RVAAP Multi-Site Investigation

Additional Remedial Design Soil Sampling

Presented by:

Charles Spurr, P.G. – Leidos

May 21, 2025

Presentation Agenda

- Present the Project Team
- Purpose of the Multi-Site Investigation
- What is Leidos' Role?
- How was Sampling Accomplished?
- Areas Sampled
  - RVAAP-38 NACA Test Area
  - RVAAP-42 Load Line 9
  - RVAAP-45 Wet Storage Area
  - CC RVAAP-76 Depot Area
- Summary of Field Efforts
- Discuss the Path Forward Dependent on Results

Project Team

- Army National Guard (lead agency)
- Ohio Army National Guard
- U.S. Army Corps of Engineers
- Ohio Environmental Protection Agency
- Leidos (performing contractor)

Multi-Site Investigation
Purpose?

Purpose of the Investigation?

Follow-up to previous remedial activities completed at the four AOCs from June 2021 to June 2022

- Previous remedial activities (excavation) were intended to address contaminated soil at the four AOCs
- Previous activities did not remove all contaminated soil
- Some PAHs and metals remain above the clean up goals (CUGs)



Multi-Site Investigation
Purpose?

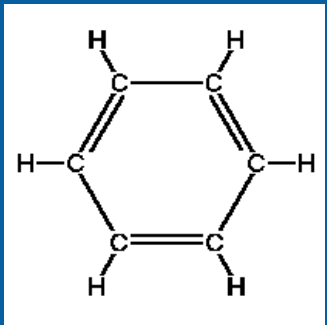
Purpose of the Investigation?

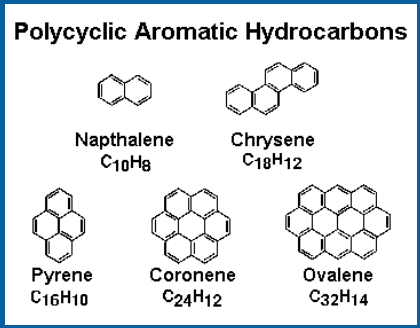
New sampling to delineate remaining contaminants at the four AOCs

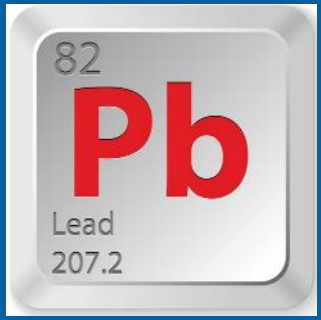
- Conduct additional sampling data collection activities to refine the extent of soils that remain above CUGs
- Conduct data validation and laboratory oversight activities
- Evaluate data from the field effort and applicable historical information to produce individual Remedial Design Addenda

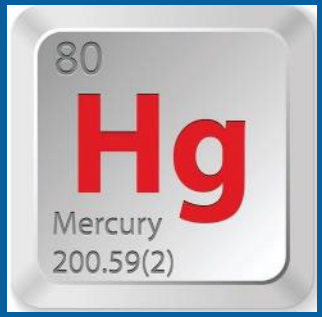
Multi-Site Investigation
What is Leidos' Role?

- Leidos was scoped with performing additional remedial design sampling at four areas of concern (AOCs) within CJAG (formerly RVAAP).
  - RVAAP-38 NACA Test Area
  - RVAAP-42 Load Line 9
  - RVAAP-45 Wet Storage Area
  - CC RVAAP-76 Depot Area
- Developed and finalized a quality assurance program plan (QAPP) which was approved by the Ohio EPA. All field activities followed the QAPP. The QAPP can be found here: https://www.rvaap.org/docs/pub/F_QAPP_ARDS_MAOC_40_00.pdf
- Additional soil sampling at all four AOCs to analyze and delineate target contaminants.
- Polycyclic aromatic hydrocarbons (PAHs) at four AOCs and metals (lead and mercury) at one AOC.

