2016
Site Monitoring Report

North Indian Bend Wash Superfund Site

Prepared for:

U.S. Environmental Protection Agency
Region IX

Prepared by:

NIBW Participating Companies

March 28, 2017

CONTENTS

CONTENTS (continued)

TABLES

Table

CONTENTS (continued)

Table

FIGURES

Figure

CONTENTS (continued)

Figure

CONTENTS (continued)

Figure

APPENDICES

Appendix

LIST OF ACRONYMS

ADEQ	Arizona Department of Environmental Quality
ADHS	Arizona Department of Health Services
ADWR	Arizona Department of Water Resources
AF	acre-feet
AFY	acre-feet per year
APP	Aquifer Protection Permit
AWC	Arcadia Water Company
AWQS	Aquifer Water Quality Standard
AZPDES	Arizona Pollutant Discharge Elimination System
CD	Consent Decree
CERP	Contingency and Emergency Response Plan
CFM	Chloroform
CGTF	Central Groundwater Treatment Facility
CMR	Compliance Monitoring Report
COC	Contaminant of Concern
COS	City of Scottsdale
COT	City of Tempe
CWTP	Chaparral Water Treatment Plant
DCE	1,1- Dichloroethene
DMR	Discharge Monitoring Report
EPA	U.S. Environmental Protection Agency
EPCOR	EPCOR Water USA
ERC	Emergency Response Coordinators
ESD	Explanation of Significant Differences
FSA	Feasibility Study Addendum
GAC	Granular Activated Carbon
gpm	gallons per minute
GMEP	Groundwater Monitoring and Evaluation Plan
GWETS	Groundwater Extraction and Treatment System
LAU	Lower Alluvial Unit
MAU	Middle Alluvial Unit
MCL	Maximum Contaminant Level
MG	Million Gallons
MRL	Method Reporting Limit
MRTF	Miller Road Treatment Facility
NGTF	NIBW Granular Activated Carbon Treatment Facility
NIBW	North Indian Bend Wash
O&M	Operation and Maintenance
OU	Operable Unit
PCE	Tetrachloroethene
PCs	Participating Companies
PE	Performance Evaluation
PV	Paradise Valley
PVARF	Paradise Valley Arsenic Removal Facility
QA	quality assurance

LIST OF ACRONYMS (continued)

RAO	Remedial Action Objective
RD/RA	Remedial Design / Remedial Action
ROD	Record of Decision
SAP	Sampling and Analysis Plan
SMR	Site Monitoring Report
SOW	Statement of Work
SRP	Salt River Project
TCA	1,1,1-Trichloroethane
TCE	Trichloroethene
UAU	Upper Alluvial Unit
UIC	Underground Injection Control
UV/OX	Ultraviolet Oxidation
VOC	Volatile Organic Compound
$\mu g/L$	micrograms per liter

North Indian Bend Wash Superfund Site

SITE MONITORING REPORT

January - December 2016

North Indian Bend Wash Superfund Site
Scottsdale, Arizona

March 28, 2017

This *2016 Site Monitoring Report* (SMR) summarizes remedial activities performed and data collected by the North Indian Bend Wash (NIBW) Participating Companies (PCs) (i.e., Motorola Solutions, Inc., Siemens, and GlaxoSmithKline) pursuant to the Amended Consent Decree, CV-91-1835-PHX-FJM, entered by the U.S. District Court for the District of Arizona on June 5, 2003. A detailed summary of the components and work requirements of the remedial action program can be found in the Record of Decision Amendment – Final Operable Unit (OU), Indian Bend Wash Area (Amended ROD), dated September 27, 2001, and Statement of Work (SOW), Appendix A to the Amended Consent Decree (Amended CD). An organizational chart identifying the key parties involved at the NIBW Superfund Site (the Site) is provided in **Appendix A**, along with current personnel having assigned roles and responsibilities for operations and emergency responses.

Additional information describing remedial activities conducted at the NIBW Site in 2016 was provided in Quarterly Reports submitted to the U.S. Environmental Protection Agency (EPA) and Arizona Department of Environmental Quality (ADEQ) on May 31, August 31, and November 30, 2016. Consistent with requirements defined in the Amended CD and SOW, this SMR includes operational summaries and updates for fourth quarter 2016.

This SMR presents a summary and overview of compliance monitoring data collected and acquired to demonstrate performance of the remedial action program. In conjunction with development of the 2016 SMR, the NIBW PCs compiled compliance monitoring data, laboratory analytical reports, quality assurance reports, and other monitoring data required by the Amended CD, SOW, governing work plans, and agency requests. This information is submitted in supplemental data reports that will be issued under separate cover. The supplemental data reports will be submitted as electronic files on compact disks and include:

- Level 4 data analytical reports and a quality assurance (QA) report issued by TestAmerica (primary NIBW laboratory analytical contractor) for analysis conducted for the NIBW groundwater monitoring program during 2016.
- Level 4 data analytical reports and a QA report issued by TestAmerica for: analysis of compliance process water samples obtained at NIBW groundwater treatment systems during 2016. The supplemental data reports also include results of the NIBW PCs annual audit activities at TestAmerica, a summary of performance evaluation sample results, and Level 4 analytical reports issued by TestAmerica for NGTF AZPDES permit samples and by Trans West Analytical Services, LLC (dba XENCO Laboratories, and back-up NIBW laboratory analytical contractor) for split sampling conducted at the Area 7 Groundwater Extraction Treatment System (GWETS).
- Data summary and TestAmerica laboratory analytical reports for inorganic water quality samples collected from four (4) Area 7 Upper Alluvium Unit (UAU) wells (PG-10UA, PG-16UA, PG-28UA and PG-29UA) and the Area 7 GWETS effluent sample port (SP-105).
- 2016 air sampling data summary and Air Toxics laboratory reports for the Area 7 GWETS and Area 12 GWETS.

1.0 GROUNDWATER MONITORING PROGRAM

Groundwater monitoring at the NIBW Superfund Site includes collection, analysis, and reporting of extensive water level, water quality, and production data from a network of groundwater monitor, extraction, and production water wells completed in the Upper Alluvium Unit (UAU), Middle Alluvium Unit (MAU), and

Lower Alluvium Unit (LAU). Locations of active, inactive, and abandoned monitor, extraction, and production wells in the vicinity of the NIBW Site are shown on **Figure 1**.

The UAU in the vicinity of the NIBW consists primarily of sand, course gravel, cobbles, and boulders. Saturated thickness in the UAU ranges from about 40 to 100 feet in the area south of Indian School Road. The MAU is comprised primarily of silt and clay, with interbedded fine sands that transmit much of the water that occurs in the unit. The MAU is fully saturated across much of the NIBW site and thickness is up to approximately 660 feet is some areas. The LAU consists of weakly to strongly cemented gravel, boulders, sand, sandy clay, and silty sand, with some interbedded clayey zones. Total thickness of the LAU generally ranges from 500 to more than 700 feet. All of the units thin significantly at the basin margins. The LAU, which is coarser grained, thicker, and more productive than the MAU, constitutes the principal alluvial aquifer in the region.

Groundwater monitoring requirements for the NIBW Site are specified in the *Groundwater Monitoring and Evaluation Plan* (GMEP), approved by the EPA on October 8, 2002. The GMEP was prepared by the NIBW PCs and defines the: 1) scope and frequency of monitoring activities; 2) requirements for data reporting and preparation of interpretive work products; 3) approach to conducting groundwater model updates; and 4) performance criteria, achievement measures, contingency initiation criteria, and contingency response actions for evaluation of the on-going effectiveness of remedial actions. Changes to the UAU monitoring program are documented in the EPA-approved Work Plan for Updated Long-term Groundwater Monitoring Program, Upper Alluvium Unit Groundwater, dated December 13, 2012 (NIBW PCs, 2012).

For some years, the NIBW PCs and EPA have acknowledged that changes and updates to some of the GMEP performance evaluation criteria and metrics are warranted. The GMEP was developed almost 15 years ago; and the progress of data collection and remedy implementation has significantly advanced our understanding of site conditions over that time period. Similarly, our understanding of the specific pieces of data and specific types of analyses that are most critical to ensuring achievement of Amended ROD remedial action objectives and Amended CD SOW performance standards has also improved during that time.

A process is underway to work with the NIBW Technical Committee to make targeted updates to the GMEP to streamline data collection and analysis, as well as to focus performance metrics on the most critical current and long-term remedy concerns. In addition, the PCs propose to align the performance evaluation process more directly to the Site remedial action objectives and performance standards. While progress was made in 2016, the GMEP update process has not been completed. Therefore, the PCs will continue to use the structure laid out in the 2002 GMEP for the 2016 SMR evaluation of the progress and performance of the various remedy components. Where applicable, areas where specific metrics warrant updating or modification will be noted.

Test America, Inc. was the Analytical Laboratory Supervising Contractor for groundwater monitoring program activities and Verdad Group LLC (Verdad) was the Groundwater Monitoring Program Supervising Contractor for the NIBW Site in 2016. **Appendix A** contains contact information, roles, and responsibilities for parties involved in key aspects of the NIBW Site remedial actions.

1.1 GROUNDWATER LEVEL MONITORING

Groundwater level monitoring was conducted semi-annually in a network of 76 monitor wells in April and 106 monitor wells in October 2016. The monitoring contractor re-measured water levels in late October at selected wells. Some of the previous water levels from earlier in October had been collected with critical extraction wells off-line. Water level measurements obtained and reported by Verdad in April and October are summarized in **Tables 1 and 2**, respectively. Water level monitoring for the UAU has been discontinued for April (as approved by EPA and ADEQ in 2013) and is now conducted annually in October at the remaining network of 29 UAU monitor wells. April 2016 water level contour maps for the MAU and LAU are shown on **Figures 2 and 3**, respectively. October 2016 water level contour maps for the UAU, MAU, and LAU are shown on **Figures 4, 5, and 6**, respectively.

In addition to periodic water level monitoring conducted at unit-specific monitor wells, continuous water level monitoring was conducted during 2016 at a group of LAU monitor wells and one extraction well in the vicinity of the EPCOR well field (referred to as the Paradise Valley [PV] well field) as part of the enhanced northern LAU monitoring program. Hydrographs showing continuous water level data for wells in the northern LAU monitoring program are provided in **Appendix B**. Additional continuous water level data was obtained during 2016 at selected MAU monitor wells as part of the *Work Plan for Area 7 Middle Alluvial Unit Source Control, Proposed Actions in Response to Non-Conformance with Performance Measures*, dated April 12, 2013, as described in Section 4.2.3, and subsequent discussions at monthly Technical Committee meetings.

Pumping, chiefly in the MAU and LAU, influences water levels and patterns of groundwater movement in the three alluvial units. The principal pumping centers are discussed in Section 1.4. While introduced in Section 1.4, **Table 6**, which summarizes monthly pumping and **Figure 16**, which shows annual pumping, for wells in the vicinity of the NIBW Site, may also be helpful references with regard to the water level discussion below. Most MAU and LAU remedial groundwater extraction wells generally operated at full capacity during 2016. Although the PCs coordinated closely with water providers in an attempt to ensure that key extraction wells were pumping, issues outside of the PCs' control led to certain wells being off line during the April and/or October compliance water level monitoring events. Miller Road Treatment Facility (MRTF) extraction well PV-15 was not pumping during the April 2016 water level round. Area 7 extraction well 7EX-4MA was not pumping during the October water level round. Central Groundwater Treatment Facility (CGTF) extraction well COS-31 was not pumping during the April 2016 water level round, and extraction wells COS-72 and COS-75A were not pumping during the October water level round. With respect to COS-75A, water levels at selected monitor wells were re-measured when the well came back on line to ensure that capture could be assessed.

Based on the October 2016 water level contour map (**Figure 4**), direction of groundwater movement in the UAU is from east to west in the area south of McDowell Road and from northeast to southwest in the area north of McDowell Road. UAU groundwater migrates toward the western margin of the Site, where it moves vertically into underlying units. Downward vertical hydraulic gradients are known to exist across the Site and the conceptual model for the site acknowledges vertical migration of groundwater from the UAU to the MAU and from the MAU to LAU in response to these gradients. In October 2016, UAU horizontal hydraulic gradients, expressed as feet per foot (unitless), ranged from about 0.0022 in the north to about 0.0036 in the south.

The complex pattern of groundwater movement observed in the MAU is the result of competing influences between the various pumping centers and the western margin, where vertical movement of groundwater into the LAU occurs. April 2016 water level contours, depicted on **Figure 2**, indicate cones of depression associated with MAU pumping that was occurring during this time period in the vicinity of: 1) Area 12 GWETS wells Salt River Project [SRP] well 23.6E,6.0N (the Granite Reef well) and MEX-1MA; 2) CGTF wells COS-71A, and COS-72; 3) Area 7 GWETS wells 7EX-3aMA and 7EX-6MA; and_4) SRP well 21.5E,8N and the Arcadia Water Company (AWC) wells.

October 2016 MAU water level data displayed on **Figure 5** show that patterns of groundwater movement were generally similar to those observed in April, except that the impact of pumping by CGTF extraction wells COS-71A and COS-72 is assumed to be greater in April than in October, due to larger sustained pumping prior to and during the monitoring round in April at these wells. Note that Area 7 GWETS extraction well 7EX-4MA was not pumping during the October 2016 water level monitoring round.

In the south part of the Site, Area 12 extraction wells MEX-1MA and the Granite Reef well were both pumping fairly continuously in April and October. Horizontal hydraulic gradients in the MAU to the southeast in the immediate vicinity of the Area 12 extraction center ranged from about 0.0080 in April to 0.0087 in October. In the north part of the Site, horizontal hydraulic gradients in the MAU in the vicinity of Thomas Road and CGTF extraction well COS-31, ranged from about 0.0035 in April, to 0.0033 in October. Area 7 extraction wells 7EX-3aMA and 7EX-6MA were both pumping continuously in April and October. Horizontal hydraulic gradients in the MAU immediately north of the Area 7 extraction center ranged from 0.012 in April to 0.010 in October. In the area between the southern and northern pumping centers, where water migrates toward the western margin, horizontal hydraulic gradients ranged from 0.0030 in April to 0.0038 in October.

Groundwater movement in the LAU is generally from recharge areas in the south and southwest parts of the Site to points of discharge at extraction and production wells to the north, as shown for April and October 2016 on **Figures 3 and 6**, respectively. Numerous wells withdraw groundwater from the LAU throughout the NIBW Site, including CGTF extraction wells, MRTF extraction wells (PV-15 and PV-14), NGTF extraction well PCX-1, and production wells operated by SRP, AWC, EPCOR, and the City of Scottsdale (COS). For both April and October 2016, a cone of depression is observed around CGTF extraction well COS-75A, one of the lead LAU extraction wells for the remedy. In April 2016, pumping at MRTF extraction well PV-14 and NGTF extraction well PCX-1, combined with pumping at nearby SRP and PV production wells, results in a regional sink for LAU groundwater to the north. This regional sink is more pronounced in the October 2016 data set, as MRTF extraction well PV-15 was also pumping at this time. Patterns of groundwater movement in the southern half of the Site are fairly consistent for both monitoring periods in 2016.

Horizontal hydraulic gradients in the LAU generally increase from south to north toward extraction well COS-75A, and then decrease sharply in the area down-gradient from COS-75A (**Figures 3 and 6**). Horizontal hydraulic gradients ranged from a maximum of about 0.013 and 0.015 in April and October, respectively, in the area immediately upgradient from CGTF extraction well COS-75A to a minimum of about 0.0030 in April and 0.0027 in October in the area between extraction wells COS-75A and PCX-1.

Changes in groundwater levels over time are evaluated by comparing recent and long-term water level data trends at UAU, MAU, and LAU monitor wells.

Table 3 summarizes the difference in water level between October 2015 and October 2016 for all monitor wells included in the water level monitoring programs for both years. Water level change is shown on maps and illustrated on associated inset bar graphs on **Figures 7 through 9** for the UAU, MAU, and LAU, respectively. Wells are arranged based on location (north to south) on the inset bar graphs. It should be noted that water level differences computed at individual wells using October 2015 and October 2016 data are representative of changes between two point measurements, which may not be reflective of long-term trends. In addition, water level changes on the order of 10 feet or more observed in monitor wells adjacent to extraction wells are usually attributed to production well cycling rather than to water level conditions in the aquifer. Water level data trends are more accurately tracked by reviewing a larger set of water level data obtained over a longer time period. Hydrographs showing water level data for the 10-year period from 2007 through 2016 for wells included in the monitoring program are provided in **Appendix C**.

In the time period from October 2015 to October 2016, observed water level changes in the UAU were all less than 3 feet (**Figure 7**). In general, water levels declined to the north of McDowell Road and rose to the south of McDowell Road. The magnitude of decline in the UAU north of Thomas Road was generally similar, ranging from 1.17 to 1.83 feet. The apparent rise at well PG-10UA was attributed to anomalous data. The magnitude of rise in the UAU south of McDowell Road generally increased from north to south, ranging from 0.37 to 2.4 feet.

Water levels in the MAU declined in all MAU monitor wells, with the exception of D-2MA (**Figure 8**). The apparent rise at D-2MA is attributed to anomalous data. Larger-scale declines (>30 feet) at M-12MA2 and E-5MA are also based on anomalous measurements and are not believed to be representative of local conditions in the upper MAU. The magnitude of decline was greatest near the extraction wells at Area 7 and Area 12.

Water level change in the LAU between October 2015 and October 2016 is variable. North of Thomas Road, water level change varied between rise and decline, depending on proximity to pumping centers (**Figure 9**). In the vicinity of

AWC wells and PV wells, water levels generally rose due to decreased pumping in the LAU at these pumping centers between October 2015 and October 2016. In the vicinity of PCX-1 and COS-75A, water levels generally declined due to increased pumping in the LAU at these pumping centers between October 2015 and October 2016. Water levels also generally rose on the east flank of the LAU monitoring network north of Thomas Road. In the vicinity and south of Thomas Road, water levels generally declined. This declining trend is likely a regional trend and is further enhanced by increased annual pumping at extraction wells COS-71A, COS-72, and COS-31 between October 2015 and October 2016. The only exceptions to the declining trend south of Thomas Road are at M-17MA/LA and PA-15LA. The apparent rise at M-17MA/LA was attributed to anomalous data. The apparent rise at PA-15LA is 3.17 feet and the cause for the rise was not determined. Larger-scale decline (>30 feet) at PA-22LA is also based on anomalous measurements and is not believed to be representative of local conditions in the LAU.

1.2 GROUNDWATER QUALITY MONITORING

Groundwater quality monitoring of VOCs designated as NIBW contaminants of concern (COCs), including trichloroethene (TCE), tetrachloroethene (PCE), 1,1,1-trichloroethane (TCA), 1,1-dichloroethene (DCE), and chloroform (CFM), was conducted in accordance with requirements of the GMEP. Water quality monitoring for the five NIBW COCs for 2016 included the following components:

- monthly sampling (when operating) at the four (4) CGTF extraction wells, two (2) MRTF extraction wells, and one (1) NGTF extraction well;
- quarterly sampling (when operating) at the three (3) Area 7 extraction wells that were operational in 2016 and two (2) Area 12 extraction wells, along with at a network of 24 selected MAU and LAU monitor wells;
- semi-annual sampling at one (1) LAU monitor well; and,
- annual sampling at the remaining 60 UAU, MAU, and LAU monitor wells. Sampling at wells B-1MA and PA-14MA, which had resumed temporarily, was discontinued in 2016 because it was not needed and was not required by the GMEP.

In general, monitoring is conducted in accordance with the Sampling and Analysis Plan (SAP) for the NIBW Site, developed by SRP and approved by EPA in 2003. However, in October 2015 the PCs prepared and submitted to EPA an addendum to the SAP to describe standard operating procedures for collection of groundwater samples at monitor wells using the HydraSleeve™ method (HydraSleeve). The addendum was incorporated into the monitoring program guidance documents provided to Verdad when they assumed the role of Groundwater Monitoring Program Supervising Contractor for the Site in March 2016. Under the original SAP for the NIBW Site, groundwater samples are obtained from monitor wells using dedicated pumps. A standard volume-based purge method, requiring stabilization of water quality field parameters, is specified, with treatment of purge water prior to discharge for wells where COCs exceed regulatory limits. The HydraSleeve sampling approach was integrated into the SAP to provide the opportunity to use this passive sampling method at the Site for monitor wells where dedicated pumps either failed or their use was deemed impractical. In practice, when dedicated pumps have failed, HydraSleeve sampling has been used as a sampling strategy on a case by case basis, considering both logistical and technical advantages and disadvantages. While HydraSleeve samples have generally shown a good agreement with historical results from traditional purge samples, where results have not been consistent, the dedicated pumps were re-installed in the wells.

Monthly and quarterly groundwater quality monitoring is generally conducted during the first week of the month, beginning in January. The annual groundwater quality monitoring program is initiated at the beginning of October. As in previous years, annual sampling continued into November and December in 2016.

A summary of laboratory results of COCs for NIBW monitor wells for 2016 is provided in **Table 4**. Production and extraction well COC results are summarized in **Table 5**. As evident from the data, TCE is the principal COC at the site and is, therefore depicted in SMR plume maps and time-series graphs. TCE concentration contours for October 2016 for the UAU, MAU, and LAU are shown on **Figures 10**, **11, and 12**, respectively. Hydrographs, showing TCE concentrations and water levels for the 10-year period from 2007 through 2016, are shown for all monitor wells included in the monitoring program in **Appendix C**. Changes in the magnitude and extent of TCE concentrations between the baseline data set, which is defined as October 2001 and coincides with the release of the Amended ROD, and October 2016, the current monitoring period, are shown for the UAU, MAU, and LAU on **Figures 13, 14, and 15**, respectively.

TCE concentrations in UAU monitor wells are consistently low and most wells are on a generally declining trend, with a maximum concentration in November 2016 of 13.0 micrograms per liter (µg/L) detected at monitor well PG-31UA. This well is located southwest of Area 7 **(Figure 10)**. The occurrence of TCE concentrations in UAU groundwater at or in excess of the Federal Maximum Contaminant Level (MCL)[1] of 5 µg/L is limited to two (2) monitor wells (PG-28UA and PG-31UA), which are both located down-gradient (southwest) from Area 7. The magnitude of TCE concentrations in UAU groundwater has decreased significantly with time, as reflected in **Appendix C** hydrographs. The extent of the UAU plumes has also decreased over time, as depicted in **Figure 13**, which compares the extent of TCE concentrations in UAU groundwater observed in October 2001 and October 2016. The area of impact, as defined by the TCE plumes in the UAU, has decreased by about 90 percent from October 2001 to October 2016.

TCE concentrations in MAU groundwater are generally higher than in the other two units, with a maximum concentration of 2,400 µg/L detected in January 2016 at monitor well W-2MA, which is located down-gradient from Area 7 **(Figure 11)**. The maximum concentration of TCE detected in October 2016 in a monitor well in the vicinity of Area 12 was 28 µg/L at E-8MA, located down-gradient from Area 12. Samples collected from Area 12 Granite Reef extraction well [SRP23.6E,6N] had a TCE concentration of 120 µg/L in November 2016 and Area 12 extraction well MEX-1MA had a TCE concentration of 42 µg/L in October 2016. The third area of elevated TCE concentrations in MAU groundwater coincides with a localized region associated with monitor well PG-6MA, located in the vicinity of the southwest margin. TCE concentration at PG-6MA was 91 µg/L in October 2016. While longer-term decreases in TCE concentrations have been observed at

[1] As set forth in the Amended ROD, cleanup standards for all NIBW COCs except chloroform are equivalent to MCLs adopted by EPA pursuant to the Safe Drinking Water Act (42 U.S.C. §§ 300f-300j-11). The chloroform cleanup standard is 6 µg/L.

many MAU monitor wells, there are also short-term increases observed at times; these trends are generally attributable to changing pumping patterns at the Area 7 and Area 12 systems. More recent trends are stable to slowly declining at most MAU wells (**Appendix C**). Changes in the extent of TCE concentrations in MAU groundwater observed between October 2001 and October 2016 are generally small (**Figure 14**). Some notable decreases in TCE concentrations have occurred in the area south and down-gradient from Area 7 due to implementation of the source control program (**Figure 14 and Appendix C**). It should be noted that the extent of the west flank of the MAU plume is more accurately represented in maps generated after the October 2001 baseline, due to the availability of data at monitor well M-17MA/LA following its installation in 2002.

TCE concentrations in LAU groundwater are generally intermediate between the UAU and the MAU, with a maximum concentration of 170 μg/L detected in October 2016 at monitor well PA-6LA (**Figure 12**). The highest concentrations of TCE in LAU groundwater occur in the north-central part of the Site. Changes in the magnitude and extent of TCE concentrations in LAU groundwater observed between October 2001 and October 2016 are generally small (**Figure 15**). TCE concentrations are decreasing in the southern half of the LAU, as containment at the MAU source areas and clean-up of the UAU results in less mass entering the LAU at the western margin over time. This trend is apparent in **Appendix C** hydrographs for LAU monitor wells in the south half of the LAU plume. Overall, the areas where TCE concentrations exceed 50 and 100 μg/L have decreased significantly since 2001.

A predictable migration of the LAU plume to the north in response to the regional gradient (**Figure 6**) and implementation of the LAU groundwater remedy through extraction at CGTF, NGTF, and MRTF wells is also apparent on **Figure 15**. As shown on **Appendix C** hydrographs, monitor and extraction wells in the northern LAU plume area have historically shown increasing TCE concentration trends due to anticipated migration of LAU mass toward PCX-1 and the MRTF extraction wells. Recently, increasing concentration trends in the northernmost part of the LAU have slowed, leveled off, and in some cases reversed. This encouraging trend is attributed to coordinated pumping at PCX-1, PV-14, and PV-15, as well as other PV wells north of the MRTF, in accordance with the optimal plume containment strategy, which prioritizes pumping from south to north, as discussed in Section 4.2.5. Conditions along the western flank of the LAU plume in the vicinity and north from S-2LA are being closely monitored and will be discussed in the following section and in Section 4.2.2.

1.3 CONTINGENCY ACTIONS

Water quality data obtained in 2016 indicate that TCE concentrations observed at monitor wells S-2LA and PG-42LA exceeded GMEP metrics associated with groundwater containment of the LAU plume. With respect to the quarterly sampling of northern LAU monitor wells, well PG-42LA exceeded the GMEP performance metric of 2 μg/L TCE in the first and fourth quarters of 2016, whereas well S-2LA exceeded the GMEP performance metric of 15 μg/L TCE during all sampling rounds conducted at this well in 2016 (**Table 4**).

Similar GMEP exceedances and trends were observed and reported at monitor wells S-2LA and PG-42LA, as well as at extraction well PV-14, in 2011, triggering contingency response actions and preparation of three separate Technical Memoranda. These response actions were summarized in the 2011 SMR. Subsequently, the NIBW PCs proposed, in a letter dated May 24, 2012, to suspend further contingency response actions until the NIBW Technical Committee could reassess GMEP performance measures and, as appropriate, establish updated metrics. EPA agreed to the temporary suspension of contingency response actions in an email dated June 1, 2012, but asked for continued reporting of data to the Technical Committee. In 2016, the NIBW PCs conducted and reported on quarterly sampling of S-2LA and PG-42LA and monthly sampling of PV-14. The TCE concentration trend at S-2LA has begun to flatten and PG-42LA continues to demonstrate a predictable TCE concentration cycle in response to seasonal pumping patterns. The PCs will continue to track and report quarterly on these wells throughout 2017.

1.4 GROUNDWATER PRODUCTION DATA

Monthly data for total groundwater production were compiled for all wells that pump at rates greater than 35 gallons per minute (gpm) and are located in the area bounded by Indian Bend Road to the north, one mile south of McKellips Road to the south, Dobson Road to the east, and Invergordon Road to the west (**Figure 1**). Monthly production data for 2016 are summarized in **Table 6**. Annual well production data for 1991 through 2016 are summarized in **Table 7**, and 2016 well production data is shown graphically on **Figure 16**, with circle size increasing with pumping volume. **Figure 16** and **Table 6** also show the estimated percent pumping distribution between the UAU, MAU, and LAU for production wells in the vicinity of the Site. Production data were obtained from municipal and private water providers, SRP, and the Arizona Department of Water Resources (ADWR).

Review of monthly production data (**Table 6**) indicates seasonal trends in pumping in response to fluctuations in demand for groundwater. In general, maximum production for municipal demand corresponds to summer months while minimum production for municipal demand corresponds to winter months. Combined monthly pumping for all wells at the NIBW Site ranged from 1,141 acre-feet (AF), which is equivalent to about 372 million gallons (MG), in December 2016, to 3,326 AF (about 1,084 MG) in July 2016.

Review of the spatial distribution of groundwater production for 2016 (**Figure 16**) indicates the presence of several pumping centers. The predominant pumping center is associated with the PV well field, located along the Arizona Canal in the vicinity of McDonald Road. Total production for 2016 at the six (6) PV wells was 10,195 AF (3,322 MG). This pumping is principally from the LAU. SRP well 22.5E,9.3N (also known as PCX-1, which is treated at NGTF) and SRP well 22.6E,10.0N pumped a total of 3,664 AF 1,194 MG) and 19 AF (6 MG) in 2016, respectively, and contribute to the LAU pumping center in this area. Pumping at PV and SRP wells in the northern LAU causes a regional cone of depression that controls groundwater movement in the LAU across the NIBW Site. Extraction and treatment of TCE at key wells in this cone of depression (i.e., at PCX-1, PV-14, and PV-15) is critical to the LAU remedy.

Outside of the northern LAU pumping center described above, production at the CGTF extraction wells is the most significant pumping that occurs within the boundaries of the NIBW Site. COS-75A and COS-71A pump exclusively and primarily from the LAU, respectively. COS-72A and COS-31 pump from both the MAU and LAU. Total production for 2016 at the four CGTF extraction wells (COS-31, COS-71A, COS-72, and COS-75A) was 6,894 AF (2,246 MG). Total production for the CGTF extraction wells in 2015 was 5,451 AF (1,776 MG). Pumping associated with the Area 7 and Area 12 groundwater extraction and treatment programs is also fairly substantial, totaling 442 AF (144 MG) and 1,941 AF (632 MG) for 2016, respectively. The AWC well field comprises another pumping center in the vicinity of the NIBW Site. Total production for 2016 at the five (5) AWC wells, which pump from the MAU and LAU, was 2,889 AF (941 MG). When operating, well City of Tempe (COT) well 6 (COT-6) comprises another significant pumping center. A total of 1,281 AF (417 MG) was pumped from COT-6 in 2016, principally from the MAU.

Table 7 summarizes annual groundwater production for wells in the vicinity of the NIBW Site for the period 1991 through 2016. From 1991 through 1995, annual groundwater production in the vicinity of the NIBW Site ranged from 18,887 AF (6,154 MG) to 31,824 AF (10,370 MG). From 1996 through 2004, groundwater production in the vicinity of the NIBW Site increased to an average of just over 40,165 AF (13,088 MG) per year. The increased groundwater withdrawals from the mid-1990s correlate to, among other factors, implementation of the NIBW groundwater remedy, which allowed water providers to return wells to service. Additionally, groundwater pumping increased in this period due to dryer than normal Arizona weather conditions. In recent years, however, groundwater production in this area has declined, averaging 28,994 acre-feet per year (AFY) (9,448 MG) for the period from 2006 through 2016. The recent decline in groundwater production is likely correlated to an increase in surface water supply available to users such as SRP and COS. In this same period, COS started up the Chaparral Water Treatment Plant (CWTP) to use SRP surface water supply and shut down some local COS wells due to implementation of the revised arsenic maximum contaminant level. Annual pumping in the vicinity of the NIBW Site for 2016 totaled 28,202 AF, or 9,190 MG, which is somewhat less than the average since 2005.

2.0 GROUNDWATER REMEDIATION PROGRAM

As provided by the Amended CD, the NIBW remedy requires containment of the MAU/LAU plumes and restoration of groundwater to drinking water standards. The groundwater remediation program consists of groundwater extraction and treatment at the CGTF, MRTF, NGTF, Area 7 GWETS, and Area 12 GWETS. The locations of the five (5) GWETS are shown on **Figure 17**. The NIBW PCs are responsible for operation of the Area 7 GWETS and Area 12 GWETS; and COS is responsible for the CGTF. The NIBW PCs own and are responsible for NGTF operations, maintenance, and performance; however, COS operates the treatment facility under contract to the NIBW PCs as the treated water may be used in its system. EPCOR Water USA (EPCOR), as owner of the MRTF, is responsible for operation of treatment for water produced from wells PV-14 and PV-15.

A monthly summary of groundwater production and estimated TCE mass removed from each NIBW extraction well is presented on **Table 8**. Mass removal estimates for individual extraction wells are computed by using a single (or average) TCE concentration value for each month in which a given well operated, and the total pumping from that well during the month. Results of samples obtained by the NIBW PCs are used where available; however, samples obtained by other parties, such as COS, are used when no PCs' data are available. The PCs have no sample results when extraction wells are not operational during their monthly monitoring round. If no TCE concentrations are available for a particular well for a particular month, values from previous or subsequent months are used.

To assure data quality and consistency associated with collection of compliance monitoring data at the treatment plants, the NIBW PCs and COS have contracted with TestAmerica (designated as primary analytical laboratory) and Trans West Analytical Services, LLC (dba XENCO Laboratories and designated as back-up to TestAmerica), both located in Phoenix, Arizona. TestAmerica and Trans West Analytical are licensed by the Arizona Department of Health Services (ADHS) under analytical laboratory license numbers AZ0728 and AZ0757, respectively. To help assure laboratory performance and data quality, COS and the NIBW PCs conducted the annual audit of TestAmerica on November 30, 2016. Results of analyses of process and treated groundwater from the MRTF, NGTF, Area 7, and Area 12 conducted by TestAmerica are summarized in **Table 9**. Process and treated groundwater sampling results for the CGTF are reported quarterly by COS.

The NIBW PCs coordinated inspections of the Area 7, Area 12 GWETS, CGTF, NGTF, and MRTF on December 13 and 14, 2016, in accordance with Section VI.B.4.d of the SOW. Representatives of EPA were present for the annual inspections at each of the treatment facilities. The groundwater treatment and extraction systems were inspected for malfunctions, deterioration, issues with Operator practices and protocols, and discharges that could result in a release of untreated groundwater. At each facility, the major system components were identified and examined for operability, condition of operating equipment, and management of untreated groundwater and residual materials. Additionally, data related to routine operation, system startup and shutdown, routine and non-routine maintenance, and sampling were made available for review during the inspections. No hazards, significant deterioration, procedural or equipment malfunctions were noted in the course of the inspections at the CGTF, MRTF, NGTF, Area 7 GWETS, and Area 12 GWETS that would affect groundwater treatment performance standards or compliance with the Amended CD/SOW. Additional details of the NIBW Site inspections are described in the *Inspection Report* provided in **Appendix D**.

2.1 GROUNDWATER REMEDIATION AT THE CENTRAL GROUNDWATER TREATMENT FACILITY

The CGTF was the first GWETS constructed at the NIBW Site. The CGTF is located at 8650 East Thomas Road (**Figure 17**). As required by the first NIBW Consent Decree, the NIBW PCs constructed the CGTF and transferred ownership to COS on March 18, 1994, at which time the treatment plant came into service. The NIBW PCs and COS subsequently modified the CGTF, and it has operated continuously (except for scheduled maintenance shutdowns) since December 1995 to treat groundwater according to EPA-approved design specifications. All samples of treated water obtained over the past 22 years have met clean-up goals and drinking water standards, and are routinely below the respective laboratory Method Reporting Limits (MRLs) for the NIBW COCs.

Groundwater extraction is performed at up to four COS-owned or contract supply wells designated as COS-31, COS-71A, COS-72, and COS-75A (the CGTF extraction wells). Extracted groundwater is pumped through approximately 18,000 feet of buried transmission pipelines to the CGTF where it is treated by air stripping. Treated groundwater from the CGTF is primarily used in the COS drinking water system, but may be discharged to the SRP water distribution system via an irrigation lateral.

COS owns and operates the CGTF and reports results of laboratory testing and plant operations directly to EPA and ADEQ. A summary of the key operational results follows. Detailed reporting of the 2016 operational status, laboratory data, and system performance was provided by COS in CGTF Compliance Monitoring Reports (CMRs) submitted on May 19, August 25, and November 22, 2016, and February 16, 2017.

2.1.1 2016 Overview

During 2016, groundwater extraction associated with the CGTF contributed to capture and containment of the MAU/LAU plume (as discussed in Section 4.2.2) and treatment provided water for beneficial use that met groundwater treatment performance standards (as discussed in Section 4.3.1).

COS reported that approximately 6,894 AF (or 2,246 MG) of groundwater were pumped and treated at the CGTF in 2016. Of the total, 372 MG were extracted from well COS-31, 560 MG from well COS-71A, 381 MG from well COS-72, and 934 MG from well COS-75A (**Table 6**). Based on extraction well data presented in **Table 8**, an estimated 594 pounds of TCE were removed by the CGTF during 2016. Concentrations for NIBW COCs in samples obtained at CGTF extraction wells in 2016 are summarized in **Table 5**. Historical groundwater production and TCE concentrations at CGTF extraction wells are graphed in **Appendix E**. As demonstrated in operations reports and CMRs provided by COS, NIBW COCs were not detected in groundwater treated at the CGTF during 2016.

2.2 GROUNDWATER REMEDIATION AT THE MILLER ROAD TREATMENT FACILITY

The MRTF was constructed to capture and treat groundwater containing NIBW COCs in the northern LAU, to provide beneficial use of groundwater pumped from remedy extraction/production wells, and to prevent migration to peripheral production wells. The MRTF is located at 5975 North Miller Road, Scottsdale, as shown on **Figure 17**. Groundwater extraction and treatment is currently performed at two (2) groundwater production wells, designated as PV-14 and PV-15, which are individually connected to MRTF. COCs in extracted groundwater are reduced by air stripping at the MRTF. Treated groundwater from wells PV-14 and PV-15 is pumped to the Paradise Valley Arsenic Removal Facility (PVARF). MRTF began operation in 1997 and is owned and operated by EPCOR.

2.2.1 2016 Overview

Groundwater extraction associated with the MRTF contributed to capture and containment of the LAU plume (as discussed in Section 4.2.5) and treatment provided water for beneficial use by SRP and EPCOR. Approximately 5,181 AF (or 1,688 MG) of groundwater were pumped and treated at MRTF in 2016, including 1,068 MG of groundwater extracted at PV-14 and 620 MG extracted at PV-15 (**Table 8**). Based on production totals and reported TCE concentrations, an estimated 42 pounds of TCE were removed from groundwater at MRTF during 2016.

According to procedures developed in the EPA-approved *Phase 2 Sampling and Analysis Plan* (SAP) and *MRTF Operation and Maintenance* (O&M) *Plan*, extraction well samples were collected during the first week of each month at PV-14 and PV-15 (when the wells were operating) and analyzed by TestAmerica for NIBW COCs.

Concentrations of NIBW COCs in samples obtained in MRTF extraction wells in 2016 are summarized in **Table 5**. Historical groundwater production and TCE concentrations at MRTF extraction wells are presented graphically in **Appendix E**. Results of laboratory analysis of samples collected from treated groundwater effluent at MRTF are summarized in **Table 9**.

A small fraction of treated water from MRTF (approximately 50.55 MG) was delivered to the SRP Arizona Canal. Discharges to the Arizona Canal are regulated by an AZPDES permit. EPCOR is responsible for monitoring and reporting associated with the AZPDES permit at MRTF.

2.2.2 Operational Summary for October through December 2016

Results of TCE analyses obtained by the NIBW PCs for MRTF extraction wells during fourth quarter 2016 are as follows (from **Table 5**):

TCE Concentrations (in µg/L)		
Date	**PV-14**	**PV-15**
10/3/2016	**0.91**	**6.6**
11/1/2016	**1.1**	**NA**
12/5/2016	**1.3**	**NA**

Notes:

NA = Not available

Routine operation, maintenance, and monitoring at the MRTF are anticipated to continue by EPCOR throughout 2017.

2.3 GROUNDWATER REMEDIATION AT THE NIBW GAC TREATMENT FACILITY

NGTF was constructed by the NIBW PCs to treat groundwater extracted from well PCX-1 to provide hydraulic capture at the leading edge of the northern LAU plume, and limit migration of the plume toward the EPCOR well field. NGTF is located at 5985 Cattletrack Road, at the southeast corner of the intersection of Miller Road and McDonald Drive in Scottsdale (**Figure 17**). NGTF includes a pre-filter located upstream of a granular activated carbon (GAC) treatment system that removes entrained solids to prevent accumulation of sediment in the media bed. Groundwater extracted from PCX-1 is treated using four (4) parallel treatment trains each consisting of two GAC contactors in lead/lag configuration. Treated water from NGTF is delivered to the CWTP for use by COS in its system, however, in the event COS does not need or cannot take PCX-1 treated water, it is delivered to the SRP Arizona Canal.

2.3.1 2016 Overview

Well PCX-1 has operated on a fairly consistent basis in 2016, with down-time generally being attributable to carbon change out and other routine maintenance activities. TCE concentrations at well PCX-1 have stabilized generally between 50 and 65 μg/L (**Table 5**).

Typically, treated water is discharged to the CWTP for municipal use by COS. However, due to COS's need to balance inorganic loading to their municipal system, pending installation of an acid feed pre-treatment system at the CGTF, most of the treated water from the NGTF was discharged to the SRP Arizona Canal in 2016 under the NGTF AZPDES permit. Treated water discharged to the Arizona Canal is monitored as required by the AZPDES permit. The results of sample analyses were summarized in monthly Discharge Monitoring Reports (DMRs), and submitted directly to the EPA and ADEQ under separate cover.

The NGTF consistently reduced NIBW COC concentrations in treated groundwater to below cleanup standards in 2016. Compliance monitoring was performed in accordance with the NGTF O&M Plan, dated March 31, 2016, to demonstrate removal of NIBW COCs from extracted groundwater and to assure groundwater treatment standards are achieved. Treatment system influent and effluent samples were collected each week (when the treatment system was operational) and submitted to TestAmerica for analysis of NIBW COCs.

The total volume of groundwater extracted and treated at NGTF during 2016 was 3,664 AF (1,194 MG), with approximately 98% of the total volume discharged to the Arizona Canal and 2% to the CWTP (see **Table 8**). An estimated 561 pounds of TCE were removed from the groundwater treated at NGTF. A summary of NIBW COC concentrations in samples obtained from well PCX-1 during 2016 is included in **Table 5**. Historical groundwater production and TCE concentrations at PCX-1 are presented graphically in **Appendix E**. Results of analyses of NGTF process and treated groundwater samples conducted by TestAmerica are summarized in **Table 9**. All treated groundwater samples analyzed in 2016 for water discharged from NGTF were below the MRL of 0.50 μg/L for TCE.

2.3.2 Operational Summary for October through December 2016

Results of TCE analyses for samples collected for the NGTF during fourth quarter 2016 are included in the following table (from **Table 9**):

TCE Concentration (in µg/L)		
Sample Date	**Influent**	**Effluent**
10/3/16	**56**	<0.50
10/10/16	**47**	<0.50
10/17/16	**50**	<0.50
10/24/16	**55**	<0.50
10/31/16	**50**	<0.50
11/7/16	**53**	<0.50
11/14/16	**61**	<0.50
11/21/16	**61**	<0.50
11/28/16	**58**	<0.50
12/5/16	**61**	<0.50
12/12/16	**56**	<0.50
12/19/16	**54**	<0.50
12/27/16	**53**	<0.50

A treatment train was installed in the fourth position during the summer and made available for use on October 12, 2016. This additional treatment train provides operational flexibility and allows the system to remain in operation while GAC media is serviced. Routine operation, maintenance, and monitoring are anticipated to continue at NGTF throughout 2017.

2.4 GROUNDWATER REMEDIATION AT AREA 7

Area 7 is a former electronics manufacturing site located at the southeast corner of 75th and 2nd Streets in Scottsdale, as shown on **Figure 17**. Siemens installed the Area 7 GWETS to enhance the NIBW groundwater remedy by extracting and treating MAU groundwater containing relatively higher COC concentrations associated with the source area, reducing COC mass allowed to migrate to the LAU extraction wells for removal and treatment. In 2016, groundwater extraction was performed using three MAU groundwater extraction wells designated as 7EX-3aMA, 7EX-4MA, and 7EX-6MA. Well 7EX-5MA became inoperable in 2012 and was abandoned in August 2016. The extracted groundwater is treated by ultraviolet oxidation (UV/OX) followed by air stripping. Treated water is discharged to the UAU using two up-gradient groundwater injection wells (7IN-1UA and 7IN-2UA). The Area 7 MAU source control GWETS was initially started in 1999. Well 7EX-6MA was added to the system in 2015.

Well 7EX-6MA was installed to replace well 7EX-5MA; however, it was also intended to replace well 7EX-4MA in the future. Well 7EX-4MA was rehabilitated in 2012, but the improvement in capacity of the well was limited. In October 2016, 7EX-4MA was taken off line due to poor performance. The location and capacity of well 7EX-6MA are designed to capture and contain the areas of the highest concentrations of TCE in the MAU plume in the vicinity of and south from Area 7. Well 7EX-6MA and 7EX-4MA share a common pipeline that connects the wells and the treatment system. As such, pumping rate at 7EX-6MA can be increased when 7EX-4MA is off-line.

2.4.1 2016 Overview

During 2016, groundwater extraction tied into the Area 7 GWETS was effective in localized MAU source control (as discussed in Section 4.2.3), treating groundwater for beneficial use to levels safely below drinking water and aquifer water quality standards for all NIBW COCs (as discussed in Section 4.3.4). Compliance monitoring was conducted in accordance with an EPA-approved *Area 7 GWETS O&M Plan* to verify removal of COCs from the extracted groundwater and assure groundwater treatment standards are achieved

A total of approximately 442 AF (or 144 MG) of groundwater were pumped and treated at the Area 7 GWETS in 2016 (**Table 8**). Of the total, approximately 50 MG was from 7EX-3aMA, approximately 17 MG from 7EX-4MA, and approximately 77 MG from 7EX-6MA. Treatment system performance data provided by the Area 7 GWETS Operator indicates an estimated 735 pounds of TCE were removed from extracted groundwater during 2016. Mass removal estimates derived from quarterly monitoring of extraction wells also indicate approximately 720 pounds of TCE mass were removed by the Area 7 GWETS (**Table 8**). The two reported TCE mass removal amounts generally differ due to the fact that Operator calculations are based on influent data (combined flow from the extraction wells) collected on a monthly basis, whereas the mass presented in **Table 8** estimates TCE mass removal for individual extraction wells generally using quarterly sampling results.

In 2016, process samples, including treated groundwater discharged from the Area 7 GWETS, were collected monthly by the Area 7 GWETS Operator (Arcadis) and submitted to TestAmerica for analyses of NIBW COCs. Samples from the Area 7 extraction wells were collected during the first week of the quarter by Arcadis A summary of NIBW COC concentrations in samples collected from Area 7 extraction wells during 2016 is included in **Table 5**. Historical groundwater production and TCE concentrations at Area 7 extraction wells are presented graphically in **Appendix E**. Results of analysis of Area 7 process and treated groundwater conducted by TestAmerica are summarized in **Table 9**. All treated groundwater samples analyzed in 2016 from the Area 7 GWETS were below the MRL of 0.50 μg/L for TCE and all other NIBW COCs, with the exception of the sample collected on December 6, 2016, which had a TCE value of 0.79 μg/L. This concentration is significantly below the cleanup standard of 5.0 μg/L. Adjustments were made to the treatment system in response to the TCE detection. Specifically, the hydrogen peroxide dose rate was increased.

Performance Evaluation (PE) samples (designated with sample identifier SP-104) were submitted to TestAmerica during January and July, 2016, and process water split samples were submitted to Trans West Analytical. A summary of the PE sample results and laboratory reports are included with other GWETS data and quality control reporting submitted under separate cover as a supplemental data report (issued concurrently with this SMR).

2.4.2 Operational Summary for October through December 2016

For the period from October to December 2016, the Area 7 GWETS operated as designed to remove COCs in extracted groundwater to meet Arizona Aquifer Water Quality Standards (AWQS) for injection in the UAU. The GWETS was available for operation approximately 87 percent of the time during fourth quarter 2016. Downtime is attributed to power outages, assessing system integrity following the NIBW COC detection in the effluent, and routine maintenance.

During the quarter, process water samples were collected from the combined influent to the GWETS at sample port SP-102, effluent from the UV/OX reactor at sample port SP-103, and effluent from the air stripper at sample port SP-105. Samples from the Area 7 extraction wells were collected in October by Arcadis at 7EX-3aMA and 7EX-6MA, and analyzed by TestAmerica. Results of TCE analyses for these Area 7 extraction wells and treatment process water samples obtained during fourth quarter 2016 are as follows (from **Tables 5 and 9**):

Area 7 Groundwater Extraction System
TCE Concentrations in µg/L

Date	7EX-3aMA	7EX-6MA
10/3/2016	**270**	**640**

Area 7 Groundwater Treatment System
TCE Concentrations in µg/L

Date	GWETS Influent	UV/OX Effluent	A/S Effluent
10/3/16	**500**	**140**	<0.50
11/7/16	**530**	**170**	<0.50
12/6/16	**480**	**330**	**0.79**

Notes:
UV/Ox = Ultraviolet oxidation
A/S = Air Stripper

In addition to testing for NIBW COCs, sampling for inorganic water quality was conducted during 2016 to monitor potential impacts of injection of treated water from the Area 7 GWETS on UAU groundwater. Inorganic water quality was monitored in groundwater samples obtained at four UAU monitor wells in the vicinity of Area 7 (i.e., PG-10UA, PG-16UA, PG-28UA, and PG-29UA) and in treated water that is recharged to the UAU through vadose zone injection wells. Results of 2016 inorganic water quality analyses are provided in an attachment to a letter titled, "*Supplemental Data Collection at the Area 7 GWETS During October 2016, NIBW Superfund Site*" that will be submitted by the NIBW PCs concurrent with this SMR as a supplemental data report. The data indicate that treated groundwater from the Area 7 GWETS generally had similar or lower concentrations of inorganic water quality constituents than observed at UAU monitor wells in the vicinity of Area 7. The inorganic data indicate UAU and MAU groundwater at Area 7 was generally of poor quality; however, the data verify that injection of treated groundwater from the Area 7 GWETS does not contribute to degradation of inorganic water quality in the UAU.

Routine operation, maintenance, and monitoring are anticipated to continue at the Area 7 GWETS throughout 2017.

2.5 GROUNDWATER REMEDIATION AT AREA 12

The Area 12 GWETS is located at the former Motorola facility at 8201 East McDowell Road, Scottsdale, as shown on **Figure 17**. Motorola installed the Area 12 GWETS to enhance the NIBW groundwater remedy by extracting and treating MAU groundwater containing relatively higher COC concentrations at the source area, reducing COC mass allowed to migrate to the southwest margin for removal and treatment at the LAU extraction wells. Groundwater extraction is performed using two MAU groundwater extraction wells designated as MEX-1MA and SRP well 23.6E,6.0N, also known as the Granite Reef well. The extracted groundwater is treated by air stripping and delivered to the SRP system for irrigation use. The Area 12 MAU source control GWETS was implemented beginning in early 1999 with start-up of well MEX-1MA. The Area 12 GWETS was fully functional when the Granite Reef well was connected in late 1999.

2.5.1 2016 Overview

During 2016, groundwater extraction tied into the Area 12 GWETS was effective in localized MAU source control (as discussed in Section 4.2.4) and groundwater treatment provided water for beneficial use that consistently met water quality standards for all NIBW COCs (as discussed in Section 4.3.5).

Compliance monitoring was conducted during 2016 in accordance with an EPA-approved *Area 12 GWETS O&M Plan* to verify removal of COCs from the extracted groundwater and assess whether groundwater treatment standards were achieved.

A total of 1,941 AF (or 633 MG) of groundwater were pumped and treated at the Area 12 GWETS in 2016 (**Table 8**). Of the total, 284 MG were extracted from MEX-1MA and 349 MG from the Granite Reef well. Treatment system performance data provided by the Area 12 GWETS Operator based on monthly sampling of extraction wells (when operating) indicates an estimated 449 pounds of TCE were removed from groundwater during 2016 (**Table 8**).

In 2016, process samples including influent and treated groundwater, were collected monthly by the Area 12 GWETS Operator and submitted to TestAmerica for analysis of NIBW COCs. Samples from the Area 12 extraction wells were collected during the first week of the month by the Operator (when the treatment system was operational). A summary of NIBW COC concentrations in samples obtained from Area 12 extraction wells in 2016 is included in **Table 5**. Historical groundwater production and TCE concentrations at Area 12 extraction wells are presented graphically in **Appendix E**. Results of analysis of Area 12 process and treated groundwater samples conducted by TestAmerica are summarized in **Table 9**. Although the Area 12 GWETS presently provides treated water for irrigation use, the treatment system is consistently operated to ensure TCE is below the more stringent drinking water MCL.

Treated groundwater from the Area 12 GWETS is delivered to an SRP irrigation lateral in accordance with the AZPDES permit, executed on July 6, 2016. Sampling and testing for limited inorganic water quality is conducted in accordance with the permit and the results are transmitted in monthly DMRs to ADEQ.

2.5.2 Operational Summary for October through December 2016

The NIBW Area 12 GWETS operated fairly consistently during the fourth quarter 2016, until it was shut down on December 23rd for annual maintenance activities and dry-up of the SRP canal. Results of TCE analyses for extraction wells and treatment process water samples obtained for fourth quarter 2016 are as follows (from **Tables 5 and 9**):

TCE Concentrations (in μg/L)

Date	MEX-1MA	Granite Reef Well	GWETS Influent	GWETS Effluent
10/3/2016	**42**	**88**	**91**	<0.50
11/1/2016	**41**	**120**	**88**	<0.50
12/5/2016	**48**	**120**	**96**	<0.50

Following SRP completion of canal dry-up activities, routine operation, maintenance, and monitoring are anticipated to continue at the Area 12 GWETS throughout 2017.

3.0 SOIL REMEDIATION PROGRAM

Soil remediation was conducted and all Amended CD requirements have been completed at NIBW Areas 6, 7, 8, and 12. As reported in the 2016 SMR, the *“Area 7 Soil-Vapor Extraction and Upper Alluvial Unit Groundwater Extraction*

System Decommissioning Summary" was submitted to the EPA on November 18, 2015. An EPA site inspection of decommissioning operations was conducted on January 21, 2016. A closure certification letter, documenting EPA concurrence that all vadose zone and UAU groundwater work at Area 7 has been completed, was received on March 3, 2016.

As described below, the second Five Year Review completed in 2016 for the NIBW Site concluded that the overall remedy was both protective and effective. However, with respect to the vadose zone, EPA noted that while the original cleanup objectives "did not consider the vapor intrusion pathway from contamination in the vadose zone", revised toxicity values for TCE led the agency to conclude that "vapor intrusion from vadose zone contamination may pose a risk". To evaluate this risk, the PCs initiated efforts during the last quarter of 2016 to compile soil gas data for the historical source areas and evaluate these data relative to EPA soil vapor intrusion screening levels. Where appropriate based on historical TCE concentrations in shallow soil gas samples and uppermost intervals of soil vapor monitor wells, the PCs began work to design shallow soil gas sampling investigations for historical source areas, all of which had been closed out under the Amended CD. These investigations, when reviewed and approved by EPA, will be implemented in 2017 and results will be reported in the 2017 SMR.

4.0 EVALUATION OF NIBW REMEDIAL ACTION PERFORMANCE

Evaluation of the NIBW remedy is based on Performance Standards set forth in the SOW. Performance Standards are defined in the SOW for groundwater monitoring, containment, and treatment. In the sections that follow, monitoring data obtained during 2016 will be evaluated to assess achievement of performance criteria.

Conclusions from the second Five Year Review, which the U.S. Army Corp of Engineers prepared on behalf of EPA in 2016 (U.S. Army Corp of Engineers, 2016), provide an additional framework for evaluating remedy performance. The purpose of the Five Year Review is to evaluate remedy implementation and performance to determine if the remedy is and will continue to be protective of human health and the environment. Based on data from 2011 through 2015, EPA's overall conclusion in the second Five Year Review was that "groundwater extraction and treatment activities at NIBW have met the goal of preventing migration of contaminants and removing contaminant mass from groundwater". Specifically, EPA concluded that "UAU contaminant mass in groundwater and the UAU plume [have] decreased significantly". Further, EPA deemed that the Area 7 and Area 12 MAU groundwater extraction and treatment systems "contain the localized areas with the highest TCE concentrations and minimize migration toward the southwestern margin and into the LAU". Finally, EPA concluded that the "groundwater remedies are capturing the LAU plume and preventing it from reaching production wells located north of these groundwater treatment systems". The NIBW PCs agree with EPA's second Five Year Review conclusions regarding the performance of the NIBW remedy, as detailed for the various remedy components below.

4.1 ASSESSMENT OF GROUNDWATER MONITORING PERFORMANCE STANDARDS

The GMEP requires an annual assessment of the scope and frequency of monitoring activities to optimize program effectiveness over time. In the first Five-Year Review of the NIBW Superfund Site (2011), EPA comprehensively reviewed groundwater monitoring data obtained pursuant to the GMEP and concluded significant progress has been achieved toward restoration of the UAU. Based on this finding, EPA and the NIBW PCs agreed to reassess and revise the UAU groundwater monitoring program as part of an optimized approach to be adopted in an updated GMEP. Results of this assessment are detailed below. Revisions to the scope and frequency of the MAU and LAU groundwater monitoring program will be evaluated as appropriate in future years.

4.1.1 Assessment of Long Term UAU Groundwater Monitoring Program

Based on discussions with the NIBW Technical Committee regarding implementation of a more streamlined approach for UAU groundwater monitoring, the NIBW PCs prepared a revised long-term UAU groundwater monitoring program proposal entitled, *Final Technical Memorandum - Recommendations for Upper Alluvial Unit Aquifer Long-Term Groundwater Monitoring Program, North Indian Bend Wash Superfund Site, Scottsdale, Arizona*, dated March 11, 2013. This proposal, which was approved by EPA, recommended formal abandonment of 30 UAU monitoring wells that were no longer needed to define either water level or water quality conditions in the UAU. The UAU wells were successfully abandoned in accordance with all ADWR requirements in 2013 and 2014.

Water quality data indicate the UAU groundwater system has for the most part been cleaned up and is soon anticipated to achieve the remedial action objective of aquifer restoration (see Section 1.2). The current, more targeted monitoring program provides the necessary data to track patterns of groundwater movement and VOC concentration declines, as well as to estimate the rate of VOC mass reduction over time, or other achievement measure agreed-upon by the Technical Committee in the future, until UAU aquifer restoration is achieved. Recommendations for abandonment of most/all of the UAU monitoring network will be made in the future after a demonstration that performance standards have been met and maintained at all UAU monitor wells.

4.1.2 Assessment of MAU Source Control Performance Measures

The MAU source control programs at Area 7 and Area 12 have been operating since 1999 to locally pump and treat TCE-impacted groundwater to minimize the TCE mass that can migrate from the source areas to the western margin. The effectiveness of MAU source control is evidenced by the approximately 26,200 pounds of TCE mass removed by groundwater extraction and treatment at Area 7 and Area 12 to date and the fact that TCE concentrations are generally stable and slowly declining at MAU monitor wells in the vicinity of and down-gradient from the source areas. Although the NIBW PCs believe the results to date indicate the MAU source control programs are effective, some specific performance measures defined in the GMEP have not been achieved for Area 7 and/or Area 12 on several occasions since implementation of the GMEP in 2002. In fact, some of these performance criteria have been found, in practice, to be unsuitable as measures of remedy performance relative to either the Amended ROD remedial action objectives for the Amended CD SOW performance standards. Work to review, analyze, and, where appropriate, recommend updated MAU source control metrics to the NIBW Technical Committee is on-going.

4.1.3 Assessment of LAU Groundwater Containment Performance Measures

Over the past several years, a small subset of the northern LAU groundwater monitoring data has not met GMEP metrics associated with plume containment on a consistent basis. In response, the NIBW PCs have comprehensively assessed and continue to evaluate the mechanisms associated with each specific triggering event. Overall, the NIBW PCs' evaluations consistently show that the NIBW remedy is containing the LAU plume. The NIBW PCs have also proposed to the Technical Committee that some of the GMEP-specified criteria used to demonstrate effectiveness may not be meaningful measures of LAU hydraulic containment and may warrant re-evaluation. While the NIBW PCs continue to closely monitor conditions at specific LAU wells, EPA has approved suspension of contingency actions associated with northern LAU containment. In conjunction with on-going data evaluation, the NIBW PCs will to work with the Technical Committee to consider potential revised GMEP performance measures and, as appropriate, updated metrics for the LAU.

4.2 ASSESSMENT OF GROUNDWATER CONTAINMENT PERFORMANCE STANDARDS

Performance of the NIBW remedy is evaluated based on a rigorous approach established in the GMEP. In the GMEP, monitoring program objectives are matched with specific performance criteria, a methodology for measuring achievement of performance criteria, a definition of when contingency evaluations or actions would be initiated, and alternative contingency response actions that may be taken. As described above, a process is underway to work with the NIBW Technical Committee to make targeted updates to the GMEP to align the performance metrics more directly to the Site remedial action objectives and performance standards. While progress was made in 2016, the GMEP update process has not been completed. Therefore, the PCs will continue to use the structure laid out in the 2002 GMEP for the 2016 SMR evaluation of the progress and performance of the various remedy components.

Based on review of 2016 monitoring data, five specific aspects of the remedy were evaluated with respect to groundwater containment performance standards, in accordance with achievement measures established in the 2002 GMEP. Aspects of the remedy that were evaluated include: 1) UAU mass flux; 2) MAU/LAU containment; 3) Area 7 MAU source control; 4) Area 12 MAU source control; and 5) northern LAU hydraulic capture.

4.2.1 Evaluation of UAU Mass Flux

The assessment of remedy performance for the UAU plumes involves monitoring of VOC mass reduction over time. For the 2016 VOC mass flux analysis, total mass of VOCs present in UAU groundwater was computed using data for saturated thickness from the October 2016 water level monitoring round and VOC concentration data from the October 2016 water quality monitoring round. **Table 10** summarizes VOC mass estimates for the UAU for 2016. Based on 2016 data, a total of about 16 gallons, or 195 pounds, of VOCs are estimated to remain in the saturated portion of the UAU (**Table 10**). **Figure 18** illustrates the decline in total VOC mass in UAU groundwater over time. Estimated total mass of VOCs present in the saturated portion of the UAU has decreased substantially over the past 23 years, declining from a high of over 11,000 pounds in 1993 to the current estimate of 195 pounds. In recent years the VOC mass reduction with time has become fairly asymptotic.

The inset table in **Figure 18** summarizes the calculated 5-year running average of VOC mass in UAU groundwater since annual mass estimates were initiated in 1996. The most recent 5-year running average of 214 pounds represents a decrease in average UAU mass relative to the previous 5-year average of 237 pounds, indicating the performance measure for UAU mass reduction has been achieved.

4.2.2 Evaluation of MAU/LAU Hydraulic Containment

The assessment of remedy performance for the MAU/LAU plume involves demonstrating that: 1) direction of groundwater movement along the periphery of the plume is toward extraction wells or the western margin; 2) the estimated location of the 5 μg/L contour for the TCE plume does not shift outward more than 1,000 feet relative to plume interpretations for the baseline time period, October 2001; and 3) TCE concentrations at a set of sentinel MAU and LAU monitor wells do not exceed specified levels. For 2016, compliance with all of these achievement measures was attained, except for levels above the TCE concentration threshold at monitor wells S-2LA and PG-42LA. This issue was previously discussed in Section 1.2 and will be discussed further in this section.

Water level and TCE concentration data for October 2016, with arrows indicating direction of groundwater movement, are shown for the MAU and LAU on **Figures 19 and 20**, respectively. Where arrows are not present, direction of groundwater movement is inferred as perpendicular to water level contours. Containment of the MAU and LAU plumes is based on direction of groundwater movement along the periphery of all areas with TCE concentrations in excess of 5 μg/L (**Figures 19 and 20**). **Figure 19** provides further interpretation of hydraulic capture for the MAU at Area 7 and Area 12, with hydraulic capture zones for the two GWETSs being inferred based on October 2016 water level contours.

For the MAU (**Figure 19**), direction of groundwater movement along the periphery of the plume is, based on October 2016 data, toward the Area 7 pumping center (associated with groundwater extraction at 7EX-3MA, 7EX-4MA, and

7EX-6MA, the Area 12 pumping center (associated with groundwater extraction at MEX-1MA and SRP 23.6E,6.0N), or toward the western margin[2]. For the LAU (**Figure 20**), direction of groundwater movement along the periphery of the plume is, based on October 2016 data, toward LAU extraction wells associated with the NIBW remedy, principally CGTF extraction well COS-75A, NGTF extraction well PCX-1, and MRTF extraction wells PV-15 and PV-14.

Figures 14 and 15 illustrate 5 μg/L TCE contours for the October 2001 and October 2016 plumes in MAU and LAU groundwater, respectively. The illustrations demonstrate that generally very little change of the 5 μg/L contour over the period has occurred in the MAU or the LAU, with the exception of anticipated migration of the LAU plume toward the MRTF and NGTF extraction wells. Between 2001 and 2016, outward shifts in the location of the 5 μg/L TCE contour in the MAU and LAU are less than the 1,000-foot performance measure, with the exception of the northern LAU, where the plume is migrating toward extraction wells tied into treatment. Along the northern and northwestern edge of the LAU plume, shifts of the 5 μg/L TCE concentration contour ranging from about 1,000 to 1,500 feet are observed between 2001 and 2016. These changes are indicative of northern migration of the LAU plume for capture by the MRTF extraction wells and not indicative of a lack of hydraulic containment (see Section 4.2.5 for further information). TCE concentrations in wells in the northern part of the LAU have generally decreased or remained constant compared to 2015 measurements. Changes in the northwestern part of the LAU plume continue to be closely monitored in relation to exceedance of GMEP performance measures at S-2LA and PG-42LA, as discussed below. An area of apparent change in plume delineation near Scottsdale Road between Thomas and McDowell Roads is attributable to the availability of new data at well M-17MA/LA beginning in 2002.

[2] As indicated on in Section 1.2, the extent of the west flank of the MAU plume was more accurately delineated following installation of monitor well M-17MA/LA in 2002. Hydrogeologic data obtained from the installation of M-17 and other nearby MAU and LAU monitor wells indicate MAU sediments coarsen and pinch out along the basin margin. Consequently, lateral groundwater flow and COC migration is limited along the mid-western and southwest flank of the MAU plume. Instead groundwater and associated COCs are inferred to move downward into the LAU in this area.

The final performance measure for MAU/LAU plume containment is a comparison of observed TCE concentrations from the October 2016 sampling round to numerical TCE concentrations specified in the GMEP at selected MAU and LAU peripheral monitor wells, as summarized below.

Required and Observed TCE Concentrations in Selected NIBW Monitor Wells

	TCE Concentration (in µg/L)	
Well Name	**Achievement Measure**	**October 2016 Sampling Round Results**
MAU Monitor Wells		
M-2MA	10	**2.3**
M-7MA	10	<0.5
S-1MA	2	<0.5
S-2MA	3	<0.5
LAU Monitor Wells		
M-5LA	10	**1.3**
PA-2LA	3	<0.5
PA-15LA	10	<0.5
PA-18LA	10	**1.0**
PG-1LA	15	<0.5
PG-44LA	5	<0.5
S-1LA	3	<0.5
S-2LA	15	**34***

* Value from December, since pump failed during October sampling event.

As previously mentioned, TCE concentrations at well S-2LA have exceeded the GMEP-established performance criterion since 2011. In response, the NIBW PCs conducted significant investigation work to characterize LAU groundwater conditions and update the assessment of plume containment summarized in the 2011 SMR. The findings of this evaluation indicated that the increase in TCE concentrations at S-2LA was attributed to migration of TCE mass from an upgradient portion of the LAU plume within the combined hydraulic capture zone created by pumping of CGTF, NGTF, and MRTF extraction wells. The observed TCE concentration for S-2LA in the above table is from December 2016; the well pump failed during the October sampling event and was not replaced until December.

After contingency response actions were initiated at S-2LA in 2011, TCE concentrations at this well continued to increase at a similar rate until 2014. Since that time, the rate of increase has slowed and TCE concentrations appear to be leveling off (**Appendix C and Figure 25**, which is introduced in Section 4.2.5). A similar increasing trend was noted beginning in 2011 at well PA-13LA, located approximately 1,500 feet east of S-2LA. In 2014 and 2015, the increasing trend at PA-13LA leveled off and in 2016 TCE concentrations have decreased to the point where they are at or below levels observed in 2011 (**Table 4**). Evaluation of water level and water quality data in conjunction with analysis of projected groundwater flow and hydraulic capture (as shown in **Figure 25**) indicate that the observed trends at these two wells do not signify a concern regarding achievement of groundwater containment performance standards. Further discussion of hydraulic capture of the northern LAU plume is provided in Section 4.2.5.

4.2.3 Evaluation of Area 7 MAU Source Area Program

The assessment of remedy performance for the Area 7 MAU source area program involves demonstrating: 1) hydraulic capture, such that the direction of groundwater movement from the vicinity of monitor well PA-12MA is toward the cone of depression associated with Area 7 pumping; and 2) a decline in 5-year running average TCE concentrations for monitor wells located within the hydraulic capture zone associated with Area 7 pumping. The 5-year running average is calculated for the time period following full implementation of the Area 7 remedy using indicator wells located within the Area 7 hydraulic capture zone, as defined in the GMEP to include: D-2MA, E-10MA, PA-10MA, PA-12MA, W-1MA, and W-2MA.

Figure 21 includes graphs of water level and TCE concentration data for indicator wells in the vicinity of Area 7. Data from these indicator wells are used to evaluate long-term trends and overall effectiveness of the Area 7 GWETS. Water levels in the vicinity of Area 7 display some seasonal patterns in response to pumping but are otherwise fairly consistent with regional trends, increasing from about 2004 to 2011, leveling off and then beginning to decline after that time. TCE concentrations in the MAU indicator wells in the vicinity of Area 7 are generally stable or declining. TCE concentration increases observed at monitor well W-1MA beginning in 2012 reversed beginning in late 2014. TCE concentrations have been variable at PA-10MA beginning in late 2015. Trends at this well can be attributed to changes in local patterns of groundwater movement resulting from changes in pumping at Area 7 GWETS and CGTF extraction wells.

Figure 21 also shows the estimated extent of hydraulic capture associated with MAU extraction in the vicinity of Area 7. MAU remedial extraction wells 7EX-3aMA, 7EX-4MA, and 7EX-6MA were pumping continuously when water level data were obtained in October 2016. Review of the interpreted hydraulic capture for the Area 7 MAU GWETS indicates that the program is achieving the Amended CD SOW performance standard of providing sufficient hydraulic control to prevent migration away from the source area of MAU groundwater with COC concentrations that are higher relative to concentrations in the surrounding vicinity. It is also fulfilling the Area 7 GWETS EPA-approved design objective of capturing and removing high concentrations of COCs in the upper MAU near the Area 7 source. The 2002 GMEP specifies an achievement measure that the hydraulic capture zone from Area 7 pumping extend south to the vicinity of PA-12MA. This achievement measure was not met in 2016 and may not be achievable using available MAU extraction wells tied into treatment at the Area 7 GWETS or the CGTF. However, the PCs believe that the current pumping configuration will continue to provide sufficient capture to prevent migration of higher COC concentrations zones associated with Area 7 from migrating to the western margin and into the LAU, achieving the performance standard of the Amended CD SOW.

An optimization test for the Area 7 GWETS to evaluate effectiveness of the pumping configuration between the two historical extraction wells (7EX-3aMA and 7EX-4MA) and newly installed well 7EX-6MA began in 2016. The objective of the evaluation is to determine an effective balance between achievement of both the mass removal and containment objectives for the Area 7 source control program. As indicated above, well 7EX-6MA was originally sited and designed to provide capture sufficient to replace both 7EX-5MA and 7EX-4MA. When anticipated performance issues with aging extraction well 7EX-4MA began to affect its pumping capacity in October 2016, the PCs focused the optimization program on evaluating the future benefit, if any, of continued pumping at 7EX-4MA. Once completed, results of the evaluation will be reported to EPA and ADEQ. This analysis is anticipated to be completed in the third quarter of 2017.

The second evaluation tool for the Area 7 MAU source control program is demonstration of a decline in the 5-year running average of TCE concentrations for the relevant monitor wells for the period following full implementation of the Area 7 groundwater remedy. **Table 11** summarizes annual average TCE concentrations for the period 1995 through 2016 at the following MAU indicator monitor wells, located within the capture zone as specified in the GMEP for MAU extraction in the vicinity of Area 7: D-2MA, E-10MA, PA-10MA, PA-12MA, W-1MA, and W-2MA. Annual average TCE concentrations at each of the specified Area 7 MAU indicator wells were computed for each year during the period 1995 through 2016; and then a total combined annual TCE average (for all wells) was determined for each year. For the 2016 calculation, the 2015 average TCE concentration was used for D-2MA because 2016 analytical results were not representative of historical trends; annual average concentrations in the remaining five Area 7 indicator wells (E-10MA, PA-10MA, PA-12MA, W-1MA and W-2MA) are stable to decreasing between 2015 and 2016. The combined average TCE concentration for the Area 7 MAU indicator wells for 2016 was 682 μg/L. Using this combined annual average TCE value, the 5-year average TCE concentration was calculated to be 925 μg/L for the period 2012 through 2016. This concentration represents a decrease relative to the 5-year average of 996 μg/L computed for 2011 through 2015. Accordingly, compliance with the mass reduction component of the Area 7 remedy performance was achieved in 2016.

Figure 22 depicts the computed 5-year running average TCE concentrations for Area 7 indicator wells. These data indicate that, except for the 5-year periods ending in 2011 and 2012, a declining trend has been observed since this performance measure came into effect in 2004. Increases in the 5-year running averages for these two periods are directly correlated to variations in TCE concentrations reported at monitor well W-2MA. Since TCE concentrations at W-2MA are the highest of all Area 7 indicator wells, slight variations in TCE concentrations can significantly affect the averages. TCE concentrations at W-2MA have varied considerably over time and have demonstrated a generally declining trend over the past 10 years (**Figure 21 and Appendix C**). W-2MA is within the capture zone created by pumping of MAU remedial extraction wells. As pumping regimens for the extraction wells vary, TCE concentrations at W-2MA vary from year to year; however, these changes in concentrations are not particularly meaningful for evaluating the effectiveness of the remedy. A similar situation occurred at well W-1MA historically, with observed TCE concentration increases and decreases being linked to shifts in pumping at Area 7 and CGTF extraction wells. As a result, use of the 5-year running average for wells located within the capture zone for Area 7 as a performance metric is problematic. In discussions with the Technical Committee, the PCs have recommended use of indicator wells located outside rather than inside the Area 7 and Area 12 GWETS capture zones to better align the metric with the Amended CD SOW performance standard of demonstrating that COC concentrations in the MAU outside the source areas (i.e., Area 7 and Area 12) are being reduced.

In conclusion, the performance measure involving a decline in 5-year running average TCE concentrations was achieved at Area 7 in 2016. However, demonstration of hydraulic capture, such that the direction of groundwater movement from the vicinity of monitor well PA-12MA is toward the cone of depression associated with Area 7 pumping was not achieved. As indicated above, the PCs believe that the current pumping configuration provides sufficient capture to prevent migration of higher COC concentrations zones associated with Area 7 from migrating to the western margin and into the LAU, achieving the Amended CD SOW performance standard.

4.2.4 Evaluation of Area 12 MAU Source Area Program

The assessment of remedy performance for the Area 12 MAU source area program involves demonstrating: 1) hydraulic capture with the direction of groundwater movement from the vicinity of Hayden Road toward the cone of depression associated with Area 12 pumping; and 2) a declining, or non-increasing trend, in 5-year running average TCE concentrations for monitor wells located within the hydraulic capture zone associated with Area 12 pumping. The 5-year running average is calculated for the time period following full implementation of the Area 12 groundwater remedy using indicator wells located within the Area 12 hydraulic capture zone, as defined in the GMEP, including: E-1MA, M-4MA, M-5MA, M-6MA, M-7MA, M-9MA, M-15MA, and PA-21MA. The groundwater remedy at Area 12 was fully operational in 1999, once both extraction wells MEX-1MA and SRP 23.6E,6.0N were brought on-line in 1999, and 2004 was the first year when 5 years of data were available to conduct the running average performance assessment.

Figure 23 includes graphs of water level and TCE concentration data for the principal indicator wells in the vicinity of Area 12. Data from these indicator wells help to evaluate long-term trends and verify overall effectiveness of the Area 12 groundwater extraction and treatment system. Water levels in the vicinity of Area 12 display seasonal patterns in response to pumping. Water level trends at the Area 12 indicator wells are generally increasing from 2004 to 2011, declining in 2012 and 2013, increasing again in 2014 and 2015, and declining again in 2016, as shown on **Figure 23**. Although TCE concentration trends at most MAU monitoring wells in the vicinity of Area 12 are stable or declining slowly over time, others exhibit variability attributed to local groundwater pumping influences. The increasing trend observed in 2013 at MAU monitoring well M-10MA2 (located directly west from Area 12) stabilized in 2014 and 2015, and appears to be reversing itself in 2016.

Figure 23 also shows MAU TCE concentration contours for October 2016 and the estimated extent of hydraulic capture associated with Area 12 MAU extraction. MAU water level contours and the associated interpretation of MAU hydraulic capture for the Area 12 GWETS for October 2016 are also shown on **Figure 19**. Review of patterns of groundwater movement and the extent of hydraulic capture for the vicinity of Area 12 indicates that cones of depression occur as a result of MAU pumping at Area 12 extraction wells (MEX-1MA and SRP 23.6E,6.0N). Consistent with the achievement measure, direction of groundwater movement from the general vicinity of Hayden Road is to the east toward these cones of depression. Accordingly, compliance with the hydraulic capture component of the Area 12 remedy performance was achieved in 2016.

Table 12 summarizes annual average TCE concentrations for the period 1994 through 2016 at the following MAU indicator wells located within the capture zone specified in the GMEP for MAU extraction at the Area 12 GWETS: E-1MA, M-4MA, M-5MA, M-6MA, M-7MA, M-9MA, M-15MA, and PA-21MA. Annual average TCE concentrations at each of the specified Area 12 MAU monitor wells were computed for the period 1994 through 2016. Next, the annual, individual monitoring well average TCE concentrations were averaged to arrive at a combined Area 12 average for each year. The combined average TCE concentration for the Area 12 MAU indicator wells for 2016 was 7 μg/L. **Figure 24** depicts the computed 5-year running average TCE concentrations for Area 12 indicator wells. Using this combined annual average TCE value, the 5-year average was calculated to be 15 μg/L for the period 2012 through 2016. This value is lower than the average of 18 μg/L that was computed for the previous 5-year period (**Figure 24**).

As evidenced by data trends**,** some of which pre-date the 10-year hydrographs shown on **Figure 23**, substantial declines in TCE concentrations have been observed over time at monitor wells within the Area 12 zone of hydraulic containment corresponding to implementation of the Area 12 groundwater remedy. These data indicate that: on-going groundwater extraction since 1999 has removed a substantial amount of TCE mass that was present in MAU groundwater in the vicinity of Area 12; and the 5-year running average concentrations in the area groundwater zone captured by the Area 12 extraction wells are generally asymptotic with time (**Figure 24**). The results indicate achievement of the mass removal component of the Area 12 remedy performance; but, results also suggest that the mass reduction may no longer be a meaningful performance measure for assessment of the Area 12 remedy.

4.2.5 Evaluation of Northern LAU Hydraulic Capture

Assessment of hydraulic capture is predicated on a systematic process established in the GMEP to collect and track key groundwater monitoring program data to ensure achievement of groundwater containment performance standards. Performance standards for groundwater containment are defined in the SOW and require that the remedial action provide sufficient hydraulic control to prevent groundwater with TCE concentrations above clean-up standards from impacting peripheral wells outside of the plume. Specific GMEP performance criteria are intended to provide objective and protective indicators of containment and enable appropriate response actions to maintain plume containment.

The assessment of remedy performance for the northern LAU program involves demonstrating: 1) the consistent presence of a cone of depression in the vicinity of the northern LAU extraction wells tied into treatment (MRTF extraction wells and PCX-1); and 2) TCE concentrations at monitor wells PG-42LA and PG-43LA, and at extraction well PV-14, that are less than or equal to 2 μg/L.

The outline of the October 2016 LAU TCE plume is shown with October 2016 LAU water level contours on **Figure 20**. Arrows are provided to infer direction of groundwater movement along the periphery of the plume. While water level contours indicate that groundwater flow from the southwest margin to the north is controlled by regional pumping, the plume is ultimately captured at a broad cone of depression that occurs as a result of focused LAU pumping at the MRTF extraction wells and PCX-1. Additional capture is also provided by LAU pumping at CGTF extraction wells COS-75A and COS-71A. Consistent with the specified performance measure, this groundwater flow pattern directs water from the LAU plume toward extraction wells tied into treatment. Projected capture zones from the NIBW Model pumping scenario known as Plan A are depicted on **Figure 25**. Plan A represents anticipated long-term average pumping conditions in place during implementation of the NIBW groundwater remedy. Plan A reflects both the pumping priorities and rates assigned to various components of the remedial action as well as anticipated pumping rates at wells that are not associated with the NIBW Site. Model simulated capture zones for Plan A provide additional support for the conclusion that pumping of the MRTF, NGTF, and CGTF extraction wells results in combined hydraulic capture encompassing and extending well beyond the LAU plume.

With regard to reported TCE levels, compliance with the second achievement measure was not fully attained in 2016. As indicated in **Table 4**, as well as in **Appendix C**, TCE concentrations were above the 2 μg/L performance metric at monitor well PG-42LA in the first and third quarterly samples obtained at the well in January and October, respectively. The two other quarterly samples at PG-42LA and all samples obtained at PG-43LA and PV-14 were at or below the 2 μg/L performance metric.

When similar results were reported at well PG-42LA in 2011, contingency response actions included data acquisition and analyses to further characterize LAU groundwater conditions. The overall findings from this nearly year-long work effort indicated that the NIBW remedy was performing effectively to contain the northern LAU plume. Low-level TCE concentrations at PV-14, which in 2016 ranged from 0.52 to 2.0 μg/L, continue to be relatively predictable and display a generally decreasing trend over the last 3 years. This positive response is attributable to operation of the MRTF extraction wells and other PV production wells consistent with the optimized pumping strategy. Plume containment and capture of the leading edge of the northern LAU plume are documented by multiple lines of evidence, including evaluation of water quality data, water level data, and groundwater modeling analyses. As indicated above, contingency actions associated with northern LAU capture were temporarily suspended in 2012 pending review and analysis by the NIBW Technical Committee to reassess GMEP performance measures and, as appropriate, establish updated metrics.

The effectiveness of the NIBW remedy in containing the LAU plume hinges on the focused and consistent pumping of MRTF and NGTF extraction wells to capture the leading edge of the plume. The combined actions of other remedy components, such as groundwater extraction at CGTF, Area 7, and Area 12, are also critical to limit movement of TCE mass to the PV pumping center. In general, water quality trends in LAU monitor and extraction wells substantiate the effectiveness of the remedy. Declining TCE concentrations in CGTF extraction wells and monitor wells in the southern portion of the LAU plume indicate decreasing TCE mass loading from the southern to the northern LAU over time[3]. Comparison of TCE

[3] Increased TCE concentrations at S-2LA and PA-13LA are inconsistent with the wider trends of generally declining TCE levels throughout the NIBW Site. As previously noted, additional monitoring was conducted at these wells in 2014 to more closely track and characterize changing water quality in this portion of the northern LAU.

mass removed over time at MRTF extraction wells PV-14 and PV-15 and NGTF extraction well PCX-1 shows that PCX-1 has been responsible for over 90 percent of the historical TCE mass captured in the northern LAU, preventing a large portion of the LAU plume from reaching the PV wellfield. In 2016, PCX-1 was responsible for about 93 percent of the combined mass extracted at MRTF and NGTF extraction wells (**Table 8**).

Hydraulic capture of the northern LAU plume is strongly controlled by the distribution of pumping between the various wells in the PV well field and vicinity and coordinated efforts to focus pumping at key extraction wells (PCX-1, PV-15, and PV-14) that are tied into treatment. **Figure 26** is a stacked bar chart showing total annual pumping volume for PV wells and PCX-1 for the time period 1990 through 2016. Wells are stacked in order of their position from south to north in the well field, such that annual pumpage for well PCX-1, the southern-most extraction well, is on the bottom and annual pumpage for well PV-17, the northern-most extraction well, is near the top of each bar. At the very top of each bar, pumping from SRP well 22.6E,10.0N, which is located southeast from PV-14, has been added. Although this well is completed across both the MAU and LAU, it contributes to LAU pumping in this region when operated by SRP. Pumping volumes contributed by PCX-1 and the MRTF extraction wells are shown in shades of red. Pumping volumes for wells without treatment are shown in shades of blue and green. A dashed line is provided to group the three southern wells that are tied into treatment (PCX-1, PV-15, and PV-14). Well SRP well 22.6E,10.0N is shown in pink.

The trends shown on **Figure 26** are significant. Focused pumping of extraction wells PCX-1, PV-15, and PV-14 that began in 1998 and continued over the ensuing 10 years effectively contained the northern LAU plume and limited impacts to peripheral production wells (including the more northerly PV wells and SRP 22.6E,10.0N). However, beginning in 2007, a decrease in the amount of pumping by MRTF extraction wells occurred and resulted in the first instance where TCE concentrations exceeded performance metrics at PG-42LA and then later at PV-14. Focused pumping of MRTF extraction wells was restored midway through 2010 and since that time EPCOR has, to the extent practicable, maintained a south to north pumping strategy, which has been shown through model projections to optimize plume containment (**Figure 25**).

Based on all available data and model projections, and notwithstanding the performance measure issues at S-2LA and PG-42LA, the northern LAU remedy is operating effectively through implementation of a coordinated extraction and treatment strategy that optimizes plume containment. The findings indicate the northern LAU remedy meets overall groundwater containment performance standards defined in the Amended CD and SOW. More meaningful LAU performance measures may also be considered during a GMEP re-evaluation process.

4.2.6 Evaluation of Need for Modeling Analyses

The remedy for the NIBW Site established in the Amended ROD includes periodic use of modeling analyses to "assess the accuracy over time of projections in the Feasibility Study Addendum (FSA)". In the GMEP, the NIBW PCs presented, and EPA and ADEQ approved, an approach to determining when modeling analyses would be considered, what the scope of modeling analyses would comprise, and how results of modeling analyses would be used.

In early 2016, the NIBW PCs conducted an analysis of hydraulic capture for the MAU and LAU remedial systems at the NIBW Site to provide the EPA Five Year Review team with information to evaluate remedy performance. The existing NIBW groundwater flow model was updated for the capture analysis, including hydraulic properties, model boundaries, and groundwater pumping rates and distributions (where appropriate). Particle tracking was used to delineate individual capture zones for each remedial action extraction well. Model results showed that:

- The Area 7 extraction system is projected to contain all of the MAU plume area delineated by the 1,000 μg/L TCE contour and most of the 500 μg/L area. Combined pumping at CGTF wells COS-71A and COS-72A enhances capture of the 500 μg/L Area 7 plume area and also captures a significant portion of the 100 μg/L plume area, along with lower concentration areas along the eastern flank of the plume. Projected capture of the MAU plume in the vicinity of Area 7 meets the objectives of the Amended CD SOW to contain relatively higher concentration areas and exceeds the objectives of the approved work plan for the Area 7 groundwater extraction and treatment program to contain the area where TCE concentrations exceed 1,000 μg/L.

- The Area 12 extraction system is projected to contain the higher TCE concentrations (greater than 100 μg/L) near the Granite Reef well and extend across a large area where TCE concentrations are between 5 and 50 μg/L. Projected capture of the MAU plume in the vicinity of Area 12 meets the objectives of the Amended CD SOW to contain relatively higher concentration areas of the MAU plume.

- Pumping of the LAU groundwater extraction system wells is projected to maintain capture over the area delineated by the 5 μg/L contour line for TCE in the LAU.

The NIBW model has been a useful tool for specific analyses over time, such as predicting patterns of groundwater movement and hydraulic capture associated with groundwater pumping occurring at the Site or changes to the pumping regime. The model was used in 2012 to support decisions regarding pumping changes associated with COS end-use of PCX-1 water and replacement of existing CGTF extraction well COS-71 with new extraction well COS71A. It was also used in 2013 and 2014 to evaluate alternate locations for installation of replacement well 7EX-6MA to enhance the Area 7 MAU source control program. It is anticipated that that if changes are proposed to the Area 7 pumping regime or other components of the remedial action, the NIBW model will be updated and utilized to support the decision making process. For example, as changes to the CGTF extraction well pumping regime to address inorganic issues are finalized, capture associated with the revised long-term pumping plan may be analyzed using the model.

4.3 ASSESSMENT OF GROUNDWATER TREATMENT PERFORMANCE STANDARDS

Performance of the NIBW groundwater treatment systems is evaluated based on criteria established in the SOW and compliance with Groundwater Cleanup Standards specified in the Amended ROD. The following sections summarize monitoring data obtained during 2015 with respect to groundwater treatment performance standards at the five treatment facilities.

As described above, the second Five Year Review completed for the NIBW Site in 2016 concluded that the overall remedy was both protective and effective. With respect to the groundwater extraction and treatment systems, however, EPA noted that "based the revised toxicity values for TCE and the increase in TCE air emissions concentrations at Area 12, the air emissions exposure pathway for [treatment] facilities should be reassessed". EPA recommended collection of ambient air samples from the vicinity of the treatment facilities and completion of updated exposure assessments for air emissions. During the 4th quarter of 2016, in response to the recommendation from the Five Year Review, the PCs compiled historical air treatment system influent and effluent data, as well as data for ambient air samples obtained at the facilities. The PCs presented these data to EPA and initiated discussion with the agency regarding appropriate next steps. Work planned for 2017, subject to EPA approval, is anticipated to include ambient air modeling and targeted ambient air sampling to evaluate potential inhalation risks at or adjacent to the treatment facilities.

4.3.1 Evaluation of the Central Groundwater Treatment Facility

Section III.C of the SOW requires that treated groundwater from the CGTF meet cleanup standards for NIBW COCs, as set forth in Table 3 of the Amended ROD. Cleanup standards defined in Table 3 are shown below.

Contaminants of Concern	Cleanup Standard (µg/L)
Trichloroethene (TCE)	5.0
Tetrachloroethene (PCE)	5.0
1,1-Dichloroethene (DCE)	6.0
1,1,1-Trichloroethane (TCA)	200
Chloroform (CFM)	6.0*

* Chloroform produced as a byproduct of municipal water supply disinfection is exempt from the treatment standard for chloroform identified in Table 3 of the Amended ROD.

Throughout 2016, samples of treated groundwater were collected from the common sump at the CGTF and analyzed for the NIBW COCs on a weekly basis when the treatment facility was in operation. NIBW COC concentrations in all common sump samples consistently achieved and exceeded the cleanup standards set forth in Table 3 of the Amended ROD. Compliance monitoring data indicate all common sump samples were at or below the 0.50 µg/L MRL for TCE and the other NIBW COCs. Quarterly results for treatment system performance sampling conducted by COS at the CGTF are reported to EPA and ADEQ under separate cover.

4.3.2 Evaluation of the Miller Road Treatment Facility

Section III.C of the SOW requires that treated groundwater from the MRTF meet the cleanup standards set forth in Table 3 of the Amended ROD. Further, treated groundwater from the MRTF discharged to SRP's system through an Arizona Canal outfall is required to meet requirements of an AZPDES permit.

Results of MRTF sampling and analysis are included in **Table 9**. NIBW COC concentrations in all treated groundwater samples from MRTF treatment trains for wells PV-14 and PV-15 consistently achieved the cleanup standards set forth in

Table 3 of the Amended ROD in 2016. Compliance monitoring data, presented in Level 4 data analytical reports as part of the supplemental data reports submittal, indicate all samples were below the 0.50 μg/L MRL for TCE and the other NIBW COCs.

4.3.3 Evaluation of NIBW GAC Treatment Facility

EPA selected GAC treatment of groundwater at the NGTF as the long-term solution for extraction well PCX-1 in the Explanation of Significant Differences (ESD) dated March 2012. The ESD does not change any of the Applicable or Relevant and Appropriate Requirements previously identified by EPA and therefore requires that treated groundwater from the NGTF meet the cleanup standards set forth in Table 3 of the Amended ROD. Further, treated groundwater from the NGTF that is discharged to the SRP water supply system at the Arizona Canal is required to meet the requirements of an AZPDES permit.

Results of NGTF sampling and analysis are included in **Table 9**. As evidenced from the laboratory data for treatment plant discharges going to both the CWTP (NGTF CP) and to the SRP Arizona Canal (Outfall 001), NIBW COC concentrations in all treated water samples were below their respective MCLs in 2016. The NGTF consistently achieved the cleanup standards set forth in Table 3 of the Amended ROD. In fact, performance monitoring data indicate all treated water samples were below the 0.50 μg/L MRL for TCE, PCE, 1,1-DCE, and TCA in 2016.

Treated groundwater discharged to the SRP water supply system at the Arizona Canal outfall was tested monthly for TCE, PCE, and pH; quarterly for inorganic water quality parameters; and at least semi-annually for 1,1-DCE, TCA, and Chloroform, as required by the AZPDES permit. The results of sampling and analyses, presented in monthly DMRs submitted to ADEQ, document that the discharge met the requirements of the AZPDES permit throughout the 2016 operating period.

4.3.4 Evaluation of the Area 7 Groundwater Treatment System

Section III.C of the SOW requires that treated groundwater from the Area 7 GWETS meet cleanup standards set forth in Section XII.B.7.b of the Amended ROD. Specifically, in the case of Area 7, treated water used to recharge the UAU aquifer must meet substantive requirements of the Underground Injection Control (UIC) Program.

Discharges of treated water to the UAU aquifer via injection wells at Area 7 that are subject to the UIC Program are regulated in Arizona by ADEQ under the Aquifer Protection Permit (APP) Program. The APP Program requires that any discharges to an aquifer must not cause or contribute to a violation of the AWQS. In Arizona, all groundwater is classified for drinking water protected use, so the AWQS are primary drinking water standards by rule. If an AWQS is already exceeded at the point of compliance in groundwater, then the discharge must not cause further degradation of the aquifer with respect to the parameter that exceeds the standard.

Throughout 2016, samples of treated groundwater were collected from air stripper effluent at the Area 7 GWETS and analyzed for NIBW COCs on a monthly frequency when the system was in operation. The results of sampling and analysis are included in **Table 9**. As evidenced from the data, the NIBW COC concentrations in all treated water samples from the Area 7 GWETS (SP-105) were below their respective MCLs in 2016; therefore, the discharge meets Arizona AWQS for these parameters. Results for treated groundwater from the Area 7 GWETS in 2016 showed that all of the NIBW COCs were below the MRL of 0.50 μg/L (**Table 9**), with the exception of the sample collected on December 6, 2016, which had a TCE value of 0.79 μg/L. This is below the cleanup standard of 5.0 μg/L. The hydrogen peroxide dose rate was increased in response to the TCE detection.

Treated groundwater that is discharged to Area 7 injection wells recharges the UAU groundwater system. Inorganic water quality in the UAU is typically poorer than that of treated groundwater from the Area 7 GWETS, which is derived from the MAU. As discussed in Section 2.4.2 of this report and evidenced by inorganic water quality data reported in the supplemental data submittal for October 2016 (issued under separate cover), injection of treated water from the Area 7 GWETS does not contribute to further degradation of inorganic water quality in UAU groundwater.

4.3.5 Evaluation of the Area 12 Groundwater Treatment System

Section III.C of the SOW requires that treated groundwater from the Area 12 GWETS meet cleanup standards set forth in Section XII.B.7.b of the Amended ROD. Specifically, in the case of Area 12, treated water that is discharged to the SRP water supply system must meet substantive requirements of the governing AZPDES permit.

Throughout 2016, samples of treated groundwater were collected from air stripper effluent at the Area 12 GWETS and analyzed for NIBW COCs on a monthly frequency when the system was in service. The results of sampling and analysis are included in **Table 9**. As evidenced from the data, the NIBW COC concentrations in all treated water samples from the Area 12 GWETS (WSP-2) were below their respective MCLs in 2016. Therefore, discharges from Area 12 GWETS met the requirements of the AZPDES permit. Results for treated groundwater from the Area 12 GWETS in 2016 showed that all of the NIBW COCs were below method detection limits (**Table 9**). Additional sampling and analysis for physical and inorganic water quality parameters is reported in monthly DMRs submitted to ADEQ and EPA.

4.4 PROGRESS TOWARD ACHIEVEMENT OF REMEDIAL ACTION OBJECTIVES

EPA established seven Remedial Action Objectives (RAOs) for the NIBW Site in the September 2001 Amended ROD. The following is a qualitative discussion of the progress achieved in satisfying RAOs, based on review of data through 2016.

<u>Remedial Action Objective #1:</u>

Restore the Upper, Middle, and Lower Aquifers to drinking water quality by decreasing the concentrations of the contaminants of concern to below the cleanup standards.

Significant progress has been made towards the removal of NIBW COCs and restoration of groundwater to drinking water quality with respect to these COCs. In 2016, the NIBW remedial actions resulted in the extraction and treatment of 5.9 billion gallons of groundwater and removal of over 2,300 pounds of TCE, as shown in **Table 8**. From the inception of the NIBW groundwater remedy in 1994, about 115 billion gallons of groundwater have been extracted to remove an estimated 89,000 pounds of TCE. Furthermore, soil remedial actions (as discussed in RAO #6) have eliminated the threat to groundwater from historical sources of TCE at EPA-identified source areas. As a consequence, TCE concentrations have dramatically decreased in the UAU and significantly decreased in portions of the MAU and LAU.

The most significant declines observed in TCE concentrations are in UAU groundwater. According to UAU mass flux calculations, the estimated VOC mass in the UAU has declined from more than 11,000 pounds in 1993 to approximately 200 pounds in 2016, representing a decrease of about 98 percent in the past 22 years (**Figure 18**). TCE concentrations in the UAU have decreased correspondingly. In 2016, the MCL for TCE was exceeded at only two monitoring wells, with the highest TCE concentration in the UAU of 13 μg/L at PG-31UA. Historically, TCE concentrations in UAU groundwater had been two to three orders of magnitude higher than at present. The extent of VOC impact in the UAU has also been greatly reduced and, as evident in **Figure 10**, only small, very localized TCE plumes remain. Based on the widespread decrease of TCE in UAU groundwater throughout the NIBW Site, EPA approved and the NIBW PCs conducted formal abandonment of 30 UAU monitor wells in 2013. As noted in Section 4.2.1, the UAU groundwater data derived from October 2016 achieved the performance criterion for the UAU mass flux metric defined in the GMEP.

Stable to declining in TCE concentrations are evident in most MAU and LAU monitor and extraction wells (**Appendix C**). Within the MAU, water quality data obtained at monitor and extraction wells generally show the impact of the significant mass removal that has taken place since initiation of the MAU source control programs. With the exception of increasing trends at a few MAU wells as a result of changing pumping patterns, TCE concentrations in groundwater in the MAU are generally stable to declining. TCE concentrations at MAU monitor wells down-gradient from the zones of capture associated with Area 7 (PA-12MA) and Area 12 (E-5MA) source control programs have generally declined since the onset of source control pumping, demonstrating the effectiveness of MAU source control in limiting TCE migration to the western margin (**Figures 21 and 23**). TCE concentrations at monitor wells within these capture zones have also generally stabilized or decreased.

Historical LAU water quality data demonstrate a clear trend of declining TCE concentrations in most wells in the southern half of the plume and progress toward aquifer restoration. Consistent operation of CGTF extraction wells over the past 20 years has captured and limited the migration of higher TCE concentrations to the northern LAU extraction wells connected to the NGTF and MRTF. With the exception of wells S-2LA and PG-42LA, TCE concentrations observed in the northern LAU are, for the most part, stable or showing slightly decreasing trends (**Figure 25 and Appendix C**). While increases at some wells are anticipated based on the remedy design for migration of LAU mass toward PCX-1 and the MRTF extraction wells, stabilizing and/or declining trends at other wells indicate that mass migration toward the northern LAU is being effectively controlled by extraction wells south of well PCX-1. Monitoring data reported on an on-going basis in **Table 8** indicate pumping of well PCX-1 is responsible for capturing 90 percent or more of the TCE mass extracted and treated by northern LAU extraction wells over time.

<u>Remedial Action Objective #2:</u>

Protect human health and the environment by eliminating exposure to contaminated groundwater.

As discussed in Section 4.3, groundwater that is extracted as part of the NIBW Site remedy has been treated to meet the groundwater cleanup standards specified in the Amended ROD.

Remedial Action Objective #3:

Provide the City of Scottsdale with a water source that meets MCLs for NIBW contaminants of concern.

The CGTF was constructed to provide treatment of TCE-impacted groundwater for COS beneficial use. Since the CGTF began operation under COS in 1994, the CGTF has treated about 62 billion gallons of groundwater to levels safely below drinking water MCLs for the NIBW COCs. The treated groundwater is blending with other potable sources and used as a supply to the COS municipal water system.

Although not COCs, increasing concentrations of inorganic constituents have impacted COS's ability to pump, treat, and serve water from certain key remedial extraction wells through its municipal system. A post treatment acid feed system at the CGTF is anticipated to be on-line in 2017. The planned acid feed system will adjust the pH of the treated water from CGTF to address calcium carbonate scale in COS's system. The PCs collaborated with COS in 2016 to develop solutions that enabled COS to manage its inorganic challenges, while continuing to support extraction and treatment to provide for TCE plume containment. By prioritizing pumping between CGTF extraction wells, COS was able to maintain near-continuous pumping at critical LAU extraction well COS-75A. This was achieved by shifting pumping away from COS-71A, which has higher concentrations of inorganic constituents, to COS-31 and COS-72, which are have more favorable inorganic water quality. In 2017, the PCs will continue to work with COS to achieve plume containment objectives in a manner that supports its municipal supply needs.

Remedial Action Objective #4:

Achieve containment of the groundwater contamination plume by preventing any further lateral migration of contaminants in groundwater.

As discussed in Section 4.2, the combined groundwater extraction tied to treatment at the CGTF, MRTF, NGTF, Area 7 GWETS, and Area 12 GWETS has achieved hydraulic containment throughout the MAU/LAU plume. Historic water level data continue to demonstrate that the direction of groundwater movement within the MAU/LAU plume is generally toward NIBW extraction wells or the western margin. TCE concentrations at monitor wells located near the edge or along the periphery of the MAU/LAU plume show decreasing trends in many parts of the Site. In cases where increasing trends at specific wells have been noted (S-2LA and PG-42LA), the NIBW PCs continue to evaluate and report trends to the Technical Committee to ensure that the overall objectives of the LAU remedy are maintained.

Remedial Action Objective #5:

Reuse of the water treated at the Site to the extent possible in accordance with Arizona's Groundwater Management Act.

Treated water produced by all five NIBW GWETSs is beneficially used. The CGTF and NGTF provide treated groundwater as a supply to the COS potable water system, or may alternately deliver treated water to SRP. The MRTF treats groundwater for use by EPCOR. At Area 7, treated groundwater is delivered to shallow injection wells that recharge the UAU aquifer. At Area 12, treated groundwater is provided to the SRP water system for irrigation use. All NIBW end-uses are consistent with beneficial use designations of ADWR and in accordance with the Groundwater Management Act. Furthermore, the NIBW remedy has incorporated COS, SRP, and EPCOR as end users of treated groundwater in lieu of groundwater pumping they have historically conducted and would have otherwise relied upon in this area.

<u>Remedial Action Objective #6:</u>

Mitigate any soil contamination that continues to impact groundwater.

As described in Section 3.0, the NIBW PCs have implemented soil remediation at four EPA-identified source areas, including Areas 6, 7, 8, and 12. The collective soil remediation has resulted in the removal of over 10,000 pounds of TCE from the unsaturated zone and eliminated these sources as an ongoing threat for groundwater impacts. .

<u>Remedial Action Objective #7:</u>

Provide long-term management of contaminated groundwater to improve the regional aquifer's suitability for potable use.

The NIBW PCs have closely coordinated the planning and implementation of NIBW remedial actions with the key water providers, including COS, SRP, and EPCOR. The efforts have strongly focused on defining mutually beneficial objectives for all parties involved in the remedy. For example the NIBW remedy requires consistent and reliable groundwater extraction in the areas most favorable for capture and containment of the MAU/LAU plumes. The water providers have considerable, but variable water demands in the NIBW Site area and a system of existing wells and infrastructure available for groundwater production.

Through technical discussions and cooperation, the parties have taken a number of steps to focus groundwater extraction and end uses for optimum water resource management. For example, the NIBW PCs have installed, modified, and replaced, as needed, a number of the water provider wells to improve groundwater plume capture and mass removal. To assure that the water providers can utilize the treated groundwater, the NIBW PCs have upgraded treatment systems and enhanced infrastructure and control systems for the water providers. The water providers have cooperated by prioritizing pumping to meet water demands using those wells most beneficial to the remedy.

In 2016, the PCs worked with COS's to help balance inorganic loading to their municipal system, pending installation of an acid feed -treatment system for the CGTF effluent. Although not COCs, increasing concentrations of inorganic constituents have impacted COS's ability to accept water from certain key remedial extraction wells. Through discussions with the Technical Committee, solutions were development that enabled COS to manage inorganic challenges, while continuing to support extraction and treatment to provide for TCE plume containment. As mentioned above, one component of this balancing was achieved through prioritized pumping of specific CGTF extraction wells. A second component was to temporarily direct most of the water from PCX-1, which is treated at the NGTF, to the SRP Arizona Canal. PCX-1 will be re-directed to discharge to the COS Chaparral Water Treatment Plant once the CGTF acid feed system is on-line in early 2017.

4.5 MANAGEMENT OF UNTREATED GROUNDWATER

Section VI.B.4.n of the SOW requires COS, SRP, and the NIBW PCs to provide a report describing the creation and maintenance of records to document compliance with Section VI.B.4.a through VI.B.4.m of the SOW. Section VI.B.4 specifies provisions for managing untreated groundwater extracted from NIBW wells as part of the remedy and requires that groundwater be managed as if it were a hazardous waste by following the requirements set forth in Sections VI.B.4.a through VI.B.4.m. The NIBW PCs, SRP, and COS are submitting the following information to fulfill the requirements for annual reporting of compliance with Section VI.B.4 of the SOW. For ease of reference, information regarding COS, SRP, and the NIBW PCs management practices pertaining to applicable requirements of Section VI.B.4 are referenced in the order listed in the SOW.

<u>Section VI.B.4.a – normal operation, maintenance, and monitoring activities:</u>

The NIBW PCs have specified procedures for management of untreated groundwater associated with sampling activities at the MRTF, NGTF, Area 7

GWETS, and Area 12 GWETS and well equipment maintenance in O&M Plans that were approved by EPA and ADEQ, as follows:

- MRTF on August 26, 2014
- NGTF on June 24, 2013, updated March 31, 2016
- Area 7 GWETS on April 7, 2014
- Area 12 GWETS on April 7, 2014

The NIBW PCs followed procedures described in the Phase I SAP for managing untreated groundwater during monitor well sampling. In 2016, well access was restricted at times during operation, maintenance, and monitoring activities conducted at SRP NIBW extraction well facilities. Except for the June 18 CGTF pipeline release described below, there were no accidental releases of untreated groundwater from SRP wells tied into treatment at the Site in 2016, including PCX-1, COS-31, or the Granite Reef well.

In 2016, access was restricted at times during maintenance activities conducted at SRP NIBW extraction well sites.

COS has specified procedures for management of untreated groundwater associated with sampling activities at the CGTF and well equipment maintenance in an EPA-approved O&M Plan, updated April 24, 2014.

There was an accidental release of untreated groundwater on June 18, 2016 associated with the CGTF. During start-up of the facility, the raw water transmission line from well COS-72 ruptured, resulting the release of approximately 1.2 MG of water to the ground within the Indian Bend Wash. Water sampling showed levels of TCE at <0.5 – 63 μg/L at the site of the break. Soil sampling at the break did not show the presence of TCE. Standing water in the vicinity of the break was removed and discharged to the city's wastewater collection system. EPA and ADEQ reviewed the incident and corrective actions report, and had no questions or comments. COS reported this event to EPA on June 18, 2016. On June 24, 2016, COS submitted to EPA the final report summarizing actions taken in response to this incident.

Section VI.B.4.c – well access:

The Final Remedial Design/Remedial Action Work Plan, prepared by the NIBW PCs, dated January 25, 2007, provides information concerning well access at the extraction well sites.

Section VI.B.4.d – annual treatment facility inspections:

Each NIBW groundwater treatment facility is inspected on a routine basis, as part of the normal O&M procedures, for equipment malfunction and deterioration that could result in the release of untreated groundwater.

As explained in Section 2 and **Appendix D** of this SMR, the NIBW PCs coordinated inspections of the NGTF and CGTF on December 13, 2016, and MRTF, Area 7, and Area 12 GWETS on December 14, 2016 in accordance with Section VI.B.4.d of the SOW. Representatives of EPA were present for the annual inspections at each of the treatment facilities. The treatment facilities were inspected for malfunctions, deterioration, and operator practices or errors that could result in a release of untreated groundwater. At each facility, the major system components were identified and examined for operability, condition of operating equipment, and management of untreated groundwater and residual materials. Additionally, data related to routine operation, system startup and shutdown, routine and non-routine maintenance, and sampling were reviewed.

The inspections indicate that the facilities are in good working condition and are operated proficiently. Based on these findings, the NIBW PCs conclude the facility operations comply with the Amended CD/SOW. No hazardous waste is generated, handled, or stored at the NIBW groundwater treatment plants. A summary report documenting the site inspection for each facility is provided in **Appendix D**.

Section VI.B.4.e – training for responding to releases of untreated groundwater:

The NIBW PCs submitted a plan for health and safety training of GWETS Operators and Emergency Coordinators to EPA as part of materials included in an August 1, 2003, "Submittal of Information Required, Section VI of the Statement of Work" provided to EPA and ADEQ. The plan specified steps to be conducted for personnel at all GWETSs to assure that they will have appropriate health and safety training to respond to releases of untreated groundwater in a manner to protect public health and the environment.

In 2016, COS provided on-line emergency response and incident management training for an untreated groundwater release for CGTF, NGTF, and Area 7 GWETS raw water pipelines. The training sessions are performed on-line and the training is tracked within the COS training management program.

The *Contingency and Emergency Response Plan* (CERP) *for Accidental Releases of Untreated Groundwater from SRP North Indian Bend Wash Site Extraction Wells*, prepared by SRP, dated January 2007, and updated September 2012, describes the training to be conducted for personnel responding to an accidental release of untreated groundwater from an SRP facility. SRP employee training records are maintained on site.

Section VI.B.4.f and g – land disposal of untreated groundwater:

The NIBW PCs, SRP, and COS have not placed untreated groundwater in any salt dome formation, salt bed formation, underground mine or cave, surface impoundments, waste piles, land treatment units, incinerators, or landfills.

Section VI.B.4.h – emergency and contingency response plans:

The EPA approved CERPs for the CGTF, MRTF, Area 7 GWETS, Area 12 GWETS, and SRP Extraction Wells in 2007. The NIBW PCs prepared updated CERPs for the MRTF (updated August 2014), Area 7 GWETS (updated May 2014) and Area 12 GWETS (updated May 2014); COS prepared the CGTF CERP (updated August 2012); and SRP prepared an updated CERP for SRP extraction wells used in the NIBW Site remedial actions (updated September 2012 and again in May 2014). The NIBW PCs submitted a CERP for NGTF in May 2014.

The CERPs describe the procedures for handling an accidental release of untreated groundwater from an extraction well in the NIBW site.

Section VI.B.4.i – emergency coordinators:

The NIBW PCs, COS, and SRP list designated emergency response coordinators for the groundwater treatment facilities and the extraction well network. Currently identified personnel responsible for emergency response at the NIBW groundwater treatment facilities and extraction well sites are listed in **Appendix A**.

Section VI.B.4.j – evidence of Holocene faults:

The NIBW PCs and SRP provided written verification in submittals dated August 1, 2003 and September 3, 2003, respectively, to EPA and ADEQ indicating the existing NIBW extraction wells and treatment facilities are not located within 200 feet of a fault, which has exhibited displacement in Holocene time. There are no recognized Holocene faults in the metropolitan Phoenix area. COS also provided this verification in July 2003.

Section VI.B.4.k – floodplains:

COS, NIBW PCs, and SRP provided information in submittals dated July, August, and September, 2003, respectively, to EPA and ADEQ to confirm that four NIBW extraction wells are in locations that would be inundated by a 100-year flood. The NIBW PCs described measures for operating the wells in the draft Groundwater Extraction Well Network O&M Plan to ensure that there will not be a release of untreated groundwater during a 100-year storm.

Section VI.B.4.l – closure:

Area 7 MAU groundwater extraction well 7EX-5MA was abandoned in August 2016.

SRP and COS did not abandon any wells associated with the NIBW project. There were no facility closure activities in 2016.

Section VI.B.4.m – containment:

The Remedial Design/Remedial Action (RD/RA) Work Plan provides information concerning containment at the extraction well sites.

5.0 SUMMARY

As set forth herein and consistent with the conclusions reached by EPA in the second Five-Year Review report that was issued in 2016, the NIBW Superfund Site remedial actions continue to result in an effective groundwater remedy that is operating as designed. **Table 8** summarizes the estimated rates and volumes of groundwater extracted and TCE mass removed in 2016 at each of the extraction wells connected to treatment. The collective remediation efforts through 2016 have achieved significant progress toward the long-term goal of aquifer restoration while providing plume containment and beneficial use of vital groundwater resources. Continued progress is anticipated through on-going operation and monitoring of the NIBW remedial action program in 2017.

6.0 DOCUMENTS SUBMITTED IN 2016

During the period January through December 2016, the NIBW PCs and SRP provided the following documents to EPA and ADEQ.

Response to Five-Year Review ARARs Evaluation, letter submitted on February 12, 2016.

2015 Site Monitoring Report, North Indian Bend Wash Superfund Site, Volume I: Text, Tables, and Illustrations and Volume II: Appendix A-F, technical report submitted on February 29, 2016 (Revised Volume 1 submitted on March 10, 2016).

Groundwater Monitoring Program Supplemental Data, North Indian Bend Wash Superfund Site, data submittal on February 29, 2016.

Groundwater Extraction and Treatment System Supplemental Data, North Indian Bend Wash Superfund Site, data submitted on February 29, 2016.

Supplemental Data Collection at the Area 7 GWETS During October 2015, NIBW Superfund Site, data submitted on February 29, 2016.

Summary of 2015 Air Sampling Data, North Indian Bend Wash Superfund Site, data submitted on February 29, 2016.

Summary of 2015 1,4-Dioxane Sampling Data, North Indian Bend Wash Superfund Site, data submitted on February 29, 2016.

Summary of 2015 Non-Compliance Water Quality Data, North Indian Bend Wash Superfund Site, data submitted on February 29, 2016.

EPCOR Water 2015 Water Quality Report for the Paradise Valley District, consumer confidence report submitted on March 7, 2016.

2015 SMR Overview, presentation submitted on March 15, 2016.

LAU Plume Time Series, presentation submitted on March 18, 2016.

NIBW Site Overview, presentation submitted on March 20, 2016.

Demonstration of Financial Ability, North Indian Bend Wash Superfund Site, submitted on March 28, 2016.

Notification of On-Going Monitoring – April 2016 Groundwater Sampling of M-10 Monitor Well, submitted on April 7, 2016.

NIBW 5YR Information Package, submitted to USACE on April 7, 2016.

> **Indian Bend Wash Superfund Site – Five Year Review ARARs Evaluation (February 2, 2011)**, copy of letter submitted by Arnold & Porter LLP to U.S. EPA February 17, 2011.
>
> **Five-Year Review Site Inspection Checklist [NIBW – Area 7]**, dated February 10, 2016.
>
> **Five-Year Review Site Inspection Checklist [NIBW – Area 12]**, dated February 10, 2016.
>
> **Five-Year Review Site Inspection Checklist [NIBW – Central Groundwater Treatment Facility]**, dated February 10, 2016.
>
> **Five-Year Review Site Inspection Checklist [NIBW – Miller Road Treatment Facility]**, dated February 10, 2016.
>
> **Five-Year Review Site Inspection Checklist [NIBW – NGTF]**, dated February 10, 2016.
>
> **Technical Memorandum – MAU and LAU Capture Analysis**, submitted by Montgomery & Associates to NIBW PCs, March 23, 2016.
>
> **Five-Year Review Interview Record [NIBW-Area 12]**, submitted by EnSolutions on April 5, 2016.
>
> **Five-Year Review Interview Record [NIBW-Area 7]**, submitted by Arcadis on April 6, 2016.
>
> **Five-Year Review Interview Record [North Indian Bend Wash]**, submitted by NIBW PCs on April 7, 2016.
>
> **Summary of Details and Work Conducted at Source Areas, North Indian Bend Wash Superfund Site**, prepared by NIBW PCs.

Recommendations and Follow-up Actions from 2011 Five-Year Review, submitted on April 27, 2016.
NIBW 5YR Information Package, submitted to USACE on May 1, 2016.

NIBW Treatment System Cost Summary, Operation and Maintenance Costs, EPA Five Year Review, 2011 to 2015, submitted on May 1, 2016.

Operation and Maintenance Plan, NIBW Granular Activated Carbon Treatment Facility, dated March 31, 2016, submitted on May 17, 2016.

Quarterly Report, January through March 2016, North Indian Bend Wash Superfund Site, report submitted on May 31, 2016.

Participating Companies' responses to Comments from EPA and ADEQ on the 2015 Site Monitoring Report, submitted on June 7, 2016.

2015 Annual Water Level Electronic Compliance Data Provision, data files submitted to ADEQ on July 14, 2016.

2015 Annual Water Quality Electronic Compliance Data Provision, data files submitted to ADEQ on July 18, 2016.

Notification of Well Maintenance at M-10 Monitor Well, submitted by NIBW PCs on August 18, 2016.

Quarterly Report, April through June 2016, North Indian Bend Wash Superfund Site, report submitted on August 26, 2016.

TCE Concentrations in Selected NIBW Wells (1995-Present) – Additional Data for GM&EP Update, presentation submitted on August 31, 2016.

Treatment System Air Monitoring and Ambient Air Data Packages:

Summary of 2015 Air Sampling Effluent Data at Area 7 and Area 12 GWETS, table submitted on September 9, 2016.

Summary of 2015 Air Sampling Data at Area 7 and Area 12 GWETS, table submitted on September 12, 2016.

Package #1

Ambient Air Data Transmittal Response to 'Submittal of Data package in Relation to Potential Area 12 Treatment Plant Emission Issues', Area 12 Ambient TCE Air Table, and Ambient Sampling Location Maps, submitted on September 22, 2016.

Package #2

Treatment System Air Monitoring and Ambient Air Data Summary, Area 12 Data Package and Ambient Air Monitoring Sampling and Analysis Plan (2006), submitted on September 30, 2016.

Notification of Well Maintenance and Sampling at M-10 Monitor Well – October 2016, electronic mail submitted on September 29, 2016.

Groundwater Flow and Particle Tracking Model Results – Analysis of Extraction Alternatives to Address Inorganic Issues at CGTF, presentation submitted on November 15, 2016.

Summary of Details and Work Conducted at Source Areas at NIBW, table submitted on November 29, 2016.

GIS Screen Shots of Preliminary TCE Soil Vapor Intrusion Evaluation Maps, submitted on November 29, 2016.

Quarterly Report, July through September 2016, North Indian Bend Wash Superfund Site, submitted on November 30, 2016.

Conceptual Model, Remedial Action Development and Current Issues Presentation, submitted on December 15, 2016.

Notification of Well Maintenance and Sampling at M-10 Monitor Well – October 2016, submitted on December 29, 2016.

2016 NIBW Technical Committee Meeting Minutes:

> **August 23rd Technical Committee Meeting Minutes**, on August 31, 2016.
>
> **October 6th Technical Committee Meeting Minutes**, submitted on October 17, 2016.
>
> **November 15th Technical Committee Meeting Minutes**, submitted on December 4, 2016.
>
> **December 12th Technical Committee Meeting Minutes**, submitted by PCs on February 7, 2017.

