



U.S. AIR FORCE

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

RAB Meeting, 20 October 2015, Galena, Alaska

Integrity - Service - Excellence

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**





U.S. AIR FORCE

Field Activities Completed in 2015

- **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**



U.S. AIR FORCE

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

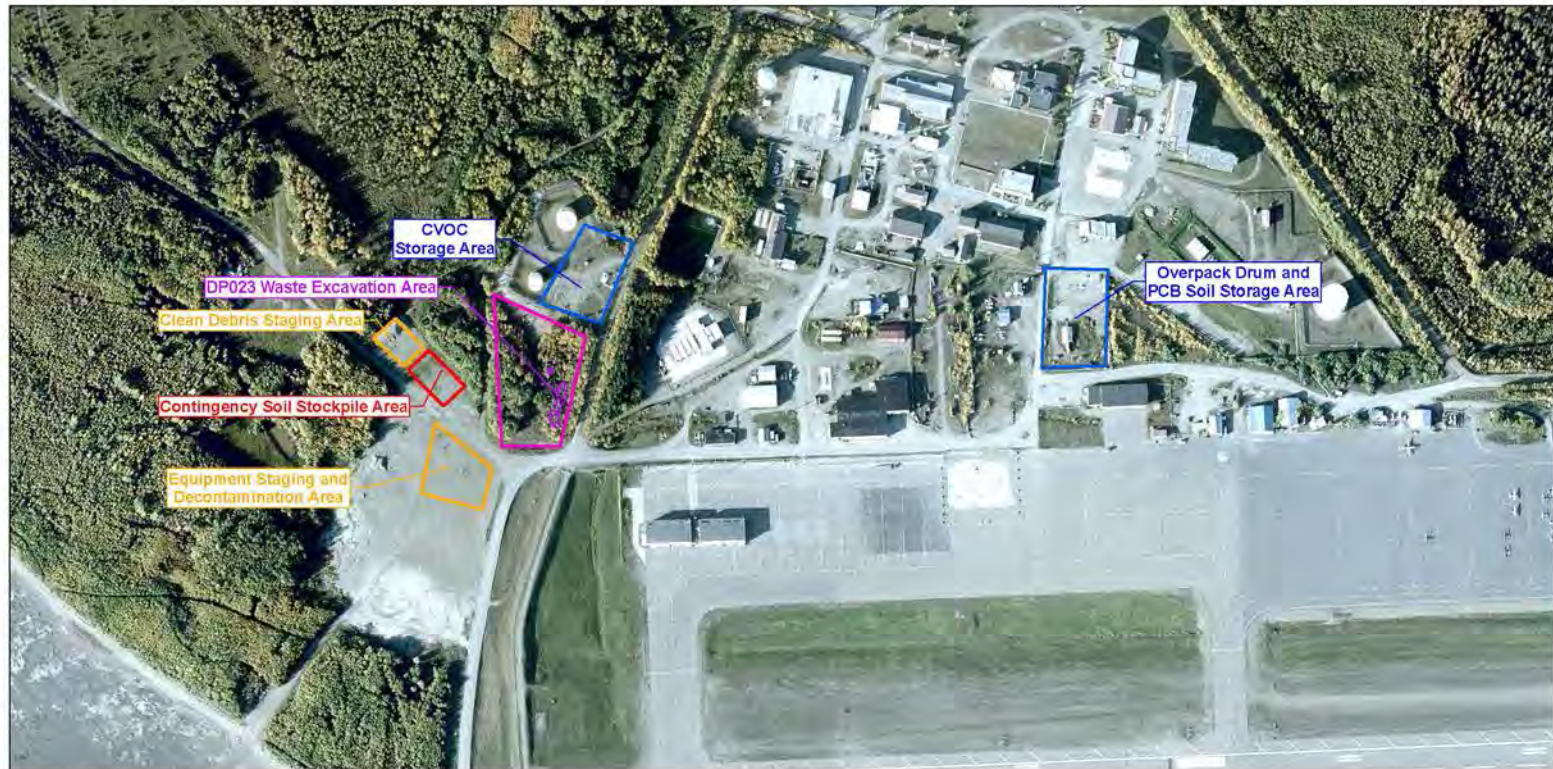
- **CERCLA Site contaminated with**
 - Polychlorinated biphenyls (PCBs),
 - Petroleum hydrocarbons,
 - Volatile organic compounds (VOCs),
 - Polycyclic aromatic hydrocarbons (PAHs), and
 - Pesticides

