubic yards classified as non-hazardous contaminated soil (80 supersacks stored at Galena over the winter and will be shipped next summer)
- Remaining berm soil was levelled
- Report in preparation

# SAFR Removal Action - Restoration



**Attachment 4**

**Tar Investigation and Pipeline Abandonment at Former Galena FOL**

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***TAR INVESTIGATION AND  
PIPELINE ABANDONMENT  
AT FORMER GALENA FORWARD  
OPERATING LOCATION (FOL),  
ALASKA***

**RAB Meeting, 20 October 2015, Galena, Alaska**

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# ***Tar Investigation Summary***

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- **The goal of this tar investigation was to define the extent of tar and tar debris based on previous investigations that identified two tar areas**
  - **Southern Tar Investigation Area located south of runway**
  - **Northern Tar Investigation Area located north of dike road**
- **A backhoe or hand auger was used to visually identify tar and tar debris in August/September 2015**
- **Tar thickness ranged from 2-12 inches and was found up to a depth of 3 feet**
- **Next step is to develop a strategy for addressing tar-contaminated soil**



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# *Southern Tar Investigation Area (Continued)*



Tar at ground surface



Tar at 1-2 feet below ground surface



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# Southern Tar Investigation Area Preliminary Results



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# *Southern Tar Investigation Area (Continued)*



Tar covered metal barrel straps found below ground surface

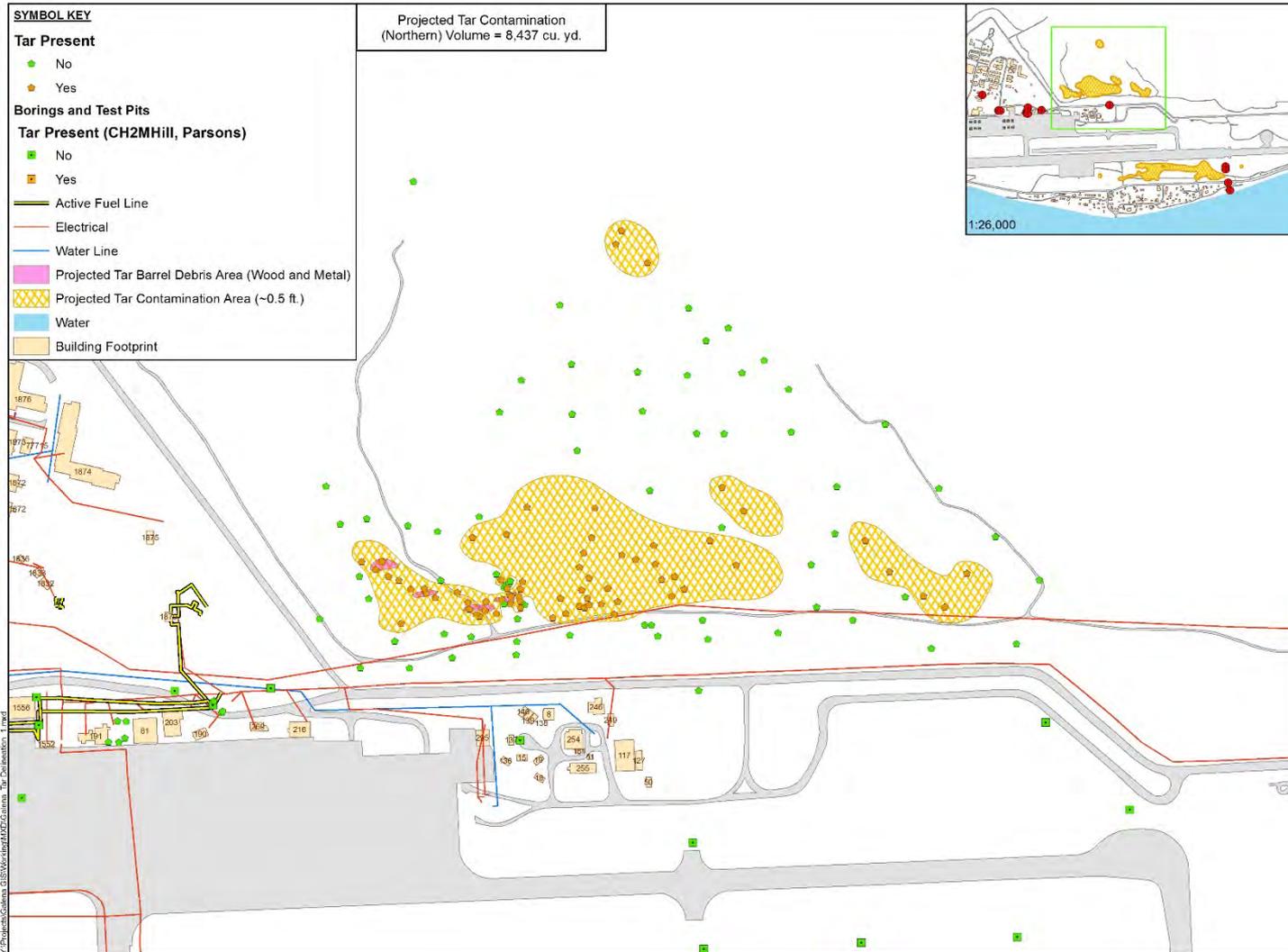


Metal barrel straps found below ground surface



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# Northern Tar Investigation Area Preliminary Results





