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Groundwater Monitoring Report First Semi-Annual 2014

Brenntag Mid-South, Inc.
Chemical Distribution Facility
2235 West Battlefield Road
Springfield, Missouri
EPA ID No. MOD0002325298

June 10, 2014

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1.0 Introduction

ARCADIS U.S., Inc. (ARCADIS), on behalf of Brenntag Mid-South, Inc. (Brenntag) operates the soil and groundwater remediation system, and conducts semi-annual groundwater monitoring activities for the chemical distribution facility located at 2235 West Battlefield Road, Springfield, Missouri (Figure 1).

Groundwater quality monitoring is performed to evaluate the nature and extent of volatile organic compounds (VOCs) in groundwater. This report presents the results of a groundwater monitoring event conducted April 22 through 24, 2014. The groundwater monitoring activities were performed in general accordance with ARCADIS' standard operating procedures, which are consistent with general environmental industry standards. Figure 2 is an aerial photo that depicts adjacent properties and locations of monitoring wells.

Groundwater samples were collected in unpreserved containers from 10 bedrock monitoring wells and one bedrock extraction well. Five of the wells are screened in the upper bedrock and 6 wells are screened in the deep bedrock. The bedrock well samples were collected in unpreserved containers so to eliminate headspace problems due to the reactive acid preservative with carbonate present in the groundwater. In addition, 13 shallow groundwater monitoring wells were collected in preserved containers. A total of 24 well samples were collected and submitted for laboratory analysis.

This report also summarizes the effectiveness of high-vacuum extraction (HVE) of volatile organic compounds (VOCs) from unsaturated soil, the groundwater "smear zone", and groundwater. The smear zone represents the expanded unsaturated interval as a result of seasonal variation and groundwater withdrawal by the HVE system. A summary of results for the sub-slab vapor extraction system (warehouse) is also provided.

Effectiveness of the HVE system is addressed in the report with use of groundwater concentration maps derived from data obtained during the current sampling event. The baseline for groundwater quality is prior to the initial HVE activities in July 1999. Discussion of the HVE system operation, maintenance, modifications to the HVE system and results of the treated groundwater discharge permit monitoring are also provided.

The Remedial Investigations Report and Feasibility Study were submitted by ARCADIS in July 2011. The USEPA and MDNR approved the reports in a letter dated August 24, 2011.

2.0 Description of Groundwater Monitoring Activities

The current layout of the Brenntag Springfield facility and monitoring well locations are shown on Figure 3.

2.1 Monitoring Well Network

The initial remedial investigation activities and installation of the HVE system was performed by C. Johnson Environmental Inc. Subsequent remedial investigations, groundwater monitoring, and operation of the HVE system has been conducted by ARCADIS since May 2001.

A total of 41 monitoring wells have been installed by Brenntag to date. Of these, 21 monitoring wells are located on the Brenntag site and 20 additional monitoring wells are located on the adjacent properties. Well completion data is summarized in Table 1 (see table footnotes). Fifteen onsite monitoring wells were completed with screens positioned near the top of bedrock or at the base of a predominantly silt, clay, and residuum. These include two former vacuum extraction pilot test wells located within the new tank farm. Five onsite monitoring wells and one offsite well were completed in the upper bedrock. Two of these wells were completed as upper-bedrock, open-hole wells constructed with steel surface casings below the top of bedrock (SAW-1 and SAW-3). Fourteen offsite monitoring wells (MW-14 through MW-27) were drilled and completed with screens across the soil/residuum and upper bedrock (Figure 3).

Three boreholes were completed as open-hole bedrock wells constructed with steel surface casings below the top of bedrock. SAW-1 is located offsite on the Acme Brick facility. SAW-2 and SAW-3 are located on the Brenntag site. In attempt to minimize the potential for shallow groundwater to migrate vertically down into the bedrock boring, each of the open-hole borings were constructed with a surface casing set at approximately 30 ft bgs and below the top of bedrock. Initially, SAW-2 was installed in July 2000 as a deep-bedrock, open-hole well with a total depth of 208 ft bgs in the Springfield Plateau

Aquifer. The open-hole SAW-2 well was later re-completed in September 2002 with a 2-inch PVC riser and 20 ft of screen at 188 – 208 ft bgs.

