PANTEX QUARTERLY PROGRESS REPORT

Remedial Action Progress

Third Quarter 2022

In support of Hazardous Waste Permit #50284 and

Pantex Plant Interagency Agreement

December 2022

Pantex Plant

FM 2373 and U.S. Highway 60

P.O. Box 30030

Amarillo, TX 79120

NNSA PRODUCTION OFFICE — UNITED BY A COMMON GOAL

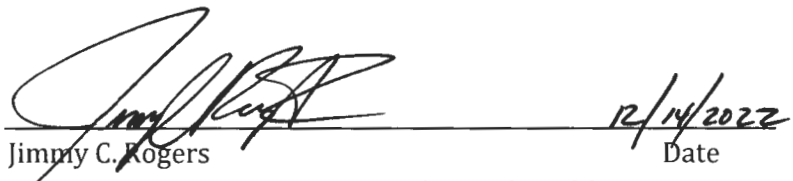
CNS consolidated nuclear security, llc

PANTEX PLANT | Y-12 NATIONAL SECURITY COMPLEX

CERTIFICATION STATEMENT

Third Quarter 2022 Remedial Action Progress Report
Pantex Plant, December 2022

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



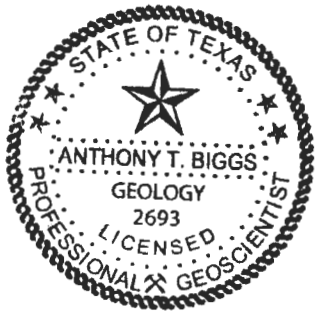
12/14/2022

Jimmy C. Rogers — Date
Senior Director, Environment, Safety and Health
Consolidated Nuclear Security, LLC

Remedial Action Progress Report
Third Quarter 2022
in Support of Hazardous Waste Permit #50284
and Pantex Plant Interagency Agreement
for the Pantex Plant, Amarillo, Texas
December 2022

Prepared by
Consolidated Nuclear Security, LLC
Management and Operating Contractor
for the
Pantex Plant and Y-12 National Security Complex
under Contract No. DE-NA0001942
with the
U.S. Department of Energy
National Nuclear Security Administration

In accordance with 30 TAC §335.553 (g), this report has been prepared and sealed by an appropriately qualified licensed professional engineer or licensed professional geoscientist.



Tony Biggs
Licensed Professional Geologist No. 2693
Environmental Projects
Consolidated Nuclear Security, LLC

12/12/2022
Date

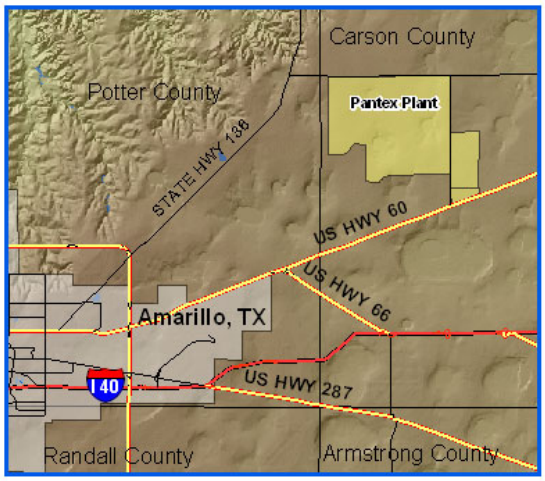
Project Team: Tony Biggs
Dr. Maeghan Brundrett
Michelle Jarrett

List of Acronyms

µg/L	micrograms per liter
CatOX	catalytic oxidation
COC	contaminant of concern
CP	Compliance Plan
Cr(VI)	hexavalent chromium
DCE	dichloroethene
DNT4A	4-amino-2,6-dinitrotoluene
EVO	emulsified vegetable oil
FGZ	fine-grained zone
GWPS	groundwater protection standard
HE	high explosive
ISB	*In Situ* bioremediation
ISPM	*In Situ* performance monitoring
lbs	Pounds
Mgal	million gallons
mV	millivolts
NAPL	non-aqueous phase liquid
ORP	oxidation-reduction potential
P1PTS	Playa 1 Pump and Treat System
PID	photoionization detector
ppmv	parts per million by volume
PQL	practical quantitation limit
RDX	hexahydro-1,3,5-trinitro-1,3,5-triazine
SAP	Sampling and Analysis Plan
Scfm	standard cubic feet per minute
SEPTS	Southeast Pump and Treat System
SVE	soil vapor extraction
TAC	Texas Administrative Code
TCE	Trichloroethene
TZM	treatment zone monitoring
VOC	volatile organic compound
WWTF	wastewater treatment facility

INTRODUCTION

The Pantex Plant, located in the Texas Panhandle 17 miles northeast of Amarillo, has implemented a response action to remediate perched groundwater and soils. Two types of systems have been installed for the groundwater response action: pump and treat systems in two areas and *In Situ* bioremediation (ISB) systems in four areas. A soil vapor extraction (SVE) system has been installed to remediate volatile organic compounds (VOCs) in soils at the Burning Ground area. This quarterly report addresses progress achieved through implementation of the remedial actions for Third Quarter of 2022.



This report provides an intermediate data summary for response action systems throughout the year. More intensive data reporting is included in the annual progress reports. The quarterly progress reports address three of the five evaluations included in the annual progress reports: response action effectiveness, uncertainty management, and early detection. The reports provide required information from Hazardous Waste Permit #50284 CP Table VII and the Pantex Interagency Agreement.

Maps of the plumes, remedial action systems, sampling locations, and system wells are provided in Appendix A. Graphs of operation and flow rates for the pump and treat systems are provided in Appendix B. Graphs of important parameters for the ISB treatment zone and downgradient wells are provided in Appendix C.

RESPONSE ACTION EFFECTIVENESS

This quarterly progress report focuses on specific criteria for the pump and treat systems, ISB systems, and a small-scale SVE system. System operation, mass removal, and evaluation of effluent in reference to established operational goals are reported for the pump and treat systems. For the ISB systems, this report evaluates geochemical conditions and availability of food source in the treatment zone and reduction of concentrations of contaminants of concern (COCs) in downgradient performance monitoring wells to evaluate whether the treatment zone is working effectively. System operation, mass removal, and effluent photoionization detector (PID) readings are evaluated for the SVE system.

Pump and Treat Systems

The groundwater remedial action at the Pantex Plant includes two pump and treat systems: Southeast Pump and Treat System (SEPTS) and Playa 1 Pump and Treat System (P1PTS). The pump and treat systems are designed to extract water and remove contaminant mass from the water before the effluent is beneficially used by the wastewater treatment facility (WWTF) and irrigation system, for general Plant needs, or for amendment injections at the ISB systems. The systems were also designed to remove water from the perched aquifer to reduce saturated thickness. This reduction in saturated thickness reduces migration of contaminants both vertically and horizontally so that natural breakdown processes can occur over time. Reducing migration provides protection for the underlying High Plains Aquifer (also known as and referred to herein as the Ogallala Aquifer). SEPTS has the capability to inject the treated water back into the perched aquifer when beneficial use is not possible. Operational priorities for the pump and treat systems emphasize beneficial use of water.

Pump and Treat System
Third Quarter 2022 Operation

Playa 1 Pump and Treat System (P1PTS)	
Days Operated	0
% Operation Time	0 %
Volume Water Treated (Mgal)	0
HE Mass Removal (lbs)	0
Beneficial Use of Water	0 %
Southeast Pump and Treat System (SEPTS)	
Days Operated	90
% Operation Time	94 %
Volume Water Treated (Mgal)	26.9
HE Mass Removal (lbs)	79.8
Chromium Mass Removal (lbs)	9.9
Beneficial Use of Water	13.9 %

*Value below operational goals

The subsurface drip irrigation system filter bank break that occurred in late June 2017 continued to impact operations of SEPTS and P1PTS during the third quarter of 2022. Due to the severity of the break, an engineering evaluation, contracting, and major repairs were required to restore the irrigation system. Repairs to the filter bank were completed in May 2019 and after completion of startup testing and repairs on the communication systems, a portion of the system became operational in March 2022. However, in April 2022, the communication interface on the system failed. System repairs were completed and the system became operationally available in late September 2022. Full operation of the subsurface system is currently hindered by lowered lagoon storage capacity due to ongoing construction of repairs to the WWTF's storage lagoons. During periods the drip irrigation system is unavailable, Pantex continues to release all WWTF water to Playa 1 as approved in the Texas Commission of Environmental Quality wastewater permit (WQ0002296000).

Current and future operations of both pump and treat systems will be impaired by the permit-restricted flow to Playa 1 until the subsurface drip and new center pivot irrigation systems are fully operational. The SEPTS system has operated at a higher capacity using injection, release to Playa 1, and scheduled shutdowns of P1PTS. Pantex planned to run P1PTS one week per quarter in the

2022 calendar year based on technical evaluations of the current overall system requirements at Pantex. However, the system was shut down at the end of April to connect P1PTS to the new center pivot irrigation system east of FM 2373 and was not operated during the third quarter. The work is expected to complete by the end of 2022.

Reduction of operational time at P1PTS allowed SEPTS to operate at a greater capacity and support capture of water along the FM 2373 fence line, at wells east of FM 2373, and at the highest plume concentrations to the south on Texas Tech property. When P1PTS is operational, SEPTS is operated at a lower capacity to meet permit requirements for release of water to Playa 1.

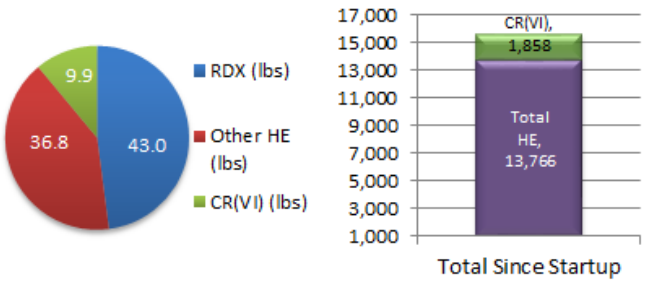


Figure 1. SEPTS Mass Removal

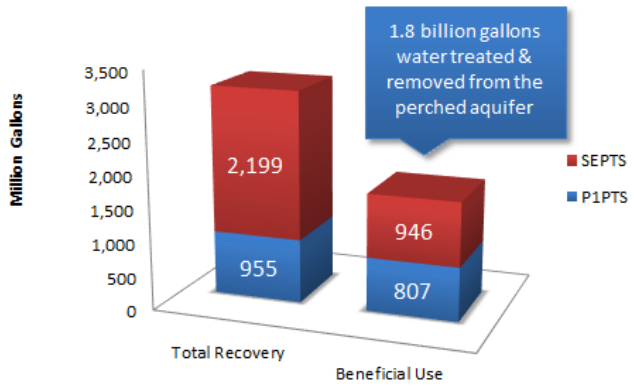


Figure 2. System Recovery and Use

Graphs of monthly operation and throughput are included in Appendix B. The SEPTS wellfield had more than 6 wells that required repair during the third quarter due to electrical and equipment issues. Pantex has issued a contract to address the problems, and most wells will be operational by the beginning of 2023. Almost 87% of the treated water was released to Playa 1. SEPTS treated about 27 million gallons (Mgal) during the third quarter. P1PTS primarily treats RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine), and SEPTS primarily treats RDX and hexavalent chromium [Cr(VI)]. Figure 1 provides SEPTS mass removal information for RDX and other high explosives (HEs) and Cr(VI) for the third quarter, as well as totals since system startup. P1PTS was not operated during third quarter, but had previously removed over 770 pounds (lbs) of high explosives (HEs). Overall, the systems have removed over 16,300 lbs of HEs and chromium contaminants from perched groundwater since operations began.

The total recovery and treatment from both systems since startup has been calculated at about 3.2 billion gallons. Because SEPTS was originally designed to inject treated water, all of the treated water prior to 2005 was injected. However, a significant volume of treated water has been used beneficially since 2005, with a total of over 1.8 billion gallons of treated water beneficially used since startup of the irrigation system. The recovery and beneficial use totals are presented in Figure 2. Currently, the systems are releasing water to the WWTF and then to Playa 1 or directly to injection wells, so a majority of the treated water is not currently beneficially used. Evaluation of

effluent data from SEPTS indicates that all COCs were treated to levels below the groundwater protection standard (GWPS).

Pantex is currently installing an irrigation alternative on the property east of FM 2373 to provide additional long-term use of the treatment system water. Funding was requested in fiscal year 2021 to design and construct infrastructure for irrigation of land east of FM 2373 using five center pivot sprinklers. The design of the new irrigation system was completed in May 2021 and a new construction contract was awarded in August 2021. Construction on the system began in November 2021 and is expected to be operational in the spring of 2023. The first irrigated crops are expected to be planted for the summer 2023 growing season.

Pantex also identified funding to design and construct three new perched injection wells to the east of Playa 2; northwest of the Zone 11 ISB System. Construction of the injection wells and infrastructure was completed in February 2022. Due to issues with the communication system, operation of the system will not begin until early 2023. The Playa 2 injection wells will provide a consistent outlet for a portion of the treated water when irrigation is not an available method for beneficial use of the treated water. These wells will also provide a method to inject the treated water without affecting movement and capture of plumes in the southeast area.

Perchlorate was detected in two SEPTS extraction wells starting in 2017, with concentrations increasing since the first detection. Perchlorate has been identified in two additional extraction wells in 2021. Pantex contracted to expand the SEPTS with a perchlorate pre-treatment for wells in the southwestern part of the system. The design portion of the contract started in August 2021 and was completed in February 2022. Construction was finished in August 2022. Mass removal for the system will be included in future reports.

ISB Systems

Four ISB systems (Zone 11 ISB, Southeast ISB, Southeast ISB Extension, and Offsite ISB) are installed and operating at Pantex during the third quarter of 2022. The systems are designed with closely spaced wells to set up a treatment zone in areas of the perched groundwater where pump and treat may not be as effective, or where the area is sensitive to vertical migration of COCs to the Ogallala Aquifer. Amendment is injected into these systems to establish treatment zones where COCs are degraded. Monitoring wells are installed downgradient of the treatment zone to monitor whether the system is effectively degrading the COCs (see maps in Appendix A). The primary COCs at the Zone 11 ISB are trichloroethene (TCE) and perchlorate. The primary COCs at the Southeast ISB are RDX and Cr(VI). The primary COC at the Southeast ISB Extension and the Offsite ISB is RDX.

The following section provides an understanding of the expected conditions at the ISB systems and downgradient concentrations of COCs. For the treatment zone wells, this report evaluates whether the conditions are present, including oxidation reduction (i.e. redox) potential (ORP) and the reduction of electron acceptors (i.e. sulfate, dissolved oxygen and nitrate), to degrade the COCs in each area. The presence of gases, such as methane, can also be an indication of deeper reducing conditions. The presence of a continued food source (total organic carbon) for the microbial

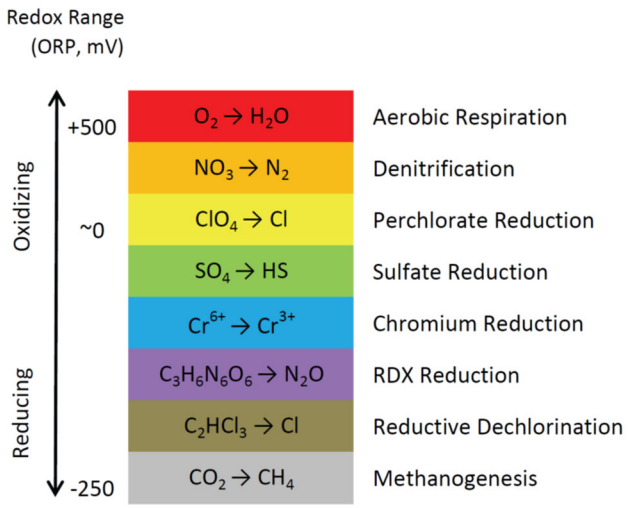


Figure 3. Redox Range for COCs

reduction of COCs is also evaluated. Strong reducing conditions (ORP below –50 millivolts (mV) to reduce RDX and TCE and near 0 mV to reduce hexavalent chromium and perchlorate) are required to adequately reduce COCs. Figure 3 presents the redox ranges for the reduction of various COCs. Dissolved gases, redox potential, nitrate, and TOC are evaluated in the ISB treatment zone performance wells to determine if the treatment zone is rebounding to baseline conditions, thus requiring amendment injection. At this time, sulfate is not used as an indicator of reducing conditions, due to potential addition of high level of sulfates in the treatment zone from molasses used during injections. Pantex is investigating this issue.

Downgradient monitoring wells are evaluated to determine if the ISB systems are effective in degrading the COCs and any breakdown products of the COCs. Graphs of data from sampled treatment zone wells and downgradient *In Situ* performance monitoring (ISPM) wells are included in Appendix C with the exception of the Offsite ISB wells, which were excluded due to limits in data.

ISB Injection Activities

Table 1. ISB Systems Activities

Month (2022)	SE ISB EXT	SE ISB	Z11 ISB	Offsite ISB[1]
January		**Sample**		
February	**Sample**			**Sample (Interrupted)** */Injection*
March		*Injection*		*Injection*
April		*Injection*	**Sample**	*Injection*
May	*Maintenance*		*Maintenance*	*Injection*
June	*Maintenance*		*Injection*	**Sample (Finished)**/*Injection*
July			*Injection*	
August	*Injection*		*Injection*	*Maintenance*
September	*Injection*	**Sample**	*Injection*	*Maintenance*
October		**Sample**		***Sample/****Injection*
November	**Sample**		**Sample**	*Injection*
December				

[1] All scheduled wells in the Offsite ISB are extraction (REC) wells and not injected; therefore, injection will not affect the sampling of the monitored wells. REC wells must be sampled during injection events when wells are operating to support injection.
SE ISB EXT = Southeast ISB Extension
SE ISB = Southeast ISB
Z11 ISB = Zone 11 ISB

Sampling of the ISB systems has been reduced to a semi-annual frequency. As a system's data is not always available for quarterly evaluation, only new and complete data sets for each system will be assessed during the current quarter. Due to weather, injection events and well maintenance activities, no system was fully sampled during the third quarter (see Table 1). Performance of all four systems will be discussed in the forthcoming *2022 Fourth Quarter Progress Report* as all data will be available at that time.

Table 1 summarizes the injection activities for 2022. Well maintenance activities for the injection ISB and REC wells were performed in August and September at the Offsite ISB system. Injections were completed at the Zone 11 ISB and Southeast ISB Extension systems in the third quarter. Future injections are scheduled for the Offsite ISB that began in October 2022.

Burning Ground SVE

The Burning Ground SVE system began operation in 2002 as a large-scale catalytic oxidizer (CatOX) system. Due to a large reduction in VOC concentrations, a small CatOX system has been operating at the Burning Ground SVE system since April 2012. This small-scale system focused on treating residual non-aqueous phase liquid (NAPL) and soil gas at a single extraction well (SVE-S-20) near the source area.

Overall, the system operated 53% of the quarter (~ 1175 hours of operation). The SVE was shut down in October 2021 as part of the pulsing plan for path to closure of the system. The system was restarted in January 2022, but shutdown in March, when an unexpected failure of the catalytic oxidizer occurred. The system was restarted on August 22 and ran until the end of October when another failure of the catalytic oxidizer shutdown the system. Figure 4 shows mass removal calculated for the third quarter and since startup for VOCs that historically contribute to the total VOC concentration.

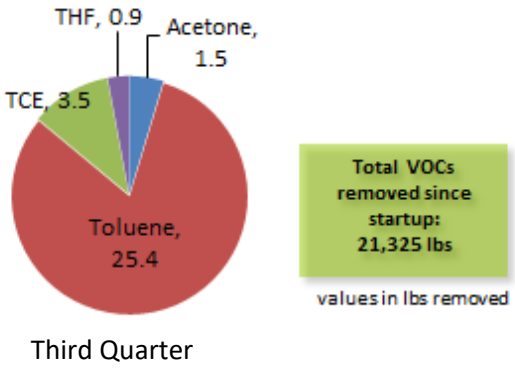


Figure 4. SVE Mass Removal

The system removed ~ 31 lbs of VOCs during the third quarter, but has removed about 21,325 lbs of VOCs since startup. Based on PID data collected at the system effluent port, system destruction efficiency was at least 99%. Analytical data collected at startup indicate that the NAPL source is almost depleted, as reflected in the current mass removal values. Pantex will continue to evaluate the system at startup and as the system continues to operate.

The system operated at a higher flow due to the modifications to the system, with the flow increased from 32 standard cubic feet per minute (scfm) in early 2017 to the current level of 44 scfm. The hourly VOC removal rates increased with the increased flow until Fourth Quarter 2018. The removal rate declined during 2018, but began to improve over the first two quarters of 2019. In the third and fourth quarter of 2019, removal rates decreased and continued to remain low in

the third quarter of 2022. As total VOC concentrations continue to remain below 100 ppmv, Pantex is actively pulsing the system to determine current recovery efforts and feasibility of system closure. A more detailed discussion is included in the *2021 Annual Progress Report*.

Uncertainty Management and Early Detection

Uncertainty management and early detection wells are evaluated to determine if there are unexpected conditions in areas where previous groundwater contamination has not been detected or confirmed (Ogallala and perched aquifers), or in previous plume locations where concentrations have fallen below GWPS, background, and the practical quantitation limit (PQL) (e.g., perched wells at the Burning Ground and Old Sewage Treatment Plant areas). Indicator COCs are evaluated at the uncertainty management/early detection wells in the quarterly report. A map depicting the wells evaluated is included in Appendix A.

Review of the uncertainty management/early detection data collected during the third quarter indicates unexpected conditions at two Ogallala Aquifer wells, PTX06-1056 and PTX06-1157. Detections exceeded the GWPS in one Ogallala Aquifer well. There were no unexpected conditions at perched uncertainty management wells in the third quarter.

4-amino-2,6-Dinitrotoluene (DNT4A), a breakdown product of 2,4,6-trinitrotoluene (TNT), has been detected at PTX06-1056, with the initial detection occurring in April 2014. Sample results collected since that time have been variable, with values exceeding the PQL since late 2016. A trend of DNT4A (performed using Mann-Kendall statistics) continues to indicate an increasing trend across all data. PTX06-1056 also continues to demonstrate detections of 1,2-dichloroethane (DCA12). DCA12 has been variably detected since August 2015, with the most recent detection below the PQL. RDX was also recently detected in PTX06-1056 with values below the PQL.

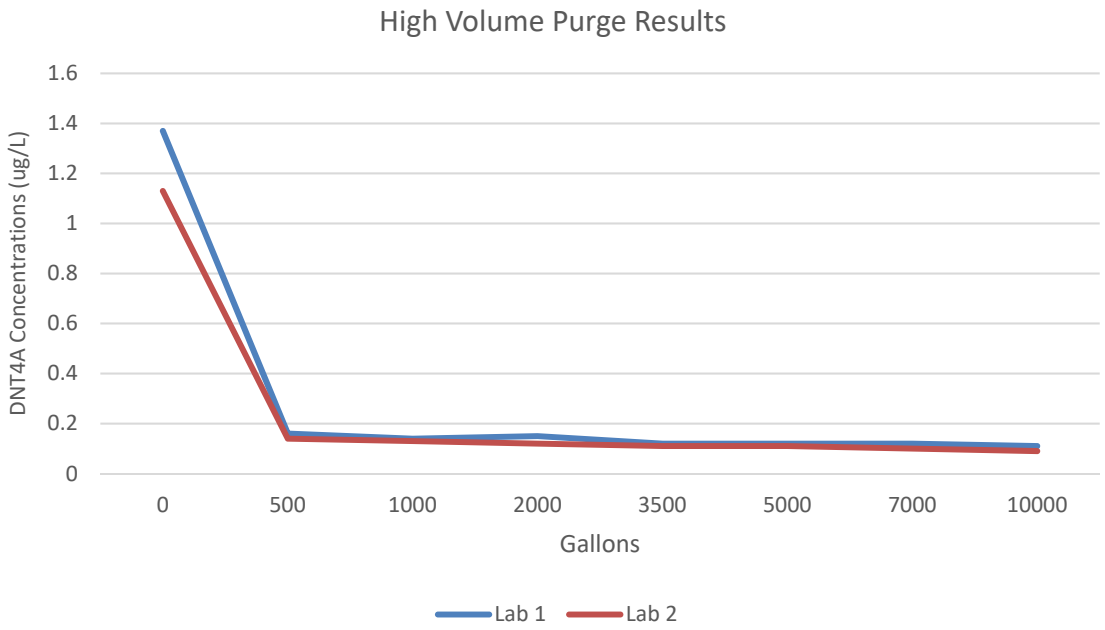
Summary of Unexpected Ogallala Detections, Third Quarter 2022

Well ID	Sample Date	Analyte	Measured Value (µg/L)	PQL (µg/L)	GWPS (µg/L)
PTX06-1056	07/18/2022	4-amino-2,6-dinitrotoluene	1.22	0.26	1.2
		RDX	0.09	0.26	2
		1, 2 – dichloroethane	0.52	1	5
PTX06-1056*	09/19/2022	4-amino-2,6-dinitrotoluene	1.37, 1.29	0.26	1.2
		RDX	0.11, 0.11	0.26	2
PTX06-1157	08/10/2022	RDX	0.34	0.26	2
PTX06-1157*	10/18/2022	RDX	ND, ND	0.26	2

ND = Non-detect

* Split sampled – Sample was sent to two individual labs.

As of May 2020, Pantex went back to semi-annual sampling for PTX06-1056 as approved by regulatory agencies. The first quarter (February 2022) result detected DNT4A at 1.1 ug/L, just below the GWPS of 1.2 ug/L. RDX was not detected in this sample. The third quarter (July 2022) result detected DNT4A above the PQL at 1.22 ug/L and RDX below the PQL (0.26 ug/L) at 0.09 ug/L. As a result, Pantex performed a high volume purge, time-series sampling event beginning on August 7 and completing on August 10. Results from that study are summarized below.



PTX06-1056 was resampled for DNT4A and RDX six weeks following the high volume purge to verify previous concentrations. Results from the verification samples confirmed DNT4A above the GWPS and detections of RDX below the PQL. Pantex is responding by installing two additional Ogallala monitoring wells to help understand nature and extent. These wells are anticipated to be installed in spring 2023. Notifications to regulators, Pantex Plant personnel and the public have been sent. Further actions will be determined based on future sampling results and in accordance with the *Pantex Plant Ogallala Aquifer and Perched Groundwater Contingency Plan*.

Additionally, RDX was detected above the PQL (0.26 ug/L) at PTX06-1157. Resamples of the well did not confirm the detection (results were non-detect). At this time, no further action will be taken and sampling will continue as approved in the *2019 Sampling and Analysis Plan* and in accordance with the *Pantex Plant Ogallala Aquifer and Perched Groundwater Contingency Plan*.

Other Unexpected Conditions

Pantex routinely evaluates data as received from the laboratory to determine if it presents off-trend, all-time high, or new detection conclusions that may require further sampling or evaluation. Through the well maintenance program, Pantex also inspects wells at least every five years to

ensure they are not silting in and to evaluate whether the well remains in contact with the formation. No unexpected conditions were noted in the third quarter.

SCHEDULE UPDATE

Pantex provided a detailed schedule of upcoming work in the *2021 Annual Progress Report*. An update of the activities scheduled to be started or completed by the publication date of this report is provided below.

Pantex accomplished the following:

- Injections into the Southeast ISB Extension were finished in August 2022.
- Injections into the Zone 11 ISB System were finished in September 2022.
- Injections into the Offsite ISB System were finished in November 2022.
- Construction of the new SEPTS perchlorate pre-treatment was completed in August 2022 and the system began operating.
- Pantex performed a time-series sampling event with a high volume purge at PTX06-1056 in August 2022.
- Phase 3 drilling at the Offsite System began in April 2022 and was completed in September 2022.
- Pantex submitted a Request for Proposal for the design of the upgrade to the SCADA system for SEPTS and P1PTS. The contract was awarded in September 2022.

Pantex continues progress toward completion of the following items:

- Pantex awarded a contract to build two mobile pump and treat systems that will be used at the Offsite Remediation System and in other areas where plume control may be required. Design was completed in April 2022. Construction of the systems has begun and the delivery of the trailers is expected during February 2023.
- The design of the new center pivot irrigation system planned to be installed east of FM 2373 was completed in May 2021. The new construction contract was awarded in August 2021 and construction began in November 2021. Operation of the system is expected by summer 2023.
- Construction of Phase 3 infrastructure for the Offsite System commenced in August 2022. Work is anticipated to be completed in spring 2023.
- Work began to evaluate the Pantex perched groundwater network, acquire LiDAR Survey information for assessing landfill cover deficiencies and acquisition of new toxicity data for Pantex COCs for use in evaluating its effect on risk in Five-Year Review. The Five-Year Review activities were initiated on August 1, 2022 and will continue through spring 2023 to produce a draft of the report. TCEQ and EPA participated in a Site Inspection of the Remedial Action Systems on September 27-28, 2022 at the Pantex Plant.
- Pantex awarded a contract for construction of two new ISB injection trailers to be used for future injection events. These trailers are anticipated to be completed by March 2023.
- An Explanation of Significant Difference was sent to EPA and TCEQ for review in September 2022. Comments were received the same month and responses have been drafted for consideration. A signed Explanation of Significant Difference is expected by the end of 2022.

Conclusions and Recommendations for Change

The remedial actions continue to operate and meet short-term expectations for cleanup of the perched groundwater in areas under the influence of the remediation systems. Perched water levels are declining, mass is being removed or reduced, and institutional controls provide protection from use of impacted groundwater, while the remedial actions continue to operate to meet long-term goals. Pantex is working to extend treatment systems to areas that are not currently under the influence of an existing remediation system. Pantex is also working to extend treated water injection and beneficial use to new areas to ensure consistent operation of the pump and treat systems.

The pump and treat systems continue to remove COC mass and water from critical areas in the perched aquifer; thus, decreasing head that drives vertical and lateral movement of perched groundwater. Pantex is continuing to pursue other options for release or use of the treated water. Pantex will continue to inject and release water to Playa 1 until the subsurface irrigation system is fully operational or other options can be constructed.

System repairs were completed at the subsurface irrigation system, with limited operation starting in March 2022. The system ran during the month of March, but an issue with the communication system caused the system to be shutdown. System repairs were completed and the system became available in late September 2022. Full operation of the subsurface system is currently hindered by lowered lagoon storage capacity due to ongoing repair of the WWTF's storage lagoons. Pantex has installed perched injection wells east of the Playa 2 area, as previously recommended. These wells will help provide a consistent outlet for release of treated water from SEPTS when beneficial use is not possible. Pantex expects to inject up to 150 gpm of treated perched groundwater once the system is brought online in 2023. Pantex completed the design and started the construction of a center pivot irrigation system east of FM 2373. Pantex also completed construction of a perchlorate pre-treatment system to address the perchlorate moving southeast through the SEPTS extraction wellfield.

Sampling was not completed at any ISB systems. Well maintenance activities, weather and injection activities prevented sampling. Injections were completed at Southeast ISB Extension and Zone 11 ISB systems in the third quarter of 2022.

Pantex continues progress toward cleanup of the southeast lobe of perched groundwater. A new ISB system (Offsite ISB) was designed to address HE contamination found on neighboring properties. Installation of infrastructure for Phase 1 and 2 of the Offsite ISB is complete and the first injection into the system was completed in October 2021. Phase 3 well construction is complete and construction of Phase 3 infrastructure commenced in August 2022 and is anticipated to be completed in spring 2023.

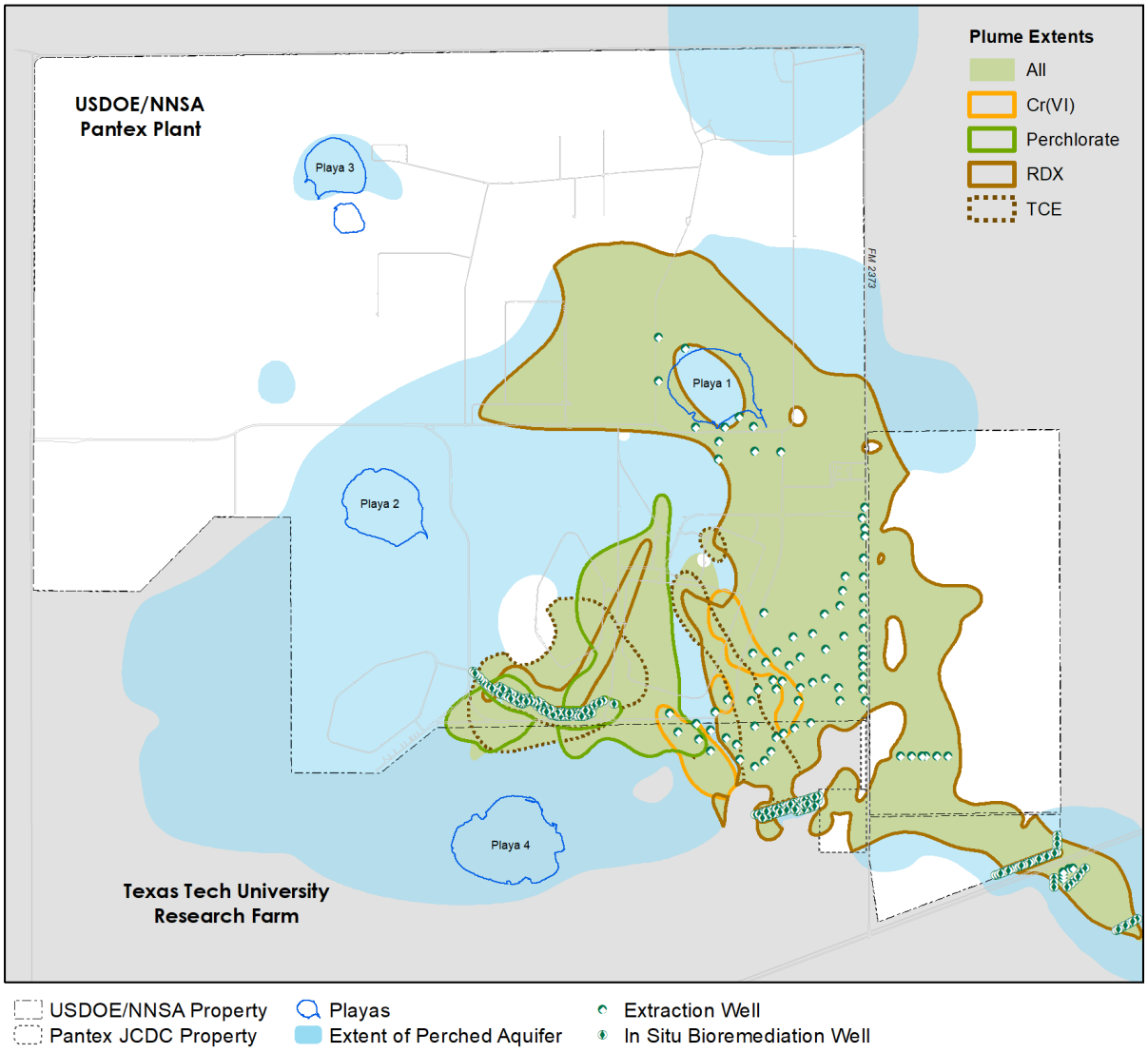
Pantex performed a time-series sampling event with a high volume purge at PTX06-1056 in August. Results of that study are summarized in this report, along with verification sampling completed in September. Plans to install two additional Ogallala wells are being implemented. Further actions

will be determined based on sampling results, in accordance with the *Pantex Plant Ogallala Aquifer and Perched Groundwater Contingency Plan*.