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# Northern Tar Investigation Area (Continued)



Tar found below ground surface



Tar found at and below ground surface



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# Northern Tar Investigation Area (Continued)



Debris from tar barrels and drums



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# ***Fuel Pipeline Abandonment Summary***

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- **During a previous excavation an abandoned pipeline was discovered to contain fuel; thus, the Air Force's objective was to locate abandoned fuel pipelines, verify that they were properly abandoned, and properly abandon them in-place if they were not plugged**
- **Metal detectors were used to acquire the pipeline locations and a combination of hand tools or a mini-backhoe was used to expose the pipe terminations**
- **August/September 2015 field activities**
  - **Pipelines A, B, C and G were cleaned out**
  - **Pipelines A, B, C, F, and H were plugged with grout**
  - **The western end of Pipeline B was not located but residual fuel was drained**



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# *Fuel Pipeline Abandonment Summary (Continued)*

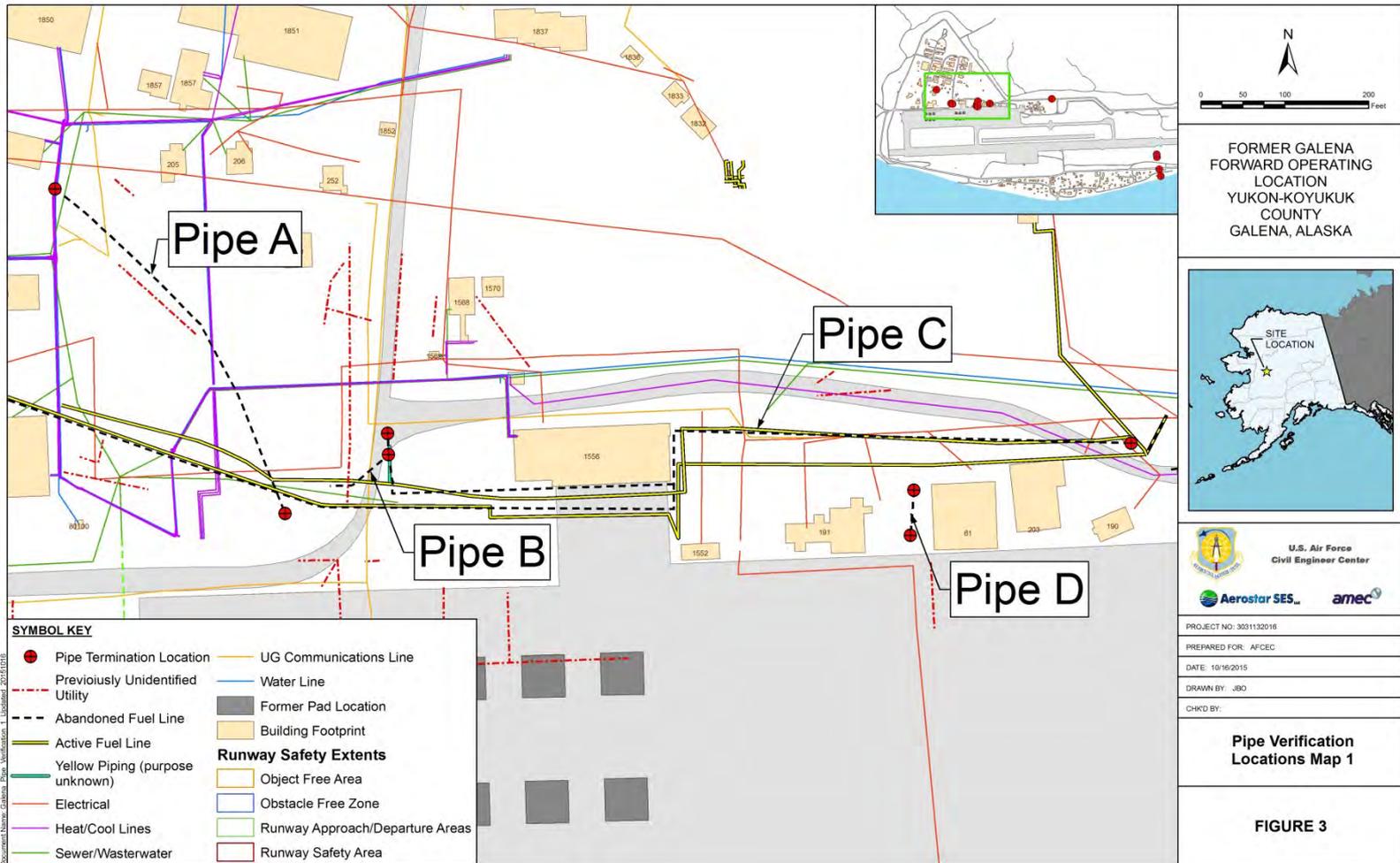
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- Pipeline D was a 1 inch steel fuel line, 89 feet long, and was removed
- Pipeline E was a 1 inch steel electrical conduit (not shown on maps but adjacent to Pipeline D)
- Approximately 480 gallons of fuel were recovered from Pipelines A, B, and C
- Next step is to develop a fuel pipeline abandonment report