Five additional deep-bedrock monitoring wells were completed at offsite locations in the Springfield Plateau Aquifer. Monitoring well SAW-4 was installed in the southwestern portion of the Back 3, LLC property located northwest of the Brenntag site. SAW-4 was competed with a 2-inch PVC riser and 20 ft of screen a total depth of 210 ft bgs (190-210 ft bgs). Wells SAW-5 and SAW-6 were installed near the northern boundary of the Foster property, located on the south side of Battlefield Road and across from the Brenntag site. These wells were completed in a similar manner as the SAW-4 with a screen length of 20 feet at total depth. Lastly, both SAW-7 and SAW-8 were installed on the ACME Brick facility. The total depth of the SAW-7 well is similar to the five other deep-bedrock monitoring wells, however it was constructed with a screen length of 40 feet.

Presently, the interim remediation system is comprised of fifty-seven dual-phase, HVE wells (Figure 4). Fifty-two HVE wells were installed in the silt and clay soil/residuum with the bottom of screen at or near the bedrock surface. Two shallow extraction wells (E51 and E52) were installed in the Central Unit to expedite the remediation of impacted soil and groundwater. HVE wells E51 and E52 were completed with screens across the soil/residuum and upper bedrock. Four shallow extraction wells (E7, E42, E45 and E47) were recompleted. These wells had been initially completed on bedrock highs with very short screen lengths. The casing and screens were pulled and the well borings were drilled to a total depth of 45 ft bgs. Each of these upper bedrock extraction wells (E7B, E42B, E45B, and E47B) was completed with screens near the top of bedrock between 20 ft and 45 ft bgs.

Five injection wells were installed for the purpose of conducting an injection pilot test. An enhanced reductive dechlorination (ERD) pilot test was conducted in 2005 in the vicinity of MW-1. A report of the initial pilot test results and discussion of ERD as a potential remedy for chlorinated volatile organic compounds (CVOCs) present was submitted in June 2006. The initial pilot test results provided the basis of a proposed expanded ERD pilot test that was initiated in March 2007. Three additional injection wells (IW-6, IW-7, and IW-8) were installed in January 2007 for the purpose of conducting an expanded ERD pilot test. The expanded ERD pilot test was completed in February 2008.

2.2 Summary of Groundwater Monitoring Event

ARCADIS personnel conducted groundwater monitoring activities between April 22 and 24, 2014. Static fluid levels were measured and phase-separated hydrocarbon (PSH) was not present in any of the monitoring wells. Groundwater samples were collected from 13 shallow monitoring wells and 11 bedrock wells during the monitoring event. The bedrock well samples include 1 upper-bedrock extraction well, 1 upper-bedrock open-hole wells, 3 upper-bedrock monitoring wells, and 6 deep-bedrock monitoring wells. Groundwater samples collected from the 24 wells were analyzed for the target list of volatile organic compounds (VOCs) using USEPA Method 8260B. Groundwater samples were collected from the monitoring wells by means of a “no purge” grab sampling device.

3.0 Fluid-Level Monitoring

An electronic oil/water interface probe was used to gauge the static water level in each well. The water level probe was decontaminated prior to measuring the first well, and between each subsequent well. All water-level measurements were collected within a 48-hour period, measured at least two times to check the reproducibility of the measurement data, and then recorded on field logs. A summary of fluid level data obtained during the recent groundwater monitoring event is provided on Table 2. A historical summary of fluid level data is included in Appendix A (on CD). A well gauging log with field data obtained during the recent monitoring event is provided in Appendix B.

4.0 Remediation System Operation, Maintenance, and Monitoring

Those extraction wells open within the HVE units and operating at the time of the monitoring event are highlighted red and depicted on Figure 4. The HVE system was operational prior to the recent monitoring event. Discussion of the system operation and evaluation of the soil and groundwater remedial effort is provided in Section 7.0.

5.0 Groundwater Quality Monitoring

Prior to sampling, each well was inspected for damage that may impact the groundwater-monitoring program. No well damage, tampering, subsidence, or frost heaving was observed during the gauging event. Four shallow monitoring

wells have accumulated between 1.6 and 4.2 feet of silt and/or sand within the well screens. These wells are noted on the Well Gauging Log (Appendix B) and include; MW-2, MW-10, MW-14, and MW-21. Four monitoring wells were either dry or had an insufficient volume of water for collection of a groundwater sample. These wells include MW-6, MW-8, MW-10, and MW-11.

The SAW-2 well was purged 5 days prior to the gauging and sampling event. This well is slow to recover when the well plug is in place. Therefore, the fluid level measured in this well is anomalous (Figure 5c).

