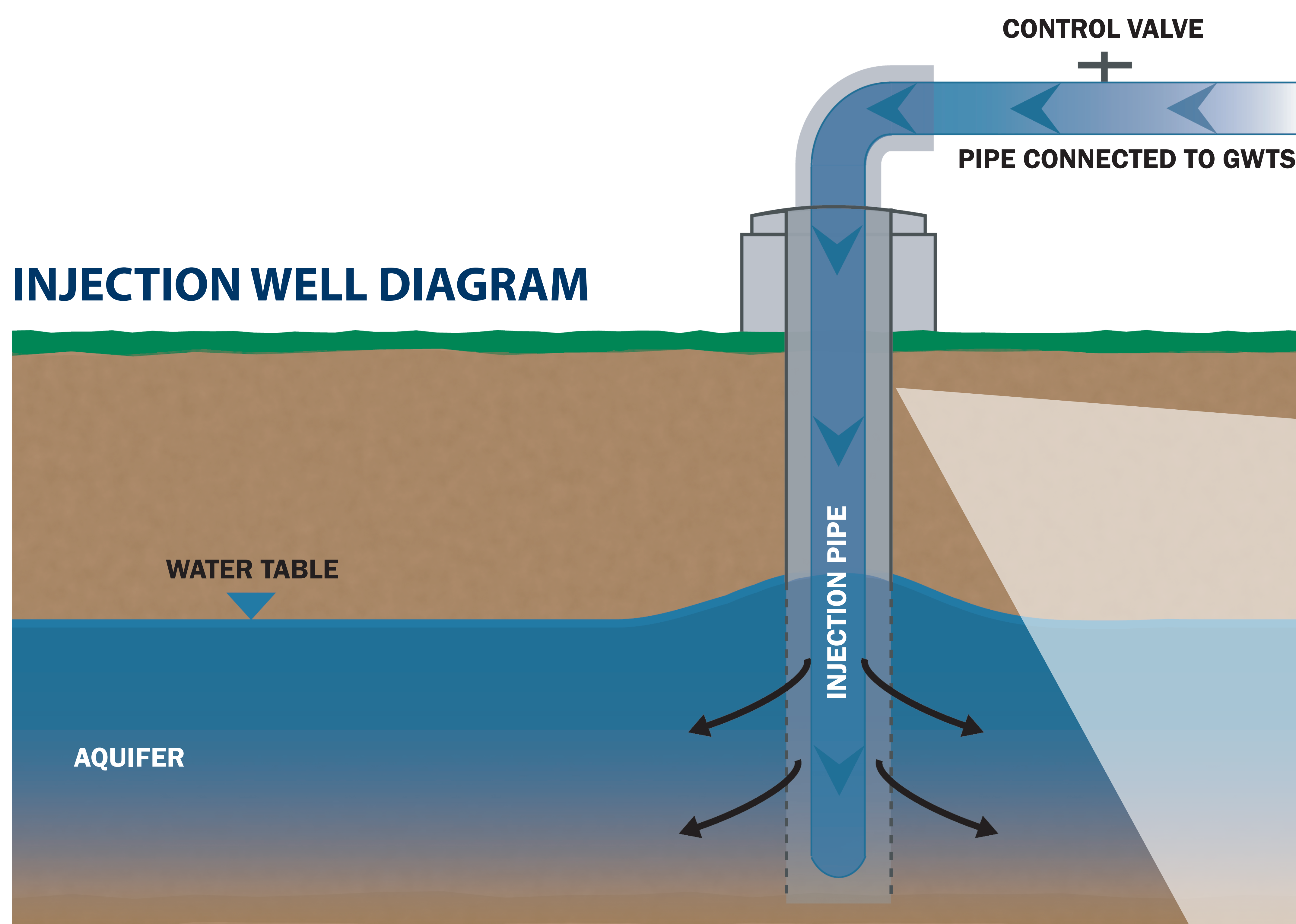


Gravity-Fed Injection of Treated Water

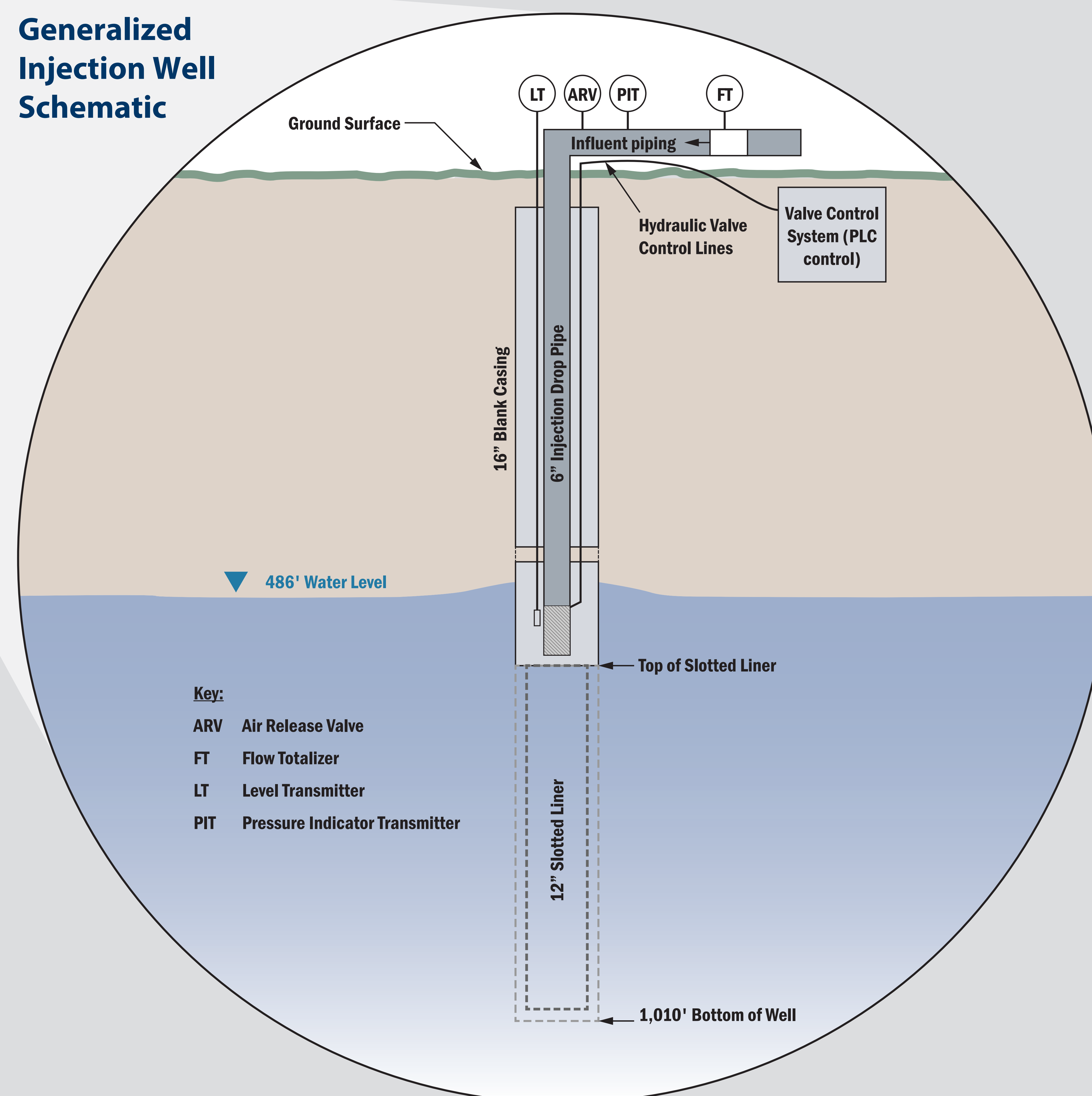


INJECTION WELL DIAGRAM



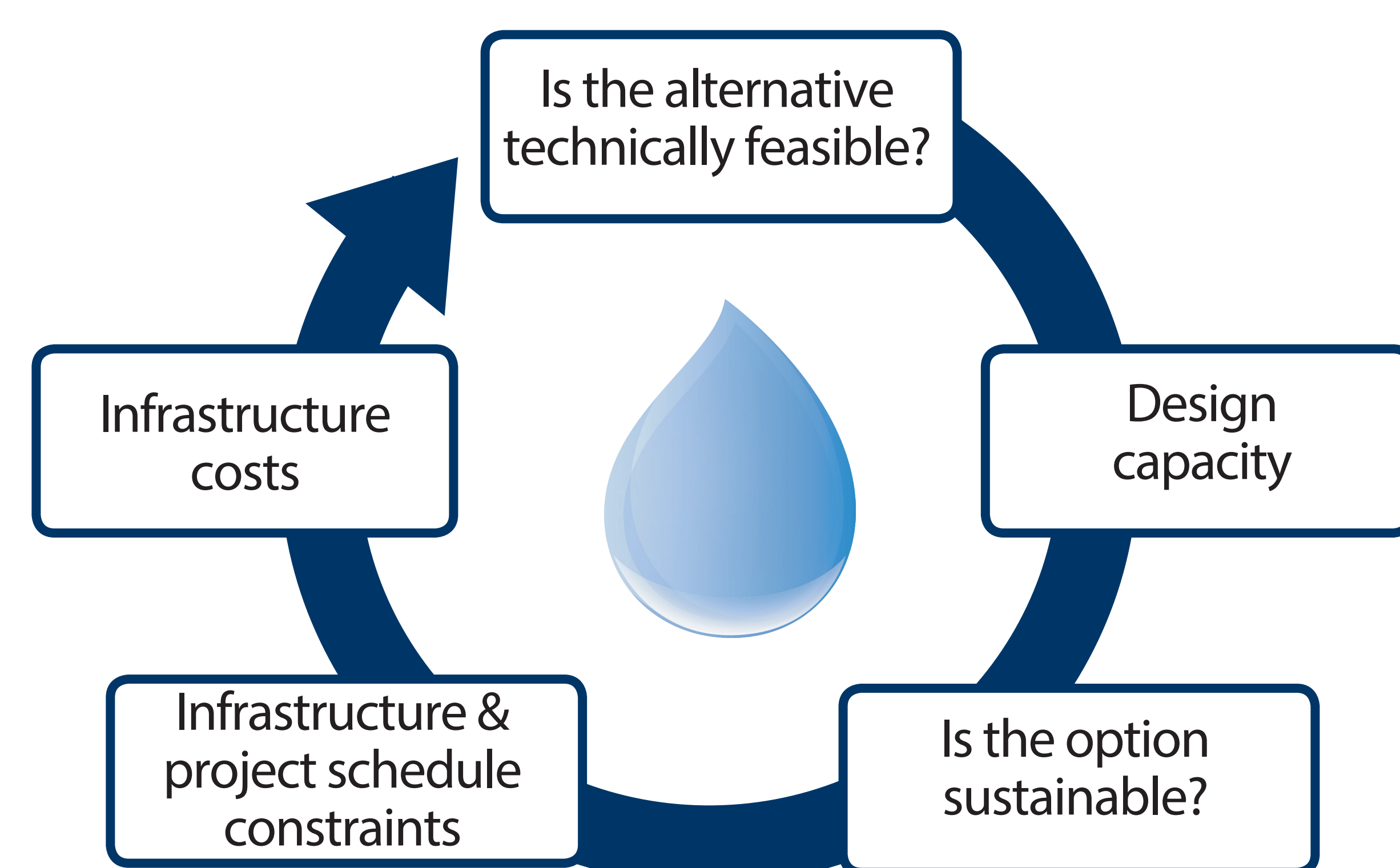
An injection well is used to place fluid underground into aquifers and/or geologic formations. In the case of the Kirtland AFB Bulk Fuels Facility remediation project, the injection wells use gravity to drop treated water out of the bottom of a pipe, into the aquifer. The water has been treated to drinking water standards and becomes part of the water in the aquifer. The volume and rate of water injected is controlled at the Groundwater Treatment System (GWTS) facility and is monitored with high accuracy instrumentation to evaluate well and aquifer response to injection.

Generalized Injection Well Schematic



Beneficial Use of Treated Water

Different options (e.g., infiltration galleries, surface application such as irrigation, retention ponds, injection, etc.) were considered for discharging water treated from the full-scale groundwater treatment facility. These options were evaluated using the beneficial reuse criteria below.



Based on evaluation, which included an understanding of how water moves through soil, two options were identified as viable methods for discharging treated water: 1.) use of the Kirtland AFB Golf Course pond to hold water for irrigation use on the golf course and 2.) use of a gravity-fed well to inject water into the aquifer.

Sentinel and Proximal Monitoring Well Locations

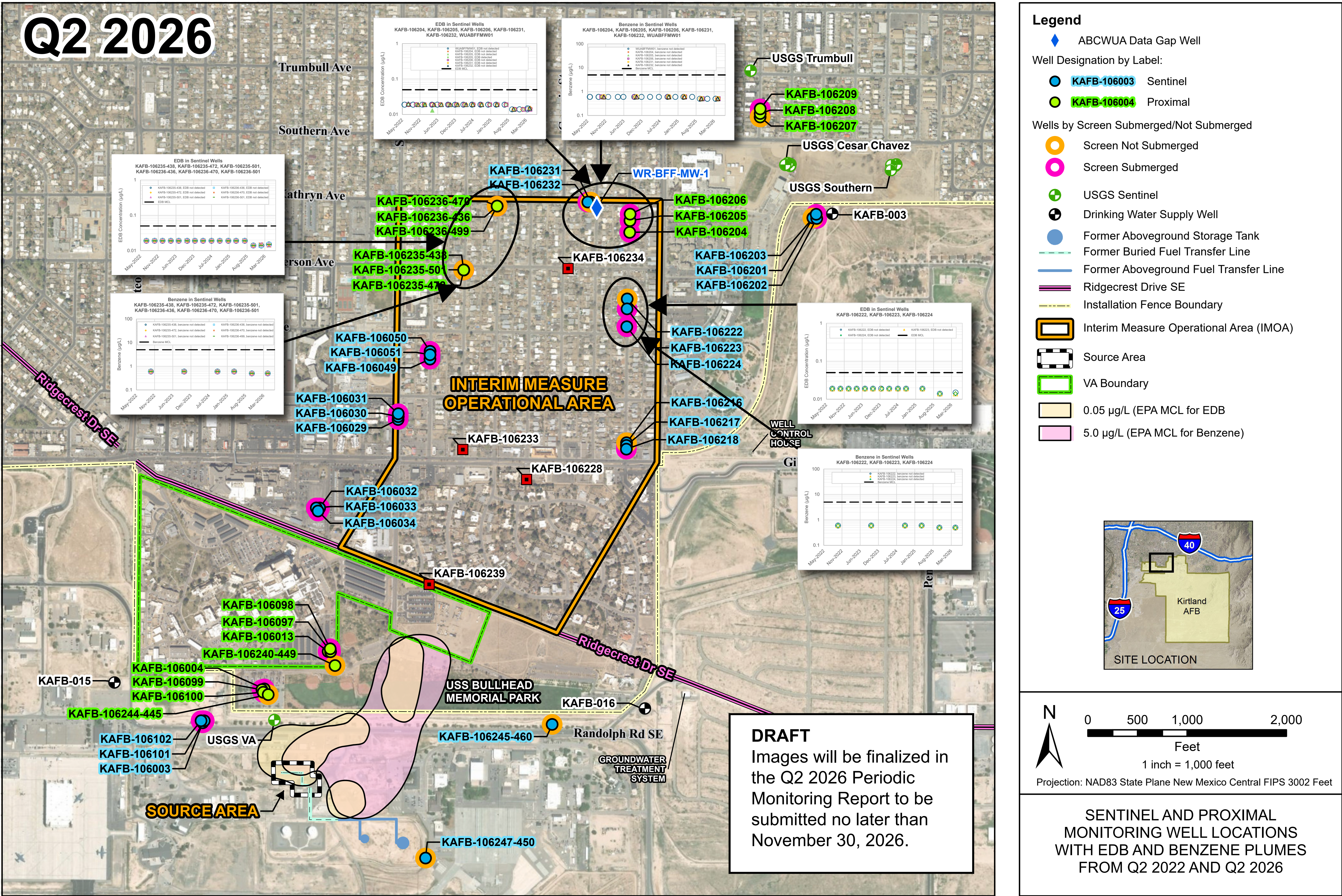
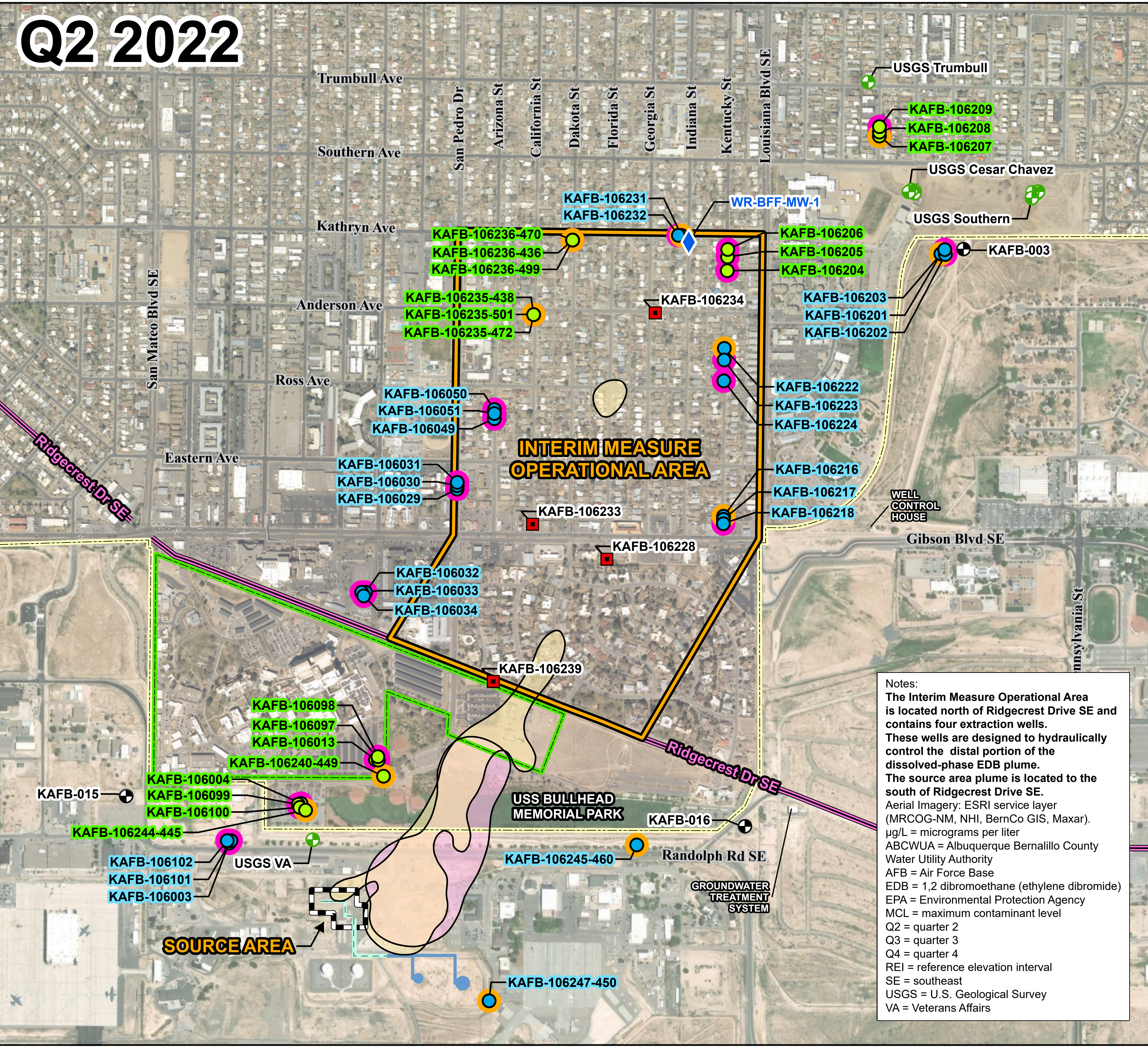
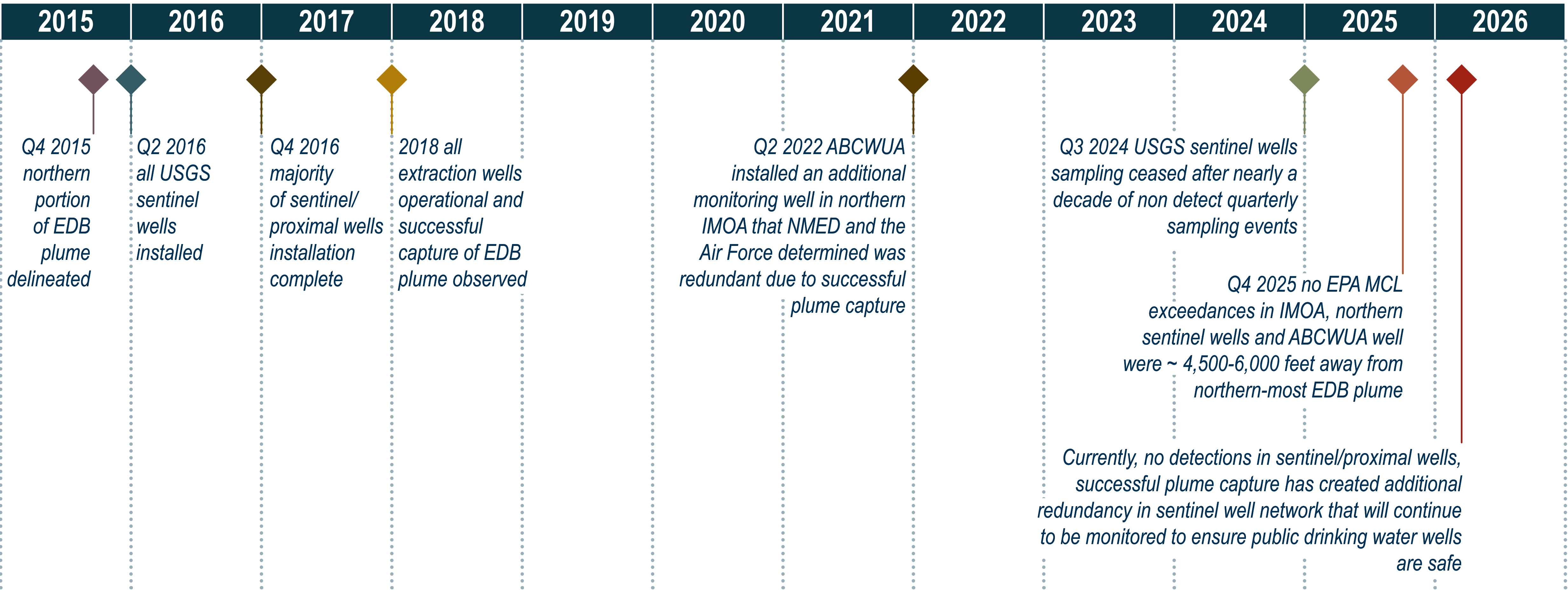