- **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



U.S. AIR FORCE

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

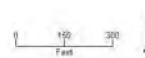


Figure 1 (Revision 1)

Site DP023 Excavation and Equipment and Soil Waste Staging Areas

Time Critical Removal Action for
Disposal Site West of Dike (Site DP023)
Former Galena Forward Operating Location, Alaska

PARSONS

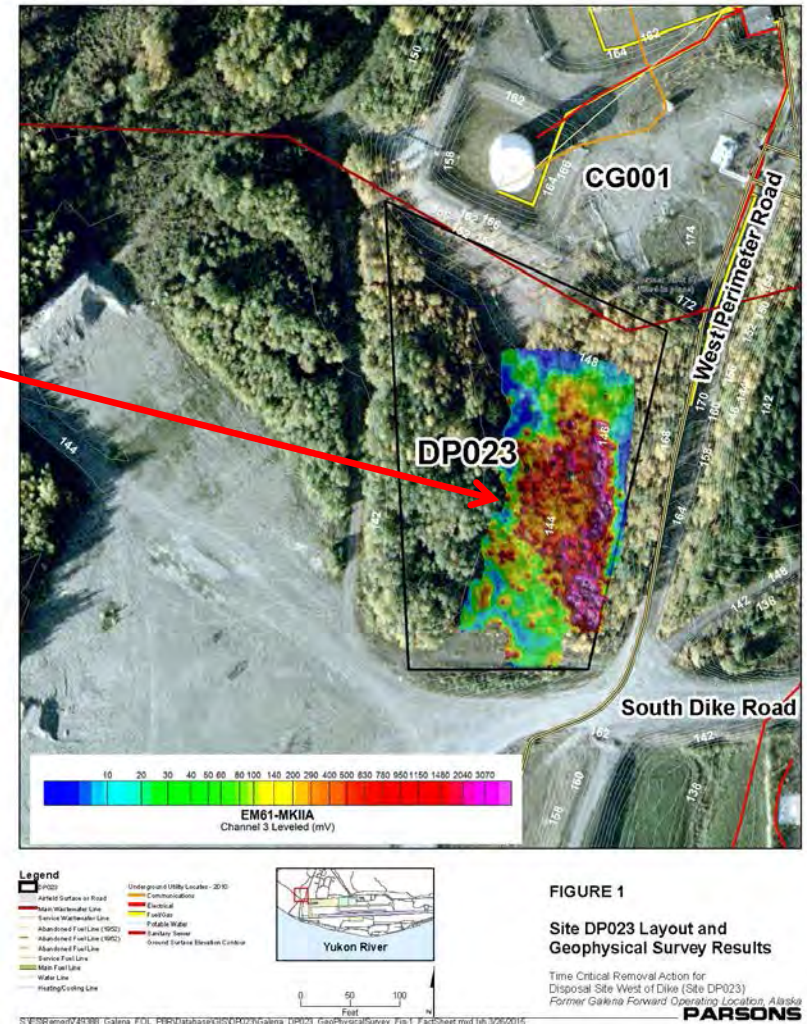
\\S1E0\Remed\74338\Galena_FOL_PBR\Galena\Site\DP023\CR\WP_DP023_SiteLayout_Fig1.mxd 5/18/2015



DP023 (Disposal Site West of Dike)

