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TETRA TECH

Former Galena Forward Operating Location

SITE SS016 INTERIM REMOVAL ACTION, LANDFARM EXPANSION AND OPERATION, AND MILLION GALLON HILL TCE SOIL STOCKPILE

APRIL 2014

BRENT JONES, CPG

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Project Team

- Air Force Civil Engineer Center
- Tetra Tech EC – Prime Contractor
- Bethel Environmental Solutions LLC – Prime Subcontractor
- Local Labor and Equipment



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Bethel Environmental Solutions
A subsidiary of Bethel Native Corporation

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Work Areas



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Galena Landfarm Projects

- **Galena 2013 Landfarm Expansion**
 - Expanded Existing Landfarm by 100% – Landfarm is now 1,570 ft. long x 78 ft. wide with a total capacity of 5,800 CY
 - Transferred 2,300 yd³ of Treated Soil to Galena Landfill for Re-use
 - Transferred 5,600 yd³ of Treated Biopile Soil to Galena Landfill for Re-use
- **Galena 2013 Landfarm Operation**
 - Transferred 950 yd³ of Petroleum-contaminated Soil from Biopile to Landfarm for Treatment
 - Transferred 4,600 yd³ of Petroleum-contaminated Soil from Site SS016 to Landfarm for Treatment
 - Began Treatment of 5,800 yd³ of Petroleum-contaminated Soil; Treatment will Continue during the 2014 Field Season

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Site SS016 Interim Removal Action Project

- Removed ~ 8,800 yd³ of Petroleum-contaminated Soil from Site SS016
 - Transferred 4,600 yd³ of soil to the Galena Landfarm for Treatment during 2013/2014.
 - Transferred 3,200 yd³ of soil to the Galena Landfarm South Stockpile 1 for Future Treatment
 - Transferred 1,000 yd³ of soil to the Galena Landfarm South Stockpile 2 for Future Treatment
- Surveyed Excavation Boundaries
- Backfilled Excavation and Re-graded the Site and approved by all stakeholders.

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Million Gallon Hill Stockpile and IDW Drums Project

- **MGH Stockpile Soil Treatment**
 - **Constructed Soil Vapor Extraction System**
 - **Moved Stockpiled Soils to SVE Treatment Pad**
 - **Began Treatment of 120 yd³ of VOC-contaminated Soil by SVE**

- **Investigation-Derived Waste 55-Gallon Drums**
 - **Characterized 45 Drums Containing IDW**
 - **Added 31 IDW Drums to MGH Stockpile for SVE Treatment**
 - **Segregated 14 IDW Drums Pending Approval for Disposal at the Galena Landfill**

- **2014 Field Season Activities**
 - **Complete SVE Treatment of VOC-contaminated Soil**
 - **Transfer 14 IDW Drums to Galena Landfill**

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Former Galena Forward Operating Location

2013-2014 SUPPLEMENTAL SITE CHARACTERIZATION WORK CH2M HILL

April 16, 2014

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Objectives for Supplemental Site Characterization Fieldwork

- Address remaining “data gaps” for delineating the nature and extent of contamination and provide sufficient data for developing cleanup plans
- Install monitoring wells at key locations within the airfield and downgradient of source areas that will be important for future monitoring and cleanup
- Perform groundwater monitoring in Summer 2013 and Spring 2014 to sample new wells and evaluate trends over time

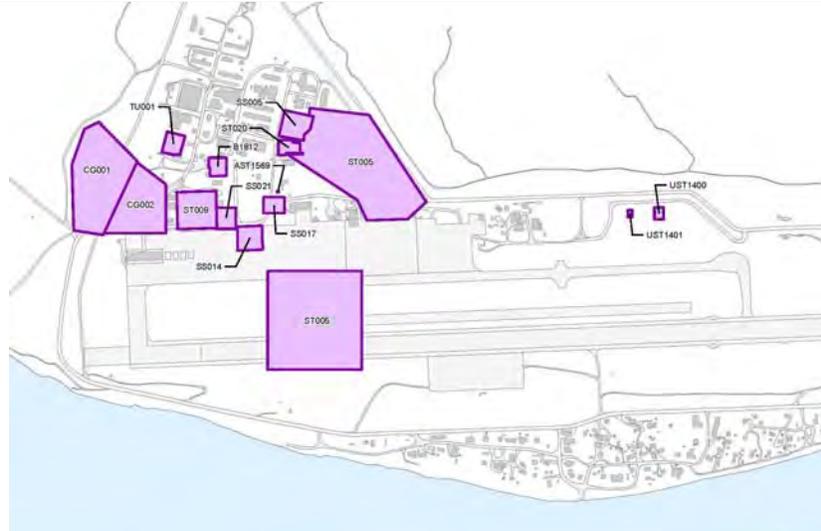
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SC Sites for Data Gap Sampling



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What Was Accomplished in 2013?