Sentinel/proximal wells:

Serve as an early warning system to protect drinking water supplies. Strategically placed between groundwater contaminant plume and drinking water supply wells. Sampled quarterly to ensure no unanticipated migration of contaminants.

USGS Sentinel wells:

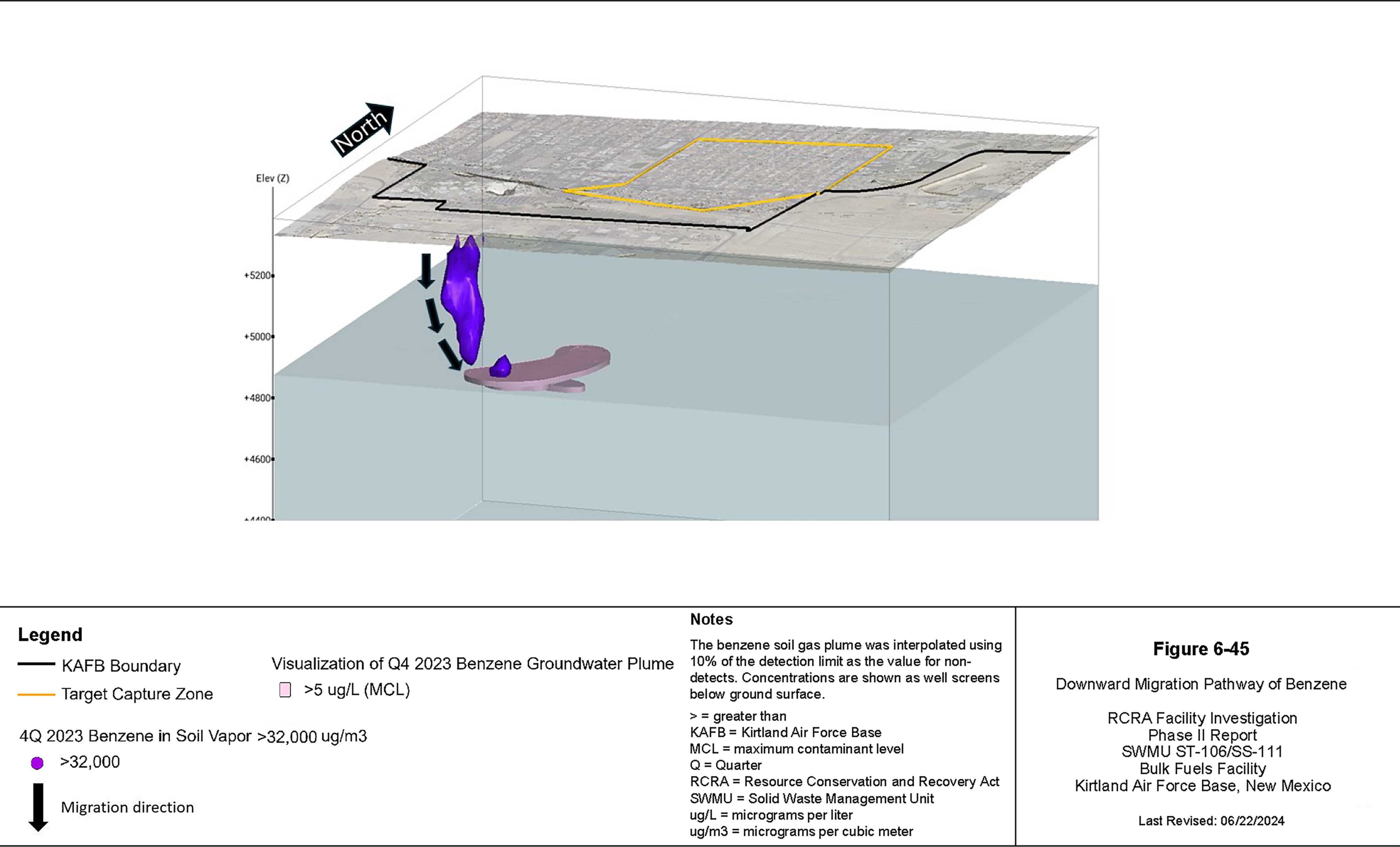
Sentinel wells that were sampled for nearly a decade with no EDB detections. Sampling ceased in Q3 2024. However, wells remain intact in case sampling data supports the need to resume sampling.



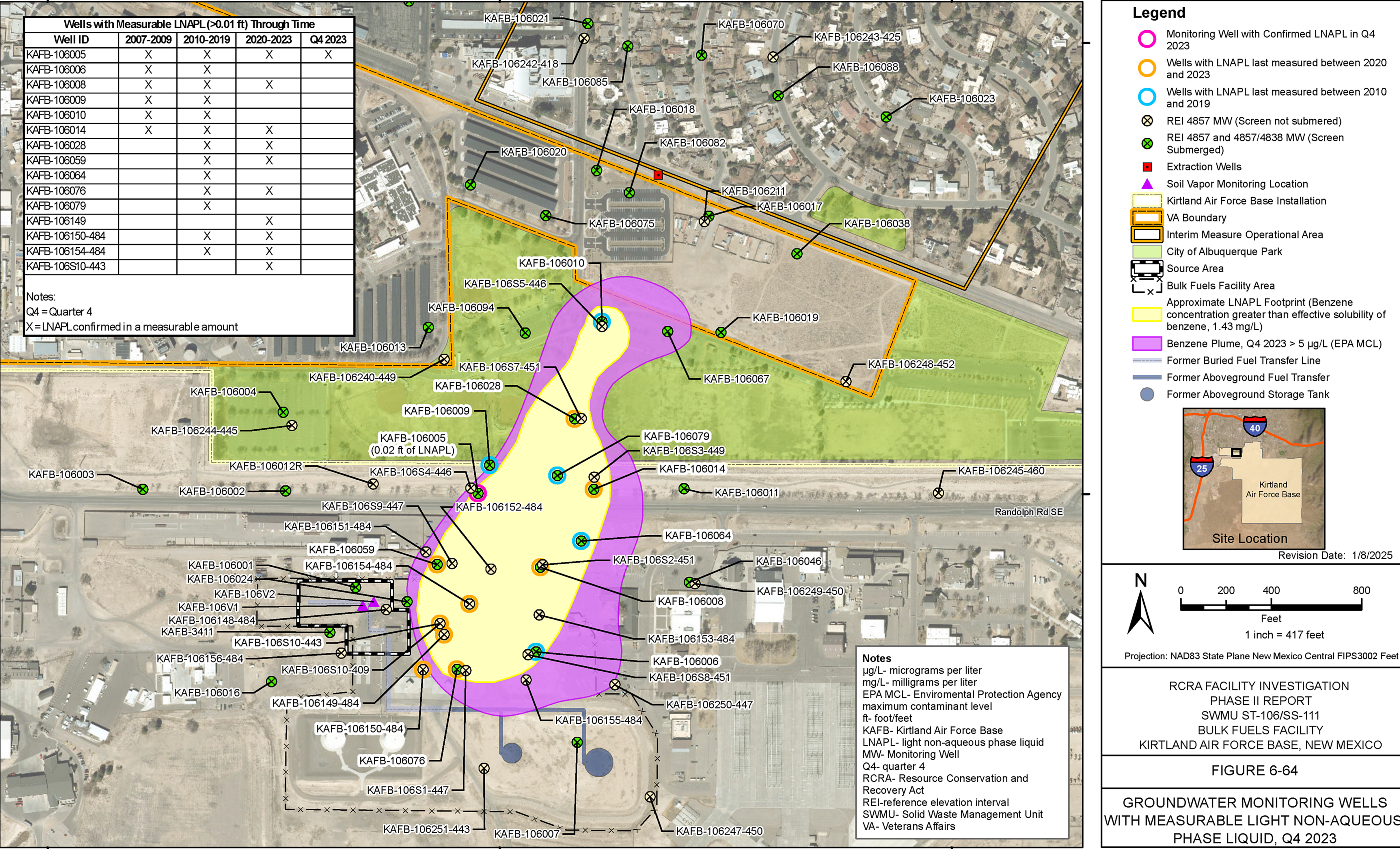
Benzene Plume and Residual Light Non-Aqueous Phase Liquid (LNAPL) Extent