TABLES

TABLE 1. SUMMARY OF GROUNDWATER LEVEL MEASUREMENTS TAKEN BY VERDAD, NORTH INDIAN BEND WASH AREA, SCOTTSDALE, ARIZONA, APRIL 2016

MONITOR WELL IDENTIFIER	MEASUREMENT DATE	DEPTH TO WATER (ft, bls)	GROUNDWATER ALTITUDE (ft, amsl)
B-1MA	4/4/2016	94.04	1,096.22
B-1UA	Not included in April monitoring event		
B-J	Not included in April monitoring event		
D-2MA	4/5/2016	120.50	1,119.53
E-1LA	4/5/2016	148.93	1,066.07
E-1MA	4/5/2016	134.96	1,079.41
E-1UA	Not included in April monitoring event		
E-2UA	Not included in April monitoring event		
E-5MA	4/26/2016	113.28	1,086.15
E-5UA	Not included in April monitoring event		
E-6UA	Not included in April monitoring event		
E-7LA	4/6/2016	122.69	1,075.10
E-7UA	Not included in April monitoring event		
E-8MA	4/6/2016	102.27	1,090.62
E-10MA	4/6/2016	147.41	1,096.45
E-12UA	Not included in April monitoring event		
E-13UA	Not included in April monitoring event		
E-14LA	4/6/2016	177.21	1,076.74
M-1MA	4/5/2016	124.92	1,085.97
M-2LA	4/5/2016	136.65	1,073.58
M-2MA	4/5/2016	121.82	1,088.24
M-2UA	Not included in April monitoring event		
M-3MA	4/5/2016	110.89	1,094.66
M-4MA	4/5/2016	129.73	1,085.17
M-5LA	4/5/2016	152.36	1,065.10
M-5MA	4/5/2016	143.69	1,073.74
M-6MA	4/5/2016	135.74	1,081.24
M-7MA	4/5/2016	129.97	1,083.90
M-9LA	4/5/2016	161.67	1,058.85
M-9MA	4/5/2016	123.24	1,097.28
M-10LA2	4/5/2016	149.09	1,070.61
M-10MA2	4/5/2016	134.37	1,085.68
M-11MA	4/6/2016	117.99	1,093.60
M-12MA2	4/6/2016	149.91	1,078.01
M-14LA	4/5/2016	165.76	1,059.42
M-14MA	4/5/2016	129.43	1,095.77
M-15MA	4/5/2016	132.64	1,086.27
M-16LA	4/5/2016	174.63	1,053.45
M-16MA	4/5/2016	127.08	1,101.07
M-17MA/LA	4/6/2016	156.94	1,080.76
PA-1MA	4/5/2016	112.55	1,112.95
PA-2LA	4/5/2016	268.42	985.34

TABLE 1. SUMMARY OF GROUNDWATER LEVEL MEASUREMENTS TAKEN BY VERDAD, NORTH INDIAN BEND WASH AREA, SCOTTSDALE, ARIZONA, APRIL 2016

MONITOR WELL IDENTIFIER	MEASUREMENT DATE	DEPTH TO WATER (ft, bls)	GROUNDWATER ALTITUDE (ft, amsl)
PA-3MA	4/5/2016	123.11	1,130.33
PA-4MA	4/6/2016	110.15	1,120.77
PA-5LA	4/6/2016	249.64	979.81
PA-6LA	4/6/2016	272.50	980.43
PA-7MA	4/6/2016	124.85	1,128.21
PA-8LA2	4/6/2016	189.38	1,038.95
PA-9LA	4/5/2016	197.34	1,039.44
PA-10MA	4/5/2016	146.71	1,090.09
PA-11LA*	4/6/2016	167.50	1,057.46
PA-12MA**	4/6/2016	141.26	1,083.70
PA-13LA	4/5/2016	259.35	989.64
PA-14MA	4/5/2016	134.47	1,114.62
PA-15LA	4/4/2016	114.71	1,089.57
PA-16MA	4/4/2016	110.87	1,093.61
PA-17MA	4/5/2016	117.08	1,121.62
PA-18LA	4/5/2016	219.02	1,019.84
PA-19LA	4/6/2016	140.58	1,080.88
PA-20MA	4/6/2016	137.64	1,083.64
PA-21MA	4/5/2016	121.98	1,103.21
PA-22LA	Obstruction in sounder tube. No water level measurement taken.		
PA-23MA	4/4/2016	86.24	1,098.18
PG-1LA	4/5/2016	274.97	974.69
PG-2LA	4/6/2016	309.87	961.19
PG-3UA	Not included in April monitoring event		
PG-4MA	4/4/2016	141.18	1,086.36
PG-4UA	Not included in April monitoring event		
PG-5MA	4/4/2016	127.01	1,087.26
PG-5UA	Not included in April monitoring event		
PG-6MA	4/4/2016	111.10	1,101.60
PG-6UA	Not included in April monitoring event		
PG-7MA	4/4/2016	101.69	1,096.17
PG-7UA	Not included in April monitoring event		
PG-8UA	Not included in April monitoring event		
PG-10UA	Not included in April monitoring event		
PG-11UA	Not included in April monitoring event		
PG-16UA	Not included in April monitoring event		
PG-18UA	Not included in April monitoring event		
PG-19UA	Not included in April monitoring event		
PG-22UA	Not included in April monitoring event		
PG-23MA/LA	4/5/2016	129.81	1,092.72
PG-23UA	Not included in April monitoring event		
PG-24UA	Not included in April monitoring event		

TABLE 1. SUMMARY OF GROUNDWATER LEVEL MEASUREMENTS TAKEN BY VERDAD, NORTH INDIAN BEND WASH AREA, SCOTTSDALE, ARIZONA, APRIL 2016

MONITOR WELL IDENTIFIER	MEASUREMENT DATE	DEPTH TO WATER (ft, bls)	GROUNDWATER ALTITUDE (ft, amsl)
PG-25UA	Not included in April monitoring event		
PG-28UA	Not included in April monitoring event		
PG-29UA	Not included in April monitoring event		
PG-30UA	Not included in April monitoring event		
PG-31UA	Not included in April monitoring event		
PG-38MA/LA	4/5/2016	151.07	1,086.17
PG-39LA	4/6/2016	154.29	1,078.29
PG-40LA	4/6/2016	306.26	969.07
PG-42LA	4/6/2016	323.11	969.20
PG-43LA	4/6/2016	297.50	967.51
PG-44LA	4/6/2016	326.61	970.98
PG-47MA	4/5/2016	130.77	1,085.92
PG-48MA	4/5/2016	141.32	1,075.52
PG-50MA	4/5/2016	156.59	1,084.37
PG-51MA	4/5/2016	153.78	1,087.13
PG-57MA	4/5/2016	121.44	1,105.59
S-1LA	4/5/2016	252.70	1,007.75
S-1MA	4/5/2016	145.46	1,114.88
S-2LA	4/6/2016	271.99	987.98
S-2MA	4/5/2016	148.40	1,112.09
W-1MA	4/6/2016	114.60	1,115.78
W-2MA	4/6/2016	152.22	1,082.86

ABBREVIATIONS:

ft, bls = feet below land surface
ft, amsl = feet above mean sea level

NOTES:

* = collected from LAU completed well at piezometer PA-11/12 located approximately 80 feet northwest of original well PA-11LA

** = collected from MAU completed well at piezometer PA-11/12 located approximately 70 feet northwest of original well PA-12MA

TABLE 2. SUMMARY OF GROUNDWATER LEVEL MEASUREMENTS TAKEN BY VERDAD, NORTH INDIAN BEND WASH AREA, SCOTTSDALE, ARIZONA, OCTOBER 2016

MONITOR WELL IDENTIFIER	MEASUREMENT DATE	DEPTH TO WATER (ft, bls)	GROUNDWATER ALTITUDE (ft, amsl)
B-1MA	10/3/2016	94.74	1,095.52
B-1UA	10/3/2016	59.70	1,130.62
B-J	10/4/2016	67.29	1,124.95
D-2MA	10/5/2016	112.03	1,128.00
E-1LA	10/5/2016	152.88	1,062.13
E-1MA	10/5/2016	135.34	1,079.03
E-1UA	10/5/2016	81.46	1,133.91
E-2UA	10/4/2016	97.07	1,127.96
E-5MA	10/4/2016	115.84	1,083.59
E-5UA	10/4/2016	74.67	1,124.89
E-6UA	10/4/2016	103.91	1,118.38
E-7LA	10/4/2016	127.62	1,070.18
E-7UA	10/4/2016	76.63	1,120.78
E-8MA	10/4/2016	106.12	1,086.78
E-10MA	10/5/2016	150.51	1,093.35
E-12UA	10/4/2016	73.62	1,130.01
E-13UA	10/4/2016	78.81	1,129.82
E-14LA	10/4/2016	183.33	1,070.62
M-1MA	10/4/2016	125.90	1,084.99
M-2LA	10/4/2016	141.47	1,068.76
M-2MA	10/17/2016	122.62	1,087.44
M-2UA	10/4/2016	79.15	1,131.03
M-3MA	10/4/2016	110.79	1,094.76
M-4MA	10/4/2016	130.54	1,084.36
M-5LA	10/4/2016	154.30	1,063.15
M-5MA	10/4/2016	142.92	1,074.51
M-6MA	10/4/2016	134.80	1,082.18
M-7MA	10/4/2016	130.17	1,083.70
M-9LA	10/5/2016	165.54	1,054.98
M-9MA	10/5/2016	124.84	1,095.68
M-10LA2	10/4/2016	155.22	1,064.48
M-10MA2	10/4/2016	136.66	1,083.39
M-11MA	10/4/2016	119.60	1,091.99
M-12MA2	10/5/2016	165.27	1,062.65
M-14LA	10/4/2016	167.92	1,057.26
M-14MA	10/4/2016	132.14	1,093.06
M-15MA	10/5/2016	133.53	1,085.37
M-16LA	10/5/2016	176.40	1,051.68
M-16MA	10/5/2016	130.26	1,097.89
M-17MA/LA	10/4/2016	161.78	1,075.92
PA-1MA	10/5/2016	116.10	1,109.40
PA-2LA	10/6/2016	274.88	978.88

TABLE 2. SUMMARY OF GROUNDWATER LEVEL MEASUREMENTS TAKEN BY VERDAD, NORTH INDIAN BEND WASH AREA, SCOTTSDALE, ARIZONA, OCTOBER 2016

MONITOR WELL IDENTIFIER	MEASUREMENT DATE	DEPTH TO WATER (ft, bls)	GROUNDWATER ALTITUDE (ft, amsl)
PA-3MA	10/6/2016	124.75	1,128.70
PA-4MA	10/5/2016	112.33	1,118.59
PA-5LA***	10/13/2016	260.79	968.66
PA-6LA	10/5/2016	279.42	973.51
PA-7MA	10/5/2016	126.86	1,126.20
PA-8LA2	10/5/2016	190.72	1,037.61
PA-9LA***	10/13/2016	203.84	1,032.94
PA-10MA***	10/13/2016	150.82	1,085.98
PA-11LA*	10/4/2016	167.12	1,057.84
PA-12MA**	10/4/2016	143.39	1,081.57
PA-13LA***	10/12/2016	271.39	977.60
PA-14MA	10/4/2016	138.20	1,110.89
PA-15LA	10/3/2016	115.72	1,088.56
PA-16MA	10/3/2016	115.41	1,089.07
PA-17MA	10/5/2016	122.84	1,115.86
PA-18LA	10/5/2016	222.01	1,016.85
PA-19LA	10/4/2016	145.87	1,075.60
PA-20MA	10/4/2016	142.95	1,078.33
PA-21MA	10/5/2016	122.88	1,102.31
PA-22LA	10/3/2016	101.96	1,082.04
PA-23MA	10/3/2016	88.59	1,095.83
PG-1LA	10/3/2016	283.03	966.63
PG-2LA****	10/3/2016	319.06	952.00
PG-3UA	10/3/2016	85.82	1,118.43
PG-4MA	10/4/2016	147.50	1,080.05
PG-4UA	10/4/2016	117.45	1,110.38
PG-5MA	10/4/2016	132.42	1,081.85
PG-5UA	10/4/2016	98.10	1,116.09
PG-6MA	10/4/2016	114.97	1,097.72
PG-6UA	10/4/2016	99.54	1,113.55
PG-7MA	10/3/2016	106.12	1,091.73
PG-7UA	10/3/2016	78.89	1,118.67
PG-8UA	10/4/2016	107.61	1,114.40
PG-10UA	10/5/2016	110.02	1,130.82
PG-11UA	10/6/2016	106.32	1,124.08
PG-16UA	10/5/2016	114.44	1,127.45
PG-18UA	10/4/2016	79.41	1,122.73
PG-19UA	10/6/2016	81.74	1,122.56
PG-22UA	10/4/2016	84.31	1,125.99
PG-23MA/LA	10/4/2016	135.00	1,087.53
PG-23UA	10/4/2016	111.74	1,111.23
PG-24UA	10/4/2016	95.63	1,116.59

TABLE 2. SUMMARY OF GROUNDWATER LEVEL MEASUREMENTS TAKEN BY VERDAD, NORTH INDIAN BEND WASH AREA, SCOTTSDALE, ARIZONA, OCTOBER 2016

MONITOR WELL IDENTIFIER	MEASUREMENT DATE	DEPTH TO WATER (ft, bls)	GROUNDWATER ALTITUDE (ft, amsl)
PG-25UA	10/4/2016	85.15	1,121.39
PG-28UA	10/6/2016	106.07	1,128.88
PG-29UA	10/5/2016	102.90	1,130.14
PG-30UA	10/5/2016	99.01	1,127.35
PG-31UA	10/4/2016	109.30	1,126.16
PG-38MA/LA	10/4/2016	159.03	1,078.21
PG-39LA	10/4/2016	157.97	1,074.61
PG-40LA	10/3/2016	316.62	958.71
PG-42LA	10/3/2016	337.49	954.82
PG-43LA	10/4/2016	307.52	957.49
PG-44LA***	10/12/2016	341.09	956.50
PG-47MA	10/4/2016	132.34	1,084.34
PG-48MA	10/4/2016	142.51	1,074.33
PG-50MA	10/5/2016	161.04	1,079.92
PG-51MA	10/5/2016	161.90	1,079.01
PG-57MA	10/5/2016	120.62	1,106.41
S-1LA	10/5/2016	257.76	1,002.69
S-1MA	10/5/2016	148.94	1,111.41
S-2LA	10/6/2016	279.64	980.34
S-2MA	10/5/2016	152.52	1,107.96
W-1MA	10/5/2016	115.80	1,114.58
W-2MA	10/6/2016	148.52	1,086.57

ABBREVIATIONS:

ft, bls = feet below land surface
ft, amsl = feet above mean sea level

NOTES:

* = collected from LAU completed well at piezometer PA-11/12 located approximately 80 feet northwest of original well PA-11LA

** = collected from MAU completed well at piezometer PA-11/12 located approximately 70 feet northwest of original well PA-12MA

*** = Value remeasured due to anomalous value during initial measuring round.

**** = Compliance measurement was taken during brief period when nearby extraction well was off. Therefore, the water level measurement was not representative of the remedy. Representative depth to water value was selected from transducer data at well PG-2LA.

TABLE 3. SUMMARY OF GROUNDWATER LEVEL DIFFERENCE BETWEEN OCTOBER 2015 AND OCTOBER 2016 NORTH INDIAN BEND WASH AREA, SCOTTSDALE, ARIZONA

MONITOR WELL IDENTIFIER	ALLUVIUM UNIT	OCTOBER 2015 DEPTH TO GROUNDWATER LEVEL (ft, bls)	OCTOBER 2016 DEPTH TO GROUNDWATER LEVEL (ft, bls)	CHANGE IN DEPTH TO GROUNDWATER LEVEL (feet)
B-1	U	61.69	59.70	1.99
B-1	M	93.83	94.74	-0.91
B-J	U	68.91	67.29	1.62
D-2	M	117.67	112.03	5.64
E-1	U	82.04	81.46	0.58
E-1	M	122.94	135.33	-12.39
E-1	L	151.45	152.88	-1.43
E-2	U	96.68	97.07	-0.39
E-5	U	75.78	74.67	1.11
E-5	M	83.39	115.84	-32.45
E-6	U	103.61	103.91	-0.30
E-7	U	77.11	76.63	0.48
E-7	L	124.74	127.62	-2.88
E-8	M	103.18	106.12	-2.94
E-10	M	145.50	150.51	-5.01
E-12	U	75.18	73.62	1.56
E-13	U	80.16	78.81	1.35
E-14	L	179.85	183.33	-3.48
M-1	M	115.90	125.90	-10.00
M-2	U	80.64	79.15	1.49
M-2	M	118.85	122.62	-3.77
M-2	L	140.07	141.47	-1.40
M-3	M	107.68	110.79	-3.11
M-4	M	120.28	130.54	-10.26
M-5	M	137.42	142.92	-5.50
M-5	L	152.61	154.30	-1.69
M-6	M	125.07	134.80	-9.73
M-7	M	130.03	130.17	-0.14
M-9	M	117.88	124.84	-6.96
M-9	L	163.94	165.54	-1.60
M-10LA2	L	154.11	155.22	-1.11
M-10MA2	M	127.18	136.66	-9.48
M-11	M	115.61	119.60	-3.99
M-12MA2	M	134.91	165.27	-30.36
M-14	M	125.02	132.14	-7.12
M-14	L	165.80	167.92	-2.12
M-15	M	126.55	133.53	-6.98
M-16	M	123.57	130.26	-6.69
M-16	L	173.92	176.40	-2.48
M-17MA/LA	L	162.33	161.78	0.55
PA-1	M	111.24	116.10	-4.86
PA-2	L	276.13	274.88	1.25
PA-3	M	122.64	124.75	-2.11
PA-4	M	108.91	112.33	-3.42
PA-5***	L	256.60	260.79	-4.19
PA-6	L	280.36	279.42	0.94
PA-7	M	124.66	126.86	-2.20
PA-8LA2	L	187.09	190.72	-3.63
PA-9***	L	195.04	203.84	-8.80
PA-10***	M	139.56	150.82	-11.26
PA-11LA*	L	164.48	167.12	-2.64
PA-12MA**	M	137.29	143.39	-6.10

TABLE 3. SUMMARY OF GROUNDWATER LEVEL DIFFERENCE BETWEEN OCTOBER 2015 AND OCTOBER 2016 NORTH INDIAN BEND WASH AREA, SCOTTSDALE, ARIZONA

MONITOR WELL IDENTIFIER	ALLUVIUM UNIT	OCTOBER 2015 DEPTH TO GROUNDWATER LEVEL (ft, bls)	OCTOBER 2016 DEPTH TO GROUNDWATER LEVEL (ft, bls)	CHANGE IN DEPTH TO GROUNDWATER LEVEL (feet)
PA-13***	L	257.76	271.39	-13.63
PA-14	M	134.05	138.20	-4.15
PA-15	L	118.89	115.72	3.17
PA-16	M	113.63	115.41	-1.78
PA-17	M	115.82	122.84	-7.02
PA-18	L	229.64	222.01	7.63
PA-19	L	143.96	145.87	-1.91
PA-20	M	140.96	142.95	-1.99
PA-21	M	118.14	122.88	-4.74
PA-22	L	70.62	101.96	-31.34
PA-23	M	86.96	88.59	-1.63
PG-1	L	283.31	283.03	0.28
PG-2****	L	316.15	319.06	-2.91
PG-3	U	86.55	85.82	0.73
PG-4	U	117.69	117.45	0.25
PG-4	M	145.65	147.50	-1.85
PG-5	U	98.96	98.10	0.86
PG-5	M	130.37	132.42	-2.05
PG-6	U	100.71	99.54	1.17
PG-6	M	114.87	114.97	-0.10
PG-7	U	80.48	78.89	1.59
PG-7	M	105.13	106.12	-0.99
PG-8	U	107.98	107.61	0.37
PG-10	U	112.82	110.02	2.80
PG-11	U	104.88	106.32	-1.44
PG-16	U	113.27	114.44	-1.17
PG-18	U	80.95	79.41	1.54
PG-19	U	84.14	81.74	2.40
PG-22	U	85.17	84.31	0.86
PG-23	U	112.40	111.74	0.66
PG-23MA/LA	L	133.75	135.00	-1.25
PG-24	U	96.70	95.63	1.07
PG-25	U	86.08	85.15	0.93
PG-28	U	104.50	106.07	-1.57
PG-29	U	101.07	102.90	-1.83
PG-30	U	97.41	99.01	-1.60
PG-31	U	107.92	109.30	-1.38
PG-38MA/LA	L	155.81	159.03	-3.22
PG-39	L	155.31	157.97	-2.66
PG-40	L	317.61	316.62	0.99
PG-42	L	337.33	337.49	-0.16
PG-43	L	308.28	307.52	0.76
PG-44***	L	336.01	341.09	-5.08
PG-47	M	128.17	132.34	-4.17
PG-48	M	128.77	142.51	-13.74
PG-50	M	151.03	161.04	-10.01
PG-51	M	156.50	161.90	-5.40
PG-57	M	119.87	120.62	-0.75
S-1	M	146.05	148.94	-2.89
S-1	L	260.22	257.76	2.46
S-2	M	149.53	152.52	-2.99
S-2	L	286.58	279.64	6.94

TABLE 3. SUMMARY OF GROUNDWATER LEVEL DIFFERENCE BETWEEN OCTOBER 2015 AND OCTOBER 2016 NORTH INDIAN BEND WASH AREA, SCOTTSDALE, ARIZONA

MONITOR WELL IDENTIFIER	ALLUVIUM UNIT	OCTOBER 2015 DEPTH TO GROUNDWATER LEVEL (ft, bls)	OCTOBER 2016 DEPTH TO GROUNDWATER LEVEL (ft, bls)	CHANGE IN DEPTH TO GROUNDWATER LEVEL (feet)
W-1	M	109.84	115.80	-5.96
W-2	M	134.43	148.52	-14.09

ABBREVIATIONS:

ft, bls = feet below land surface
U = Upper Alluvium Unit monitor well
M = Middle Alluvium Unit monitor well
L = Lower Alluvium Unit monitor well

NOTES:

* = collected from LAU completed well at piezometer PA-11/12 located approximately 80 feet northwest of original well PA-11LA

** = collected from MAU completed well at piezometer PA-11/12 located approximately 70 feet northwest of original well PA-12MA

*** = Value remeasured due to anomalous value during initial measuring round.

**** = Compliance measurement was taken during brief period when nearby extraction well was off. Therefore, the water level measurement was not representative of the remedy. Representative depth to water value was selected from transducer data at well PG-2LA.

1) Wells arranged alphabetically, then by unit.

TABLE 4. 2016 LABORATORY RESULTS FOR GROUNDWATER MONITORING WELLS
NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA
(results presented in micrograms per liter, µg/L)

WELL TYPE	SAMPLE LOCATION	SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA 200	DCE 6	TCM 6	PCE 5	TCE 5	REPORT
Monitoring	B-J	B-J	10/10/2016	Original	TA	<0.50	<0.50	0.73	<0.50	2.7	550-70888
Monitoring	D-2MA	D-2MAHS	4/13/2016	Original	TA	NR [a]	NR [a]	NR [a]	NR [a]	NR [a]	550-61796
Monitoring	D-2MA	D-2 MAHS	4/26/2016	Original	TA	NR [a]	NR [a]	NR [a]	NR [a]	NR [a]	550-62381
Monitoring	D-2MA	D-2 MAHS	6/16/2016	Original	TA	<0.50 [b]	<0.50 [b]	0.69 [b]	1.7 [b]	**310/300 [b]**	550-64991
Monitoring	D-2MA	Y	6/16/2016	Duplicate	TA	<0.50 [b]	<0.50 [b]	1.3 [b]	2.9 [b]	**470/590 [b]**	550-64991
Monitoring	D-2MA	D-2MAHS	7/12/2016	Original	TA	<0.50 [c]	<0.50 [c]	1.2 [c]	2.8 [c]	**470 [c]**	550-66208
Monitoring	D-2MA	D-2MA	10/13/2016	Original	TA	<0.50	<0.50	0.70	<0.50	**8.4**	550-71154-1
Monitoring	E-1MA	E-1MA	1/8/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	3.5	550-56858
Monitoring	E-1MA	E-1MA	4/15/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**7.4**	550-61942
Monitoring	E-1MA	E-1MA	7/14/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**6.3**	550-66379
Monitoring	E-1MA	E-1MA	10/18/2016	Original	TA	<0.50	<0.50 [(1)]	<0.50	<0.50	**7.5**	550-71460
Monitoring	E-5MA	E-5MA	1/5/2016	Original	TA	<0.50	<0.50	1.5	1.1	**39**	550-56638
Monitoring	E-5MA	E-5 MAHS	4/26/2016	Original	TA	<0.50 [b]	<0.50 [b]	<0.50 [b]	<0.50 [b]	**9.7 [b]**	550-62381
Monitoring	E-5MA	V	4/26/2016	Duplicate	TA	<0.50 [b]	<0.50 [b]	<0.50 [b]	<0.50 [b]	**9.7 [b]**	550-62381
Monitoring	E-5MA	E-5MAHS	7/12/2016	Original	TA	<0.50 [c]	<0.50 [c]	<0.50 [c]	<0.50 [c]	1.8 [c]	550-66208
Monitoring	E-5MA	E-5MA	10/12/2016	Original	TA	<0.50	<0.50	1.3	0.97	**27**	550-71117
Monitoring	E-5UA	E-5UAHS	10/17/2016	Original	TA	<0.50	<0.50	<0.50	0.50	3.6	550-71361
Monitoring	E-7LA	E-7LA	10/20/2016	Original	TA	<0.50	<0.50	0.87	1.7	**10**	550-71637
Monitoring	E-7UA	E-7UA	10/12/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	1.3	550-71117
Monitoring	E-8MA	E-8MA	10/12/2016	Original	TA	<0.50	<0.50	1.4	0.62	**28**	550-71117
Monitoring	E-10MA	E-10MA	1/8/2016	Original	TA	<0.50	<0.50	0.63	3.3	3.7	550-56858
Monitoring	E-10MA	J	1/8/2016	Duplicate	TA	<0.50	<0.50	0.62	3.4	3.9	550-56858
Monitoring	E-10MA	E-10 MAHS	4/26/2016	Original	TA	<0.50	<0.50	<0.50	2.8	3.3	550-62381
Monitoring	E-10MA	E-10MAHS	7/12/2016	Original	TA	<0.50	<0.50	<0.50	1.6	2.8	550-66208
Monitoring	E-10MA	E-10MAHS	10/17/2016	Original	TA	<0.50	<0.50[(1)]	<0.50	2.8	3.1	550-71361
Monitoring	E-12UA	E-12UA	10/12/2016	Original	TA	<0.50	<0.50	0.57	<0.50	2.5	550-71117
Monitoring	E-13UA	E-13UA	10/10/2016	Original	TA	<0.50	<0.50	0.71	<0.50	2.0	550-70888
Monitoring	M-2MA	M-2MAHS	10/18/2016	Original	TA	<0.50	<0.50[(1)]	<0.50	<0.50	2.3	550-71460
Monitoring	M-2MA	AW	10/18/2016	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	2.4	550-71460
Monitoring	M-2UA	M-2UA	10/10/2016	Original	TA	<0.50	<0.50	0.88	<0.50	1.7	550-70888
Monitoring	M-4MA	7845	1/20/2016	Original	TA	<0.50	<0.50	0.53	0.54	**13**	550-57683
Monitoring	M-4MA	M-4MAHS	4/13/2016	Original	TA	<0.50	<0.50	<0.50	0.80	**14**	550-61796
Monitoring	M-4MA	M-4MAHS	7/12/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**13**	550-66208
Monitoring	M-4MA	M-4MAHS	10/17/2016	Original	TA	<0.50	<0.50[(1)]	0.50	<0.50	**12**	550-71361
Monitoring	M-5LA	M-5LA	10/18/2016	Original	TA	<0.50	<0.50[(1)]	1.6	<0.50	1.3	550-71460
Monitoring	M-5MA	M-5MA	1/6/2016	Original	TA	<0.50	<0.50	1.2	0.79	**28**	550-56717
Monitoring	M-5MA	M-5MA	4/11/2016	Original	TA	<0.50	<0.50	0.53	<0.50	**13**	550-61620
Monitoring	M-5MA	Q	4/11/2016	Duplicate	TA	<0.50	<0.50	0.51	<0.50	**12**	550-61620
Monitoring	M-5MA	M-5MA	7/13/2016	Original	TA	<0.50	<0.50	0.64	<0.50	**14**	550-66278
Monitoring	M-5MA	AD	7/13/2016	Duplicate	TA	<0.50	<0.50	0.68	<0.50	**14**	550-66278
Monitoring	M-5MA	M-5MA	10/18/2016	Original	TA	<0.50	<0.50[(1)]	0.87	0.55	**18**	550-71460
Monitoring	M-6MA	M-6MA	1/6/2016	Original	TA	<0.50	<0.50	0.73	<0.50	**14**	550-56717
Monitoring	M-6MA	M-6MA	4/11/2016	Original	TA	<0.50	<0.50	0.84	0.52	**17**	550-61620
Monitoring	M-6MA	M-6MA	7/13/2016	Original	TA	<0.50	<0.50	0.57	<0.50	**7.6**	550-66278
Monitoring	M-6MA	M-6MA	10/20/2016	Original	TA	<0.50	<0.50	0.69	<0.50	**10**	550-71637
Monitoring	M-7MA	M-7MA	10/11/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-71030
Monitoring	M-9MA	M-9MA	10/11/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	2.5	550-71030
Monitoring	M-10LA2	M-10LA2	10/21/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**7.4**	550-71605

TABLE 4. 2016 LABORATORY RESULTS FOR GROUNDWATER MONITORING WELLS NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA
(results presented in micrograms per liter, µg/L)

WELL TYPE	SAMPLE LOCATION	SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA	DCE	TCM	PCE	TCE	REPORT
						200	*6*	*6*	*5*	*5*	
Monitoring	M-10MA2	M-10MA2	1/5/2016	Original	TA	<0.50	<0.50	0.51	<0.50	**22**	550-56638
Monitoring	M-10MA2	G	1/5/2016	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	**21**	550-56638
Monitoring	M-10MA2	M-10MA	4/12/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**15**	550-61696
Monitoring	M-10MA2	R	4/12/2016	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	**14**	550-61696
Monitoring	M-10MA2	M-10MA2HS	8/29/2016	Original	TA	<0.50	0.82	1.3	0.69	**50**	550-68736
Monitoring	M-10MA2	AH	8/29/2016	Duplicate	TA	<0.50	0.83	1.2	0.62	**48**	550-68736
Monitoring	M-10MA2	M-10MA2	10/11/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**16**	550-71030
Monitoring	M-10MA2	AP	10/11/2016	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	**14**	550-71030
Monitoring	M-11MA	M-11MA	10/12/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-71117
Monitoring	M-12MA2	M-12MA2	10/12/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**13**	550-71117
Monitoring	M-12MA2	AQ	10/12/2016	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	**14**	550-71117
Monitoring	M-14LA	M-14LA	10/20/2016	Original	TA	<0.50	<0.50	1.1	4.7	**15**	550-71637
Monitoring	M-15MA	M-15MA	1/6/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**6.6**	550-56717
Monitoring	M-15MA	M-15MA	4/12/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**5.1**	550-61696
Monitoring	M-15MA	M-15MA	7/13/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	4.3	550-66278
Monitoring	M-15MA	M-15MA	10/18/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	4.7	550-71460
Monitoring	M-16LA	M-16LA	12/8/2016	Original	TA	<0.50	<0.50	1.3	3.7	**21**	550-74150
Monitoring	M-16MA	M-16MA	10/18/2016	Original	TA	<0.50	<0.50 (1)	<0.50	<0.50	**5.8**	550-71460
Monitoring	M-17MA/LA	M-17MA/LA	1/5/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**8.4**	550-56638
Monitoring	M-17MA/LA	M-17MA/LA HS	4/26/2016	Original	TA	<0.50	<0.50	0.92	<0.50	1.1	550-62381
Monitoring	M-17MA/LA	M-17MA/LAHS	7/12/2016	Original	TA	<0.50	<0.50	0.58	<0.50	0.89	550-66208
Monitoring	M-17MA/LA	M-17MA/LAHS	10/17/2016	Original	TA	<0.50	<0.50(1)	<0.50	<0.50	0.70	550-71361
Monitoring	PA-2LA	PA-2LA	10/18/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-71462
Monitoring	PA-5LA	PA-5LA	1/4/2016	Original	TA	<0.50	0.86	3.0	4.2	**75**	550-56562
Monitoring	PA-5LA	PA-5LA	4/13/2016	Original	TA	<0.50	0.98	3.3	4.7	**80**	550-61796
Monitoring	PA-5LA	PA-5LA	7/15/2016	Original	TA	<0.50	0.81	3.4	4.2	**81**	550-66446
Monitoring	PA-5LA	PA-5LA	10/13/2016	Original	TA	<0.50	0.94	3.8	4.0	**80**	550-71154-2
Monitoring	PA-6LA	PA-6LA	1/4/2016	Original	TA	<0.50	2.8	3.3	**17**	**170**	550-56562
Monitoring	PA-6LA	E	1/4/2016	Duplicate	TA	<0.50	3.0	3.7	**18**	**160**	550-56562
Monitoring	PA-6LA	PA-6LA	4/13/2016	Original	TA	<0.50	2.5	3.5	**16**	**140**	550-61799
Monitoring	PA-6LA	S	4/13/2016	Duplicate	TA	<0.50	2.5	3.5	**17**	**150**	550-61796
Monitoring	PA-6LA	PA-6LA	7/12/2016	Original	TA	<0.50	3.2	3.8	**21**	**160**	550-66208
Monitoring	PA-6LA	AB	7/12/2016	Duplicate	TA	<0.50	2.7	3.8	**16**	**170**	550-66208
Monitoring	PA-6LA	PA-6LA	10/13/2016	Original	TA	<0.50	3.6	4.2	**19**	**170**	550-71154-2
Monitoring	PA-6LA	AU	10/13/2016	Duplicate	TA	<0.50	4.1	4.6	**19**	**170**	550-71154-2
Monitoring	PA-8LA2	PA-8LA2	11/9/2016	Original	TA	<0.50	<0.50(2)	1.2	**11**	**14**	550-72679
Monitoring	PA-8LA2	BD	11/9/2016	Duplicate	TA	<0.50	<0.50(2)	1.2	**11**	**13**	550-72679
Monitoring	PA-9LA	PA-9LAHS	10/17/2016	Original	TA	<0.50	<0.50	0.69	<0.50	**13**	550-71361
Monitoring	PA-10MA	7844	1/20/2016	Original	TA	<0.50	<0.50	<0.50	0.50	**30**	550-57683
Monitoring	PA-10MA	PA-10MAHS	4/13/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**23**	550-61796
Monitoring	PA-10MA	PA-10MAHS	7/12/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**13**	550-66208
Monitoring	PA-10MA	PA-10MAHS	10/17/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**30**	550-71361
Monitoring	PA-11LA	PA-11LA	10/12/2016	Original	TA	<0.50	<0.50	1.4	<0.50	<0.50	550-71117
Monitoring	PA-12MA	PA-12MA	1/4/2016	Original	TA	<0.50	<0.50	<0.50	3.1	**230**	550-56562
Monitoring	PA-12MA	PA-12MA	4/12/2016	Original	TA	<0.50	<0.50	0.50	3.4	**250**	550-61696
Monitoring	PA-12MA	PA-12MA	7/13/2016	Original	TA	<0.50	<0.50	0.55	3.7	**260**	550-66278
Monitoring	PA-12MA	PA-12MA	10/12/2016	Original	TA	<0.50	<0.50	0.51	2.5	**240**	550-71117

TABLE 4. 2016 LABORATORY RESULTS FOR GROUNDWATER MONITORING WELLS NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA

(results presented in micrograms per liter, µg/L)

WELL TYPE	SAMPLE LOCATION	SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA	DCE	TCM	PCE	TCE	REPORT
						200	*6*	*6*	*5*	*5*	
Monitoring	PA-13LA	PA-13LAHS	4/26/2016	Original	TA	<0.50 [b]	<0.50 [b]	<0.50 [b]	<0.50 [b]	**17** [b]	550-62381
Monitoring	PA-13LA	PA-13LAHS	7/12/2016	Original	TA	<0.50 [d]	<0.50 [d]	<0.50 [d]	<0.50 [d]	**50** [d]	550-66208
Monitoring	PA-13LA	PA-13LAHS	10/17/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**74** [d]	550-71360
Monitoring	PA-15LA	PA-15LA	10/7/2016	Original	TA	<0.50	<0.50	2.1	0.66	<0.50	550-70785
Monitoring	PA-16MA	PA-16MAHS	11/9/2016	Original	TA	<0.50	<0.50(2)	<0.50	<0.50	3.2	550-72679
Monitoring	PA-18LA	PA-18LA	10/11/2016	Original	TA	<0.50	<0.50	2.4	<0.50	1.0	550-71030
Monitoring	PA-19LA	PA-19LA	10/20/2016	Original	TA	<0.50	0.99	1.8	3.0	**54**	550-71637
Monitoring	PA-20MA	PA-20MA	10/20/2016	Original	TA	<0.50	0.50	1.3	2.1	**43**	550-71637
Monitoring	PA-20MA	BA	10/20/2016	Duplicate	TA	<0.50	<0.50	1.2	2.1	**44**	550-71637
Monitoring	PA-21MA	PA-21MAHS	11/9/2016	Original	TA	<0.50	<0.50(2)	<0.50	<0.50	<0.50	550-72679
Monitoring	PA-21MA	BC	11/9/2016	Duplicate	TA	<0.50	<0.50(2)	<0.50	<0.50	<0.50	550-72679
Monitoring	PG-1LA	PG-1LA	1/5/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-56638
Monitoring	PG-1LA	PG-1LA	4/13/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-61799
Monitoring	PG-1LA	PG-1LA	7/12/2016	Original	TA	<0.50	<0.50	0.51	<0.50	<0.50	550-66208
Monitoring	PG-1LA	PG-1LA	10/7/2016	Original	TA	<0.50	<0.50	0.63	<0.50	<0.50	550-70893
Monitoring	PG-1LA	AN	10/7/2016	Duplicate	TA	<0.50	<0.50	0.59	<0.50	<0.50	550-70893
Monitoring	PG-2LA	PG-2LA	4/15/2016	Original	TA	<0.50	<0.50	0.81	2.1	**41**	550-61942
Monitoring	PG-2LA	PG-2LA	7/12/2016	Original	TA	<0.50	<0.50	0.88	2.0	**43**	550-66208
Monitoring	PG-2LA	PG-2LA	10/21/2016	Original	TA	<0.50	<0.50	0.78	1.8	**41**	550-71611
Monitoring	PG-2LA	BB	10/21/2016	Duplicate	TA	<0.50	<0.50	0.83	1.8	**42**	550-71611
Monitoring	PG-3UA	PG-3UA	10/6/2016	Original	TA	<0.50	<0.50	0.76	<0.50	2.2	550-70744
Monitoring	PG-4MA	PG-4MA	10/11/2016	Original	TA	<0.50	<0.50	0.56	<0.50	1.6	550-71030
Monitoring	PG-4UA	PG-4UA	10/17/2016	Original	TA	<0.50	<0.50(1)	0.53	**18**	0.90	550-71361
Monitoring	PG-5MA	PG-5MA	10/10/2016	Original	TA	<0.50	<0.50	1.1	0.93	**22**	550-70888
Monitoring	PG-5UA	PG-5UA	10/6/2016	Original	TA	<0.50	<0.50	0.58	<0.50	1.6	550-70744
Monitoring	PG-6MA	PG-6MA	10/10/2016	Original	TA	<0.50	1.3	3.1	3.5	**91**	550-70888
Monitoring	PG-6MA	AO	10/10/2016	Duplicate	TA	<0.50	1.4	3.3	3.6	**96**	550-70888
Monitoring	PG-6UA	PG-6UA	10/7/2016	Original	TA	<0.50	<0.50	0.77	<0.50	2.3	550-70785
Monitoring	PG-7MA	PG-7 MA	10/6/2016	Original	TA	<0.50	<0.50	0.65	<0.50	1.7	550-70744
Monitoring	PG-8UA	PG-8UA	10/11/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-71030
Monitoring	PG-10UA	PG-10UA	10/13/2016	Original	TA	<0.50	<0.50	0.64	<0.50	0.91	550-71154-1
Monitoring	PG-11UA	PG-11UA	10/6/2016	Original	TA	<0.50	<0.50	1.1	<0.50	<0.50	550-70744
Monitoring	PG-16UA	PG-16UA	10/18/2016	Original	TA	<0.50	<0.50(1)	0.66	<0.50	0.55	550-71460
Monitoring	PG-18UA	PG-18UA	10/12/2016	Original	TA	<0.50	<0.50	0.72	<0.50	1.1	550-71117
Monitoring	PG-19UA	PG-19UA	10/6/2016	Original	TA	<0.50	<0.50	0.64	<0.50	2.3	550-70744
Monitoring	PG-19UA	AM	10/6/2016	Duplicate	TA	<0.50	<0.50	0.63	<0.50	2.2	550-70744
Monitoring	PG-22UA	PG-22UAHS	11/9/2016	Original	TA	<0.50	<0.50(2)	<0.50	1.2	4.9	550-72679
Monitoring	PG-23MA/LA	PG-23MA/LA	10/17/2016	Original	TA	<0.50	<0.50(1)	1.1	1.1	**12**	550-71361
Monitoring	PG-23MA/LA	AV	10/17/2016	Duplicate	TA	<0.50	<0.50(1)	1.1	1.1	**12**	550-71361
Monitoring	PG-23UA	PG-23UA	10/11/2016	Original	TA	<0.50	<0.50	0.57	<0.50	1.7	550-71030
Monitoring	PG-24UA	PG-24UAHS	11/9/2016	Original	TA	<0.50	<0.50(2)	<0.50	<0.50	0.63	550-72679
Monitoring	PG-25UA	PG-25UAHS	11/21/2016	Original	TA	<0.50	<0.50	0.64	<0.50	2.7	550-73261
Monitoring	PG-25UA	BE	11/21/2016	Duplicate	TA	<0.50	<0.50	0.54	<0.50	2.3	550-73261
Monitoring	PG-28UA	PG-28UA	10/13/2016	Original	TA	<0.50	<0.50	1.4	<0.50	**5.1**	550-71154-1
Monitoring	PG-29UA	PG-29UA	11/9/2016	Original	TA	<0.50	<0.50(2)	0.50	<0.50	1.9	550-72679
Monitoring	PG-31UA	PG-31UAHS	11/9/2016	Original	TA	<0.50	<0.50(2)	2.3	<0.50	**13**	550-72679
Monitoring	PG-38MA/LA	PG-38MA/LAHS	10/17/2016	Original	TA	<0.50	<0.50(1)	<0.50	2.2	<0.50	550-71361
Monitoring	PG-39LA	PG-39LA	10/19/2016	Original	TA	<0.50	<0.50	1.0	2.4	4.4	550-71546

TABLE 4. 2016 LABORATORY RESULTS FOR GROUNDWATER MONITORING WELLS NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA

(results presented in micrograms per liter, µg/L)

WELL TYPE	SAMPLE LOCATION	SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA 200	DCE 6	TCM 6	PCE 5	TCE 5	REPORT
Monitoring	PG-40LA	PG-40LA	1/7/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**21**	550-56806
Monitoring	PG-40LA	I	1/7/2016	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	**21**	550-56806
Monitoring	PG-40LA	PG-40LA	4/14/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**18**	550-61891
Monitoring	PG-40LA	PG-40LA	7/11/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**13**	550-66141
Monitoring	PG-40LA	AA	7/11/2016	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	**14**	550-66141
Monitoring	PG-40LA	PG-40LA	10/19/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**16**	550-71548
Monitoring	PG-40LA	AZ	10/19/2016	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	**15**	550-71548
Monitoring	PG-42LA	PG-42LA	1/7/2016	Original	TA	<0.50	<0.50	0.60	<0.50	3.2	550-56806
Monitoring	PG-42LA	PG-42LA	4/12/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	1.8	550-61696
Monitoring	PG-42LA	PG-42LAHS	8/29/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-68736
Monitoring	PG-42LA	PG-42LA	10/19/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	3.3	550-71548
Monitoring	PG-43LA	PG-43LA	1/7/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-56806
Monitoring	PG-43LA	PG-43LA	4/12/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-61696
Monitoring	PG-43LA	PG-43LA	7/12/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-66208
Monitoring	PG-43LA	PG-43LA	10/19/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-71548
Monitoring	PG-44LA	PG-44LA	1/7/2016	Original	TA	<0.50	<0.50	2.2	<0.50	0.50	550-56806
Monitoring	PG-44LA	PG-44LA	4/12/2016	Original	TA	<0.50	<0.50	2.1	<0.50	<0.50	550-61696
Monitoring	PG-44LA	PG-44LA	7/12/2016	Original	TA	<0.50	<0.50	2.4	<0.50	<0.50	550-66208
Monitoring	PG-44LA	AC	7/12/2016	Duplicate	TA	<0.50	<0.50	2.4	<0.50	<0.50	550-66208
Monitoring	PG-44LA	PG-44LA	10/19/2016	Original	TA	<0.50	<0.50	2.6	<0.50	<0.50	550-71548
Monitoring	PG-48MA	PG-48MA	1/6/2016	Original	TA	<0.50	<0.50	1.4	0.76	**30**	550-56717
Monitoring	PG-48MA	PG-48MA	4/13/2016	Original	TA	<0.50	<0.50	1.1	0.68	**25**	550-61796
Monitoring	PG-48MA	PG-48MA	7/13/2016	Original	TA	<0.50	<0.50	1.2	0.64	**23**	550-66278
Monitoring	PG-48MA	PG-48MA	10/12/2016	Original	TA	<0.50	<0.50	1.1	0.64	**24**	550-71117
Monitoring	PG-48MA	AS	10/12/2016	Duplicate	TA	<0.50	<0.50	1.1	0.70	**24**	550-71117
Monitoring	PG-49MA	PG-49MA	10/12/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-71117
Monitoring	PG-50MA	PG-50MA	10/18/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	3.5	550-71460
Monitoring	PG-54MA	PG-54MA	10/18/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	2.5	550-71460
Monitoring	PG-54MA	AY	10/18/2016	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	2.5	550-71460
Monitoring	PG-55MA	PG-55MA	10/12/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	4.7	550-71117
Monitoring	PG-55MA	AR	10/12/2016	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	**5.1**	550-71117
Monitoring	PG-56MA	PG-56MA	10/13/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	3.3	550-71154-1
Monitoring	S-1LA	S-1LA	10/13/2016	Original	TA	<0.50	<0.50	1.0	**21**	<0.50	550-71154-1
Monitoring	S-1LA	AT	10/13/2016	Duplicate	TA	<0.50	<0.50	1.1	**20**	<0.50	550-71154-1
Monitoring	S-1MA	S-1MAHS	11/9/2016	Original	TA	<0.50	<0.50 (2)	<0.50	**5.0**	<0.50	550-72679
Monitoring	S-2LA	S-2LA	1/6/2016	Original	TA	<0.50	<0.50	0.63	<0.50	**34**	550-56717
Monitoring	S-2LA	H	1/6/2016	Duplicate	TA	<0.50	<0.50	0.70	<0.50	**34**	550-56717
Monitoring	S-2LA	S-2LA	4/15/2016	Original	TA	<0.50	<0.50	0.54	<0.50	**31**	550-61942
Monitoring	S-2LA	U	4/15/2016	Duplicate	TA	<0.50	<0.50	0.58	0.50	**31**	550-61942
Monitoring	S-2LA	S-2LA	7/15/2016	Original	TA	<0.50	<0.50	0.55	<0.50	**31**	550-66446
Monitoring	S-2LA	AF	7/15/2016	Duplicate	TA	<0.50	<0.50	0.54	<0.50	**30**	550-66446
Monitoring	S-2LA	S-2LAHS	11/9/2016	Original	TA	<0.50	<0.50 (2)	<0.50	<0.50	2.3 [e]	550-72675
Monitoring	S-2LA	S-2LA	12/8/2016	Original	TA	<0.50	<0.50	0.59	<0.50	**34**	550-74148
Monitoring	S-2LA	BG	12/8/2016	Duplicate	TA	<0.50	<0.50	0.65	<0.50	**35**	550-74148
Monitoring	S-2MA	S-2MAHS	10/17/2016	Original	TA	<0.50	<0.50	0.58	<0.50	<0.50	550-71361
Monitoring	W-1MA	W-1MA	1/5/2016	Original	TA	<0.50	<0.50	0.81	1.8	**380**	550-56638
Monitoring	W-1MA	W-1MA	4/14/2016	Original	TA	<0.50	<0.50	0.75	2.1	**410**	550-61887
Monitoring	W-1MA	W-1MA	7/14/2016	Original	TA	<0.50	<0.50	0.84	1.8	**370**	550-66379
Monitoring	W-1MA	W-1MA	10/19/2016	Original	TA	<0.50	<0.50	0.81	1.5	**310**	550-71546

TABLE 4. 2016 LABORATORY RESULTS FOR GROUNDWATER MONITORING WELLS NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA

(results presented in micrograms per liter, µg/L)

WELL TYPE	SAMPLE LOCATION	SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA	DCE	TCM	PCE	TCE	REPORT
						200	*6*	*6*	*5*	*5*	
Monitoring	W-2MA	W-2MA	1/5/2016	Original	TA	<0.50	0.51	1.1	**8.4**	**2,400**	550-56638
Monitoring	W-2MA	W-2MA	4/14/2016	Original	TA	<0.50	0.61	0.96	**9.8**	**2,100**	550-61887
Monitoring	W-2MA	T	4/14/2016	Duplicate	TA	<0.50	0.53	1.0	**9.3**	**2,000**	550-61887
Monitoring	W-2MA	W-2MA	7/14/2016	Original	TA	<0.50	<0.50	0.93	**9.0**	**2,300**	550-66379
Monitoring	W-2MA	AE	7/14/2016	Duplicate	TA	<0.50	0.51	1.0	**9.0**	**2,200**	550-66379
Monitoring	W-2MA	W-2MA	10/13/2016	Original	TA	<0.50	<0.50	1.1	**6.6**	**1,500**	550-71154-1
--	QC	FRB (Trip)	1/4/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-56562
--	QC	FRB (Trip)	1/5/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-56638
--	QC	FRB (Trip)	1/6/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-56717
--	QC	FRB (Trip)	1/7/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-56806
--	QC	FRB (Trip)	1/8/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-56858
--	QC	FRB (Trip)	4/11/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-61620
--	QC	FRB (Trip)	4/12/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-61696
--	QC	FRB (Trip)	4/13/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-61796
--	QC	FRB (Trip)	4/14/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-61887
--	QC	FRB (Trip)	4/15/2016	TB	TA	<0.50(2)	<0.50(2)	<0.50(1)(3)(4)	<0.50(1)(3)(4)	<0.50(1)(3)(4)	550-61942
--	QC	FRB (Trip)	4/26/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-62381
--	QC	FRB (Trip)	6/16/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-64991
--	QC	FRB (Trip)	7/11/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-66141
--	QC	FRB (Trip)	7/12/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-66208
--	QC	FRB (Trip)	7/13/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-66278
--	QC	FRB(Trip)	7/14/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-66379
--	QC	FRB (Trip)	7/15/2016	TB	TA	<0.50(5)	<0.50(5)	<0.50(5)	<0.50(5)	<0.50(5)	550-66446
--	QC	FRB (Trip Blank)	8/29/2016	TB	TA	<0.50(6)	<0.50(6)	<0.50(6)	<0.50(6)	<0.50(6)	550-68736
--	QC	FRB (Trip)	10/6/2016	TB	TA	<0.50	<0.50(2)	<0.50	<0.50	<0.50	550-70744
--	QC	FRB (Trip)	10/7/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-70785
--	QC	FRB (Trip)	10/10/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-70888
--	QC	FRB (Trip)	10/11/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-71030
--	QC	FRB (Trip)	10/12/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-71117
--	QC	FRB (Trip)	10/13/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-71154
--	QC	FRB (Trip)	10/17/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-71361
--	QC	FRB (Trip)	10/18/2016	TB	TA	<0.50	<0.50(1)	<0.50	<0.50	<0.50	550-71460
--	QC	FRB (Trip)	10/19/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-71546
--	QC	FRB (Trip)	10/20/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-71637
--	QC	FRB (Trip)	10/21/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-71605
--	QC	FRB (Trip)	11/9/2016	TB	TA	<0.50	<0.50(2)	<0.50	<0.50	<0.50	550-72679
--	QC	FRB (Trip)	11/21/2016	TB	TA	<0.50(2)	<0.50(1)(3)(7)	<0.50	<0.50	<0.50	550-73261
--	QC	FRB (Trip)	12/8/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-74148

ABBREVIATIONS:

TCA = 1,1,1-Trichloroethane
DCE = 1,1-Dichloroethene
TCM = Chloroform
PCE = Tetrachloroethene
TCE = Trichloroethene

ID = Identifier
TA = TestAmerica, Inc.
<0.50 = Analytical result is less than laboratory detection limit
QC = Quality Control
TB = Trip Blank
FRB = Field Reagent Blank

TABLE 4. 2016 LABORATORY RESULTS FOR GROUNDWATER MONITORING WELLS
NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA

(results presented in micrograms per liter, µg/L)

WELL TYPE	SAMPLE LOCATION	SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA	DCE	TCM	PCE	TCE	REPORT
						200	*6*	*6*	*5*	*5*	

NOTES:

[a] Samples obtained at well D-2MA on April 13 and April 26 are not representative. The HydraSleeves were not installed within the perforations. These results are not included. The well was resampled in June with the HydraSleeve installed at the proper depth within the perforations.

[b] HydraSleeve sample results for selected wells were outside expected range of results compared with samples previously obtained using the pump and purge method. Cause for the difference in results is unknown.

[c] HydraSleeve sample results for selected wells were outside expected range of results compared with samples previously obtained using the pump and purge method. Cause for the difference in results is unknown. Dedicated pumping equipment was subsequently installed prior to the October monitoring event.

[d] HydraSleeve sample results for selected wells were outside expected range of results compared with samples previously obtained using the pump and purge method. Cause for the difference in results is unknown. Concentrations are increasing and approaching historical levels.

[e] HydraSleeve sample results were outside expected range of results compared with samples previously obtained using the pump and purge method. Cause for the difference in results is unknown. Dedicated pumping equipment was problematic during the October monitoring event and was subsequently removed. A new pump was installed following this November HydraSleeve sample.

** If duplicate is greater than the original value, the duplicate was used for contouring on the plume maps.

5.0 = Cleanup Standards for Treated Water (µg/L)

5.1 Sample result exceeds Cleanup Standards for Treated Water

(1) V1 Flag: CCV recovery was above method acceptance limits. This target analyte was not detected in the sample.

(2) R6 Flag: Laboratory Fortified Blank / Laboratory Fortified Blank Duplicate (LFB / LFBD) relative percent difference (RPD) exceeded method control limit. Recovery met acceptance criteria.

(3) L5 Flag: The associated blank spike recovery was above laboratory/method acceptance limits. This analyte was not detected in the sample.

(4) R1 Flag: Relative Percent Difference/Relative Standard Deviation (RPD/RSD) exceeded the method acceptance limit.

(5) N1 Flag: The closing continuing calibration verification (CCV) and laboratory control sample duplicate (LCSD) were analyzed out of BFB tune time due to an autosampler error. All affected samples will be re-analyzed except for the following samples: (CCV 550-93833/18), (LCSD 550-93833/1018) and 550-66446-05 (trip blank) since the trip blank could not be re-analyzed due to insufficient sample volume with only one vial provided. The data have been qualified with N1 and reported, see analytical batch 550-93833.

(6) N1 Flag: Due to equipment error the closing QC could not be run. However, FRB (Trip Blank) (550-68736-8) did not have enough sample to reanalyze therefore they are being reported with an N1 flag.

(7) N1 Flag: The %RPD of the laboratory control sample (LCS) and laboratory control standard duplicate (LCSD) in analytical batch 550-103794 recovered outside control limits for the following analytes:1.1-Dichloroethene.The LCSD also recovered outside of the laboratory acceptance limits for this analyte. All samples are ND; therefore, the data is not impacted. The LCSD and samples will be reported with L5 and N1 qualifiers.

TABLE 5. 2016 LABORATORY RESULTS FOR GROUNDWATER EXTRACTION WELLS
NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA
(results presented in micrograms per liter, µg/L)

WELL TYPE	SAMPLE LOCATION	SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA 200	DCE 6	TCM 6	PCE 5	TCE 5	REPORT
AREA 7 GWETS											
Extraction	7EX-3aMA	7EX-3MA	1/14/2016	Original	TA	<0.50	<0.50	1.1	2.6	**380**	550-57288
Extraction	7EX-3aMA	7EX-3MA	4/5/2016	Original	TA	<0.50	<0.50	1.0	2.2	**330**	550-61395
Extraction	7EX-3aMA	7EX-3MA	7/13/2016	Original	TA	<0.50	<0.50	0.98	2.4	**340**	550-66401
Extraction	7EX-3aMA	7EX-3MA	10/3/2016	Original	TA	<0.50	<0.50	1.1	1.6	**270**	550-70527
Extraction	7EX-4MA	7EX-4MA	1/14/2016	Original	TA	<0.50	<0.50	0.50	3.6	**1,100**	550-57288
Extraction	7EX-4MA	7EX-4MA	4/5/2016	Original	TA	<0.50	<0.50	0.55	4.4	**1,300**	550-61395
Extraction	7EX-4MA	7EX-4MA	7/14/2016	Original	TA	<0.50	<0.50	0.70	4.6	**1,400**	550-66401
Extraction	7EX-6MA	7EX-6MA	1/14/2016	Original	TA	<0.50	<0.50	0.77	3.1	**540**	550-57288
Extraction	7EX-6MA	7EX-6MA	4/5/2016	Original	TA	<0.50	<0.50	0.82	3.5	**620**	550-61395
Extraction	7EX-6MA	7EX-6MA	7/13/2016	Original	TA	<0.50	<0.50	0.89	3.4	**640**	550-66401
Extraction	7EX-6MA	7EX-6MA	10/3/2016	Original	TA	<0.50	0.58	0.89	3.8	**640**	550-70527
CGTF											
Extraction	COS-31	COS-31	6/6/2016	Original	TA	<0.50	<0.50	0.52	0.66	**9.2**	550-64400
Extraction	COS-31	COS-31	7/5/2016	Original	TA	<0.50	<0.50	0.74	1.2	**12**	550-65792
Extraction	COS-31	COS-31	8/9/2016	Original	TA	<0.50	<0.50	0.66	1.1	**12**	550-67863
Extraction	COS-31	COS-31	10/3/2016	Original	TA	<0.50	<0.50	0.75	1.3	**14**	550-70477
Extraction	COS-71A	COS-71A	1/22/2016	Original	TA	<0.50	<0.50	1.1	1.2	**29**	550-57692
Extraction	COS-71A	L	1/22/2016	Duplicate	TA	<0.50	<0.50	1.0	0.99	**25**	550-57692
Extraction	COS-71A	COS-71A	2/2/2016	Original	TA	<0.50	<0.50	1.2	1.1	**26**	550-58123
Extraction	COS-71A	COS-71A	3/7/2016	Original	TA	<0.50	<0.50	1.1	1.1	**20**	550-59845
Extraction	COS-71A	O	3/7/2016	Duplicate	TA	<0.50	<0.50	1.1	1.1	**20**	550-59845
Extraction	COS-71A	COS-71A	4/4/2016	Original	TA	<0.50	<0.50	1.1	1.1	**19**	550-61179
Extraction	COS-71A	P	4/4/2016	Duplicate	TA	<0.50	<0.50	1.2	1.1	**19**	550-61179
Extraction	COS-71A	COS-71A	5/2/2016	Original	TA	<0.50	<0.50	1.1	1.1	**19**	550-62738
Extraction	COS-71A	W	5/2/2016	Duplicate	TA	<0.50	<0.50	1.1	1.2	**19**	550-62738
Extraction	COS-71A	COS-71A	10/3/2016	Original	TA	<0.50	<0.50	0.98	0.75	**39**	550-70477
Extraction	COS-71A	AL	10/3/2016	Duplicate	TA	<0.50	<0.50	0.89	0.79	**37**	550-70477
Extraction	COS-72	COS-72	1/8/2016	Original	TA	<0.50	<0.50	<0.50	0.77	**7.2**	550-56856
Extraction	COS-72	F	1/8/2016	Duplicate	TA	<0.50	<0.50	<0.50	0.75	**7.4**	550-56856
Extraction	COS-72	COS-72	2/22/2016	Original	TA	<0.50	<0.50	0.53	1.1	**7.9**	550-59176-2
Extraction	COS-72	COS-72	6/16/2016	Original	TA	<0.50	<0.50	0.79	4.9	**12**	550-64993
Extraction	COS-72	COS-72	7/5/2016	Original	TA	<0.50	<0.50	0.86	4.6	**12**	550-65792
Extraction	COS-75A	COS-75A	1/11/2016	Original	TA	<0.50	0.75	2.6	**7.8**	**69**	550-56905
Extraction	COS-75A	K	1/11/2016	Duplicate	TA	<0.50	1.1	2.3	**7.4**	**62**	550-56905
Extraction	COS-75A	COS-75A	2/2/2016	Original	TA	<0.50	0.95	2.2	**6.7**	**53**	550-58123
Extraction	COS-75A	M	2/2/2016	Duplicate	TA	<0.50	1.0	2.3	**6.3**	**51**	550-58123
Extraction	COS-75A	COS-75A	3/7/2016	Original	TA	<0.50	0.83	2.0	**7.3**	**50**	550-59845
Extraction	COS-75A	COS-75A	4/4/2016	Original	TA	<0.50	1.0	2.2	**7.3**	**52**	550-61179
Extraction	COS-75A	COS-75A	5/2/2016	Original	TA	<0.50	0.88	2.3	**7.5**	**50**	550-62738
Extraction	COS-75A	COS-75A	6/6/2016	Original	TA	<0.50	0.97	2.3	**6.9**	**49**	550-64400
Extraction	COS-75A	X	6/6/2016	Duplicate	TA	<0.50	<0.50	2.3	**6.9**	**48**	550-64400
Extraction	COS-75A	COS-75A	7/5/2016	Original	TA	<0.50	0.95	2.4	**6.5**	**49**	550-65792
Extraction	COS-75A	Z	7/5/2016	Duplicate	TA	<0.50	0.98	2.2	**7.0**	**49**	550-65792
Extraction	COS-75A	COS-75A	8/9/2016	Original	TA	<0.50	0.59	1.8	4.3	**36**	550-67863
Extraction	COS-75A	AG	8/9/2016	Duplicate	TA	<0.50	0.57	1.9	4.3	**35**	550-67863
Extraction	COS-75A	COS-75A	9/8/2016	Original	TA	<0.50	0.68	1.7	4.8	**36**	550-69227

TABLE 5. 2016 LABORATORY RESULTS FOR GROUNDWATER EXTRACTION WELLS
NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA
(results presented in micrograms per liter, µg/L)

WELL TYPE	SAMPLE LOCATION	SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA 200	DCE 6	TCM 6	PCE 5	TCE 5	REPORT
AREA 12 GWETS											
Extraction	MEX-1MA	MEX-1-1A-02232016	2/23/2016	Original	TA	<0.50	2.5	2.0	**5.5**	**67**	550-59204
Extraction	MEX-1MA	MEX-1-1A-03012016	3/1/2016	Original	TA	<0.50	0.51	1.5	3.9	**50**	550-59539
Extraction	MEX-1MA	MEX-1-1A-04042016	4/4/2016	Original	TA	<0.50	1.3	1.5	2.8	**41**	550-61160
Extraction	MEX-1MA	MEX-1-1A-05022016	5/2/2016	Original	TA	<0.50	1.3	1.6	3.5	**46**	550-62689
Extraction	MEX-1MA	MEX-1-1A-06062016	6/6/2016	Original	TA	<0.50	1.2	1.4	2.8	**42**	550-64382
Extraction	MEX-1MA	MEX-1-1A-07052016	7/5/2016	Original	TA	<0.50	0.92	1.5	2.8	**43**	550-65790
Extraction	MEX-1MA	MEX-1-1A-08012016	8/1/2016	Original	TA	<0.50	1.2	1.3	2.7	**39**	550-67208
Extraction	MEX-1MA	MEX-1-1A-09062016	9/6/2016	Original	TA	<0.50	1.3	1.2	2.9	**47**	550-69070
Extraction	MEX-1MA	MEX-1-1A-10032016	10/3/2016	Original	TA	<0.50	0.90	1.4	2.6	**42**	550-70449
Extraction	MEX-1MA	MEX-1-1A-11012016	11/1/2016	Original	TA	<0.50	1.4	1.5	2.5	**41**	550-72104
Extraction	MEX-1MA	MEX-1-1A-12052016	12/5/2016	Original	TA	<0.50	1.1	1.6	2.8	**48**	550-73787
Extraction	SRP23.6E6N	GR-1-1A-02232016	2/23/2016	Original	TA	<0.50	0.61	1.9	1.5	**50**	550-59204
Extraction	SRP23.6E6N	GR-1-1A-03012016	3/1/2016	Original	TA	<0.50	1.5	5.0	3.1	**130**	550-59539
Extraction	SRP23.6E6N	GR-1-1A-04042016	4/4/2016	Original	TA	<0.50	1.7	5.5	3.3	**130**	550-61160
Extraction	SRP23.6E6N	GR-1-1A-05022016	5/2/2016	Original	TA	<0.50	1.7	5.5	3.7	**130**	550-62689
Extraction	SRP23.6E6N	GR-1-1A-06062016	6/6/2016	Original	TA	<0.50	1.4	5.1	2.9	**120**	550-64382
Extraction	SRP23.6E6N	GR-1-1A-07052016	7/5/2016	Original	TA	<0.50	1.6	5.4	3.2	**120**	550-65790
Extraction	SRP23.6E6N	GR-1-1A-08012016	8/1/2016	Original	TA	<0.50	1.7	5.2	3.4	**120**	550-67208
Extraction	SRP23.6E6N	GR-1-1A-09062016	9/6/2016	Original	TA	<0.50	2.1	**6.2**	3.9	**120**	550-69070
Extraction	SRP23.6E6N	GR-1-1A-10032016	10/3/2016	Original	TA	<0.50	0.89	4.3	2.2	**88**	550-70449
Extraction	SRP23.6E6N	GR-1-1A-11012016	11/1/2016	Original	TA	<0.50	1.5	4.8	2.8	**120**	550-72104
Extraction	SRP23.6E6N	GR-1-1A-12052016	12/5/2016	Original	TA	<0.50	1.0	5.0	2.6	**120**	550-73787
NGTF											
Extraction	PCX-1	PCX-1	1/4/2016	Original	TA	<0.50	0.84	1.5	4.8	**60**	550-56543
Extraction	PCX-1	PCX-1	2/1/2016	Original	TA	<0.50	1.2	1.7	4.8	**63**	550-58028
Extraction	PCX-1	PCX-1	3/3/2016	Original	TA	<0.50	0.94	1.5	**5.4**	**60**	550-59687
Extraction	PCX-1	PCX-1	4/4/2016	Original	TA	<0.50	0.90	1.6	4.6	**56**	550-61156
Extraction	PCX-1	PCX 1	5/2/2016	Original	TA	<0.50	0.79	1.6	**5.2**	**56**	550-62691
Extraction	PCX-1	PCX-1	6/8/2016	Original	TA	<0.50	0.86	1.6	4.0	**52**	550-64585
Extraction	PCX-1	PCX-1	7/5/2016	Original	TA	<0.50	0.87	1.8	4.9	**58**	550-65770
Extraction	PCX-1	PCX-1	8/1/2016	Original	TA	<0.50	0.80	1.6	4.4	**51**	550-67209
Extraction	PCX-1	PCX-1	9/6/2016	Original	TA	<0.50	0.84	1.6	4.1	**53**	550-69076
Extraction	PCX-1	PCX-1	10/3/2016	Original	TA	<0.50	0.61	1.7	3.9	**54**	550-70455
Extraction	PCX-1	PCX-1	11/1/2016	Original	TA	<0.50	0.84	1.5	4.0	**49**	550-72103
Extraction	PCX-1	PCX-1	12/5/2016	Original	TA	<0.50	0.97	1.9	4.4	**60**	550-73786
MRTF											
Extraction	PV-14	PV14	1/4/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	0.52	550-56541
Extraction	PV-14	PV14	2/6/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-58445
Extraction	PV-14	PV14	3/1/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	2.0	550-59557
Extraction	PV-14	PV14	4/4/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	0.52	550-61159
Extraction	PV-14	PV14	5/2/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	0.68	550-62703
Extraction	PV-14	PV 14	6/6/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	1.4	550-64381
Extraction	PV-14	PV14	7/5/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	0.82	550-65769
Extraction	PV-14	PV 14	8/1/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	1.2	550-67207
Extraction	PV-14	PV14	9/6/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	1.1	550-69071
Extraction	PV-14	PV14	10/3/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	0.91	550-70456

TABLE 5. 2016 LABORATORY RESULTS FOR GROUNDWATER EXTRACTION WELLS NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA

(results presented in micrograms per liter, µg/L)

WELL TYPE	SAMPLE LOCATION	SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA 200	DCE 6	TCM 6	PCE 5	TCE 5	REPORT
Extraction	PV-14	PV14	11/1/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	1.1	550-72105
Extraction	PV-14	PV14	12/5/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	1.3	550-73788
Extraction	PV-15	PV15	1/4/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**5.8**	550-56541
Extraction	PV-15	PV15	2/6/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**5.2**	550-58445
Extraction	PV-15	PV15	3/1/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**6.0**	550-59557
Extraction	PV-15	PV15	6/21/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**6.4**	550-65173
Extraction	PV-15	PV15	7/5/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**7.3**	550-65769
Extraction	PV-15	PV15	9/6/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**7.2**	550-69071
Extraction	PV-15	PV15	10/3/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	**6.6**	550-70456
Trip/Field Blanks											
--	Area 7 [a]	Trip Blank	7/13/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-66401
--	CGTF	FRB (Trip)	1/8/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-56856
--	CGTF	FRB (Trip)	1/11/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-56905
--	CGTF	FRB (Trip)	1/22/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-57692
--	CGTF	FRB (Trip Blank)	2/2/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-58123
--	CGTF [b]	Trip Blank	2/22/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-59176-1
--	CGTF	FRB(Trip)	3/7/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-59845
--	CGTF	FRB(Trip)	4/4/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-61179
--	CGTF	FRB(Trip)	5/2/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-62738
--	CGTF	FRB(Trip)	6/6/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-64400
--	CGTF [c]	FRB(Trip)	6/16/2016	TB	TA	TB in GW cooler. See Table 4.					550-64991
--	CGTF	FRB(Trip)	7/5/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-65792
--	CGTF	FRB(Trip)	9/8/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-69227
--	CGTF [b]	FRB(Trip)	10/3/2016	TB	TA	<0.50	<0.50 (1)	<0.50	<0.50	<0.50	550-70478
--	NGTF	TB	1/4/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-56543
--	NGTF [d]	TB	2/1/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-58043
--	NGTF	TB	3/3/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-59687
--	NGTF	TB	4/4/2016	TB	TA	<0.50 (2)	<0.50 (2)	<0.50 (2)	<0.50 (2)	<0.50 (2)	550-61156
--	NGTF	TB	5/2/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-62691
--	NGTF [d]	TB	6/8/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-64523
--	NGTF	TB	7/5/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-65770
--	NGTF	TB	8/1/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-67209
--	NGTF	TB	9/6/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-69076
--	NGTF	TB	10/3/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-70455
--	NGTF [d]	TB	11/1/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-72100
--	NGTF	TB	12/5/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-73786
--	MRTF	TB	1/4/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-56541
--	MRTF	TB	2/6/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-58445
--	MRTF	TB	3/1/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-59557
--	MRTF	TB	4/4/2016	TB	TA	<0.50 (2)	<0.50 (2)	<0.50 (2)	<0.50 (2)	<0.50 (2)	550-61159
--	MRTF	TB	5/2/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-62703
--	MRTF	TB	6/6/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-64381
--	MRTF	TB	6/21/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-65173
--	MRTF	TB	7/5/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-65769
--	MRTF	TB	8/1/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-67207
--	MRTF	TB	9/6/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-69071
--	MRTF	TB	10/3/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-70456

TABLE 5. 2016 LABORATORY RESULTS FOR GROUNDWATER EXTRACTION WELLS NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA

(results presented in micrograms per liter, µg/L)

WELL TYPE	SAMPLE LOCATION	SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA *200*	DCE *6*	TCM *6*	PCE *5*	TCE *5*	REPORT
--	MRTF	TB	11/1/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-72105
--	MRTF	TB	12/5/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-73788

ABBREVIATIONS:

TCA = 1,1,1-Trichloroethane
DCE = 1,1-Dichloroethene
TCM = Chloroform
PCE = Tetrachloroethene
TCE = Trichloroethene

ID = Identifier
TA = TestAmerica, Inc.
<0.50 = Analytical result is less than laboratory detection limit
QC = Quality Control
TB = Trip Blank
FRB = Field Reagent Blank

NOTES:

** If duplicate is greater than the original value, the duplicate was used for contouring on the plume maps.

*** All Area 12 GWETS trip blanks are reported with Treatment System data in Table 9. Some Trip Blanks are reported seperately with treatment system or groundwater monitoring data. Separate reporting is as follows:

[a] Most Area 7 GWETS trip blanks accompanied Treatment System samples in the same cooler on a separate chain of custody form. Trip Blank data for these samples are reported on Table 9.

[b] CGTF samples, where noted, accompanied MRTF non-compliance production well samples in same cooler on a separate chain of custody form. Results for Trip Blank from non-compliance lab report are shown here.

[c] CGTF samples, where noted, accompanied groundwater monitoring samples in the same cooler on a separate chain of custody form. These Trip Blanks are reported on Table 4.

[d] Some NGTF samples accompanied AZPDES samples in the same cooler on a separate chain of custody form, and appear in the AZPDES sample lab report. AZPDES data is reported seperately by the facility operator to ADEQ, so Trip Blank results from separate the seperate lab reports are shown here.

5.0 = Cleanup Standards for Treated Water (µg/L)

5.2 Sample result exceeds Cleanup Standards for Treated Water

(1) R6 Flag: Laboratory Fortified Blank / Laboratory Fortified Blank Duplicate (LFB / LFBD) relative percent difference (RPD) exceeded method control limit. Recovery met acceptance criteria.

(2) N1 Flag: Method(s) 524.2: Due to an auto sampler error no closing continuing calibration verification (CCV) was analyzed. The trip blanks could not be re-analyzed due insufficient sample volume, only one vial provided. The data has been qualified with N1 and reported, see analytical batch 550-86845.

TABLE 6. SUMMARY OF 2016 MONTHLY GROUNDWATER PRODUCTION NORTH INDIAN BEND WASH AREA, SCOTTSDALE, ARIZONA

Production Well ID	Estimated Pumping Distribution Percentage			Gallons (x1000)													Total In Acre-Feet	Calculated Pumping Distribution (Acre-Feet)		
	UAU	MAU	LAU	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total		UAU	MAU	LAU
7EX-1UA	100	0	0	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	0	0.0	0.0	0.0	0.0
7EX-3aMA	0	100	0	4,257	1,674	3,643	4,943	5,180	4,795	5,136	3,747	3,958	4,186	4,391	4,516	50,426	154.8	0.0	154.8	0.0
7EX-4MA	0	100	0	1,521	594	1,390	1,944	1,880	1,633	1,840	3,589	2,328	0	0	0	16,720	51.3	0.0	51.3	0.0
7EX-5MA	0	100	0	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	0	0.0	0.0	0.0	0.0
7EX-6MA[a]	0	100	0	9,206	5,320	1,184	7,265	7,120	6,742	4,195	4,239	6,801	9,025	7,626	8,267	76,991	236.3	0.0	236.3	0.0
PV-11	0	18	82	961	13,152	53,494	77,546	79,441	74,401	76,132	71,383	68,661	76,111	76,215	60	667,557	2,048.7	0.0	368.8	1,679.9
PV-12B[b]	0	0	100	0	614	21,779	80,484	121,950	113,270	116,772	111,206	65,506	88,406	72,967	16,319	809,273	2,483.6	0.0	0.0	2,483.6
PV-14	0	0	100	70,508	86,393	95,646	92,398	94,696	91,011	93,100	93,206	88,588	89,697	89,499	83,114	1,067,856	3,277.1	0.0	0.0	3,277.1
PV-15	0	18	82	95,650	89,792	65,543	0	0	68,056	64,721	44,755	88,032	53,440	0	50,409	620,398	1,903.9	0.0	342.7	1,561.2
PV-16	0	0	100	0	0	1,870	0	7,707	20,079	38,660	21,894	2,740	28,641	3,745	6	125,342	384.7	0.0	0.0	384.7
PV-17	0	0	100	0	0	2,027	0	2,904	5,922	13,430	3,652	2,321	908	385	5	31,554	96.8	0.0	0.0	96.8
AVI **	0	100	0	3,601	3,601	3,601	3,601	3,601	3,601	3,601	3,601	3,601	3,601	3,601	3,601	43,214	132.6	0.0	132.6	0.0
AWC 7A	0	0	100	12,989	10,636	22,377	22,023	22,742	23,722	24,559	24,809	20,912	19,160	12,568	4,976	221,472	679.7	0.0	0.0	679.7
AWC 8	0	75	25	8,298	9,650	14,312	20,237	20,304	10,294	0	0	0	0	0	0	83,095	255.0	0.0	191.3	63.8
AWC 8A	0	65	35	5,300	6,545	8,056	8,084	10,445	12,031	13,944	12,163	9,507	10,395	6,243	3,855	106,568	327.0	0.0	212.6	114.5
AWC 9A	0	45	55	7,734	5,965	0	11,950	10,570	30,929	35,299	34,691	38,329	26,197	15,499	15,879	233,041	715.2	0.0	321.8	393.3
AWC 12A	0	66	34	12,973	16,396	41,719	32,733	34,083	24,538	33,123	34,308	28,196	19,321	15,264	4,625	297,279	912.3	0.0	602.1	310.2
COS 3	0	32	68	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	0.0	0.0	0.0
COS 4	0	95	5	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	0.0	0.0	0.0
COS 14	0	53	47	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	0.0	0.0	0.0
COS 25 *	0	70	30	4	91	349	1,118	1,916	2,241	2,212	978	1,667	874	0	0	11,450	35.1	0.0	24.6	10.5
COS 70	0	75	25	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	0.0	0.0	0.0
COS 71A[c]	0	19	81	60,755	66,594	87,558	87,199	47,840	0	8,464	79,064	59,915	62,427	0	0	559,816	1,718.0	0.0	326.4	1,391.6
COS 72	0	50	50	10,523	37,057	32,999	46,157	85,663	81,835	83,968	0	1,883	0	0	505	380,588	1,168.0	0.0	584.0	584.0
COS 73	2	77	21	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	0.0	0.0	0.0
COS 74	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
COS 75A	0	0	100	80,523	99,000	105,465	96,289	103,493	97,456	92,846	99,368	67,278	70,312	12,961	8,868	933,858	2,865.9	0.0	0.0	2,865.9
COS 76	0	0	100	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	0.0	0.0	0.0
COT 6	0	70	30	0	0	0	0	88,355	90,857	99,160	82,998	56,138	0	0	0	417,507	1,281.28	0.00	896.90	384.38
IBGC	10	90	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LAIRD 2	4	66	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
MDWC	0	70	30	2,504	2,178	4,164	4,957	5,364	5,202	5,316	7,414	5,448	4,540	4,967	2,433	54,486	167.2	0.0	117.0	50.2
MEX-1MA	0	100	0	0	7,980	30,100	29,220	28,940	26,700	27,210	27,640	27,390	28,950	28,220	21,360	283,710	870.7	0.0	870.7	0.0
QRIA	0	66	34	0	0	0	1,458	1,768	1,444	1,627	958	1,498	628	0	0	9,382	28.8	0.0	19.0	9.8
SRIR SCC	0	40	60	2,180	2,902	4,409	5,197	7,302	7,381	4,780	5,692	6,007	5,497	3,631	1,994	56,972	174.8	0.0	69.9	104.9
SRIR 4	0	100	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	0.0	0.0	0.0
SRIR 10	2	68	30	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	0.0	0.0	0.0

TABLE 6. SUMMARY OF 2016 MONTHLY GROUNDWATER PRODUCTION
NORTH INDIAN BEND WASH AREA, SCOTTSDALE, ARIZONA

Production Well ID	Estimated Pumping Distribution Percentage			Gallons (x1000)													Total In Acre-Feet	Calculated Pumping Distribution (Acre-Feet)		
	UAU	MAU	LAU	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total		UAU	MAU	LAU
SRP 21.5E,8N	0	100	0	0	779	0	15,084	0	0	0	2,193	0	49	0	0	18,104	55.6	0.0	55.6	0.0
SRP 22.1E,8.5N	0	100	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	0.0	0.0	0.0
SRP 22.3E,7N	2	98	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	0.0	0.0	0.0
SRP 22.4E,9N	NA	NA	NA	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	NA	NA	NA
SRP 22.5E,5.5N	0	100	0	0	0	111	0	7	0	0	0	0	94	0	0	212	0.6	0.0	0.6	0.0
SRP 22.5E,6N	0	100	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	0.0	0.0	0.0
SRP 22.5E,9.3N (PCX 1)	0	0	100	101,540	108,874	99,971	84,733	115,186	77,629	112,439	61,507	100,644	111,728	105,223	114,528	1,194,001	3,664.3	0.0	0.0	3,664.3
SRP 22.6E,10N	0	32	68	0	2,203	0	0	0	0	0	4,005	0	0	0	0	6,207	19.1	0.0	6.1	13.0
SRP 22.9E,10.8N[d]	0	50	50	0	0	0	23,898	1,000	0	785	3,259	29	94	0	0	29,066	89.2	0.0	44.6	44.6
SRP 23.3E,7.3N (COS 31)	0	57	43	0	0	0	3,168	31,342	54,799	86,829	85,007	58,265	52,739	0	0	372,149	1,142.1	0.0	651.0	491.1
SRP 23.3E,7.5N (COS 6)	1	79	20	0	0	0	0	3,555	130	297	0	72	0	0	0	4,054	12.4	0.1	9.8	2.5
SRP 23.5E,5.3N	0	70	30	0	0	0	0	1,564	3	0	0	0	209	0	0	1,776	5.45	0.0	3.82	1.64
SRP 23.5E,8.8N	0	53	47	0	0	0	0	893	33	0	0	0	10	0	0	935	2.87	0.0	1.52	1.35
SRP 23.5E,9.5N	0	0	100	0	0	0	0	0	0	0	0	153	140	59	0	352	1.1	0.0	0.0	1.1
SRP 23.5E,10.6N[e]	0	32	68	0	925	0	19,444	0	0	0	0	0	0	0	0	20,369	62.5	0.0	20.0	42.5
SRP 23.6E,6N (Granite Reef)	0	100	0	0	8,300	36,390	35,610	36,040	34,330	32,320	34,660	33,870	36,210	34,590	26,490	348,810	1,070.5	0.0	1,070.5	0.0
SRP 24E,10.5N	0	52	48	0	1,636	0	28,030	0	1,092	854	3,024	225	72	0	0	34,931	107.2	0.0	55.7	51.5
Total Monthly Discharge (Gallons x 1,000)				**491,027**	**588,850**	**738,156**	**844,768**	**982,849**	**972,157**	**1,083,618**	**965,011**	**849,962**	**803,659**	**497,654**	**371,810**	**9,189,521**				
Total Monthly Discharge (Acre-Feet)				**1,507**	**1,807**	**2,265**	**2,593**	**3,016**	**2,983**	**3,326**	**2,962**	**2,608**	**2,466**	**1,527**	**1,141**	**28,202**	**28,202**	**0**	**7,442**	**20,759**

ABBREVIATIONS:

7EX = Area 7 Extraction Wells
AB = Well Abandoned
AVI = Arcadia Vista Improvement
AWC = Arcadia Water Company
COS = City of Scottsdale
COT = City of Tempe
IBGC = Indian Bend (Rio Salado) Golf Course
LAIRD = Tempe School District No. 3
MDWC = McDowell Water Company
MEX = Motorola Extraction Well
NA = Not Available
N.I.S. = Not in Service
PV = Paradise Valley
QRIA = Quail Run Irrigation Association
SRIR = Salt River Indian Reservation
SRP = Salt River Project
SCC = Scottsdale Community College

NOTES:

* All water from Well 25 goes directly to McKellips Park irrigation and does not go to City of Scottsdale's water delivery system.
** Monthly values are based on an average of the annual total.
[a] Replacement well for 7EX-5MA
[b] Replacement well for PV-12
[c] Replacement well for COS-71
[d] Replacement well for SRP 23E,10.8N
[e] Replacement well for SRP 23.4E,10.6N

TABLE 7. SUMMARY OF ANNUAL GROUNDWATER PRODUCTION FROM 1991 THROUGH 2016 NORTH INDIAN BEND WASH AREA, SCOTTSDALE, ARIZONA

Production Well ID	Gallons (x1000)																								
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
7EX-1UA [1]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	13,514	13,654	14,585	12,966	12,627	0	0	0	0
7EX-3aMA [2]	---	---	---	---	---	---	---	---	13,170	87,375	76,401	64,048	77,690	83,654	72,475	73,094	74,020	64,062	70,290	73,227	68,454	89,646	82,936	85,411	75,046	50,426
7EX-4MA [2]	---	---	---	---	---	---	---	---	12,498	57,645	50,958	29,736	35,822	27,685	19,076	22,205	12,790	12,225	19,259	24,851	30,447	46,901	51,448	35,461	28,280	16,720
7EX-5MA [3]	---	---	---	---	---	---	---	---	---	---	---	42,094	96,280	85,914	102,191	95,534	103,234	78,932	88,997	72,160	69,657	19,315	0	0	0	0
7EX-6MA [4][a]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	25,524	76,991
PV-11	141,681	10,008	6,048	49,440	147,437	191,702	314,834	234,419	477,245	308,005	541,897	479,842	272,363	317,251	234,580	388,303	237,616	525,273	353,453	108,631	584,592	769,961	823,065	610,793	587,317	667,557
PV-12	78,760	161,849	160,265	197,764	442,311	766,800	302,222	224,958	317,991	242,826	292,758	269,215	255,925	181,905	190,159	235,528	177,350	415,980	478,840	182,527	416,242	72,486	0	AB	AB	AB
PV-12B [b]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	464,884	769,618	438,959	422,165	809,273
PV-14	697,184	578,435	747,760	670,253	556,129	387,737	203,056	584,633	575,456	512,210	487,780	593,518	632,011	677,341	771,890	387,497	632,798	232,191	149,512	451,695	854,265	930,498	696,185	1,031,782	1,097,813	1,067,856
PV-15	607,810	653,910	616,805	404,378	204,347	289,088	629,291	950,086	1,066,526	996,539	811,431	913,461	1,017,488	1,082,598	1,059,244	1,066,791	281,022	418,495	890,424	997,698	1,053,100	1,022,323	831,104	1,078,491	1,006,058	620,398
PV-16	1,170,129	1,019,287	1,131,036	1,048,376	981,234	1,067,411	1,051,729	583,415	423,634	541,894	699,049	475,143	414,571	319,872	341,430	246,221	567,698	831,067	704,898	842,941	314,954	253,545	184,509	89,102	84,721	125,342
PV-17	---	---	7,080	715,206	711,787	711,787	906,660	568,588	358,059	54,352	105,121	57,730	128,252	102,762	38,113	173,522	451,742	1,015,459	1,297,930	1,005,540	221,181	10,293	35,513	12,581	12,304	31,554
AVI	78,763	79,074	89,128	95,840	91,608	88,372	93,030	79,825	84,295	75,740	79,388	76,049	70,533	78,501	68,605	62,650	54,663	67,011	57,627	60,168	60,117	54,030	51,308	48,633	44,140	43,214
AWC 7A	77,412	338,402	401,431	424,251	374,819	340,712	190,891	223,939	298,585	305,173	276,139	220,294	229,397	170,813	176,534	45,049	40,934	51,903	63,065	39,431	155,622	263,542	229,121	280,630	299,937	221,472
AWC 8	363,078	418,945	410,874	417,285	233,147	341,332	270,555	370,570	319,651	292,498	138,800	279,501	212,209	321,431	293,885	254,674	365,994	353,379	326,794	313,928	311,522	317,644	153,290	129,982	138,410	83,095
AWC 8A	0	0	0	215,398	394,624	265,618	271,981	266,446	271,888	184,594	136,050	226,063	257,184	245,347	156,650	195,585	3,353	112,147	117,745	196,227	34,277	55,067	113,073	44,916	67,315	106,568
AWC 9A	434,580	128,063	97,615	136,891	210,374	226,053	236,429	180,337	166,739	214,811	323,119	213,268	168,569	159,197	133,705	278,127	403,515	221,656	259,969	304,614	280,265	284,404	308,515	263,003	229,236	233,041
AWC 12A	242,769	182,413	171,403	174,068	329,099	241,366	331,889	272,153	232,164	309,621	329,926	295,895	321,098	312,606	370,420	406,087	405,590	426,091	349,362	366,436	391,746	229,546	337,512	309,414	274,882	297,279
COS 2	250,311	366,789	246,573	32,587	0	0	0	0	0	0	0	0	0	0	0	0	0	AB	AB	AB	AB	AB	AB	AB	AB	AB
COS 3	226,940	237,611	371,887	410,270	406,218	322,974	386,618	363,730	260,750	91,100	156,906	142,948	129,909	95,897	162,641	2,062	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.
COS 4	42,215	39,244	47,984	95,807	56,487	28,646	84,058	146,211	159,421	328,716	411,993	310,812	347,167	308,158	445,980	17,765	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.
COS 14	116,505	71,871	214,611	317,726	343,300	265,520	238,930	229,608	306,935	396,650	91,174	0	0	0	0	0	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.
COS 25	260,701	199,541	48,721	484,574	551,724	242,256	25,618	8,730	0	0	6,482	15,627	14,628	15,460	9,442	25,372	15,728	14,472	12,850	10,148	14,398	14,801	11,768	9,929	11,903	11,450
COS 69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	AB	AB	AB	AB	AB	AB	AB	AB	AB
COS 70	133,678	2,553	43,066	390,067	110,774	55,201	93,123	2,709	0	0	0	0	0	0	0	0	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.
COS 71	0	0	6,480	502,719	234,943	1,126,972	958,101	946,903	631,967	787,926	1,013,550	432,044	764,771	638,982	387,740	826,102	492,646	697,198	725,001	557,523	371,970	475,775	370,408	12,211	AB	AB
COS 71A [c]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	52,797	505,229	559,816
COS 72	0	0	4,991	394,796	299,685	699,937	662,468	779,085	953,964	763,436	556,347	821,780	560,773	1,028,060	1,016,259	927,729	460,529	327,703	1,087,912	820,643	1,022,055	82,907	169,017	16,847	285,438	380,588
COS 73	3,271	649,298	1,007,101	3,252	795	9,743	3,157	527	0	0	0	0	0	0	0	0	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	N.I.S.
COS 74	42,763	38,042	635,564	733,867	825,076	460,914	396,669	790,408	918,226	1,092,783	1,165,908	1,003,371	955,818	1,098,504	1,172,087	424,447	325,721	318,930	426,465	469,534	139,478	382,838	155,871	193,017	65	0
COS 75A	0	0	0	0	452,657	796,408	892,870	951,517	830,739	896,406	979,506	836,006	933,512	926,306	936,472	929,487	559,788	821,026	878,726	841,481	848,597	917,870	1,108,302	987,970	777,406	933,858
COS 76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.
COS 77	0	3,088	1,103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	AB	AB	AB	AB	AB	AB	AB	AB	AB
COS 78	999,204	328	1,029	650	0	0	3,099	0	0	0	0	0	0	0	0	0	0	AB	AB	AB	AB	AB	AB	AB	AB	AB
COT 6	150	1,668	2,777	10,122	3,441	160,308	4,197	0	0	446,480	734,304	221,080	26,831	0	22,571	390	0	153	1,666	389,936	355,018	9	506,354	369,685	385,707	417,507
IBGC	69,987	59,242	65,845	66,839	61,266	79,697	75,740	68,887	344	28,365	64,996	69,982	62,855	65,938	59,087	63,778	63,778	69,938	59,199	60,546	56,053	37,910	68,382	0	NA	NA
LAIRD 2	8,178	1,453	1,827	964	1,655	1,655	4,650	1,573	8,432	9,857	0	0	0	0	0	3,853	3,853	322	530	357	285	365	558	412	119	0
MDWC	27,289	27,835	53,587	62,535	58,707	66,855	62,060	59,829	67,278	72,475	59,485	53,208	51,864	45,985	1,352	50,081	50,046	54,355	46,873	48,614	42,379	43,956	37,426	36,964	39,853	54,486
MEX-1MA [5]	---	---	---	---	---	---	---	---	34,348	256,586	361,409	227,273	119,380	315,708	309,919	311,978	332,752	405,260	394,010	407,090	398,980	273,270	318,740	223,710	200,600	283,710
QRIA	17,503	16,001	13,437	12,768	13,407	14,166	17,274	16,544	19,832	8,863	16,435	15,212	14,628	13,541	12,883	15,665	14,333	14,718	12,962	10,837	12,140	10,965	11,727	10,510	10,921	9,382
SRIR SCC	86,231	86,231	78,736	91,777	79,599	84,063	77,791	36,374	69,629	78,217	76,349	76,153	65,411	68,046	76,319	82,780	61,274	68,592	74,861	42,721	67,924	74,567	56,762	65,405	60,768	56,972
SRIR 4	60,580	7,771	0	31,631	3	0	248	38	0	0	0	0	0	0	0	0	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.
SRIR 10	47,583	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.

TABLE 7. SUMMARY OF ANNUAL GROUNDWATER PRODUCTION FROM 1991 THROUGH 2016 NORTH INDIAN BEND WASH AREA, SCOTTSDALE, ARIZONA

Production Well ID	Gallons (x1000)																								
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SRP 21.5E,8N	74,479	2,829	5,090	59,887	17,536	19,600	0	1,302	213,170	454,442	247,362	160,470	166,324	254,063	28,797	0	0	0	3,397	5,321	13,803	114,214	116,117	208,382	73,131	18,104
SRP 22.1E,8.5N	147,778	103,488	14,221	78,782	3,189	21,219	25	1,051	8	488,285	214,764	3,126	0	7,299	0	0	0	0	0	0	0	0	0	0	0	N.I.S.
SRP 22.3E,7N	0	0	0	0	756	22	0	0	0	0	0	0	0	0	0	0	0	N.I.S.	0	0	0	0	0	0	0	N.I.S.
SRP 22.4E,9N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.
SRP 22.5E,5.5N	0	0	0	0	0	0	0	0	0	0	123,673	264,377	0	0	0	0	0	0	0	0	0	0	64,101	0	88	212
SRP 22.5E,6N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N.I.S.	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.
SRP 22.5E,9.3N (PCX 1)[(6)]	---	---	---	---	---	---	744,308	1,169,490	928,957	1,094,148	709,461	1,080,881	1,032,519	1,002,262	1,003,406	1,109,259	983,481	856,322	1,012,745	1,008,500	891,933	971,762	1,000,902	478,633	1,076,158	1,194,001
SRP 22.6E,10N	195,626	9,773	4,636	184,709	22,836	99,731	0	85	261,217	613,096	583,486	699,074	935,270	828,047	97,937	103,237	289,257	79,268	62,767	30,503	66,444	290,043	68,455	228,571	63,629	6,207
SRP 22.9E,10.8N[d]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	128,034	173,499	305,492	183,239	29,066
SRP 23E,10.8N (COS5W)	137,618	60,933	6,744	33,979	115,096	7,607	15,747	5,701	154,864	350,263	337,880	148,376	447,267	174,920	14,322	21,004	120,014	N.I.S.	AB	AB	AB	AB	AB	AB	AB	AB
SRP 23.3E,7.3N (COS 31)	0	1,305	21,834	1,007,196	15,974	1,222,373	973,894	493,236	916,864	748,167	983,356	1,091,407	1,019,344	516,934	826,859	560,651	309,239	655,172	5,133	118,375	454,664	713,491	257,409	489,661	208,113	372,149
SRP 23.3E,7.5N (COS 6)	156,795	24,127	-3	35,527	47,921	192,207	168,263	246,769	101,318	62,194	102,249	80,341	138,380	88,935	1,638	1,769	175,013	0	0	0	0	0	0	0	7,723	4,054
SRP 23.4E,10.6N (COS5E)	507,724	565,069	578,233	658,438	663,544	757,582	723,706	779,598	832,331	566,682	392,775	278,701	470,274	576,706	30,001	0	0	N.I.S.	AB	AB	AB	AB	AB	AB	AB	AB
SRP 23.5E,5.3N	122,870	3,077	4,077	3,271	4,920	2,856	0	34,473	111,366	144,215	126,690	226,058	128,631	255,259	3,348	0	78,673	0	2,941	0	0	0	0	7	6,194	1,776
SRP 23.5E,8.8N	66,487	1,775	557	2,556	7,176	52	49	685	1,499	132,274	70,905	21,050	213,020	241,944	1,505	2,922	134,579	0	1,551	0	965	0	531	3	101	935
SRP 23.5E,9.5N	0	0	0	0	0	0	0	85	502	117,592	131	99,548	30,042	256,542	2,051	1,988	163,479	0	2,021	0	1,303	33	15,054	163	0	352
SRP 23.5E,10.6N[e]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	83,907	191,216	217,193	115,912	20,369
SRP 23.6E,6N (Granite Reef)	0	0	0	0	0	0	0	0	104,439	287,660	174,199	319,110	180,870	42,938	58,781	173,699	44,516	99,160	79,599	70,470	79,880	70,110	77,410	195,150	305,880	348,810
SRP 24E,10.5N	113,065	3,151	578,233	113,496	16,493	122,709	2,124	2,397	381,364	470,577	408,894	616,127	528,528	428,180	31,260	45,701	188,758	11,621	9,319	0	411	204,488	323,257	332,586	138,399	34,931
Total Discharge (Gallons x1000)	7,807,696	6,154,481	7,898,386	10,369,940	9,092,091	11,779,250	11,417,355	11,676,917	12,887,663	14,970,743	14,519,488	13,549,998	13,527,407	13,461,492	10,741,611	9,632,587	8,679,775	9,333,593	10,142,344	9,947,259	9,698,087	9,788,023	9,770,464	8,894,456	8,849,725	9,189,521
Total Discharge (Acre-Feet)	23,961	18,887	24,239	31,824	27,903	36,149	35,039	35,835	39,551	45,943	44,559	41,583	41,514	41,312	32,965	29,561	26,637	28,644	31,126	30,527	29,762	30,038	29,984	27,296	27,159	28,202

ABBREVIATIONS:

- 7EX = Area 7 Extraction Wells
- AB = Well Abandoned
- AVI = Arcadia Vista Improvement
- AWC = Arcadia Water Company
- COS = City of Scottsdale
- COT = City of Tempe
- IBGC = Indian Bend (Rio Salado) Golf Course
- LAIRD = Tempe School District No. 3
- MDWC = McDowell Water Company
- MEX = Motorola Extraction Well
- NA = Not available
- N.I.S. = Not in Service
- PV = Paradise Valley
- QRIA = Quail Run Irrigation Association
- SRIR = Salt River Indian Reservation
- SRP = Salt River Project
- --- = No Data

NOTES:

(1) Extraction well 7EX-1UA went into service in 2008.
(2) Extraction wells 7EX-3MA and 7EX-4MA went into service in September 1999.
(3) Extraction well 7EX-5MA went into service in February 2002.
(4) Extraction well 7EX-6MA went into service in October 13, 2015.
(5) Well MEX-1MA went into service in October 1999.
(6) Well 22.5E,9.3N (PCX-1) went into service in April 1997.

[a] Replacement well for 7EX-5MA
[b] Replacement well for PV-12
[c] Replacement well for COS 71
[d] Replacement well for SRP 23E,10.8N
[e] Replacement well for SRP 23.4E,10.6N

TABLE 8. SUMMARY OF 2016 NIBW EXTRACTION WELL PUMPAGE AND ESTIMATED TCE MASS REMOVED
NORTH INDIAN BEND WASH AREA, SCOTTSDALE, ARIZONA

			Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	TOTALS	ANNUAL PUMPAGE (in acre-feet)	ANNUAL PUMPAGE (in gpm)
CGTF	COS-31	pumpage	-	-	-	3,167.8	31,341.8	54,799.2	86,829.3	85,007.2	58,264.7	52,738.7	-	-	372,149	1,142	708
		[TCE]	-	-	-	5.5	6.4	9.2	12.	12.	12.4	14.	-	-	6		
		est TCE mass	-	-	-	0.1	1.7	4.2	8.7	8.5	6.	6.2	-	-	35		
	COS-71A	pumpage	60,754.9	66,593.9	87,558.	87,199.3	47,839.8	-	8,464.3	79,064.2	59,914.9	62,426.6	-	-	559,816	1,718	1,065
		[TCE]	29.	26.	20.	19.	19.	-	52.6	43.6	24.3	39.	-	-	23		
		est TCE mass	14.7	14.4	14.6	13.8	7.6	-	3.7	28.8	12.1	20.3	-	-	130		
	COS-72	pumpage	10,522.5	37,056.7	32,998.7	46,157.2	85,663.3	81,834.7	83,967.9	-	1,882.7	-	-	504.7	380,588	1,168	724
		[TCE]	7.2	7.9	8.7	12.7	11.7	12.	12.	-	12.	-	-	12.	8		
		est TCE mass	0.6	2.4	2.4	4.9	8.4	8.2	8.4	-	0.2	-	-	0.1	36		
	COS-75A	pumpage	80,523.2	99,000.3	105,465.2	96,288.9	103,493.4	97,455.7	92,845.7	99,368.1	67,277.6	70,311.5	12,960.6	8,868.1	933,858	2,866	1,777
		[TCE]	69.	53.	50.	52.	50.	49.	49.	36.	36.	60.6	58.6	56.6	52		
		est TCE mass	46.4	43.8	44.	41.8	43.2	39.9	38.	29.9	20.2	35.6	6.3	4.2	393		
	TOTAL	pumpage	151,800.7	202,650.9	226,022.	232,813.1	268,338.2	234,089.5	272,107.2	263,439.5	187,339.9	185,476.9	12,960.6	9,372.8	**2,246,411**	**6,894**	**4,274**
		est TCE mass	61.7	60.7	61.	60.6	60.8	52.3	58.8	67.1	38.6	62.	6.3	4.2	**594**		
MRTF	PV-14	pumpage	70,508.	86,393.	95,646.	92,398.	94,696.	91,011.	93,100.	93,206.	88,588.	89,697.	89,499.	83,114.	1,067,856	3,277	2,032
		[TCE]	0.5	0.5	2.	0.5	0.7	1.4	0.8	1.2	1.1	0.9	1.1	1.3	1		
		est TCE mass	0.3	0.4	1.6	0.4	0.5	1.1	0.6	0.9	0.8	0.7	0.8	0.9	9		
	PV-15	pumpage	95,650.	89,792.	65,543.	-	-	68,056.	64,721.	44,755.	88,032.	53,440.	-	50,409.	620,398	1,904	1,180
		[TCE]	5.8	5.2	6.	-	-	6.4	7.3	7.3	7.2	6.6	-	6.6	5		
		est TCE mass	4.6	3.9	3.3	-	-	3.6	3.9	2.7	5.3	2.9	-	2.8	33		
	TOTAL	pumpage	166,158.	176,185.	161,189.	92,398.	94,696.	159,067.	157,821.	137,961.	176,620.	143,137.	89,499.	133,523.	**1,688,254**	**5,181**	**3,212**
		est TCE mass	4.9	4.3	4.9	0.4	0.5	4.7	4.6	3.7	6.1	3.6	0.8	3.7	**42**		
NGTF	PCX-1	pumpage	101,540.1	108,873.8	99,970.9	84,733.1	115,185.6	77,629.4	112,438.6	61,506.8	100,643.5	111,727.6	105,223.5	114,528.3	1,194,001	3,664	2,272
		$Discharge_{Canal}$	101,140.4	108,660.4	99,660.8	84,529.9	115,034.5	77,554.2	112,280.1	61,393.9	100,453.1	111,286.6	91,456.3	106,604.4	1,170,055	3,591	2,226
		$Discharge_{CWTP}$	77.4	-	-	-	-	-	83.3	-	99.6	-	13,586.7	7,625.4	21,472	66	41
		[TCE]	60.	63.	60.	56.	56.	52.	58.	51.	53.	54.	49.	60.	56		
		est TCE mass	50.8	57.2	50.1	39.6	53.8	33.7	54.4	26.2	44.5	50.3	43.	57.3	**561**		
AREA 7 GWETS	7EX-3aMA	pumpage	4,257.	1,674.1	3,642.6	4,942.7	5,179.7	4,794.7	5,136.2	3,747.3	3,958.3	4,185.7	4,391.1	4,516.4	50,426	155	96
		[TCE]	380.	350.	350.	330.	330.	330.	340.	340.	340.	270.	270.	270.	325		
		est TCE mass	13.5	4.9	10.6	13.6	14.3	13.2	14.6	10.6	11.2	9.4	9.9	10.2	136		
	7EX-4MA	pumpage	1,521.5	594.	1,390.4	1,943.8	1,879.5	1,633.3	1,840.3	3,589.3	2,328.1	-	-	-	16,720	51	32
		[TCE]	1,100.	1,200.	1,200.	1,300.	1,300.	1,300.	1,400.	1,400.	1,400.	-	-	-	967		
		est TCE mass	14.	5.9	13.9	21.1	20.4	17.7	21.5	41.9	27.2	-	-	-	184		
	7EX-6MA	pumpage	9,205.6	5,319.9	1,184.2	7,264.8	7,120.1	6,742.4	4,195.	4,238.8	6,801.3	9,025.4	7,625.9	8,267.3	76,991	236	146
		[TCE]	540.	650.	650.	620.	620.	620.	640.	640.	640.	640.	640.	640.	628		
		est TCE mass	41.5	28.9	6.4	37.6	36.8	34.9	22.4	22.6	36.3	48.2	40.7	44.2	401		
	TOTAL	pumpage	14,984.	7,588.	6,217.1	14,151.4	14,179.3	13,170.4	11,171.4	11,575.4	13,087.8	13,211.1	12,017.1	12,783.7	**144,137**	**442**	**274**
		est TCE mass	68.9	39.7	31.	72.3	71.5	65.8	58.5	75.2	74.8	57.6	50.6	54.3	**720**		
AREA 12 GWETS	MEX-1MA	pumpage	-	7,980.	30,100.	29,220.	28,940.	26,700.	27,210.	27,640.	27,390.	28,950.	28,220.	21,360.	283,710	871	540
		[TCE]	-	67.	50.	41.	46.	42.	43.	39.	47.	42.	41.	48.	42		
		est TCE mass	-	4.5	12.6	10.	11.1	9.4	9.8	9.	10.7	10.1	9.7	8.6	105		
	SRP 23.6E6N	pumpage	-	8,300.	36,390.	35,610.	36,040.	34,330.	32,320.	34,660.	33,870.	36,210.	34,590.	26,490.	348,810	1,070	664
		[TCE]	-	50.	130.	130.	130.	120.	120.	120.	120.	88.	120.	120.	104		
		est TCE mass	-	3.5	39.5	38.6	39.1	34.4	32.4	34.7	33.9	26.6	34.6	26.5	344		
	TOTAL	pumpage	-	16,280.	66,490.	64,830.	64,980.	61,030.	59,530.	62,300.	61,260.	65,160.	62,810.	47,850.	**632,520**	**1,941**	**1,203**
		est TCE mass	-	7.9	52.	48.6	50.2	43.7	42.1	43.7	44.7	36.7	44.3	35.1	**449**		
														Total Pumping (in million gallons):	**5,905**	--	--
														Total Pumping (in acre-feet):	--	**18,123**	--
														TCE Mass Removal (in pounds):	**2,367**	--	--
														Total Pumping (in gpm):	--	--	**11,235**

EXPLANATION:

1) [TCE] = Concentration of trichloroethene, in micrograms per liter (μg/L) .
2) Most TCE results listed are as reported from TestAmerica; where PCs samples(s) not available, City of Scottsdale (COS) sample results may be used. Where multiple samples were collected during the same month, the value shown is the average of those results. Where samples were not able to be collected (e.g., extraction well was offline during scheduled sampling date), but a well operated during the month, TCE value used comprises the results (or average results) of samples obtained during previous or subsequent months.
3) Estimated TCE mass reported is in pounds.
4) Pumpage values reported is in thousands of gallons (x1000).
5) gpm = gallons per minute
6) CWTP = Chaparral Water Treatment Plant
7) Well 7EX-6MA was drilled, constructed, and tested during June through August 2015. Operation of 7EX-6MA as a remedial extraction well began on October 13, 2015.
8) Area 12 was not operating in January due to annual SRP canal dry-up.

\- Indicates well was not pumped, therefore no sample was taken and no TCE was removed.

North Indian Bend Wash Superfund Site

TABLE 9. 2016 LABORATORY RESULTS FOR TREATMENT SYSTEM SAMPLES
NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA
(results presented in micrograms per liter, µg/L)

SAMPLE LOCATION	FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA 200	DCE 6	TCM 6	PCE 5	TCE 5	Report
AREA 7 GWETS										
SP-102 (influent)	SP-102	1/14/2016	Original	TA	<0.50	<0.50	0.74	3.0	**690**	550-57289
SP-102 (influent)	SP-102	2/4/2016	Original	TA	<0.50	<0.50	0.81	3.6	**680**	550-58450
SP-102 (influent)	SP-102	3/14/2016	Original	TA	<0.50	<0.50	0.72	2.8	**540**	550-60340
SP-102 (influent)	SP-102	4/5/2016	Original	TA	<0.50	<0.50	0.85	3.7	**690**	550-61396
SP-102 (influent)	SP-102	5/2/2016	Original	TA	<0.50	<0.50	0.97	4.1	**590**	550-62725
SP-102 (influent)	SP-102	6/6/2016	Original	TA	<0.50	<0.50	0.90	3.6	**630**	550-64402
SP-102 (influent)	SP-102	7/13/2016	Original	TA	<0.50	<0.50	0.93	3.8	**680**	550-66403
SP-102 (influent)	SP-102	8/11/2016	Original	TA	<0.50	<0.50	0.80	3.1	**640**	550-67912
SP-102 (influent)	SP-102	9/9/2016	Original	TA	<0.50	<0.50	0.86	3.6	**720**	550-69294
SP-102 (influent)	SP-102	10/3/2016	Original	TA	<0.50	<0.50	1.1	3.0	**500**	550-70528
SP-102 (influent)	SP-102	11/7/2016	Original	TA	<0.50	<0.50	0.83	3.0	**530**	550-72499
SP-102 (influent)	SP-102	12/6/2016	Original	TA	<0.50	<0.50	0.84	3.1	**480**	550-73997
SP-103 (UV/Ox effluent)	SP-103	1/14/2016	Original	TA	<0.50	<0.50	0.79	1.9	**260**	550-57289
SP-103 (UV/Ox effluent)	SP-103	2/4/2016	Original	TA	<0.50	<0.50	0.80	1.9	**240**	550-58450
SP-103 (UV/Ox effluent)	SP-103	3/14/2016	Original	TA	<0.50	<0.50	0.64	1.6	**230**	550-60340
SP-103 (UV/Ox effluent)	SP-103	4/5/2016	Original	TA	<0.50	<0.50	0.81	1.7	**210**	550-61396
SP-103 (UV/Ox effluent)	SP-103	5/2/2016	Original	TA	<0.50	0.73	0.90	2.2	**240**	550-62725
SP-103 (UV/Ox effluent)	SP-103	6/6/2016	Original	TA	<0.50	<0.50	0.89	1.7	**200**	550-64402
SP-103 (UV/Ox effluent)	SP-103	7/13/2016	Original	TA	<0.50	0.52	0.93	1.4	**130**	550-66403
SP-103 (UV/Ox effluent)	SP-103	8/11/2016	Original	TA	<0.50	2.7	0.78	2.1	**420**	550-67912
SP-103 (UV/Ox effluent)	SP-103	9/9/2016	Original	TA	<0.50	2.6	0.87	2.2	**470**	550-69294
SP-103 (UV/Ox effluent)	SP-103	10/3/2016	Original	TA	<0.50	<0.50	0.95	0.97	**140**	550-70528
SP-103 (UV/Ox effluent)	SP-103	11/7/2016	Original	TA	<0.50	<0.50	0.88	1.3	**170**	550-72499
SP-103 (UV/Ox effluent)	SP-103	12/6/2016	Original	TA	<0.50	2.5	0.89	1.9	**330**	550-73997
SP-105 (Air Stripper Effluent)	SP-105	1/14/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-57289
SP-105 (Air Stripper Effluent)	SP-105	2/4/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-58450
SP-105 (Air Stripper Effluent)	SP-105	3/14/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-60340
SP-105 (Air Stripper Effluent)	SP-105	4/5/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-61396
SP-105 (Air Stripper Effluent)	SP-105	5/2/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-62725
SP-105 (Air Stripper Effluent)	SP-105	6/6/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-64402
SP-105 (Air Stripper Effluent)	SP-105	7/13/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-66403
SP-105 (Air Stripper Effluent)	SP-105	8/11/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-67912
SP-105 (Air Stripper Effluent)	SP-105	9/9/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-69294
SP-105 (Air Stripper Effluent)	SP-105	10/3/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-70528
SP-105 (Air Stripper Effluent)	SP-105	11/7/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-72499
SP-105 (Air Stripper Effluent)	SP-105	12/6/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	0.79	550-73997
AREA 12 GWETS										
WSP-1 (Influent)	WSP-1-1A-02232016	2/23/2016	Original	TA	<0.50	1.5	2.0	3.2	**57**	550-59204
WSP-1 (Influent)	WSP-1-1A-03012016	3/1/2016	Original	TA	<0.50	1.5	3.5	3.4	**92**	550-59539
WSP-1 (Influent)	WSP-1-1A-04042016	4/4/2016	Original	TA	<0.50	1.6	3.7	2.9	**89**	550-61160
WSP-1 (Influent)	WSP-1-1A-05022016	5/2/2016	Original	TA	<0.50	1.6	3.6	3.4	**92**	550-62689
WSP-1 (Influent)	WSP-1-1A-06062016	6/6/2016	Original	TA	<0.50	1.5	3.7	2.8	**86**	550-64382
WSP-1 (Influent)	WSP-1-1A-07052016	7/5/2016	Original	TA	<0.50	1.6	4.1	3.5	**98**	550-65790
WSP-1 (Influent)	WSP-1-1A-08012016	8/1/2016	Original	TA	<0.50	1.6	3.5	3.1	**87**	550-67208
WSP-1 (Influent)	WSP-1-1A-09062016	9/6/2016	Original	TA	<0.50	1.8	4.2	3.4	**85**	550-69070
WSP-1 (Influent)	WSP-1-1A-10032016	10/3/2016	Original	TA	<0.50	1.6	4.2	2.9	**91**	550-70449

TABLE 9. 2016 LABORATORY RESULTS FOR TREATMENT SYSTEM SAMPLES
NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA
(results presented in micrograms per liter, µg/L)

SAMPLE LOCATION	FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA 200	DCE 6	TCM 6	PCE 5	TCE 5	Report
AREA 12 GWETS (continued)										
WSP-1 (Influent)	WSP-1-1A-11012016	11/1/2016	Original	TA	<0.50	1.6	3.5	2.8	**88**	550-72104
WSP-1 (Influent)	WSP-1-1A-12052016	12/5/2016	Original	TA	<0.50	1.6	4.0	2.8	**96**	550-73787
WSP-2 (Air Stripper Effluent)	WSP-2-1A-02232016	2/23/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-59192
WSP-2 (Air Stripper Effluent)	WSP-2-1A-03012016	3/1/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-59493
WSP-2 (Air Stripper Effluent)	WSP-2-1A-04042016	4/4/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-61154
WSP-2 (Air Stripper Effluent)	WSP-2-1A-05022016	5/2/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-62690
WSP-2 (Air Stripper Effluent)	WSP-2-1A-06062016	6/6/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-64380
WSP-2 (Air Stripper Effluent)	WSP-2-1A-07052016	7/5/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-65753
WSP-2 (Air Stripper Effluent)	WSP-2-1A-08012016	8/1/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-67192
WSP-2 (Air Stripper Effluent)	WSP-2-1A-09062016	9/6/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-69059
WSP-2 (Air Stripper Effluent)	WSP-2-1A-10032016	10/3/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-70447
WSP-2 (Air Stripper Effluent)	WSP-2-1A-11012016	11/1/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-72097
WSP-2 (Air Stripper Effluent)	WSP-2-1A-12052016	12/5/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-73784
MRTF										
Tower 1 Effluent	Tower 1	1/4/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-56541
Tower 1 Effluent	Tower 1	2/6/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-58445
Tower 1 Effluent	Tower 1	3/1/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-59557
Tower 1 Effluent	Tower 1	6/21/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-65173
Tower 1 Effluent	Tower 1	7/5/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-65769
Tower 1 Effluent	Tower 1	9/6/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-69071
Tower 1 Effluent	Tower 1	10/3/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-70456
Tower 2 Effluent	Tower 2	9/6/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-69071
Tower 2 Effluent	Tower 2	10/3/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-70456
Tower 2 Effluent	Tower 2	11/1/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-72105
Tower 2 Effluent	Tower 2	12/5/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-73788
Tower 3 Effluent	Tower 3	1/4/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-56541
Tower 3 Effluent	Tower 3	2/6/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-58445
Tower 3 Effluent	Tower 3	3/1/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-59557
Tower 3 Effluent	Tower 3	4/4/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-61159
Tower 3 Effluent	Tower 3	5/2/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-62703
Tower 3 Effluent	Tower 3	6/6/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-64381
Tower 3 Effluent	Tower 3	7/5/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-65769
Tower 3 Effluent	Tower 3	8/1/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-67207
NGTF										
NGTF Influent*	NGTF - INF	1/4/2016	Original	TA	<0.50	0.94	1.5	**5.0**	**61**	550-56546
NGTF Influent*	NGTF - INF	1/11/2016	Original	TA	<0.50	1.1	1.8	**5.7**	**71**	550-56914
NGTF Influent*	NGTF - INF	1/19/2016	Original	TA	<0.50	1.1	1.7	**5.3**	**64**	550-57454
NGTF Influent*	NGTF - INF	1/25/2016	Original	TA	<0.50	0.85	1.5	**5.0**	**61**	550-57729
NGTF Influent*	NGTF - INF	2/1/2016	Original	TA	<0.50	1.1	1.6	**5.1**	**64**	550-58036
NGTF Influent*	NGTF - INF	2/8/2016	Original	TA	<0.50	1.2	1.6	**5.0**	**64**	550-58473
NGTF Influent*	NGTF - INF	2/16/2016	Original	TA	<0.50	0.91	1.8	4.8	**59**	550-58914
NGTF Influent*	NGTF - INF	2/22/2016	Original	TA	<0.50	0.96	1.6	4.7	**59**	550-59166
NGTF Influent*	NGTF - INF	2/29/2016	Original	TA	<0.50	0.91	1.7	**5.4**	**63**	550-59464
NGTF Influent*	NGTF - INF	3/7/2016	Original	TA	<0.50	0.92	1.6	**5.4**	**60**	550-59835
NGTF Influent*	NGTF - INF	3/14/2016	Original	TA	<0.50	0.99	1.7	**5.9**	**63**	550-60269
NGTF Influent*	NGTF - INF	3/21/2016	Original	TA	<0.50	1.0	1.7	**5.1**	**63**	550-60587

TABLE 9. 2016 LABORATORY RESULTS FOR TREATMENT SYSTEM SAMPLES
NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA

(results presented in micrograms per liter, µg/L)

SAMPLE LOCATION	FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA	DCE	TCM	PCE	TCE	Report
					200	*6*	*6*	*5*	*5*	
NGTF (continued)										
NGTF Influent*	NGTF - INF	3/28/2016	Original	TA	<0.50	0.98	1.8	**5.0**	**64**	550-60876
NGTF Influent*	NGTF - INF	4/4/2016	Original	TA	<0.50	1.0	1.8	4.6	**60**	550-61166
NGTF Influent*	NGTF - INF	4/11/2016	Original	TA	<0.50	0.95	1.6	**5.4**	**59**	550-61603
NGTF Influent*	NGTF - INF	4/18/2016	Original	TA	<0.50	0.90	1.5	4.7	**52**	550-62008
NGTF Influent*	NGTF - INF	5/2/2016	Original	TA	<0.50	0.90	1.5	4.6	**53**	550-62693
NGTF Influent*	NGTF - INF	5/9/2016	Original	TA	<0.50	0.96	1.6	**5.6**	**57**	550-63128
NGTF Influent*	NGTF - INF	5/16/2016	Original	TA	<0.50	0.87	1.7	**5.3**	**56**	550-63474
NGTF Influent*	NGTF - INF	5/23/2016	Original	TA	<0.50	0.94	1.7	4.7	**59**	550-63837
NGTF Influent*	NGTF - INF	5/31/2016	Original	TA	<0.50	0.88	1.6	4.2	**54**	550-64165
NGTF Influent*	NGTF - INF	6/6/2016	Original	TA	<0.50	0.92	1.6	3.8	**51**	550-64384
NGTF Influent*	NGTF - INF	6/13/2016	Original	TA	<0.50	0.80	1.5	4.8	**56**	550-64791
NGTF Influent*	NGTF - INF	6/20/2016	Original	TA	<0.50	0.94	1.6	4.3	**52**	550-65121
NGTF Influent*	NGTF - INF	7/5/2016	Original	TA	<0.50	0.94	1.6	**5.0**	**58**	550-65760
NGTF Influent*	NGTF - INF	7/11/2016	Original	TA	<0.50	0.80	1.5	4.5	**54**	550-66116
NGTF Influent*	NGTF - INF	7/18/2016	Original	TA	<0.50	0.85	1.7	**5.0**	**57**	550-66507
NGTF Influent*	NGTF - INF	7/25/2016	Original	TA	<0.50	0.92	1.7	4.7	**58**	550-66842
NGTF Influent*	NGTF - INF	8/1/2016	Original	TA	<0.50	0.74	1.5	4.3	**52**	550-67205
NGTF Influent*	NGTF - INF	8/8/2016	Original	TA	<0.50	0.94	1.7	**5.1**	**58**	550-67645
NGTF Influent*	NGTF - INF	8/15/2016	Original	TA	<0.50	0.82	1.5	4.2	**50**	550-68059
NGTF Influent*	NGTF - INF	9/6/2016	Original	TA	<0.50	1.1	1.6	4.5	**58**	550-69035
NGTF Influent*	NGTF - INF	9/12/2016	Original	TA	<0.50	0.92	1.7	4.6	**56**	550-69370
NGTF Influent*	NGTF - INF	9/19/2016	Original	TA	<0.50	0.94	1.7	**5.0**	**62**	550-69785
NGTF Influent*	NGTF - INF	9/26/2016	Original	TA	<0.50	0.85	1.4	4.5	**53**	550-70155
NGTF Influent*	NGTF - INF	10/3/2016	Original	TA	<0.50	0.75	1.6	4.3	**56**	550-70441
NGTF Influent*	NGTF - INF	10/10/2016	Original	TA	<0.50	0.98	1.6	3.6	**47**	550-70869
NGTF Influent*	NGTF - INF	10/17/2016	Original	TA	<0.50	0.97	1.7	4.1	**50**	550-71288
NGTF Influent*	NGTF - INF	10/24/2016	Original	TA	<0.50	0.91	1.7	4.5	**55**	550-71680
NGTF Influent*	NGTF - INF	10/31/2016	Original	TA	<0.50	0.97	1.6	4.4	**50**	550-72031
NGTF Influent*	NGTF - INF	11/7/2016	Original	TA	<0.50	0.99	1.6	4.4	**53**	550-72475
NGTF Influent*	NGTF - INF	11/14/2016	Original	TA	<0.50	0.76	1.7	4.8	**61**	550-72868
NGTF Influent*	NGTF - INF	11/21/2016	Original	TA	<0.50	0.84	1.8	4.8	**61**	550-73260
NGTF Influent*	NGTF - INF	11/28/2016	Original	TA	<0.50	0.76	1.5	4.7	**58**	550-73475
NGTF Influent*	NGTF - INF	12/5/2016	Original	TA	<0.50	0.83	1.7	4.6	**61**	550-73804
NGTF Influent*	NGTF - INF	12/12/2016	Original	TA	<0.50	0.93	1.7	4.8	**56**	550-74246
NGTF Influent*	NGTF - INF	12/19/2016	Original	TA	<0.50	0.83	1.5	4.8	**54**	550-74626
NGTF Influent*	NGTF - INF	12/27/2016	Original	TA	<0.50	0.75	1.6	4.6	**53**	550-74923
Outfall 001 (Effluent)	AZCO	1/4/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-56546
Outfall 001 (Effluent)	AZCO	1/11/2016	Original	TA	<0.50	<0.50	0.74	<0.50	<0.50	550-56914
Outfall 001 (Effluent)	AZCO	1/19/2016	Original	TA	<0.50	<0.50	1.1	<0.50	<0.50	550-57454
Outfall 001 (Effluent)	AZCO	1/25/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-57729
Outfall 001 (Effluent)	AZCO	2/1/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-58036
Outfall 001 (Effluent)	AZCO	2/8/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-58473
Outfall 001 (Effluent)	AZCO	2/16/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-58914
Outfall 001 (Effluent)	AZCO	2/22/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-59166
Outfall 001 (Effluent)	AZCO	2/29/2016	Original	TA	<0.50	<0.50	0.77	<0.50	<0.50	550-59464
Outfall 001 (Effluent)	AZCO	3/7/2016	Original	TA	<0.50	<0.50	1.0	<0.50	<0.50	550-59835

TABLE 9. 2016 LABORATORY RESULTS FOR TREATMENT SYSTEM SAMPLES
NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA
(results presented in micrograms per liter, µg/L)

SAMPLE LOCATION	FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA 200	DCE 6	TCM 6	PCE 5	TCE 5	Report
NGTF (continued)										
Outfall 001 (Effluent)	AZCO	3/14/2016	Original	TA	<0.50	<0.50	1.3	<0.50	<0.50	550-60269
Outfall 001 (Effluent)	AZCO	3/21/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-60587
Outfall 001 (Effluent)	AZCO	3/28/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-60876
Outfall 001 (Effluent)	AZCO	4/4/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-61166
Outfall 001 (Effluent)	AZCO	4/11/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-61603
Outfall 001 (Effluent)	AZCO	4/18/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-62008
Outfall 001 (Effluent)	AZCO	5/2/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-62693
Outfall 001 (Effluent)	AZCO	5/9/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-63128
Outfall 001 (Effluent)	AZCO	5/16/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-63474
Outfall 001 (Effluent)	AZCO	5/23/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-63837
Outfall 001 (Effluent)	AZCO	5/31/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-64165
Outfall 001 (Effluent)	AZCO	6/6/2016	Original	TA	<0.50	<0.50	0.65	<0.50	<0.50	550-64384
Outfall 001 (Effluent)	AZCO	6/13/2016	Original	TA	<0.50	<0.50	0.93	<0.50	<0.50	550-64791
Outfall 001 (Effluent)	AZCO	6/20/2016	Original	TA	<0.50	<0.50	1.3	<0.50	<0.50	550-65121
Outfall 001 (Effluent)	AZCO	7/5/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-65760
Outfall 001 (Effluent)	AZCO	7/11/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-66116
Outfall 001 (Effluent)	AZCO	7/18/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-66507
Outfall 001 (Effluent)	AZCO	7/25/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-66842
Outfall 001 (Effluent)	AZCO	8/1/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-67205
Outfall 001 (Effluent)	AZCO	8/8/2016	Original	TA	<0.50	<0.50	0.73	<0.50	<0.50	550-67645
Outfall 001 (Effluent)	AZCO	8/15/2016	Original	TA	<0.50	<0.50	1.0	<0.50	<0.50	550-68059
Outfall 001 (Effluent)	AZCO	9/6/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-69035
Outfall 001 (Effluent)	AZCO	9/12/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-69370
Outfall 001 (Effluent)	AZCO	9/19/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-69785
Outfall 001 (Effluent)	AZCO	9/26/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-70155
Outfall 001 (Effluent)	AZCO	10/3/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-70441
Outfall 001 (Effluent)	AZCO	10/10/2016	Original	TA	<0.50	<0.50	0.67	<0.50	<0.50	550-70869
Outfall 001 (Effluent)	NGTF-AZCO	10/17/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-71288
Outfall 001 (Effluent)	NGTF-AZCO	10/24/2016	Original	TA	<0.50	<0.50	0.65	<0.50	<0.50	550-71680
Outfall 001 (Effluent)	AZCO	10/31/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-72031
Outfall 001 (Effluent)	AZCO	11/7/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-72475
Outfall 001 (Effluent)	AZCO	11/14/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-72868
Outfall 001 (Effluent)	AZCO	11/21/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-73260
Outfall 001 (Effluent)	NGTF-CP	11/28/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-73475
Outfall 001 (Effluent)	AZCO	12/5/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-73804
Outfall 001 (Effluent)	AZCO	12/12/2016	Original	TA	<0.50	<0.50	0.65	<0.50	<0.50	550-74246
Outfall 001 (Effluent)	AZCO	12/19/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-74626
Outfall 001 (Effluent)	AZCO	12/27/2016	Original	TA	<0.50	<0.50	0.69	<0.50	<0.50	550-74923
Trip/Field Blanks										
QC - Area 7	Field Blank	1/14/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-57289
QC - Area 7	Trip Blank	1/14/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-57289
QC - Area 7	Field Blank	2/4/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-58450
QC - Area 7	Trip Blank	2/4/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-58450
QC - Area 7	Field Blank	3/14/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-60340
QC - Area 7	Trip Blank	3/14/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-60340
QC - Area 7	Field Blank	4/5/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-61396

TABLE 9. 2016 LABORATORY RESULTS FOR TREATMENT SYSTEM SAMPLES
NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA
(results presented in micrograms per liter, µg/L)

SAMPLE LOCATION	FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA	DCE	TCM	PCE	TCE	Report
					200	*6*	*6*	*5*	*5*	
Trip/Field Blanks (continued)										
QC - Area 7	Trip Blank	4/5/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-61396
QC - Area 7	Field Blank	5/2/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-62725
QC - Area 7	Trip Blank	5/2/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-62725
QC - Area 7	Field Blank	6/6/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-64402
QC - Area 7	Trip Blank	6/6/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-64402
QC - Area 7	Field Blank	7/13/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-66403
QC - Area 7	Trip Blank	7/13/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-66403
QC - Area 7	Field Blank	8/11/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-67912
QC - Area 7	Trip Blank	8/11/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-67912
QC - Area 7	Field Blank	9/9/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-69294
QC - Area 7	Trip Blank	9/9/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-69294
QC - Area 7	Field Blank	10/3/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-70528
QC - Area 7	Trip Blank	10/3/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-70528
QC - Area 7	Field Blank	11/7/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-72499
QC - Area 7	Trip Blank	11/7/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-72499
QC - Area 7	Field Blank	12/6/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-73997
QC - Area 7	Trip Blank	12/6/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-73997
QC - Area 12	FB-1-1A-02232016	2/23/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-59192
QC - Area 12	TB	2/23/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-59192
QC - Area 12	FB-1-1A-03012016	3/1/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-59493
QC - Area 12	TB	3/1/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-59493
QC - Area 12	FB-1-1A-04042016	4/4/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-61154
QC - Area 12	TB	4/4/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-61154
QC - Area 12	FB-1-1A-05022016	5/2/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-62690
QC - Area 12	TB	5/2/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-62690
QC - Area 12	FB-1-1A-06062016	6/6/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-64380
QC - Area 12	TB	6/6/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-64380
QC - Area 12	FB-1-1A-07052016	7/5/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-65753
QC - Area 12	TB	7/5/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-65753
QC - Area 12	FB-1-1A-08012016	8/1/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-67192
QC - Area 12	TB	8/1/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-67192
QC - Area 12	FB-1-1A-09062016	9/6/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-69059
QC - Area 12	TB	9/6/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-69059
QC - Area 12	FB-1-1A-10032016	10/3/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-70447
QC - Area 12	TB	10/3/2016	TB	TA	<0.50	<0.50[(1)]	<0.50	<0.50	<0.50	550-70447
QC - Area 12	FB-1-1A-11012016	11/1/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-72097
QC - Area 12	TB	11/1/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-72097
QC - Area 12	FB-1-1A-12052016	12/5/2016	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-73784
QC - Area 12	TB	12/5/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-73784
QC -MRTF	TB	1/4/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-56541
QC -MRTF	TB	2/6/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-58445
QC -MRTF	TB	3/1/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-59557
QC -MRTF	TB	4/4/2016	TB	TA	<0.50[(2)]	<0.50[(2)]	<0.50[(2)]	<0.50[(2)]	<0.50[(2)]	550-61159
QC -MRTF	TB	5/2/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-62703
QC -MRTF	TB	6/6/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-64381
QC -MRTF	TB	6/21/2016	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-65173

TABLE 9. 2016 LABORATORY RESULTS FOR TREATMENT SYSTEM SAMPLES
NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA
(results presented in micrograms per liter, µg/L)

SAMPLE LOCATION	FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA 200	DCE 6	TCM 6	PCE 5	TCE 5	Report
Trip/Field Blanks (continued)										
QC -MRTF	TB	7/5/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-65769
QC -MRTF	TB	8/1/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-67207
QC -MRTF	TB	9/6/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-69071
QC -MRTF	TB	10/3/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-70456
QC -MRTF	TB	11/1/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-72105
QC -MRTF	TB	12/5/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-73788
QC - NGTF	TB	1/4/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-56546
QC - NGTF	TB	1/11/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-56914
QC - NGTF	TB	1/19/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-57454
QC - NGTF	TB	1/25/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-57729
QC - NGTF	TB	2/1/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-58036
QC - NGTF	TB	2/8/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-58473
QC - NGTF	TB	2/16/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-58914
QC - NGTF	TB	2/22/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-59166
QC - NGTF	TB	2/29/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-59464
QC - NGTF	TB	3/7/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-59835
QC - NGTF	TB	3/14/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-60269
QC - NGTF	TB	3/21/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-60587
QC - NGTF	TB	3/28/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-60876
QC - NGTF	TB	4/4/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-61166
QC - NGTF	TB	4/11/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-61603
QC - NGTF	TB	4/18/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-62008
QC - NGTF	TB	5/2/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-62693
QC - NGTF	TB	5/9/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-63128
QC - NGTF	TB	5/16/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-63474
QC - NGTF	TB	5/23/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-63837
QC - NGTF	TB	5/31/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-64165
QC - NGTF	TB	6/6/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-64384
QC - NGTF	TB	6/13/2016	TB	TA	<0.50(3)(4)(5)	<0.50(6)	<0.50(3)(4)(5)	<0.50	<0.50(6)	550-64791
QC - NGTF	TB	6/20/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-65121
QC - NGTF	TB	7/5/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-65760
QC - NGTF	TB	7/11/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-66116
QC - NGTF	TB	7/18/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-66507
QC - NGTF	TB	7/25/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-66842
QC - NGTF	TB	8/8/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-67645
QC - NGTF	TB	8/15/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-68059
QC - NGTF	TB	9/6/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-69035
QC - NGTF	TB	9/12/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-69370
QC - NGTF	TB	9/19/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-69785
QC - NGTF	TB	9/26/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-70155
QC - NGTF	TB	10/3/2016	TB	TA	<0.50	<0.50(1)	<0.50	<0.50	<0.50	550-70441
QC - NGTF	TB	10/10/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-70869
QC - NGTF	TB	10/17/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-71288
QC - NGTF	TB	10/24/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-71680
QC - NGTF	TB	10/31/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-72031
QC - NGTF	TB	11/7/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-72475

TABLE 9. 2016 LABORATORY RESULTS FOR TREATMENT SYSTEM SAMPLES
NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA
(results presented in micrograms per liter, µg/L)

SAMPLE LOCATION	FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA 200	DCE 6	TCM 6	PCE 5	TCE 5	Report
Trip/Field Blanks (continued)										
QC - NGTF	TB	11/14/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-72868
QC - NGTF	TB	11/21/2016	TB	TA	<0.50 (6)	<0.50(3)(5)(7)	<0.50	<0.50	<0.50	550-73260
QC - NGTF	TB	11/28/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-73475
QC - NGTF	TB	12/5/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-73804
QC - NGTF	TB	12/12/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-74246
QC - NGTF	TB	12/19/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-74626
QC - NGTF	TB	12/27/2016	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-74923

ABBREVIATIONS:

TCA = 1,1,1-Trichloroethane
DCE = 1,1-Dichloroethene
TCM = Chloroform
PCE = Tetrachloroethene
TCE = Trichloroethene
AZCO = Arizona Canal Outfall
ID = Identifier
TA = TestAmerica, Inc.
<0.50 = Analytical result is less than laboratory detection limit
QC = Quality Control
TB = Trip Blank
FB = Field Blank

NOTES:

* Influent sampling results at the NGTF are not compliance data; however, they are reported here for completeness.

