

#### DEPARTMENT OF THE AIR FORCE

## AIR FORCE CIVIL ENGINEER CENTER INSTALLATION SUPPORT SECTION EDWARDS AIR FORCE BASE, CALIFORNIA

18 May 2023

#### MEMORANDUM FOR DISTRIBUTION

FROM: AFCEC/CZOW

120 North Rosamond Boulevard

Edwards Air Force Base, California 93524

SUBJECT: Edwards AFB Restoration Advisory Board (RAB) Meeting Minutes – 17 November 2022

1. Time: 5:30 p.m.

2. Place: Hampton Inn & Suites, 2300 West Double Play Way, Lancaster, CA 93536

3. Chairman: Col Matthew S. Caspers, Air Force Co-Chair

4. The following RAB members were present:

<u>Name</u> <u>Position</u>

Mr. Todd Battey California Environmental Protection Agency (Cal/EPA) Lahontan

Regional Water Quality Control Board (LRWQCB) Remedial Project

Manager (RPM)

Mr. Kevin Depies Cal/EPA Department of Toxic Substances Control (DTSC) RPM
Mr. Ethan Finkel United States Environmental Protection Agency (U.S. EPA) RPM

Mr. William Gaddis Rosamond Public Representative

Mr. Mohamed Ibrahim
Mr. Dante Rodriguez
U.S. EPA RPM
U.S. EPA RPM
U.S. EPA RPM
Edwards AFB RPM

Mr. David Soltis Base Housing Public Representative

Mr. Victor Yaw Public Co-Chair and Mojave Public Representative Mr. Otto Zahn Main Base Test Wing Public Representative

#### 5. The following RAB members were absent:

Name Position

Mr. Darrell Dorris Alternate Lancaster Public Representative

Mr. Bruce Lewis Cal/EPA DTSC RPM

Dr. Joseph Mabry Air Force Research Laboratory (AFRL) Public Representative

Mr. Raj Malhi Primary Lancaster Public Representative

Mr. Alonzo Poach Cal/EPA LRWQCB RPM

Ms. Alexia Svejda California City Public Representative

Vacant Boron Public Representative

Vacant Edwards AFB North Base Public Representative Vacant Edwards AFB South Base Public Representative

Vacant National Aeronautics and Space Administration (NASA) Armstrong

Public Representative

Vacant North Edwards Public Representative

#### 6. The following advisors were present:

<u>Name</u> <u>Organization</u>

Ms. Claudia Basura Air Force Civil Engineer Center (AFCEC)/Environmental

Management Directorate, Operations Division, West Branch

(CZOW)

Mr. Joe Dunwoody AFCEC/CZOW

Mr. Gary Hatch 412th Test Wing Public Affairs

Mr. Sam Huleis AFRL Environmental and Fuels/Propellants Manager

Ms. Jeanette Van Norden AFCEC/CZOW Mr. Gregory Neate AFCEC/CZOW Ms. Leilani Richardson AFCEC/CZOW

Mr. Dale Riedel 412th Test Wing Judge Advocate

Ms. Julia Tseng AFCEC/CZOW

#### 7. Others present were as follows:

Name Organization
Mr. Ranney Adams
Public

Mr. Nick Choula Media Fusion
Ms. Madeline Guadarrama Media Fusion

Mr. James Elliott SRS
Mr. Manish Joshi SRS
Ms. Isabel Kirsch BB&E

Mr. Juan Lopez Plant 442 Public Co-chair

Mr. Jacques Marcillac SRS

Ms. Alexis McCadney
Mr. Marc Minneci
Mr. John Perry

BB&E (Recorder)
412 CEG/CEVC
Media Fusion

- 8. Col Caspers introduced himself and Mr. Ibrahim as new RAB members, called the meeting to order and read the *Statement of Purpose and Conduct*.
- 9. Col Caspers presented the 19 May 2022 RAB Meeting Minutes for acceptance. The RAB members accepted the minutes as presented.
- 10. New Business Environmental Restoration Program (ERP) Update (see attachment).
- a. Mr. Schiff provided an overview of the ERP activities that occurred at Edwards AFB since the May 2022 RAB Meeting.
- (1) Mr. Schiff discussed the Community Involvement Plan (CIP). The Air Force is preparing responses to regulatory comments on the draft plan. A preview final CIP is expected to be issued for a 30-day comment period March 2023, and this comment period will be advertised in local newspapers. The document will be posted on the Edwards AFB public website with a link on the RAB Facebook page and RAB members will be notified via email. The final CIP is expected to published July 2023.
- (2) Mr. Schiff discussed perfluoroalkyl and polyfluoroalkyl substances (PFAS) and the Remedial Investigation efforts underway for aqueous film-forming foam (AFFF) areas. On 16 June 2022, a draft work plan addendum for field event #2 was submitted to regulatory agencies and comment resolution is in progress. The Relative Risk Site Evaluation (RRSE) is completed annually and an initial RRSE was

completed in fiscal year 2022 to include a public comment period and stakeholder input. Fiscal year 2022 and 2023 RRSE's have been uploaded to the Administrative Record.

- (3) Mr. Schiff briefed the RAB members on Operable Unit (OU) 1/8 Main Base, which is still pre-Record of Decision (ROD), and that Technical Working Group (TWG) meetings are being held regularly with the regulatory agencies to resolve issues on information to be included in a Feasibility Study (FS) Addendum. Issues under review include vapor intrusion, risk assessments, groundwater monitoring, plume stability and restoration potential of remediation technologies.
- (a) Mr. Schiff said the Air Force completed indoor air sampling of Building 1807 semiannually. On 4 May 2022, sampling results confirmed that trichloroethene (TCE) levels are below all actions level with new heating, ventilation and air conditioning (HVAC) operating continuously all day. The Air Force is awaiting data validation of the November 2022 sampling results. The Building 1807 Annual Indoor Air Monitoring Report for November 2021 to May 2022 was submitted to regulatory agencies in August 2022 and is currently under review.
  - (4) Mr. Schiff reviewed the post-ROD sites at OU2 South Base.
- (a) The Air Force will continue sampling for PFAS at the Site 14 groundwater extraction and treatment system (GETS). The Draft Sites 5/14 Annual Remedial Action Status Report (ARASR) was submitted to regulatory agencies October 2022.
- (b) The Site 29 Remedial Action Work Plan (RAWP) was submitted for review to regulatory agencies July 2022. The work plan includes cap design drawings.
- (c) Site 76 has an in situ chemical oxidation (ISCO) treatment system in operation. The Draft Site 76 ARASR and the Draft Site 76 ISCO RAWP Addendum was submitted to regulatory agencies September 2022.
- (5) Mr. Schiff explained OU4/9 AFRL contains pre- and post-ROD areas, and that annual groundwater monitoring has been performed in all groundwater areas. Land use controls (LUCs) are in place for post-ROD South AFRL and AFRL Soil and Debris sites.
- (a) Building 8595 in South AFRL has a soil vapor extraction (SVE) system that operates continuously to mitigate potential vapor intrusion.
- (b) A work plan is under regulatory review to install two boreholes to address a data gap identified by the OU4/9 AFRL TWG.
- (6) Air Force and regulator discussions continue on revising the draft final OU4/9 AFRL Arroyos ROD. Revisions are being made in accordance with the U.S. EPA Region 9 Administrator decision on the ROD dispute. Regulatory agencies provided their responses to the Air Force's Revised Draft Final ROD on 1 November 2022. In December 2022, the Air Force, regulatory agencies and legal counsels will meet to discuss and resolve any items of disagreement. When resolution is agreed to by all agencies, the Air Force will prepare and publish a new AFRL Arroyos Proposed Plan (PP), announce the availability of the PP for public comments, and conduct a PP public meeting. Public comments will be incorporated into the Final AFRL Arroyos ROD.
- (a) The AFRL Arroyos Well Installation Work Plan to install 13 new groundwater monitoring wells has been finalized. Well installations began the first week of November 2022. The wells will provide data on downgradient plume boundaries.

