Managed and Operated by
Consolidated Nuclear Security, LLC

Environmental Projects: Public Meeting

November 1, 2022

Tony Biggs

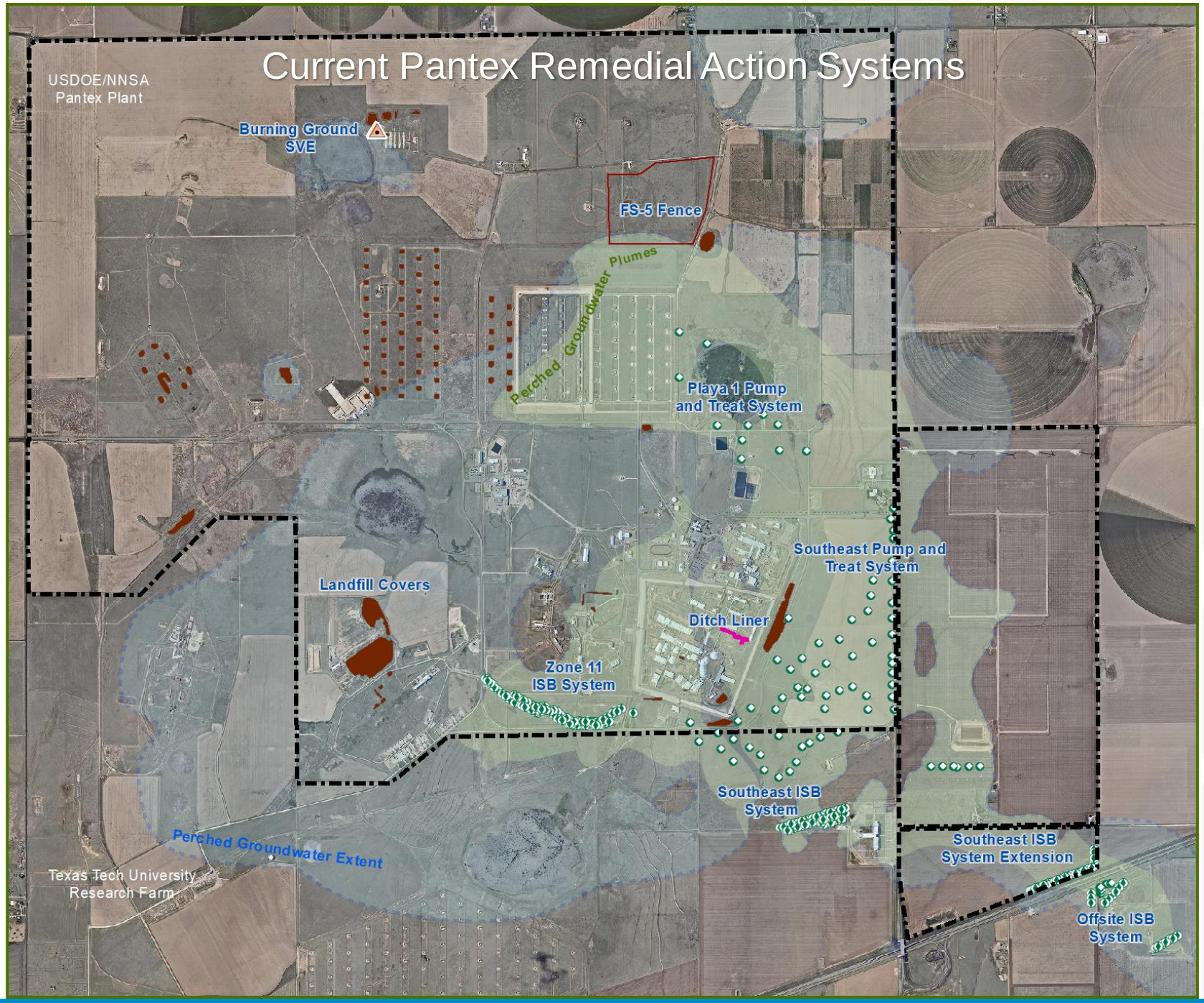
Environmental Projects Department Manager

Presentation Highlights

Pantex Overview

Remedial Action Status at Pantex

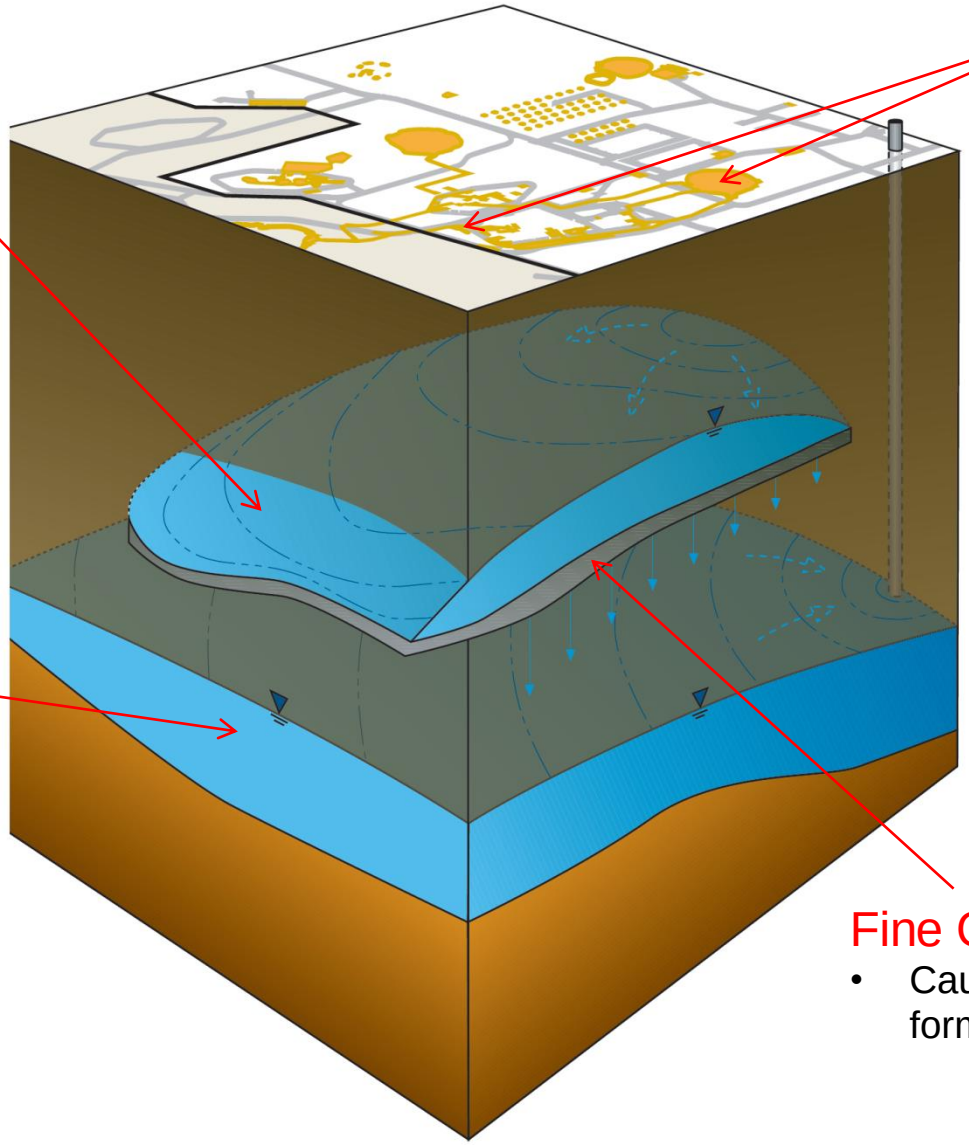
- Cleanup Actions
- Accomplishments for 2021
  - Pump and Treat Systems
  - *In Situ* Bioremediation Systems
  - Soil Vapor Extraction System
  - Ogallala Detection Monitoring
- Emerging contaminants – PFAS/PFAOS
- Five-Year Review (FYR) Milestones Accomplishments


Current Pantex Remedial Action Systems
USDOE/NNSA
Pantex Plant
Burning Ground
SVE
FS-5 Fence
Perched Groundwater Plumes
Playa 1 Pump
and Treat System
Southeast Pump and
Treat System
Landfill Covers
Ditch Liner
Zone 11
ISB System
Southeast ISB
System
Perched Groundwater Extent
Texas Tech University
Research Farm
Southeast ISB
System Extension
Offsite ISB
System