5.0 = Cleanup Standards for Treated Water (µg/L)

5.1 Sample result exceeds Cleanup Standards for Treated Water

(1) V9 Flag: CCV Recovery was below method acceptance limits.

(2) N1 Flag: Due to an auto sampler error no closing continuing calibration verification (CCV) was analyzed. The trip blanks could not be re-analyzed due insufficient sample volume, only one vial provided. The data has been qualified with N1 and reported, see analytical batch 550-86845.

(3) L5 Flag: The associated blank spike recovery was above laboratory/method acceptance limits. This analyte was not detected in the sample.

(4) R1 Flag: Relative Percent Difference/Relative Standard Deviation (RPD/RSD) exceeded the method acceptance limit.

(5) V1 Flag: CCV recovery was above method acceptance limits. This target analyte was not detected in the sample.

(6) R6 Flag: Laboratory Fortified Blank / Laboratory Fortified Blank Duplicate (LFB / LFBD) relative percent difference (RPD) exceeded method control limit. Recovery met acceptance criteria.

(7) N1 Flag: The %RPD of the laboratory control sample (LCS) and laboratory control standard duplicate (LCSD) in analytical batch 550-103794 recovered outside control limits for the following analytes:1.1-Dichloroethene.The LCSD also recovered outside of the laboratory acceptance limits for this analyte. All samples are ND; therefore, the data is not impacted. The LCS/LCSD and samples will be reported with L5 and N1 qualifiers.

TABLE 10. SUMMARY OF VOC MASS ESTIMATES IN UAU GROUNDWATER FOR OCTOBER 2016
NORTH INDIAN BEND WASH SITE, SCOTTSDALE, ARIZONA

POLYGON (WELL NAME)	TOTAL VOCs (micrograms per liter)[a]	ELEVATION BASE OF UAU (feet, amsl)	ELEVATION UAU WATER TABLE (feet, amsl)	SATURATED THICKNESS (feet)	POLYGON AREA (square feet)	SATURATED POLYGON VOLUME (cubic feet)	SATURATED PORE VOLUME (liters)	VOC MASS (gallons)	VOC MASS (pounds)
B-J	3.43	1,065	1,124.95	60	1,312,017	78,655,419	668,232,844	0.42	5.05
E-5UA	4.1	1,067	1,124.89	58	1,563,483	90,510,031	768,946,069	0.58	6.95
E-7UA	1.3	1,079	1,120.78	42	2,135,156	89,206,818	757,874,361	0.18	2.17
E-12UA	3.07	1,075	1,130.01	55	1,868,432	102,782,444	873,208,812	0.49	5.91
E-13UA	2.71	1,080	1,129.82	50	851,113	42,402,450	360,238,492	0.18	2.15
M-2UA	2.58	1,081	1,131.03	50	1,081,841	54,124,505	459,825,559	0.22	2.62
PG-3UA	2.96	1,046	1,118.43	72	1,523,224	110,327,114	937,306,065	0.51	6.12
PG-4UA	19.43	1,055	1,110.38	55	2,867,709	158,813,724	1,349,233,759	4.82	57.81
PG-5UA	2.18	1,036	1,116.09	80	1,729,659	138,528,389	1,176,895,637	0.47	5.66
PG-6UA	3.07	1,043	1,113.55	71	2,363,199	166,723,689	1,416,434,448	0.80	9.59
PG-8UA	0	1,060	1,114.40	54	1,631,115	88,732,656	753,846,026	0.00	0.00
7EX-1UA					Well Abandoned in 2015				
PG-10UA	1.55	1,089	1,130.82	42	693,947	29,020,864	246,552,550	0.07	0.84
PG-11UA	1.1	1,076	1,124.08	48	2,167,731	104,224,506	885,460,140	0.18	2.15
PG-16UA	1.21	1,079	1,127.45	48	1,327,719	64,327,986	546,511,267	0.12	1.46
PG-18UA	1.82	1,045	1,122.73	78	1,953,438	151,840,736	1,289,993,339	0.43	5.18
PG-19UA	2.94	1,049	1,122.56	74	1,407,810	103,558,504	879,801,979	0.48	5.70
PG-22UA[b]	6.1	1,067	1,125.99	59	1,764,305	104,076,352	884,201,463	0.99	11.89
PG-23UA	2.27	1,055	1,111.23	56	1,753,035	98,573,158	837,447,979	0.35	4.19
PG-24UA[b]	0.63	1,054	1,116.59	63	1,535,896	96,131,731	816,706,344	0.09	1.13
PG-25UA[b]	3.34	1,056	1,121.39	65	1,538,241	100,585,579	854,544,903	0.52	6.29
PG-28UA	6.5	1,061	1,128.88	68	1,669,714	113,340,186	962,904,221	1.15	13.80
PG-29UA[b]	2.4	1,080	1,130.14	50	1,345,997	67,488,290	573,360,262	0.25	3.03
PG-31UA[b]	15.3	1,081	1,126.16	45	2,706,853	122,241,481	1,038,526,954	2.92	35.04
TOTALS							**19,338,053,473**	**16.24**	**194.74**

ABBREVIATIONS:

feet, amsl = feet, above mean seal level

NOTES:

[a] Includes total concentration of TCE, PCE, 1,1,1-TCA, DCE, and Chloroform from October 2016 water quality data set. "0" indicates either that concentrations of all VOCs were below the detection limit, the well was dry, or the well is no longer included in the NIBW Monitoring Program due to long-term ND levels of VOCs.

[b] Well was sampled in November 2016.

TABLE 11. AVERAGE TCE CONCENTRATIONS FOR MONITOR WELLS IN THE VICINITY OF AREA 7, MIDDLE ALLUVIUM UNIT

AVERAGE TCE CONCENTRATIONS (micrograms per liter)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
D-2MA	---	5,600	4,650	3,500	2,200	2,369	2,533	2,180	2,200	1,650	1,650	1,145	828	1,015	1,550	1,675	1,825	1,725	1,650	1,303	1,375	1,375
E-10MA	6	6	6	11	15	15	15	14	10	8	7	6	5	6	5	5	6	5	5	6	4	3
PA-10MA	12	15	26	68	96	68	39	39	46	39	41	36	35	41	34	31	36	24	22	21	22	24
PA-12MA	190	135	175	360	760	608	586	581	580	483	483	400	407	360	400	370	343	348	303	355	300	245
W-1MA	2,800	1,045	560	200	497	1,432	707	389	495	270	335	151	129	95	88	44	70	195	387	575	468	368
W-2MA	3,000	1,950	2,050	1,950	2,900	3,844	3,875	4,490	4,875	4,725	5,275	4,325	4,225	4,900	4,325	4,100	3,925	4,450	3,575	3,700	2,850	2,075
ANNUAL AVERAG	**1,202**	**1,458**	**1,245**	**1,015**	**1,078**	**1,390**	**1,292**	**1,282**	**1,368**	**1,196**	**1,298**	**1,010**	**938**	**1,069**	**1,067**	**1,038**	**1,034**	**1,124**	**990**	**993**	**837**	**682**

NOTES:

1) Duplicates were not used in the calculation of 5-Year Average TCE Concentrations.
2) 2015 average TCE concentration was used for D-2MA because 2016 data was not representative of historical trends.

Five-Year Average TCE Concentrations (micrograms per liter)

1995-1999	**1,199**	**Start-Up of 7EX-3MA and 7EX-4MA Extraction Wells**
1996-2000	**1,237**	
1997-2001	**1,204**	
1998-2002	**1,211**	**Start-Up of 7EX-5MA Extraction Well**
1999-2003	**1,282**	**Area 7 GWETS Fully Operational**
2000-2004	**1,305**	**Performance Measure Became Effective**
2001-2005	**1,287**	
2002-2006	**1,231**	
2003-2007	**1,162**	
2004-2008	**1,102**	
2005-2009	**1,077**	
2006-2010	**1,024**	
2007-2011	**1,029**	
2008-2012	**1,066**	**Beginning in 2012 7EX-5MA Extraction Well Inoperable**
2009-2013	**1,051**	
2010-2014	**1,036**	
2011-2015	**996**	**Start-Up of 7EX-6MA Extraction Well**
2012-2016	**925**	

TABLE 12. AVERAGE TCE CONCENTRATIONS FOR MONITOR WELLS WITHIN ZONE OF HYDRAULIC CAPTURE, MIDDLE ALLUVIUM UNIT, AREA 12

AVERAGE TCE CONCENTRATIONS (micrograms per liter)

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
E-1MA	367	440	490	370	350	370	18	3	130	3	56	73	42	22	63	21	34	37	27	55	37	4	6
M-4MA	29	20	32	31	32	28	27	20	24	21	25	26	20	21	20	19	20	23	23	23	20	17	13
M-5MA	377	365	295	120	43	65	79	115	105	45	53	54	68	65	50	65	58	48	33	34	19	13	18
M-6MA	333	315	180	113	120	125	22	7	55	2	40	69	43	49	68	38	63	52	60	77	48	20	12
M-7MA	11	7	6	8	9	3	0	1	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0
M-9MA	150	113	72	52	24	15	10	8	5	6	7	7	4	4	5	5	4	4	5	5	4	3	3
M-15MA	105	14	115	83	40	75	40	25	19	14	13	11	12	12	12	12	11	10	10	9	8	6	5
PA-21MA	44	14	8	7	3	2	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
ANNUAL AVERAGE	**177**	**161**	**150**	**98**	**78**	**85**	**24**	**22**	**42**	**12**	**24**	**30**	**24**	**22**	**27**	**20**	**24**	**22**	**20**	**25**	**17**	**8**	**7**

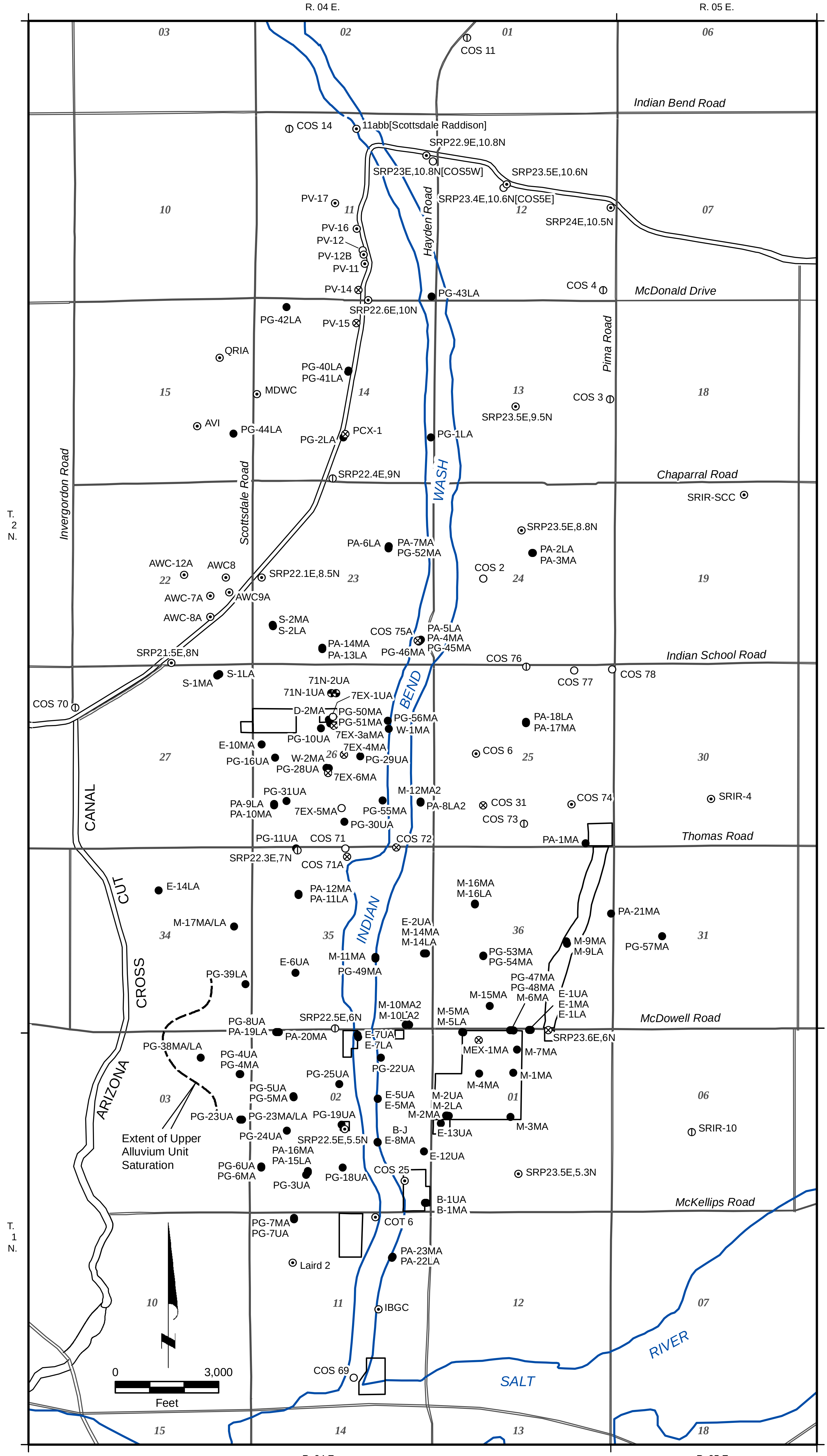
NOTES:

1) Duplicates were not used in the calculation of 5-Year Average TCE Concentrations.

Five-Year Average TCE Concentrations (micrograms per liter)

1994-1998	**133**	
1995-1999	**114**	**Start-Up of MEX-1 and SRP Granite Reef Extraction**
1996-2000	**87**	**Area 12 GWETS Fully Operational**
1997-2001	**62**	
1998-2002	**50**	
1999-2003	**37**	
2000-2004	**25**	**Performance Measure Became Effective**
2001-2005	**26**	
2002-2006	**26**	
2003-2007	**22**	
2004-2008	**25**	
2005-2009	**25**	
2006-2010	**23**	
2007-2011	**23**	
2008-2012	**23**	
2009-2013	**22**	
2010-2014	**22**	
2011-2015	**18**	
2012-2016	**15**	

FIGURES



EXPLANATION

PA-15LA	●	Monitor Well Location and Identifier
COS75A	⊗	Extraction Water Well Location and Identifier
COS74	⊙	Production Water Well Location and Identifier
SRP22.4E, 9N	⦶	Inactive Production or Monitor Water Well Location and Identifier
71N-1UA	◈	Injection Well and Identifier
COS69	○	Abandoned Production Water Well and Identifier

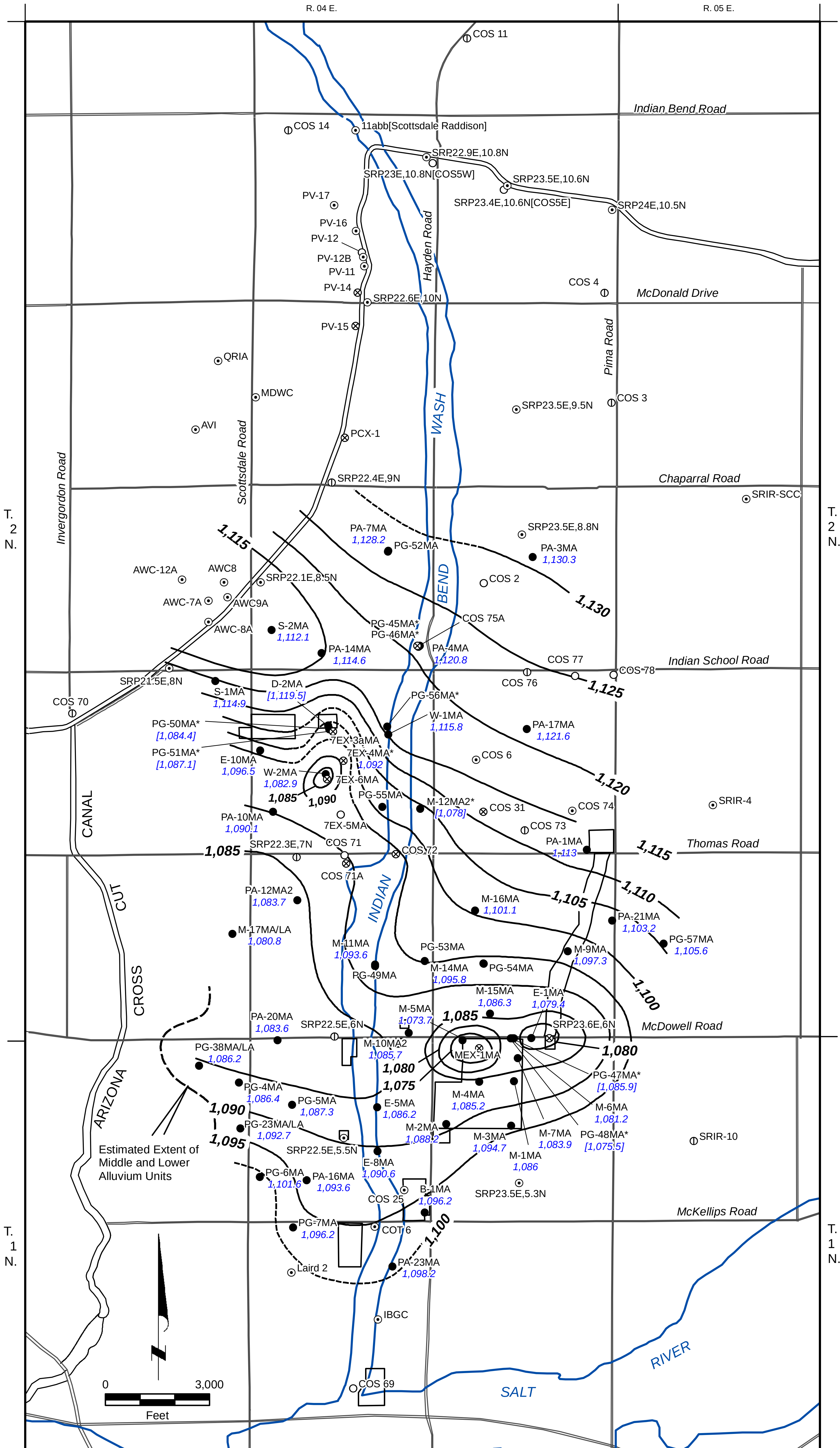
NORTH INDIAN BEND WASH AREA
MARICOPA COUNTY, ARIZONA

WELL LOCATION MAP

North Indian Bend Wash Superfund Site

FIGURE 1

GIS-TUC\366.1402\ALL_WELLS_2016_Locmap\14Mar2017



EXPLANATION

PG-7MA ● 1,096.2	Middle Alluvium Monitor Well (MAU) Location and Identifier * Denotes the Well is or responds as a Lower MAU Well Groundwater Level Altitude, in feet above mean sea level [ ] Indicates Data Not Used for Contouring 7EX-4MA* Measurement was obtained using transducer
COS75A ⊗	Extraction Water Well Location and Identifier
COS74 ⊙	Production Water Well Location and Identifier
SRP22.5E, 6N ⦶	Inactive Production Water Well Location and Identifier
COS69 ○	Abandoned Production Water Well or Monitor Well Location and Identifier
— 1,090 —	Groundwater Level Altitude Contour, in feet above mean sea level Dashed where approximate

NOTE: Water level collected from MAU completed well at piezometer PA-11/12 located approximately 70 feet northwest of original well PA-12MA

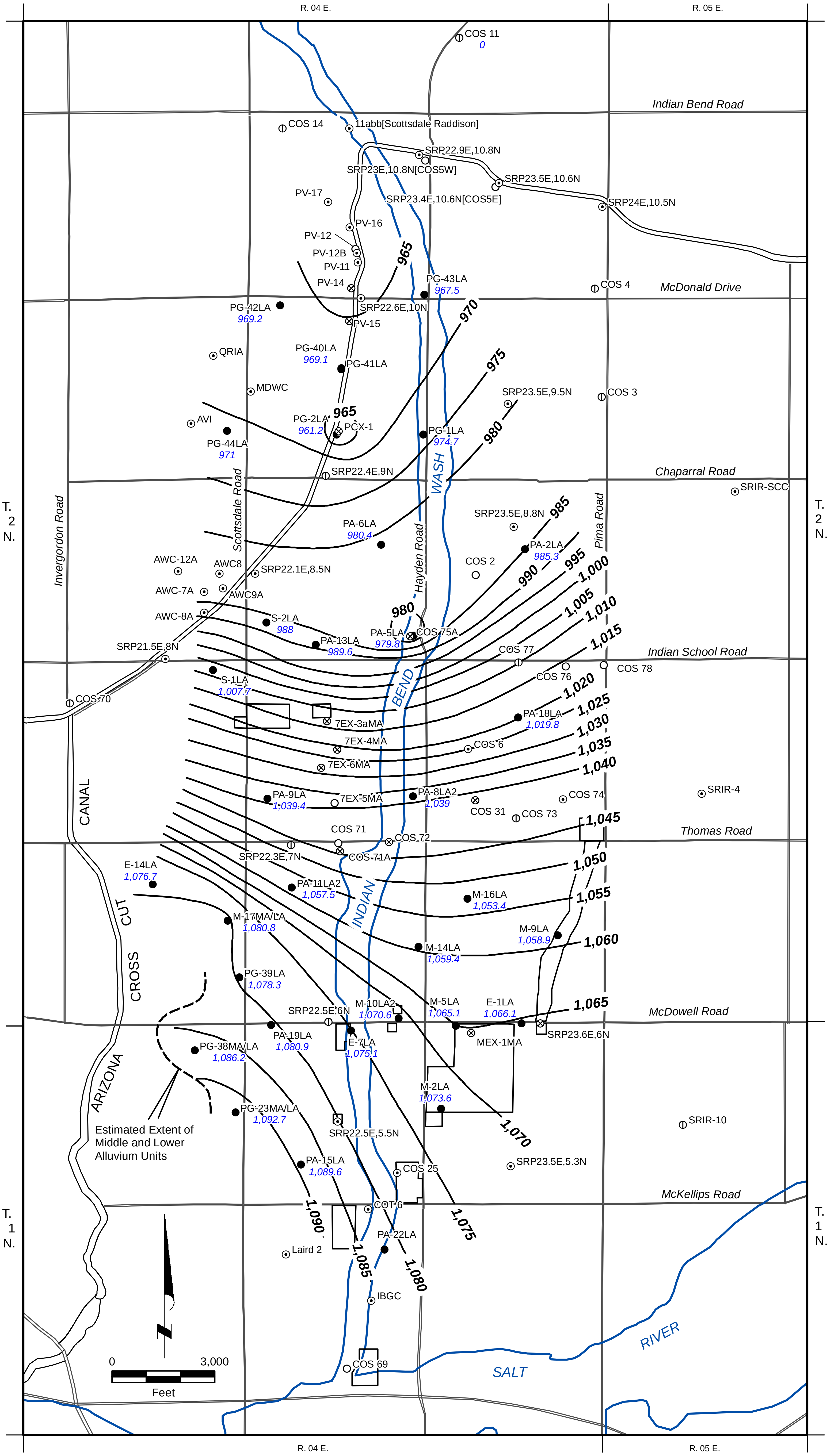
NORTH INDIAN BEND WASH AREA
MARICOPA COUNTY, ARIZONA

GROUNDWATER LEVEL CONTOURS MIDDLE ALLUVIUM UNIT WELLS APRIL 2016

North Indian Bend Wash Superfund Site

FIGURE 2

GIS-Tuc\366.1402\WaterLevel\2016\MAU_WLApr2016\21Mar2017



EXPLANATION

PA-15LA ● Lower Alluvium Monitor Well Location and Identifier
1,089.6 Groundwater Level Altitude, in feet above mean sea level

COS75A ⊗ Extraction Water Well Location and Identifier

COS74 ⊙ Production Water Well Location and Identifier

SRP22.5E, 6N ⦶ Inactive Production Water Well Location and Identifier

COS69 ○ Abandoned Production Water Well or Monitor Well Location and Identifier

—1,090 — Groundwater Level Altitude Contour, in feet above mean sea level;

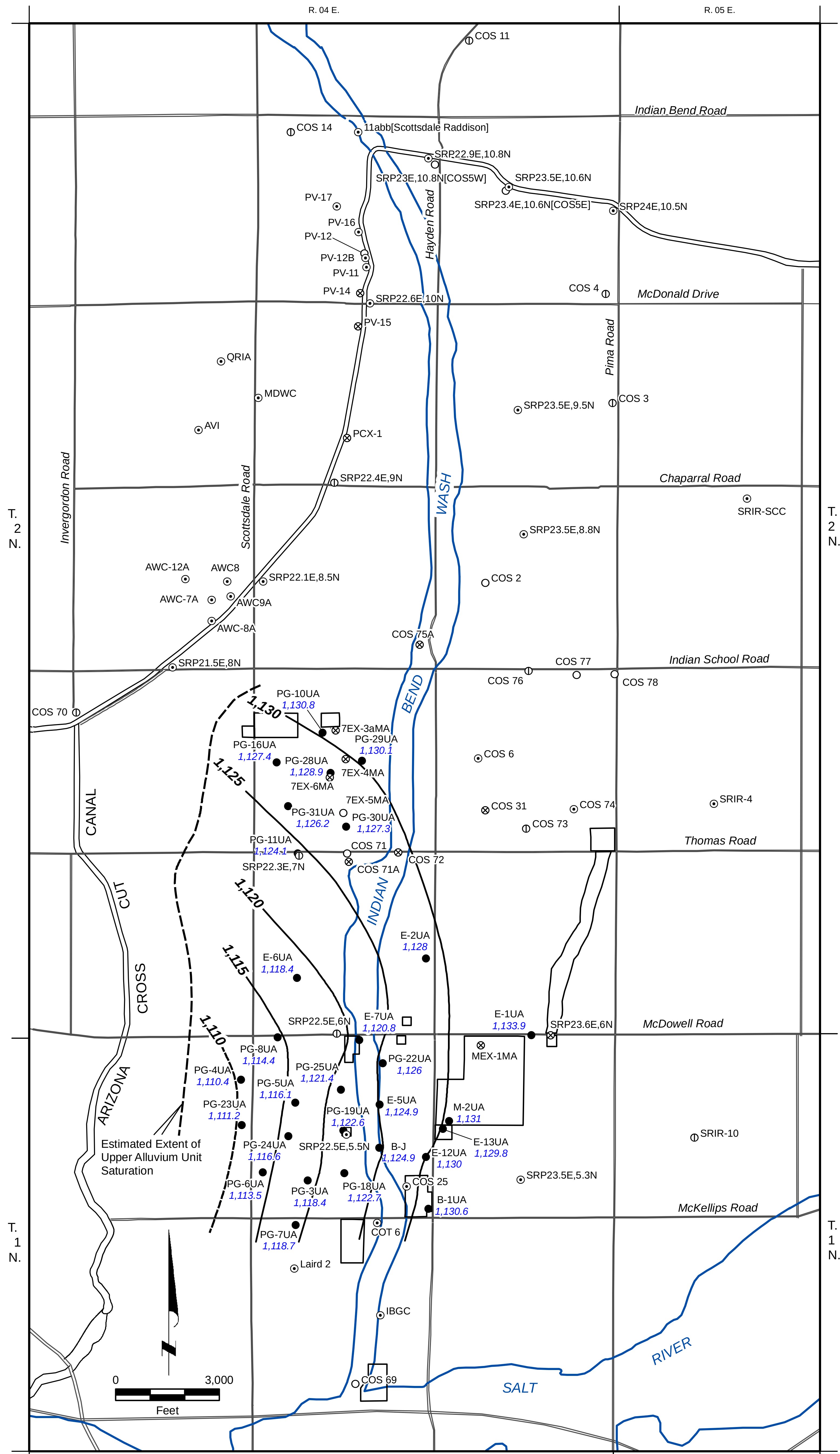
NORTH INDIAN BEND WASH AREA
MARICOPA COUNTY, ARIZONA

GROUNDWATER LEVEL CONTOURS
LOWER ALLUVIUM UNIT WELLS
APRIL 2016

North Indian Bend Wash Superfund Site

FIGURE 3

GIS-TUC\366.1402\WL\2016\LAU_WLApr2016\23Mar2017



EXPLANATION

PG-7UA ● Upper Alluvium Monitor Well Location and Identifier
1,118.7 Groundwater Level Altitude, in feet above mean sea level
[ ] Indicates data not used in contouring

COS75A ⊗ Extraction Water Well Location and Identifier

COS74 ⊙ Production Water Well Location and Identifier

SRP22.5E, 6N ⦶ Inactive Production Water Well Location and Identifier

COS69 ○ Abandoned Production Water Well or Monitor Well Location and Identifier

---1,120 — Groundwater Level Altitude Contour, in feet above mean sea level
Dashed where approximate

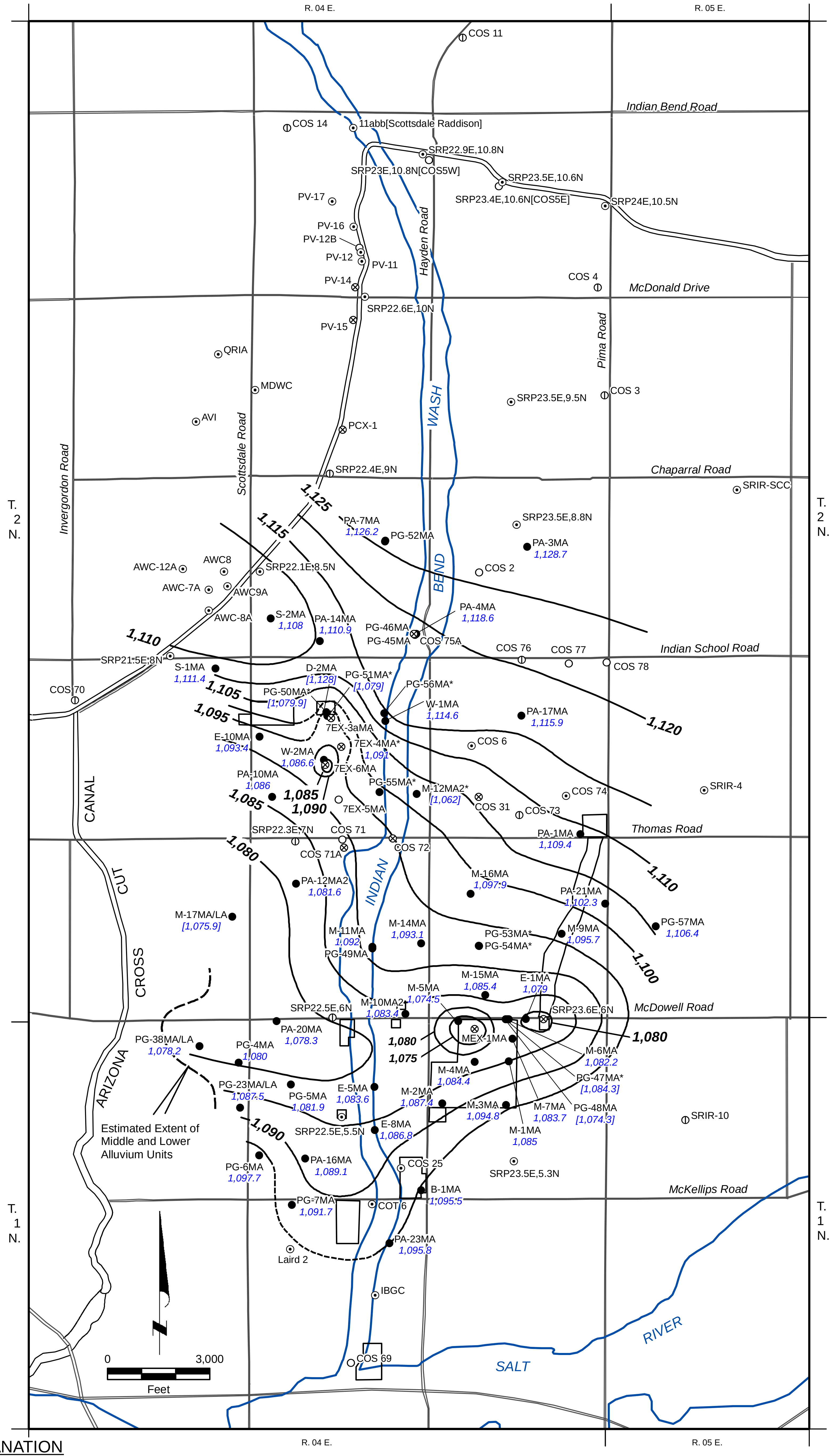
NORTH INDIAN BEND WASH AREA
MARICOPA COUNTY, ARIZONA

GROUNDWATER LEVEL CONTOURS
UPPER ALLUVIUM UNIT WELLS
OCTOBER 2016

North Indian Bend Wash Superfund Site

FIGURE 4

GIS-TUC\366.1402\WL\2016\UAU_WLOct2016\23Mar2017



EXPLANATION

PG-7MA 1,091.7 ● Middle Alluvium Monitor Well (MAU) Location and Identifier
* Denotes the Well is or responds as a Lower MAU Well
Groundwater Level Altitude, in feet above mean sea level
[ ] Indicates Data Not Used for Contouring
7EX-4MA* Measurement was obtained using transducer

COS75A ⊗ Extraction Water Well Location and Identifier

COS74 ⊙ Production Water Well Location and Identifier

SRP22.5E, 6N ⦶ Inactive Production Water Well Location and Identifier

COS69 ○ Abandoned Production Water Well or Monitor Well Location and Identifier

1,090 Groundwater Level Altitude Contour, in feet above mean sea level
Dashed where approximate

NOTE: Water level collected from MAU completed well at piezometer PA-11/12 located approximately 70 feet northwest of original well PA-12MA

NORTH INDIAN BEND WASH AREA

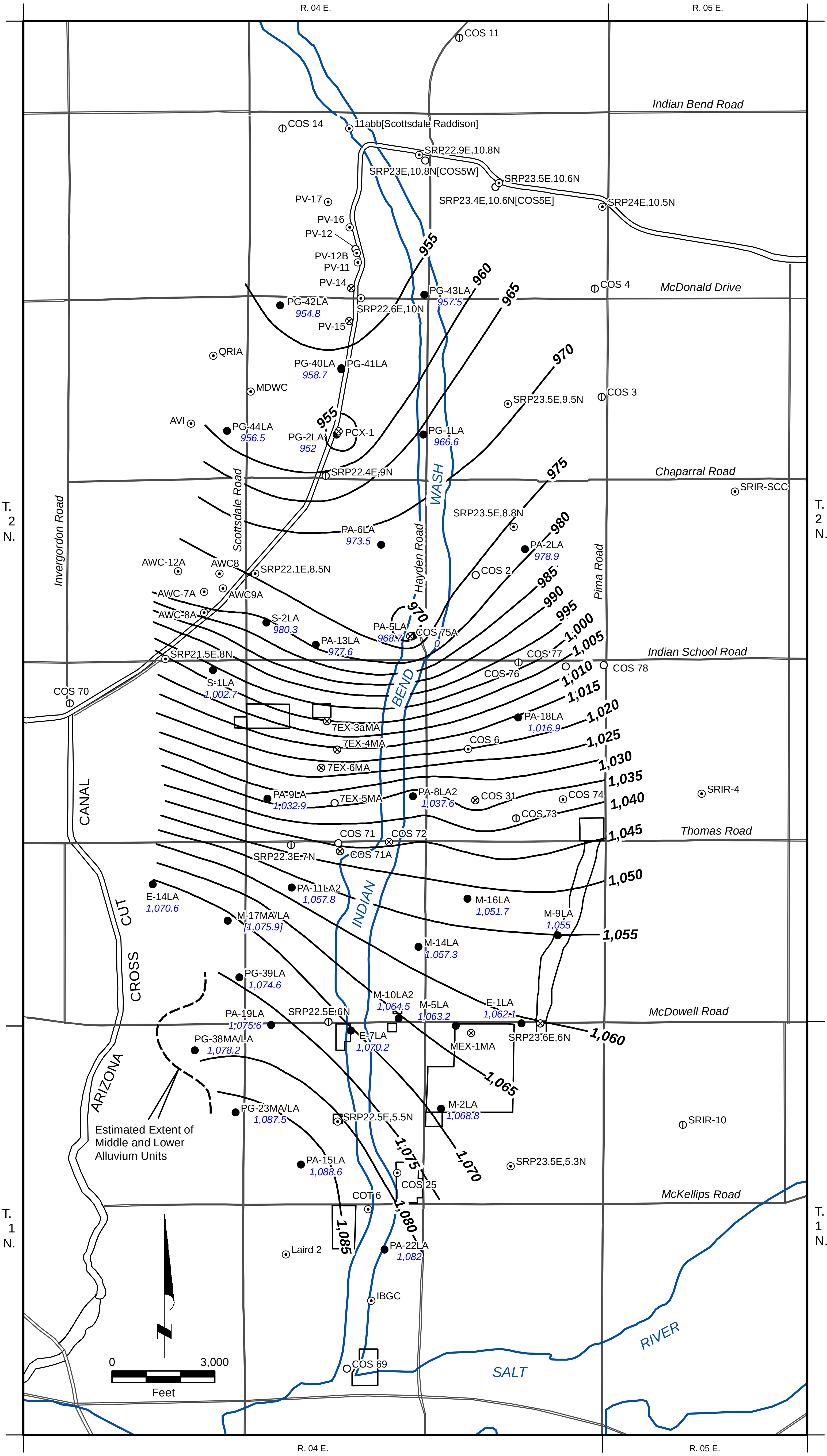
MARICOPA COUNTY, ARIZONA

GROUNDWATER LEVEL CONTOURS MIDDLE ALLUVIUM UNIT WELLS OCTOBER 2016

North Indian Bend Wash Superfund Site

FIGURE 5

GIS-TUC\366.1402\WL\2016\MAU_WLOct2016\23Mar2017



EXPLANATION

PA-15LA ●	Lower Alluvium Monitor Well Location and Identifier
1,088.6	Groundwater Level Altitude, in feet above mean sea level [ ] Indicates data not used in contouring PG-2LA* measurement was obtained from transducer
COS75A ⊗	Extraction Water Well Location and Identifier
COS74 ⊙	Production Water Well Location and Identifier
SRP22.5E, 6N ⏀	Inactive Production Water Well Location and Identifier
COS69 ○	Abandoned Production Water Well or Monitor Well Location and Identifier
—1,085—	Groundwater Level Altitude Contour, in feet above mean sea level

NORTH INDIAN BEND WASH AREA

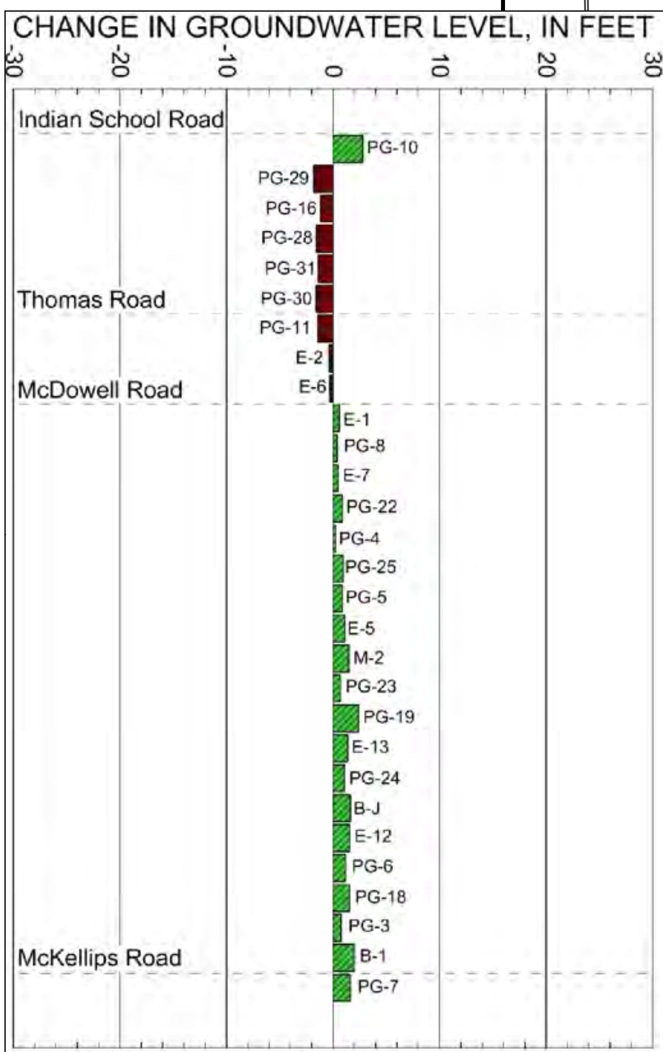
MARICOPA COUNTY, ARIZONA

GROUNDWATER LEVEL CONTOURS
LOWER ALLUVIUM UNIT WELLS
OCTOBER 2016

North Indian Bend Wash Superfund Site

FIGURE 6

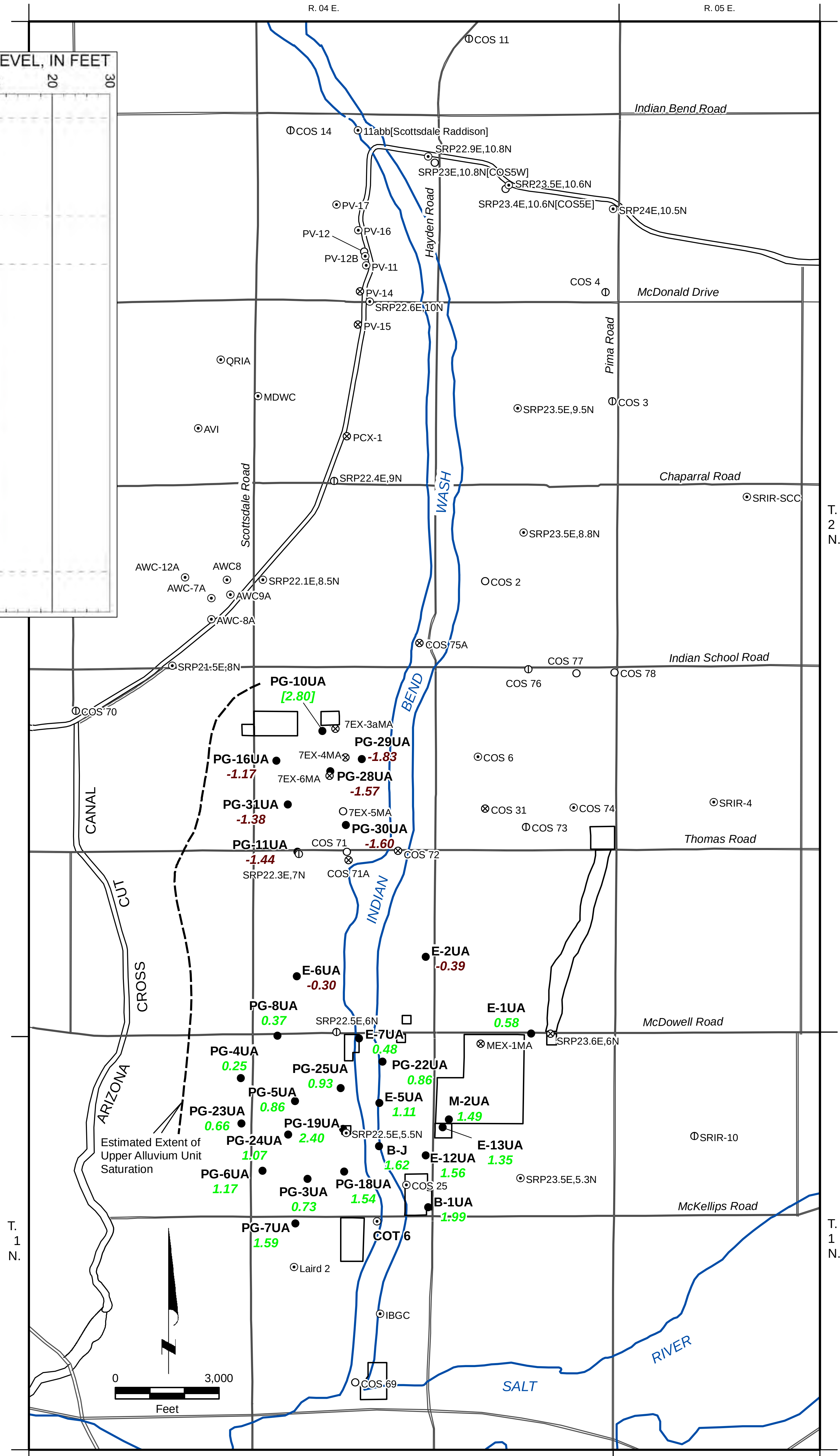
GIS-TUC\366.1402\WL\2016\LAU_WLOct2016\14Mar2017



NOTES:

1) Well locations arranged north to south.

2) Positive change indicates an increase in water level.
Negative change indicates a decrease in water level.



EXPLANATION

PG-7UA -0.99 ● Upper Alluvium Monitor Well Location and Identifier
Groundwater Level Rise, in feet
Groundwater Level Decline, in feet

[ ] Bracketed where 2015, 2016, or both measurements were not used in contouring

COS75A ⊗ Extraction Water Well Location and Identifier

COS74 ⊙ Production Water Well Location and Identifier

SRP22.5E, 6N ⦶ Inactive Production Water Well Location and Identifier

COS69 ○ Abandoned Production Water Well or Monitor Well Location and Identifier

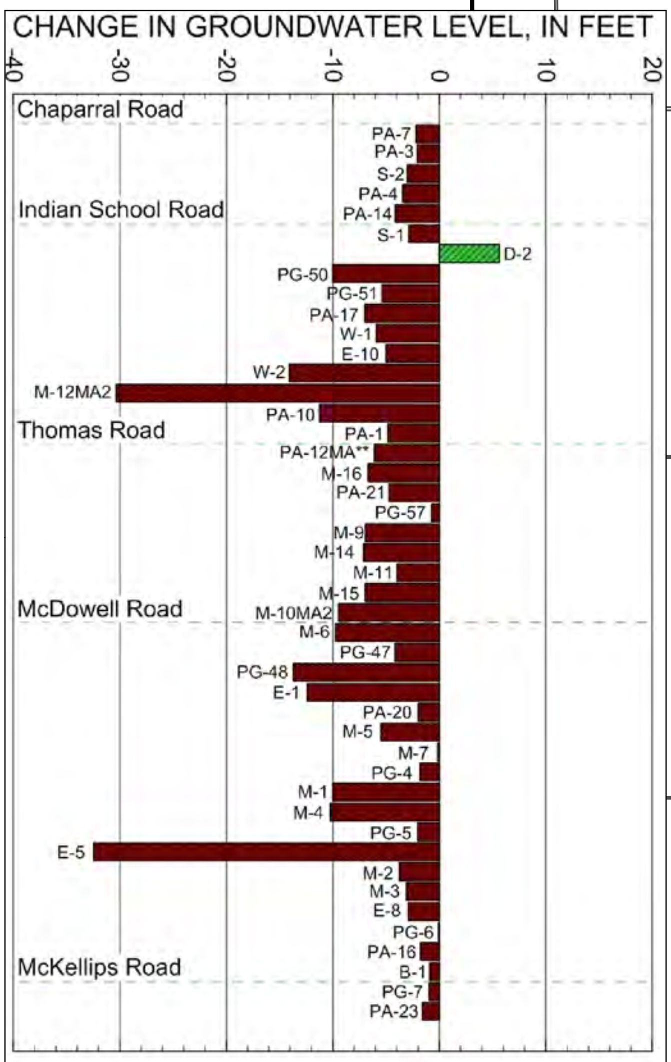
NORTH INDIAN BEND WASH AREA
MARICOPA COUNTY, ARIZONA

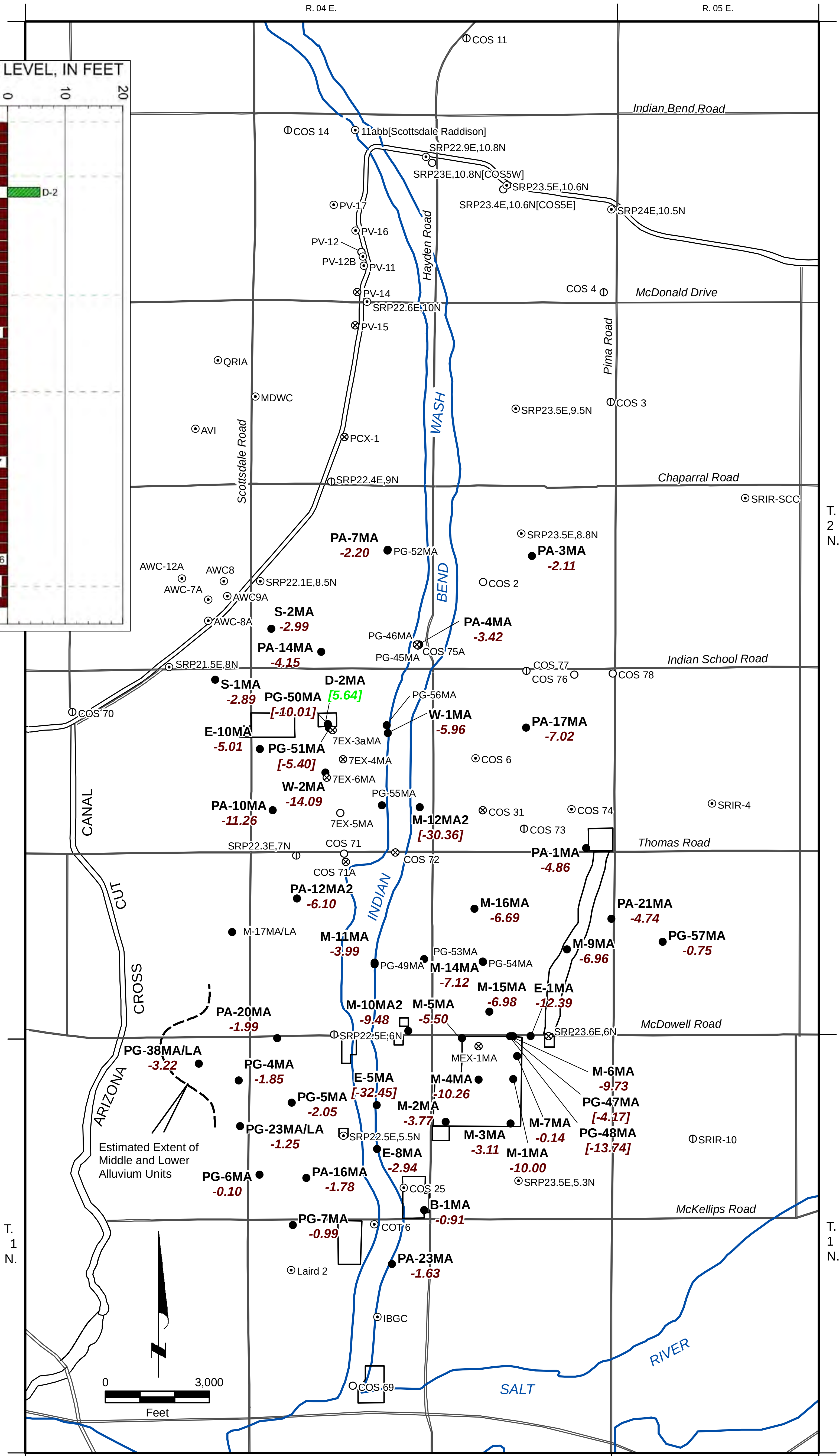
CHANGE IN UPPER ALLUVIUM UNIT GROUNDWATER LEVEL OCTOBER 2015 TO OCTOBER 2016

North Indian Bend Wash Superfund Site

FIGURE 7

GIS-TUC\366.1402\WL\2016\UAU_WLOct2016_DIFFERENCE\28Mar2017





NOTES:

1) Well locations arranged north to south.

2) Positive change indicates an increase in water level.
Negative change indicates a decrease in water level.

3) E-5MA water level for 2015 was anomalously high. Value was not used for contouring.

4) **Water level was collected from MAU completed well at piezometer PA-11/12 located approximately 70 feet northwest of original well PA-12MA.

EXPLANATION

PG-7MA ● Middle Alluvium Monitor Well (MAU) Location and Identifier
-0.99 * Denotes the Well is or responds as a Lower MAU Well

Groundwater Level Rise, in feet
Groundwater Level Decline, in feet
[ ] Bracketed where 2015, 2016, or both measurements were not used in contouring

COS75A ⊗ Extraction Water Well Location and Identifier

COS74 ⊙ Production Water Well Location and Identifier

SRP22.5E, 6N ⦶ Inactive Production Water Well Location and Identifier

COS69 ○ Abandoned Production Water Well or Monitor Well Location and Identifier

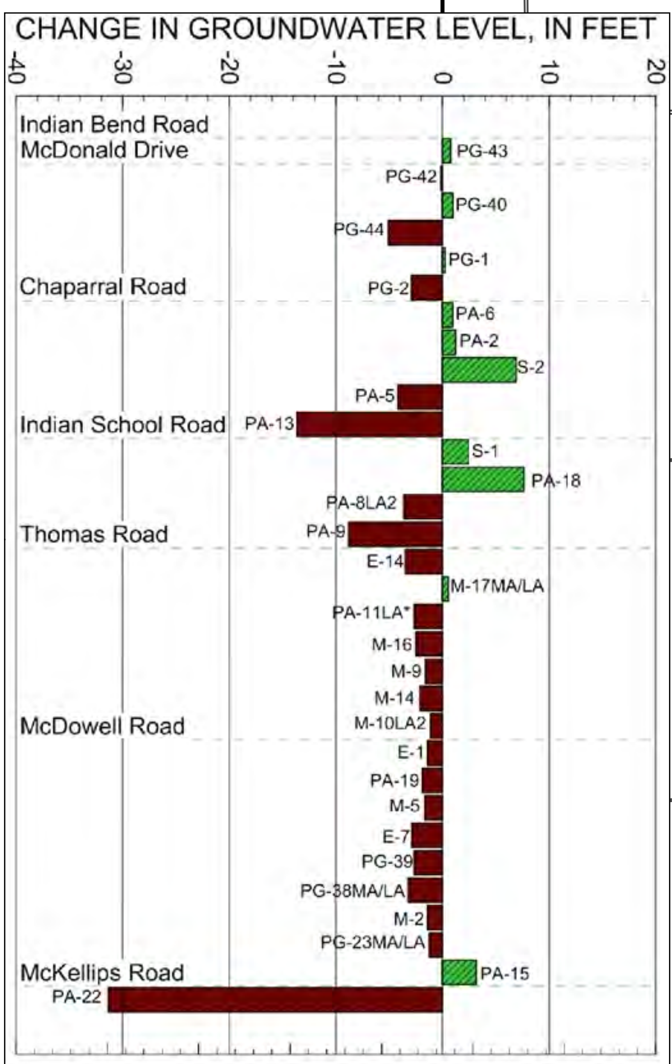
NORTH INDIAN BEND WASH AREA
MARICOPA COUNTY, ARIZONA

CHANGE IN MIDDLE ALLUVIUM UNIT GROUNDWATER LEVEL OCTOBER 2015 TO OCTOBER 2016

North Indian Bend Wash Superfund Site

FIGURE 8

GIS-TUC\366.1402\WL\2016\MAU_WLOct2016_DIFFERENCE\28Mar2017



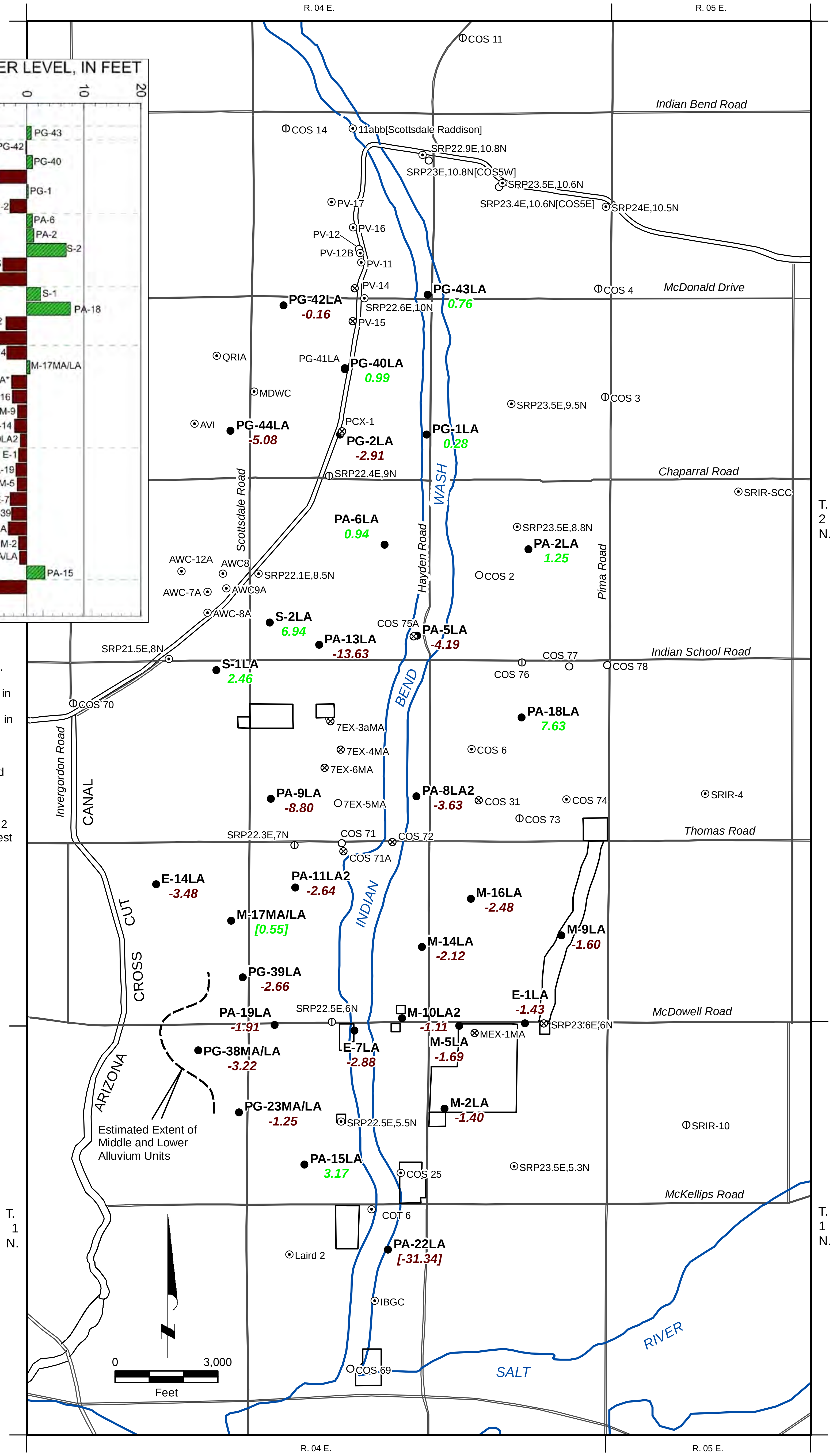
NOTES:

1) Well locations arranged north to south.

2) Positive change indicates an increase in water level.
Negative change indicates a decrease in water level.

3) PA-22LA water level for 2015 was anomalously high. Value was not used for contouring.

4) *Water level was collected from LAU completed well at piezometer PA-11/12 located approximately 80 feet northwest of original well PA-11LA.



EXPLANATION

PA-15LA ● 3.17 — Lower Alluvium Monitor Well Location and Identifier

Groundwater Level Rise, in feet

Groundwater Level Decline, in feet

[ ] Bracketed where 2015, 2016, or both measurements were not used in contouring

COS75A ⊗ Extraction Water Well Location and Identifier

COS74 ⊙ Production Water Well Location and Identifier

SRP22.5E, 6N ⦶ Inactive Production Water Well Location and Identifier

COS69 ○ Abandoned Production Water Well or Monitor Well Location and Identifier

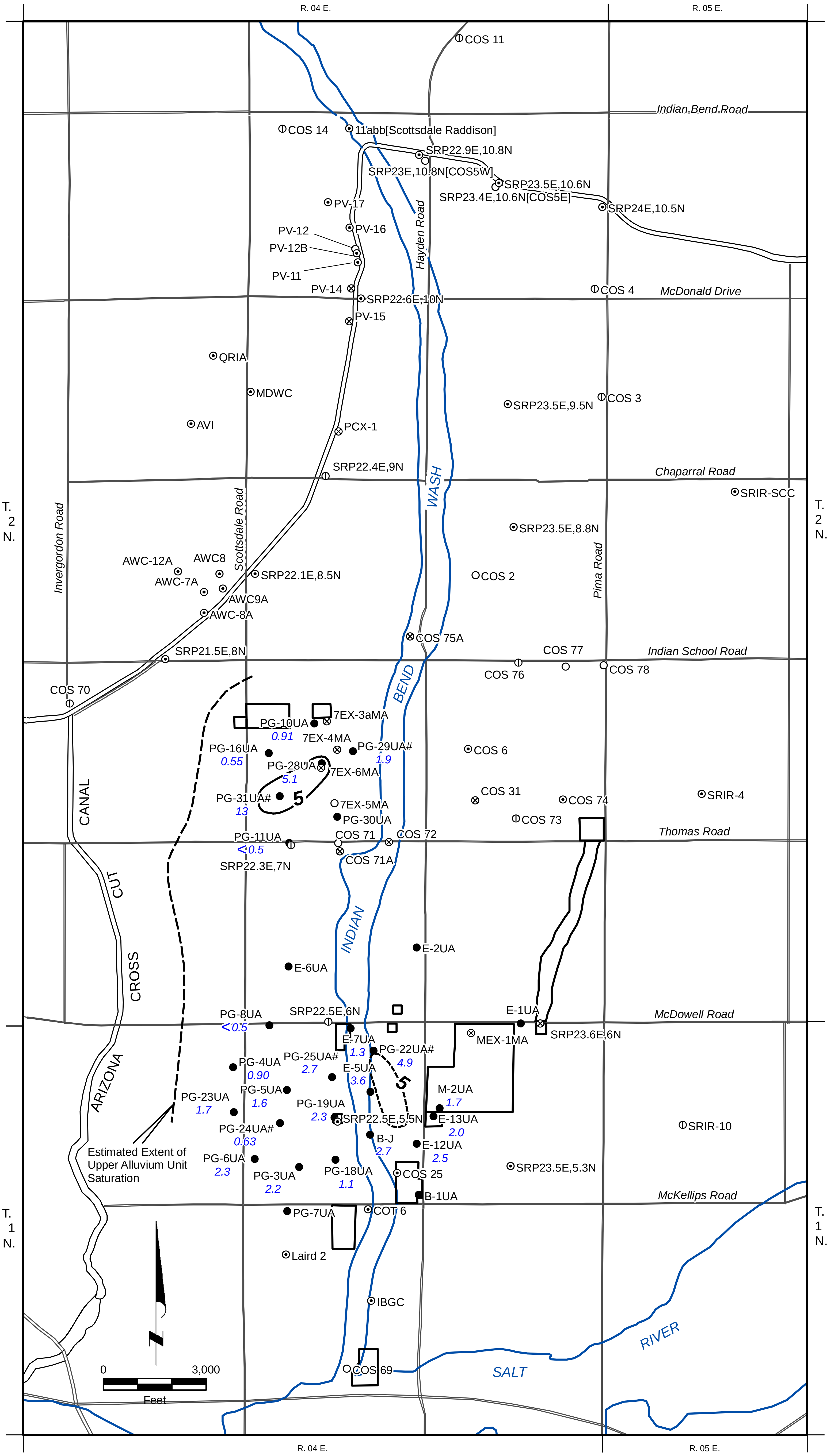
NORTH INDIAN BEND WASH AREA
MARICOPA COUNTY, ARIZONA

CHANGE IN LOWER ALLUVIUM UNIT GROUNDWATER LEVEL OCTOBER 2015 TO OCTOBER 2016

North Indian Bend Wash Superfund Site

FIGURE 9

GIS-TUC\366.1402\WL\2016\LAU_WLOct2016_DIFFERENCE\28Mar2017



EXPLANATION

PG-5UA — Upper Alluvium Monitor Well Location and Identifier
# denotes sampled November 2016

1.6 — Concentration of TCE, micrograms per liter

COS75A — Extraction Water Well Location and Identifier

COS74 — Production Water Well Location and Identifier

SRP22.5E, 6N — Inactive Production Water Well Location and Identifier

COS69 — Abandoned Production Water Well or Monitor Well Location and Identifier

5 — TCE Concentration Contour, in micrograms per liter
Dashed where approximate

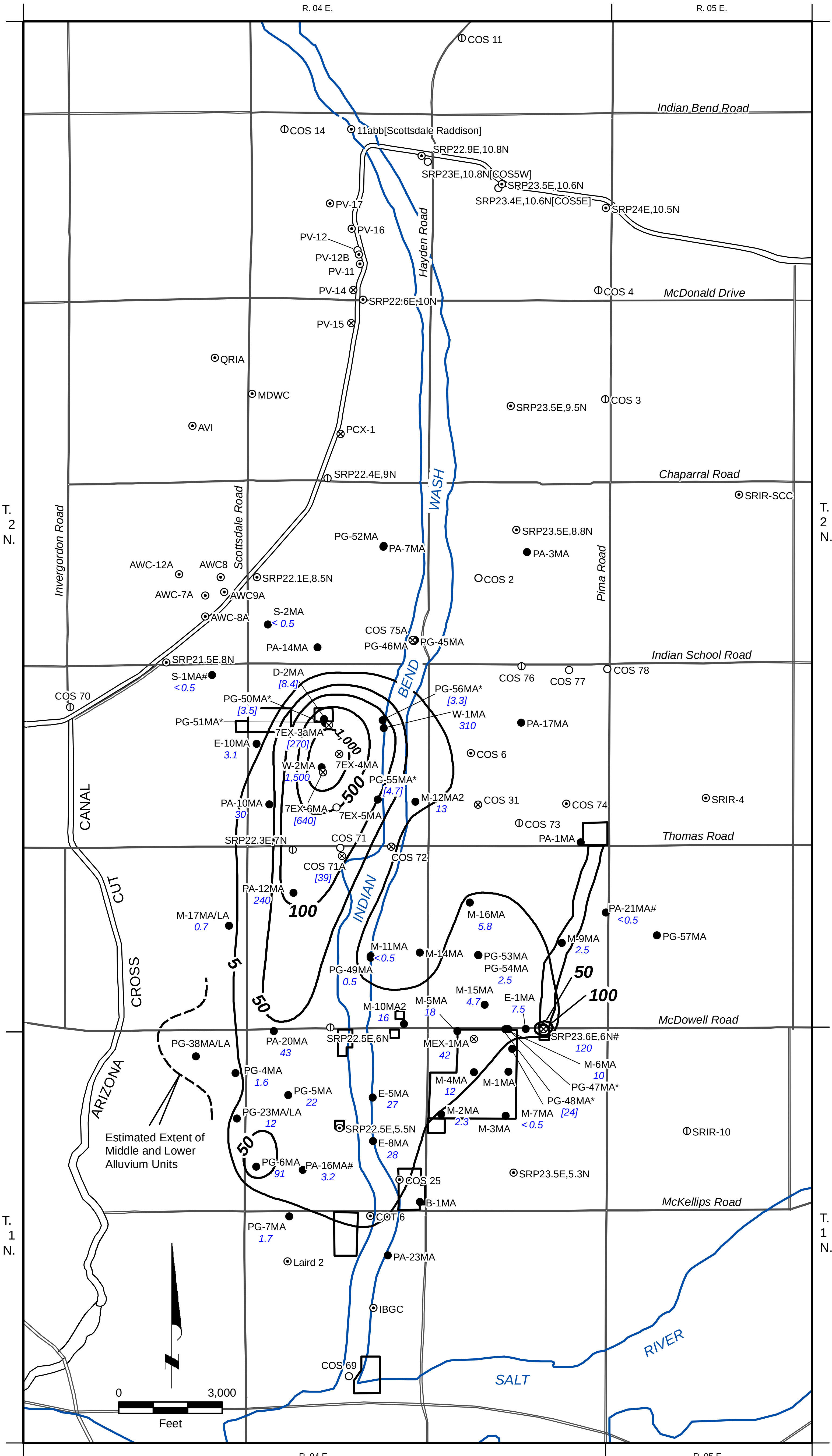
NORTH INDIAN BEND WASH AREA
MARICOPA COUNTY, ARIZONA

CONCENTRATION OF TCE IN UPPER ALLUVIUM UNIT WELLS OCTOBER 2016

North Indian Bend Wash Superfund Site

FIGURE 10

GIS-TUC\366.1402\TCE\2016\UAU_TCE_Oct2016\23Mar2017



EXPLANATION

PG-6MA ● Middle Alluvium (MAU) Monitor Well Location and Identifier
* denotes the well is a Lower MAU well
\# denotes sampled November 2016

91 — Concentration of TCE, micrograms per liter;
[ ] indicates data not used for contouring

COS75A ⊗ Extraction Water Well Location and Identifier

COS74 ⊙ Production Water Well Location and Identifier

SRP22.5E, 6N ⦶ Inactive Production Water Well Location and Identifier

COS69 ○ Abandoned Production Water Well or Monitor Well Location and Identifier

—5— TCE Concentration Contour, in micrograms per liter

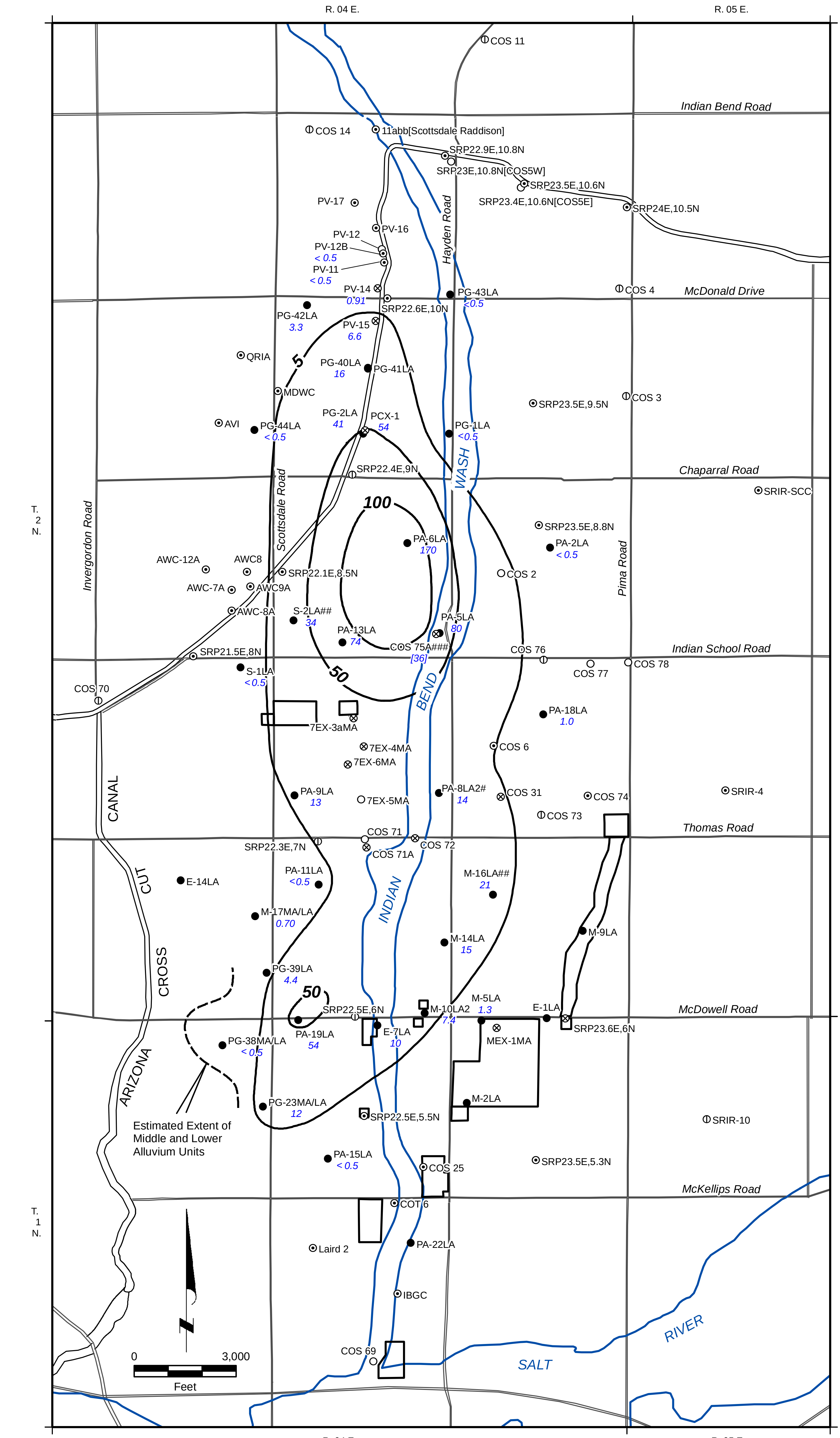
NORTH INDIAN BEND WASH AREA
MARICOPA COUNTY, ARIZONA

CONCENTRATION OF TCE IN MIDDLE ALLUVIUM UNIT WELLS OCTOBER 2016

North Indian Bend Wash Superfund Site

FIGURE 11

GIS-TUC\366.1402\TCE\2016\MAU_TCE_Oct2016\15Mar2017



EXPLANATION

PA-13LA ●	Lower Alluvium Monitor Well Location and Identifier # denotes alternative sampling date (# November 2016; ## December 2016; ### September 2016)
160	Concentration of TCE, micrograms per liter [ ] indicates data not used for contouring
COS75A ⊗	Extraction Water Well Location and Identifier
COS74 ⊙	Production Water Well Location and Identifier
SRP22.5E, 6N ⦶	Inactive Production Water Well Location and Identifier
COS69 ○	Abandoned Production Water Well or Monitor Well Location and Identifier
—50—	TCE Concentration Contour, in micrograms per liter

NORTH INDIAN BEND WASH AREA

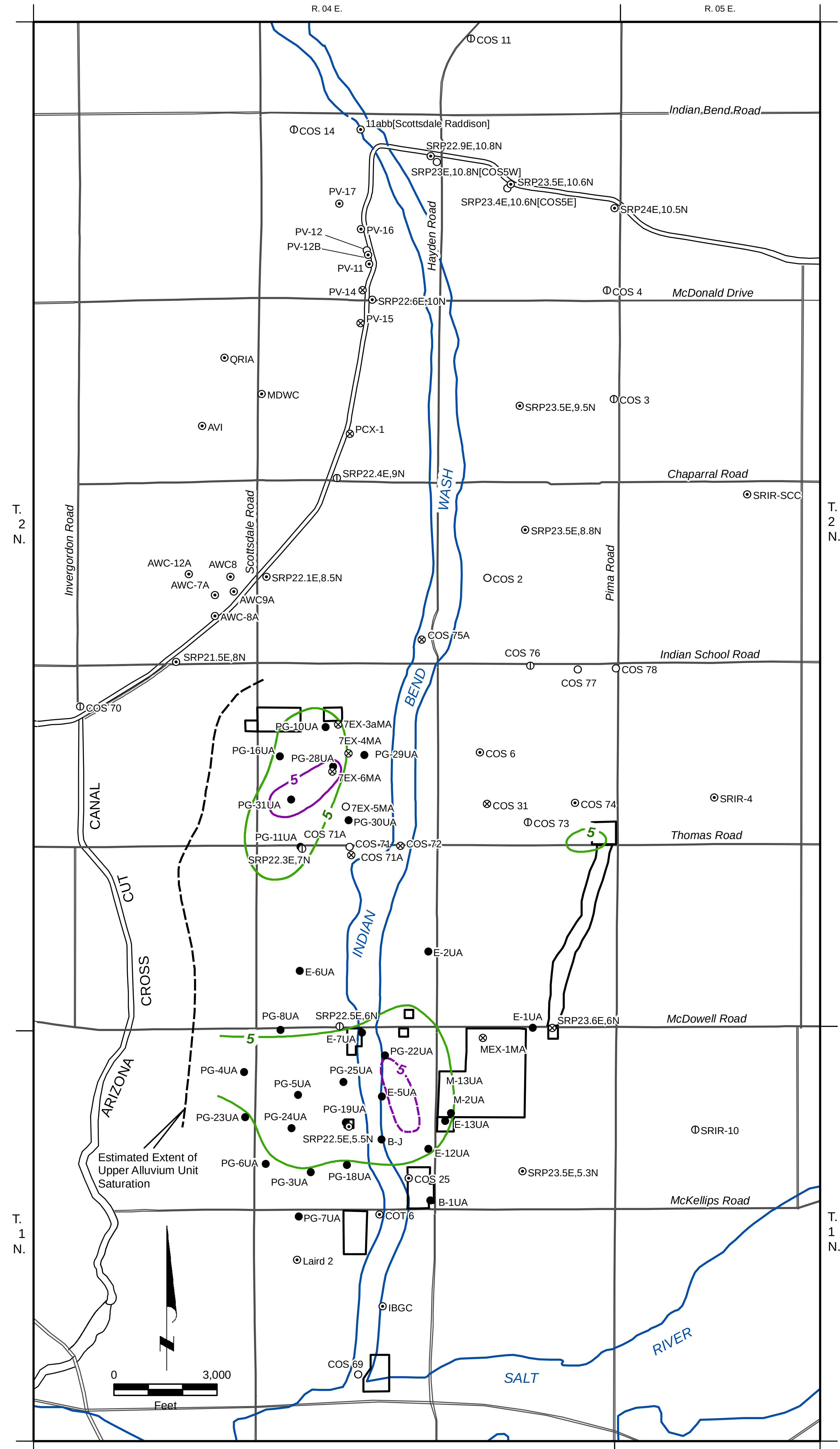
MARICOPA COUNTY, ARIZONA

CONCENTRATION OF TCE IN LOWER ALLUVIUM UNIT WELLS OCTOBER 2016

North Indian Bend Wash Superfund Site

FIGURE 12

GIS-TUC\366.1402\TCE\2016\LAU_TCE_Oct2016\15Mar2017



EXPLANATION

PG-5UA ●	Upper Alluvium Monitor Well Location and Identifier
COS75A ⊗	Extraction Water Well Location and Identifier
COS74 ⊙	Production Water Well Location and Identifier
SRP22.5E, 6N ⦶	Inactive Production Water Well Location and Identifier
COS69 ○	Abandoned Production Water Well or Monitor Well Location and Identifier
—5— (green)	TCE Concentration Contour, in micrograms per liter (October 2001)
—5— (purple)	TCE Concentration Contour, in micrograms per liter (October 2016)
- - - - -	Contour approximate

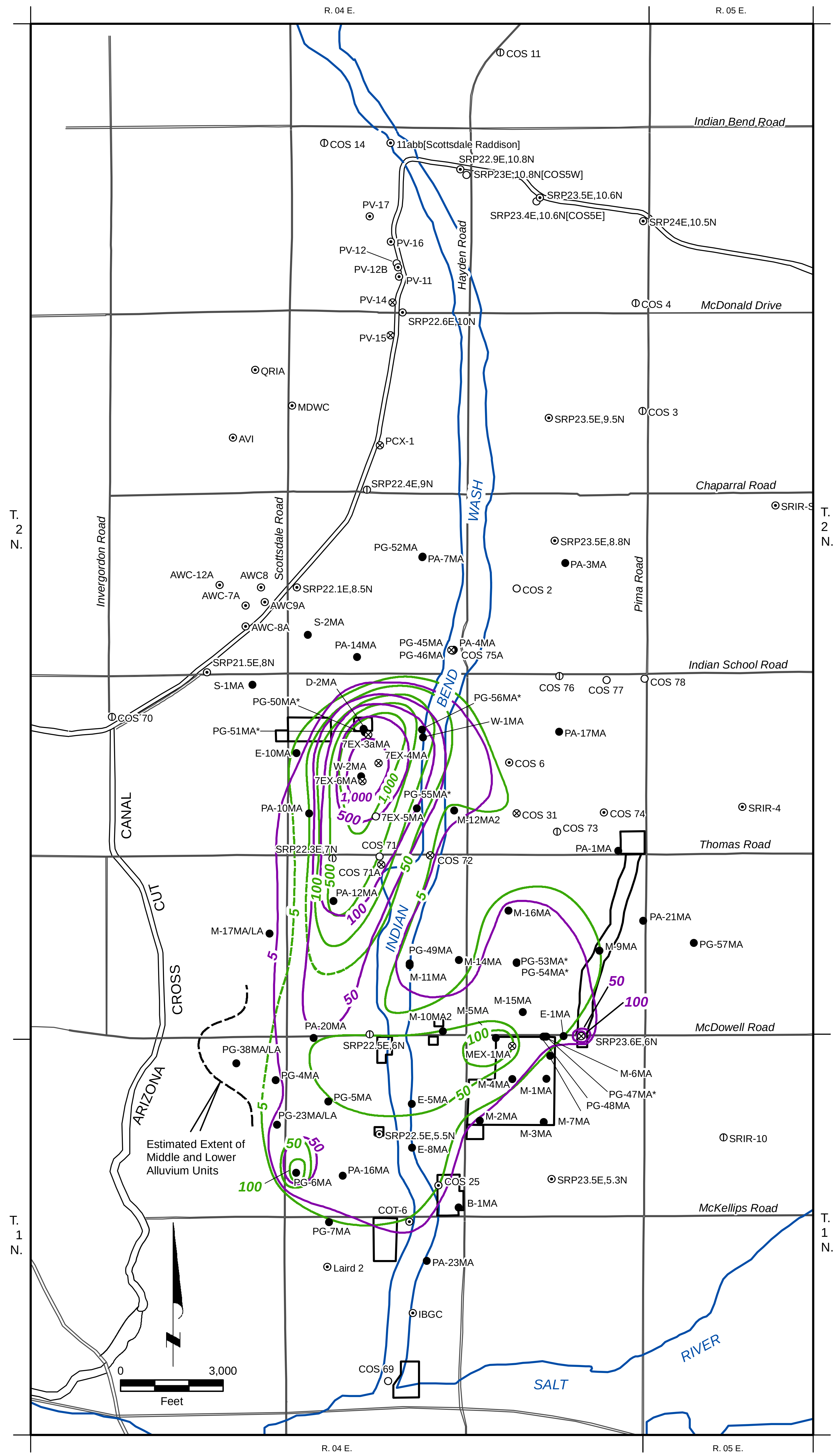
NORTH INDIAN BEND WASH AREA
MARICOPA COUNTY, ARIZONA

CONCENTRATION OF TCE IN UPPER ALLUVIUM UNIT WELLS OCTOBER 2001 - OCTOBER 2016

North Indian Bend Wash Superfund Site

FIGURE 13

GIS-TUC\366.1402\TCE\2016\UAU_TCE_Oct2001-2016\23Mar2017



EXPLANATION

- PG-6MA ● Middle Alluvium (MAU) Monitor Well Location and Identifier
  * denotes the well is a Lower MAU well
- COS75A ⊗ Extraction Water Well Location and Identifier
- COS74 ⊙ Production Water Well Location and Identifier
- SRP22.5E, 6N ⦶ Inactive Production Water Well Location and Identifier
- COS69 ○ Abandoned Production Water Well or Monitor Well Location and Identifier
- —50— TCE Concentration Contour, in micrograms per liter (October 2001)
  - - - - Contour approximate; no data available for M-17MA/LA in 2001
- —50— TCE Concentration Contour, in micrograms per liter (October 2016)

NORTH INDIAN BEND WASH AREA

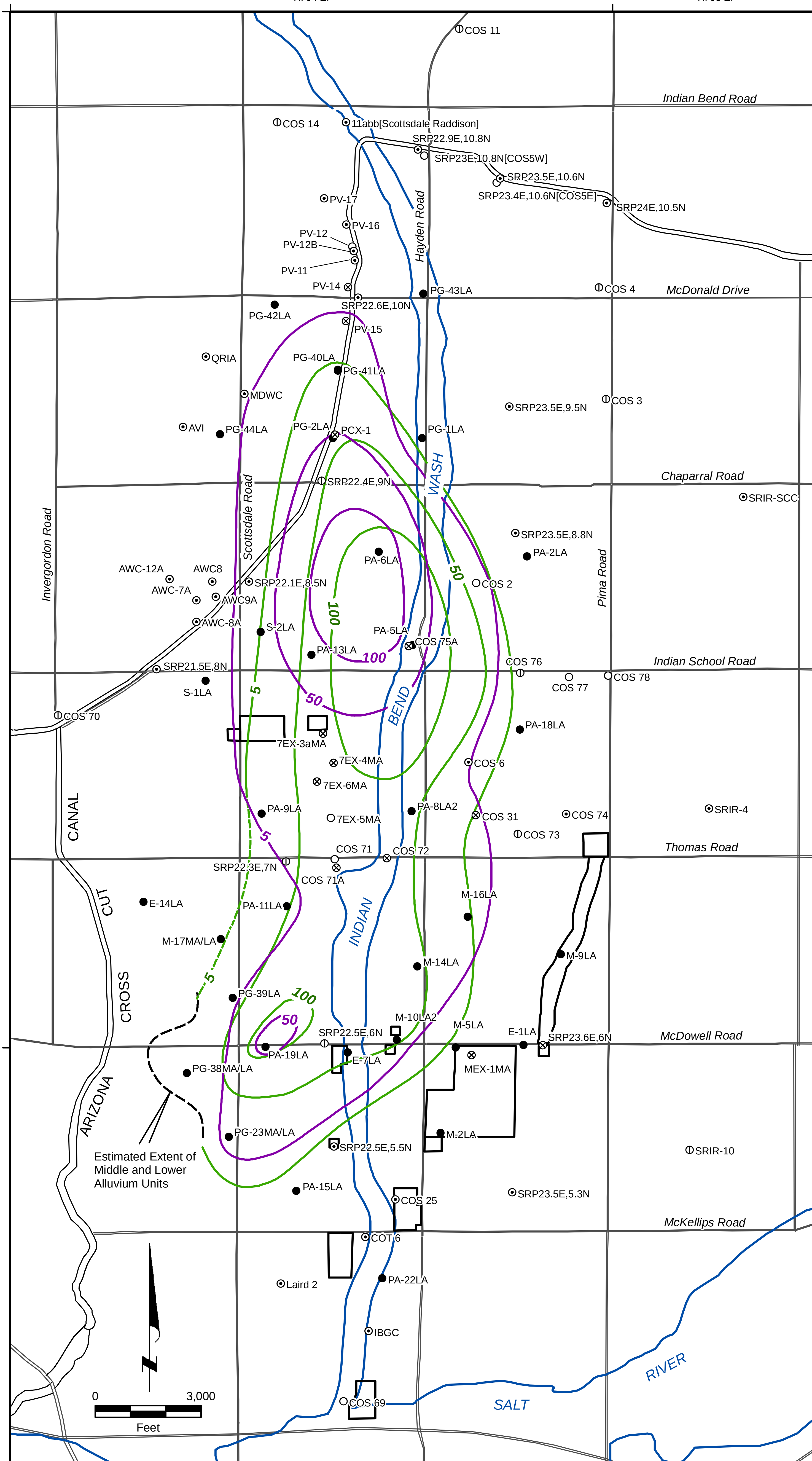
MARICOPA COUNTY, ARIZONA

CONCENTRATION OF TCE IN MIDDLE ALLUVIUM UNIT WELLS OCTOBER 2001 - OCTOBER 2016

North Indian Bend Wash Superfund Site

FIGURE 14

GIS-TUC\366.1402\TCE\2016\MAU_TCE_Oct2001-2016\23Mar2017



EXPLANATION

PA-13LA ● Lower Alluvium Monitor Well Location and Identifier

COS75A ⊗ Extraction Water Well Location and Identifier

COS74 ⊙ Production Water Well Location and Identifier

SRP22.5E, 6N ⦶ Inactive Production Water Well Location and Identifier

COS69 ○ Abandoned Production Water Well or Monitor Well Location and Identifier

50 TCE Concentration Contour, in micrograms per liter (October 2001)

Contour approximate; no data available for M-17MA/LA in 2001

50 TCE Concentration Contour, in micrograms per liter (October 2016)

NORTH INDIAN BEND WASH AREA

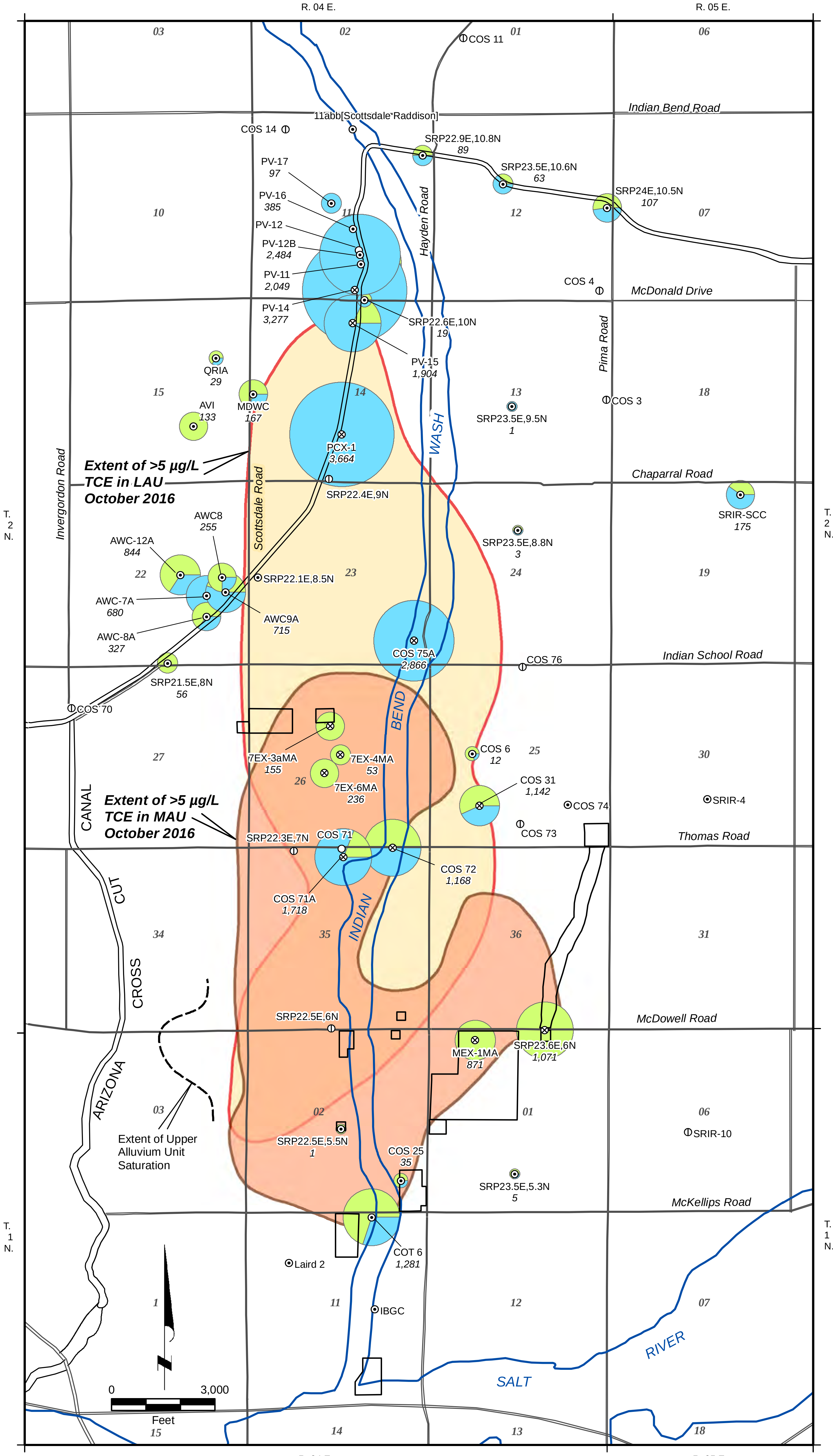
MARICOPA COUNTY, ARIZONA

CONCENTRATION OF TCE IN LOWER ALLUVIUM UNIT WELLS OCTOBER 2001 - OCTOBER 2016

North Indian Bend Wash Superfund Site

FIGURE 15

GIS-TUC\366.1402\TCE\2016\LAU_TCE_Oct2001-2016\23Mar2017



R. 04 E.

R. 05 E.

EXPLANATION

COS75A ⊗ Extraction Water Well Location and Identifier

COS25 ⊙ Production Water Well Location and Identifier
35 Annual Production for 2016, in acre-feet

SRP22.4E, 9N ⦶ Inactive Production Water Well Location and Identifier

COS69 ○ Abandoned Production Water Well or Monitor Well Location and Identifier

PUMPING DISTRIBUTION

Estimated Relative Percent Pumping from MAU

Estimated Relative Percent Pumping from LAU

VOLUME PUMPED, acre-feet

1 -10

11 - 50

51 - 100

101 - 500

501 - 1,000

1,001 - 2,000

2,001 - 3,000

>3,000

NORTH INDIAN BEND WASH AREA

MARICOPA COUNTY, ARIZONA

ANNUAL WELL PRODUCTION 2016

North Indian Bend Wash Superfund Site

2017

FIGURE 16

GIS-TUC\366.1402\WaterLevel\2016\AnnualWellProduction_2016\16Mar2017

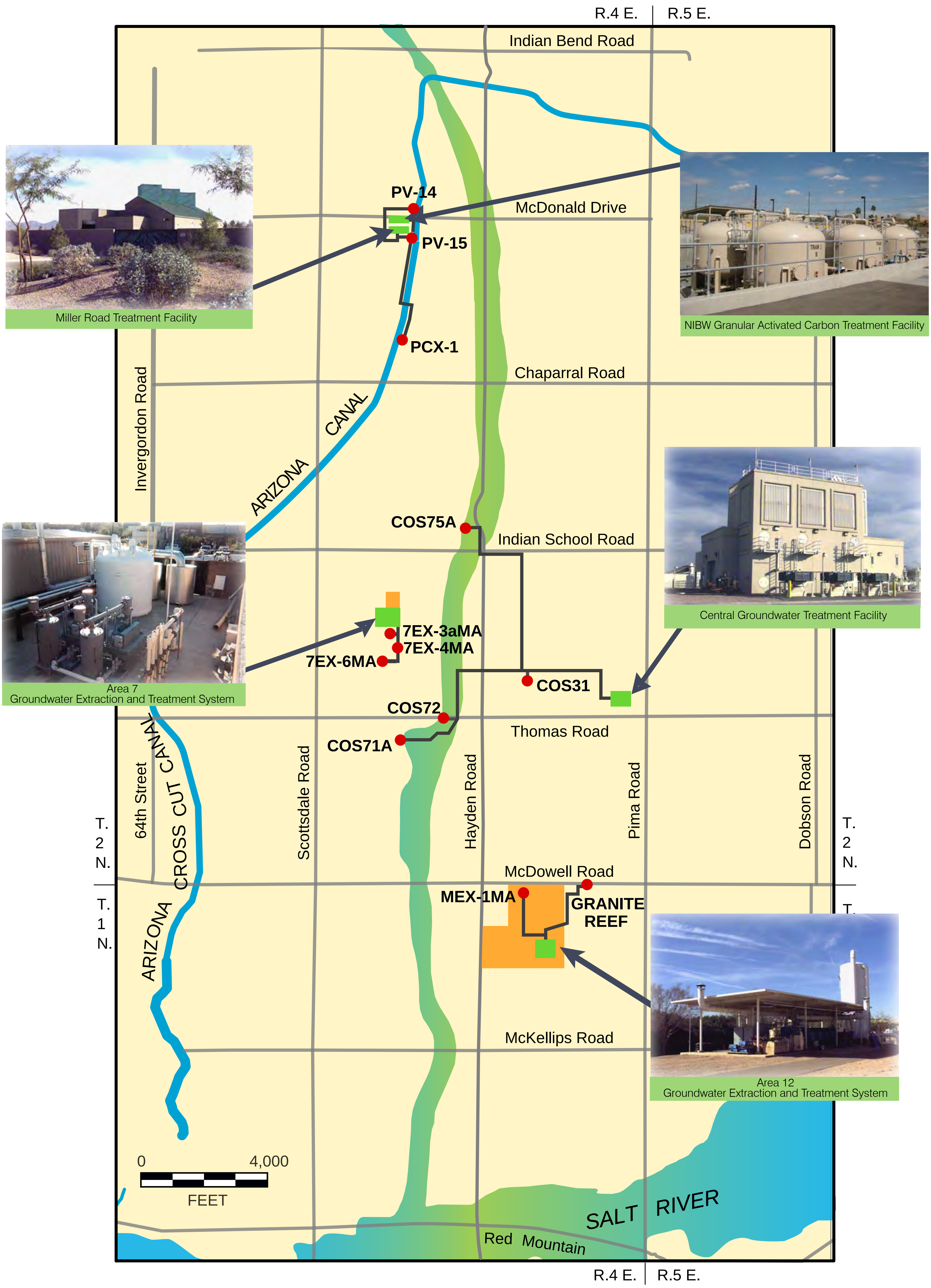
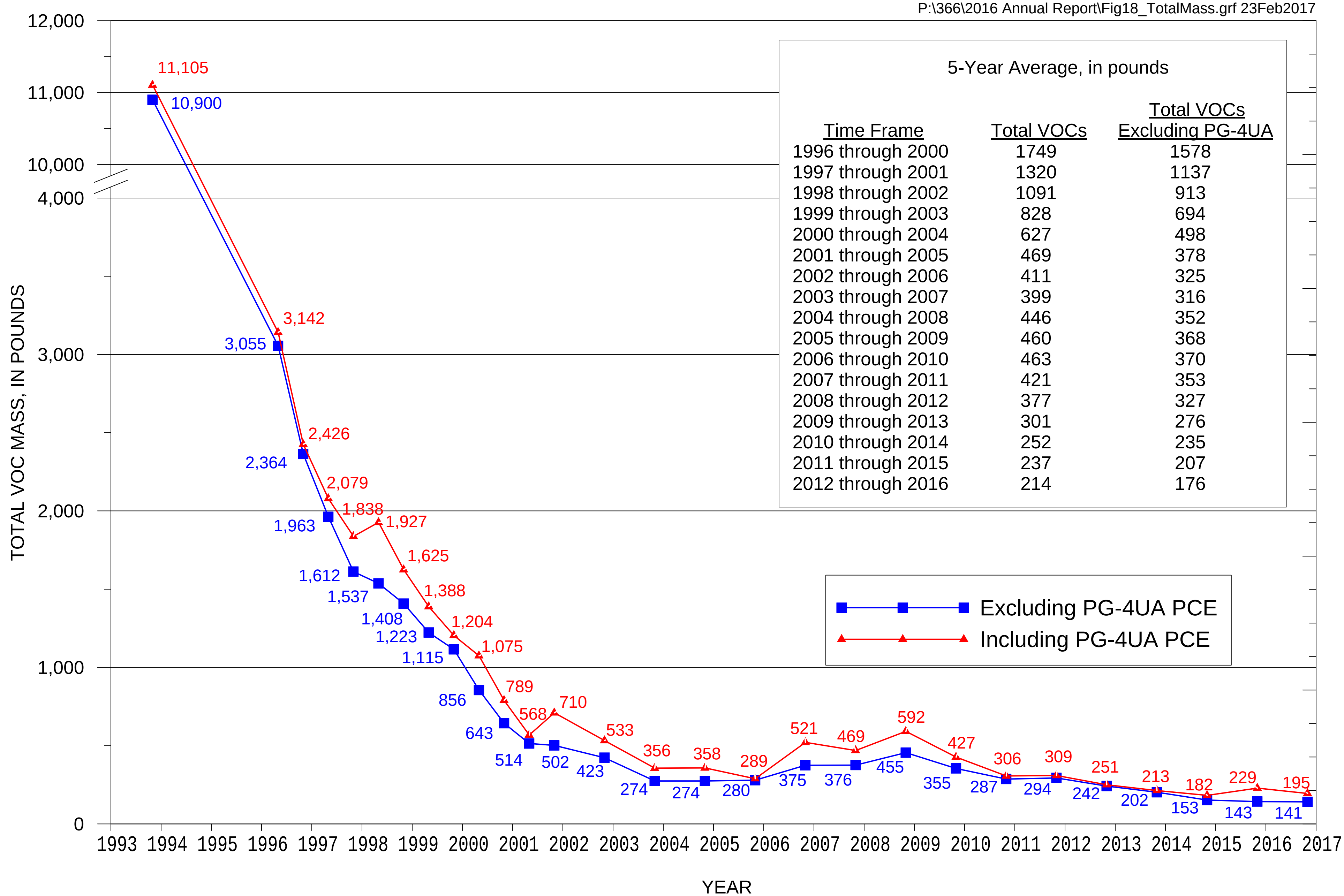


FIGURE 17. LOCATIONS FOR ACTIVE EXTRACTION WELLS, PIPELINES, AND TREATMENT FACILITIES, NIBW SUPERFUND SITE

North Indian Bend Wash Superfund Site

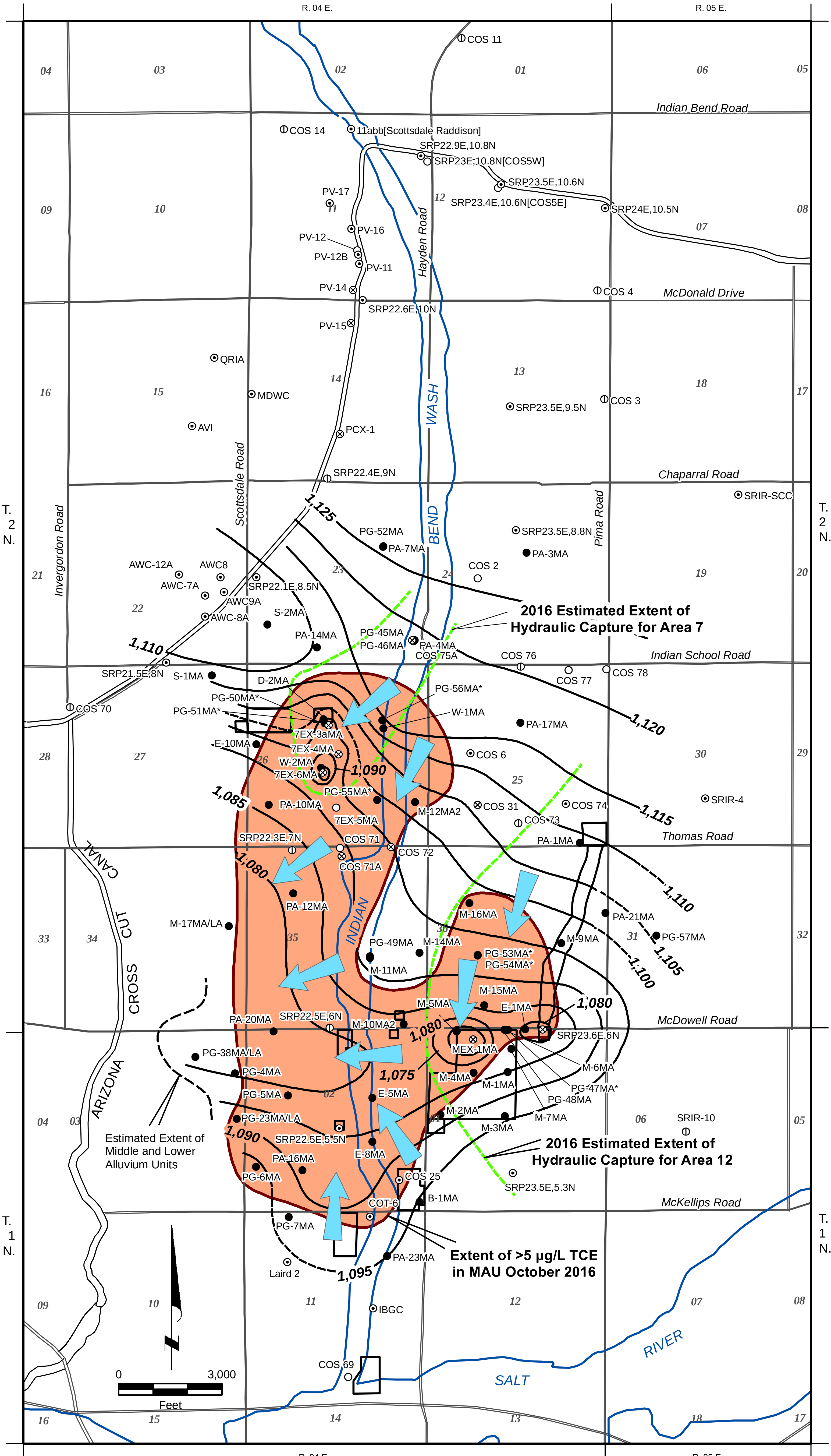
P:\366\2016 Annual Report\Fig18_TotalMass.grf 23Feb2017



Time Frame	Total VOCs	Total VOCs Excluding PG-4UA
1996 through 2000	1749	1578
1997 through 2001	1320	1137
1998 through 2002	1091	913
1999 through 2003	828	694
2000 through 2004	627	498
2001 through 2005	469	378
2002 through 2006	411	325
2003 through 2007	399	316
2004 through 2008	446	352
2005 through 2009	460	368
2006 through 2010	463	370
2007 through 2011	421	353
2008 through 2012	377	327
2009 through 2013	301	276
2010 through 2014	252	235
2011 through 2015	237	207
2012 through 2016	214	176

FIGURE 18. TOTAL MASS OF VOLATILE ORGANIC COMPOUNDS IN SATURATED PORTION OF UPPER ALLUVIUM UNIT

North Indian Bend Wash Superfund Site



EXPLANATION

PG-6MA ●	Middle Alluvium (MAU) Monitor Well Location and Identifier * denotes the well is a Lower MAU well
COS75A ⊗	Extraction Water Well Location and Identifier
COS74 ⊙	Production Water Well Location and Identifier
SRP22.5E, 6N ⦶	Inactive Production Water Well Location and Identifier
COS69 ○	Abandoned Production Water Well or Monitor Well Location and Identifier
— 1,090 —	Groundwater Level Altitude Contour, in feet above mean sea level Dashed where approximate
⇨	Direction of Groundwater Movement

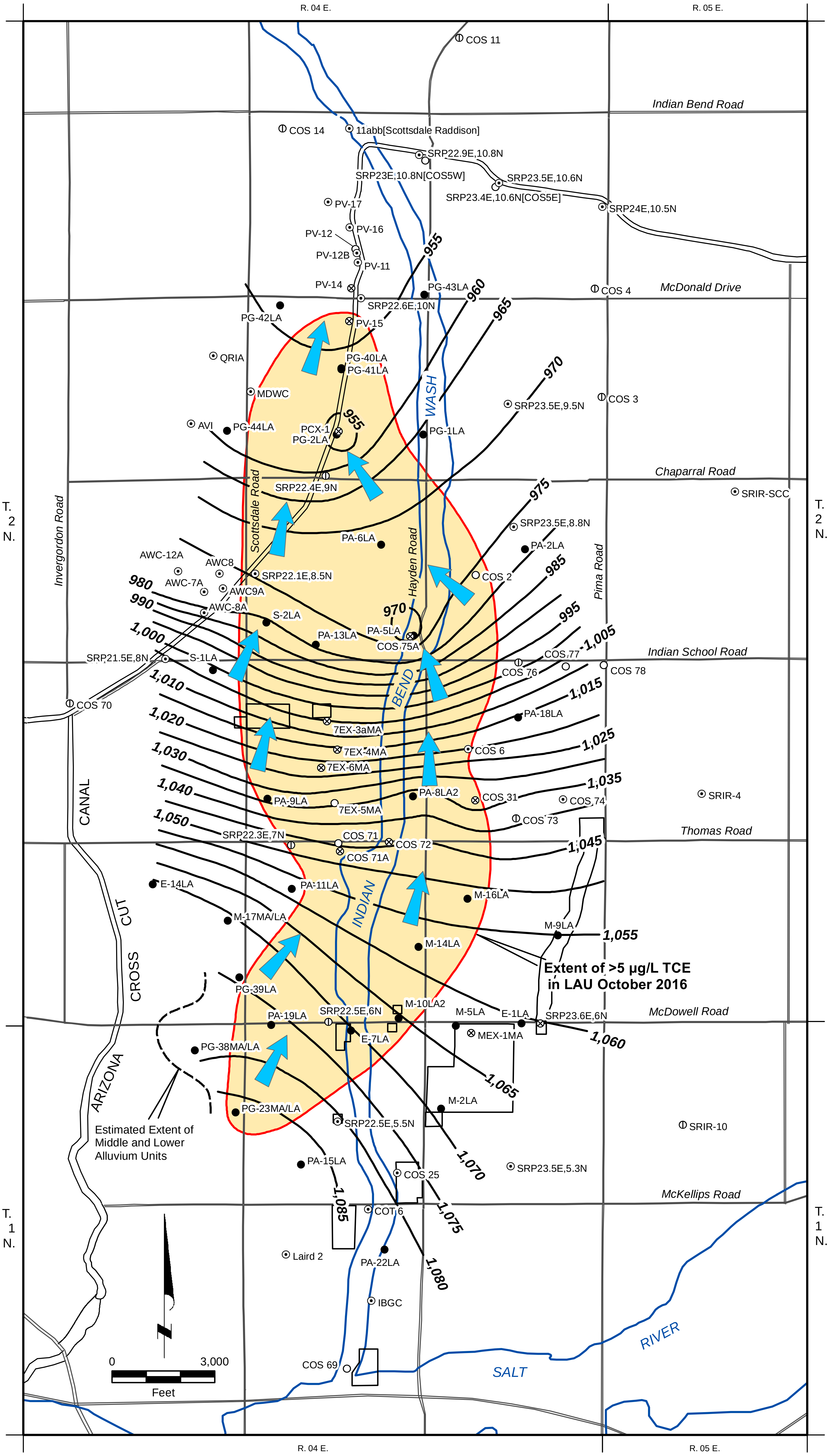
NORTH INDIAN BEND WASH AREA
MARICOPA COUNTY, ARIZONA

ESTIMATED HYDRAULIC CONTAINMENT OF MIDDLE ALLUVIUM UNIT PLUME OCTOBER 2016

North Indian Bend Wash Superfund Site

FIGURE 19

GIS-TUC\366.1402\WaterLevel\2016\MAU_WLOct2016_CAPTURE\14Mar2017



EXPLANATION

PA-15LA ● Lower Alluvium Monitor Well Location and Identifier

COS75A ⊗ Extraction Water Well Location and Identifier

COS74 ⊙ Production Water Well Location and Identifier

SRP22.5E, 6N ⦶ Inactive Production Water Well Location and Identifier

COS69 ○ Abandoned Production Water Well or Monitor Well Location and Identifier

—1,090— Groundwater Level Altitude Contour, in feet above mean sea level

Direction of Groundwater Movement

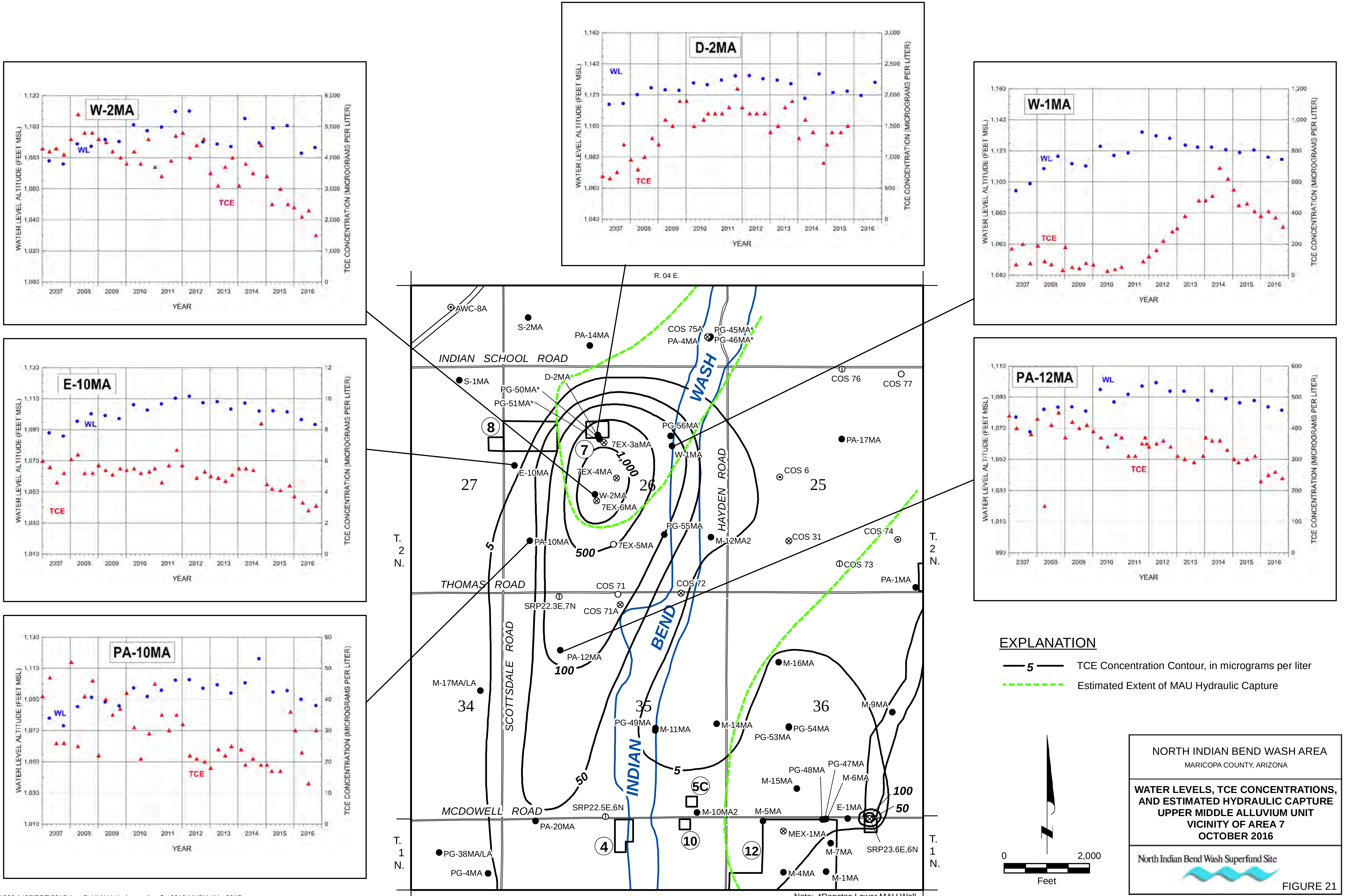
NORTH INDIAN BEND WASH AREA
MARICOPA COUNTY, ARIZONA

