

LESSONS LEARNED FROM DESKTOP OPTIMIZATION EFFORT FOR FUDS

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PROBLEM STATEMENT

Many Formerly Used Defense Sites (FUDS) Ground Water (GW) Sites

- Hundreds of Sites Requiring Remediation
- Large costs, Long “tails”

Need to “Move the Needle” on accelerating closure, reduce cost to complete

Traditional optimization studies relatively slow, expensive

- Justified for some projects
- USACE optimization process: Remediation System Evaluation (RSE)

Need fast and efficient process to assess FUDS GW sites



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PROPOSED APPROACH

Proposed to HQ USACE a rapid “tiger team” approach

- Small team (2 person, senior engineers and geologists)
- Gather key documents (Decision Document, RI, Operational data, cost, etc.)
- Meeting or call with PM/team
- Rapid assessment, brief (2-4 page) memo on findings and recommendations
 - Accelerate closure and reduce cost
 - Identify common/systemic barriers to progress
- Review by district team and possibly their contractor
- May recommend RSE if justified

Pilot test proposed in FY18



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PILOT IMPLEMENTATION

Developed standard checklist, report memo outline
Reviewed FUDS GW sites in USACE Northwestern
Division

Chose 14 sites based on discussions with division &
district FUDS program managers

Studies used readily available documents from internal
databases, requested other recent info from PMs

- Decision documents
- Operational reports
- Remedial Investigation reports
- Pilot test reports, etc.



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PILOT IMPLEMENTATION, CONTINUED

Teams formed with EM CX engineering & hydrogeology staff

One lead technical person

- Review materials, complete checklist
- Compile plume maps, piezometric maps, cross-sections

Meet with other technical tiger team member

- Discuss conceptual site model
- Review objectives
- Brainstorm

Lead tiger team member drafts memo

- Review by other team member, EM CX PM

Transmit the memo & checklist to district team and division



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PILOT IMPLEMENTATION, CONTINUED

Sites considered

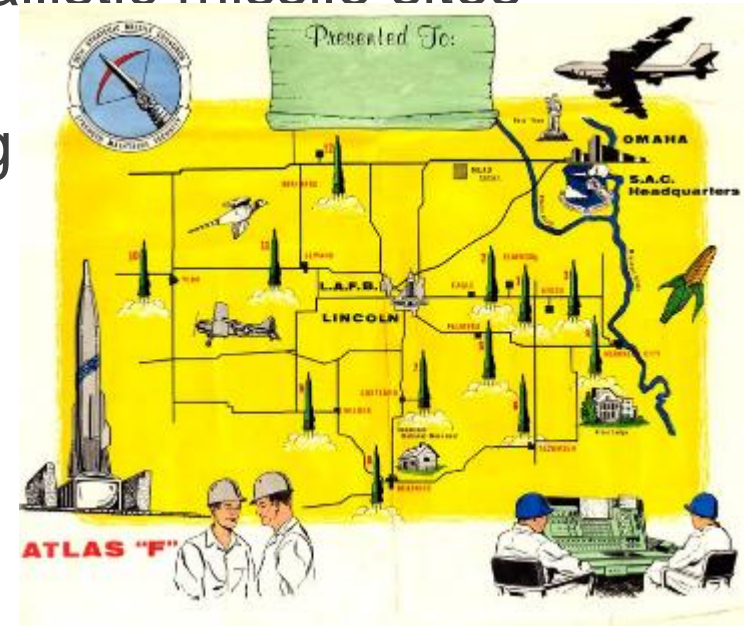
- Mostly former intercontinental ballistic missile sites (Atlas, Titan)
- Former munitions manufacturing
- Former Air Force radar site

Contaminants

- Chlorinated solvents
- Explosives

Existing remedies

- In-situ bioremediation, chemical oxidation/reduction
- Pump & treat at manufacturing site
- Monitored natural attenuation



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RESULTS AND RECOMMENDATIONS TO DATE

Sites are making progress, in some cases quite substantial progress

Contractors taking varied approaches to amendment injection, varied success

- Direct injection
- Recirculation

Ground water circulation as option to accelerate cleanup

Issues with adequate treatment of source areas

- Additional (high resolution) characterization or vertical profiling to target treatment
- Offered alternatives, enhancements to accelerate closure



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RESULTS AND RECOMMENDATIONS TO DATE, CONTINUED

Recommended transition to MNA sites treated to plateau levels (or one additional injection event)

Difficulties treating fine-grained heterogeneous lithology

- Address with aggressive technology, better characterization or alternative RAOs

Monitoring optimization recommendations

Some sites targeting MCLs for non-potable aquifers (e.g., perched aquifers or low yield shallow unit)

Costs under \$5,000 per site, expect costs to be further reduced



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ISSUES IDENTIFIED



Follow-up and tracking recommendations

- Follow-up encourages implementation of recommendations
- Tracking recommendations, implementation for assessing full benefit of effort
- Still considering tracking mechanism

MCLs used as standards in all groundwater DD

- Even when no potential for potable use
- Anticipated barrier to achieving “Response Complete” by FY21
- Develop metrics for ending active treatment prior to MNA
- Recognizing the need to continue long-term management & monitoring of site <https://www.itrcweb.org>

Resources for continuation of the effort

- Planning ~20 sites per FY over 6 years

Consider training & transfer of injection guidance



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CASE STUDY

Missile Facility in Nebraska

COCs: TCE and daughter products

RA: Enhanced Reductive Dechlorination (ERD)

RAOs: Restore aquifer to DWS shallow and deep

Issues: Large off site plume

Right of Entry limitations

Potable wells/residences adjacent to the site

MNA will not meet DWS by 2021 timeline

Recommendations:

Use GW recirculation to accelerate cleanup

Gain RoE to off site monitoring wells

Optimize monitoring program