Groundwater Flow at Pantex

Perched Aquifer

- Depth: 200-300 ft bgs
- Saturated thickness: <1 to 75 ft (avg 15 -20')



Playas/Ditches

- Past discharges of legacy wastes expanded our perched aquifer and contributed high explosive, solvents, perchlorate and chromium to perched groundwater

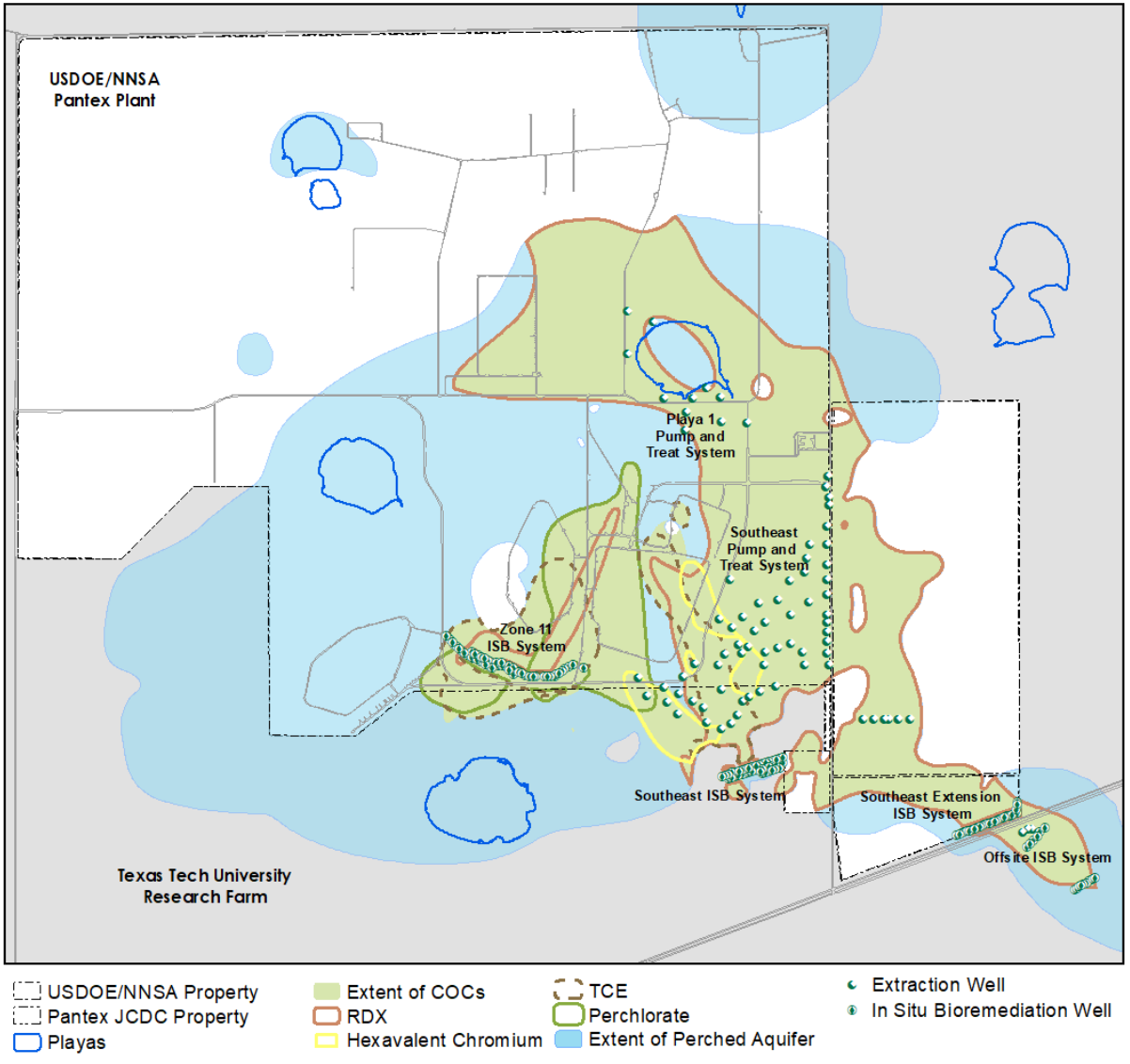
Ogallala Aquifer

- Regional drinking water resource
- Depth: 400-500 ft bgs
- Saturated thickness ranges from 100-400 ft occurs 100-200 ft beneath perched aquifer

Fine Grained Zone (FGZ)

- Causes perched water to form

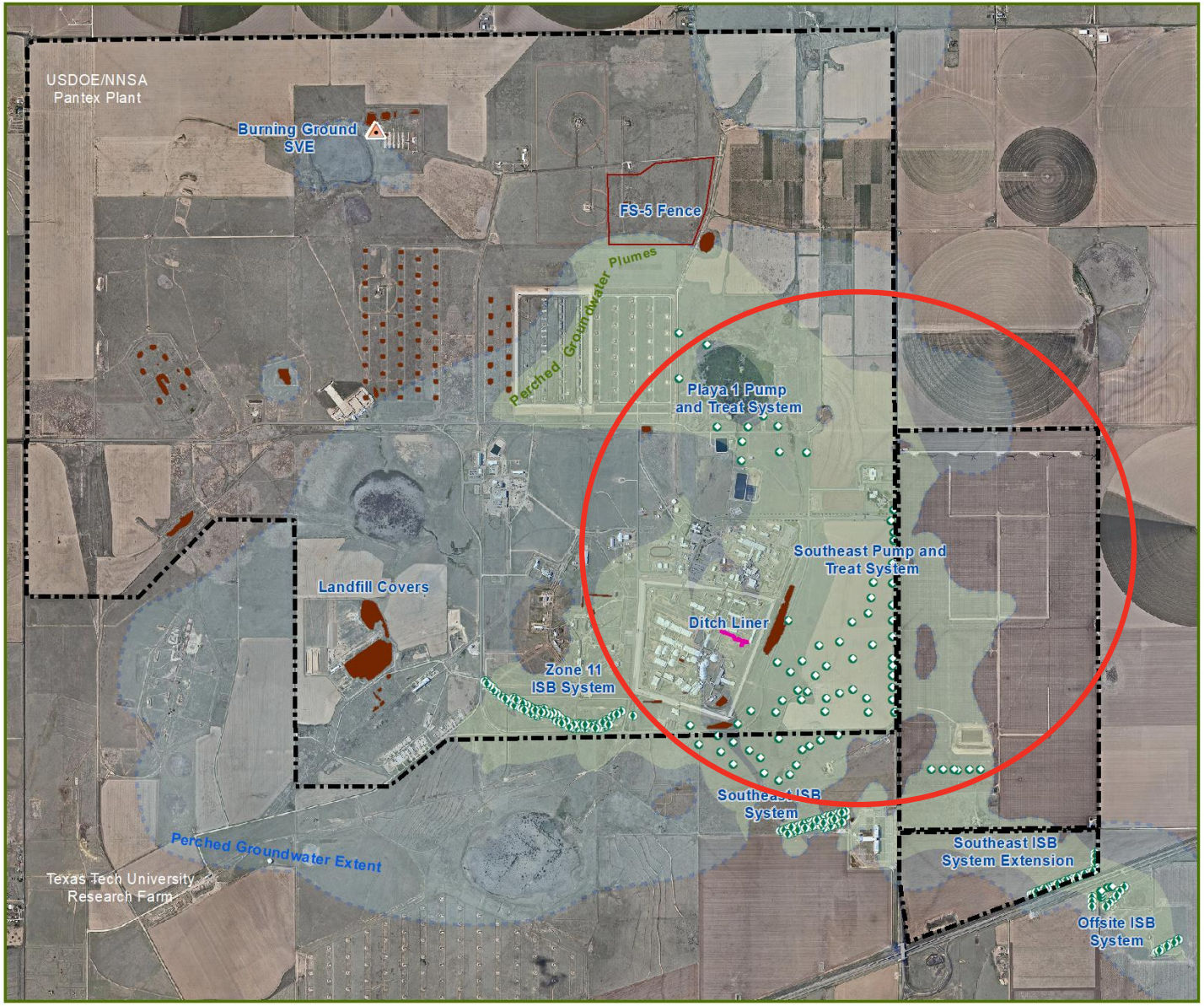
Groundwater Plumes at Pantex



- Perched Groundwater Extent as of Dec 2021
- Main contaminants:
  - High explosives (RDX)
  - Metals (Cr^{+6})
  - Solvents (TCE)
  - Perchlorate
- Mainly contained within DOE controlled boundaries; one area of migration offsite requiring action.