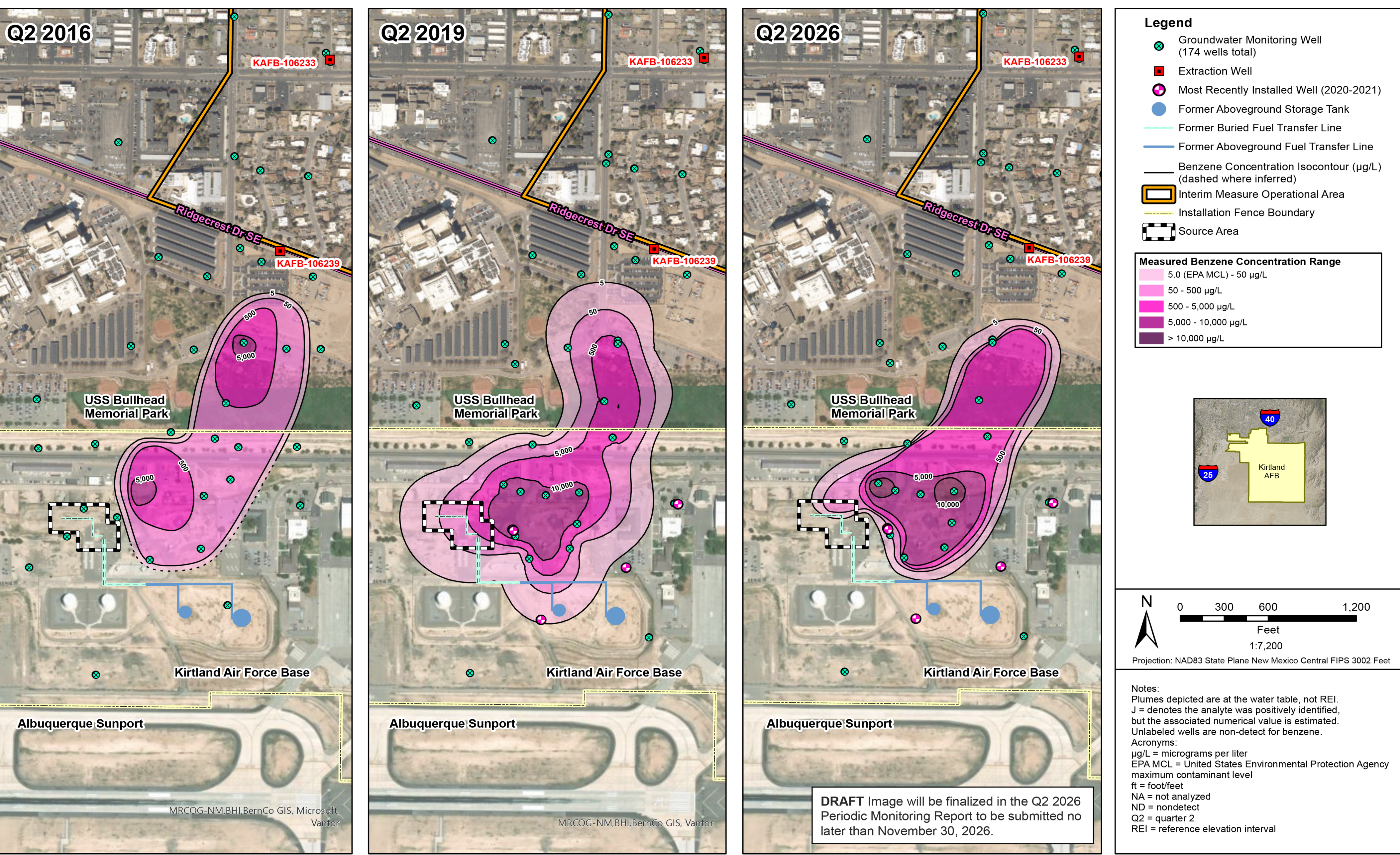
Downward Migration Pathway of Benzene



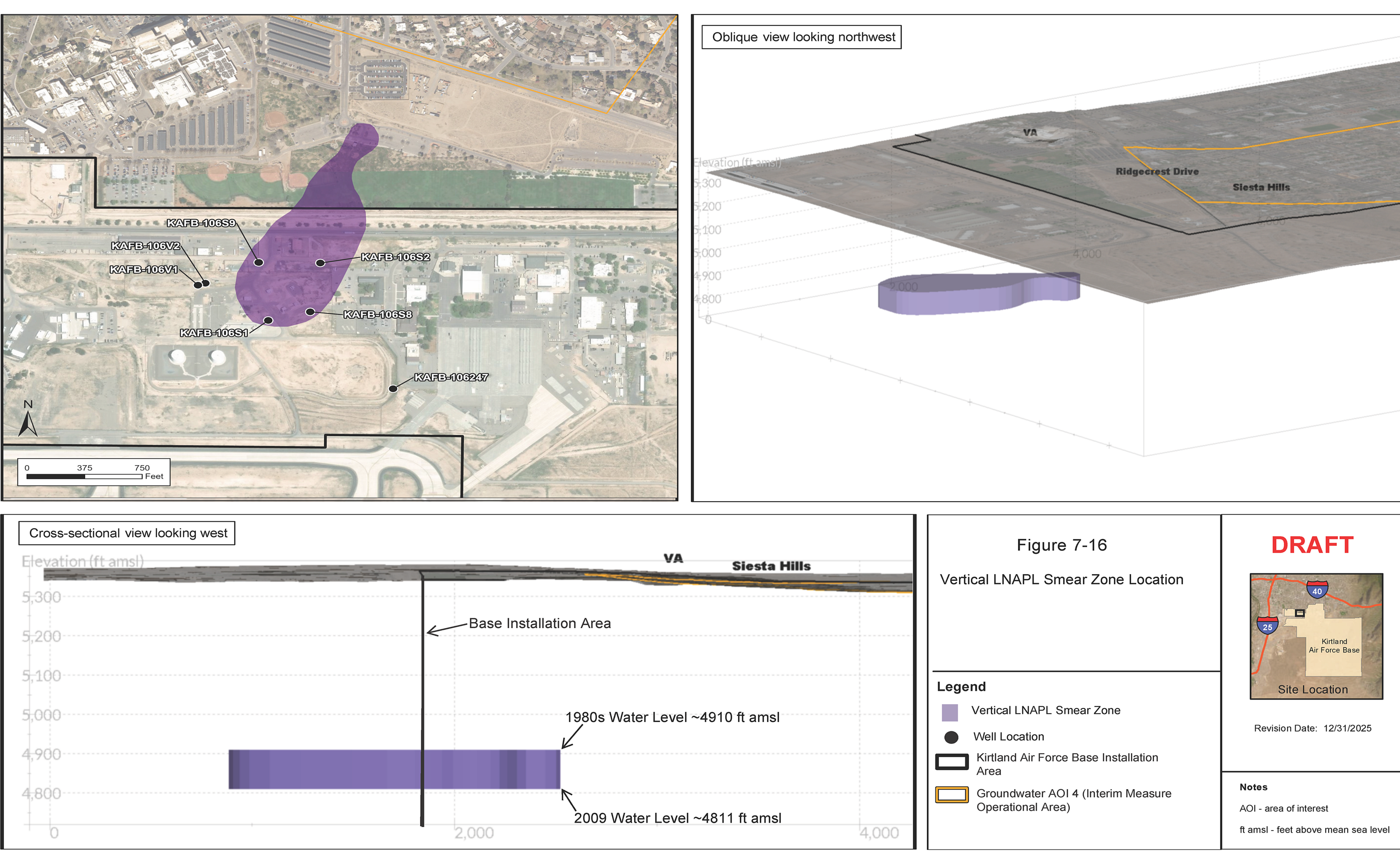
Horizontal LNAPL Extent



Benzene Plume Footprint (over time)



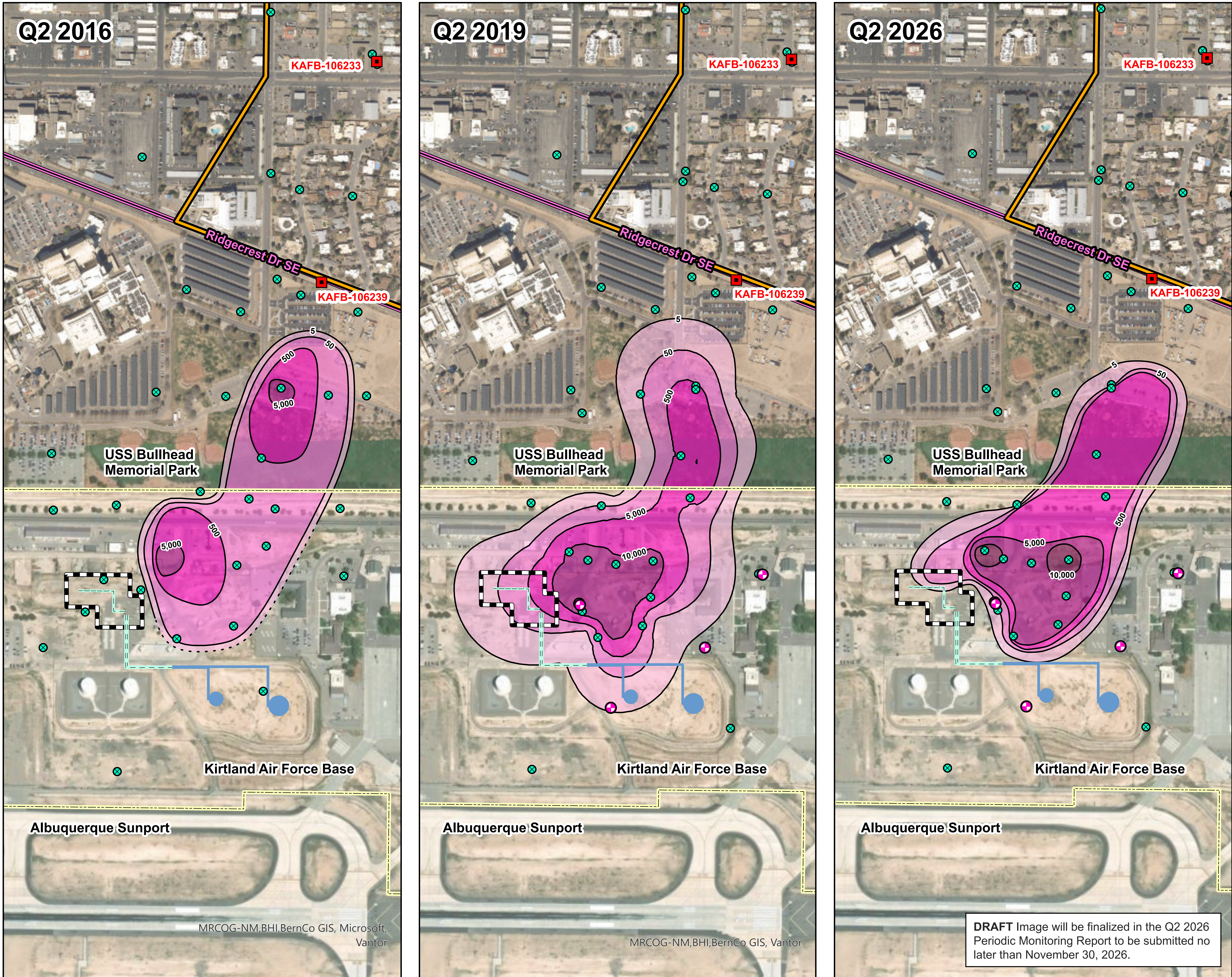
Vertical LNAPL Smear Zone



Benzene Plume Footprint (over time)



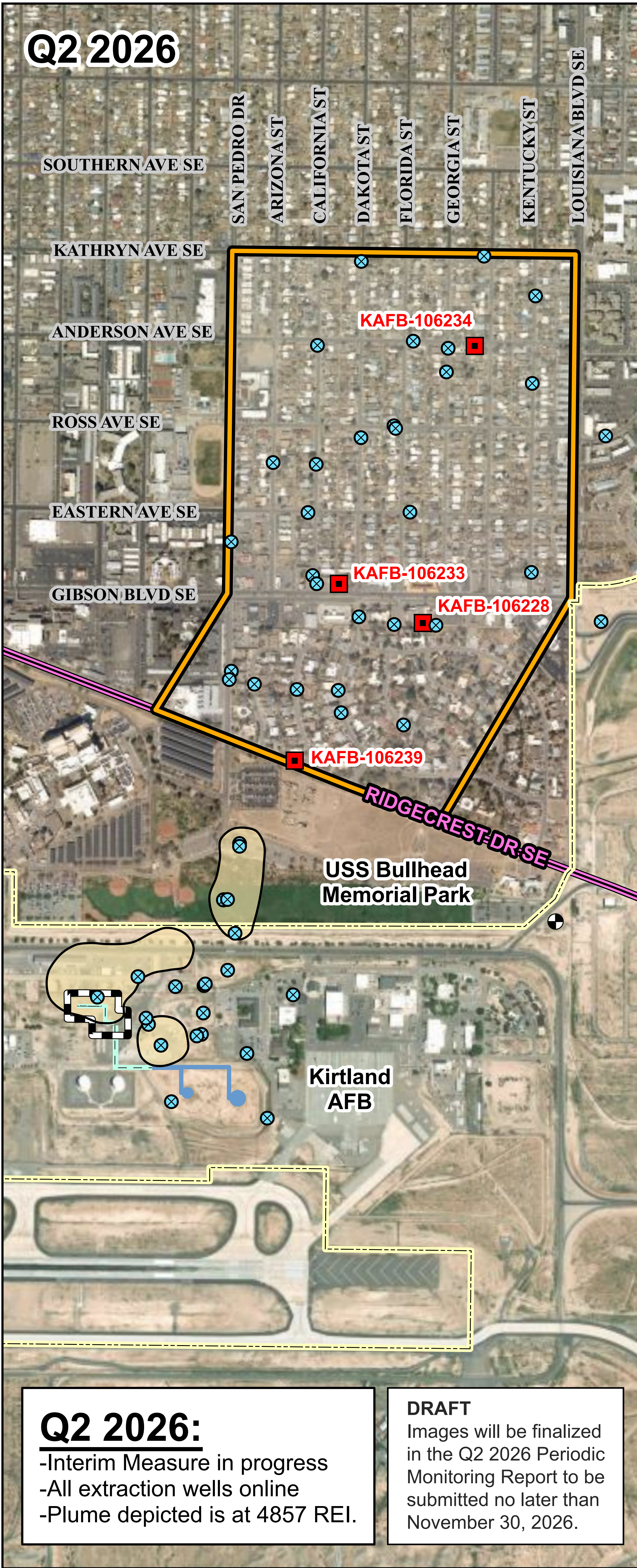
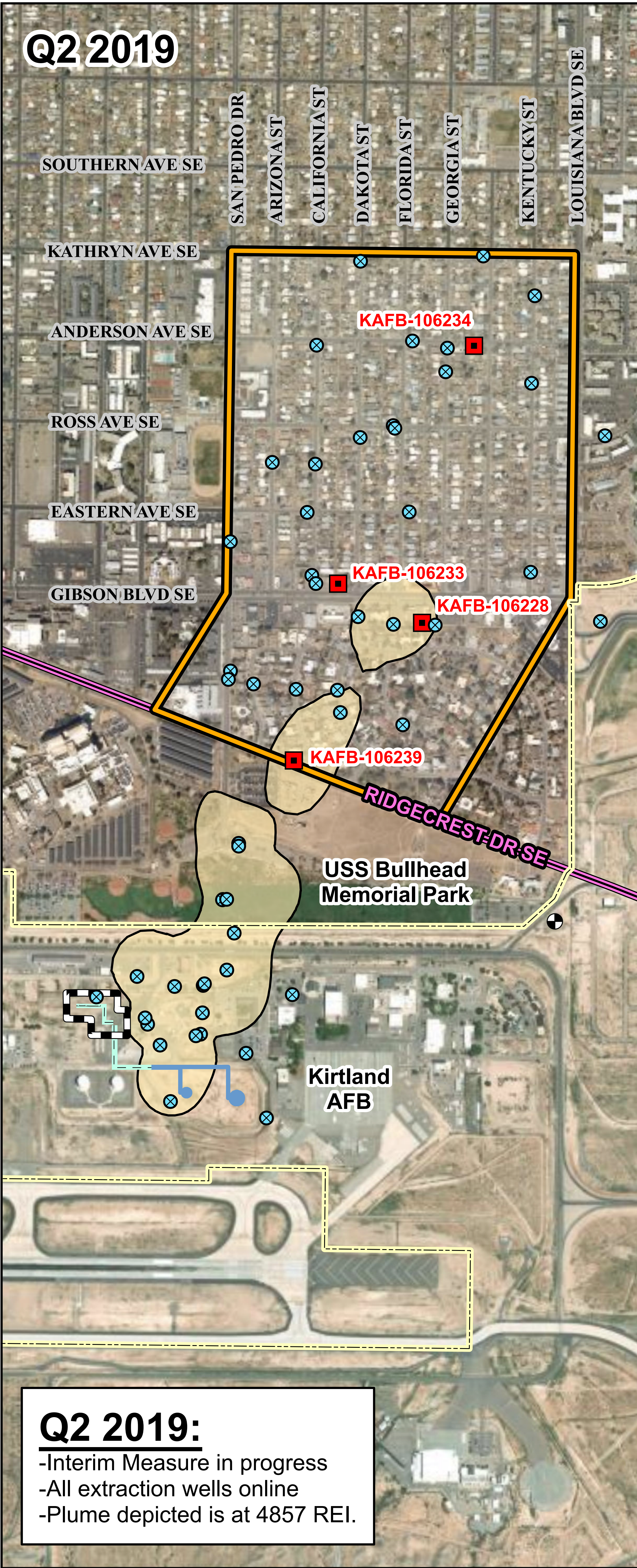
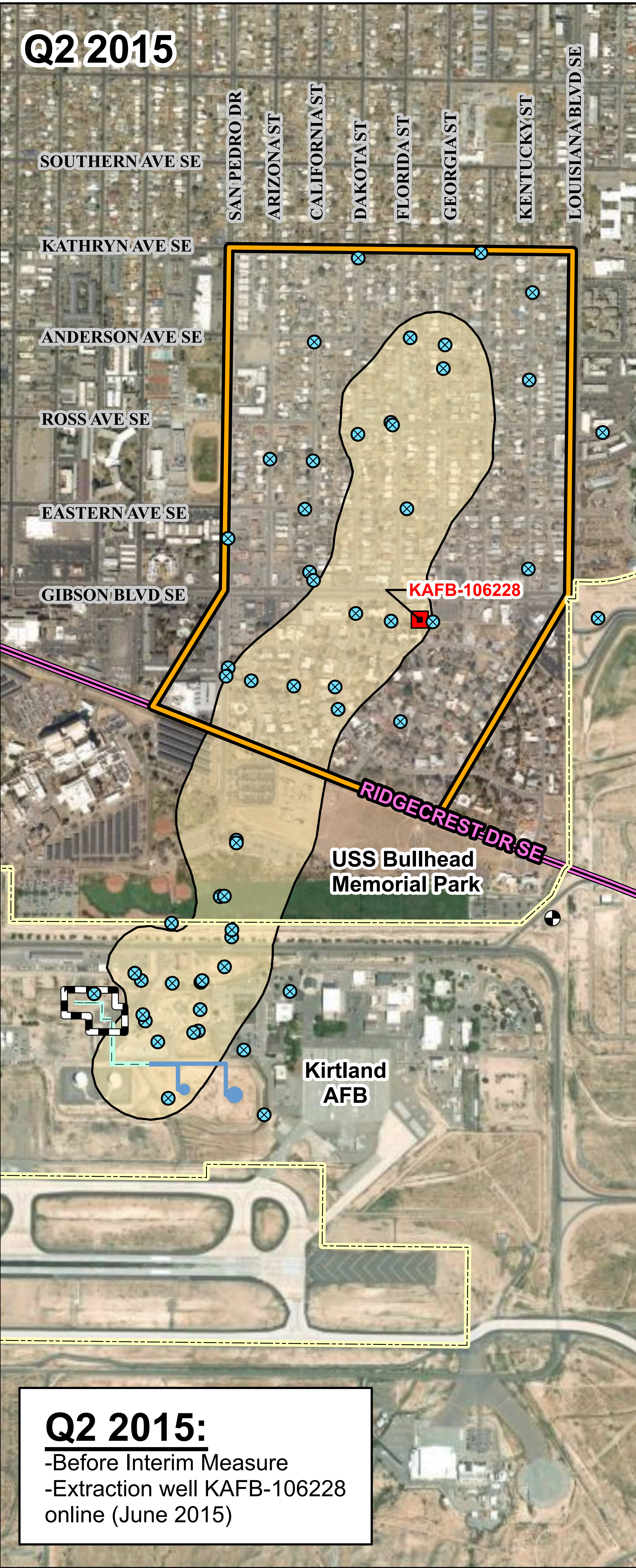
Comparison of Benzene in the Source Area Between Q2 2016 and Q2 2026



EDB Plume Footprint (over time)



Comparison of Dissolved-Phase EDB in the Interim Measure Operational Area Between Q2 2015 and Q2 2026



Legend

- Groundwater Monitoring Well
- Extraction Well
- Drinking Water Supply Well
- Former Aboveground Storage Tank
- Former Buried Fuel Transfer Line
- Former Aboveground Fuel Transfer Line
- Ridgecrest Drive SE
- Interim Measure Operational Area
- Installation Fence Boundary
- Source Area
- Dissolved-Phase EDB ≥ 0.05 $\mu\text{g/L}$ (EPA MCL)

SITE LOCATION

Scale: 0 600 1,200 2,400 Feet
1 inch equals 1,200 feet

Projection: NAD83 State Plane New Mexico Central FIPS 3002 Feet

General Notes:
Aerial imagery provided by ESRI Online service.
EDB plume contour generated with ESRI Spatial Analyst and adjusted with professional judgement.