- (7) Mr. Schiff said OU5/10 North Base is pre-ROD and the optimized Site 285 interim treatment system continues to address perchlorate in the groundwater. The Air Force will convert groundwater monitoring well 196-MW17 to an extraction well to remove perchlorate in an area with higher concentrations. The Air Force will redevelop four extraction wells that have become filled with silt over time. In July 2022, a second round of vapor intrusion sampling was completed, and the Air Force is awaiting data validation of the results. A Revised Draft OU5/10 FS is expected to be submitted to regulatory agencies in May 2023.
- (8) The OU6 NASA Armstrong annual groundwater monitoring event was completed in October 2022. Mr. Schiff explained that three wells have been installed with two more planned for December 2022, well N3-MW08 has been decommissioned and one well box and the surrounding concrete was replaced.
- (9) Mr. Schiff said the OU7 Basewide Miscellaneous is pre-ROD, and the Air Force is developing a soil gas sampling work plan. Soil gas data will inform the proposed remedies for the draft PP, which will then be submitted to the regulatory agencies for review.
- (a) OU7 Site 3 is post-ROD and the Air Force is preparing responses to regulatory agencies' comments on the Site 3 Remedial Action Work Plan Addendum.
- (10) OU7 Chemical Warfare Materiel Site 442 is post-ROD. Vegetation at the site has been identified as "stressed or dead" during semiannual inspections over multiple years. The purpose of the vegetation is to provide coverage that limits or prevents erosion of the enhanced cover system. Revegetation is planned for November or December 2022.
- (11) Mr. Schiff said the Second Multisite Five-Year Review Report (FYRR) of 19 sites was finalized in September 2022. The U. S. EPA concurred with remedy protectiveness in the short term for 18 of the 19 sites. The cleanup remedy for Site 29, a former South Base landfill, is expected to be protective upon completion. The Air Force will address FYRR recommendations to ensure protectiveness in the long term and is currently coordinating signatures for the final report. Availability of the final FYRR will be announced in local newspapers.
- (12) Mr. Schiff said the Draft Site 25 Feasibility Study/Technical Impracticability Report was submitted to the regulatory agencies in July 2022 and the Air Force is currently waiting for comments, which are due at the end of November 2022. In May 2022, the Air Force initiated a phytoremediation treatability study, which uses poplar trees planted within three lined trenches to break down contaminants from extracted groundwater. The poplar trees died in August 2022 due to overwatering in July 2022, which was caused by a malfunctioning irrigation system. Additional trees were replanted in September 2022 to re-establish the study and monitoring is ongoing.
- (13) Mr. Schiff said a Draft Military Munitions Response Program ROD is planned to be submitted to regulatory agencies in May 2023.
- (14) Mr. Schiff asked the RAB members whether there were any questions or comments. None of the members had questions or comments.
- 11. Opportunity for Public Comment Mr. Gary Hatch reported no public comments or questions had been submitted.
- 12. Old Business Status of RAB Vacancies.
- a. Mr. Hatch reported there are five public representative vacancies. Two vacancies are for the off-base communities of Boron and North Edwards, while three are for the on-base communities of NASA

Armstrong, South Base and North Base. Mr. Hatch said vacancy notices are advertised periodically through basewide emails and in local newspapers.

- 13. Reports from Public Representatives.
  - a. Mr. Gaddis, Rosamond, had no updates
  - b. Mr. Zahn, Main Base Test Wing, said that this would be his last RAB as he is retiring.
  - c. Mr. Yaw, Mojave, had no updates.
  - d. Mr. Soltis, Base Housing, had no updates.
- 14. Reports from RPMs.
- a. Mr. Rodriguez, U.S. EPA, commented on the growth of the environmental restoration program and the accomplishments made.
  - b. Mr. Finkel, U.S. EPA, had no comments.
  - c. Mr. Ibrahim, U.S. EPA, had no comments.
- d. Mr. Battey, LRWQCB, had no comments, but introduced himself to the RAB members since this was his first time attending a RAB meeting in person.
- e. Mr. Depies, DTSC, elaborated on PFAS as an emerging contaminant and the environmental procedures being implemented to continue protecting public health.
  - f. Mr. Schiff, Edwards AFB, did not have any further comments.
- 15. The next RAB meeting is proposed for 18 May 2023 in California City, California.
- 16. The meeting was adjourned at 6:36 p.m.

///Original signed by///	///Original signed by///
MATTHEW S. CASPERS, Colonel, USAF	VICTOR YAW
Air Force Co-Chair	Public Co-Chair
Restoration Advisory Board	Restoration Advisory Board

#### Attachment:

Environmental Restoration Program Update for Edwards AFB, California, 17 November 2022

DISTRIBUTION: AFCEC 412 TW/CV/JA/PA/SE 412 OMRS/SGPB AFRL RAB Members Cal/EPA DTSC Cal/EPA LRWQCB U.S. EPA

## **Air Force Installation & Mission Support Center**



# Environmental Restoration Program Update for Edwards AFB, California

Paul Schiff AFCEC/CZOW 17 Nov 2022



# List of Acronyms





- 3Rs = Recognize, Retreat, Report
- AFFF = Aqueous Film Forming Foam
- AFRL = Air Force Research Laboratory, Detachment 7
- ARASR = Annual Remedial Action Status Report
- CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
- CIP = Community Involvement Plan
- ERP = Environmental Restoration Program
- FS = Feasibility Study
- FYR = Five-Year Review
- GETS = groundwater extraction and treatment system
- ISCO = in situ chemical oxidation
- LUC = Land Use Controls