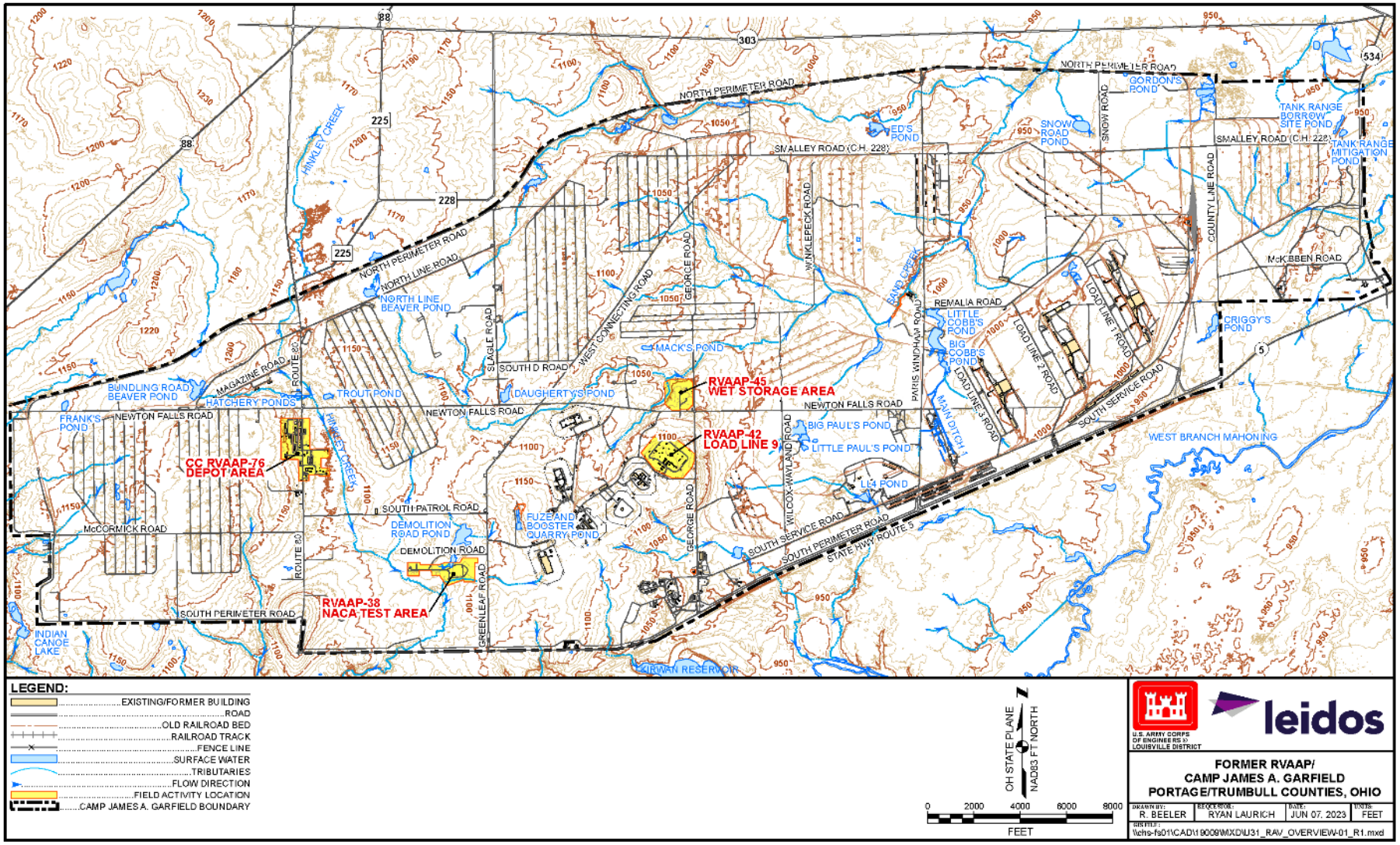






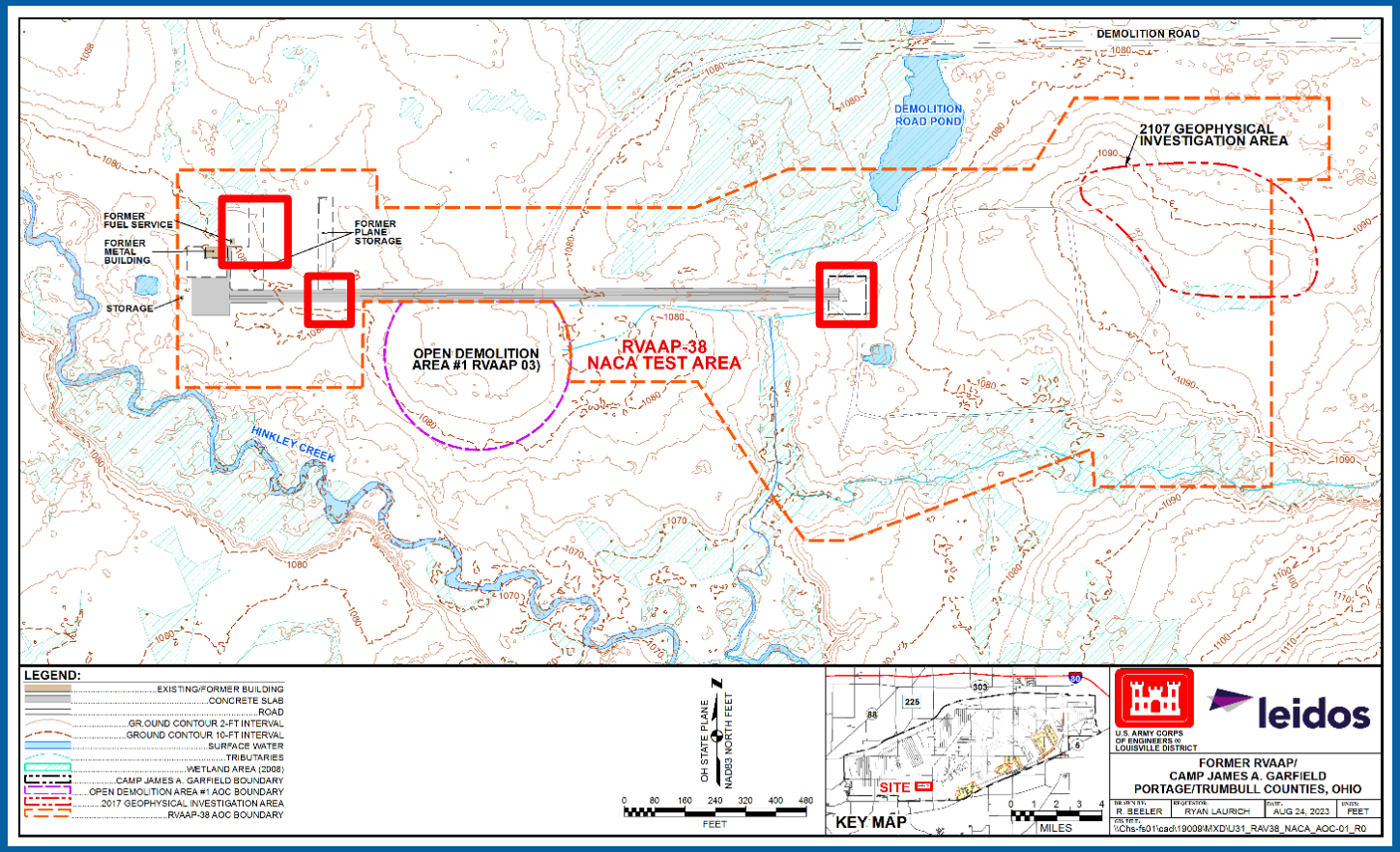


Multi-Site Investigation
Facility Map with Locations



Multi-Site Investigation
RVAAP-38 NACA Test Area

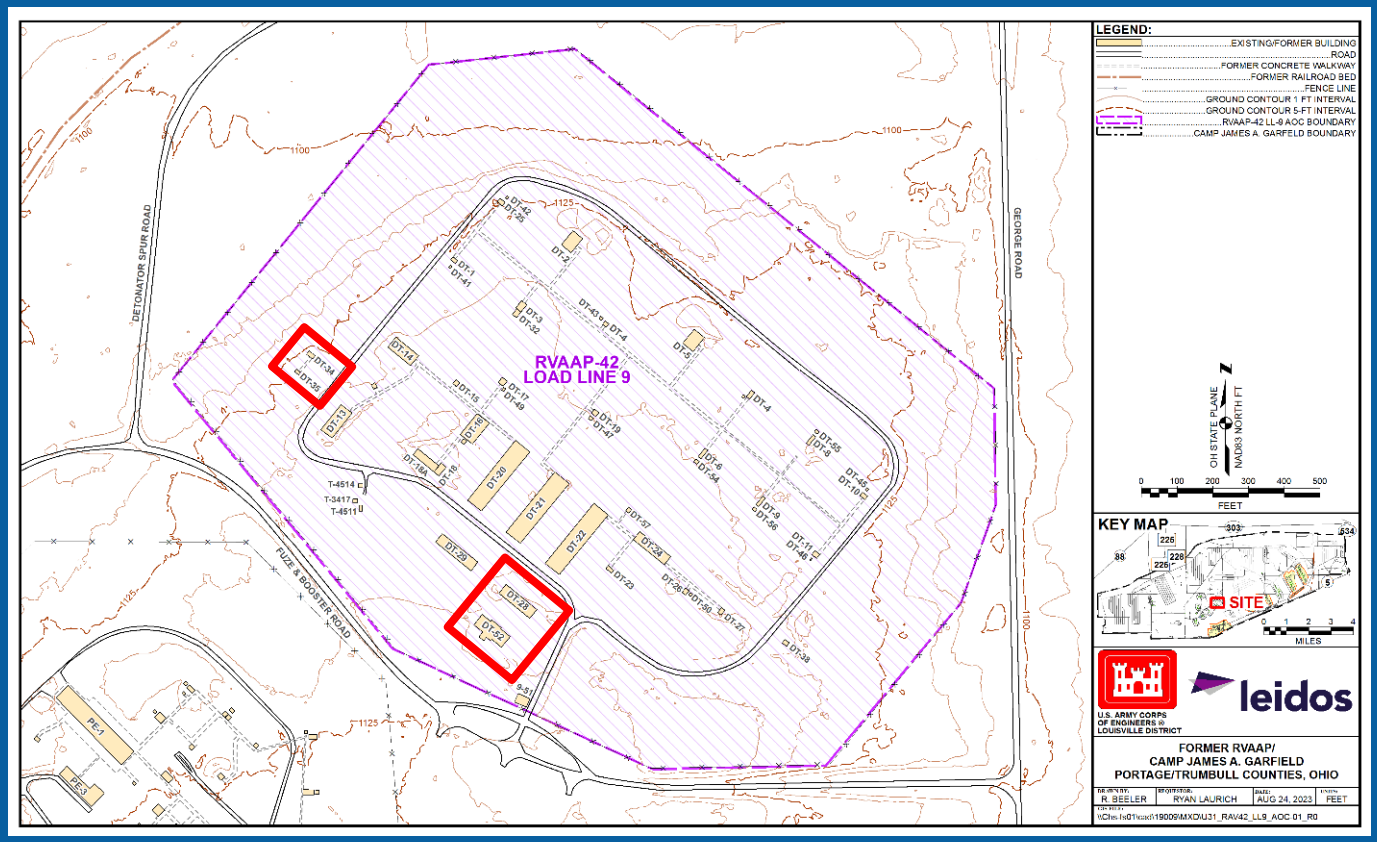
- Used by NACA (National Advisory Committee for Aeronautics)
- Crash testing airplanes from 1947 to 1953
- Performed tests using 17 planes with crashes occurring before takeoff



Site features include gravel access roads, plane storage areas, a concrete runway and monorail, camera stations, a fuel shack, a metal building, observation towers, and storage shacks near the observation towers