U.S. AIR FORCE

- 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





U.S. AIR FORCE

Excavation from DP023



Clean debris taken to landfill



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



U.S. AIR FORCE

DP023 Site Status

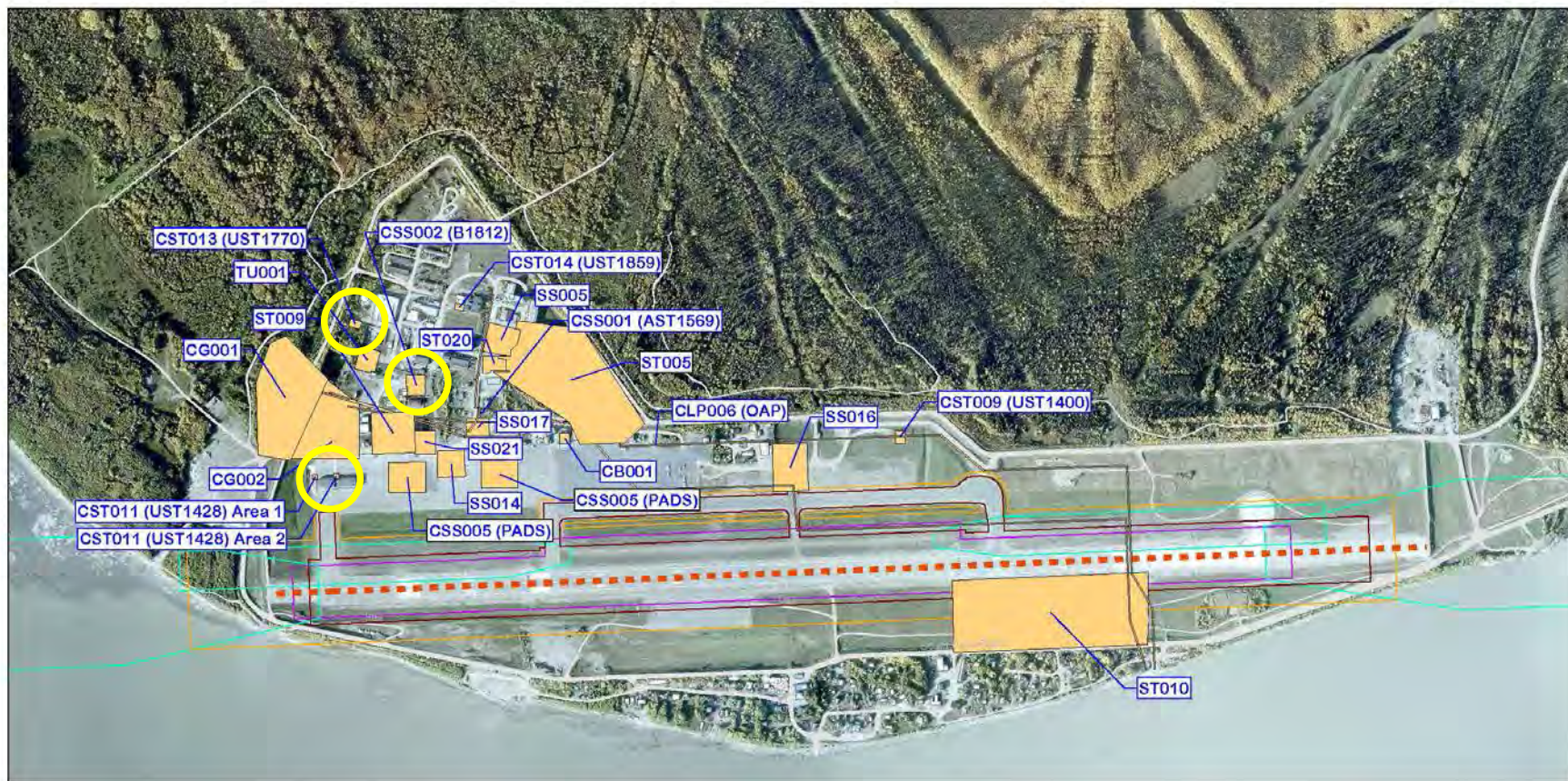
- **The majority of debris and contaminated soil was removed**
- **Not all debris could be removed during the 2015 field season**
- **Areas that were not excavated were covered with clean soil to prevent accidental exposure**
- **Cleanup will follow the CERCLA process with a Feasibility Study, Proposed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





