PANTEX ENVIRONMENTAL RESTORATION

High Explosives Detection Monitoring in the Ogallala Aquifer

The Pantex Groundwater Resource Conservation and Recovery Act Facility Investigation Report identified impacts to perched groundwater that require corrective action. The Pantex Site Wide Human Health Risk Assessment predicted that perched groundwater underneath the Pantex Plant containing high explosives (HEs) and other constituents could migrate over time to the Ogallala Aquifer, the main drinking water source for the area. The area of primary concern is in the southeast corner of the main Plant and offsite, adjacent to this area. The fine-grained zone that created the perched aquifer prevents vertical migration in most areas, but becomes thinner and more permeable in the southeast where migration to the Ogallala Aquifer is possible.

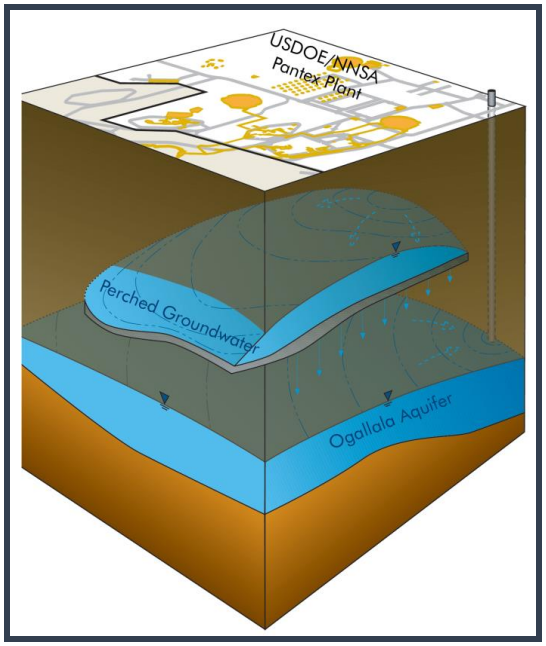

Fig. 1. Groundwater Beneath Pantex

Pantex monitors 29 Ogallala Aquifer wells and three additional wells along the southern boundary to evaluate the continued protectiveness of remedial actions for the drinking water aquifer.

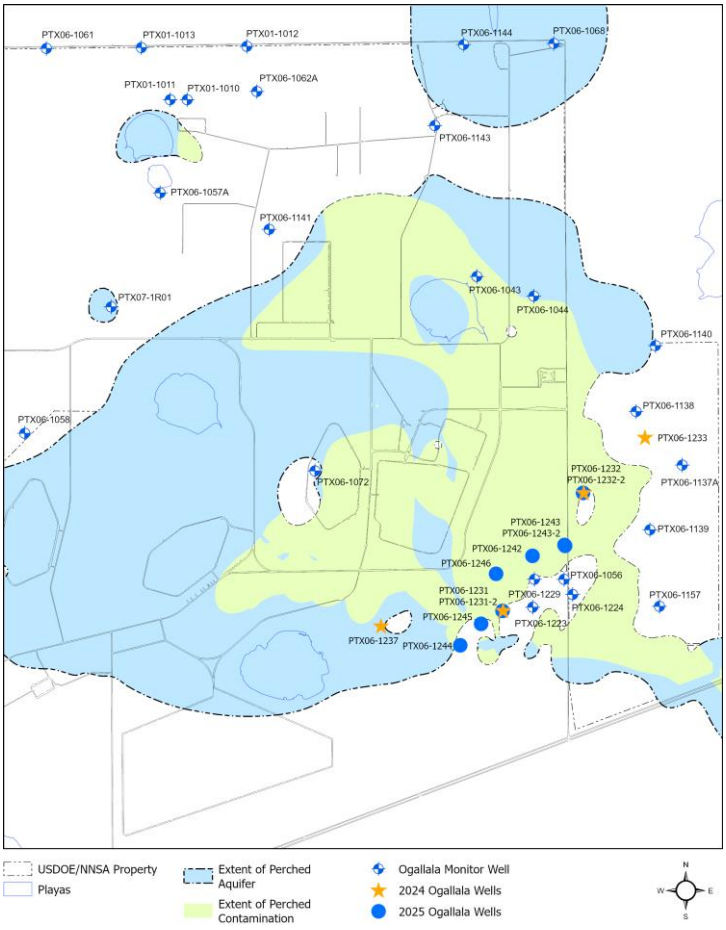

Fig. 2. Ogallala Monitoring Well Network

The Ogallala well network monitors for breakthrough of legacy constituents to the Ogallala Aquifer from the overlying perched aquifer. One Ogallala monitoring well (PTX06-1056) continues to demonstrate detections of legacy