ESTIMATED HYDRAULIC CONTAINMENT OF LOWER ALLUVIUM UNIT PLUME OCTOBER 2016

North Indian Bend Wash Superfund Site

FIGURE 20

GIS-TUC\366.1402\WL\2016\LAU_WLOct2016_CAPTURE\14Mar2017



GIS-TUC\366.1402\TCE\2016\Area7_UMAU-Hydrographs_Oct2016.MXD\14Mar2017

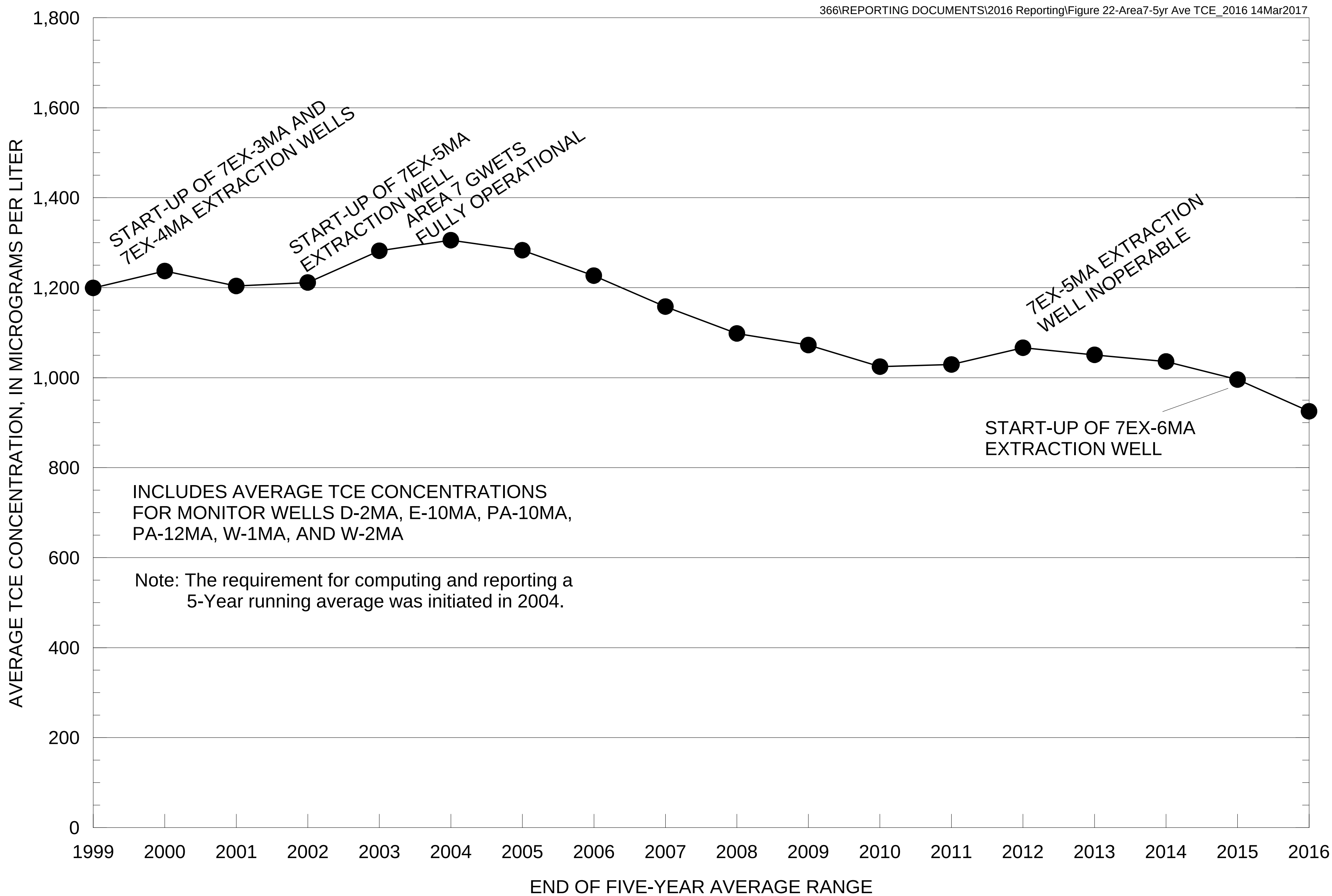
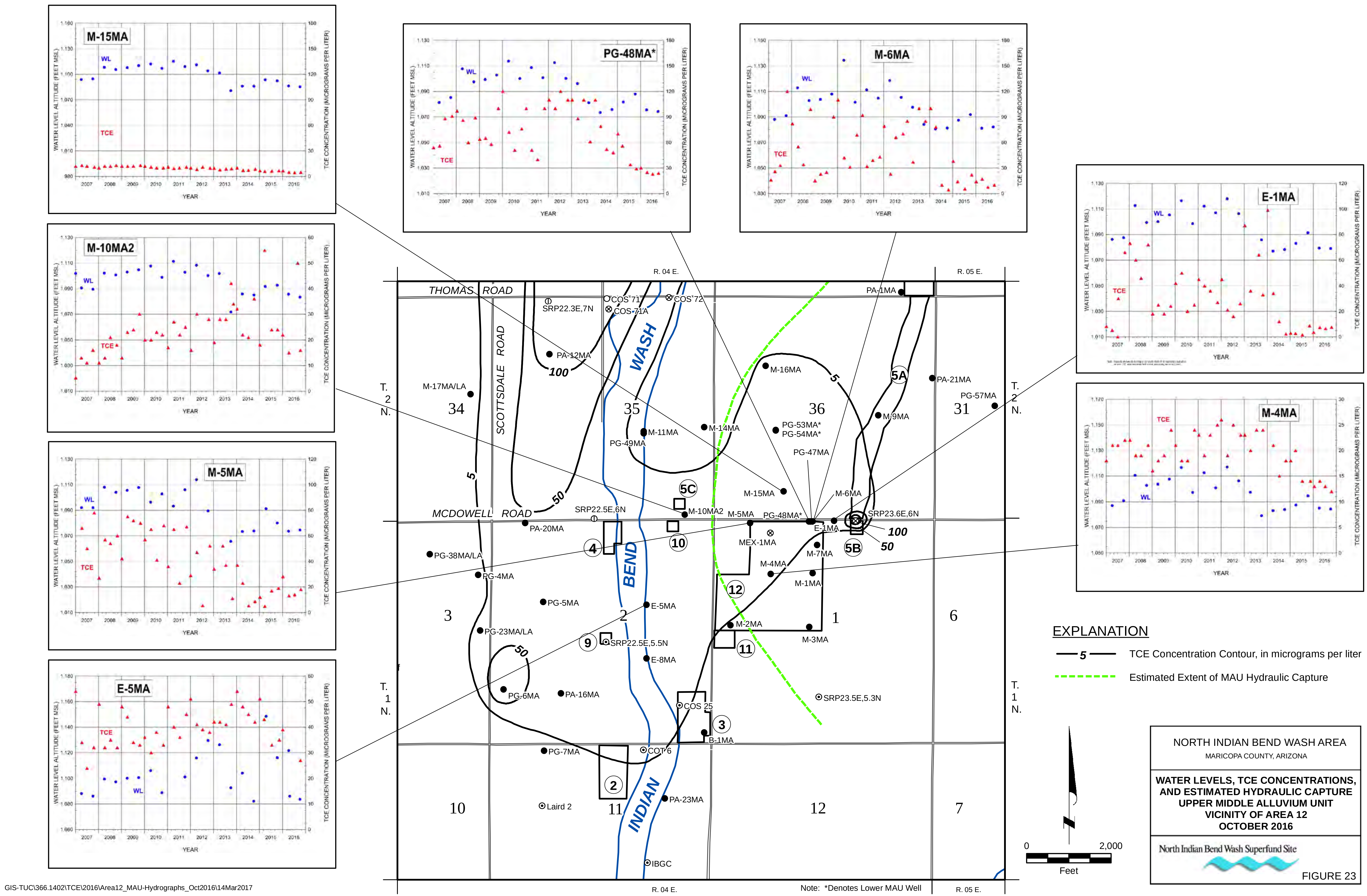


FIGURE 22. FIVE-YEAR RUNNING AVERAGE TCE CONCENTRATIONS UPPER MIDDLE ALLUVIUM UNIT VICINITY OF AREA 7

North Indian Bend Wash Superfund Site



GIS-TUC\366.1402\TCE\2016\Area12_MAU-Hydrographs_Oct2016\14Mar2017

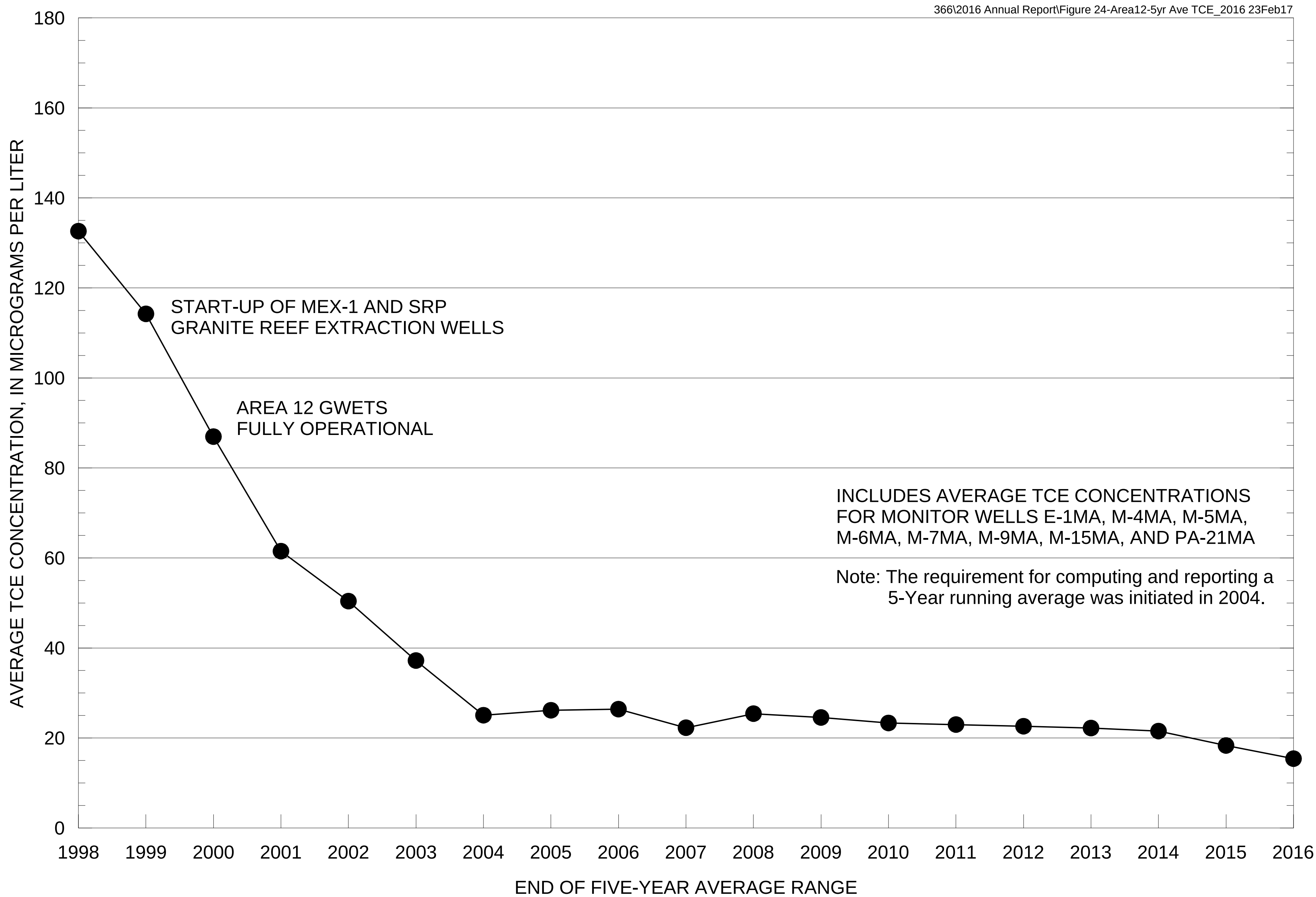
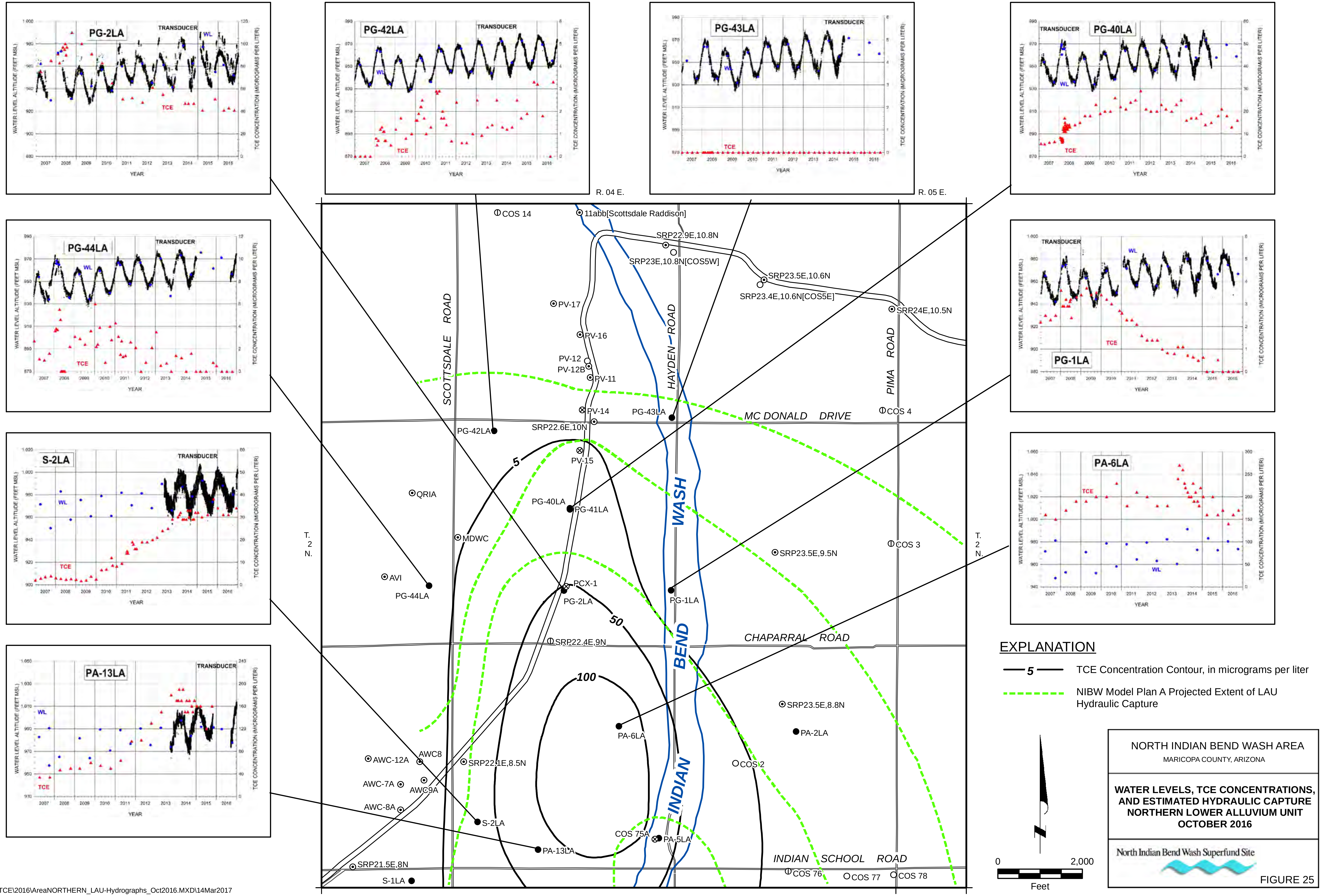


FIGURE 24. FIVE-YEAR RUNNING AVERAGE TCE CONCENTRATIONS UPPER MIDDLE ALLUVIUM UNIT, VICINITY OF AREA 12

North Indian Bend Wash Superfund Site



GIS-TUC\366.1402\TCE\2016\AreaNORTHERN_LAU-Hydrographs_Oct2016.MXD\14Mar2017

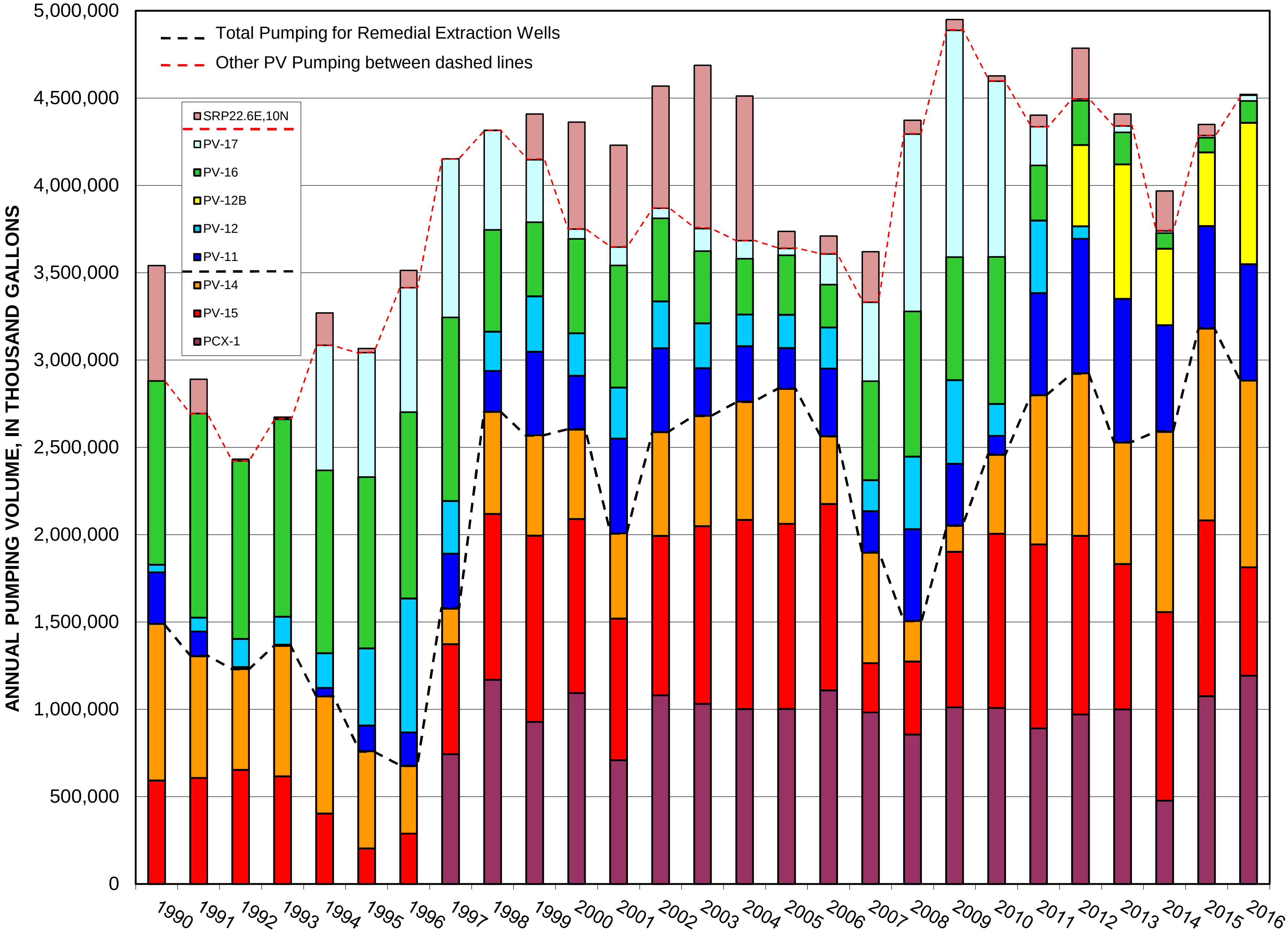
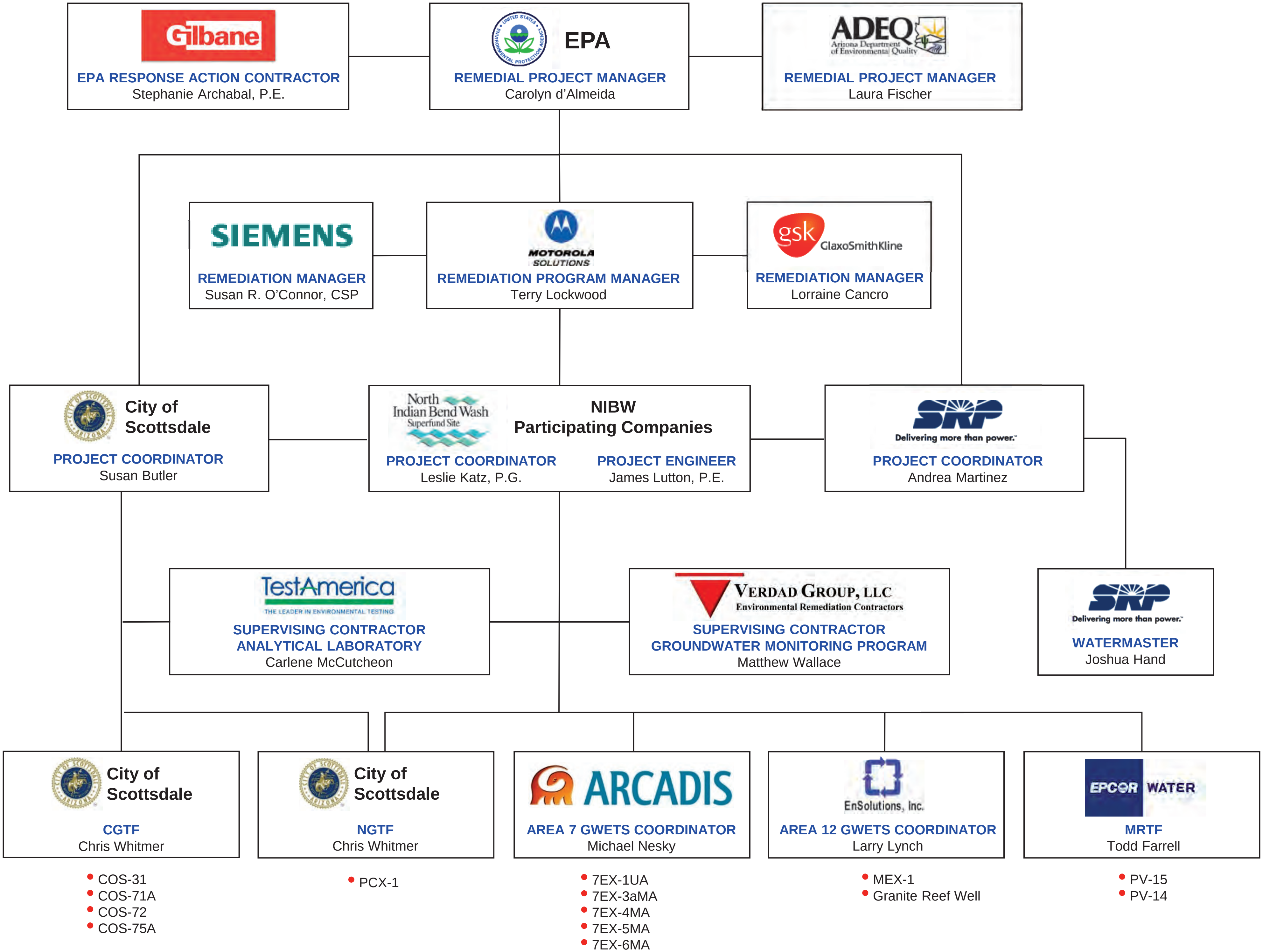


FIGURE 26. DISTRIBUTION OF PUMPING IN VICINITY OF PV PUMPING CENTER

North Indian Bend Wash Superfund Site

APPENDIX A

ROLES AND RESPONSIBILITIES FOR NIBW SUPERFUND SITE REMEDIAL ACTIONS



Gilbane
EPA RESPONSE ACTION CONTRACTOR
Stephanie Archabal, P.E.
EPA
REMEDIAL PROJECT MANAGER
Carolyn d'Almeida
ADEQ
Arizona Department of Environmental Quality
REMEDIAL PROJECT MANAGER
Laura Fischer
SIEMENS
REMEDIATION MANAGER
Susan R. O'Connor, CSP
MOTOROLA SOLUTIONS
REMEDIATION PROGRAM MANAGER
Terry Lockwood
gsk GlaxoSmithKline
REMEDIATION MANAGER
Lorraine Cancro
City of Scottsdale
PROJECT COORDINATOR
Susan Butler
North Indian Bend Wash Superfund Site
NIBW
Participating Companies
PROJECT COORDINATOR
Leslie Katz, P.G.
PROJECT ENGINEER
James Lutton, P.E.
SRP
Delivering more than power.
PROJECT COORDINATOR
Andrea Martinez
TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
SUPERVISING CONTRACTOR
ANALYTICAL LABORATORY
Carlene McCutcheon
VERDAD GROUP, LLC
Environmental Remediation Contractors
SUPERVISING CONTRACTOR
GROUNDWATER MONITORING PROGRAM
Matthew Wallace
SRP
Delivering more than power.
WATERMASTER
Joshua Hand
City of Scottsdale
CGTF
Chris Whitmer
City of Scottsdale
NGTF
Chris Whitmer
ARCADIS
AREA 7 GWETS COORDINATOR
Michael Nesky
EnSolutions, Inc.
AREA 12 GWETS COORDINATOR
Larry Lynch
EPCOR WATER
MRTF
Todd Farrell
COS-31
COS-71A
COS-72
COS-75A
PCX-1
7EX-1UA
7EX-3aMA
7EX-4MA
7EX-5MA
7EX-6MA
MEX-1
Granite Reef Well
PV-15
PV-14

CONTACTS LIST AND KEY ROLES

Site Wide Operation and Maintenance Plan

NIBW Participating Companies

Motorola Project Manager

Terry Lockwood
Motorola Solutions, Inc.
2900 South Diablo Way
Building A, Suite 150
Tempe, AZ 85282

602-760-4763 office
602-617-8563 mobile

terry.lockwood@motorolasolutions.com

NIBW Project Coordinator

Leslie Katz, P.G.
5010 East Shea Boulevard
Suite 145
Phoenix, AZ 85254

520-881-4912 office
520-245-4802 mobile

lkatz@elmontgomery.com

NIBW Project Engineer

James Lutton, P.E.
5010 East Shea Boulevard
Suite 145
Phoenix, AZ 85254

916-452-4684 office

james.lutton@jalpe.net

Agency

EPA Remedial Project Manager

Carolyn d'Almeida,
Region IX (SFD-8-1)
U.S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, CA 94105-3901

415-972-3150 office

dAlmeida.carolyn@epa.gov

ADEQ Project Manager

Laura Fischer
Arizona Department of Environmental Quality
Mail Code 4415B-1
1110 West Washington Street
Phoenix, AZ 85007

602-771-0200 office

Lf4@azdeq.gov

AREA 7
KEY ROLES

Site Project Manager

Terry Lockwood
Motorola Solutions, Inc.
2900 South Diablo Way
Building A, Suite 150
Tempe, AZ 85282

602-760-4763   office
602-617-8563   mobile

terry.lockwood@motorolasolutions.com

Incident Coordinator

Michael Nesky, P.E.
ARCADIS U.S., Inc.
14201 North 87th Street, Suite 135
Scottsdale, Arizona 85260

480-905-9311   office
480-905-9353   fax

michael.nesky@arcadis-us.com

Treatment System Coordinator

Ryan O'Keefe
ARCADIS U.S., Inc.
14201 North 87th Street, Suite 135
Scottsdale, Arizona 85260

480-905-9311   office
602-295-6708   mobile
480-905-9353   fax

rokeefe@arcadis-us.com

AREA 12
KEY ROLES

Site Project Manager

Terry Lockwood
Motorola Solutions, Inc.
2900 South Diablo Way
Building A, Suite 150
Tempe, AZ 85282

602-760-4763   office
602-617-8563   mobile

terry.lockwood@motorolasolutions.com

Incident Coordinator

Larry Lynch, P.E.
EnSolutions, Inc.
7620 East McKellips Road, Suite 4-71
Scottsdale, AZ 85257

561-762-7690   mobile

larry@ensolutions.us

Treatment System Coordinator

Larry Lynch, P.E.
EnSolutions, Inc.
7620 East McKellips Road, Suite 4-71
Scottsdale, AZ 85257

561-762-7690   mobile

larry@ensolutions.us

MILLER ROAD TREATMENT FACILITY
KEY ROLES

MRTF Operations Manager

Tim Williams
EPCOR
12021 North Panorama Drive
Fountain Hills, AZ 85268

623-445-2475 office
602-358-5738 mobile

tawilliams@epcor.com

NIBW Program Manager

Terry Lockwood
Motorola Solutions, Inc.
2900 South Diablo Way
Building A, Suite 150
Tempe, AZ 85282

602-760-4763 office
602-617-8563 mobile

terry.lockwood@motorolasolutions.com

EPCOR Incident Coordinator

Tim Williams
EPCOR
12021 North Panorama Drive
Fountain Hills, AZ 85268

623-445-2475 office
602-358-5738 mobile

tawilliams@epcor.com

NIBW PC's Incident Coordinator

Larry Lynch
EnSolutions. Inc.
7620 East McKellips Road, Suite 4-71
Scottsdale, AZ 85257

561-762-7690 mobile

larry@ensolutions.us

MRTF Coordinator

Todd Farrell
EPCOR
6215 North Cattletrack Road
Scottsdale, AZ 85250

602-388-7170 mobile

tfarrell@epcor.com

CENTRAL GROUNDWATER TREATMENT FACILITY
KEY ROLES

Project Coordinator

Susan Butler
City of Scottsdale
8787 East Hualapai Drive
P.O. Box 25089
Scottsdale, AZ 85255

480-312-8712 office
480-312-8728 fax

sbutler@scottsdaleaz.gov

Emergency Response Coordinator Priority List During Normal Business Hours:

1. Chris Whitmer, CGTF Senior Operator
   Phone: 480-312-0390
   Mobile: 602-402-3223
2. Senior Operator on staff
   Pager: 602-238-0278
3. Brian Paulson, Treatment Manager
   Phone: 480-312-8941
   Mobile: 602-319-2931

After Hours:

1. Chris Whitmer, CGTF Senior Operator
   Mobile: 602-402-3223
2. Senior Operator on staff
   Mobile: 480-341-4629
   Pager: 602-238-0278
3. Water Production Operator on call
   Mobile: 480-421-8884
   Pager: 602-223-0481
4. Telemetry Pager
   Pager: 602-223-4812
5. Water Distribution on call
   Pager: 602-229-3677
6. Brian Paulson, Treatment Manager
   Mobile: 602-319-2931

COS Regulatory Contact List:

A.) Sue Butler, COS Water Quality Coordinator
480-312-8712 office, business hours
480-225-6557 mobile, after hours

B.) Carie Wilson, COS Regulatory Compliance Manager
480-312-8718 office, business hours
602-499-7942 mobile, after hours

C.) Suzanne Grendahl, Water Quality Director
480-312-8719 office, business hours
623-640-1474 mobile, after hours

NIBW GAC TREATMENT FACILITY
KEY ROLES

Site Project Manager

Terry Lockwood
Motorola Solutions, Inc.
2900 South Diablo Way
Building A, Suite 150
Tempe, AZ 85282

602-760-4763   office
602-617-8563   cell

terry.lockwood@motorolasolutions.com

NIBW PC's Incident Coordinator

Larry Lynch
EnSolutions. Inc.
7620 East McKellips Road, Suite 4-71
Scottsdale, AZ 85257

561-762-7690 mobile

larry@ensolutions.us

NGTF Operator:

1. Chris Whitmer, CGTF Senior Operator
   Phone: 480-312-0390
   Mobile: 602-402-3223
2. Senior Operator on staff
   Pager: 602-238-0278

GROUNDWATER MONITORING AND EXTRACTION WELL FIELD SERVICES KEY ROLES

Site Project Manager

Terry Lockwood
Motorola Solutions, Inc.
2900 South Diablo Way
Building A, Suite 150
Tempe, AZ 85282

602-760-4763   office
602-617-8563   cell

terry.lockwood@motorolasolutions.com

**Field Services Contractor,
Project Manager**

Matthew Wallace
Verdad Group, LLC
1 East Washington Street
Suite 500
Phoenix, AZ 85004

855-458-7834   phone

matt@verdadgroupllc.com

PHASE 2 SAMPLING AND ANALYSIS PLAN
KEY ROLES

NIBW Project Coordinator

Leslie Katz, P.G.
5010 East Shea Boulevard
Suite 145
Phoenix, AZ 85254

520-881-4912 office
520-245-4802 mobile

Samplers

Central Groundwater Treatment Facility

Tom Byers
City of Scottsdale

Miller Road Treatment Facility

Larry Lynch, P.E.
EnSolutions

Area 7 GWETS

Michael Nesky, P.E.
ARCADIS U.S., Inc.

Area 12 GWETS

Larry Lynch, P.E.
EnSolutions

NIBW PCs QA Officer

James Lutton, P.E.
5010 East Shea Boulevard
Suite 145
Phoenix, AZ 85254

916-452-4684 office

COS QA Officer

Gail Adams
City Of Scottsdale
8787 E. Hualapai Drive
Scottsdale, AZ 85255

480-312-8744 phone
480-312-8728 fax

Laboratory Data QC Officer

Carlene McCutcheon
Test America
4645 E. Cotton Center Blvd.
Building 3, Suite 189
Phoenix, AZ 85040

602-437-3340 phone
602-454-9303 fax

NIBW PCs Data QC Officer

Marla Odom
5010 East Shea Boulevard
Suite 145
Phoenix, AZ 85254

520-881-4912 office

NIBW PARTICIPATING COMPANIES
CONTACT LIST AND KEY ROLES

Call-Out for any Reported Release of Untreated Groundwater at:

SRP 22.5E-9.3N (PCX-1)

SRP 23.3E-7.3N (COS-31)

SRP 23.6E-6N (Granite Reef)

1) NIBW Project Coordinator

Leslie Katz, P.G.
5010 East Shea Boulevard
Suite 145
Phoenix, AZ 85254

520-881-4912 office
520-245-4802 mobile

lkatz@elmontgomery.com

2) NIBW Project Engineer

James Lutton, P.E.
5010 East Shea Boulevard
Suite 145
Phoenix, AZ 85254

916-452-4684 office

james.lutton@jalpe.net

3) Motorola Project Manager

Terry Lockwood
Motorola Solutions, Inc.
2900 South Diablo Way
Building A, Suite 150
Tempe, AZ 85282

602-760-4763 office
602-617-8563 mobile

terry.lockwood@motorolasolutions.com

APPENDIX B

NORTHERN LAU CONTINUOUS
WATER LEVEL MONITORING GRAPHS, 2016

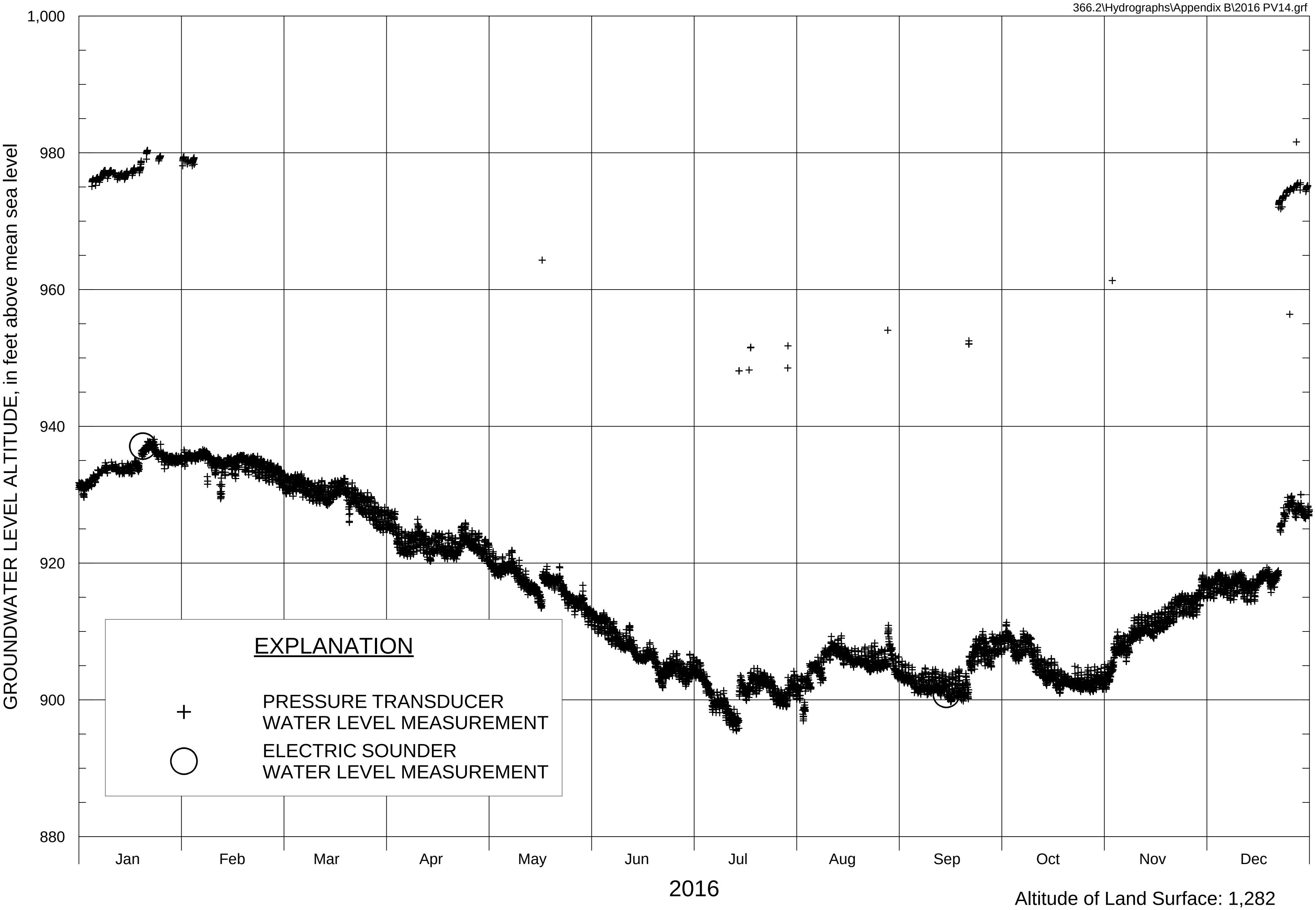


FIGURE B-1. GROUNDWATER LEVEL HYDROGRAPH FOR EXTRACTION WELL PV-14

Note: 1) Higher water levels are representative of non-pumping conditions; lower water levels are representative of pumping conditions.

North Indian Bend Wash Superfund Site

FIGURE B-2. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PG-1LA

North Indian Bend Wash Superfund Site

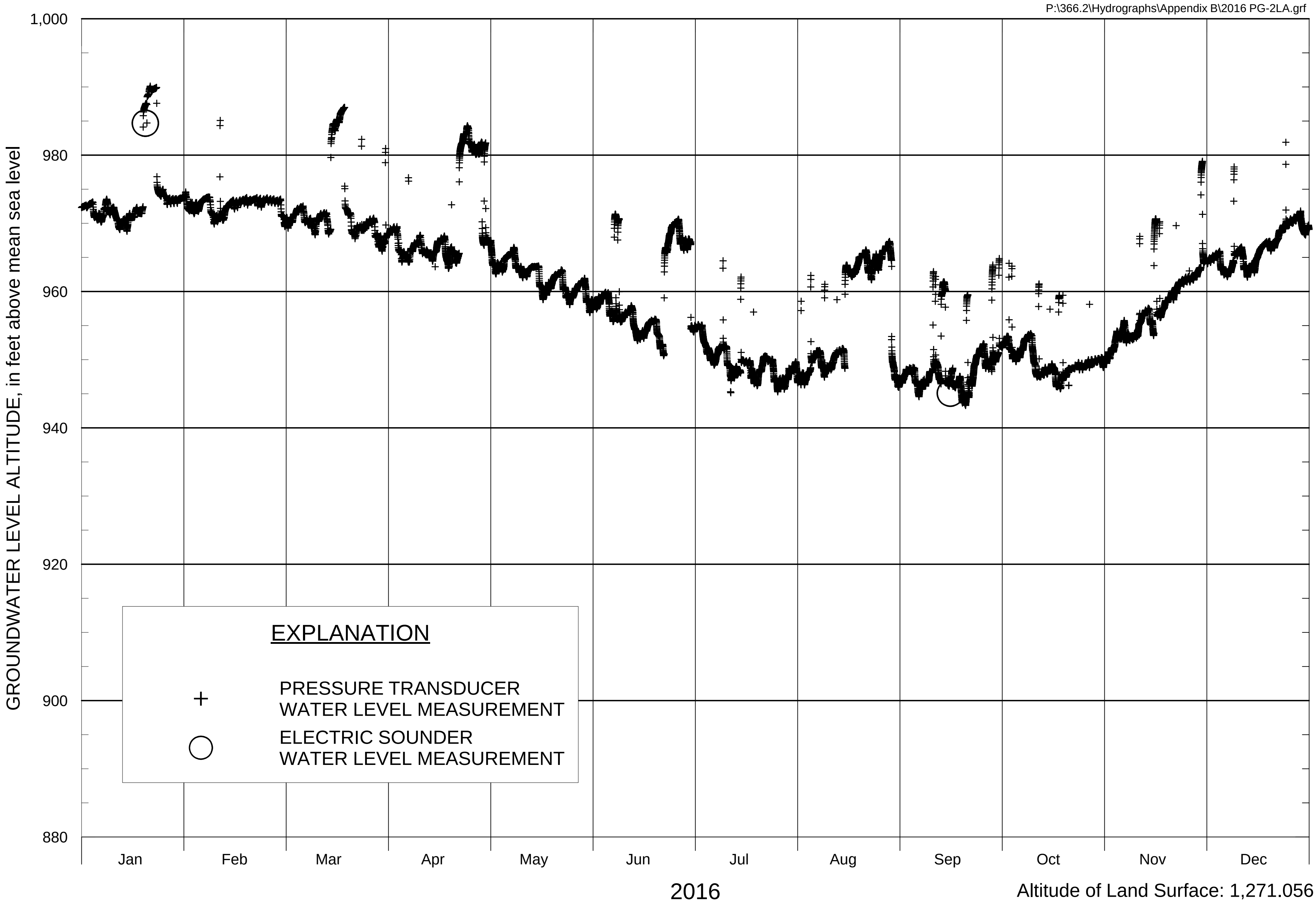
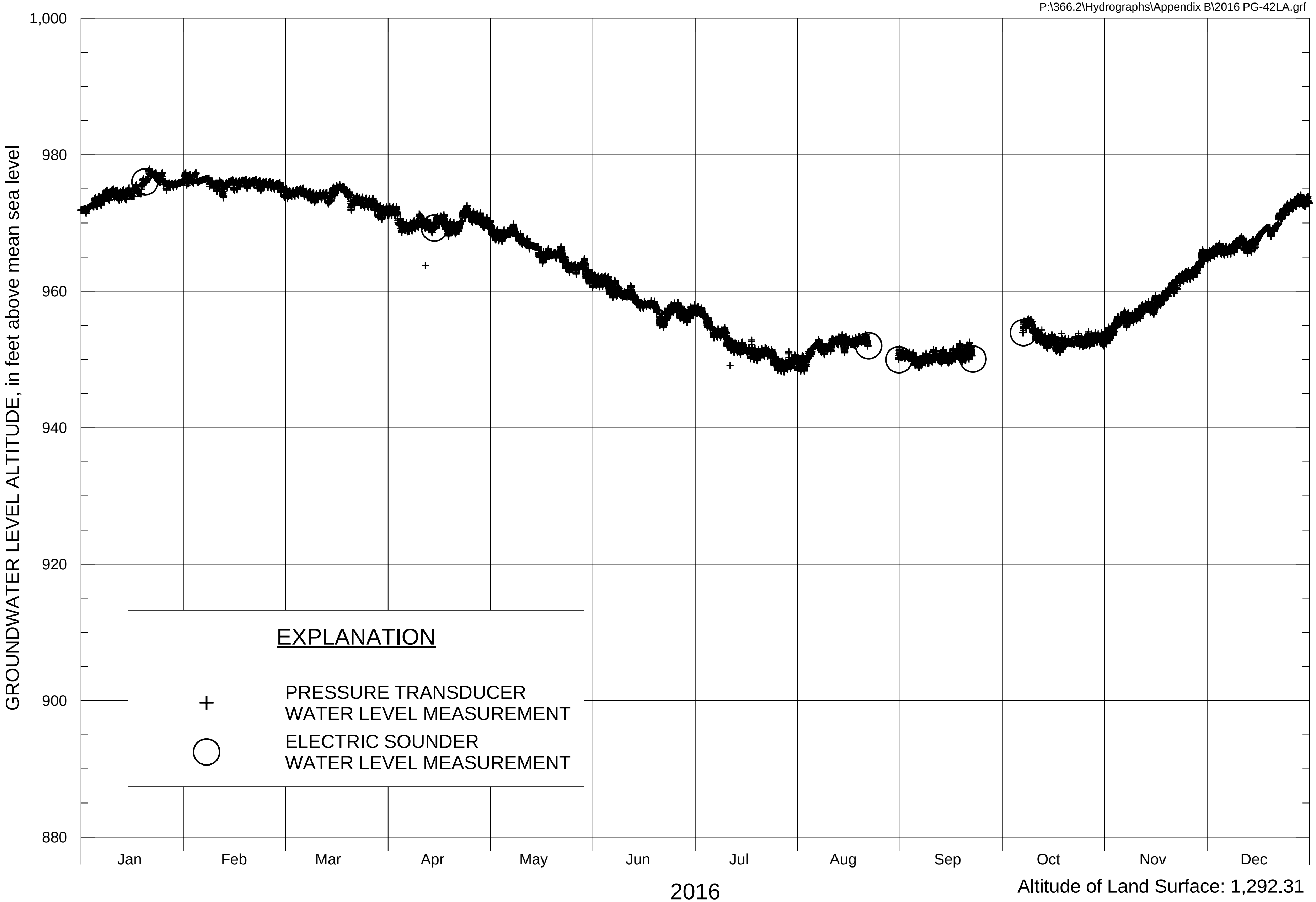


FIGURE B-3. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PG-2LA

North Indian Bend Wash Superfund Site

P:\366.2\Hydrographs\Appendix B\2016 PG-42LA.grf



Altitude of Land Surface: 1,292.31

FIGURE B-4. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PG-42LA

North Indian Bend Wash Superfund Site

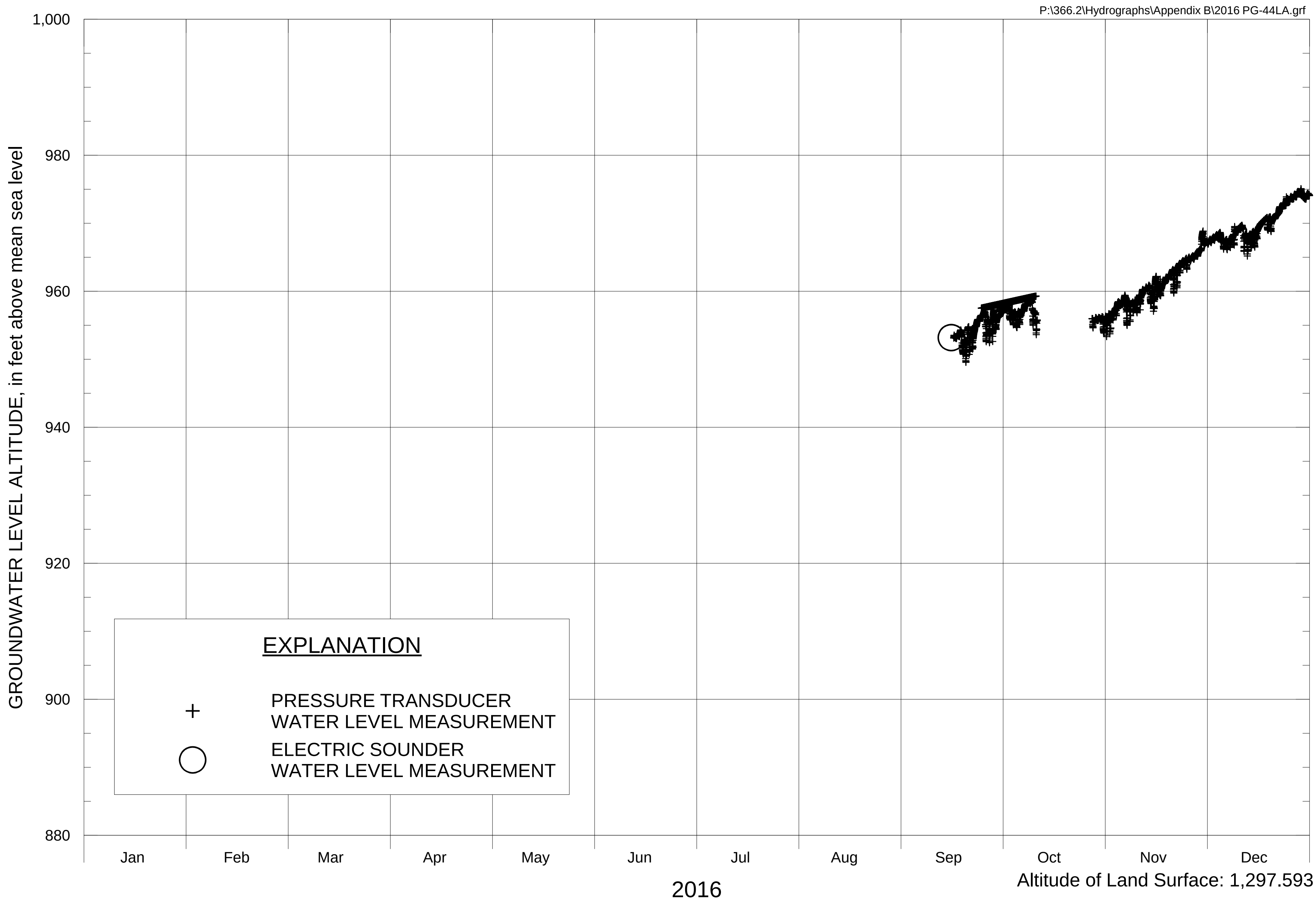


FIGURE B-5. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PG-44LA

North Indian Bend Wash Superfund Site

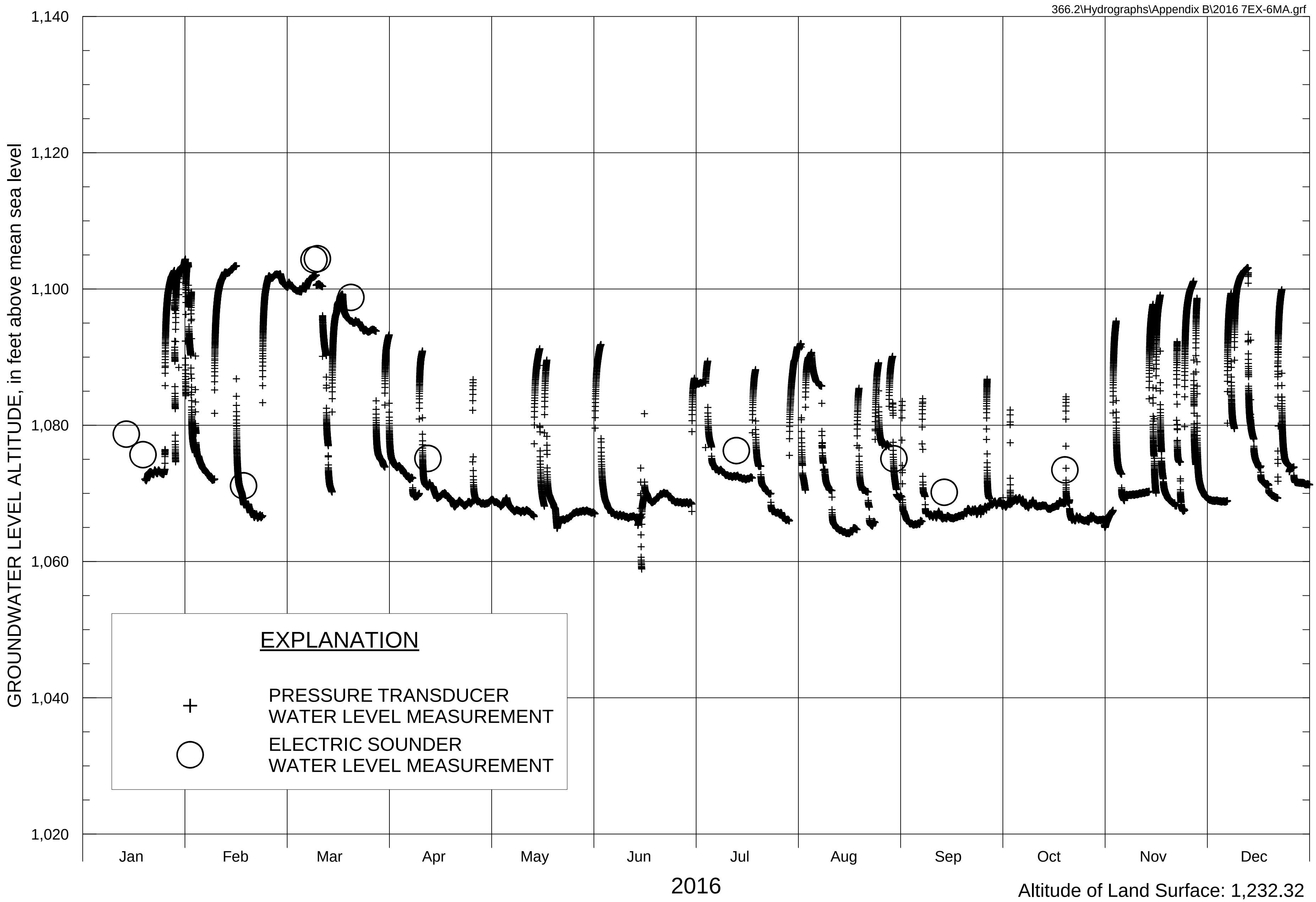


FIGURE B-6. GROUNDWATER LEVEL HYDROGRAPH FOR EXTRACTION WELL 7EX-6MA

Note: 1) Well 7EX-6MA replaced well 7EX-5MA in August 2015.

North Indian Bend Wash Superfund Site

APPENDIX C

WATER LEVEL HYDROGRAPHS AND TCE TIME-SERIES DATA
FOR NIBW MONITOR, PRODUCTION AND EXTRACTION WELLS

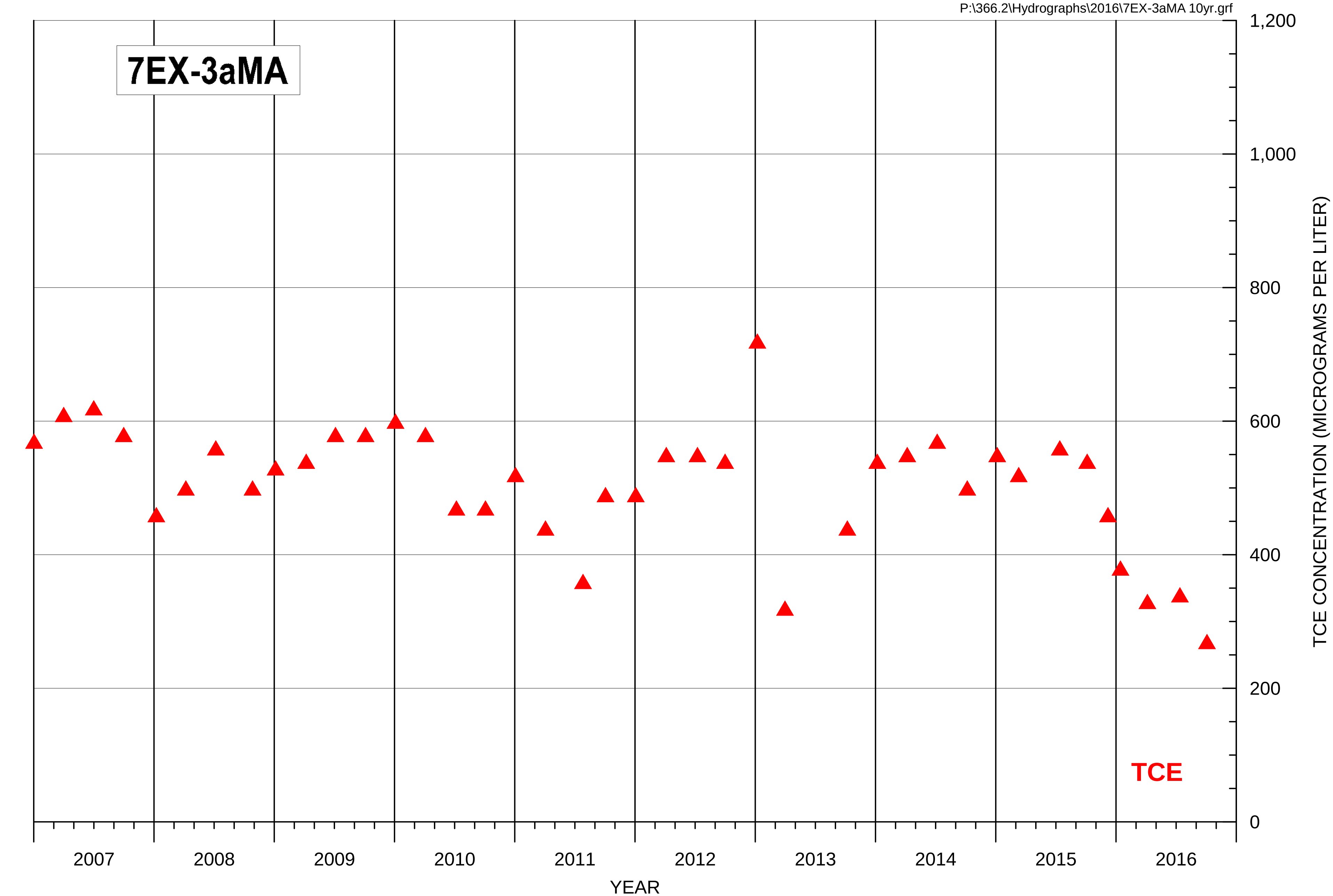


FIGURE C-1. TCE CONCENTRATIONS FOR EXTRACTION WELL 7EX-3aMA

North Indian Bend Wash Superfund Site

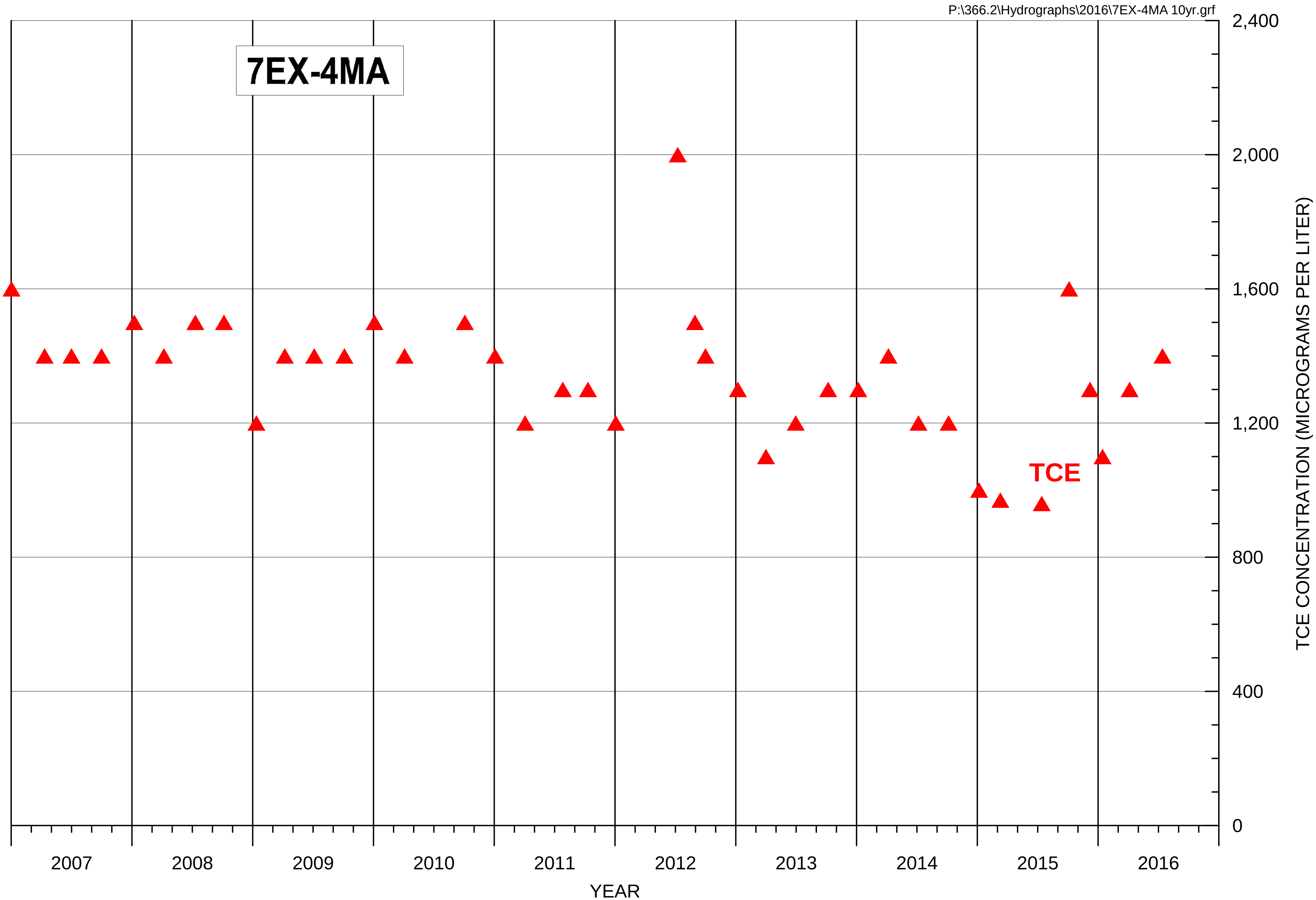


FIGURE C-2. TCE CONCENTRATIONS FOR EXTRACTION WELL 7EX-4MA

North Indian Bend Wash Superfund Site

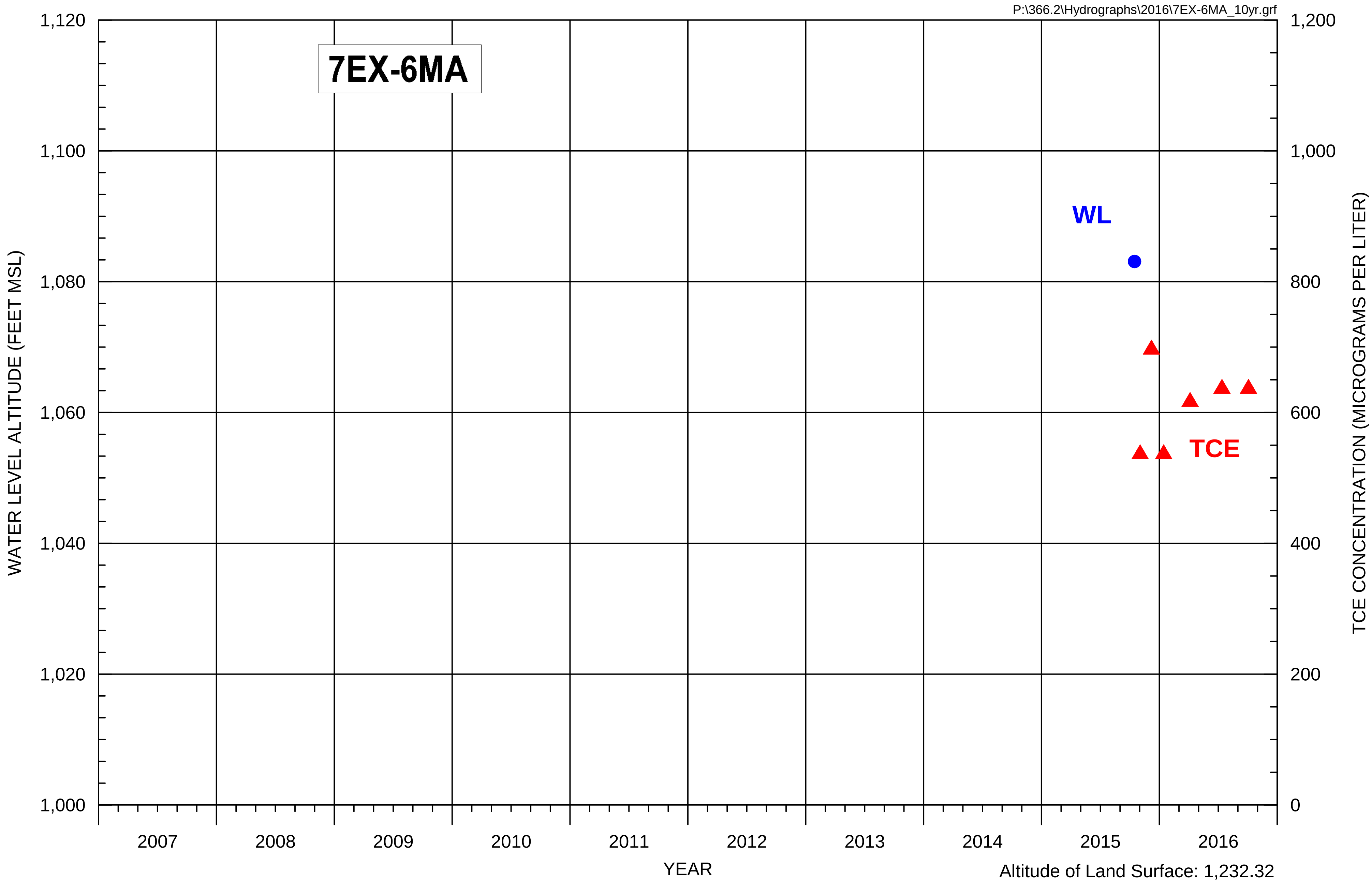


FIGURE C-3. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR EXTRACTION WELL 7EX-6MA

North Indian Bend Wash Superfund Site

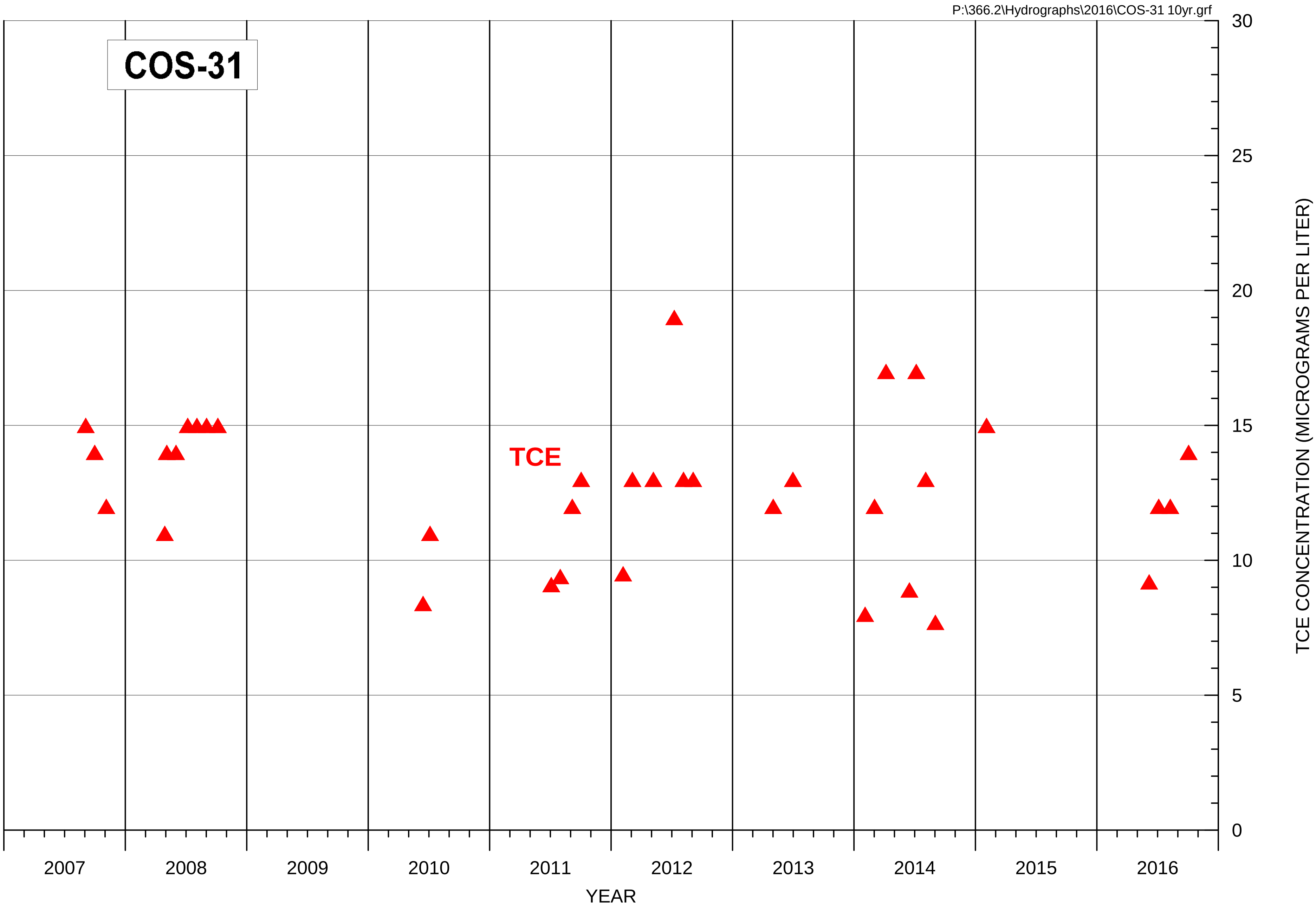


FIGURE C-4. TCE CONCENTRATIONS FOR EXTRACTION WELL COS-31

North Indian Bend Wash Superfund Site

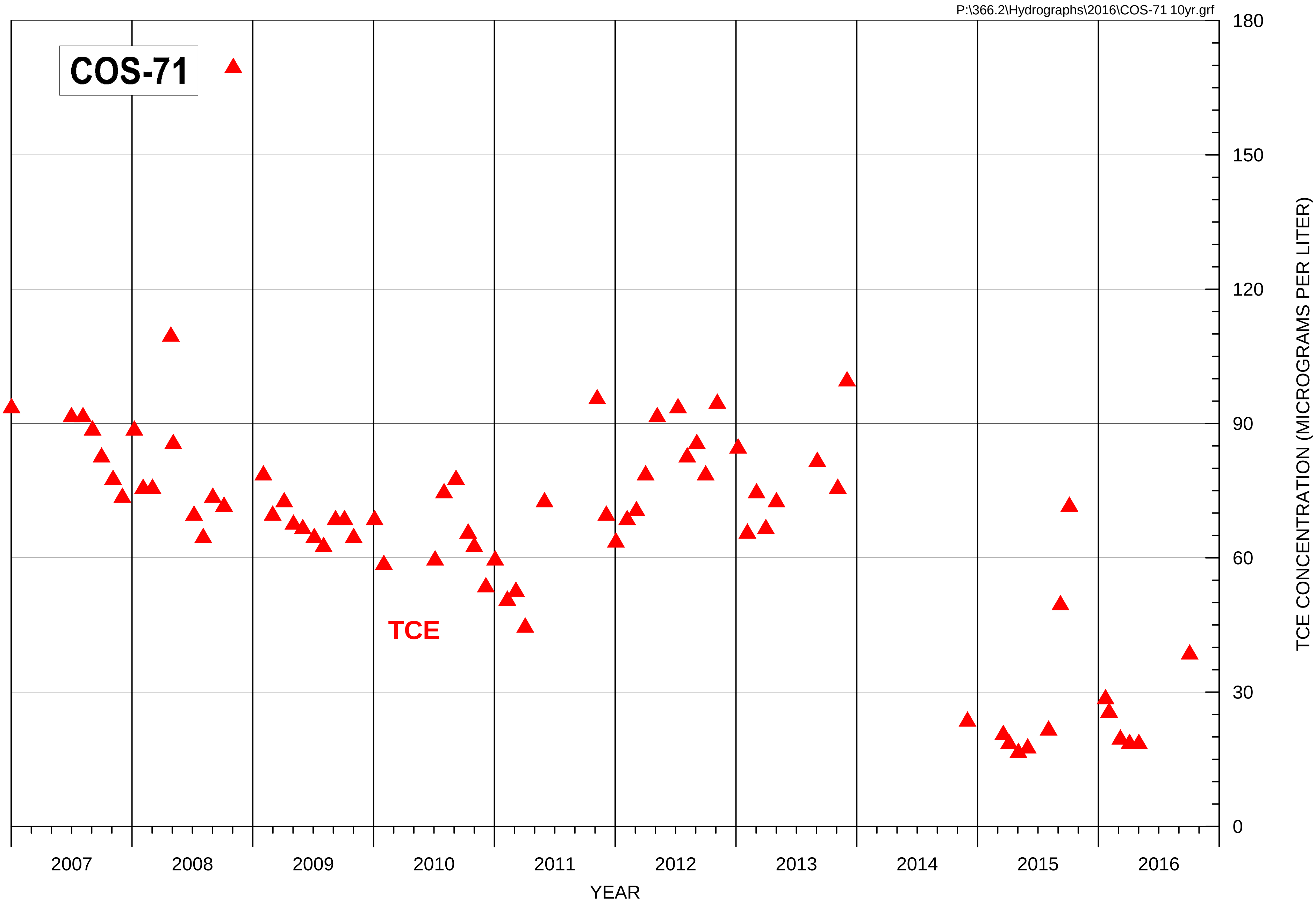


FIGURE C-5. TCE CONCENTRATIONS FOR EXTRACTION WELL COS-71 & COS-71A

Note: Well COS-71 was abandoned April 10, 2014 and was replaced by Well COS-71A.

North Indian Bend Wash Superfund Site

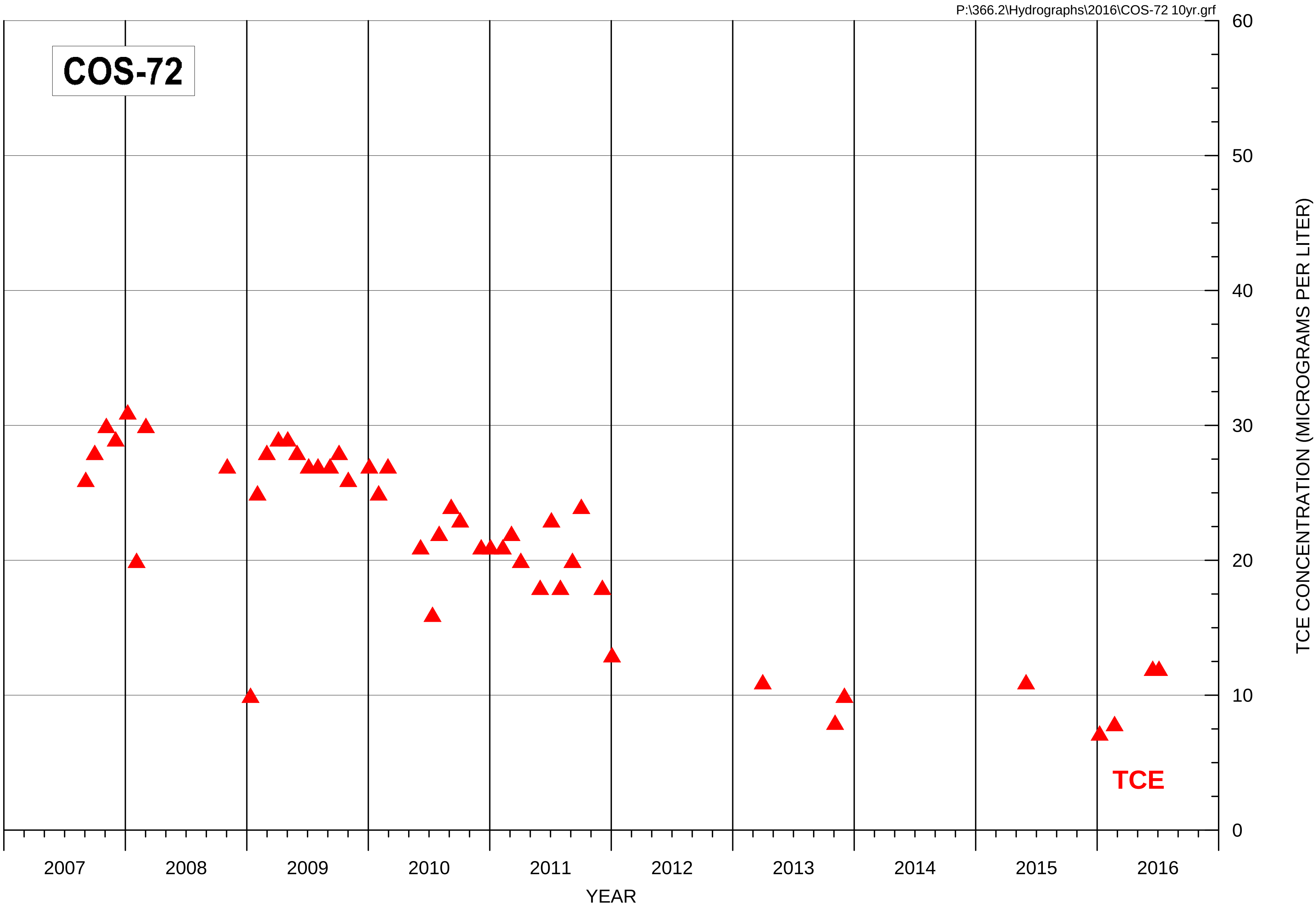


FIGURE C-6. TCE CONCENTRATIONS FOR EXTRACTION WELL COS-72

North Indian Bend Wash Superfund Site

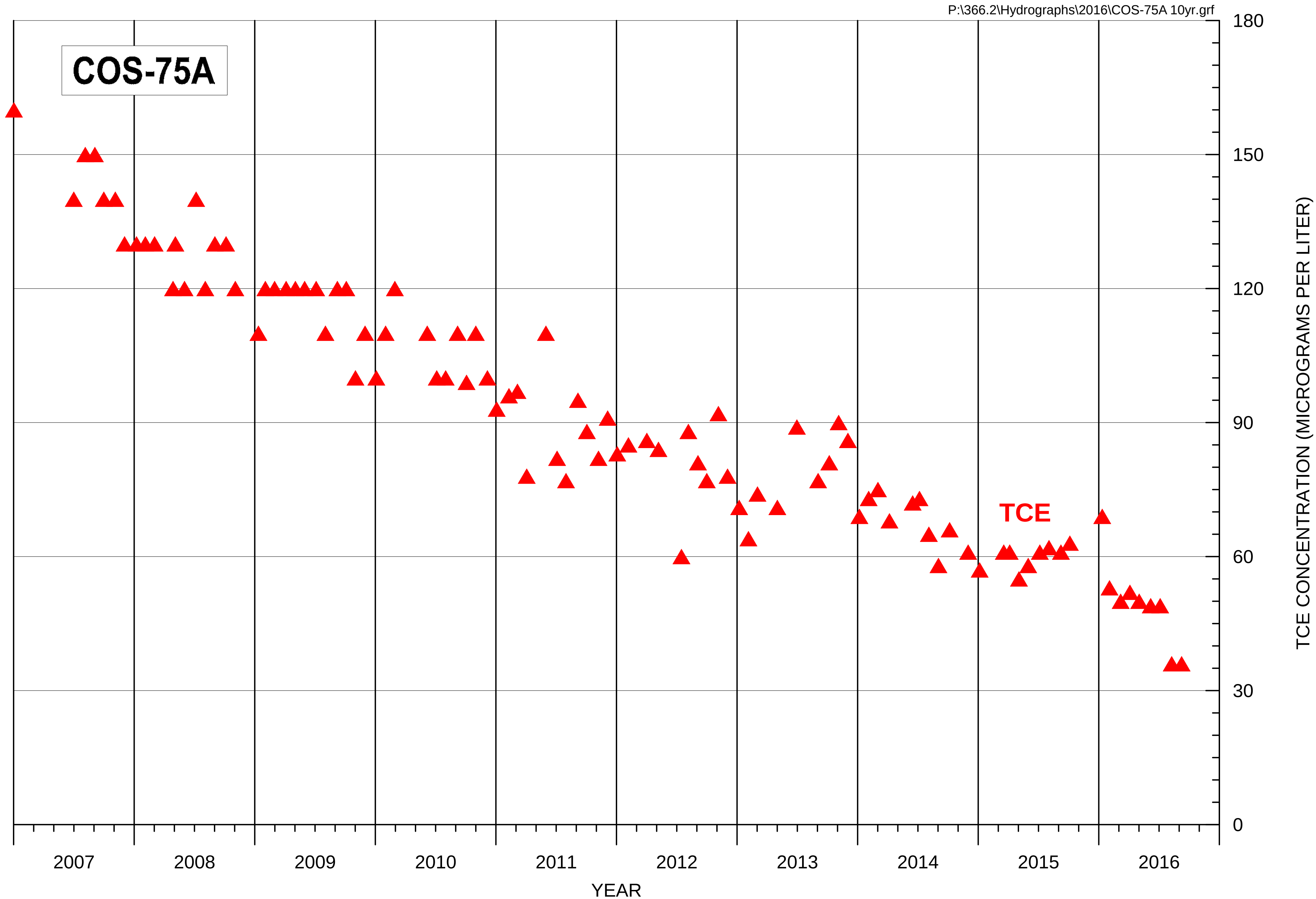


FIGURE C-7. TCE CONCENTRATIONS FOR EXTRACTION WELL COS-75A

North Indian Bend Wash Superfund Site

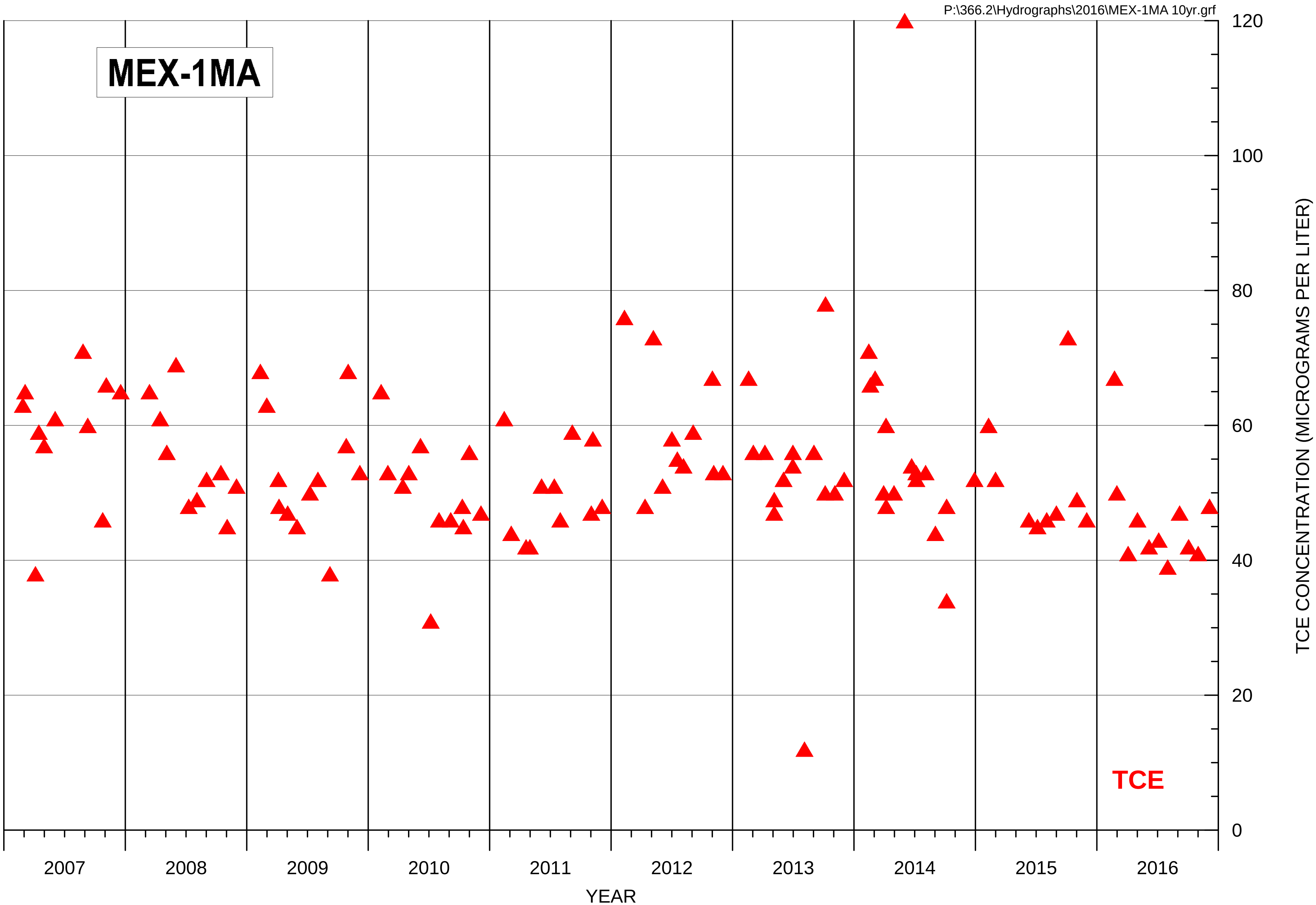


FIGURE C-8. TCE CONCENTRATIONS FOR EXTRACTION WELL MEX-1MA

North Indian Bend Wash Superfund Site

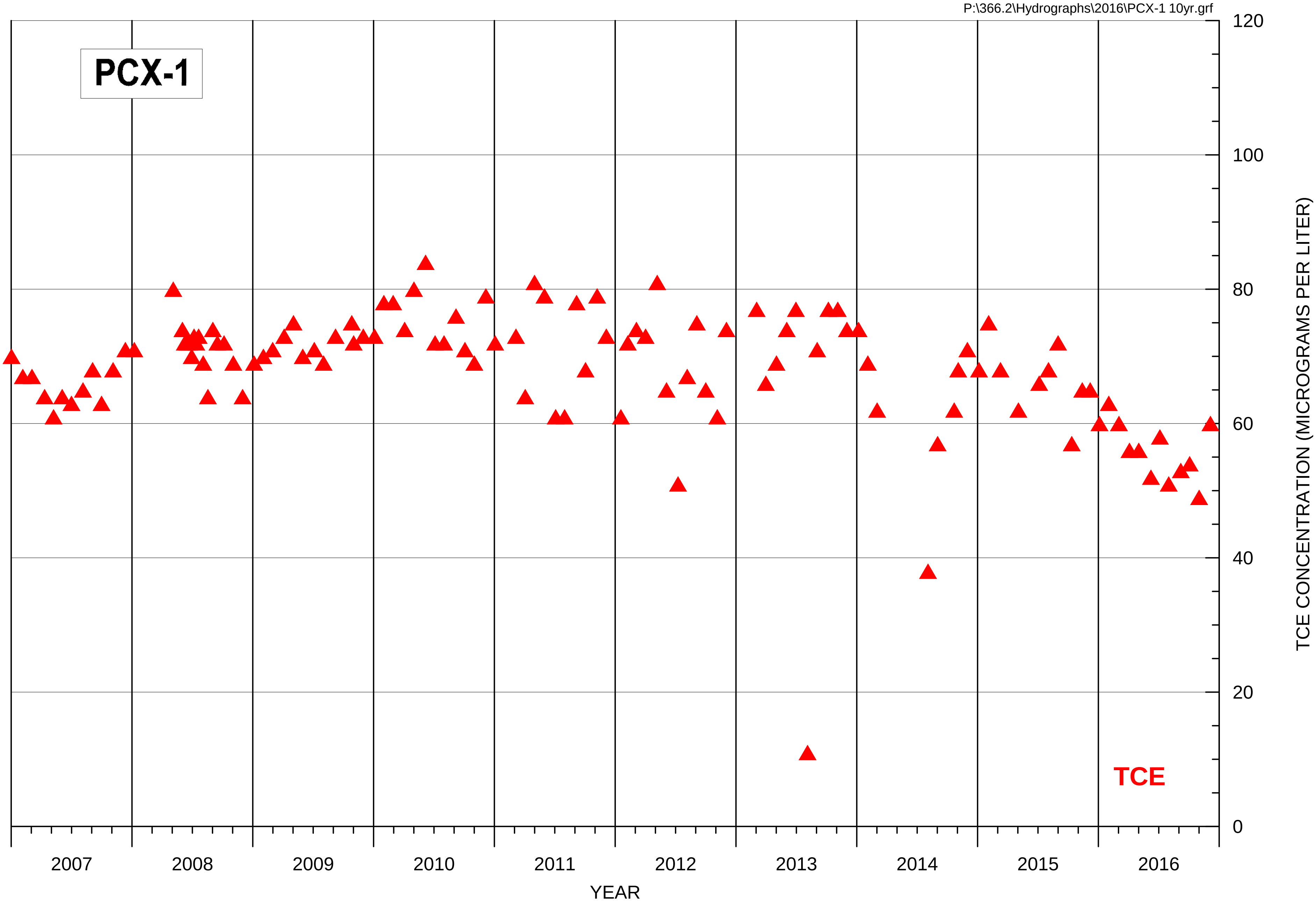


FIGURE C-9. TCE CONCENTRATIONS FOR EXTRACTION WELL PCX-1

North Indian Bend Wash Superfund Site

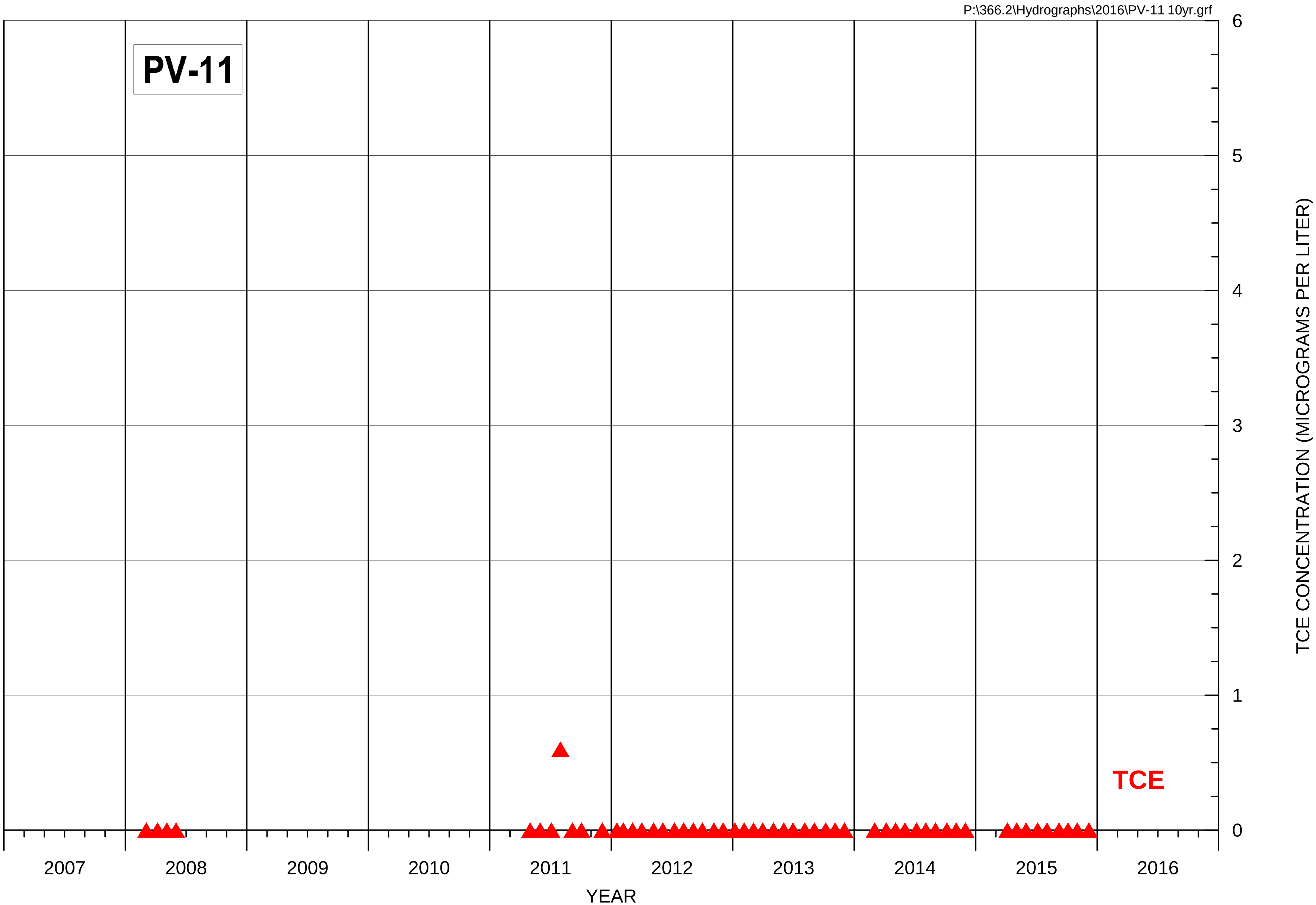


FIGURE C-10. TCE CONCENTRATIONS FOR PRODUCTION WELL PV-11

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site

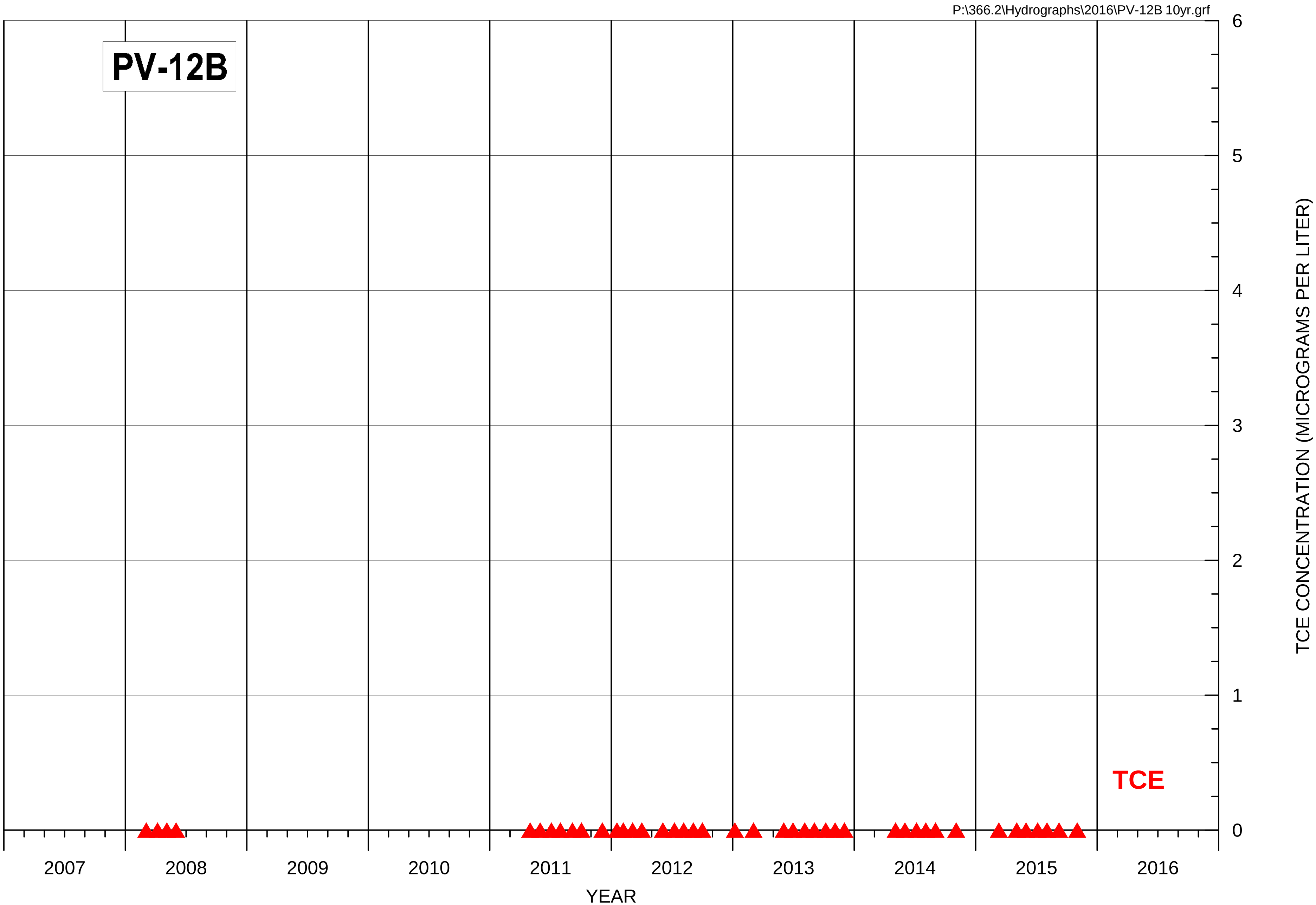


FIGURE C-11. TCE CONCENTRATIONS FOR PRODUCTION WELL PV-12B

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site

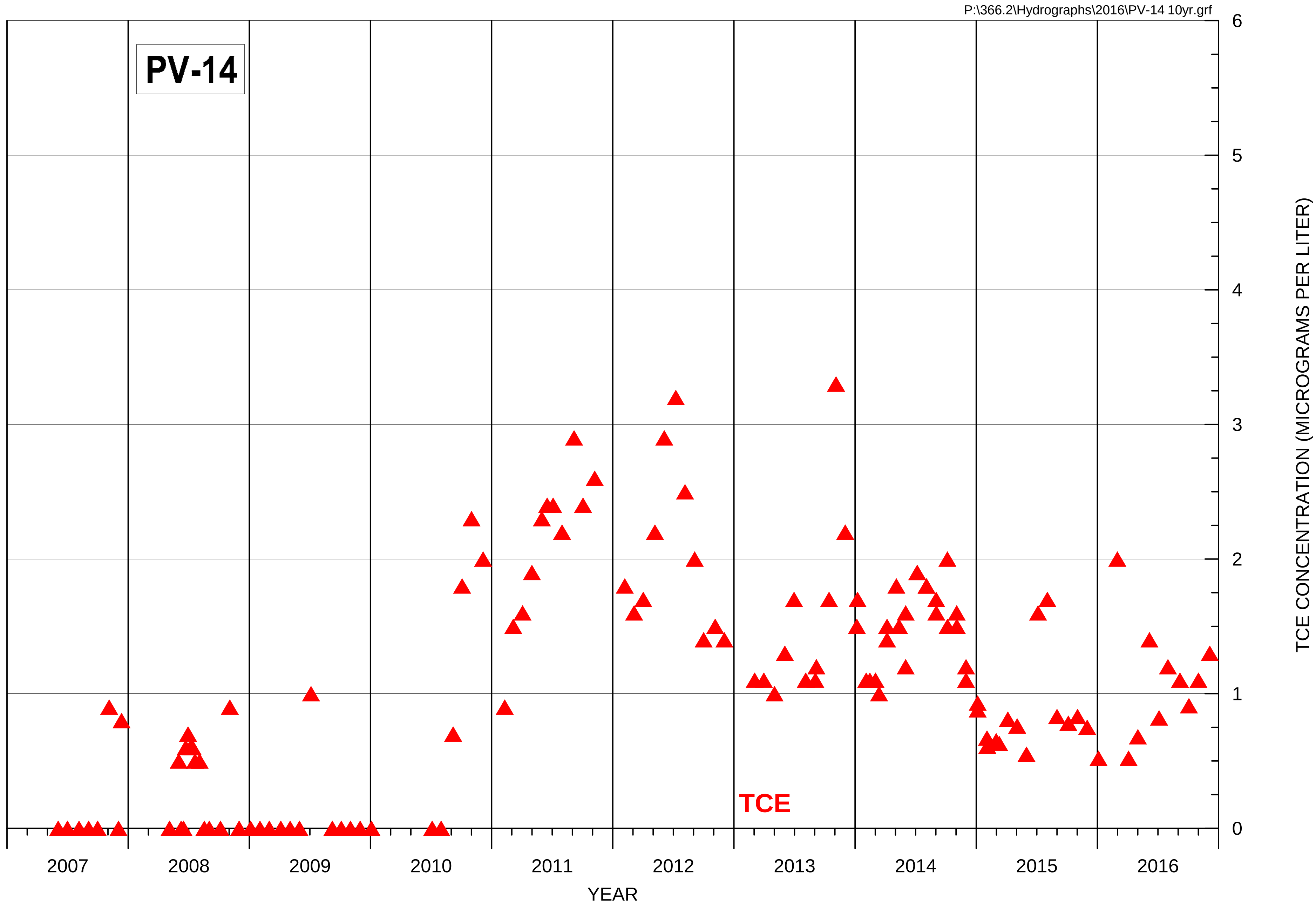


FIGURE C-12. TCE CONCENTRATIONS FOR PRODUCTION WELL PV-14

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site

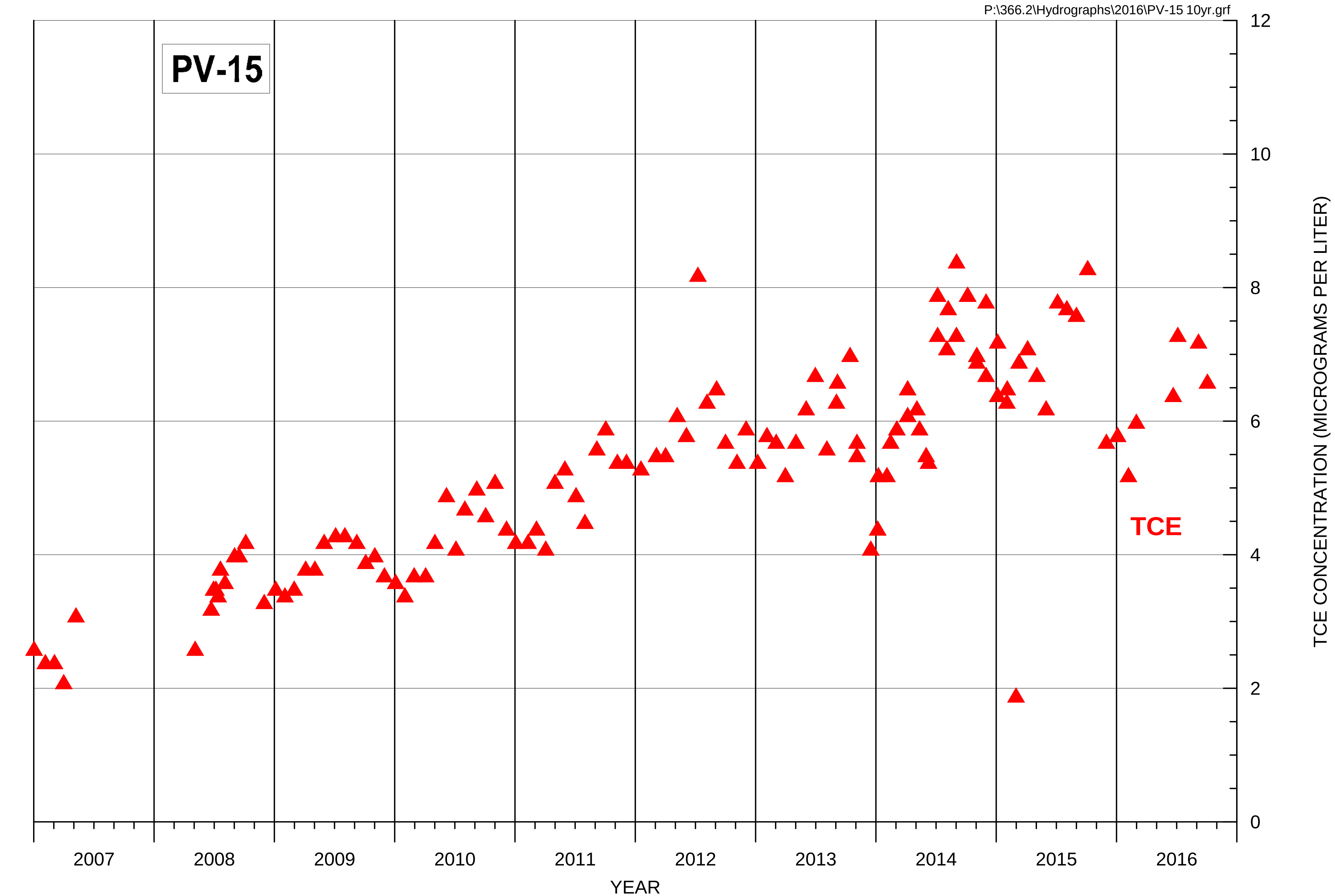


FIGURE C-13. TCE CONCENTRATIONS FOR PRODUCTION WELL PV-15

North Indian Bend Wash Superfund Site

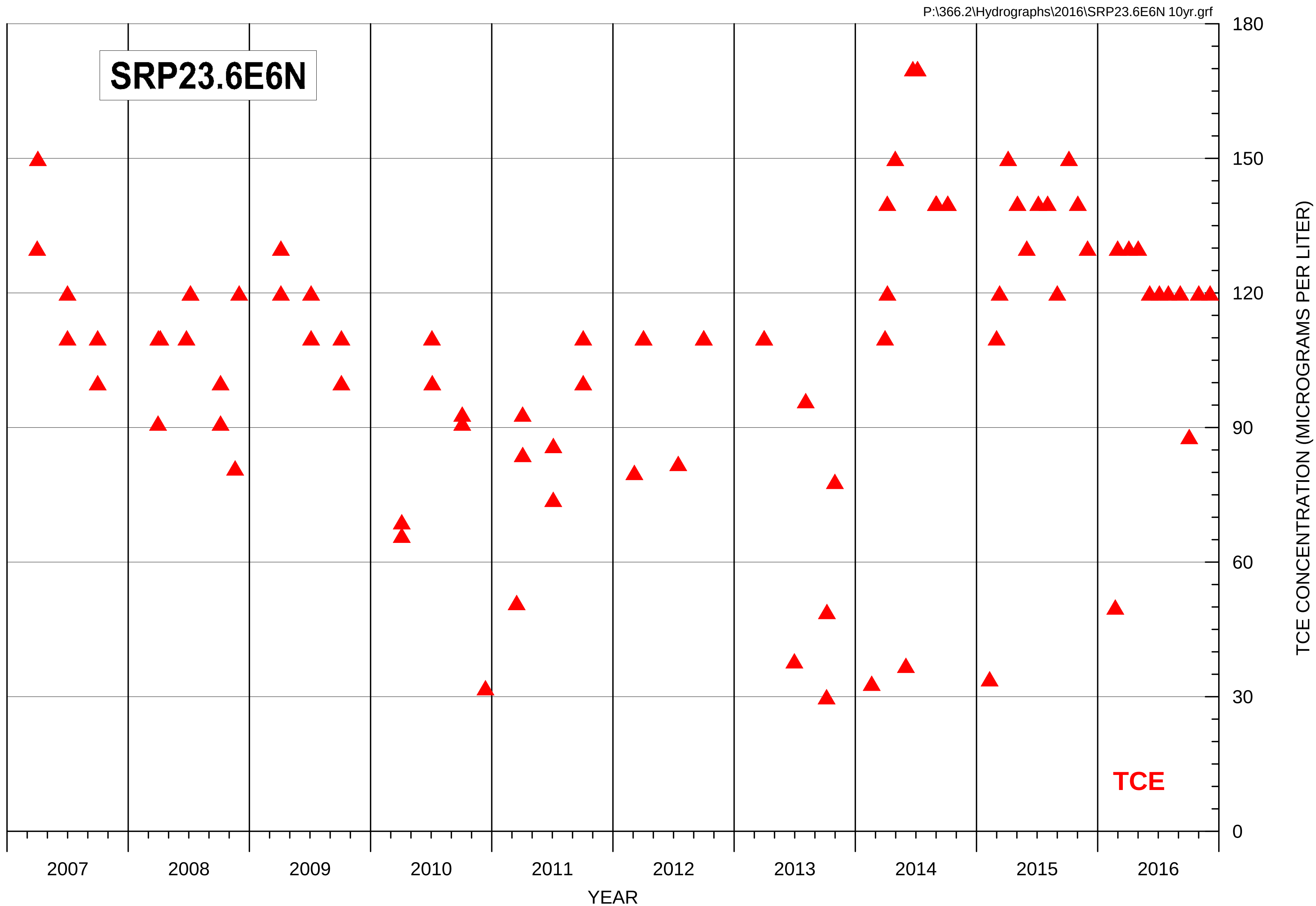
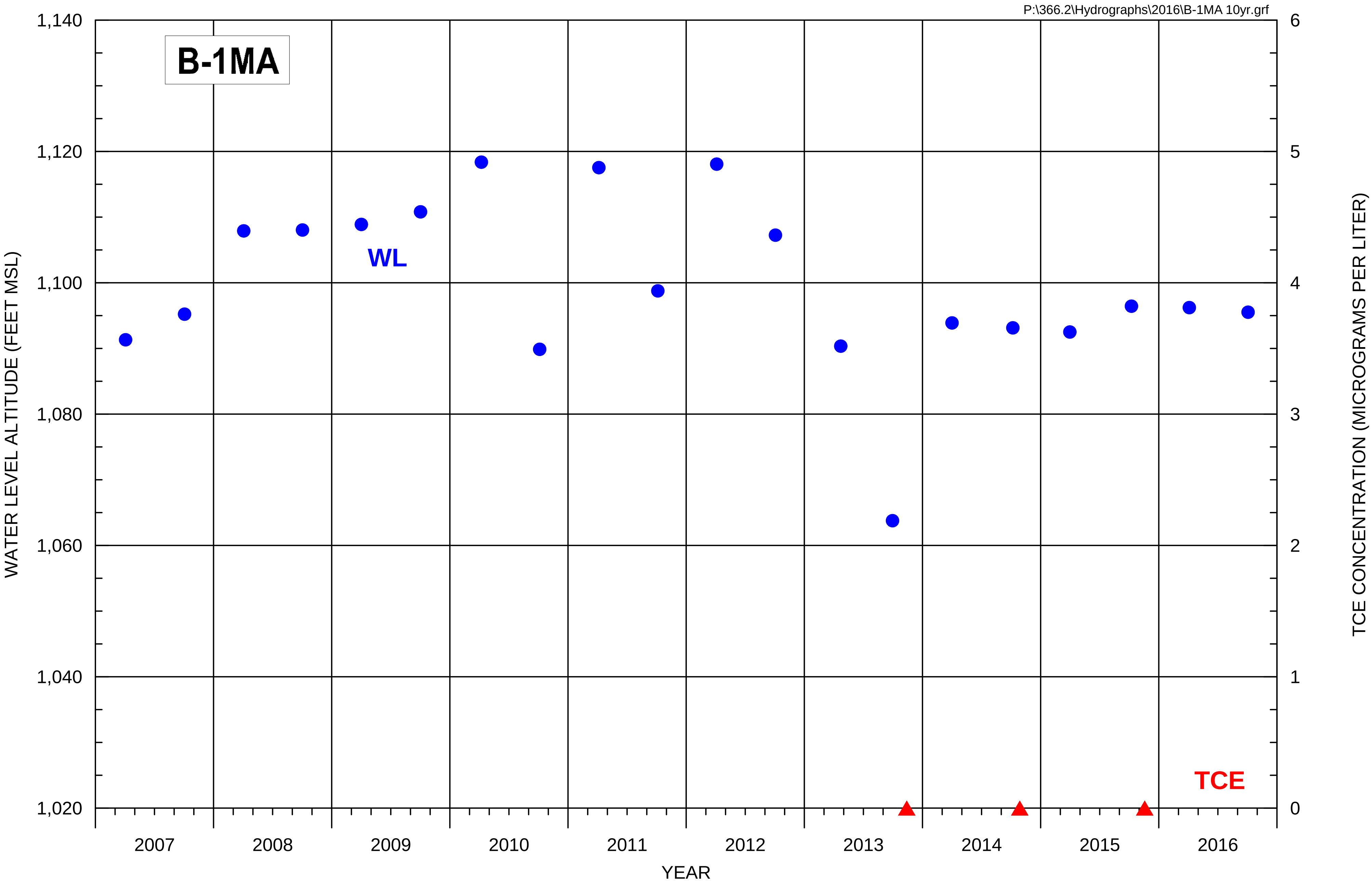


FIGURE C-14. TCE CONCENTRATIONS FOR EXTRACTION WELL SRP23.6E6N

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,190.26

FIGURE C-15. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL B-1MA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site

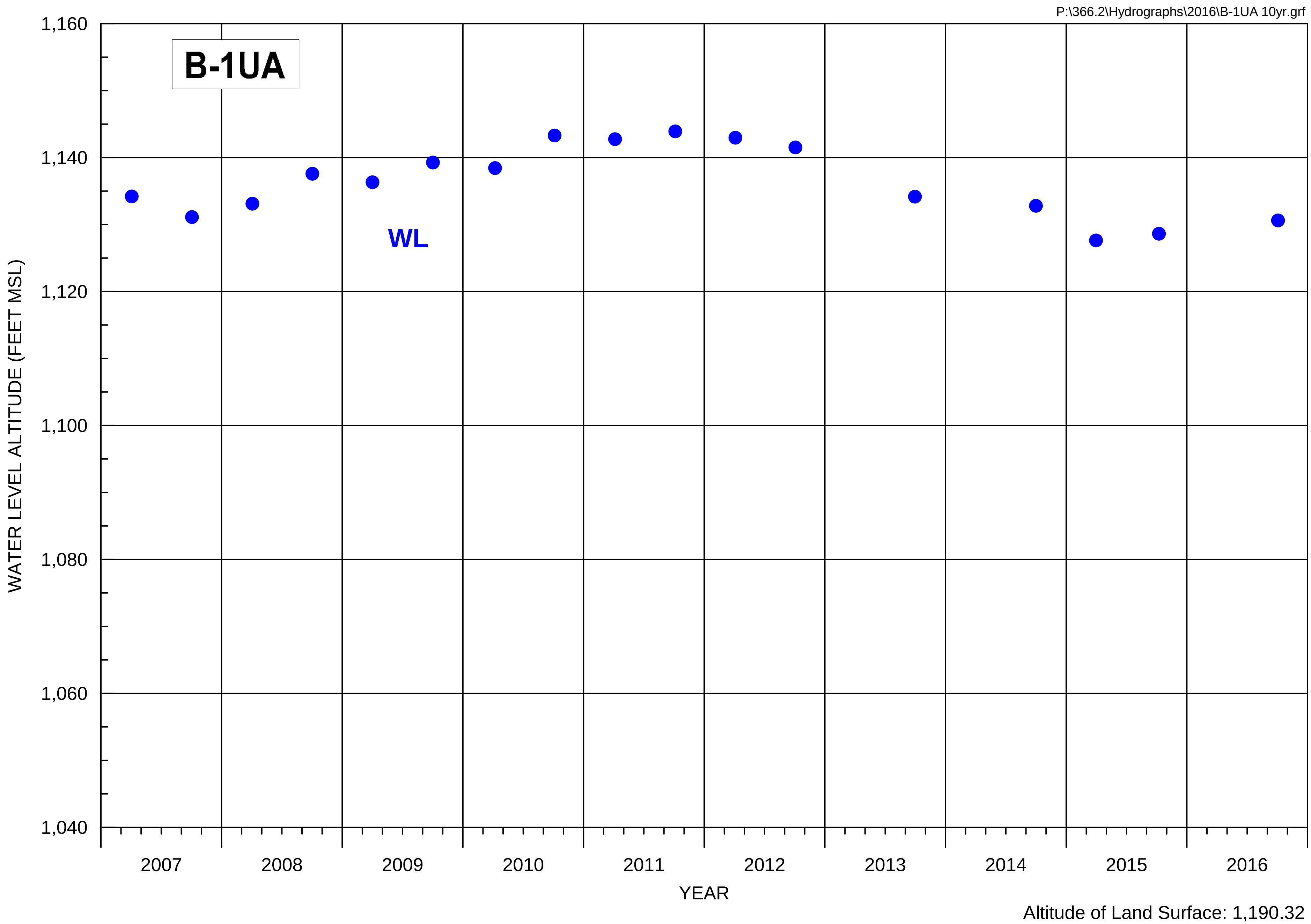


FIGURE C-16. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL B-1UA

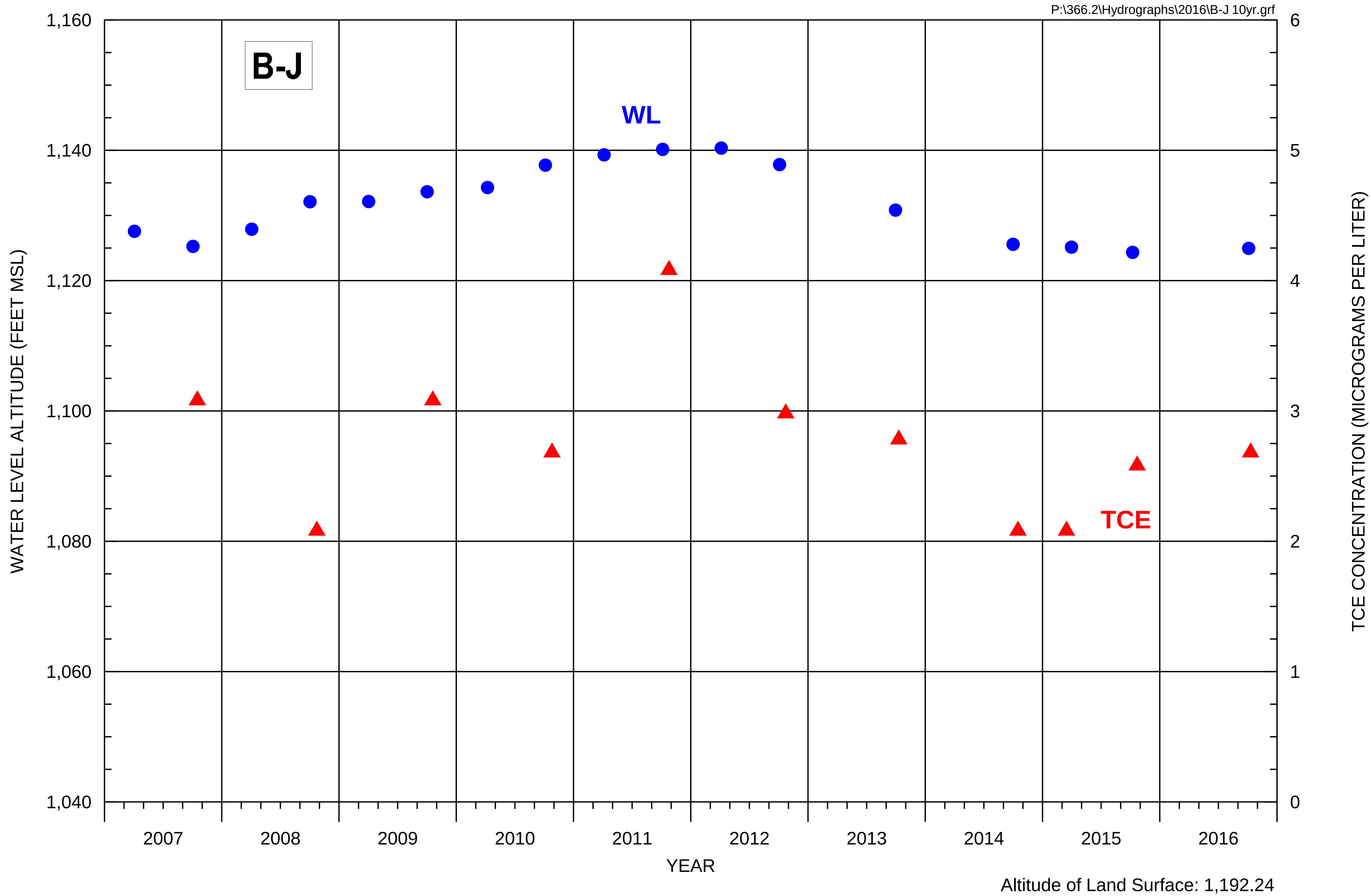


FIGURE C-17. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL B-J

North Indian Bend Wash Superfund Site

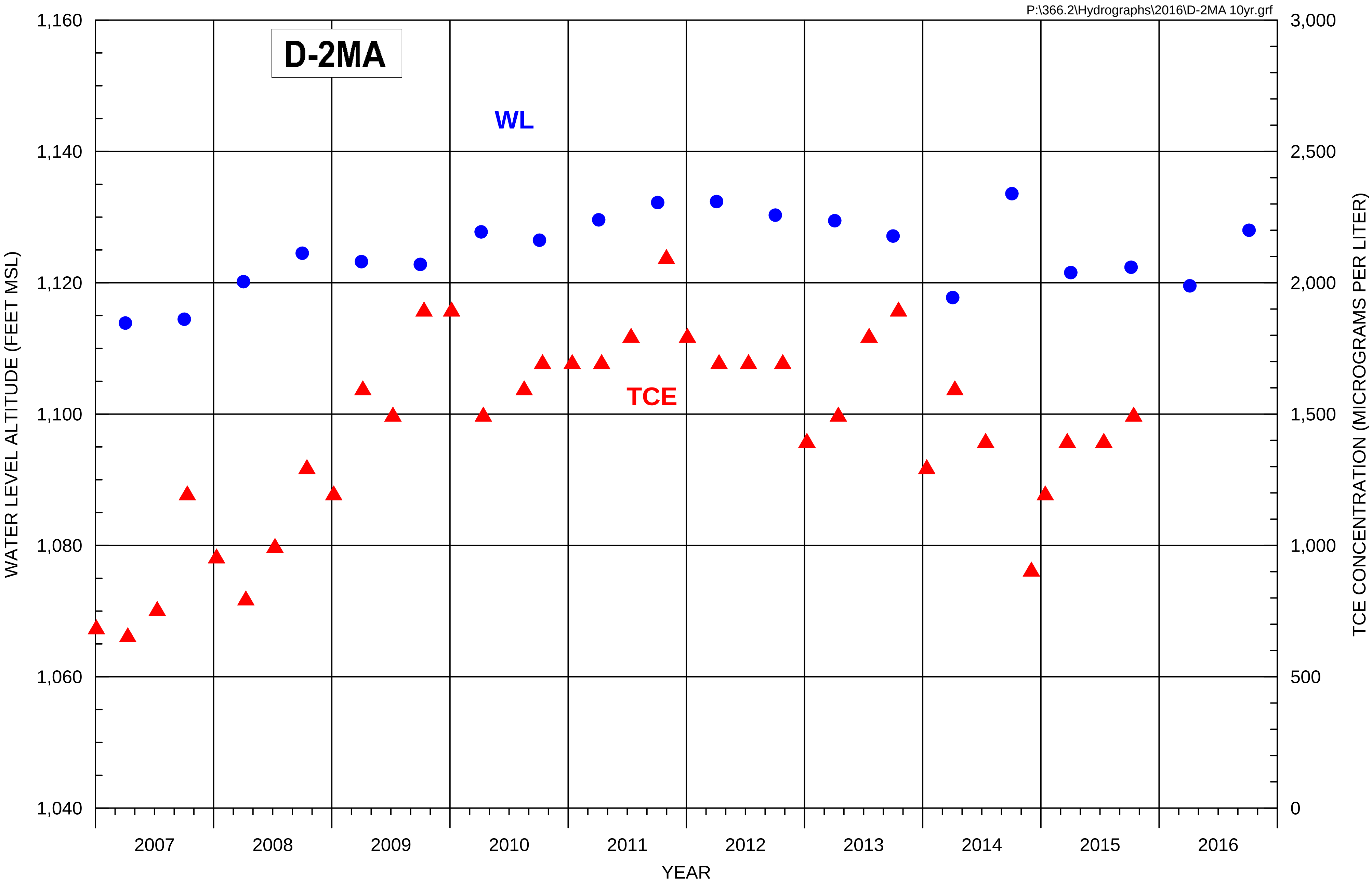


FIGURE C-18. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL D-2MA

North Indian Bend Wash Superfund Site

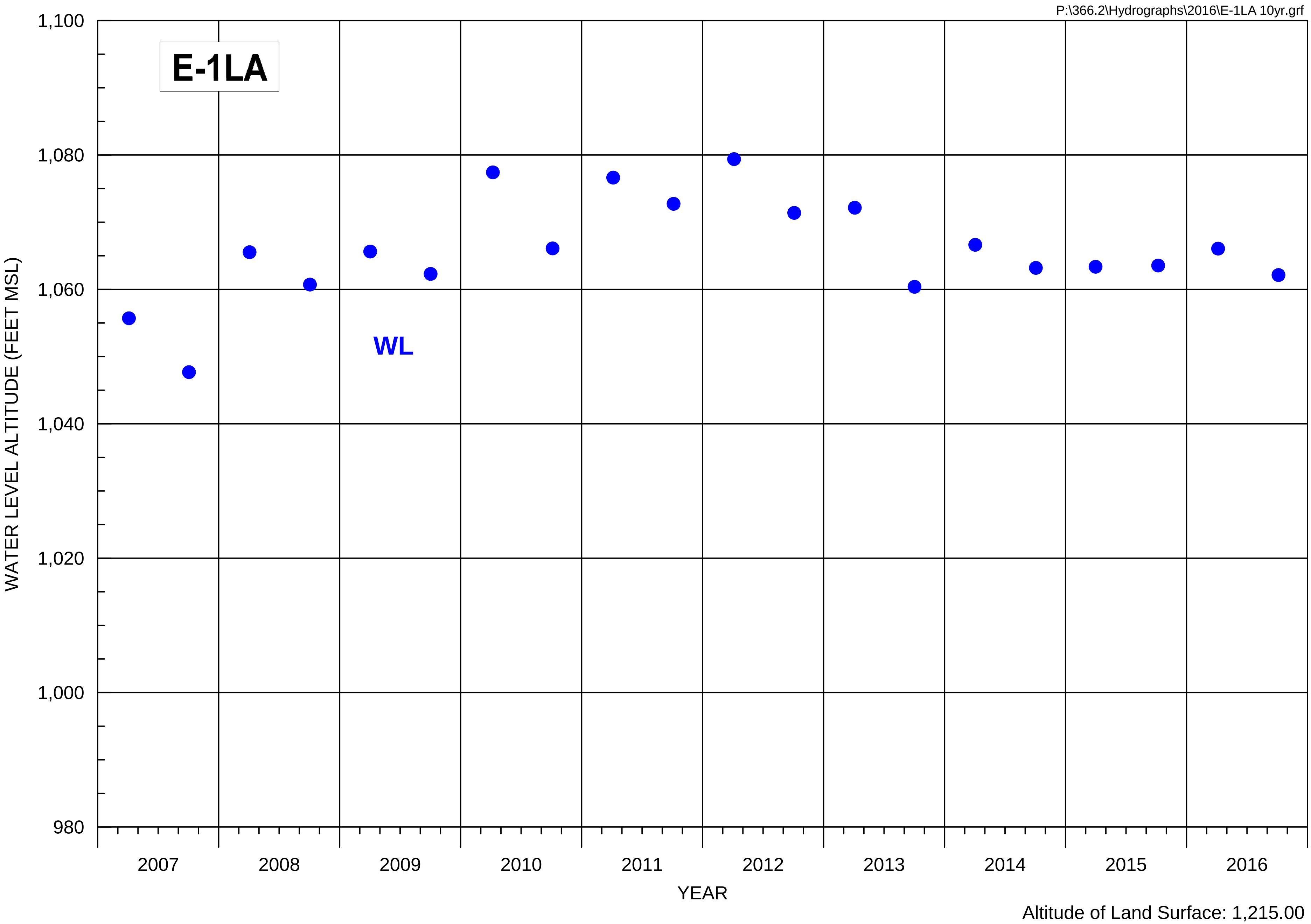
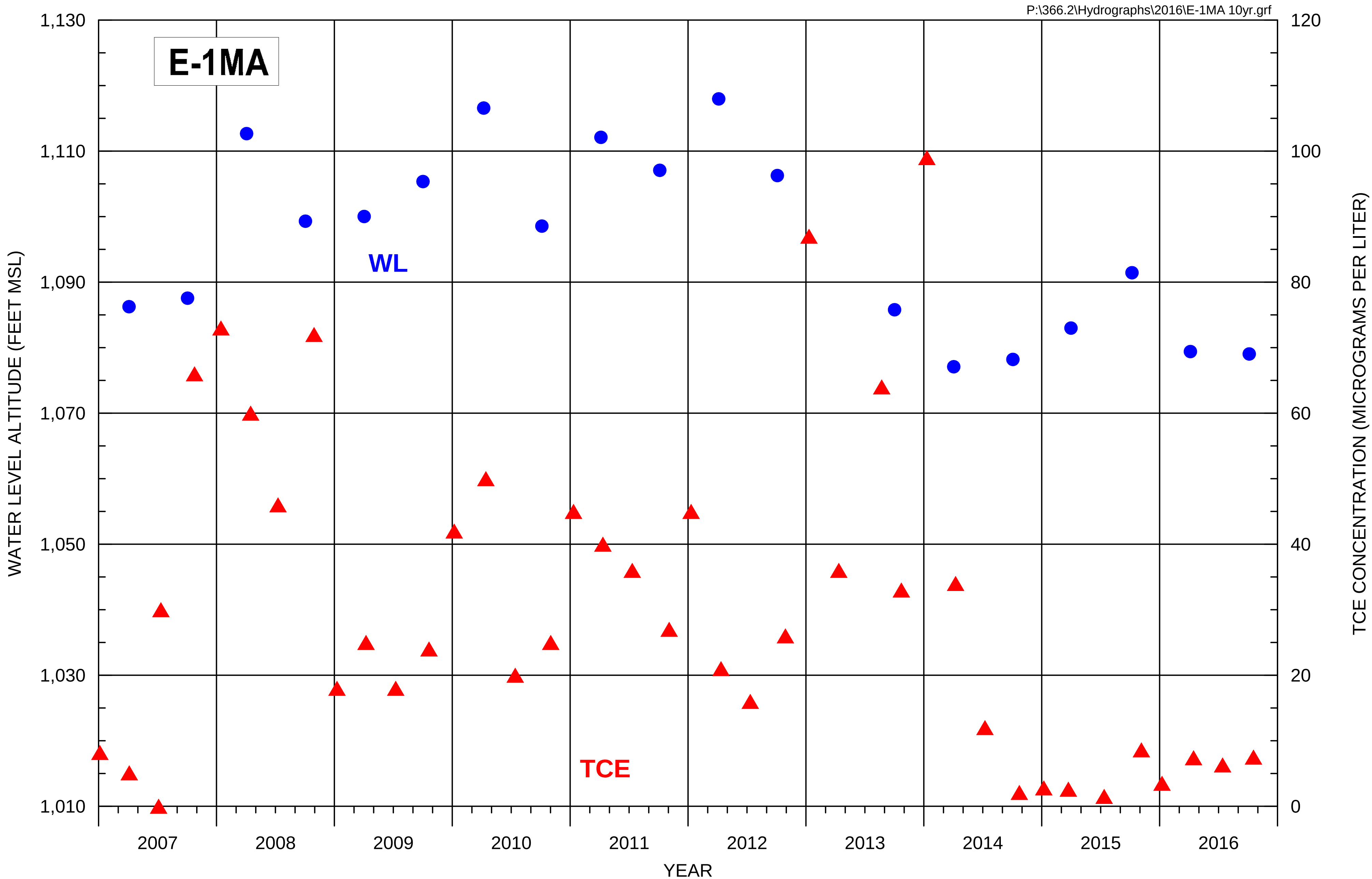