U.S. AIR FORCE

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

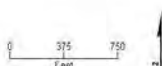


Figure 1

Investigation Areas
for Site Characterization

Former Galena Forward Operating Location, Alaska

PARSONS



U.S. AIR FORCE

CSS002 (B1812) Phase I Cleanup Excavation

- 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





U.S. AIR FORCE

CST013 (UST1770) Excavation

- **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**





U.S. AIR FORCE

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

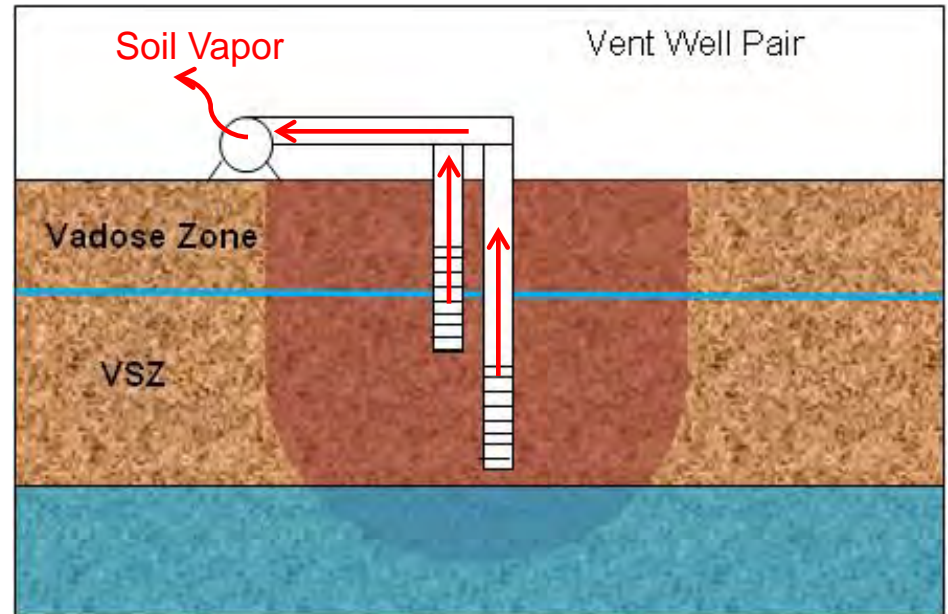




U.S. AIR FORCE

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



U.S. AIR FORCE

SVE Pilot Test Locations



Legend

ADOT Runway Control Areas

- Approach (TERPS)
- CFA
- CFZ
- Safety Area
- Runway Centerline

- Remedial Investigation Areas
- Building

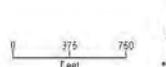


Figure 2

Investigation Areas
for Remedial Investigation

Former Galena Forward Operating Location, Alaska

PARSONS



U.S. AIR FORCE

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





U.S. AIR FORCE

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**



U.S. AIR FORCE

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**





U.S. AIR FORCE

2016 Field Work Locations



Legend

ADOT Runway Control Areas

- Approach (TERPS)
- OFA
- OFZ
- Safety Area
- Runway Centerline

- Remedial Investigation Areas
- Building

- SVE System
- Air Sparge/SVE
- Bioventing

0 375 750
Feet

Investigation Areas for Remedial Investigation

October 2015 Presentation for
Former Galena Forward Operating Location, Alaska
PARSONS

S:\3\Hemish\4388_Galena_FOL_FBR\alaska\GOW\Hemish\2016\Galena_2016\Location_012015.mxd 08/10/2015



U.S. AIR FORCE

Communications

- **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/**](http://afcec.publicadmin-record.us.af.mil/)



U.S. AIR FORCE

Questions?

■ Please send comments to:

AL Weilbacher
Program Manager
BRAC Support Branch
AFCEC/CIBE
2261 Hughes Ave., Ste 155
Lackland AFB, TX 78236-9853
Adolph.Weilbacher@us.af.mil



Attachment 3

Small Arms Firing Range Time Critical Removal Action

This page left intentionally blank

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

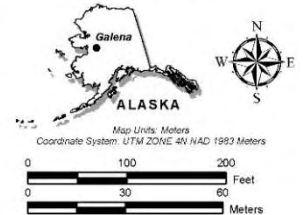


Lead Field Screening Locations and Results



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



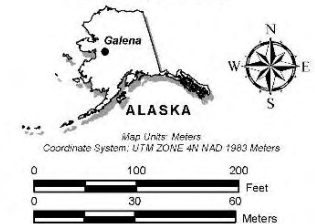
Drawn By: D.F. Date Drawn/Revised: 7/5/2015 Project No. 05033

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



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
Backstop: 45 feet long, 20 feet wide, 12 feet tall
Firing Line: 250 feet long