- Field work had a delayed start due to the severe flooding event, but was able to begin the end of July and continued through September 21st. All planned work was completed.
- The work included 3 weeks of nighttime drilling in the airfield installing monitoring wells within the groundwater plume area downgradient of the POL Tank Farm (Site ST005).

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What Was Accomplished in 2013? (cont'd)

- Overall, the following was accomplished in 2013
 - Installed 22 new groundwater monitoring wells to better characterize contaminant plumes and allow for future monitoring during cleanup.
 - Installed 31 soil borings and hand augered at 6 locations to address “data gaps” in the nature & extent characterization of contaminant source areas.
 - Sampled 104 permanent monitoring wells and 9 temporary wells to further delineate groundwater plumes.
 - Other related activities included repairs to existing monitoring wells and collecting groundwater level data from data loggers.
 - Finalized and received ADEC approval on Site Characterization/ Remedial Investigation Reports for 24 sites.

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Example Soil Investigation Site – Former Building 1812 Site

- Located northeast of the Water Treatment Plant
- Previously unknown contaminant source area that was found during site inspection sampling and investigation of an adjacent underground storage tank (UST) site in 2010.



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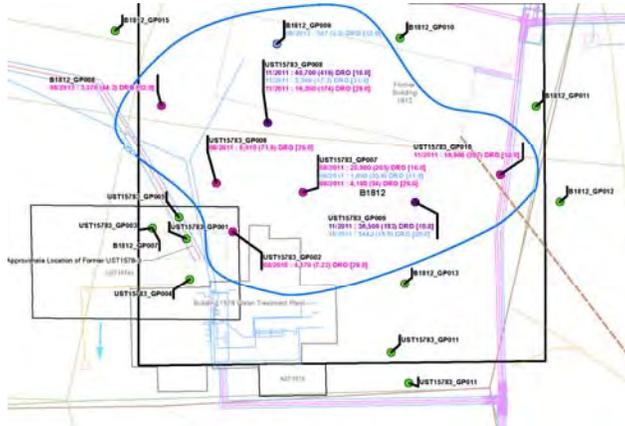
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Example Soil Investigation Site – Former Building 1812 Site (cont'd)

- Diesel fuel above the ADEC Cleanup Level (250 mg/kg) in the variably saturated zone soils (9 to 33 feet deep).



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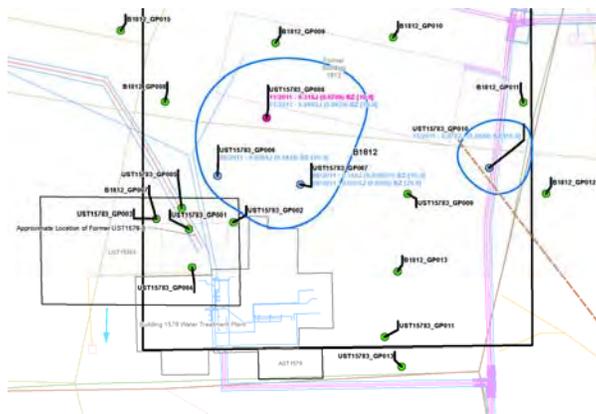
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Example Soil Investigation Site – Former Building 1812 Site (cont'd)

- Benzene above the ADEC Cleanup Level (0.025 mg/kg) in the variably saturated zone soils (9 to 33 feet deep).



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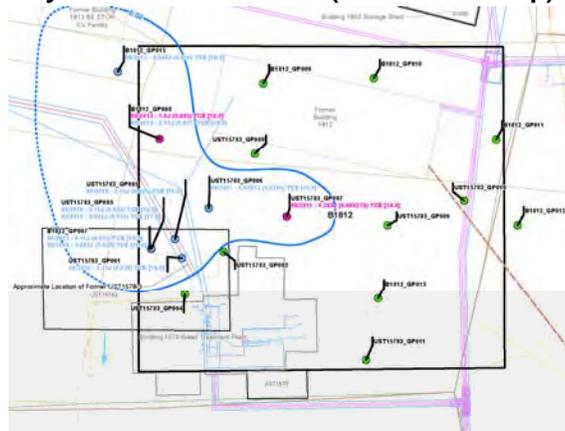
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Example Soil Investigation Site – Former Building 1812 Site (cont'd)

- Trichloroethene (TCE) above the ADEC Cleanup Level (0.02 mg/kg) in the variably saturated zone soils (9 to 33 feet deep).



