



# ***Kirtland Air Force Base Bulk Fuels Facility Leak Cleanup***

***Albuquerque Bernalillo County Water Utility Authority  
March 22, 2023 (5:00 PM)***

***Colonel Jason F. Vattioni, Commander Kirtland AFB  
Ryan Wortman, Air Force Civil Engineer Center***





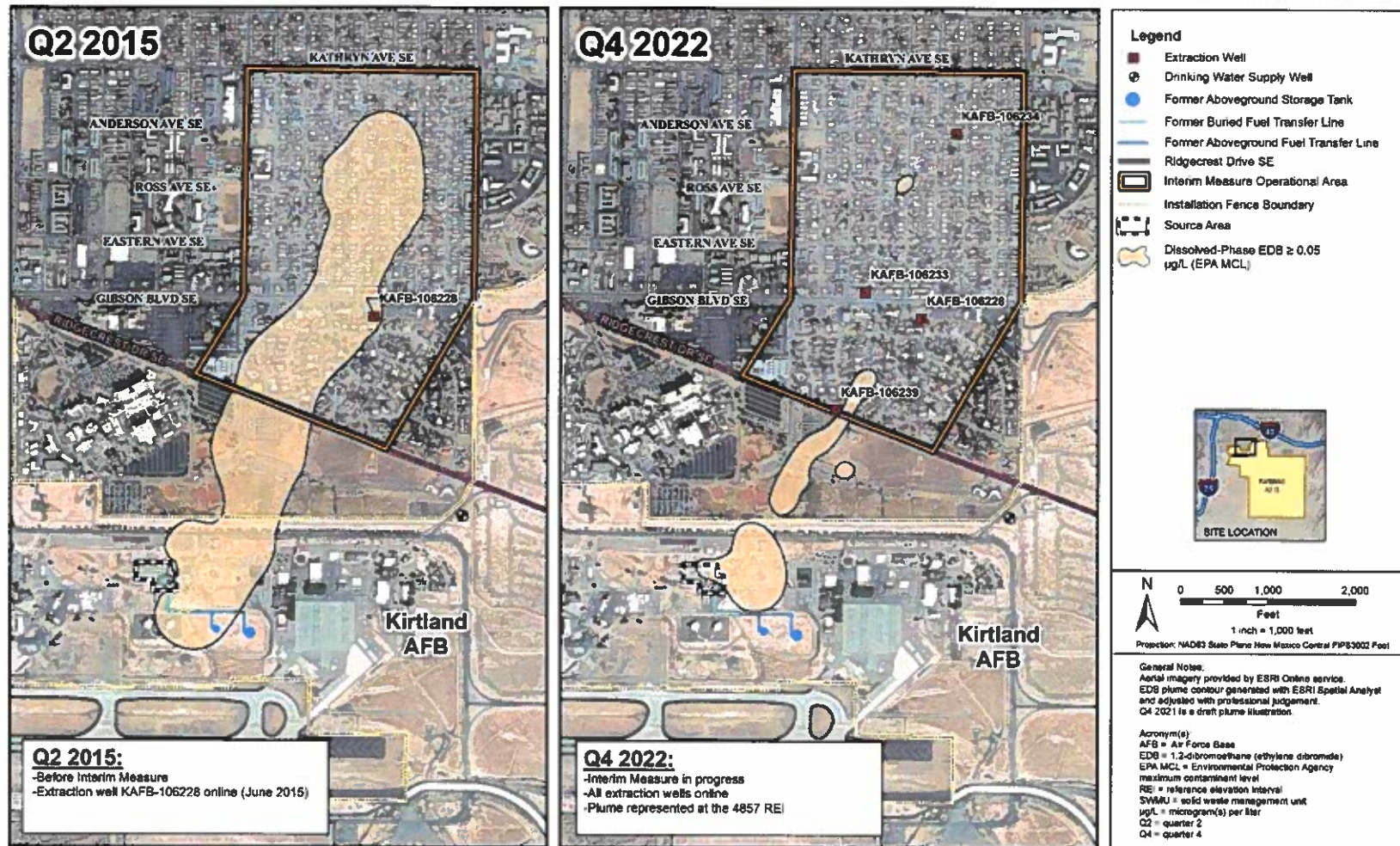
## ***Status update: Kirtland AFB Bulk Fuels Facility (BFF)***



- Ethylene Dibromide (EDB) interim corrective measure pump and treat
- EDB Plume and Monitoring Network
- Revised Monitoring Work Plans
- Resource Conservation Recovery Act (RCRA) Corrective Action Process
- Benzene Plume Stability
- Site Activity Timeline
- Risk Assessment Overview