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

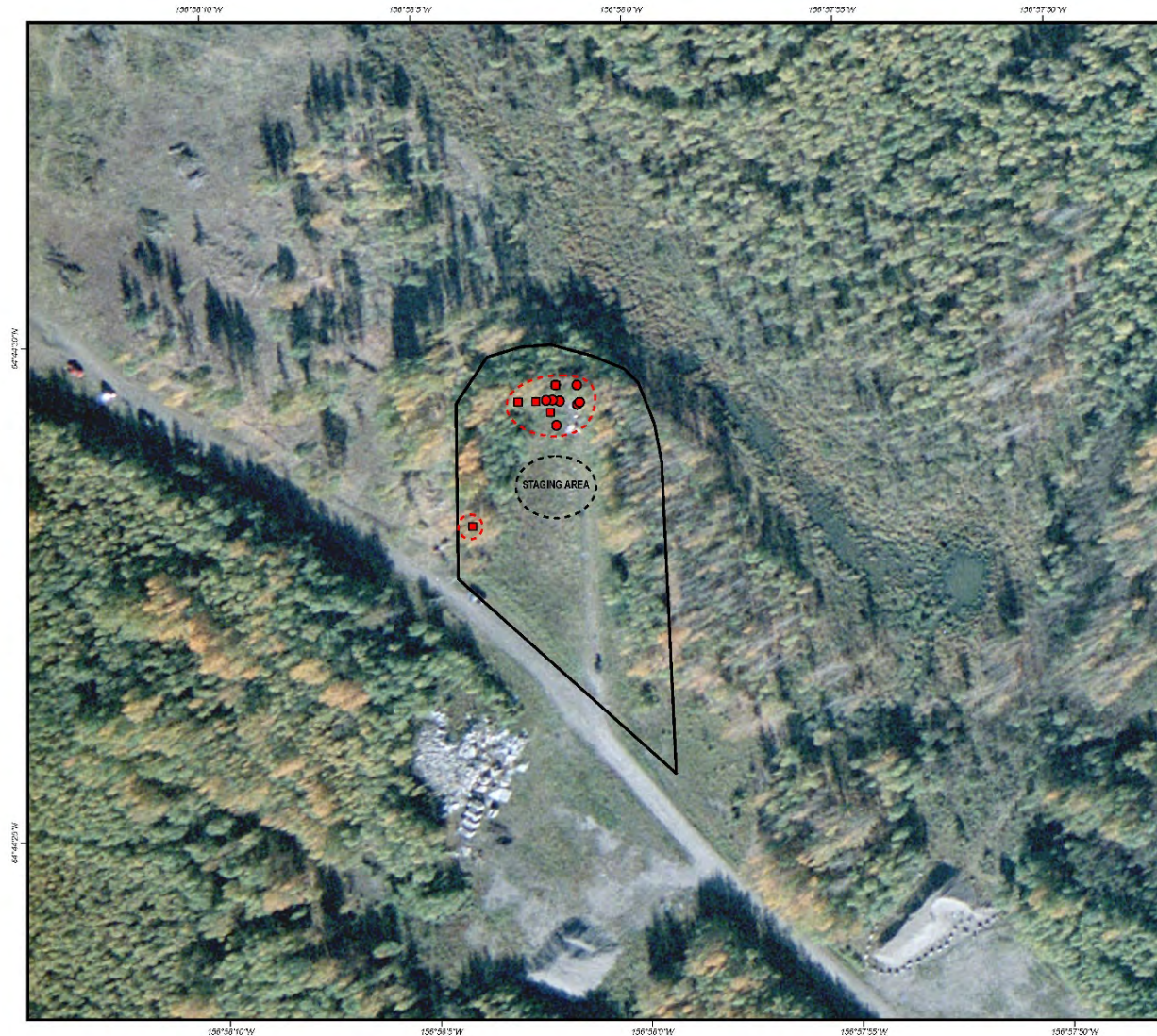
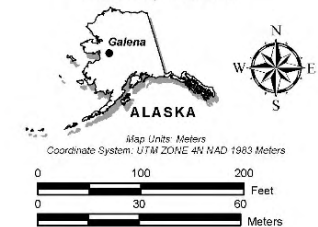


Figure 4
Estimated Excavation Areas of Lead and Antimony Contaminated Soils
Former Galena Forward Operating Location
Galena, Alaska



Legend

- Estimated Excavation
- Current Small Arms Firing Range Footprint

Laboratory Analysis

Results

- Exceeds Soil Cleanup Level

Depth

- 0-1 ft
- 1-2 ft
- ^ 2-3 ft

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
 Backstop: 45 feet long, 20 feet wide, 12 feet tall
 Firing Line: 250 feet long