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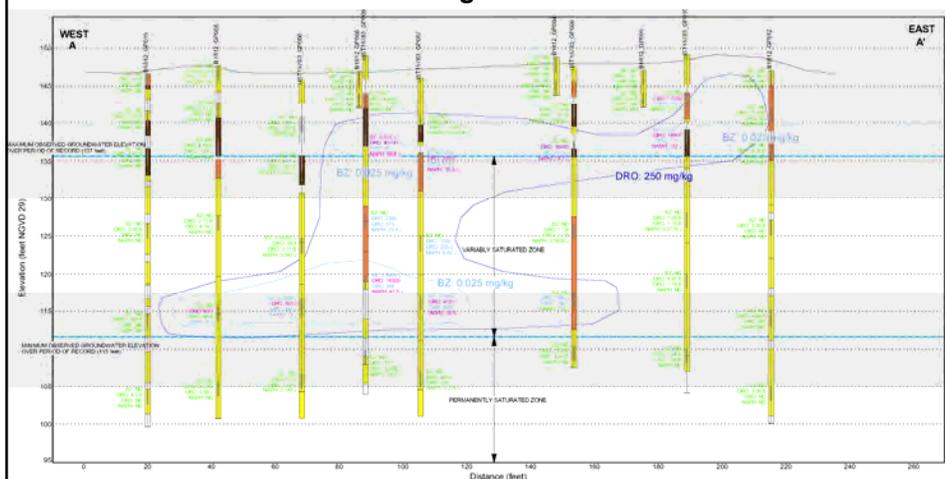
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Example Soil Investigation Site – Former Building 1812 Site (cont'd)

- East-west cross-section through Site B1812



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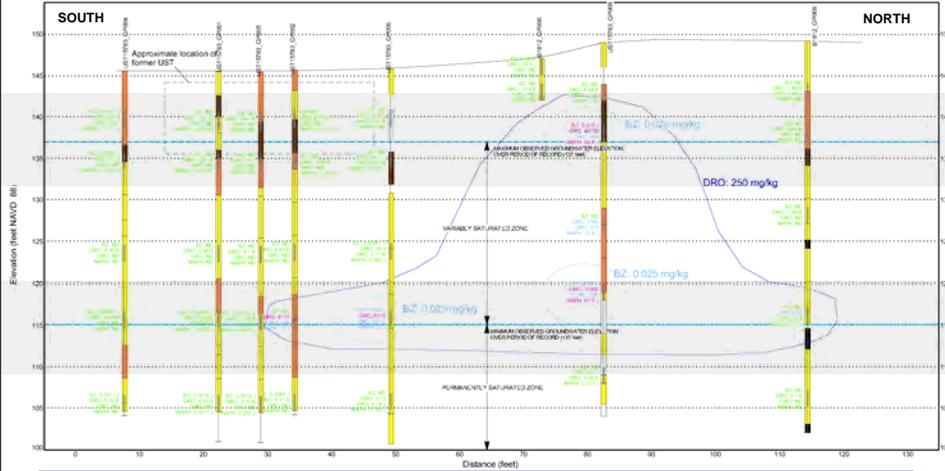
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Example Soil Investigation Site – Former Building 1812 Site (cont'd)

North-south cross-section through Site B1812.



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Updated Groundwater Plume Delineation

Diesel fuel groundwater plumes, based on Fall 2011 and 2013 data.



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Updated Groundwater Plume Delineation (cont'd)

- Benzene groundwater plumes, based on Fall 2011 and 2013 data.



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Updated Groundwater Plume Delineation (cont'd)

- TCE groundwater plumes, based on Fall 2011 and 2013 data.



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2014 Field Schedule

- April 2014: Spring groundwater well sampling (up to 40 wells including all of the new wells installed in 2013)
- August 2014: Water levels, demobilization

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Questions?

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Former Galena Forward Operating Location

SUPPLEMENTAL REMEDIAL INVESTIGATION AND SYSTEM EVALUATION AT THE FORMER GALENA FORWARD OPERATING LOCATION, ALASKA

Galena RAB Meeting, 16 April 2014

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Sites in Triangle Area



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Triangle Area Results

- OWS1833: Sampled 5 soil borings to delineated TCE in soil in an area around a former drywell.
- SS019/SS006: Delineated TCE in groundwater, including downgradient extent. Confirmed TCE is one single plume and not two separate plumes.
- West Perimeter Road (SS025) – Delineated TCE in shallow unsaturated soil beneath West Perimeter Road. Sampled groundwater at the toe of the Perimeter Road to determine that TCE does not impact groundwater.

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Triangle Area Results

- Building 1499 (power plant), Buildings 1858/1859 (dining/cold storage area) and Building 191 (ERA Terminal) – installed vapor sampling points, will be sampled in April and June 2014
- Disposal Area West of Dike (DSWD) – test pits encountered debris at base of West Perimeter Road, including a drum full of waste oil. PCBs were detected in soil at one test pit.