- MMRP = Military Munitions
   Response Program
- OU = Operable Unit
- PP = Proposed Plan
- RAB = Restoration Advisory Board
- RAWP = Remedial Action Work Plan
- RI = Remedial Investigation
- ROD = Record of Decision
- RRSE = Relative Risk Site Evaluation
- SVE = soil vapor extraction
- TCE = trichloroethene
- TS = Treatability Study
- TWG = technical working group
- VI = vapor intrusion



# Community Involvement Plan (CIP) Update





- Air Force preparing responses to regulatory comments on the draft plan
- Preview Final CIP now expected to be issued for 30-day public comment period March 2023
  - Comment period will be advertised in local newspapers
  - Preview Final CIP will be posted on Edwards public website with a link on the RAB Facebook page
  - RAB members will be notified via e-mail
- Final expected to be published July 2023



# Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)





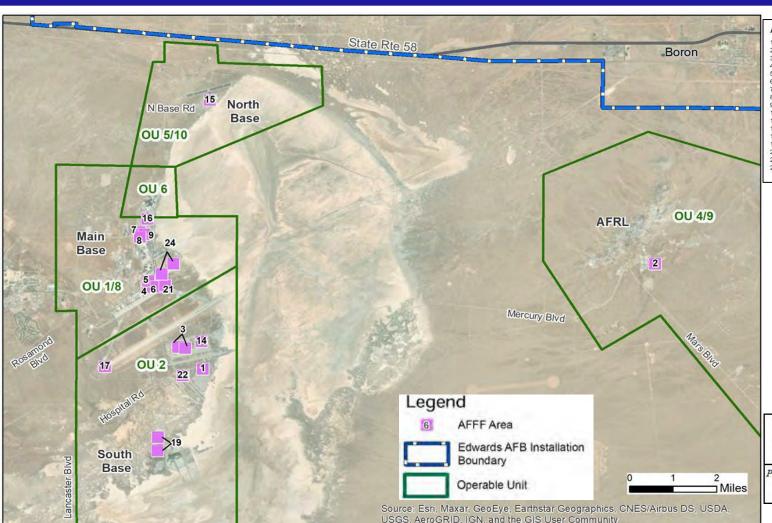
- Remedial Investigation (RI) effort underway
  - 16 June 2022: Submitted Draft UFP-QAPP Addendum No. 1 for Field Event #2 (comment resolution in progress)
  - November 2022 February 2023: Field Event #2
- Relative Risk Site Evaluation (RRSE)
  - Completed annually
  - Initial RRSE completed in FY22 included public comment period and stakeholder input
  - FY22 and FY23 RRSE uploaded to Administrative Record website <a href="https://ar.afcec-cloud.af.mil/">https://ar.afcec-cloud.af.mil/</a> as AR#'s 6182 and 6183 respectively.



## Edwards AFB Phase I RI of AFFF Areas







#### AFFF Area Index

- AFFF Area 1 : ERP Site 14 (Former/Current FTA)
- AFFF Area 2 : ERP Site 26 (Former AFRL FTA)
- AFFF Area 3: Hangar Buildings 151/160 AFFF Area 4: Hangar Building 1600
- AFFF Area 5: Hangar Building 1608
- AFFF Area 6: Hangar Building 1624
- AFFF Area 7 : Hangar Building 1870
- AFFF Area 8: Hangar Building 1874 AFFF Area 9: Hangar Building 1881
- 14 AFFF Area 14 : Fire Station #3 (Building 250)
- 15 AFFF Area 15 : Fire Station #5 (Building 4456)
- 16 AFFF Area 16 : Former Fire Station (Building 1850) 17 AFFF Area 17: 1970 Aero Spacelines 377MGT
- 19 AFFF Area 19 : Former Main Base Sewage Treatment Plant
- 21 AFFF Area 21 : Former Nozzle Spray Test Area
- 22 AFFF Area 22 : Refractometer Spray Test Area
- 24 Former AFFF Area 24 : Pad 7 Outfall and Stormwater Detention Pond

U.S. Army Corps of Engineers Albuquerque District

Air Force Civil Engineer Center

Phase I Remedial Investigation of AFFF Areas Edwards Air Force Base California



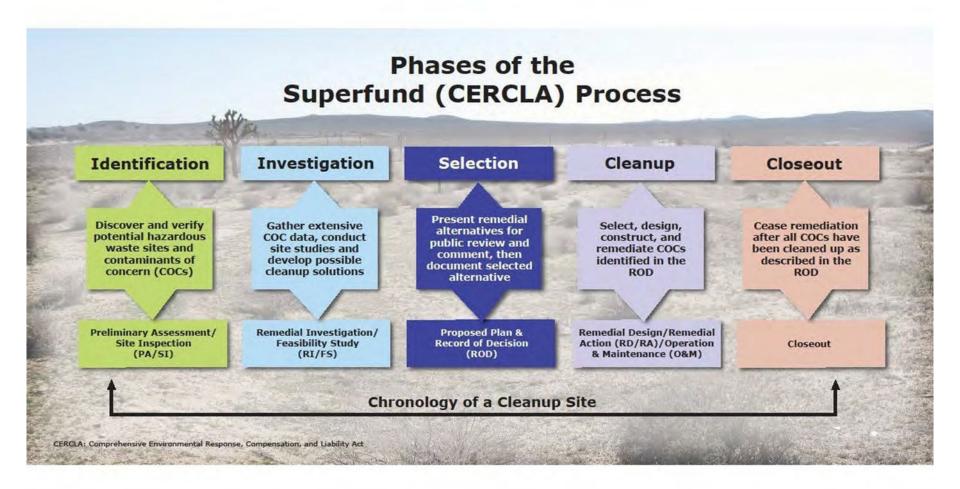
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## Superfund Phases