Multi-Site Investigation
RVAAP-42 Load Line 9

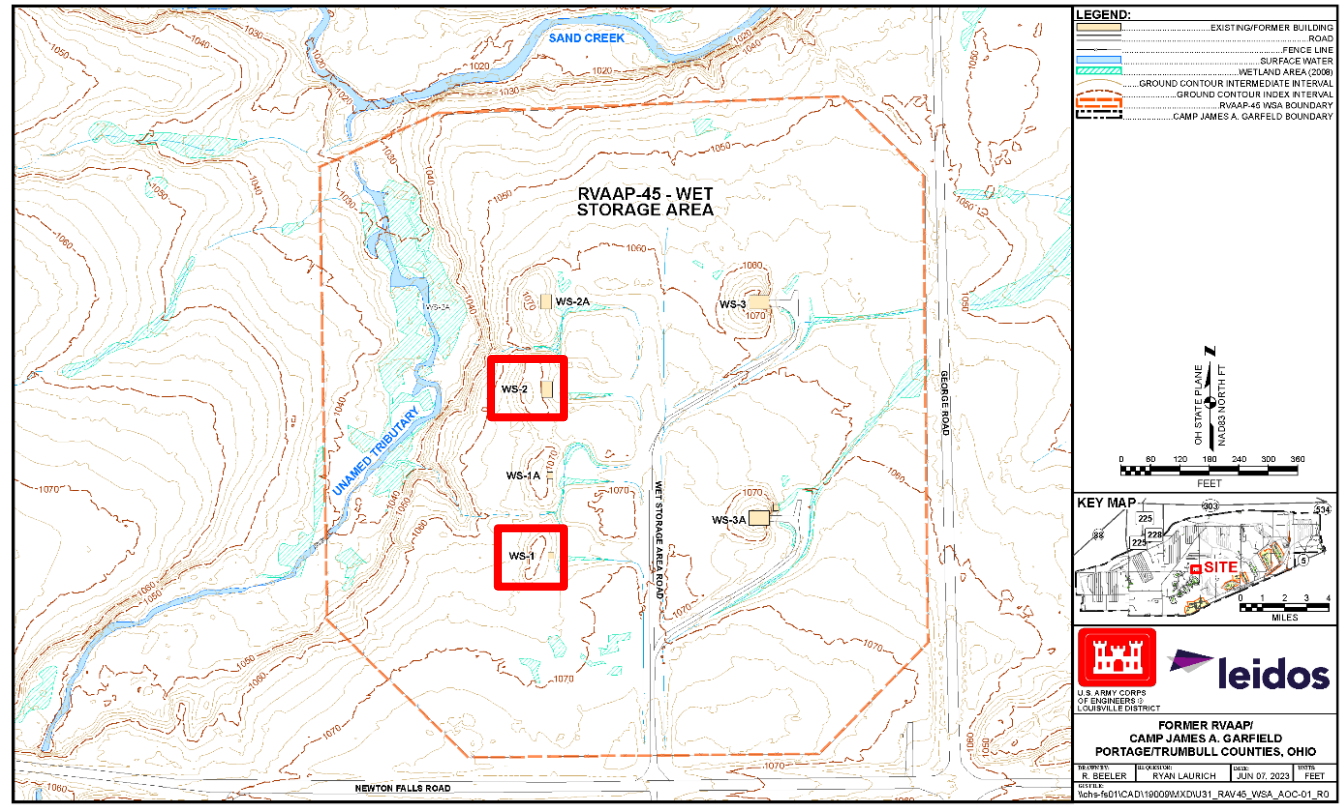
- Formerly known as the “detonator line”
- Assembled fuze component parts for artillery projectiles
- Operated from 1941-1945
- No other known uses



Site features include gravel roads and an elevated water tank (now used as a radio antenna). All other Structures have been removed.

Multi-Site Investigation
RVAAP-45 Wet Storage Area

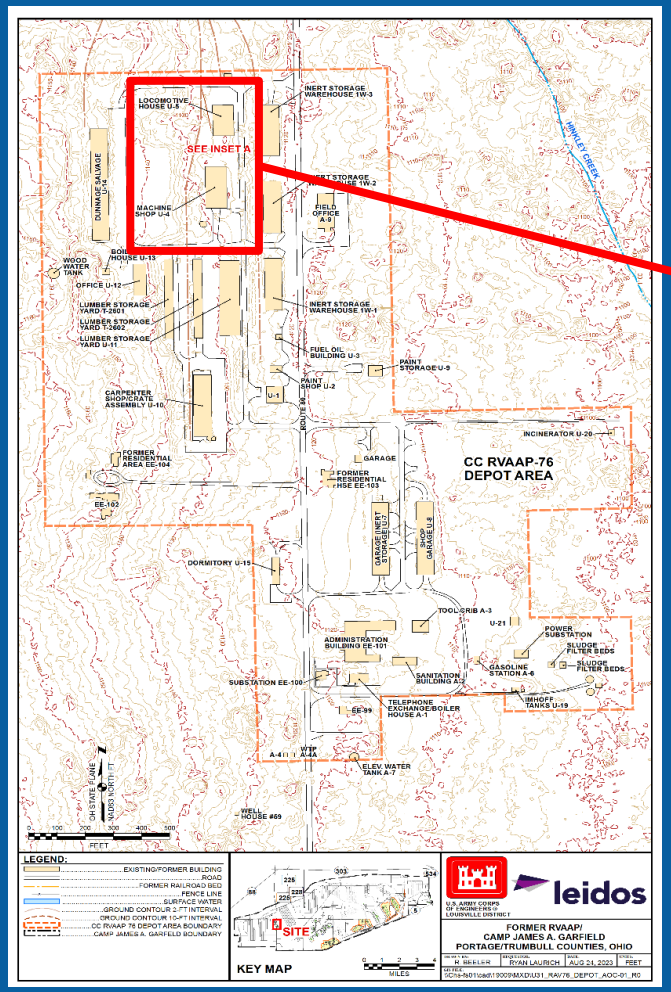
- Formerly used as an explosives storage area from 1941 - 1945
- Used for high explosives and shock-sensitive materials
- Lead azide, mercury fulminate, and tetryl
- Materials were containerized and covered in water

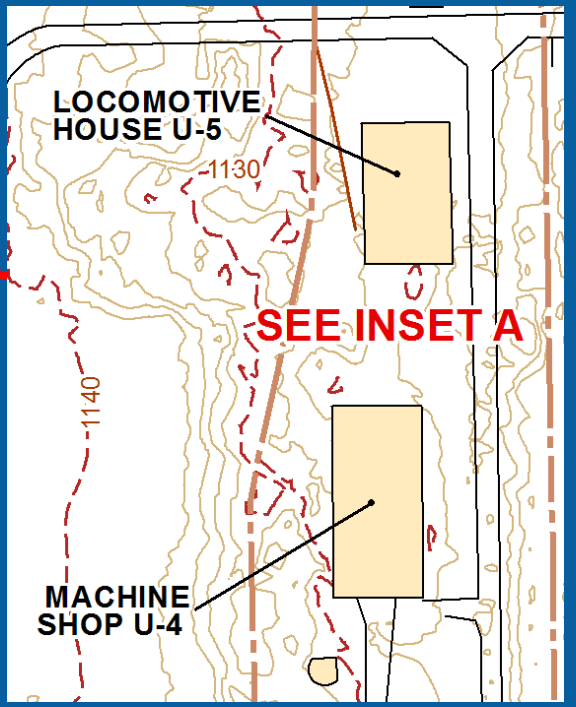


Site features include access roads and the site formerly housed six (6) igloos for explosives storage.

Multi-Site Investigation
CC RVAAP-76 Depot Area

- Formerly used for fueling operations, locomotive repair, petroleum oil and lubricant storage, solid waste incinerator activities, and vehicle repair and maintenance.
- The OHARNG actively uses this area
- Several structures including U-4 and U-5 remain, which are used for storage.