# EDB Plume – 2015 vs 2022



**\*Plume maps are based on actual measurements and not simulations**

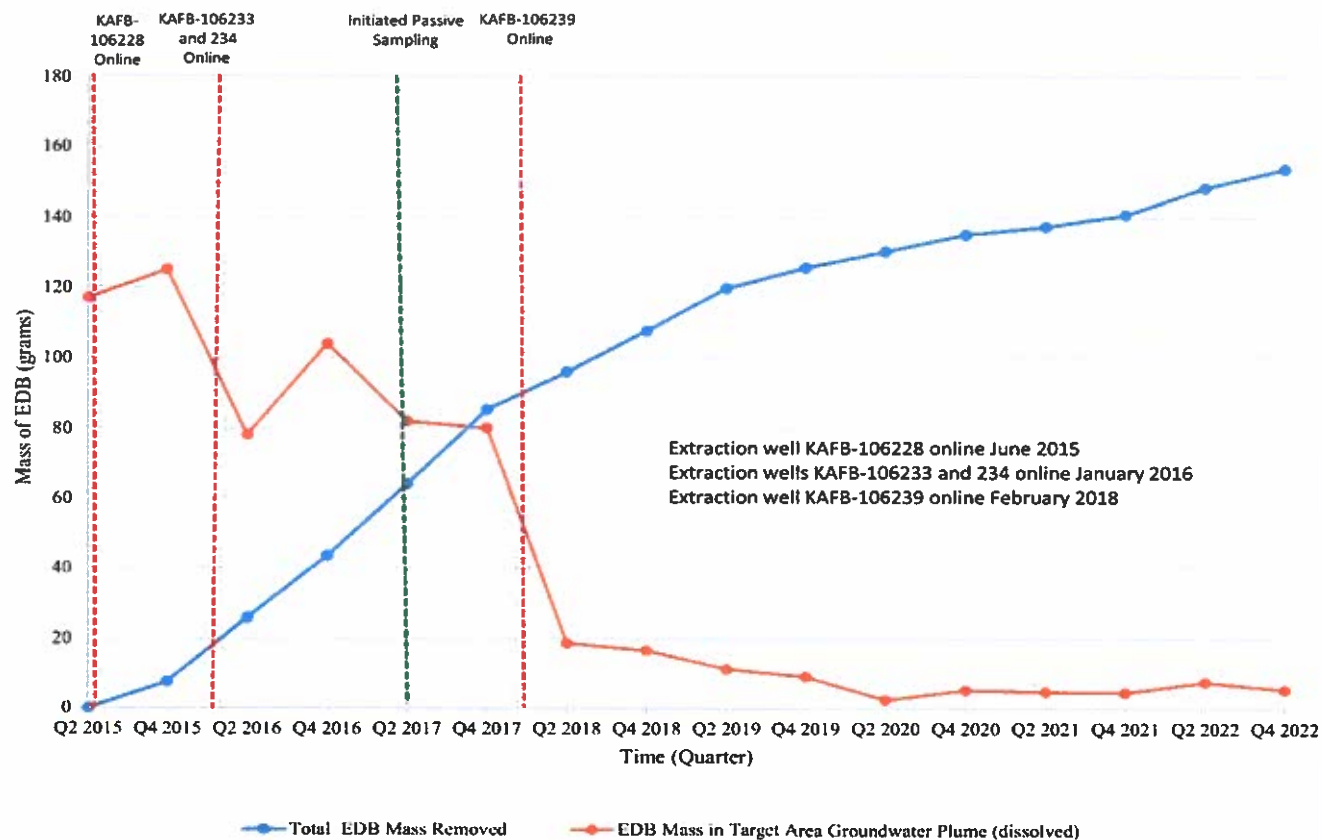
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# Status Update: EDB Interim Measure



## EDB Mass in Groundwater vs. Time



Pump and treat interim measure has achieved an estimated 96% reduction in the interim measure operational area of the dissolved EDB mass since 2015







## ***Revised Monitoring Work Plans***



- Air Force Received Notice of Disapproval on November 8, 2022, for Groundwater Monitoring Work Plan
- Revised Soil Vapor Monitoring Work Plan requested from NMED on September 16, 2022
- Air Force submitted an extension and meeting request to NMED on March 1, 2023
  - Meeting is required to determine how revised work plans can be developed in a way that will ensure data is usable throughout RCRA corrective action process