FIGURE C-19. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL E-1LA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,214.37

FIGURE C-20. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL E-1MA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site

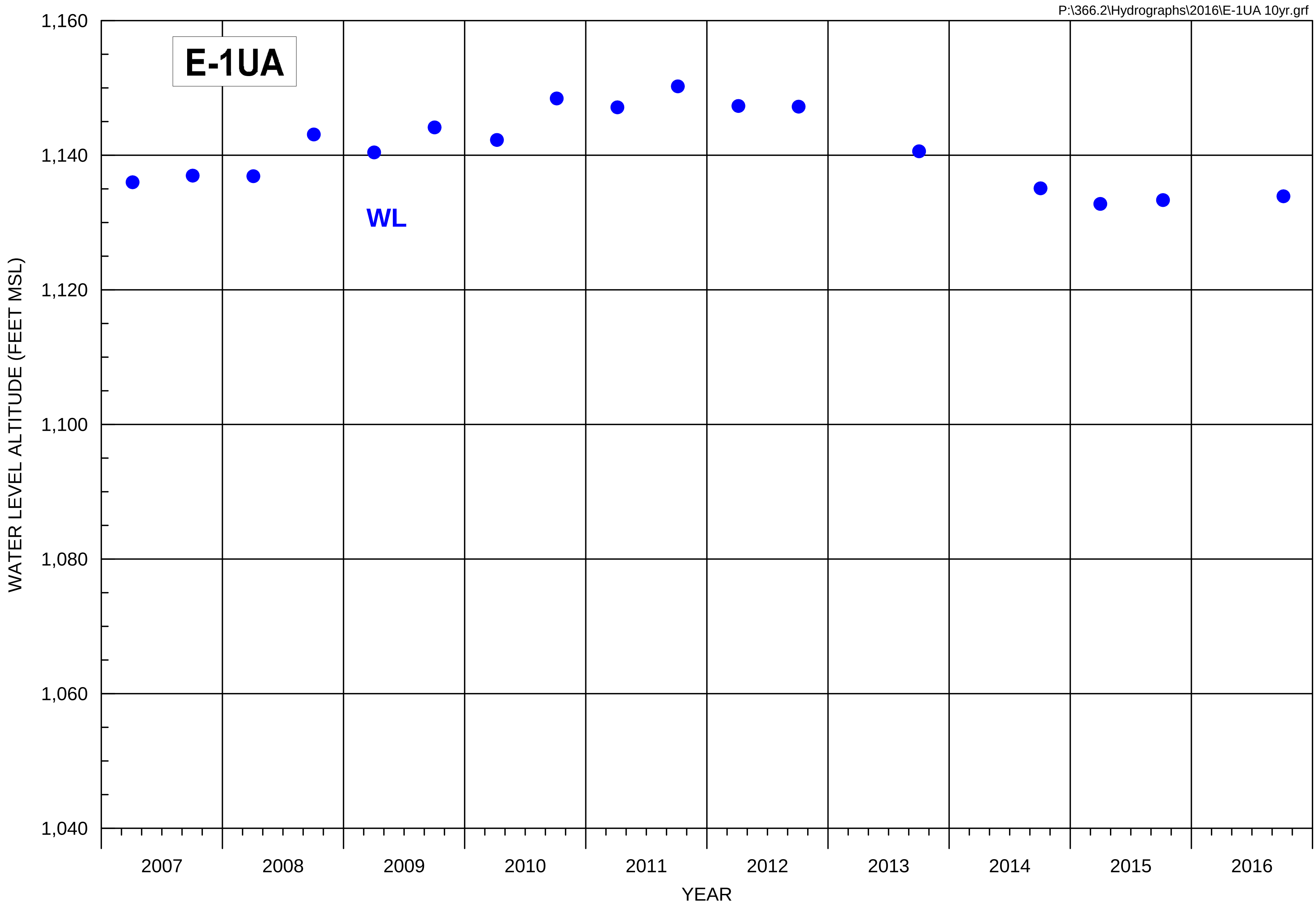


FIGURE C-21. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL E-1UA

North Indian Bend Wash Superfund Site

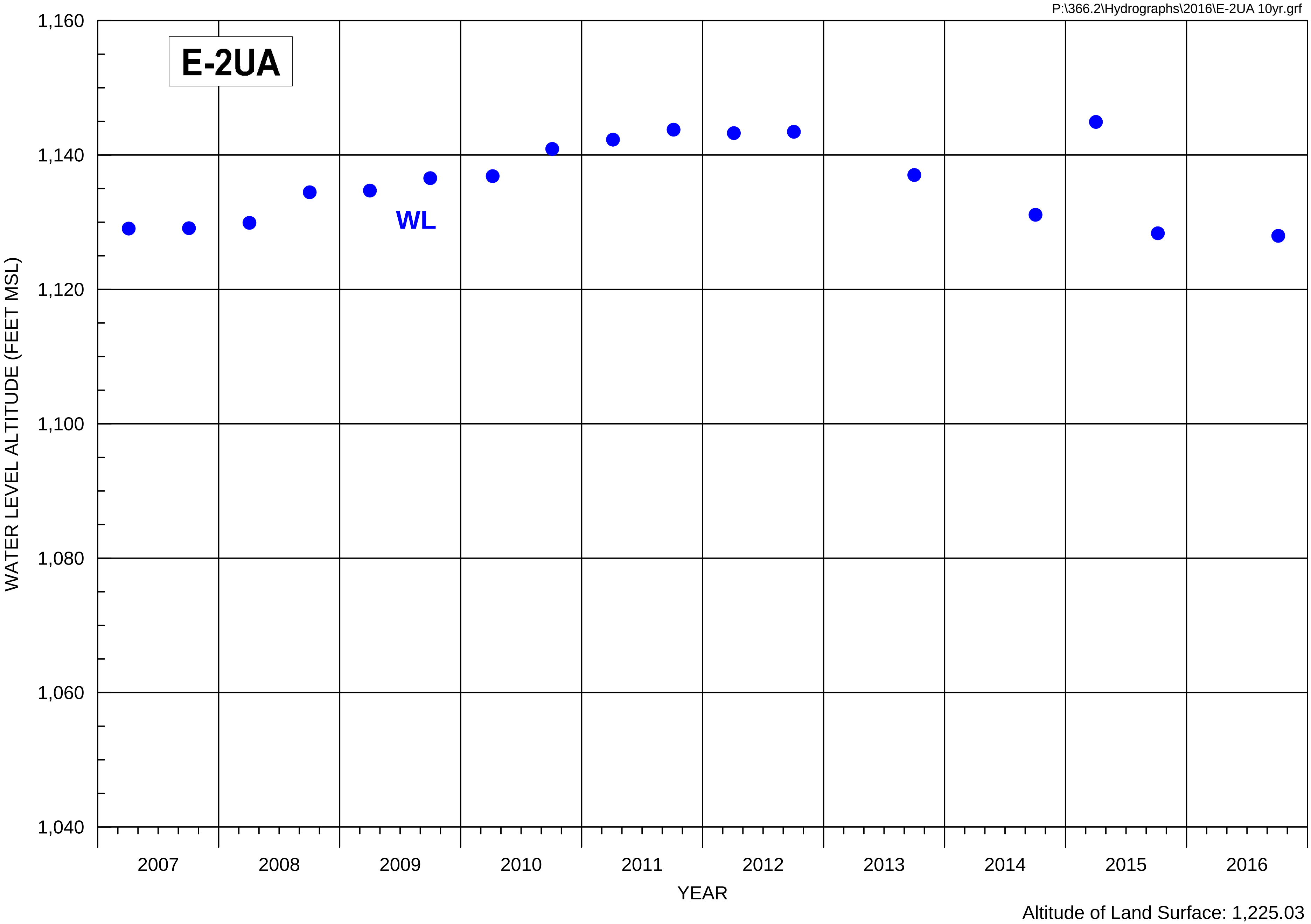


FIGURE C-22. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL E-2UA

North Indian Bend Wash Superfund Site

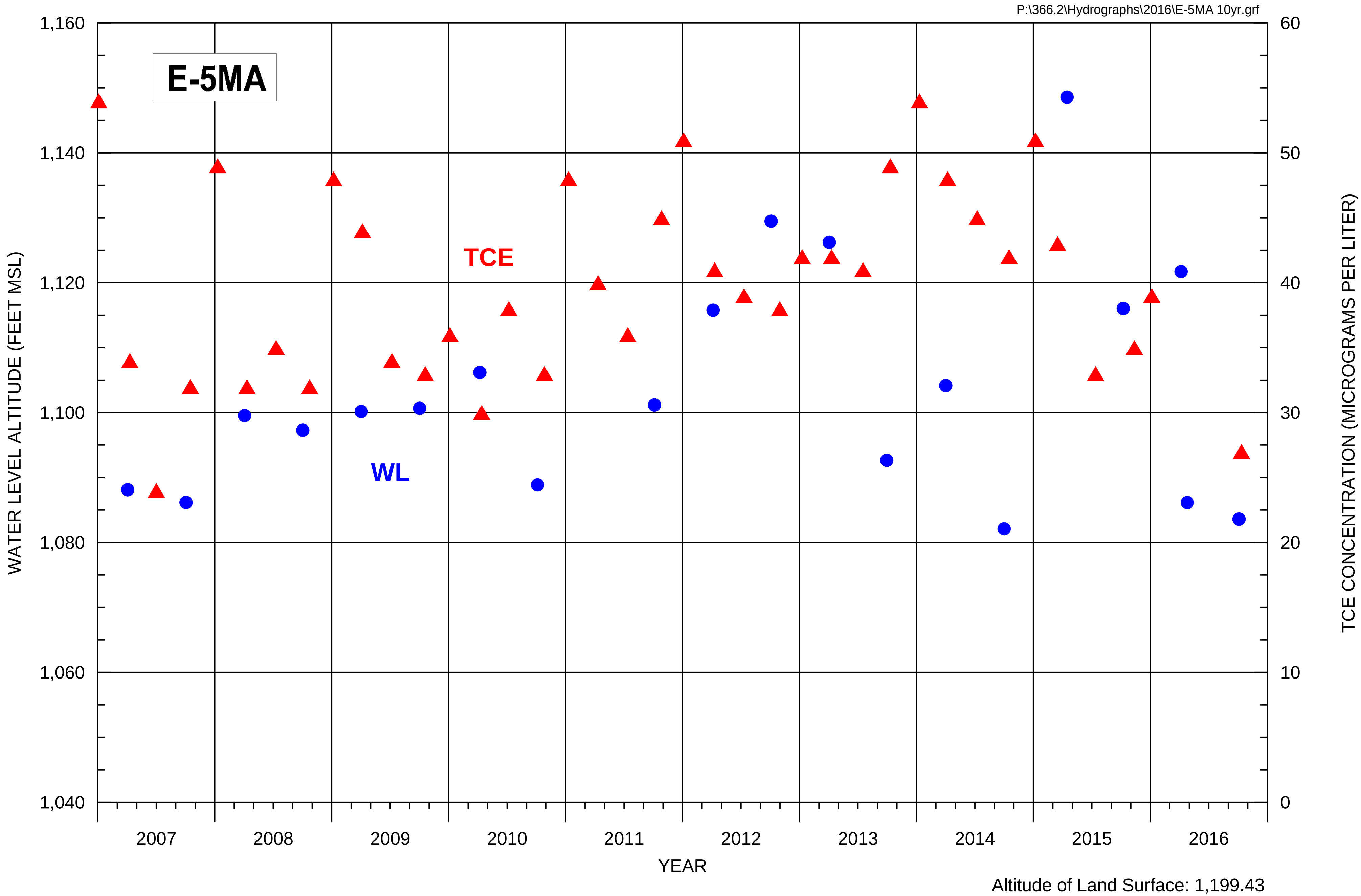


FIGURE C-23. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL E-5MA

North Indian Bend Wash Superfund Site

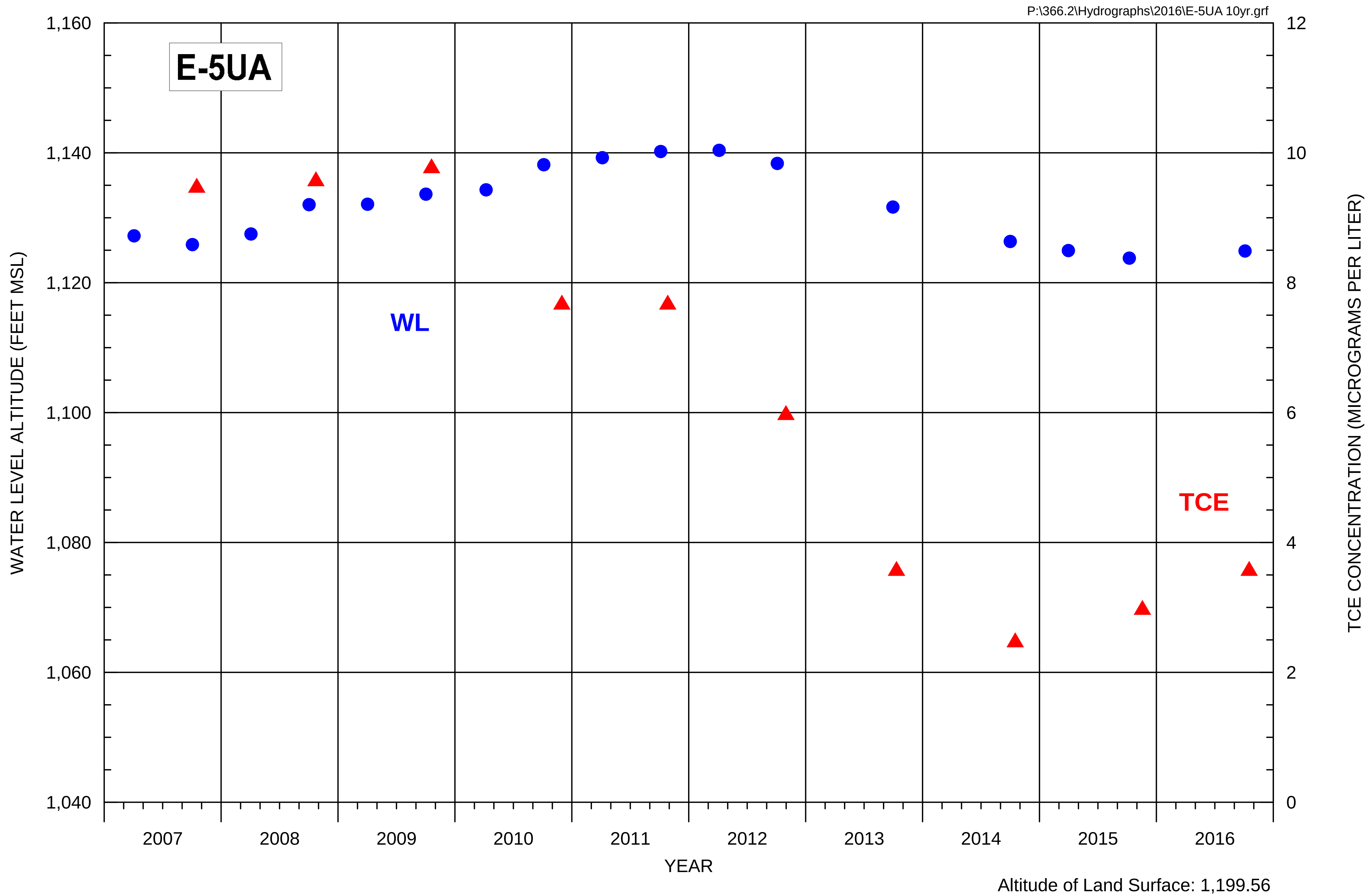


FIGURE C-24. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL E-5UA

North Indian Bend Wash Superfund Site

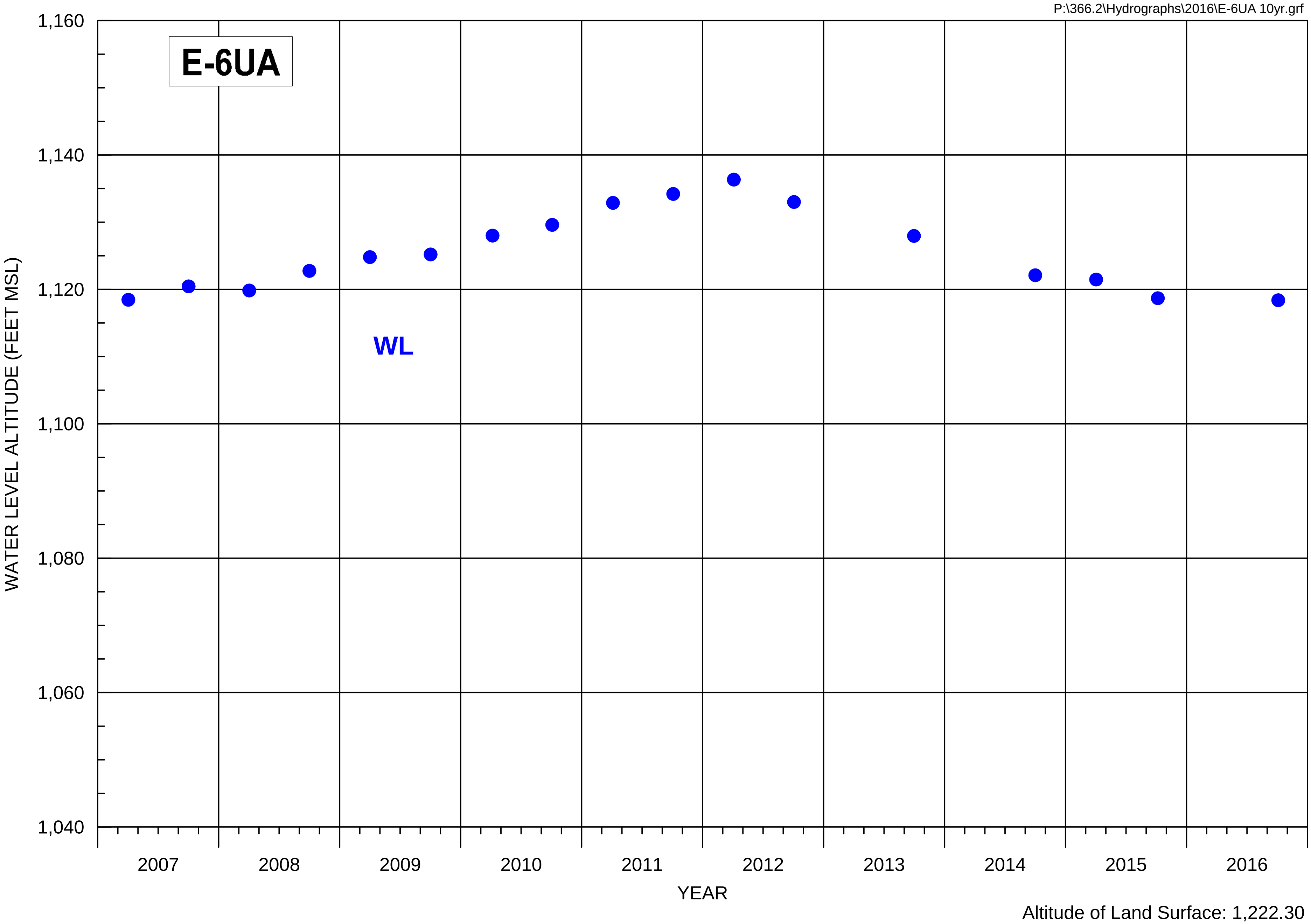


FIGURE C-25. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL E-6UA

North Indian Bend Wash Superfund Site

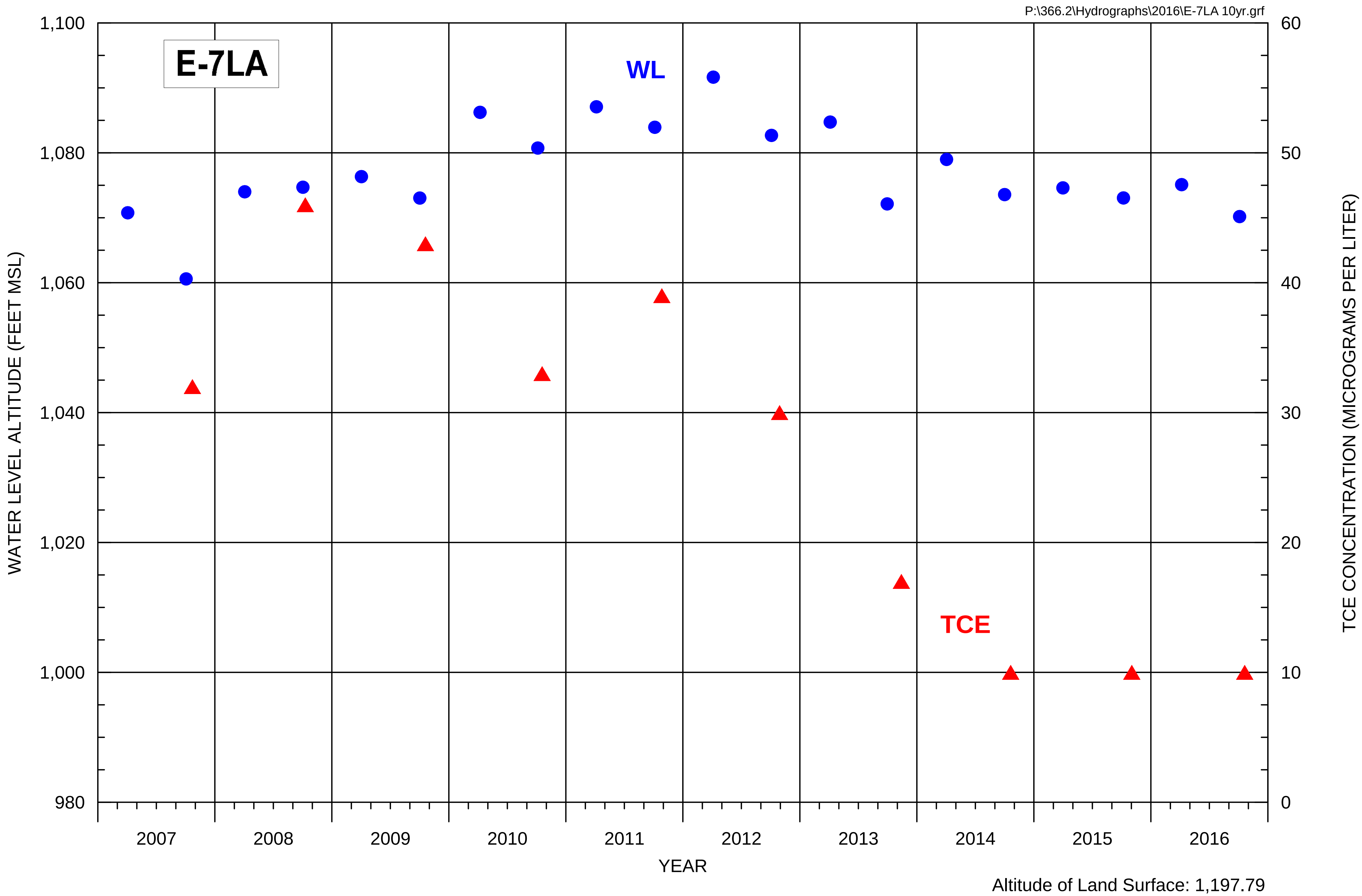


FIGURE C-26. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL E-7LA

North Indian Bend Wash Superfund Site

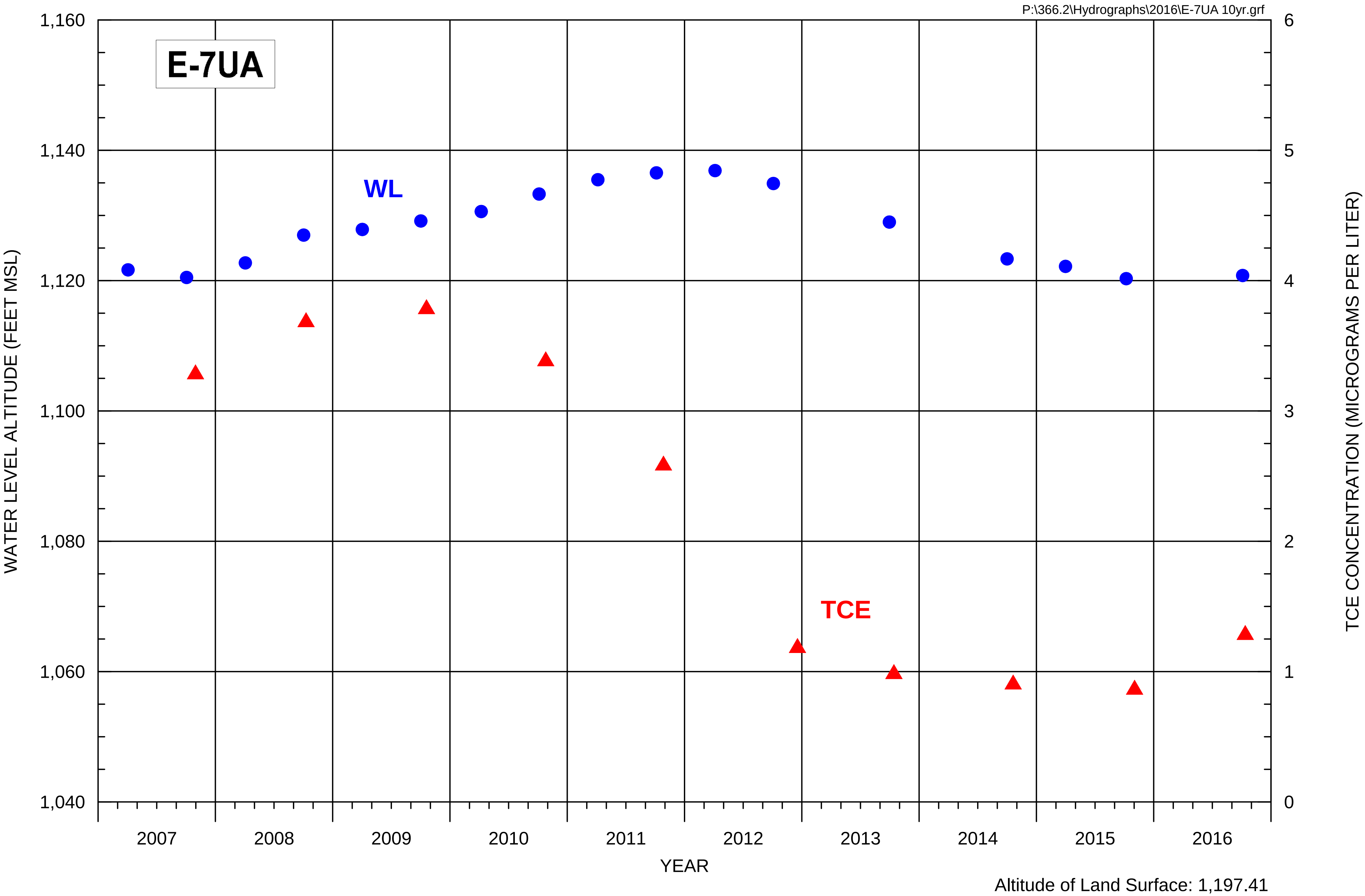


FIGURE C-27. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL E-7UA

North Indian Bend Wash Superfund Site

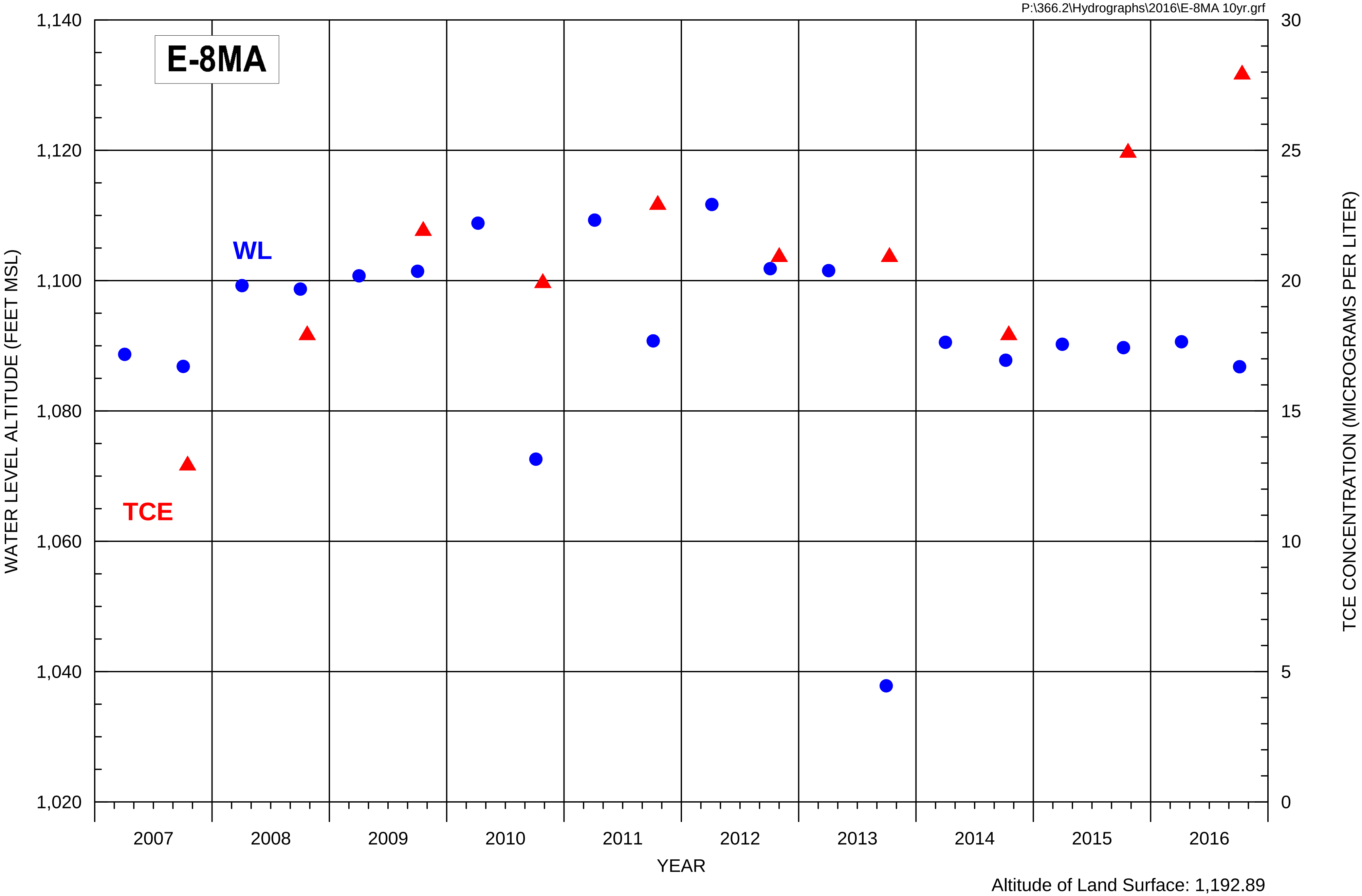


FIGURE C-28. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL E-8MA

North Indian Bend Wash Superfund Site

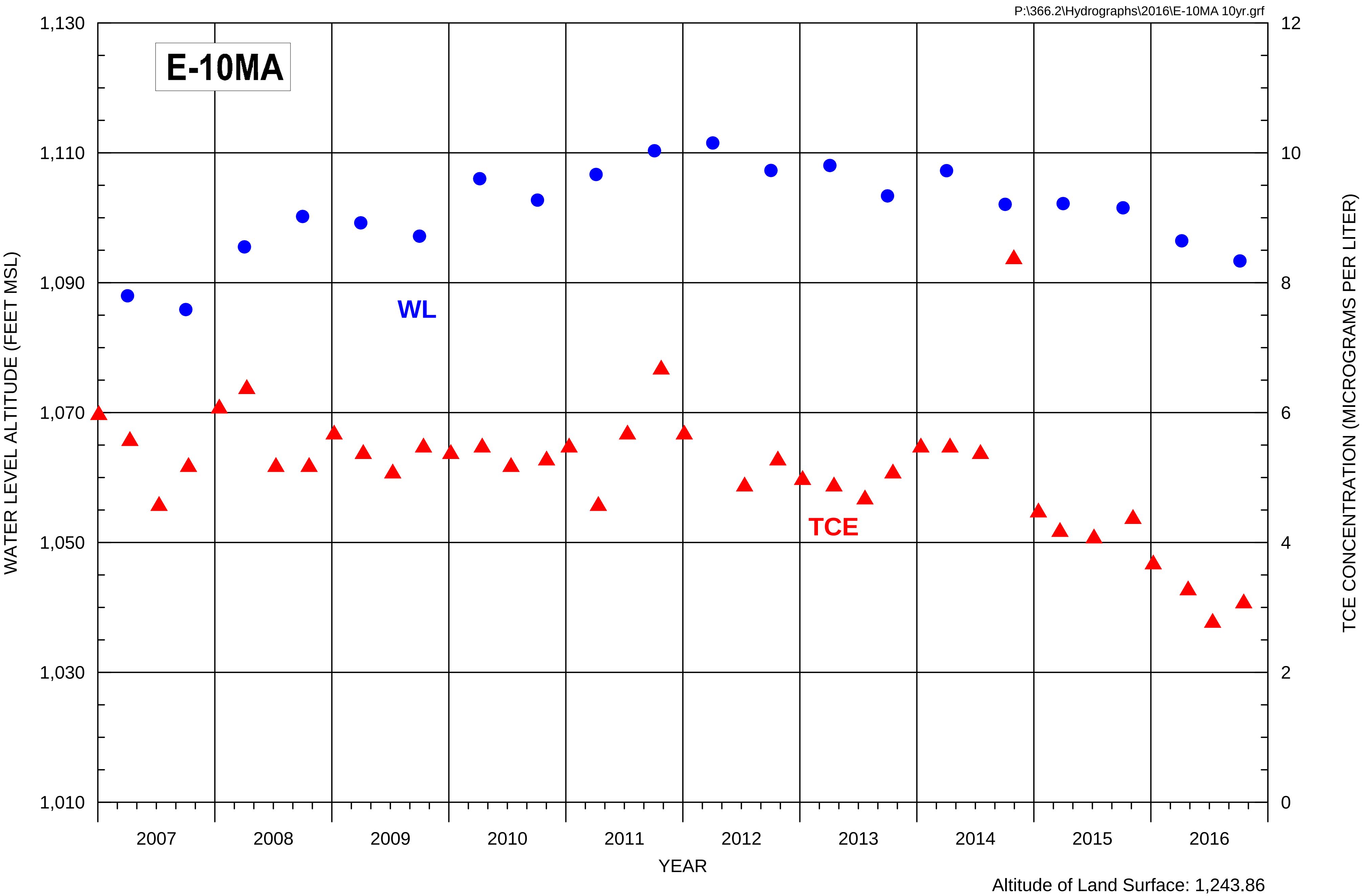


FIGURE C-29. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL E-10MA

North Indian Bend Wash Superfund Site

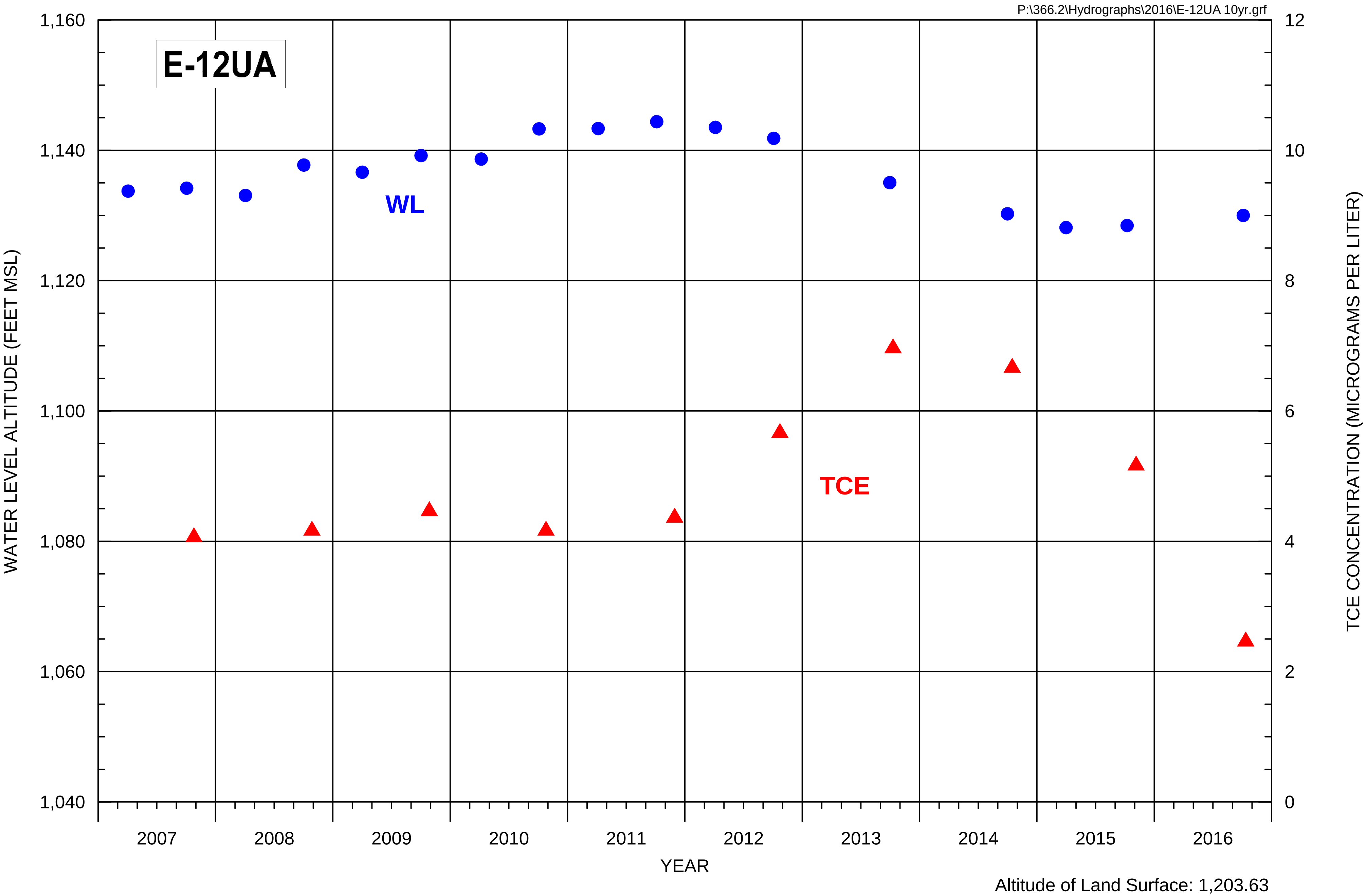
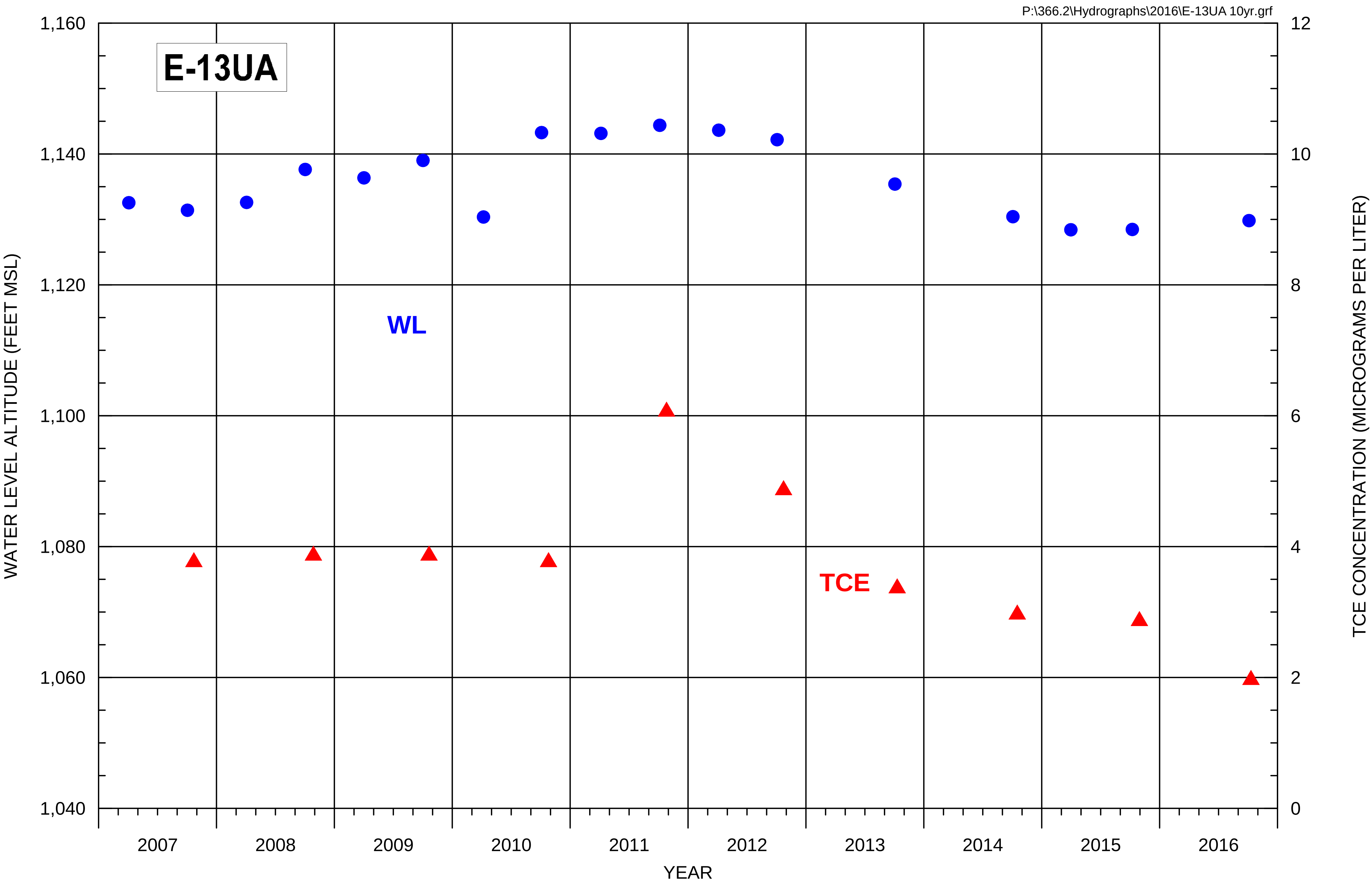


FIGURE C-30. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL E-12UA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,208.63

FIGURE C-31. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL E-13UA

North Indian Bend Wash Superfund Site

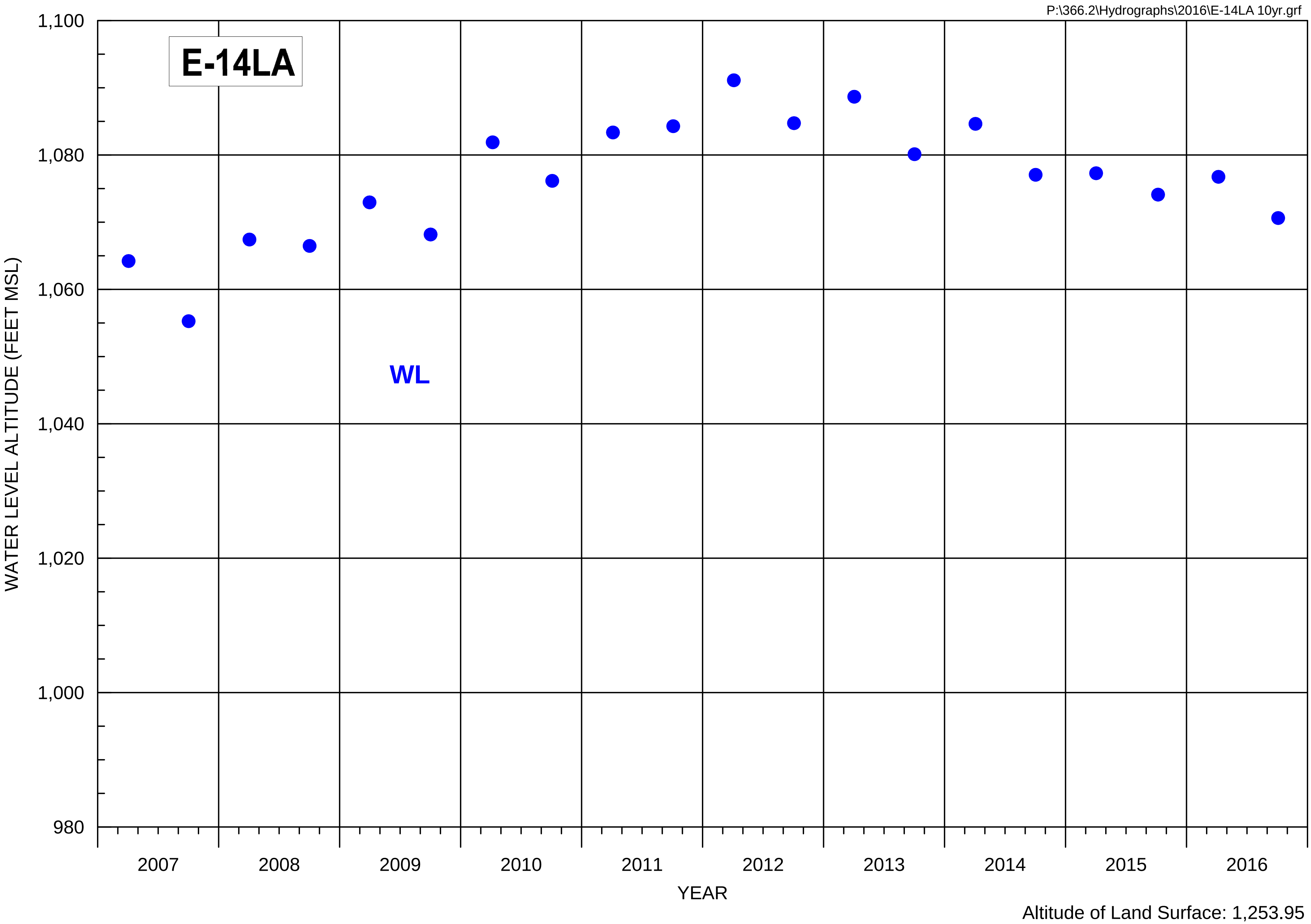


FIGURE C-32. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL E-14LA

North Indian Bend Wash Superfund Site

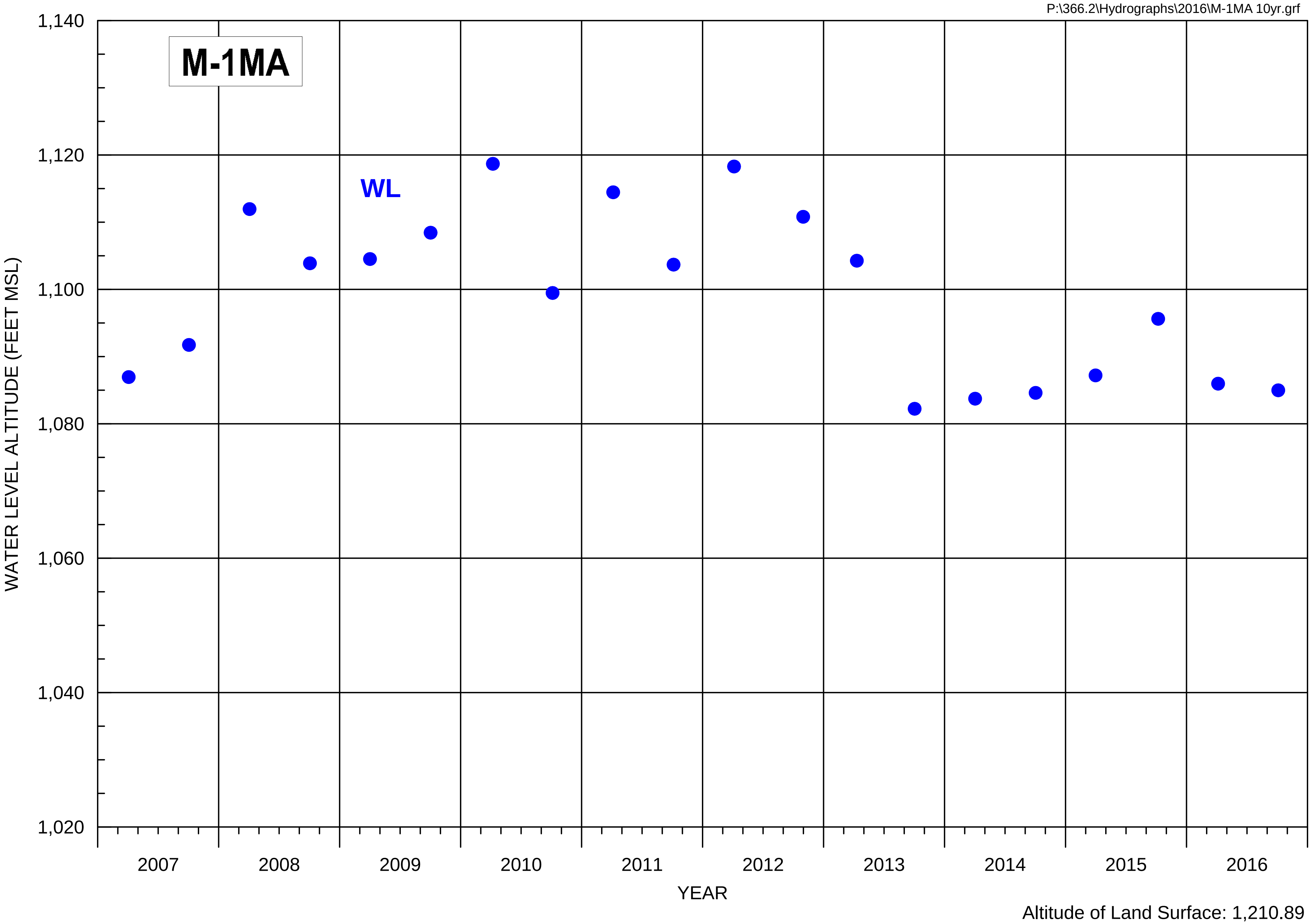
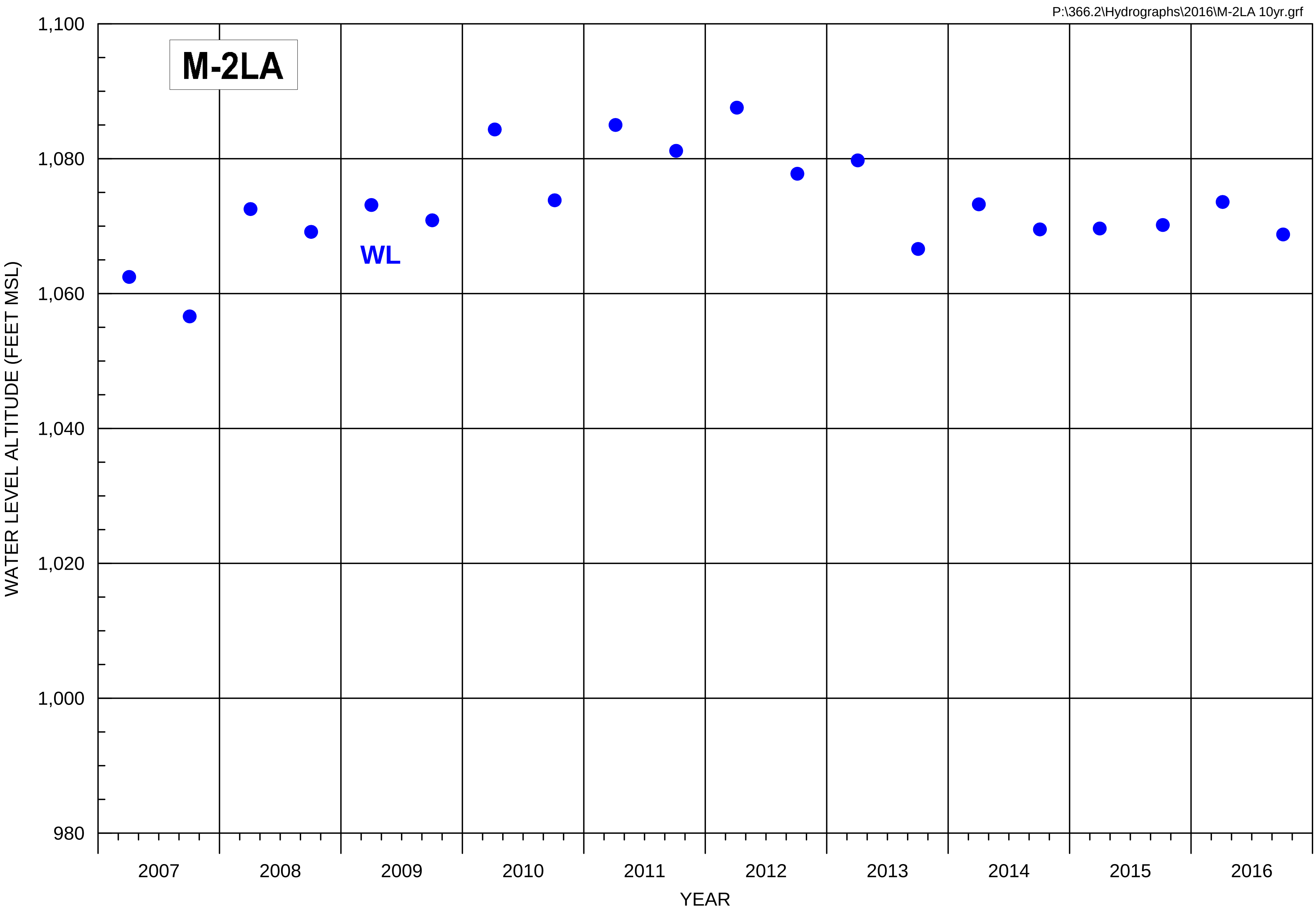


FIGURE C-33. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL M-1MA



Altitude of Land Surface: 1,210.23

FIGURE C-34. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL M-2LA

North Indian Bend Wash Superfund Site

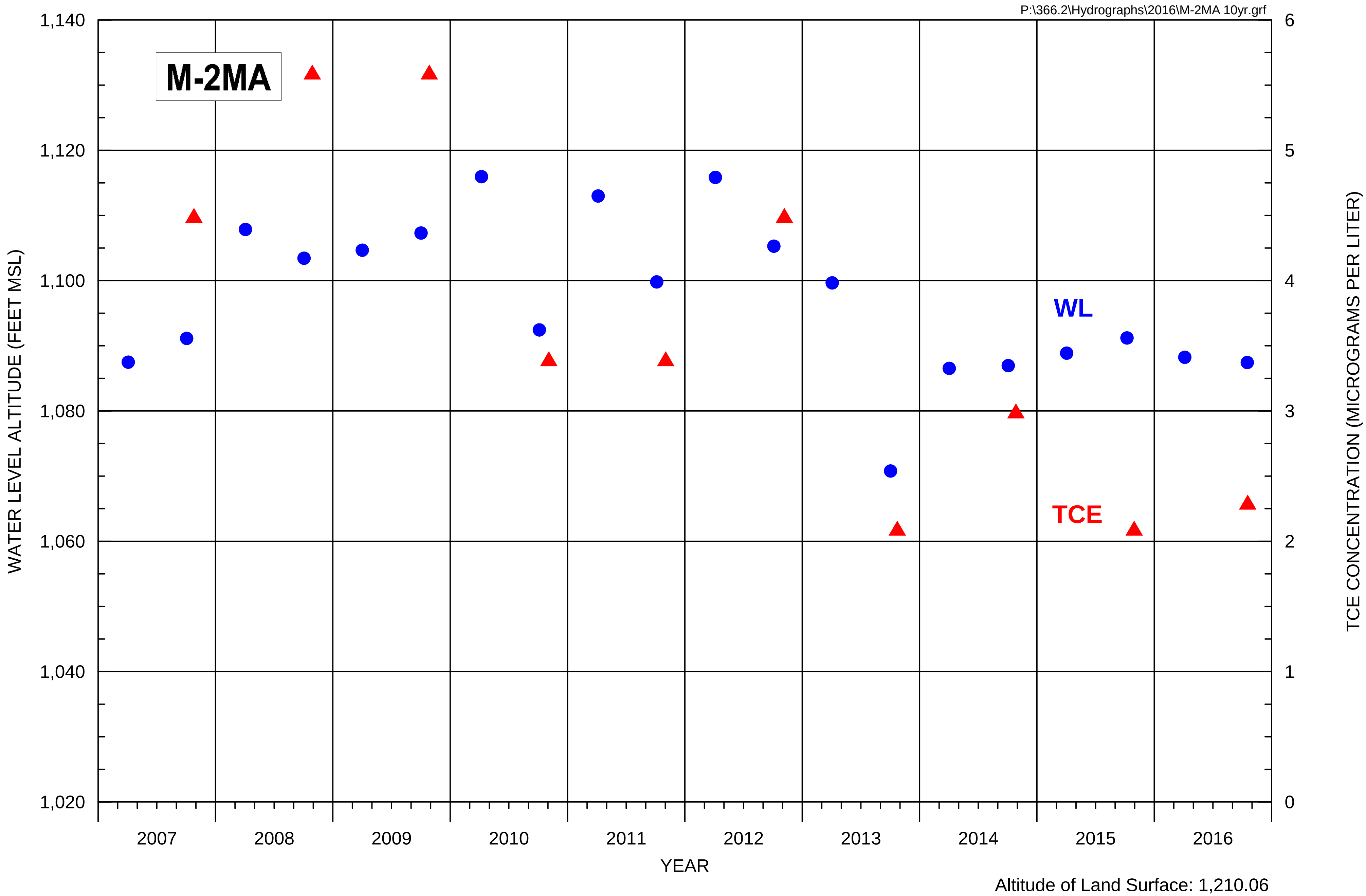
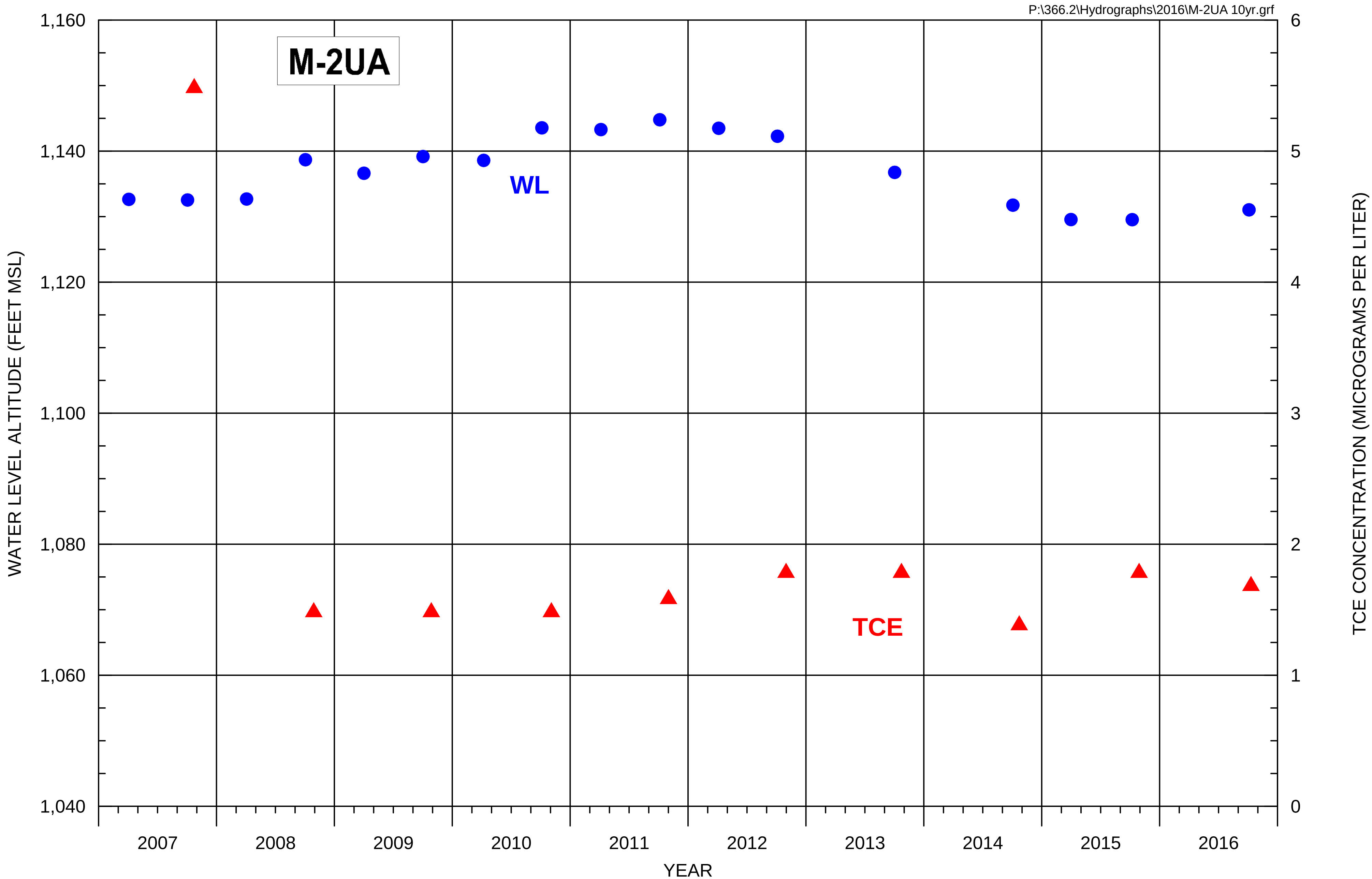


FIGURE C-35. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-2MA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,210.17

FIGURE C-36. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-2UA

North Indian Bend Wash Superfund Site

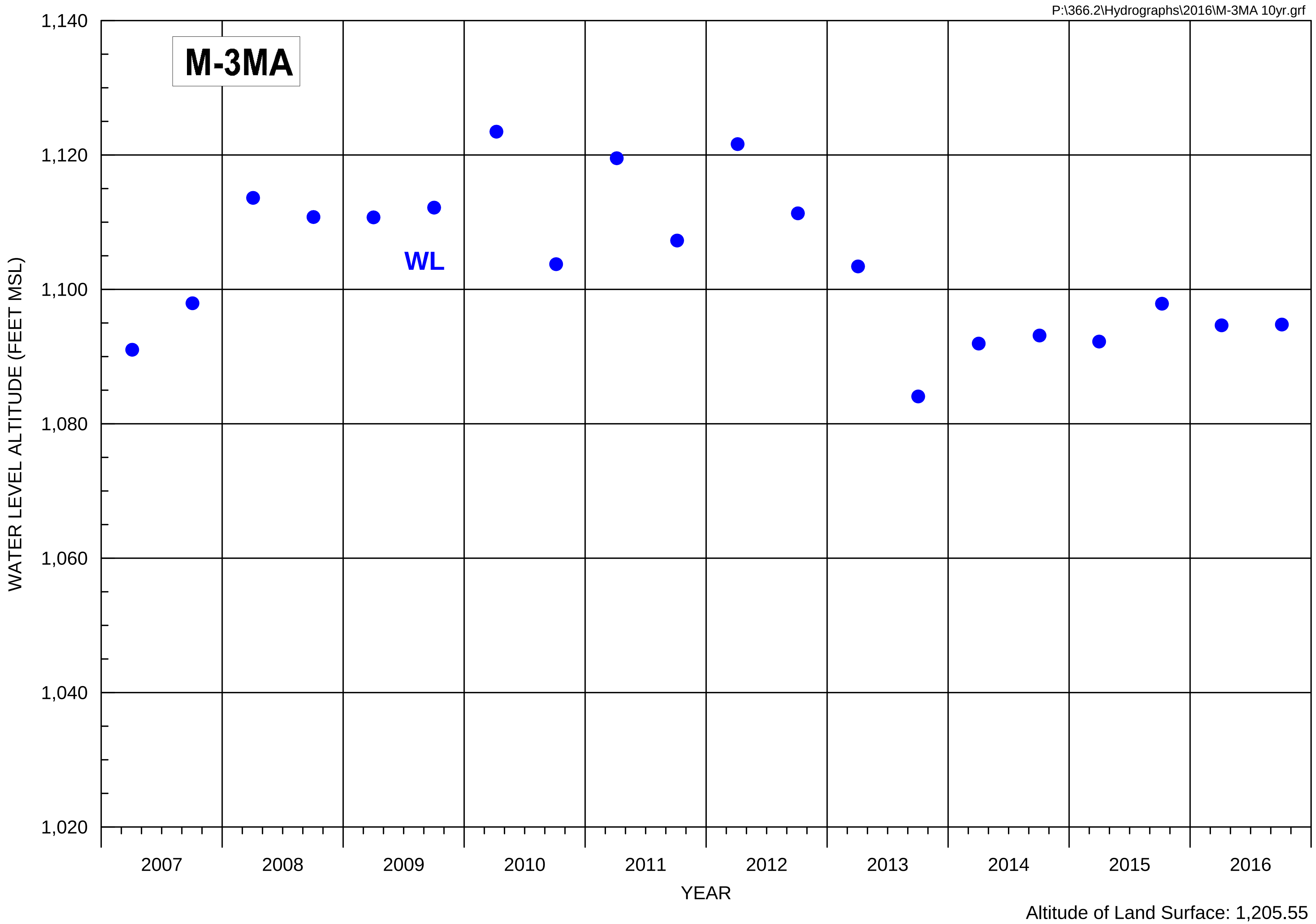


FIGURE C-37. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL M-3MA

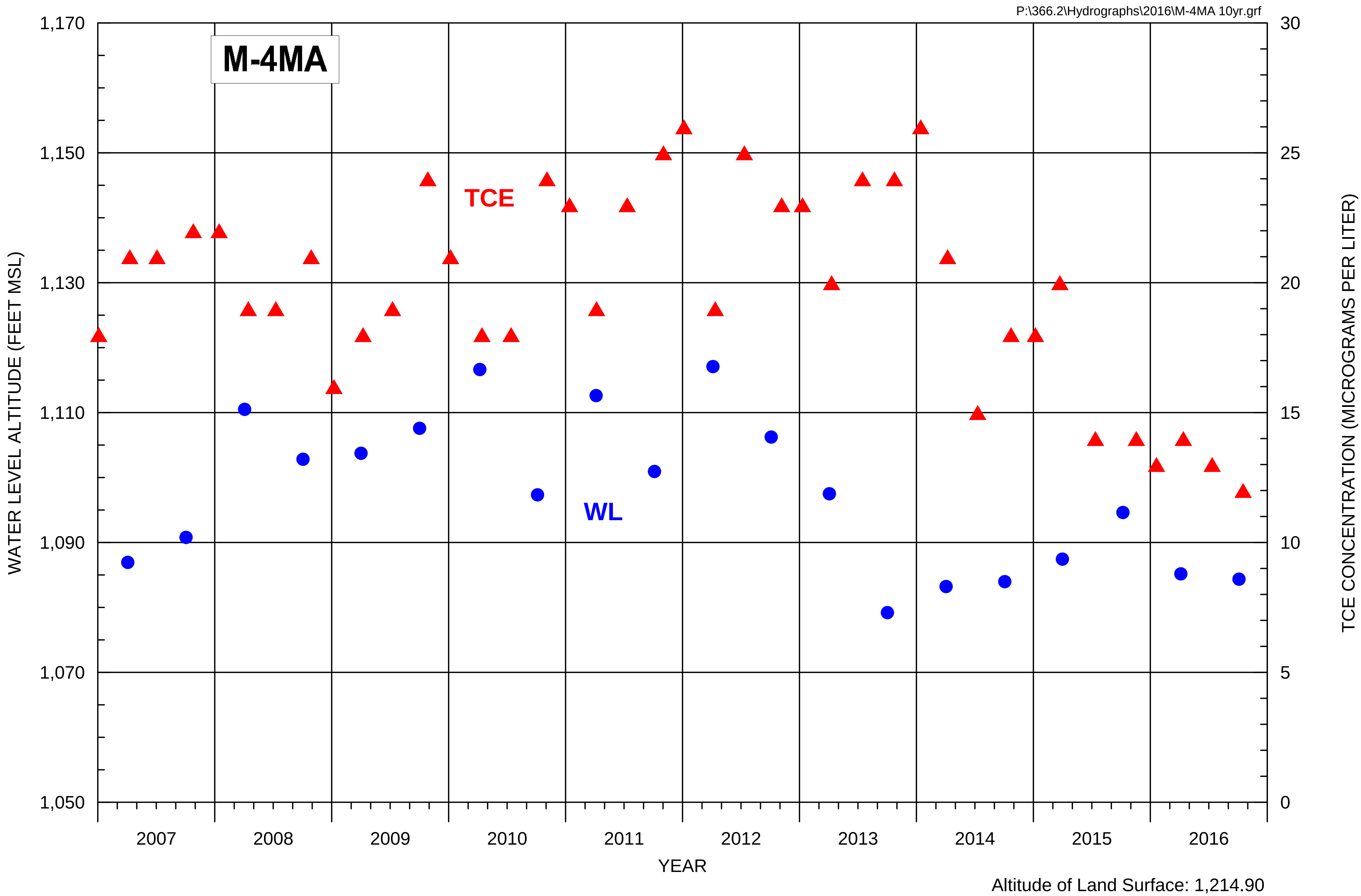
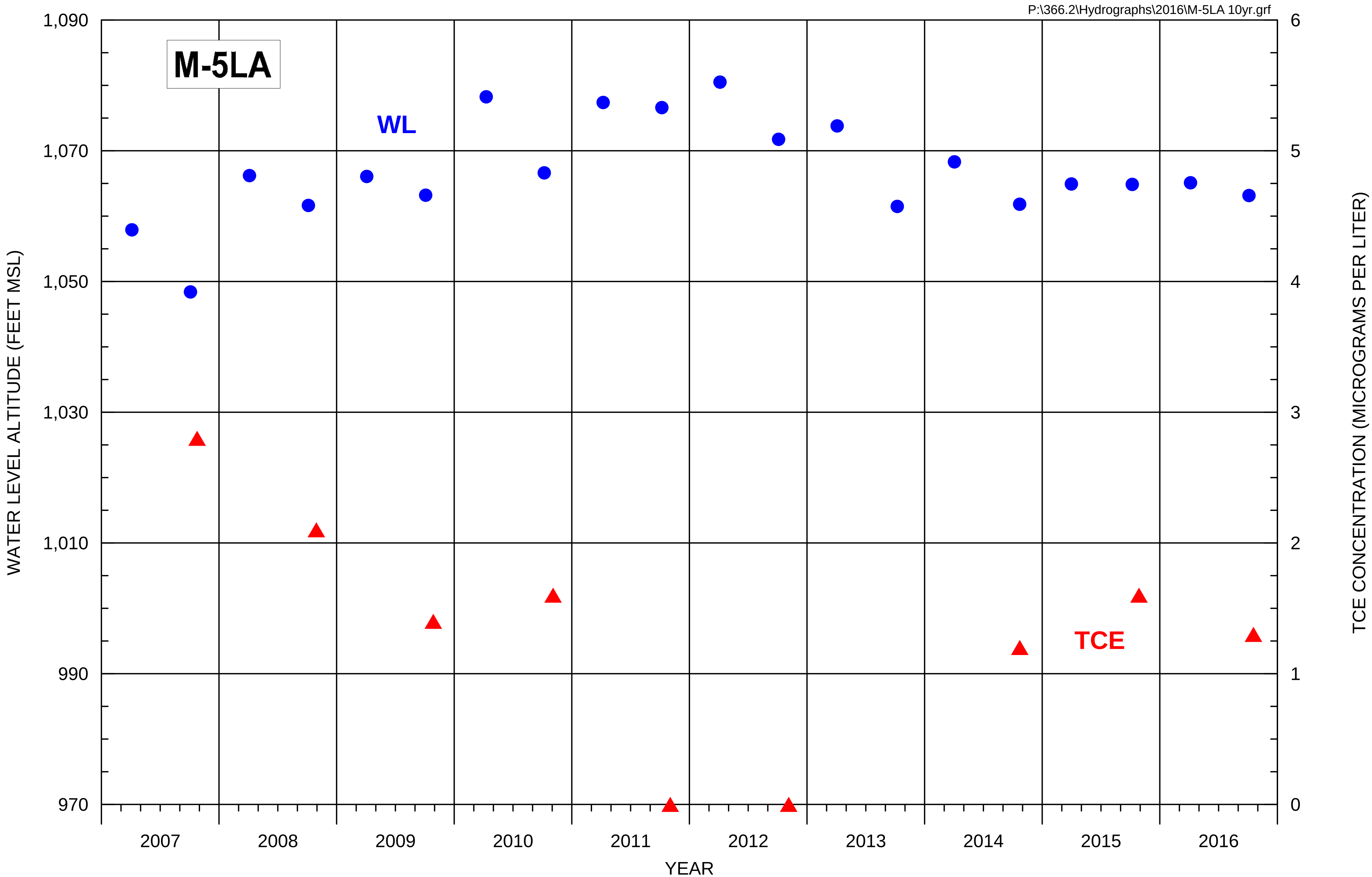


FIGURE C-38. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-4MA

North Indian Bend Wash Superfund Site

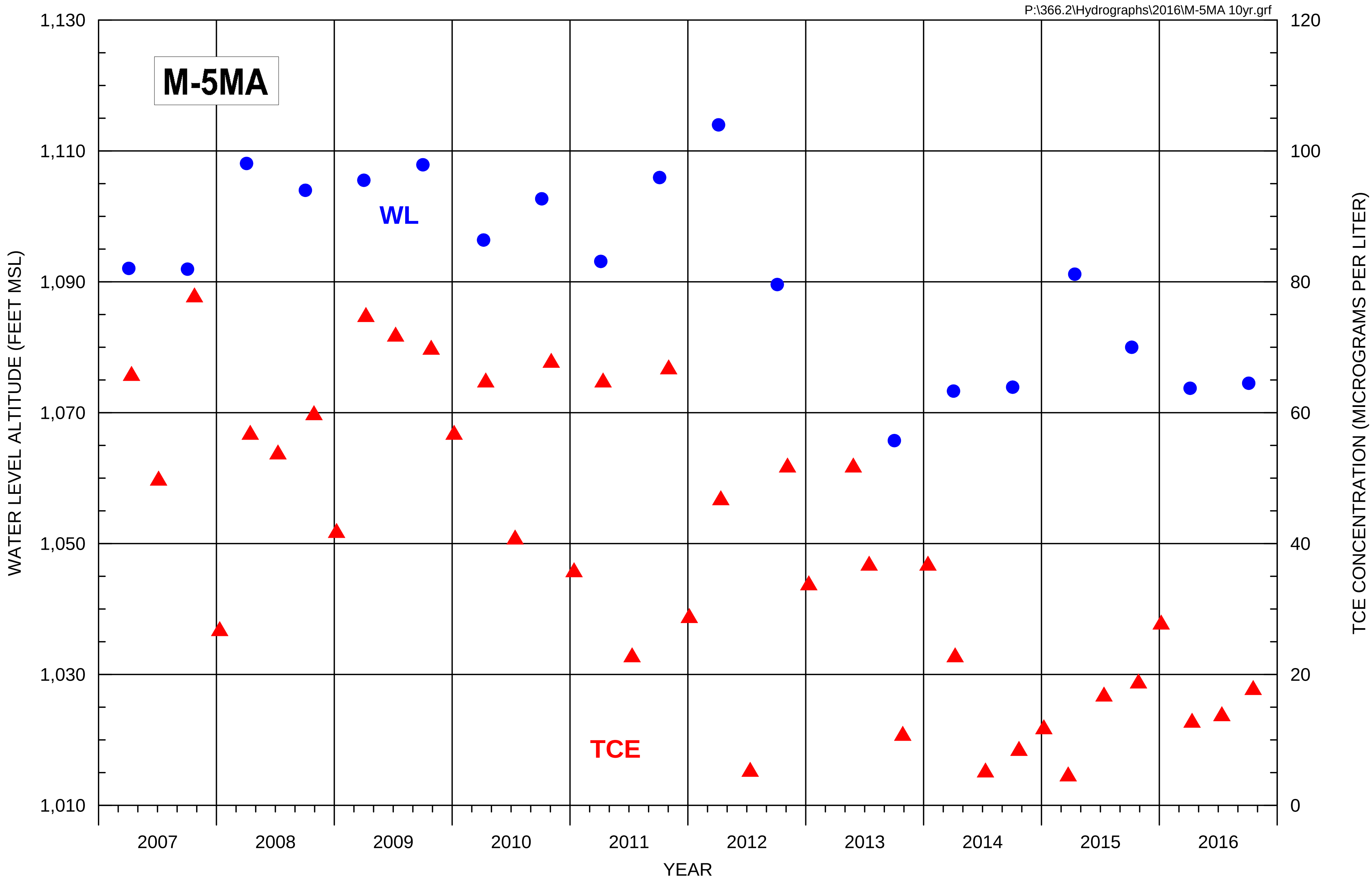


Altitude of Land Surface: 1,217.46

FIGURE C-39. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-5LA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

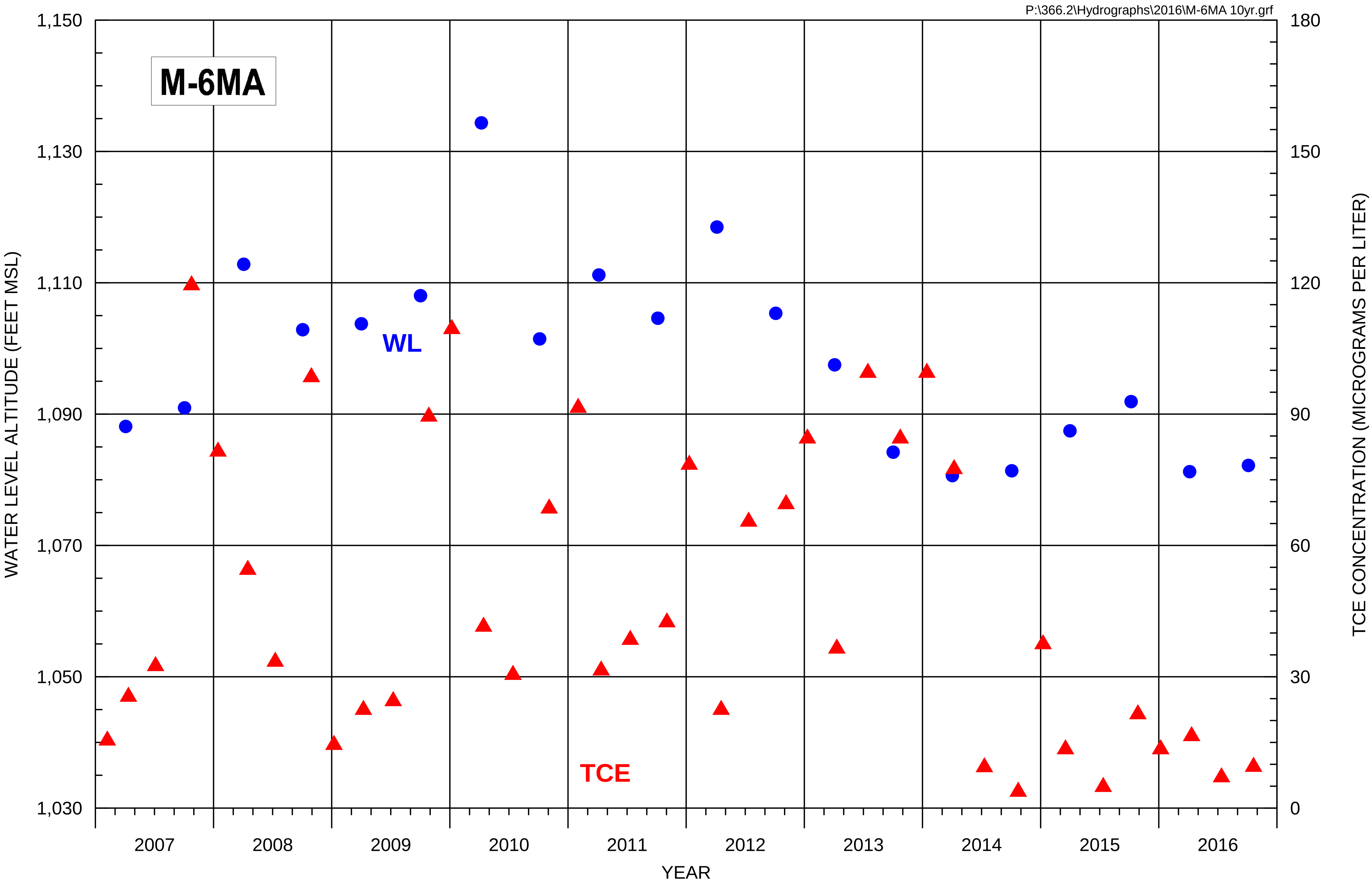
North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,217.43

FIGURE C-40. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-5MA

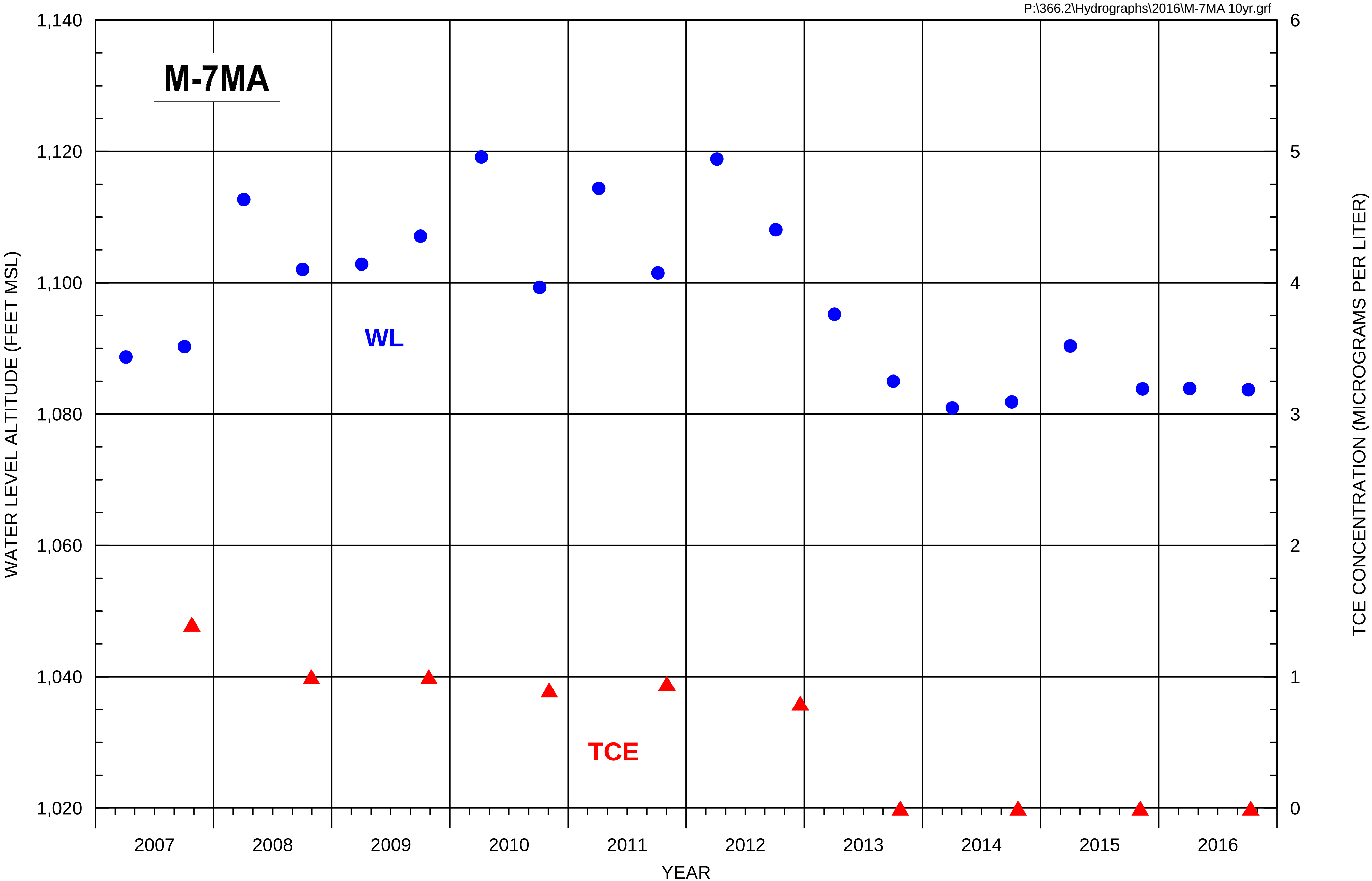
North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,216.98

FIGURE C-41. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-6MA

North Indian Bend Wash Superfund Site

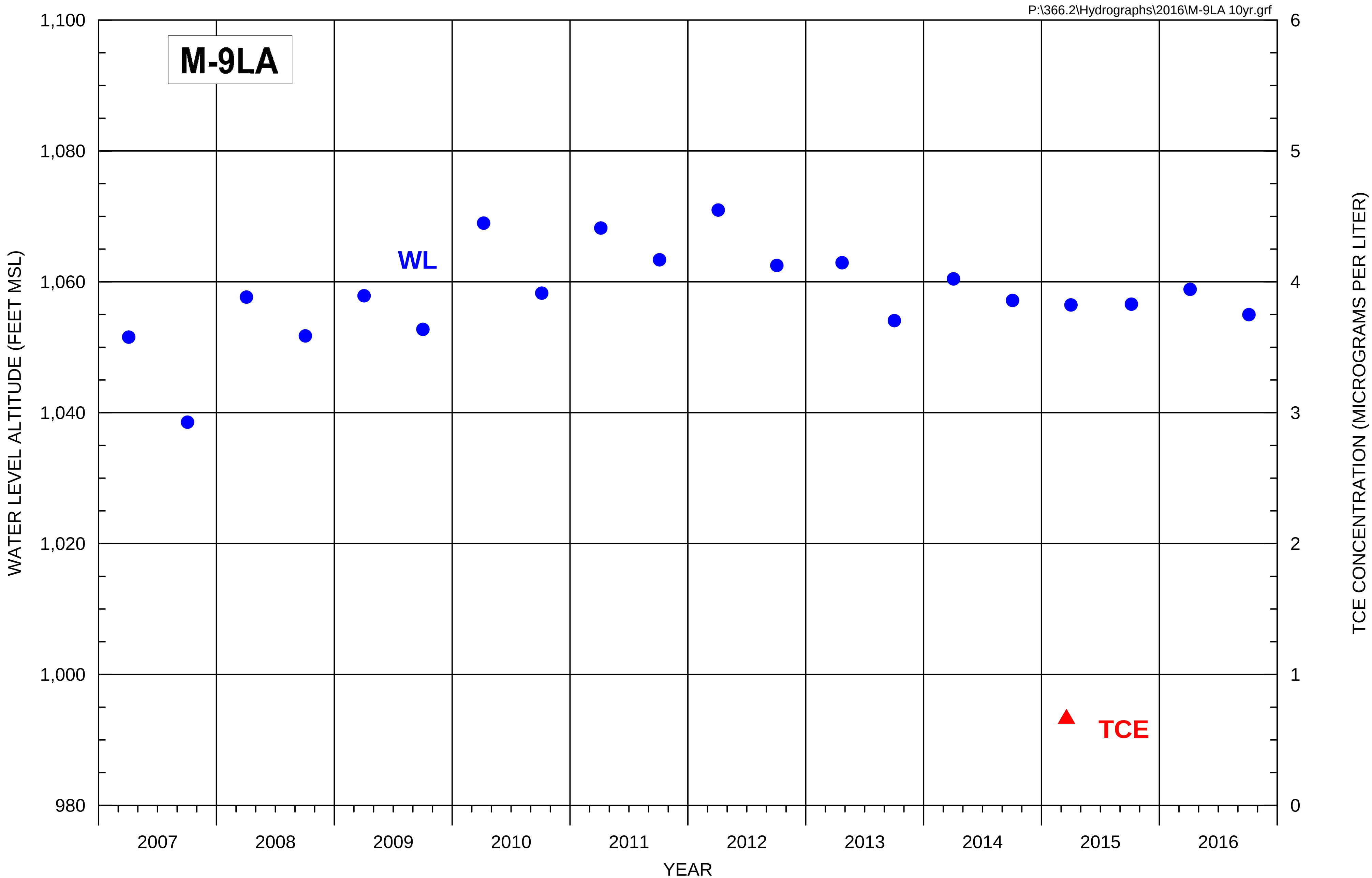


Altitude of Land Surface: 1,213.87

FIGURE C-42. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-7MA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,220.52

FIGURE C-43. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-9LA

North Indian Bend Wash Superfund Site

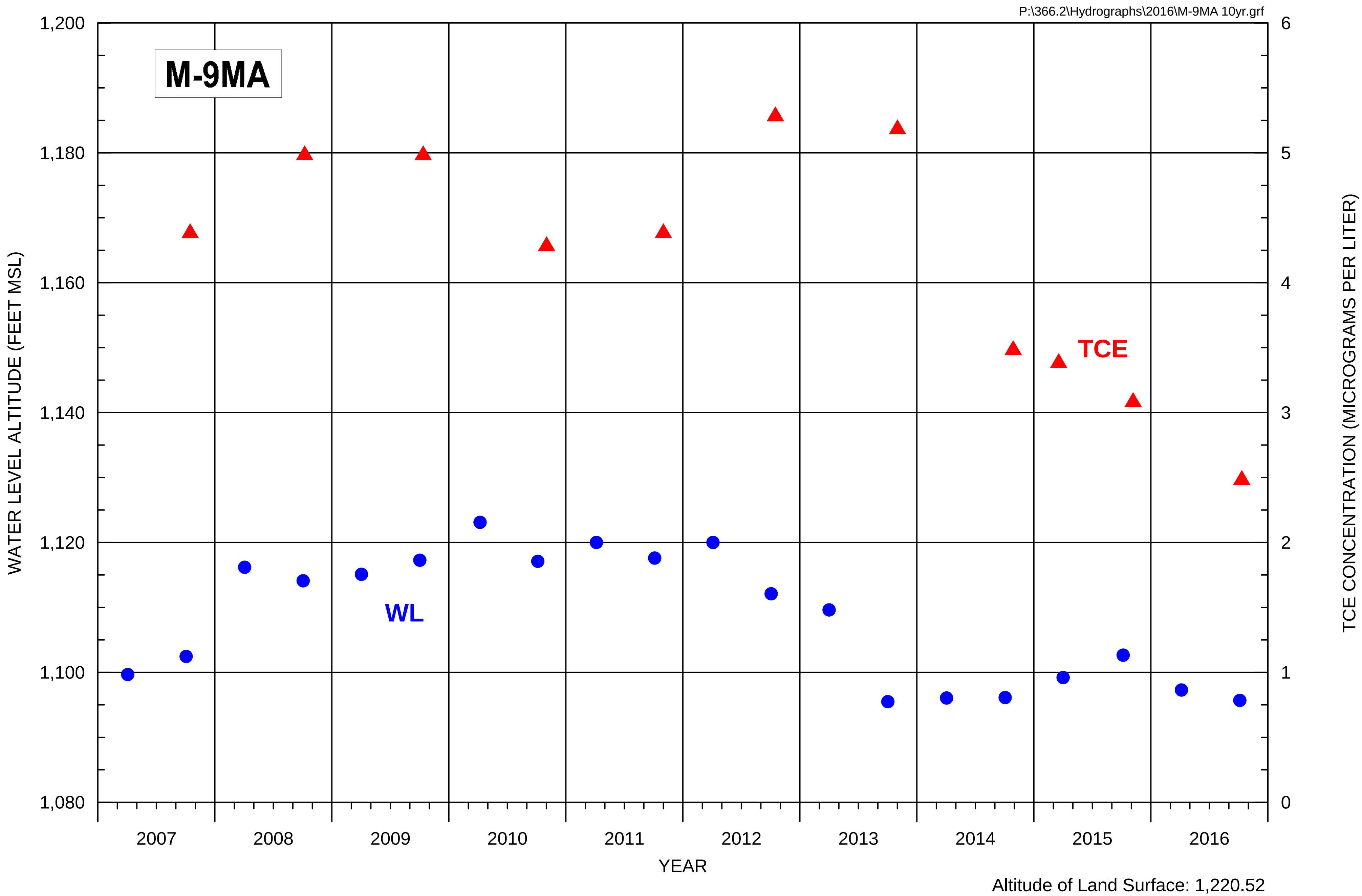
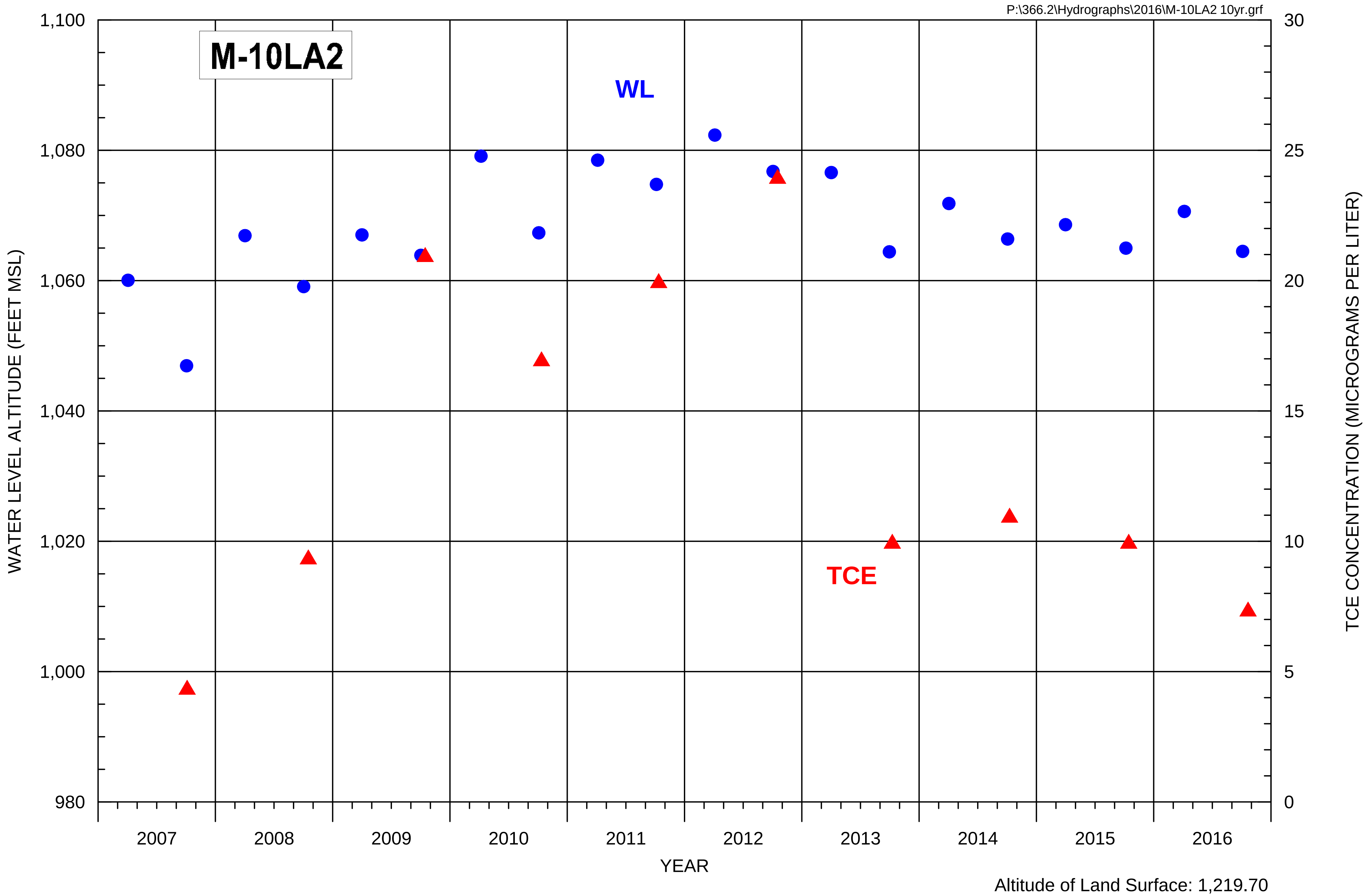


FIGURE C-44. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-9MA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,219.70

FIGURE C-45. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-10LA2

North Indian Bend Wash Superfund Site

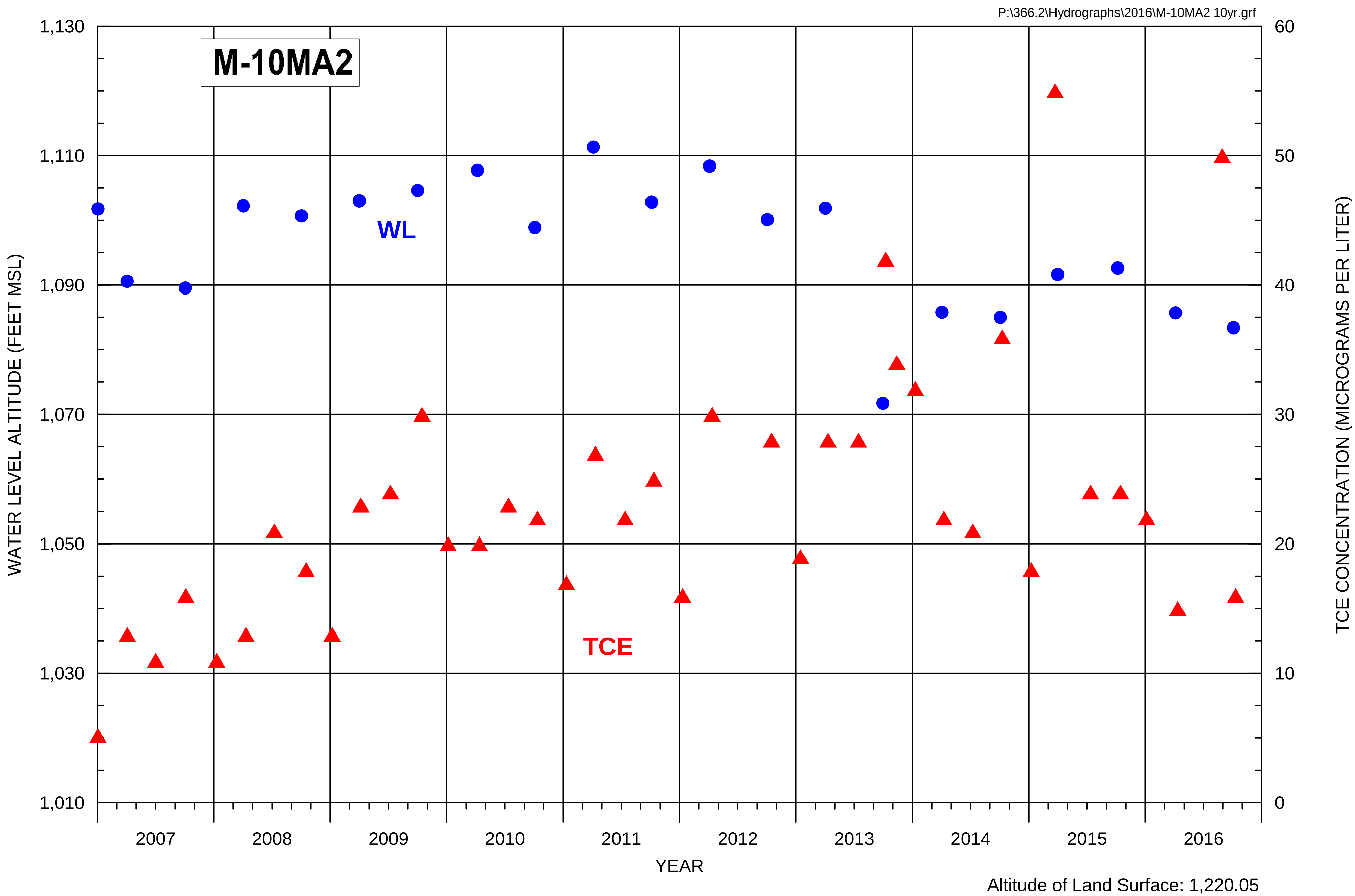


FIGURE C-46. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-10MA2

North Indian Bend Wash Superfund Site

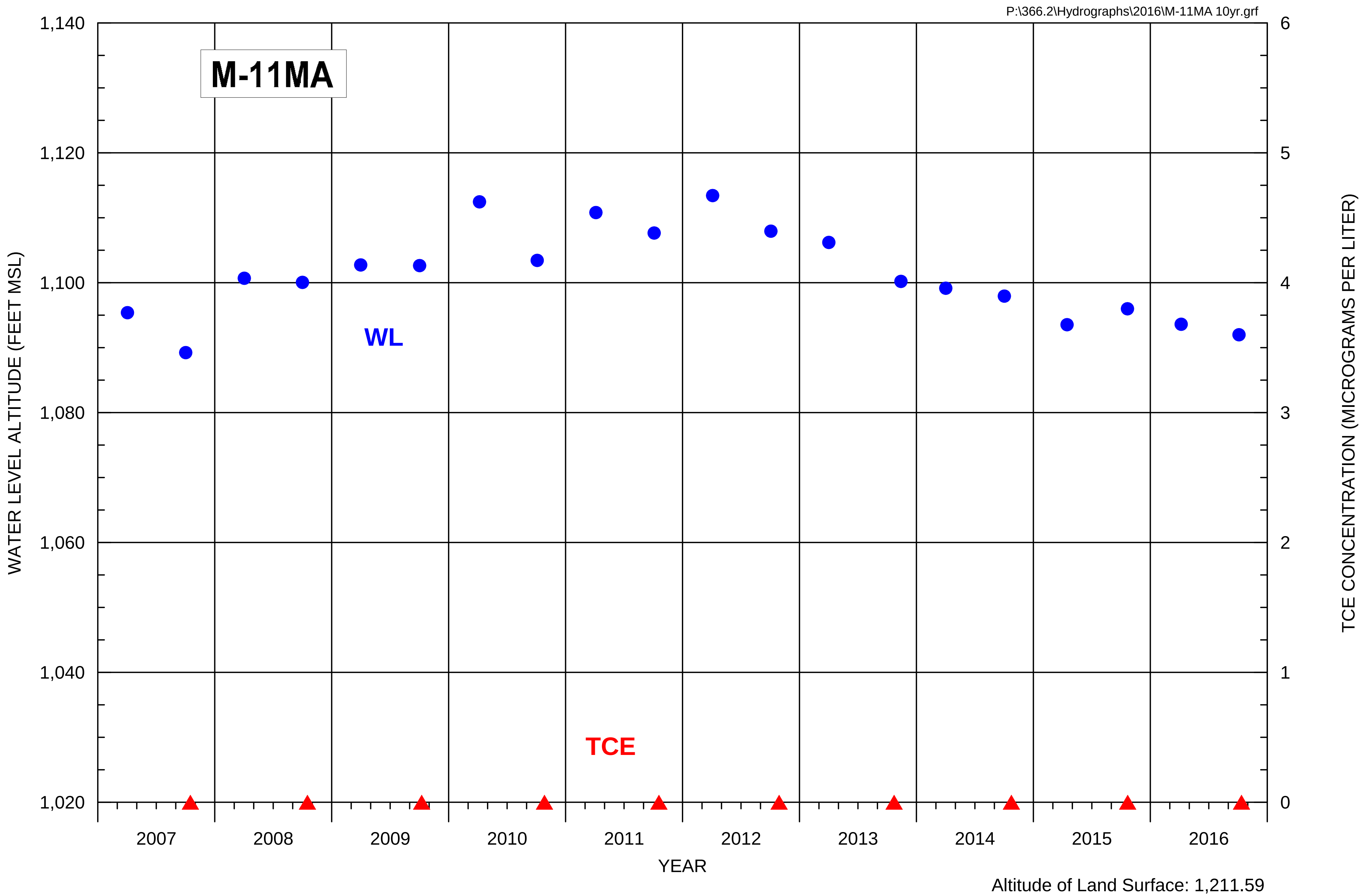


FIGURE C-47. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-11MA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site

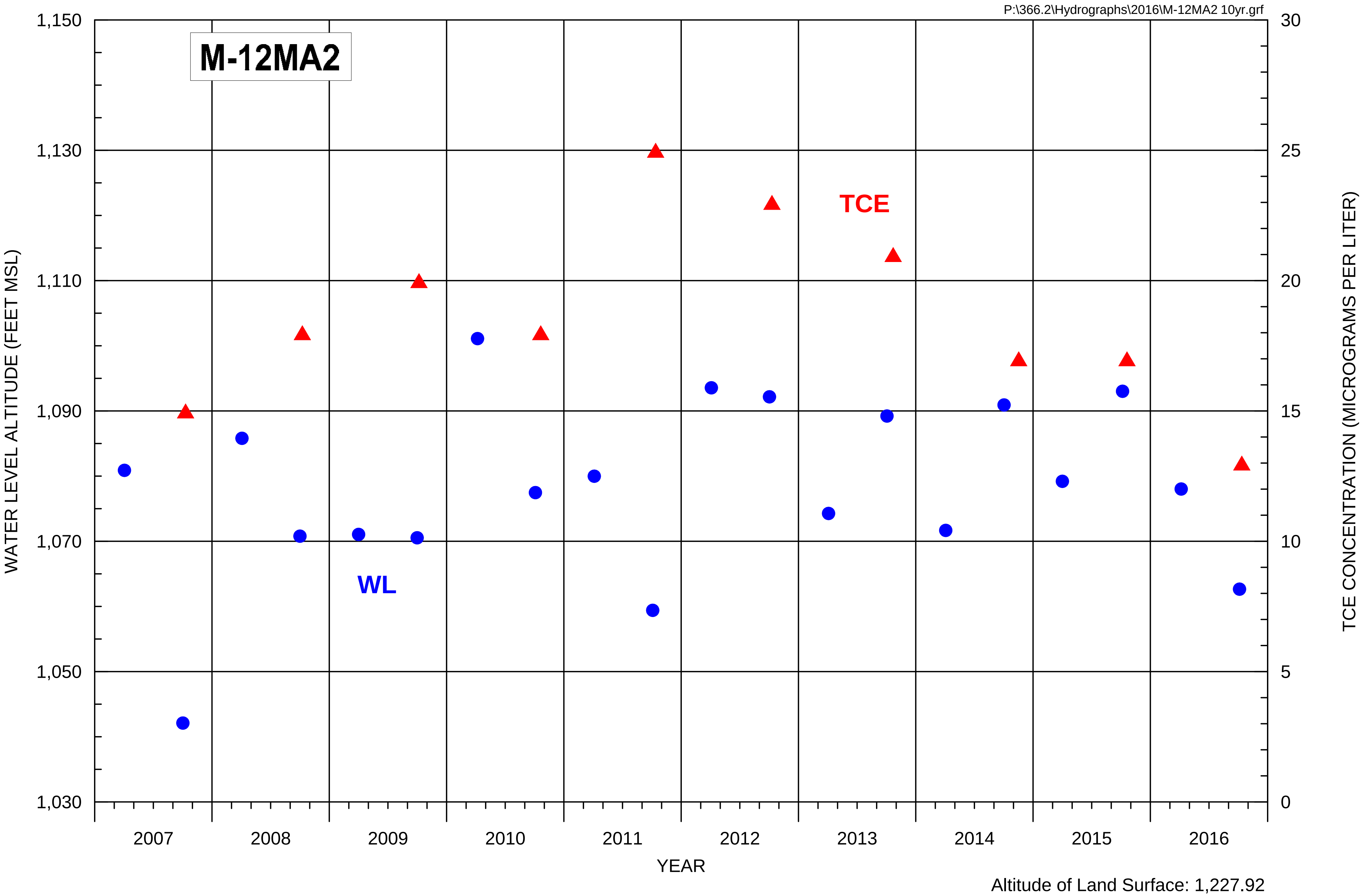


FIGURE C-48. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-12MA2

North Indian Bend Wash Superfund Site

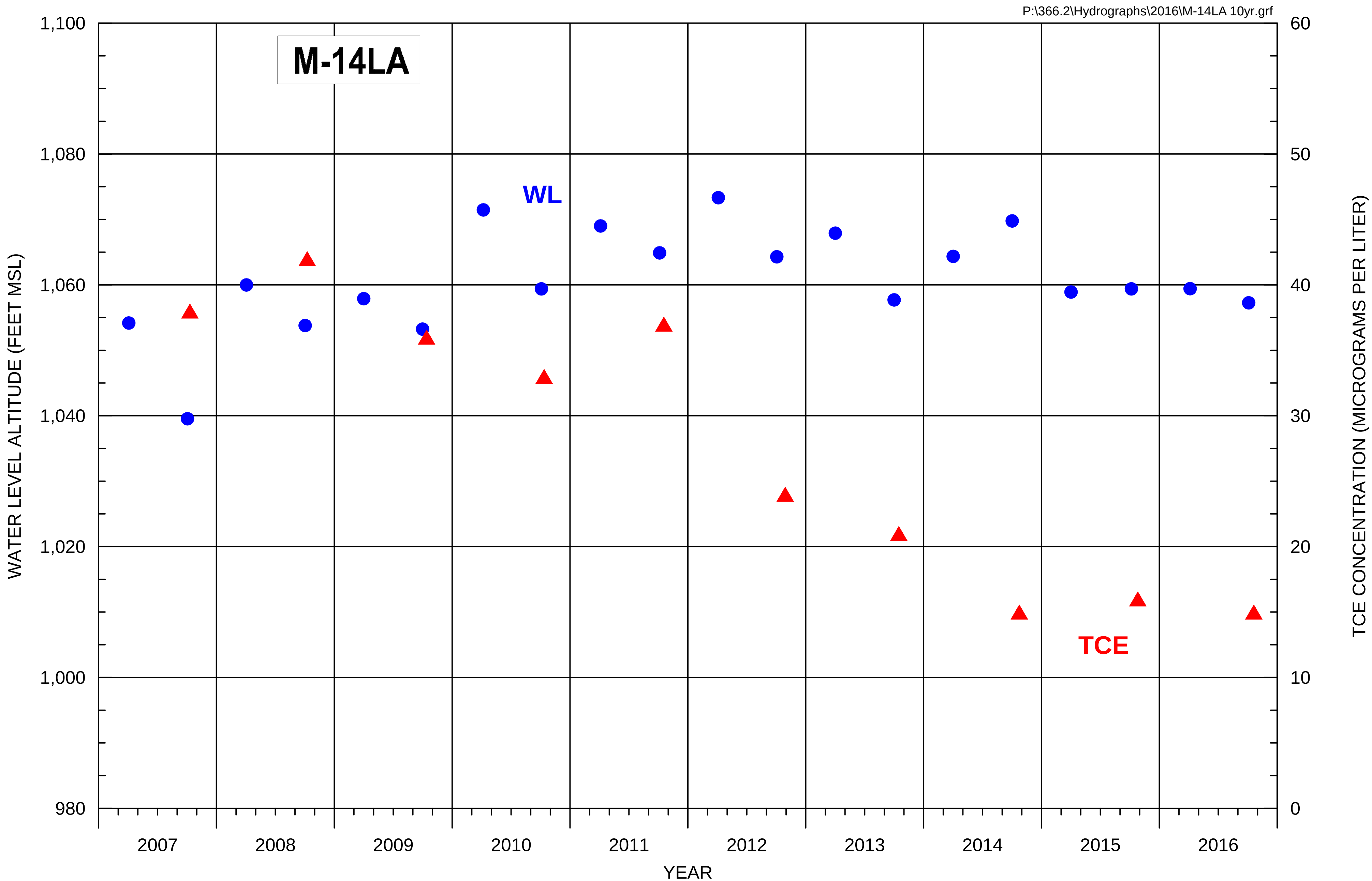


FIGURE C-49. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-14LA

North Indian Bend Wash Superfund Site

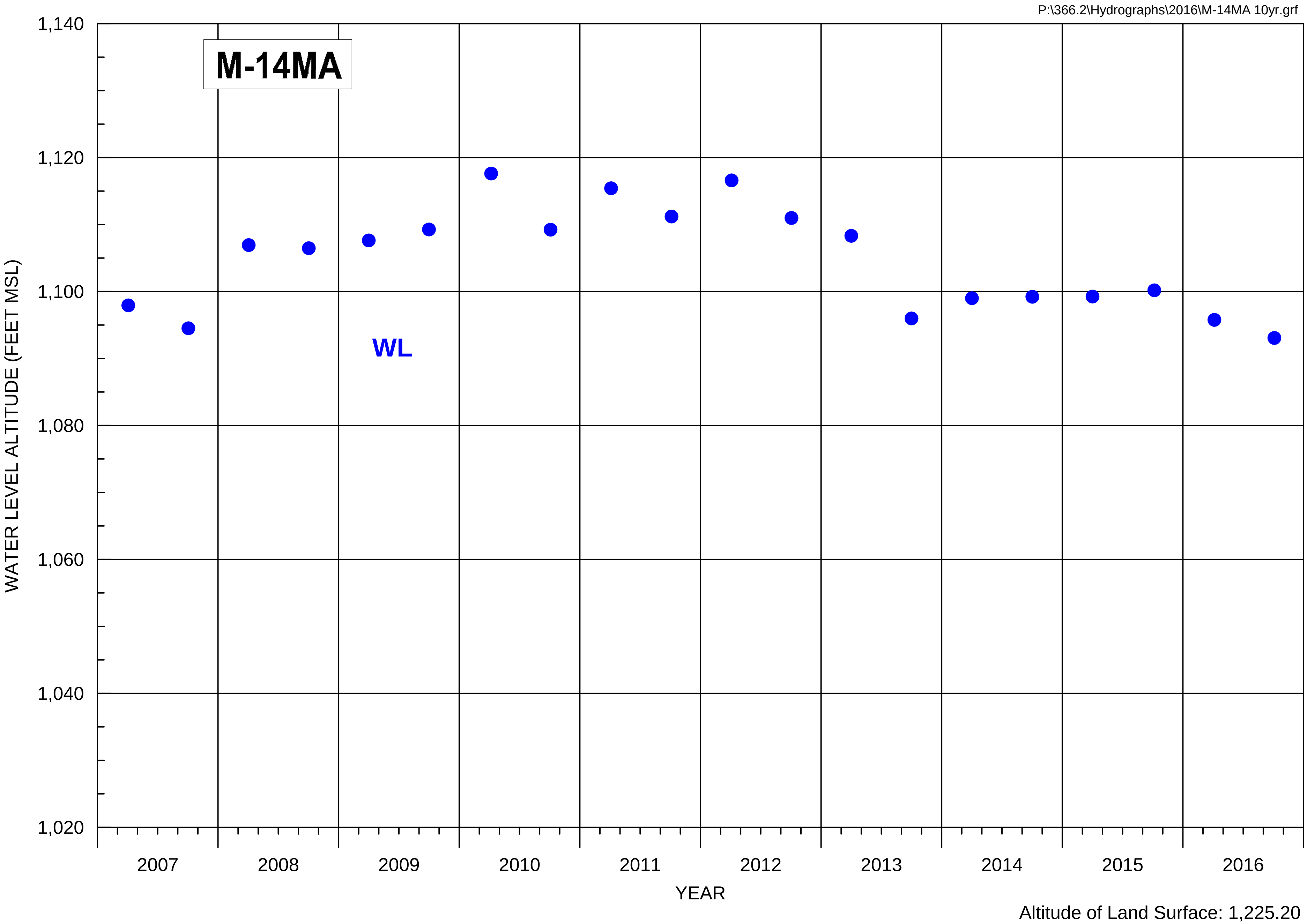
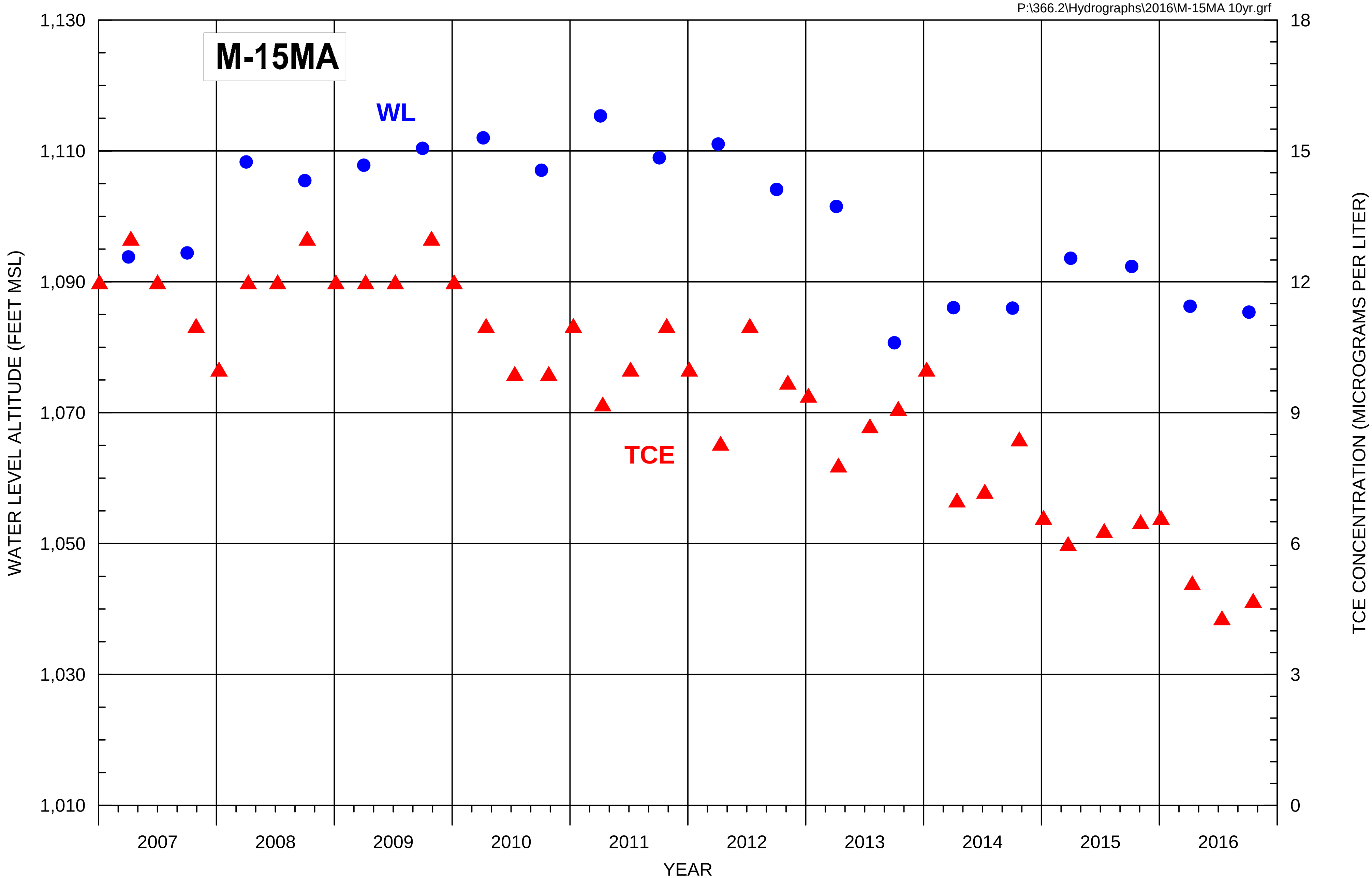