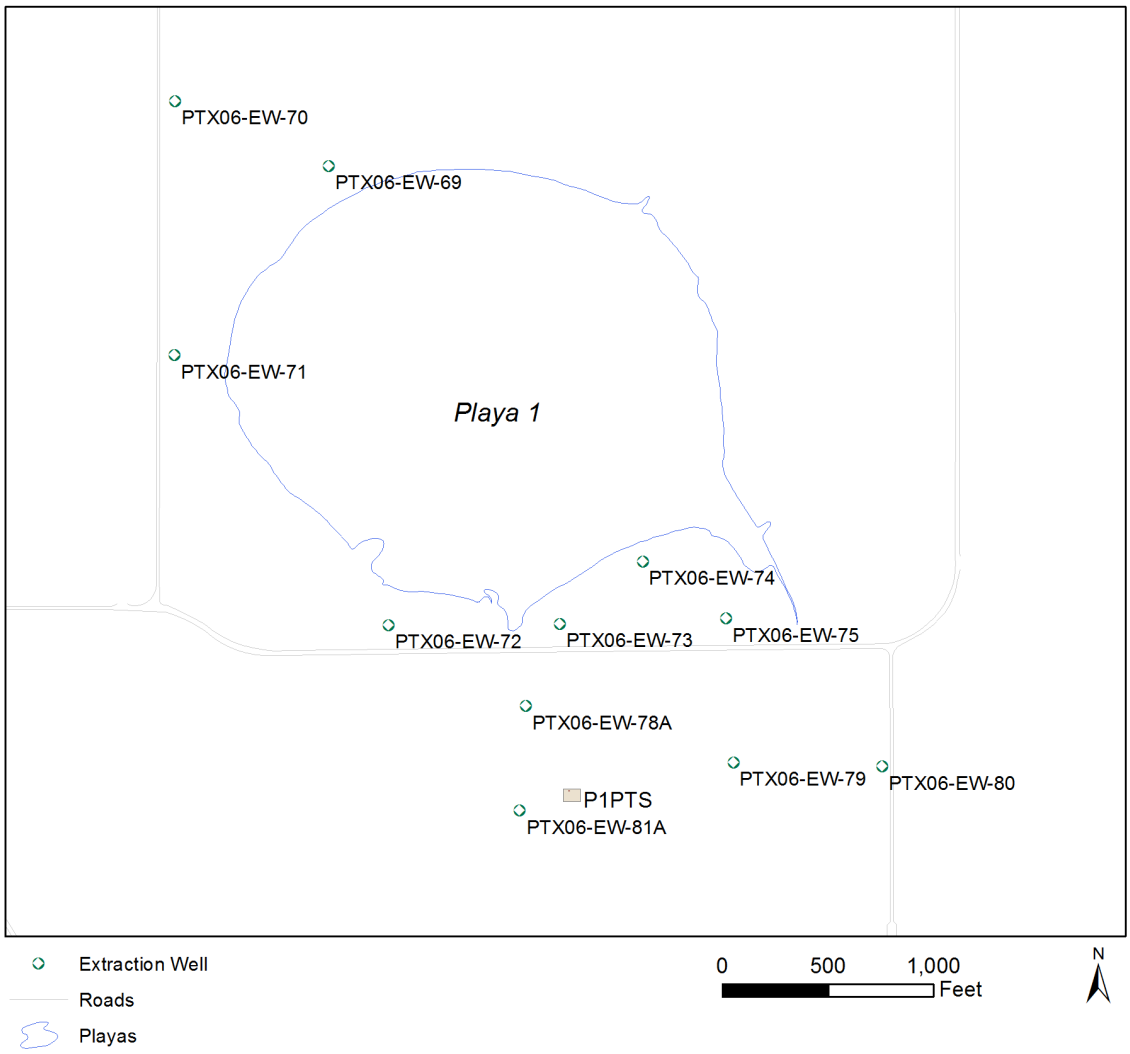
The SVE system continues to treat soil gas and residual NAPL in the solvent evaporation pit/ chemical burn pit area of the Burning Ground, thereby mitigating vertical movement of VOCs to groundwater. Pantex was unable to complete rebound tests successfully, and was unable to prepare a path to closure as recommended in the first Five-Year Review. Therefore, Pantex has evaluated other paths to closure for this system. In May 2017, Pantex completed a modification to six inactive SVE extraction wells surrounding the active extraction well SVE-S-20 to open the wells to ambient air. This modification enhances airflow through the formation while the system is operating. The airflow increased from 32 scfm to about 44 scfm over time. Evaluation of hourly VOC removal indicates that the mass removal rate initially increased with the increase in influent airflow; however, influent concentrations and mass removal have greatly decreased since the system was modified. Pantex is actively pulsing the system to evaluate final closure of the system and will provide further recommendations based on review of influent SVE data in the annual report.

The groundwater remedies are considered to be protected for the short-term, as untreated perched groundwater usage is controlled to prevent human contact and monitoring data continue to indicate that the remedial actions remain generally protective of the Ogallala Aquifer. Additional investigation of the area of the Ogallala Aquifer near PTX06-1056 will begin in early 2023 with installation of two new monitoring wells.

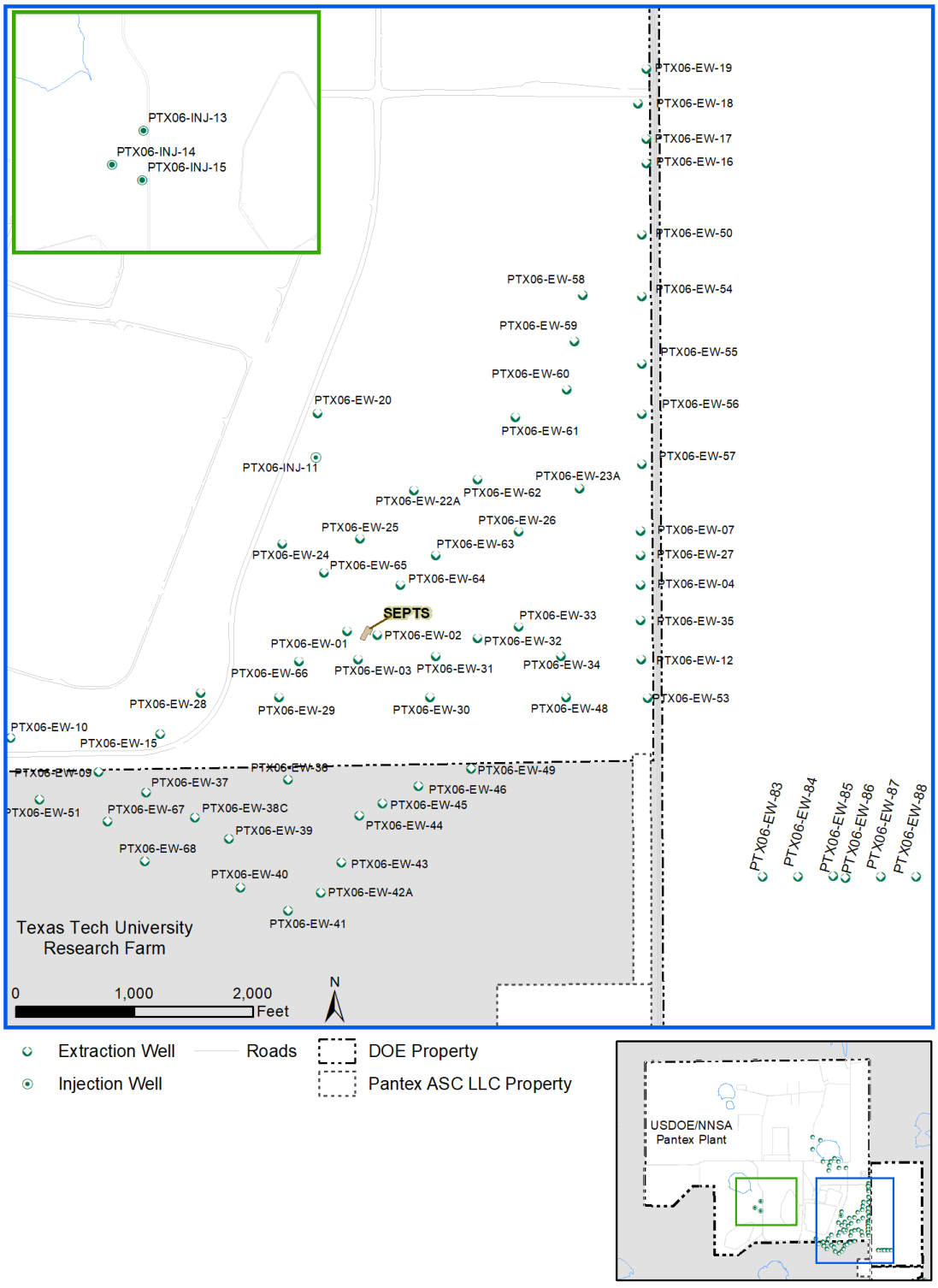
Appendix A
Maps



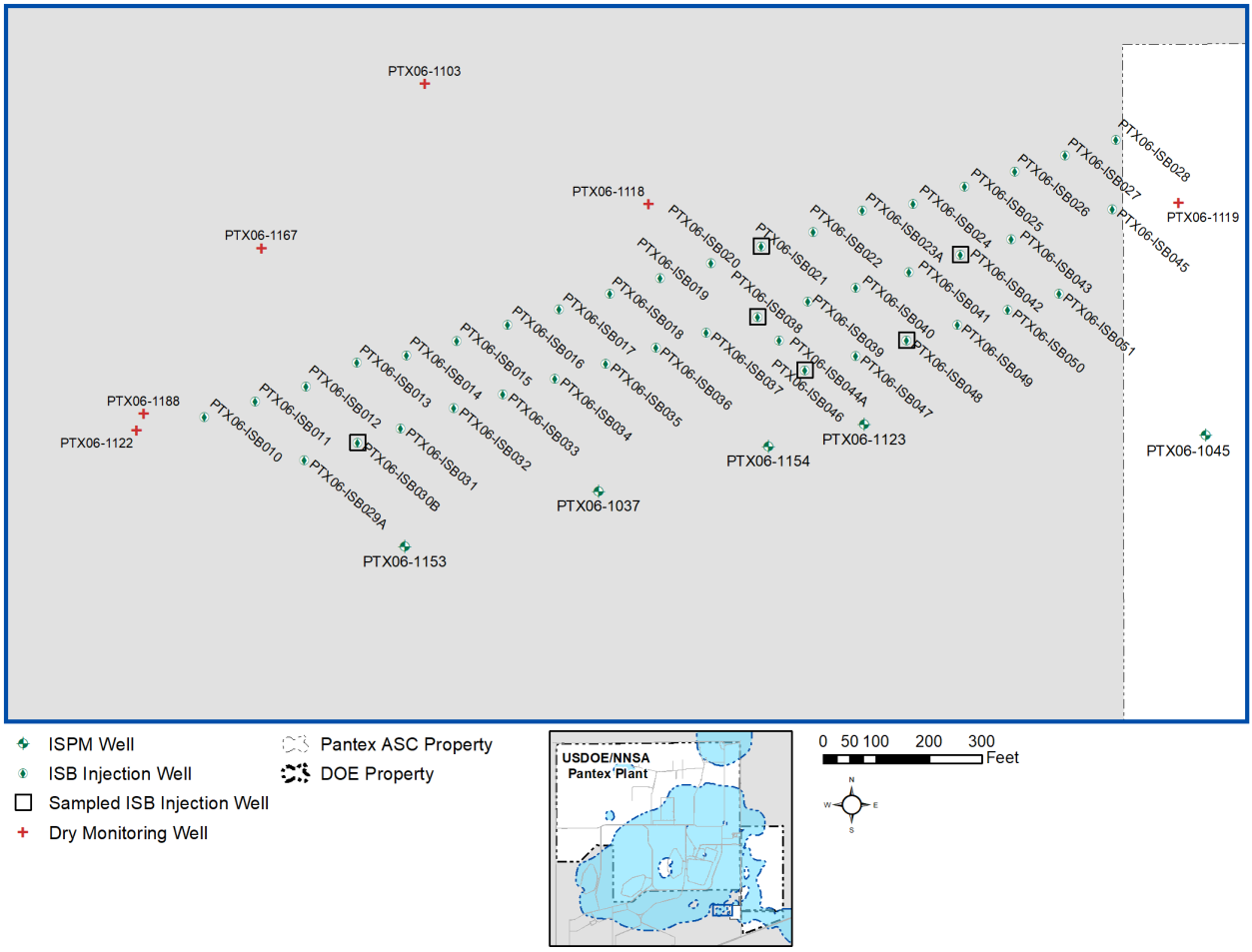
Extent of Perched Groundwater and Contaminant Plumes



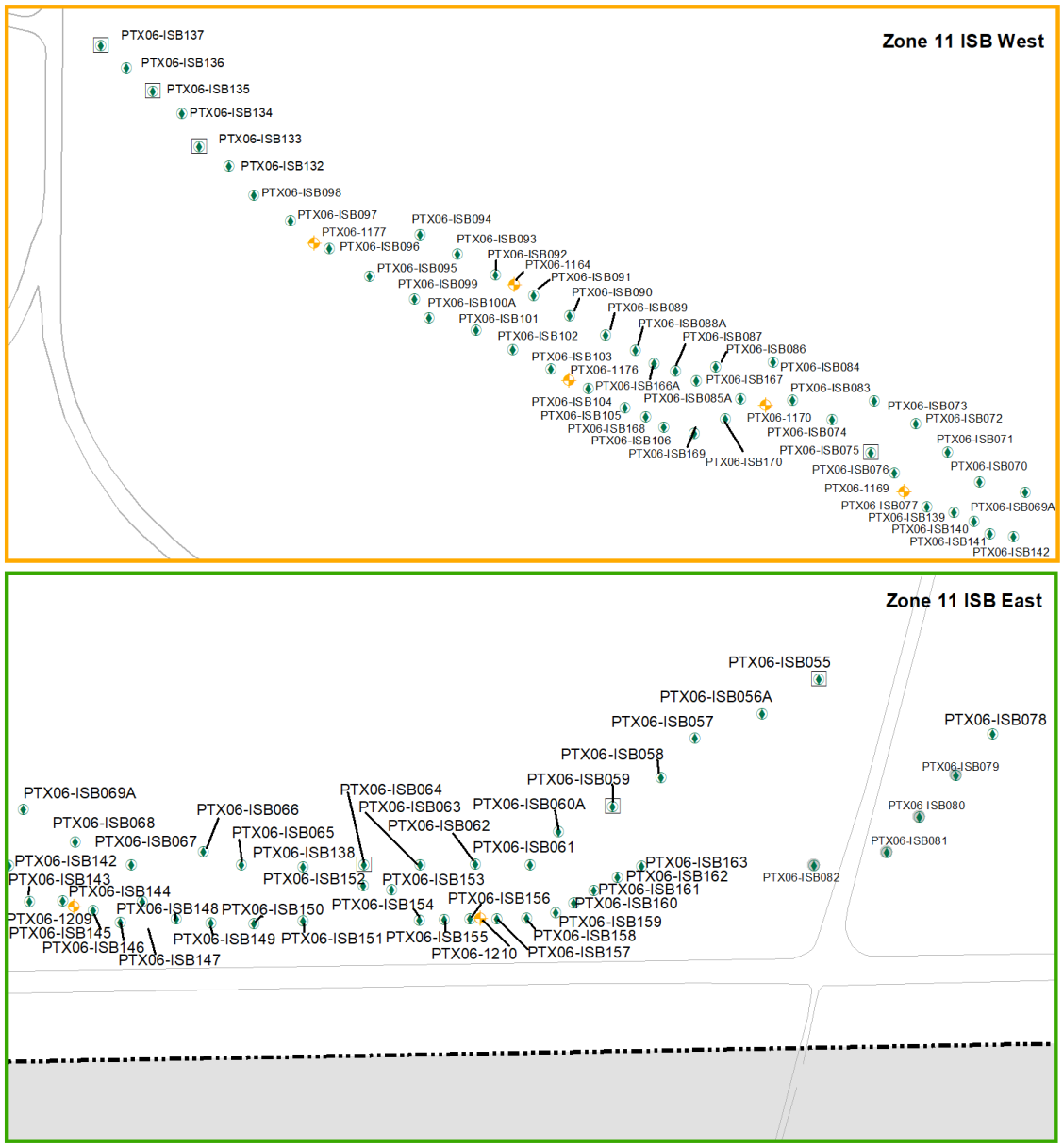
Playa 1 Pump and Treat System Wells

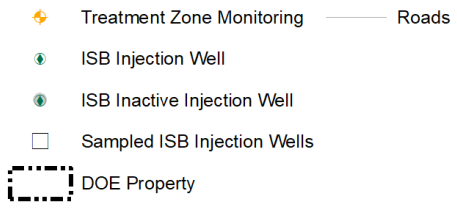


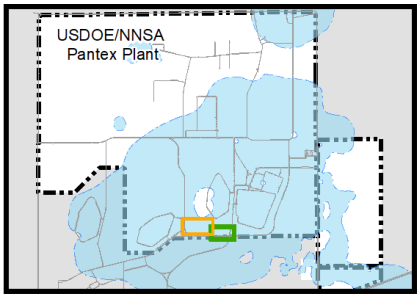
Southeast Pump and Treat System Wells



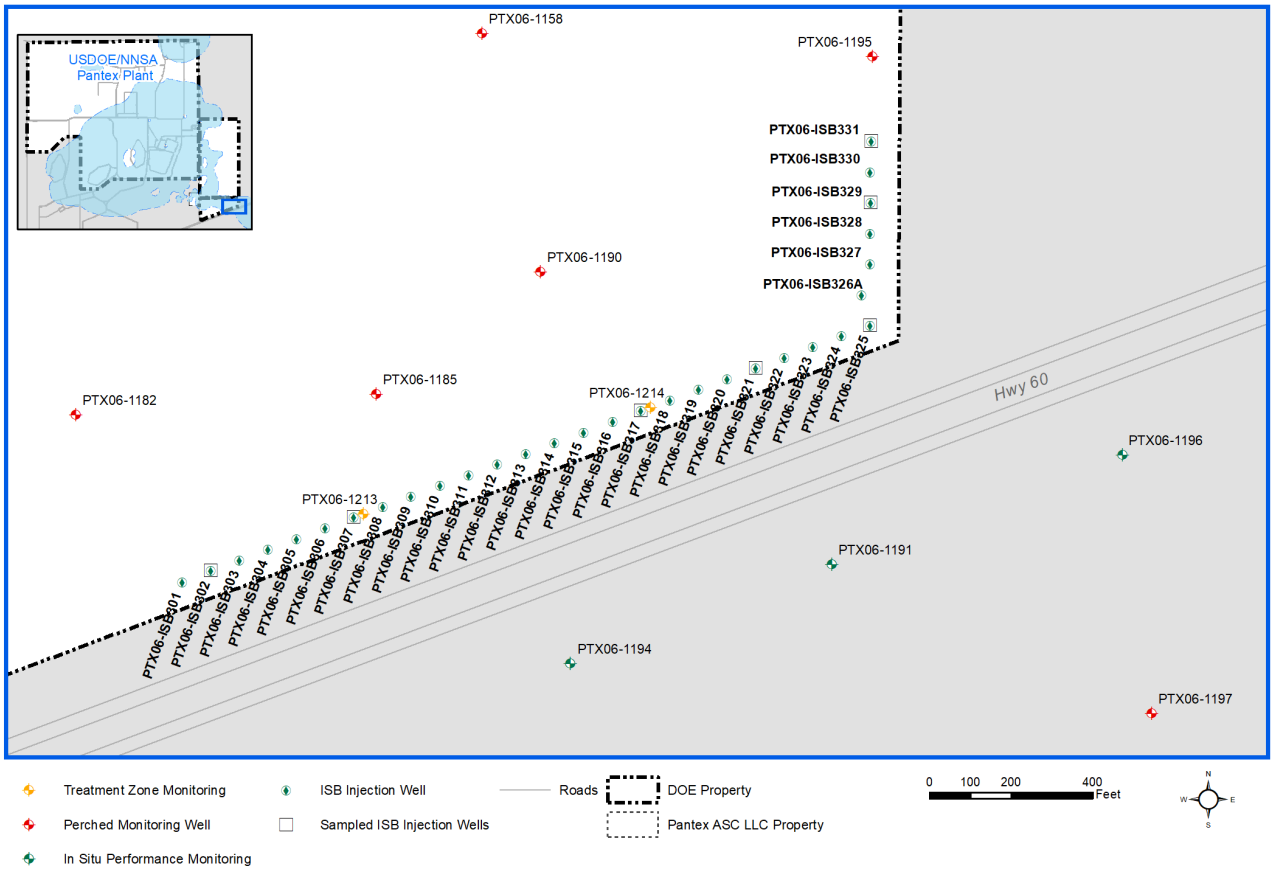
Southeast ISB Wells and Sampling Locations



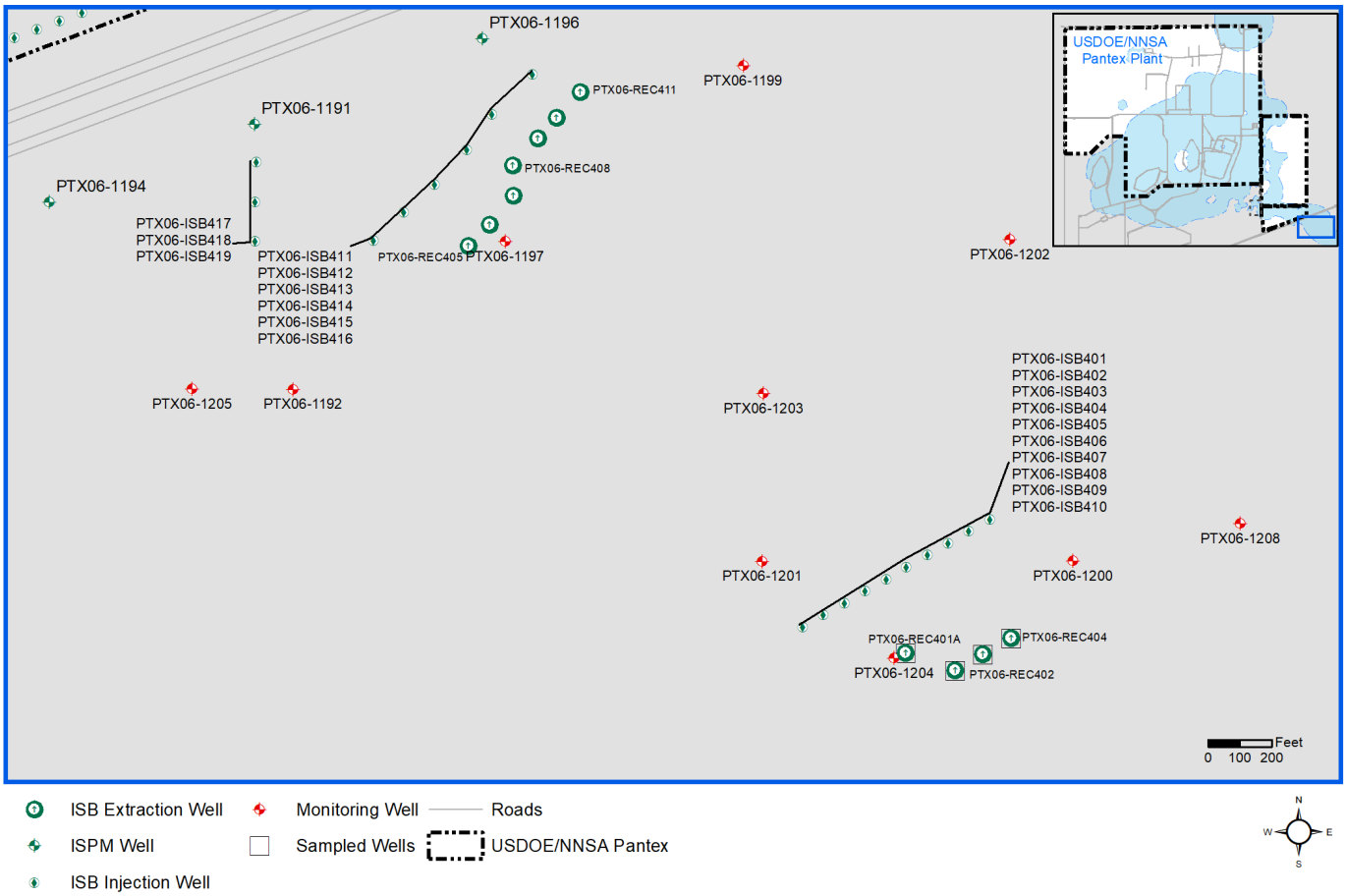




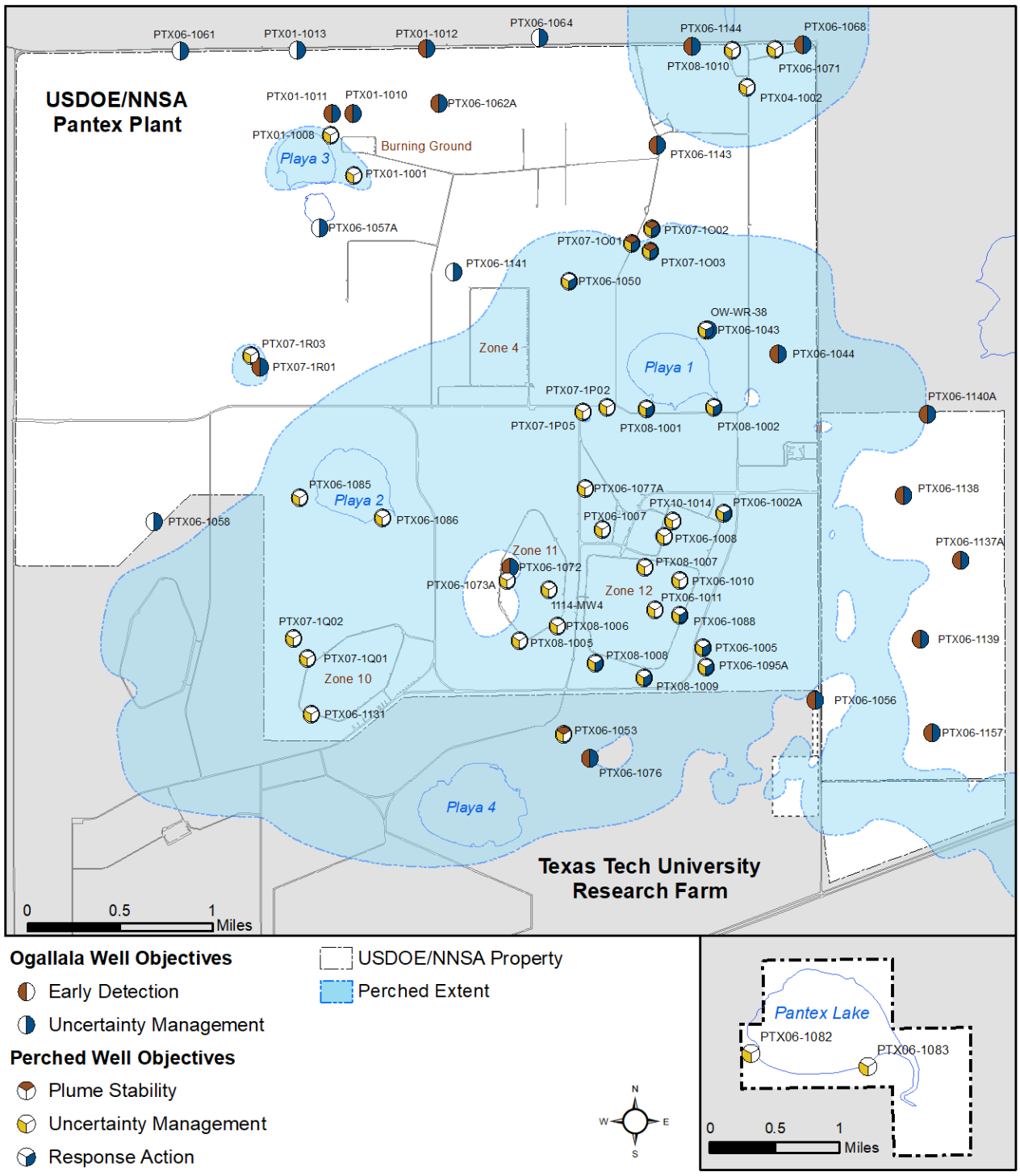
Zone 11 ISB Wells and Sampling Locations



Southeast ISB Extension Wells and Sampling Locations



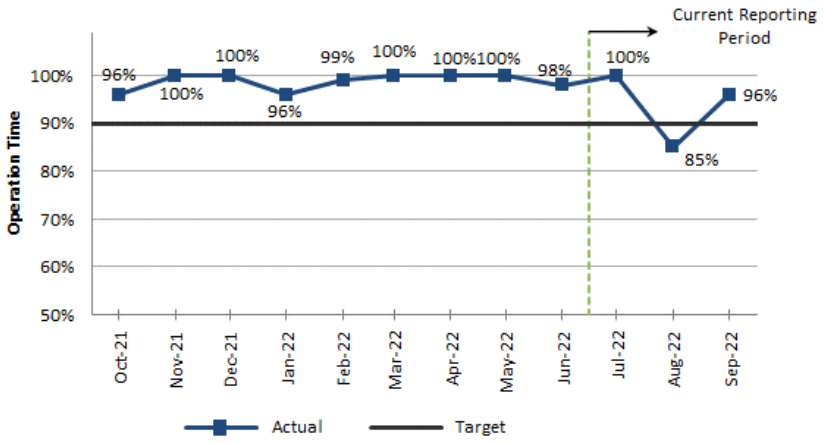
Offsite ISB Wells and Sampling Locations



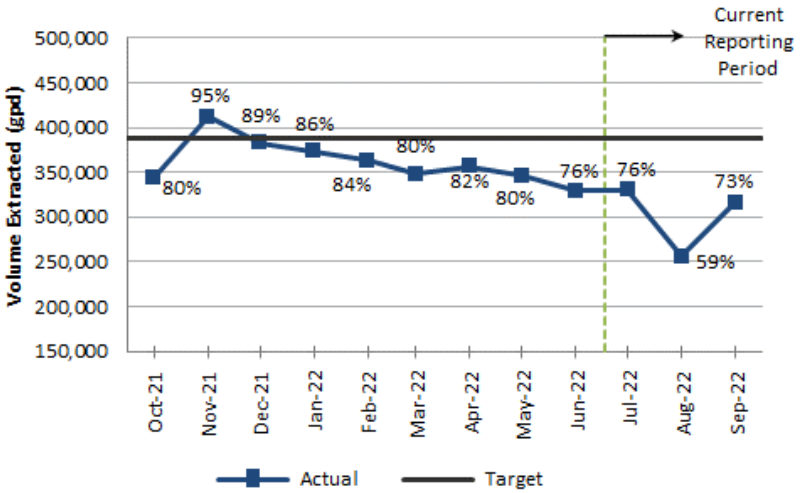
Uncertainty Management and Early Detection Wells Evaluated in the Quarterly Progress Report