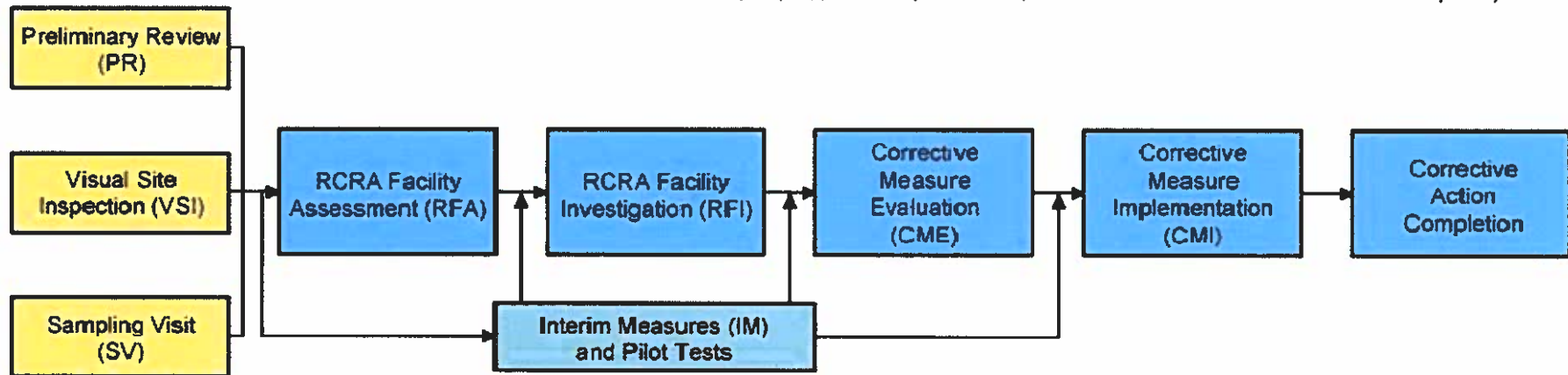




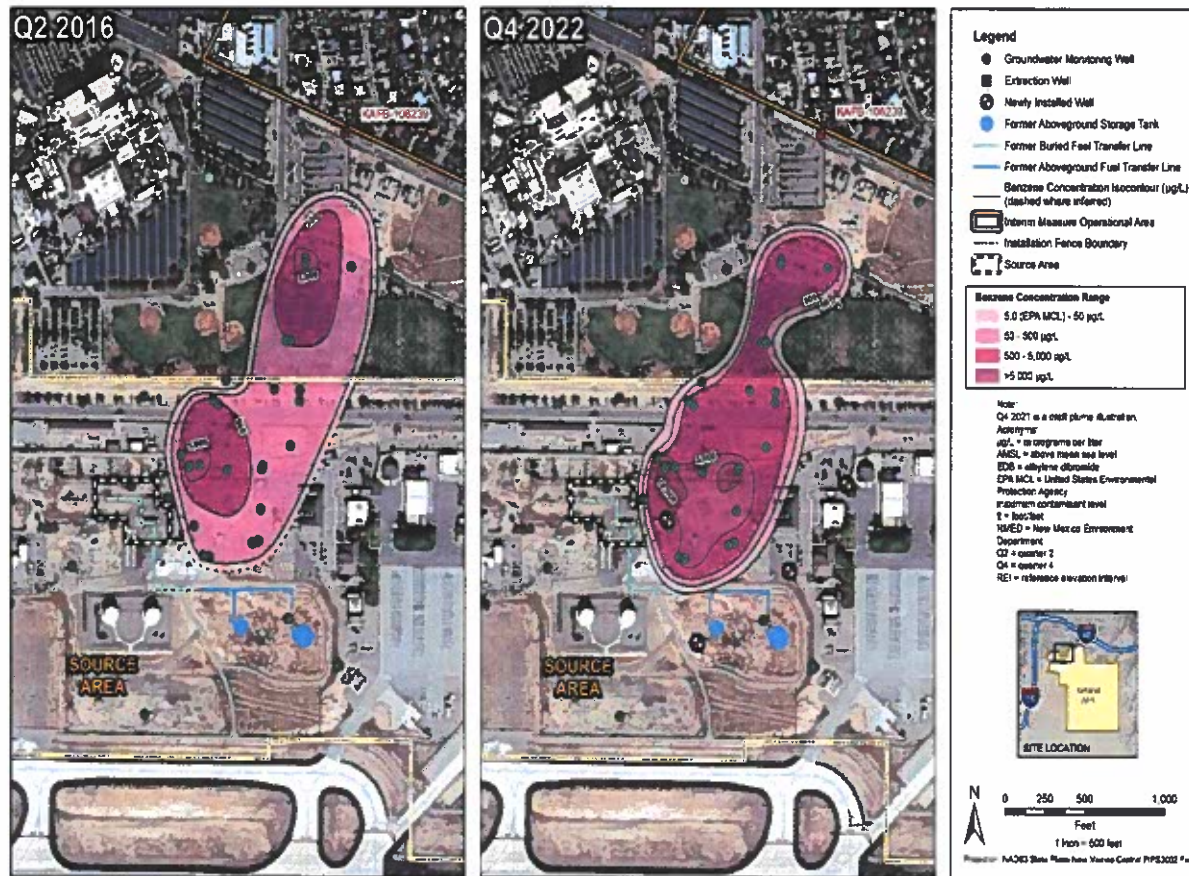
# RCRA Corrective Action Process



\*Image adapted from California Department of Toxic Substances Control (<https://dtsc-topock.com/resource-conservation-and-recovery-act>)



- Pace of cleanup is driven by the iterative corrective action (CA) process established by the Environmental Protection Agency (EPA) and enforced by the RCRA Permit under authority of the New Mexico Environment Department (NMED)
- Information from previous phases necessarily informs subsequent phases with many of these activities being conducted in parallel
- All activities in the RCRA CA process inform the Corrective Measure Evaluation (CME): early interim measures (IM), pilot studies, groundwater pump and treat IM, RCRA Facility Investigation (RFI) I and II, and ongoing monitoring results



- Benzene plume located south of Ridgecrest Dr SE
- Benzene plume has been stable and does not threaten drinking water wells (no current complete exposure pathway)

***\*Plume maps are based on actual measurements and not simulations***

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# Risk Assessment Overview



- Risk Assessment submitted to NMED on July 17, 2017
- On December 19, 2018, NMED approved the soil and groundwater portions of the Risk Assessment:
  - Approved on-site and off-base soil risk assessment conclusions of no unacceptable risk
  - *“Groundwater - NMED agrees that groundwater impacted by contaminants from the BFF is not currently used as a drinking water source, and that the ongoing interim corrective measures and land use controls (LUCs) are necessary to prevent exposure.”*





# Questions?



## Point of Contact:

Ryan Wortman, Physical Scientist, - [ryan.wortman.3@us.af.mil](mailto:ryan.wortman.3@us.af.mil)

Ashley Palacios, Public Affairs, – [ashley.palacios@us.af.mil](mailto:ashley.palacios@us.af.mil)

Kirtland AFB Public Affairs, (505) 846-5991 - [377ABW.PA@us.af.mil](mailto:377ABW.PA@us.af.mil)

## Additional information:

Online at <https://www.kirtland.af.mil/Home/BFF/> and <https://ar.afcec-cloud.af.mil/> or visit our New Information Station at the New Mexico Veterans Memorial at 1100 Louisiana Blvd SE, Albuquerque, NM

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# New Mexico Environment Department

## Kirtland Bulk Fuels Facility Spill Update

Rick Shean, Resource Protection Division Director

March 22, 2023

ABCWUA Water Authority Governing Board Meeting







# Kirtland Air Force Base Bulk Fuels Facility Spill

NMED's Hazardous Waste Bureau (HWB) enforces both the Resource Conservation and Recovery Act (RCRA) and the New Mexico Waste Act through implementing the regulations of both laws.

HAZARDOUS WASTE TREATMENT  
FACILITY OPERATING PERMIT  
EPA ID No. NM9570024423

issued to

UNITED STATES AIR FORCE

for the

OPEN DETONATION UNIT

located at

KIRTLAND AIR FORCE BASE  
BERNALILLO COUNTY, NEW MEXICO

issued by the

NEW MEXICO ENVIRONMENT DEPARTMENT  
HAZARDOUS WASTE BUREAU  
2905 RODEO PARK DRIVE EAST, BUILDING 1  
SANTA FE, NEW MEXICO, 87505

July 2010

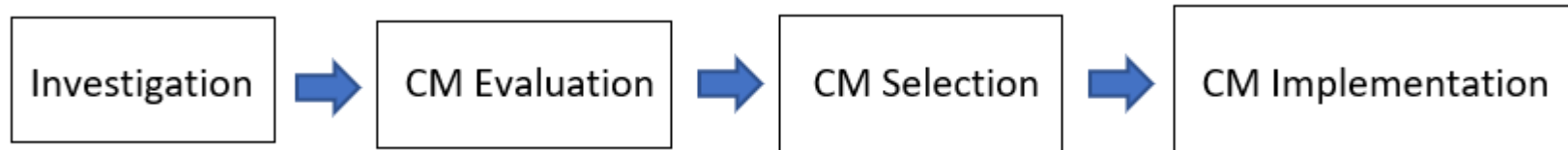
- The Bulk Fuels Facility Spill (BFFS) site is regulated by NMED HWB because it is a site on KAFB's RCRA Permit.
- NMED HWB's role in the site is to oversee the investigation and clean-up activities of the BFFS site under the RCRA Permit through both regulatory and technical oversight to achieve the permanent clean-up of the contaminated groundwater associated with the BFFS site in the shortest amount of time.



# RCRA Corrective Measures

Corrective Measures (CM): the regulatory term for activities that remove contamination from affected media at the BFFS site:

Soil, Subsurface Vapor, Free Phase Fuels, and Groundwater



- Investigation – Determine the nature and extent of the contamination in all media at the site.
- Corrective Measures Evaluation – Evaluate the potential methods to remediate the site.
- Corrective Measures Selection – The best possible option is chosen by NMED, public, stakeholder, and facility input via the public comment period.
- Corrective Measures Implementation – the chosen remediation strategy is put in place, operated, and monitored for effectiveness.