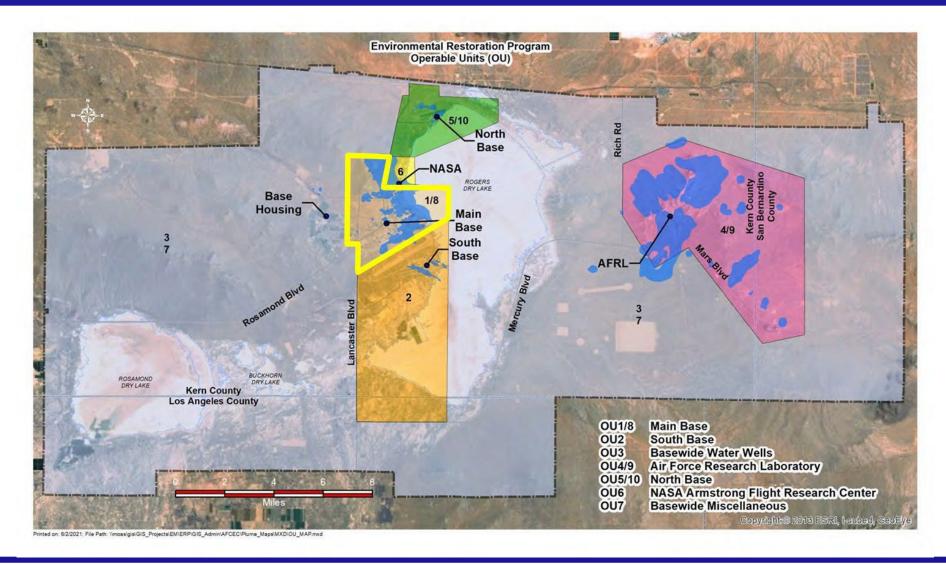




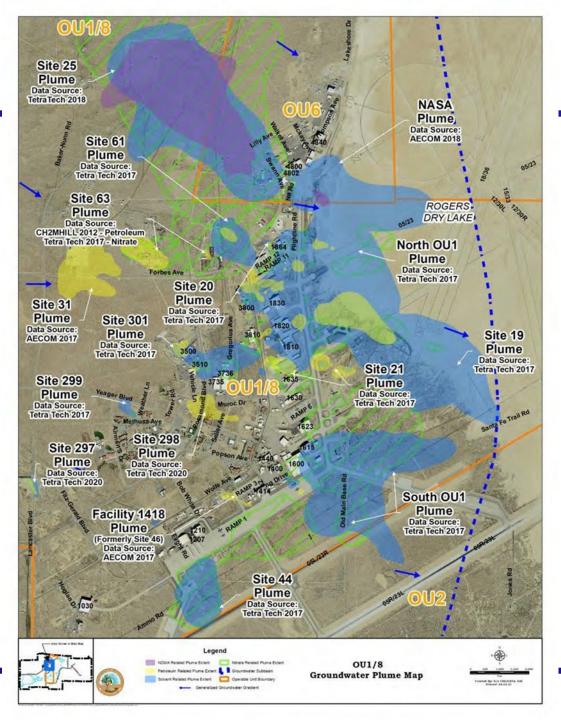
# OU1/8 Main Base (Pre-ROD)

















# OU1/8 Main Base (Pre-ROD)





- Continue OU1/8 Technical Working Group (TWG) meetings to resolve issues for incorporation into the Feasibility Study (FS) Addendum
  - Review VI reports/risk assessment
  - Groundwater modeling/plume stability
  - Restoration potential and remediation technologies



# OU1/8 Main Base (Pre-ROD)





## Building 1807

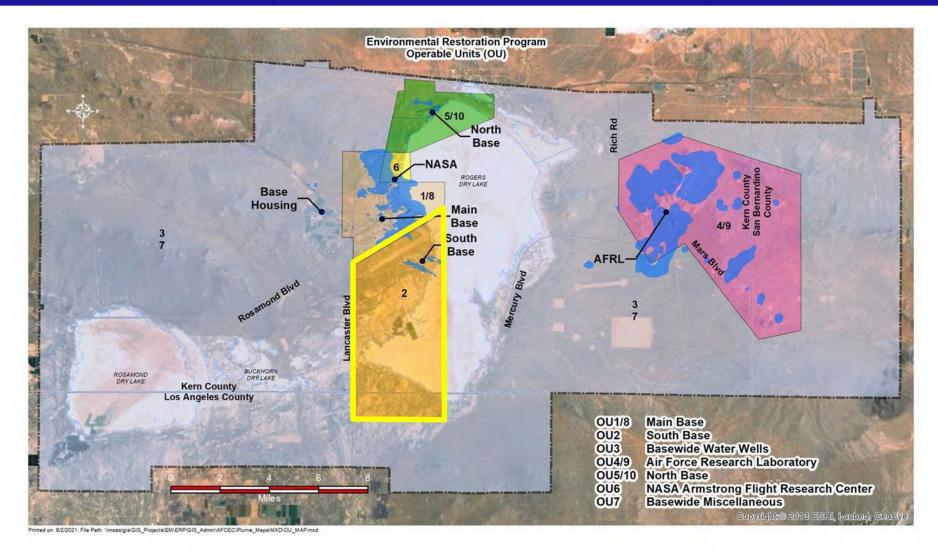
- Indoor air sampling completed annually
  - 4 May 2022: Results confirmed that trichloroethene (TCE) levels are below all action levels with new heating, ventilation and air conditioning operating continuously (i.e., 24/7)
  - 3 November 2022: Awaiting data validation of results
- Bldg. 1807 Annual Indoor Air Monitoring Report (November 2021 and May 2022) submitted in August 2022, currently under regulatory agency review



# OU2 South Base (Pre- and Post-ROD)















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# OU2 South Base (Post-ROD)





#### Sites 5/14

- Continue sampling for PFAS at the Site 14 groundwater extraction and treatment system (GETS)
- Draft Sites 5/14 Annual Remedial Action Status Report (ARASR) submitted to regulatory agencies in October 2022



# OU2 South Base (Post-ROD)





#### • Site 29

 Remedial Action Work Plan Addendum to include cap design drawings, submitted July 2022 to the regulatory agencies for review





# OU2 South Base (Post-ROD)





#### Site 76

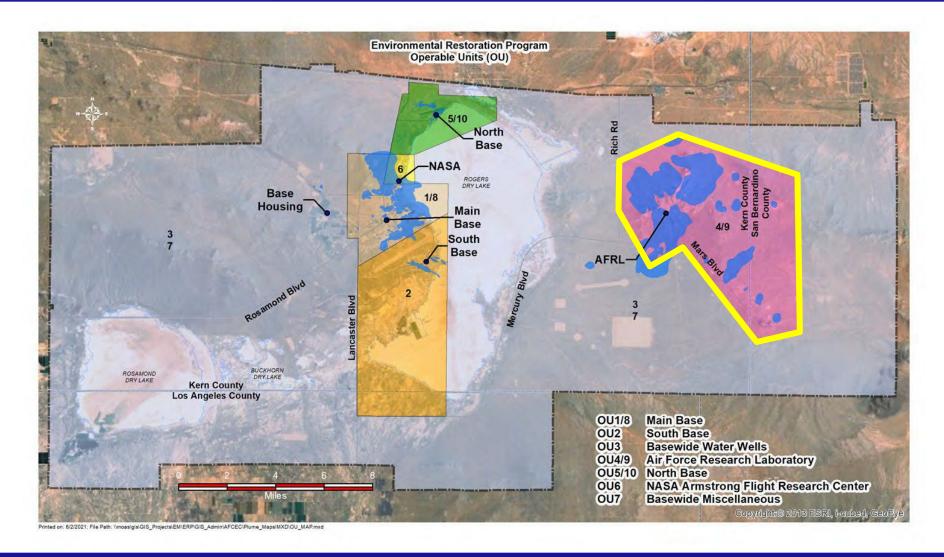
- In situ chemical oxidation (ISCO) treatment process continues operating
- Draft Site 76 ARASR submitted to regulatory agencies September 2022
- Draft Site 76 ISCO RAWP Addendum submitted to regulatory agencies September 2022