Acronym(s):
AFB = Air Force Base
EDB = 1,2-dibromoethane (ethylene dibromide)
EPA MCL = Environmental Protection Agency maximum contaminant level
REI = reference elevation interval
 $\mu\text{g/L}$ = microgram(s) per liter
Q2 = quarter 2

Groundwater Standards for clean-up at the Bulk Fuels Facility Project

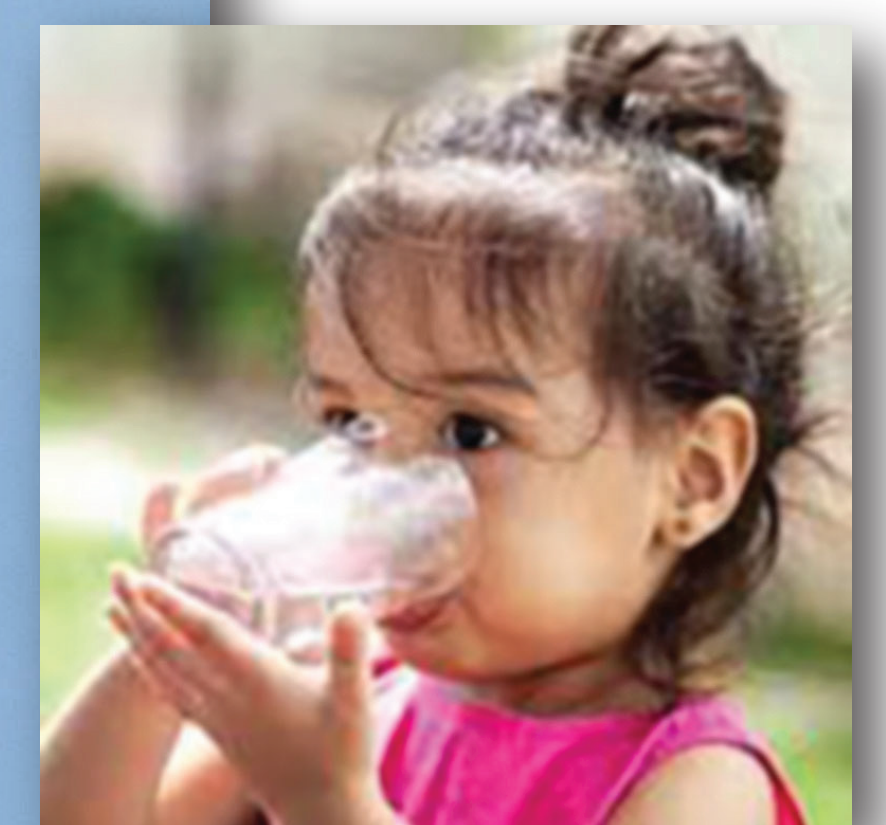


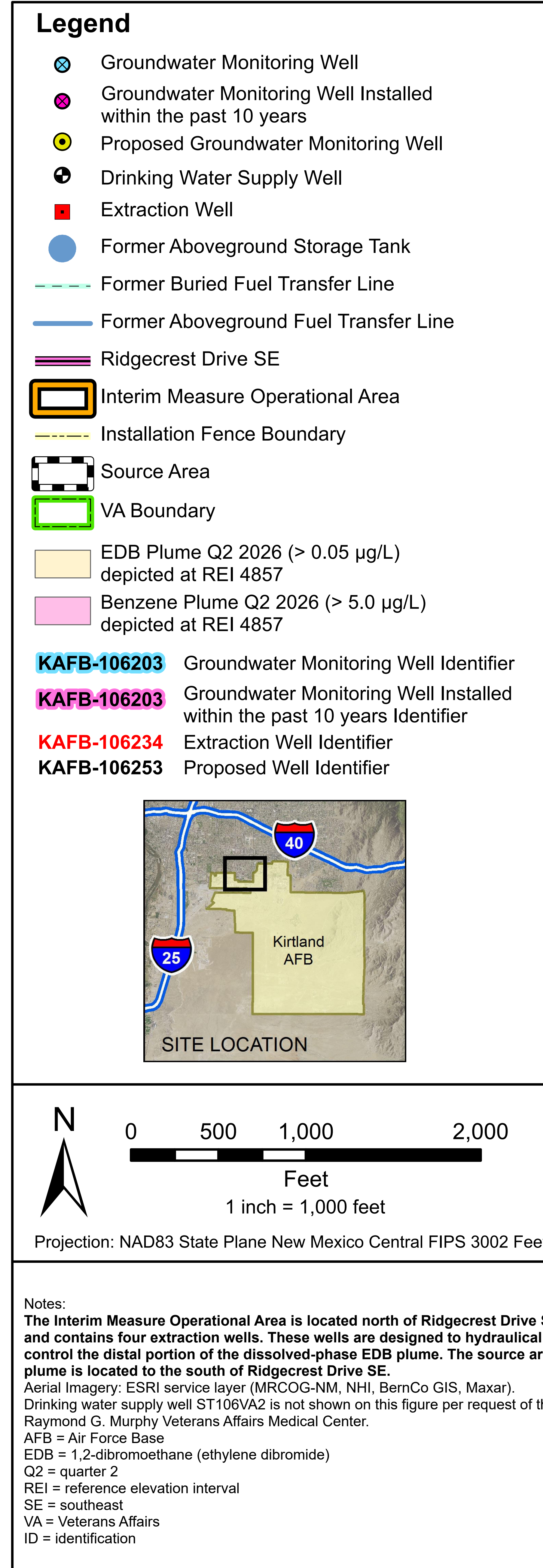
New Mexico Environment Department (NMED) Promulgated Standard for Groundwater Cleanup

- NMED regulates groundwater at Kirtland AFB with the Resource Conservation and Recovery Act Permit:
- The Permit requires the cleanup levels for groundwater shall be the New Mexico Water Quality Control Commission (WQCC) water quality standards and the drinking water Maximum Contaminant Levels (MCLs) adopted by Environmental Protection Agency (EPA) under the Federal Safe Drinking Water Act.
- If both a WQCC standard and a MCL have been established for a contaminant, then the most stringent of the two levels shall be the cleanup level for that contaminant.”

Uses of the Safe Drinking Water Act standard (MCLs)

- Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. Thus, MCLs are used locally and nationally to ensure that tap water is safe to drink. MCLs limit the amount of certain contaminants in water provided by public water systems.
- MCL uses for restoration (clean-up) activities
 - Delineate the groundwater contamination: show the entire area of groundwater that is at or above the Safe Drinking Water Act Standard
 - Objectively quantify risk to drinking water supply
 - Target contamination above these standards with remedial technologies
 - Demonstrate if a site can be clean closed or requires additional corrective actions





Proposed Groundwater Monitoring Wells

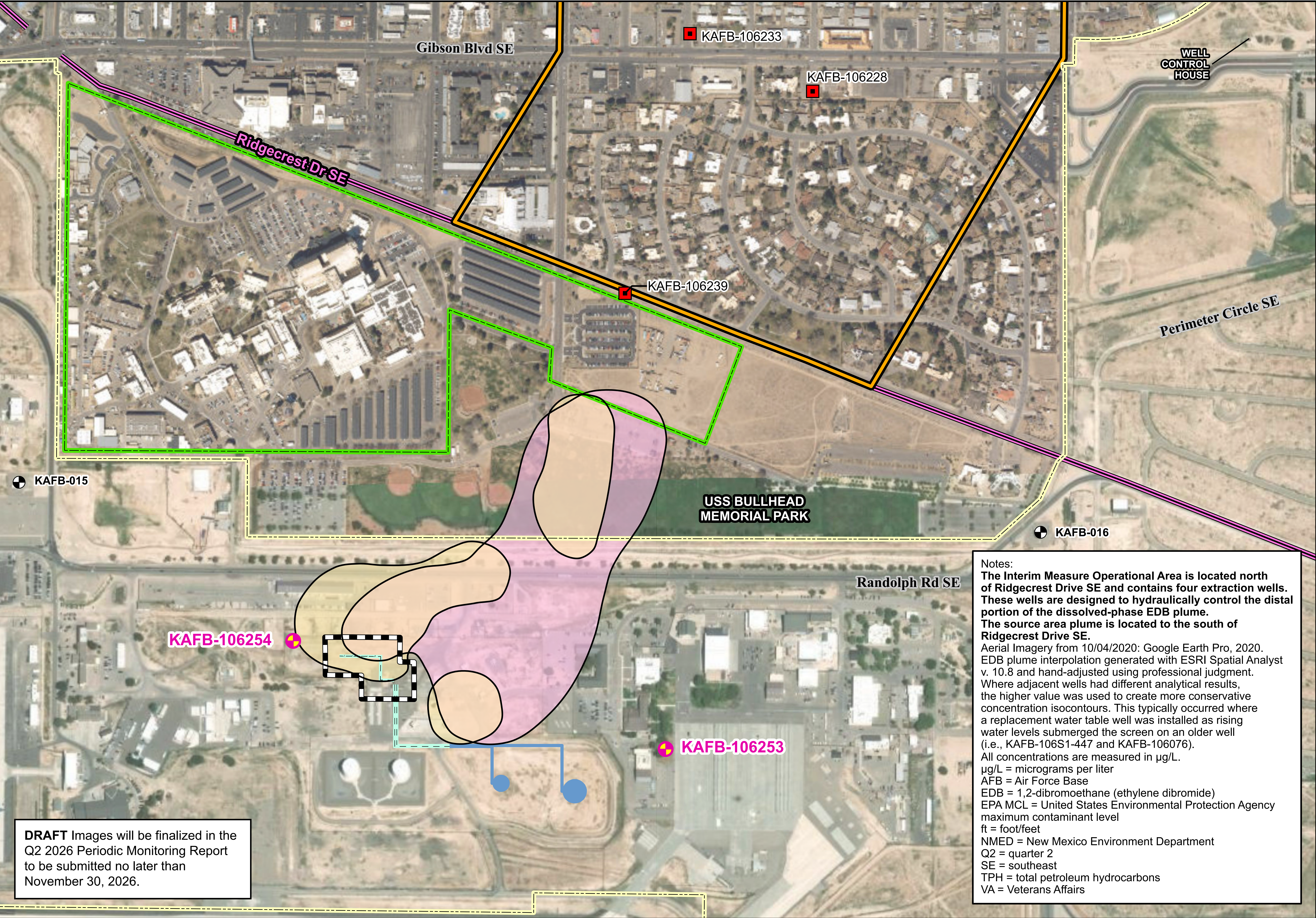


The well locations for wells KAFB-106253 and KAFB-106254 were selected to optimize the assessment of EDB, benzene, and TPH in the source area groundwater plume. Optimized Assessment required due to rising water table observed at the site since 2009 and the associated submergence of existing groundwater monitoring wells near the source area.

- KAFB-106253 will be installed to better assess benzene and TPH concentrations in the southeastern portion of the GWM network where benzene and TPH have historically been detected above the MCLs.

- KAFB-106254 will be installed to better assess EDB and benzene concentrations in the southwestern portion of the GWM network where EDB has historically been detected above the MCL and benzene has historically been detected below the MCL.

Both wells are proposed to be constructed as a single well with a well screen that intersects the water table, beginning approximately 15 ft below, and extending approximately 25 ft above the water table encountered at the time of drilling to allow for the potential future water table rise.



Legend

- Proposed Monitoring Well Location
- Extraction Well
- Drinking Water Supply Well
- Former Aboveground Storage Tank
- Former Buried Fuel Transfer Line
- Former Aboveground Fuel Transfer Line
- Ridgecrest Drive SE
- Interim Measure Operational Area
- Installation Fence Boundary
- Source Area
- VA Boundary
- Q2 2026 EDB Concentration - 0.05 µg/L (EPA MCL)
- Q2 2026 Benzene Concentration - 5.0 µg/L (EPA MCL)

Notes:

The Interim Measure Operational Area is located north of Ridgecrest Drive SE and contains four extraction wells. These wells are designed to hydraulically control the distal portion of the dissolved-phase EDB plume. The source area plume is located to the south of Ridgecrest Drive SE.

Aerial Imagery from 10/04/2020: Google Earth Pro, 2020. EDB plume interpolation generated with ESRI Spatial Analyst v. 10.8 and hand-adjusted using professional judgment. Where adjacent wells had different analytical results, the higher value was used to create more conservative concentration isocontours. This typically occurred where a replacement water table well was installed as rising water levels submerged the screen on an older well (i.e., KAFB-106S1-447 and KAFB-106076). All concentrations are measured in µg/L.

µg/L = micrograms per liter
AFB = Air Force Base
EDB = 1,2-dibromoethane (ethylene dibromide)
EPA MCL = United States Environmental Protection Agency maximum contaminant level
ft = foot/feet
NMED = New Mexico Environment Department
Q2 = quarter 2
SE = southeast
TPH = total petroleum hydrocarbons
VA = Veterans Affairs

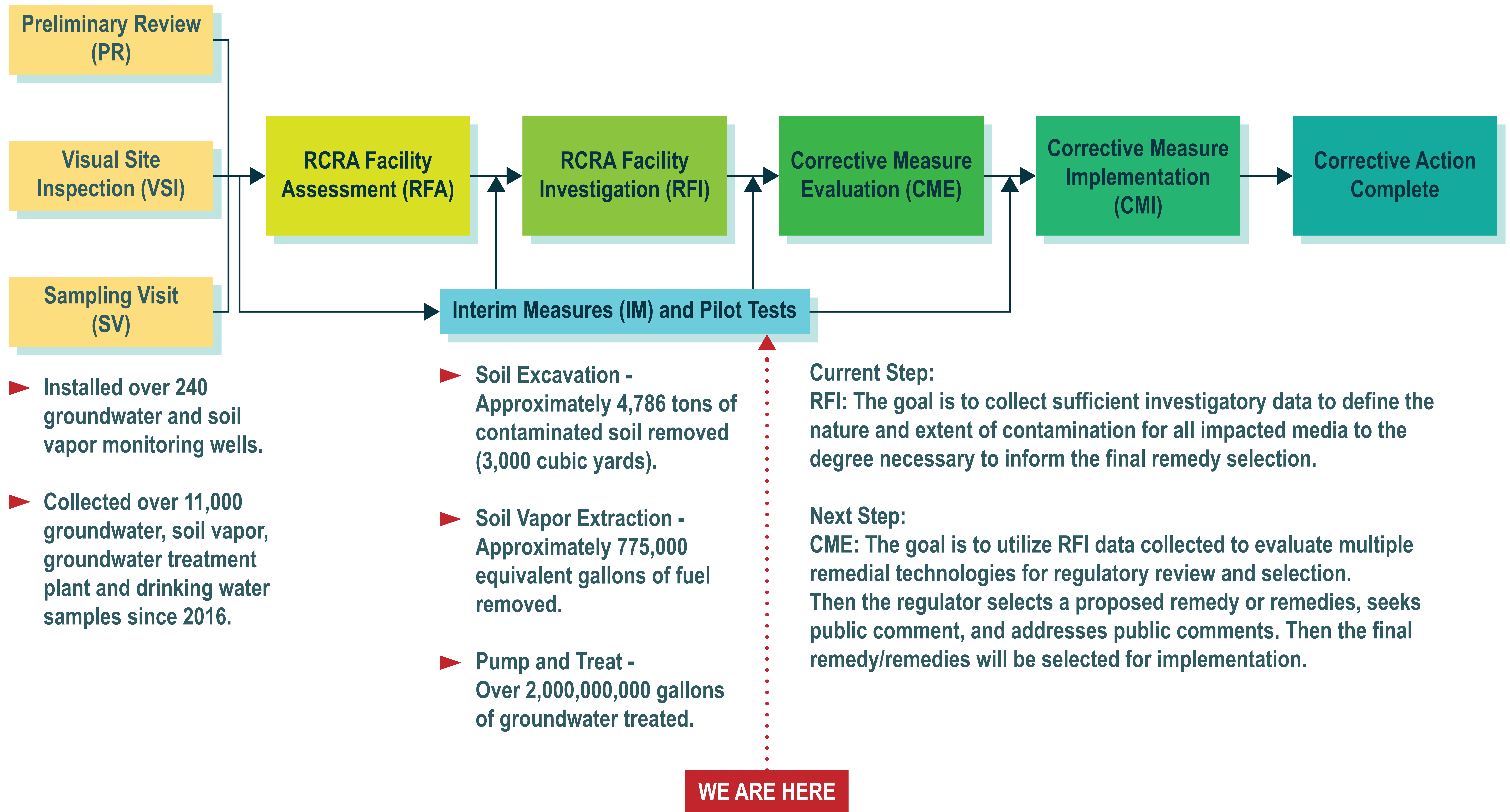
SITE LOCATION

0 300 600 1,200
Feet
1 inch = 600 feet

Projection: NAD83 State Plane New Mexico Central FIPS 3002 Feet

**PROPOSED LOCATIONS FOR
GROUNDWATER MONITORING WELLS
KAFB-106253 AND KAFB-106254**

RCRA Corrective Action Process



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

Recent Field Work



Extraction well KAFB-106239 turbidity after initial three bails



Extraction well KAFB-106239 final turbidity



Passive samplers wedged in KAFB-106S2 (photo from downhole camera)