4-amino-2,6-dinitrotoluene (DNT4A), a breakdown product of TNT, first detected in April 2014. Further detections of DNT4A and other high explosive compounds, including RDX, prompted Pantex to begin planning expansion of the Ogallala well network to help evaluate potential sources and extent of the contamination. Pantex installed 3 Ogallala monitor wells (PTX06-1223, PTX06-1224, and PTX06-1229) in 2023 and collected samples to initiate preliminary investigation.

Based on the data gathered in 2023, Pantex received special funding to implement measures to begin evaluating extent of the detections by installing three additional Ogallala monitor wells in 2024 (orange stars on Fig. 2 and 3). Fate and transport modeling was utilized in 2024 to plan new drilling locations and to evaluate potential sources for the detections at PTX06-1229. Pantex installed three new Ogallala monitor wells by January 2025: PTX06-1231, PTX06-1232, and PTX06-1233.

Data from the most recent sampling event for the Ogallala wells in the vicinity or downgradient of PTX06-1229 are depicted on Fig. 3 along with the maximum observed RDX concentration in late 2024/early 2025 at all other Ogallala wells. HE detections above GWPS from newly drilled 2024 wells are outlined in the following table.

Summary of 2025 HE Detections at Newly Drilled Ogallala Wells

Well ID	Analyte	Measured Value (µg/L)	GWPS (µg/L)
PTX06-1231	RDX	862	2
	TNX	20.2	2
	DNT4A	11.1	1.2
	DNT2A	2.68	1.2
PTX06-1232			
	RDX	27.1	2
PTX06-1233	No detections near or above GWPS		

Pantex installed a packer at PTX06-1229 in February 2025 to separate the lower and upper screened intervals. Samples were collected from the lower interval in June 2025 and then from the upper interval in July 2025. The two intervals conveyed similar results and were measured at lower concentrations than the previous 2024 sampling event. PTX06-1229 sampling results above GWPS are outlined in the following table.

Summary of 2025 HE Detections at PTX06-1229

Interval	Analyte	Measured Value (µg/L)	GWPS (µg/L)
Lower interval	RDX	210	2
	TNX	15.5	2
	DNT4A	3.4	1.2
Upper interval			
	RDX	242	2
	TNX	13.4	2
	DNT4A	3.4	1.2
2024 Maximum	RDX	382	2

The following conclusions and actions were determined from the data collected from all Ogallala wells installed to date:

- Sample results from PTX06-1231 and 1232 provide an understanding of the structure of the plume.
- Early sample results from the upper sampling interval at PTX06-1233, along with data from other wells to the north and south (PTX06-1137A and PTX06-1138), indicate that HEs are delineated downgradient to the northeast (in the direction groundwater is flowing). Further work is planned to evaluate the deeper sampling interval at this well to verify HE concentrations vertically.
- Further investigation is underway to identify source areas and delineate the plume to the north of PTX06-1231 and PTX06-1232. Extra wells are also planned to delineate the plume vertically at specific locations to determine its maximum depth.
- Pantex plans to develop an early action to control plume movement from areas of higher concentration. This will allow time for Pantex to complete investigation and develop the necessary cleanup action for the Ogallala Aquifer.

Presently, there is no impact or imminent threat to existing drinking, irrigation, or livestock water wells in the Ogallala Aquifer from these detections. Samples collected from wells located upgradient of onsite and offsite water supplies (see wells in yellow boxes in Fig. 3) indicate that there are no HEs at those locations. Pantex obtains water for plant processes, personnel use, and consumption from Ogallala production wells located in the northeast corner of the Plant property. Pantex has tested the Ogallala monitoring wells in that region and no detections of HEs has been observed. These results indicate there is no impact to Pantex or neighboring water supplies.