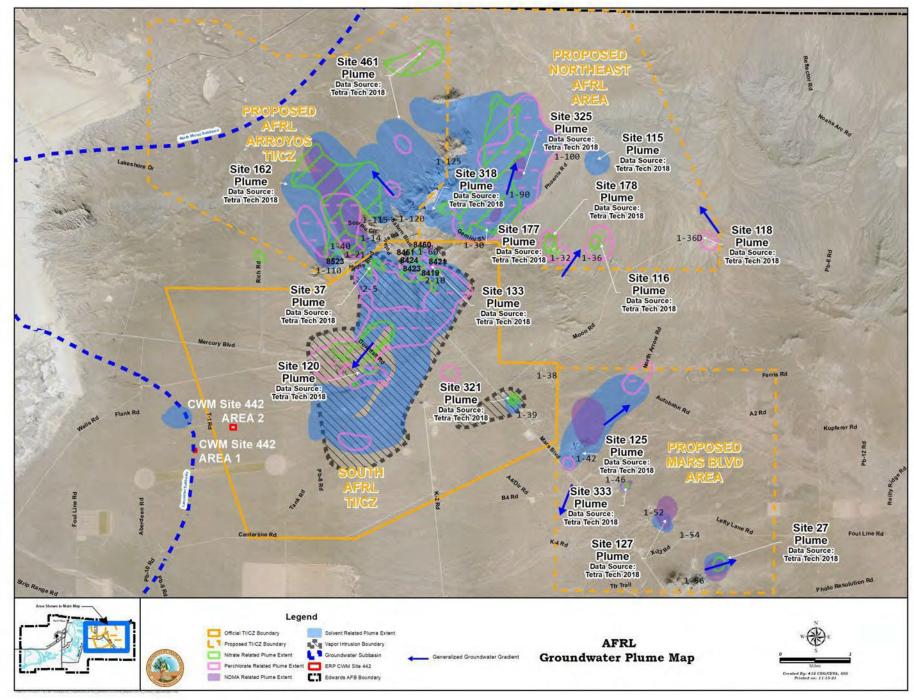


# OU4/9 AFRL (Pre- and Post-ROD)











# OU4/9 AFRL (Pre- and Post-ROD)





- Annual groundwater monitoring in all areas
- Land Use Controls in place for post-ROD areas
   South AFRL and AFRL Soil and Debris Sites
- South AFRL
  - Soil vapor extraction (SVE) system continues operating near Building 8595 to mitigate potential vapor intrusion
  - Will install two boreholes (work plan under regulatory agency review) and five groundwater monitoring wells (contract awarded end of September 2022) to address TWG data gaps



# OU4/9 AFRL Arroyos (Pre-ROD)







- AFRL Arroyos Record of Decision (ROD)
  - Regulatory agencies provided response to Air Force Revised Draft Final ROD on 1 November 2022
  - Air Force and regulatory agency staff and legal counsels to meet in December 2022 to discuss and resolve items of disagreement



# OU4/9 AFRL Arroyos (Pre-ROD)





## Arroyos ROD (cont.)

- When a Draft Final ROD is agreed-to by all agencies, Air Force will:
  - Prepare and publish a new AFRL Arroyos Proposed Plan (PP), announce availability of the PP for public comment, and conduct a PP public meeting
  - Incorporate public comments into and submit the Final AFRL Arroyos ROD



1962 F-1 engine test at Test Stand 1A



# OU4/9 AFRL Arroyos (Pre-ROD)





- Finalized AFRL Arroyos Well Installation Work Plan to install 13 new groundwater monitoring wells within the AFRL Arroyos in October 2022
- Well installations began first week of November 2022
- Wells will provide data on downgradient plume boundaries