Passive samplers successfully removed



Golf course main pond tumbleweed removal

Extraction well KAFB-106239 rehabilitation



Removing the failed pump in KAFB-106024



Q2 gauging well



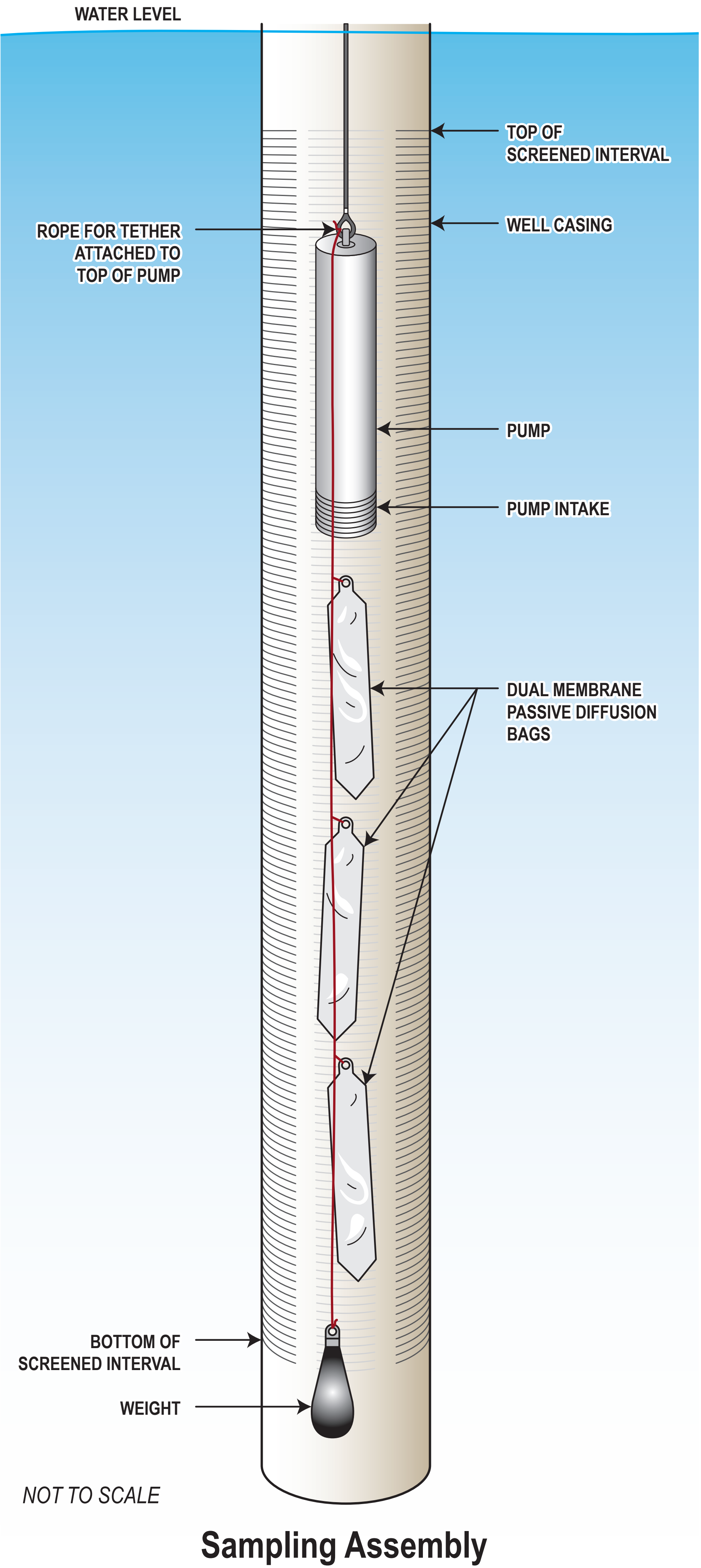
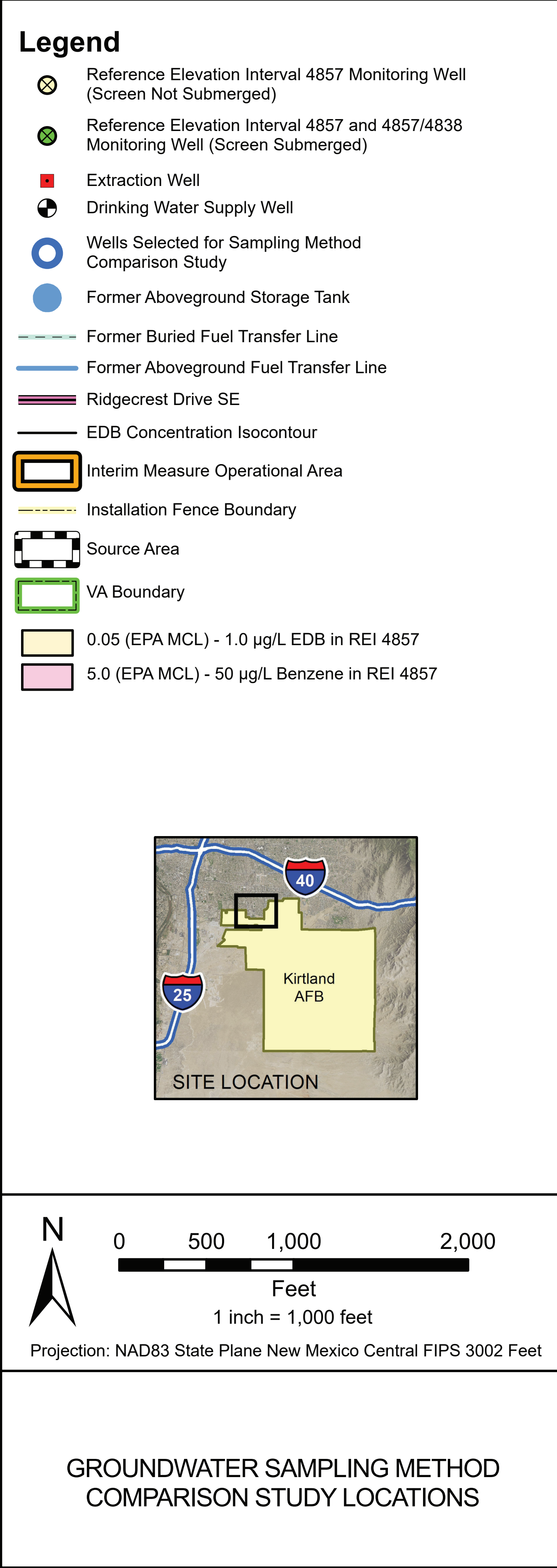
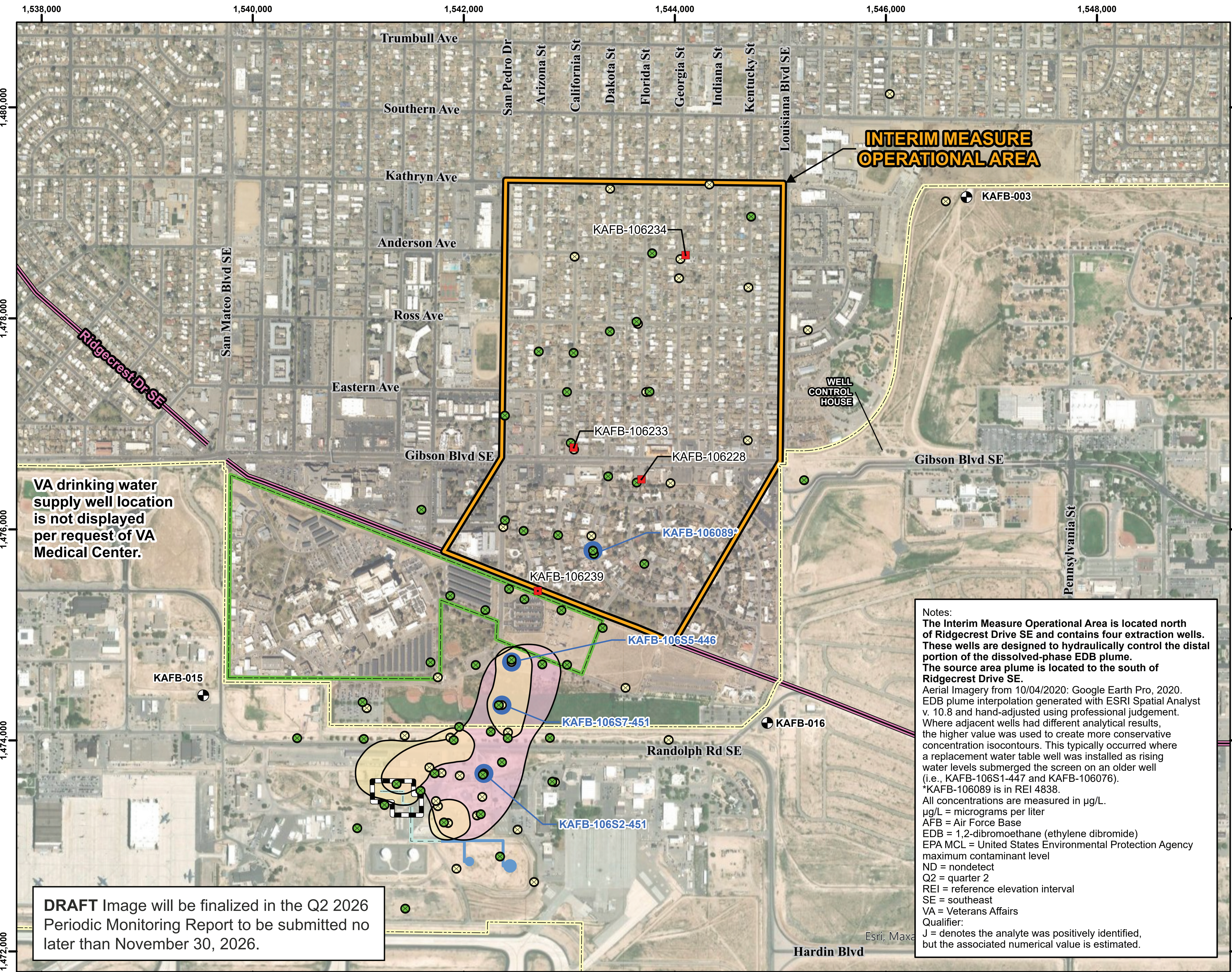
KAFB-106024 failed pump removal

Sampling Comparison Study

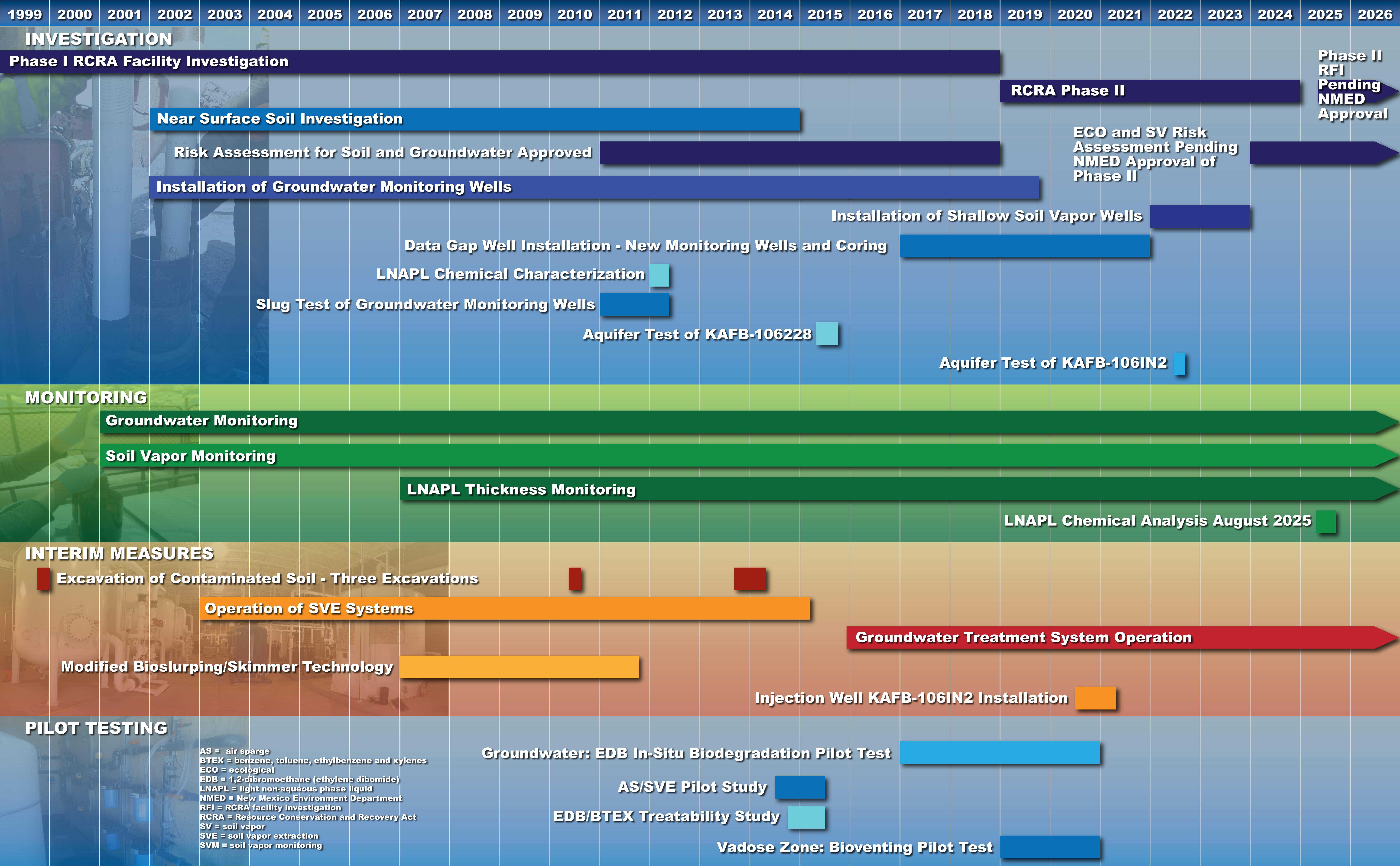


- In July 2025, NMED issued an approval with modifications for the Groundwater Sampling Method Comparison Study Supplemental Investigation Work Plan
- Objective is to compare trends between passive and low-flow groundwater sampling methodologies
- Groundwater samples are collected concurrently from KAFB-106S2-451, KAFB-106S5-446, KAFB-106S7-451, and KAFB-106089 using both passive and low-flow sampling methods
- Eight quarters of comparison study sampling began in Q3 2025. Preliminary data collected prior to NMED approval using the same methods will be used to supplement the study
- The analytical data obtained from this sampling method comparison study will be used to compare trends between passive and low-flow sampling methods at the Bulk Fuels Facility Site

ASTM D7929-20 Section X3.1.1 Procedure	Supplemental Investigation Work Plan Section 5.4 Procedure	Variation
Passive sampler and pump deployed	Passive sampler and pump deployed simultaneously	No difference.
Passive sampler is fully submerged and left in the well for the proper equilibration period prior to sampling	Passive sampler is fully submerged and left in the well for the proper equilibration period prior to sampling (at least 14 days)	No difference.
Samples collected from the same depth	Passive samples collected below the pump inlet depth	Due to the well casing diameter, the pump and passive samplers cannot be placed at the same depth at the same time. Passive samplers will be hung 0.2 feet below the pump, minimizing the difference in depth.
Avoid disturbance to the water column when removing the passive sampler	Low-flow sample collected prior to passive sample to minimize disturbance to the water column	Due to the depth to groundwater at this site (approximately 450 ft bgs), it is difficult to install or remove equipment without significantly disturbing the water column. To eliminate the risk of disturbing the water column, the entire sampling assembly will be installed prior to the passive sampling equilibration time, and will not be removed until after low-flow sampling is complete.
Collect passive sample prior to pumped sample	Low-flow sample collected prior to passive sample	Because the passive samplers will be hung below the pump, they cannot be retrieved without also removing the pump. To minimize disturbance to the water column, low-flow samples will be collected first and then the entire sampling assembly will be retrieved to collect passive samples.