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DSWD Test Pits



Debris pulled from the test pits included old pipe, cables, timbers, vehicle parts, empty drums (below), and one drum of oil at Test Pit 3 (left)



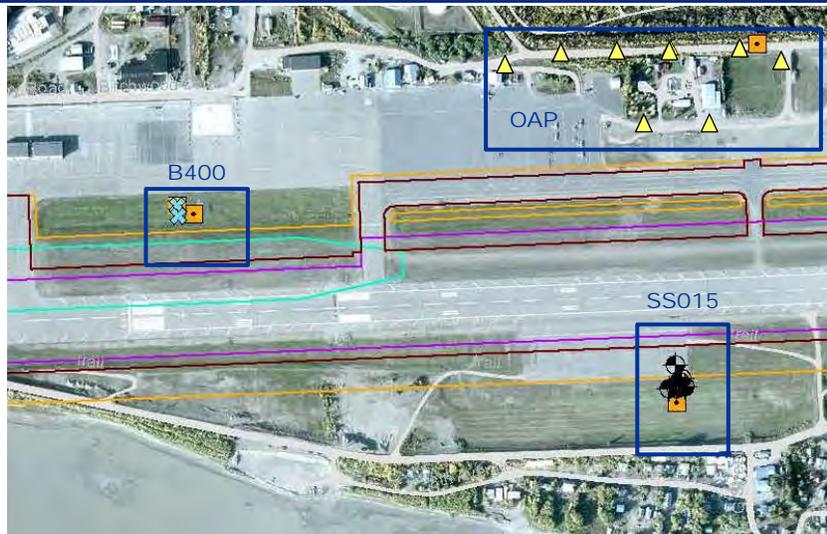
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Sites in Western Airfield Area



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Western Airfield Area Results

- Former Weather Station (B400) – Installed 2 monitoring wells, sampled 2 soil borings and sampled groundwater from 1 boring to delineate the extent of TCE in soil and groundwater. Delineated TCE in soil and groundwater to less than cleanup levels downgradient of a former AST. TCE still exceeds its extent screening level in soil and groundwater to the south.
- Old Abandoned Pipelines (OAP) – Conducted a passive soil gas survey to determine there are no fuel releases along old pipelines along the Taxiway and Perimeter Road areas. Sampled one soil boring to confirm no fuel compounds in soil exceed screening levels.

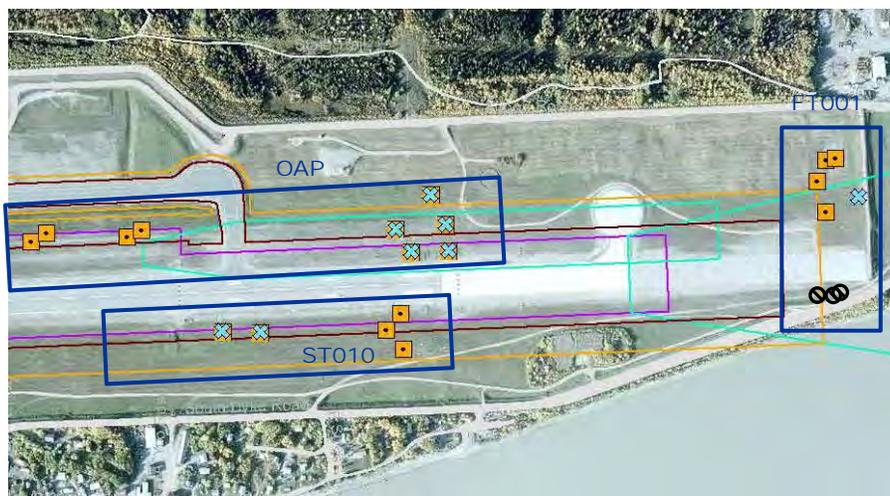
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Sites in Eastern Airfield Area



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Eastern Airfield Area Results

- Old Abandoned Pipeline (OAP) – Sampled soil from 9 borings and groundwater from 5 borings to delineate the extent of fuel hydrocarbons in soil and groundwater.
- ST010 – Sampled soil from 5 borings and groundwater from 2 borings to delineate the extent of fuel hydrocarbons in soil and groundwater.
- Former Fire Training Area (FT001) – Installed three monitoring wells at toe of plume to delineate DRO and benzene in groundwater. Installed one boring with groundwater sample to delineate benzene to east of the fire training area.