FIGURE C-50. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL M-14MA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,218.91

FIGURE C-51. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-15MA

North Indian Bend Wash Superfund Site

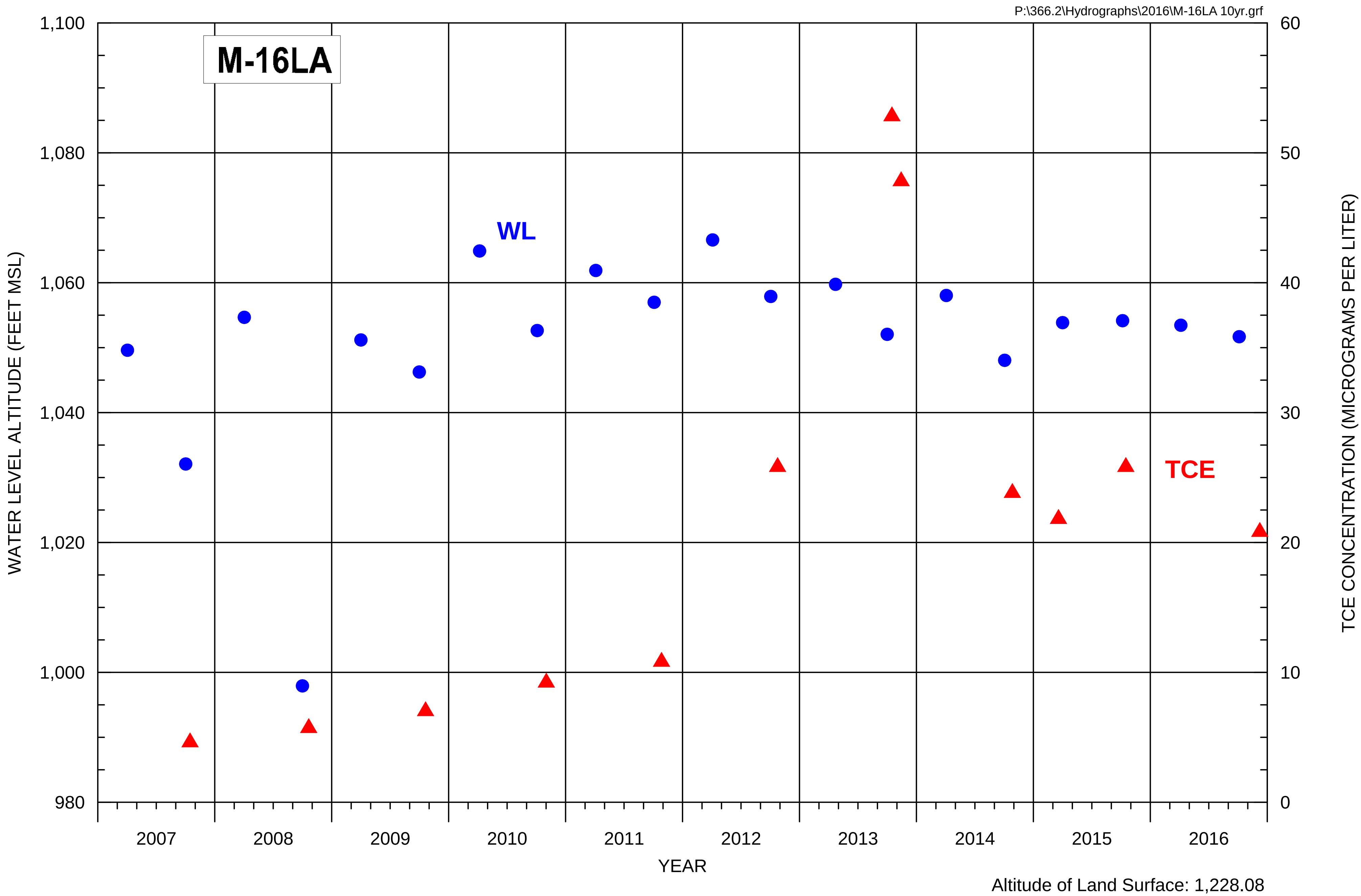
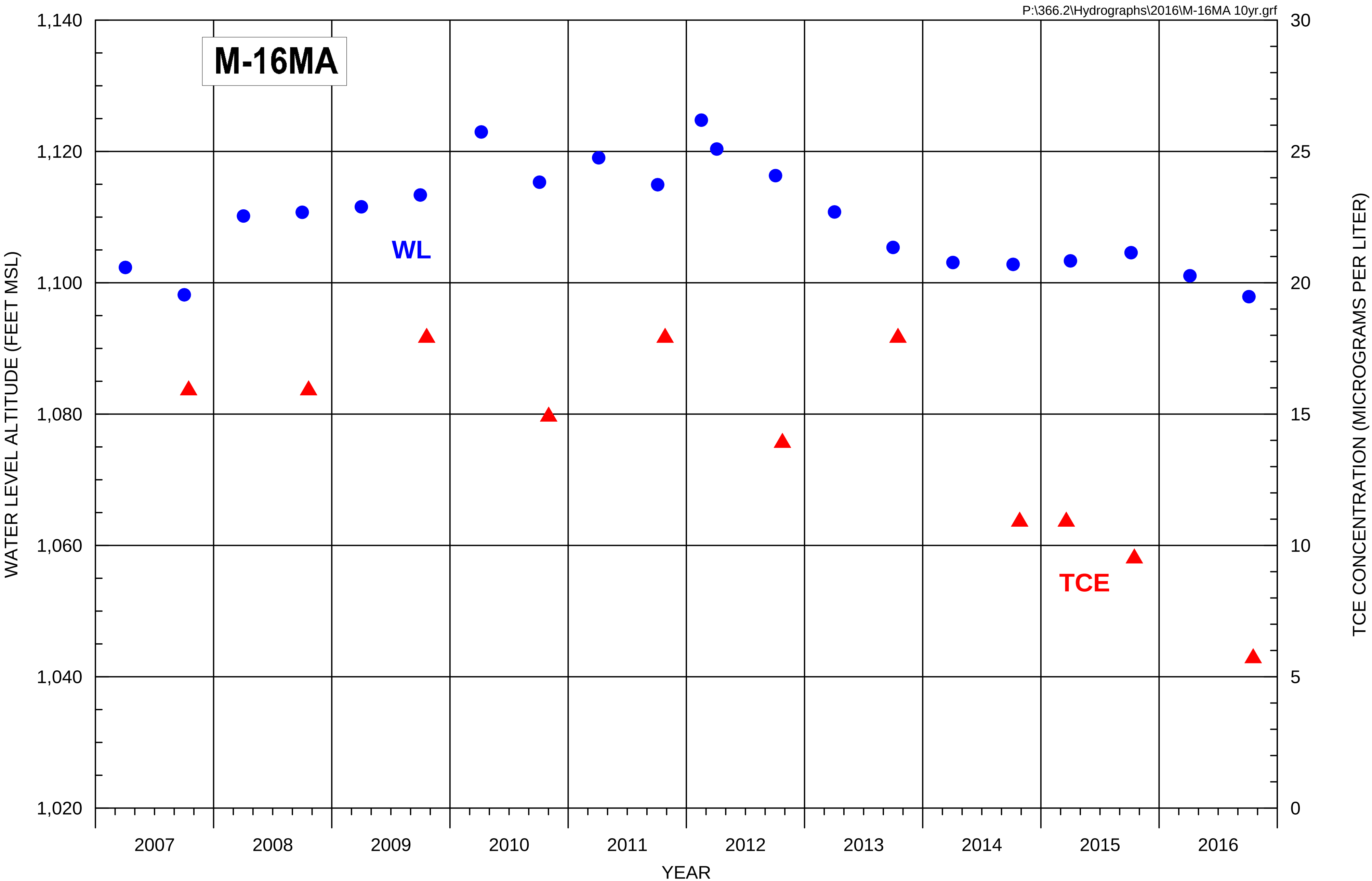


FIGURE C-52. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-16LA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,228.15

FIGURE C-53. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-16MA

North Indian Bend Wash Superfund Site

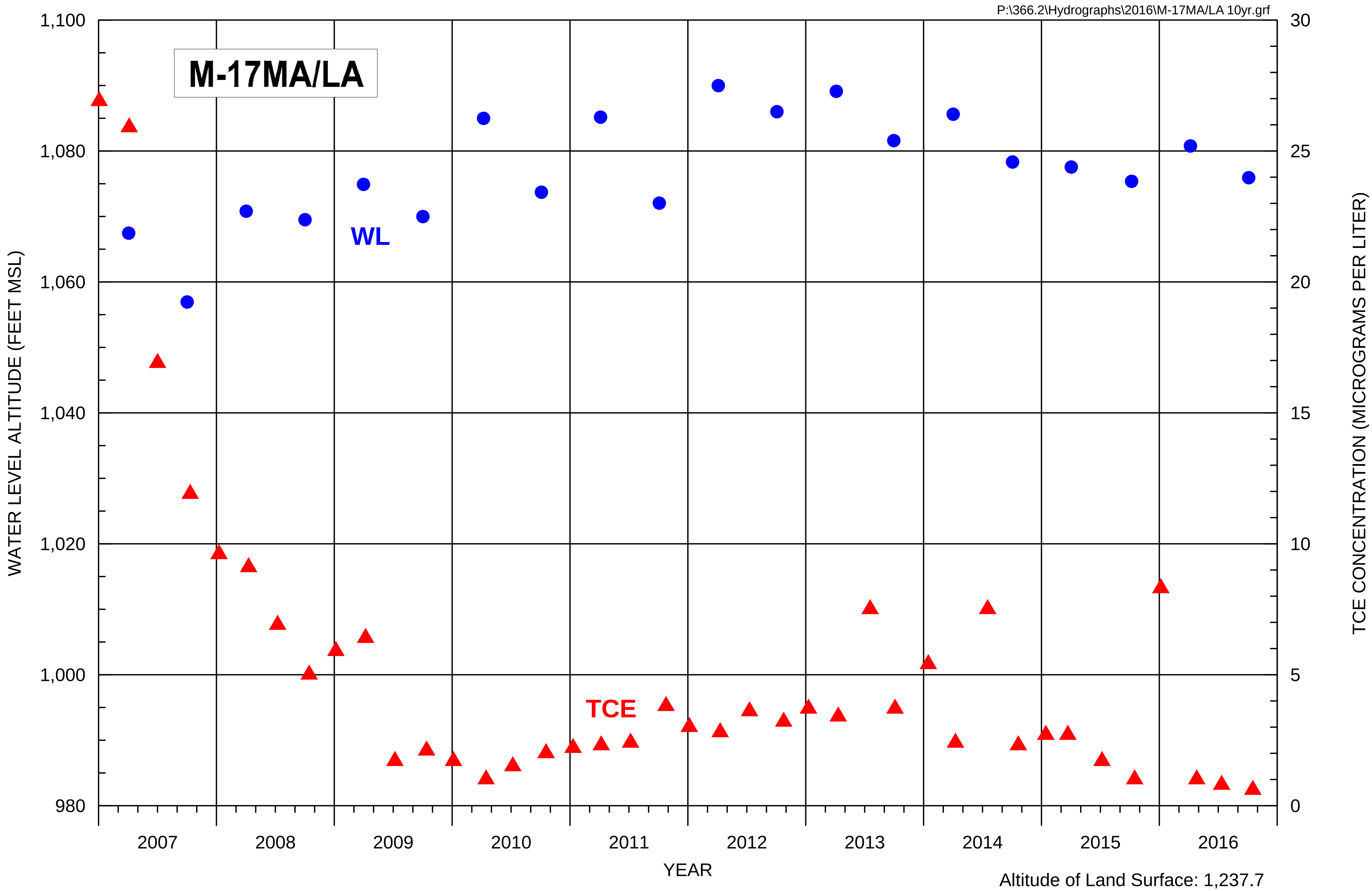


FIGURE C-54. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-17MA/LA

North Indian Bend Wash Superfund Site

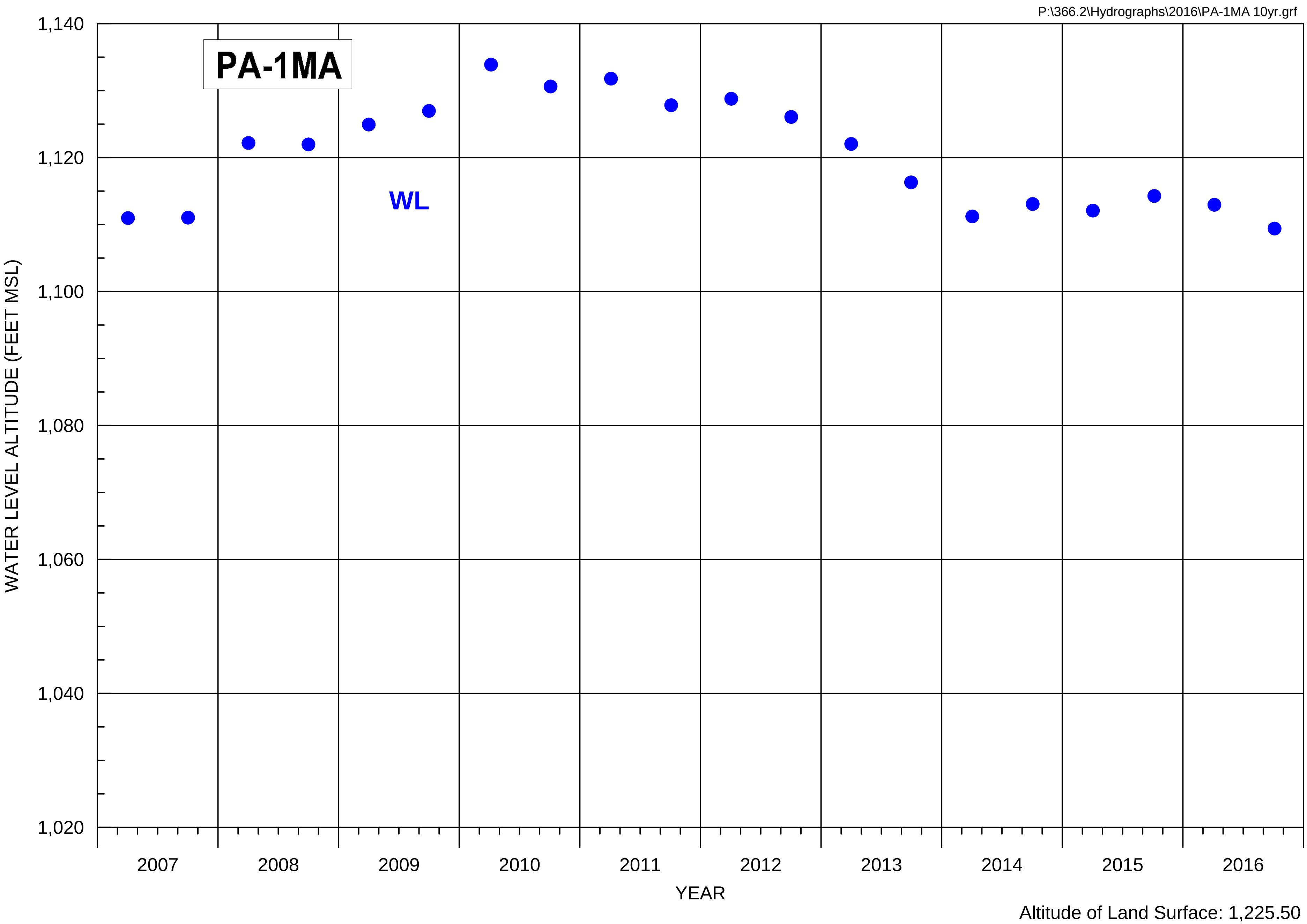


FIGURE C-55. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PA-1MA

North Indian Bend Wash Superfund Site

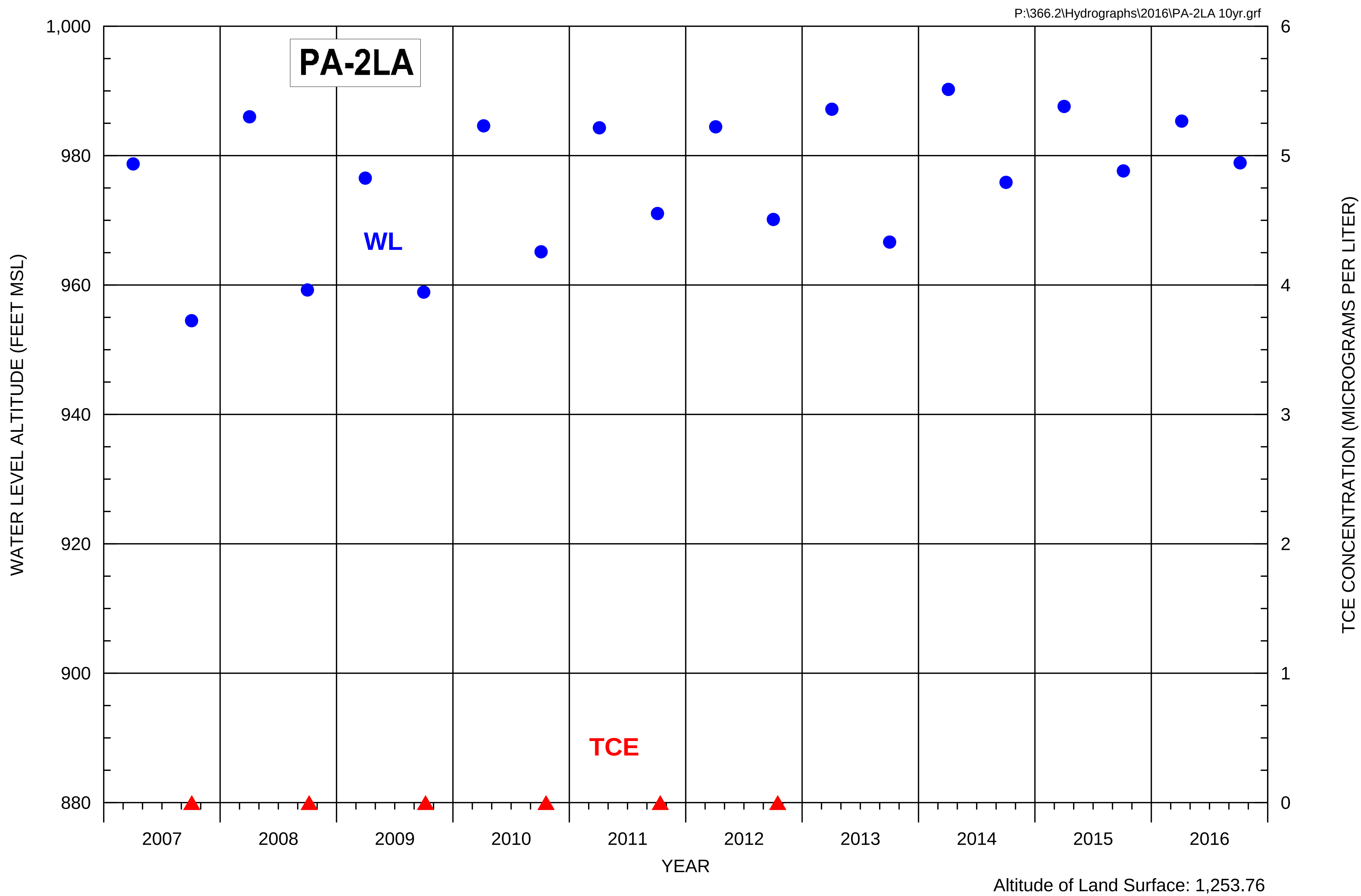
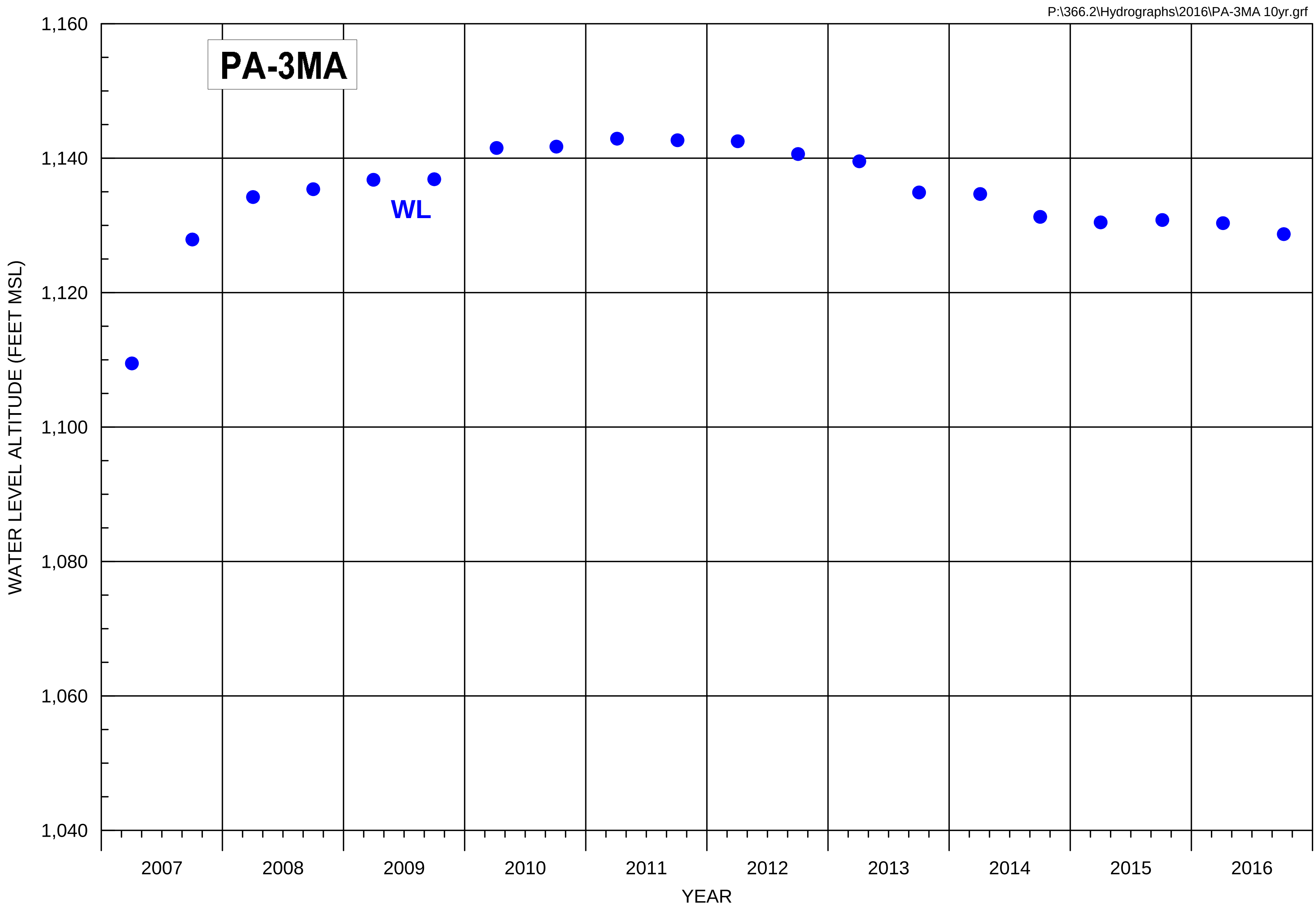


FIGURE C-56. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-2LA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

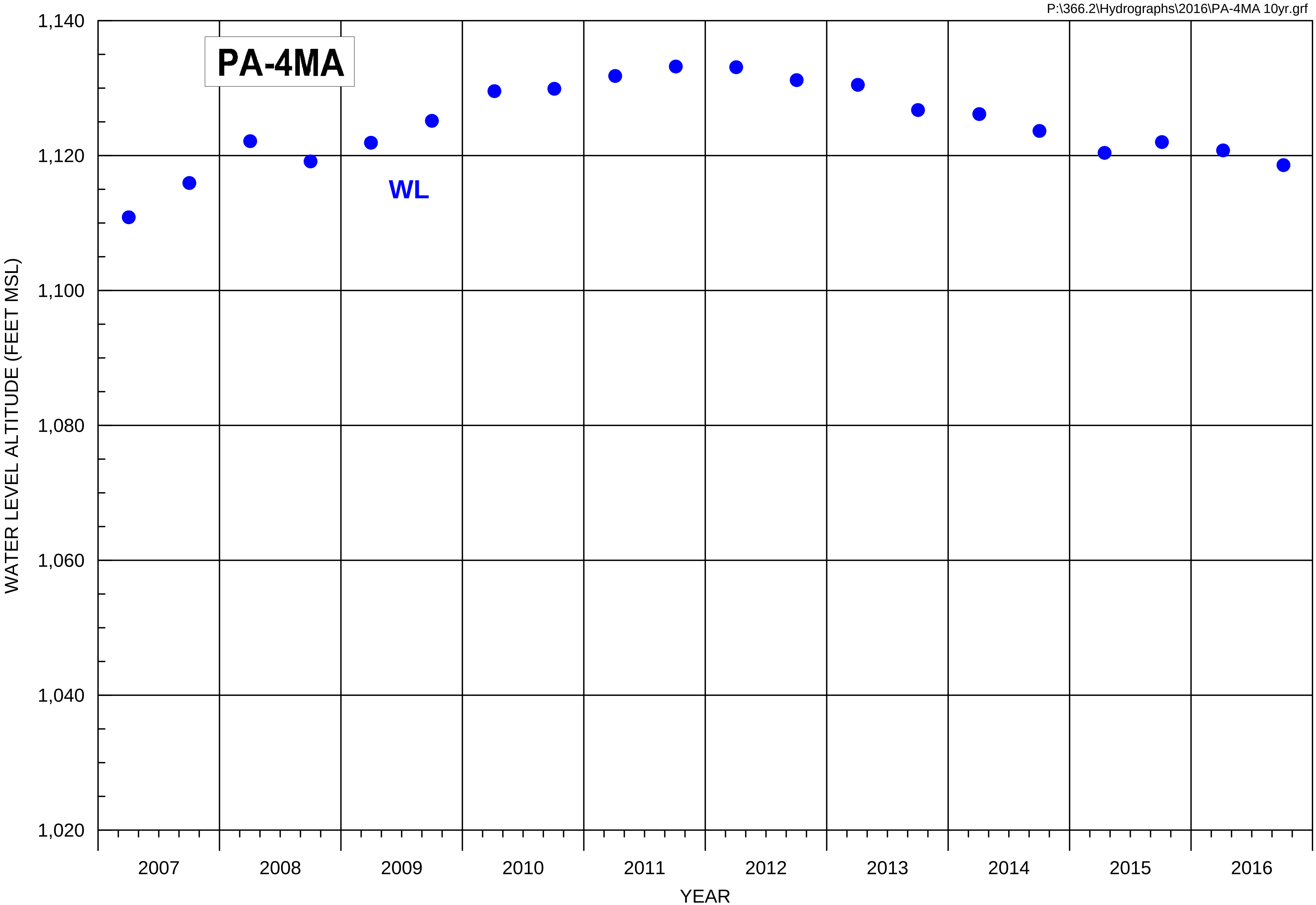
North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,253.44

FIGURE C-57. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PA-3MA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,230.92

FIGURE C-58. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PA-4MA

North Indian Bend Wash Superfund Site

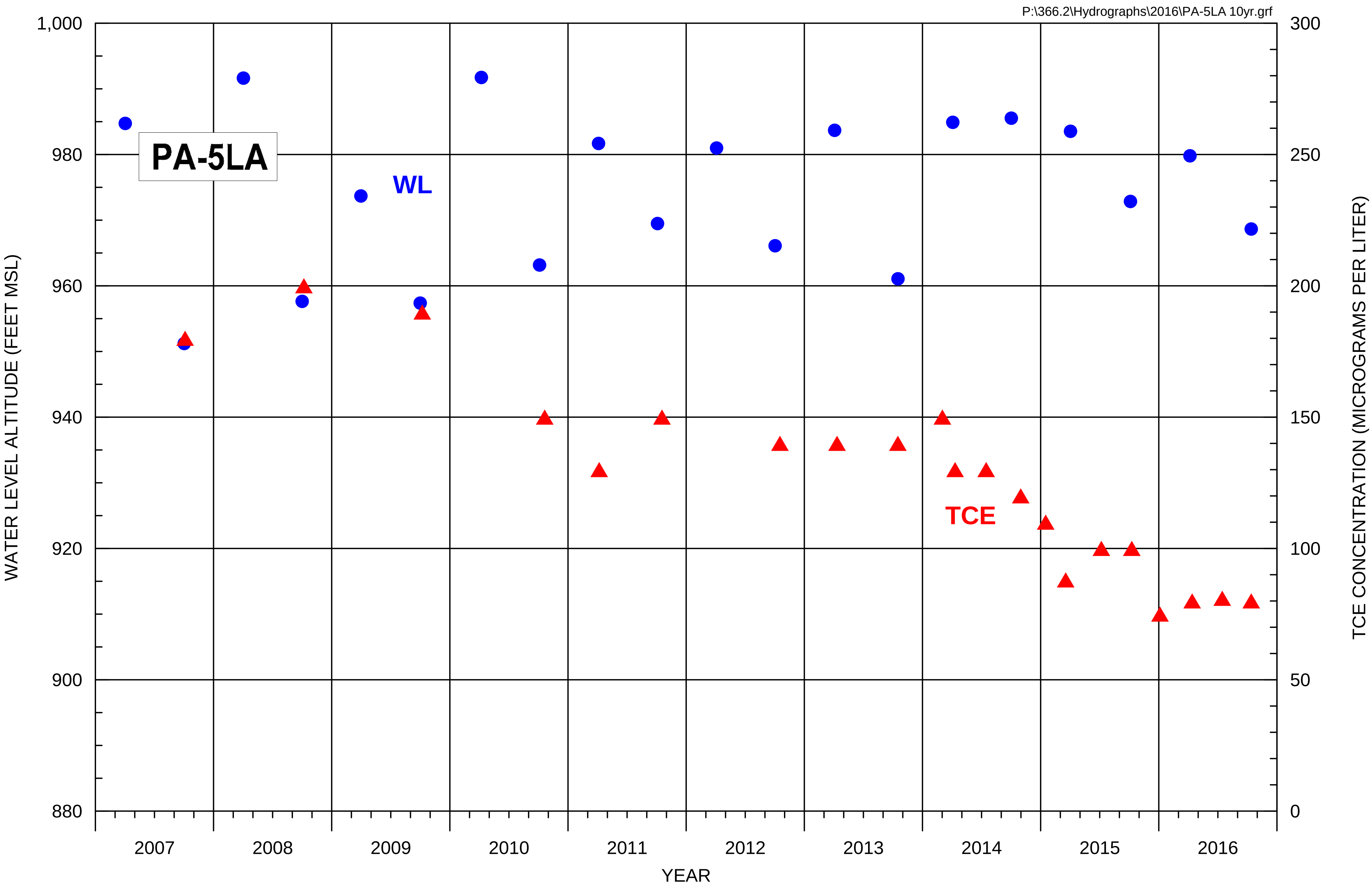


FIGURE C-59. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-5LA

North Indian Bend Wash Superfund Site

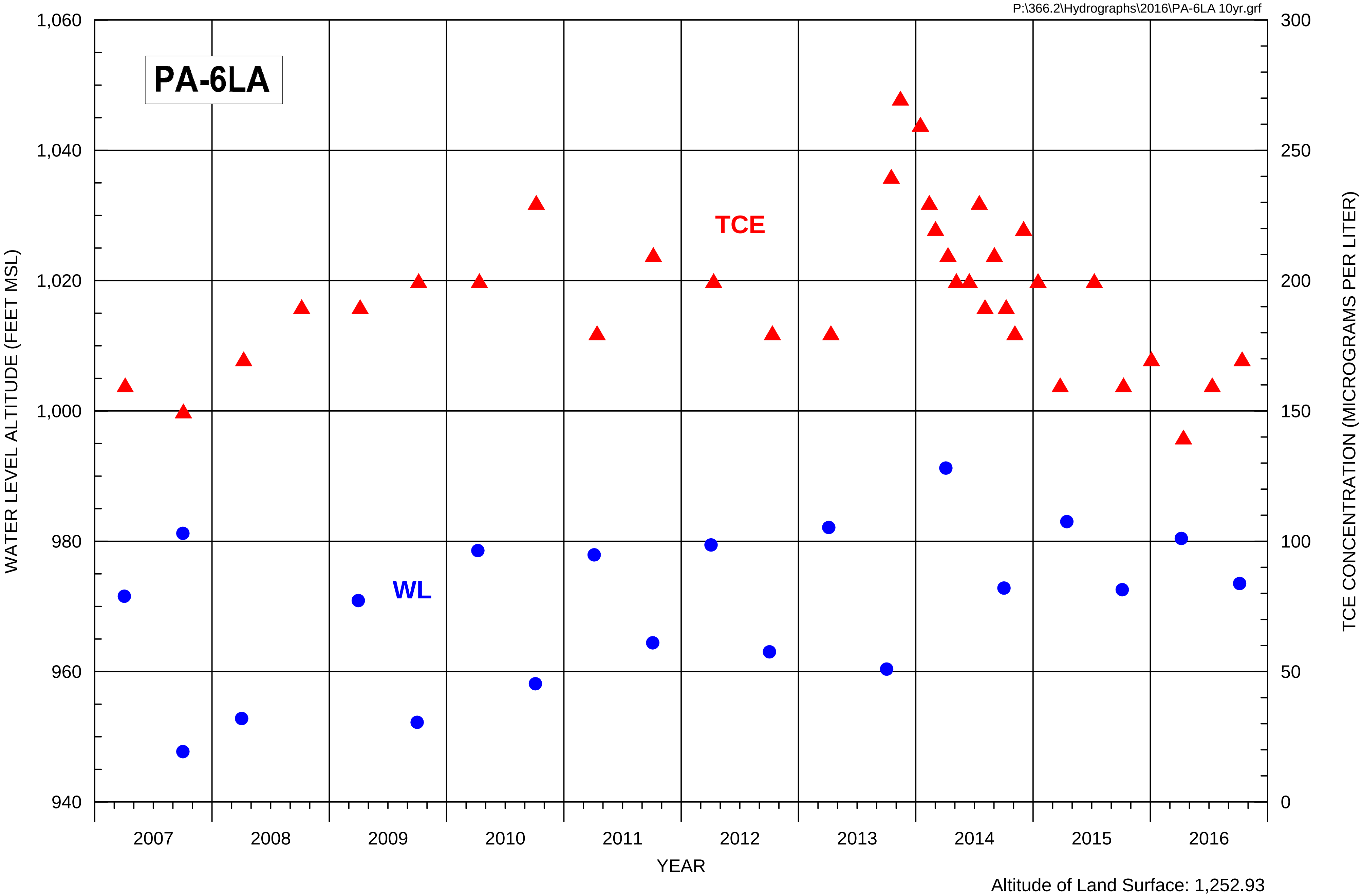


FIGURE C-60. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-6LA

North Indian Bend Wash Superfund Site

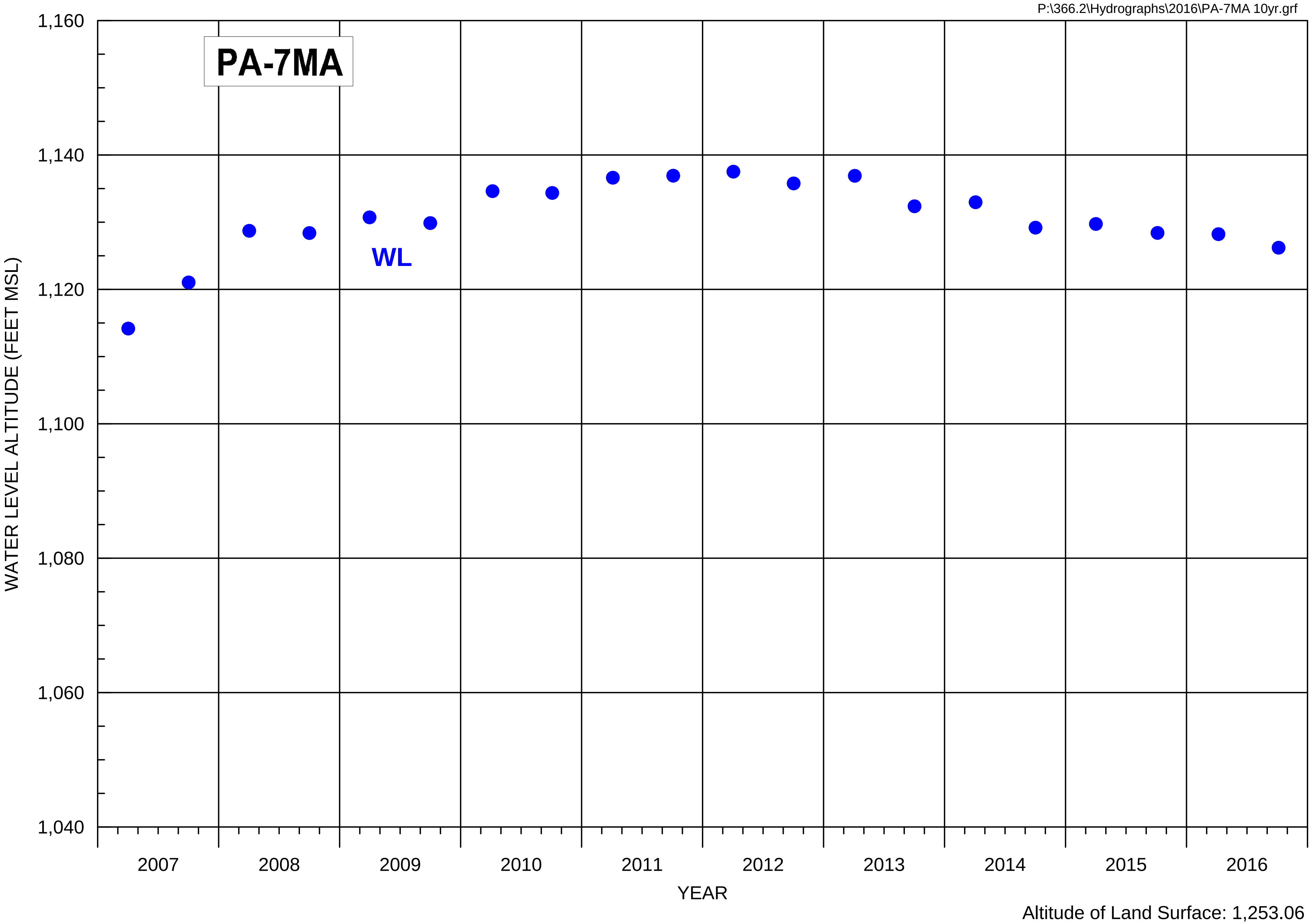
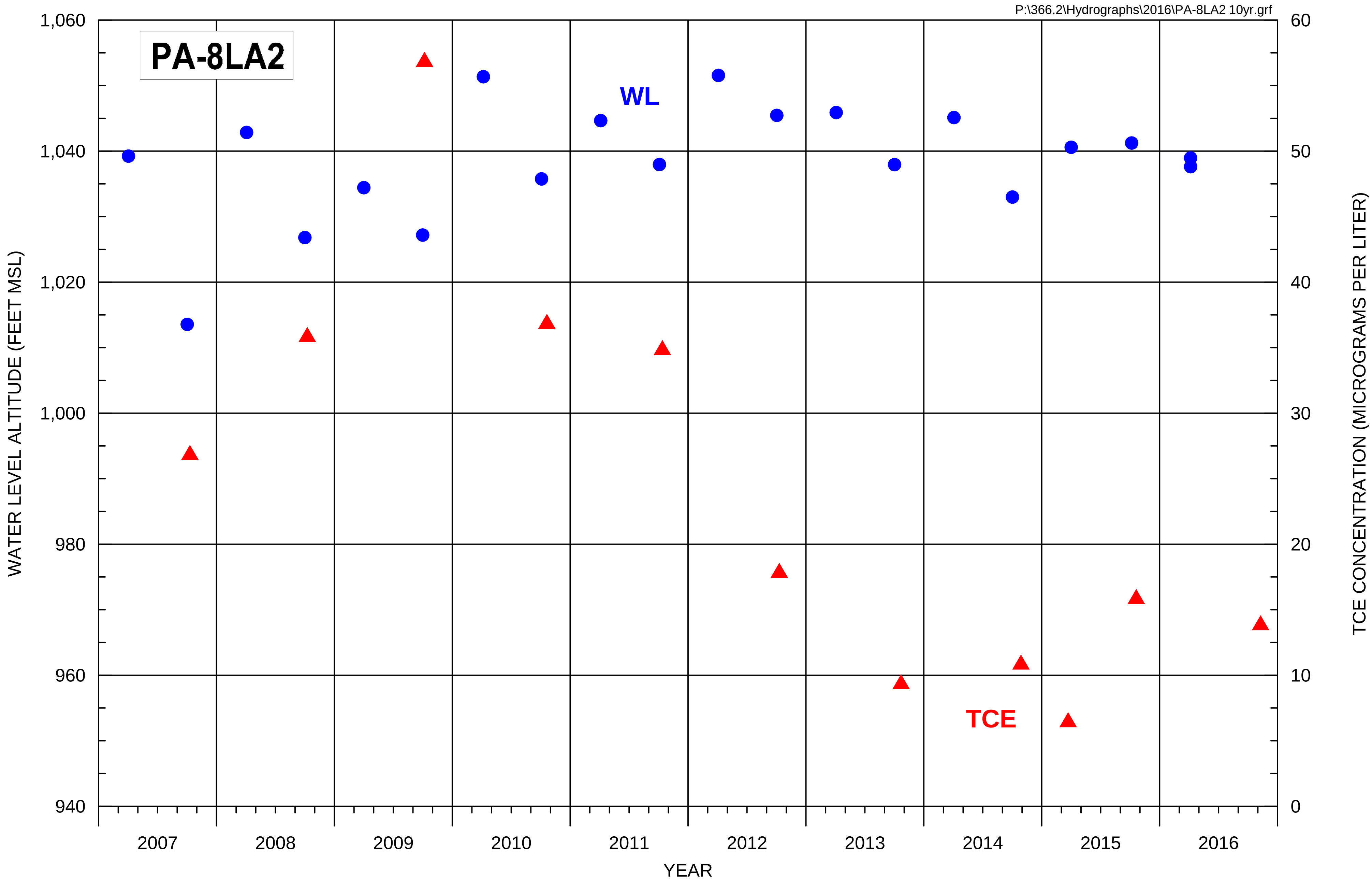


FIGURE C-61. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PA-7MA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,228.33

FIGURE C-62. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-8LA2

North Indian Bend Wash Superfund Site

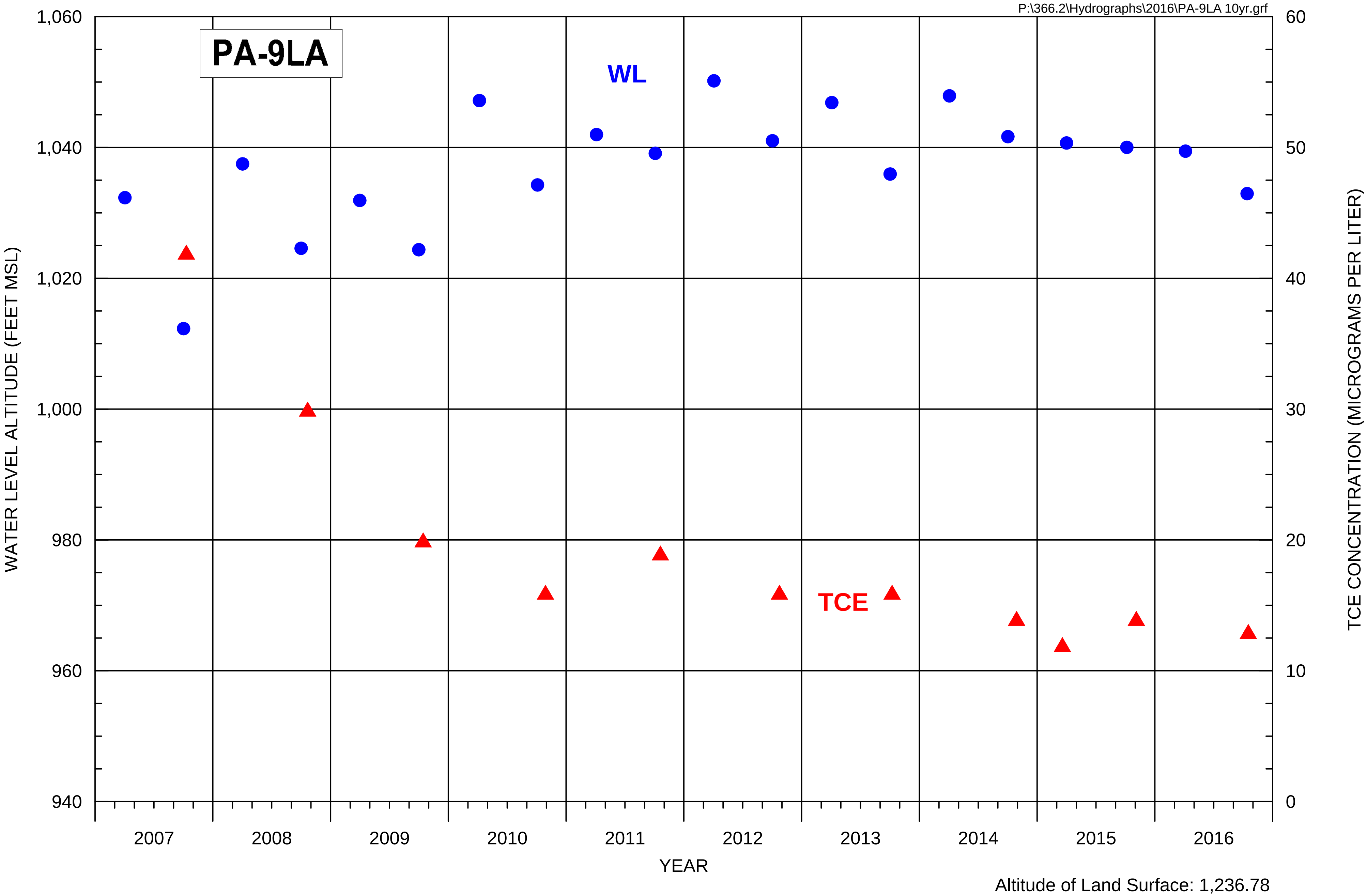


FIGURE C-63. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-9LA

North Indian Bend Wash Superfund Site

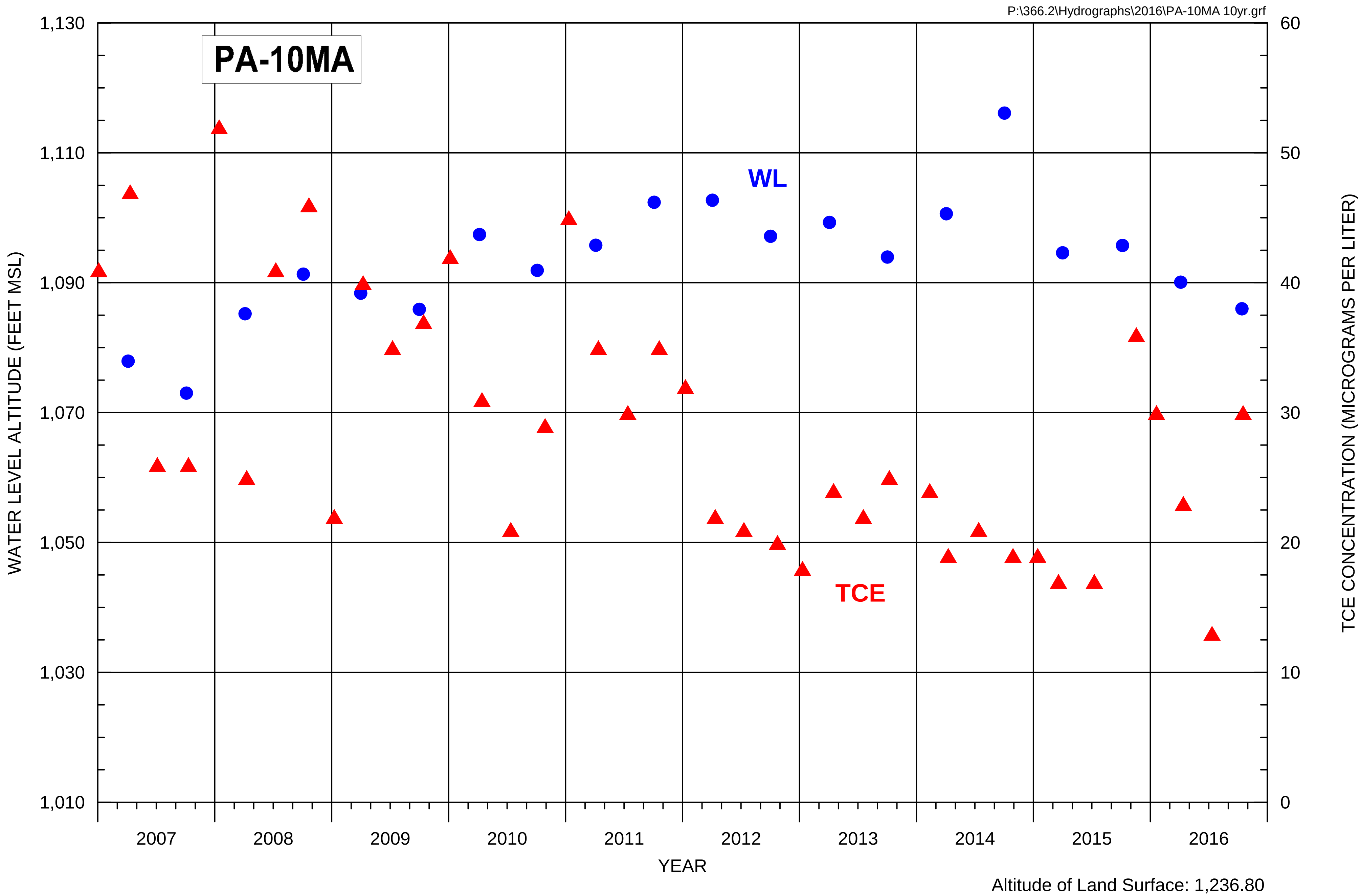
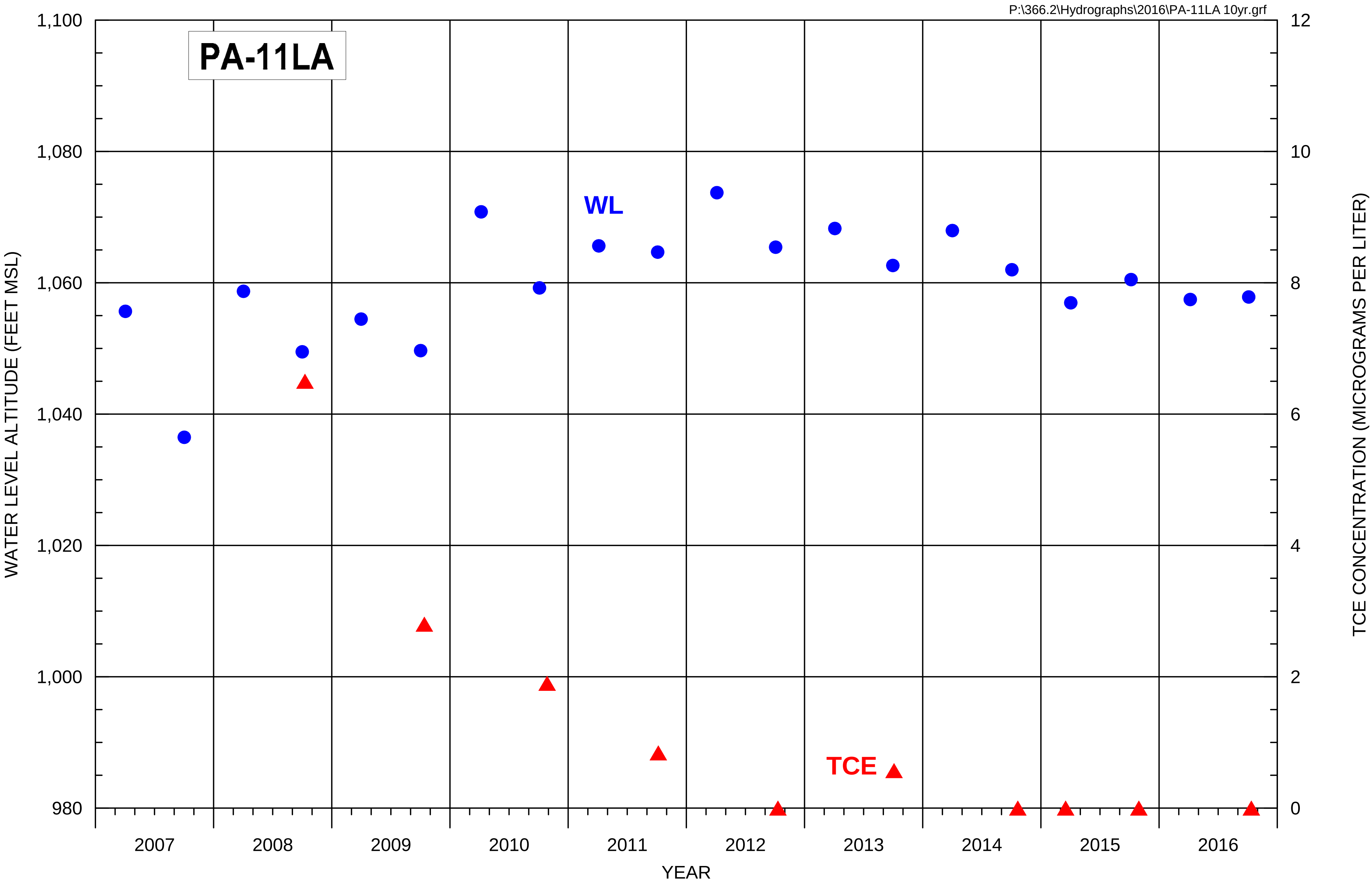


FIGURE C-64. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-10MA

North Indian Bend Wash Superfund Site

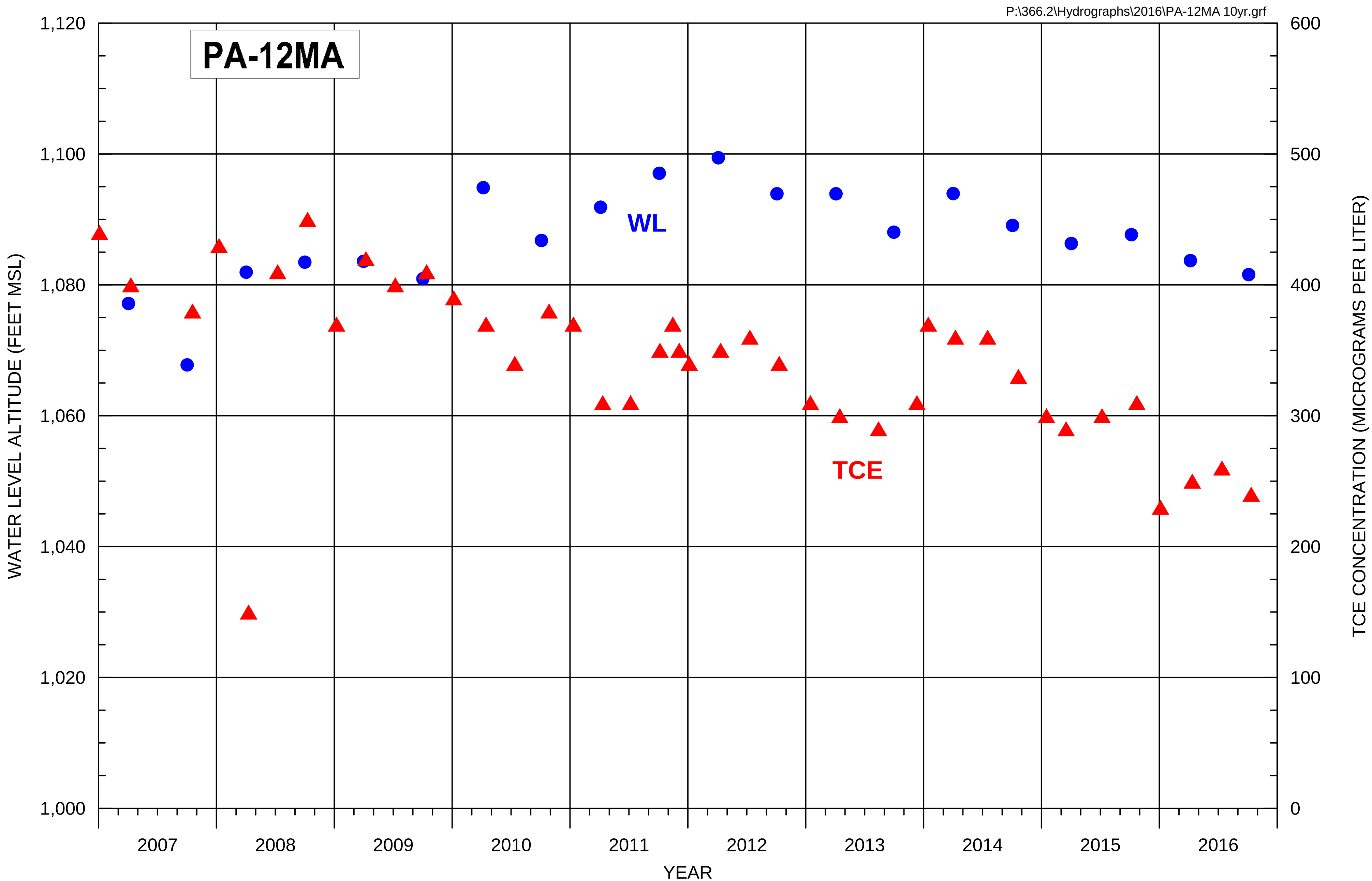


Altitude of Land Surface: 1,224.96

FIGURE C-65. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-11LA

Note: Water level collected from LAU completed well at piezometer PA-11/12 located approximately 80 feet northwest of original well PA-11LA. Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,224.96

FIGURE C-66. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-12MA

Note: Water level collected from MAU completed well at piezometer PA-11/12 located approximately 70 feet northwest of original well PA-12MA.

North Indian Bend Wash Superfund Site

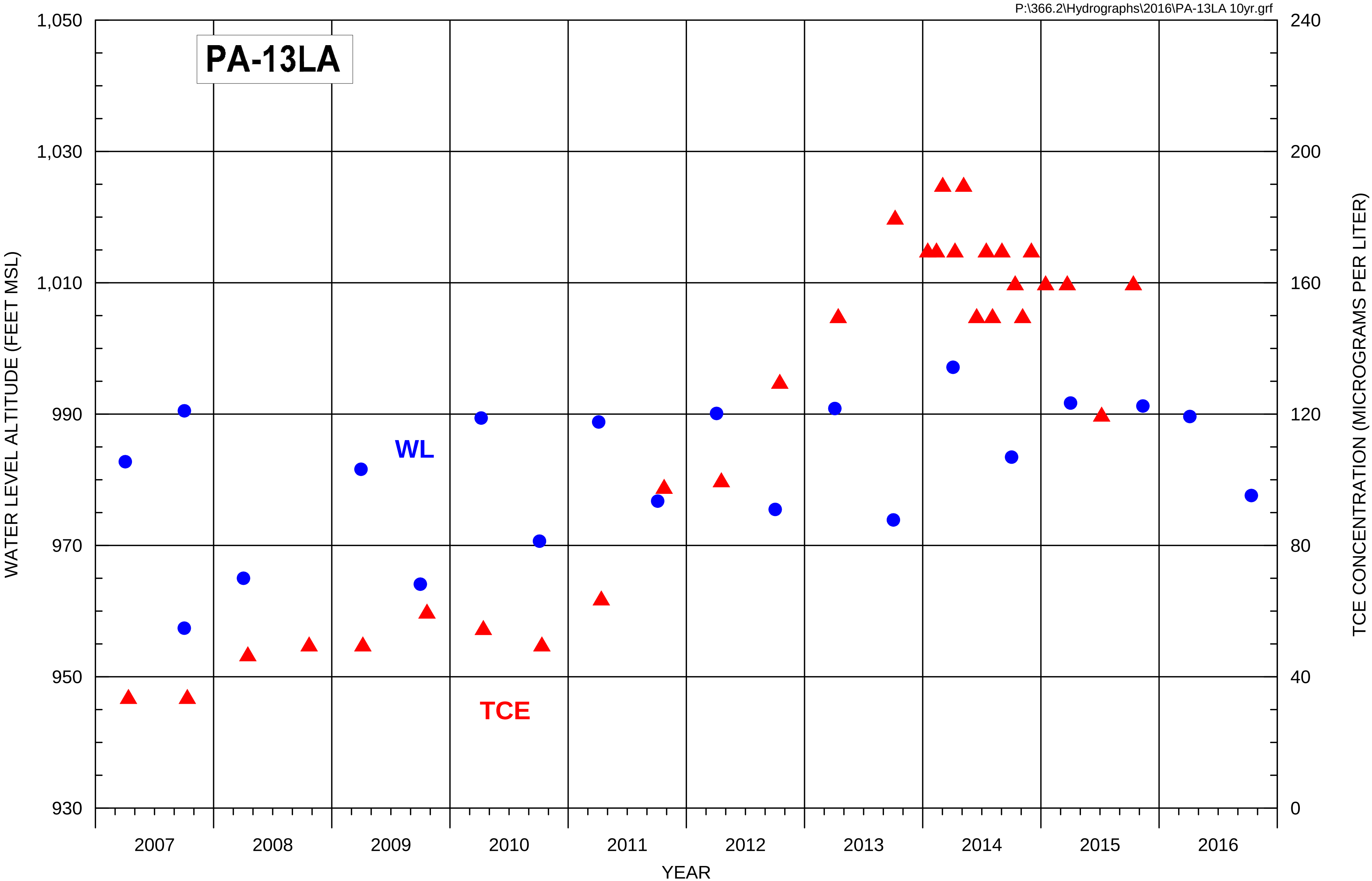
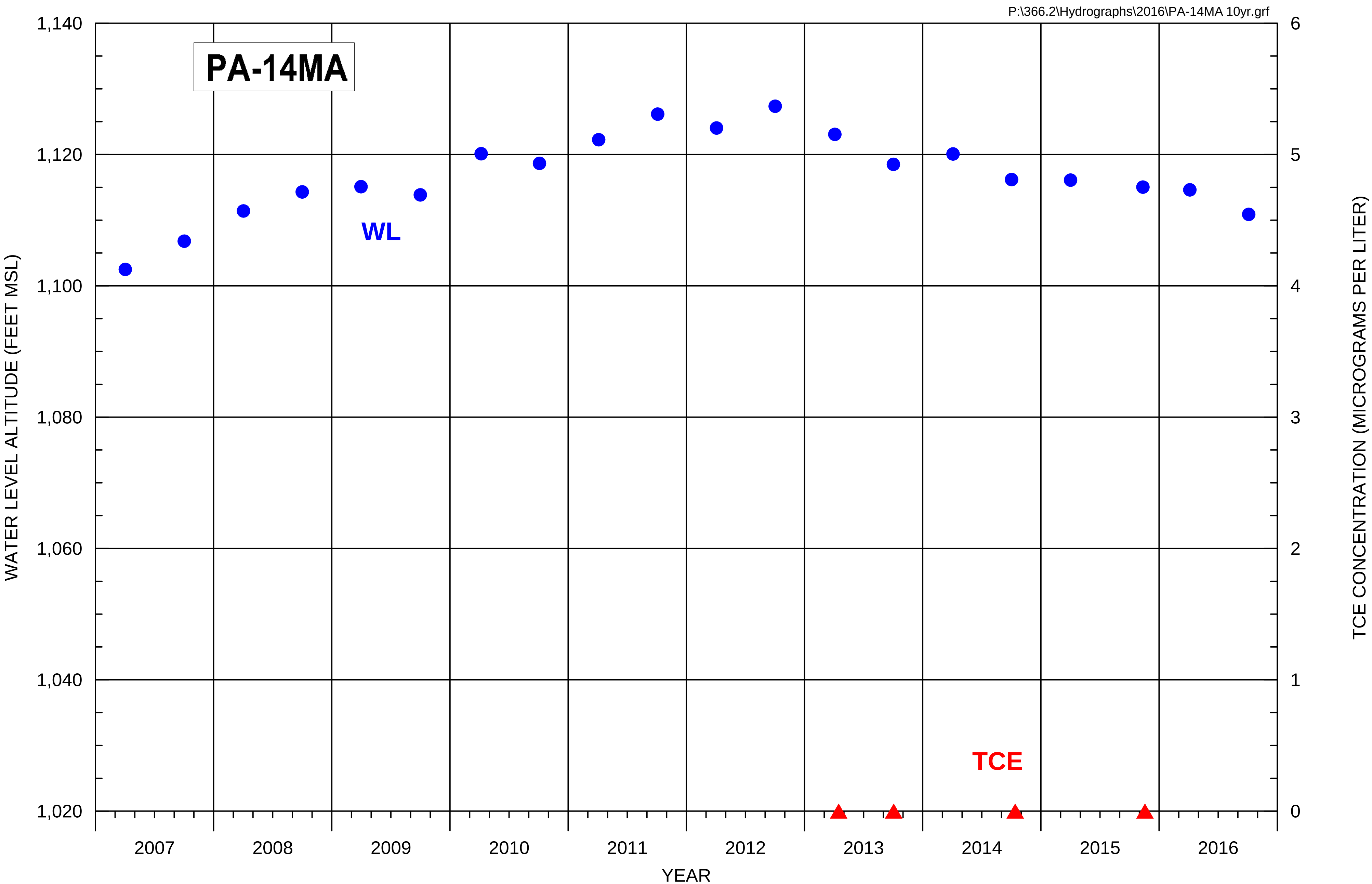


FIGURE C-67. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-13LA

North Indian Bend Wash Superfund Site

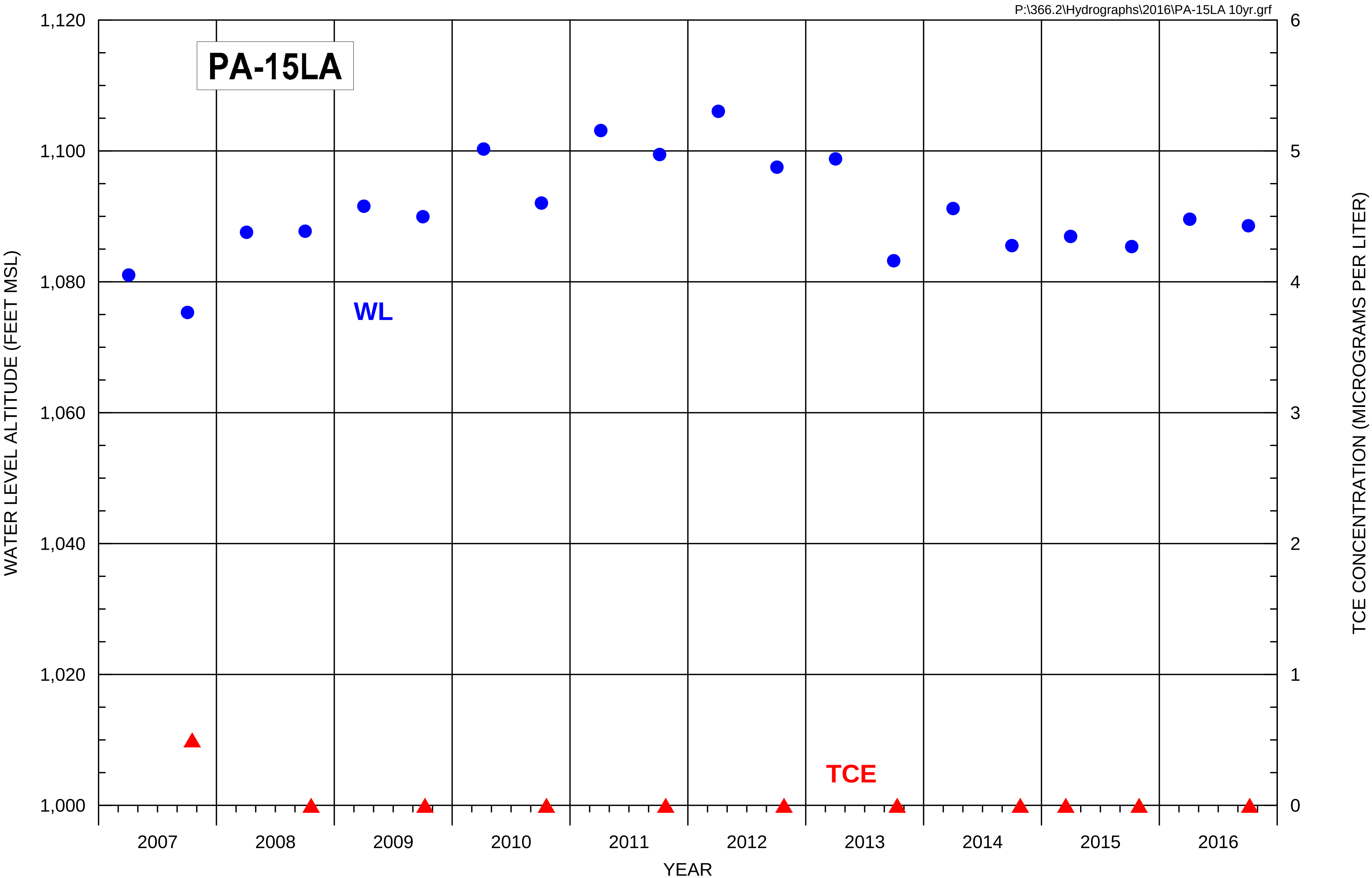


Altitude of Land Surface: 1,249.09

FIGURE C-68. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-14MA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,204.28

FIGURE C-69. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-15LA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site

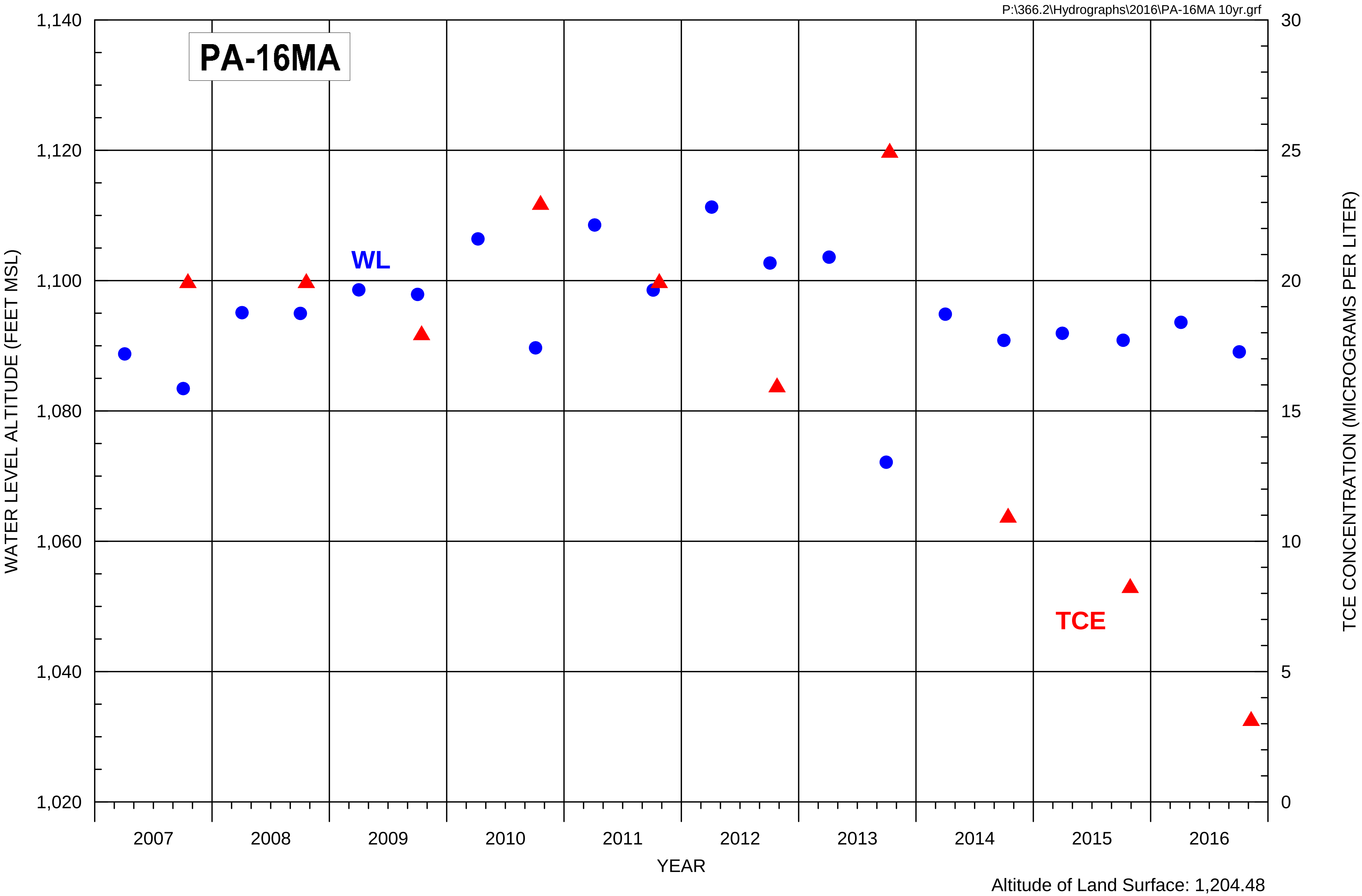


FIGURE C-70. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-16MA

North Indian Bend Wash Superfund Site

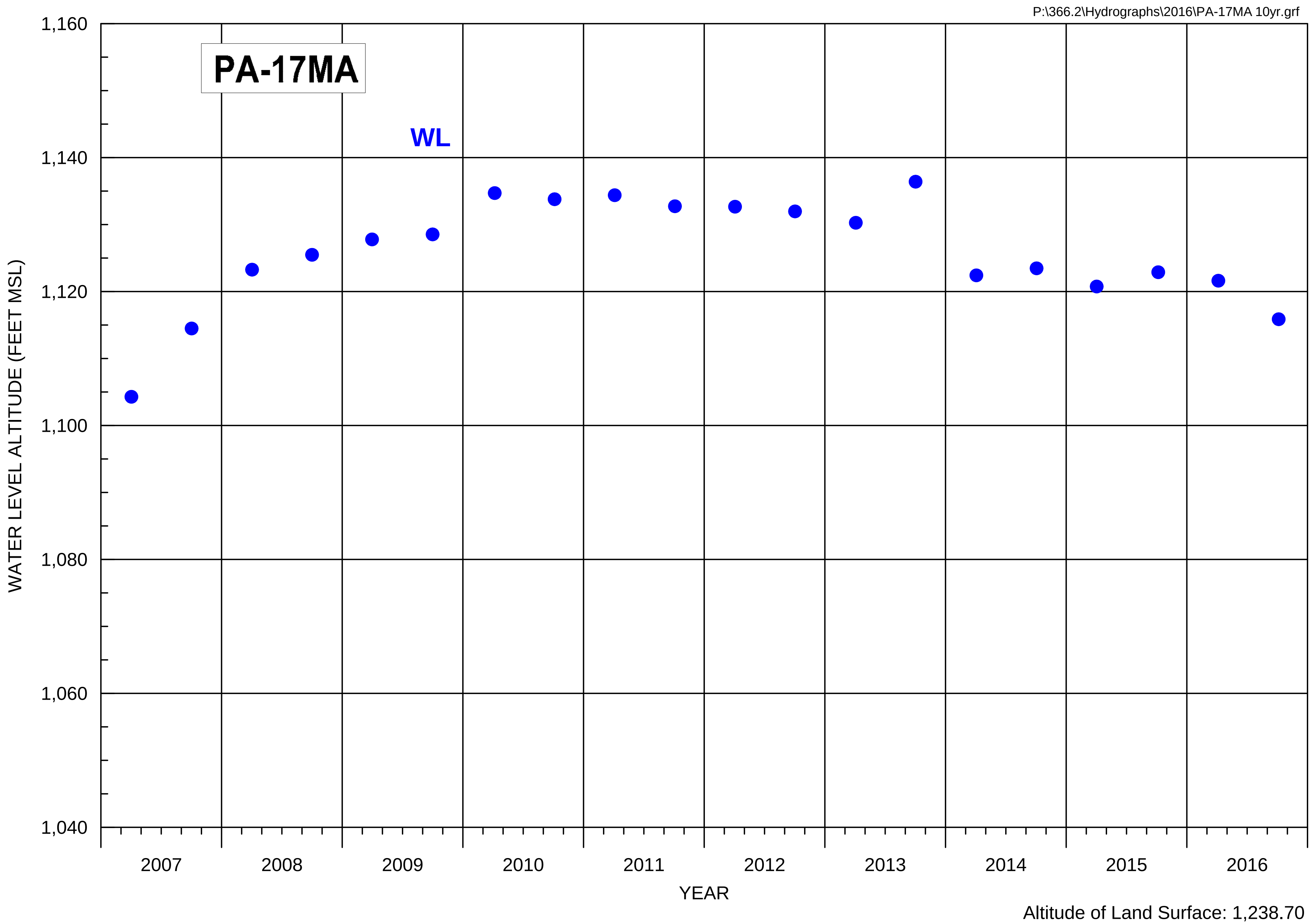


FIGURE C-71. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PA-17MA

North Indian Bend Wash Superfund Site

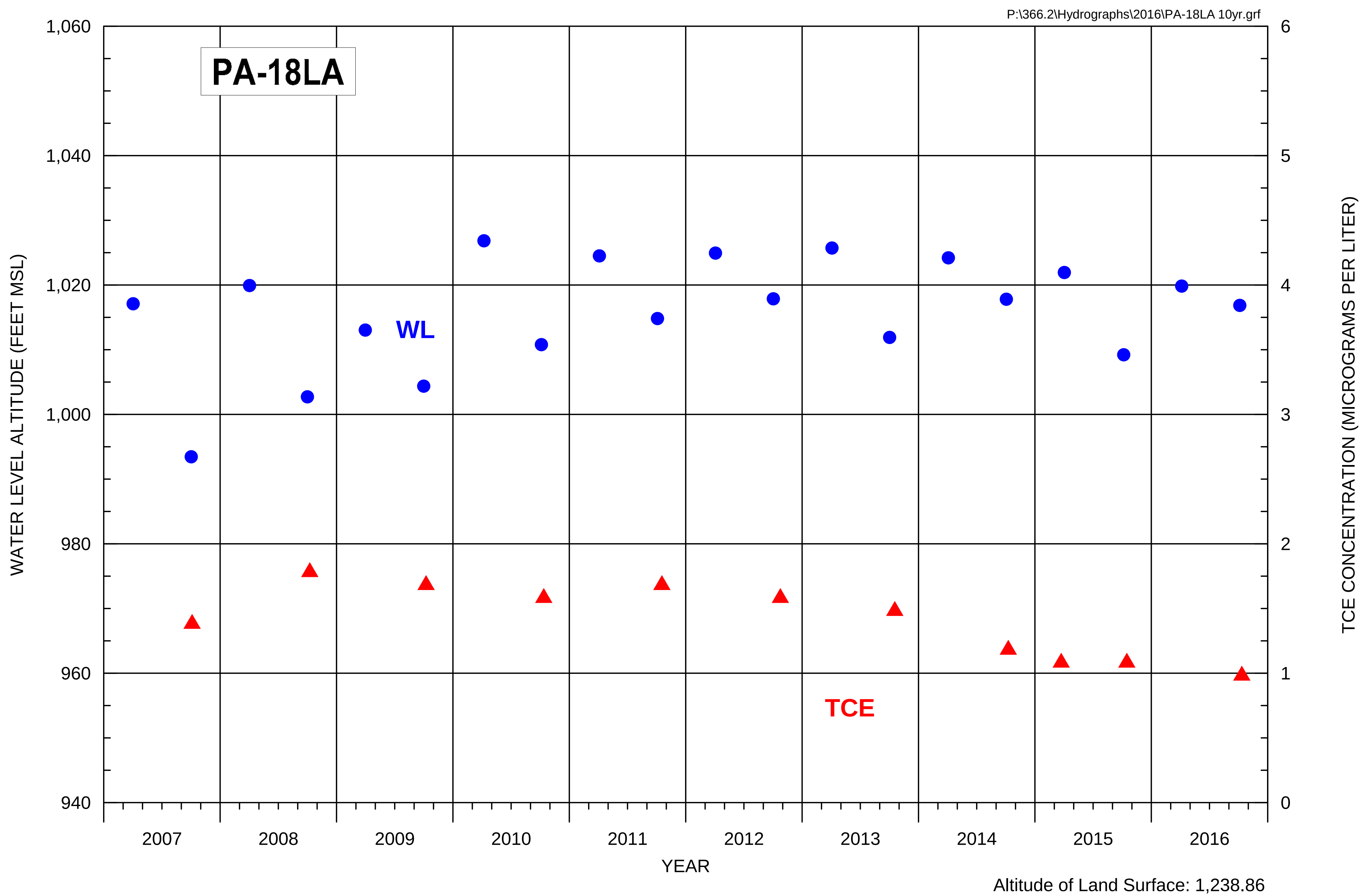
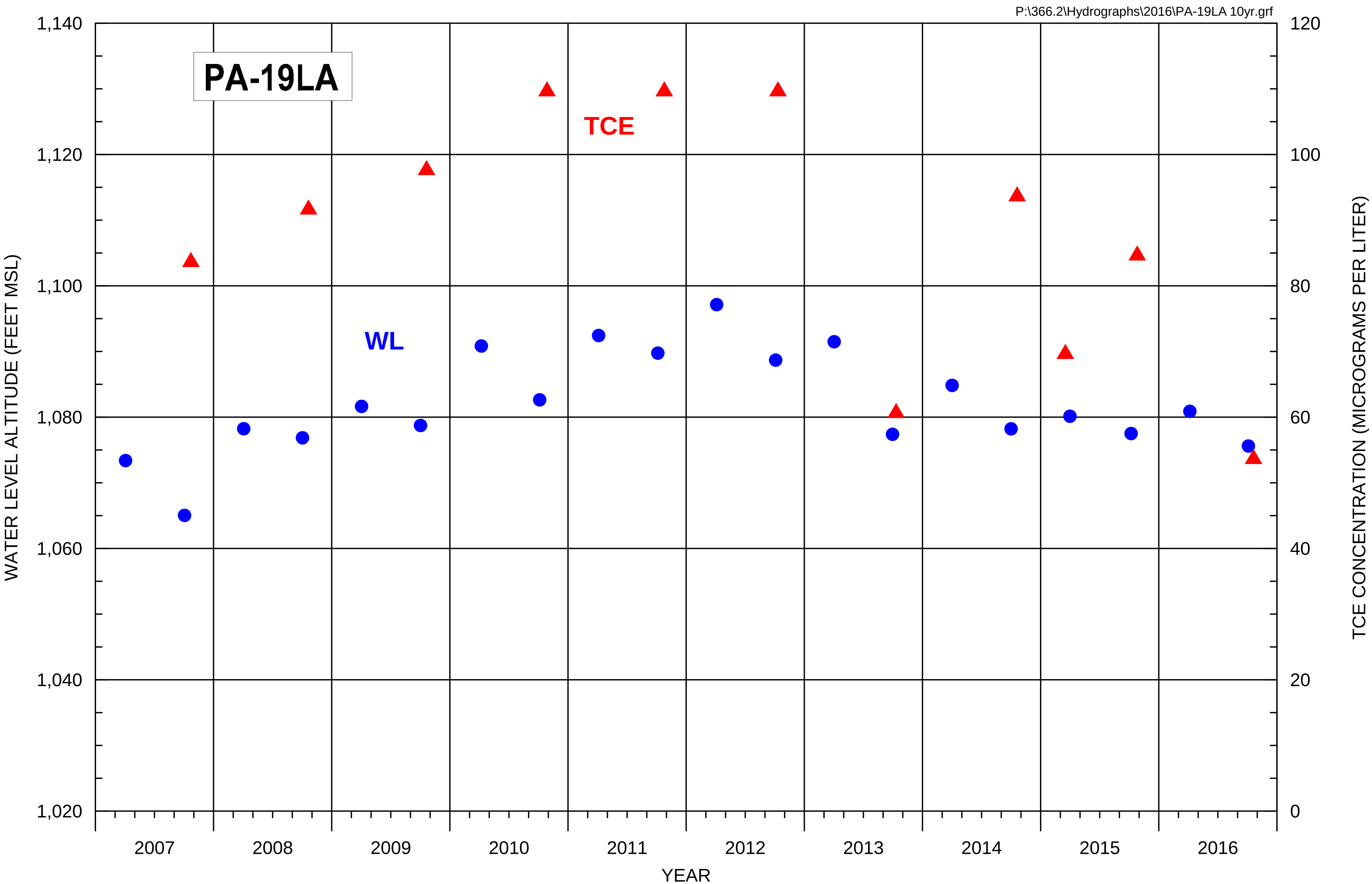


FIGURE C-72. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-18LA

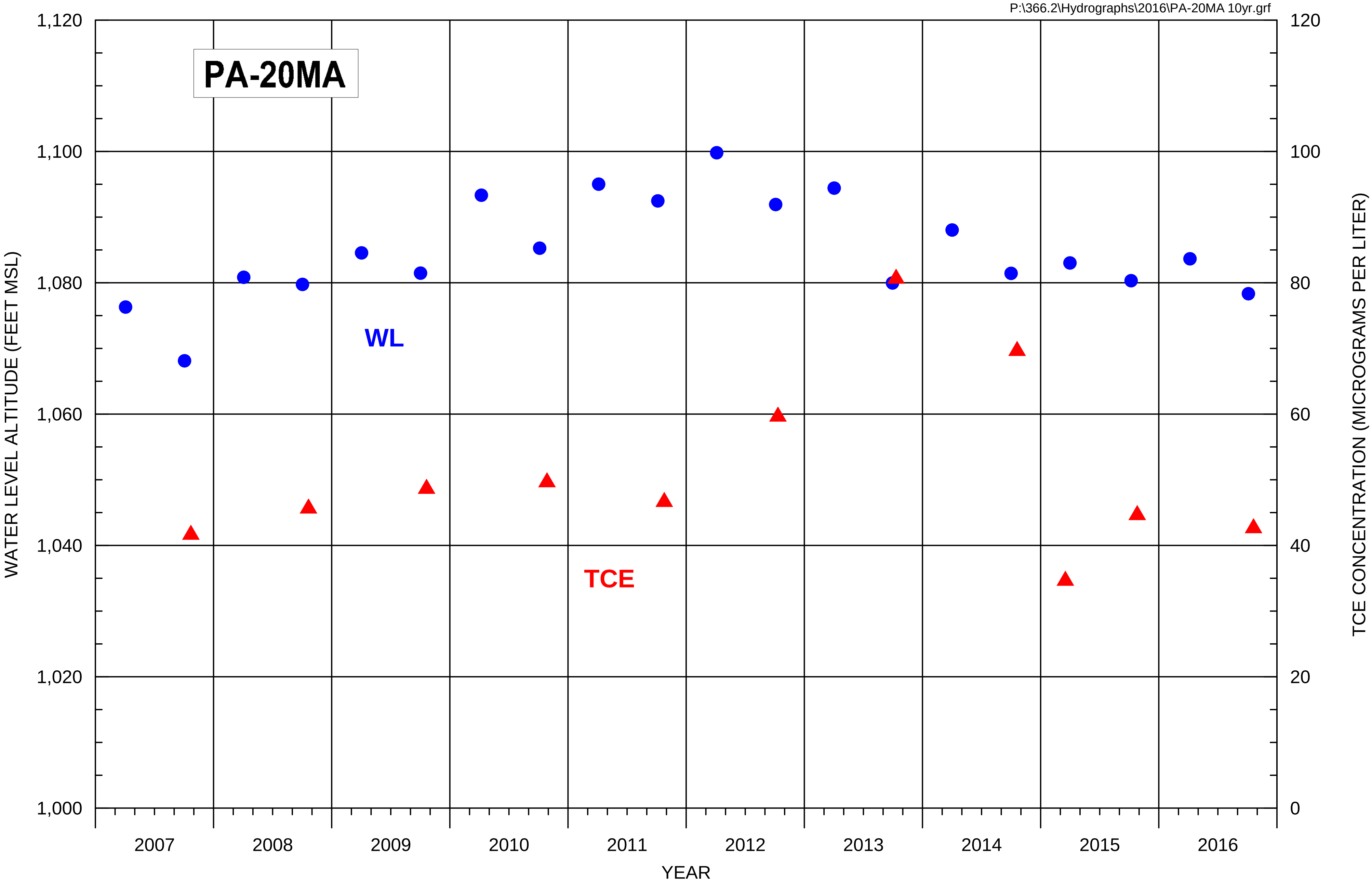
North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,221.46

FIGURE C-73. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-19LA

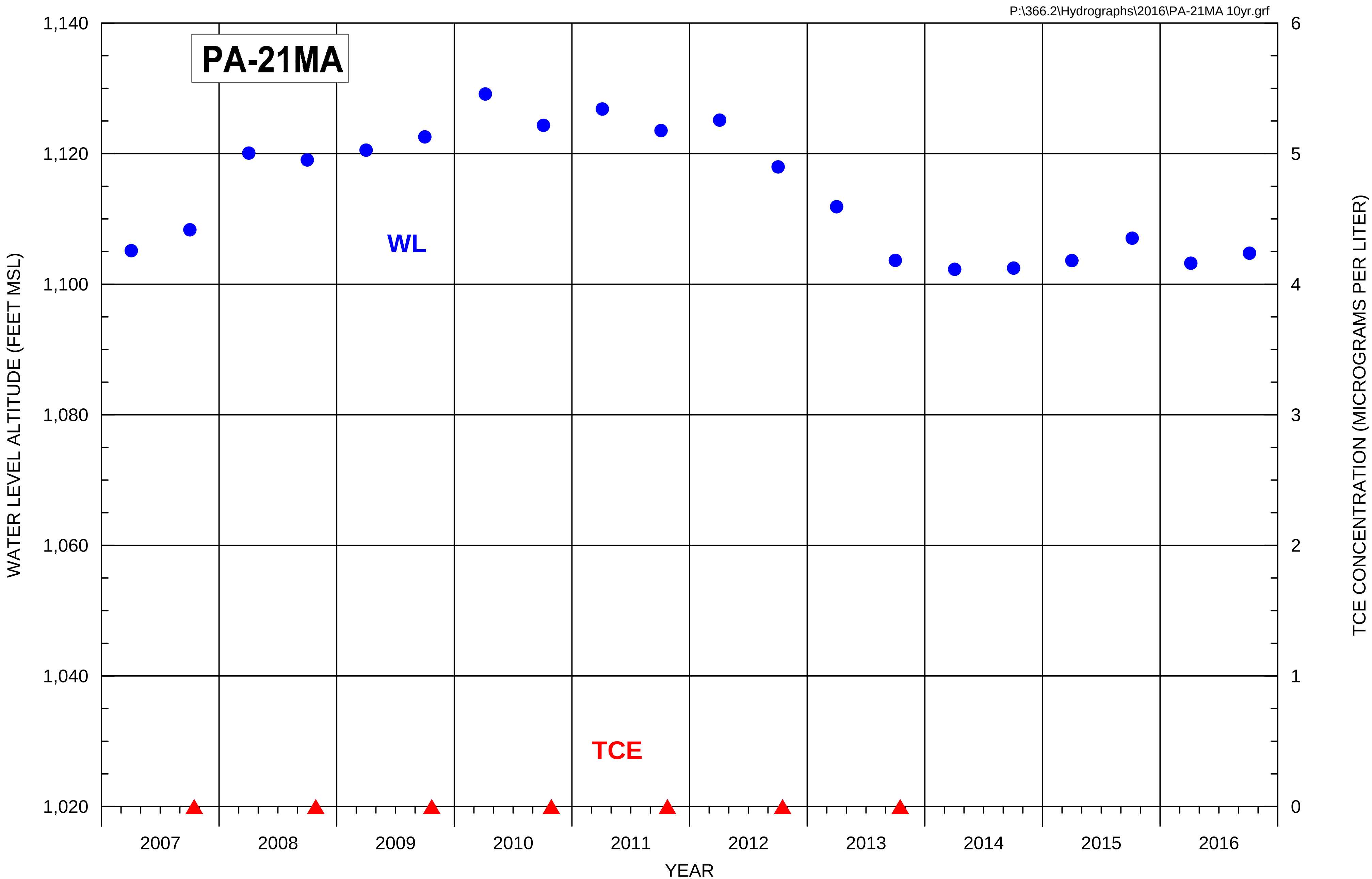
North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,221.28

FIGURE C-74. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-20MA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,225.19

FIGURE C-75. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-21MA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site

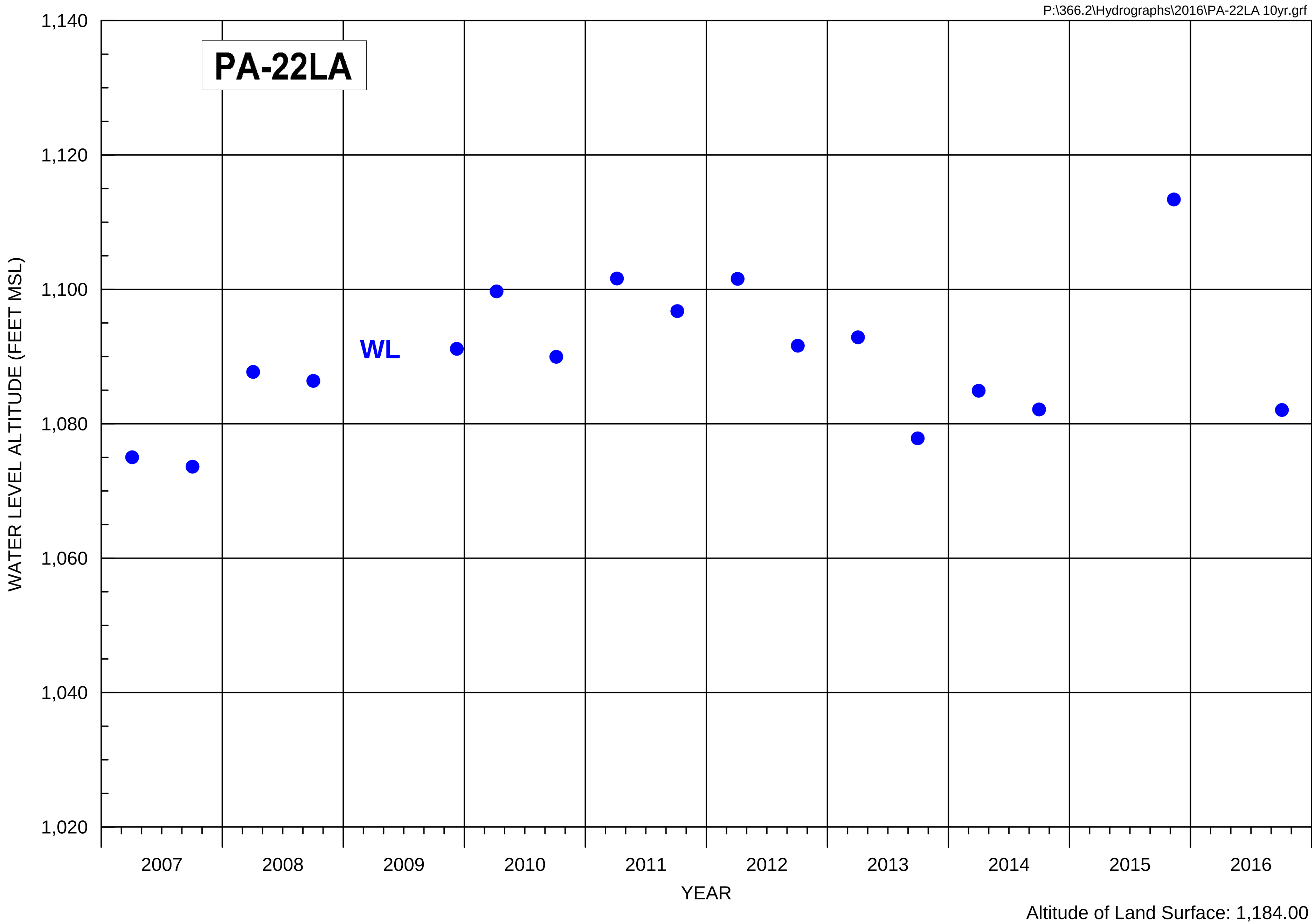


FIGURE C-76. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PA-22LA

North Indian Bend Wash Superfund Site

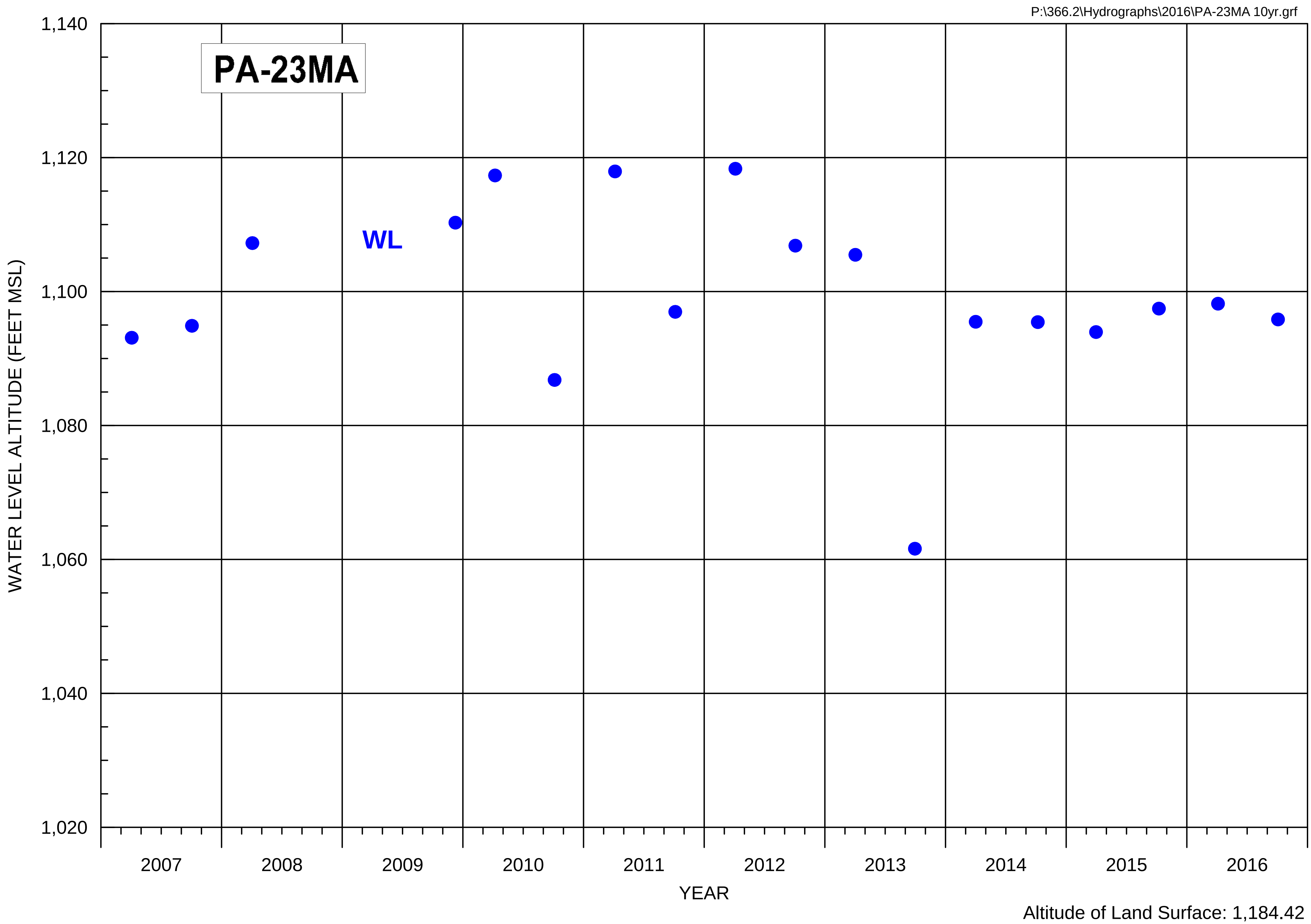
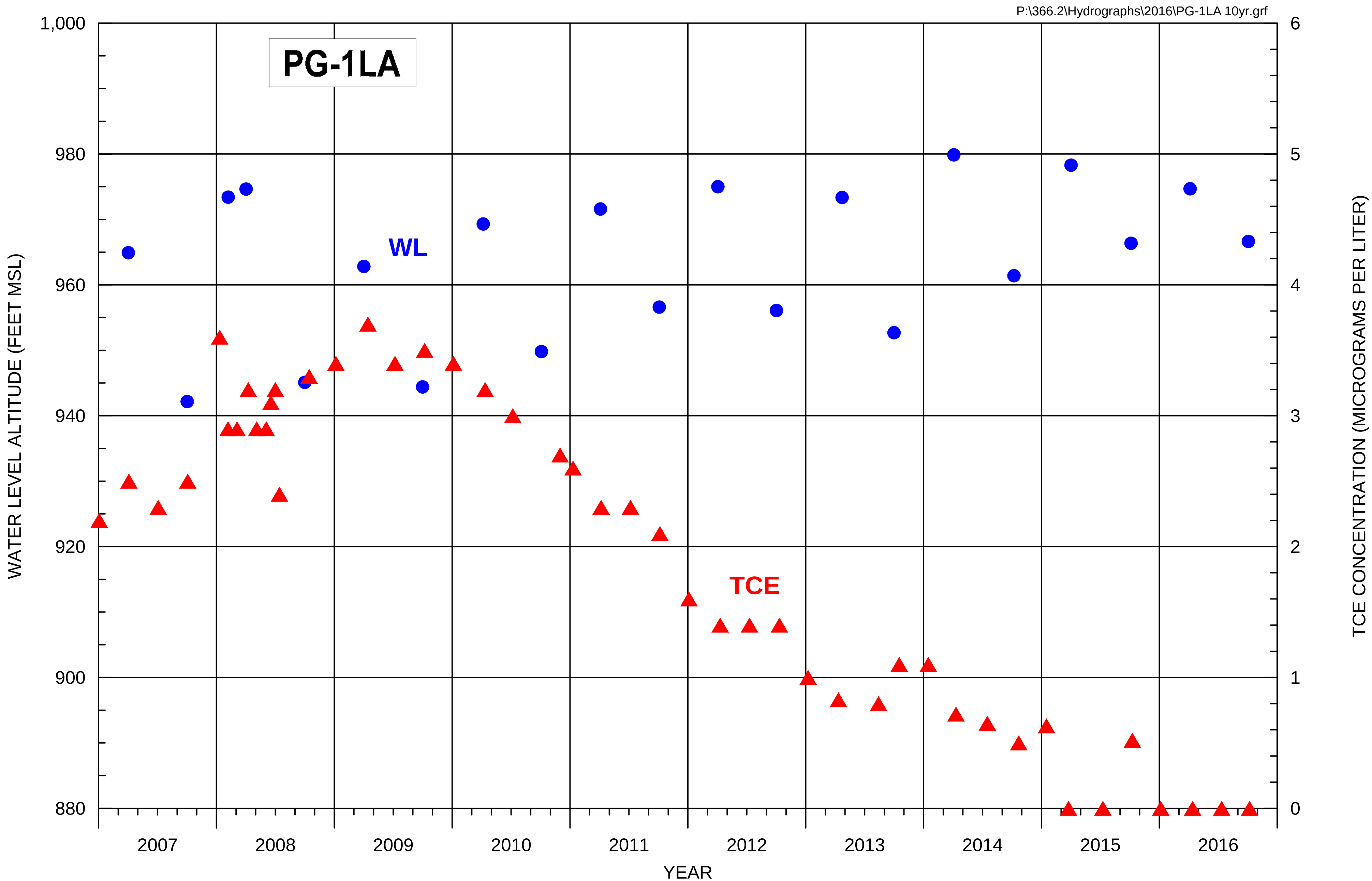


FIGURE C-77. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PA-23MA

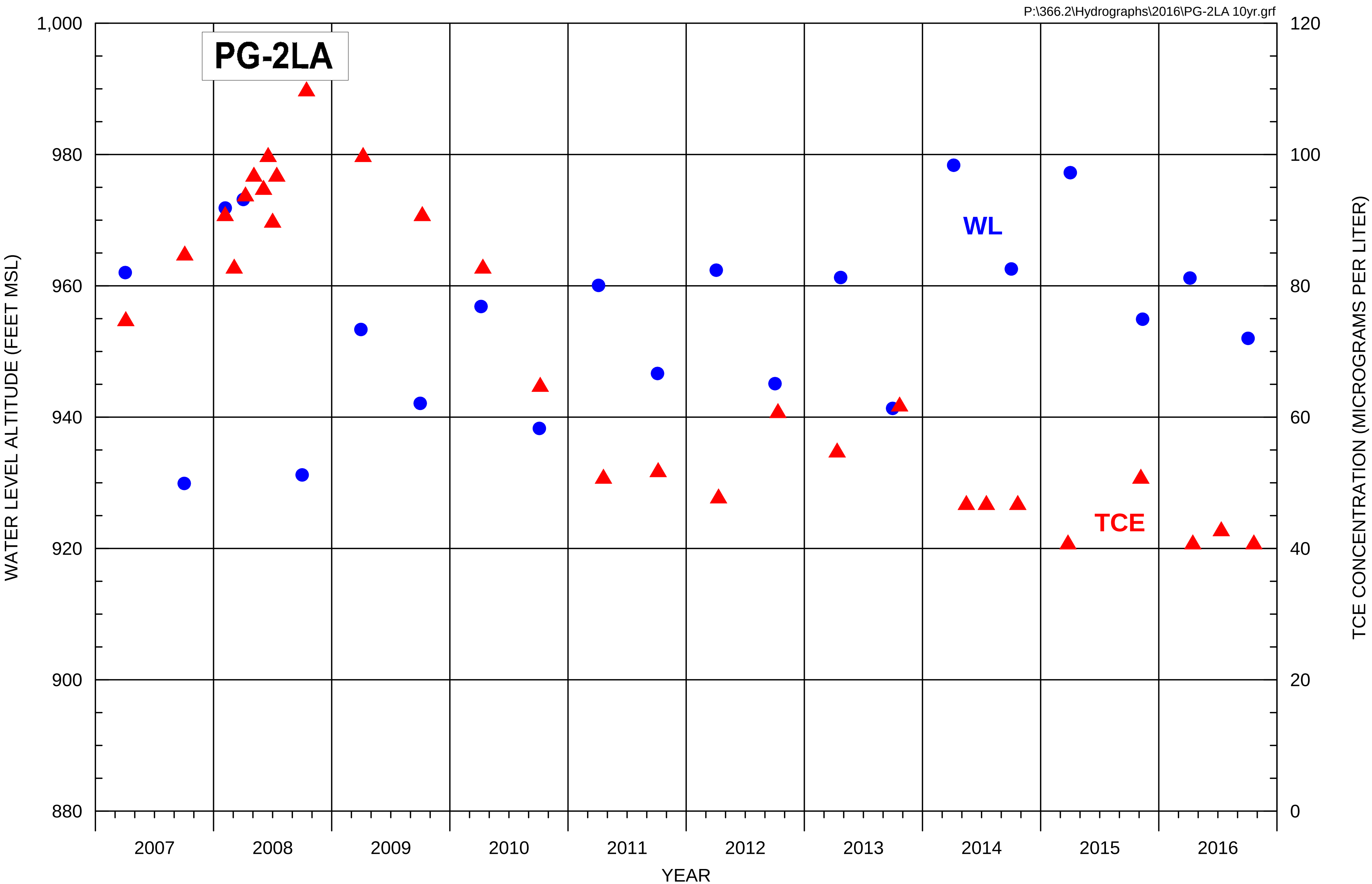


Altitude of Land Surface: 1,249.66

FIGURE C-78. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-1LA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

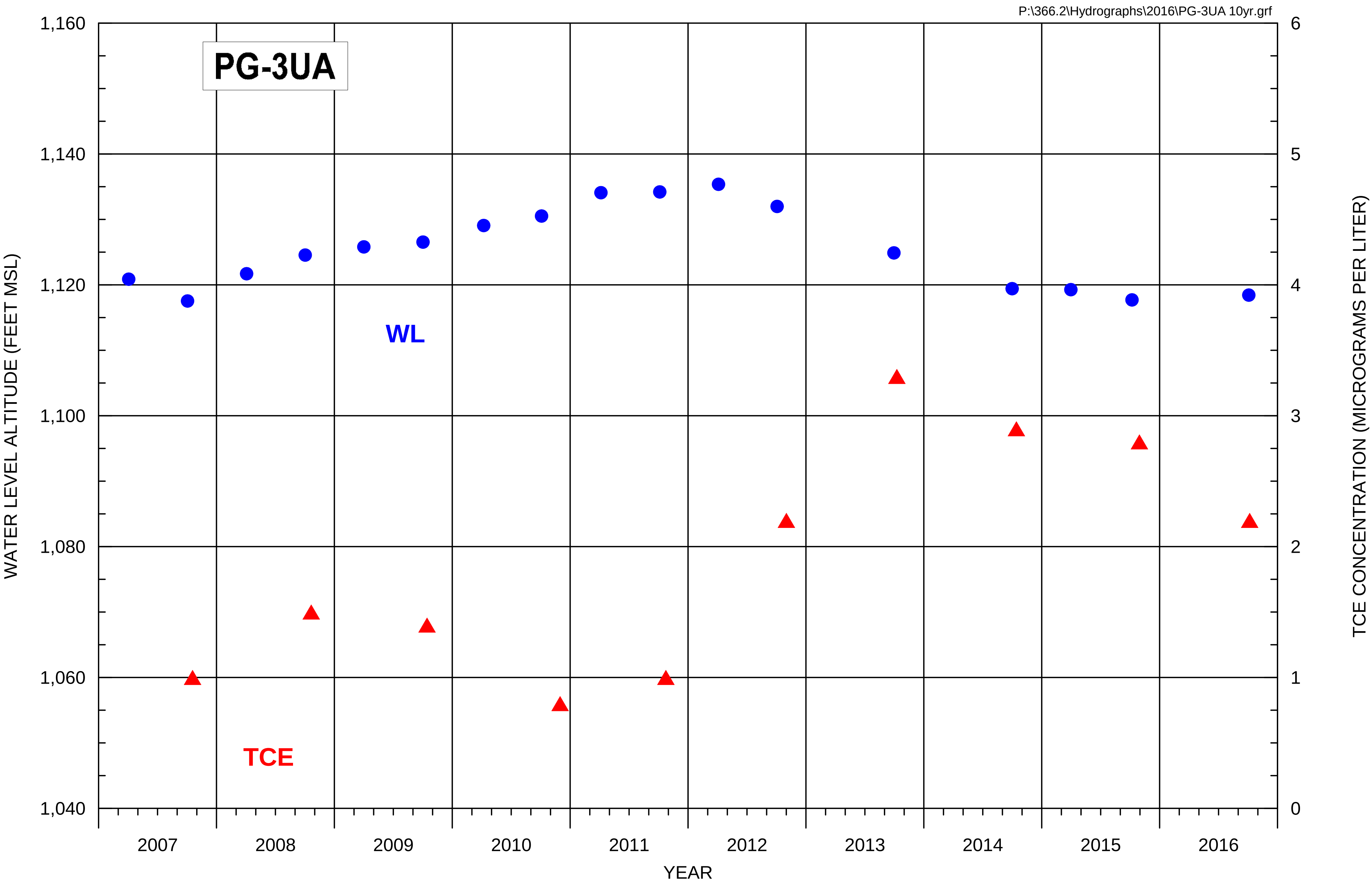
North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,271.06

FIGURE C-79. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-2LA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,204.25

FIGURE C-80. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-3UA

North Indian Bend Wash Superfund Site

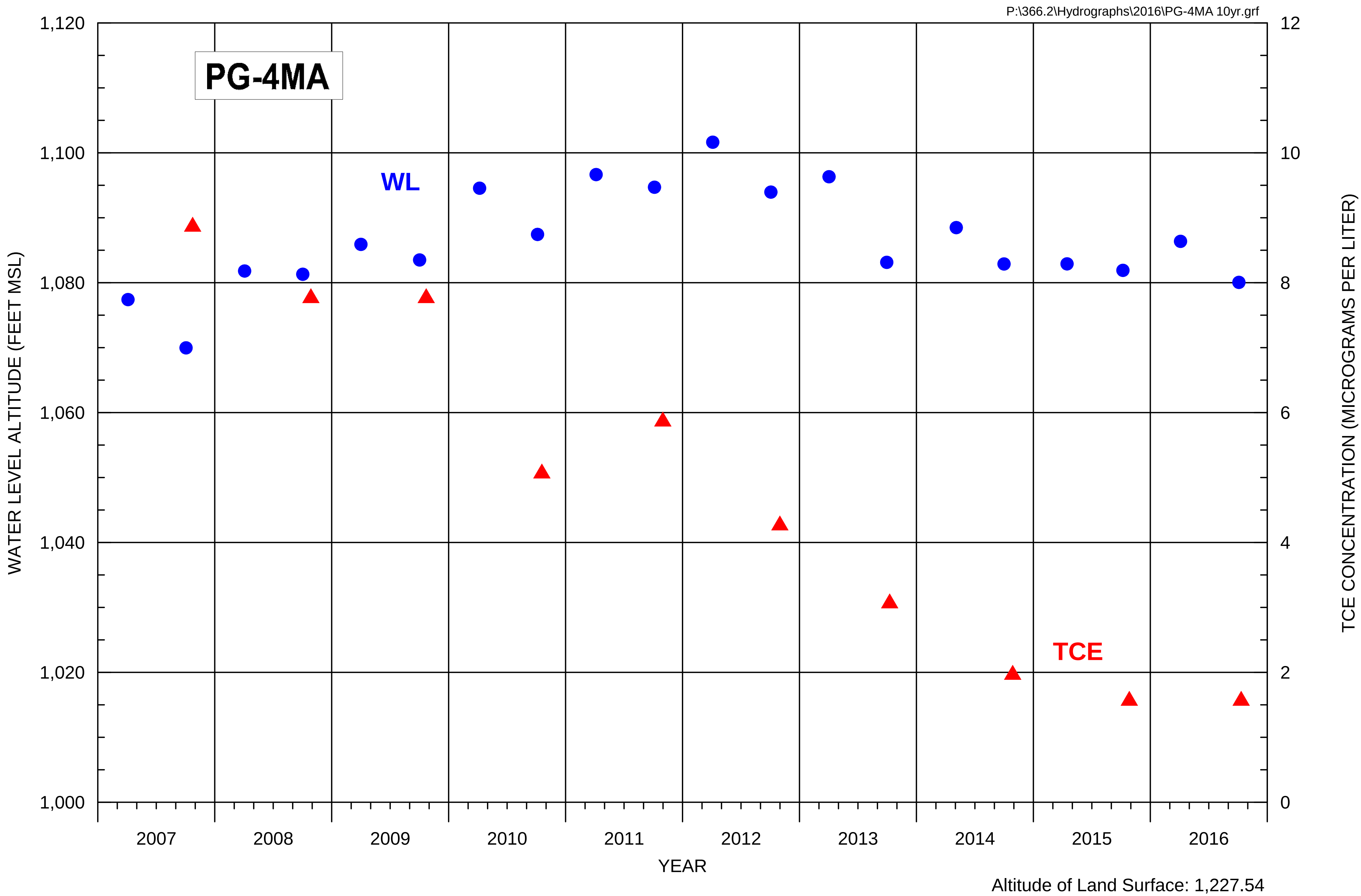
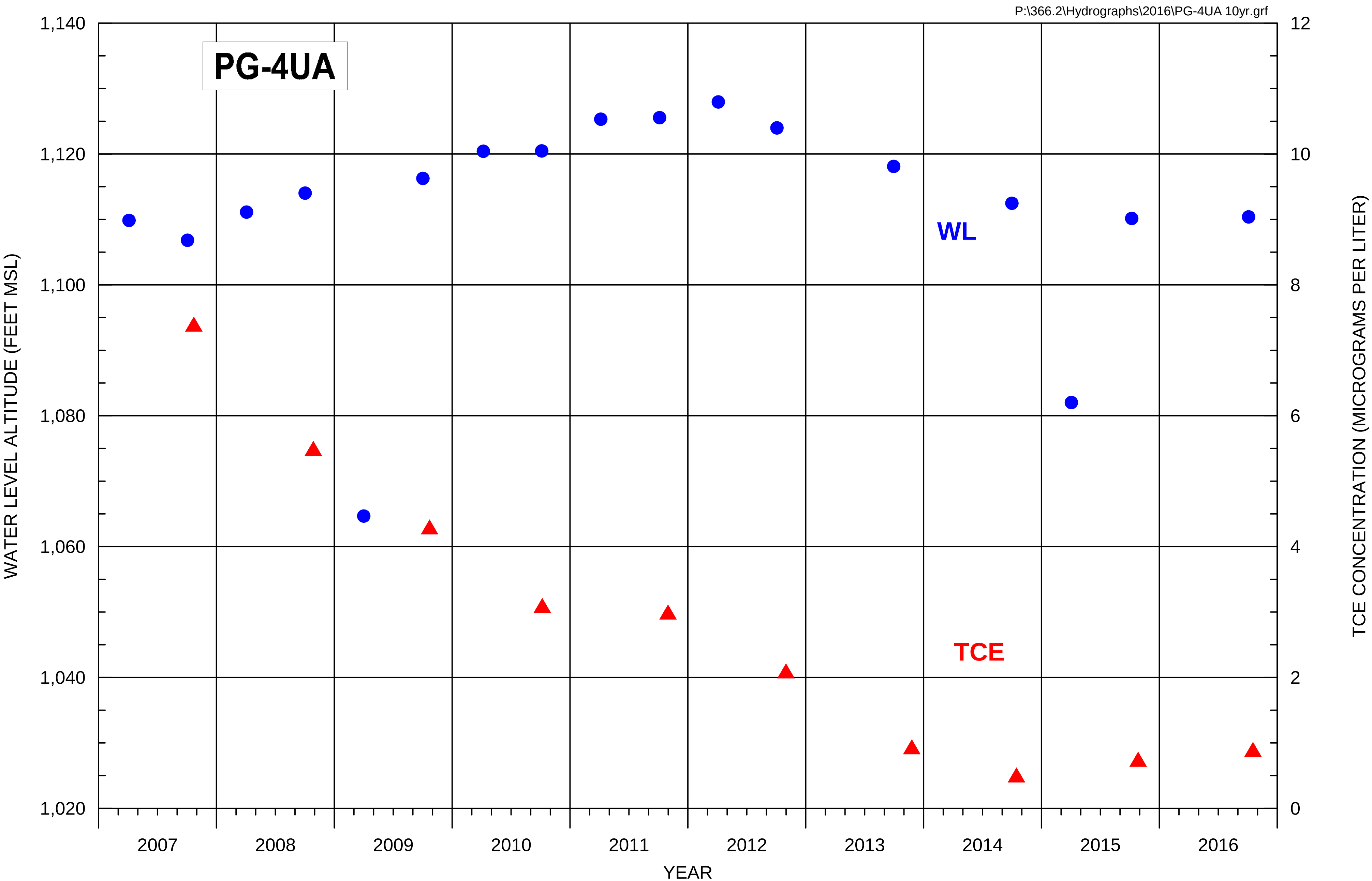


FIGURE C-81. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-4MA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,227.83