Pump and Treat Systems

Pantex Plant Remedial Action Systems



Pump and Treat Systems

2021 Accomplishments:

- 126 Mgal treated
- 518 lbs of contaminants removed

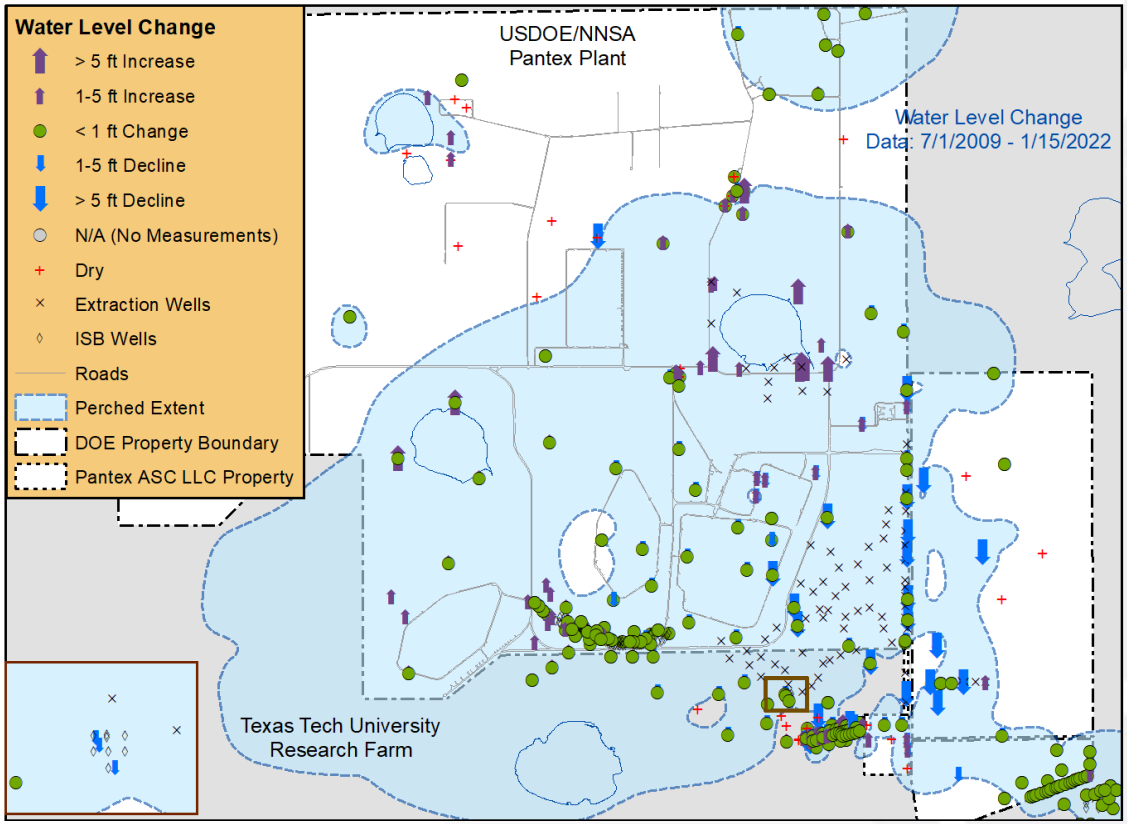
Accomplishments

(Since startup)

- 3.1 billion gallons treated
- 1.7 billion gallons beneficially used
- Declining water levels in areas under the influence of the systems

Challenges:

- **Drip irrigation system under repair into 2022**
  - Resolution: New Pivot Irrigation east of FM 2373 – (construction phase to be complete in March 2023)
  - Resolution: Drip irrigation system repairs completed and has started testing in September 2022
- **Aging infrastructure at SEPTS and P1PTS**
  - Resolution: Awarded contract in September 2022 to upgrade SCADA systems at pump and treat systems
- **Perchlorate entering SEPTS wellfield**
  - Resolution: Finished installation of perchlorate treatment at SETPS in August 2022



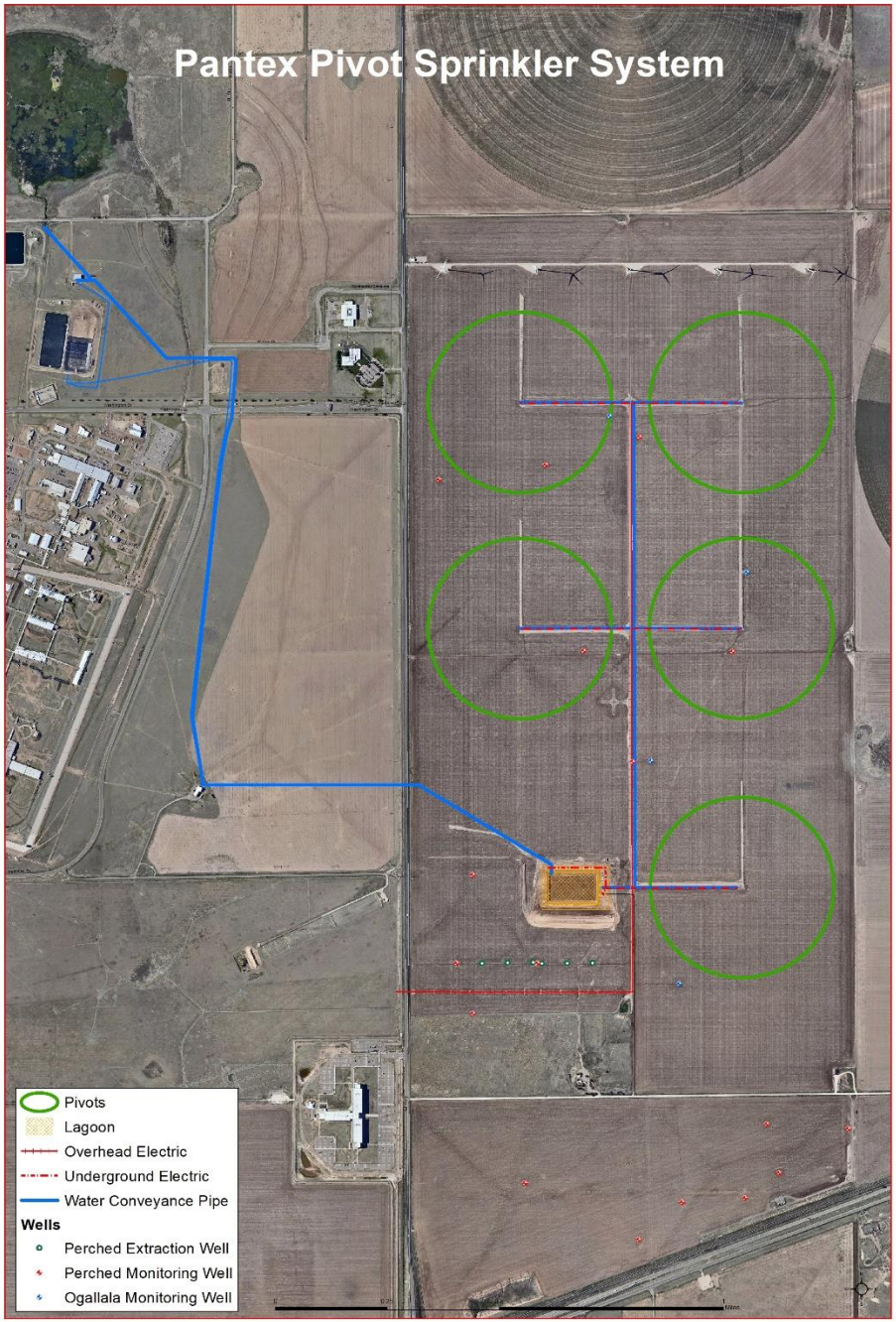
Pivot Sprinkler East of FM 2373

Milestones:

- Began construction in November 2021
- Complete construction in March 2023
- System commissioned to begin operating by Summer 2023

System Components:

- 5 pivot sprinklers, subsurface conveyance line and lagoon pond
- SCADA system to communicate with SEPTS and P1PTS