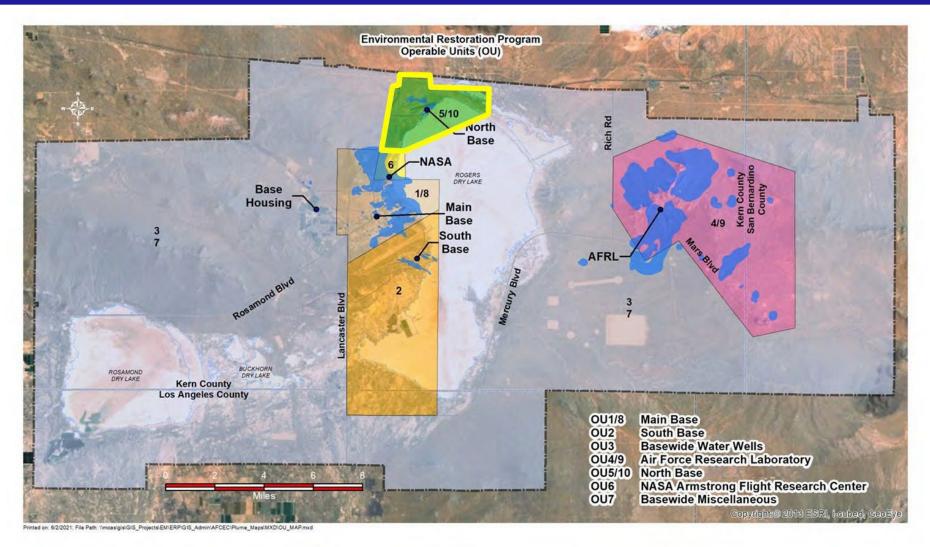


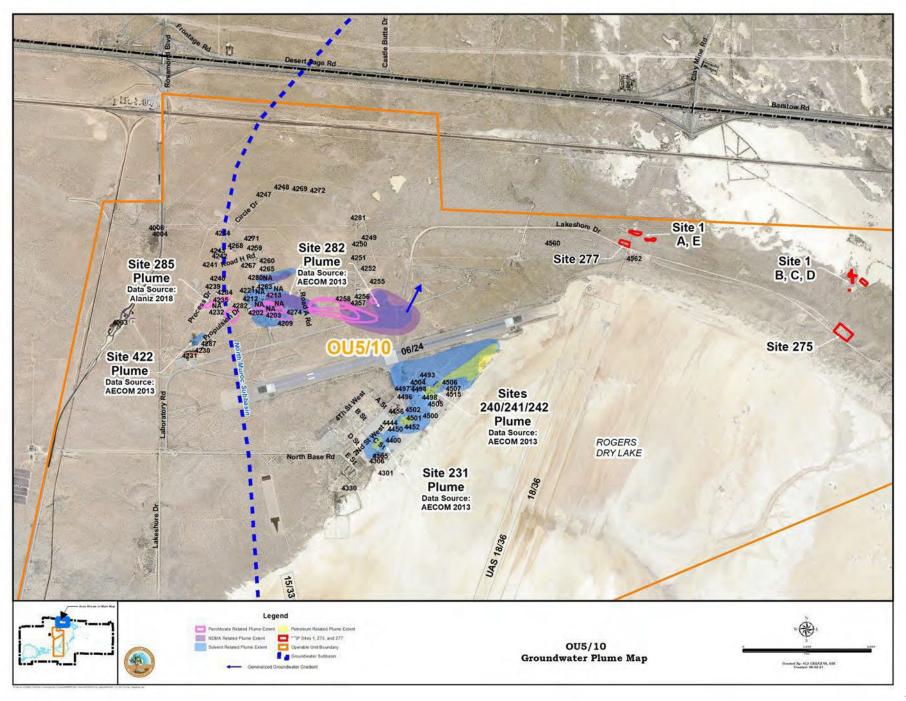


# OU5/10 North Base (Pre-ROD)











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# OU5/10 North Base (Pre-ROD)





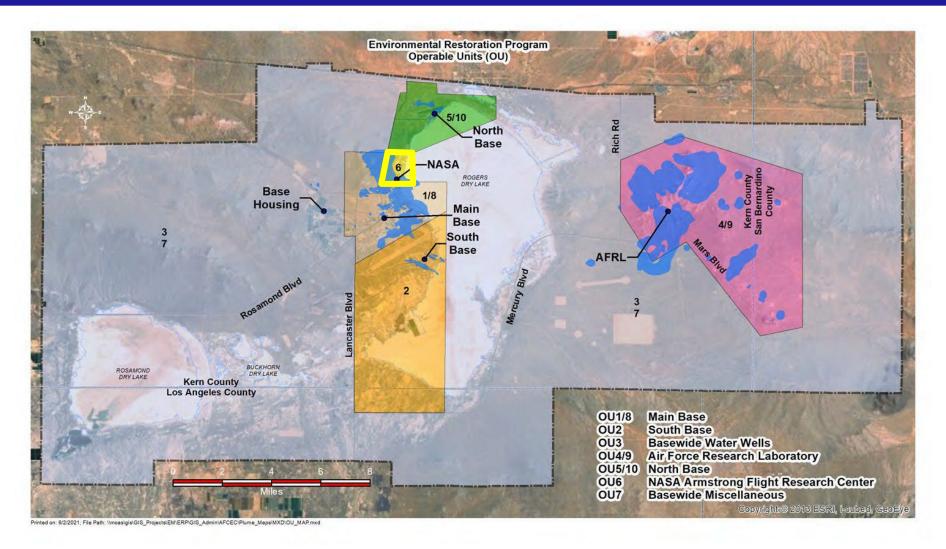
- Optimized Site 285 interim treatment system continues to address perchlorate in groundwater
  - Will convert groundwater monitoring well 196-MW17 to an extraction well to remove perchlorate in area with higher concentration
  - Will redevelop four extraction wells that have become silted over time
- July 2022: Completed second round of VI sampling, awaiting data validation
- May 2023: Revised Draft OU5/10 FS expected to be submitted to regulatory agencies



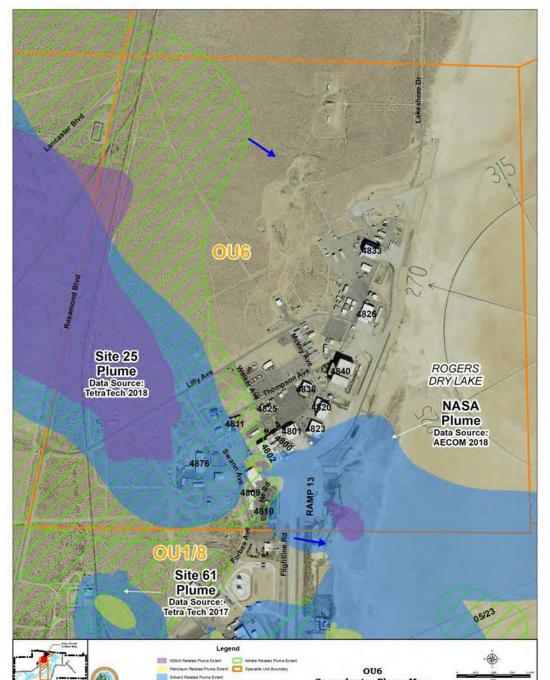
# OU6 NASA Armstrong (Post-ROD)















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Solvent Related Plume Map

Generalizes Croundwater Plume Map

Generalizes Croundwater Crasser:

Groundwater Plume Map

Generalizes Croundwater Crasser:

Groundwater Plume Map

Groundwater Plume Map

Generalizes Croundwater Crasser:

A Groundwater Plume Map



# OU6 NASA Armstrong (Post-ROD)





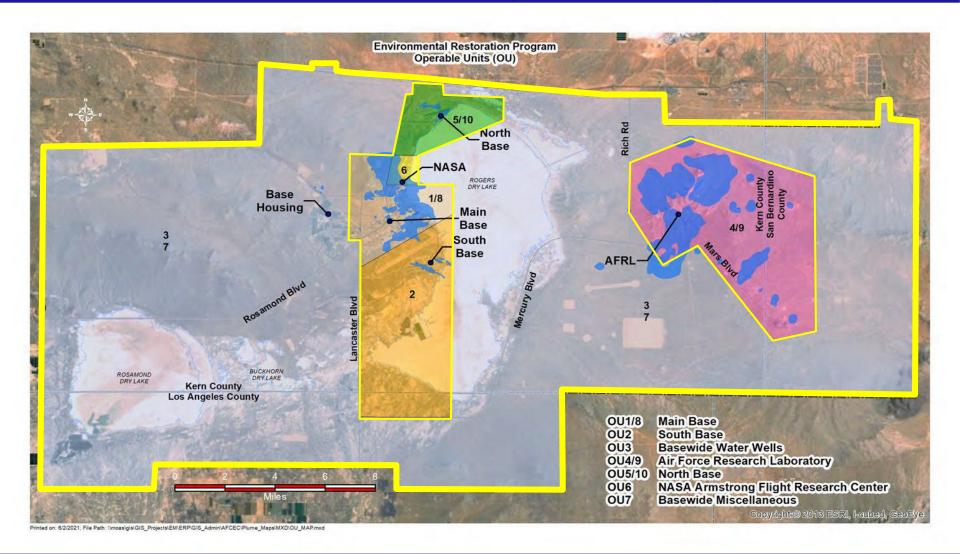
- October 2022: Annual groundwater monitoring event completed
  - Three wells have been installed with two more planned for December 2022
  - N3-MW08 was decommissioned
  - One well box and the surrounding concrete was replaced