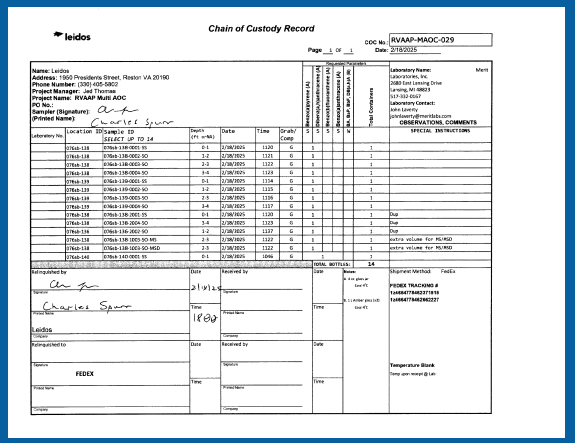
Multi-Site Investigation
How was Sampling Accomplished?

Methods for performing soil sampling

- Discrete soil sampling (grab sampling)
  - Analyze soil at specific points and depth
  - Use of Direct Push Technology (DPT)
  - Geoprobe drilling machine
- Geologist recorded lithology for every boring
- Sampling every 1-foot interval to total depth
  - Most borings were drilled from 0-4 feet below ground surface (bgs) with four samples per boring.
- Soil homogenized in pans and then placed in glass jars and labeled.
- Thorough daily sample QC
  - Checking sample counts and labels (time, date, etc) against chain of custody (COC)
- Samples shipped daily to the laboratory for analysis



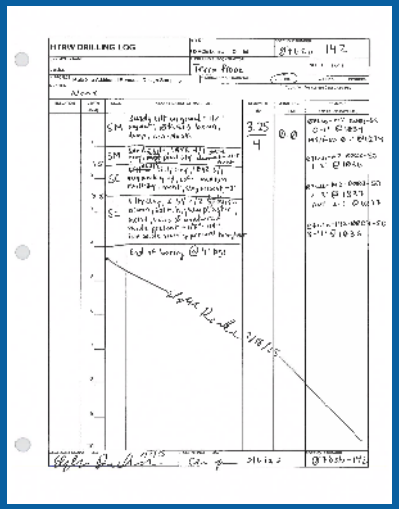



Chain of Custody Record

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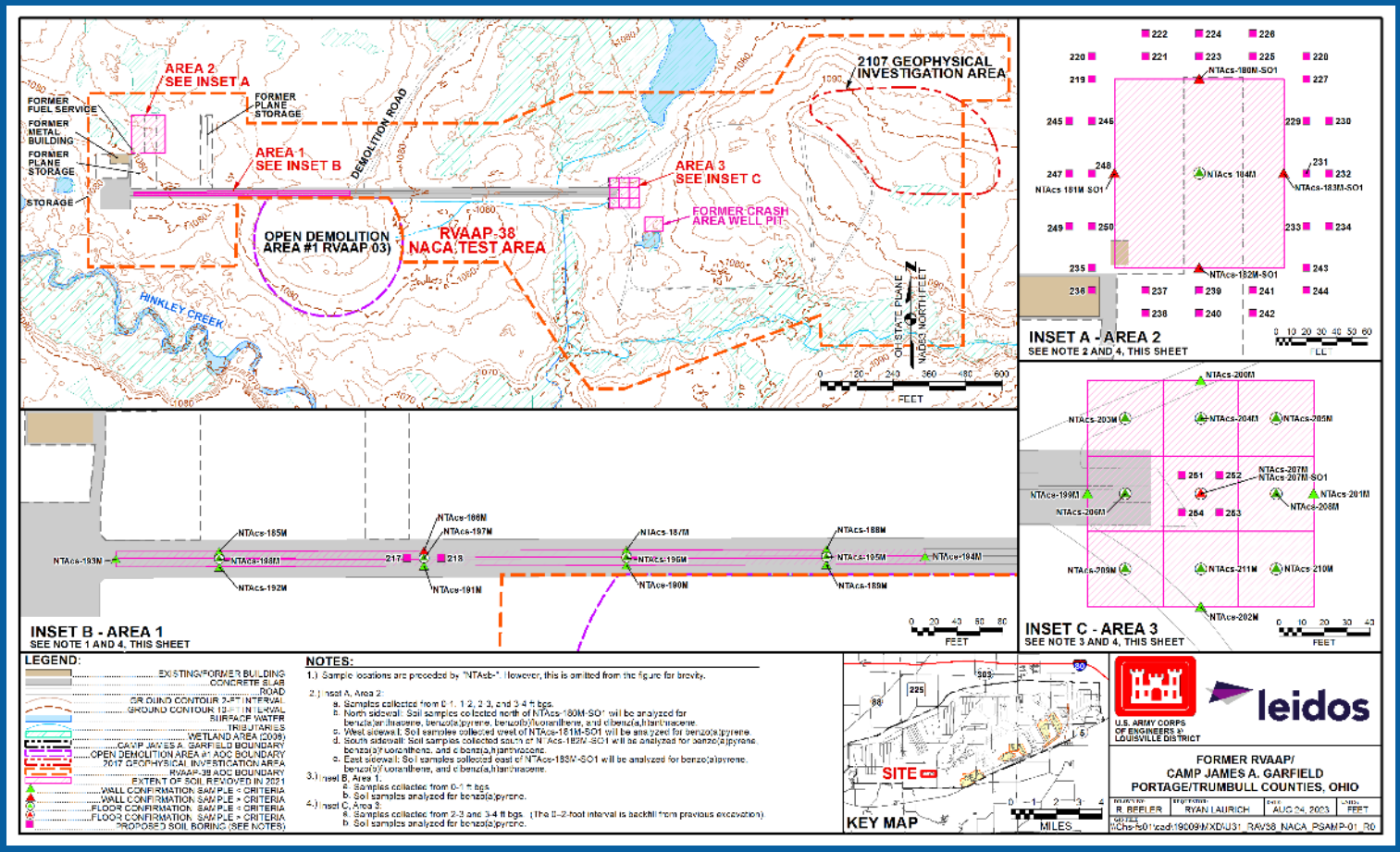
DOC No. RVAAP-MAOC-029

Date: 2/18/2025


ARMY DRILLING LOG

Multi-Site Investigation
Sampling at RVAAP-38 NACA Test Area

- Three separate areas located within the NACA Test Area AOC
- Removal actions (excavations) performed in 2021 shown in pink grids
- Multi-Site additional remedial design samples as smaller pink squares



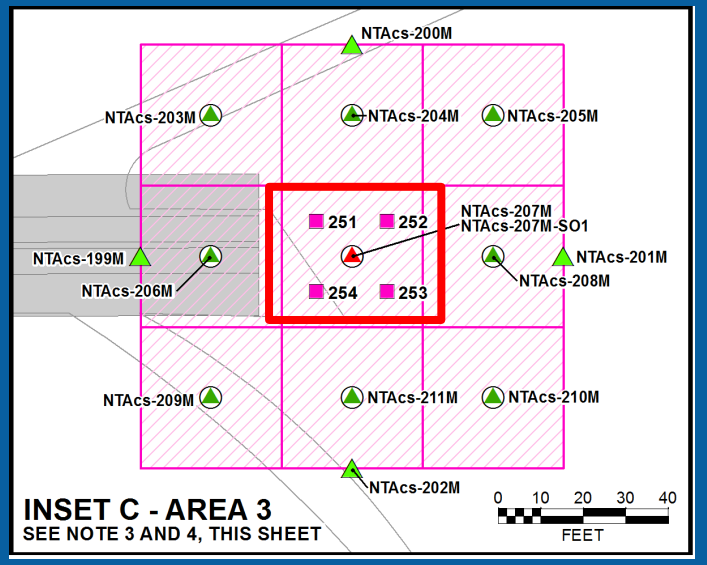
Multi-Site Investigation
Sampling at RVAAP-38 NACA Test Area