Drawn By: D.F. Date Drawn/Revised: 7/6/2015 Project No: 05033

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

This page left intentionally blank



U.S. AIR FORCE

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

RAB Meeting, 20 October 2015, Galena, Alaska

Integrity - Service - Excellence



Tar Investigation Summary

U.S. AIR FORCE

- **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**



U.S. AIR FORCE

Southern Tar Investigation Area (Continued)



Tar at ground surface



Tar at 1-2 feet below ground surface



U.S. AIR FORCE

Southern Tar Investigation Area Preliminary Results



Integrity - Service - Excellence



U.S. AIR FORCE

Southern Tar Investigation Area (Continued)



Tar covered metal barrel straps found below ground surface

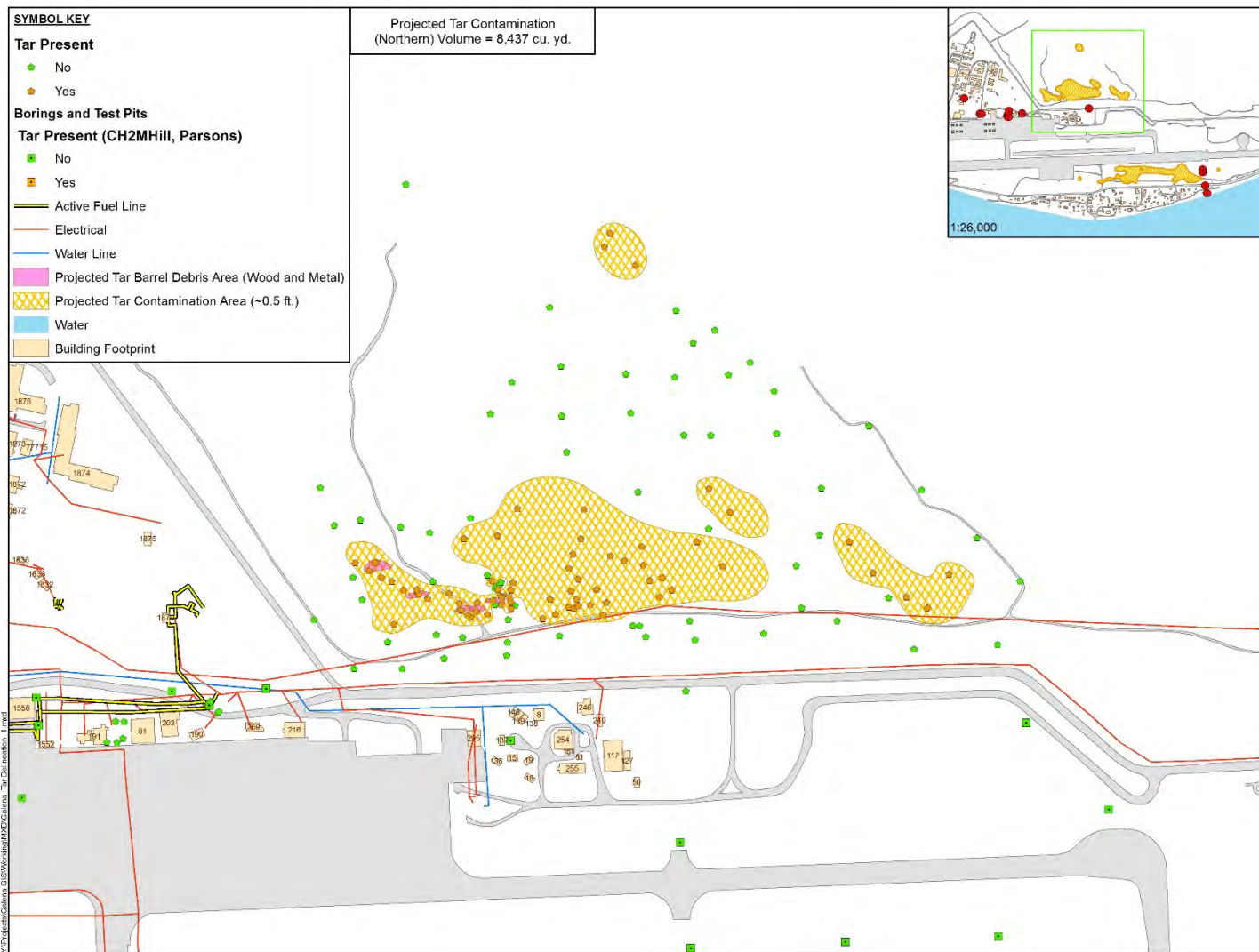


Metal barrel straps found below ground surface



U.S. AIR FORCE

Northern Tar Investigation Area Preliminary Results



Integrity - Service - Excellence



U.S. AIR FORCE

Northern Tar Investigation Area (Continued)