FIGURE C-82. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-4UA

North Indian Bend Wash Superfund Site

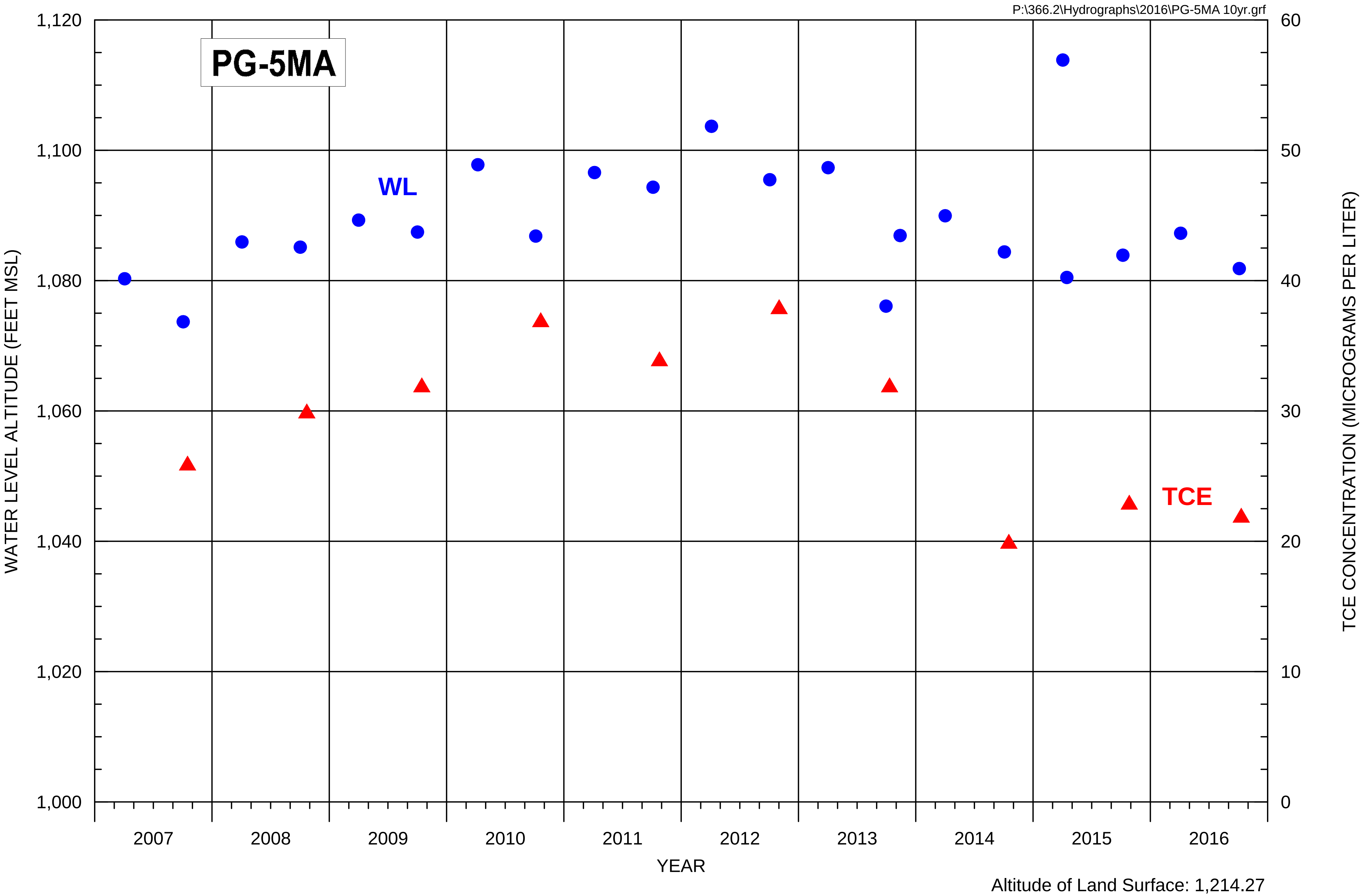


FIGURE C-83. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-5MA

North Indian Bend Wash Superfund Site

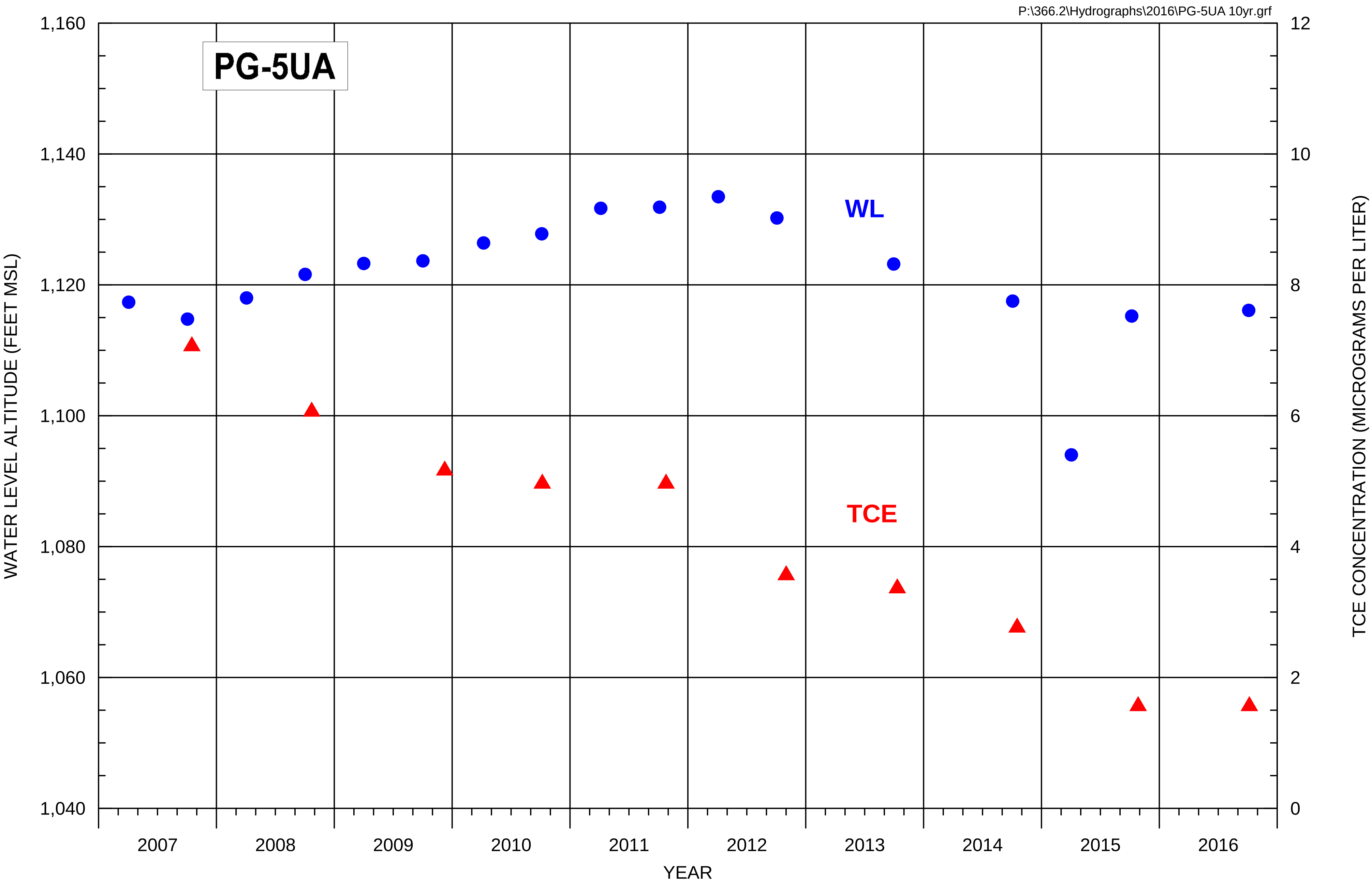
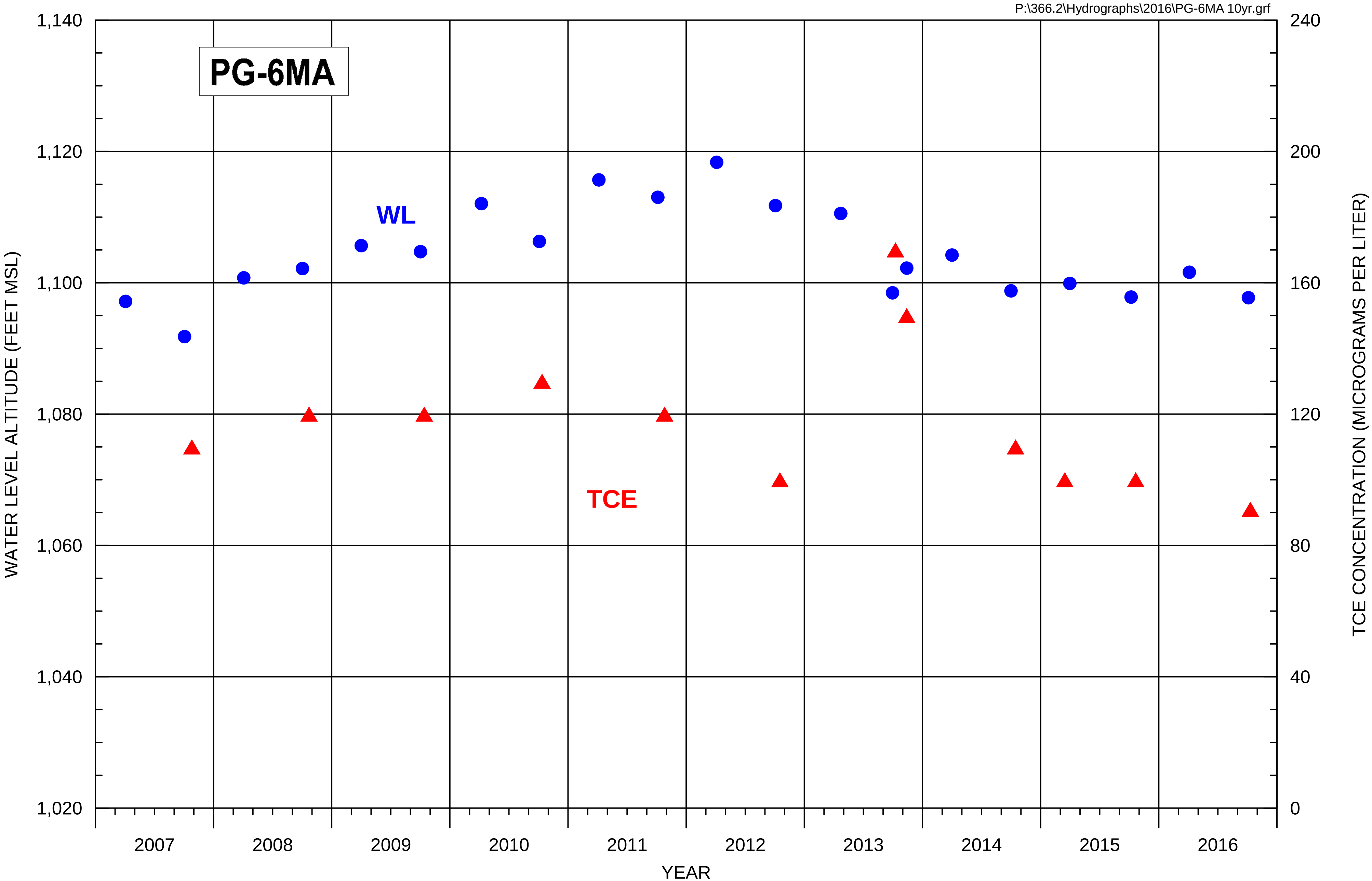


FIGURE C-84. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-5UA

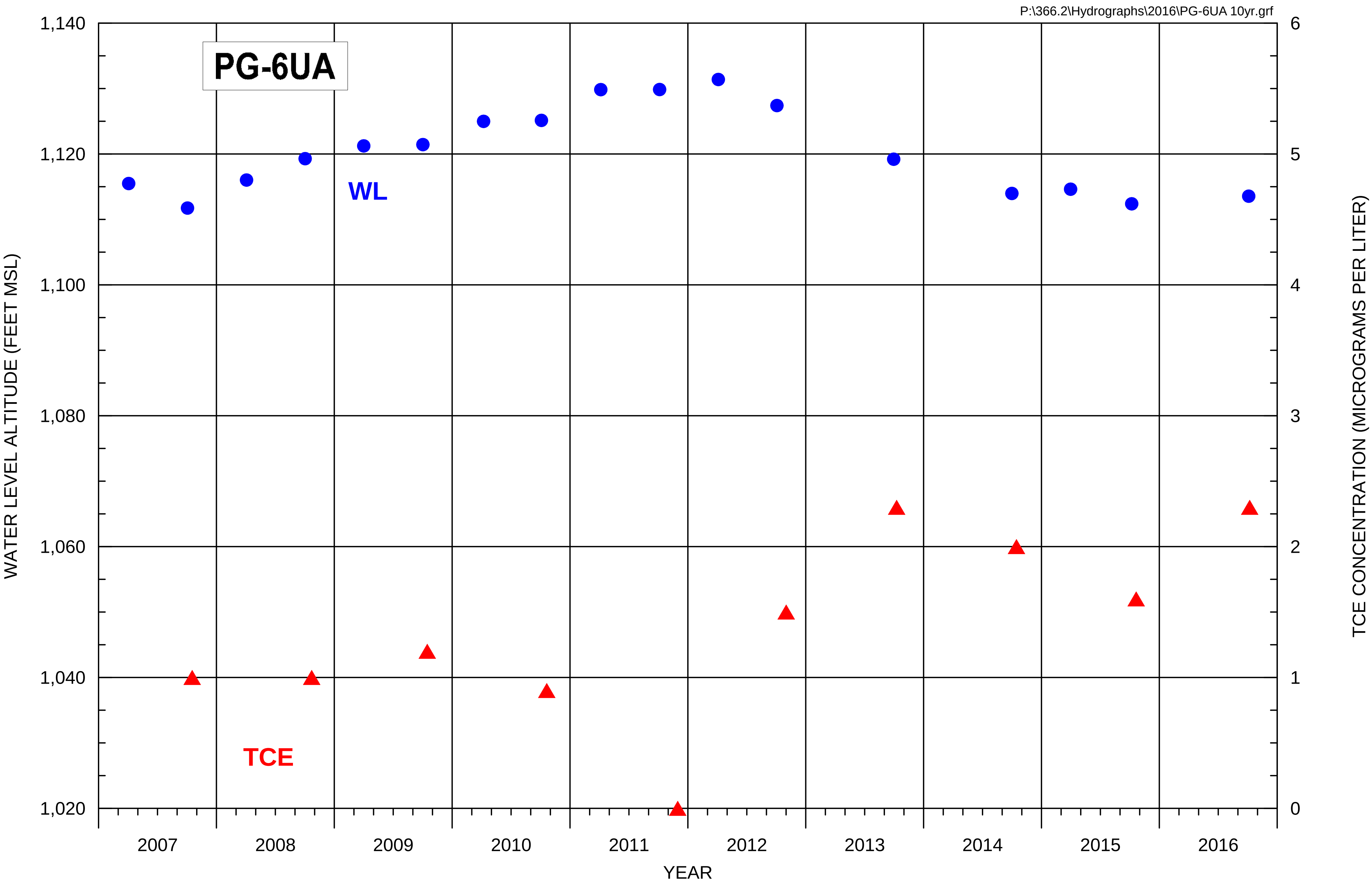
North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,212.70

FIGURE C-85. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-6MA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,213.09

FIGURE C-86. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-6UA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site

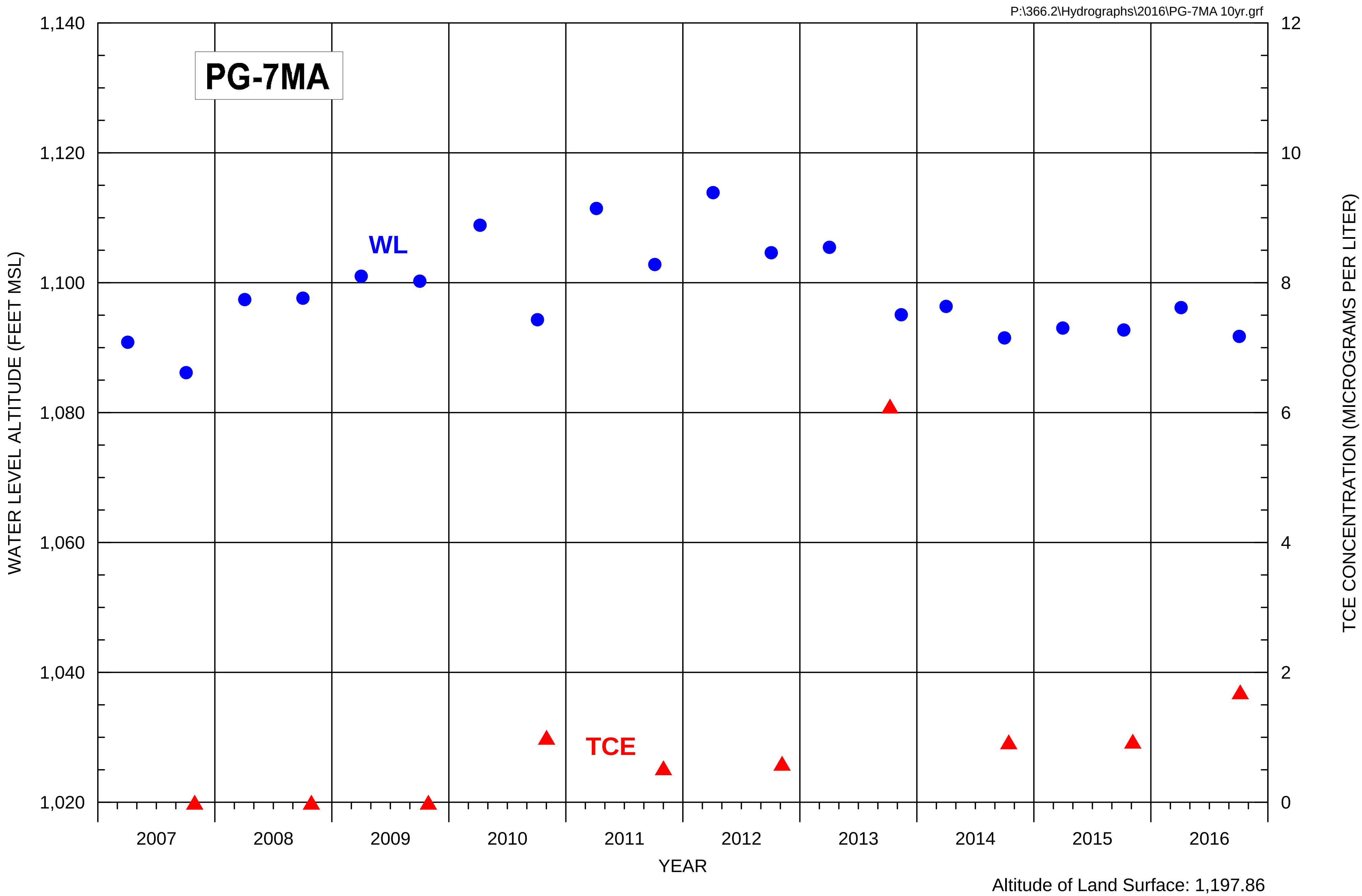


FIGURE C-87. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-7MA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site

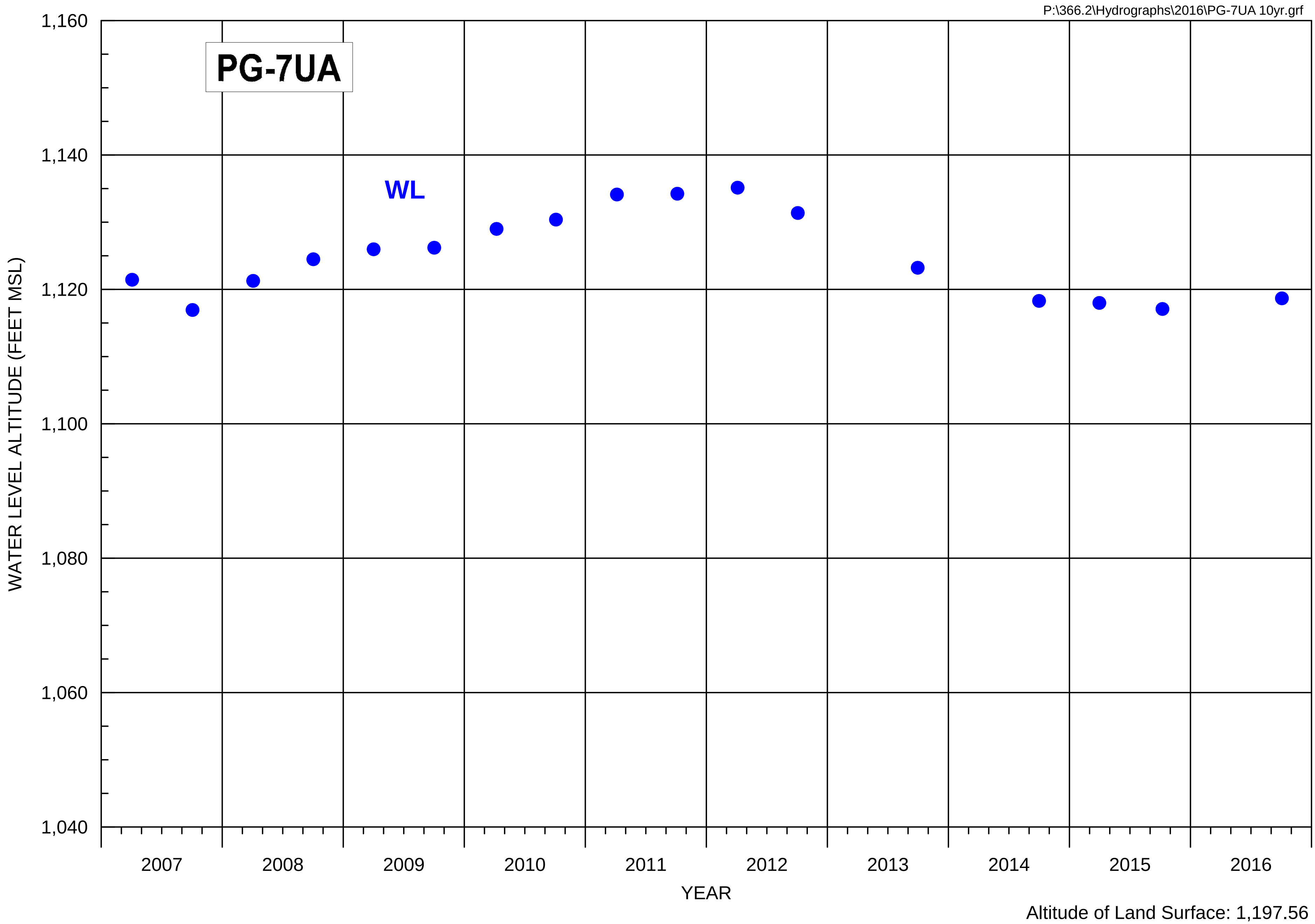


FIGURE C-88. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PG-7UA

North Indian Bend Wash Superfund Site

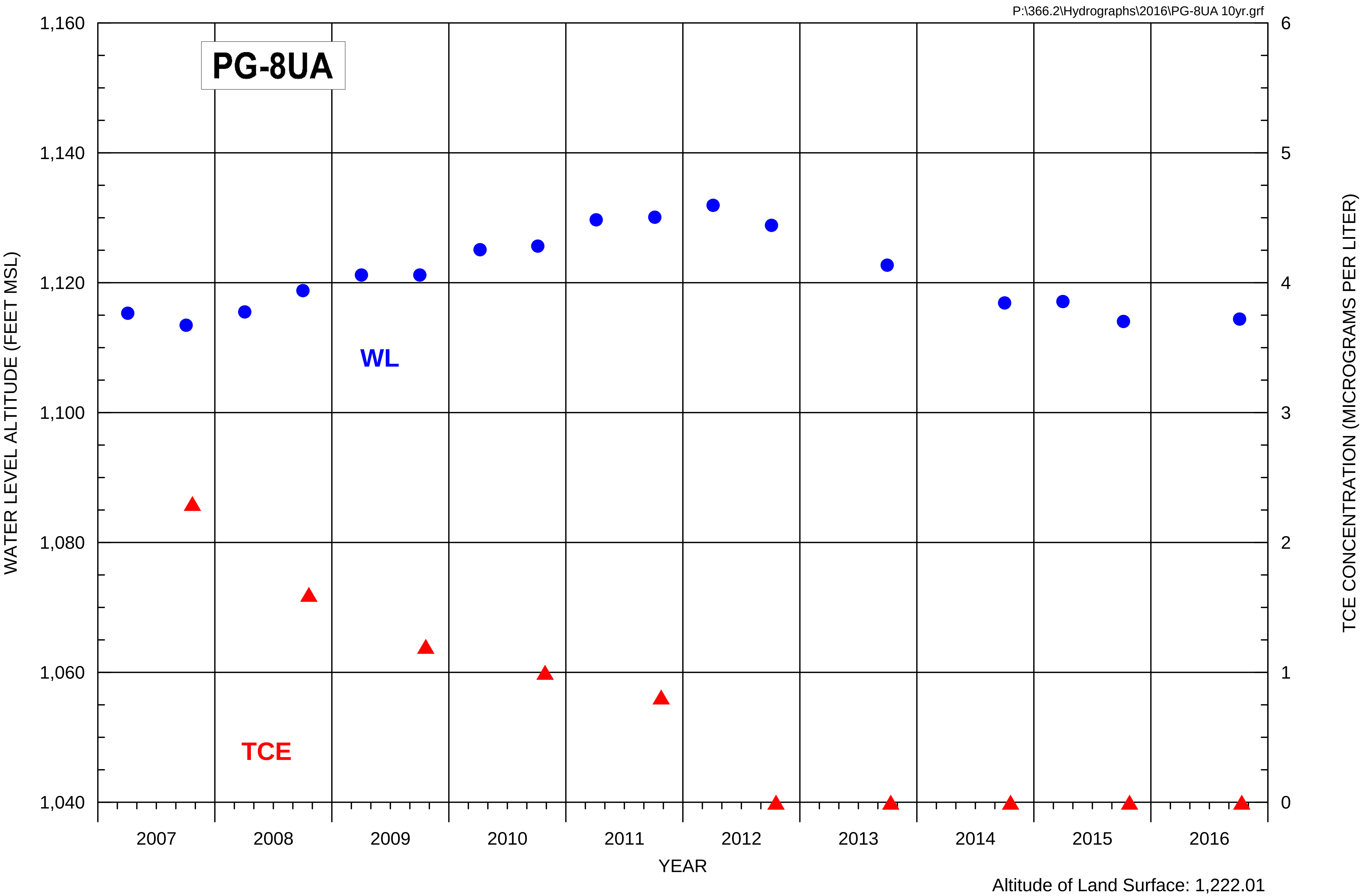
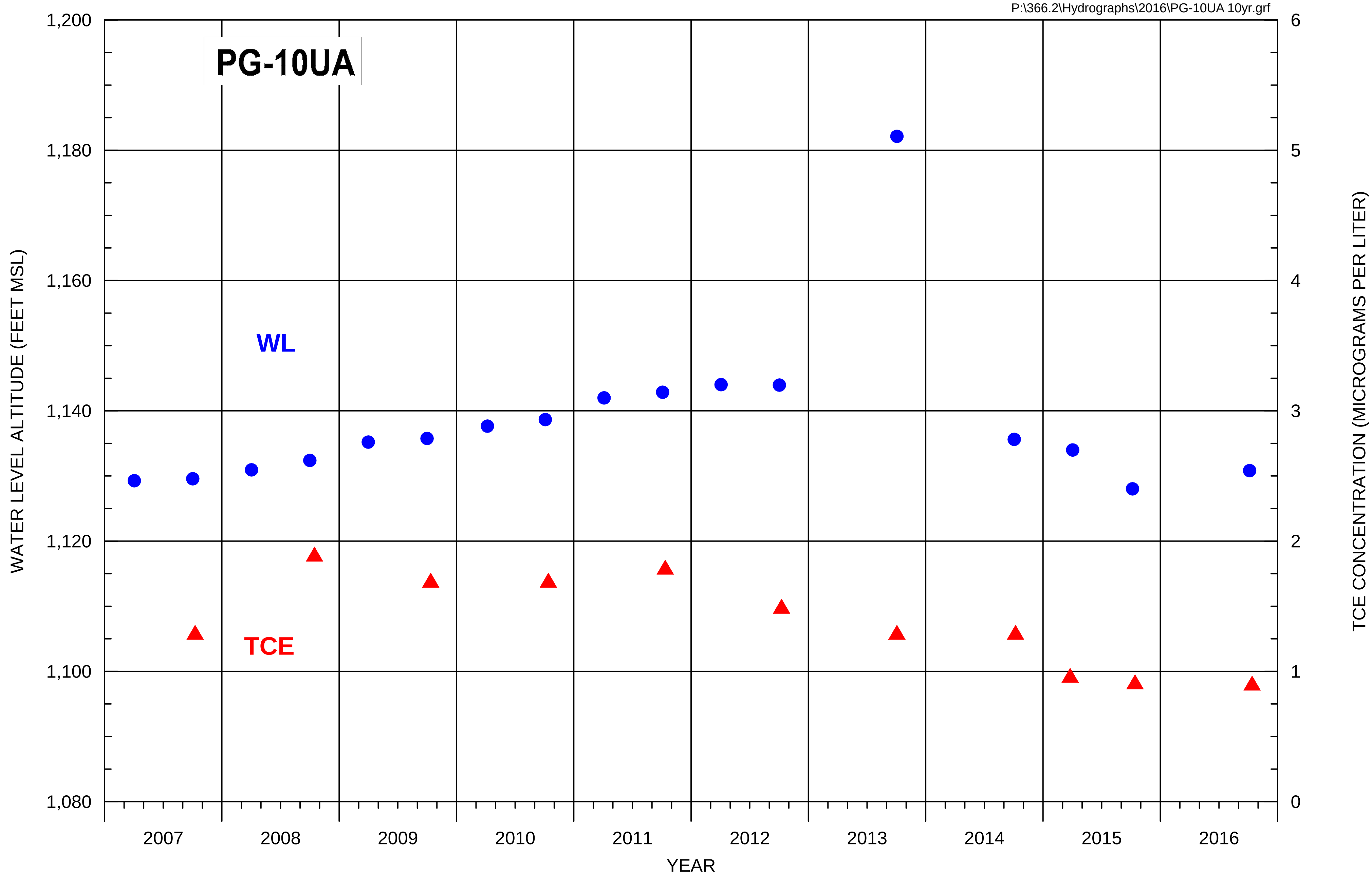


FIGURE C-89. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-8UA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.



Altitude of Land Surface: 1,240.84

FIGURE C-90. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-10UA

North Indian Bend Wash Superfund Site

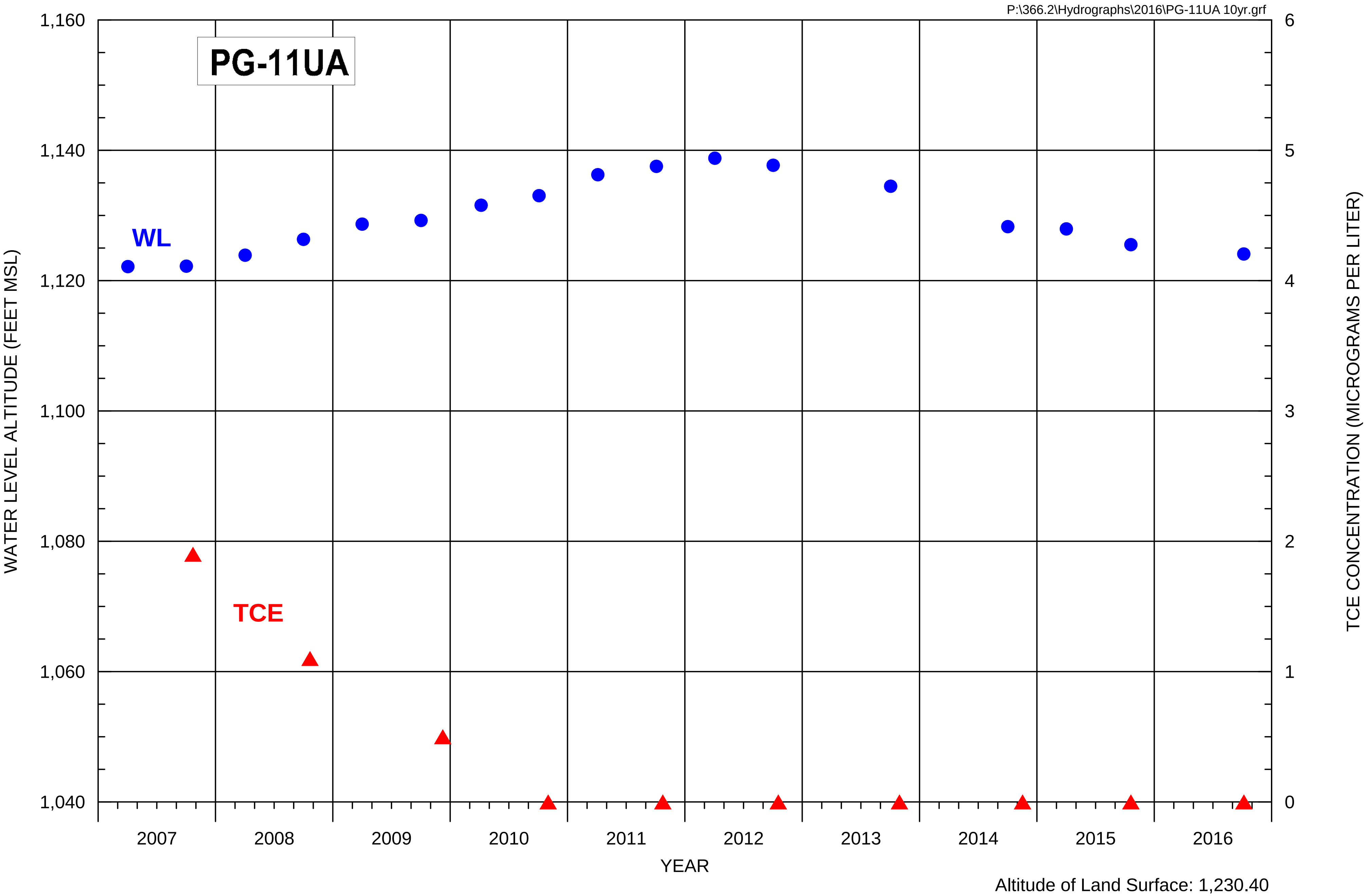
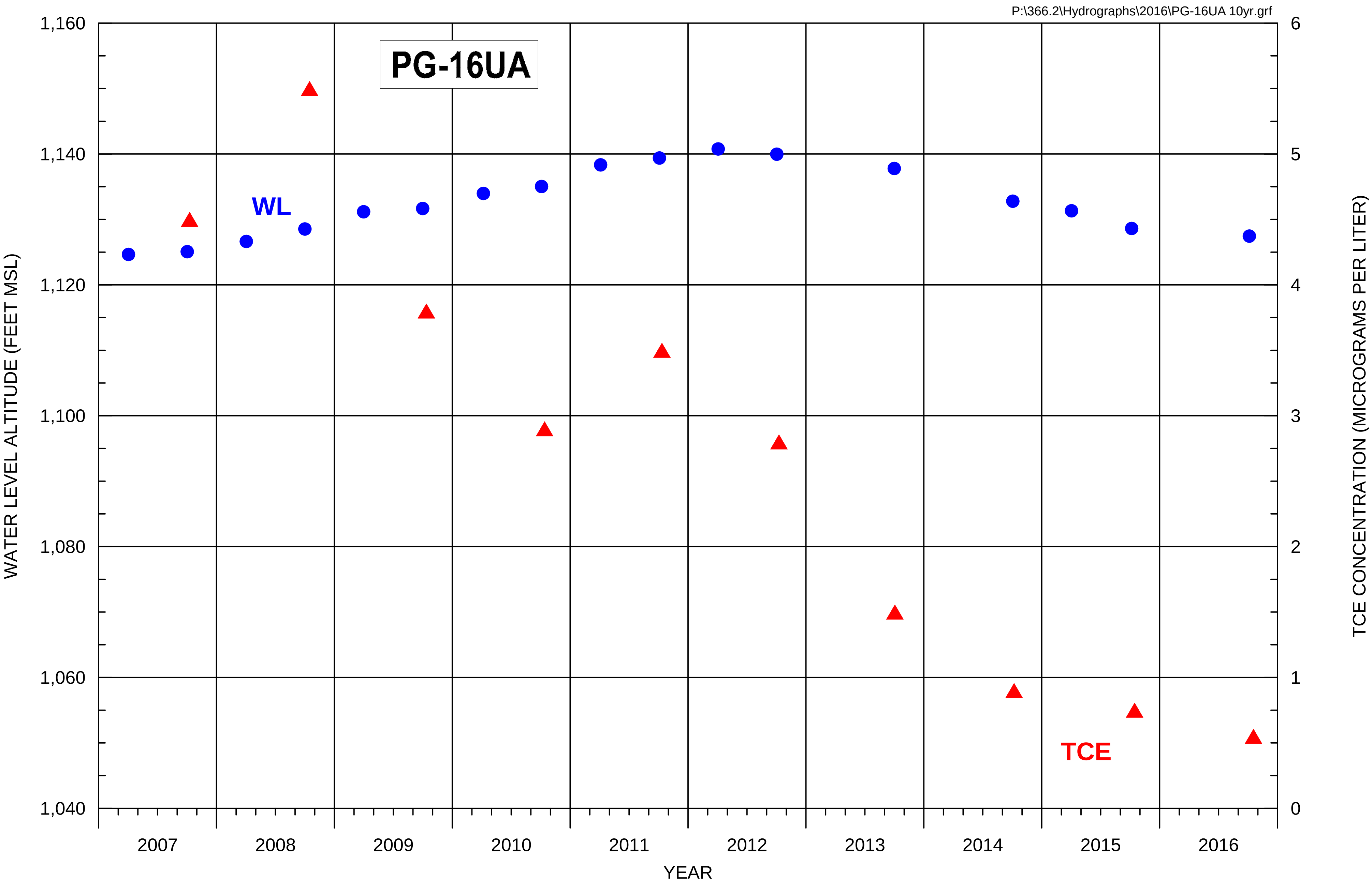


FIGURE C-91. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-11UA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

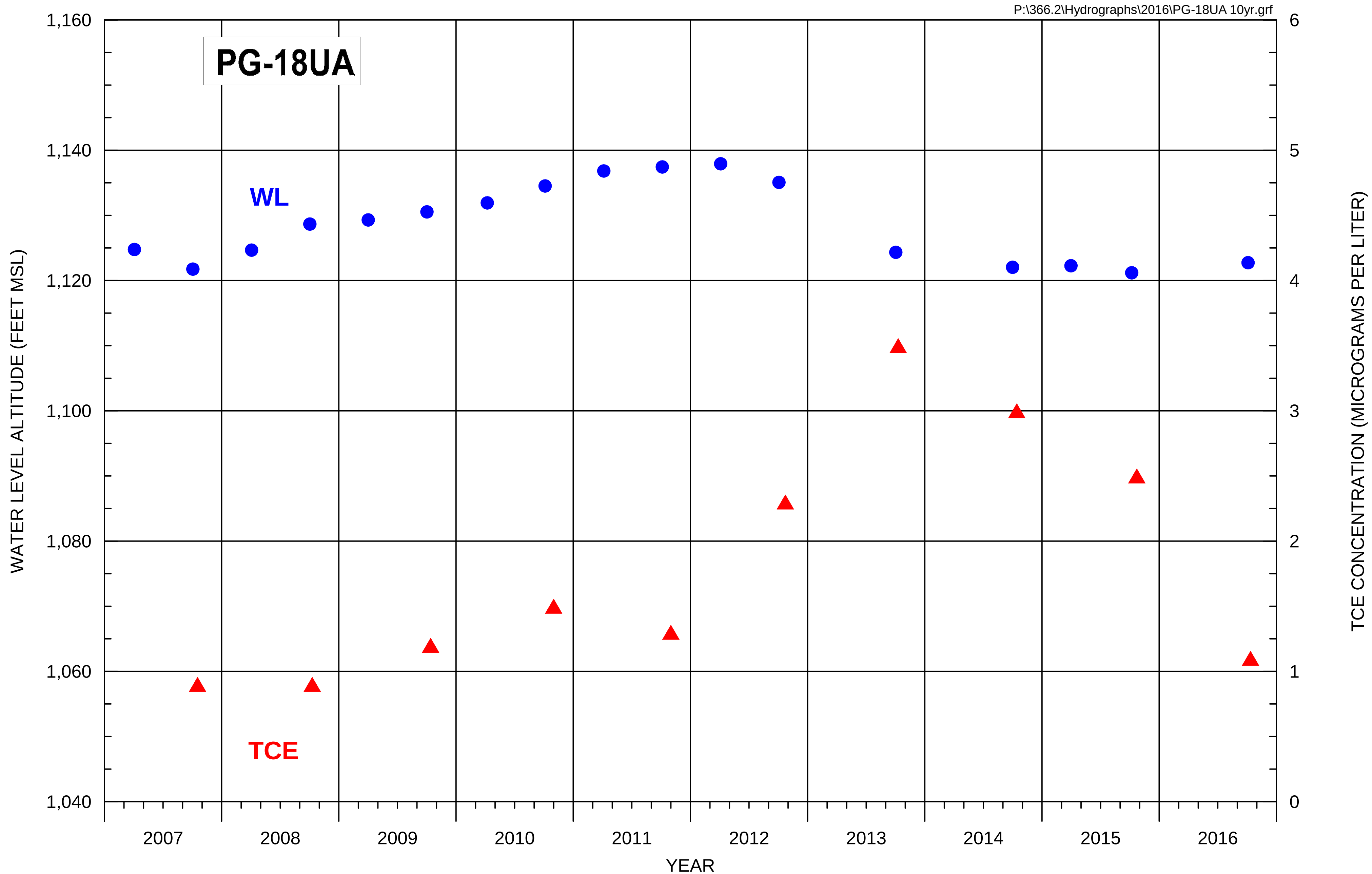
North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,241.89

FIGURE C-92. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-16UA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,202.13

FIGURE C-93. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-18UA

North Indian Bend Wash Superfund Site

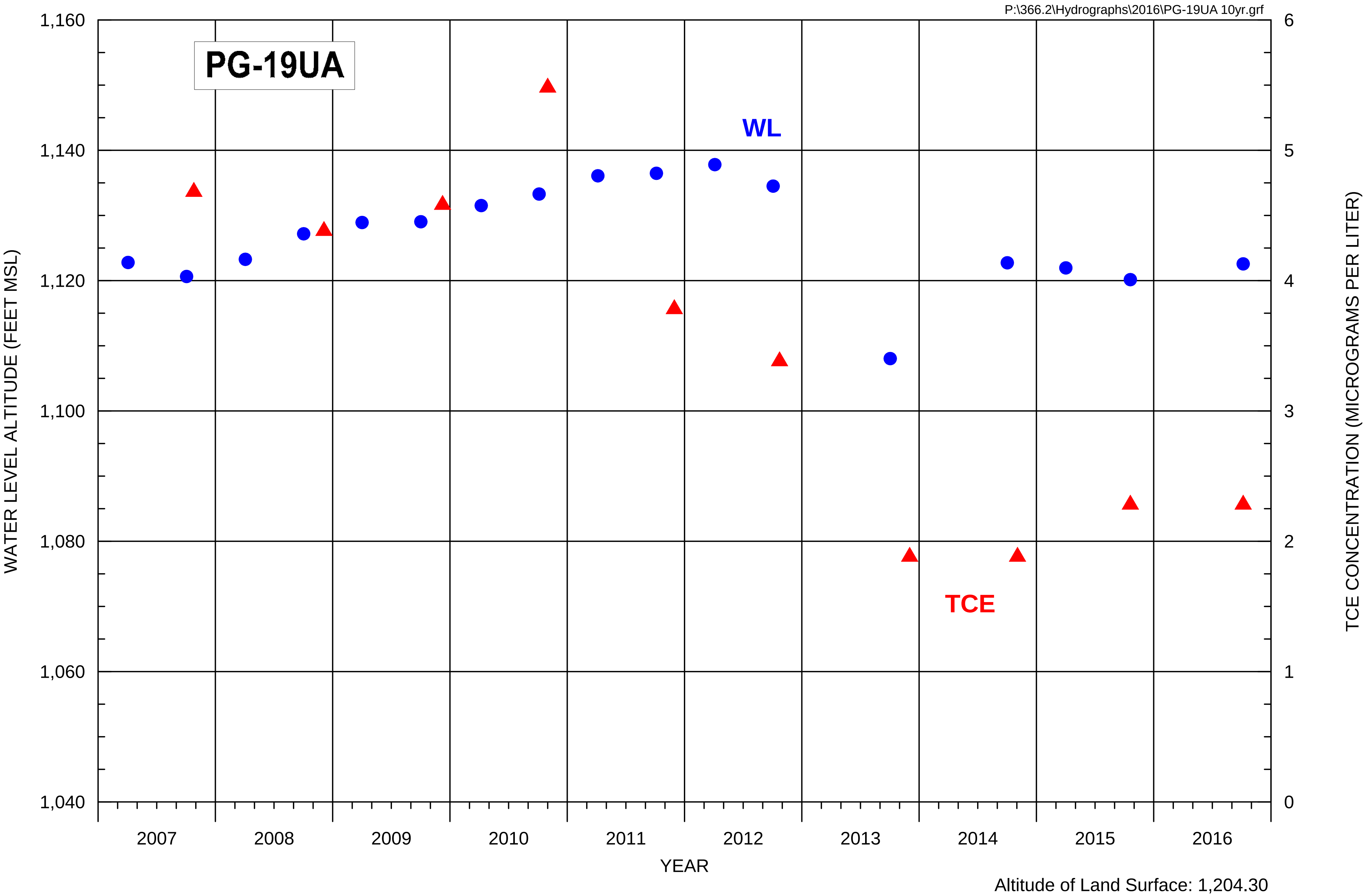
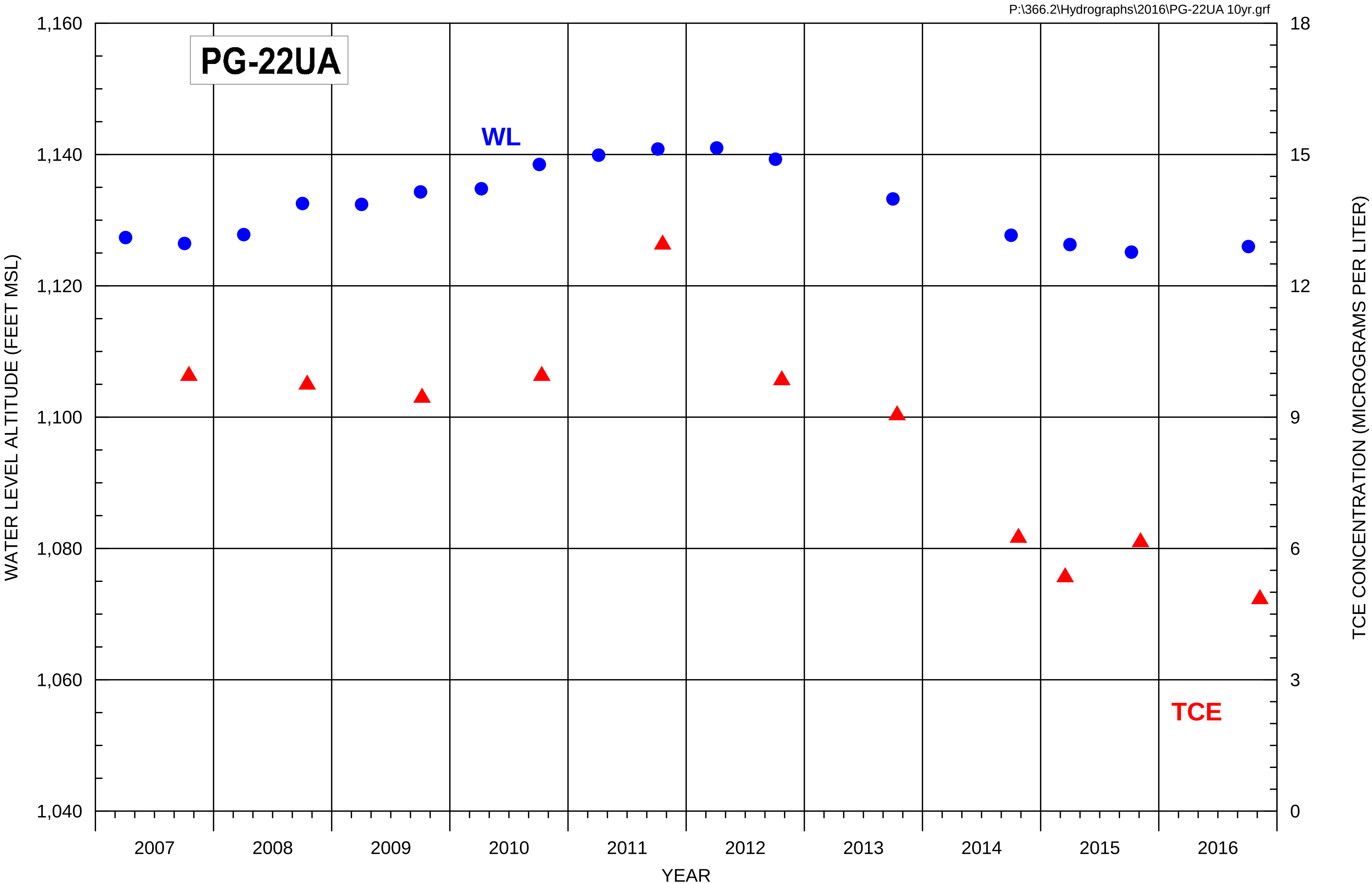


FIGURE C-94. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-19UA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,210.29

FIGURE C-95. WATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-22UA

North Indian Bend Wash Superfund Site

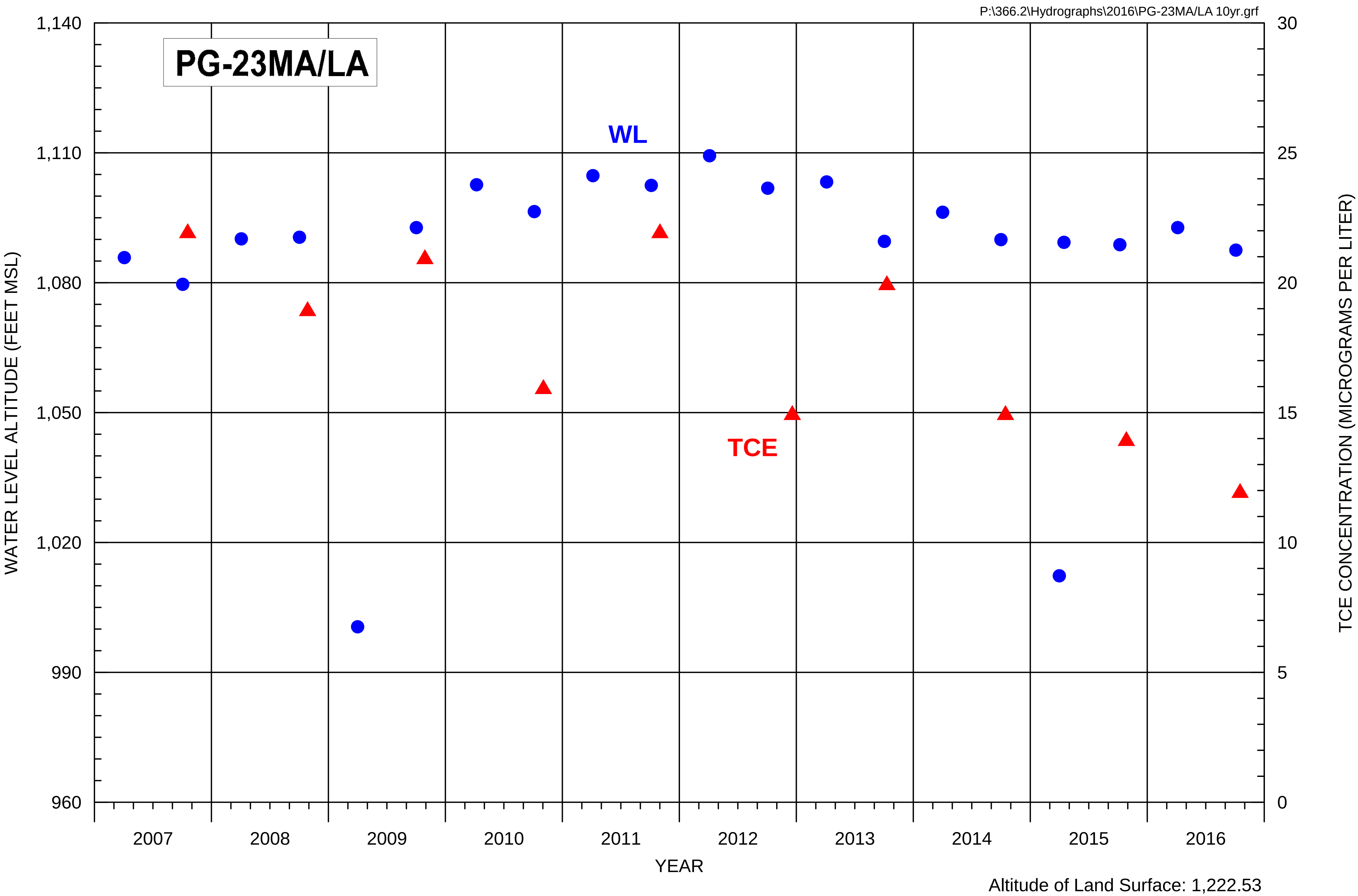


FIGURE C-96. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-23MA/LA

North Indian Bend Wash Superfund Site

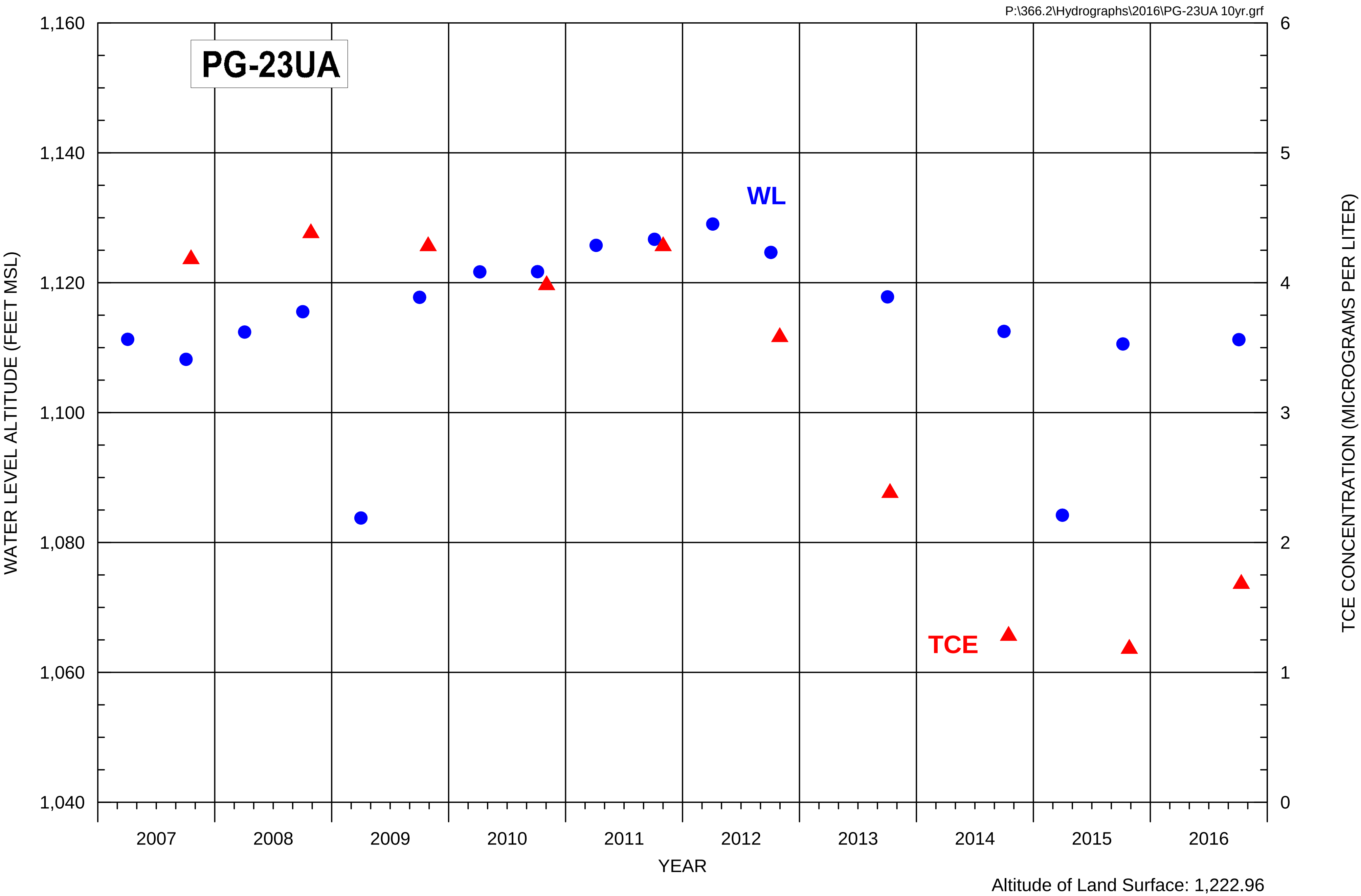


FIGURE C-97. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-23UA

North Indian Bend Wash Superfund Site

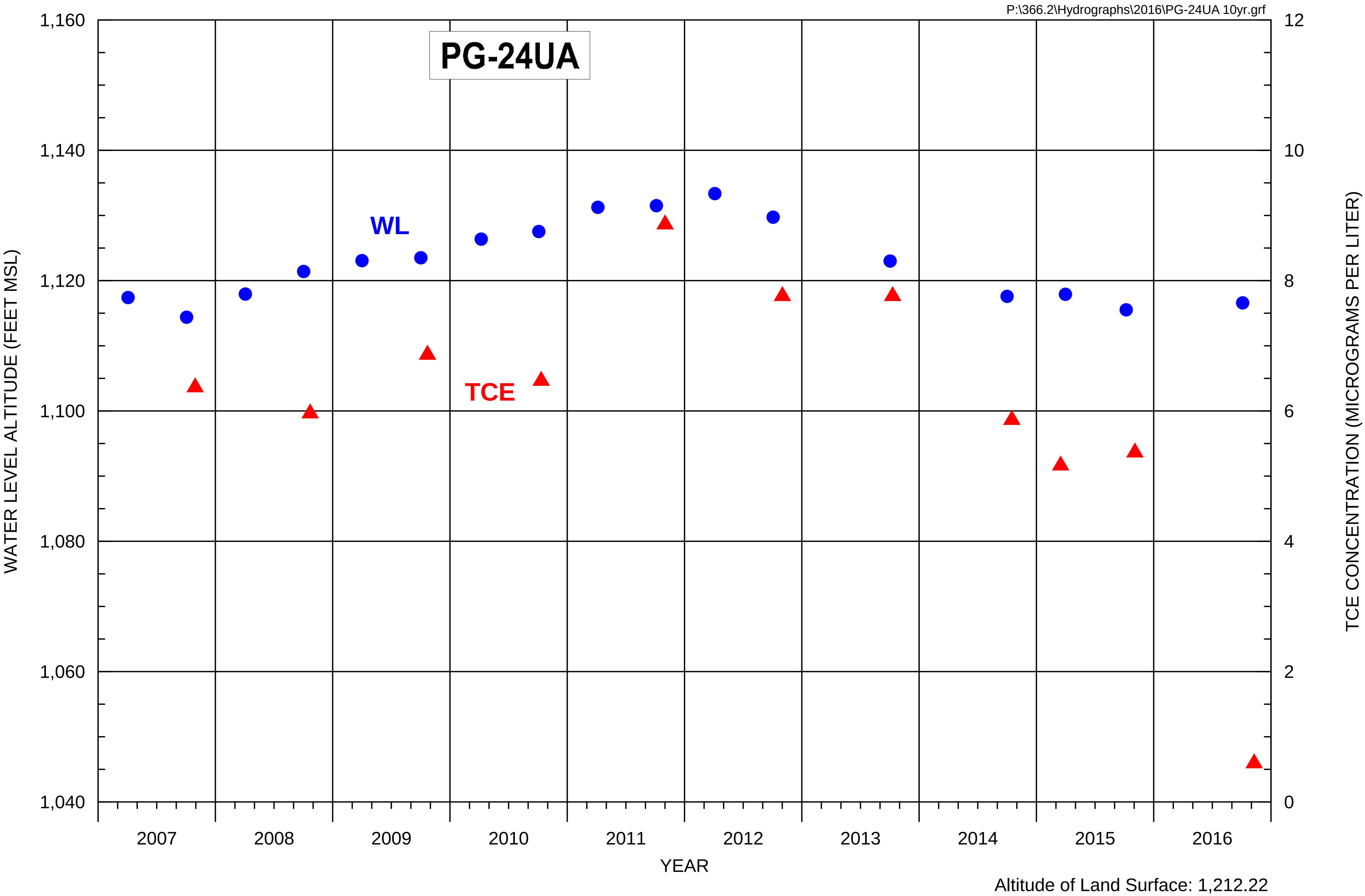


FIGURE C-98. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-24UA

North Indian Bend Wash Superfund Site

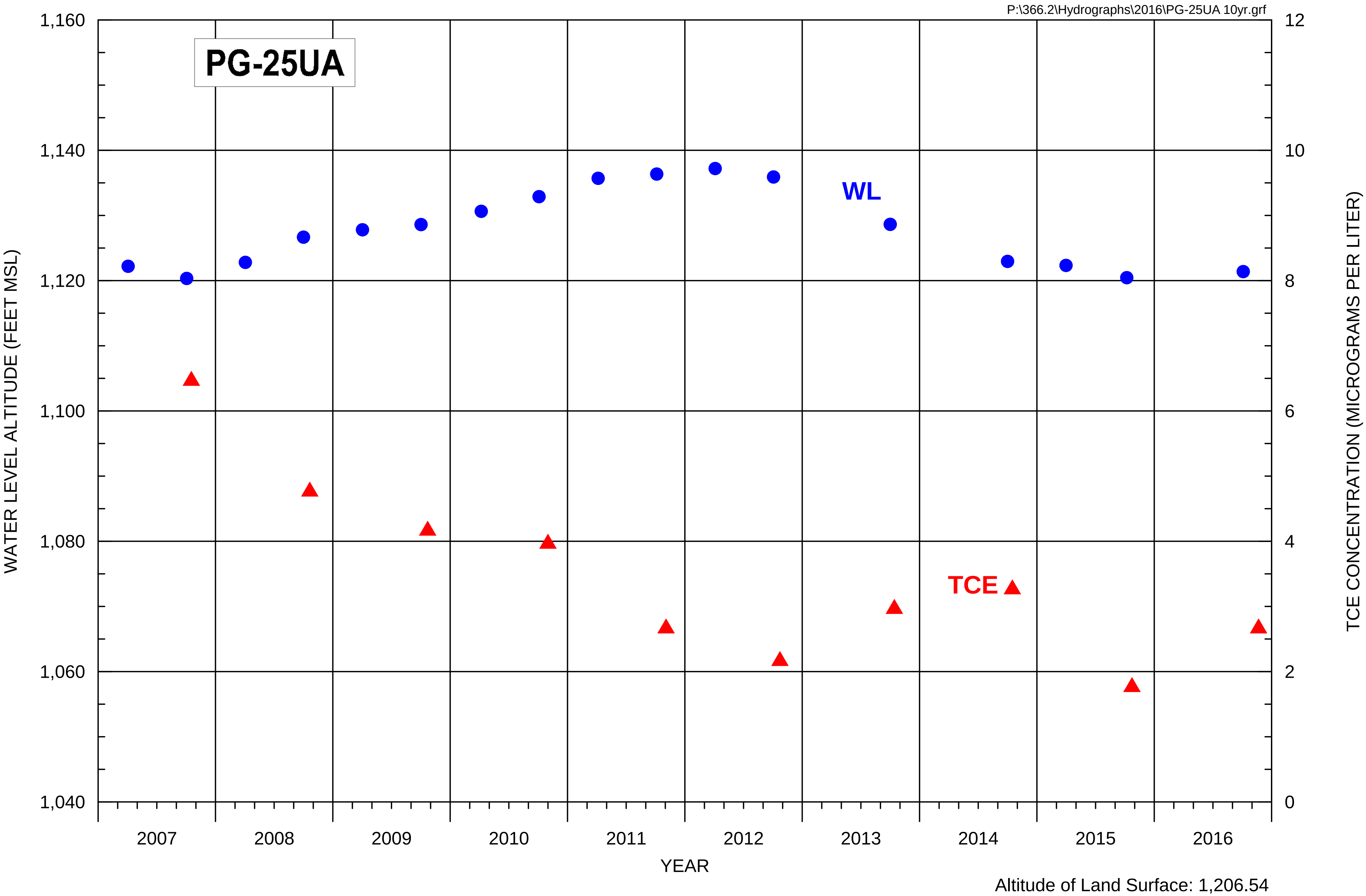
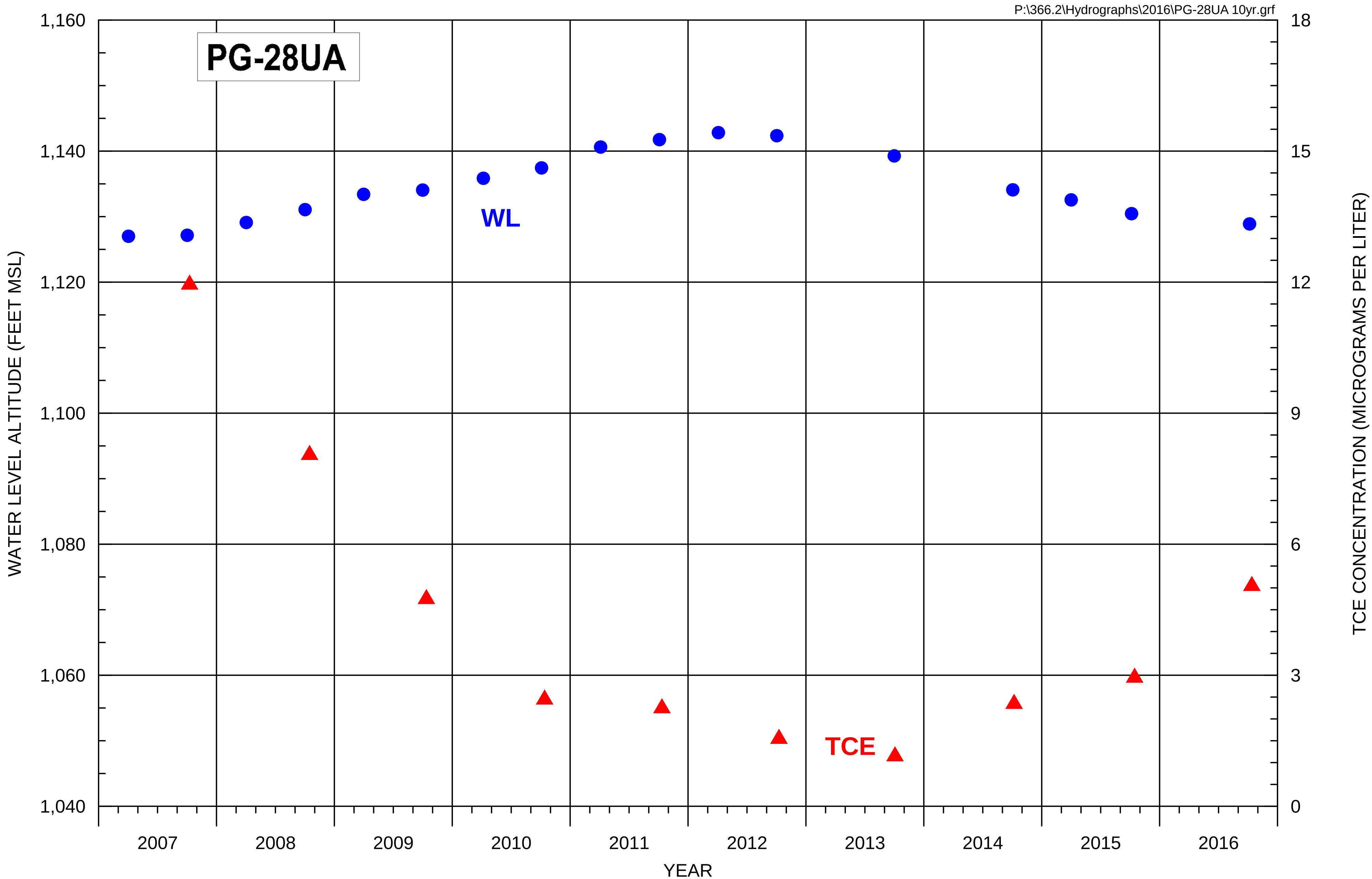


FIGURE C-99. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-25UA

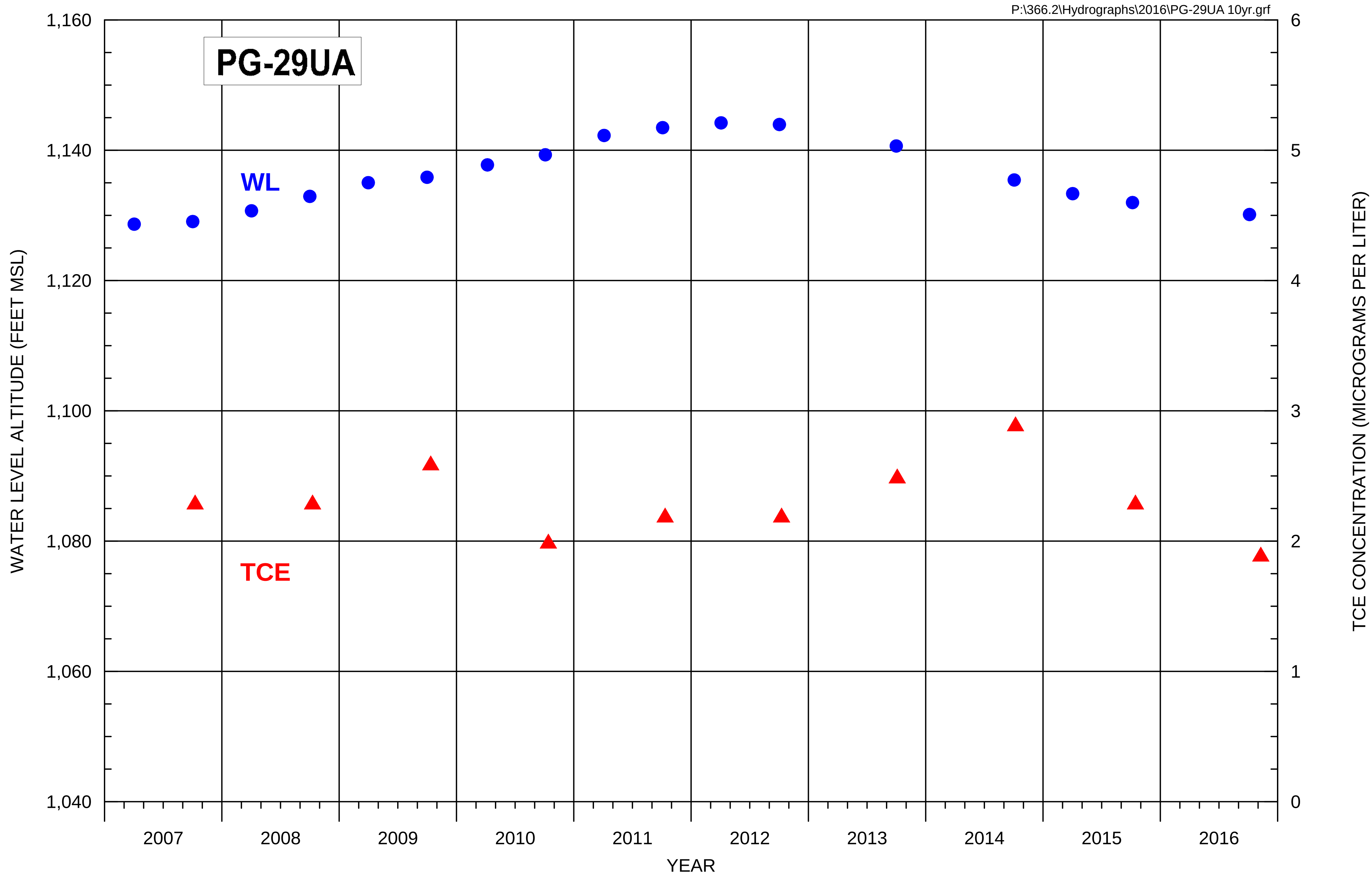
North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,234.95

FIGURE C-100. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-28UA

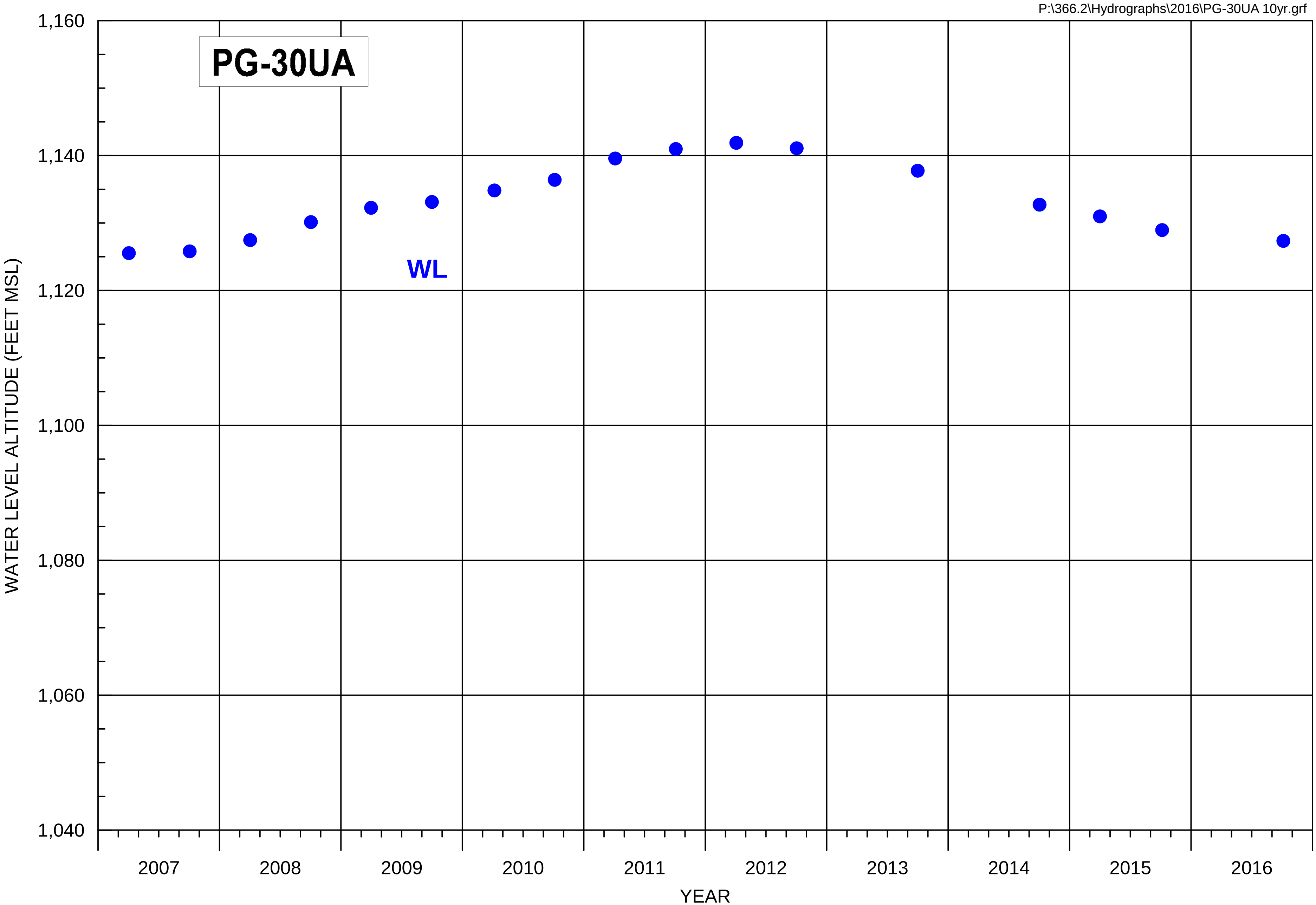
North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,233.03

FIGURE C-101. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-29UA

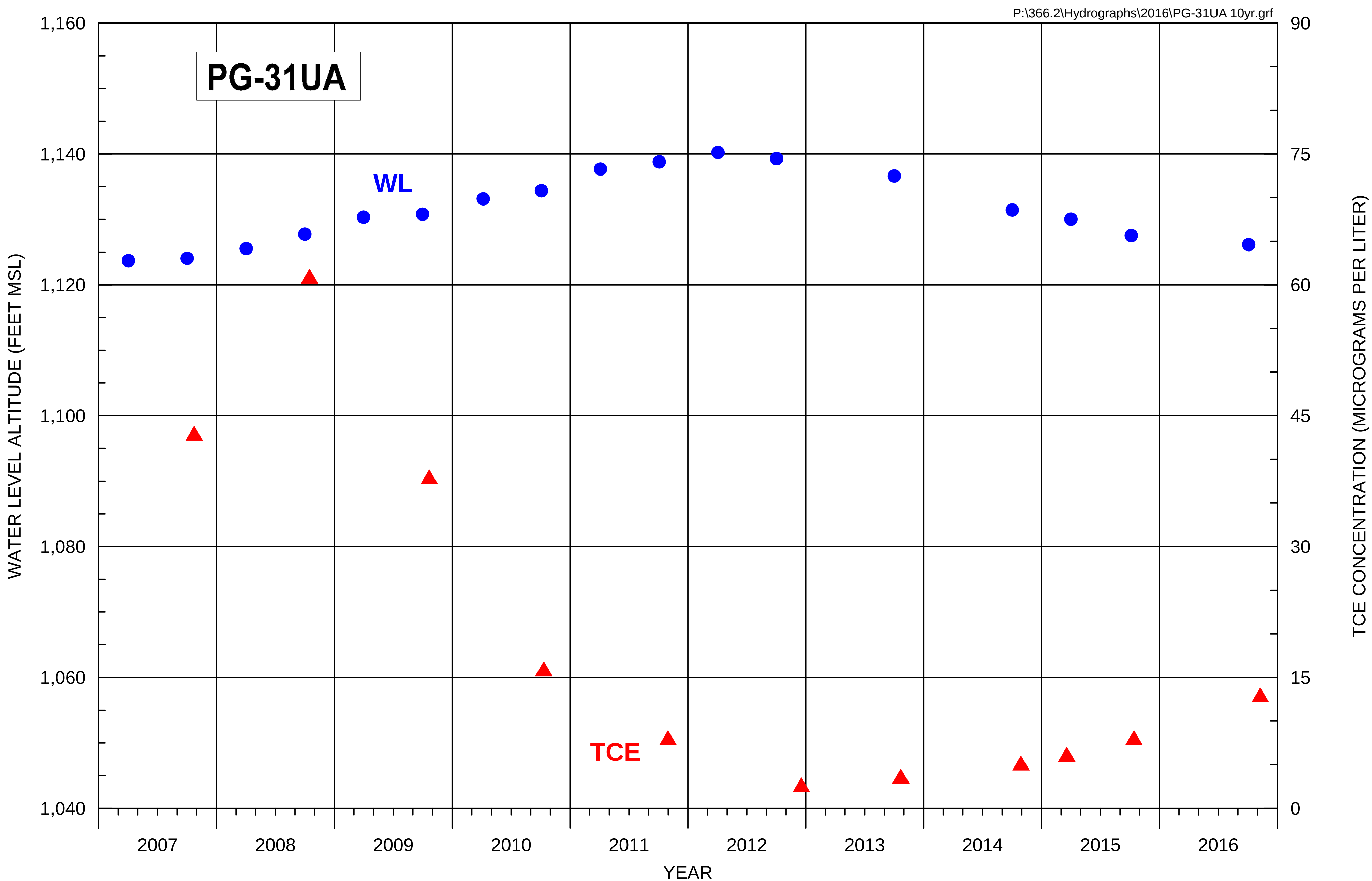
North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,226.36

FIGURE C-102. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PG-30UA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,235.45

FIGURE C-103. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-31UA

North Indian Bend Wash Superfund Site

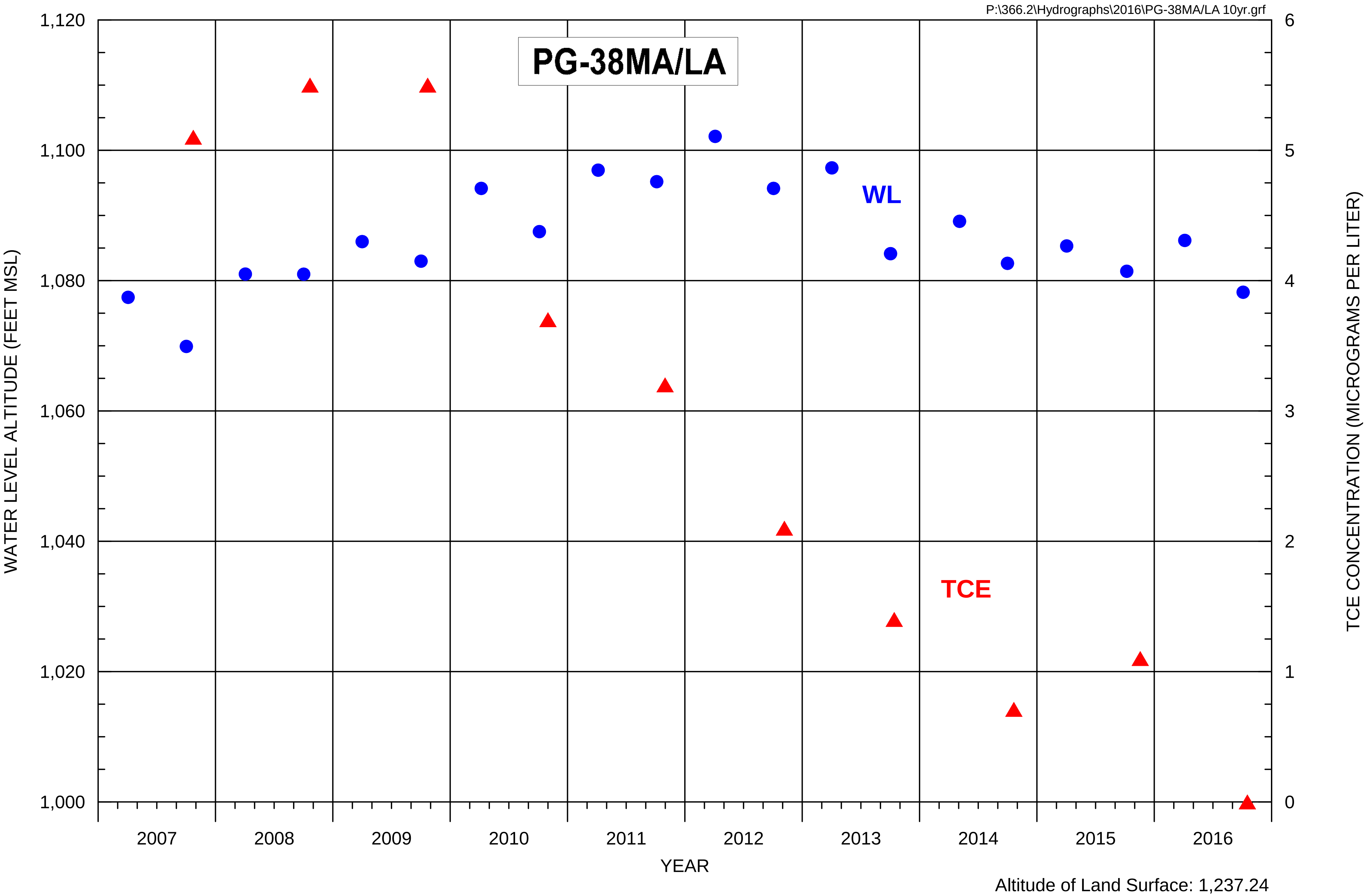


FIGURE C-104. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-38MA/LA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site

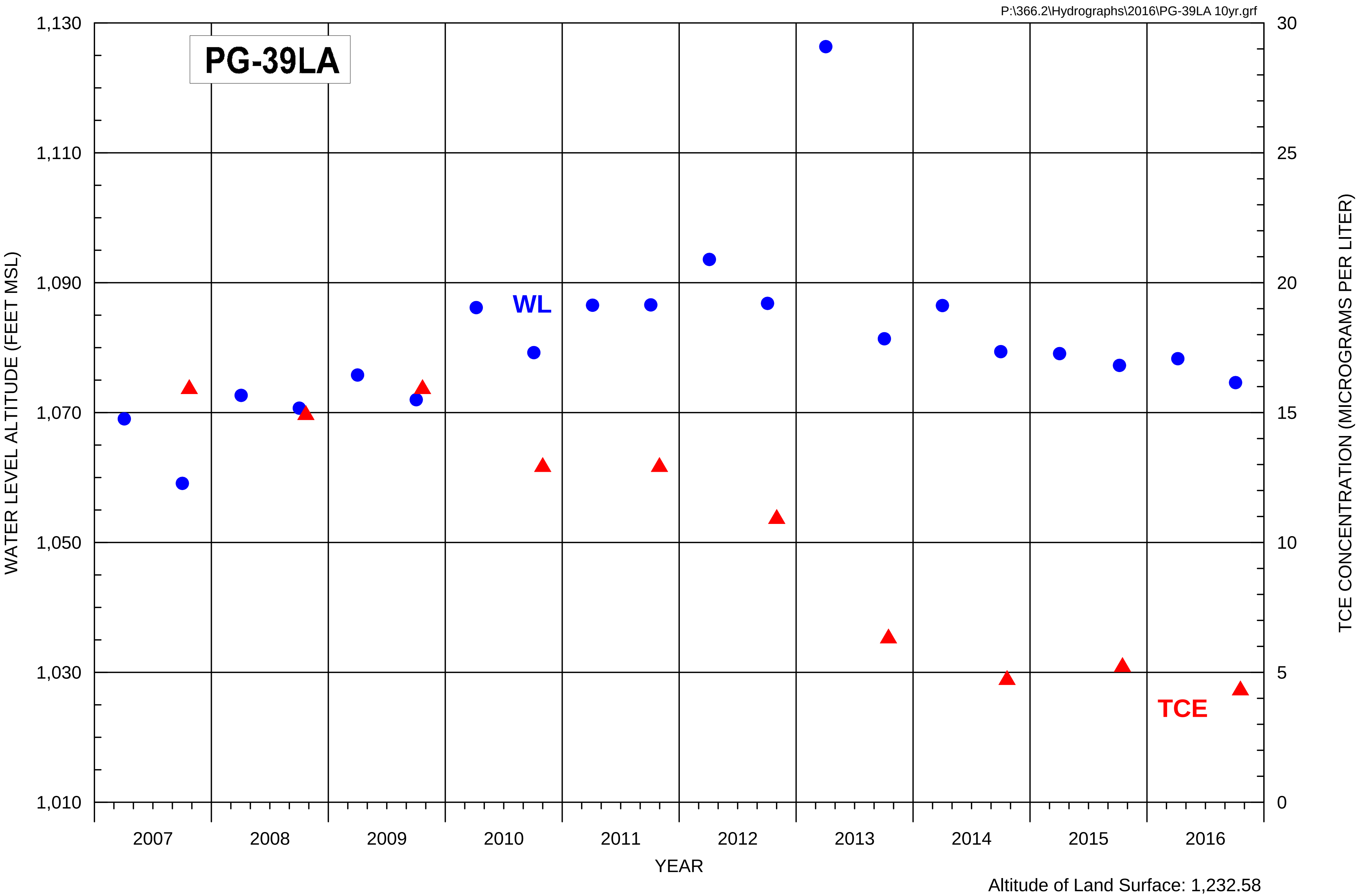


FIGURE C-105. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-39LA

North Indian Bend Wash Superfund Site

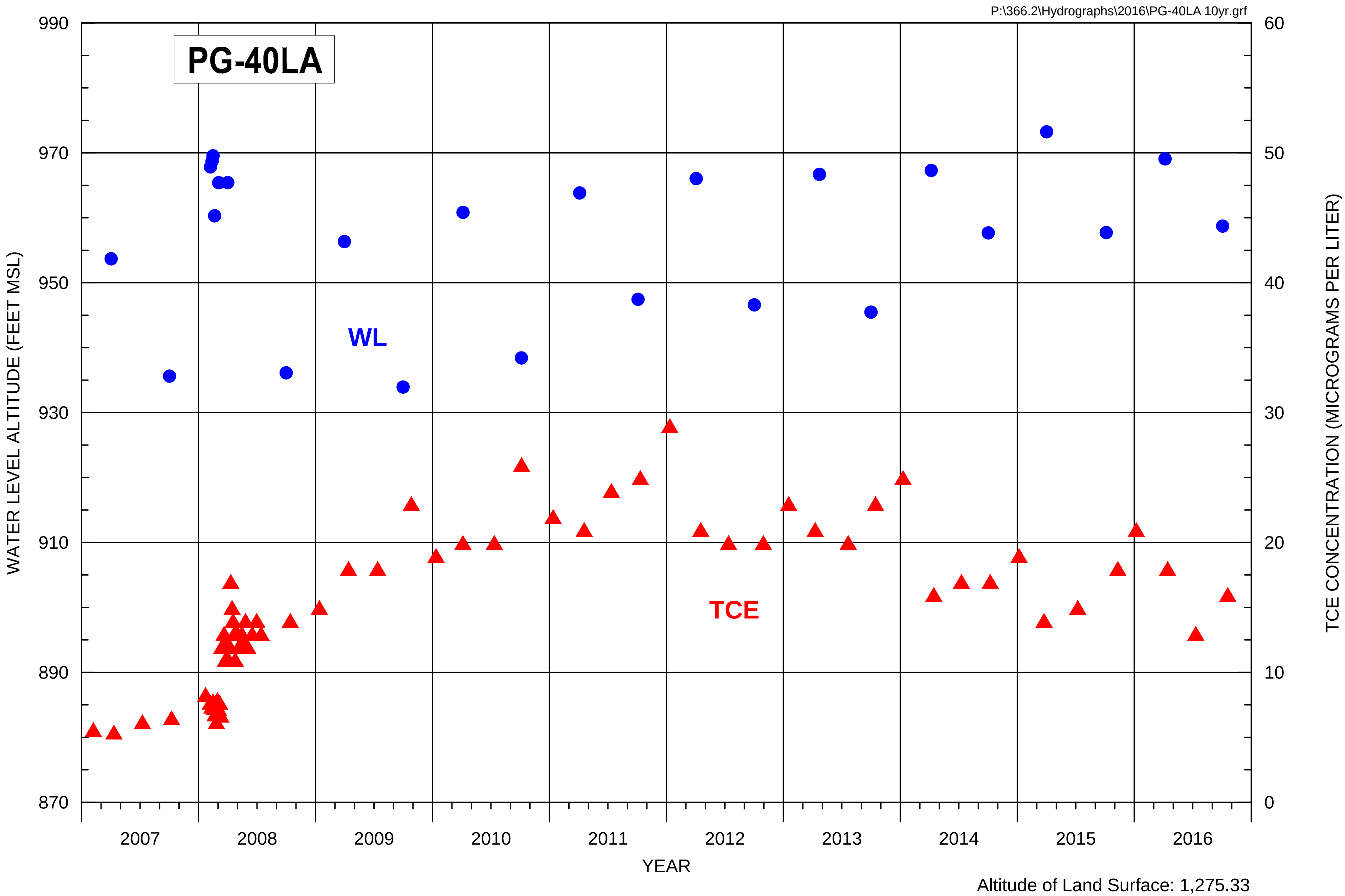
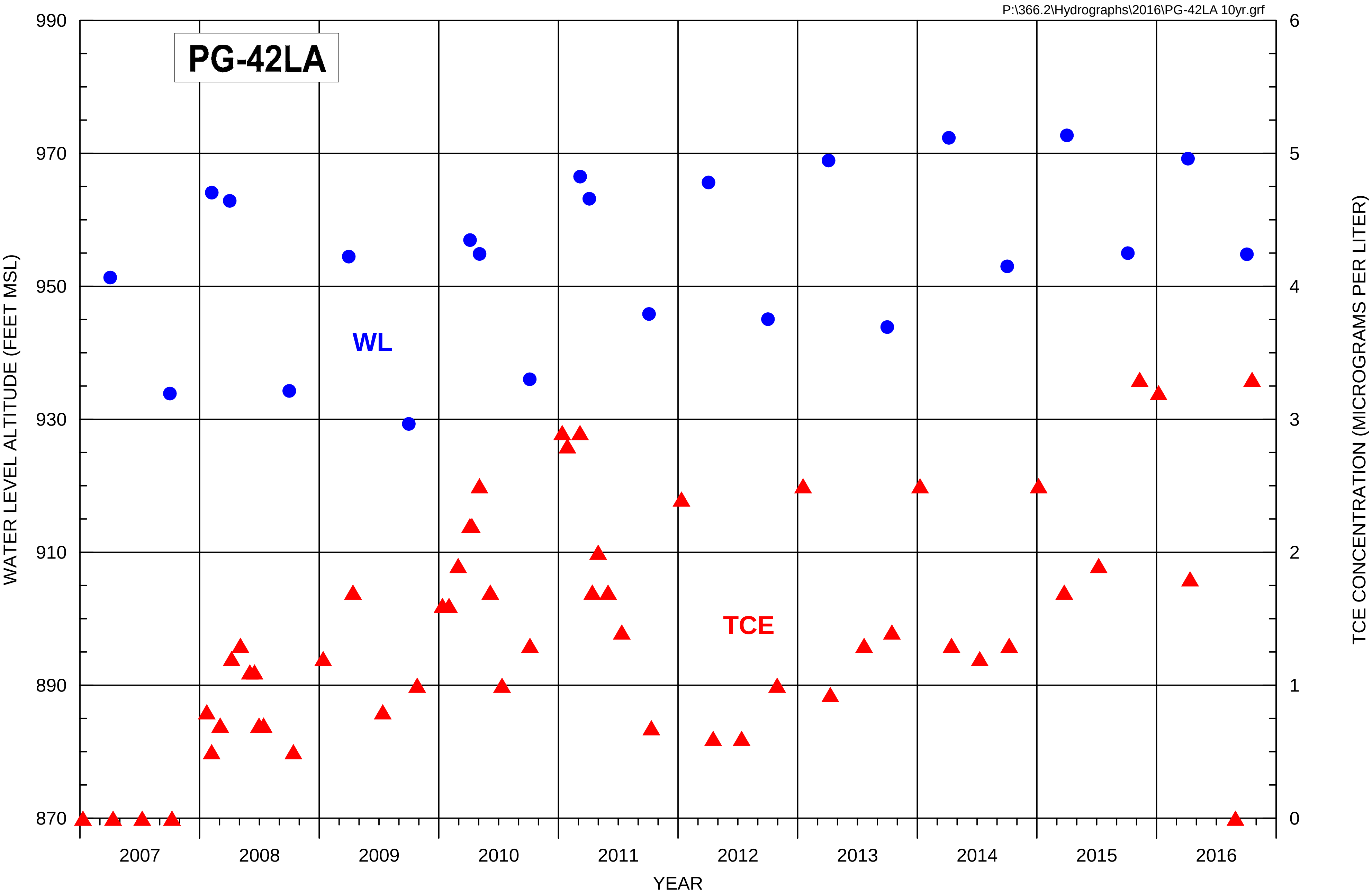


FIGURE C-106. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-40LA

North Indian Bend Wash Superfund Site

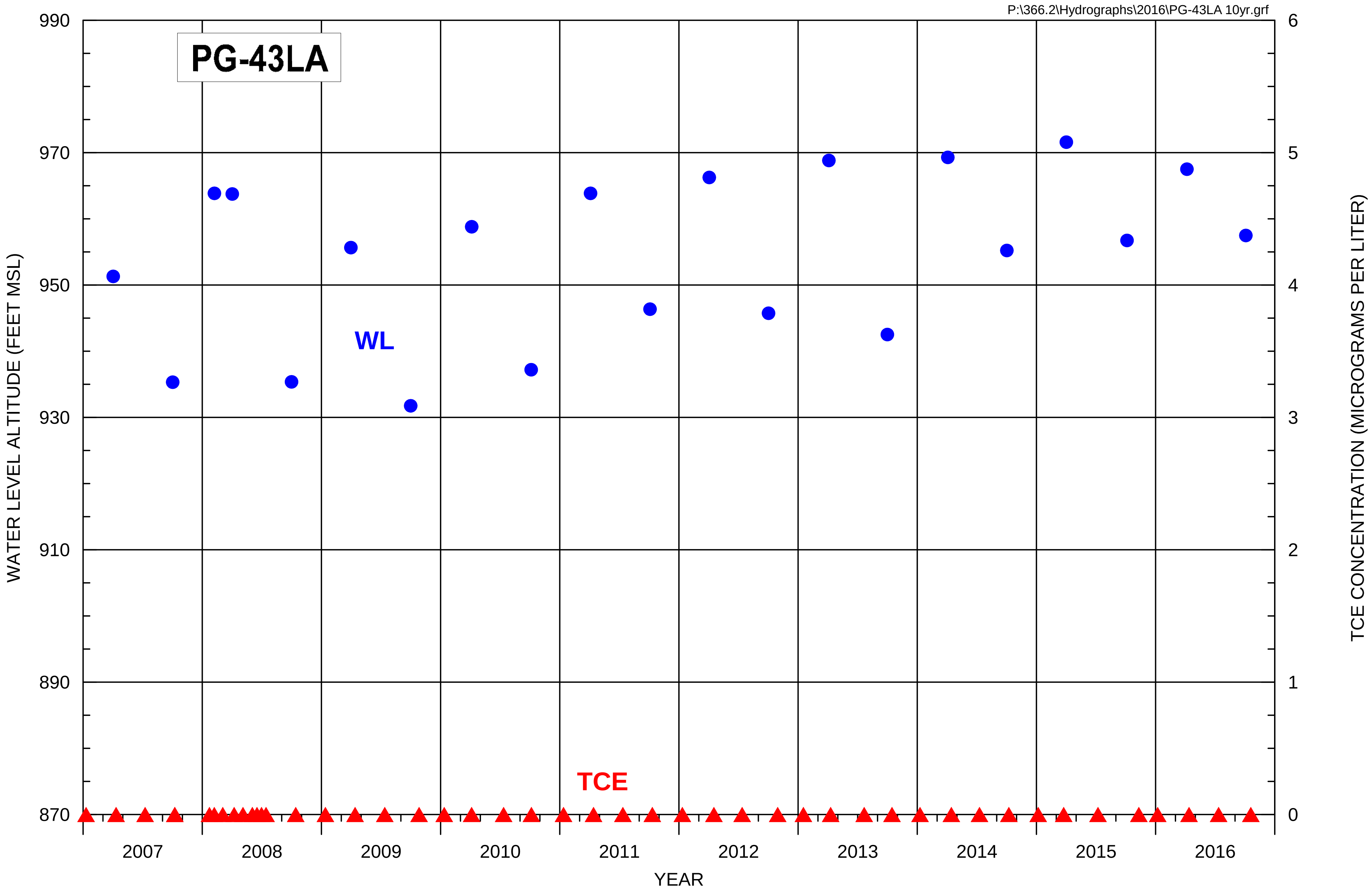


Altitude of Land Surface: 1,292.31

FIGURE C-107. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-42LA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site

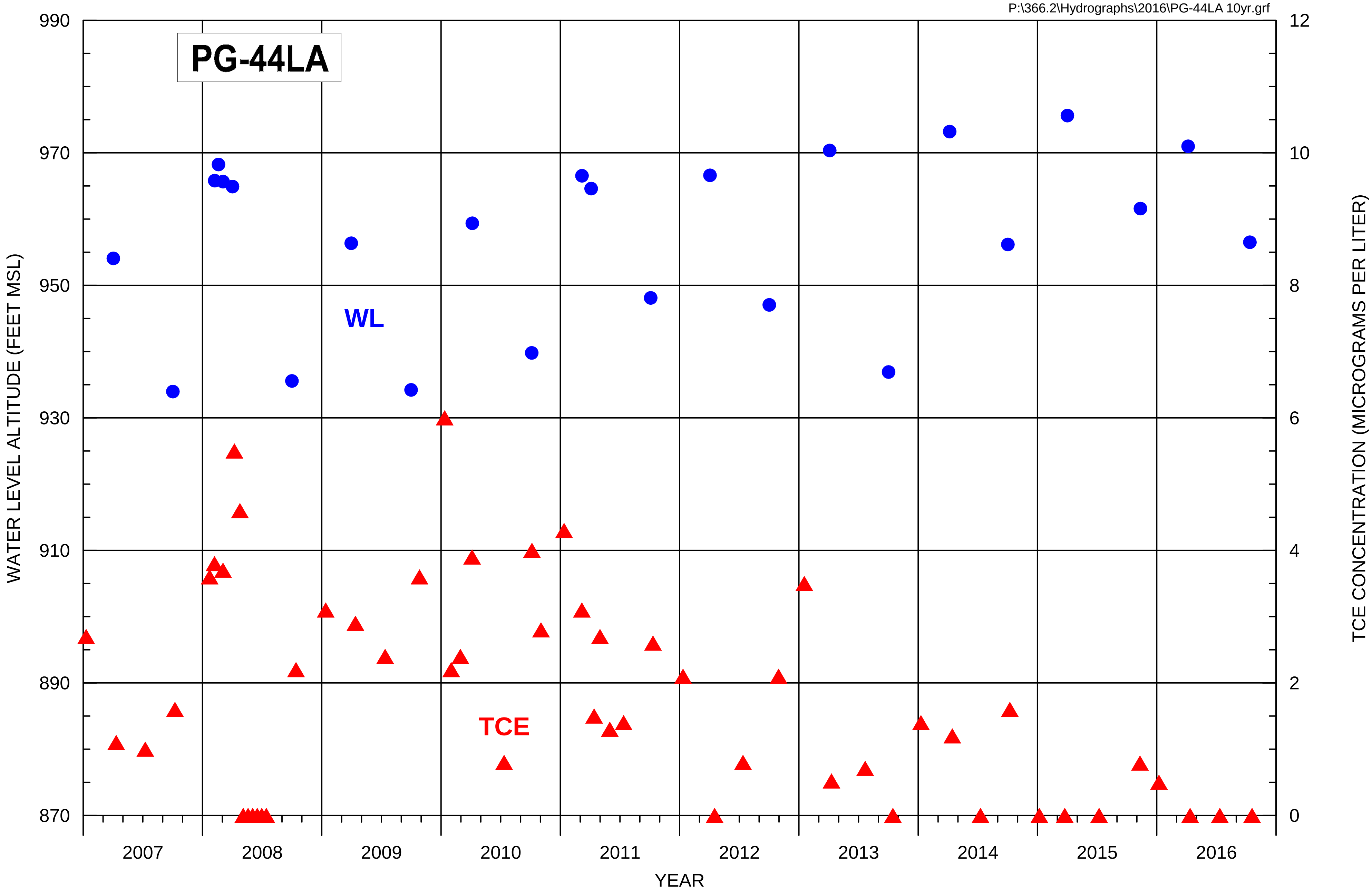


Altitude of Land Surface: 1,265.01

FIGURE C-108. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-43LA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site

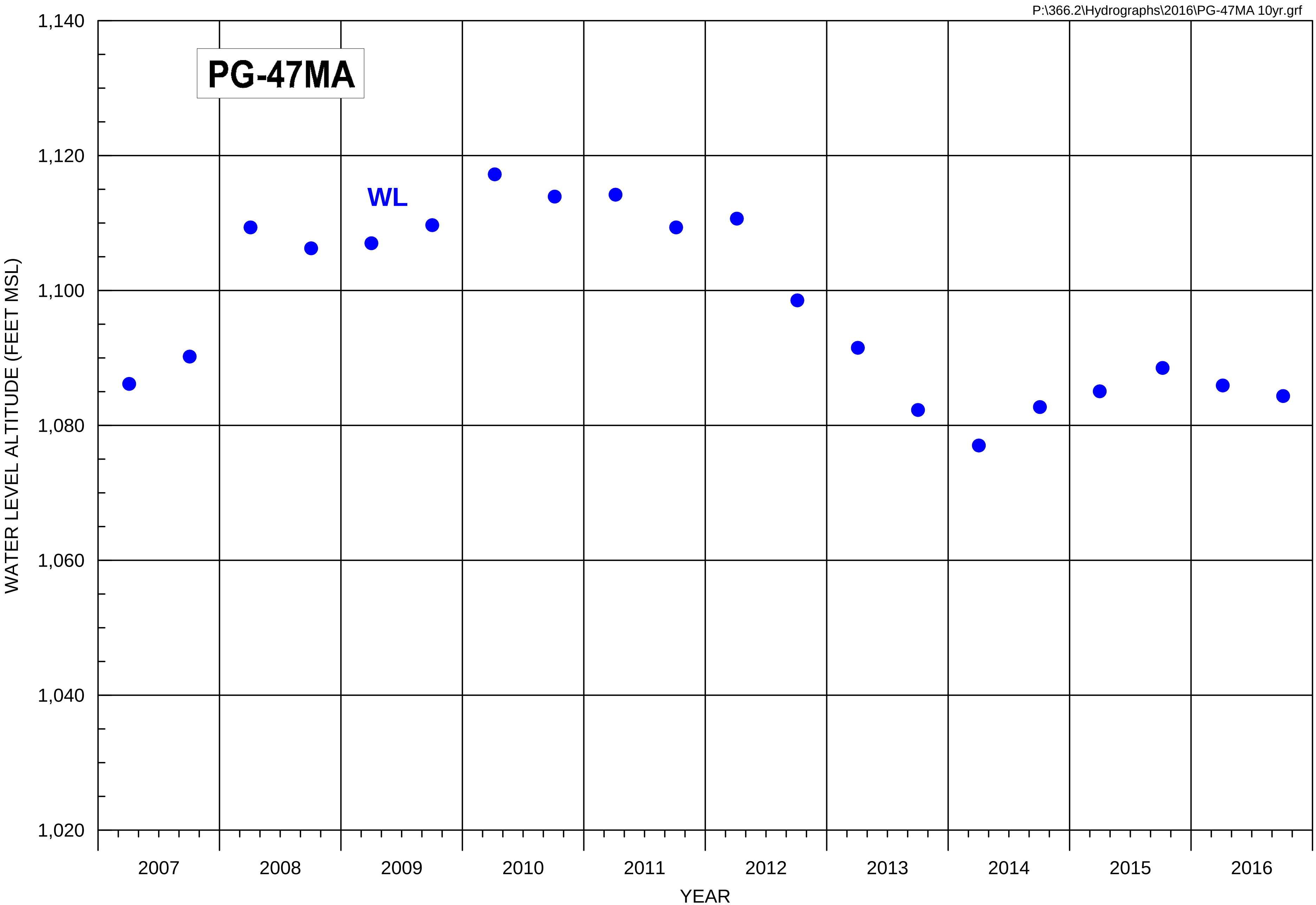


Altitude of Land Surface: 1,297.59

FIGURE C-109. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-44LA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,216.69

FIGURE C-110. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PG-47MA

North Indian Bend Wash Superfund Site

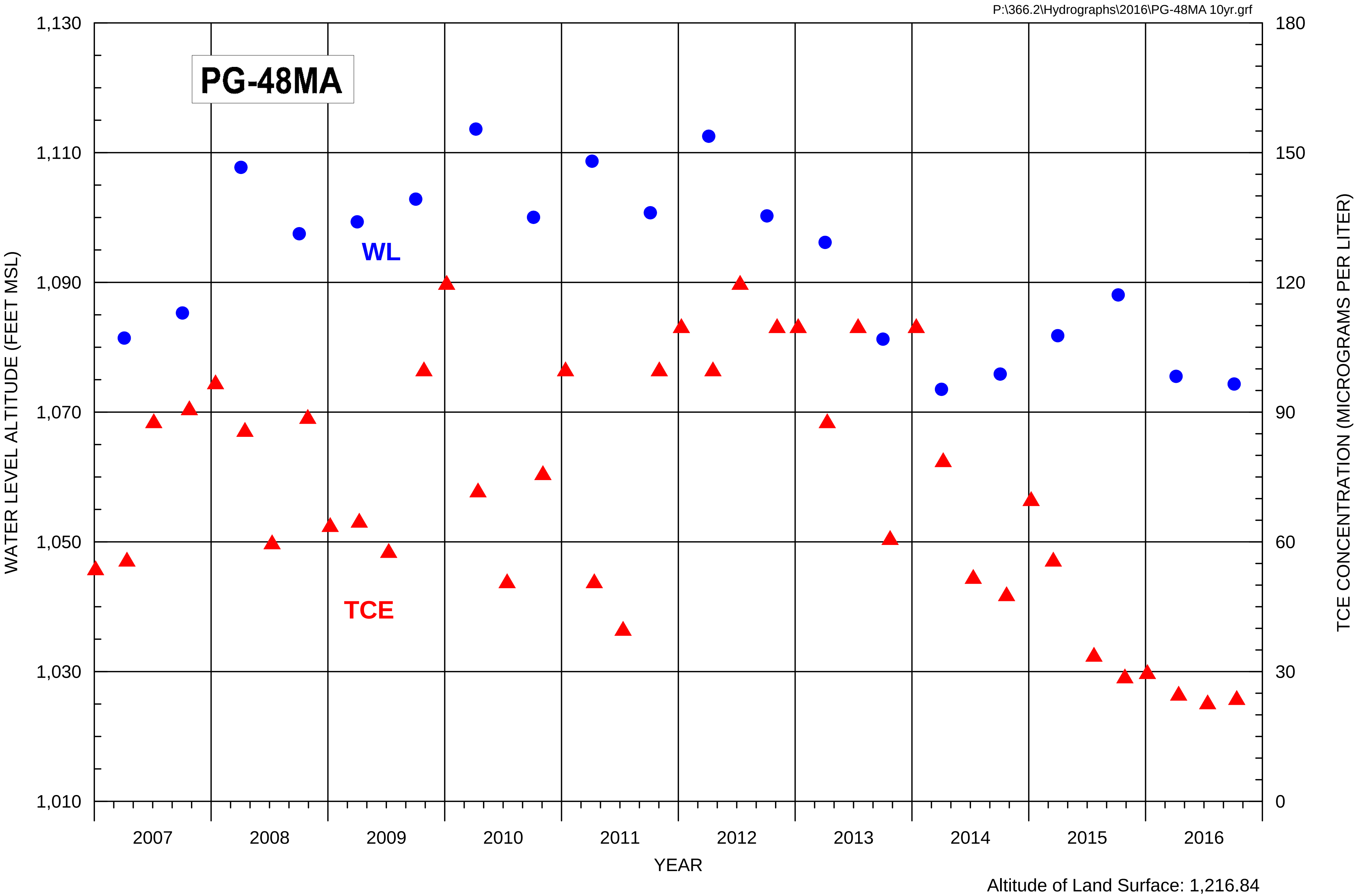
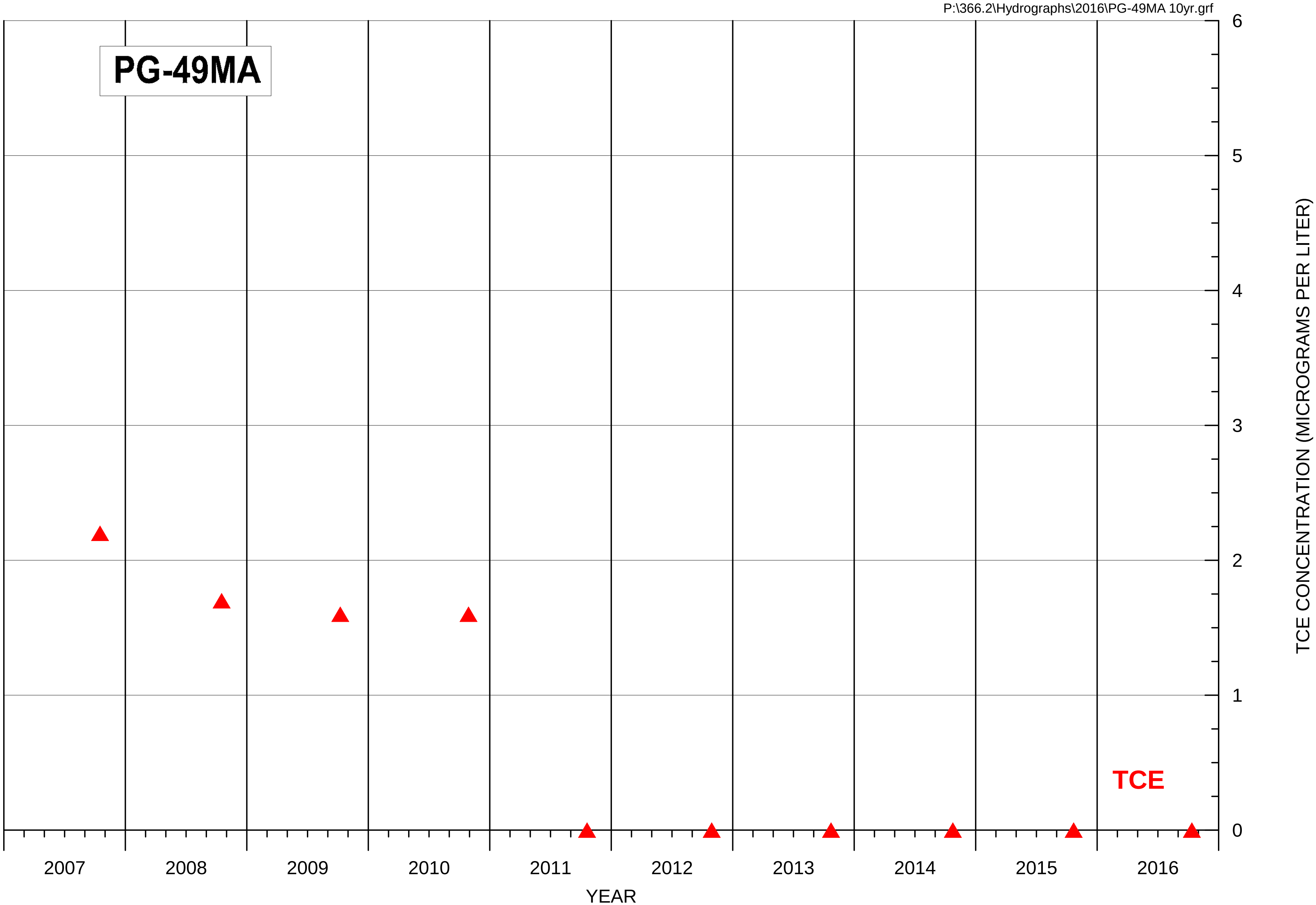


FIGURE C-111. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-48MA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,210.48

FIGURE C-112. TCE CONCENTRATIONS FOR MONITOR WELL PG-49MA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site

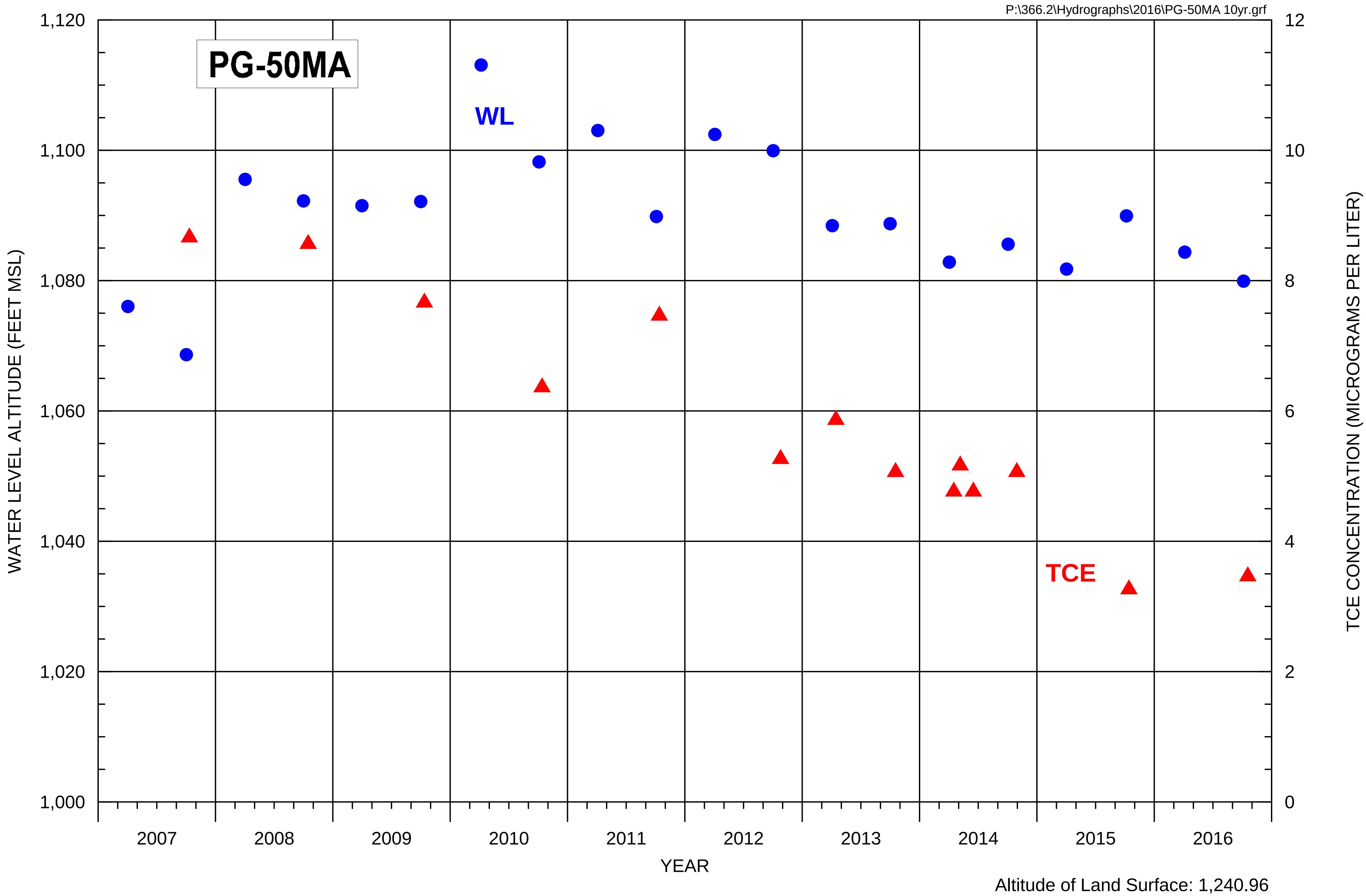
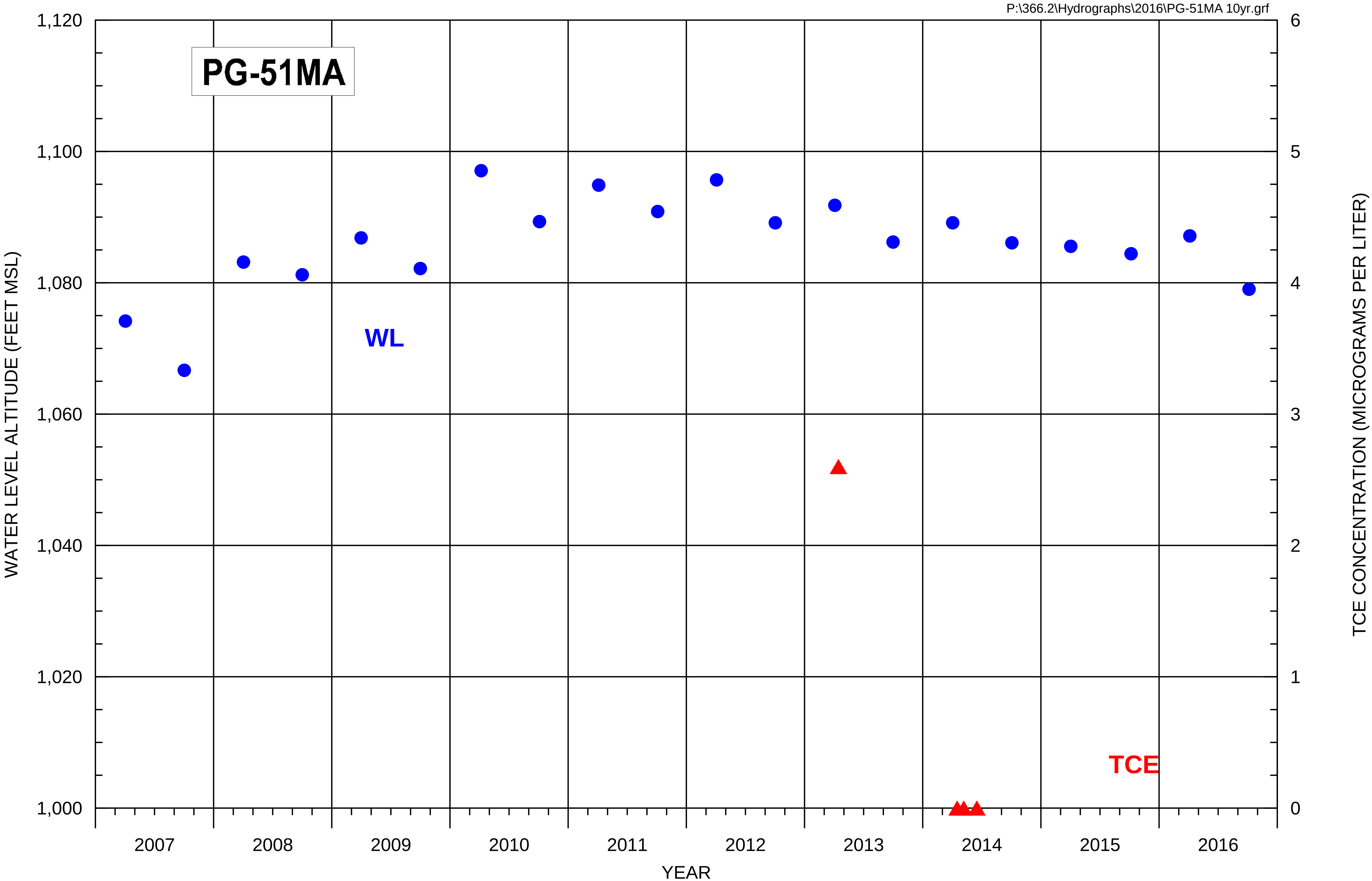


FIGURE C-113. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-50MA

North Indian Bend Wash Superfund Site

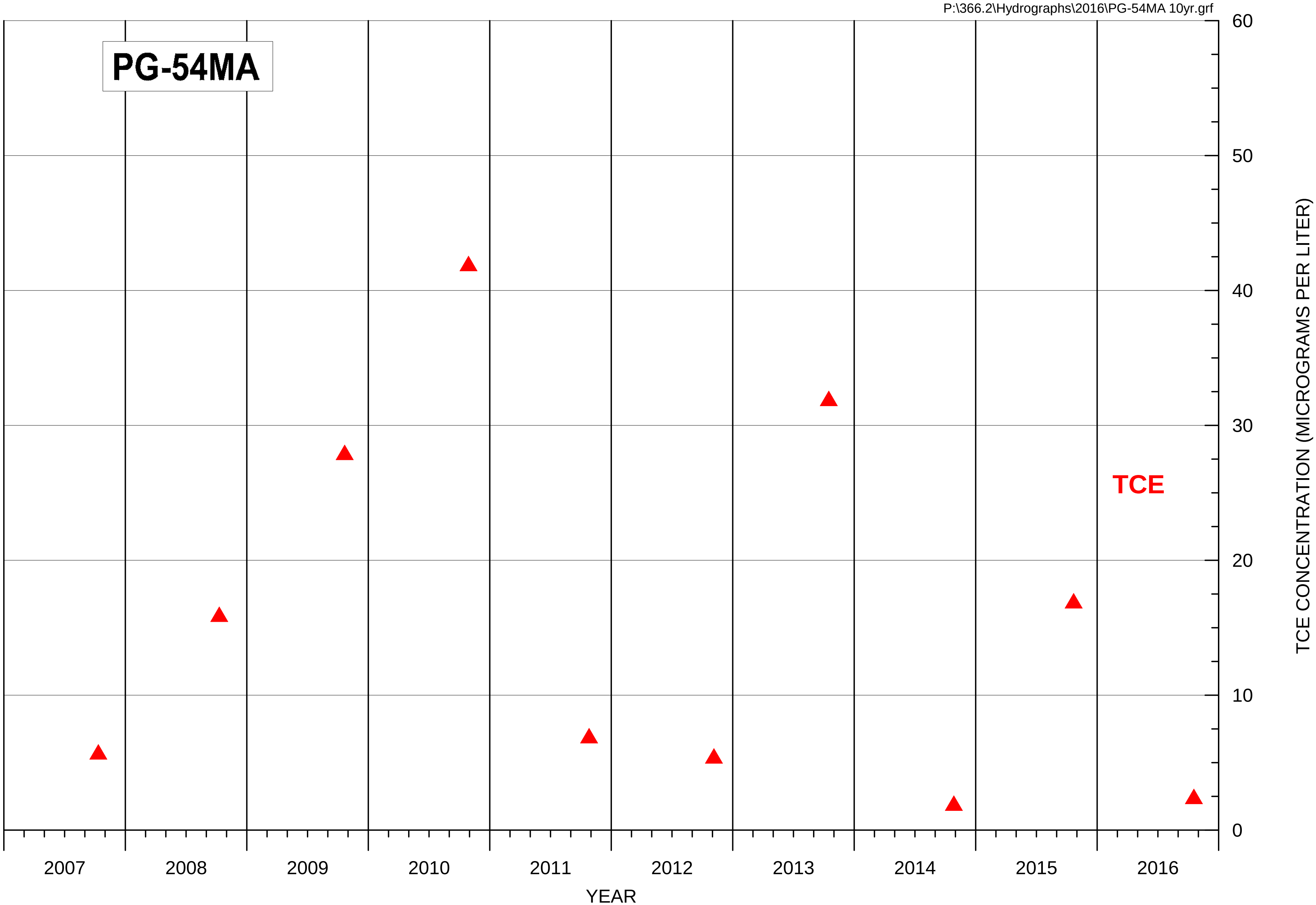


Altitude of Land Surface: 1,240.91

FIGURE C-114. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-51MA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,224.83