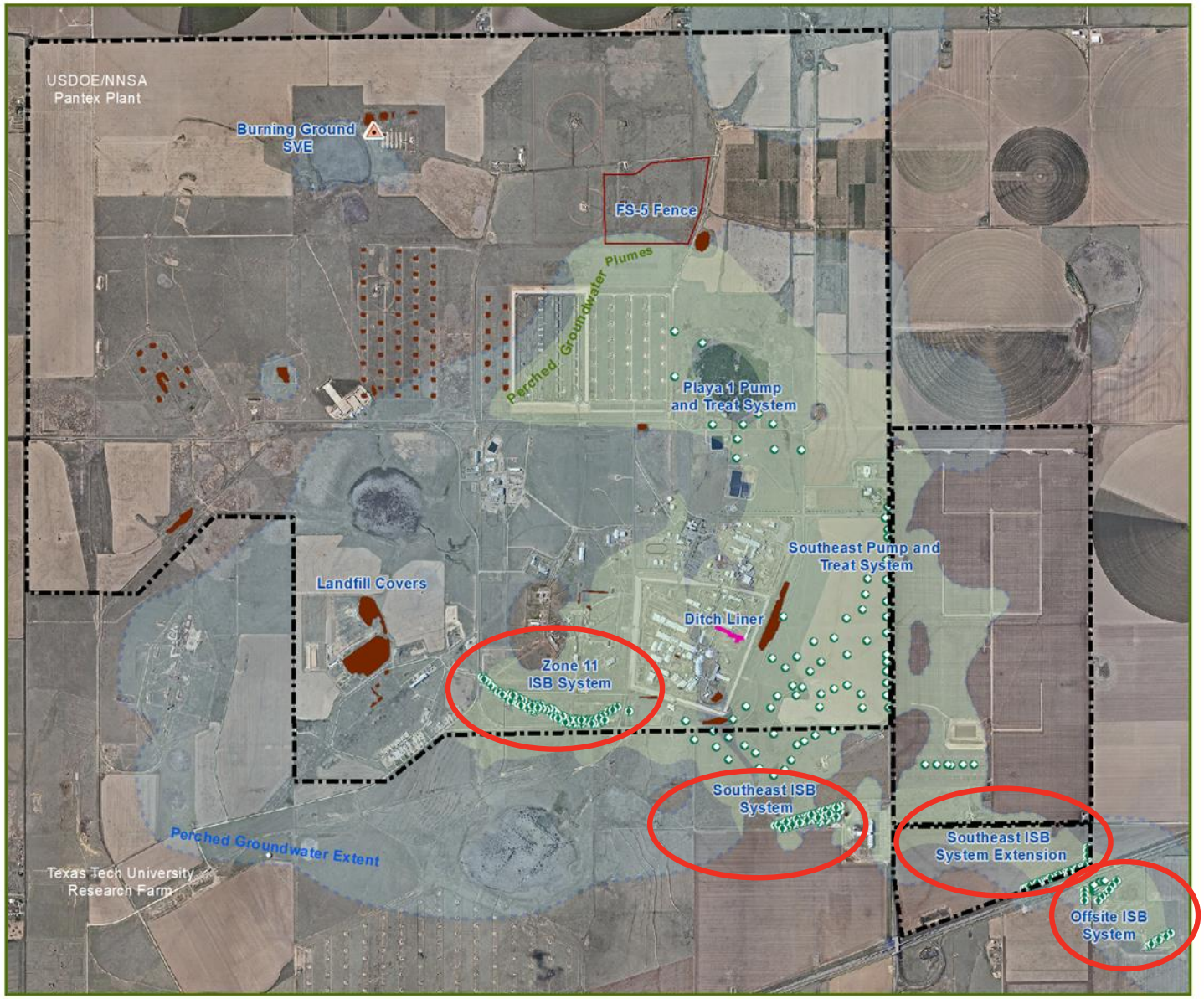
Perchlorate Treatment at SEPTS

System Specifications

- Addresses perchlorate plume coming into SEPTS wellfield
- Total capacity of system: 135 gpm
- Treats extracted water from 19 SEPTS wells

In Situ Bioremediation Systems

Pantex Plant Remedial Action Systems



In Situ Bioremediation (ISB) Systems

(1) Zone 11 ISB:

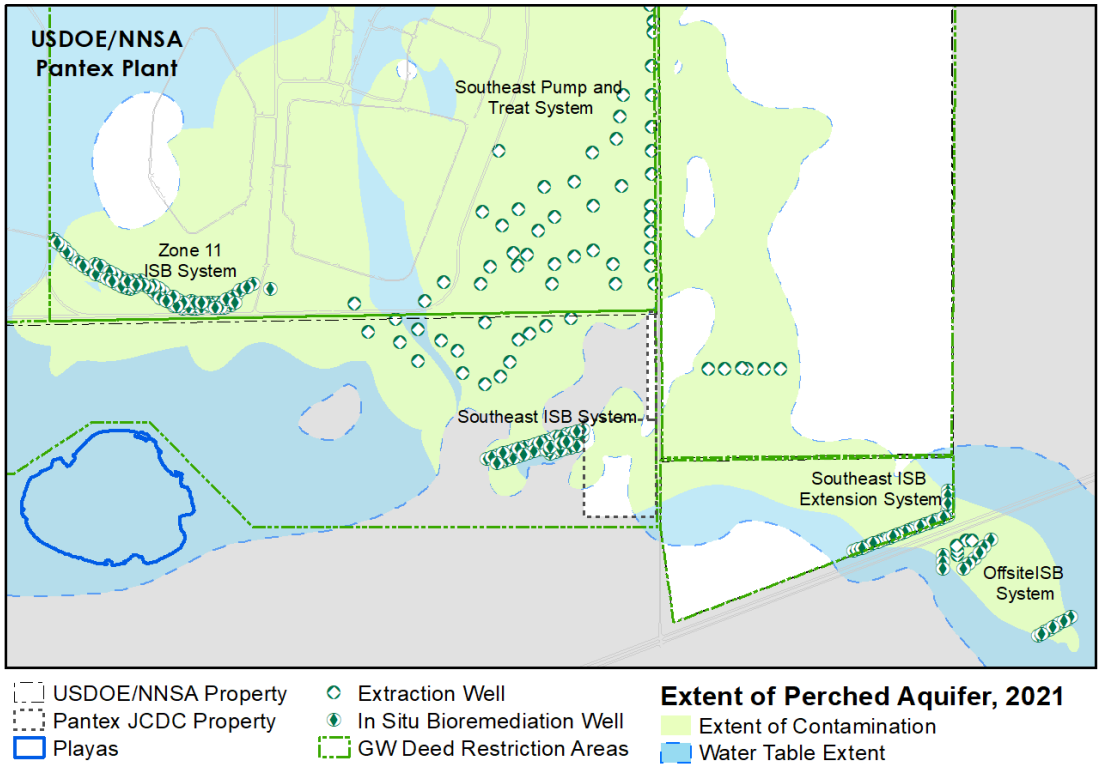
- Perchlorate and TCE reduced near or below groundwater protection standards (GWPS) at most wells

(2) Southeast ISB:

- High explosives reduced below groundwater protection standards (GWPS) at most wells
- Hexavalent chromium reduced in all wells.

(3) Southeast Extension ISB:

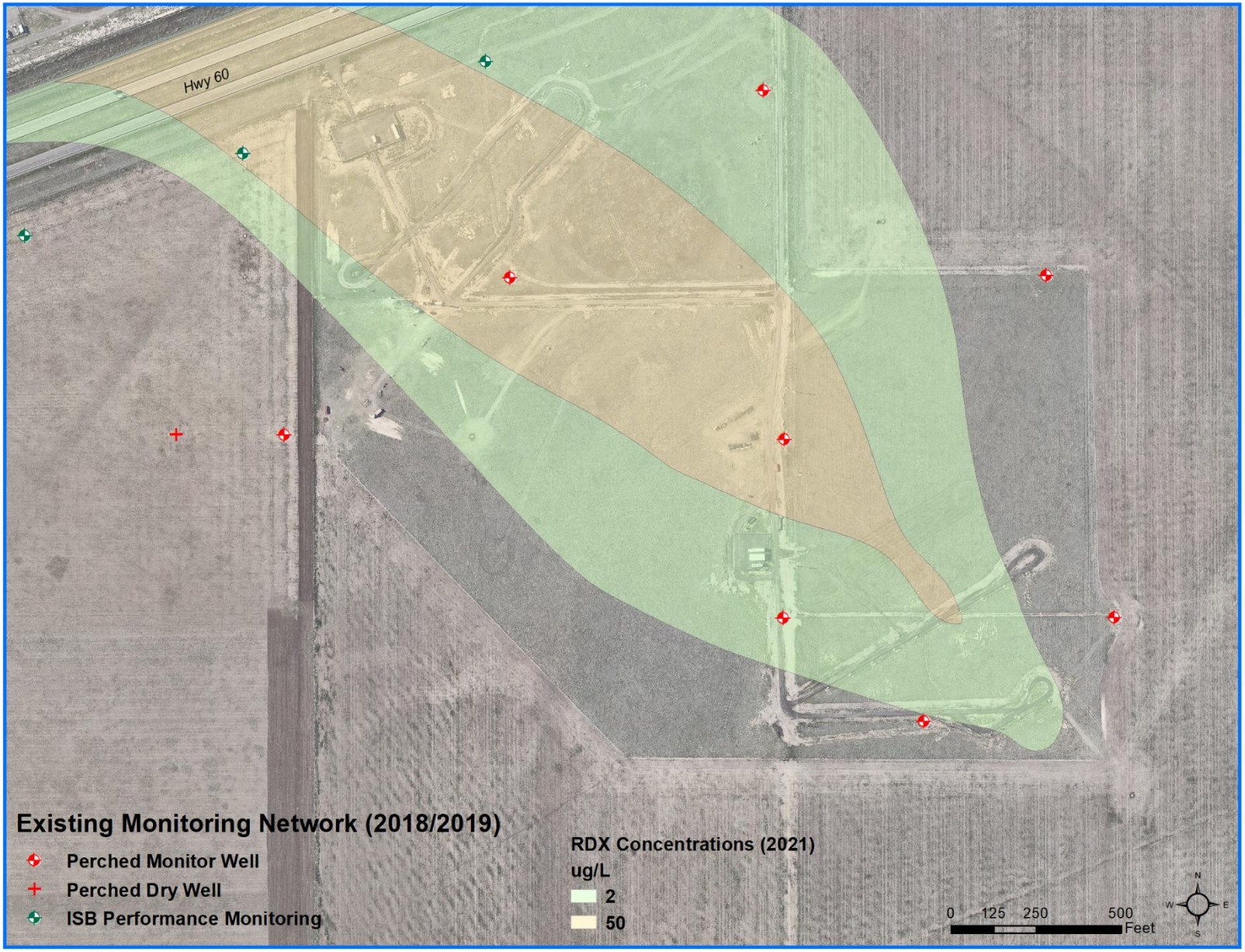
- Expected reduction of HE in in 2023 – early indications of treatment in Offsite Treatment System wells near the northern boundary



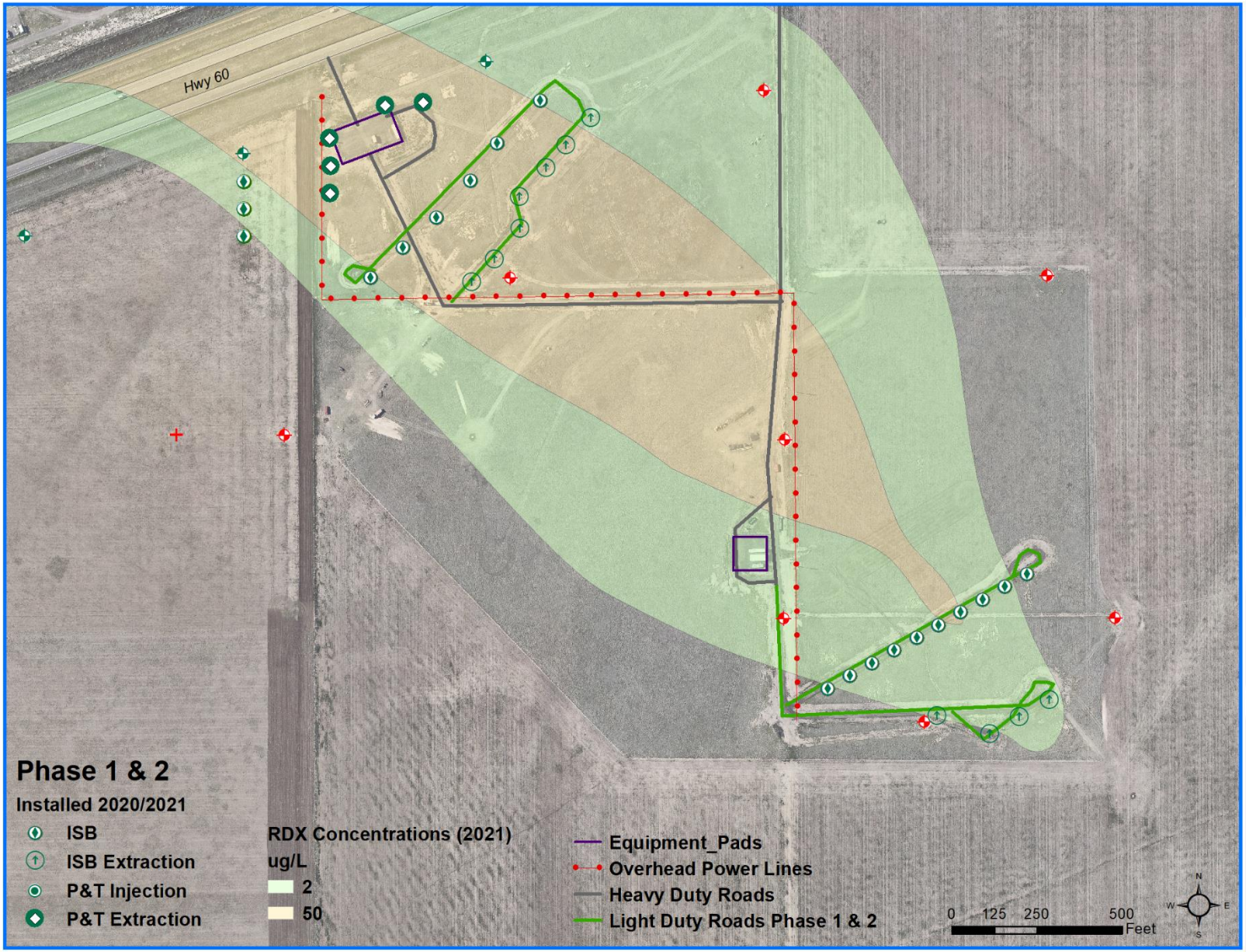
2021 Accomplishments :

- Zone 11 ISB
  - 31 new ISB wells added to address the changing flow gradients in the Zone 11 area and to replace wells that cannot be injected
  - Completed one injection event including new wells, where complete
- Southeast ISB Extension
  - Completed two injection events in 2021
- Offsite ISB
  - Wells at the leading edge of the plume were injected

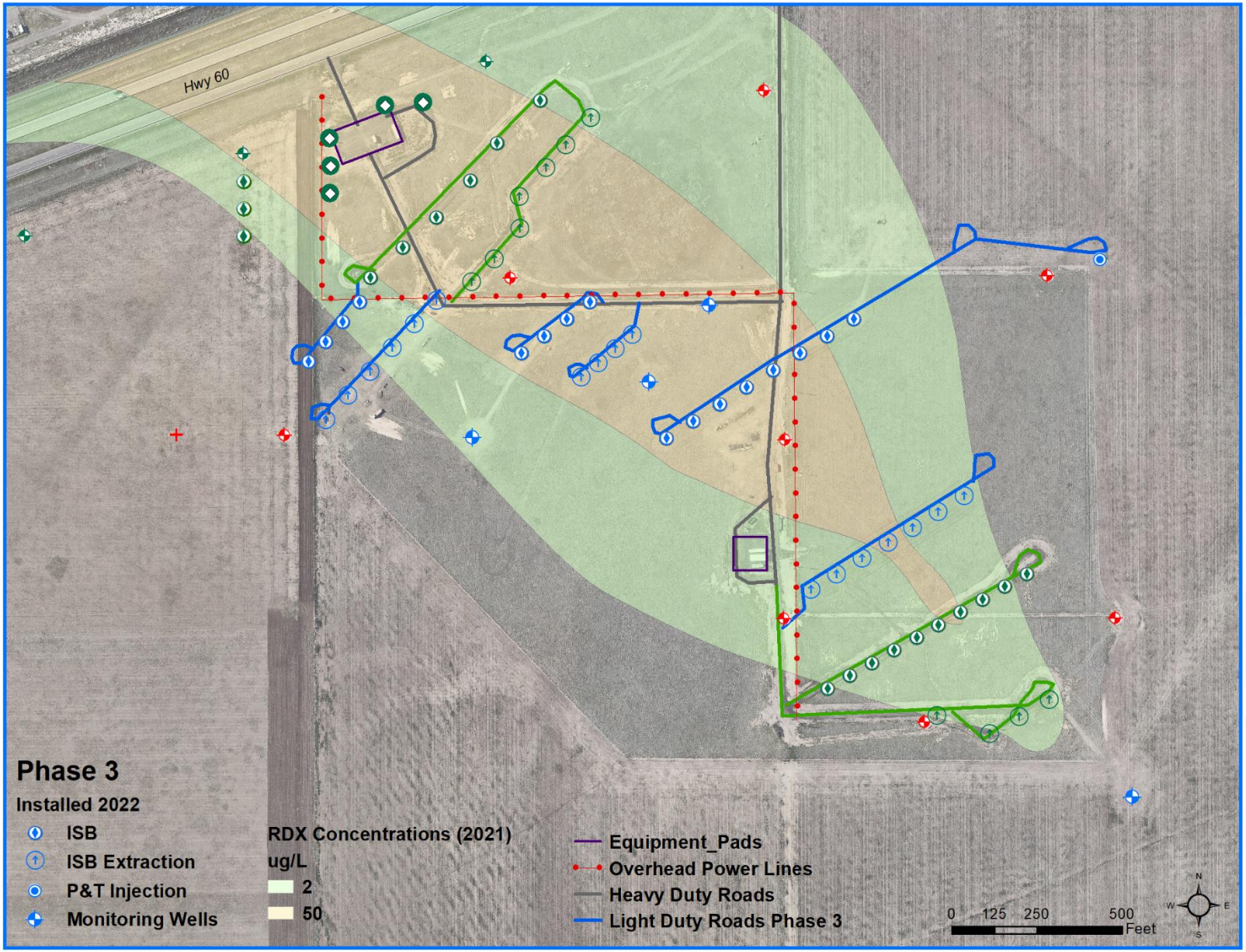
Offsite Plume (Before Remedy)