Tar found below ground surface



Tar found at and below ground surface



U.S. AIR FORCE

Northern Tar Investigation Area (Continued)



Debris from tar barrels and drums



U.S. AIR FORCE

Fuel Pipeline Abandonment Summary

- **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**



U.S. AIR FORCE

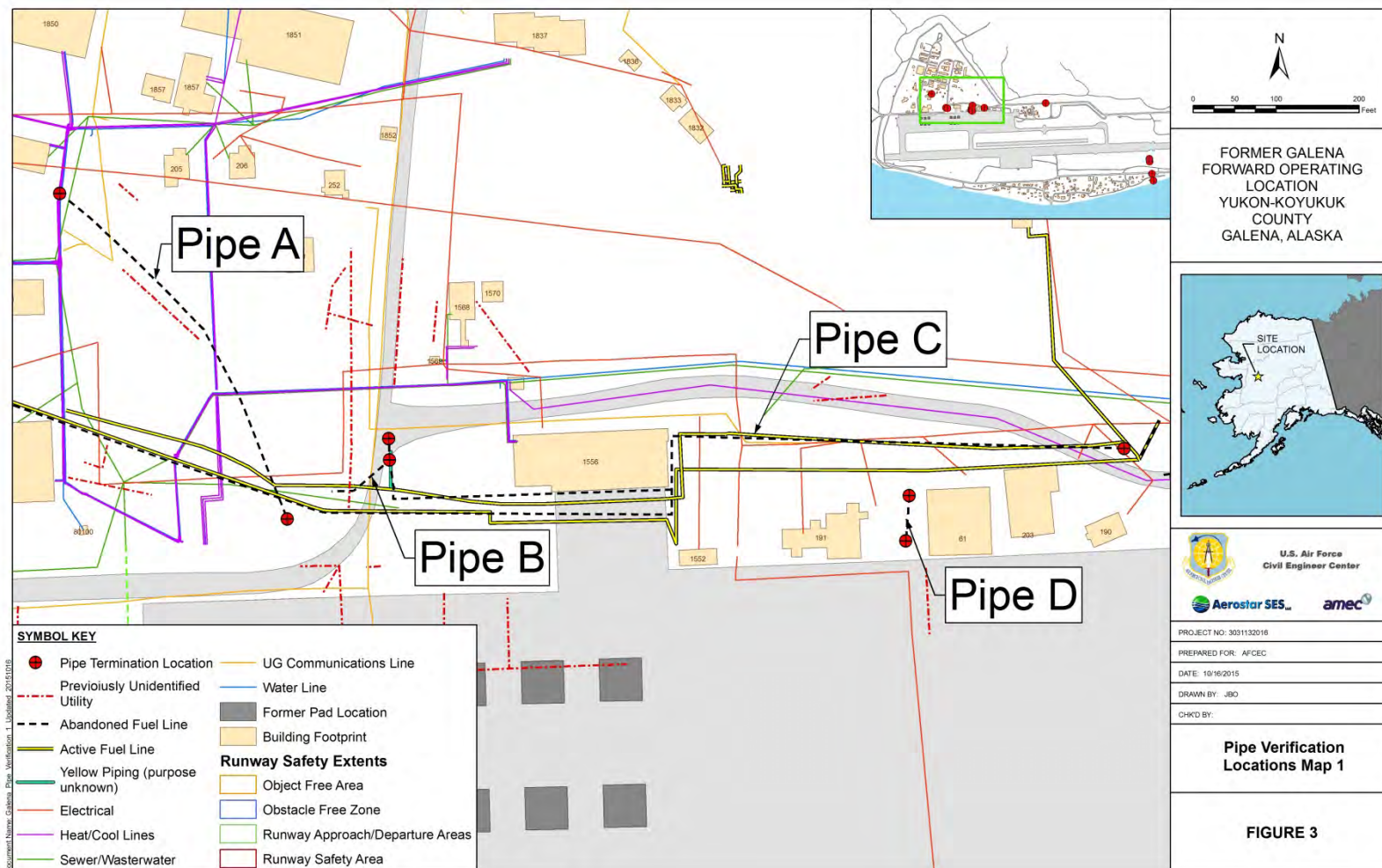
Fuel Pipeline Abandonment Summary (Continued)