# Kirtland Air Force Base Bulk Fuels Facility Spill

The site is currently in the Investigation Phase

When release happened the water table was higher than it is today.

- Due to municipal use the water table steadily dropped over decades.
- The water table steadily rose again with the shutdown of the Ridgecrest Municipal Well Field and the city's use of water from the Rio Grande river through the San Juan Chama project.
- Released fuel was then submerged beneath the rising water table.

The source area of the release has not been addressed.

- The submerged hydrocarbon contaminated fuels in the source area remains a continuing source of groundwater contamination, particularly EDB and benzene.
- The currently operating Groundwater Treatment System **does not** address the continuing source of groundwater contamination from the source area.
- If the WUA resumes utilizing/pumping the Ridgecrest Municipal Well Field, contaminants from the source area will migrate towards those wells.



# Kirtland Air Force Base Bulk Fuels Facility Spill

The site is currently in the Investigation Phase

The characterization of all affected media at the site must be completed.

- The extent of contamination in the source area must be defined.
- The extent of soil vapor contamination must be defined.
- The migration pathway that the released fuels followed to reach the groundwater needs to be determined before remedies can be evaluated at the site.

## Challenges

The BFFS site was transferred to HWB from NMED's Office of the Secretary in 2019.

- HWB has noted data gaps in the investigations conducted to date in order to complete site characterization
- NMED has given the KAFB direction to conduct further investigations.





# Kirtland Air Force Base Bulk Fuels Facility Spill

## Data Gaps

Information needed to complete the Investigation phase of work:

- Free phase fuels – Investigation reports from KAFB these state that these are defined and are no longer present in substantial quantities, NMED disagrees based on information in submitted reports.
- Migration pathway – This is the path the released fuels traveled from the leaking pipelines to the groundwater. NMED asked KAFB to provide an investigation work plan to investigate the migration pathway in a letter dated February 27, 2023.

## Risk Assessment –

- Cannot be completed until the investigation phase is complete.
- Groundwater clean up standards have not been met across the site.



# Kirtland Air Force Base Bulk Fuels Facility Spill

## Data gaps for investigation and technical inadequacies

- Soil Vapor Sampling
  - A review of data showed that current sampling methods are not collecting representative samples.
    - Correcting current sampling methods to collect representative soil vapor samples.
    - NMED provided direction to KAFB in correspondence on several occasions. KAFB has not acted on this direction to date.
- Groundwater Monitoring
  - Review of data showed that passive sampling is not comparable to active sampling.
    - Discontinuing passive sampling of groundwater and returning to active sampling.
    - Reversing reduction in sampling locations and reductions of the analytical suite.
    - Periodic sampling all wells, including wells north of Ridgecrest Drive, with active sampling methods to confirm extent of groundwater contamination.





# Kirtland Air Force Base Bulk Fuels Facility Spill

## Next Steps

### Getting back on track

- Fill the data gaps and complete investigation activities so that a remedy can be selected.
- KAFB must follow HWB technical direction to collect accurate and representative site data.

### When the data gaps are filled, and representative site data is collected

- The investigation phase can be completed.
- A viable remedy can be selected and active remediation at the site can begin as soon as possible.



# Questions?



Rick Shean, Director  
Resource Protection Division  
New Mexico Environment Department  
[Rick.Shean@env.nm.gov](mailto:Rick.Shean@env.nm.gov)

*Thank You!*



# **Project Update: Kirtland Air Force Base, Bulk Fuels Facility**

Diane Agnew

Water Rights Program Manager

March 22, 2023





# Site History

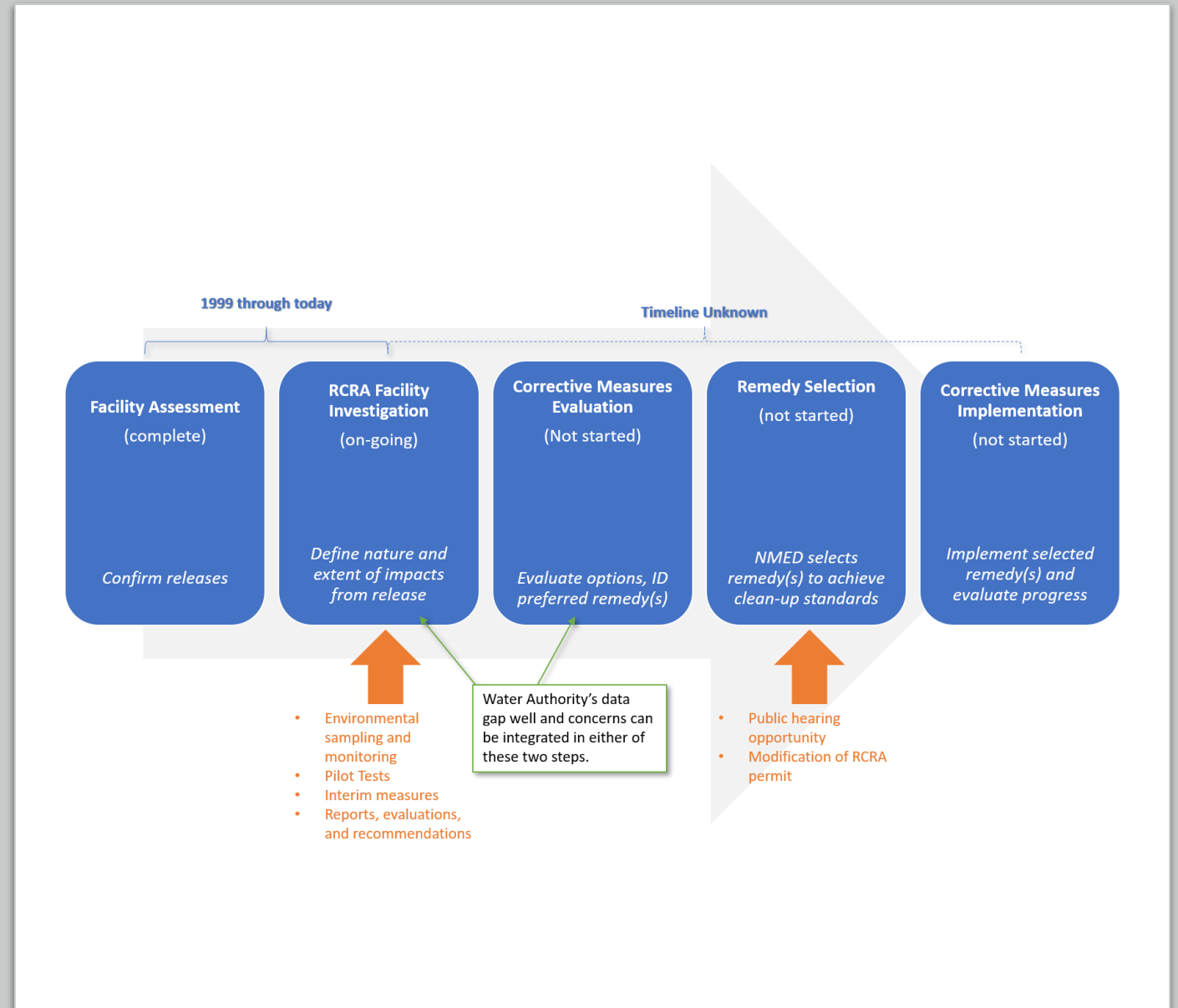
- Fuel discovered on the ground at Kirtland Air Force Base (KAFB) Bulk Fueling Facility (BFF) in 1999
- Subsequent investigation revealed that both groundwater and soil are impacted by fuel contaminants from a leak beginning in the mid-1970s
- Contamination at the site includes many contaminants, but one of particular concern is EDB (*ethylene dibromide*)
- Environmental Protection Agency (EPA) has set a Maximum Contaminant Level Goal (MCLG) of 0 micrograms per liter for EDB which is the only level with *no* risk to human health