Appendix B
Pump and Treat System Graphs

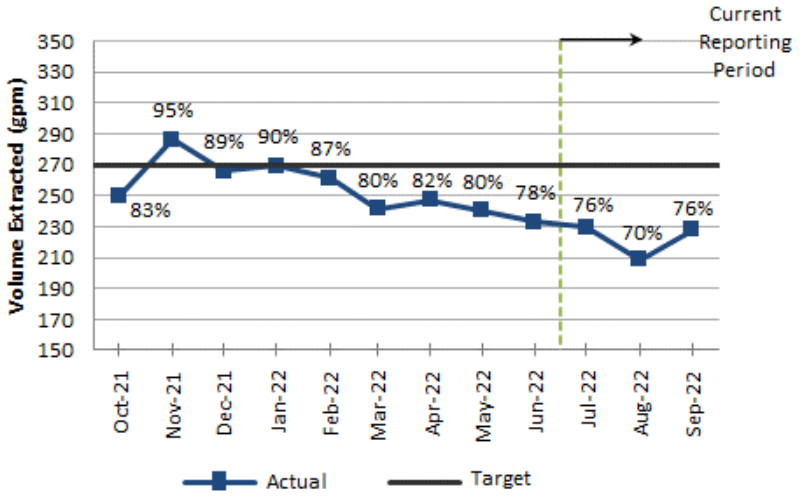
Southeast Pump and Treat System Graphs



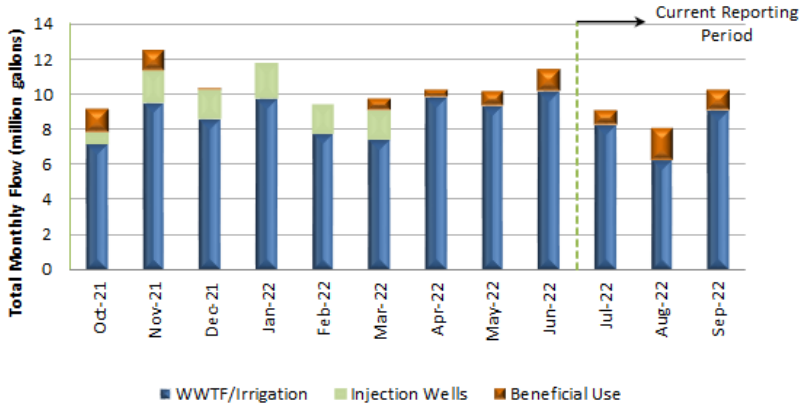
SEPTS Operation Time vs Target



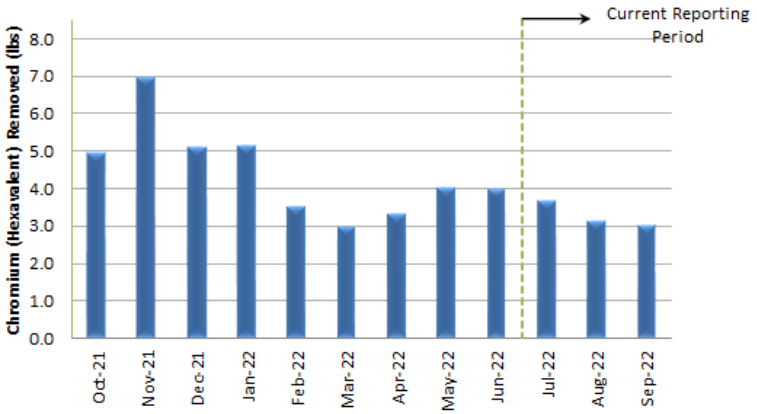
SEPTS GPD and % Capacity



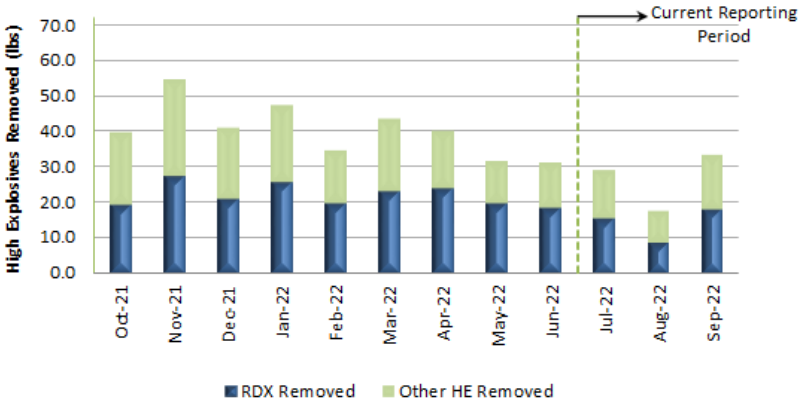
SEPTS Average GPM and % Capacity



SEPTS Monthly Total Flow

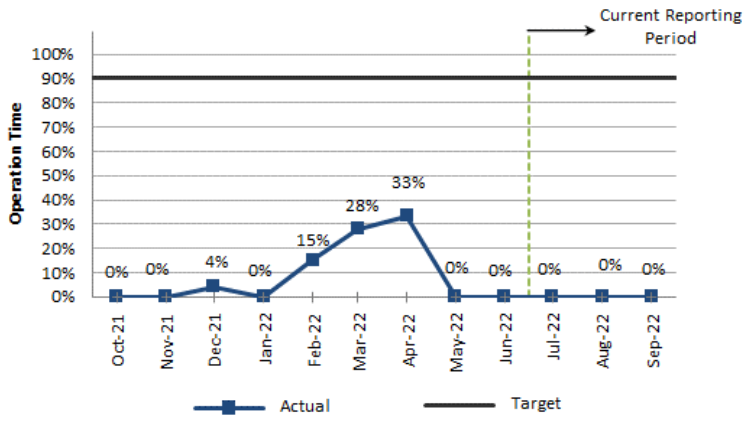


SEPTS Chromium Mass Removal by Month

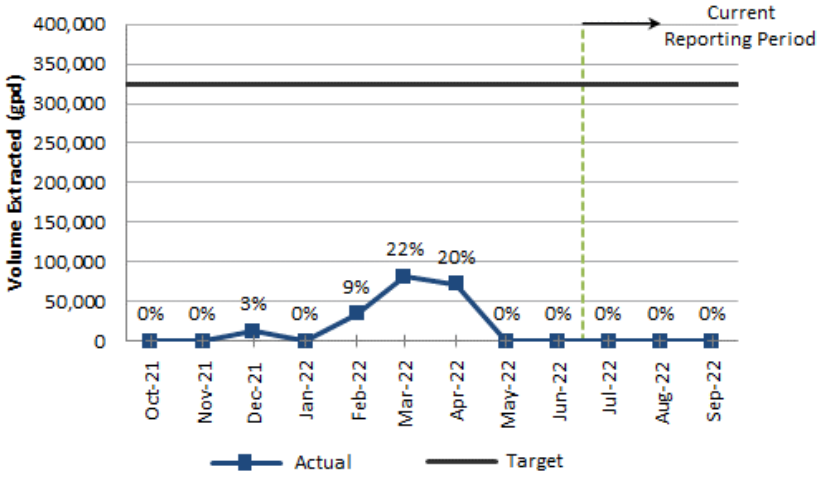


SEPTS HE Mass Removal by Month

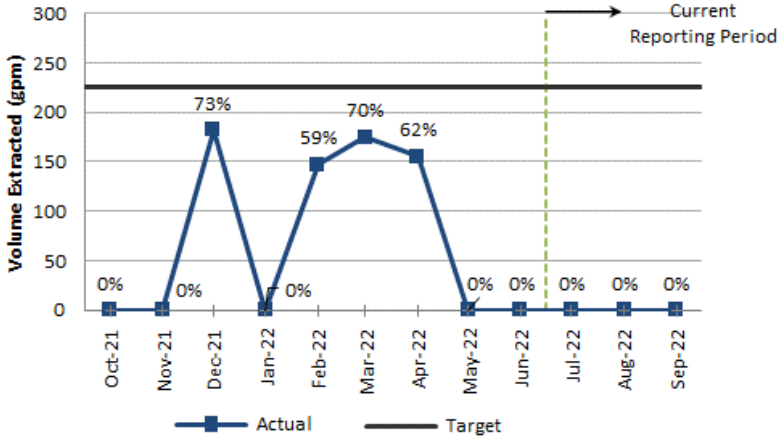
Playa 1 Pump and Treat System Graphs



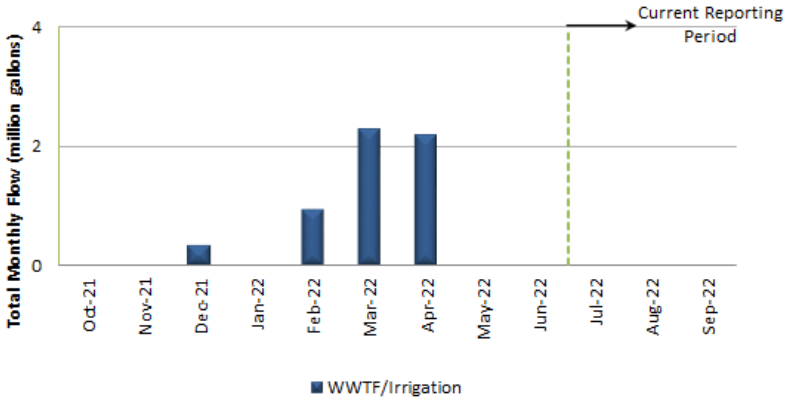
P1PTS Operational Time Vs Target



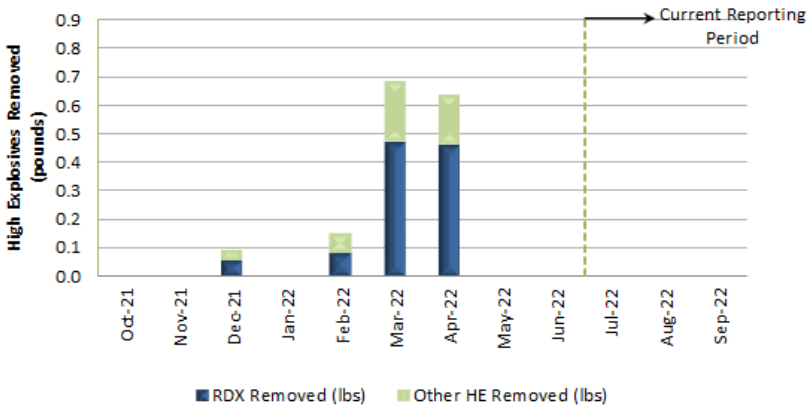
P1PTS Average GPD and % Capacity



P1PTS Average GPM and % Capacity



P1PTS Monthly System Total Flow



P1PTS HE Mass Removal by Month

Appendix B Glossary

Operation Time	Operation time represents the percentage of the total number of hours the system was actually operated vs. the total possible hours the system could have operated on a monthly basis.
GPM Extraction	The gallons per minute (GPM) extraction rate represents the extraction rate from the well field while the system was operating. This is a measurement of the well field's capability to support the overall system throughput goals. Low well field rates can occur due to inoperable wells or decline in saturated thickness that makes extraction difficult.
GPD Extraction	The gallons per day (GPD) extraction rate represents the system's ability to meet overall throughput goals, considering the well field extraction rate and the system's operational rate. This rate is affected by the ability to extract water from the well field and the system downtime.
Total Monthly Flow	Total monthly flow is the total volume of extracted water measured at the influent point of the pump and treat system. Individual well measurements and flow rates are provided in the annual progress report.

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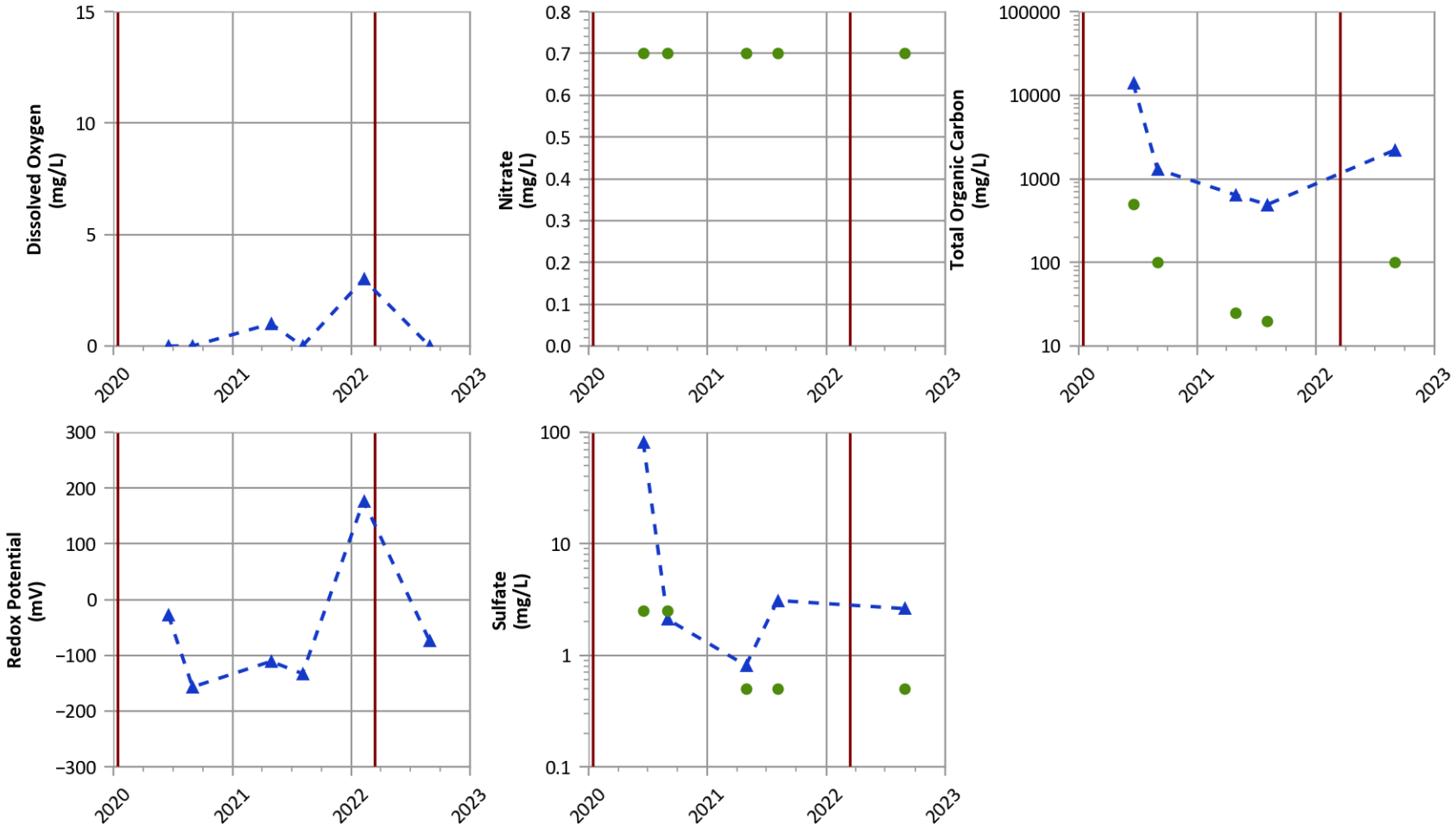
Appendix C
ISB Graphs

Southeast ISB Graphs

PTX06-ISB021 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant

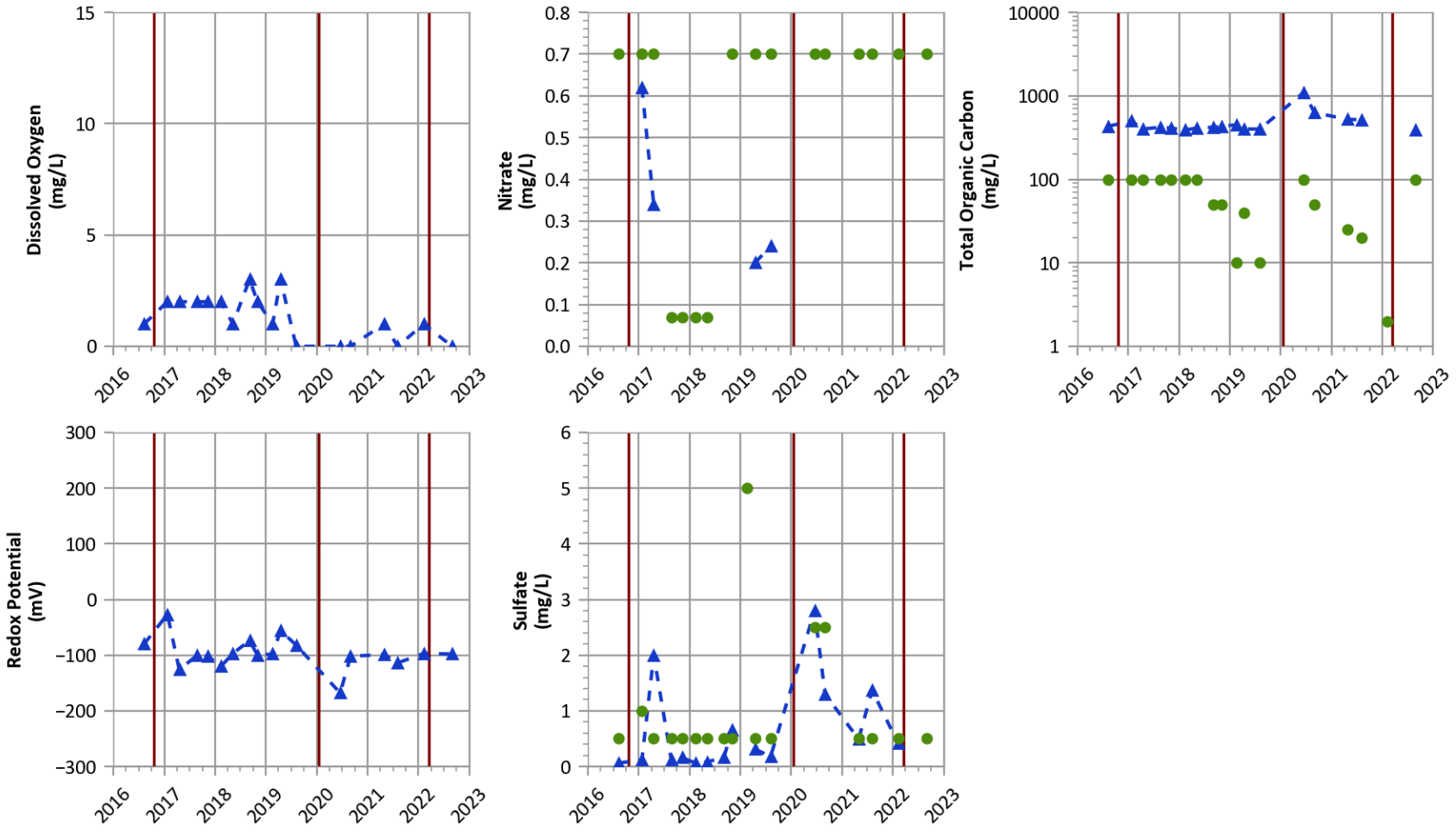


Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location

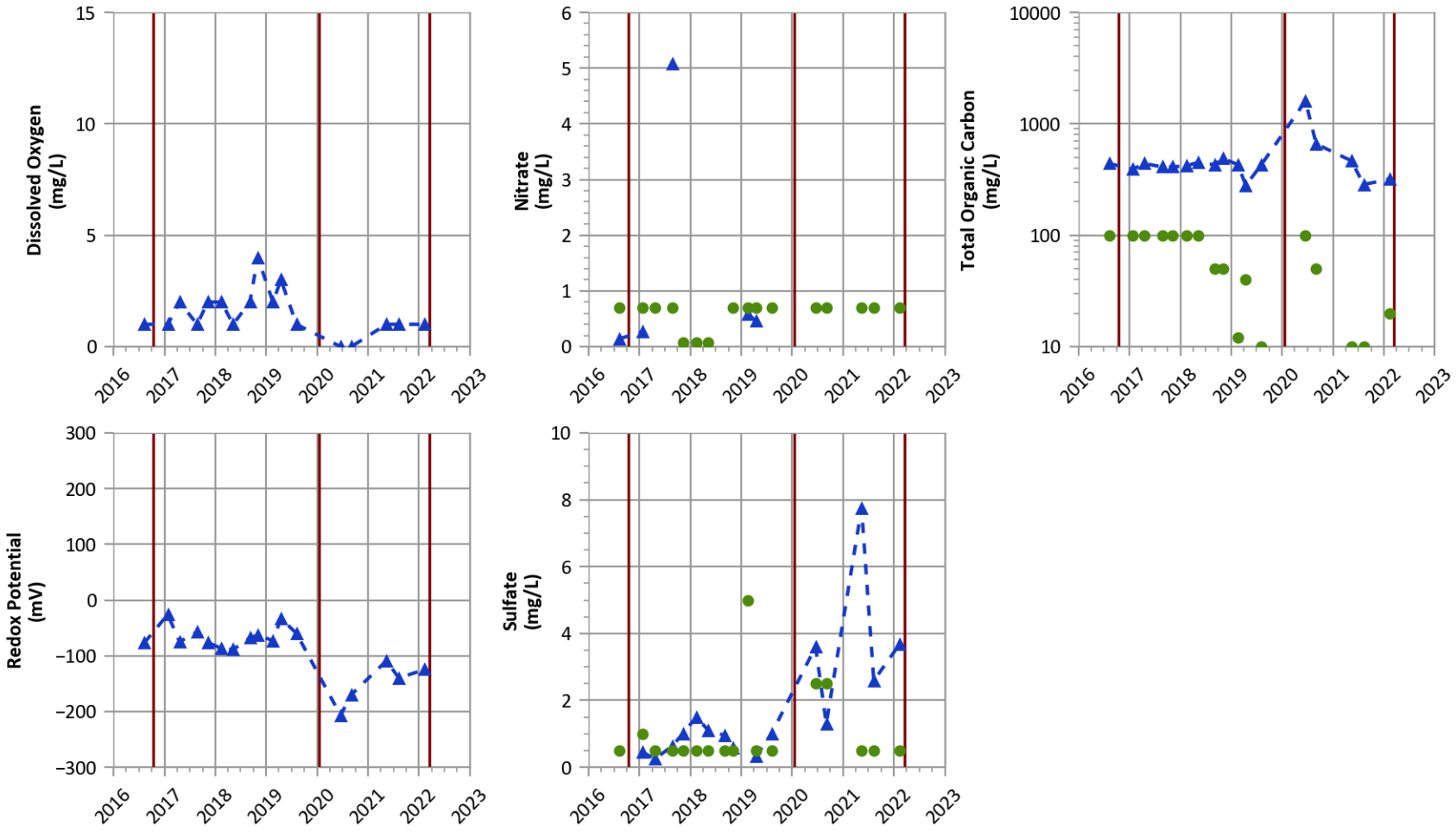
PTX06-ISB030B Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

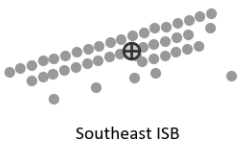
Well Location

PTX06-ISB038 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant

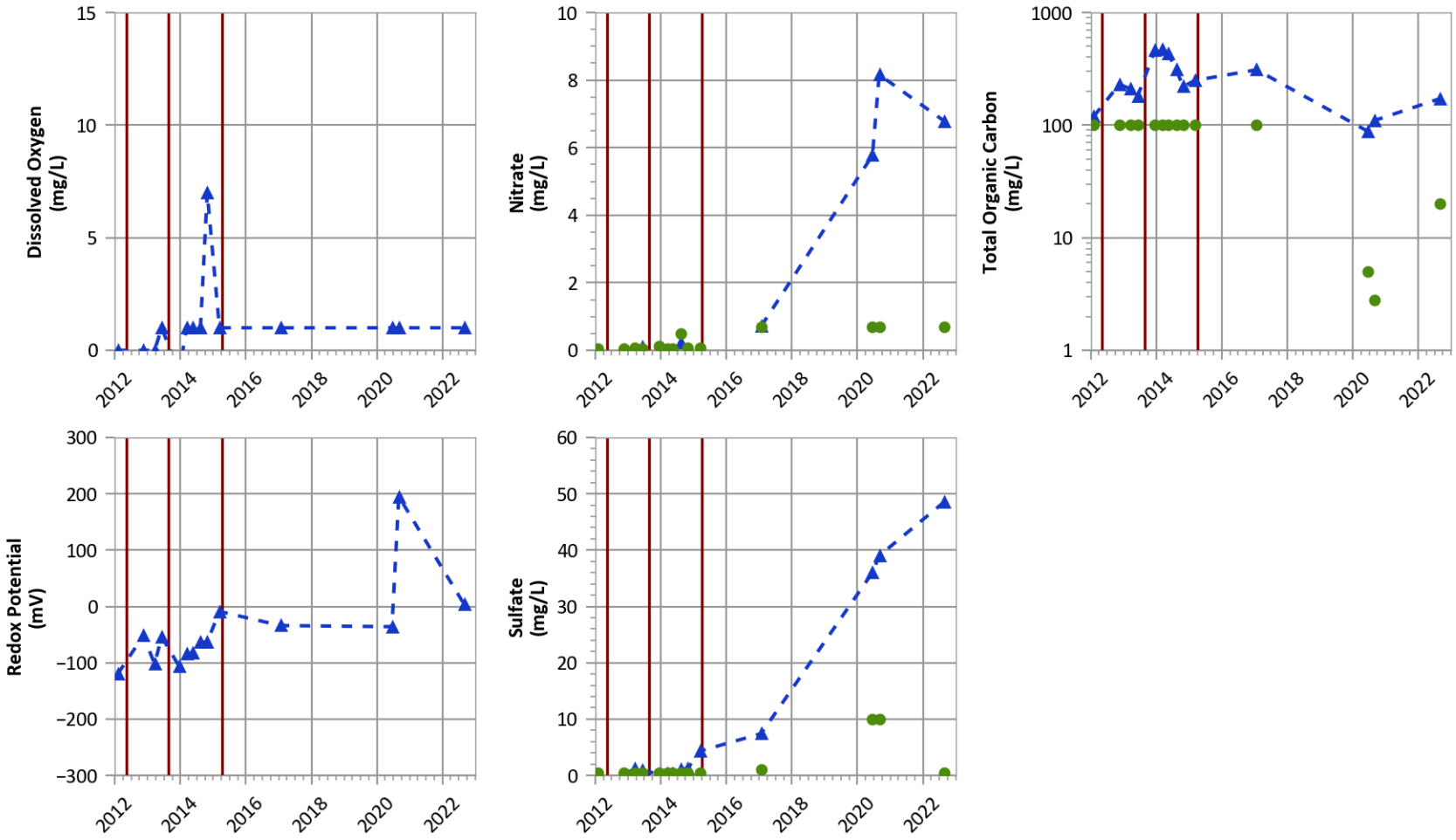


Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Well Location



PTX06-ISB042 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant

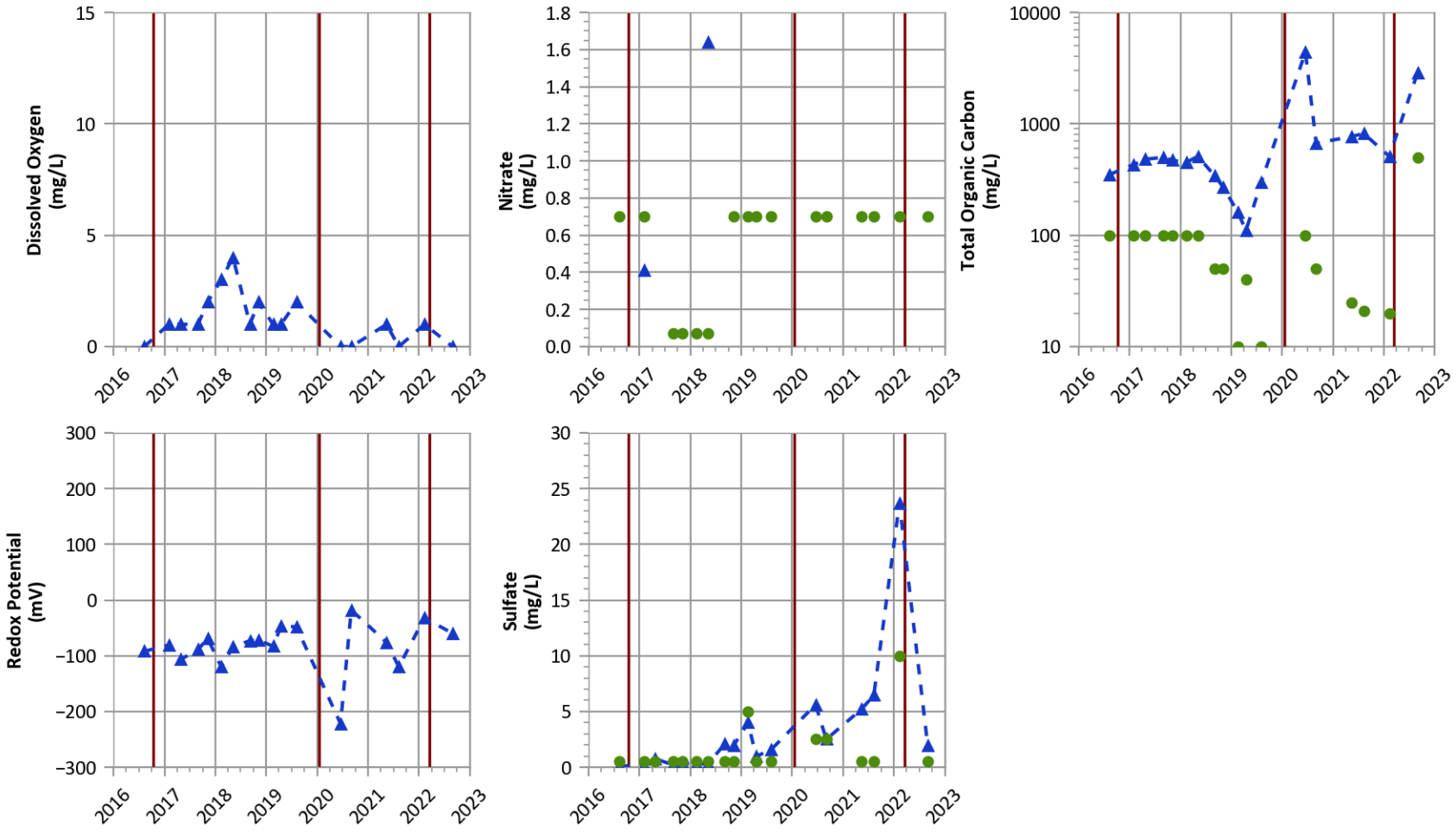


Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Well Location

Southeast ISB

PTX06-ISB046 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant

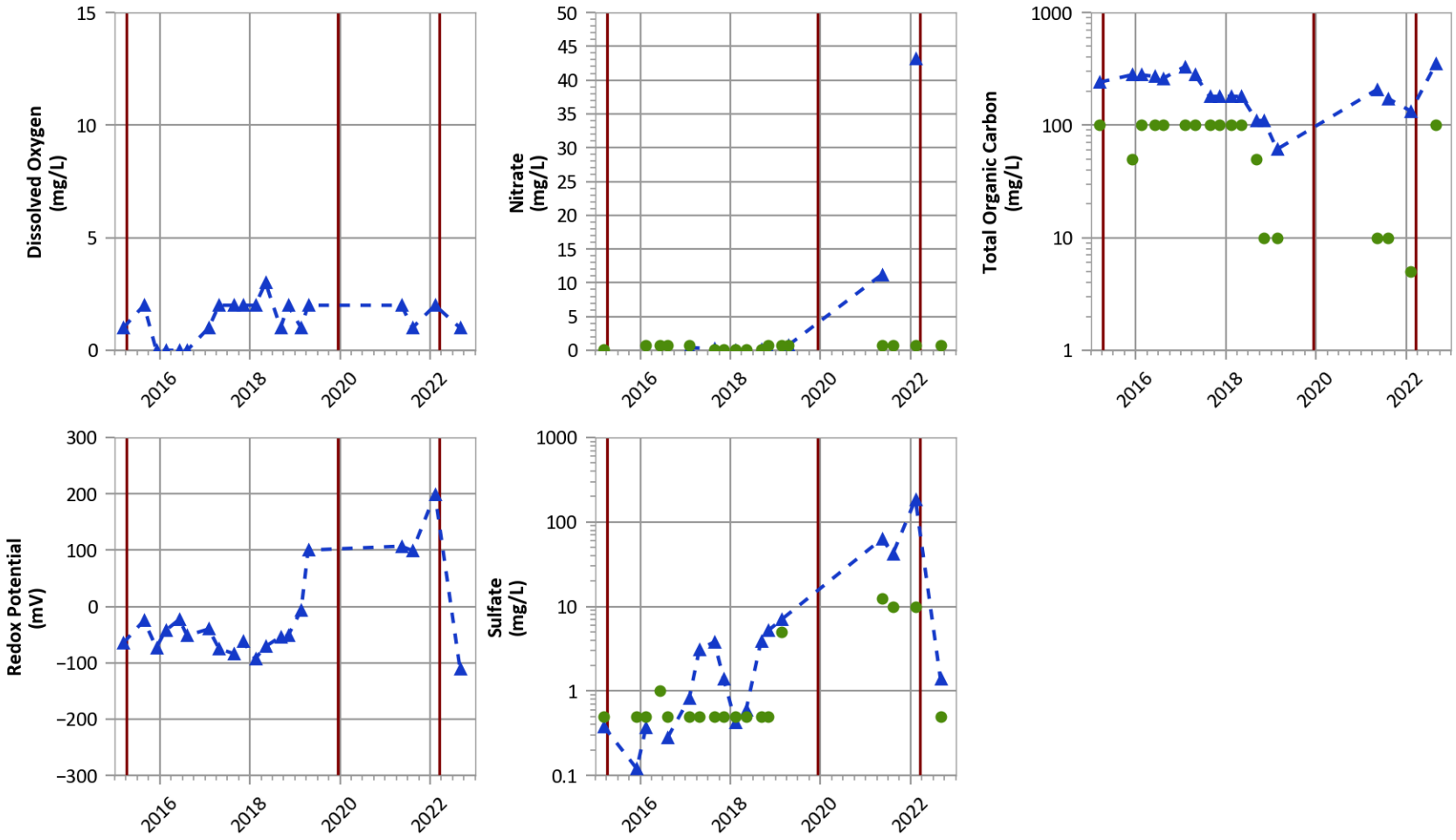


Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Well Location

Southeast ISB

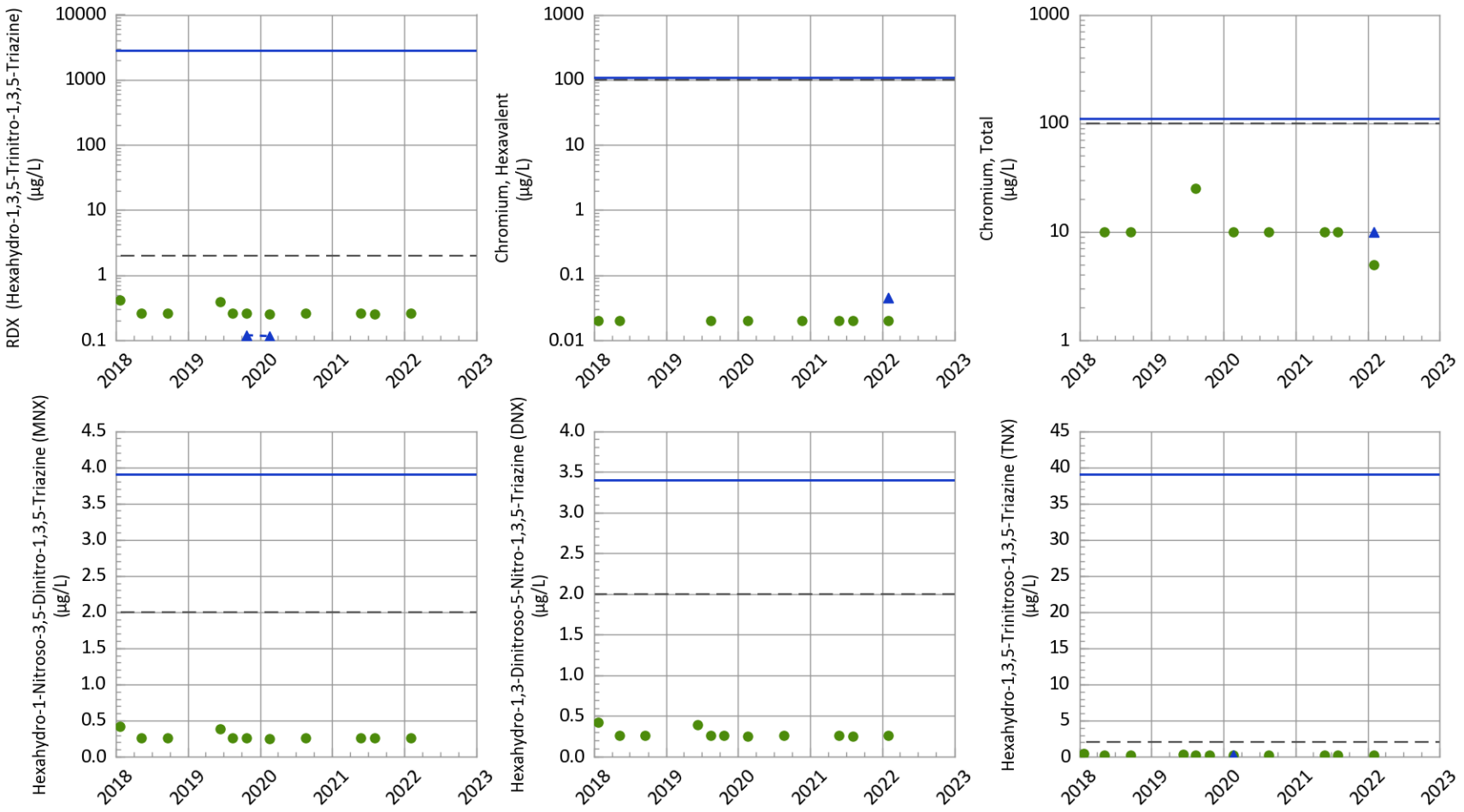
PTX06-ISB048 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

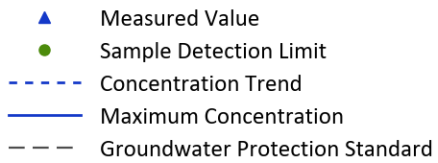
Well Location

PTX06-1037 Downgradient Performance Indicators
Southeast In Situ Bioremediation System
USDOE/NNSA Pantex Plant