# Fuel Pipeline Location – Map 1

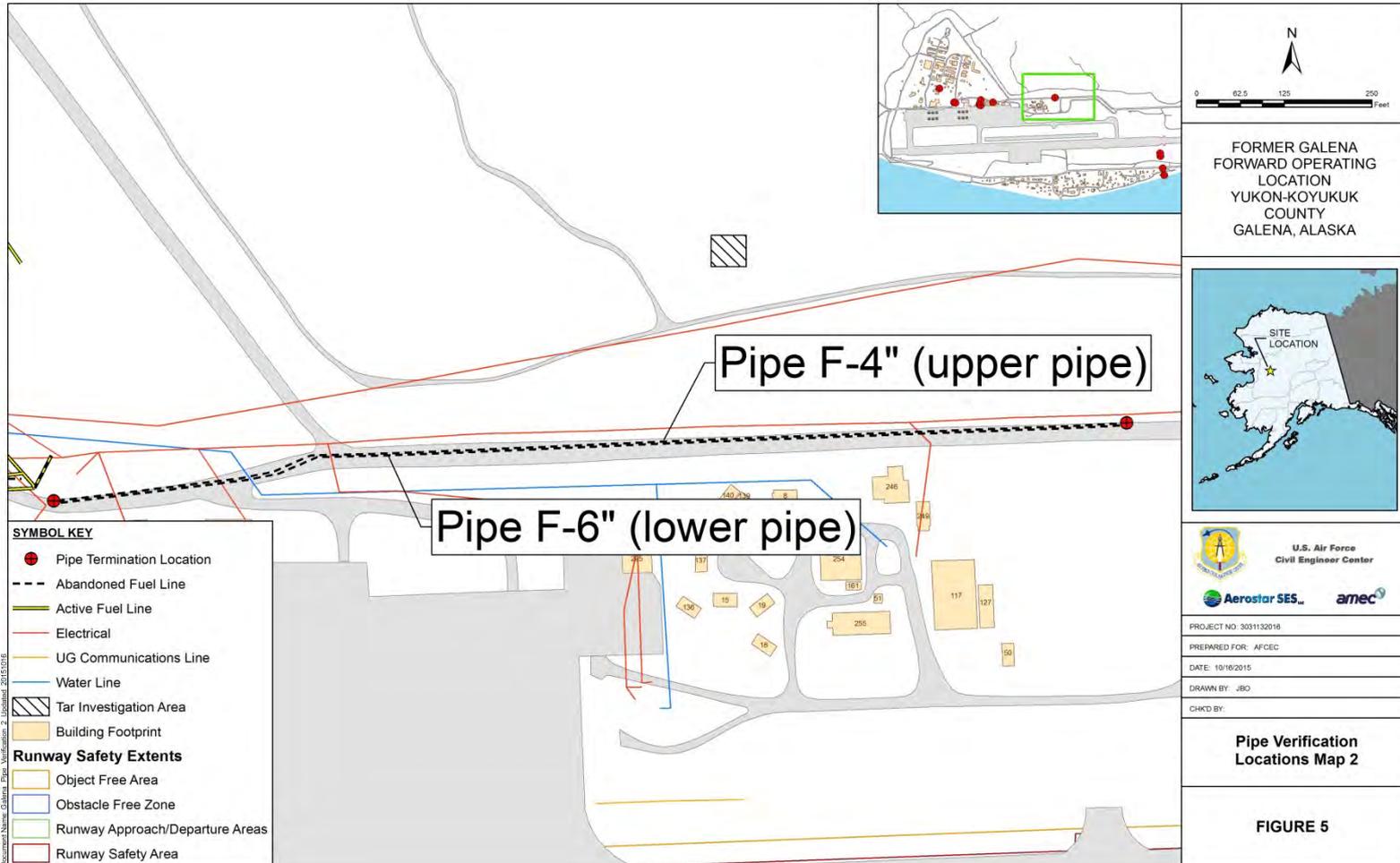
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# Fuel Pipeline Location – Map 2

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# Fuel Pipeline Location – Map 3

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