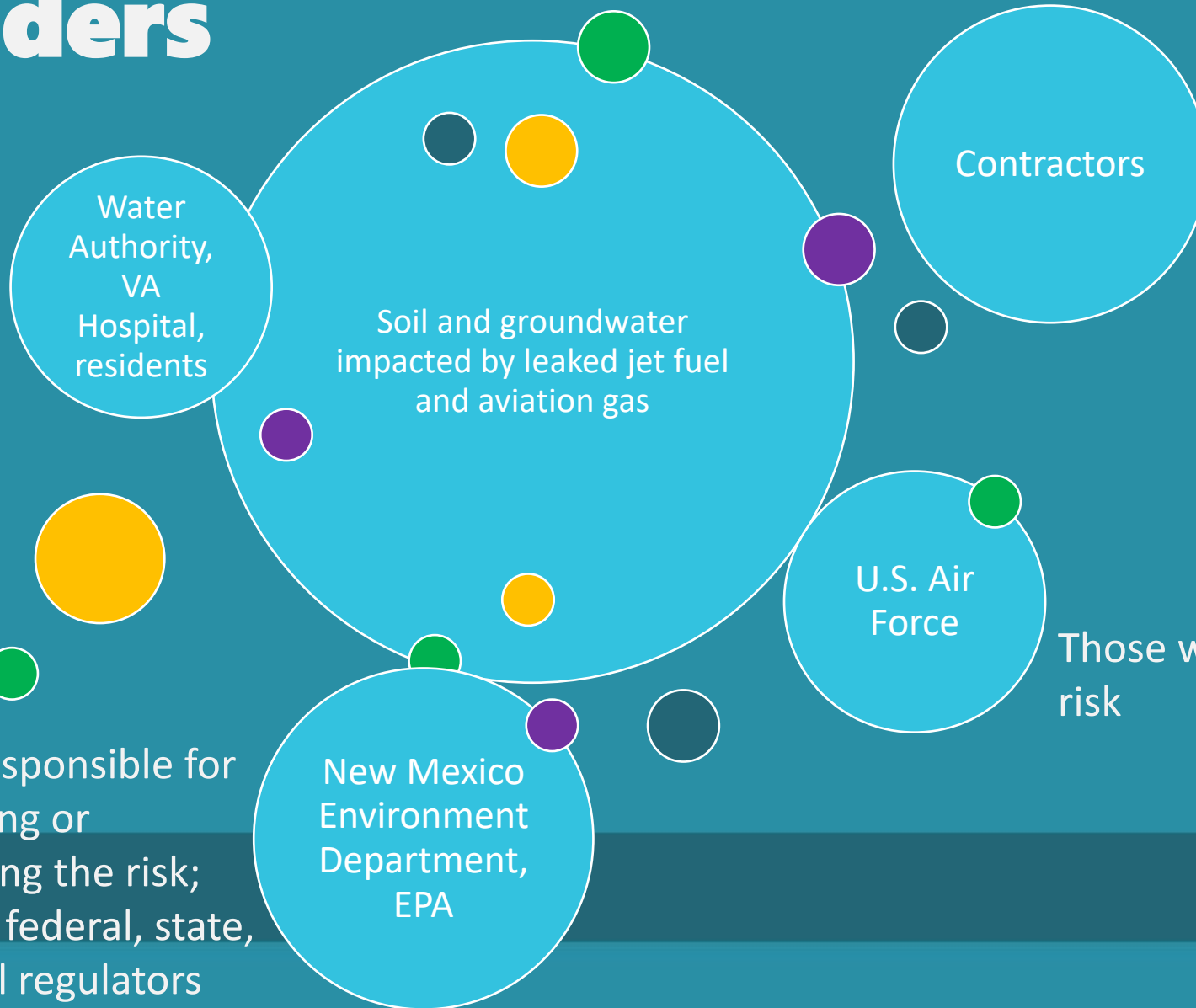
# Site History

- Site currently following Resource Conservation and Recovery Act (RCRA) Corrective Action process
- Regulatory agency is the New Mexico Environment Department Hazardous Waste Bureau (NMED HWB)
- After more than 20 years since discovering the leak, the site is still in the RCRA Facility Investigation (RFI) phase
- EDB detections at plume edge are less than a mile away from critical supply wells
- Water Authority voluntarily samples nearby supply wells
  - No contaminants have been detected in any samples to date



# Kirtland AFB BFF Jet Fuel Leak - Stakeholders

May be adversely affected by decisions; conventionally defines “stakeholder”