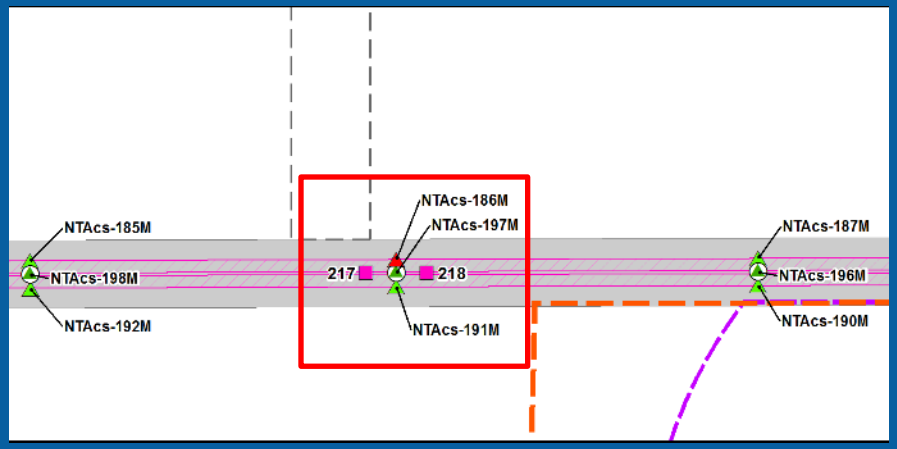
Area 3 sampled where benzo(a)pyrene exceeded CUG in the center of excavation from 2021 (right)

- Four borings (NTAsb-251 through 254) sampled 2-4 feet bgs

Area 1 sampled where benzo(a)pyrene exceeded CUG along north wall of excavation from 2021 (below)

- Two borings (NTAsb-217 and 218) sampled 0-1 foot bgs







Multi-Site Investigation
Sampling at RVAAP-38 NACA Test Area

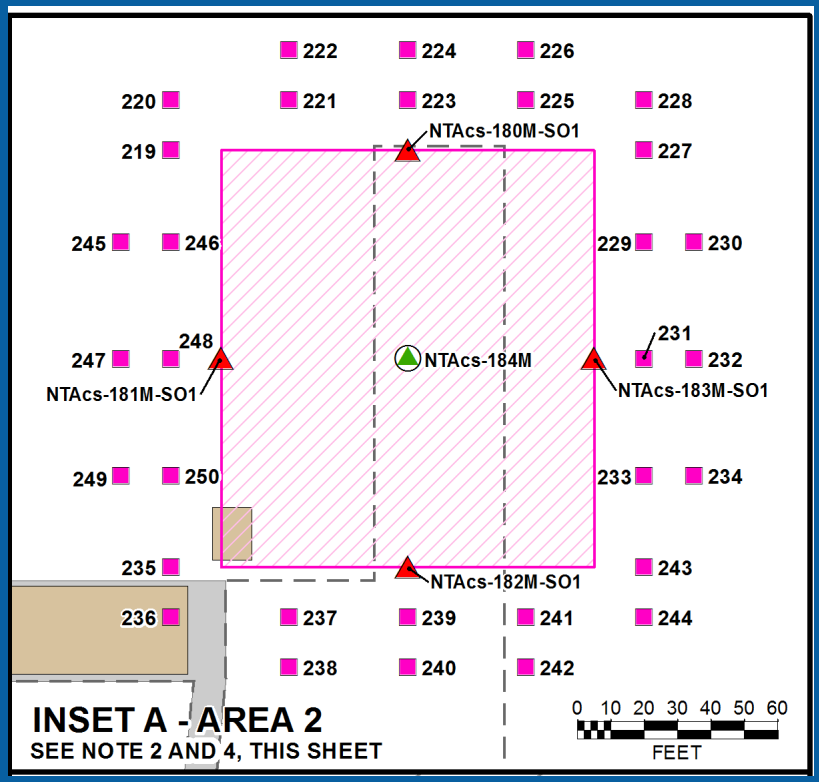
Area 2 is the largest area with 32 soil borings (NTAsb-219 through NTAsb-250) 0-4 feet bgs.

Excavation bottom did not exceed CUGs.

Four PAHs were greater than the CUGs along sidewalls.

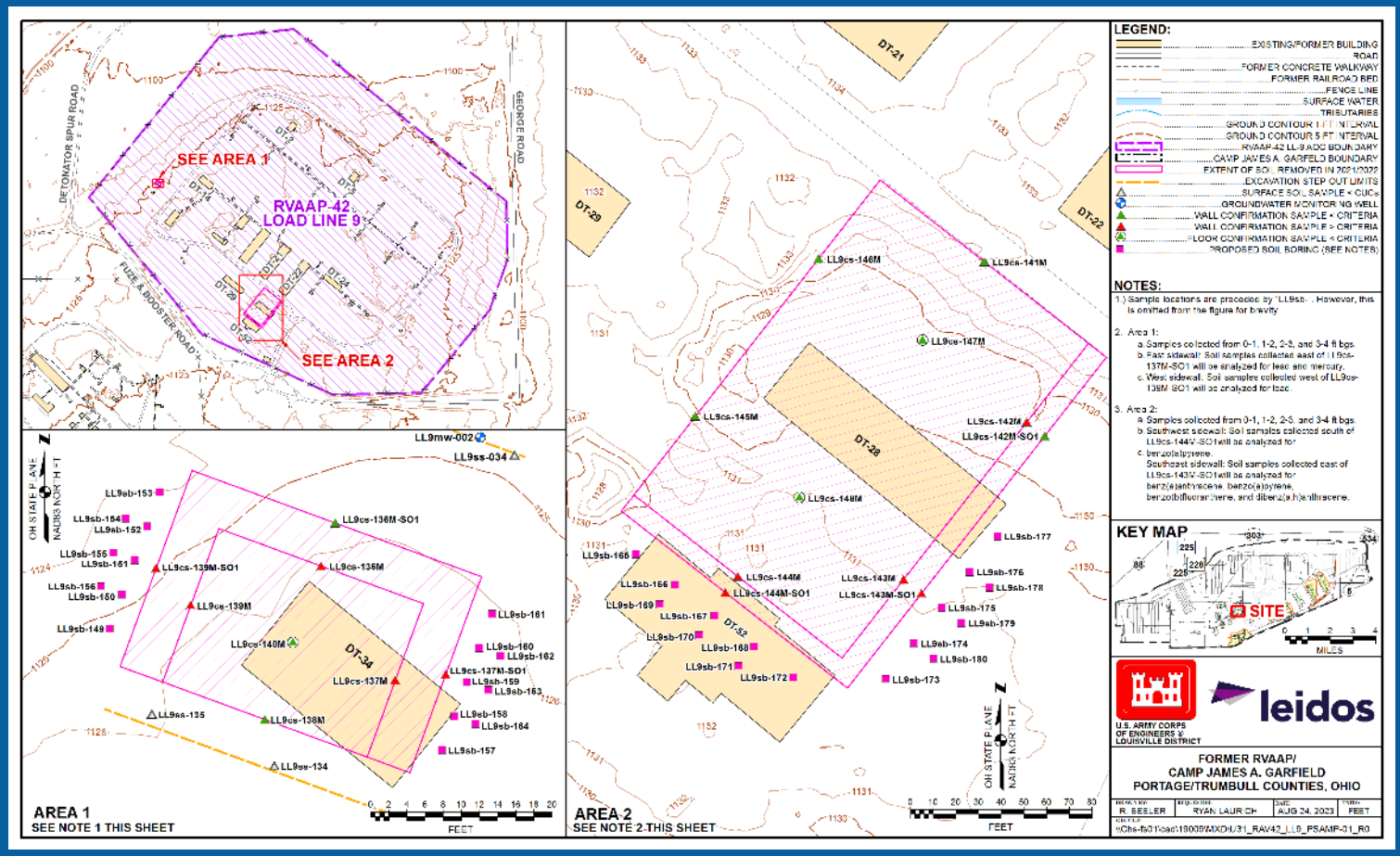
- North wall: benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene
- West wall: Benzo(a)pyrene only
- South and East wall: benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene