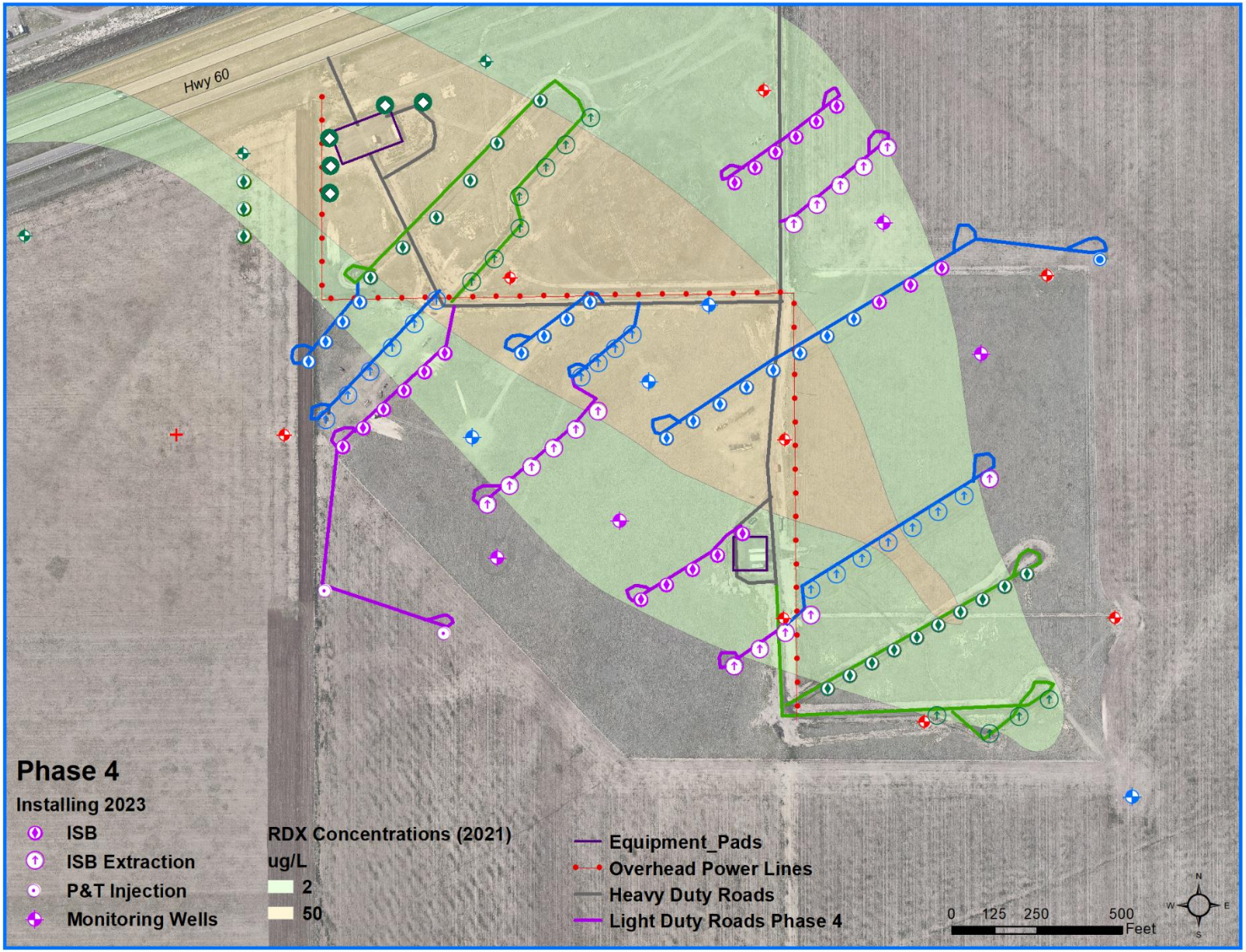
Offsite Plume Remediation (Phase 1 & 2)



Offsite Plume Remediation (Phase 3)

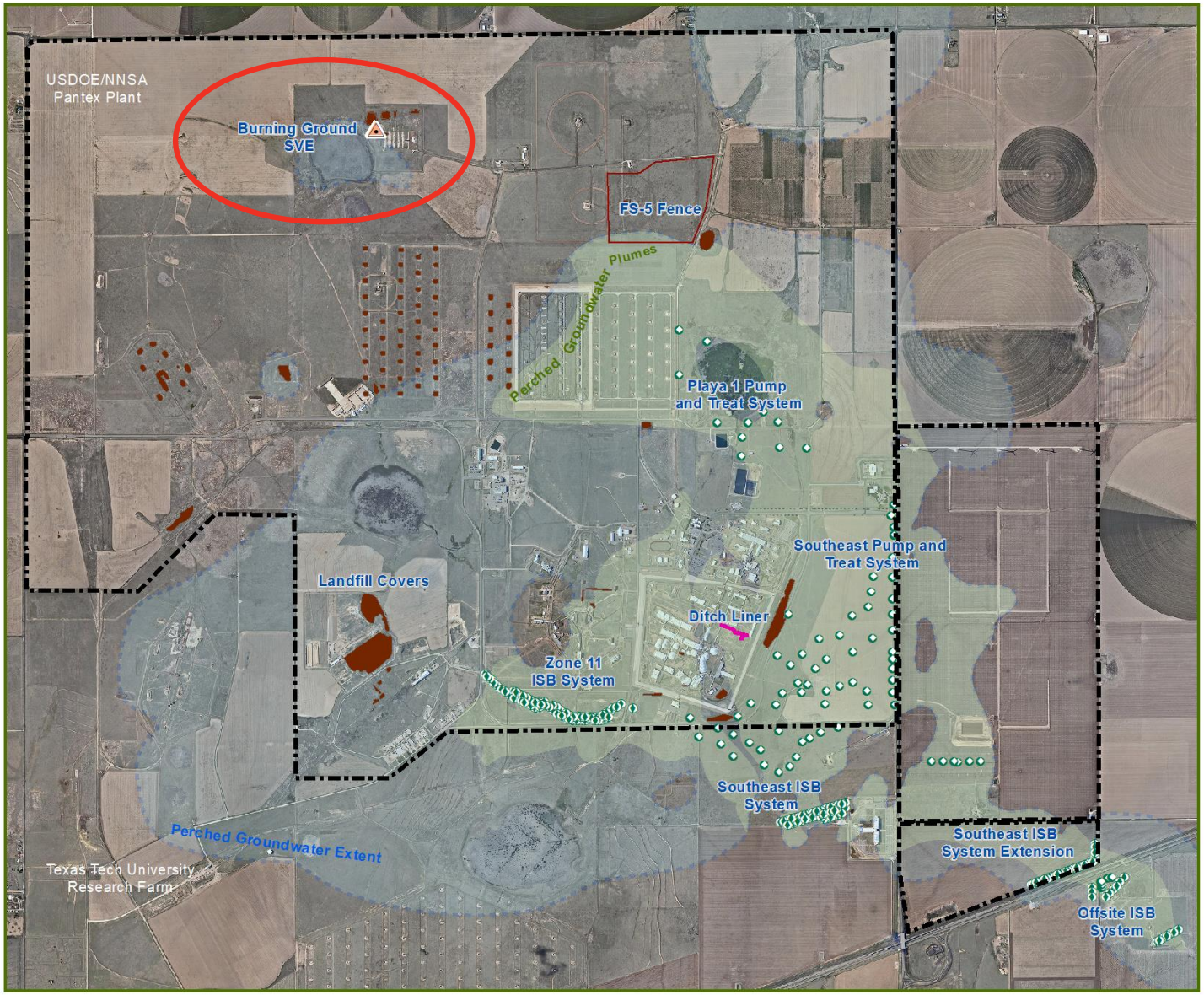


Offsite Plume Remediation (Phase 4)