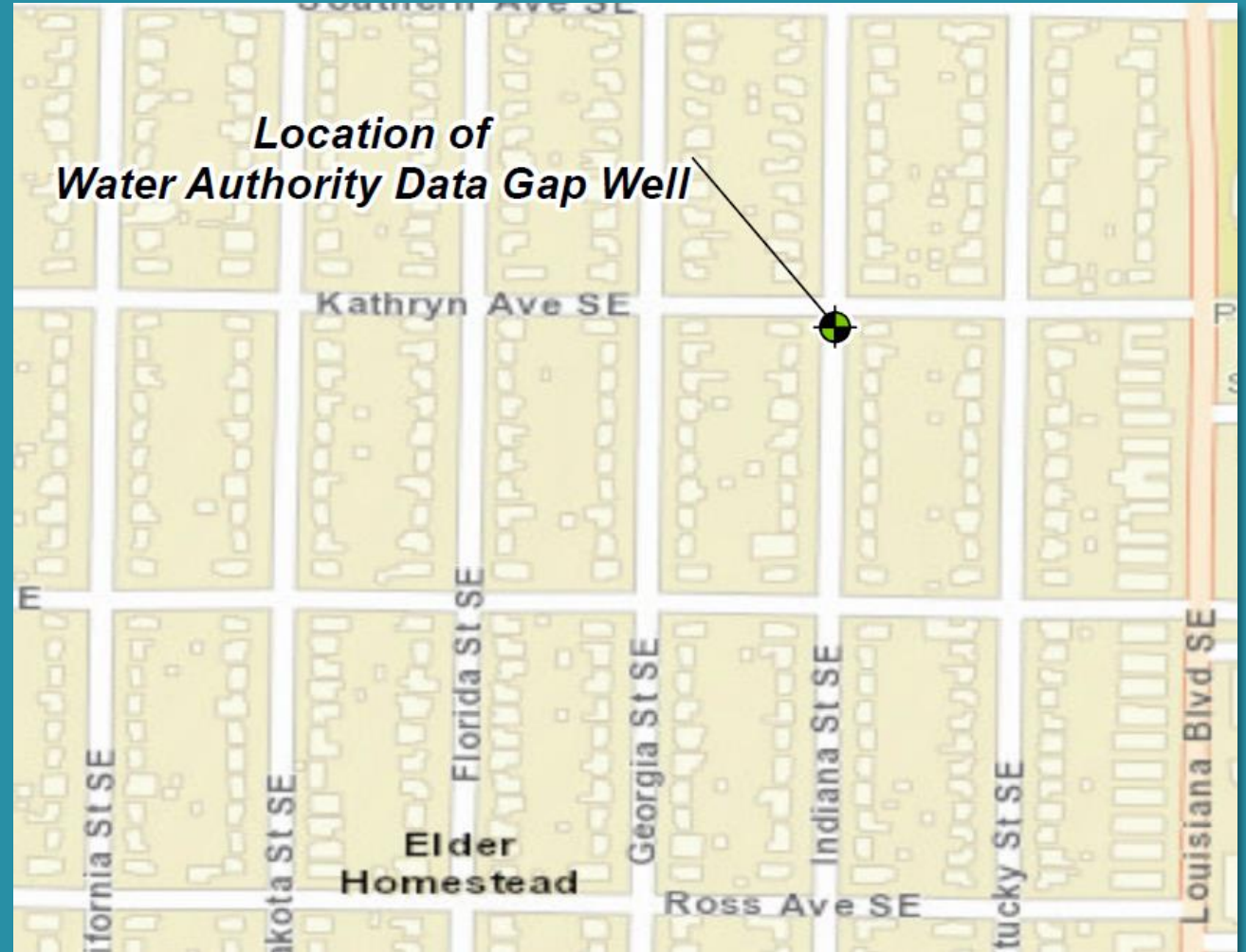
May be favorably affected by a decision, typically economic gain