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SS015 Bioreactor

- Operated SS015 solar powered bioreactor from June to September
- Bioreactor is effective at degrading trichloroethene (TCE) to dichloroethene (DCE) and vinyl chloride (VC)
- Further degradation of DCE and VC is limited by the quantity of bacteria in groundwater that can degrade these compounds
- Bioreactor will be operated and monitored from May to September 2014, and will be optimized to enhance degradation of DCE and VC



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Parsons 2014 Field Work Summary

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2014 Supplemental Remedial Investigations

- Collect soil gas and air samples for a vapor intrusion evaluation at four buildings in Triangle area
- Operate, evaluate, and optimize SS015 bioreactor
 - Add organic substrate to enhance biodegradation
 - Consider adding microbes to completely degrade DCE and VC



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Parsons 2014 Field Schedule

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- April 21 to 29: Sample vapor intrusion sites and sample bioreactor monitoring wells (3 man crew for 8-10 days)
- May 19 to 23: Sample bioreactor and start up solar powered recirculation system (2 man crew for 4 days)
- June 16 to 25: Sample vapor intrusion sites and monitor bioreactor (3 man crew for 8-10 days)
- Mid-July and Mid-August: Bioreactor monitoring (2 man crew for 2 days)
- Mid-September: Bioreactor final monitoring and shut down (2 man crew for 3-4 days)

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Former Galena FOL
Military Munitions Response Program
(MMRP) Supplemental Comprehensive Site
Evaluation (CSE) Phase II
RAB Meeting
16 April 2014

Former Galena FOL MMRP Supplemental CSE Phase II RAB Meeting – 16 April 2014

The Project Team



Project Overview



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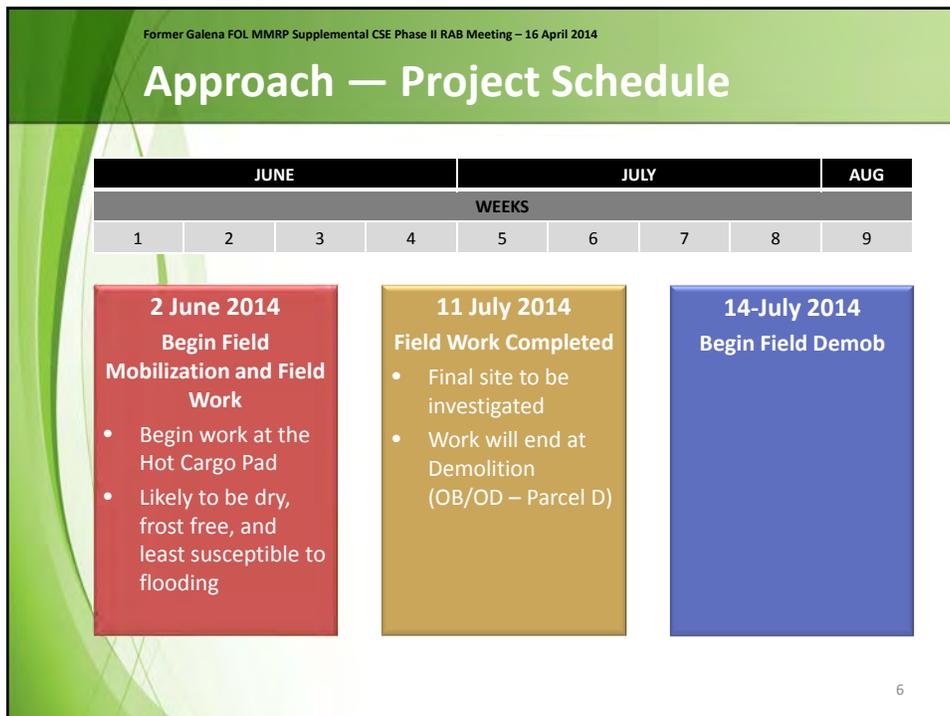
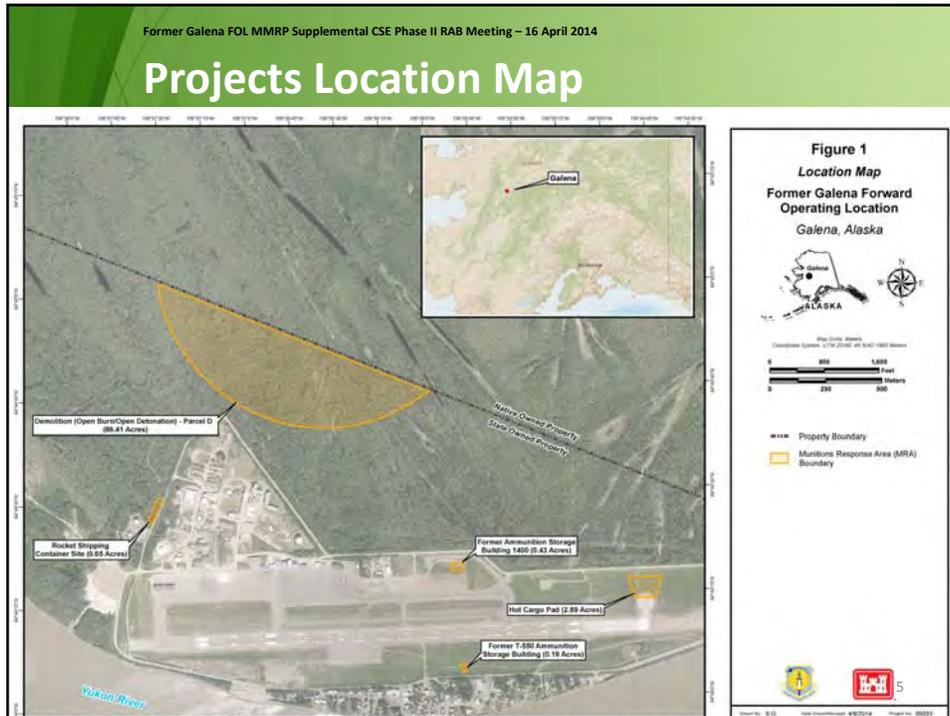
Project Overview