Site Activity Timeline

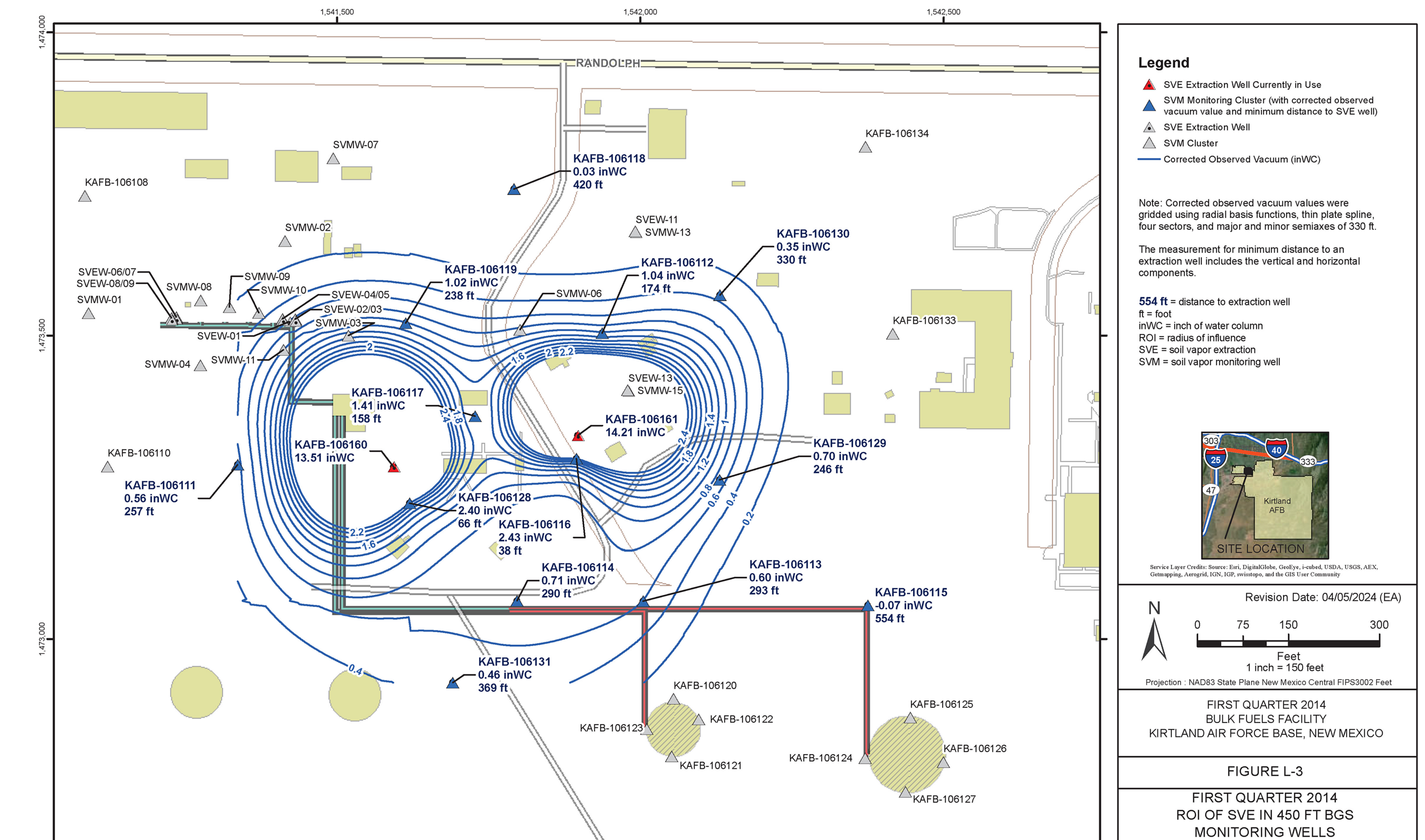
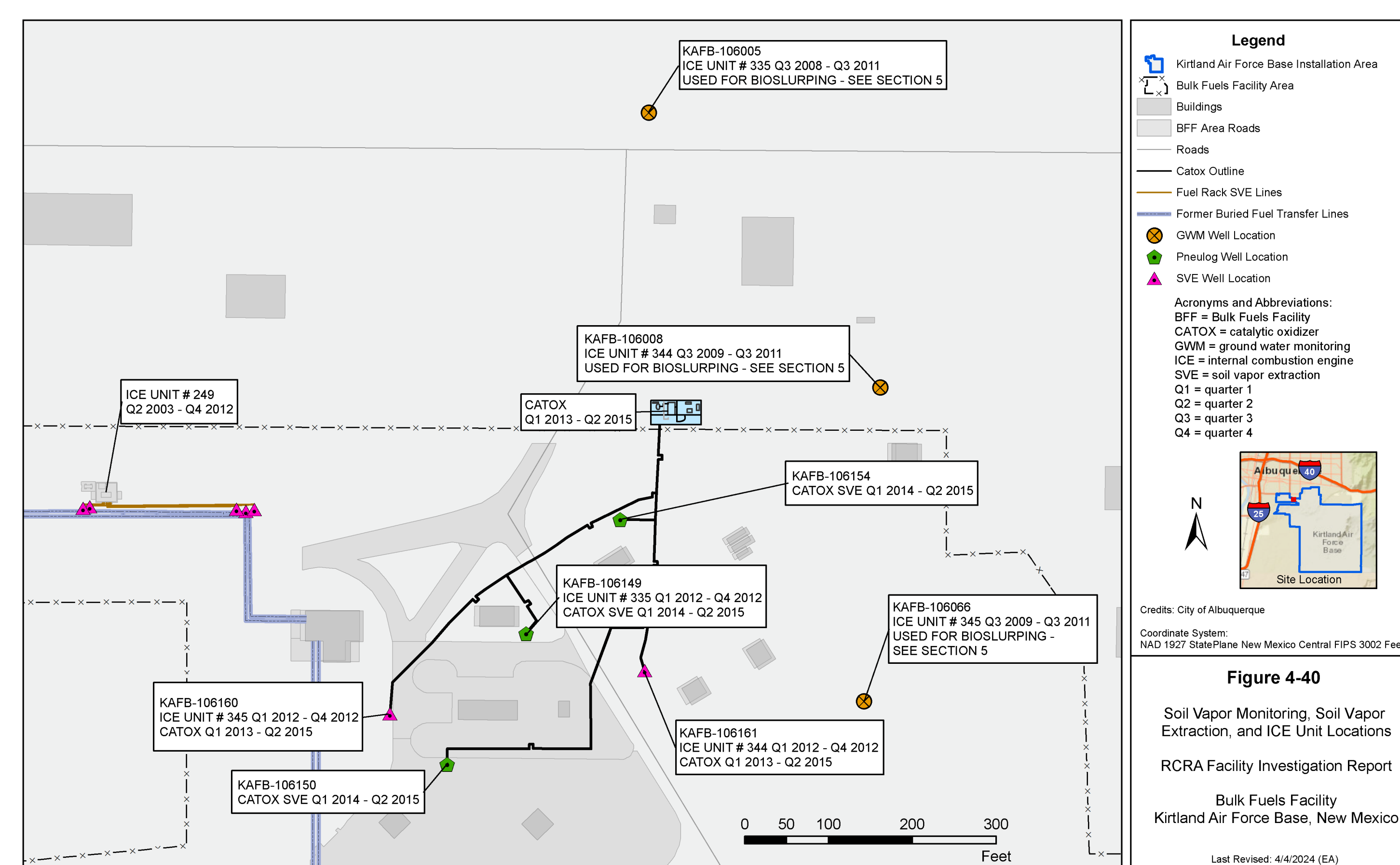
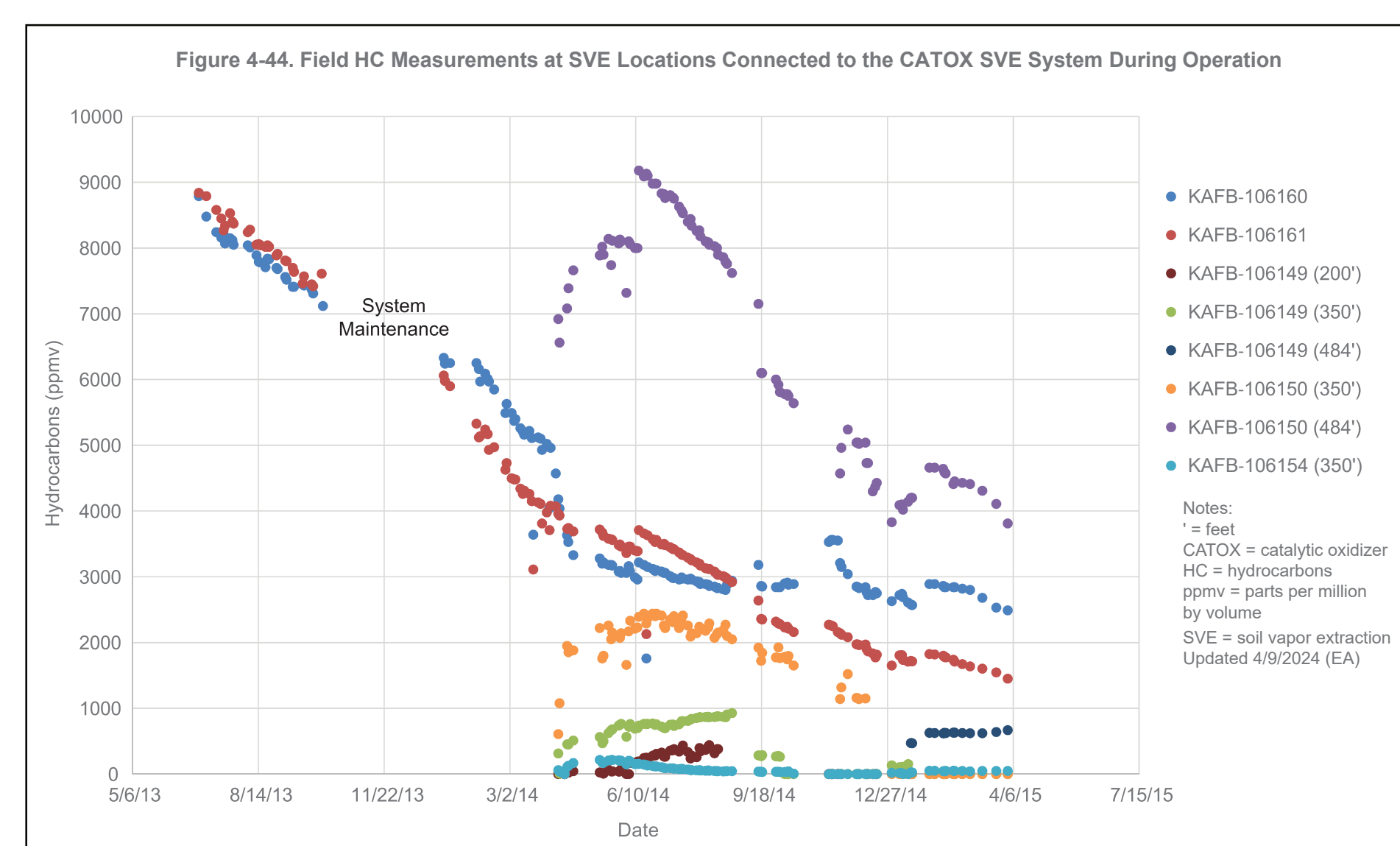
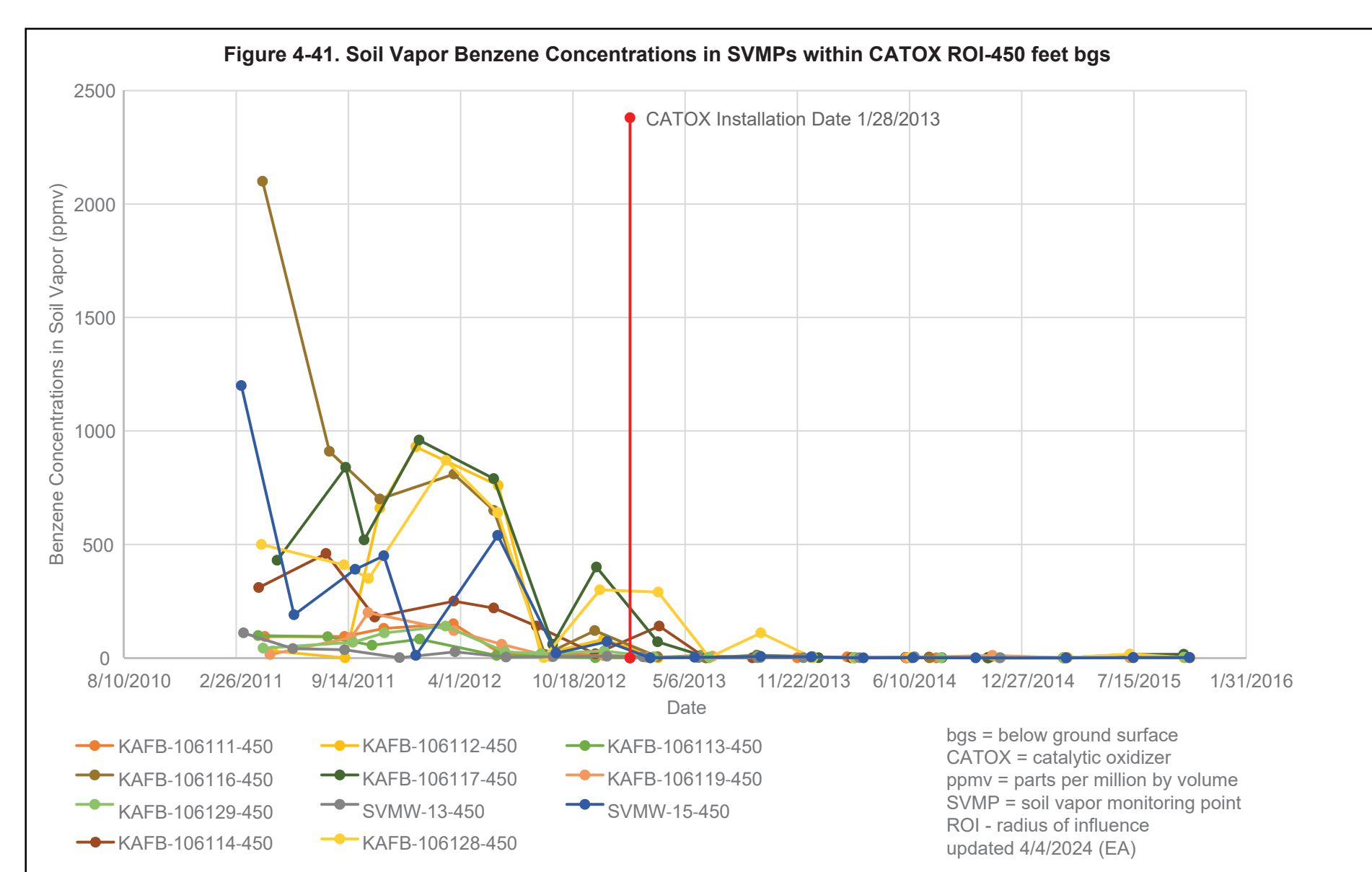
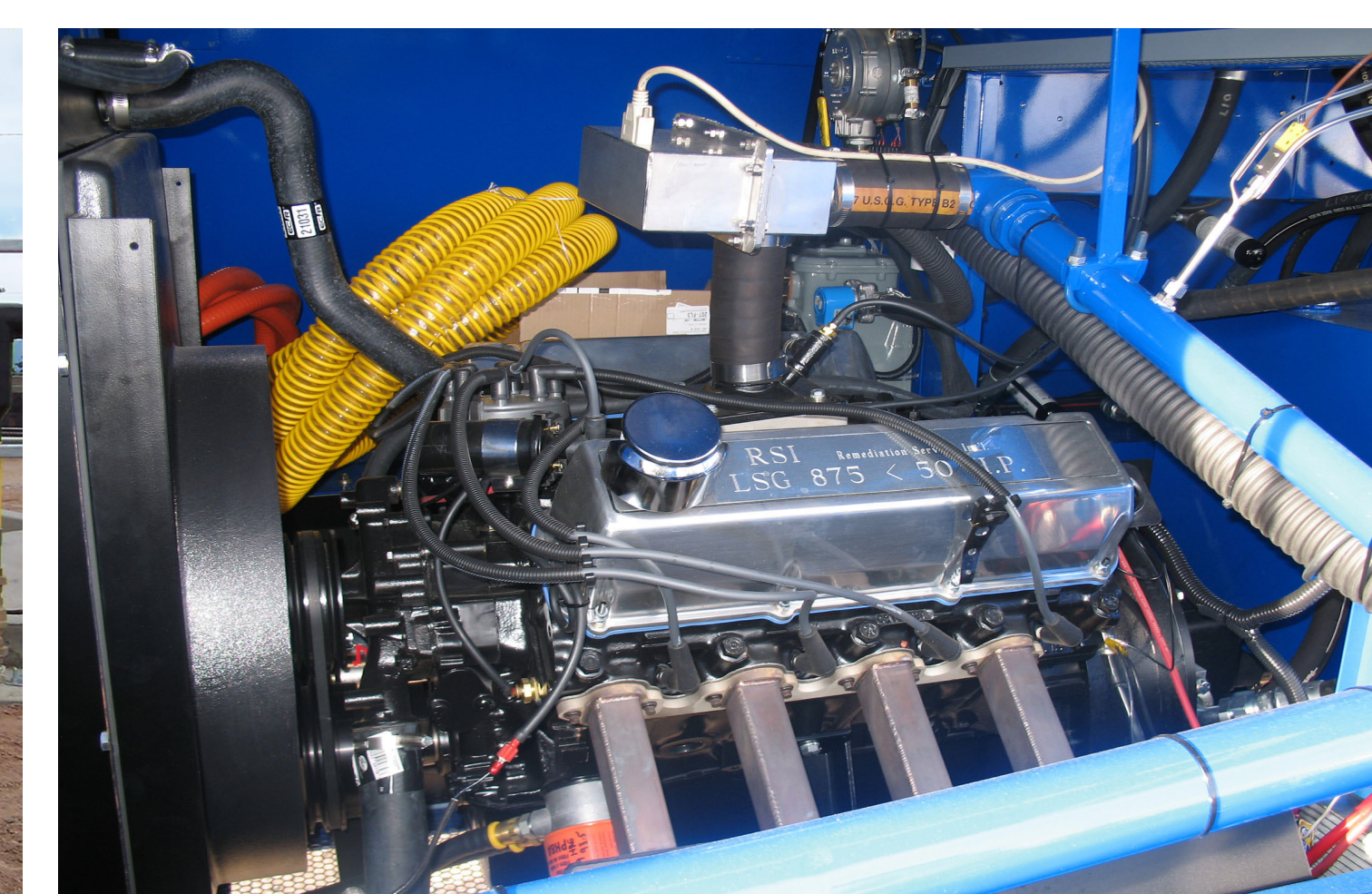