Those who create the risk

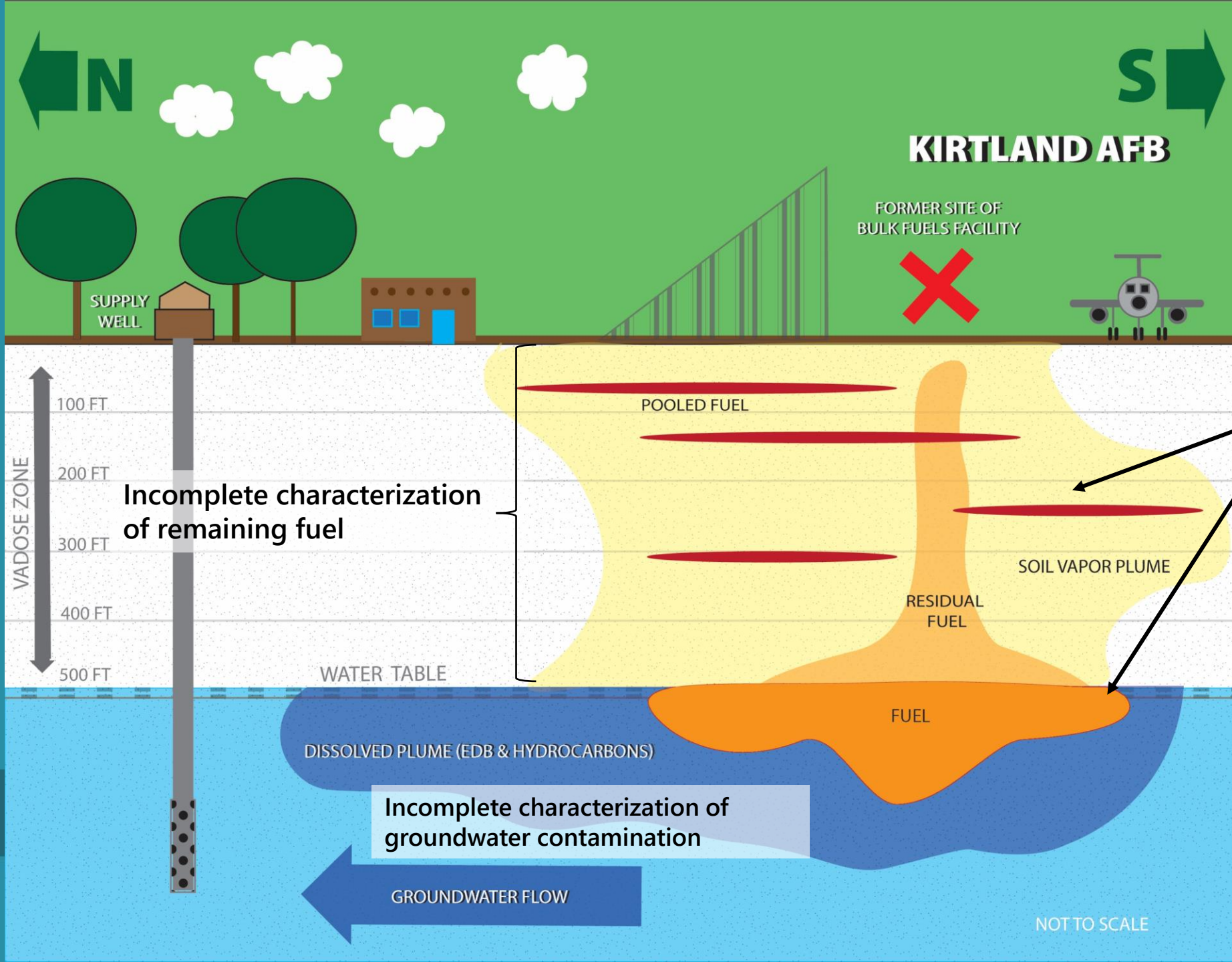


# Water Authority Data Gap Monitoring Well

- Water Authority drilled its own monitoring well to address data gap in EDB plume using Capital Outlay Funding
- Monitoring well installation was completed in April 2022
- Quarterly monitoring of the well is ongoing
  - No EDB has been detected in this well







## Definitions

*EDB*: ethylene dibromide

*Soil vapor*: gases from the vaporization of contaminants.

*Vadose Zone*: the portion of Earth between the land surface and the surface of groundwater.