Soil Vapor Extraction System

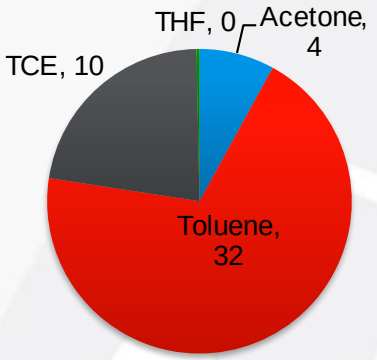
Pantex Plant Remedial Action Systems



Soil Vapor Extraction System

Installed in February 2002

- Remedial goal to reduce the mass of Volatile Organic Compounds (VOCs) – highest historical Toluene concentration ~ 1845 ppmv; highest current concentration ~ 70 ppmv



2021 Accomplishments

Future Operations:

- Continue to evaluate declining source
- Plan to pulse system in 2020 - 2023 to evaluate potential for future closure

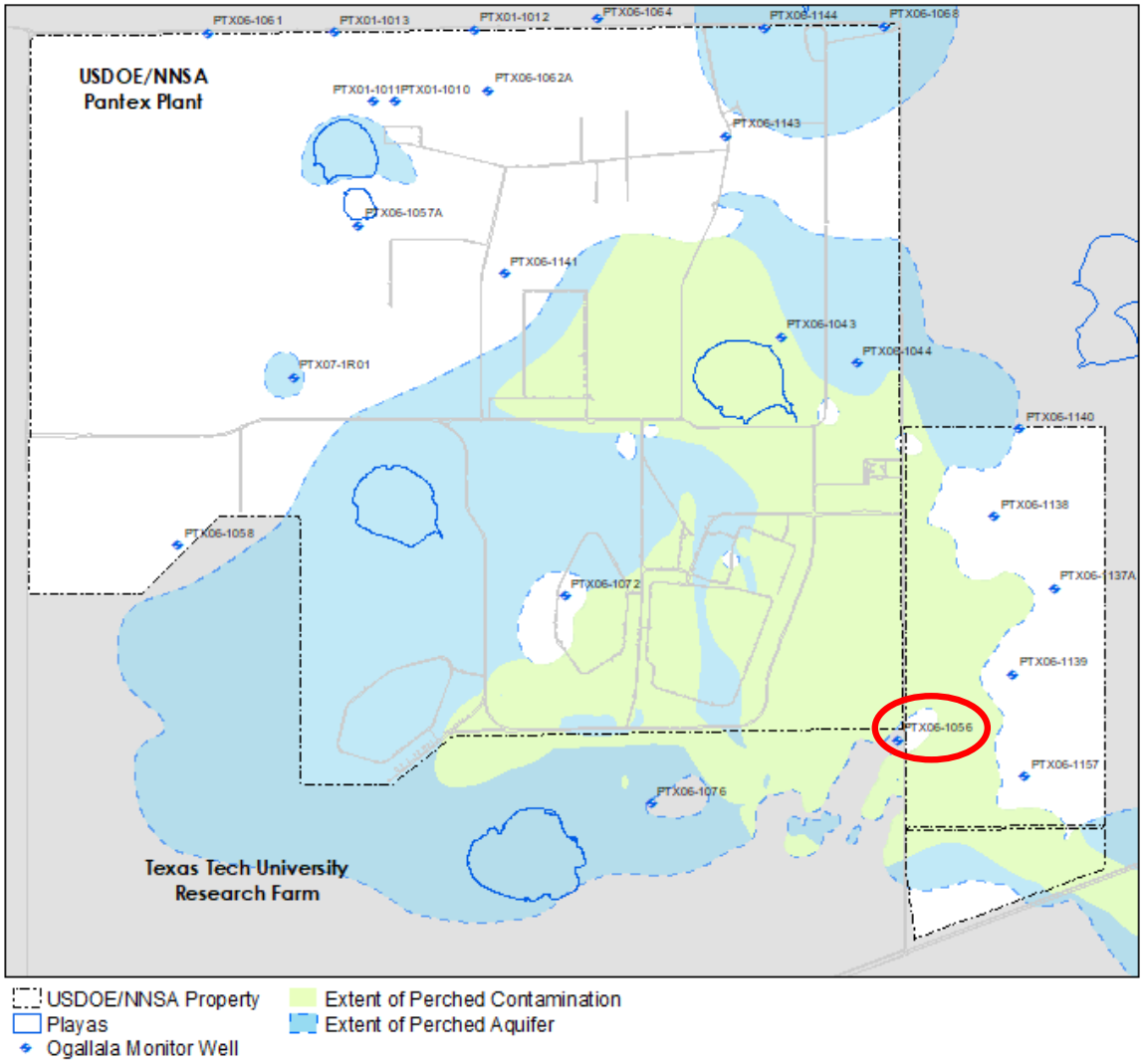
Ogallala Detection Monitoring

Monitoring Information:

- 24 wells monitored
  - Including one well located on neighbor property (PTX06-1064, located north of Pantex property)
- All detected analytes below the Groundwater Protection Standard (GWPS)

Challenges with Recent Detections (PTX06-1056)

- 1,2-DCA, a volatile organic compound, continued to be detected below GWPS
- DNT4A, a high explosive was detected below the GWPS through 2021 but was detected slightly above GWPS in 2022