Soil Vapor Extraction (SVE) and Vadose Zone Interim Measure (IM) Summary

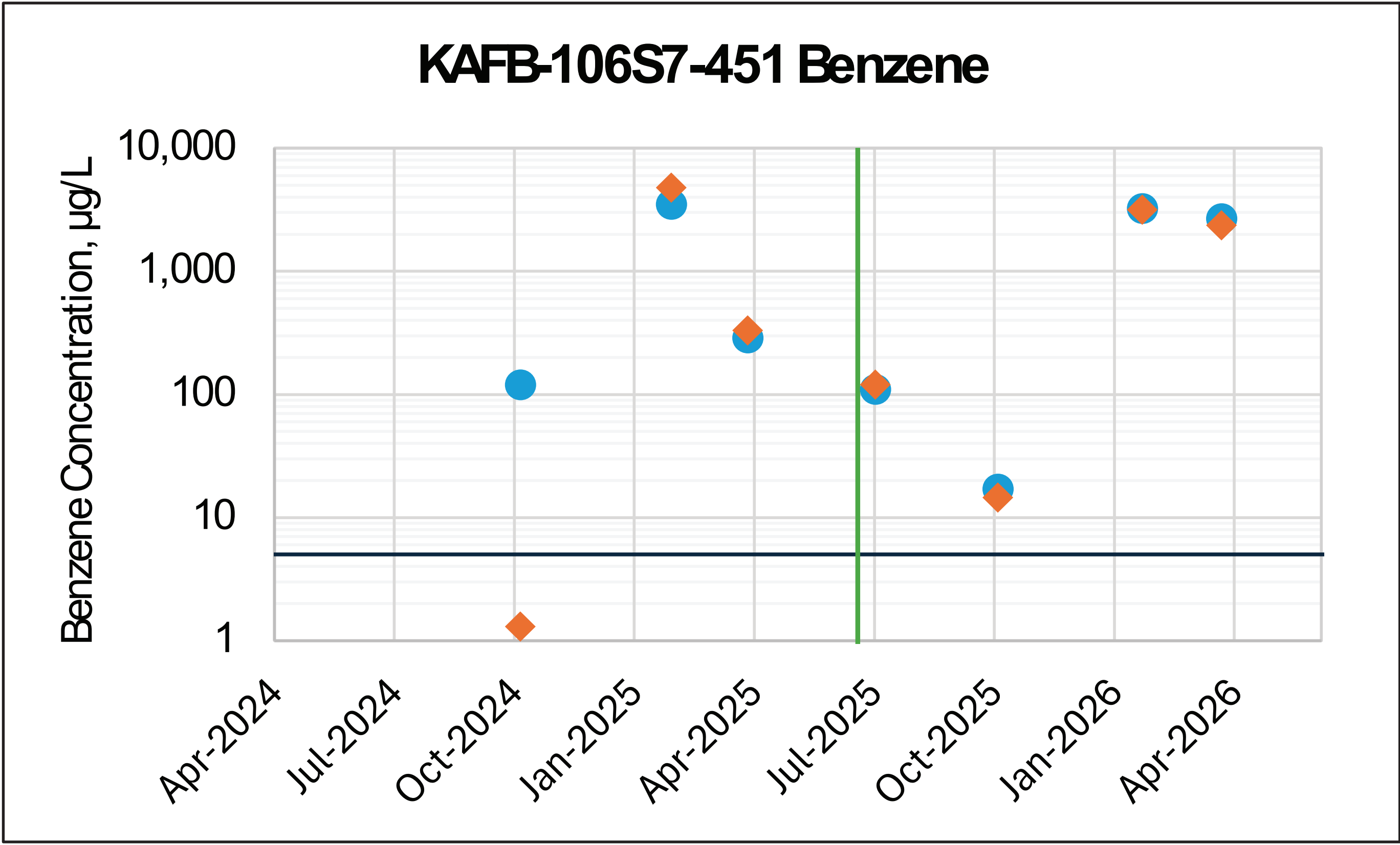
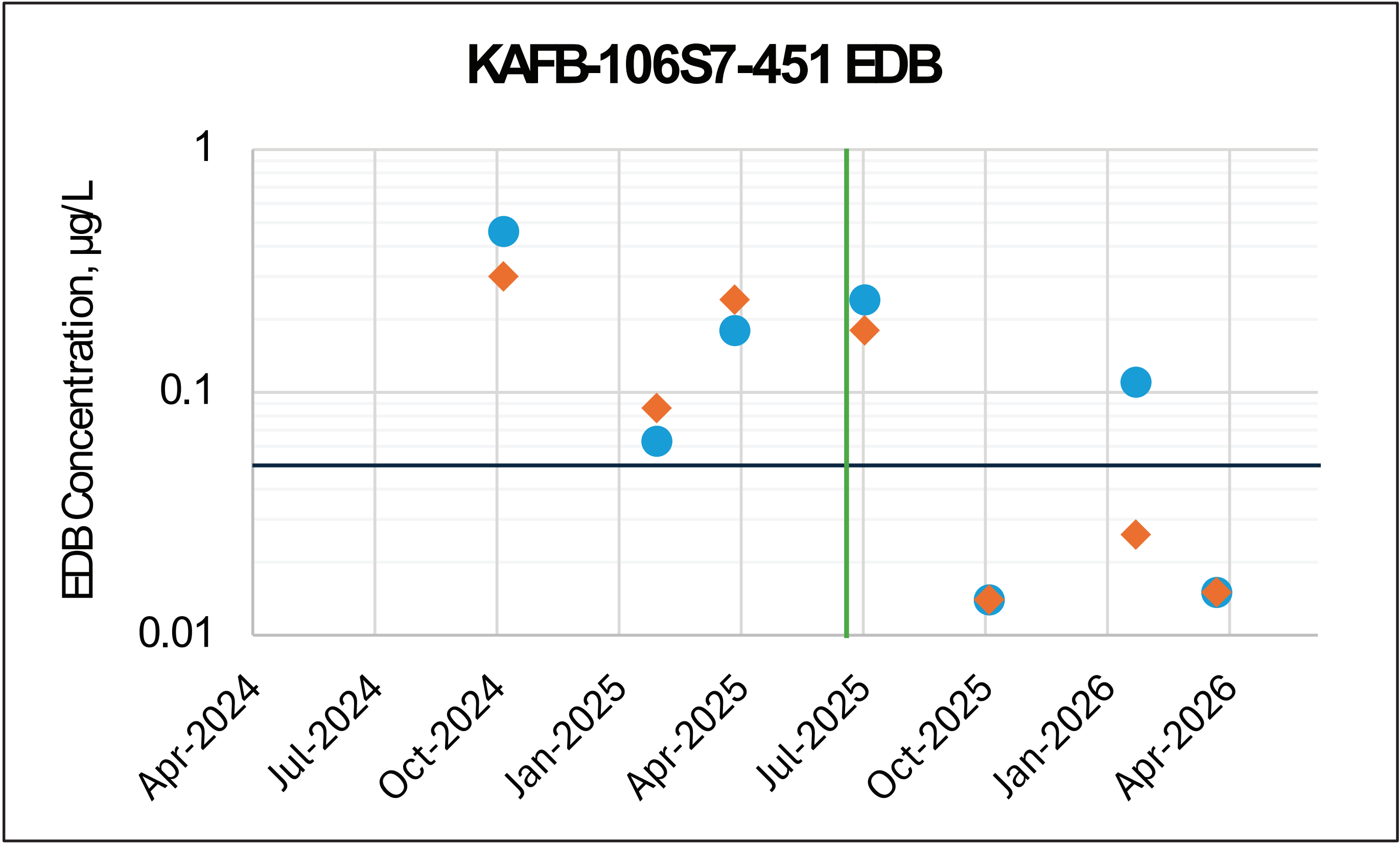
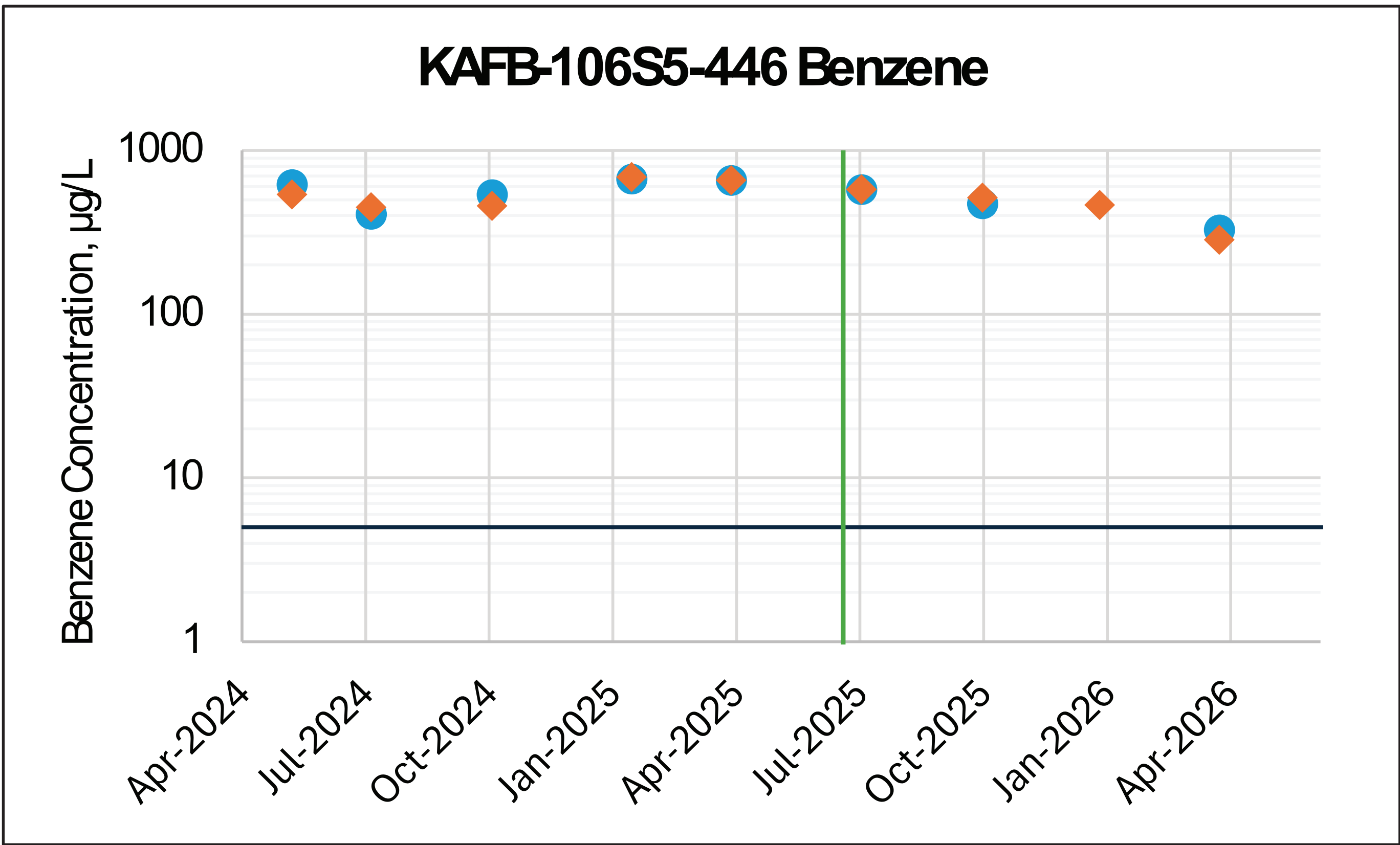
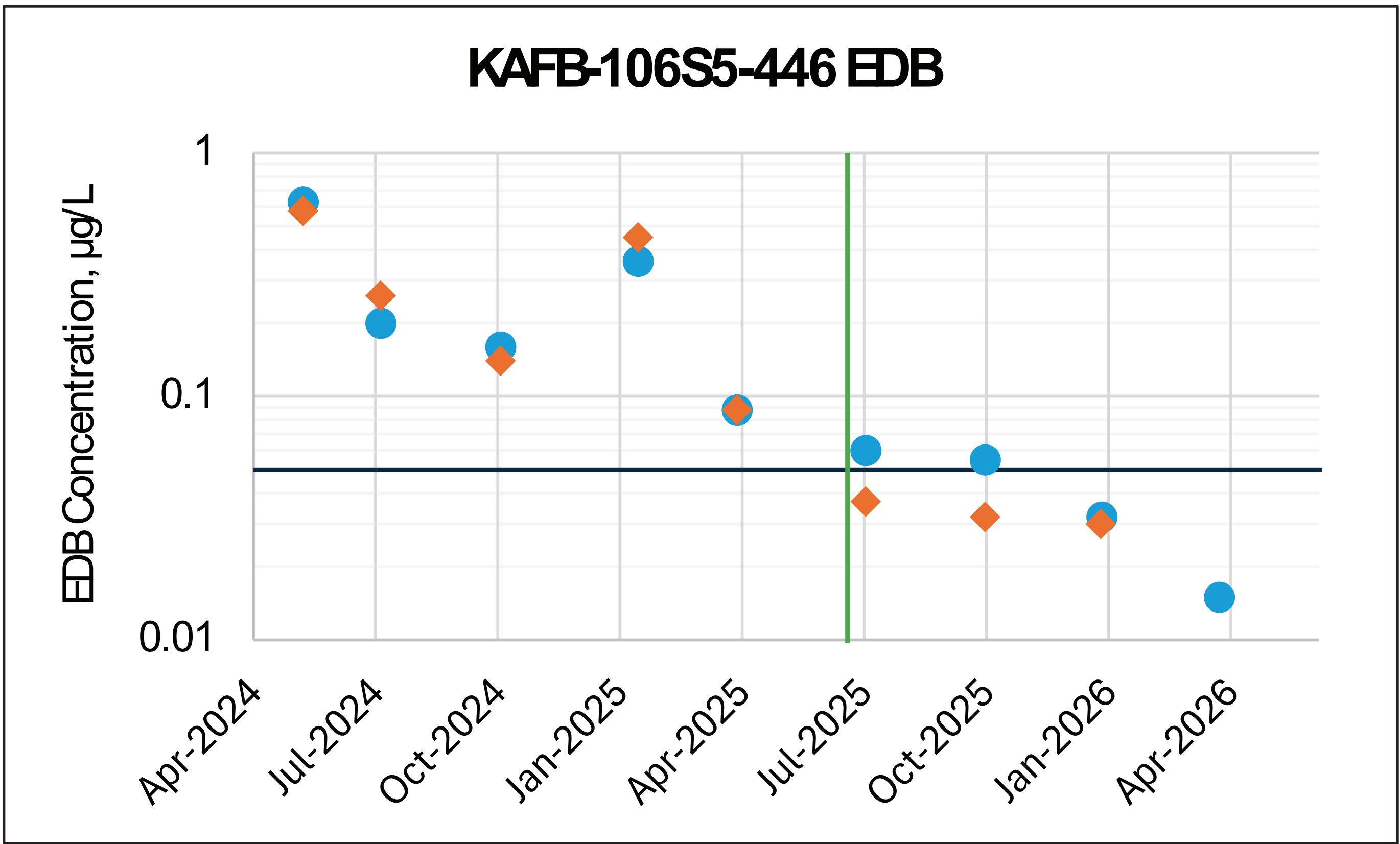
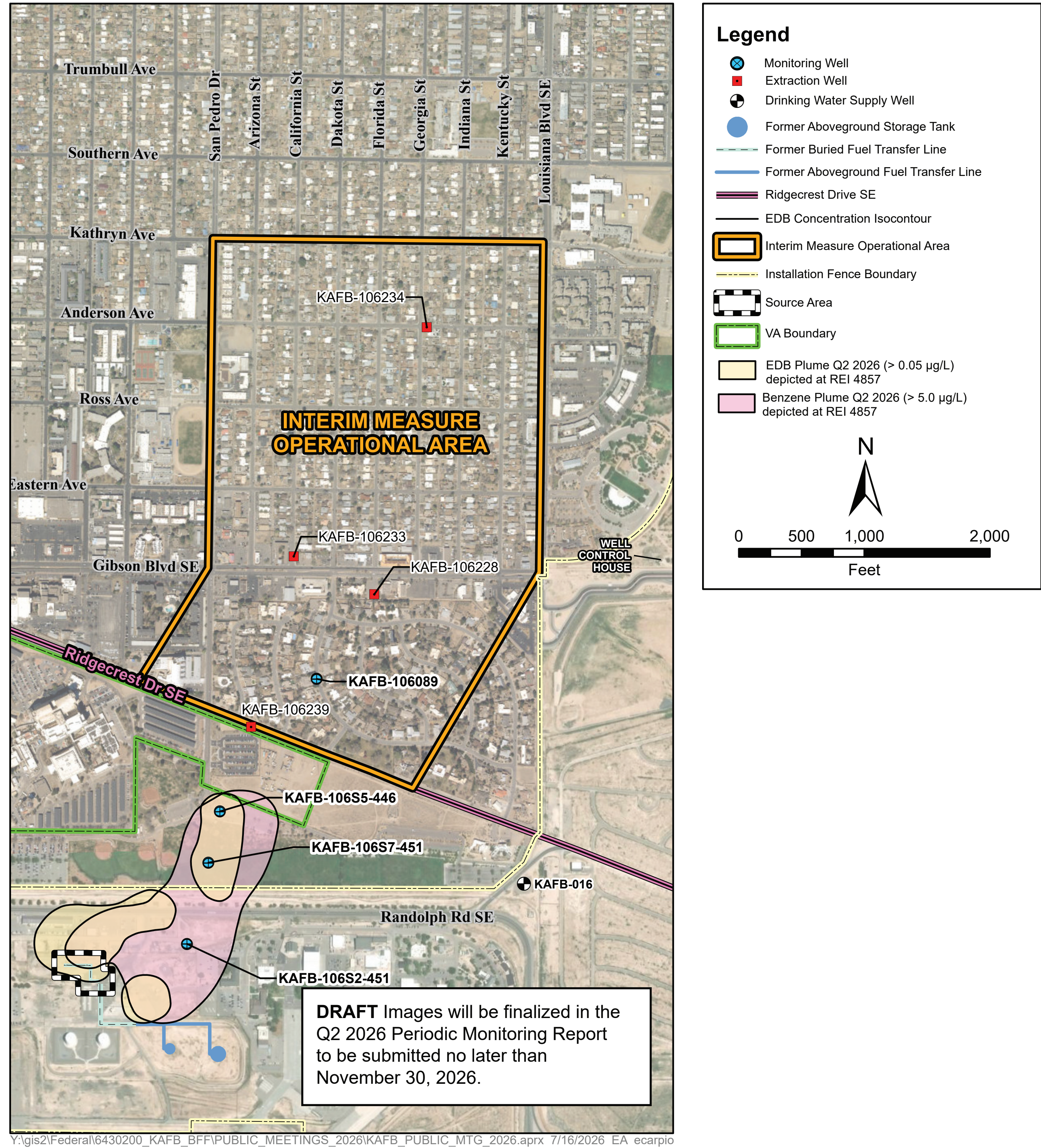
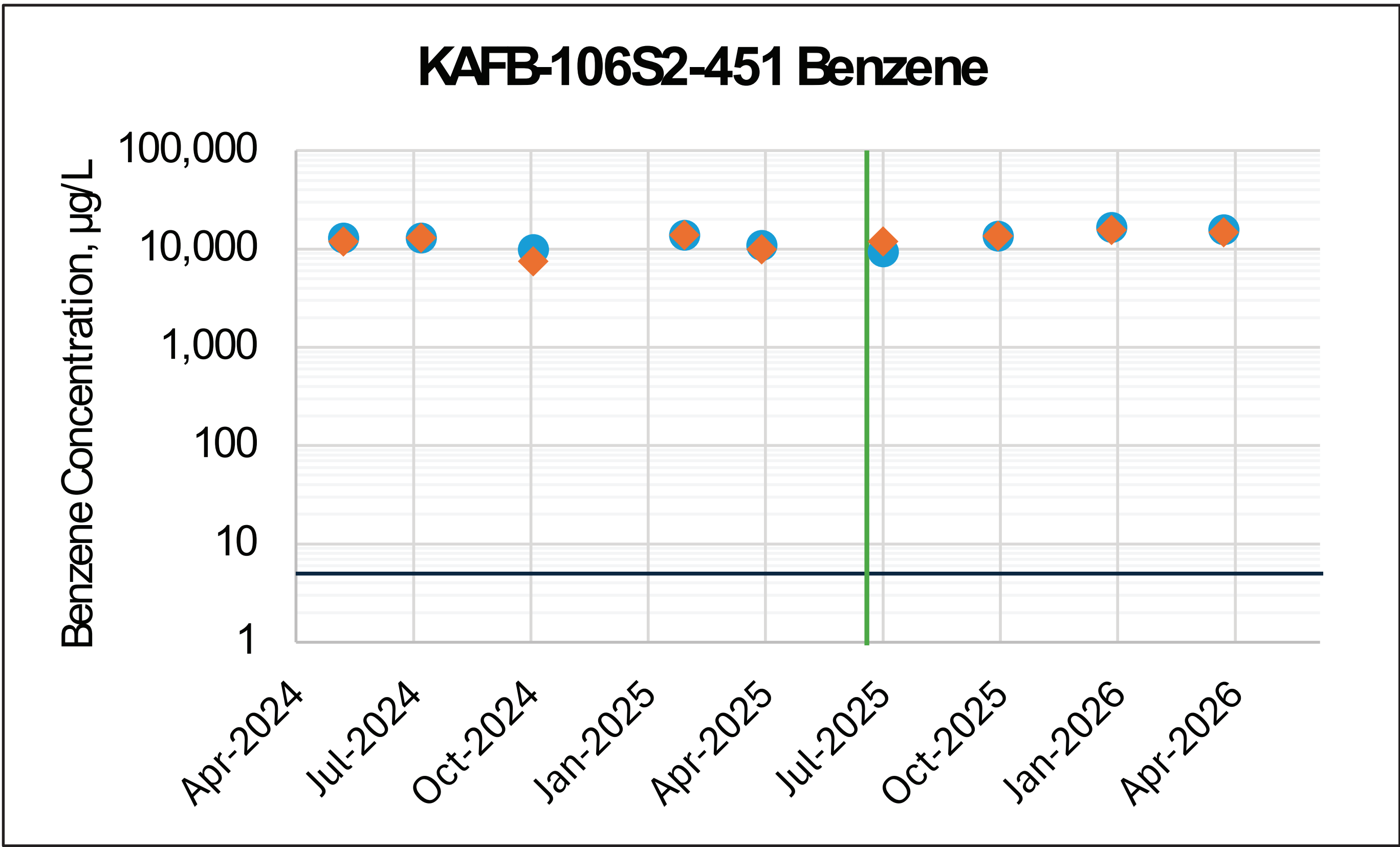
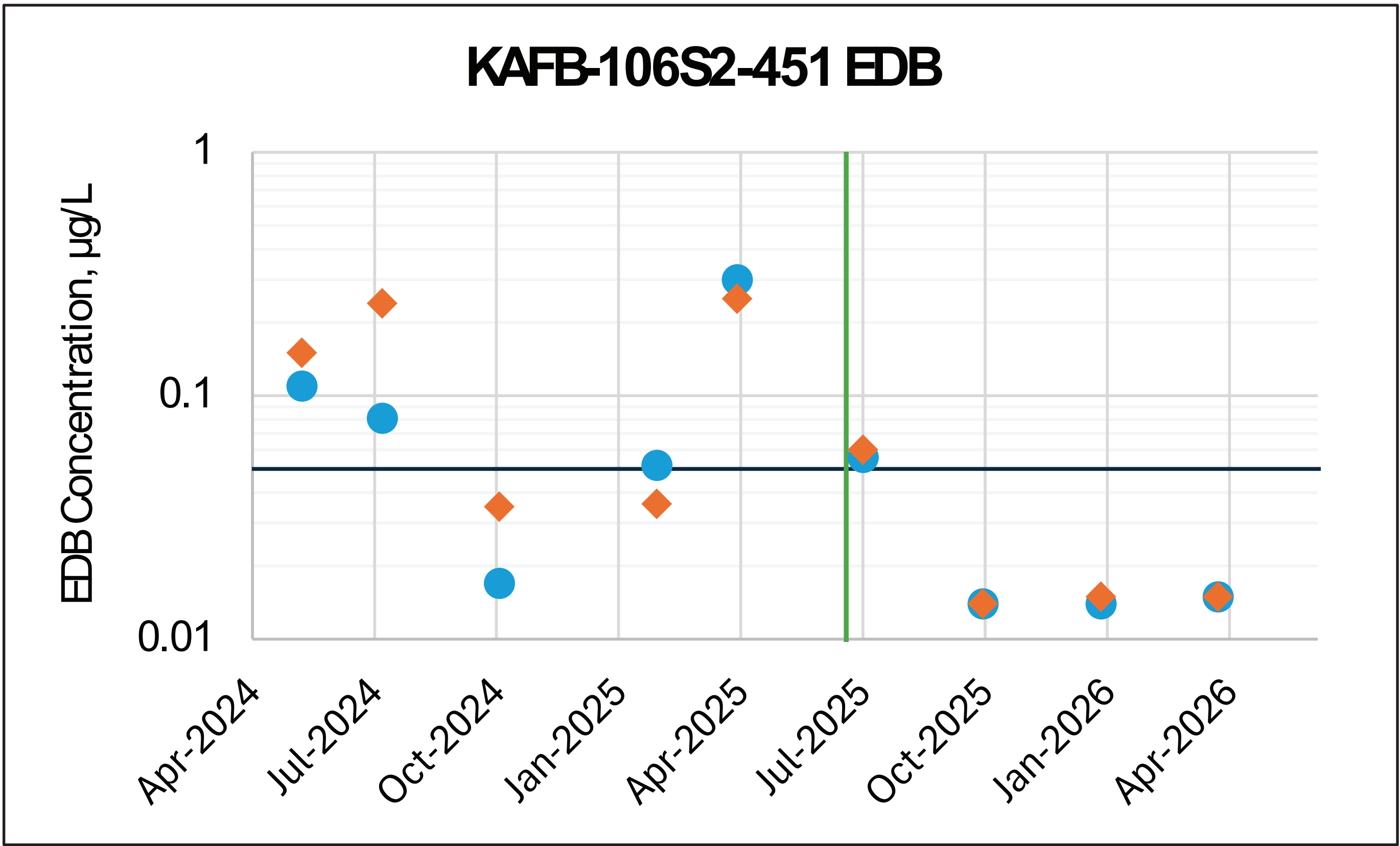
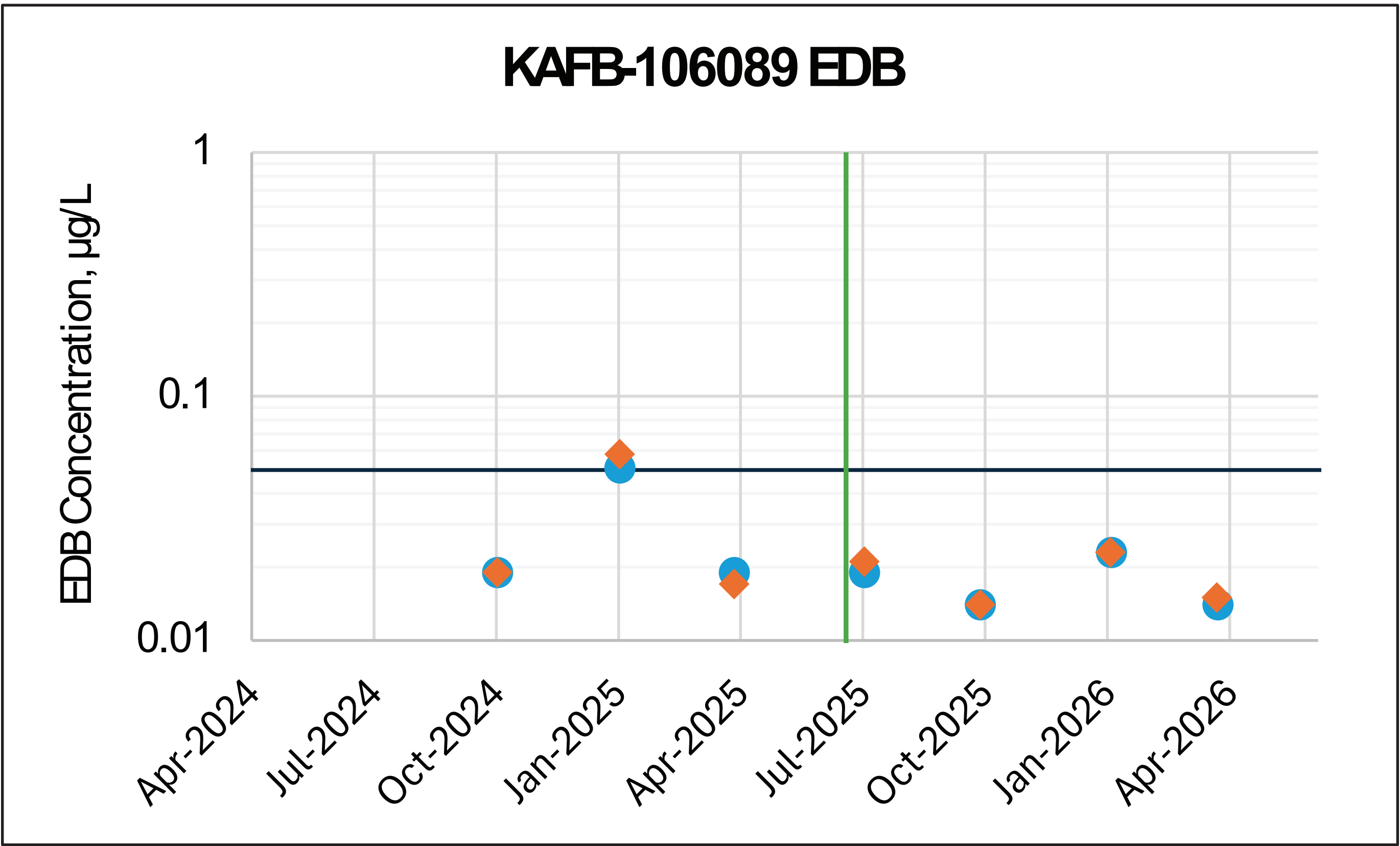