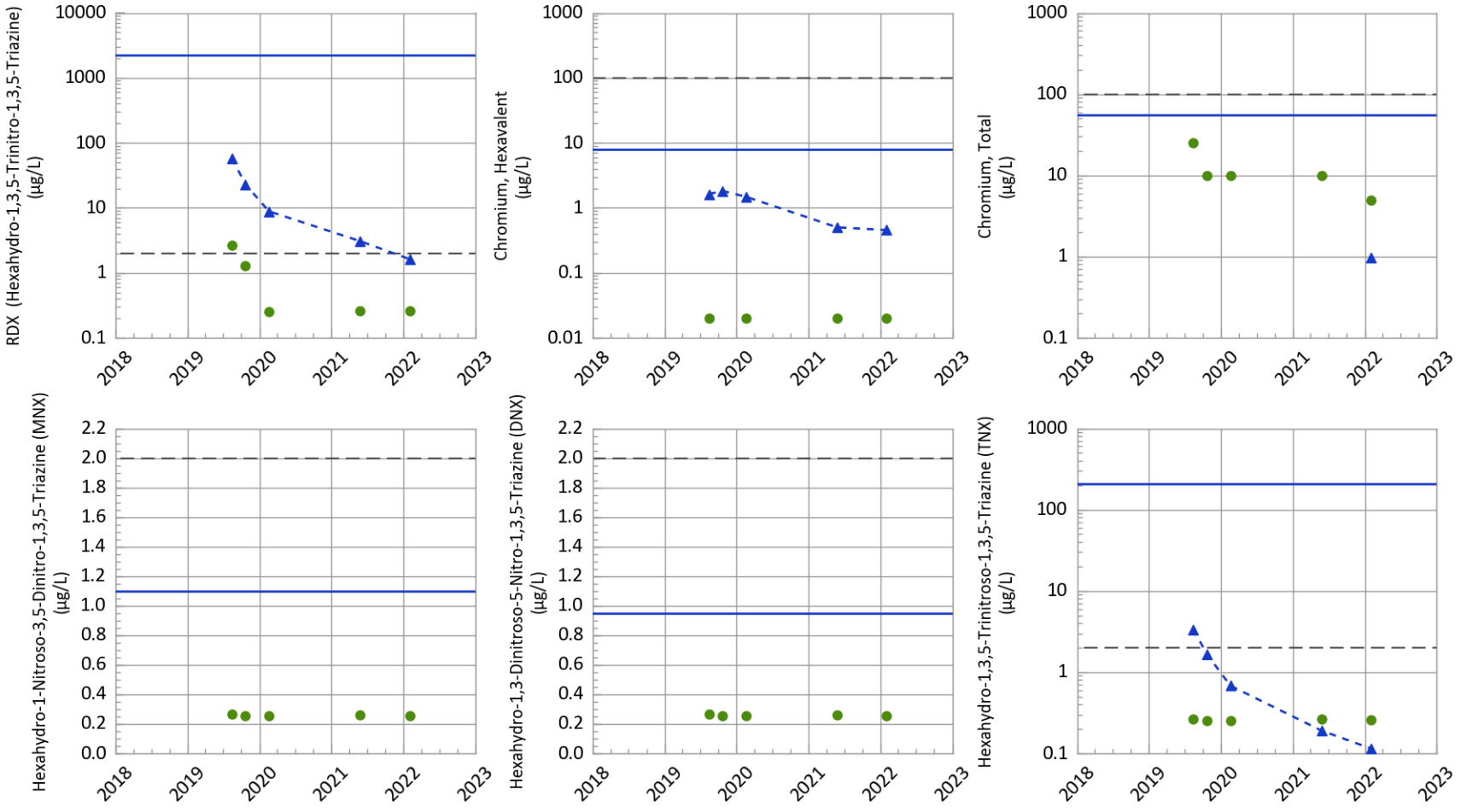
Most Recent Measured COC Concentrations (Feb 18, 2020)

COC	Concentration (µg/L)	GWPS (µg/L)
RDX	Non-Detect	2.0
MNX	Non-Detect	2.0
CR-6	0.045	100.0
DNX	Non-Detect	2.0
CR	10.0	100.0
TNX	Non-Detect	2.0



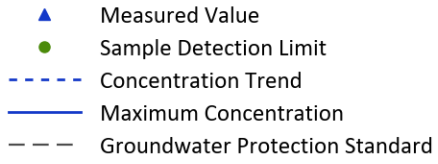
Well Location

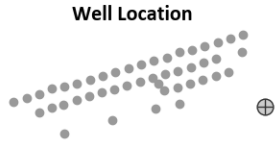
PTX06-1045 Downgradient Performance Indicators
Southeast In Situ Bioremediation System
USDOE/NNSA Pantex Plant



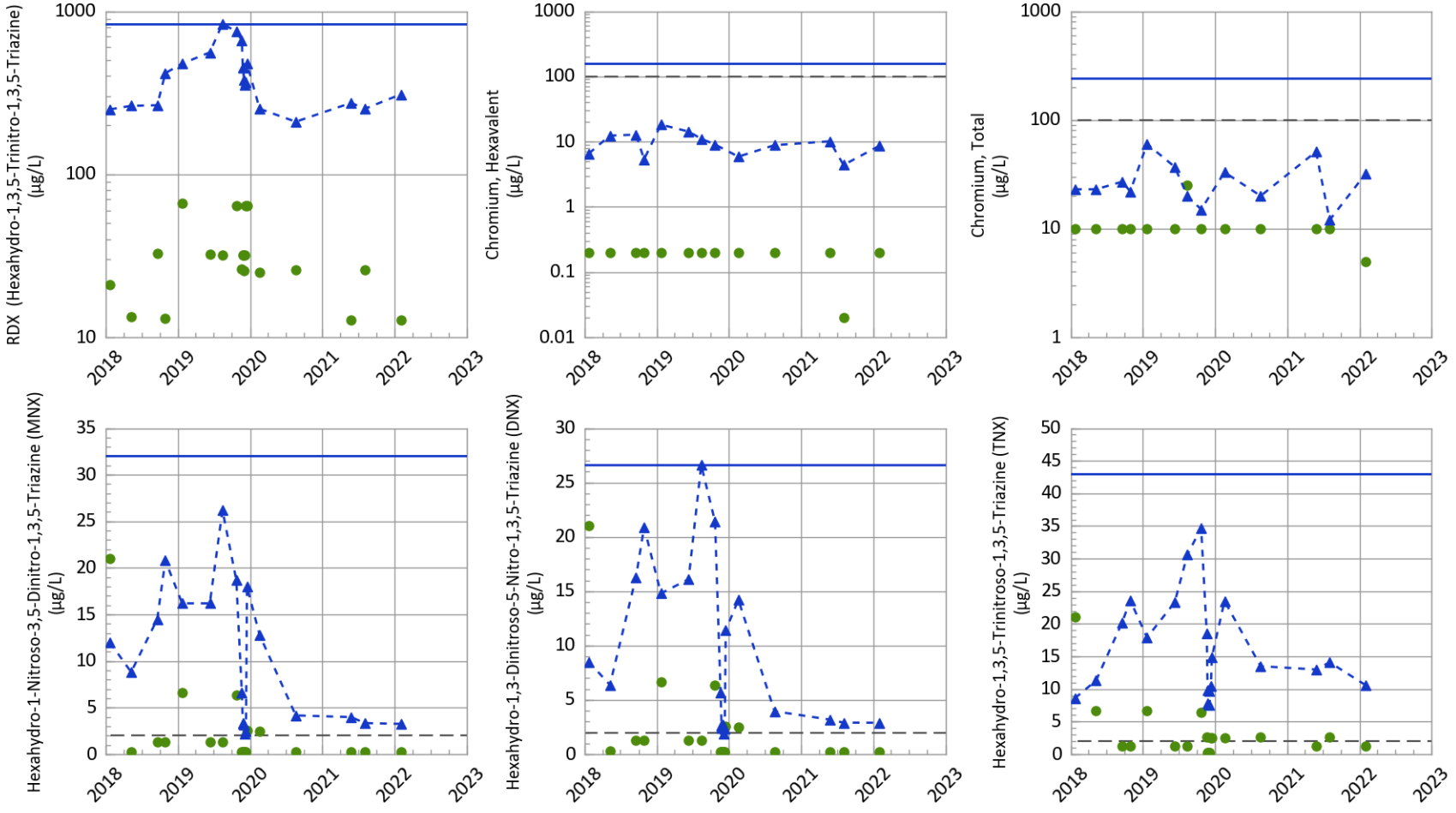
Most Recent Measured COC Concentrations (Feb 01, 2022)

COC	Concentration (µg/L)	GWPS (µg/L)
RDX	1.63	2.0
MNX	Non-Detect	2.0
CR-6	0.456	100.0
DNX	Non-Detect	2.0
CR	0.97	100.0
TNX	0.115	2.0



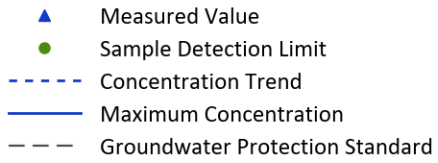


PTX06-1153 Downgradient Performance Indicators
Southeast In Situ Bioremediation System
USDOE/NNSA Pantex Plant



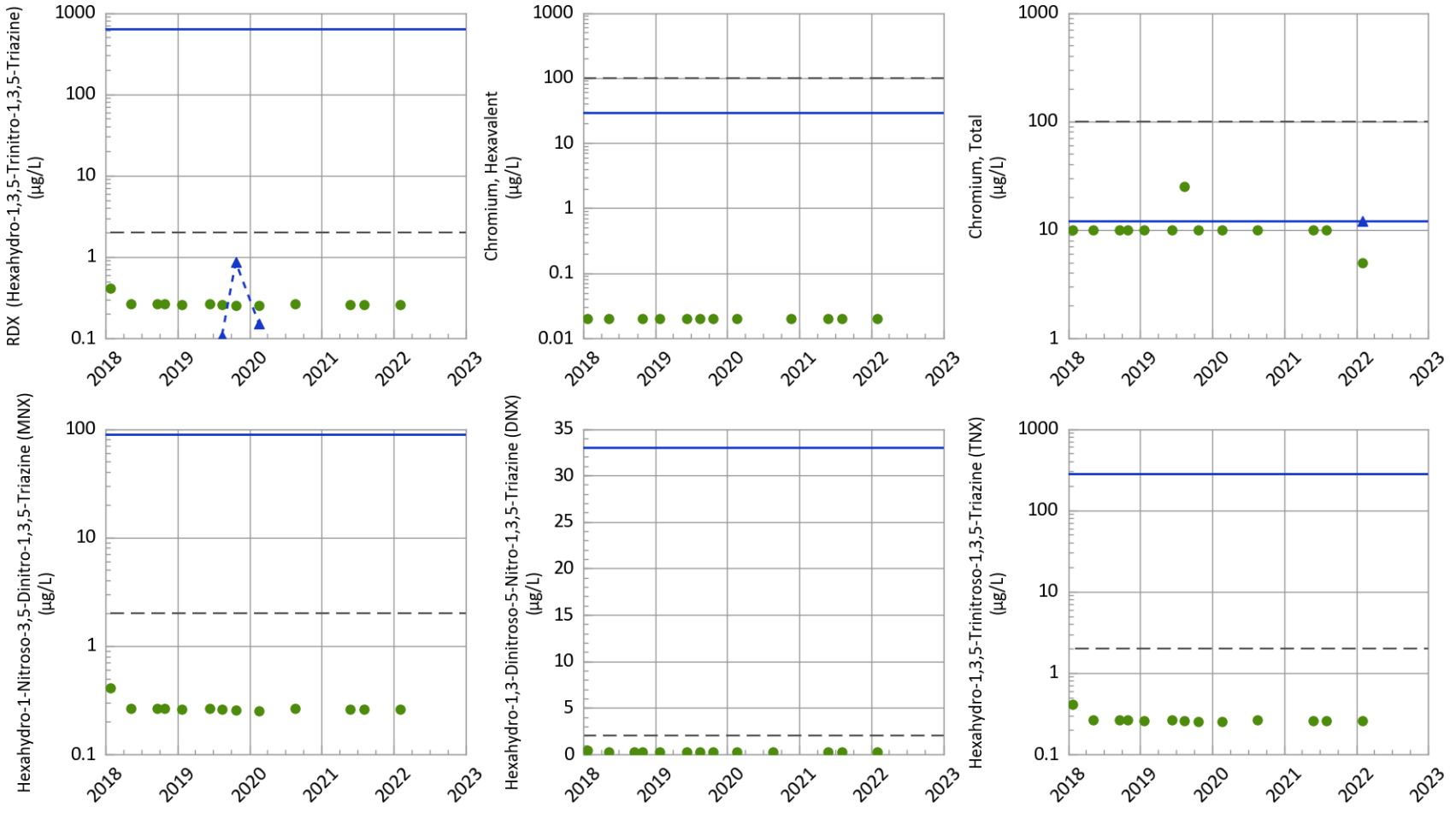
Most Recent Measured COC Concentrations (Feb 01, 2022)

COC	Concentration (µg/L)	GWPS (µg/L)
RDX	309.0	2.0
MNX	3.26	2.0
CR-6	8.655	100.0
DNX	2.9	2.0
CR	32.0	100.0
TNX	10.6	2.0



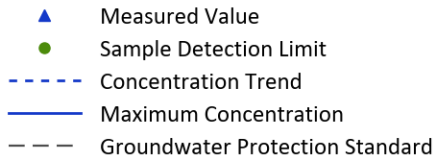
Well Location

PTX06-1154 Downgradient Performance Indicators
Southeast In Situ Bioremediation System
USDOE/NNSA Pantex Plant



Most Recent Measured COC Concentrations (Feb 01, 2022)

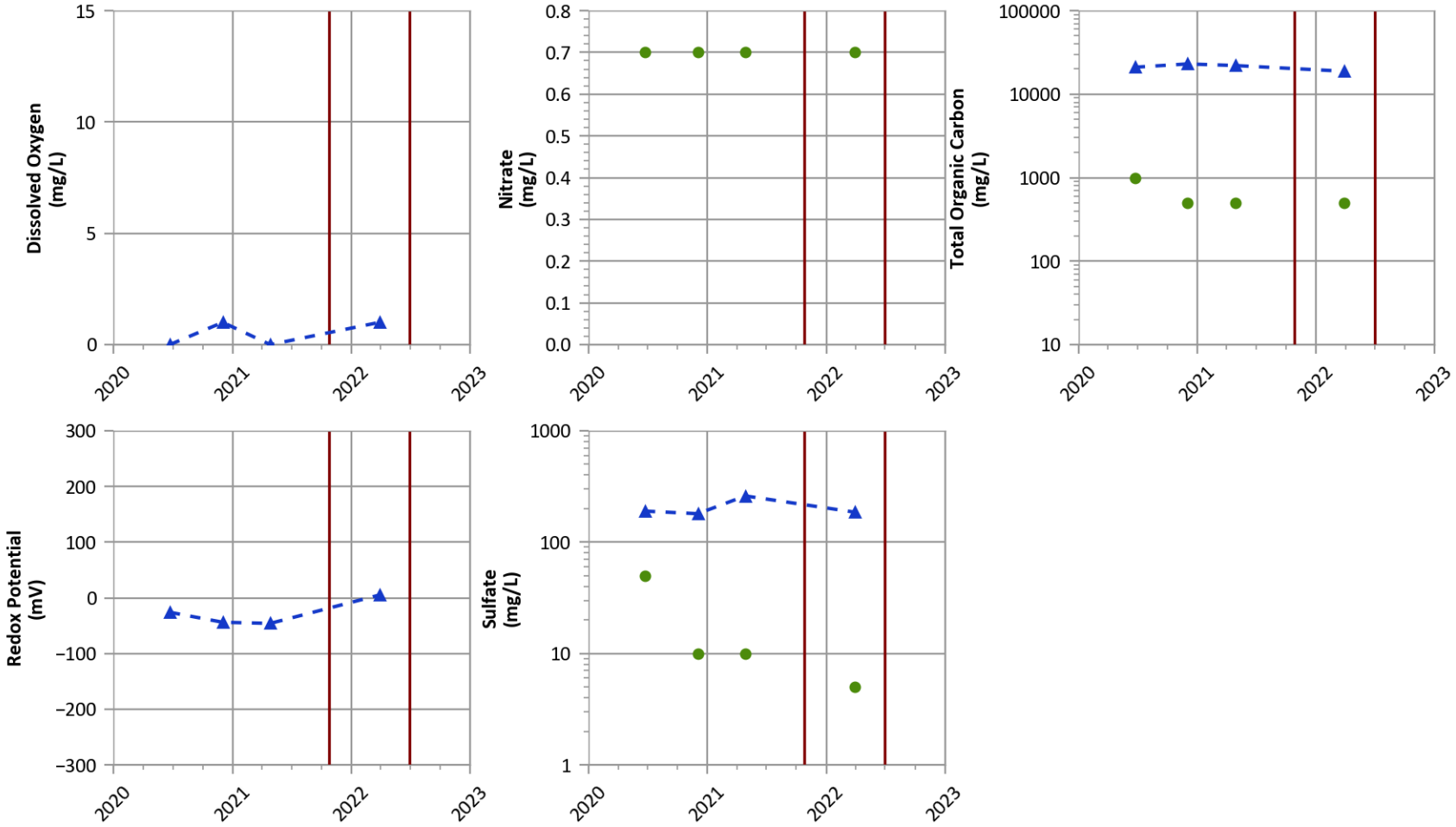
COC	Concentration (µg/L)	GWPS (µg/L)
RDX	Non-Detect	2.0
MNX	Non-Detect	2.0
CR-6	Non-Detect	100.0
DNX	Non-Detect	2.0
CR	12.0	100.0
TNX	Non-Detect	2.0



Well Location

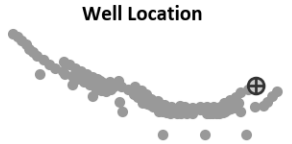
Zone 11 ISB Graphs

PTX06-ISB055 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



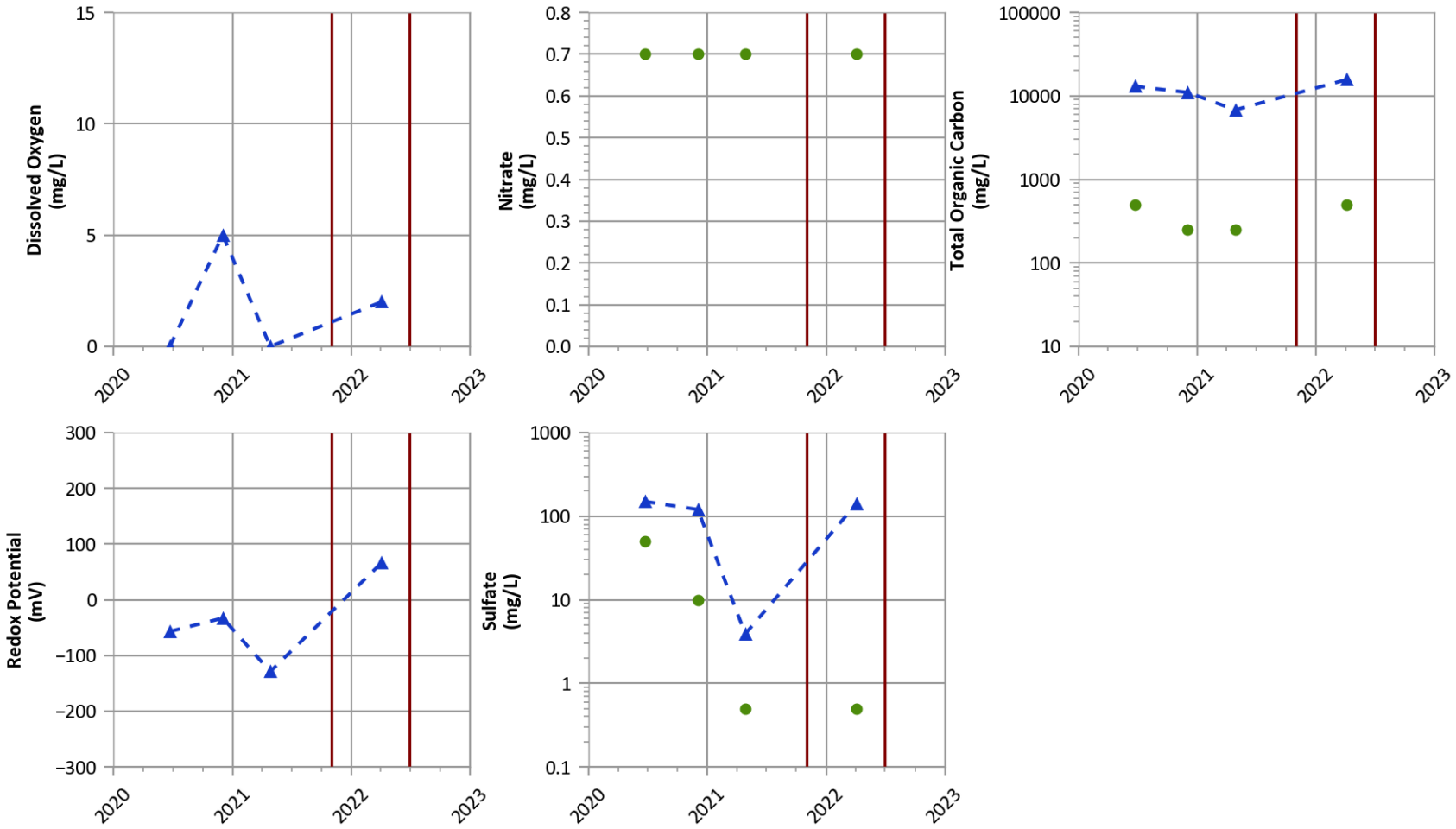
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Well Location



Zone 11 ISB

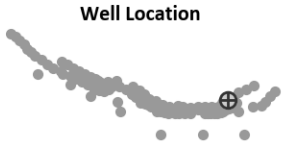
PTX06-ISB059 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

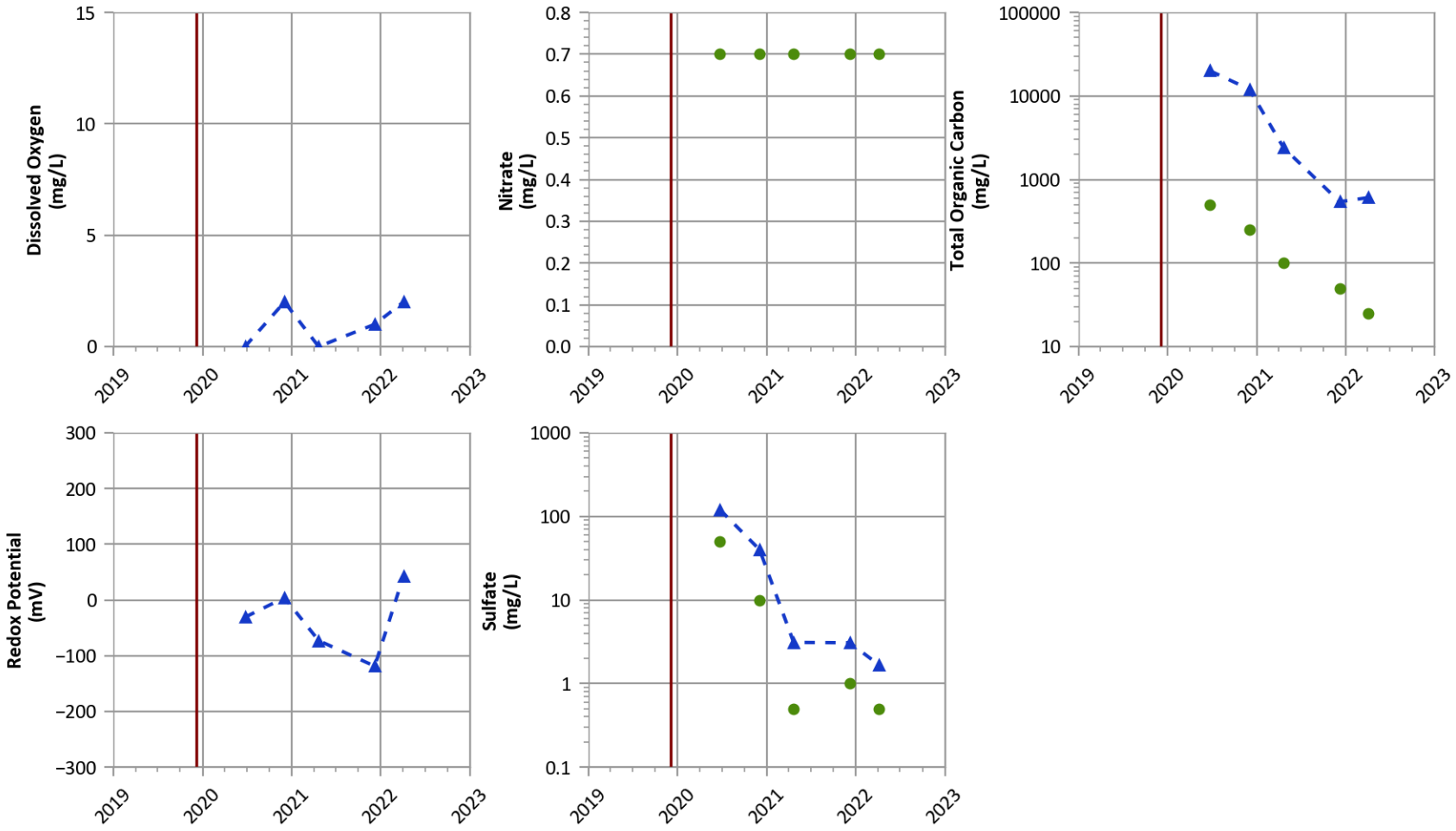
Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location



Zone 11 ISB

PTX06-ISB064 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant

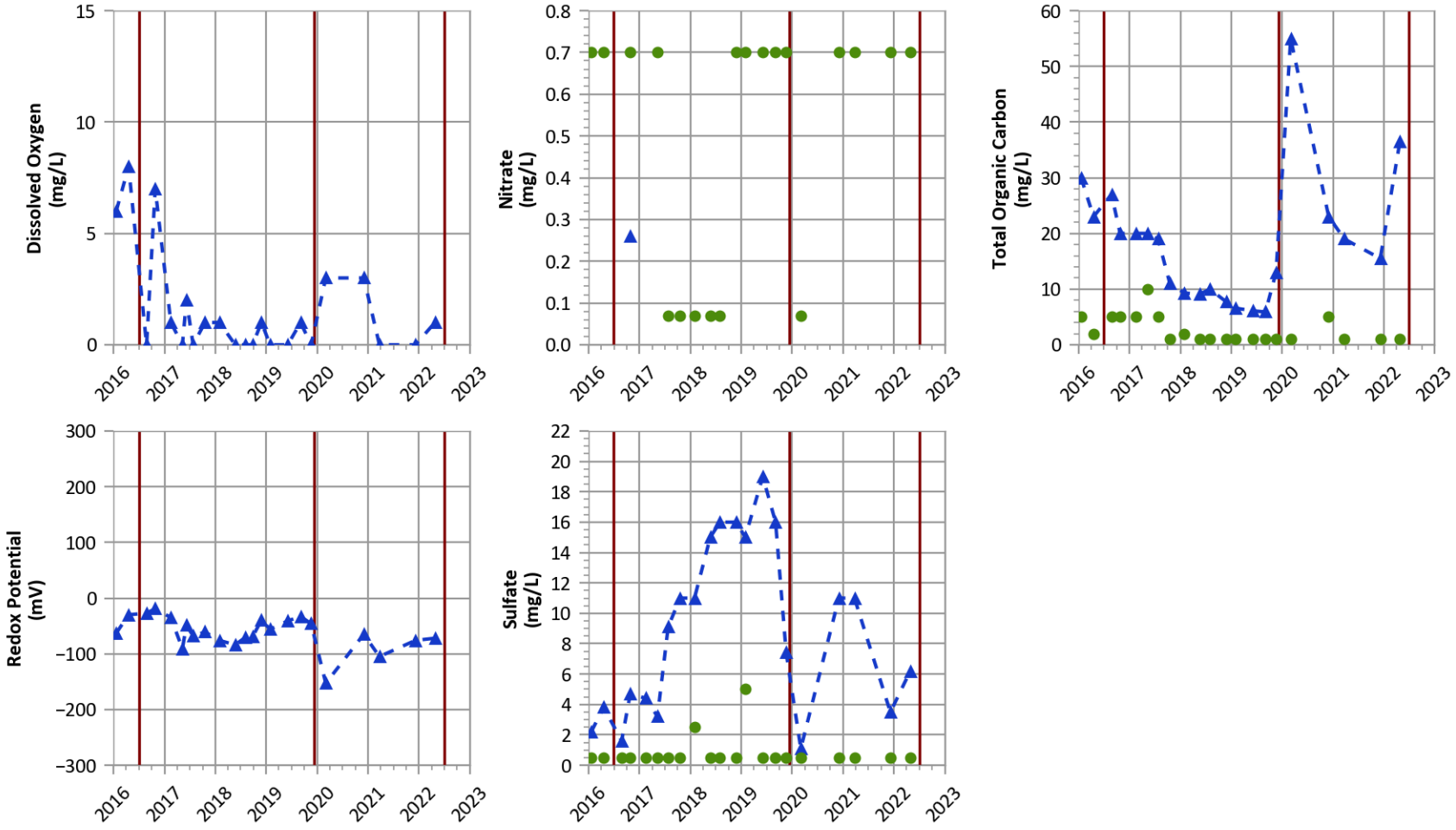


Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Well Location

Zone 11 ISB

PTX06-ISB075 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant

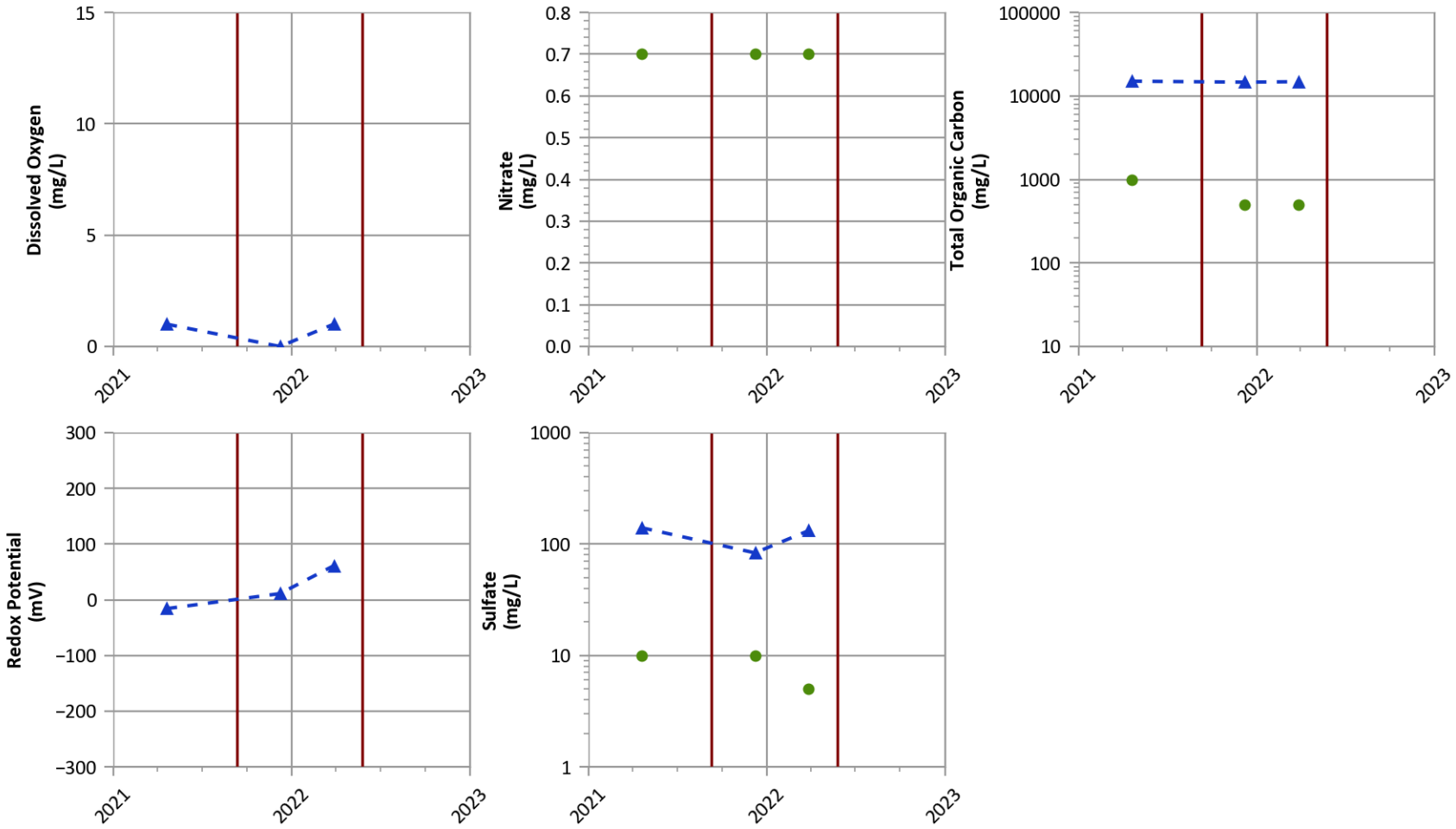


Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Well Location

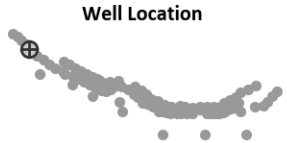
Zone 11 ISB

PTX06-ISB133 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



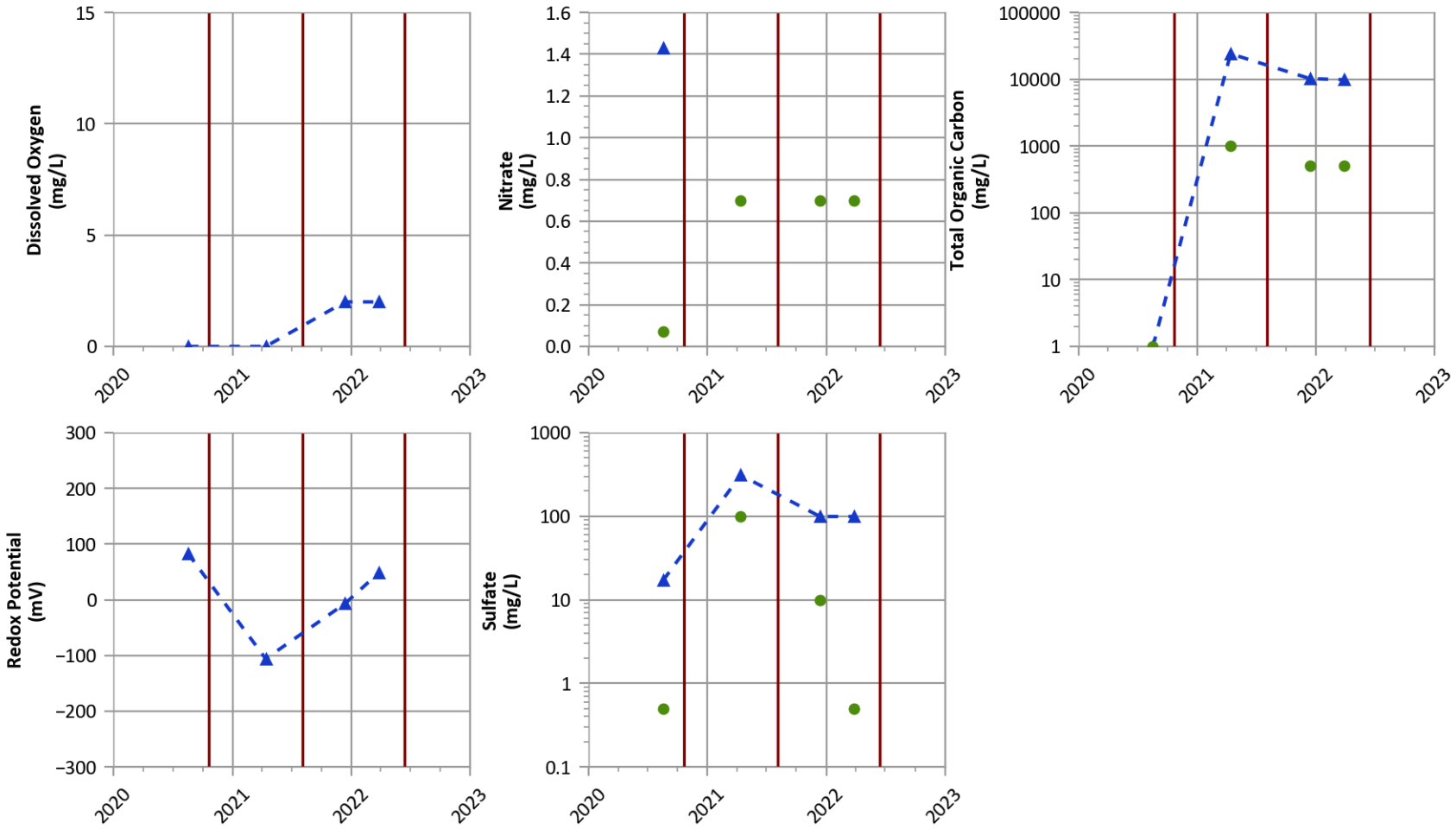
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Well Location