Multi-Site Investigation
Sampling at RVAAP-42 Load Line 9

- Two separate areas located within Load Line 9
- Removal actions (excavations) performed in 2021/2022 shown in pink grids
- Multi-Site additional remedial design samples as smaller pink squares

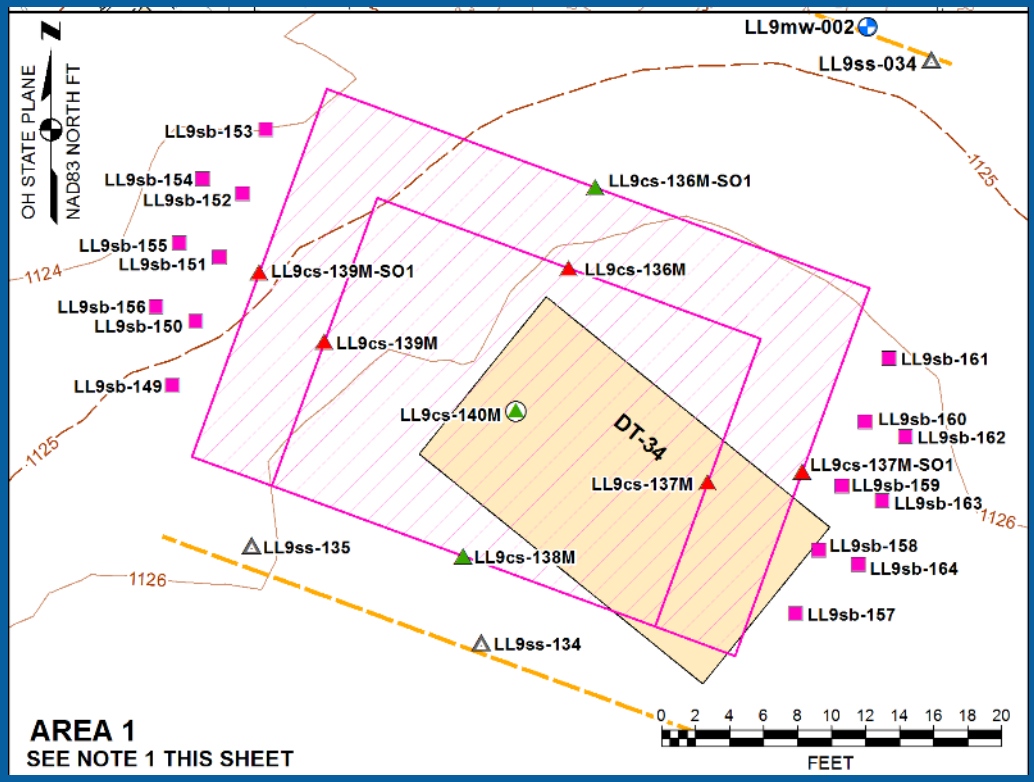


Multi-Site Investigation
Sampling at RVAAP-42 Load Line 9

Area 1: concentrations of lead and mercury exceeded CUGs based on 2021/2022 remedial action

- West sidewall: lead exceeded CUGs
- East sidewall: mercury and lead exceeded CUGs
- Sixteen total borings (LL9sb-149 through LL9sb-164) sampled 0-4 feet bgs