Several forms of IM performed between (2003-2015)

- Internal combustion engine (2003-2012; targeted where fuel was released)
 - Skimmer pumps (2007-2008; following the first discovery of fuel at the water table in 2007; 280 gallons removed)
 - Modified Bioslurping (2008-2011; targeted fuel at the water table)
 - Catalytic oxidizer (2013-2015; utilized five SVE wells across vadose zone)
 - 567,050 equivalent gallons of fuel removed from vadose zone through bioslurping and SVE
 - 209,000 gallons of fuel biodegraded due to SVE operation
 - On October 21, 2015, during a technical working group meeting attended by Air Force, NMED, and other stakeholders, it was decided to deactivate the CATOX SVE due to low vapor recovery and high supplemental fuel consumption
 - Since SVE shutdown, semi-annual soil vapor monitoring has been conducted to define the nature and extent of soil vapor contamination under steady-state conditions
 - SVE technologies will be evaluated in the CME Phase
- Approximately 775,000 equivalent gallons of fuel removed due to SVE, skimmer pump, and bioslurping**

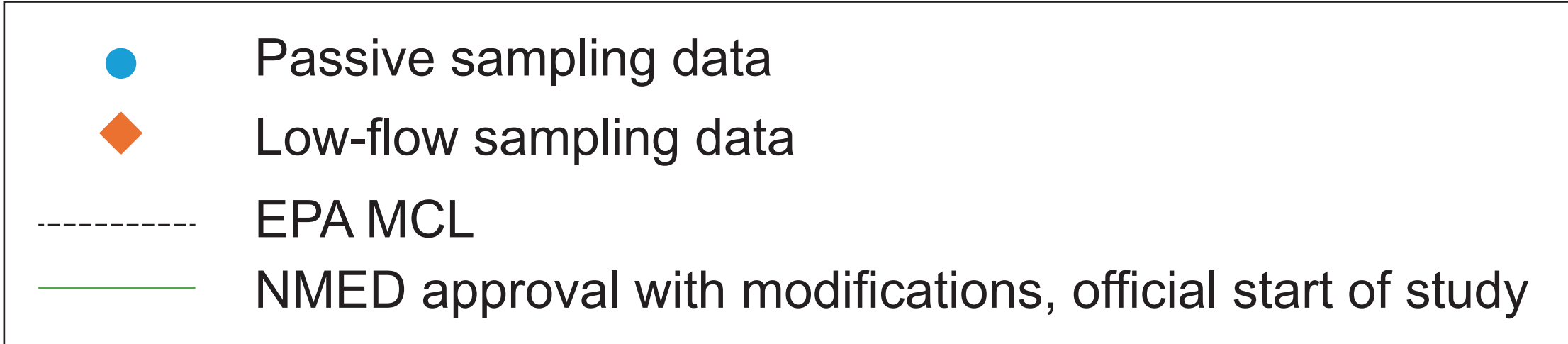


Time Series Graphs for Comparison Study Wells to Date



Notes:
All benzene results for KAFB-106089 were non-detect.
Open symbols indicate non-detect result at the LOD concentration.
Eight quarters of comparison study sampling began in Q3 2025.
Preliminary data collected prior to NMED approval using the same methods will be used to supplement the study.

EDB = 1,2-dibromoethane (ethylene dibromide)
EPA = U.S. Environmental Protection Agency
LOD = limit of detection
MCL = maximum contaminant level
NMED = New Mexico Environment Department
REI = reference elevation interval
Q3 = quarter 3
Q2 = quarter 2
µg/L = microgram(s) per liter



Treated Effluent Disposition Locations

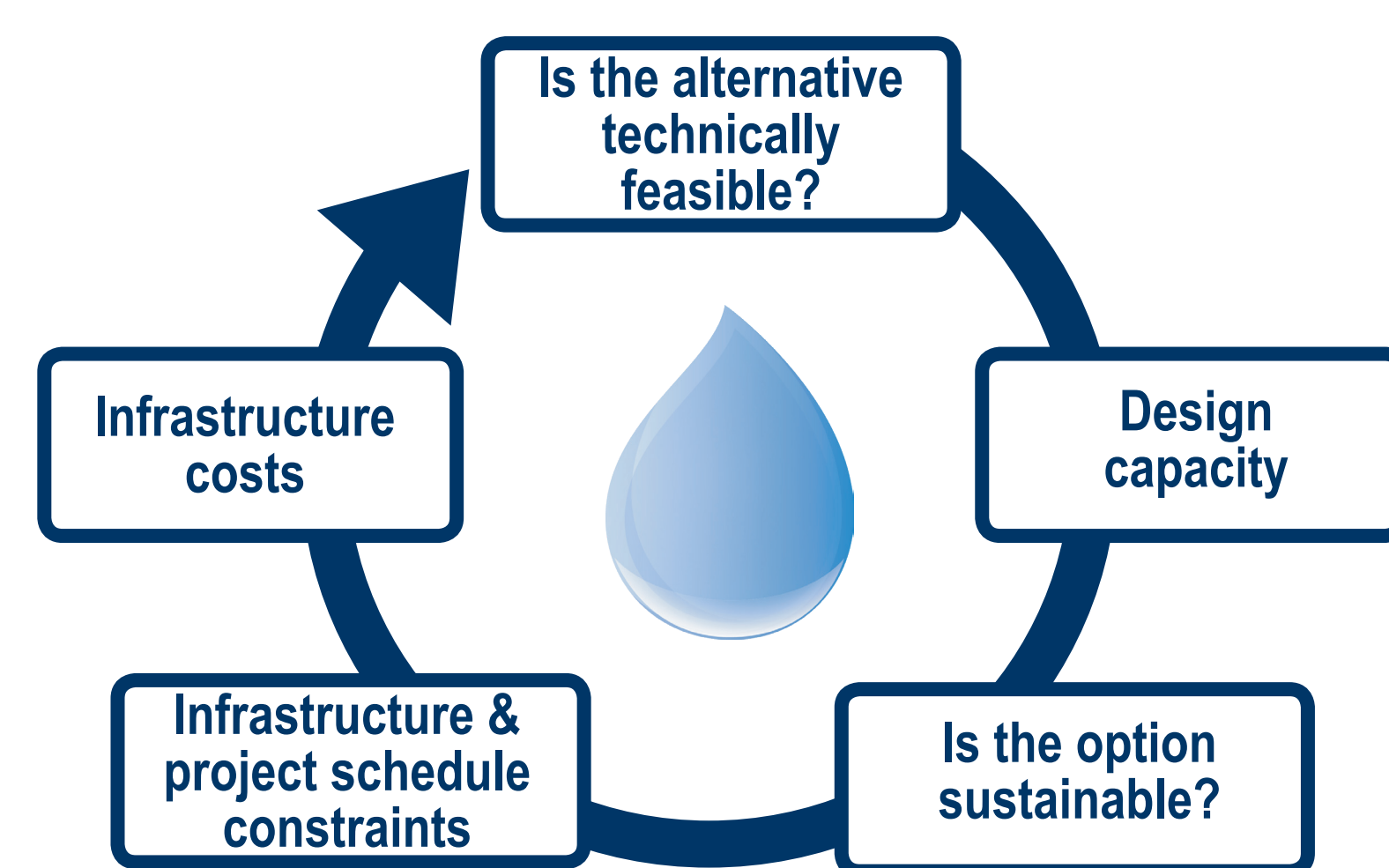


Treated effluent quantities discharged as of 7/13/2026:

- 2,532,596,200 total gallons treated
- 1,395,788,965 treated gallons discharged to Golf Course Main Pond
- 688,262,235 treated gallons discharged to KAFB-007
- 448,545,000 treated gallons discharged to KAFB-106IN2

BENEFICIAL USE OF TREATED WATER

Different options (e.g., infiltration galleries, surface application such as irrigation, retention ponds, injection, etc.) were considered for discharging water treated from the full-scale groundwater treatment facility. These options were evaluated using the beneficial reuse criteria below.



Based on evaluation, which included an understanding of how water moves through soil, two options were identified as viable methods for discharging treated water: 1.) use of the Kirtland AFB Golf Course pond to hold water for irrigation use on the golf course and 2.) use of a gravity-fed well to inject water into the aquifer.