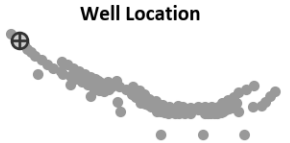
Zone 11 ISB

PTX06-ISB135 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



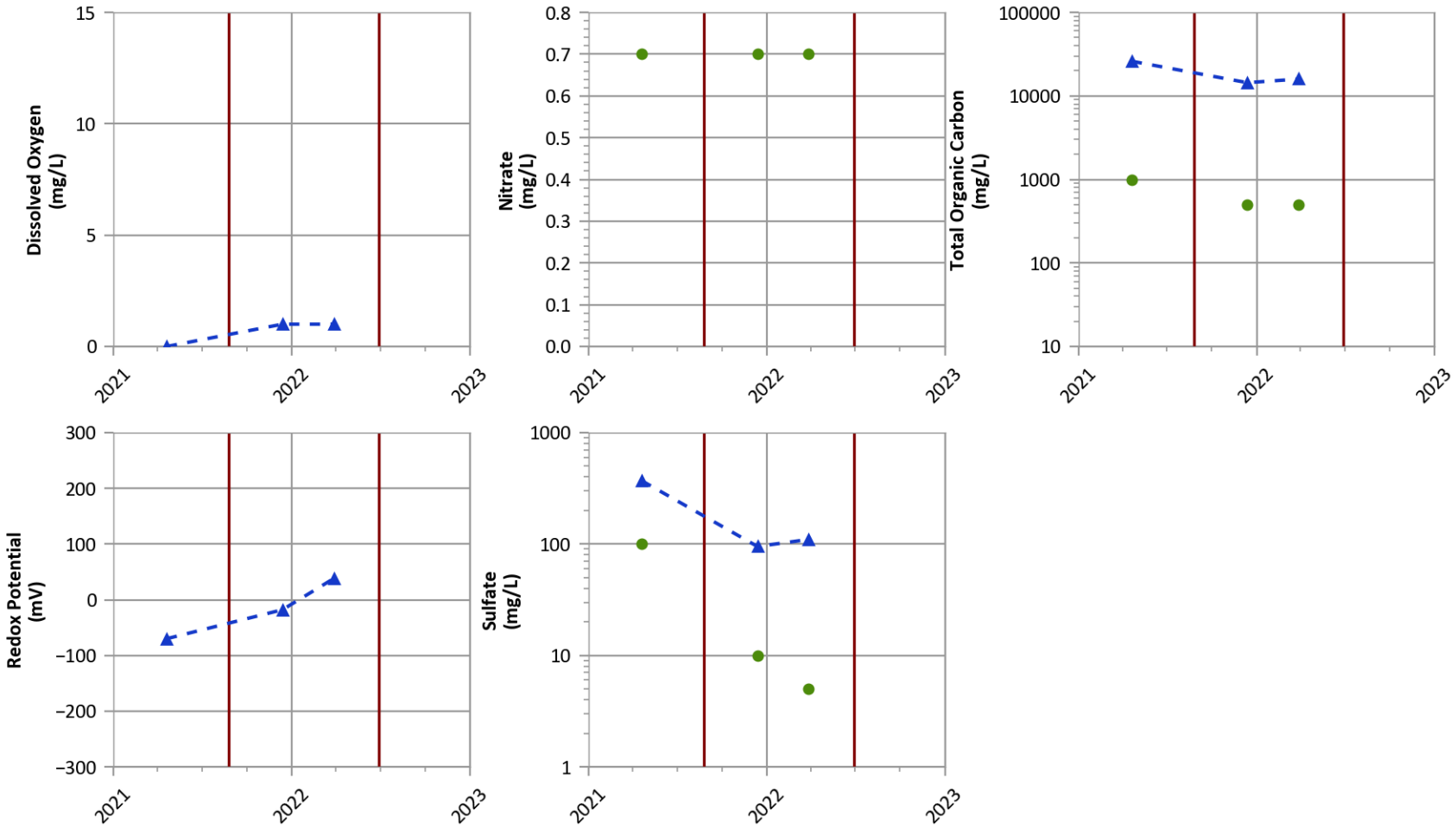
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Well Location



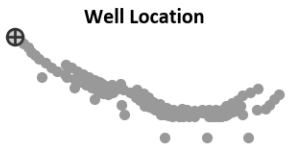
Zone 11 ISB

PTX06-ISB137 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



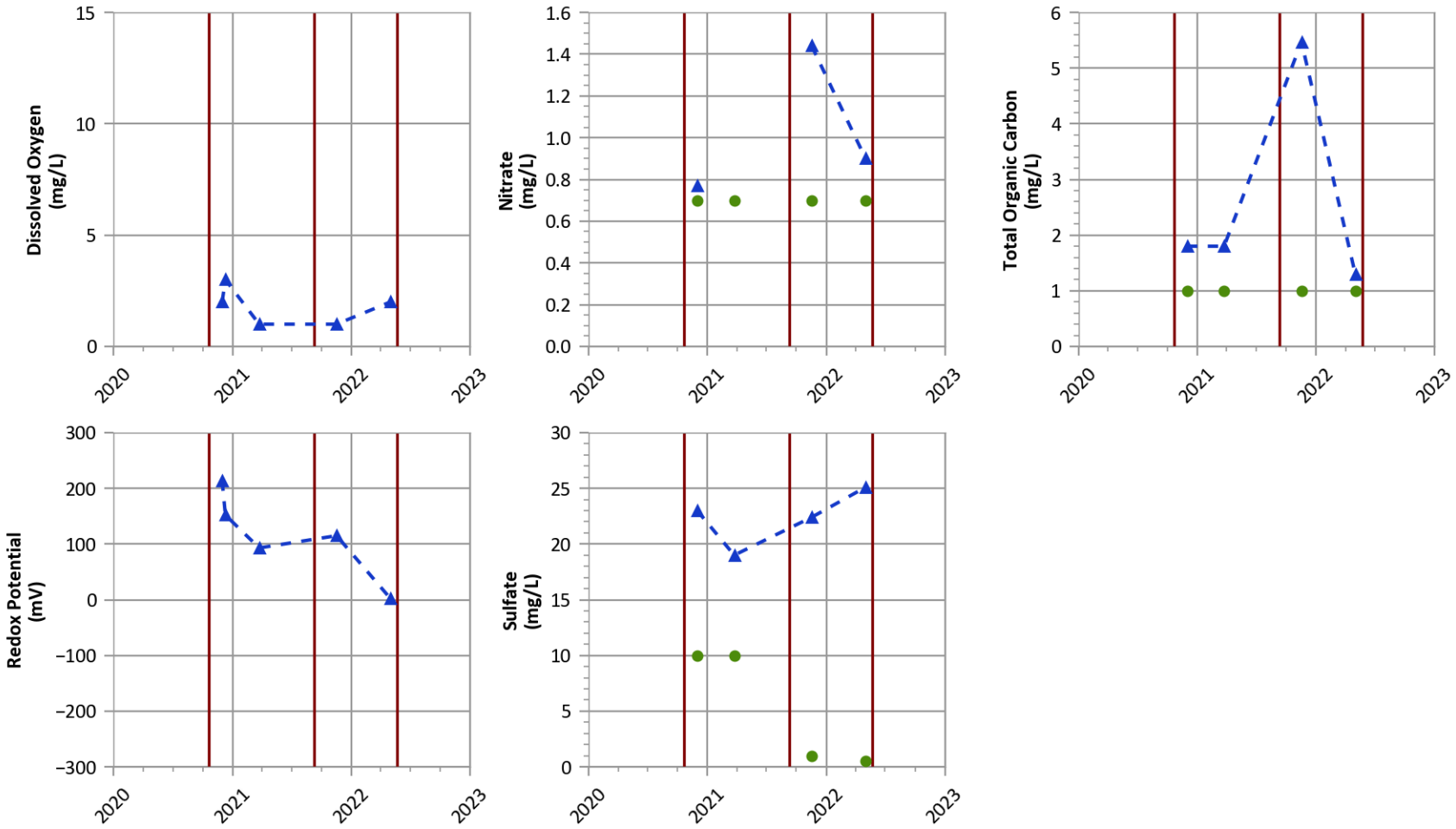
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Well Location

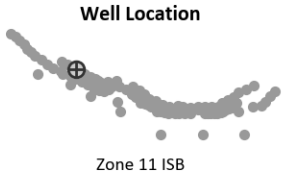


Zone 11 ISB

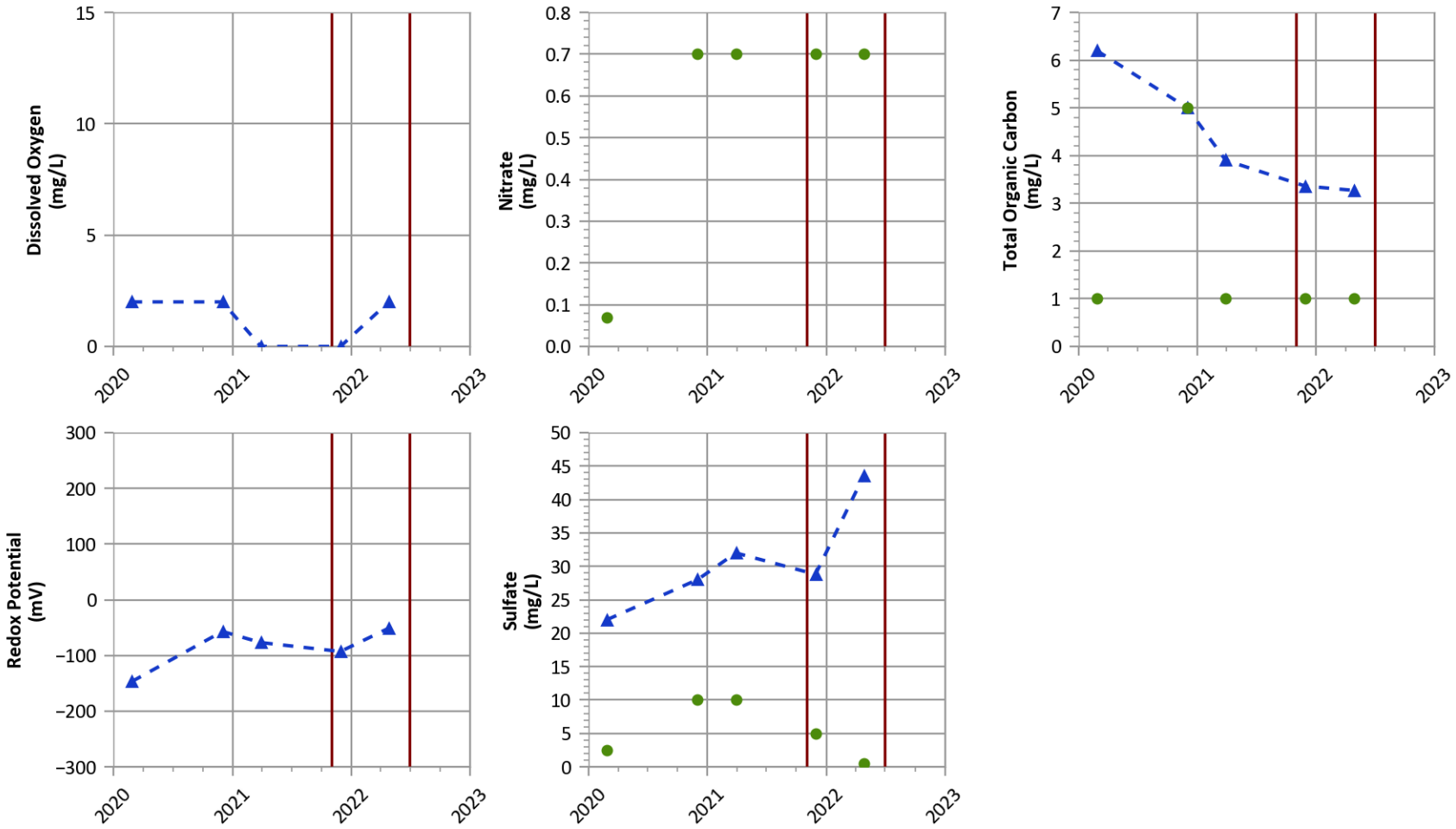
PTX06-1164 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

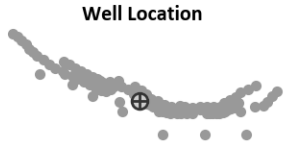


PTX06-1169 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



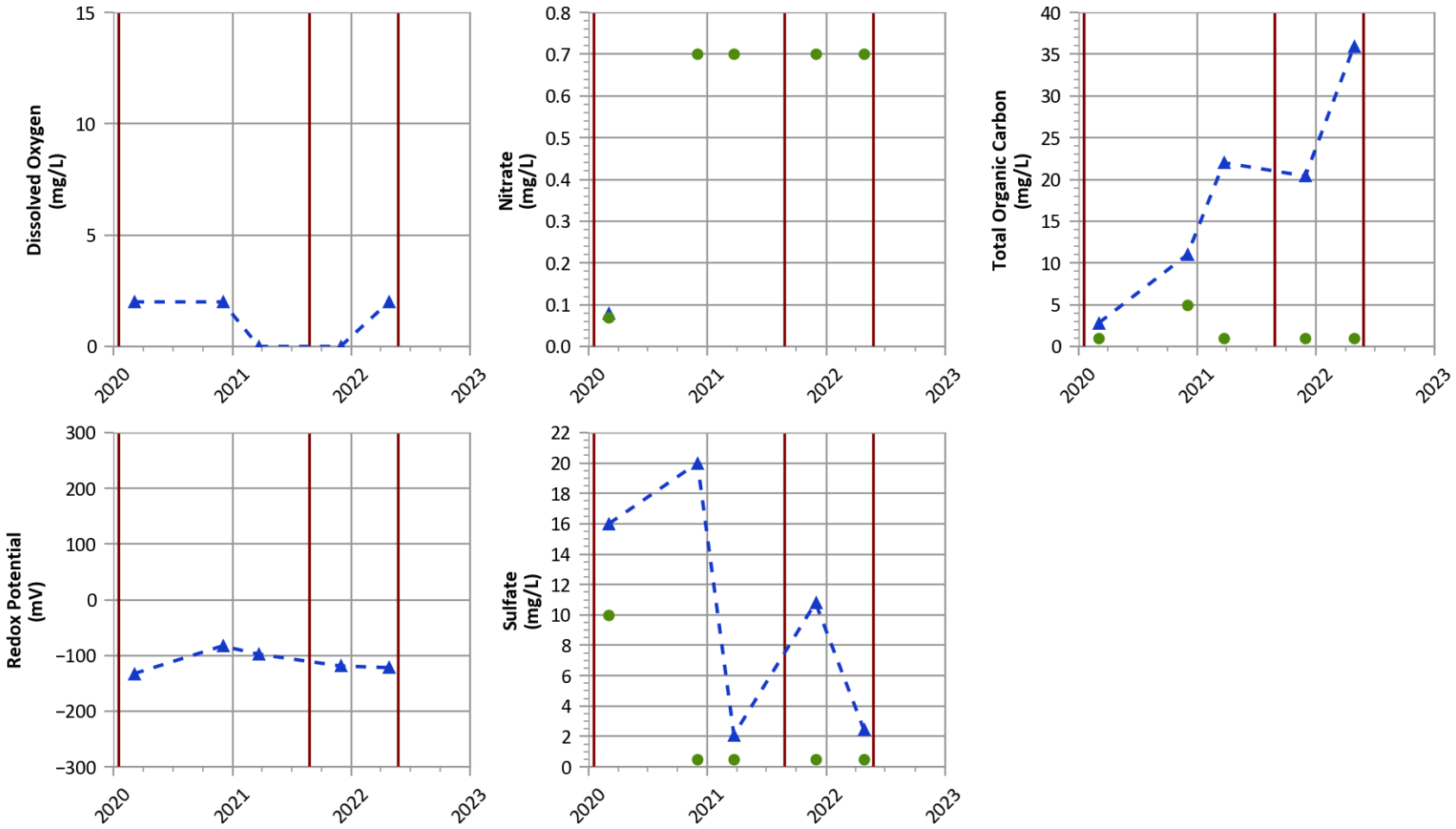
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Well Location



Zone 11 ISB

PTX06-1170 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



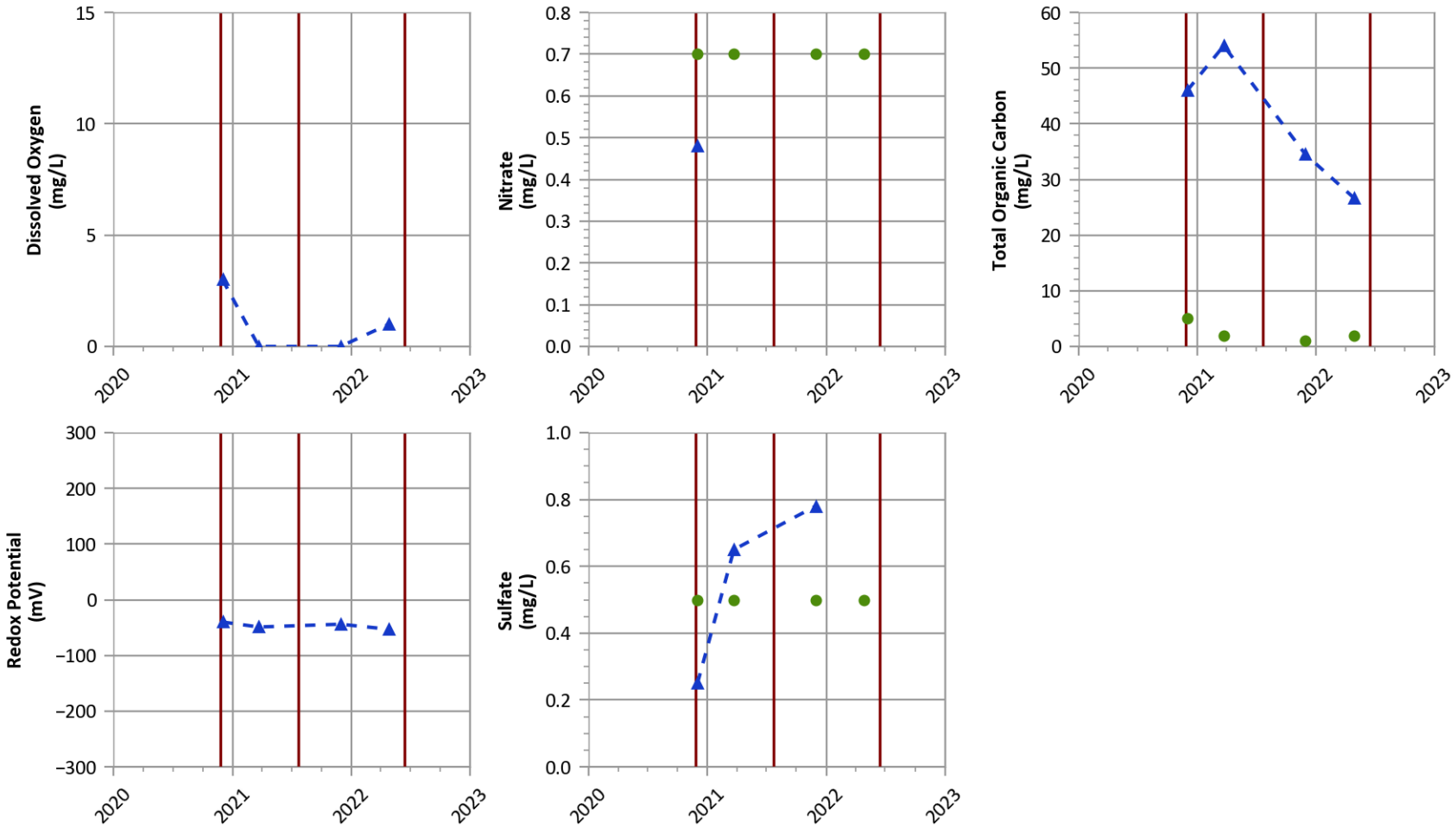
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location

Zone 11 ISB

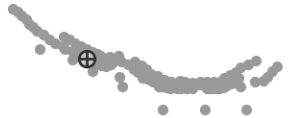
PTX06-1176 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

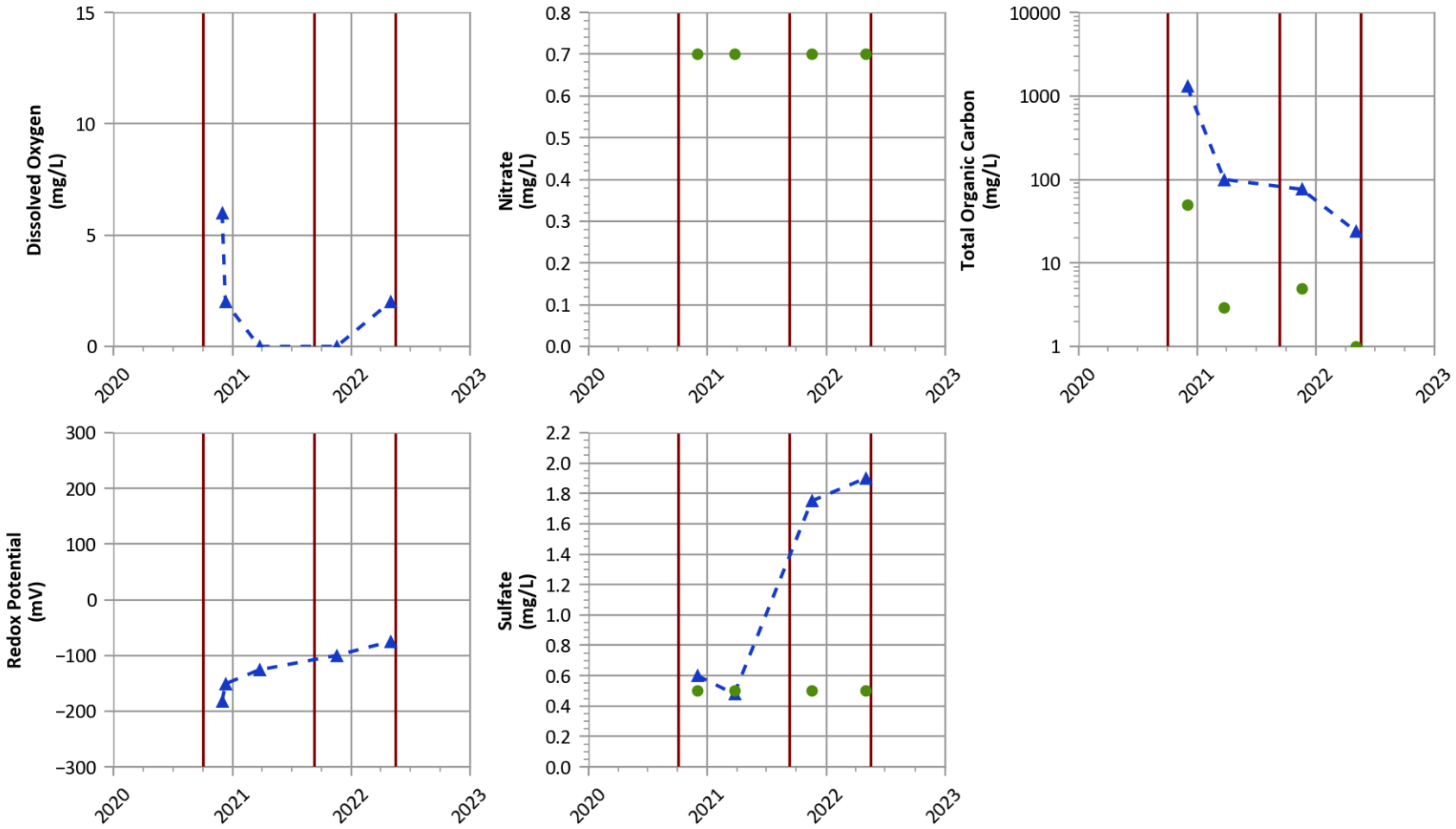
Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location



Zone 11 ISB

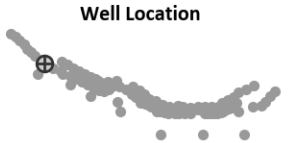
PTX06-1177 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

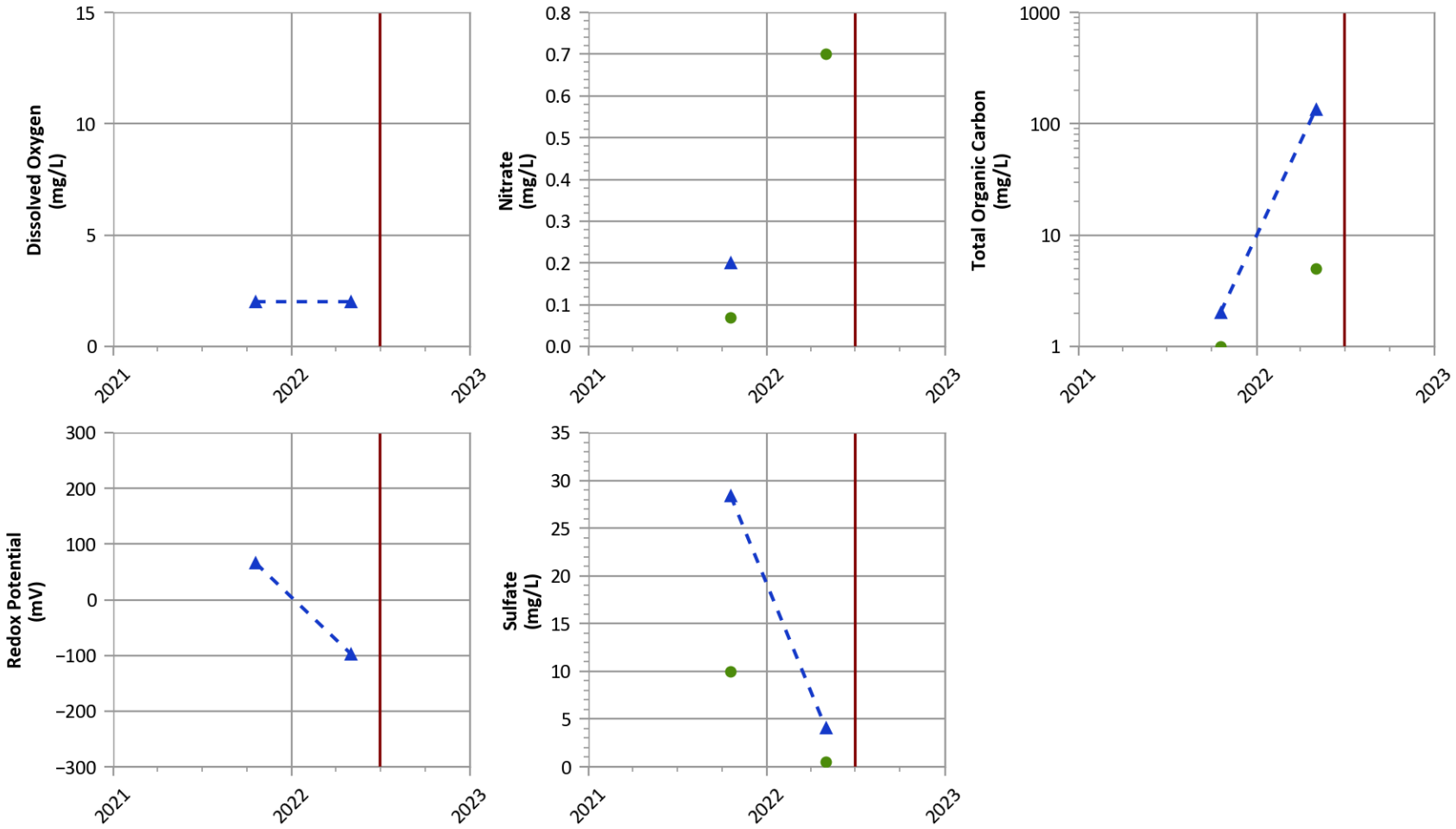
Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location



Zone 11 ISB

PTX06-1209 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



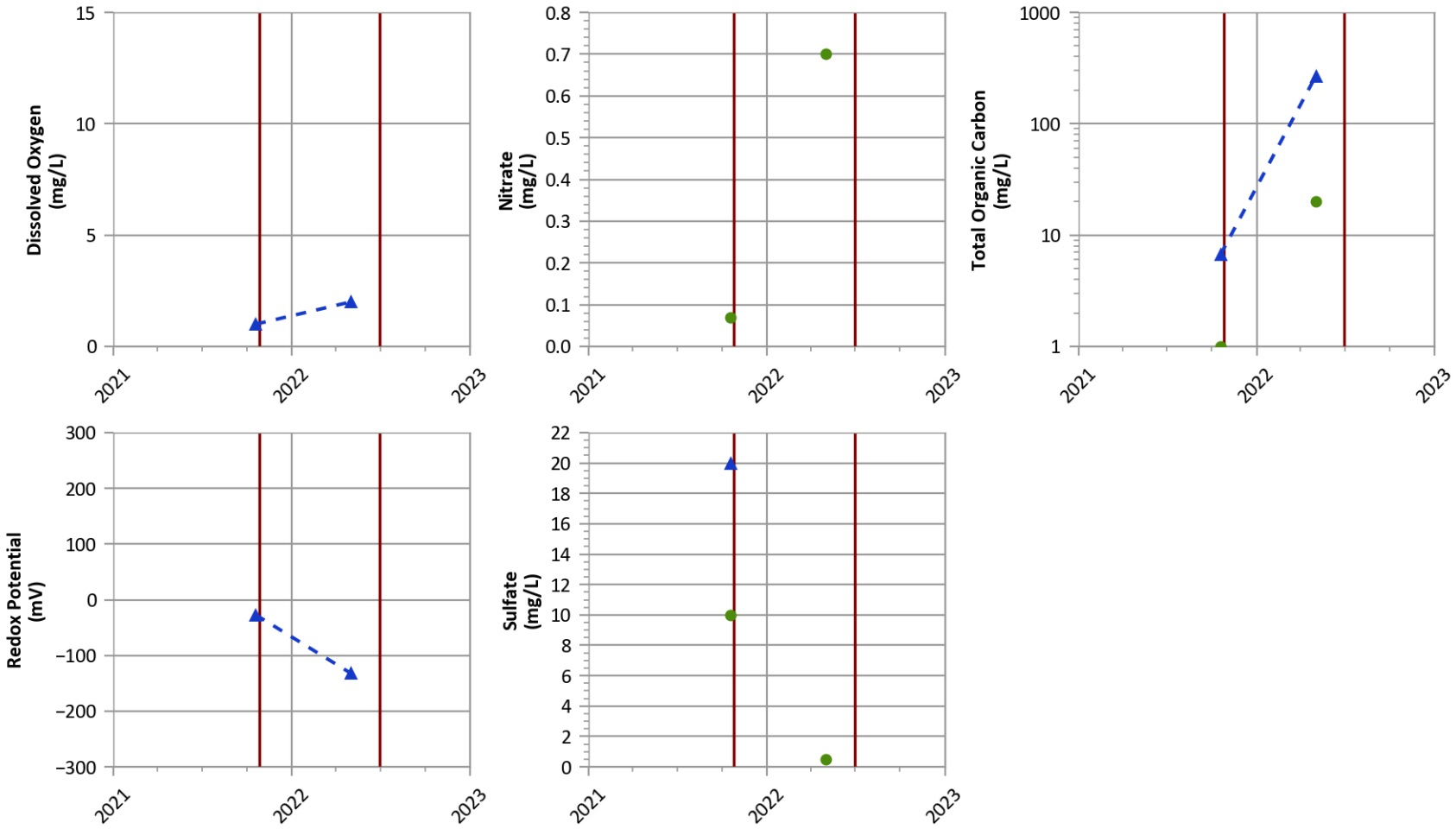
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location

Zone 11 ISB

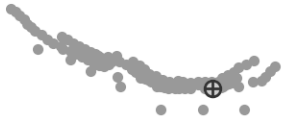
PTX06-1210 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

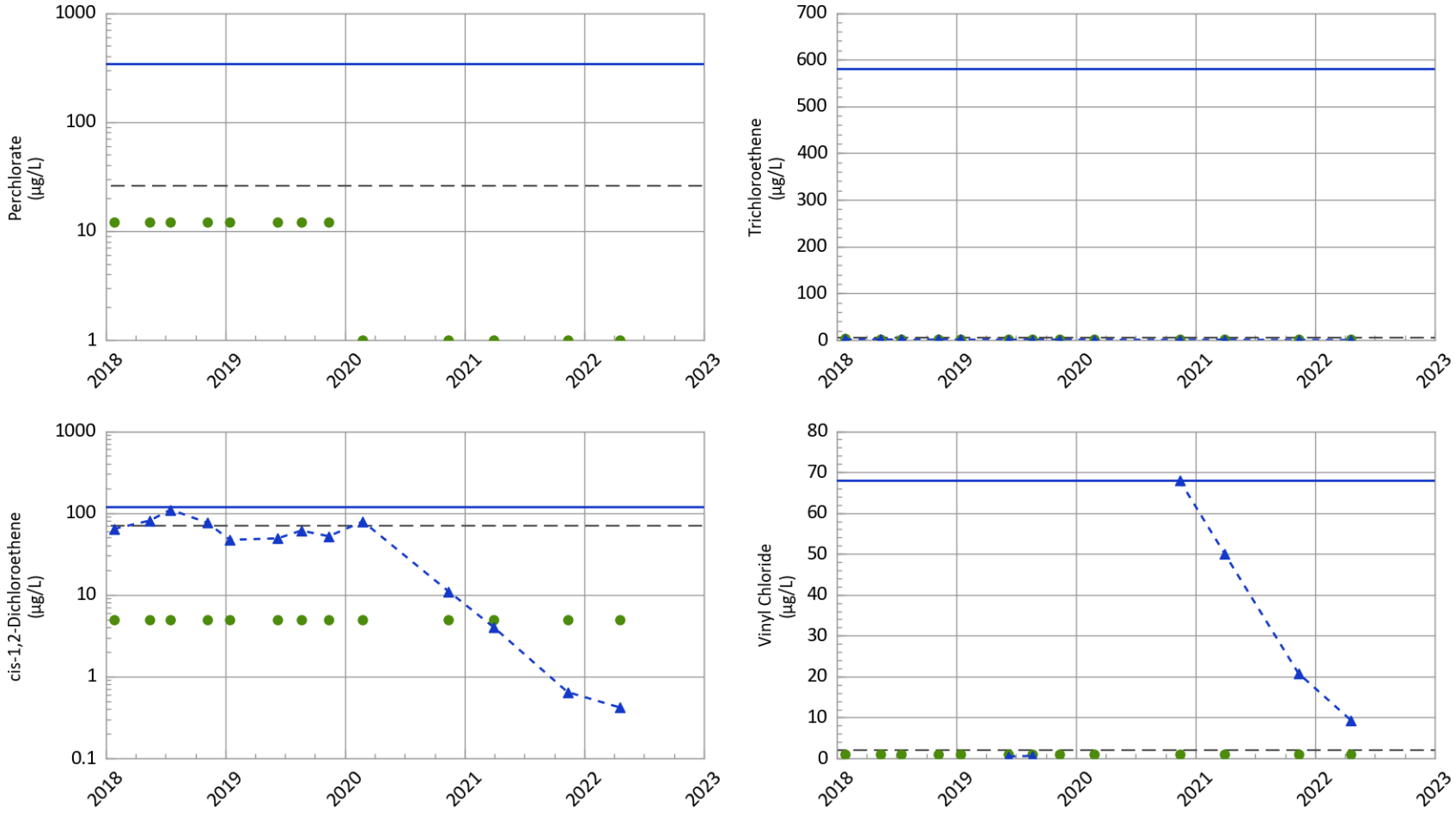
Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location