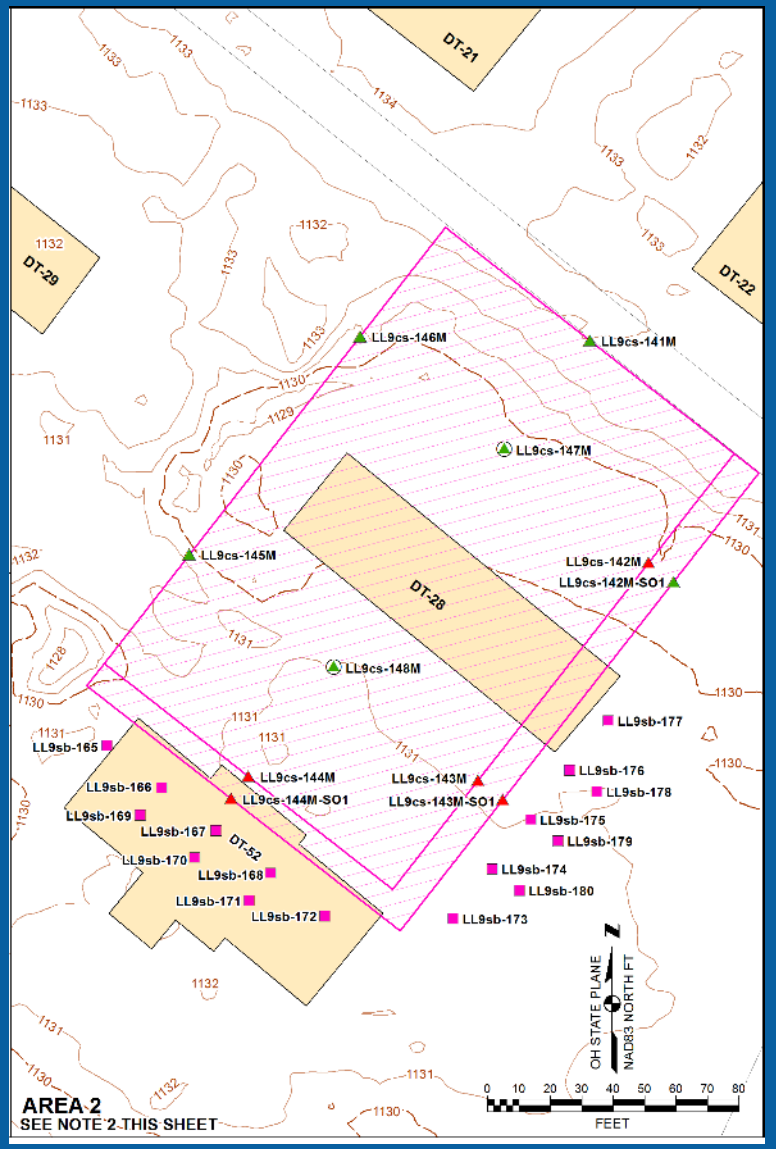




Multi-Site Investigation
Sampling at RVAAP-42 Load Line 9

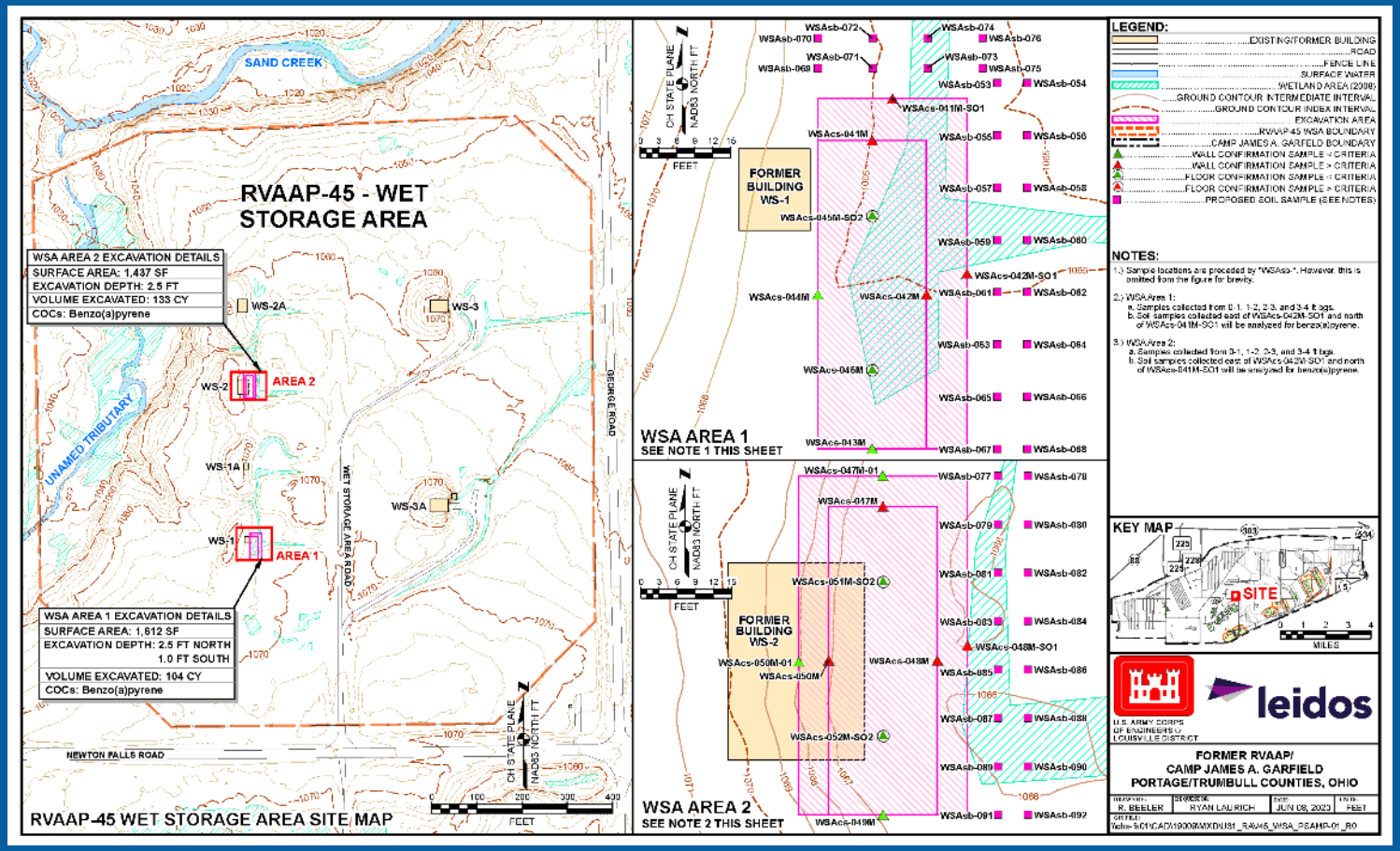
Area 2: concentrations of PAHs were greater than the CUGs

- Southeast sidewall: benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene exceeded CUGs
- Southwest sidewall: Benzo(a)pyrene exceeded CUGs
- Sixteen total borings (LL9sb165 – LL9sb180) sampled 0-4 feet bgs



Multi-Site Investigation
Sampling at RVAAP-45 Wet Storage Area

- Two separate areas located within West Storage Area
- Removal actions (excavations) performed in 2021 shown in pink grids
- Multi-Site additional remedial design samples as smaller pink squares



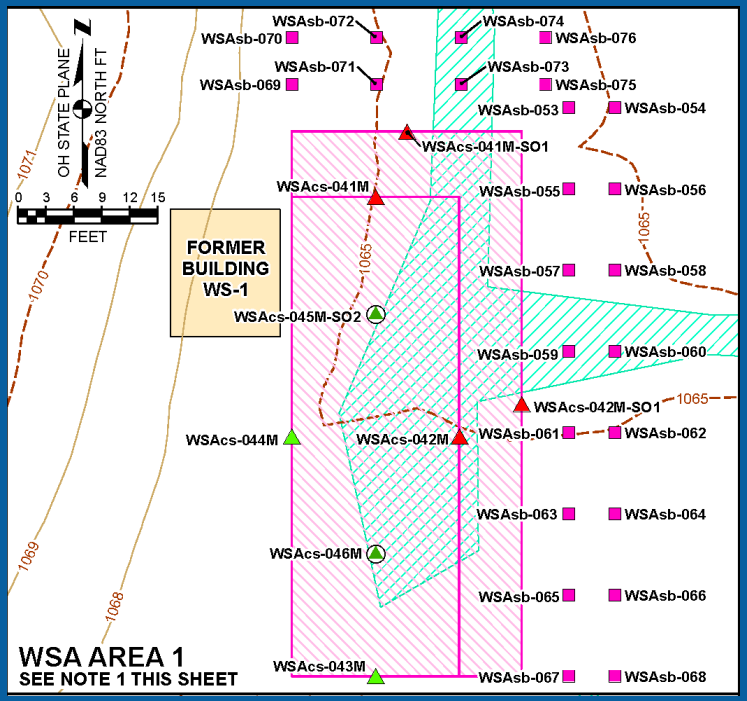
Multi-Site Investigation
Sampling at RVAAP-45 Wet Storage Area

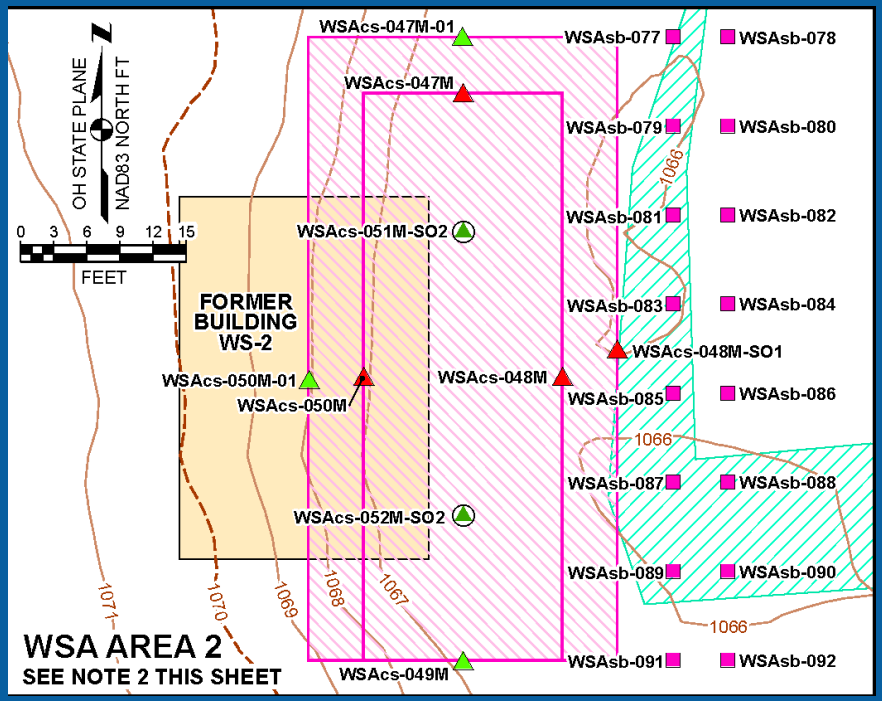
Area 1: concentrations of PAH benzo(a)pyrene exceeded CUGs along North and east sidewall