- 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



U.S. AIR FORCE

Fuel Pipeline Location – Map 1

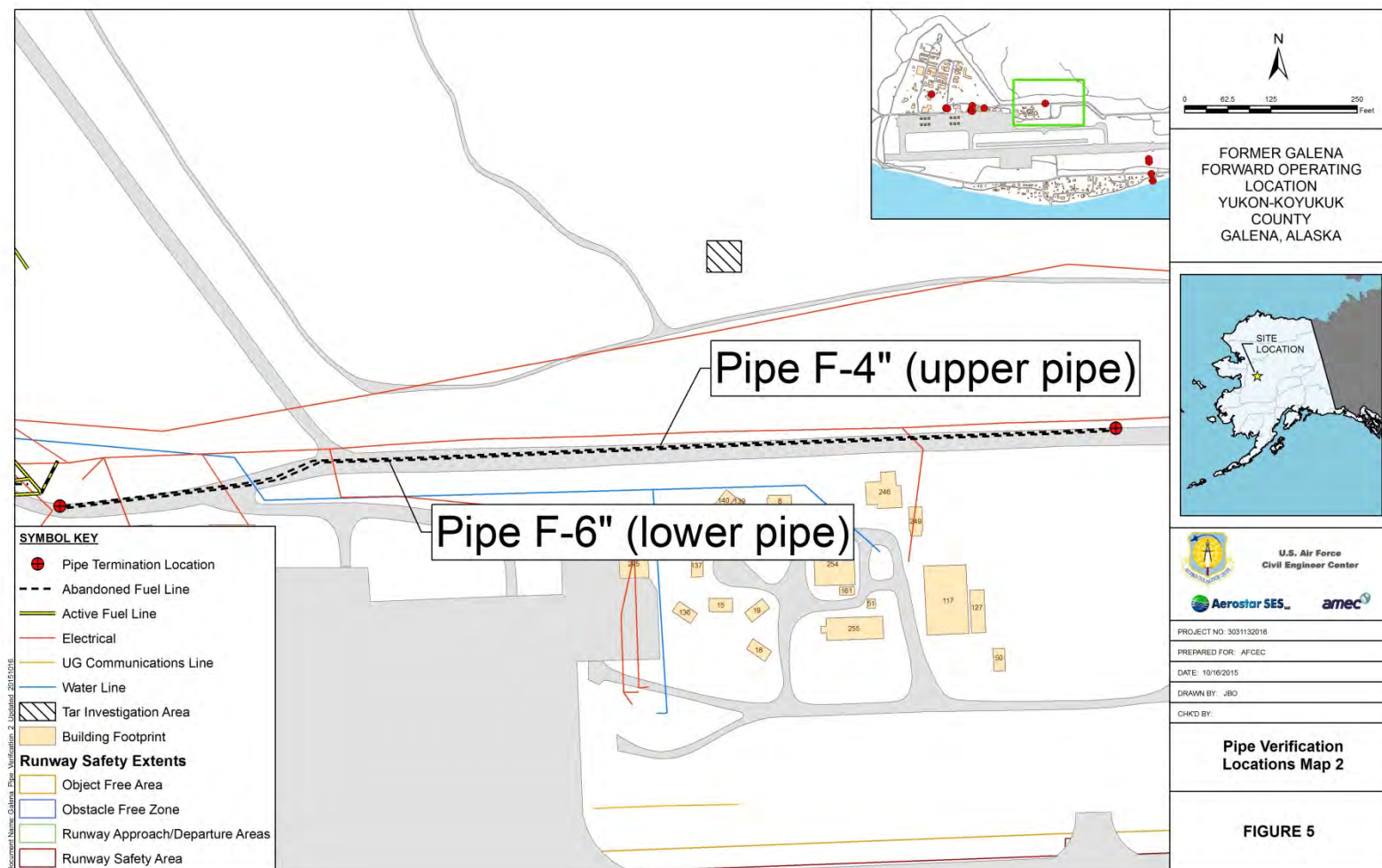


Integrity - Service - Excellence



U.S. AIR FORCE

Fuel Pipeline Location – Map 2



Integrity - Service - Excellence



U.S. AIR FORCE

Fuel Pipeline Location – Map 3