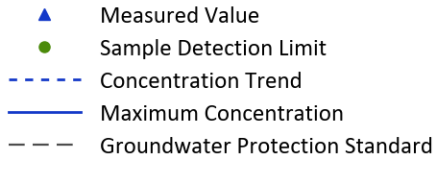
Zone 11 ISB

PTX06-1012 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant

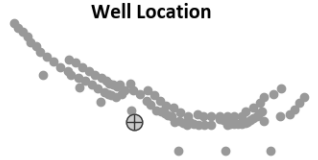


Most Recent Measured COC Concentrations (Apr 19, 2022)

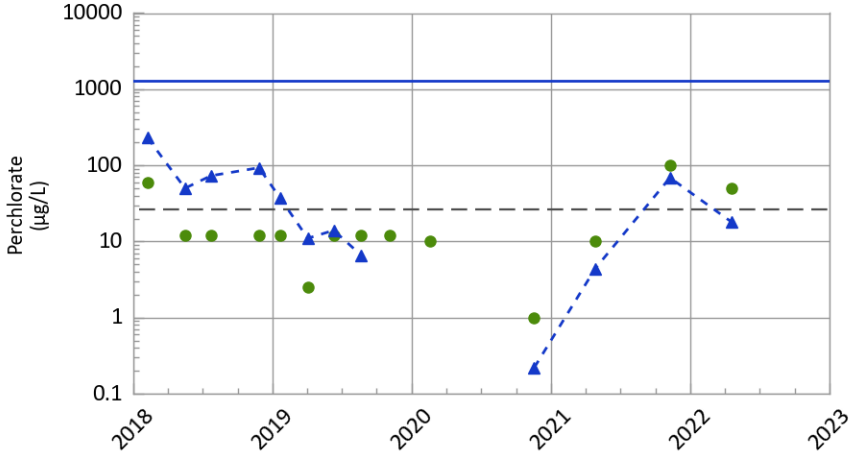
COC	Concentration (µg/L)	GWPS (µg/L)
PERC	Non-Detect	26.0
DCE12C	0.419	70.0
TCE	0.199	5.0
VC	9.35	2.0

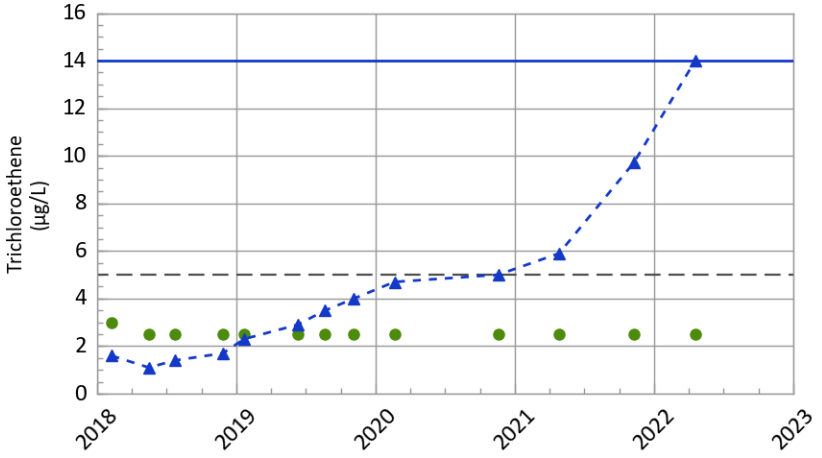


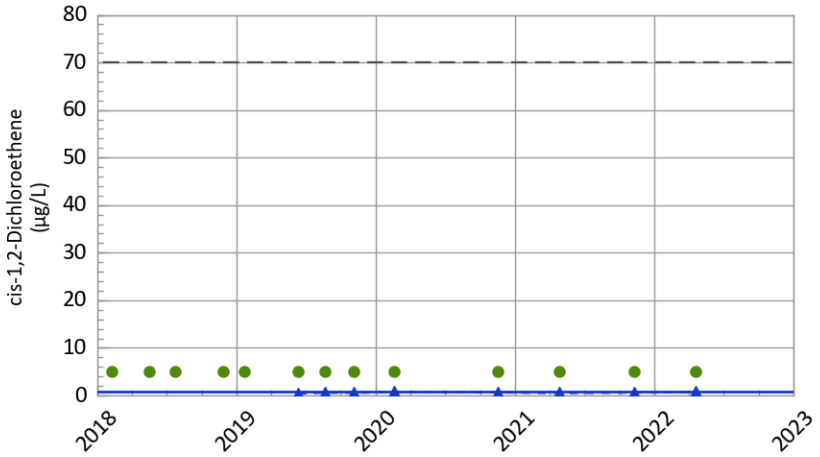
Well Location

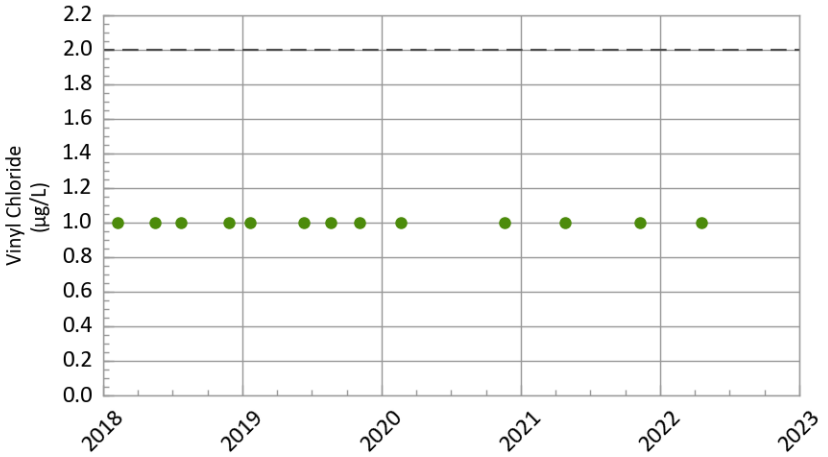


PTX06-1148 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant



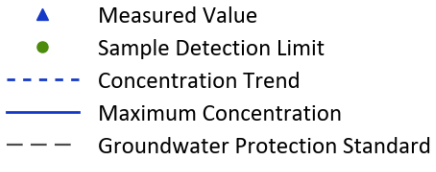


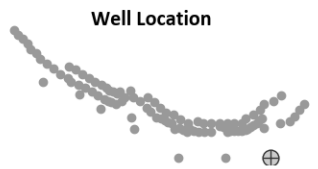




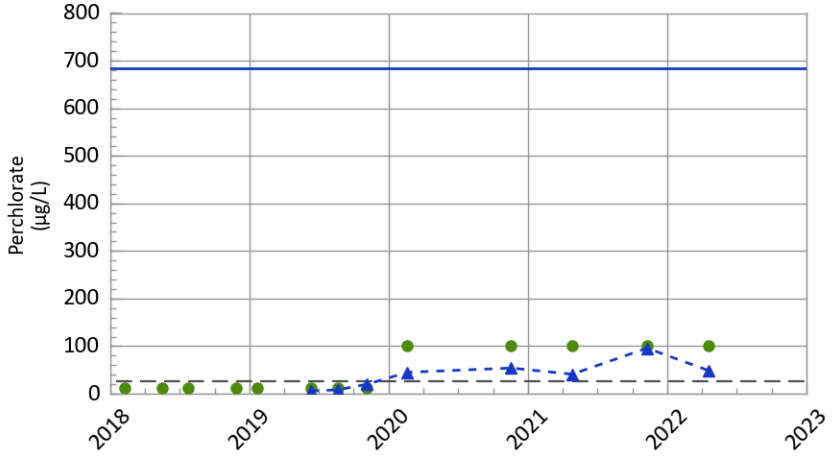
Most Recent Measured COC Concentrations (Apr 18, 2022)

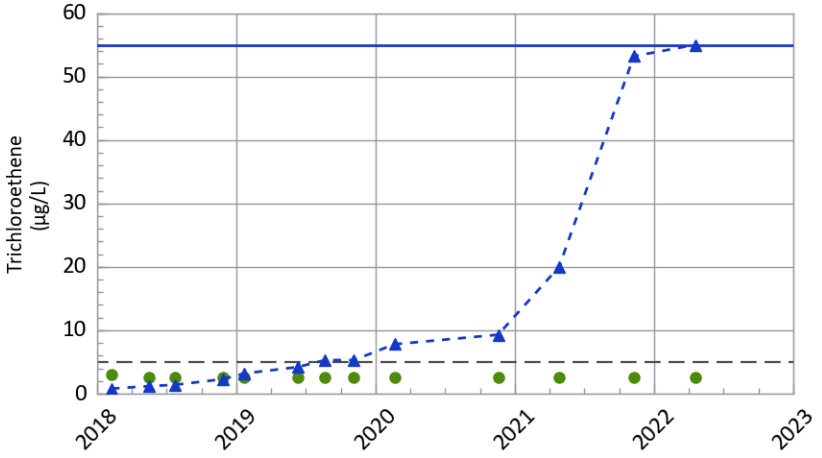
COC	Concentration (µg/L)	GWPS (µg/L)
PERC	18.1	26.0
DCE12C	0.708	70.0
TCE	14.0	5.0
VC	Non-Detect	2.0

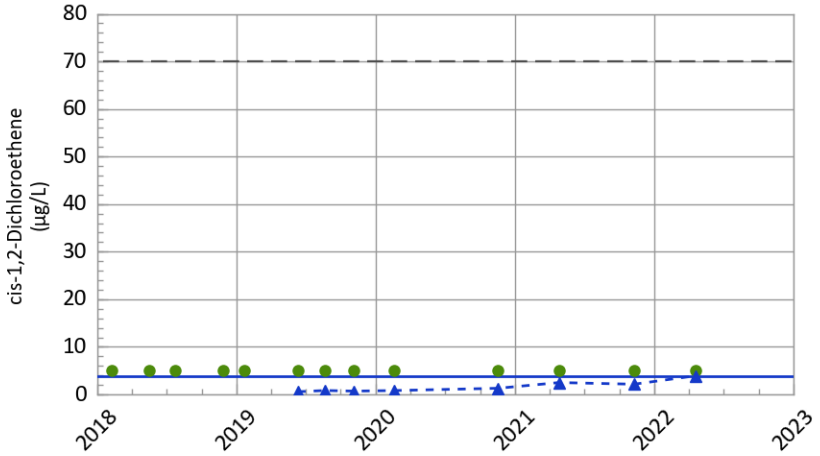


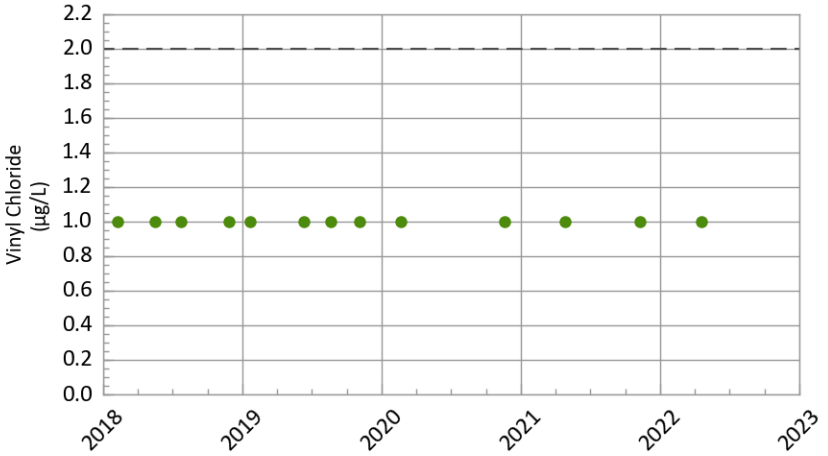


PTX06-1149 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant



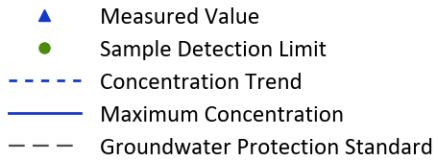




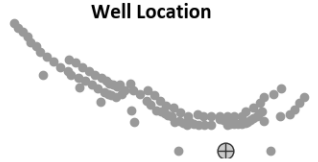


Most Recent Measured COC Concentrations (Apr 18, 2022)

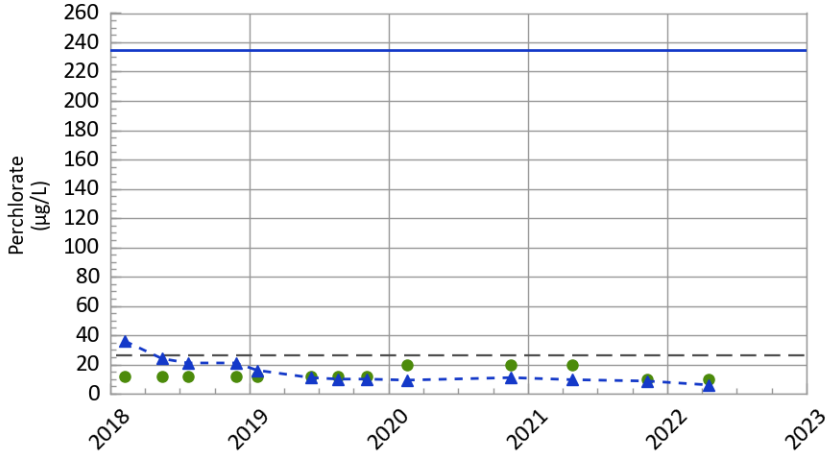
COC	Concentration (µg/L)	GWPS (µg/L)
PERC	49.0	26.0
DCE12C	3.91	70.0
TCE	55.0	5.0
VC	Non-Detect	2.0

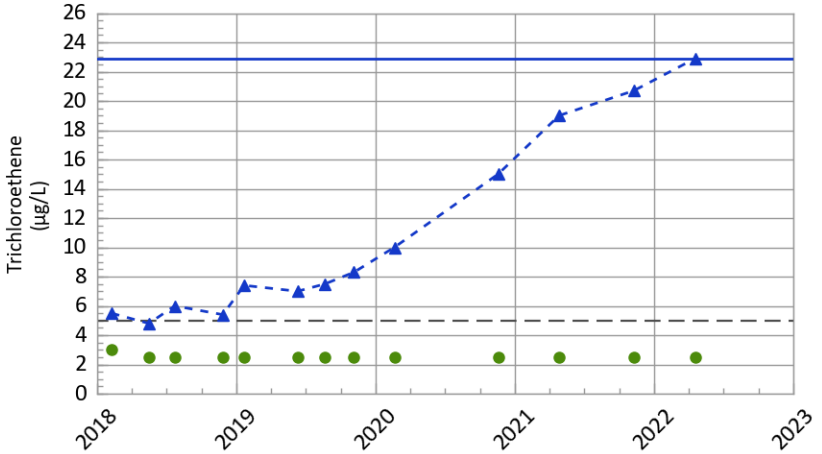


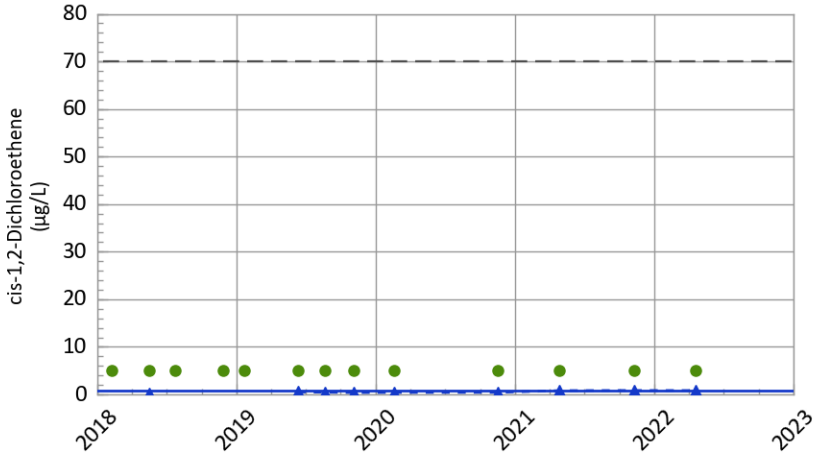
Well Location

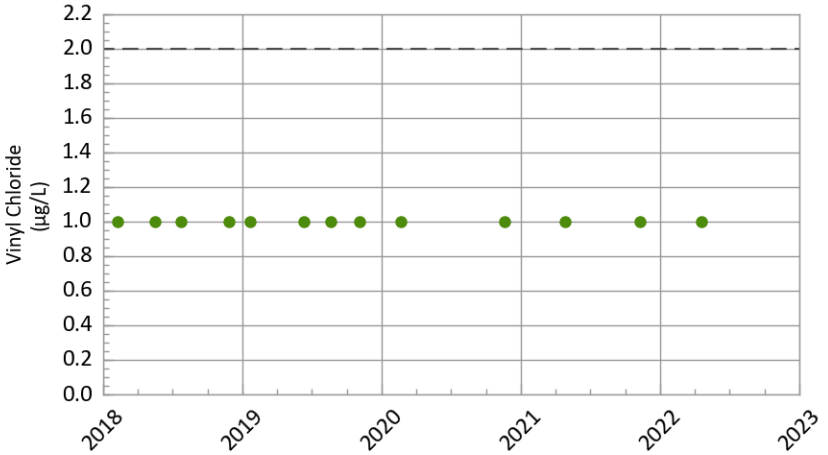


PTX06-1150 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant



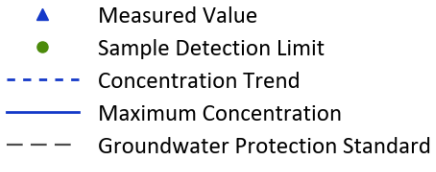


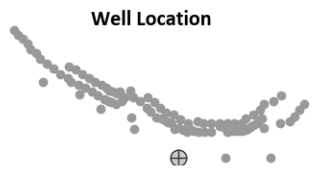




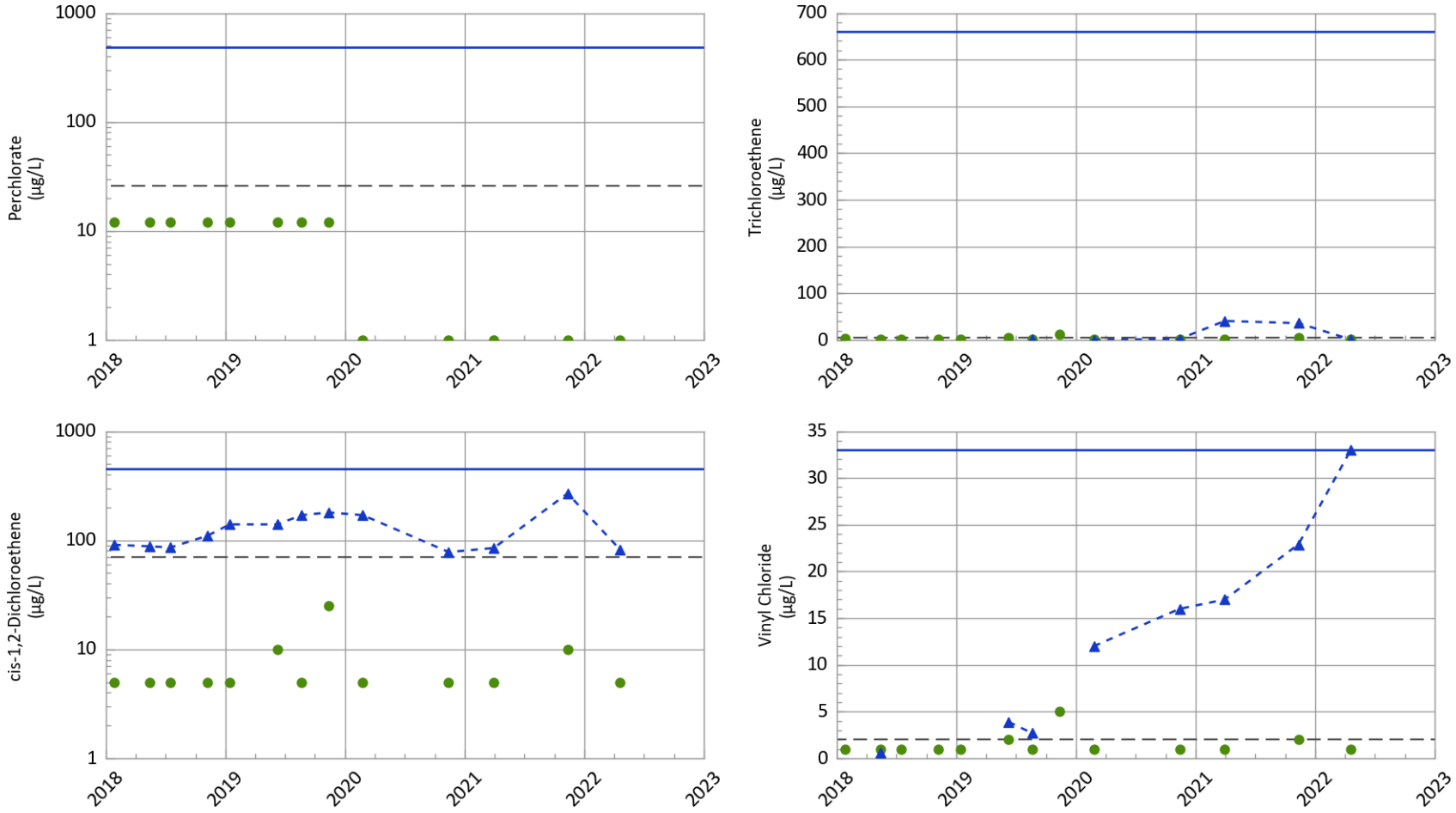
Most Recent Measured COC Concentrations (Apr 18, 2022)

COC	Concentration (µg/L)	GWPS (µg/L)
PERC	6.05	26.0
DCE12C	0.818	70.0
TCE	22.9	5.0
VC	Non-Detect	2.0



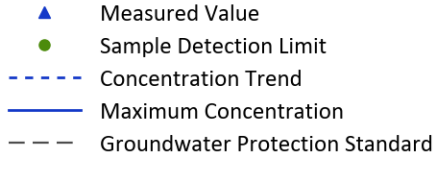


PTX06-1155 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant

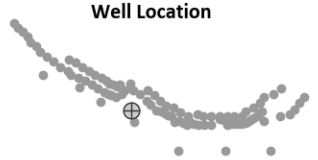


Most Recent Measured COC Concentrations (Apr 19, 2022)

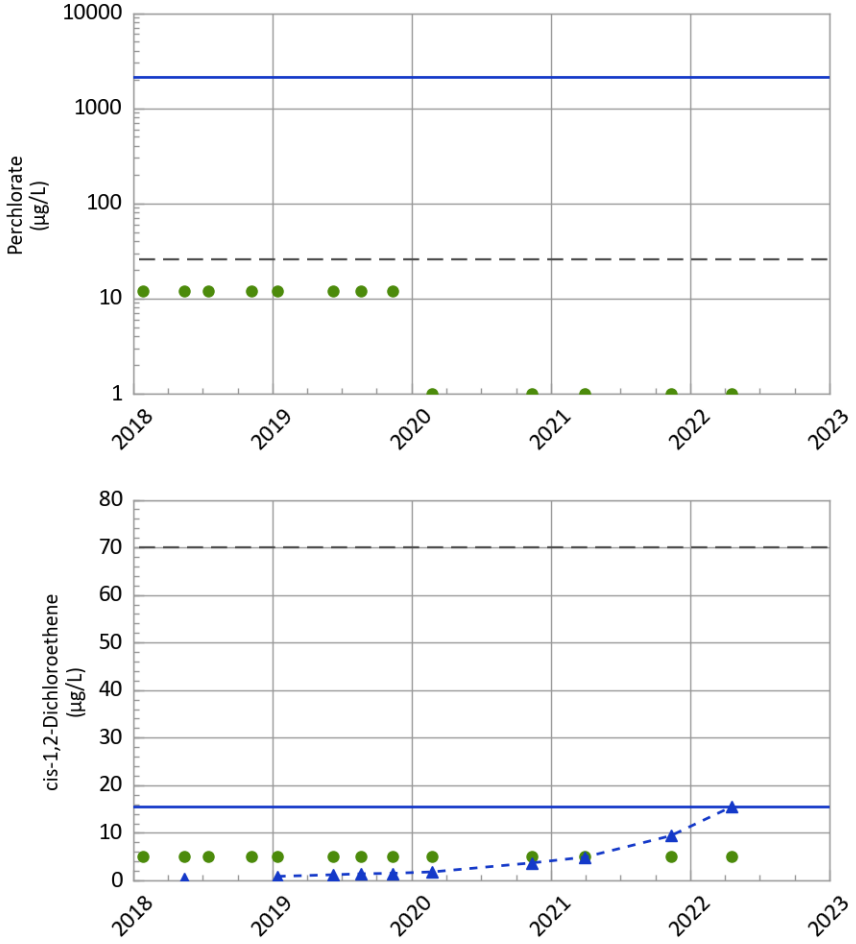
COC	Concentration (µg/L)	GWPS (µg/L)
PERC	Non-Detect	26.0
DCE12C	82.5	70.0
TCE	1.26	5.0
VC	33.0	2.0

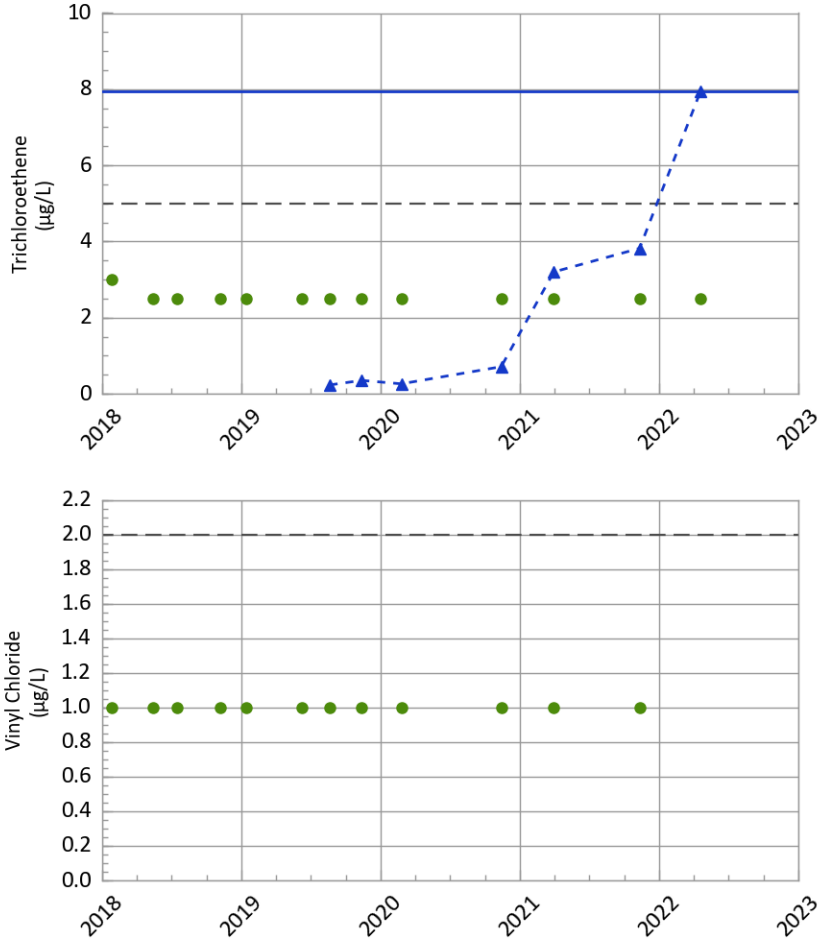


Well Location



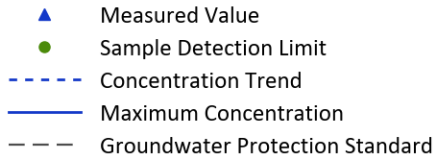
PTX06-1156 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant

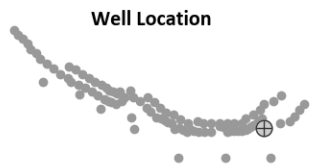




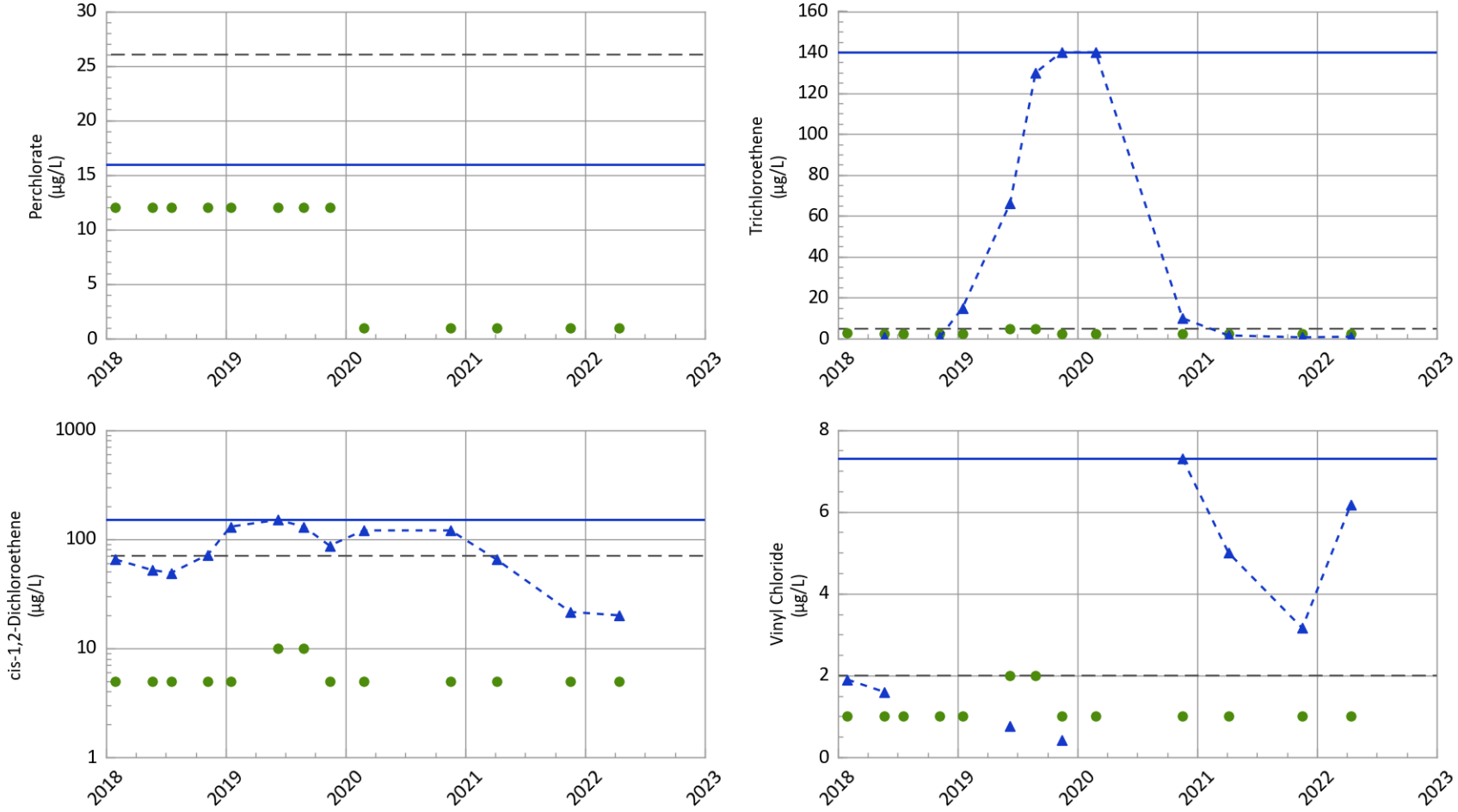
Most Recent Measured COC Concentrations (Nov 10, 2021)

COC	Concentration (µg/L)	GWPS (µg/L)
PERC	Non-Detect	26.0
DCE12C	15.5	70.0
TCE	7.95	5.0
VC	Non-Detect	2.0



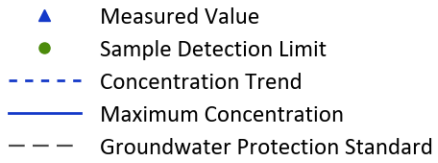


PTX06-1173 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant

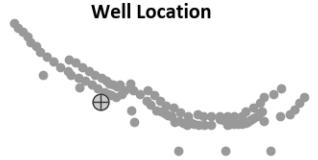


Most Recent Measured COC Concentrations (Apr 13, 2022)

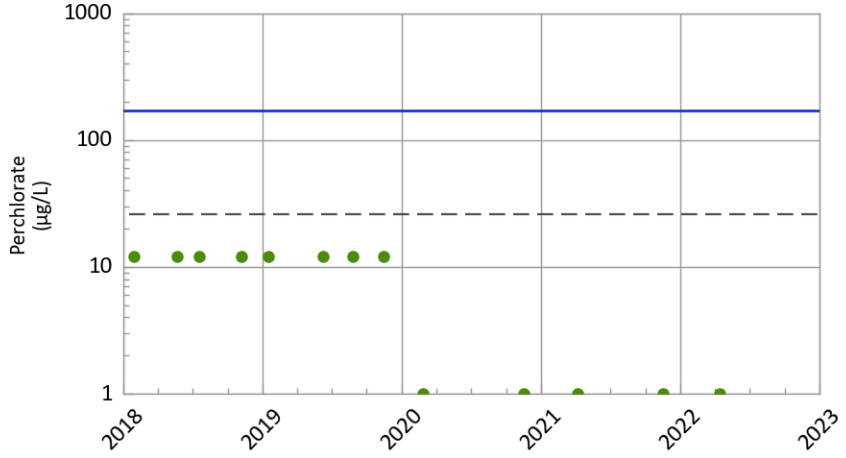
COC	Concentration (µg/L)	GWPS (µg/L)
PERC	Non-Detect	26.0
DCE12C	20.0	70.0
TCE	0.964	5.0
VC	6.17	2.0