5 MRAs to be investigated under this Contract

- Former Ammunition Storage Building 1400
- Hot Cargo Pad
- Demolition Area (Open Burn/Open Detonation [OB/OD]) – Parcel D
- Rocket Shipping Container Site
- Former Ammunition Storage Building T-550



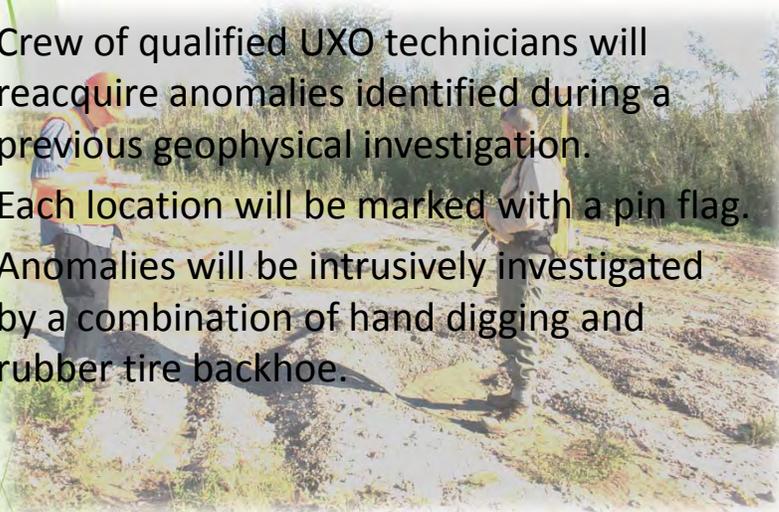
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Former Galena FOL MMRP Supplemental CSE Phase II RAB Meeting – 16 April 2014

Field Activities

- Crew of qualified UXO technicians will reacquire anomalies identified during a previous geophysical investigation.
- Each location will be marked with a pin flag.
- Anomalies will be intrusively investigated by a combination of hand digging and rubber tire backhoe.