No Source Treatment

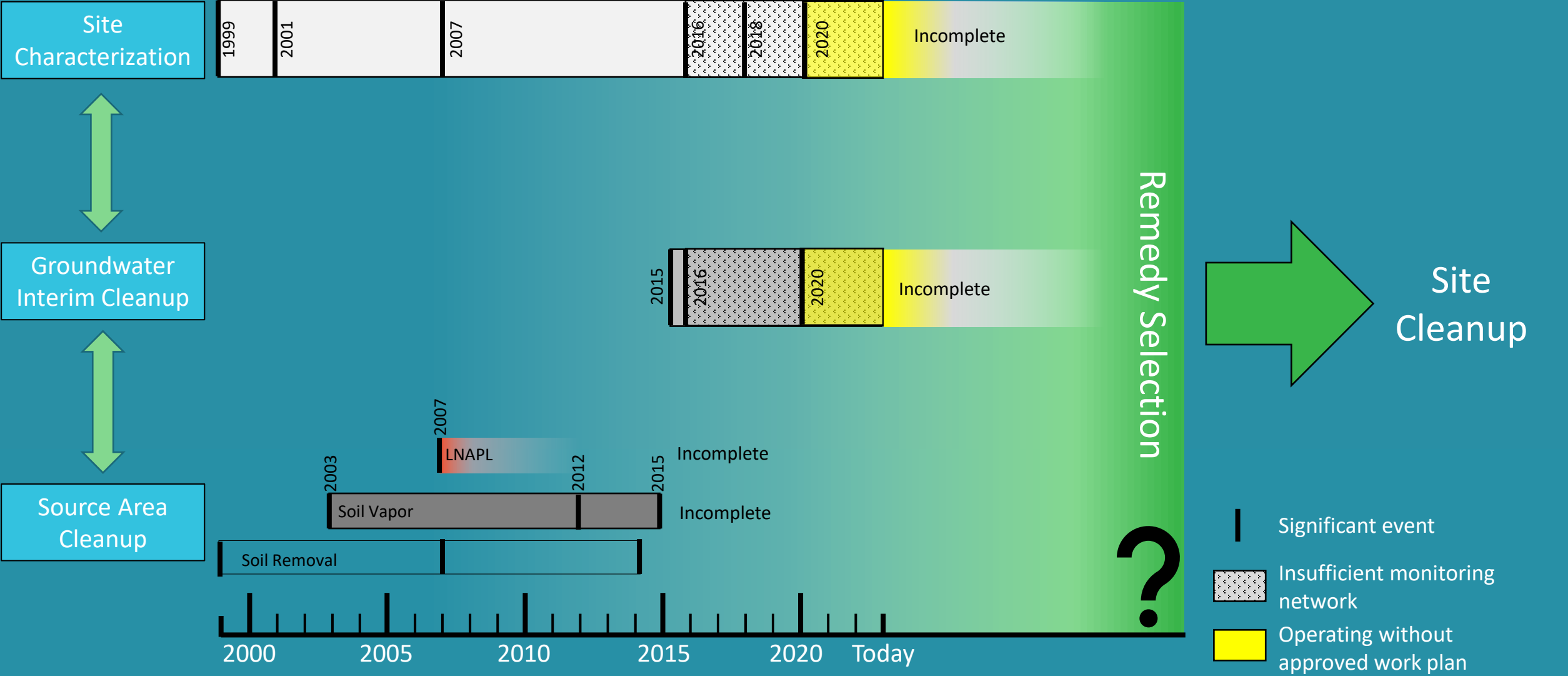








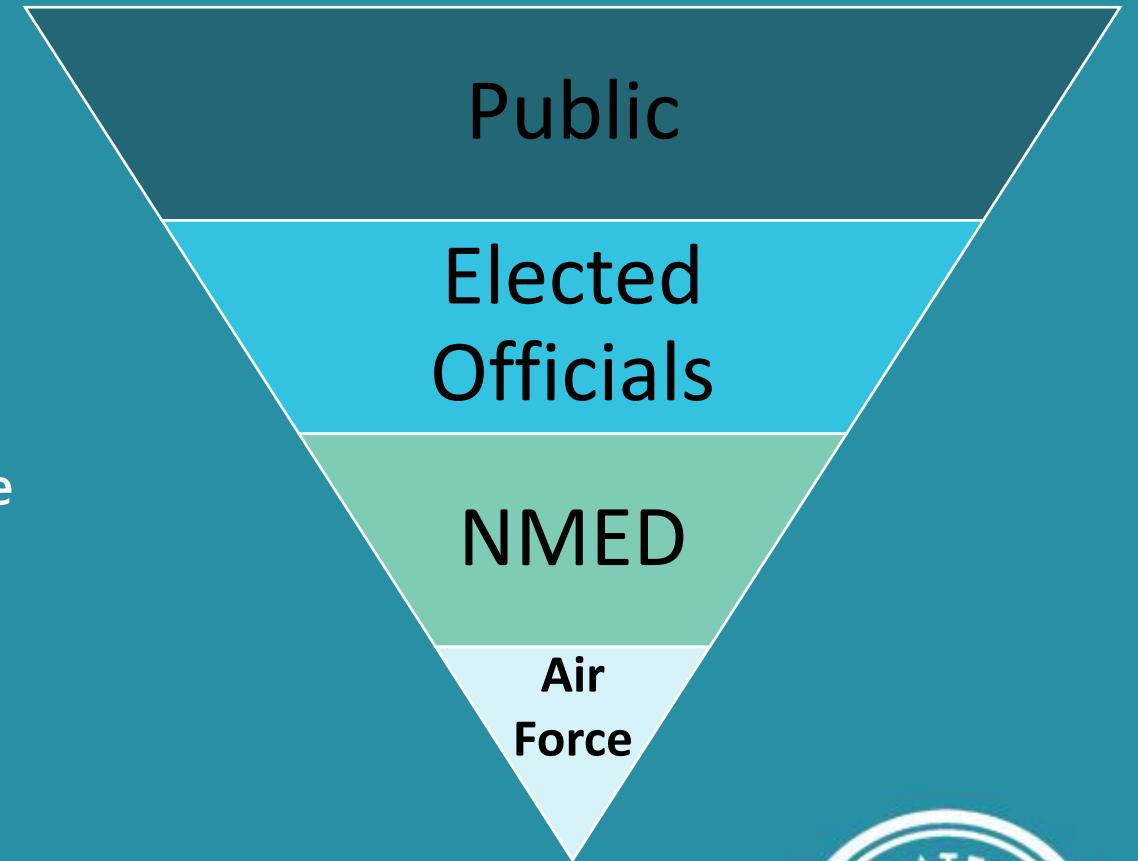
# Slowing Progress





# Moving Forward

- Key site needs:
  - MNA cannot be used as a final remedy at this site
  - Active remediation of source area must take place ASAP
  - Guaranteed funding allocation until site closure
  - Continued support to ensure oversight from NMED can continue
- Engagement from public and elected officials



# Questions?





## Technical Customer Advisory Committee

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March 16, 2023

Chair Eric C. Olivas  
Albuquerque Bernalillo County Water Utility Governing Board  
P.O. Box 568  
Albuquerque, NM 87103

Re: Concerns about Progress on Corrective Action at the Kirtland Air Force Base Bulk Fuels Facility  
Groundwater Contamination (NMED – HWB permitted hazardous waste facility ID No. 2400)

Dear Board Members -

Aircraft fuel, leaked into Albuquerque's aquifer from Kirtland Air Force Base's Bulk Fuels Facility (BFF), poses a threat to Albuquerque's water supply. But nearly a quarter century after the leak was discovered, the Air Force's response and commitment to problem resolution is lagging. Cleanup is likely more than a decade away, with significant uncertainty remaining about the nature and current extent of the contamination (including its 3-dimensional aspect).

This clear and present danger was created by a leak in an underground pipe that went undetected for decades. Constituents dissolved in groundwater from the BFF spill have spread beyond the boundary of Kirtland Air Force Base to the north-northeast in the direction of the Water Authority's Ridgecrest wells. While no detectable contamination has reached those drinking water wells during the Water Authority's voluntary monthly monitoring, fuel and the contaminant ethylene dibromide (EDB) pose a significant long-term threat. The Environmental Protection Agency has established an EDB Maximum Contaminant Level Goal (MCLG) of zero. The Water Authority identified the BFF spill in its 2018 Rivers and Aquifers Protection Plan as one of the community's top priority contamination sites.

Even more worrisome, recently the New Mexico Environment Department (NMED) Hazardous Waste Bureau (HWB) has charged that the Air Force's groundwater sampling is inadequate, and cleanup efforts are falling short. "The Permittee (Kirtland Air Force Base) has not provided any groundwater remediation proposals in the source area of the plume for over 20 years, prematurely shut down the vadose zone remediation efforts without HWB approval and has yet to define the full extent of the light non-aqueous phase liquids (LNAPL) at the site," the HWB wrote to the Air Force in a Jan. 19, 2023 letter. The HWB stated that the actions, or lack thereof, have created "significant delays" in the transition from site characterization to cleanup.

An Action Plan and a realistic schedule concerning contamination understanding and clean-up goals is lacking. The Air Force has submitted 16 different extension requests from 2020 to the present for various reasons. Well thought out work plans, which are followed by the Air Force's chosen contractor to understand the extent of contamination in the aquifer, vadose zone, and source area have yet to be



submitted, creating a crucial data gap that delays the active remediation efforts. Delays in even completing a *plan* to determine the extent of contamination mean delays in the eventual cleanup that is needed to protect Albuquerque's drinking water and maintain customer's trust. The Air Force's delay in completing a plan calls into question their commitment to clean-up.

The Air Force's consolidated groundwater monitoring plan for the site is now three years overdue because it has not addressed the data gaps in the extent of dissolved contamination in groundwater. These work plans are part of a pattern in which years frequently pass between NMED requirements for work on the site and Air Force actions. This delay is one of many that continues to push out the timeline for when remediation will begin in earnest. Every day of delay increases the threat to our water supply. Potentially worse than these delays is the Air Force's suggestion to cease remediation altogether in favor of monitored natural attenuation. This is not an acceptable alternative and cannot be allowed.

The Technical Customer Advisory Committee requests the Board, as stewards of our water supply and leaders in our community, to apply pressure to ensure the following:

- the data gap between state requirements and Air Force deliverables is reduced, with the goal of reducing this to zero, and rebuilding trust in the Air Force's stewardship efforts;
- the NMED-HWB, as the regulator acting on behalf of our community, is supported in their efforts to protect and clean-up our aquifer;
- actions to immediately actively remediate the source area are accelerated, and not allow monitored natural attenuation as has been recently suggested by the Air Force; and
- the Air Force adequately fund the work needed to reduce the risk to Albuquerque's water supply.

Sincerely,

Paul van Gulick, P.E. & P.S (ret.), Chair	Deborah Dixon, P.E.
Erwin Melis, PhD., P.G., Vice Chair	John Fleck
Mark Begay, NNOP	Robert Fowlie, P.E.
Jitka Dekojova, PLA	Jingjing Wang, PhD.
Donald T. Lopez, P.E.	