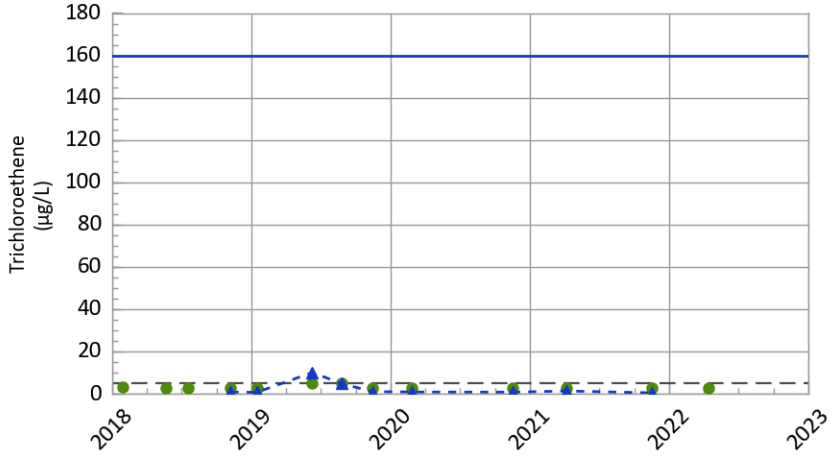


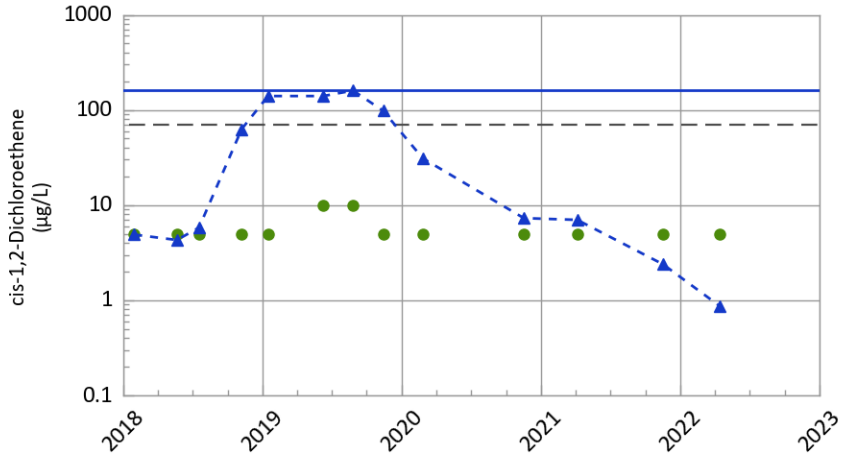
Well Location

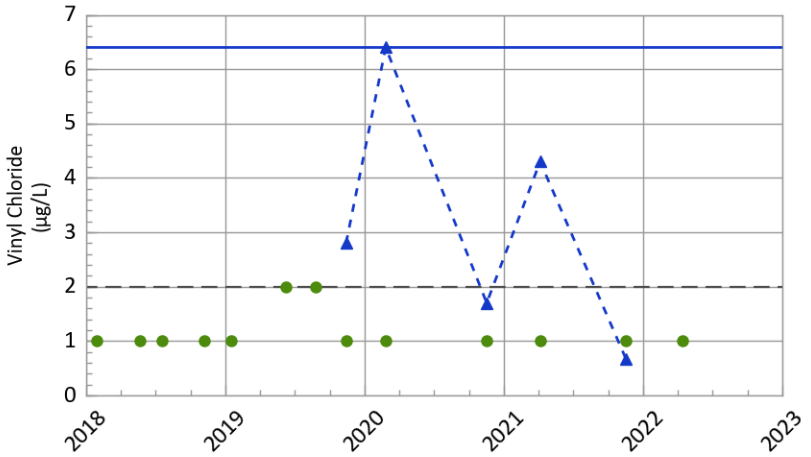


PTX06-1174 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant



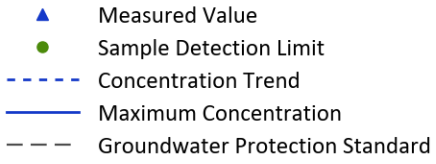


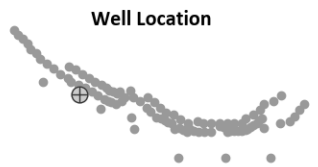




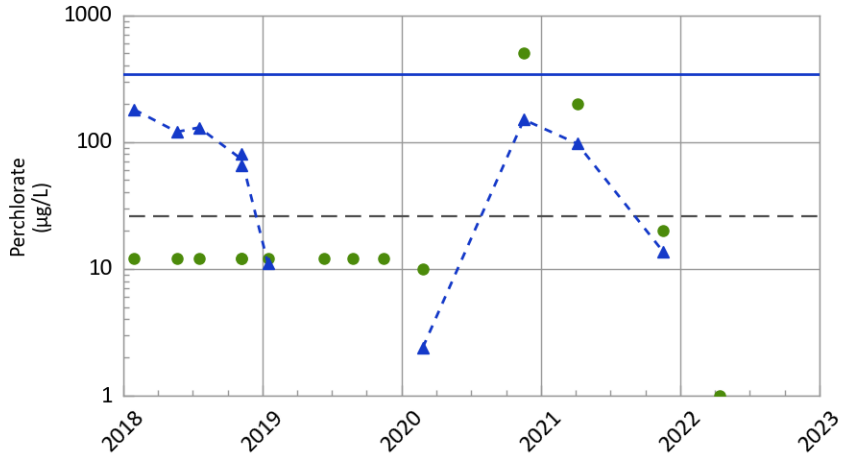
Most Recent Measured COC Concentrations (Nov 16, 2021)

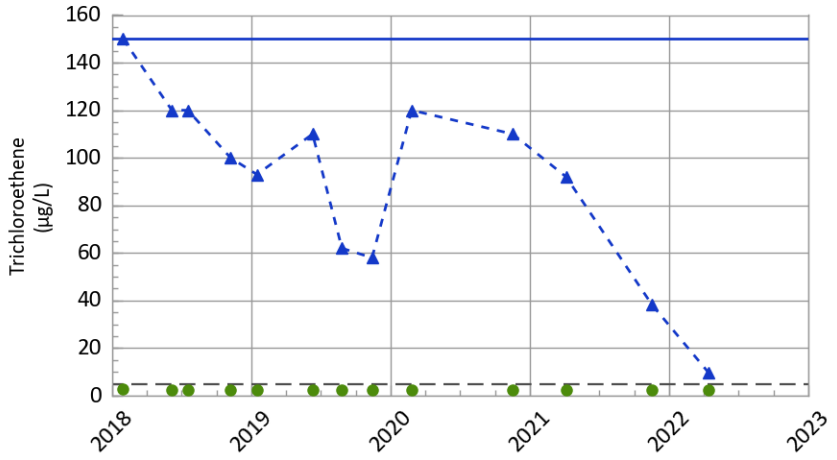
COC	Concentration (µg/L)	GWPS (µg/L)
PERC	Non-Detect	26.0
DCE12C	0.874	70.0
TCE	Non-Detect	5.0
VC	Non-Detect	2.0

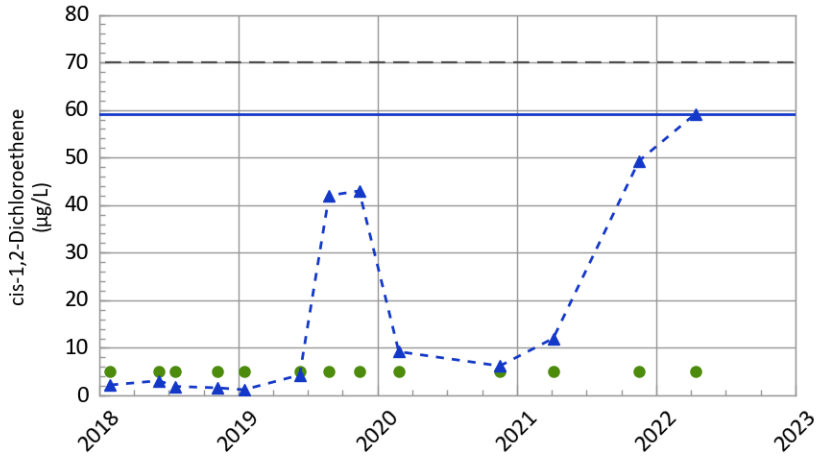


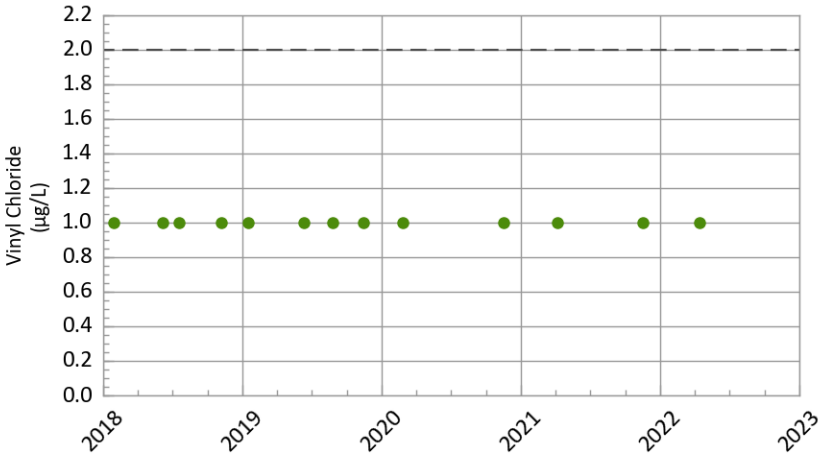


PTX06-1175 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant



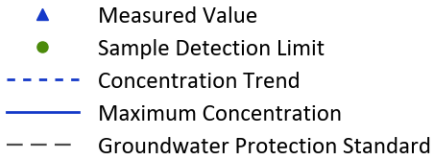


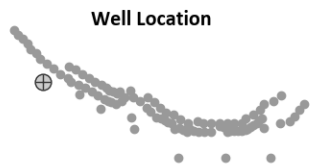




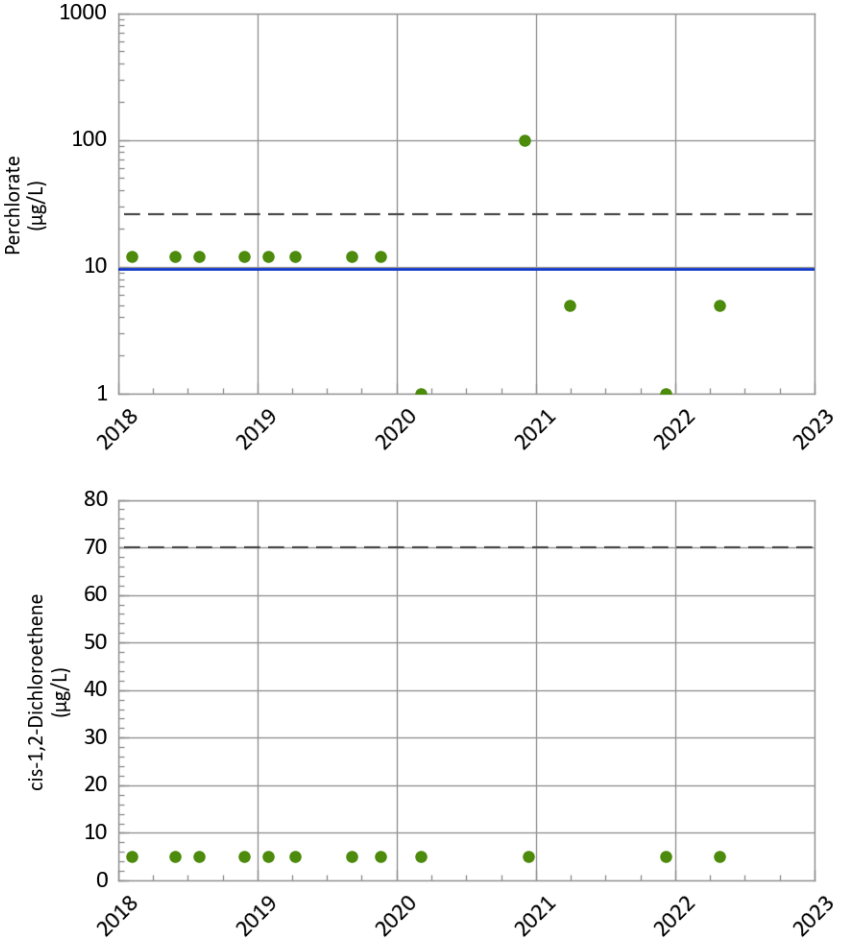
Most Recent Measured COC Concentrations (Apr 13, 2022)

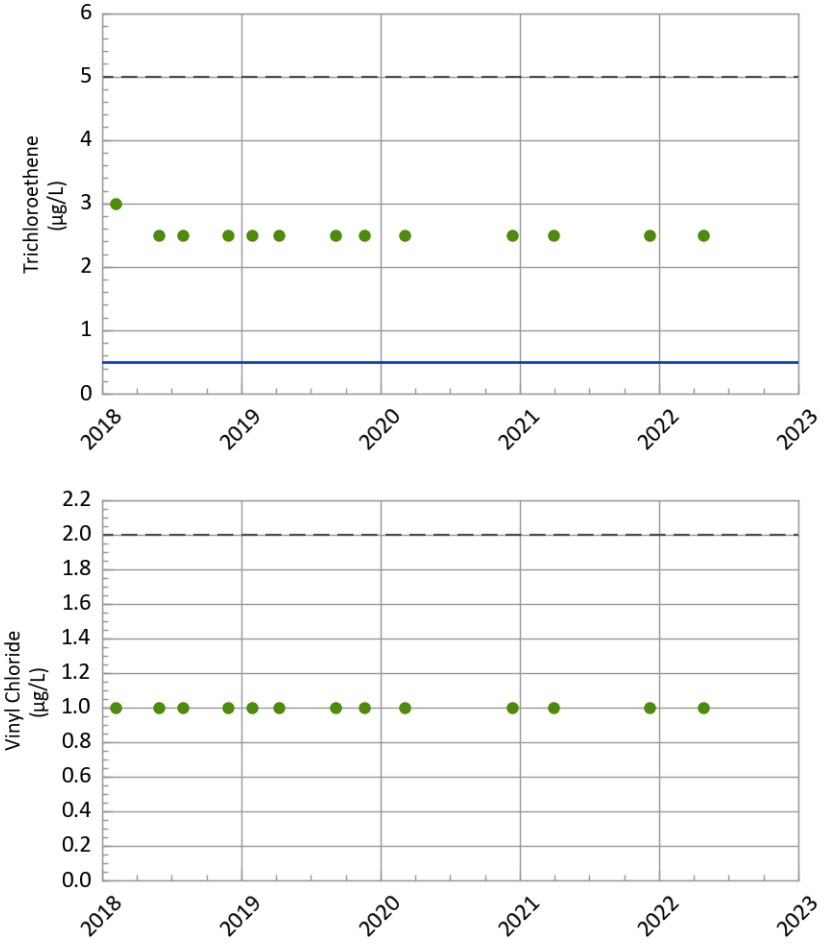
COC	Concentration (µg/L)	GWPS (µg/L)
PERC	Non-Detect	26.0
DCE12C	59.2	70.0
TCE	9.83	5.0
VC	Non-Detect	2.0





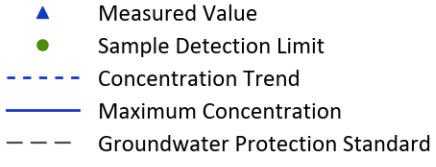
PTX06-ISB079 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant

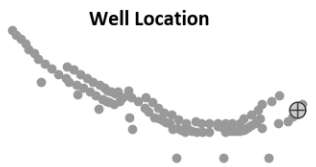




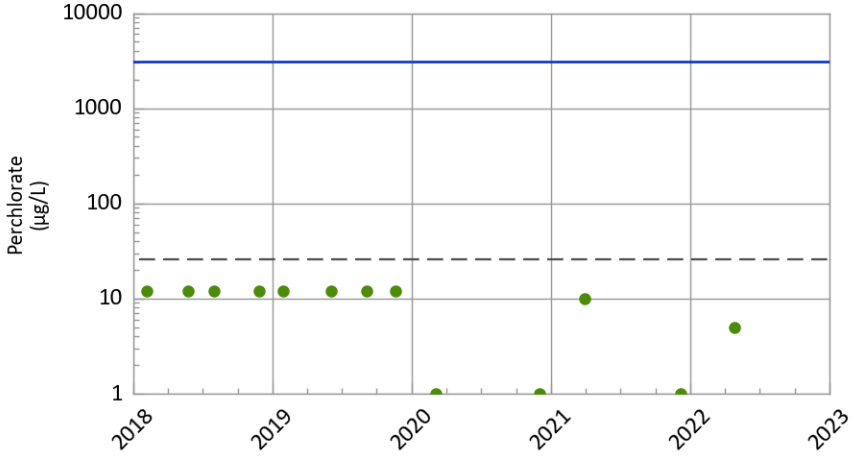
Most Recent Measured COC Concentrations (Apr 26, 2022)

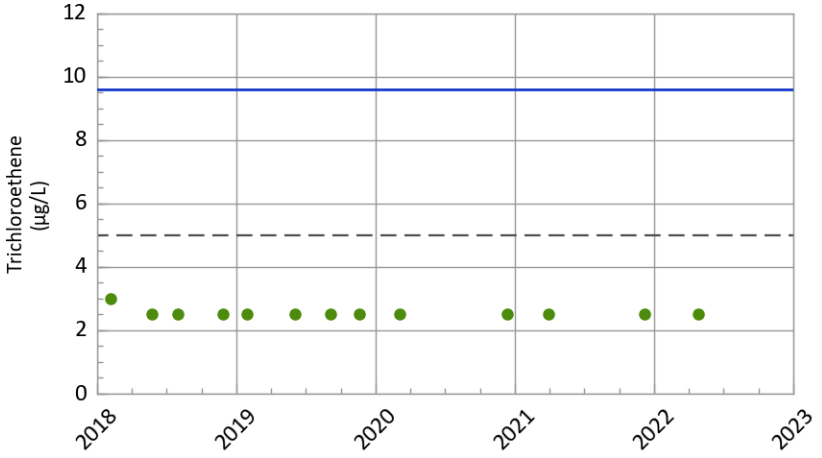
COC	Concentration (µg/L)	GWPS (µg/L)
PERC	Non-Detect	26.0
DCE12C	Non-Detect	70.0
TCE	Non-Detect	5.0
VC	Non-Detect	2.0

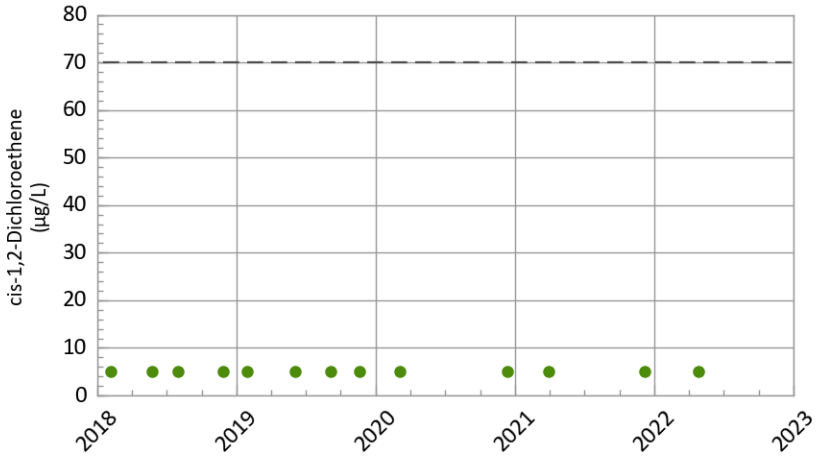


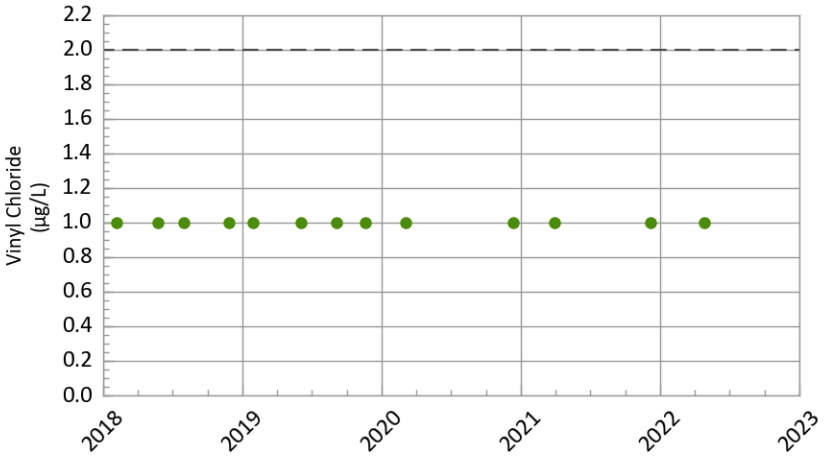


PTX06-ISB082 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant



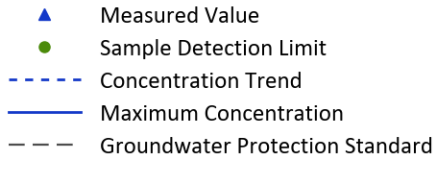


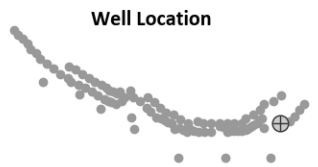




Most Recent Measured COC Concentrations (Apr 26, 2022)

COC	Concentration (µg/L)	GWPS (µg/L)
PERC	Non-Detect	26.0
DCE12C	Non-Detect	70.0
TCE	Non-Detect	5.0
VC	Non-Detect	2.0





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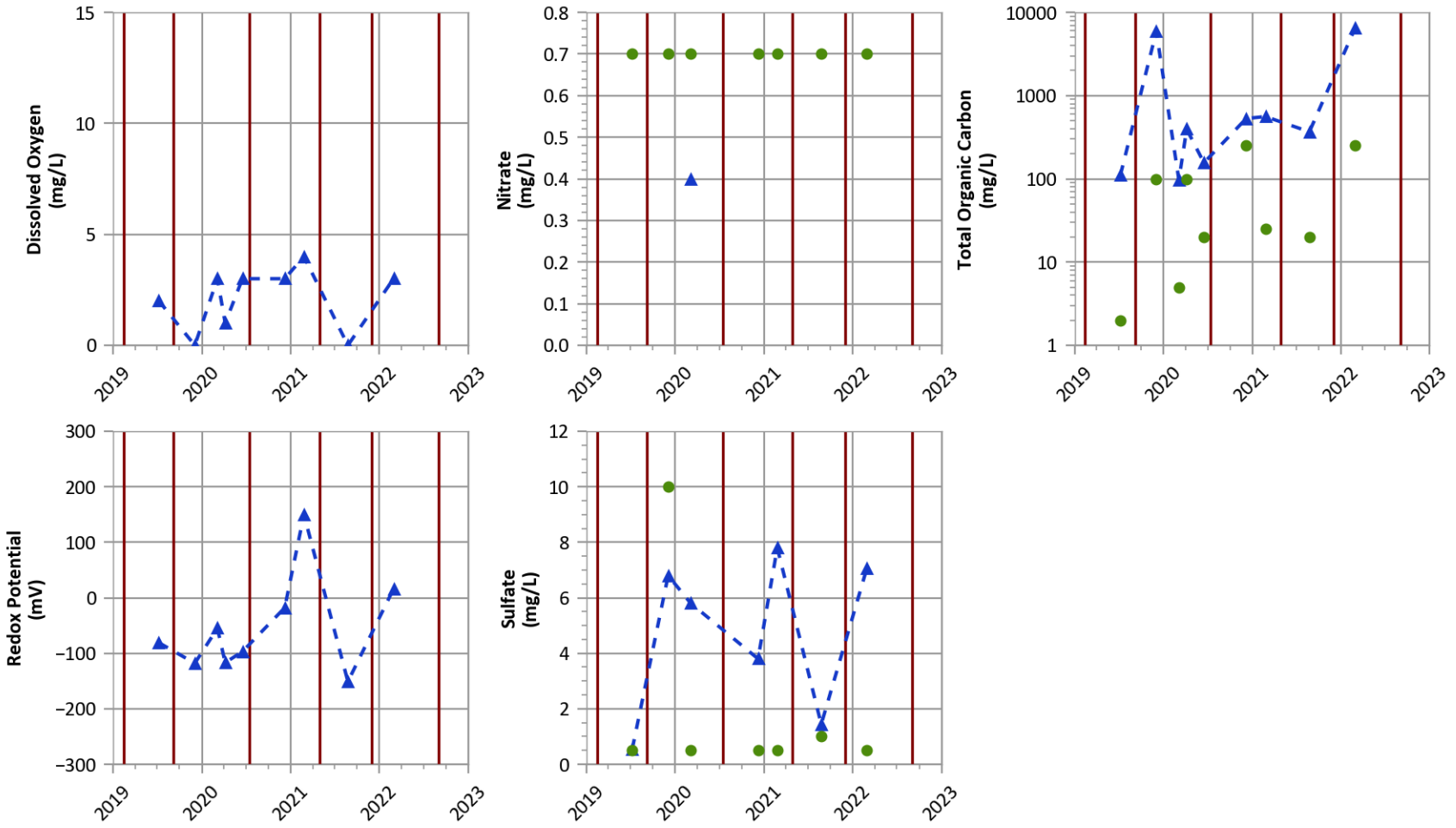
Southeast ISB Extension

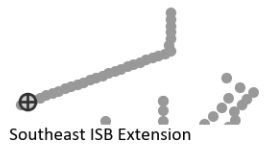
PTX06-ISB302 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



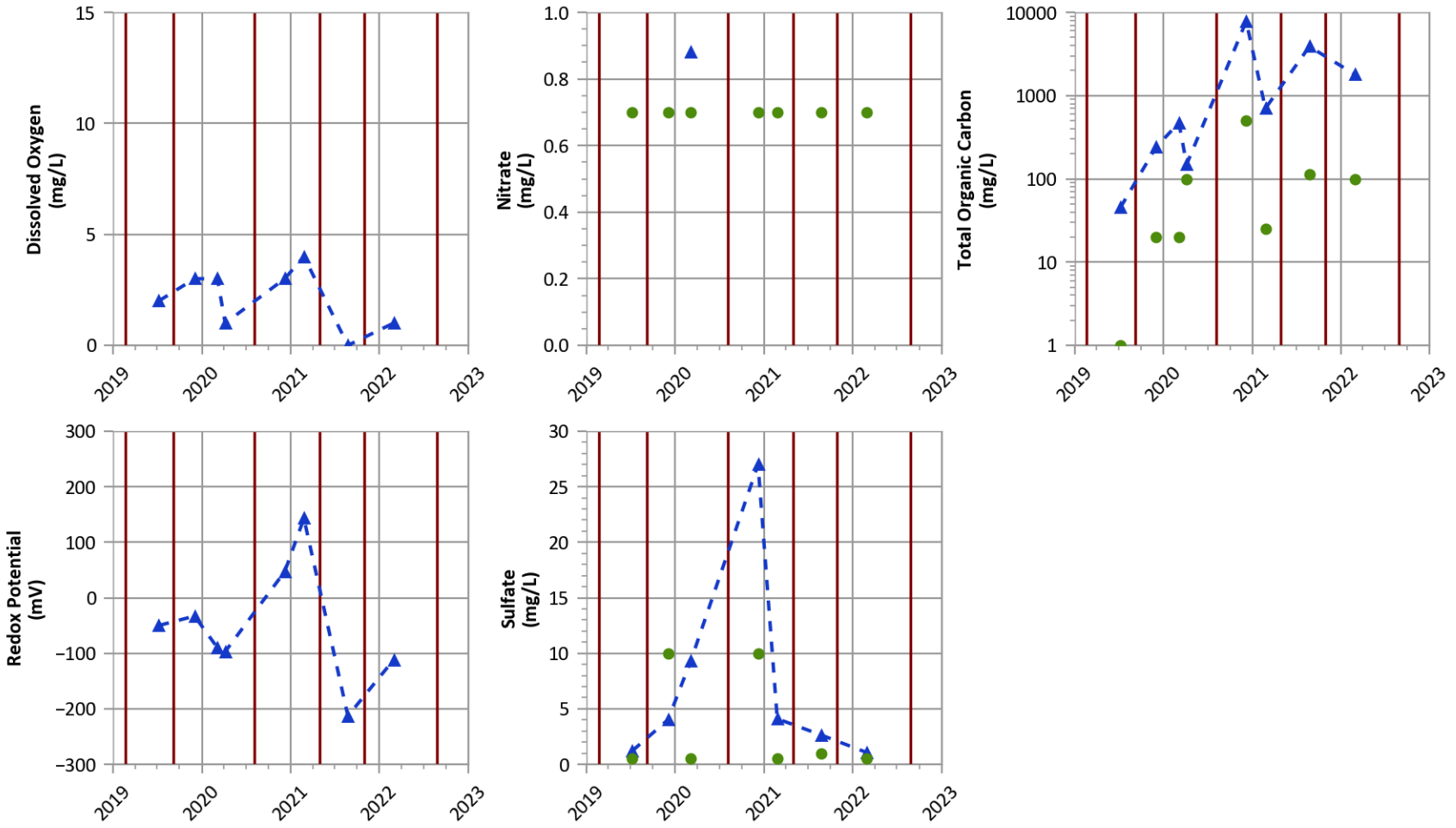
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location

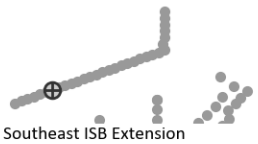


PTX06-ISB307 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant

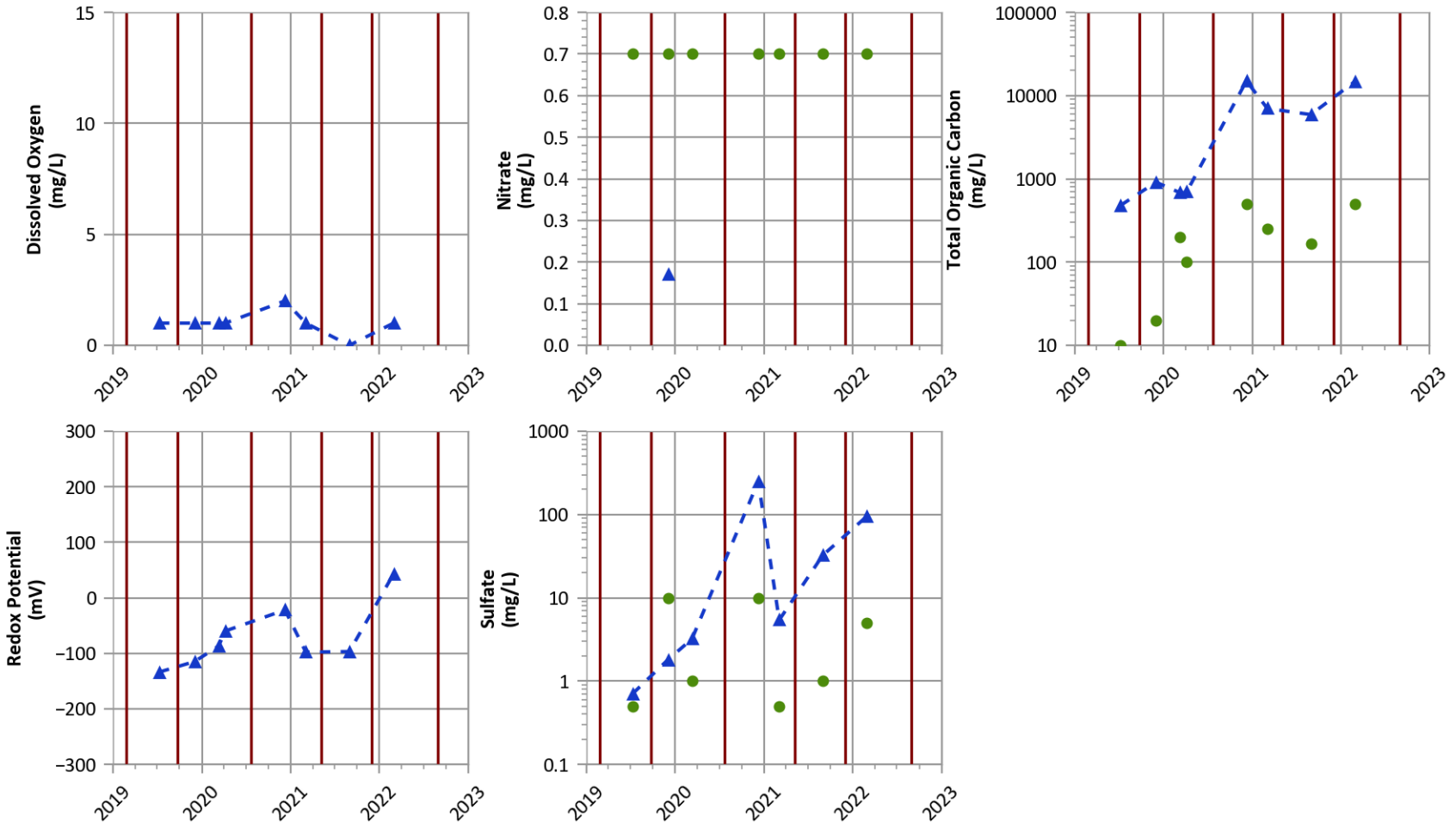


Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Well Location



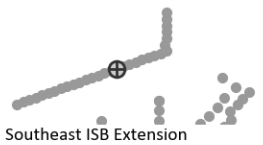
PTX06-ISB317 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



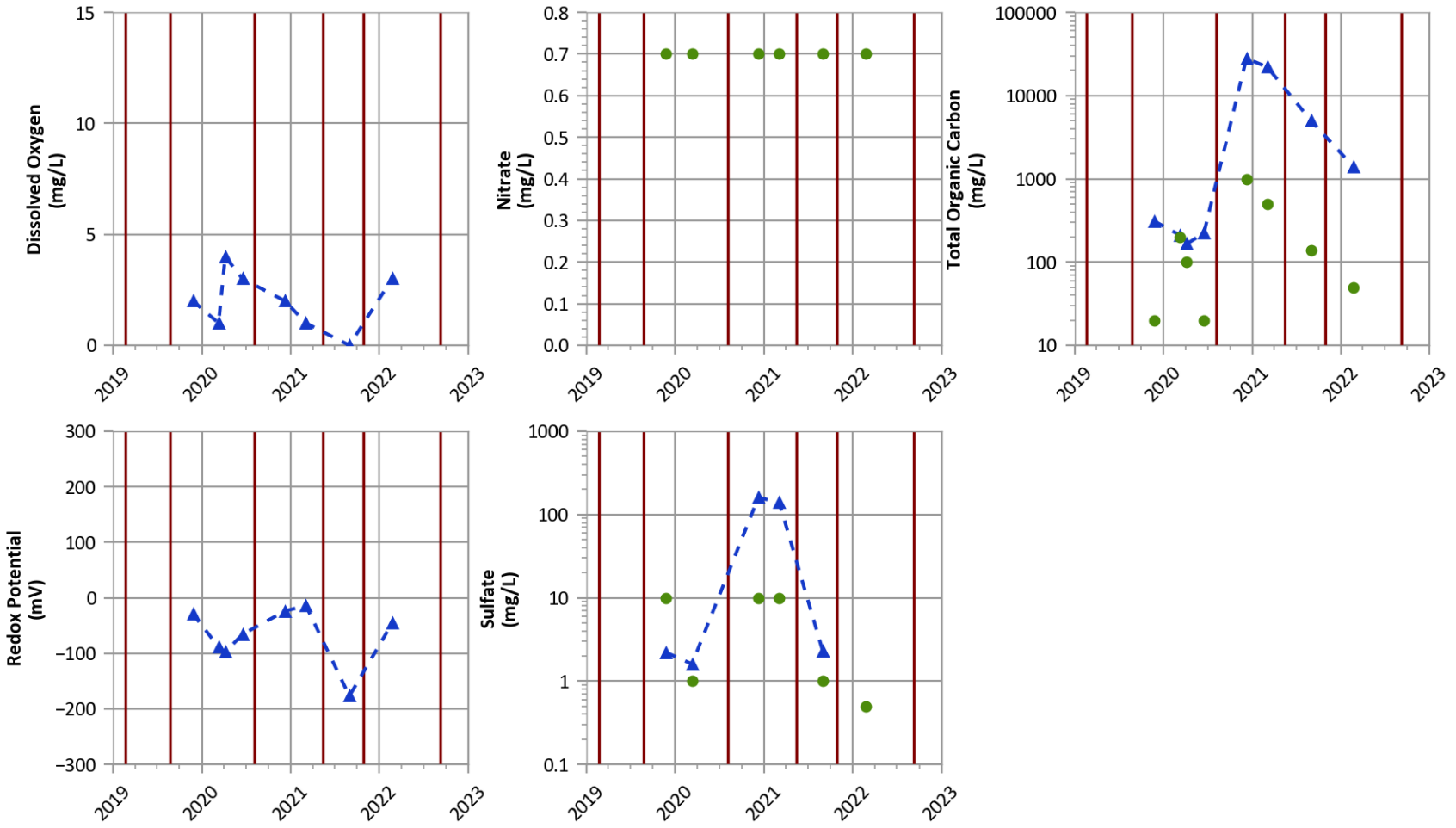
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location