FIGURE C-115. TCE CONCENTRATIONS FOR MONITOR WELL PG-54MA

North Indian Bend Wash Superfund Site

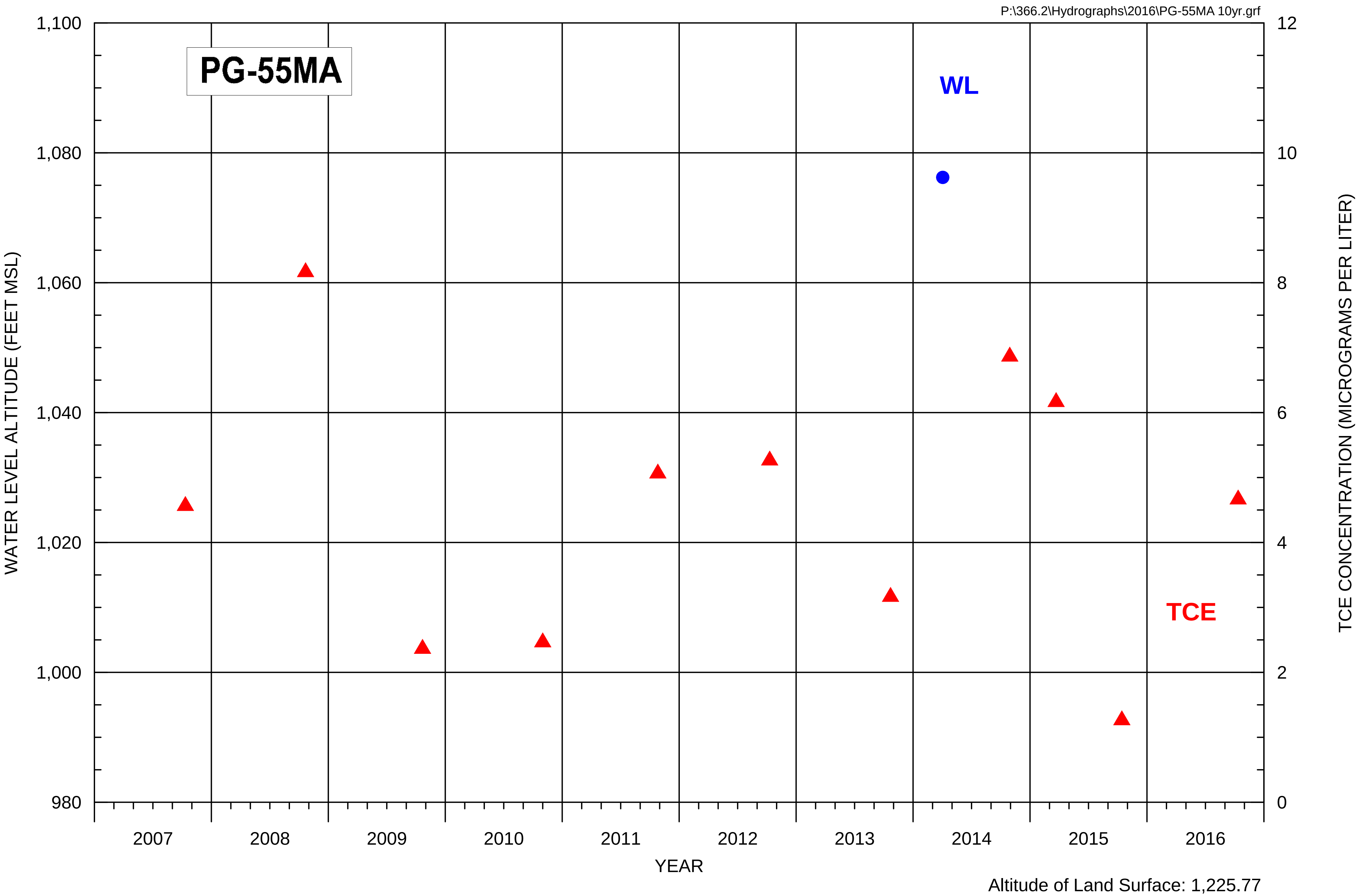
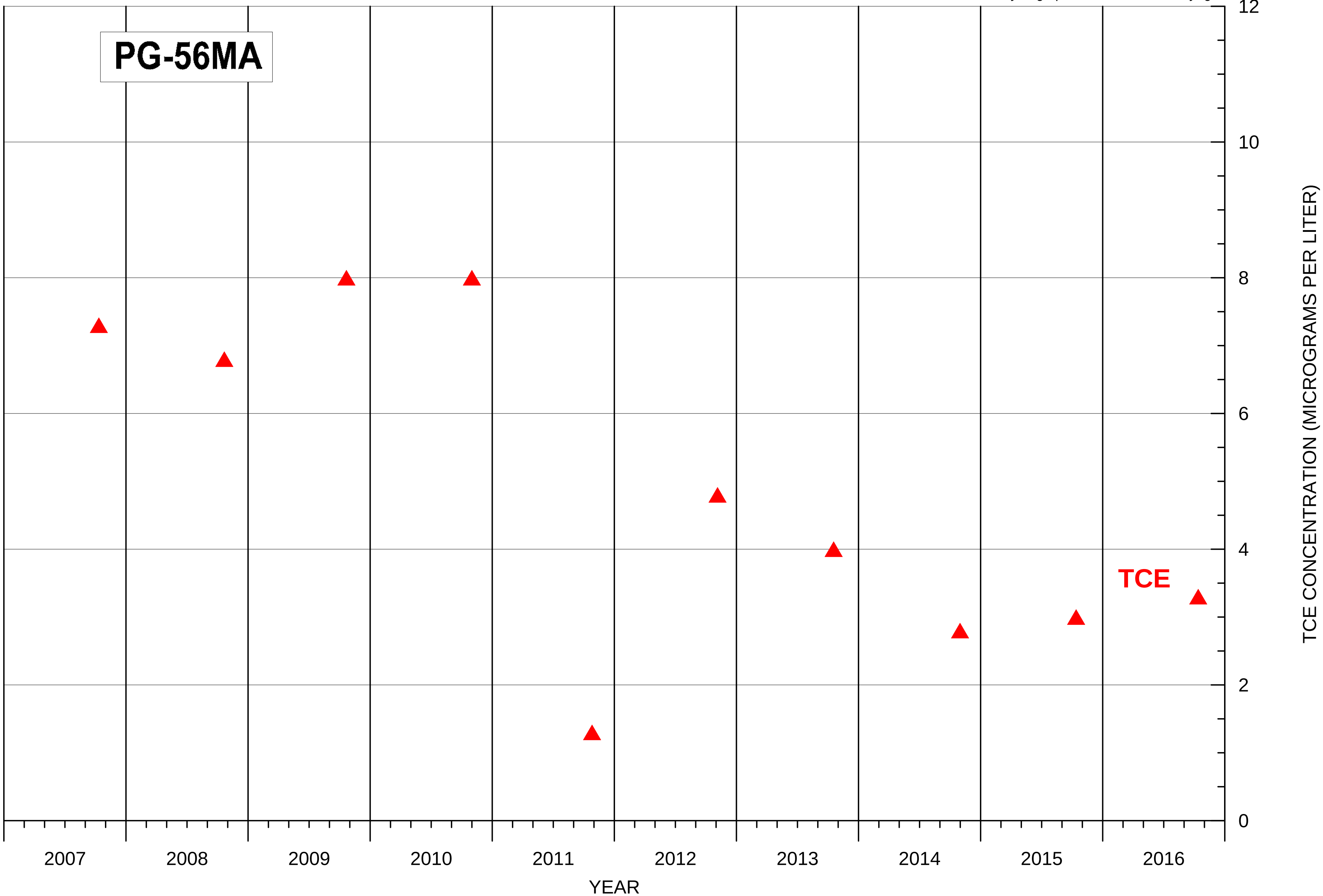


FIGURE C-116. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-55MA

North Indian Bend Wash Superfund Site

P:\366.2\Hydrographs\2016\PG-56MA 10yr.grf



Altitude of Land Surface: 1,231.86

FIGURE C-117. TCE CONCENTRATIONS FOR MONITOR WELL PG-56MA

North Indian Bend Wash Superfund Site

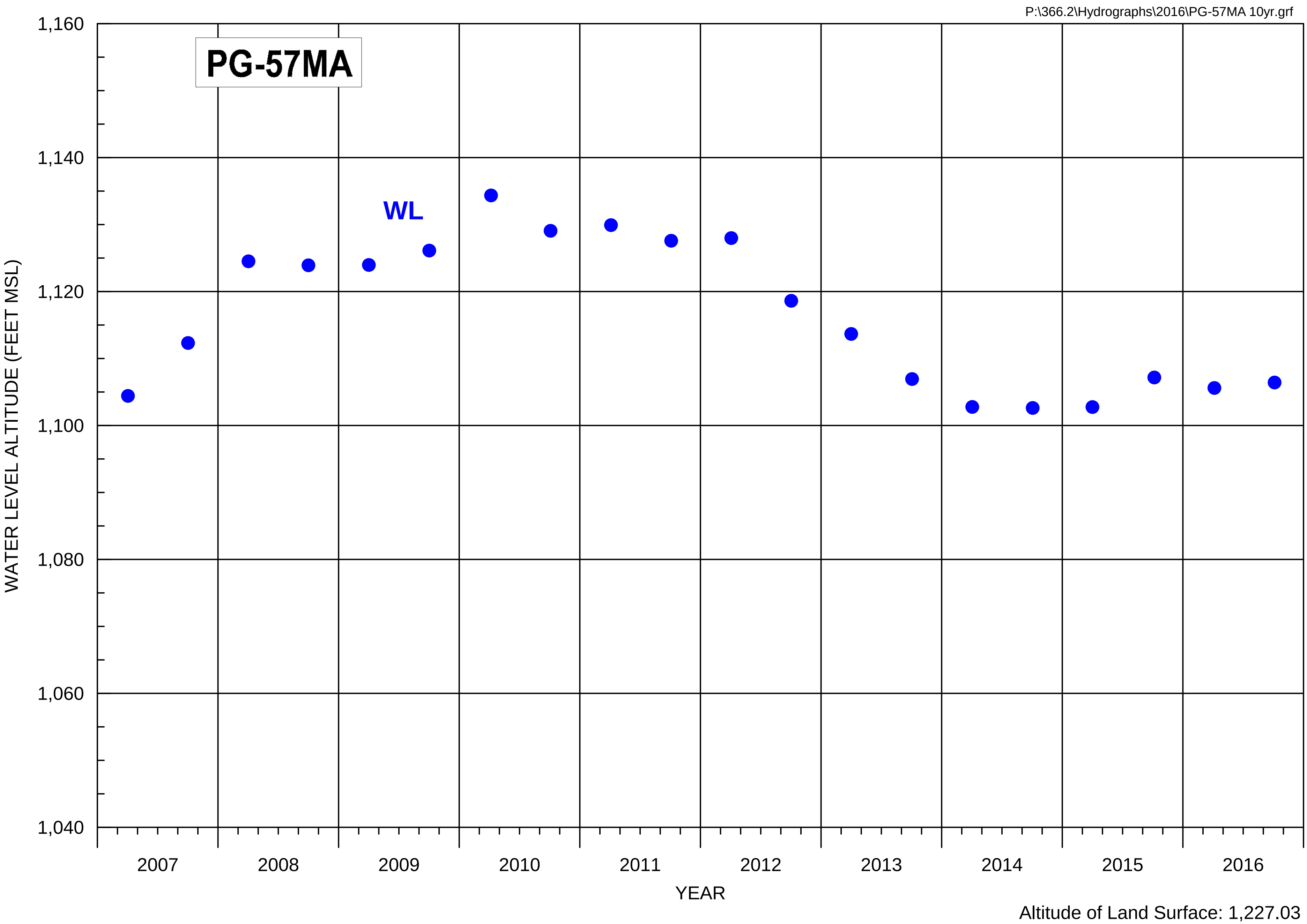


FIGURE C-118. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PG-57MA

North Indian Bend Wash Superfund Site

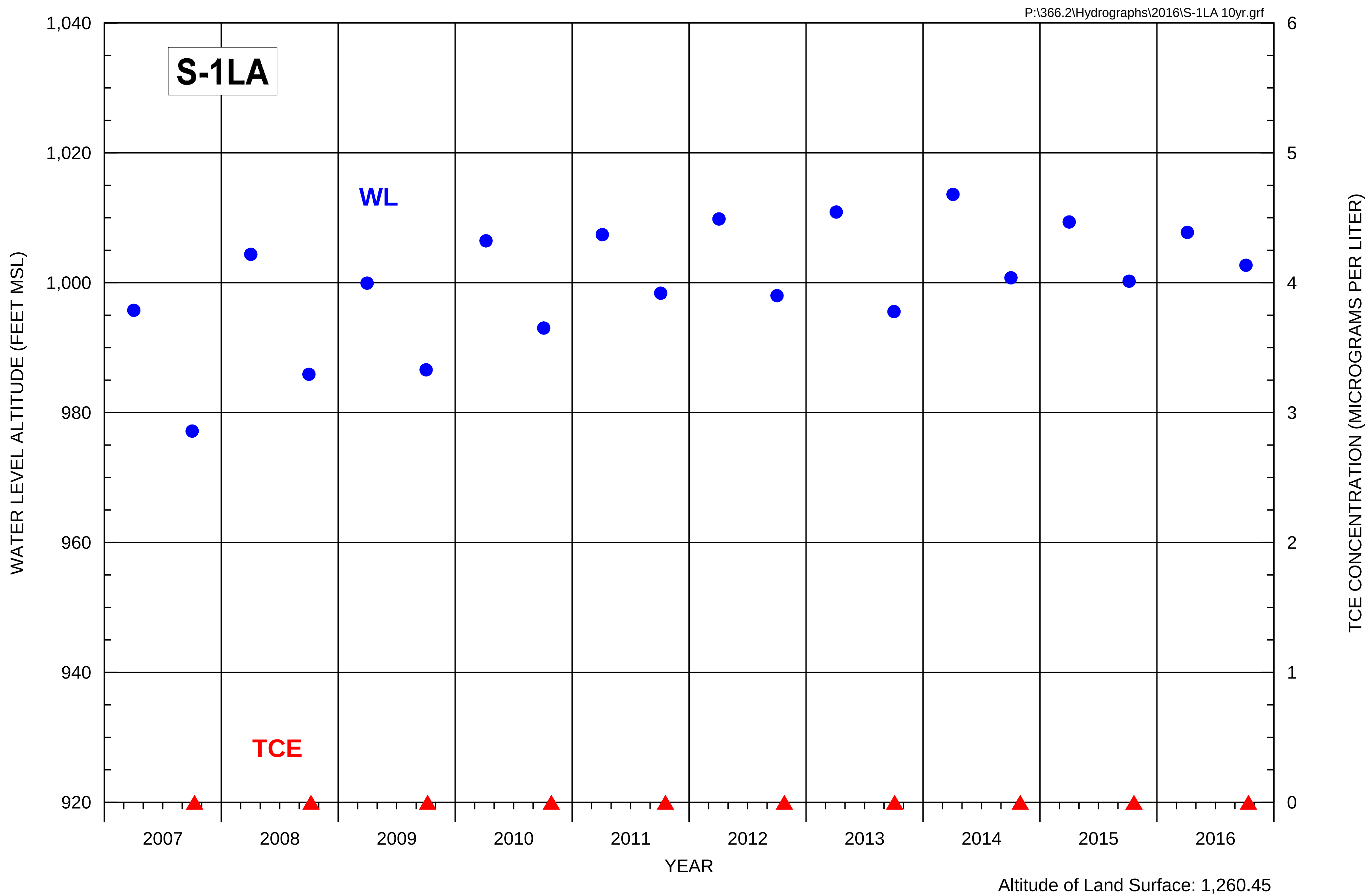
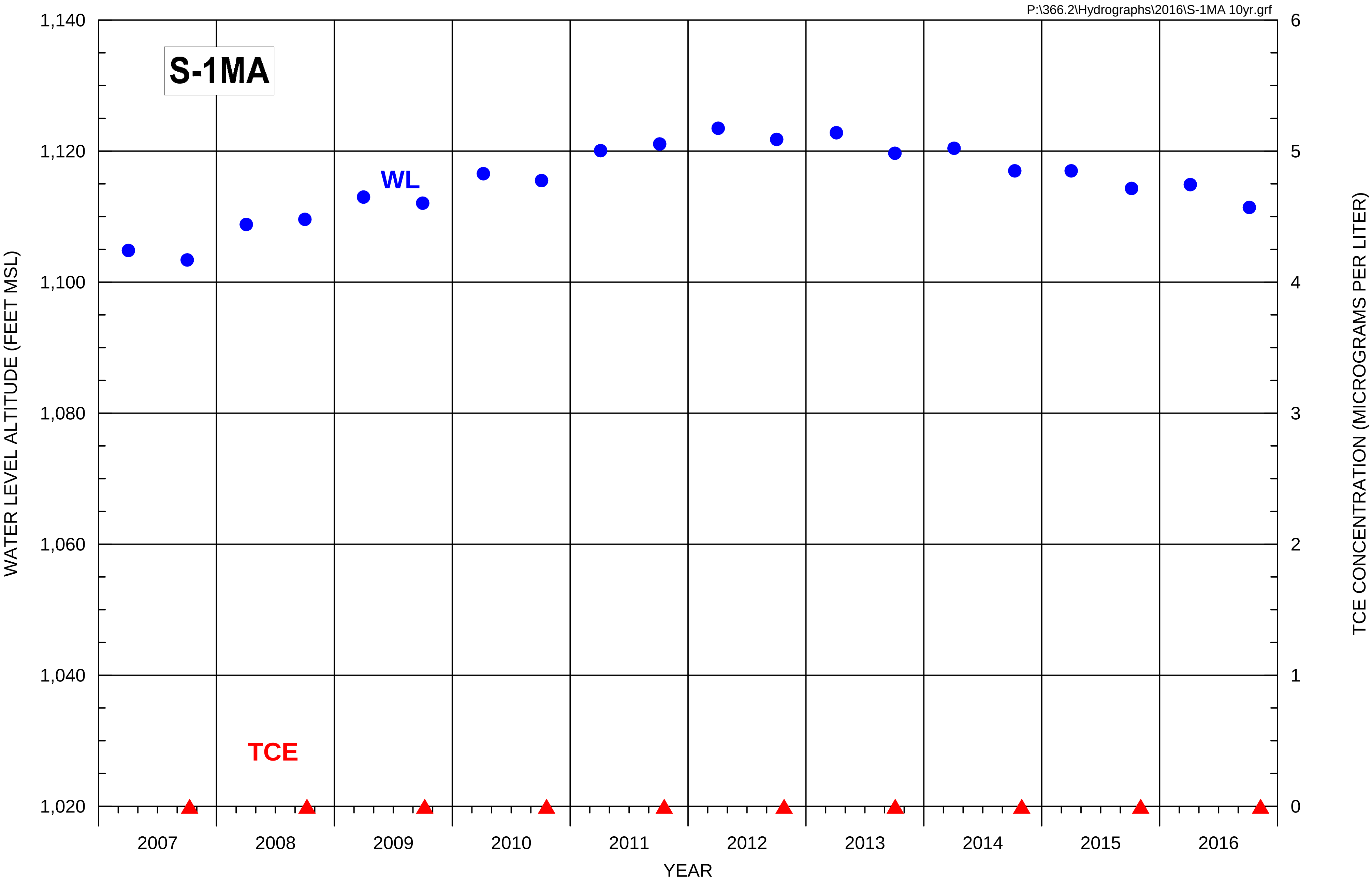


FIGURE C-119. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL S-1LA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,260.34

FIGURE C-120. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL S-1MA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site

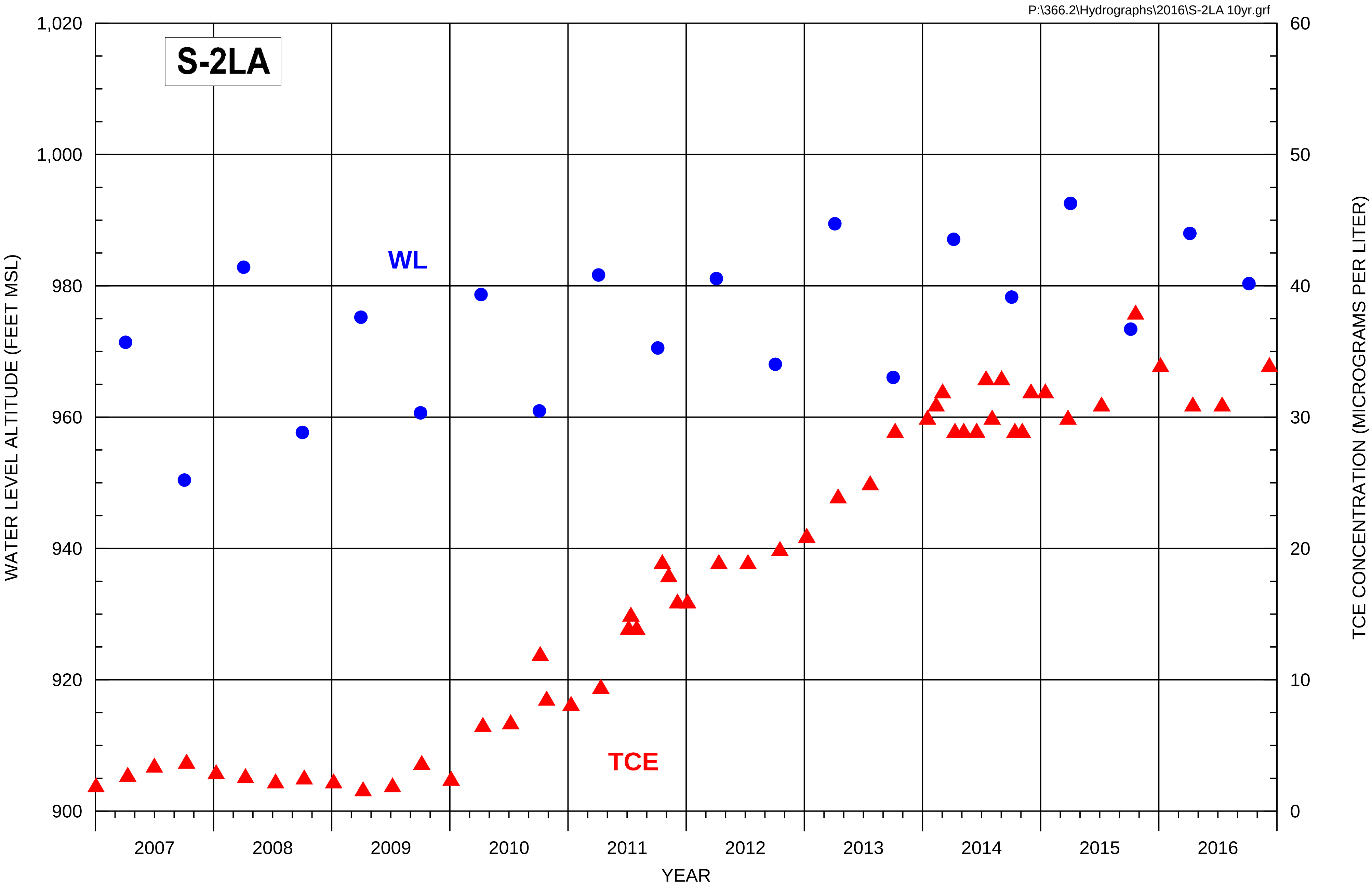


FIGURE C-121. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL S-2LA

North Indian Bend Wash Superfund Site

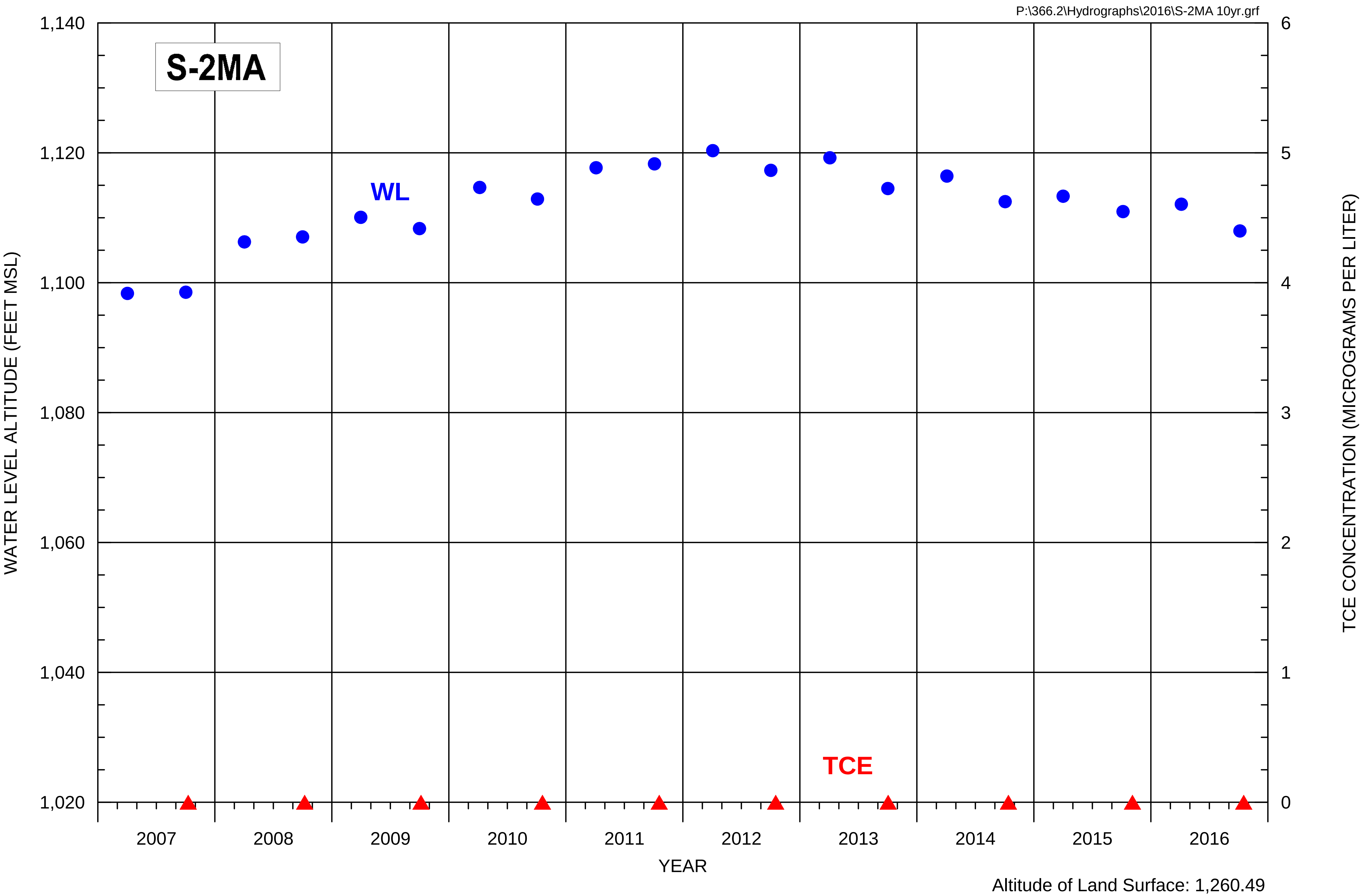


FIGURE C-122. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL S-2MA

Note: Results shown as having a concentration of '0' represent samples where TCE was not detected at the laboratory reporting limit.

North Indian Bend Wash Superfund Site

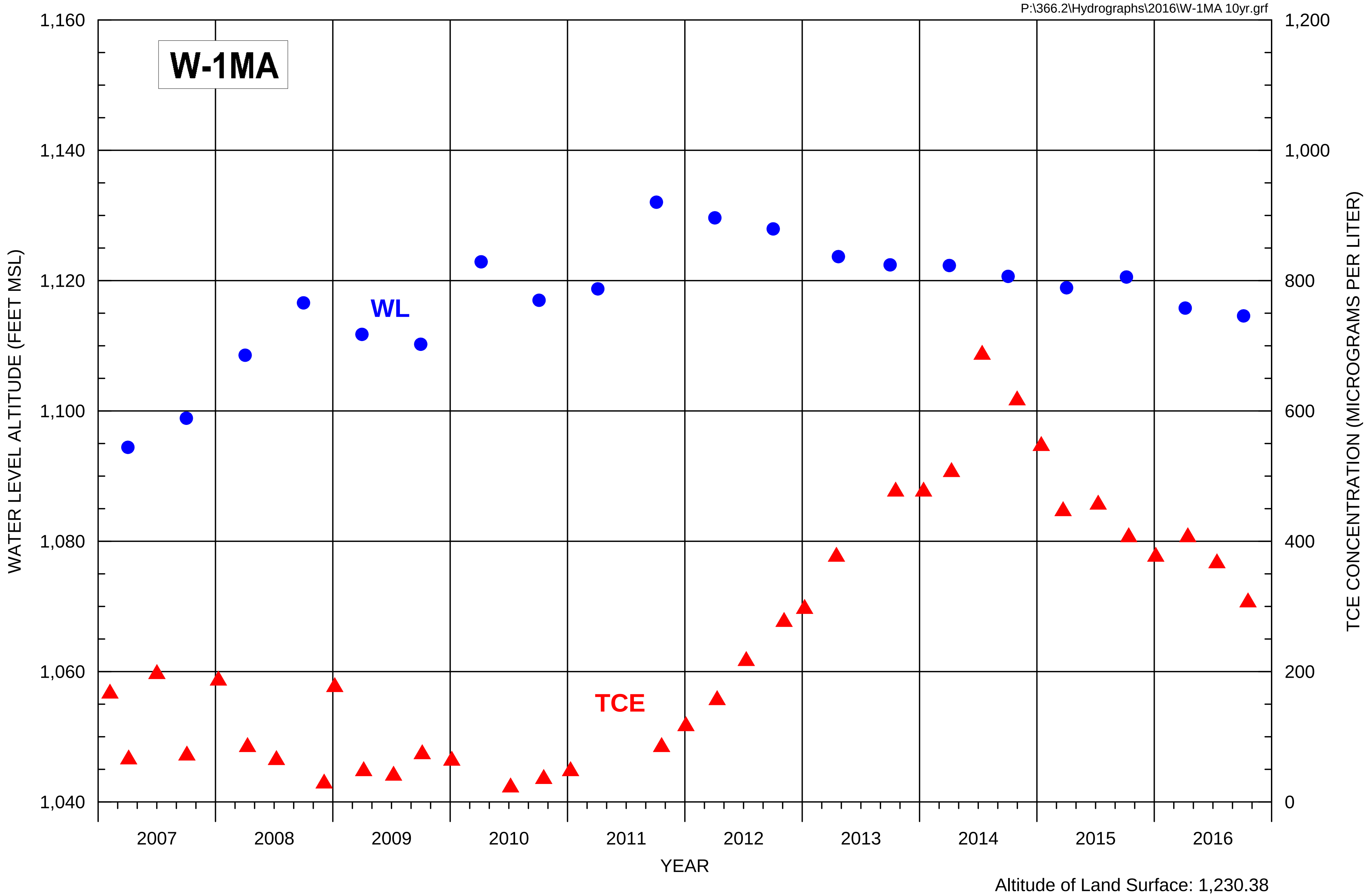


FIGURE C-123. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL W-1MA

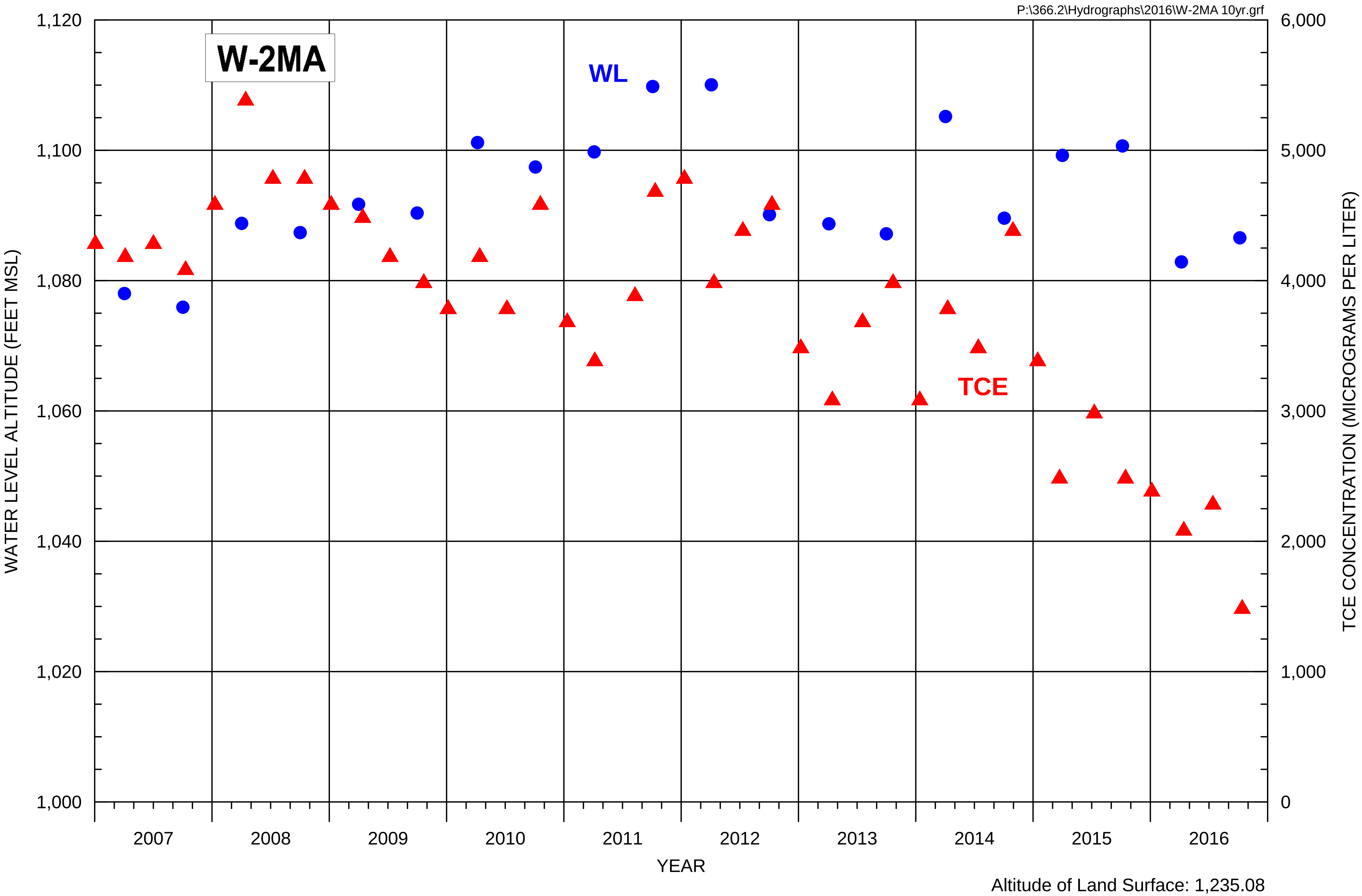


FIGURE C-124. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL W-2MA

North Indian Bend Wash Superfund Site

APPENDIX D

2016 SITE INSPECTION REPORT
GROUNDWATER TREATMENT FACILITIES

2016 INSPECTION REPORT
GROUNDWATER TREATMENT FACILITIES

North Indian Bend Wash Superfund Site

Prepared for:

U.S. Environmental Protection Agency
Region IX

Prepared by:

NIBW Participating Companies

March 28, 2017

2016 ANNUAL INSPECTION REPORT
Groundwater Treatment Facilities
North Indian Bend Wash Superfund Site
Scottsdale, Arizona

1.0 INTRODUCTION

This report documents the activities and findings for the North Indian Bend Wash (NIBW) groundwater treatment plant inspections conducted in accordance with Section VI.B.4.d of the NIBW Statement of Work (SOW). The purpose of the inspections, as described in the SOW, is to identify malfunctions, deterioration, operator practices or errors, and discharges that may be causing or could result in a release of untreated groundwater. The inspections were coordinated and conducted by the NIBW Participating Companies (PCs) and attended by representatives of the U.S. Environmental Protection Agency (EPA) and Arizona Department of Environmental Quality (ADEQ).

2.0 OVERVIEW

The groundwater remedy for the NIBW Superfund Site addresses hydraulic containment and aquifer restoration by monitoring, extracting, and treating groundwater affected by volatile organic compounds (VOCs), including the following five NIBW contaminants of concern (COCs): trichloroethene (TCE), tetrachloroethene (PCE), 1,1-dichloroethene (DCE), 1,1,1-trichloroethane (TCA), and chloroform. The NIBW COCs are treated to levels set forth in the Amended Consent Decree (ACD). Five separate groundwater extraction and treatment systems are used to extract and treat NIBW COC-affected groundwater at the Site. These systems are referred to as the Central Groundwater Treatment Facility (CGTF), Miller Road Treatment Facility (MRTF), North Indian Bend Wash GAC Treatment Facility (NGTF), Area 7 Groundwater Extraction and Treatment System (GWETS), and Area 12 GWETS.

Complete descriptions of the CGTF, MRTF, Area 7 GWETS and Area 12 GWETS and associated operation and maintenance (O&M) activities are presented in the "*Feasibility Study Addendum, North Indian Bend Wash Superfund Site*", dated November 15, 2000 (FSA), "*Record of Decision Amendment – Final Operable Unit, Indian Bend Wash Area*", dated September 27, 2002 (AROD), and the "*Sitewide Operation and Maintenance Plan*", dated June 5, 2006 (Sitewide O&M Plan), with individual treatment plant O&M plan updates that were prepared in 2014.

Detailed design and operational information for NGTF is included in "*Design Report, PCX-1 Granular Activated Carbon Treatment Facility*", dated August 2012, and "*Operation and Maintenance Plan, North Indian Bend Wash GAC Treatment Facility*", dated March 31, 2016.

All five groundwater treatment systems were designed to reduce NIBW COCs to below concentrations specified in Table 3 of the AROD (Cleanup Levels).

3.0 INPECTION PROCEDURES

3.1 Routine Inspections

The operators routinely inspect the treatment facilities, either daily or weekly. Data logging of parameters, such as totalized flow and equipment state, is performed during site visits. Data logging of critical parameters, such as air and water flow rates, is performed by the computer control system at each facility on an hourly basis, at a minimum. The operators review the data for trends and anomalies to evaluate the overall operation of the treatment systems.

Due to the size of the treatment plants and the drinking water end-use, the NIBW PCs coordinate and conduct regular operational review meetings on an approximate monthly basis with the operators for the CGTF and NGTF. The NIBW PCs also visit all of the treatment facilities frequently for a walk-through and to meet with the operators. These meetings include discussions of current operations issues, routine maintenance, planning for upcoming non-routine maintenance such as column cleaning, and equipment and/or systems upgrades.

Weekly, monthly, and/or quarterly data and operating reports are submitted by the facility operators. These reports are reviewed by the NIBW PCs to document O&M issues and confirm treatment effectiveness of each plant.

3.2 Annual Inspections

Inspections are conducted annually in accordance with the SOW and ACD. The inspections for CGTF and NGTF were conducted on December 13, 2016, and inspections for MRTF, Area 7 GWETS, and Area 12 GWETS were conducted on December 14, 2016.

The schedule of site inspections was coordinated in advance with EPA and ADEQ to provide an opportunity for regulatory agency participation. Representatives of EPA's contractor, Gilbane, Inc., were present during the inspections. The inspections included a facility walk-through; interview with the primary operator; visual inspections of the treatment equipment, waste storage areas, and groundwater containment systems; and review of operating and maintenance data. Detailed operating data and maintenance logs for routine operation and non-routine projects are maintained and available for review at each treatment facility in accordance with the SOW. Additionally, documents such as the facility O&M Plans, O&M Manuals, Contingency and Emergency Response Plans, and Health and Safety Plan are kept at each respective facility. A description of each facility inspection and associated results are provided in the following section.

4.0 FACILITY INSPECTIONS

4.1 Area 7 Groundwater Extraction and Treatment System

NIBW Area 7 is located at the southeast corner of 75th Street and 2nd Street in Scottsdale. The groundwater treatment system is located in the southeast corner of Area 7 in an area approximately 56 feet by 75 feet. The facility includes the treatment system and control equipment. Groundwater extraction is performed using three remote MAU groundwater extraction wells (7EX-3aMA, 7EX-4MA, and 7EX-6MA). In its current configuration, the groundwater treatment system is designed to treat up to 500 gallons per minute (gpm) of NIBW COC-affected groundwater. Treated water is delivered to one of two remote groundwater injection wells (7IN-1UA and 7IN-2UA) for recharge to the Upper Alluvium Unit (UAU).

In 2012, well 7EX-5MA became unusable during a rehabilitation project to increase production at that location. In 2015, well 7EX-6MA was sited, installed, and began extraction to replace both wells 7EX-4MA and 7EX-5MA while still capturing the highest concentrations of NIBW COCs in the vicinity of Area 7. Well 7EX-5MA was formally abandoned in August 2016.

In early October 2016, the pumping water level in well 7EX-4MA had declined to a point that the pump began to stall. Previously, the well pump had been lowered to near the bottom of the well in response to this issue. A well rehabilitation was performed in 2012 with limited results. Additional rehabilitation efforts at well 7EX-4MA are not likely to result in a significant production increase. Well 7EX-4MA is currently offline.

In 2016, the typical water flow rate to the Area 7 GWETS was approximately 360 gpm. The typical air flow rate through the shallow-tray air stripper at Area 7 was approximately 2,700 cubic feet per minute (cfm).

The major components of the GWETS include submersible water pumps, wellhead equipment, piping from the wellheads to the treatment plant, an equalization tank, an ultraviolet oxidation (UV/Ox) reactor, a low-profile air stripper, and a vapor-phase granular activated carbon (GAC) treatment system.

During normal operation, treated groundwater is injected into the UAU via wells 7IN-1UA and/or 7IN-2UA. The GWETS is equipped to discharge treated groundwater either to the UAU aquifer upgradient of Area 7 through the injection wells or, under limited circumstances, to the Scottsdale sanitary sewer during maintenance on the system.

The groundwater treatment plant includes a building, which houses the major treatment equipment such as the UV/Ox and air stripper systems. A control room is integral with the building and is equipped with the motor control center (MCC) and human machine interface (HMI), main control center, including programmable logic controller (PLC), and motor drives.

The equalization tank and GAC adsorbers are located outside the building on the north side of the treatment plant area. A double-contained hydrogen peroxide tank is located on the south side of the treatment plant area in a contained concrete foundation with a six-inch berm. The entire treatment plant area is paved with concrete and surrounded by a two-inch berm for containment.

The treatment plant is surrounded by a block wall for security. Access to the plant is provided through three steel gates, two located on the west wall and one on the south wall.

4.1.1 Area 7 Maintenance and Condition

The Area 7 GWETS is operated and maintained by Arcadis, Inc. (Arcadis), an engineering consultant working on behalf of the NIBW PCs. Arcadis makes twice daily remote checks on the system and makes weekly inspections of the equipment and grounds at Area 7. The operator also maintains operations logs and data spreadsheets at Area 7. The logs and spreadsheets were presented for review by the inspection team during the site inspection. Equipment maintenance records, including task and date, are kept on a separate log. Other site and operational information kept in a log book includes daily inspections observations and any other data collected by the operator. Treatment system data is also automatically logged by the control system and accessed through the HMI.

The Area 7 GWETS operated more than 75 percent of the time during 2016. Downtime is attributed to optimization testing of Area 7 wells, routine equipment maintenance, and multiple periodic power outages, primarily related to local weather.

In general, the facility appeared clean with no apparent leaks or significant deterioration during the inspection. The equipment was clean, labeled, and well maintained.

Wells 7EX-3MA, 7EX-4MA, and 7EX-6MA were the primary sources of groundwater for the Area 7 GWETS in 2016. The pump in well 7EX-4MA was shut down in early October due to a low pumping water level in the well.

During the inspection, the process pumps in the plant appeared to be operating smoothly and without abnormal noises or vibrations. The process pumps are inspected and serviced weekly. No significant maintenance or replacement was required on the process pumps at Area 7 in 2016.

The UV/Ox system appeared to be operating normally during the inspection. The lamps in both UV/Ox reactor #1 and UV/Ox reactor #2 were replaced on September 23, 2016.

The blower appeared to be running smoothly during the inspection. The blower is direct drive and operated via a variable frequency drive which maintains fan speed. The operator indicated that the blower has performed well, and no service has been required. All dampers are checked monthly for operability.

The internal air stripper trays were inspected in December 2016. The internal air stripper trays were last cleaned in January 2015. With the use of the scale inhibitor, only minor accumulation of calcium carbonate scale was present during the inspection; however, this does not affect the air stripper performance. Descaling is typically performed every few years, as needed.

Treated water from Area 7 is injected into the underlying UAU aquifer using wells 7IN-1UA and 7IN-2UA.

The injection wells are equipped with monitoring devices that will shut down discharge to the injection wells in the event water in the wells rises to pre-determined levels.

At the time of the inspection, no operational issues were apparent with either injection well 7IN-1UA or 7IN-2UA.

Arcadis indicated that all instruments, alarms, and interlocks for the main control system were tested and validated in August 2016.

4.1.2 Results

Based on operating and monitoring data, the Area 7 GWETS has consistently met treatment performance criteria set forth in the ACD.

Based on the 2016 inspection of the Area 7 GWETS, no treatment performance issues, hazards, significant deterioration, or equipment malfunctions were apparent.

4.2 Area 12 Groundwater Extraction and Treatment System

The Area 12 GWETS is located at the General Dynamics facility at 8201 East McDowell Road in Scottsdale, Arizona. At this site, the air stripping tower is located just west of the Chemical Operations Building. The Area 12 GWETS is designed to treat up to 1,850 gpm of groundwater. Groundwater is extracted from two wells: MEX-1MA and SRP well 23.6E-6.0N, also known as the Granite Reef well. The Granite Reef well is owned and operated by SRP. The treated groundwater is delivered to SRP's irrigation distribution system through a connection to an SRP lateral pipeline, located along Granite Reef Road.

Typical flow rates from MEX-1MA and the Granite Reef well in 2016 were approximately 650 to 750 gpm and 800 to 900 gpm, respectively. During much of 2016, both the Granite Reef well and MEX-1MA were operated concurrently.

The Area 12 system is typically shutdown for the annual SRP dry-up in late December and restarted in early February, once the discharge is allowed by SRP. The system remained offline until February 2016 for the annual SRP dry-up. Much of the 2016 scheduled maintenance was performed during that time.

The Area 12 GWETS consists of an air stripping system and an off-gas treatment system. Groundwater is pumped from the extraction wells in individual pipes to a common manifold near the air stripper. The air stripper is a counter-current forced-draft, packed column through which the NIBW COCs are removed from the groundwater. In 2016, the typical air flow rate through the air stripper was approximately 5,400 cfm.

The off-gas treatment is a vapor-phase GAC polishing system. The treated groundwater is discharged to SRP's irrigation distribution system under an agreement between SRP and Motorola Solutions, Inc.

The main control panel containing the system PLC is located at the Area 12 treatment plant. Each well pump system is connected to the PLC using an Ethernet connection with signals traveling via a fiber optic pathway. Each well site also contains a PLC to control the individual remote well operation. The remote well pump PLCs also interface with SRP systems to monitor and control well operation.

A small control room located at the treatment plant houses the HMI and various plant-specific records. The HMI consists of a computer that supports a graphical user interface, logs operating data, and allows remote operation and data transfer using a telephone modem.

4.2.1 Area 12 Maintenance and Condition

The Area 12 GWETS is operated and maintained by EnSolutions, an engineering consultant working on behalf of the NIBW PCs. When in operation, EnSolutions makes daily remote checks on the system via computer and approximately twice weekly visits to the GWETS. During the visits, the operator conducts inspections of the equipment and grounds at Area 12. The operator also maintains operations logs and data spreadsheets at the facilities. The logs and spreadsheets were presented for review by the inspection team during the site inspection. A safety coordinator for the General Dynamics facility makes daily walk-throughs at the Area 12 GWETS.

Except for the scheduled maintenance shut down in January through February 22, 2016 for the annual SRP dry-up, the Area 12 GWETS was available for operation more than 98% of the time in 2016.

In general, the facility appeared clean, with no apparent leaks or significant deterioration during the inspection. The equipment was clean, labeled, and well maintained.

The blowers appeared to run smoothly. The air stripper blower belts were changed in January 2016 during the extended SRP dry-up. The main blower was also balanced and aligned during the January 2015 SRP dry-up. The blower belts were changed in July 2016. The operator indicated that the blowers have performed well since that time, and no other non-routine service has been required.

Scale removal was last performed on the air stripper column in January 2016 during the extended SRP dry-up. Scale removal is typically performed annually when maintenance is performed during the SRP dry-up period.

The process control system is monitored continuously by the computer. The system must be in auto-mode for start-up and operation. The system cannot start with an active shutdown alarm. The primary control system alarms are tested annually during the SRP dry-up maintenance period. The control system primary alarms were tested and validated in January 2016. The results of the testing were presented for review. The testing data indicated that all systems were operable. The operator indicated that the alarms are routinely tested when the system is shut down. All equipment, control device elements, transmitters, alarms, and interlocks are tested at least once per year.

4.2.2 Results

Based on operating and monitoring data, the Area 12 GWETS has consistently met performance criteria set forth in the ACD.

Based on the 2016 inspection of the Area 12 GWETS, no treatment performance problems, hazards, significant deterioration, or equipment malfunctions were apparent.

4.3 Miller Road Treatment Facility

MRTF is located at 5975 Cattletrack Road, south of the intersection of Cattletrack Road and McDonald Drive in Scottsdale, Arizona. The facility is owned and operated by, and the responsibility of, EPCOR Water USA (EPCOR). MRTF is used to treat water from EPCOR production wells PV-14 and PV-15.

MRTF consists of three individual air stripping treatment trains. Each treatment train includes a counter-current, forced-draft air stripper with appurtenant equipment, such as an air blower. The off-gas from each air stripper passes through a mist eliminator, then through ducting to one of three GAC adsorbers before discharge to the atmosphere. Each air stripper column was designed to treat groundwater at flow rates up to 2,100 gpm, with a typical air flow rate of approximately 11,300 cfm. A comprehensive rehabilitation project completed in 2010 refurbished the air stripper column internals and made several other improvements at the facility.

Water produced from wells PV-14 and PV-15 is treated by EPCOR typically through Treatment Train 3 and Treatment Train 2, respectively, and delivered to the clearwell at MRTF, where it is then pumped to EPCOR's Paradise Valley Arsenic Removal Facility. If not required for use in EPCOR's system, treated water may be delivered to SRP via the Arizona Canal outfall. The treatment system is configured such that water from one well is treated through a specific column. The treatment piping allows water from well PV-14 to be treated through Tower 2 or 3, and water from well PV-15 can be treated through Tower 1 or 2.

At the time of the inspection, treatment of water from both wells PV-14 and PV-15 was occurring at MRTF. EPCOR is responsible for operation and maintenance at MRTF.

All of the treatment equipment, except the GAC adsorbers, is located inside the treatment building. The treatment building consists of several rooms including the air stripper room, which houses the air stripper columns, blowers, and distribution pumps; the electrical room, which supports the MCCs, starters, Remote Terminal Units (RTUs), Remote Input/Output (RIO) cabinets, transformers, and other electrical equipment; and the control room, where the HMI, laboratory, and records are located.

For security and aesthetics, the facility is surrounded by a masonry wall with locking access gates.

4.3.1 MRTF Maintenance and Condition

EPCOR made relevant operating, monitoring, and safety documents, as well as operating data and maintenance logs for MRTF, available during the inspection. Additionally, the operator was interviewed and a walk-through of the facility was conducted.

EPCOR mans MRTF for several hours a day, five days a week. The operator makes daily inspections of the equipment and grounds at MRTF. The operator also maintains operations logs and data spreadsheets at the facility.

MRTF was available for treatment of groundwater from wells PV-14 and PV-15 the entire year. Wells PV-14 and PV-15 are operated based on demand from EPCOR's system. Well PV-15 is the highest priority for pumping, so it remains operational nearly continuously. Well PV-14 may be shut down from time to time in the winter months due to low demand. The pump in well PV-15 failed on March 22, 2016. The motor was replaced and the pump restarted on June 8, 2016. On July 23, 2016, a splice in the electrical cable shorted and the pump failed. The splice was repaired and the pump restarted on August 17, 2017. The electrical cable shorted again on October 19, 2016. The cable was replaced and the pump restarted on December 15, 2016.

Column cleaning to remove calcium carbonate scale at MRTF was planned for early 2017. Column cleaning consists of circulating a low pH solution through the packing to remove the accumulated scale. Spent cleaning solution is discharged to the City of Scottsdale (COS) sanitary sewer under requirements of a temporary discharge permit issued by COS.

The blowers and treatment area are inspected daily by the operator. Maintenance, such as balancing and belt alignment on the blowers, is performed by EPCOR technicians on an as needed basis in accordance with the O&M instructions provided by the manufacturer. All blowers at MRTF appeared to run smoothly without excessive vibration and unusual noises during the inspection.

The equipment and work areas at MRTF appeared clean and well maintained during the inspection. The piping, valves, and instruments were labeled and appeared in good condition.

EPCOR indicated that the automated valves are tested and calibrated once per year. The manual valves are exercised approximately three to four times a year. Process instruments are checked and calibrated and/or tested once per year by EPCOR.

The air handling system appeared tight and in good condition during the inspection. EPCOR indicated that the dampers are exercised periodically.

4.3.2 Results

Based on operating data, MRTF has consistently met performance criteria set forth in the ACD.

Based on the 2016 inspection of MRTF, no treatment performance issues, hazards, significant deterioration, or equipment malfunctions were apparent.

4.4 Central Groundwater Treatment Facility

The CGTF is located at 8650 E. Thomas Road in Scottsdale, Arizona at the northeast corner of Pima Park, a municipal park. Other nearby facilities include the CGTF wells and Reservoir 80, into which treated water from the CGTF is discharged for beneficial use as a supply to the COS potable water system.

Background and details of the CGTF are provided in the O&M Plan developed for this facility. The EPA-approved CGTF O&M Plan, dated March 2006 and updated in April 2014, describes the facility, major pieces of equipment, control strategies, and performance monitoring of the treatment plant. Design parameters and performance of CGTF have been validated and documented in the O&M Plan, quarterly Compliance Monitoring Reports, and annual data reports for the NIBW Site.

Additionally, an extensive engineering evaluation of the plant, equipment, and control system was conducted between August and October 2008. The results and findings associated with those activities are included in the final report, *Engineering Evaluation, Central Groundwater Treatment Facility*, dated January 2009, by Environ.

The CGTF uses air stripping to remove NIBW COCs, primarily TCE, from groundwater. The CGTF is comprised of three separate, parallel treatment trains. Each treatment train consists of a packed column, a process air fan, and an off-gas vapor treatment system that removes NIBW COCs prior to discharge to the atmosphere. Each column has a design capacity of 3,150 gpm. The overall capacity of the CGTF is approximately 9,450 gpm. The separate treatment trains allow for one or more columns to be removed from service while the other column(s) continue to operate.

Groundwater is pumped from wells COS-75A, COS-71A, COS-72, and COS-31 through transmission pipelines to the CGTF. Currently, only well COS-75A is pumped to and treated at CGTF. Water from well COS-31 may be used as back-up if water from other sources is not available. Influent water combines in a common raw water header and is evenly distributed into the available columns, where it flows, top to bottom through the column packing while airflow is pulled through the tower in a counter-current direction.

Since water from the wells is delivered to CGTF in a common header, the flow rate through each column can vary depending on the number of wells and columns in service at any given time. Typically, the flow rate through the columns ranges between approximately 1,500 and 3,000 gpm.

The treated water is collected in individual sumps at the bottom of each column and then flows by gravity into a common sump. The treated water is discharged to the COS potable system or to the SRP irrigation system. The capacity of the connection to the SRP irrigation system varies based on several factors, with a current maximum of approximately 4,000 gpm. Blending of CGTF treated water with other water supplies occurs in the potable water storage facility, Reservoir 80, just south of the site.

A process air fan is used to pull air through an intake filter then upward through the packed column, counter-current to the water flow. The off-gas is directed through a mist eliminator, a natural gas-fired duct heater, and then to a GAC contactor prior to discharge to the atmosphere. The duct heater reduces relative humidity prior to VOC adsorption in the GAC contactors.

The majority of the treatment equipment, except the duct heaters, GAC contactors, and chlorination equipment, is located inside the CGTF treatment building. The treatment building consists of several rooms, including: the air stripper room, which houses the packed columns and process air fans; the electrical equipment room, which supports the MCCs, starters, RTUs, RIO cabinets, transformers, and other electrical equipment; and the laboratory. Chlorination equipment is located in a separate building at the Reservoir 80 booster station and is part of the drinking water system operated by COS.

For security and aesthetics, the facility is surrounded by a masonry wall with locking access gates.

4.4.1 CGTF Maintenance and Condition

CGTF is operated and maintained by a COS water treatment operator. COS operations personnel also monitor the status of CGTF remotely. Operators make minimum daily inspections of the equipment and grounds at CGTF. The operator maintains operations logs and data spreadsheets at the facility. The logs and spreadsheets were presented for review by the inspection team during the site inspection. Technical staff from Scottsdale Water Operations, such as mechanics and instrumentation technicians, also provide maintenance support, as needed.

The Scottsdale Water Resources Department uses a city-wide preventative maintenance program for all equipment operated by the water operations staff. This program maintains a service record database for each piece of equipment and alerts the technicians when routine preventative maintenance is necessary.

The CGTF was available for operation continuously between January and October. On November 1, 2016, CGTF was shut down for annual column cleaning and maintenance. The system was restarted on December 29, 2016. In general, the facility appeared clean with no apparent leaks or significant deterioration. The equipment is clean, labeled, and well maintained.

All piping appeared in good condition without leaks or corrosion during the inspection. All valves in the plant are turned at least once per year to verify proper working order.

All blowers appeared to run smoothly. The blowers are serviced during each GAC service event on the associated treatment train. Service activities include alignment, bearing repacking, and inspection and tightening the drive belts. Blowers 2 and 3 were rebalanced in early 2016. Blower 1 was last rebalanced in 2015. Balancing reduces vibration of the air systems during operation.

The air handling and treatment system appeared tight and in good condition during the inspection. The dampers are exercised periodically to ensure proper operation.

Visual inspection through the viewports on the air stripper column during the inspection indicated clean to moderate scaling of packing material.

The trays at the top of each column are visually inspected by the operator on a monthly basis for even water distribution and for accumulation of debris produced from the wells.

The process control system is monitored continuously. COS has implemented a program to test all switches and alarms on a routine basis when a treatment train is offline for GAC service. Results of the control tests are maintained in a notebook at CGTF. Additionally, instruments are checked and calibrated during the GAC service events by COS instrument technicians.

4.4.2 Results

Based on operating data, CGTF has consistently met performance criteria set forth in the ACD.

Based on the 2016 inspection at CGTF, no treatment performance problems, hazards, significant deterioration, or significant equipment malfunctions were apparent.

4.5 NIBW GAC Treatment Facility

The NGTF is located at 5985 North Cattletrack Road in Scottsdale, Arizona at the southwest corner of Cattletrack Road and McDonald Drive. NGTF is owned by Motorola Solutions, Inc. and is operated under contract by Scottsdale Water Resources. Treated water from NGTF is delivered to Scottsdale's Chaparral Water Treatment Plant (CWTP), located approximately one-half mile east of NGTF, or to SRP's Arizona Canal through a dedicated outfall immediately east of the site.

NGTF treats water from extraction well PCX-1. The production rate from well PCX-1 is approximately 2,600 gpm. Treatment of water from well PCX-1 at NGTF is accomplished using liquid-phase GAC. A pre-filter located upstream of the GAC system removes entrained solids to prevent accumulation of sediment in the media bed. The GAC system is comprised of four separate, parallel treatment trains. Each treatment train consists of two contactors, each containing approximately 20,000 pounds of GAC with interconnecting piping and valves. Each treatment train has a design capacity of approximately 1,050 gpm, which results in an empty bed contact time of just over 5 minutes. All four treatment trains are used for treatment of groundwater from well PCX-1. The flow of water from well PCX-1 is typically split across three treatment trains, while the remaining treatment is in standby mode. Service rotates among the four treatment trains. This arrangement allows the system to remain operating while GAC media is serviced. The treatment train in the fourth position at NGTF was installed in the summer of 2016 and put into service on October 12, 2016.

Groundwater enters the treatment train through the LEAD contactor, which provides the required NIBW COC treatment. Treated groundwater then flows through the LAG contactor. Between each contactor in the train is a valve "tree" consisting of eight butterfly valves. The configuration of the valve tree allows for each of the two GAC contactors in the treatment train to operate in either LEAD or LAG position and also supports reverse flow through the contactors for backwashing the media.

Following GAC treatment, water is disinfected by COS and delivered to the CWTP finished water reservoir through a dedicated 16-inch pipeline between the facilities. Chlorination is required by COS to meet drinking water standards associated with the CWTP. The disinfection system at NGTF is not considered part of treatment of NIBW COCs in groundwater, however reference to disinfection is provided in this document for completeness.

After GAC servicing or during normal operation, the media may require backwashing to remove fines and sediment build-up in the bed. Backwash operations consist of redirecting treated water to the backwash supply header, and subsequently to the valve tree of the respective treatment train. Backwash water is collected in the backwash storage tank, and discharged to the sanitary sewer.

The control building at NGTF supports the control console with HMI, appurtenant mechanical equipment, electrical equipment, and the RTU containing the main PLC. The system is linked with COS's city-wide SCADA System. Remote RIO panels are located near each treatment train. The RIO panels receive inputs from the position switches at each valve on the respective valve tree. Indicator lights on each RIO panel locally indicate in which operating configuration the treatment train is set. The program logic associated with the SCADA system is secure and only accessible by authorized personnel. Changes to the program can only be made after review and acceptance by Scottsdale and the NIBW PCs.

The Scottsdale Water Resources Department uses a city-wide preventative maintenance program for all equipment operated by the water operations staff. This program maintains a service record database for each piece of equipment and alerts the technicians when routine preventative maintenance is necessary. Service records for all the primary equipment at NGTF were available for review at the time of the inspection.

The treatment facility site comprises approximately one and a half acres surrounded by a masonry block wall, with a main vehicle entry gate and two walk-through gates. The facility in its current configuration is designed to treat groundwater extracted from well PCX-1. The facility is designed to allow for further expansion in the future, if necessary, to accept and treat groundwater from other sources, with a maximum hydraulic capacity of approximately 4,400 gpm.

4.5.1 NGTF Maintenance and Condition

The NGTF is maintained by a COS water treatment operator. COS operations personnel also monitor the status of NGTF remotely. Operators make minimum daily inspections of the equipment and grounds at NGTF. The operator maintains operations logs and data spreadsheets at the facility. The logs and spreadsheets were presented for review by the inspection team during the site inspection.

Well PCX-1 and NGTF were available for service nearly the entire year. Before the fourth treatment train became available on October 12, 2016, the system shut down for up to ten days when GAC change-out service was required, since all three treatment trains were used in that configuration. With the availability of a standby treatment train, the system remains online during change-out service of the media. Currently, the service life of the carbon in the LEAD contactors is approximately six weeks.

The facility appeared clean and well maintained with no apparent leaks or deterioration during the inspection. The equipment was clean and in good condition. The piping, valves, and instrumentation labeling appeared complete. All piping appeared in good condition without leaks or corrosion.

The process control system is monitored continuously. Instruments are checked and calibrated in accordance with the manufacturers' instructions by COS instrument technicians. Maintenance is scheduled and performed through Scottsdale's city-wide preventive maintenance system.

4.5.2 Results

Based on operating data, NGTF has consistently met performance criteria set forth in the ACD.

Based on the 2016 inspection at NGTF, no treatment performance problems, hazards, significant deterioration, or significant equipment malfunctions were apparent.

5.0 RECOMMENDATIONS

5.1 Previous Recommendations

- Update the NGTF O&M Plan to reflect three treatment train mode operation with the increased production capacity from well PCX-1.

The revisions to the NGTF O&M Plan will be prepared in the first half of 2016.

The NGTF O&M Plan was revised to reflect three treatment train operation. The document was published on March 31, 2016.

- Continue to monitor water levels in the Area 7 injection well 7IN-2UA to confirm that the aquifer in the vicinity of the well is accepting the water at a satisfactory rate without excessive build-up in the well.

  No change has been observed in the ability of well 7IN-2UA to accept treated water from Area 7 GWETS.

- Provide another NGTF O&M Plan update to reflect the addition of the fourth treatment train when it is completed.

  The O&M Plan will be updated in 2017 to reflect the availability of the fourth treatment train at NGTF.

5.2 New Recommendations

Update NGTF O&M Plan to reflect the addition of the fourth treatment train.

APPENDIX E

ANNUAL GROUNDWATER PRODUCTION AND
TCE TIME-SERIES DATA FOR NIBW EXTRACTION WELLS

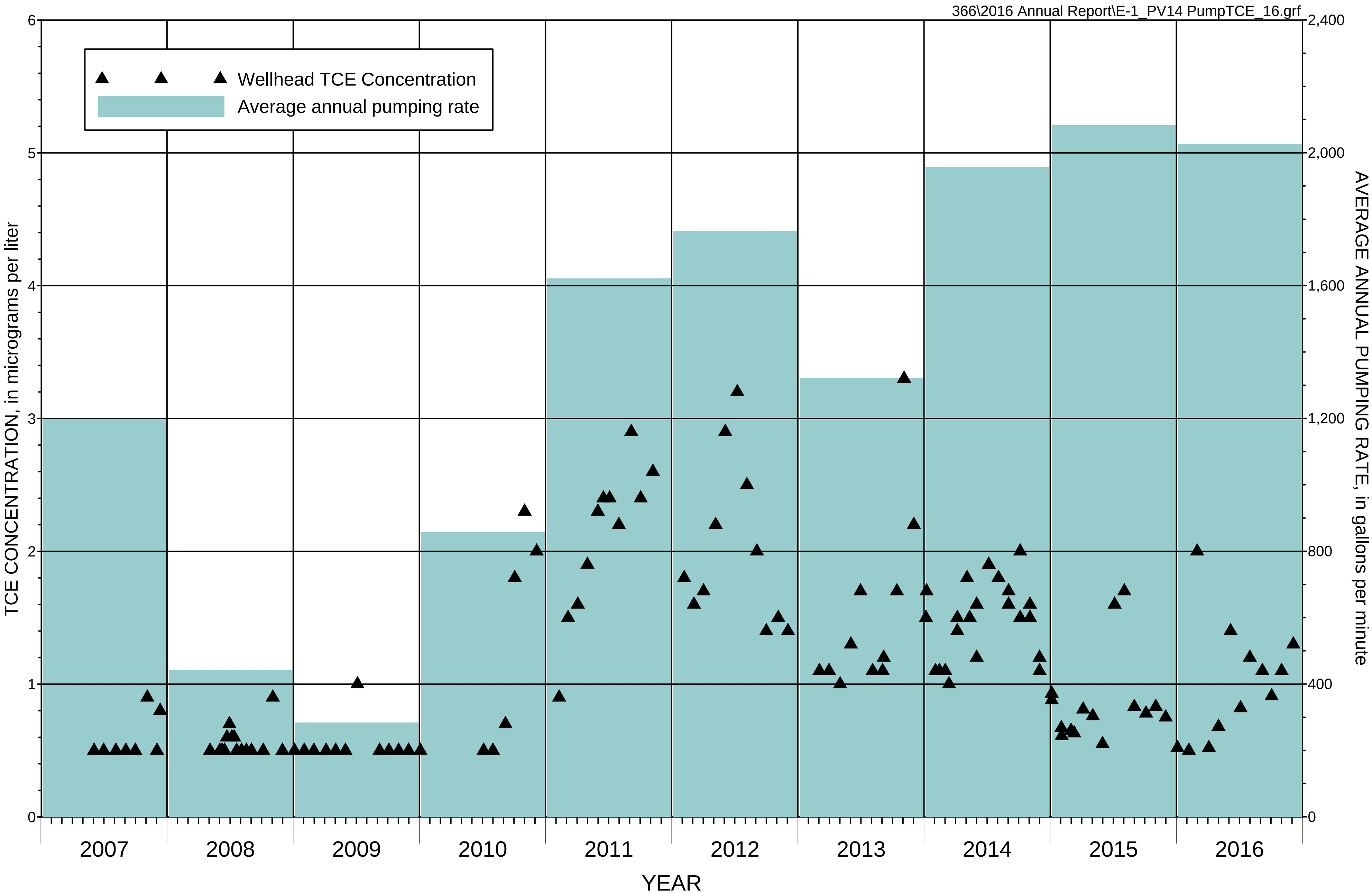


FIGURE E-1. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL PV-14 2007 THROUGH 2016

North Indian Bend Wash Superfund Site

Note: All values of 0.5 indicate lab results of 0.5 micrograms per liter or less.

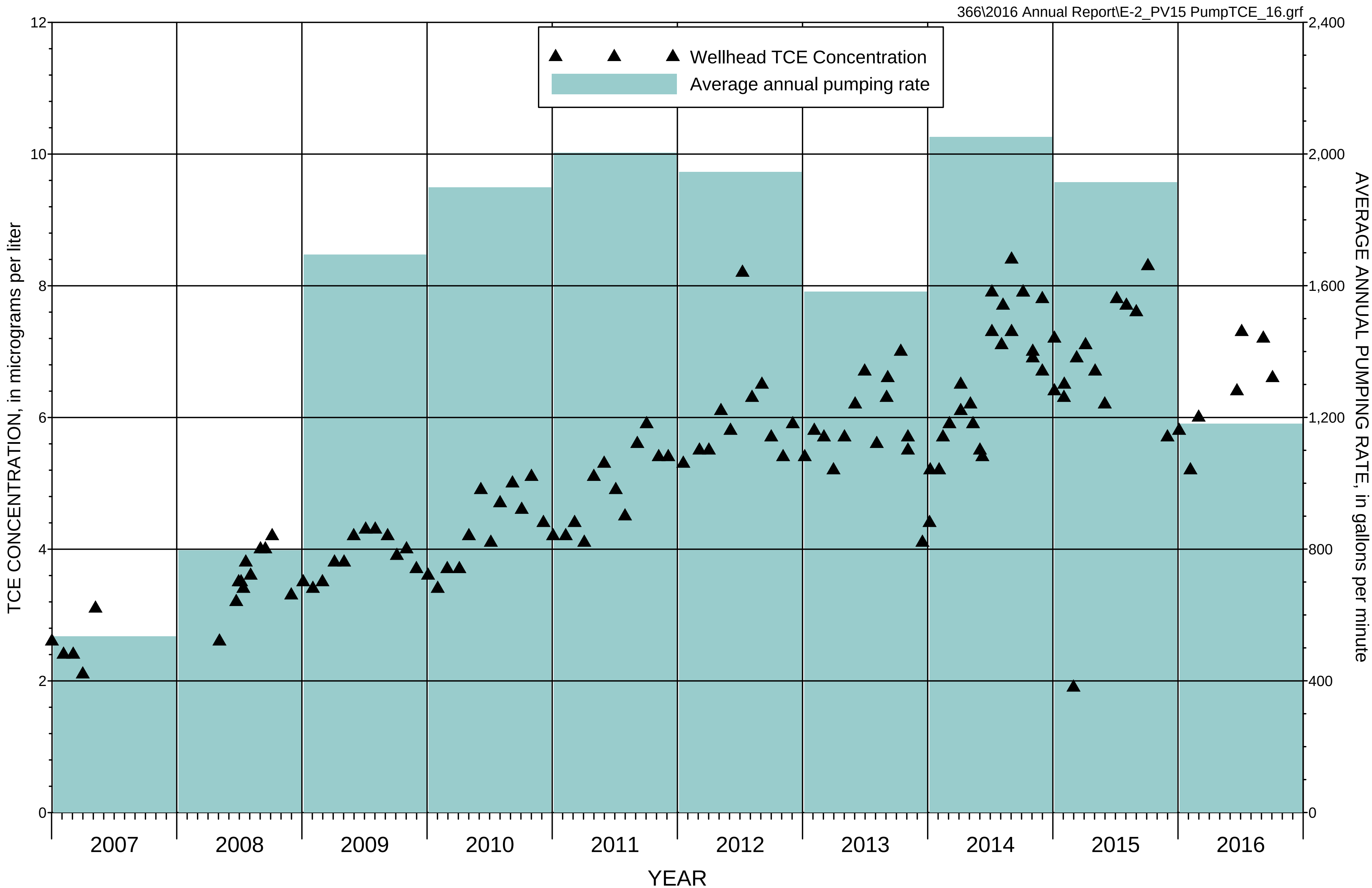


FIGURE E-2. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL PV-15 2007 THROUGH 2016

North Indian Bend Wash Superfund Site

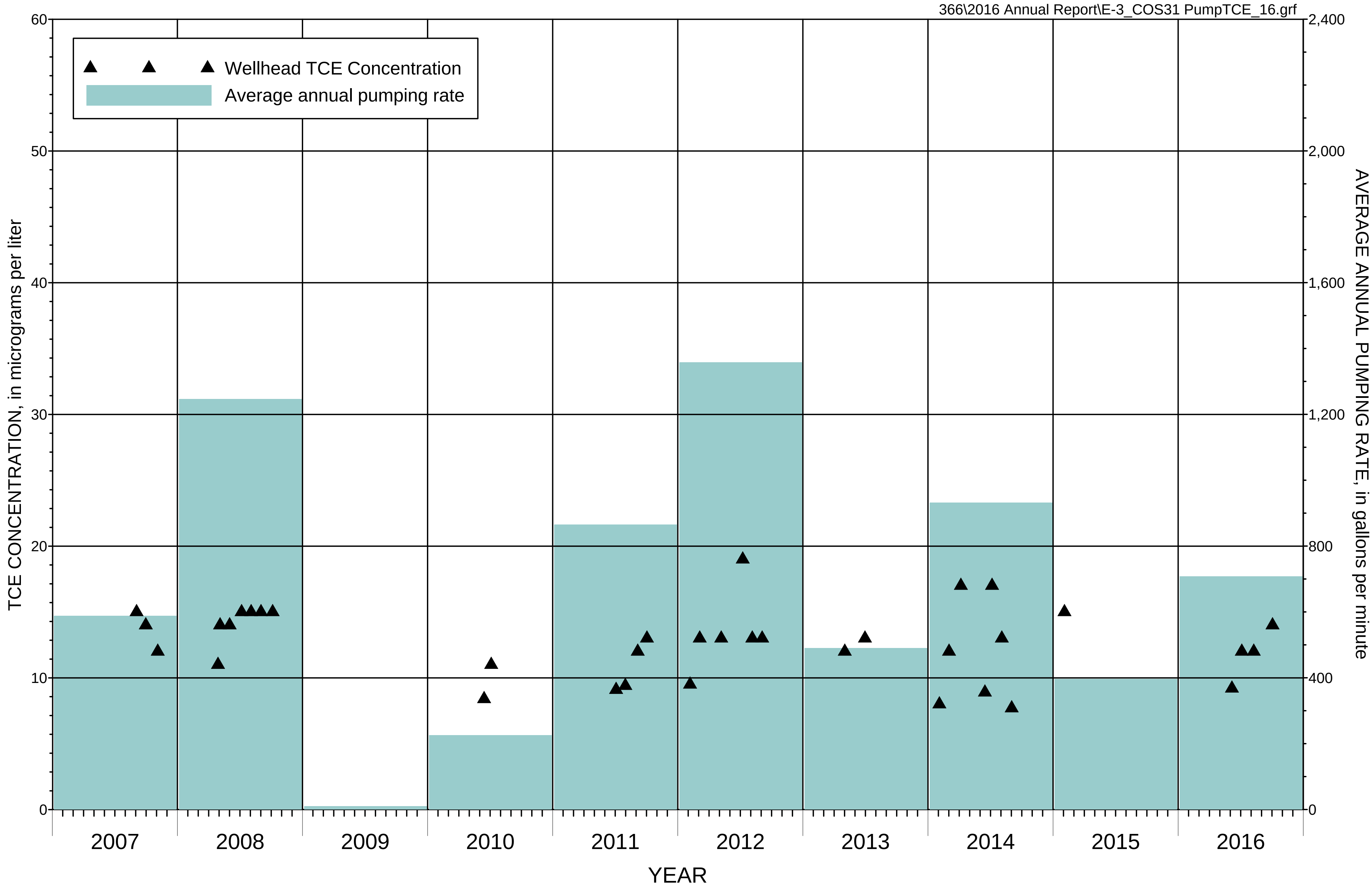


FIGURE E-3. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL COS-31 2007 THROUGH 2016

North Indian Bend Wash Superfund Site

Note: Well not sampled in 2009 due to intermittent operation. Assume average TCE concentrations from 2008. COS did collect samples in September and December (8.51 and 6.14 micrograms per liter, respectively), however, due to the intermittent well operation, those samples may not be representative.

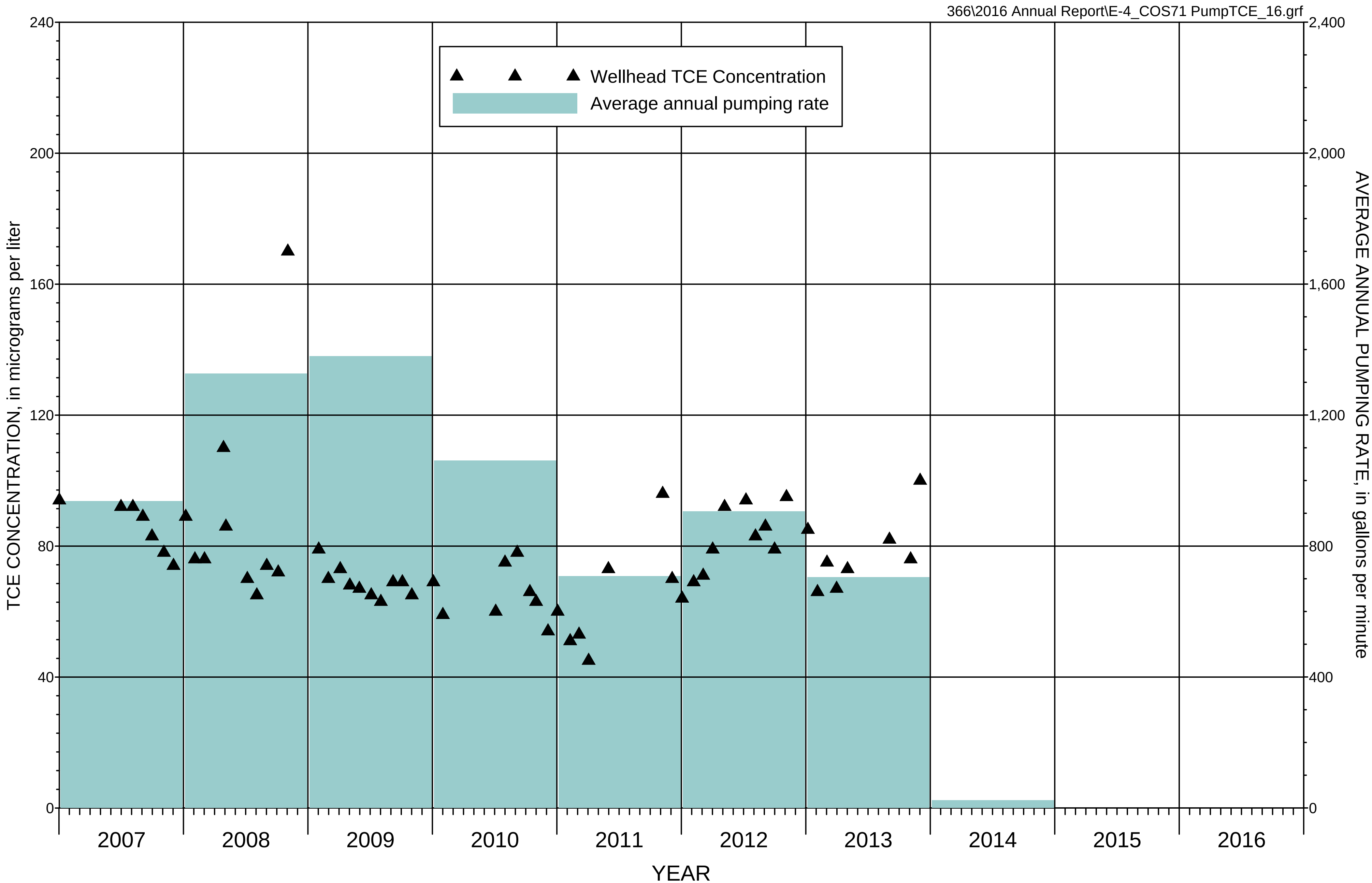


FIGURE E-4. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL COS-71 2007 THROUGH 2016

Note: Well COS-71A replaced Well COS-71 April 2014.

North Indian Bend Wash Superfund Site

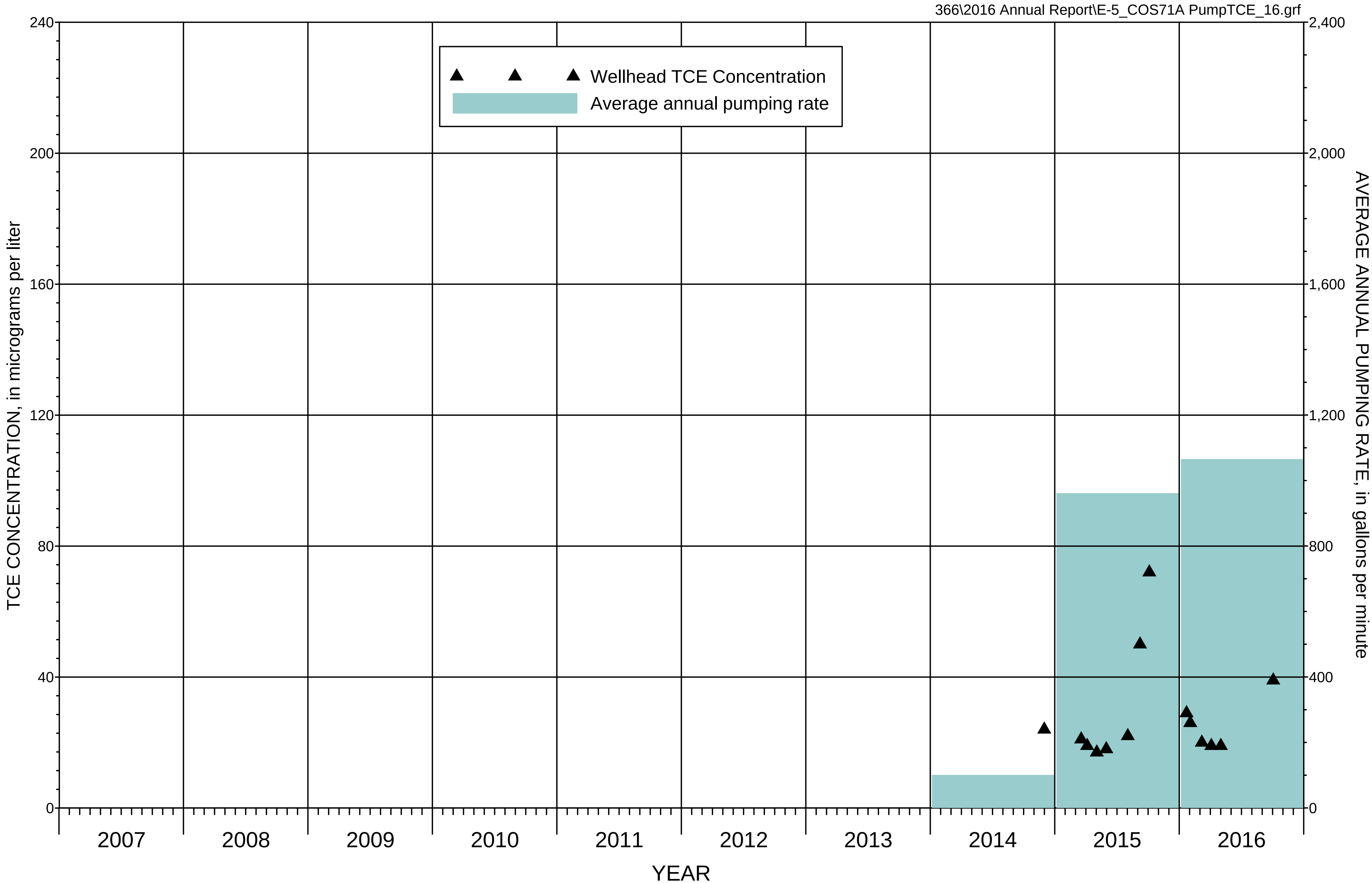


FIGURE E-5. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL COS-71A 2007 THROUGH 2016

Note: Well COS-71A replaced Well COS-71 April 2014.

North Indian Bend Wash Superfund Site

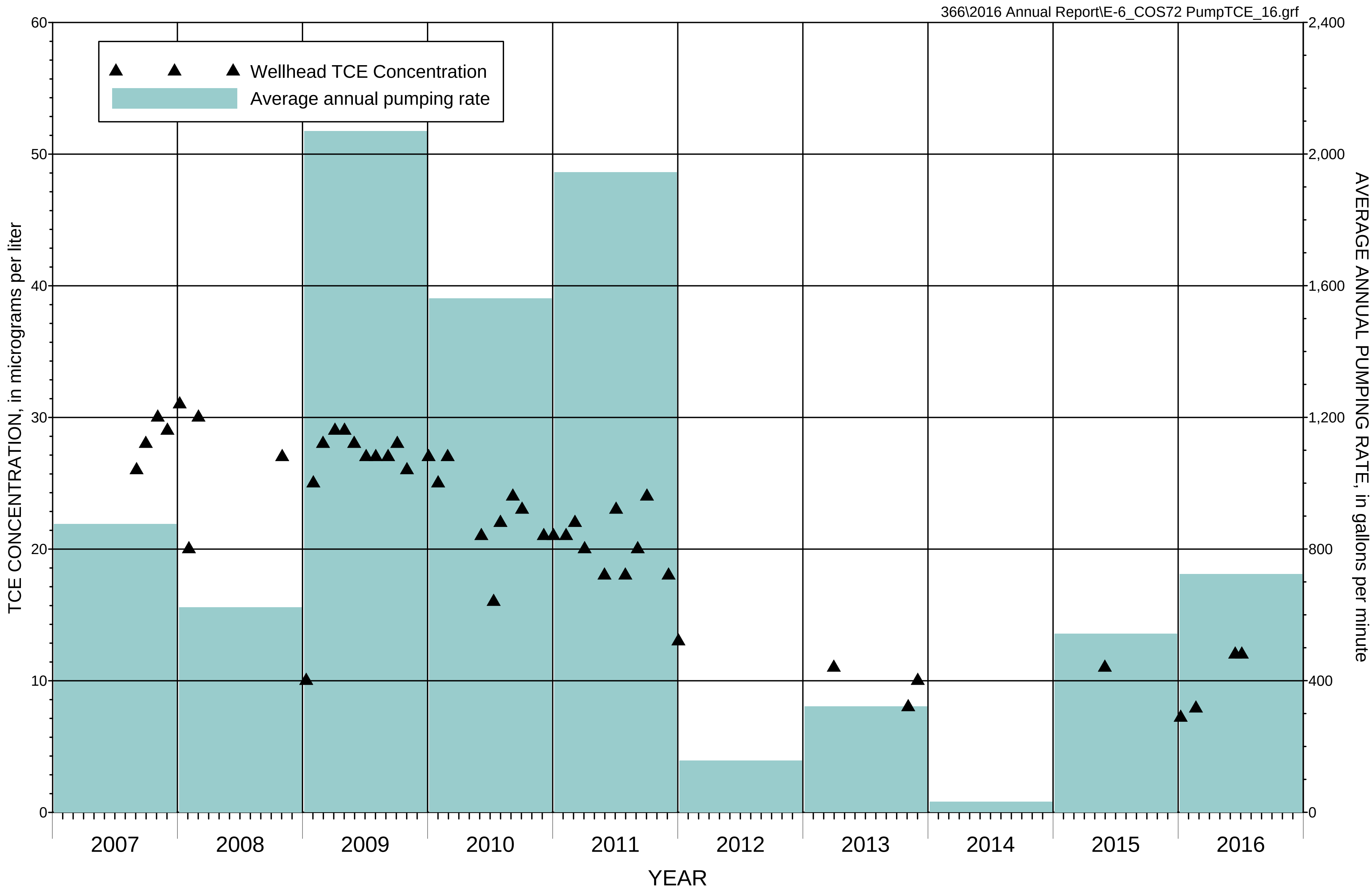


FIGURE E-6. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL COS-72 2007 THROUGH 2016

North Indian Bend Wash Superfund Site

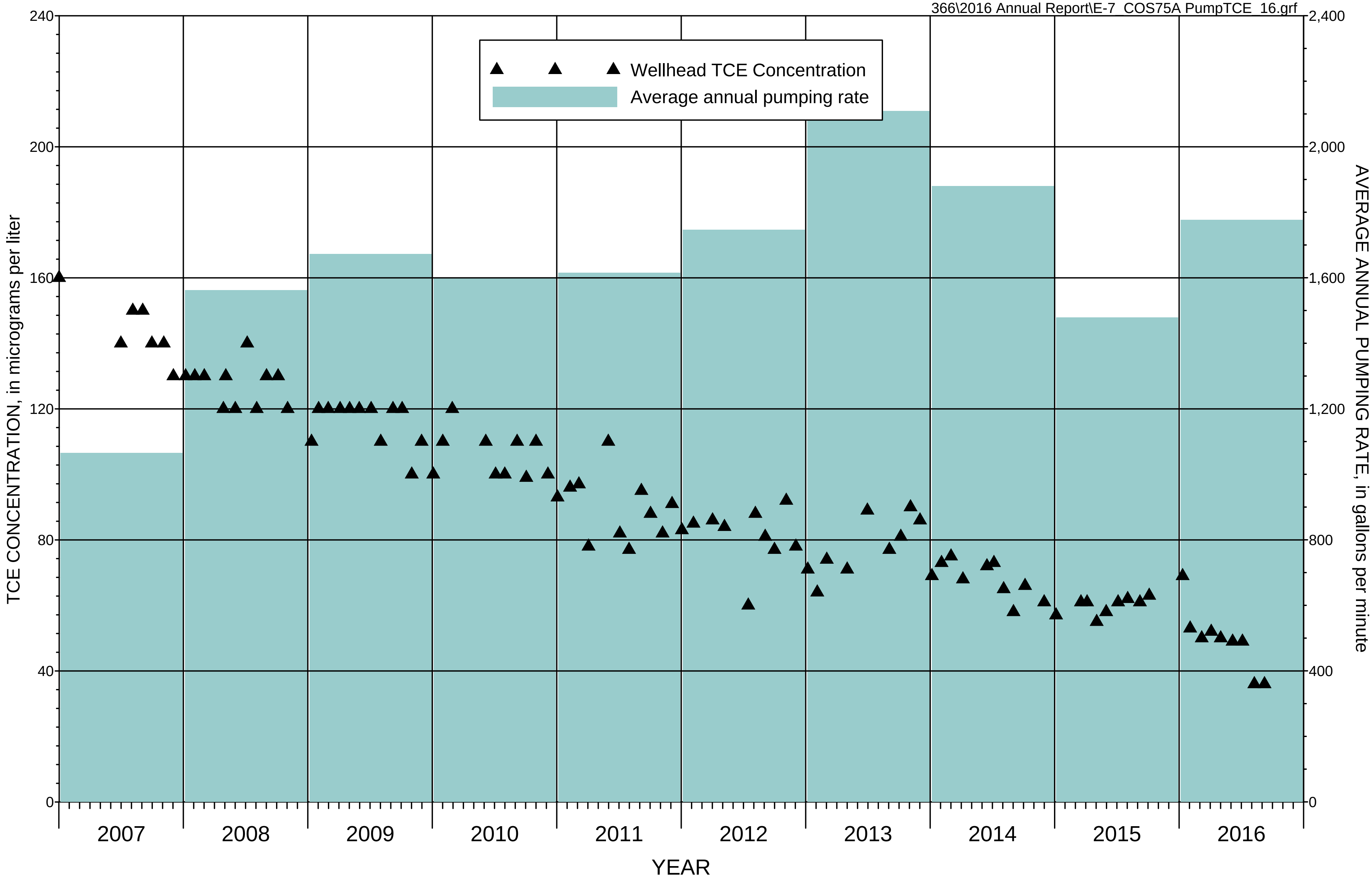


FIGURE E-7. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL COS-75A 2007 THROUGH 2016

North Indian Bend Wash Superfund Site

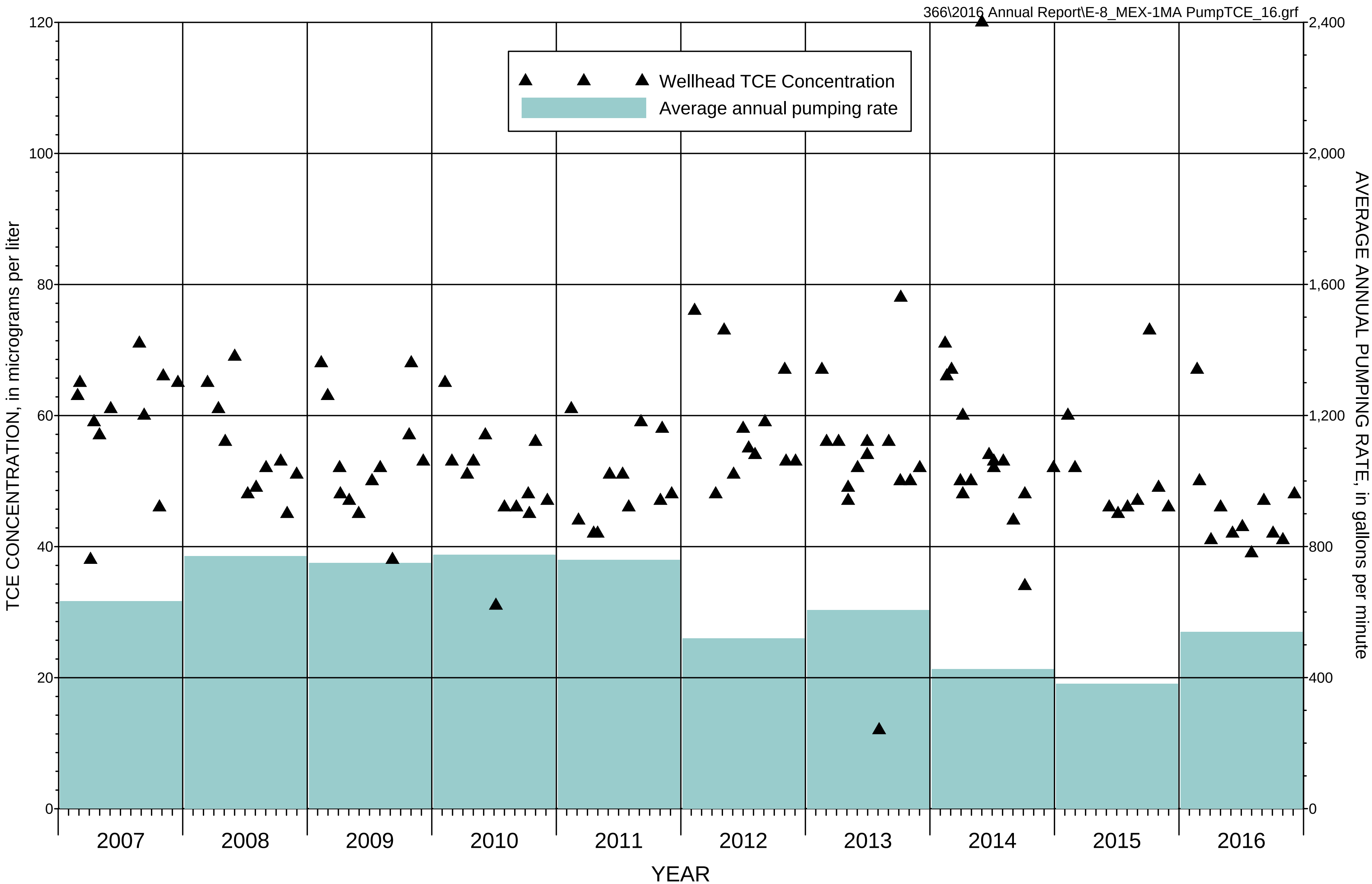


FIGURE E-8. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL MEX-1MA 20070 THROUGH 2016

North Indian Bend Wash Superfund Site

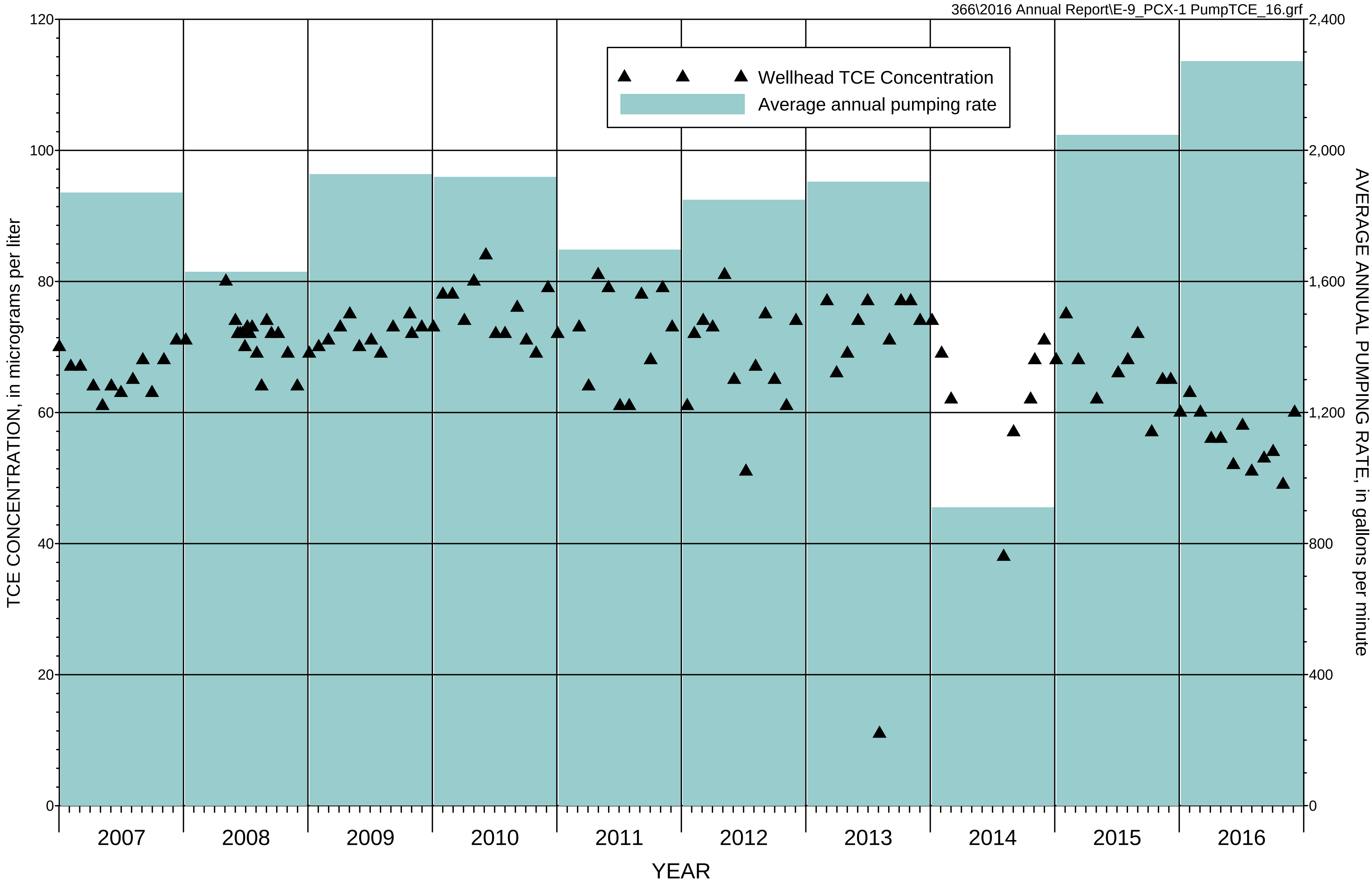


FIGURE E-9. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL PCX-1 2007 THROUGH 2016

North Indian Bend Wash Superfund Site

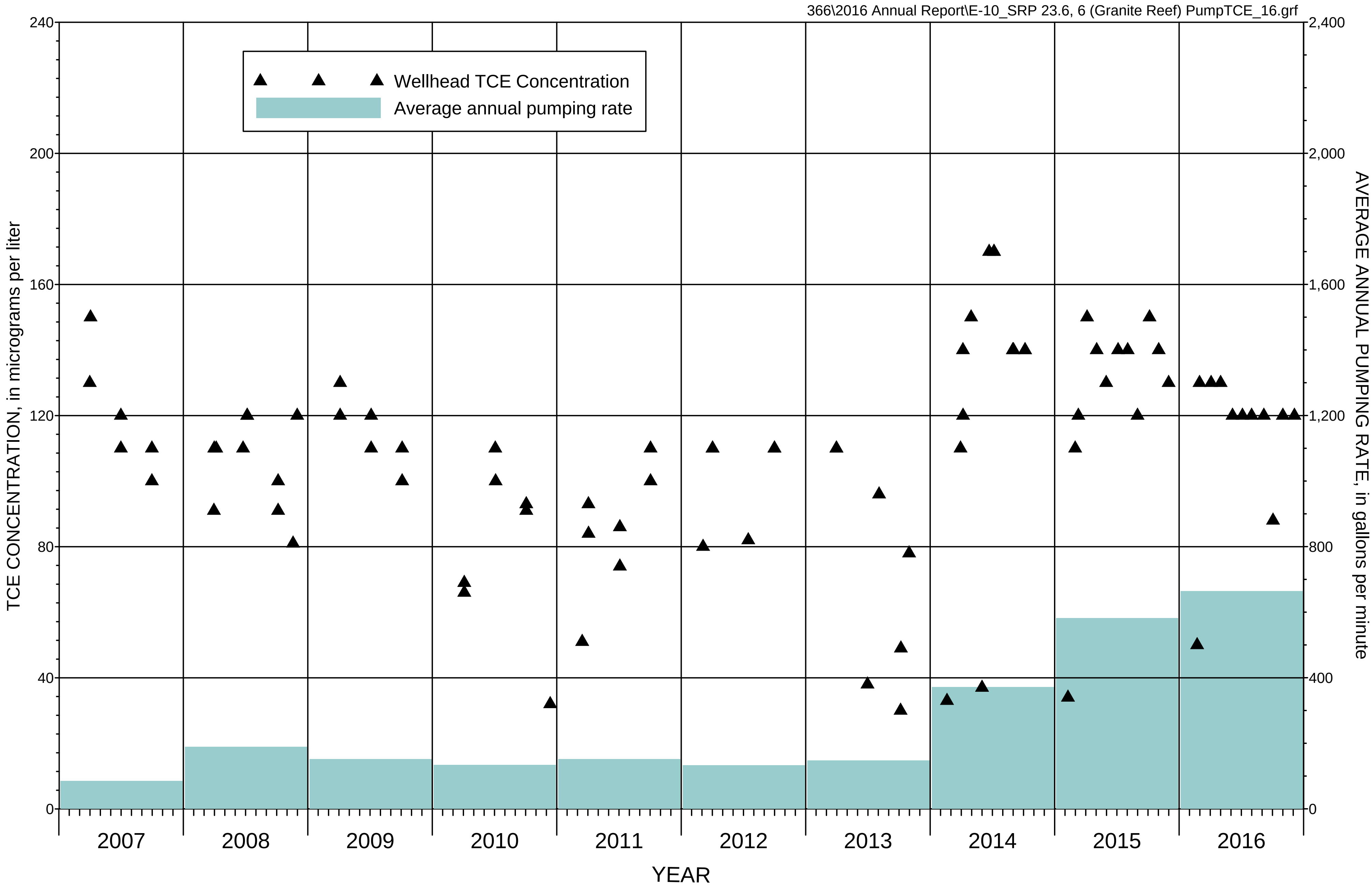


FIGURE E-10. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL SRP 23.6E, 6N (GRANITE REEF), 2007 THROUGH 2016

North Indian Bend Wash Superfund Site

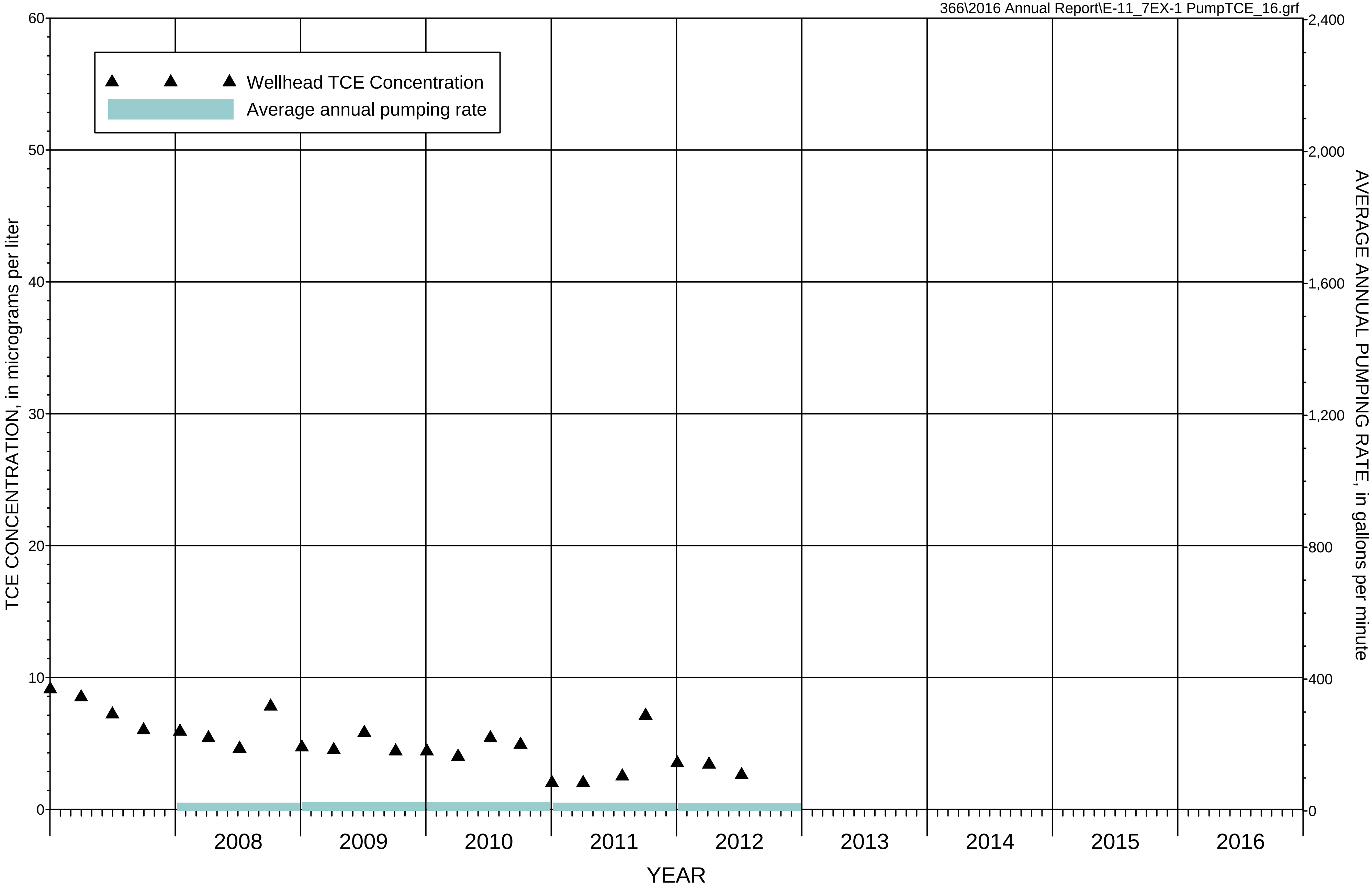


FIGURE E-11. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL 7EX-1UA 2007 THROUGH 2016

North Indian Bend Wash Superfund Site

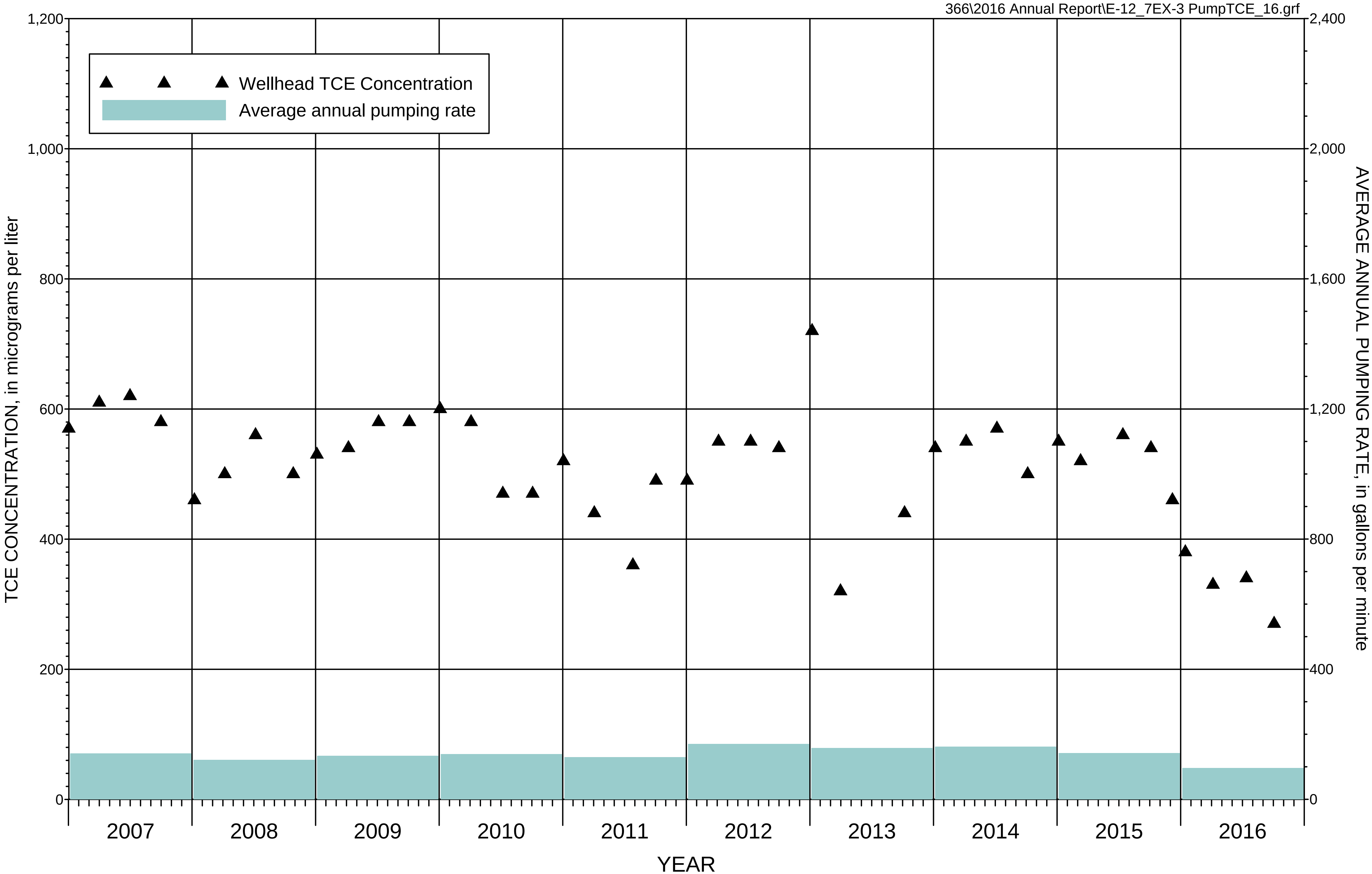


FIGURE E-12. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL 7EX-3aMA 2007 THROUGH 2016

North Indian Bend Wash Superfund Site

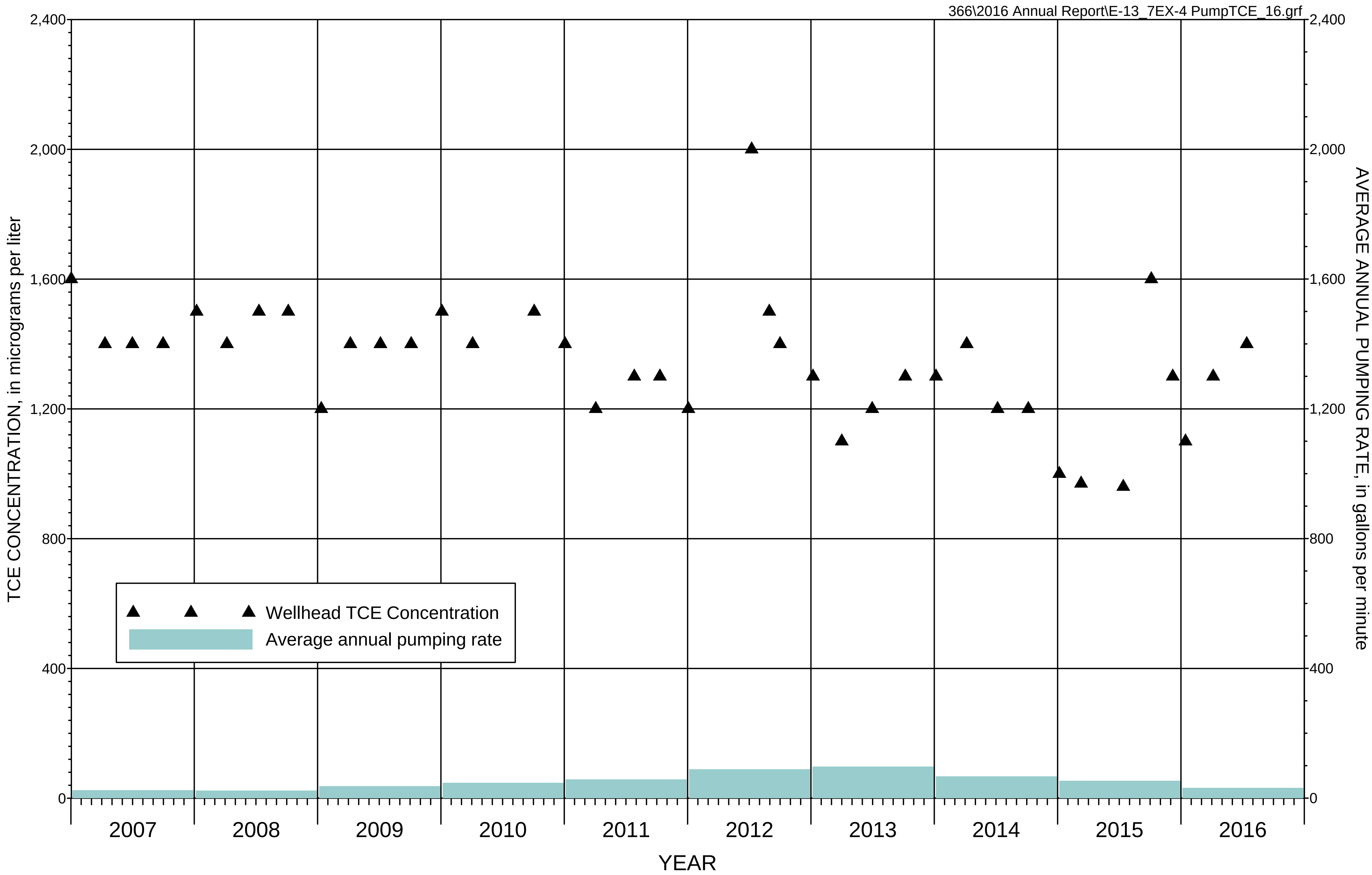


FIGURE E-13. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL 7EX-4MA 2007 THROUGH 2016

North Indian Bend Wash Superfund Site

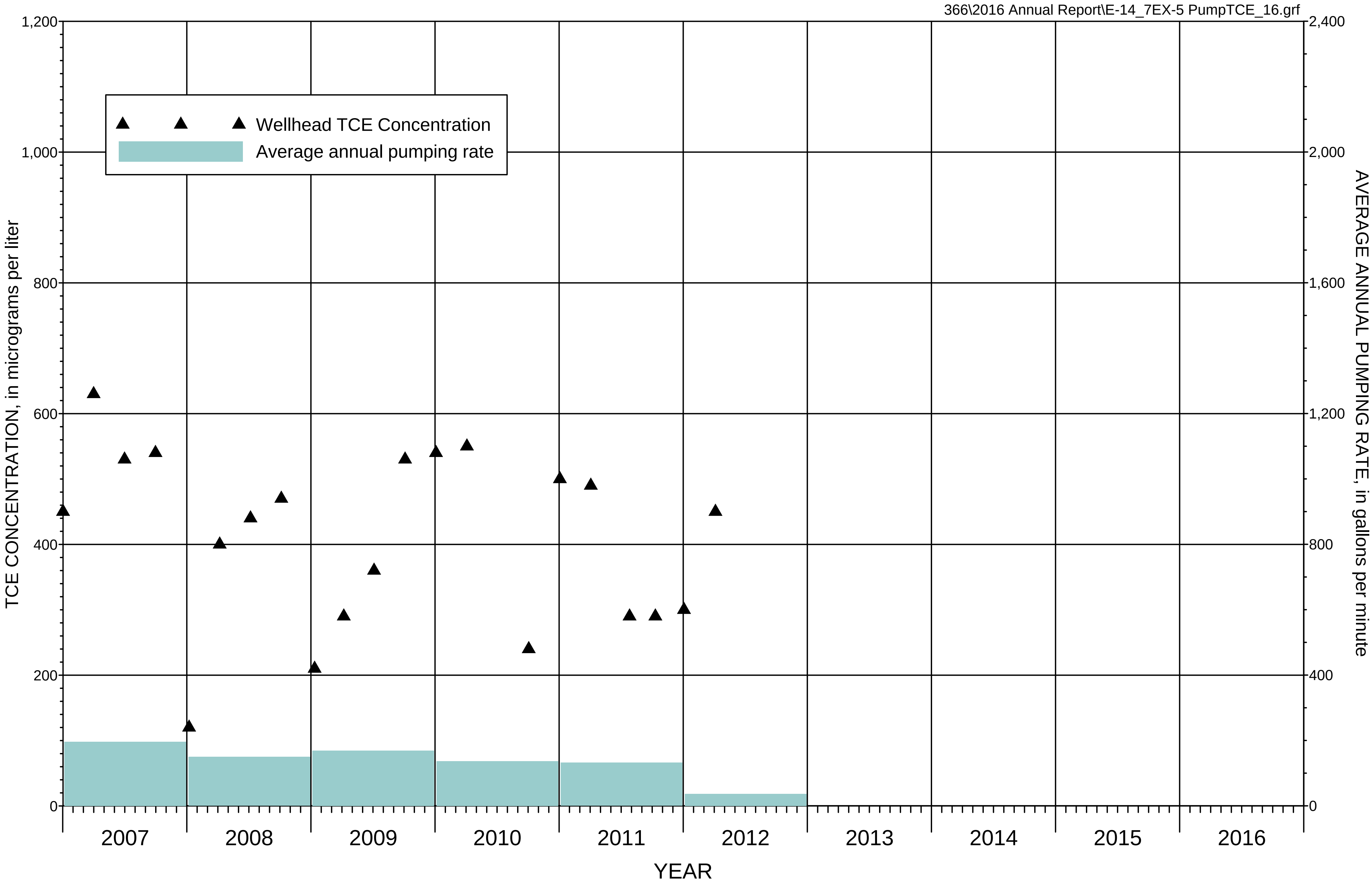


FIGURE E-14. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL 7EX-5MA 2007 THROUGH 2016

Note: Well 7EX-6MA replaced Well 7EX-5MA August 2015.

North Indian Bend Wash Superfund Site

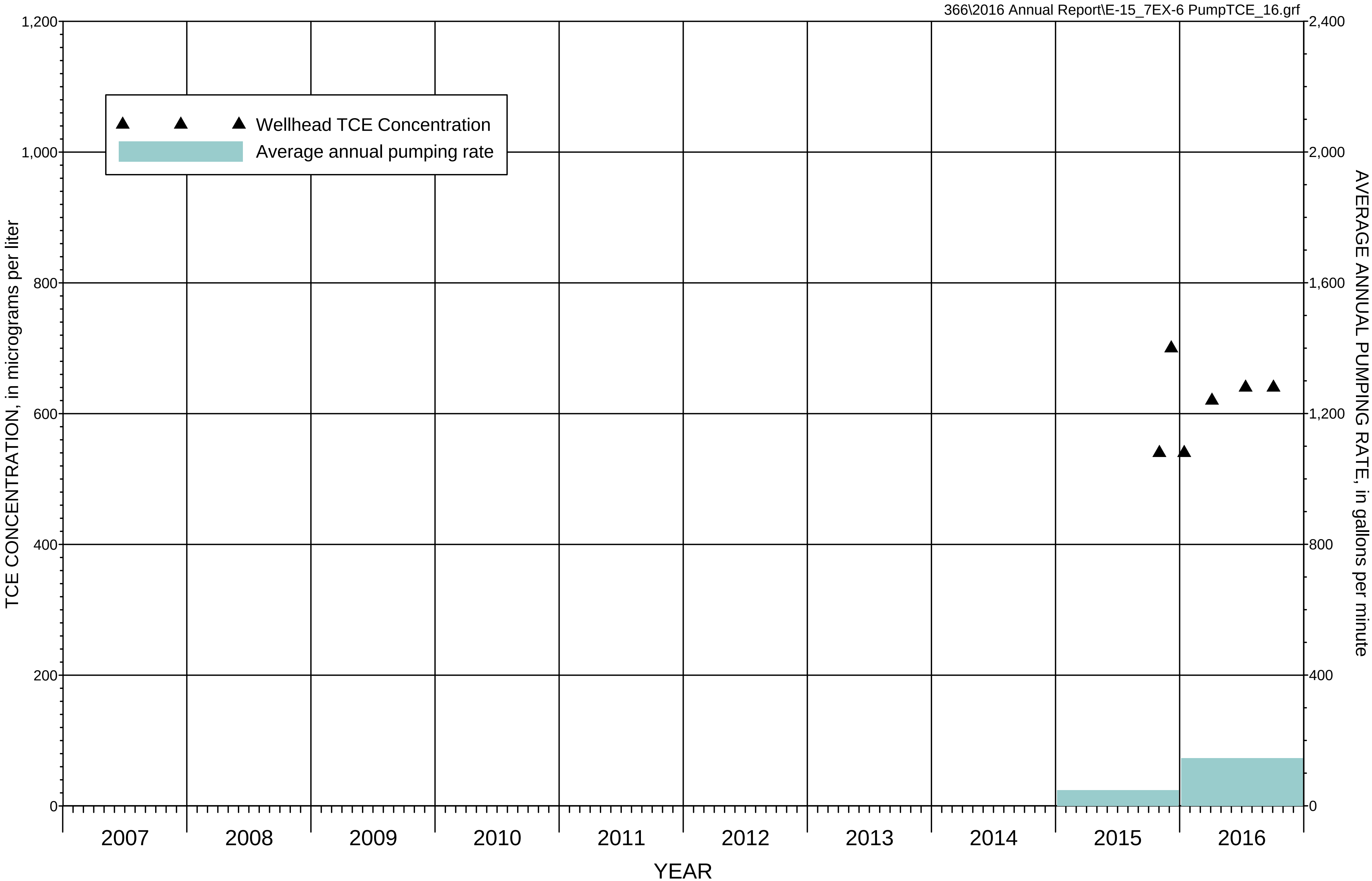


FIGURE E-15. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL 7EX-6MA 2007 THROUGH 2016

Note: Well 7EX-6MA replaced Well 7EX-5MA August 2015.

North Indian Bend Wash Superfund Site