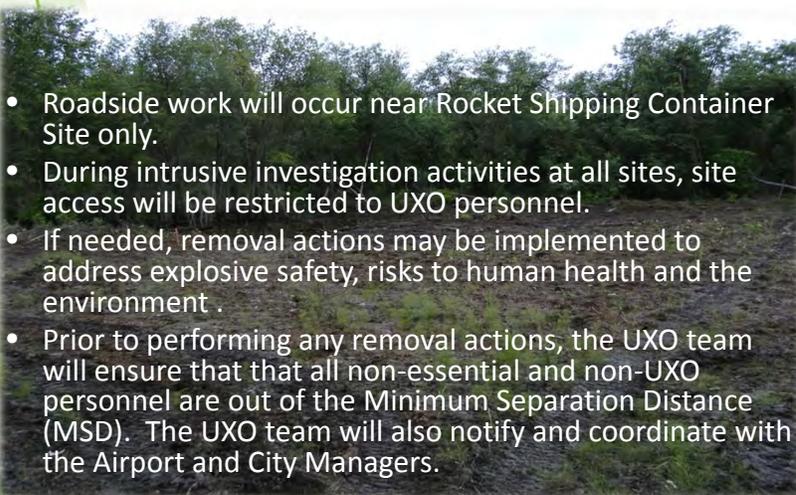


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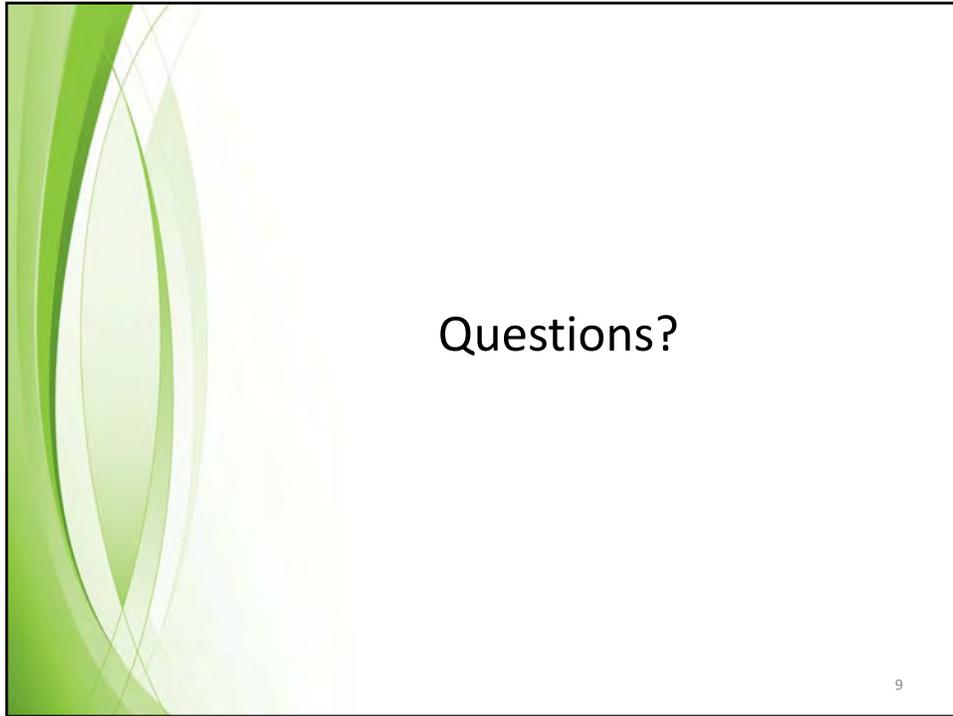
Former Galena FOL MMRP Supplemental CSE Phase II RAB Meeting – 16 April 2014

Community Awareness/Site Safety

- Roadside work will occur near Rocket Shipping Container Site only.
- During intrusive investigation activities at all sites, site access will be restricted to UXO personnel.
- If needed, removal actions may be implemented to address explosive safety, risks to human health and the environment.
- Prior to performing any removal actions, the UXO team will ensure that all non-essential and non-UXO personnel are out of the Minimum Separation Distance (MSD). The UXO team will also notify and coordinate with the Airport and City Managers.



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

Galena RAB Meeting, 16 April 2014

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Former Galena FOL Performance Based Contract

- Parsons - Prime Contractor
- Partnering Team – CH2M Hill and Ahtna
- 6.5 year contract
- 31 Sites



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Parsons Team

- Parsons - Bruce Henry (PM), Brian Blicher and Kevin Smith (Field Managers)
- CH2M Hill
 - Win Westervelt (PM)
- Ahtna
 - Jaime Oakley/Nino Muniz (PM)
- Subcontractors (TBD)
 - Analytical Laboratory - EMAX
 - Drilling - TBD
 - Construction/Excavation – TBD
 - Local Resources – lodging, vehicles, equipment and operators

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Performance Objectives

- Remedy-in-Place (RIP): All 31 Sites by 30 September 2019
- Stretch Goals
 - Response Complete (RC): 8 Sites
 - Site Closeout (SC): 8 sites



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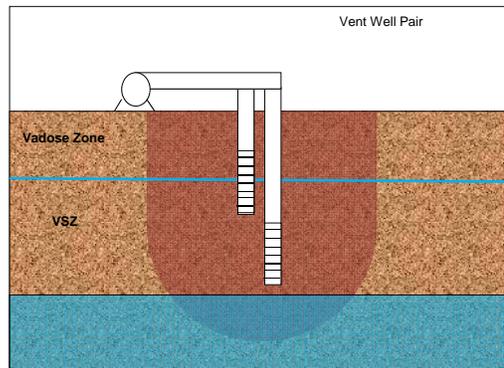
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Technical Approaches

- Excavation and Landfarming/Disposal
- Bioventing
- Soil Vapor Extraction
- Biosparging



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Technical Approaches (con't)

- In-situ Bioremediation
- Sulfate-Enhanced Natural Attenuation
- In-situ Chemical Oxidation
- Monitored Natural Attenuation