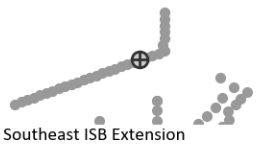
PTX06-ISB321 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



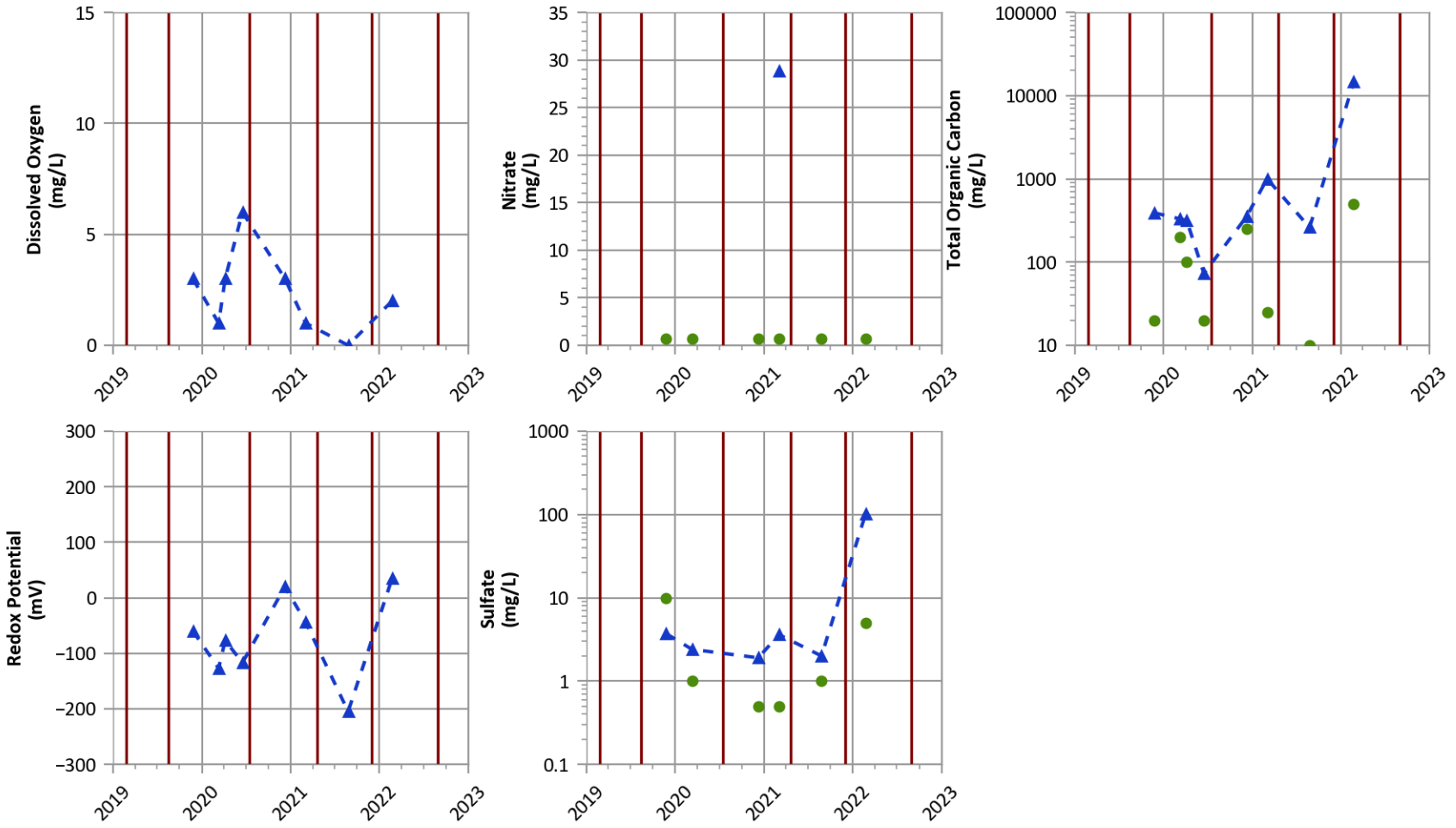
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location



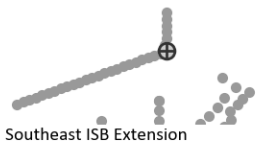
PTX06-ISB325 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



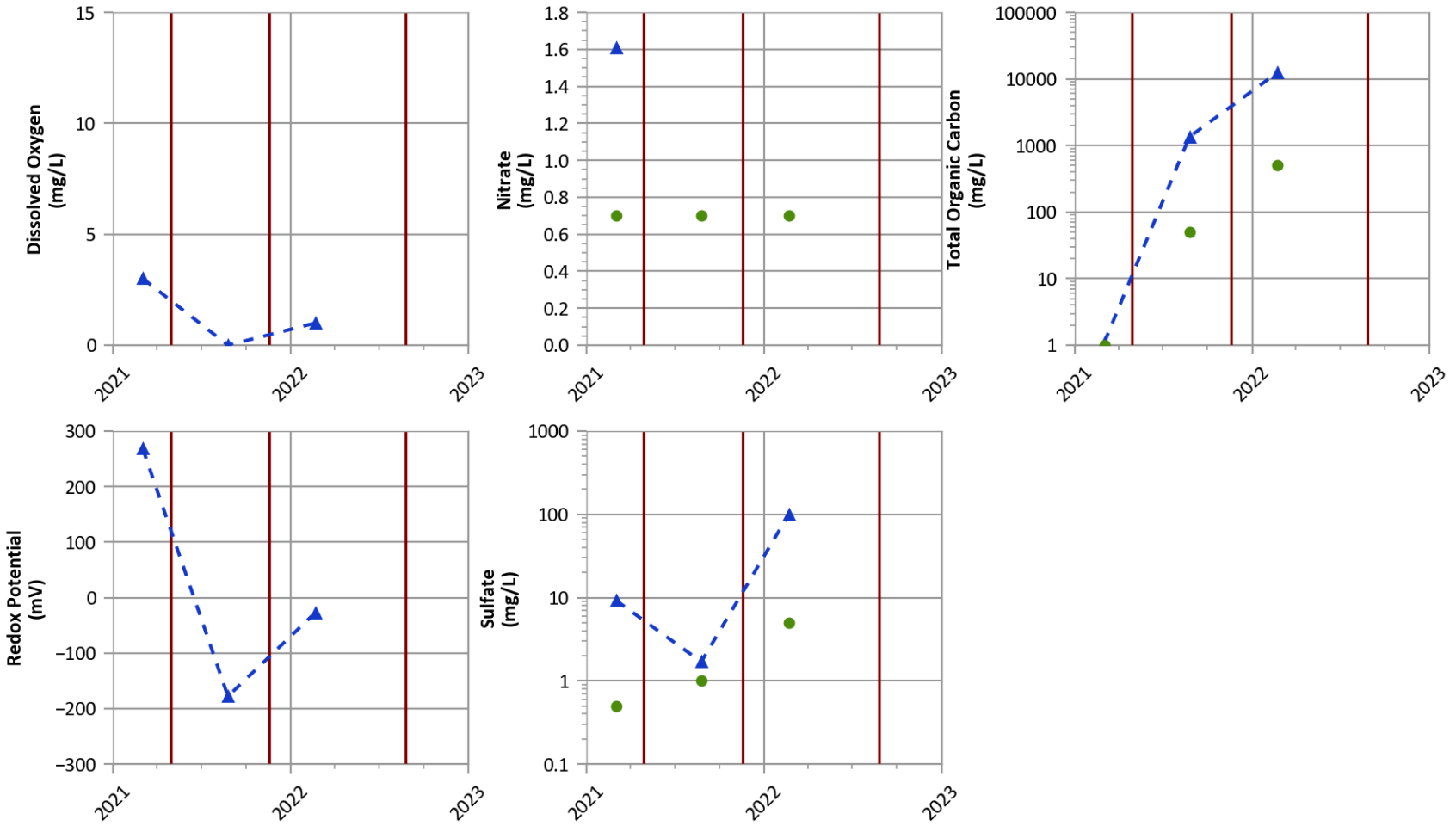
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location

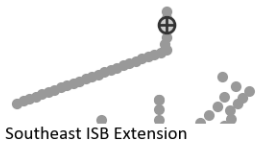


PTX06-ISB329 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant

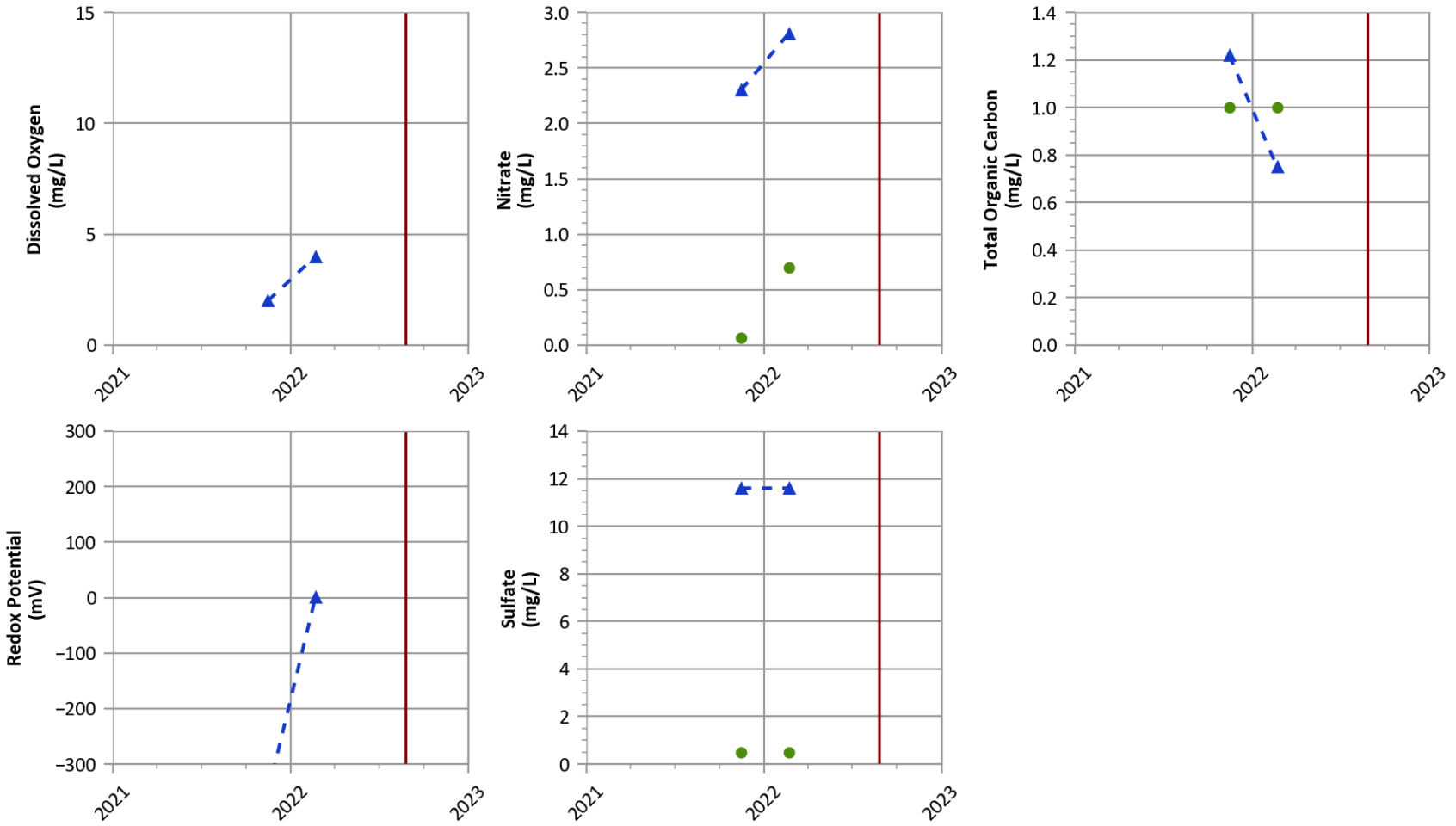


Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Well Location



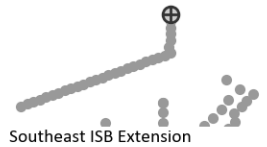
PTX06-ISB331 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



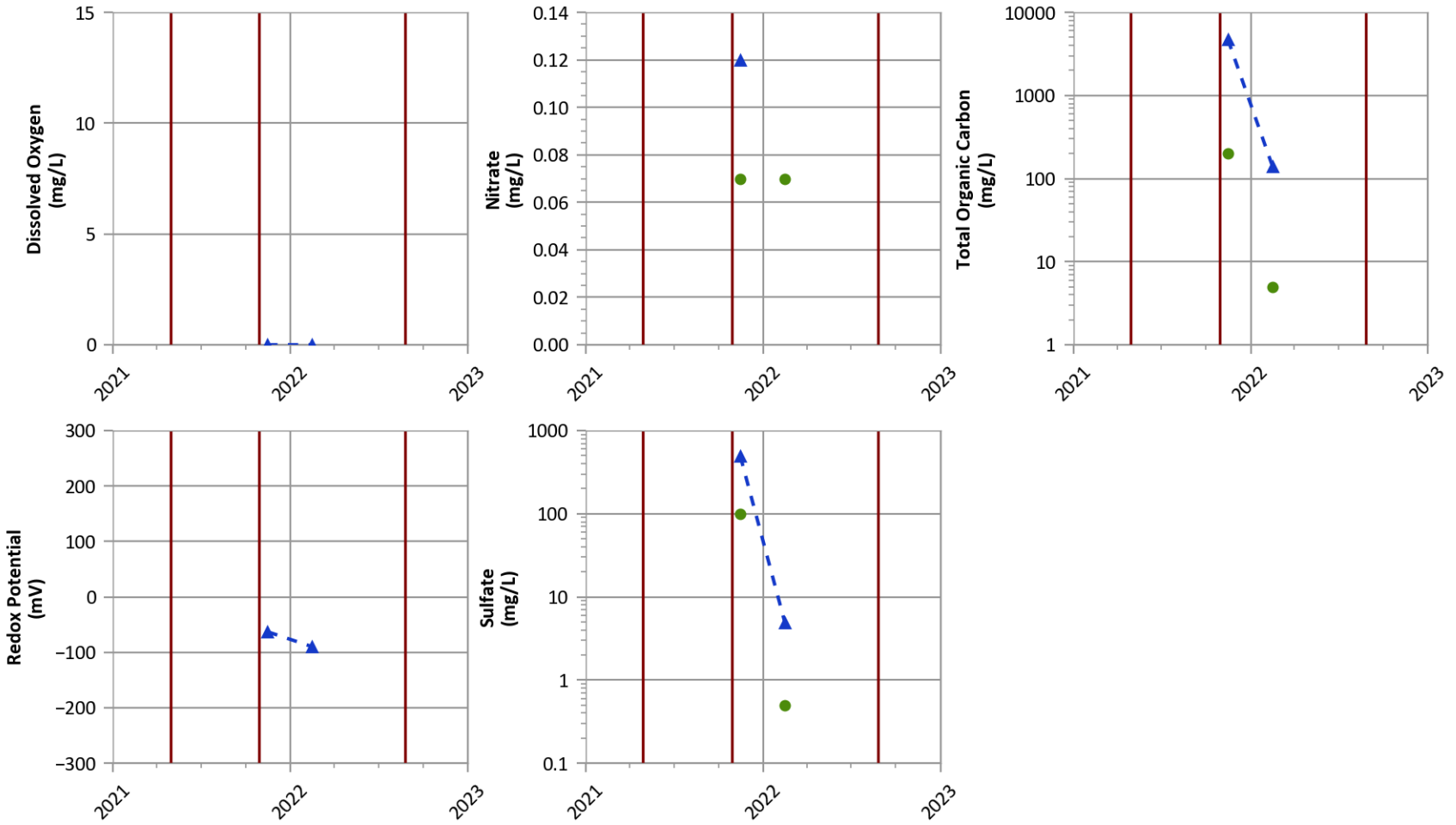
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location



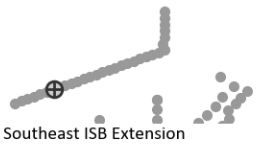
PTX06-1213 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



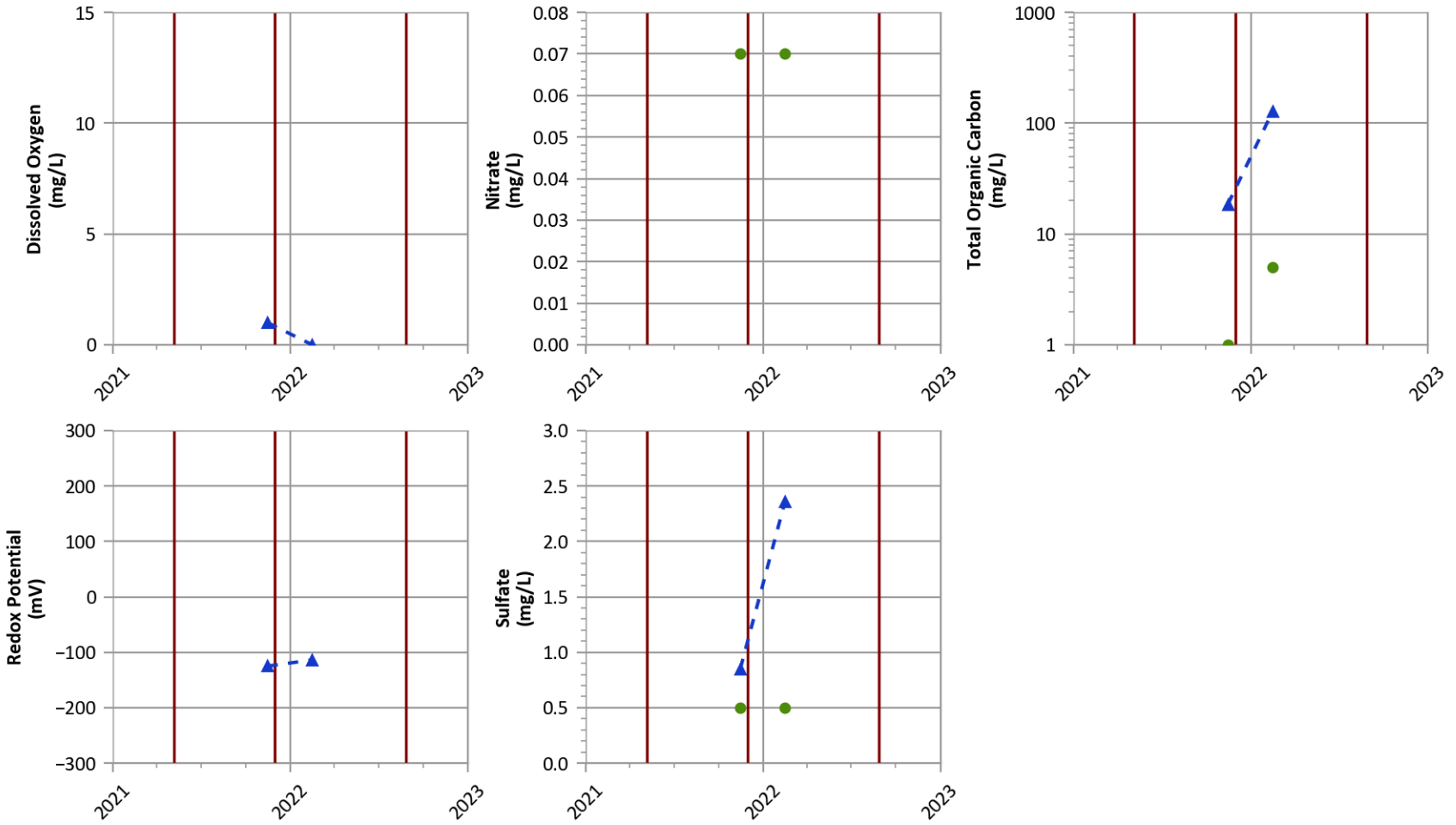
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location



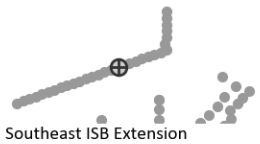
PTX06-1214 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



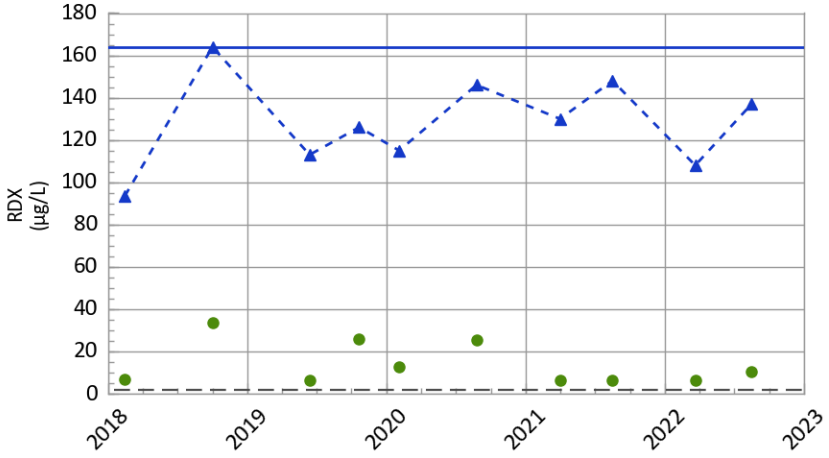
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

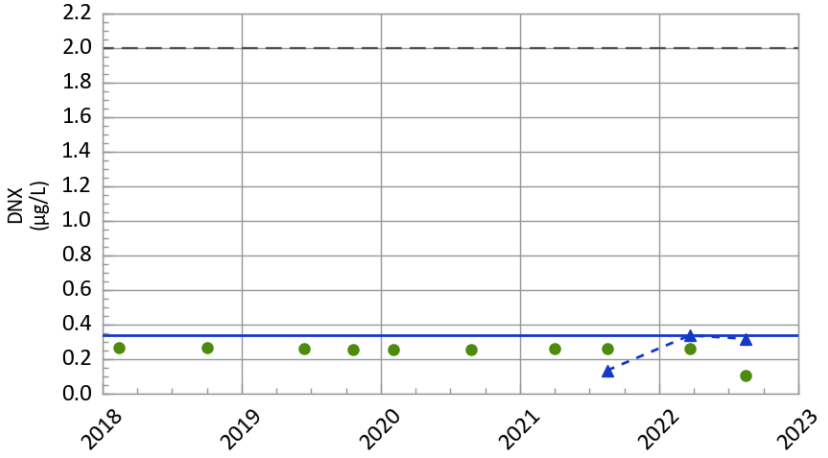
Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

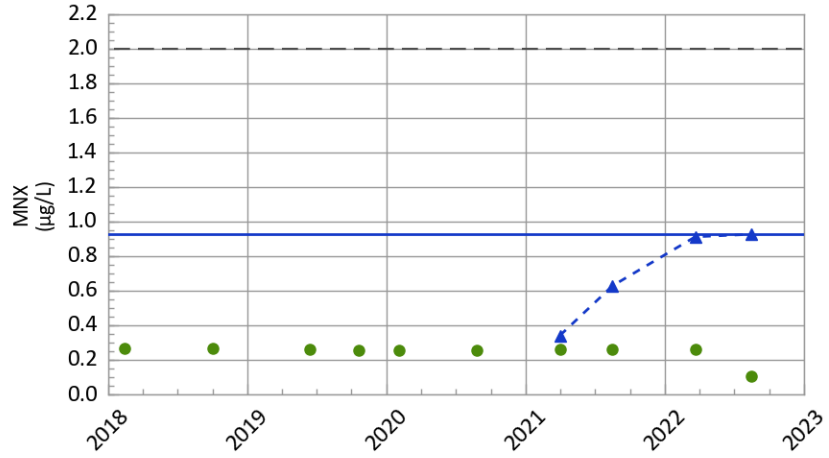
Well Location

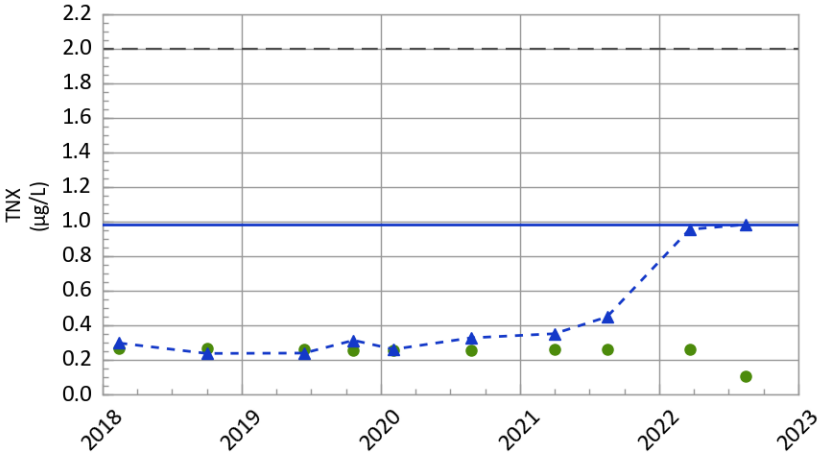


PTX06-1191 Downgradient Performance Indicators
Southeast Ext In Situ Bioremediation System
USDOE/NNSA Pantex Plant



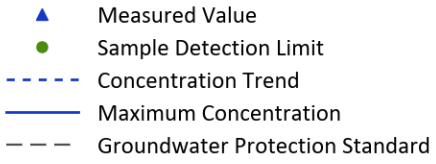


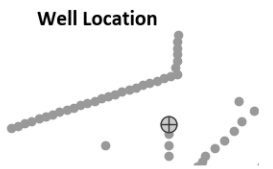




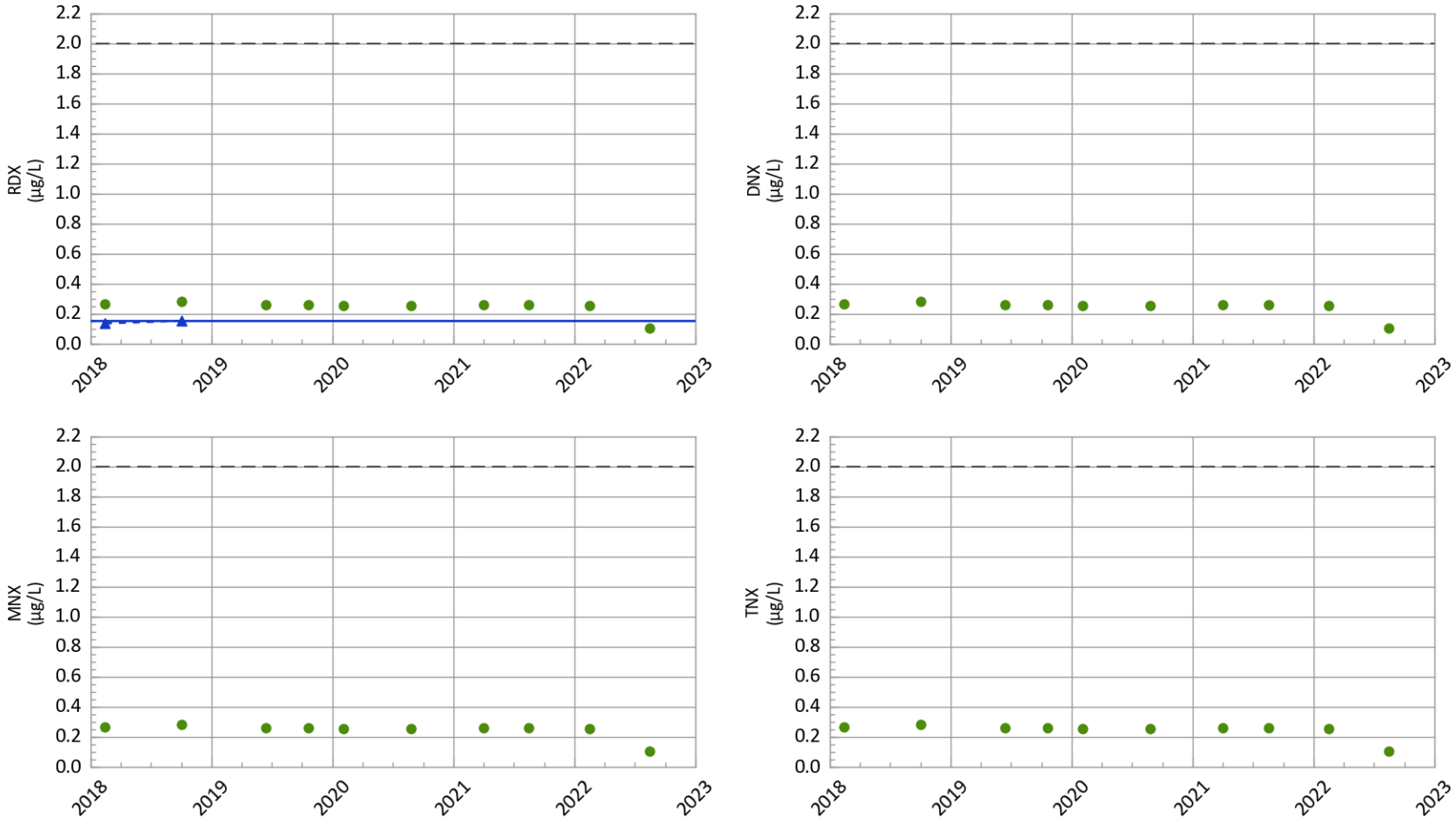
Most Recent Measured COC Concentrations (Aug 16, 2022)

COC	Concentration (µg/L)	GWPS (µg/L)
RDX	137.0	2.0
MNX	0.926	2.0
DNX	0.318	2.0
TNX	0.982	2.0



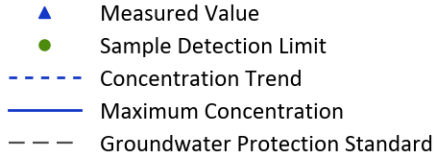


PTX06-1194 Downgradient Performance Indicators
Southeast Ext In Situ Bioremediation System
USDOE/NNSA Pantex Plant

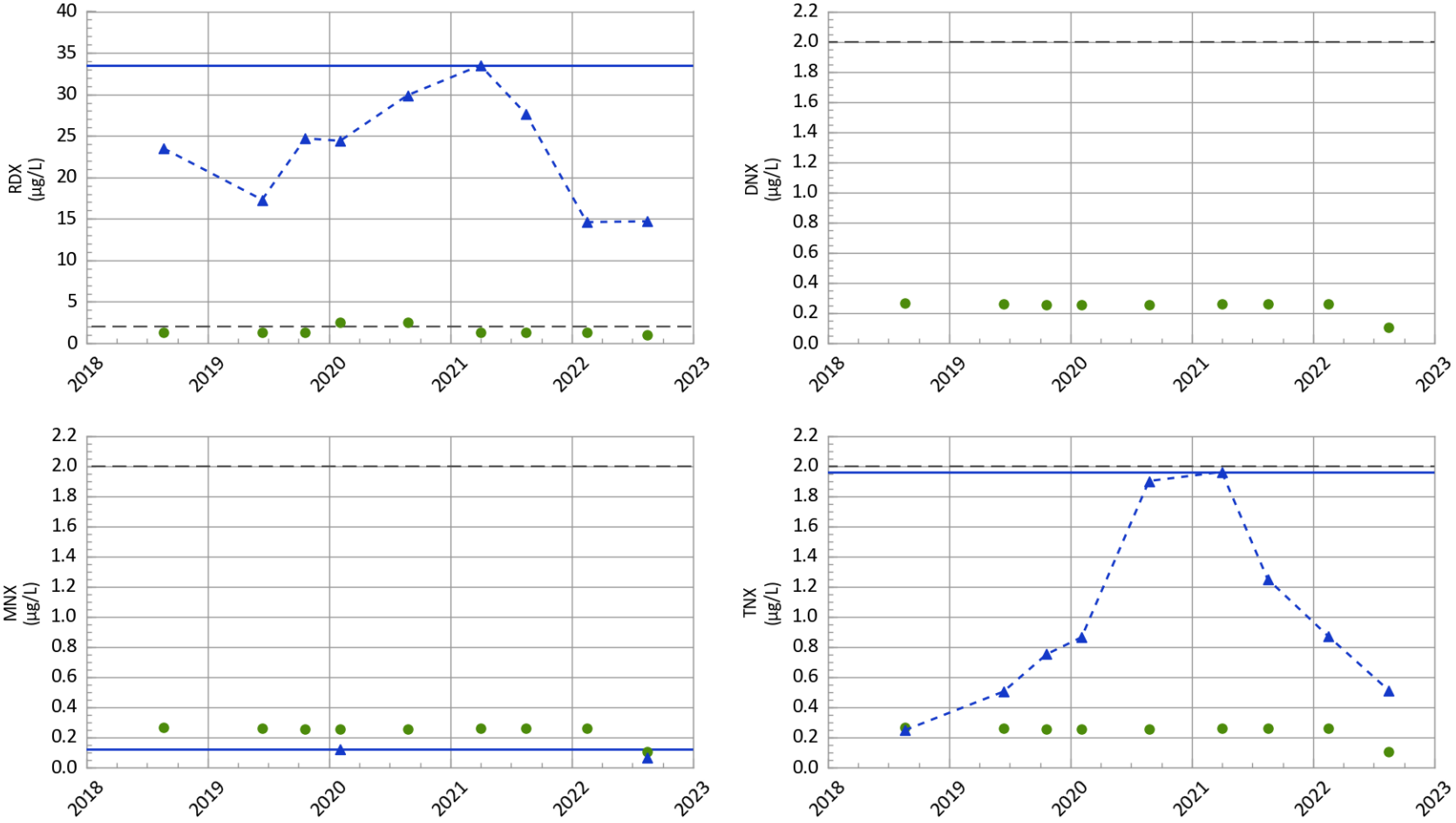


Most Recent Measured COC Concentrations (Aug 16, 2022)

COC	Concentration (µg/L)	GWPS (µg/L)
RDX	Non-Detect	2.0
MNX	Non-Detect	2.0
DNX	Non-Detect	2.0
TNX	Non-Detect	2.0



PTX06-1196 Downgradient Performance Indicators
Southeast Ext In Situ Bioremediation System
USDOE/NNSA Pantex Plant



Most Recent Measured COC Concentrations (Aug 16, 2022)

COC	Concentration (µg/L)	GWPS (µg/L)
RDX	14.7	2.0
MNX	0.0672	2.0
DNX	Non-Detect	2.0
TNX	0.511	2.0

Measured Value
Sample Detection Limit
Concentration Trend
Maximum Concentration
Groundwater Protection Standard

Well Location