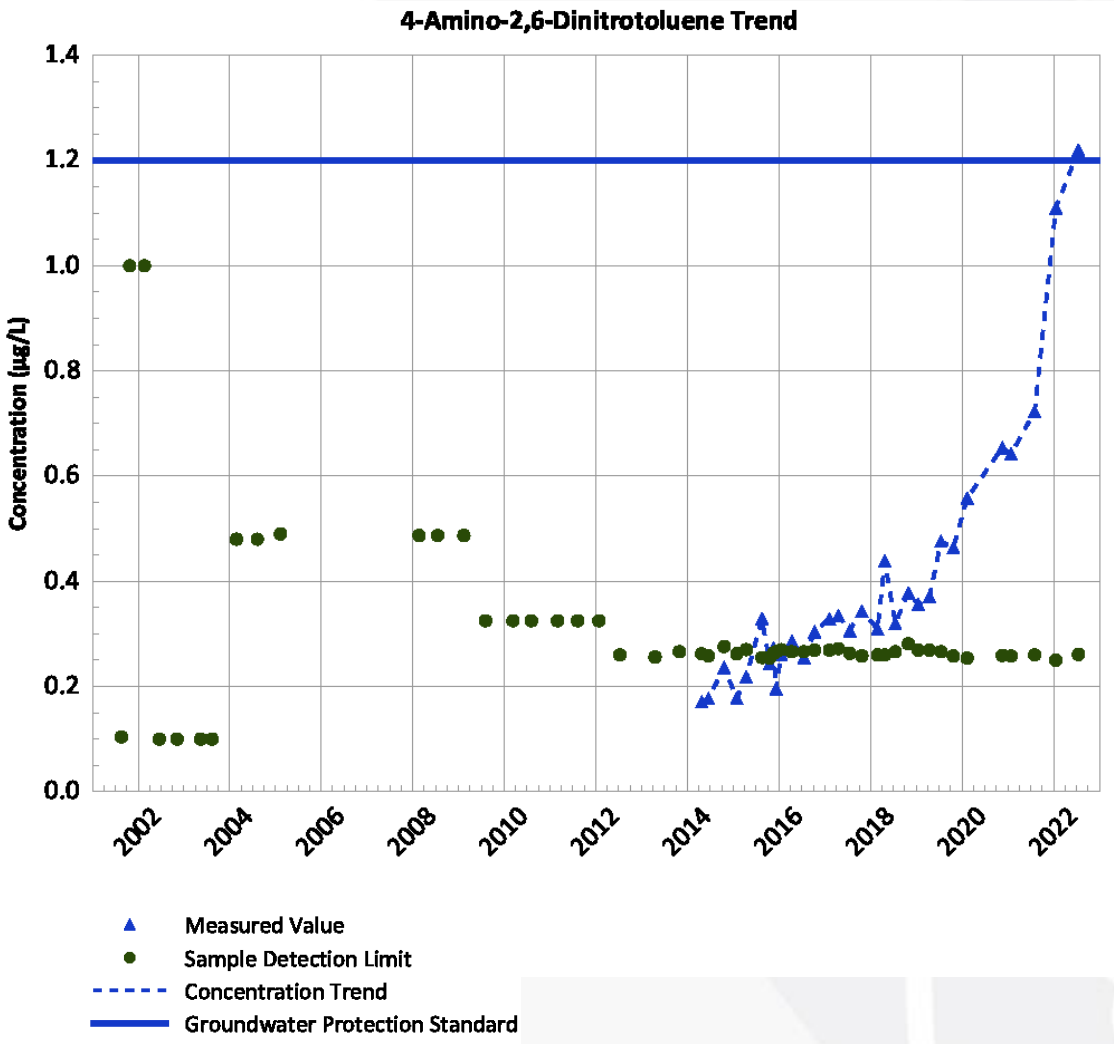


* DNT4A – 4-amino-2,6-dinitrotoluene 1,2-DCA – 1,2-dichloroethane

Ogallala Well PTX06-1056

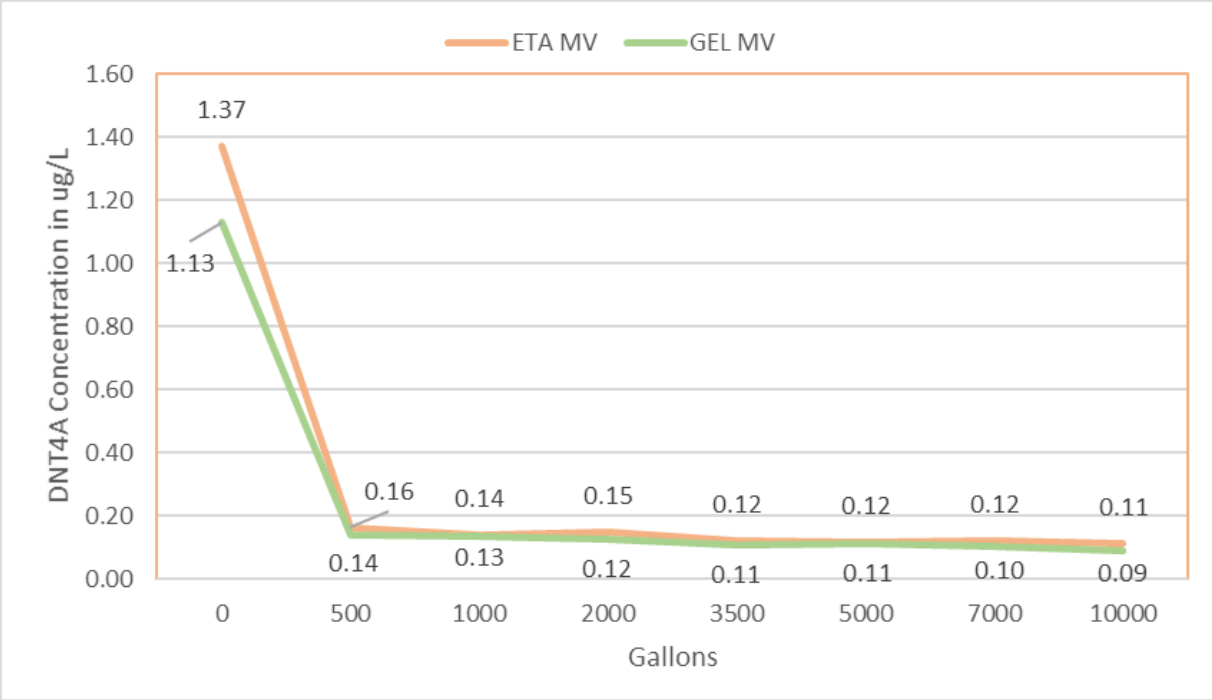
Recent Detections of DNT4A

- **Detection (1.22 ug/L) slightly above the GWPS (1.2 ug/L) in July 2022 sample. TCEQ co-sample did not confirm this detection (ND result).**
  - High volume purge sampling event completed August 7-10, 2022
  - Resample occurred September 19, 2022 – TCEQ co-sampled



Ogallala Well PTX06-1056

- **Results of High Volume Purge Event**



- **Results of September 2022 Resample**
  - DNT4A measured at 1.37 ug/L
  - RDX measured at 0.115 ug/L
  - Future actions based on *Pantex Plant Ogallala Aquifer and Perched Groundwater Contingency Plan* – (1) make notifications to regulators and (2) determine extent of contamination


Pantex Supply Wells
Not In Direction of
Groundwater Flow
from PTX06-1056
USDOE/NNSA
Pantex Plant
Burning Ground
FM 2373
Zone 4
2-Miles in the
Direction of
Groundwater Flow
Estimated Travel Time
To Boundary, if No
Actions Taken -
100 + Years
1-Mile in the
Direction of
Groundwater Flow
Zone 11
Zone 12
Zone 10
PTX06-1056
Detect of High Explosive Compound
above Cleanup Standard, July 2022
JCDC
Hwy 60
Texas Tech University
Research Farm
0
0.5
1
2
Miles
Pantex Water Supply
Ogallala Aquifer Monitor Well
Ogallala Aquifer Water Flow Direction
USDOE/NNSA Property
N
W
E
S

Per-and polyfluoroalkyl Substances (PFAS)

- **Following guidance from the DOE *PFAS Strategic Roadmap: DOE Commitments to Action 2022 – 2025***
  - *Pantex identifying known historic and current PFAS use*
  - *Developing PFAS sampling plan*
  - *Sampling drinking water in December 2022*

- **Pantex fire department has used Aqueous Film Forming Foam (AFFF) in the past for fire fighting demonstrations and training but AFFF is no longer used at Pantex**

Pantex is committed to reducing potential risk to the public and environment from PFAS compounds.

2nd Five Year Review Follow-Up Actions

- **Address the perchlorate plume that is moving into the SEPTS well field**
  - Continued monitoring the plume expansion and the influent to the SEPTS
  - Ceased pumping at wells where perchlorate had increased until new perchlorate treatment system was in place
  - Perchlorate treatment system contract awarded, system was constructed in 2022 and began operation in August
- **Address minor deficiencies in landfill protective soil covers**
  - Completed adding new fill to SVS 7a and 7b landfills in the center of the Plant
  - Reseeding completed at Landfill 15
  - A long-term contract has been used to address minor deficiencies in the soil covers. Annual tasks are set up to address findings

Explanation of Significant Differences

- **Explanation of Significant Differences (ESD)**
  - As part of the closeout of the 2nd FYR, Pantex submitted an ESD to regulatory agencies
  - The ESD describes the nature of the significant differences Pantex has implemented to remedial actions selected in the Record of Decision (ROD) and originally installed to achieve cleanup objectives
  - *Significant Differences*
    - Change to a more mobile carbon source (molasses) for ISB injections
    - Additional wells installed at Zone 11 ISB to help with injections where older wells were unable to take required injection volumes
    - Installation of Southeast ISB Extension and Offsite ISB to address expanded southeast plume
  - Public will be notified when ESD is available on the Pantex environmental website

3rd Five Year Review

- **Development of the new FYR has begun and final report is scheduled to be completed by September 2023**
- **New Five Year Review will:**
  - Evaluate whether remedial actions are performing as designed
  - Evaluate whether data used to select the remedial actions are still valid
  - Evaluate whether the remedial actions are currently protective and will remain protective of human health and the environment
- **As part of the FYR process, we need your feedback**
  - Questionnaires are available in the back of the room
  - Please provide feedback on how well Pantex is conveying information on our remedial actions

Questions

Reports and slides can be found at:

http://pantex.energy.gov/mission/environment/environmental-cleanup-documents

Remediation Summary Booklet – available here and on our website

Fact Sheets – available here and on our website

Five Year Review Questionnaires – available here