Pantex continues to plan for installation of new wells and to complete full investigation of nature and extent of the newly discovered plume in the Ogallala Aquifer. Pantex has contracted for the completion of the investigation which includes installation of eight new wells in 2025 and the development of an investigation work plan, in accordance with a recommendation provided in the Third Five-Year Review (HGL and Pantex, 2023). The investigation work plan is scheduled for completion in March 2026. As Pantex develops the investigation work plan and completes investigation, sampling will continue to ensure that the area is appropriately monitored.

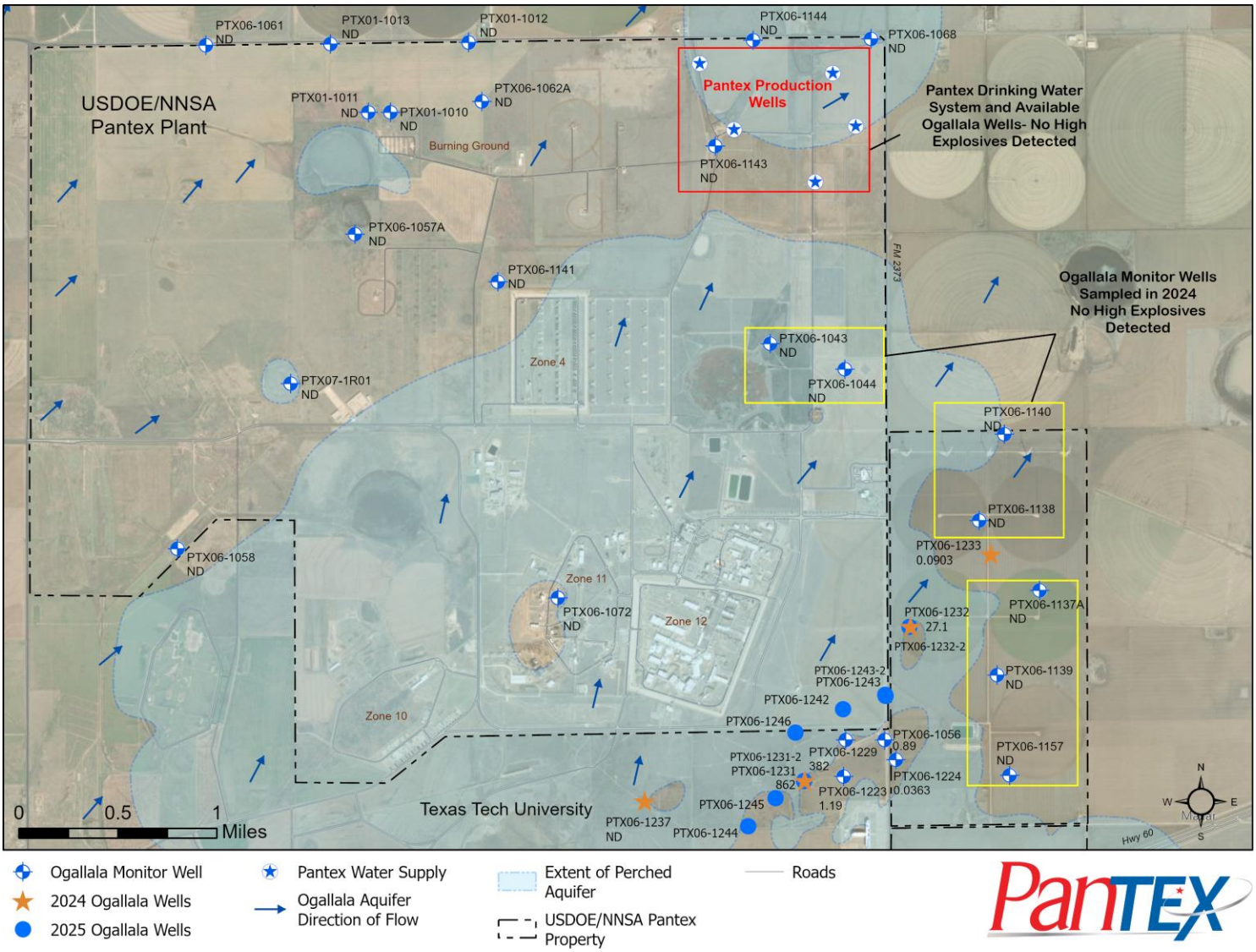

Fig. 3. Ogallala Wells RDX Results