# OU7 Basewide Miscellaneous (Pre-ROD)









# OU7 Basewide Miscellaneous (Pre-ROD)





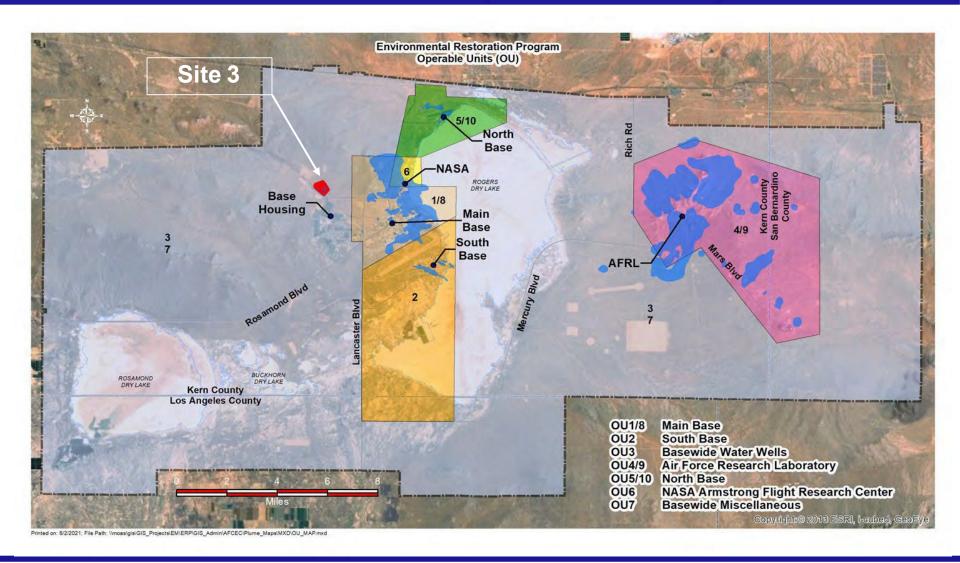
- Air Force is developing a soil gas sampling work plan
  - Soil gas data will inform the proposed remedies for the draft Proposed Plan, which will be submitted to the regulatory agencies for review



# OU7 Site 3 (Post-ROD)





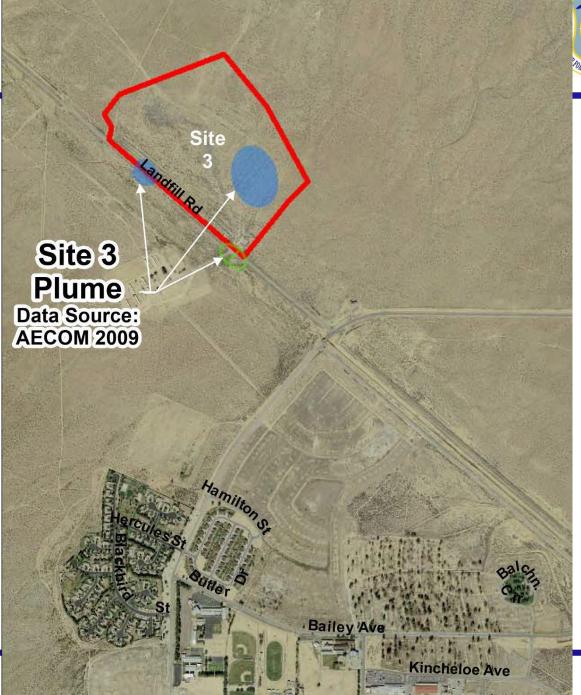








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 Air Force preparing responses to regulatory agencies' comments on Site 3 RAWP Addendum

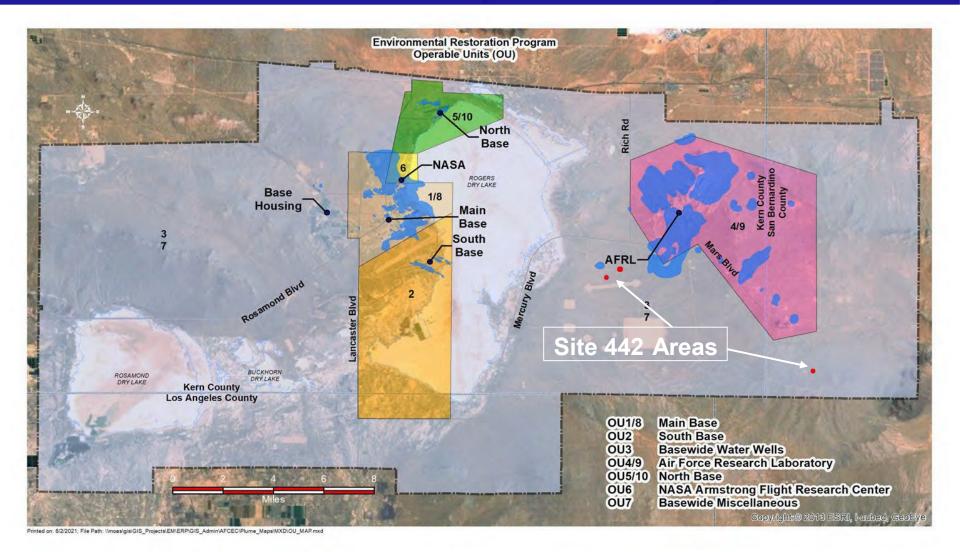




## OU7 Chemical Warfare Materiel (Post-ROD)





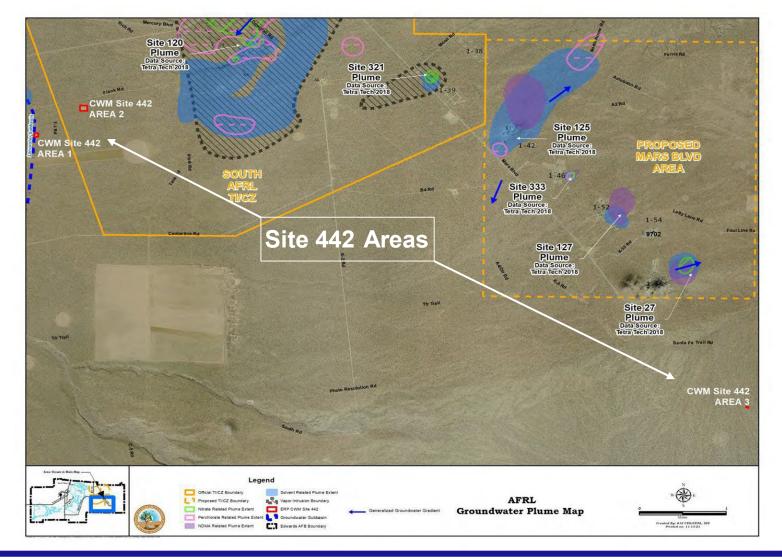




# OU7 Chemical Warfare Materiel (Post-ROD)









# OU7 Chemical Warfare Materiel (Post-ROD)





#### **November 2022 Update:**

- Vegetation has been identified as "stressed or dead" during semiannual inspection for multiple years
- The purpose of the vegetation is to provide coverage that limits or prevents erosion of the enhanced cover system
- Revegetation planned for November/December 2022