- Twenty-four total borings (WSAsb-053 through WSAsb-076) sampled 0-4 feet bgs

Area 2: concentrations of PAH benzo(a)pyrene exceeded CUGs along East sidewall

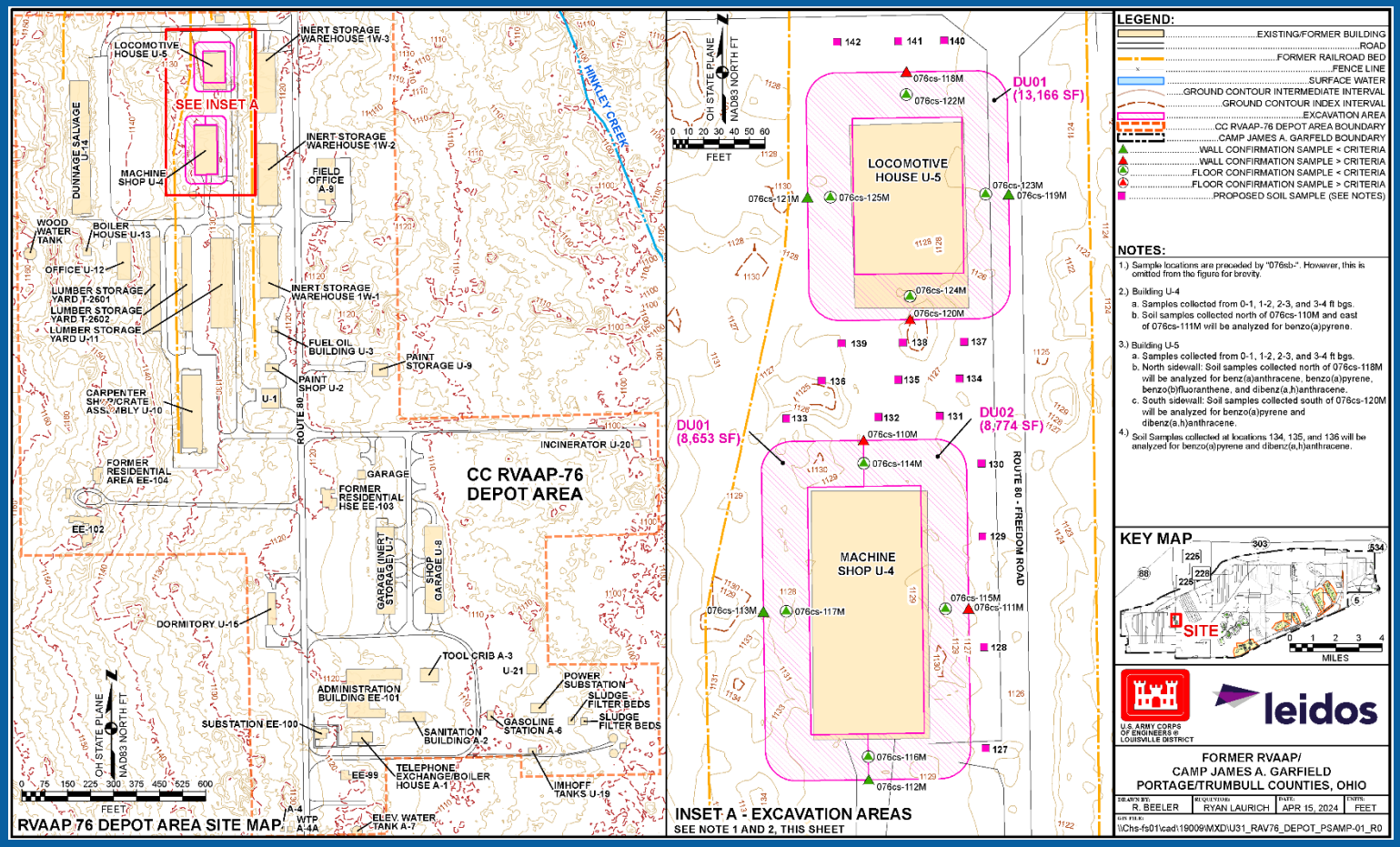
- Sixteen total borings (WSAsb-077 through WSAsb-092) sampled 0-4 feet bgs





Multi-Site Investigation
Sampling at CC RVAAP-76 Depot Area

- Two separate areas located within the Depot Area
- Removal actions (excavations) performed in 2021 shown in pink grids
- Multi-Site additional remedial design samples as smaller pink squares



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Multi-Site Investigation
Sampling at CC RVAAP-76 Depot Area

North of U-5: benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene exceeded CUGs

- Three borings (076sb-141, 142, and 143) sampled 0-4 feet bgs

South of U-5: benz(a)anthracene and benzo(a)pyrene exceeded CUGs

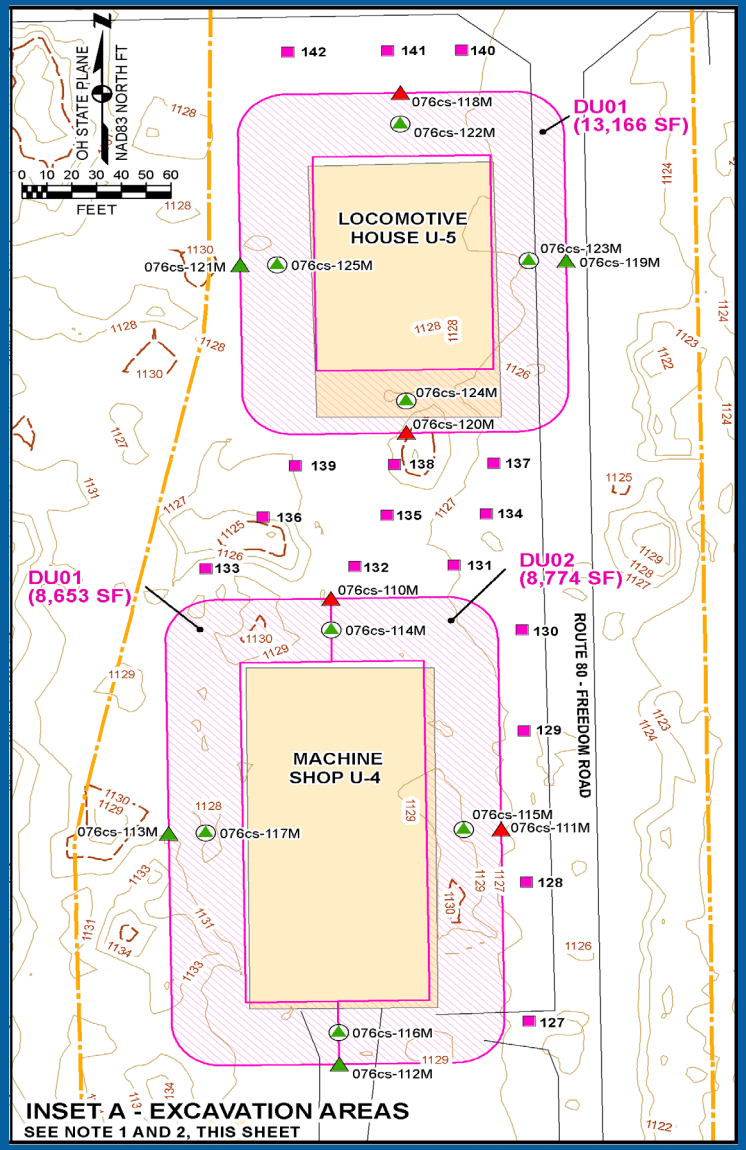
- Six borings (076sb-134 through 076sb-139) sampled 0-4 feet bgs

North of U-4: benzo(a)pyrene exceeded CUGs

- Three borings (076sb-131, 132, and 133) sampled 0-4 feet bgs

East of U-4: benzo(a)pyrene exceeded CUGs

- Four borings (076sb-127 through 076sb-130) sampled 0-4 feet bgs



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Multi-Site Investigation
Summary

- Collected a total of 520 field samples (1-foot intervals of soil) + QC samples for a grand total of 695 samples
- Samples are validated by chemistry team
- Writing a report that summarizes field activities and sample results
- Conclusions based on results will determine path forward

Sampling Breakdown

Matrix/Event	Number of Field Samples	Field Duplicate Samples	Field Blanks	Equipment Rinsate Blanks	MS/MSDs	Total Analyses
RVAAP-38 NACA Test Area (Area 1)	32	4	1	4	2/2	45
RVAAP-38 NACA Test Area (Area 2)	128	13	0	13	7/7	168
RVAAP-38 NACA Test Area (Area 3)	8	1	0	1	1/1	12
RVAAP-42 Load Line 9 (Area 1)	64	7	0	7	4/4	86
RVAAP-42 Load Line 9 (Area 2)	64	7	0	7	4/4	86
RVAAP-45 Wet Storage Area (Area 1)	96	10	0	10	5/5	126
RVAAP-45 Wet Storage Area (Area 2)	64	7	0	7	4/4	86
CC RVAAP-76 Depot Area	64	7	0	7	4/4	86

Multi-Site Investigation
Path Forward

Exceedances in soil samples?

- Review of data determines whether sites are delineated.
- Additional remedial activities (i.e., excavation) to address remaining contaminants and achieve CUGs.



Questions?