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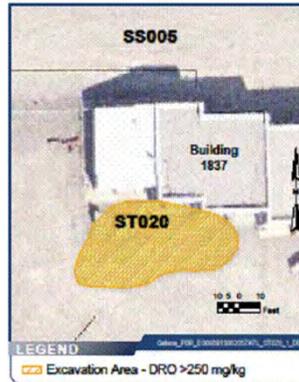
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Example SC Sites

- Smaller sites like ST020 (Building 1857) that do not have groundwater contamination will be cleaned up by excavating and landfarming contaminated soil



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Example SC Sites

- Horizontal wells may be used to biovent and biosparge fuel contaminants in variably saturated zone beneath large sites



Photo Courtesy of Directed Technologies Drilling

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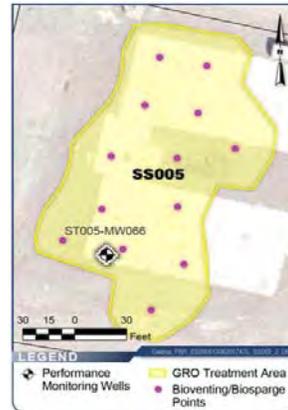
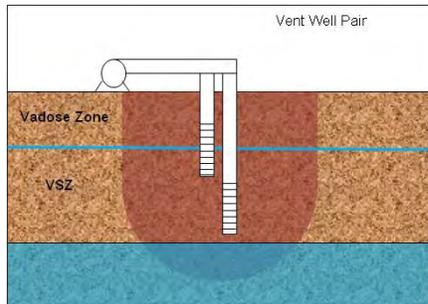
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Example SC Sites

- Smaller sites such as SS005 will have vertical bioventing wells, typically installed in pairs to treat entire variably saturated zone



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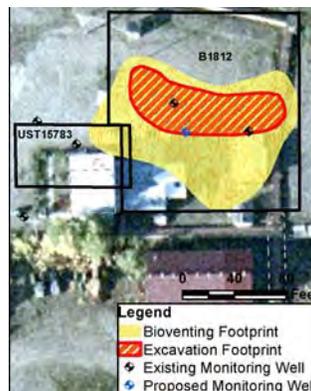
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Example SC Sites

- Some sites like Building 1812 will be cleaned up with a combination of technologies such as excavation and bioventing



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Scope of Work – RI Sites

- RI Sites (10 total)
 - Feasibility Study (FS)
 - Proposed Plan (PP)
 - Record of Decision (ROD)
 - Remedial Design/Remedial Action Work Plan (RD/RAWP)
 - Remedial Action Completion Report (RACR)
 - Remedial Action-Operations Reports (RA-O)
 - Land Use Control (LUC) Plans and Inspection Reports
 - Remedy Complete or Site Closure Reports (as appropriate)

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RI Site Locations (10 total)



Legend
A00P Runway Control Areas
S30006
01954333
030015
030016
030017
030018
030019
030020
030021
Remedial Investigation Areas
Remedy Complete

Investigation Areas
for Remedial Investigation
PARSONS

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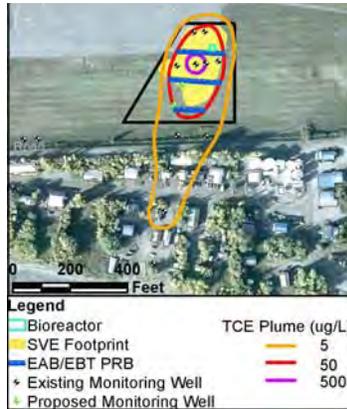
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Example RI Site

- RI sites such as SS015 with fuel and chlorinated solvents will be treated with excavation/SVE for unsaturated or variably saturated soil combined in situ bioremediation for groundwater



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Disposal Site West of Dike

- The DSWD site will have an interim soil sampling and removal action to remove debris and contamination in the disposal area and to determine if there is any contamination that cannot be excavated



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Schedule

- Summer 2014
 - SC Addendums and Feasibility Studies
 - Groundwater Monitoring Plan
 - DSWD Interim Delineation Plan
- 2014 Field Work
 - Annual Groundwater Monitoring (late August/September)
 - DSWD Soil Sampling (September)
- Fall/Winter 2014 – Cleanup Plans (SC Sites), Decision Documents and Remedial Action Work Plans (RI Sites)
- Summer 2015 – Implement select Cleanup Plans and Pilot Tests
- 2016 to 2018 – Implement remaining remedies
- 2019 to 2020 – Operate Remedies, Prepare RC/SC reports

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Communication and Information

- Bi-annual Galena RAB Meetings (April/October)
- BRAC Web Site: <http://www.afcec.af.mil/brac/galena/>
- ADEC Spill Prevention and Response Website: <http://dec.alaska.gov/spar/csp/sites/galena.htm>
- Former Galena FOL Administrative Record: <http://afcec.publicadmin-record.us.af.mil/>

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