### Second Multisite FYR





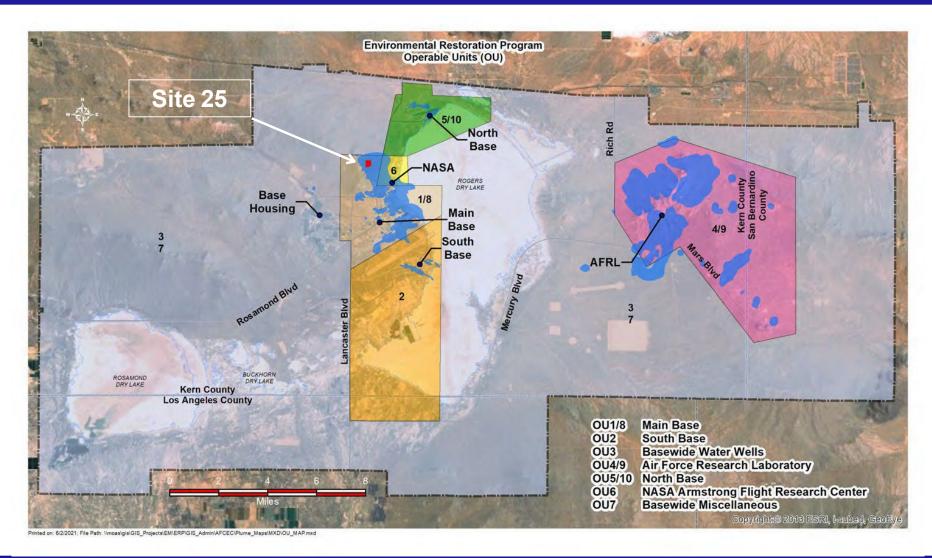
- Second Multisite Five-Year Review Report of 19 sites finalized September 2022
  - Based on review, U.S. EPA Region 9 concurred with remedy protectiveness in the short term for 18 of the 19 sites
    - Cleanup remedy for Site 29 (former South Base landfill) expected to be protective upon completion
  - The Air Force will address FYRR recommendations to ensure protectiveness in the long term
- Currently coordinating signature of final report
  - Availability will be announced in local newspapers



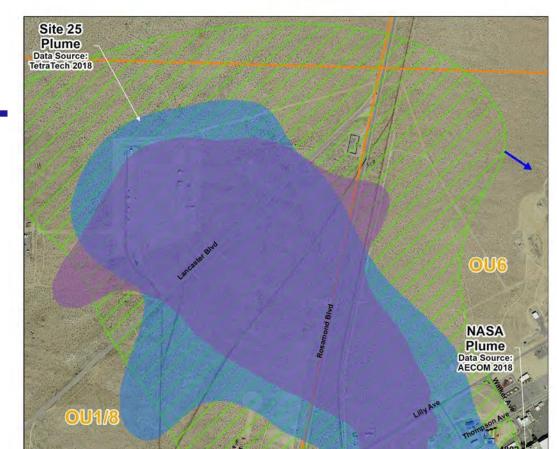
# Site 25 (Pre-ROD)











Site 61

Plume Data Source: Tetra Tech 2017

> Site 25 Groundwater Plume Map

Legend

NOMA Related Plume Extent. Instate Related Plume Extent.

Petroleum Related Plume Extent 🔼 Operable Unit Boundary

Generalized Groundwater Gradient

Solvent Related Plume Extent

Site 63

Plume
Data Source:
CH2MHILL 2012 - Petroleum
Tetra Tech 2017 - Nitrate







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- Draft Site 25 Feasibility Study/Technical Impracticability Report was submitted in July 2022, and Air Force is currently waiting for regulatory agency comments due the end of November 2022
- May 2022, Air Force initiated a phytoremediation treatability study
  - Utilizes poplar trees planted within three lined trenches to break down contaminants from extracted groundwater





- Trees died in August 2022 due to overwatering in July 2022 caused by malfunctioned irrigation system
- Trees were replanted in September 2022 to re-establish the study
- Monitoring ongoing







# Site 25 (Pre-ROD)















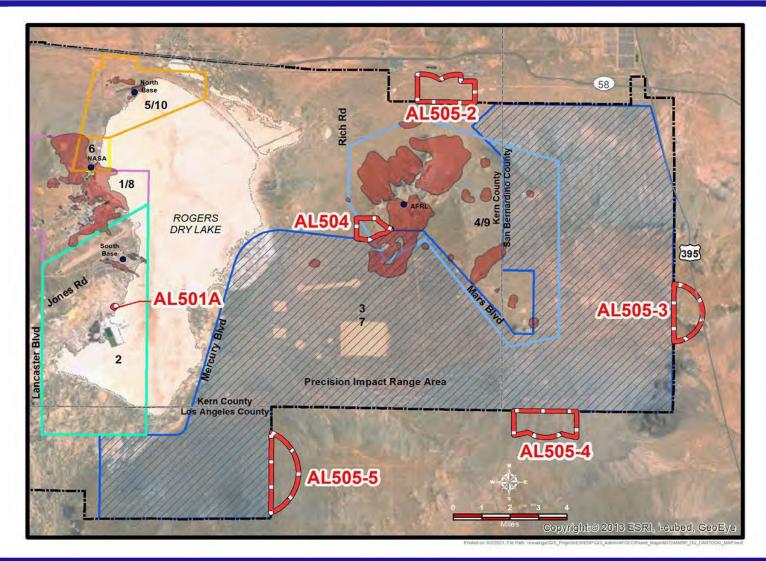
Your Success is Our Mission!



### Military Munitions Response Program (MMRP) (Pre-ROD)













 May 2023: Draft MMRP ROD expected to be submitted to regulatory agencies









Follow the 3Rs of Explosives Safety:

#### · Recognize:

when you may have encountered a munition and that munitions are dangerous.

#### Retreat:

do not approach, touch, move or disturb it, but carefully leave the area.

#### · Report:

call 911 and advise the police of what you saw and where you saw it.



### Questions?