5.1 No Purge - Grab Sample Collection

Depth to groundwater and the total well depths were used to calculate the volume of water in the well casing (Appendix B). All wells were sampled using a no-purge, grab sample device (HydraSleeve). Sample depths were chosen per the criteria approved by the MDNR in a letter dated November 14, 2011. The approved sampling protocol includes;

1. The sampling depth for deep monitoring wells will be at mid-point of the saturated screen.
2. The sampling depth for shallow monitoring wells will be determined by measuring the total well depth and depth to water to obtain the water column height. The HydraSleeve sampler will be lowered to the calculated mid-point of the water column and a groundwater sample will be collected.
3. In the event the well screen of a shallow monitoring well is saturated, the sampling depth will be at mid-point of the screen.
4. A HydraSleeve sampler will be slowly lowered into the water column to the calculated sampling depth. A minimum of 5 minutes will be allowed prior to removing the sampler and collecting the groundwater sample.
5. Groundwater samples from wells screened in the limestone bedrock (13) will be collected in unpreserved containers. This will be done to avoid a potential headspace problem created by the effervescence of acid preservative due to carbonate particulates in the groundwater.
6. Samples from the remaining shallow monitoring wells (29) will be collected in preserved (HCL) containers.

The groundwater samples were immediately placed on ice and promptly transported to Test America in Denver, Colorado for analysis of VOCs by USEPA Method 8260B. Groundwater parameter measurements of pH, specific conductance, and temperature were recorded.

5.2 Quality Control Samples

For quality control purposes, two field duplicate samples were collected during the groundwater monitoring event. All samples were submitted to the analytical laboratory for analysis of VOCs by USEPA Method 8260B. Two trip blanks were submitted in addition to two field samples (SAW-1, and MW-15) for laboratory preparation of a matrix spike and matrix spike duplicate sample (MS/MSD).

5.3 Laboratory Analytical Data Reporting

Chemicals of potential concern (COPCs) in groundwater were identified in the Remedial Investigation Report and are provided in Table 3a. A summary of recent groundwater analytical data for monitoring well and quality control samples analyzed for VOCs by USEPA Method 8260B is provided in Table 3b. A historical summary of VOCs detected in groundwater is provided in Appendix A (on CD). The laboratory analytical reports for the recent groundwater sampling event are also included in Appendix A (on CD).

6.0 Data Results

6.1 Groundwater Flow

A groundwater elevation map derived from fluid level data obtained during the recent monitoring event is presented as Figure 5a. The calculated hydraulic gradient between the onsite well TF EW-1N and offsite well MW-24 is approximately 0.04 ft per foot. The high vacuum extraction treatment system was in operation prior to and during the fluid level gauging conducted during the recent sampling event. As a result the fluid level elevations reflect the local conditions with the effect of groundwater withdrawal. Figure 5b is provided as comparison to the groundwater elevations measured during the previous gauging event.

If the high vacuum extraction treatment system is in operation at the time groundwater elevations are measured the groundwater flow maps are stylized to reflect the drawdown at the extraction wells. These wells include those located in the lower areas on the bedrock surface and upper-bedrock extraction wells E7B, E42B, and E47B. When in operation, the upper-bedrock extraction wells can be closed at the well head, the drop tube removed, and the fluid gauged in order to assess the drawdown conditions. Groundwater drawn down in the areas of the extraction wells is evidenced in nearby monitoring wells when they are operated for a sustained period of time prior to gauging.

Groundwater elevation data provided on Figure 5a depicts the recent groundwater gradient in the northwest portion of the facility. The groundwater table is drawn down as a result of the upper bedrock extraction wells E7B (Rail Spur Unit), E42B, E45B, and E47B (Northwest Unit). Well E45B was connected to the dual phase high vacuum extraction system in June 2010. However, significant silt was pumped from this well which created ongoing O&M issues with the treatment system (surge tank, air stripper, filters, and carbon). As a result, well E45B was turned off in November 2012.

Monitoring well screens completed on interpreted subsurface bedrock highs are often at or above the groundwater elevation when the adjacent extraction wells are in operation. In turn, many of the shallow extraction wells that are installed on subsurface bedrock highs are temporarily turned off. Water table elevation fluctuations are also attributed to seasonal variations.

Fluid levels in the six upper-bedrock monitoring wells are measured in conjunction with the additional 15 onsite monitoring wells completed in the overlying soil/residuum. Fluid levels measured in the upper-bedrock monitoring wells indicate groundwater elevations approximate to those measured in nearby shallow monitoring wells completed in the overlying soil/residuum. This evidence suggests that hydraulic connection exists between the unconsolidated soil/residuum and upper bedrock.

A potentiometric surface map of the deep Springfield Plateau Aquifer is derived from fluid level data obtained from 6 monitoring wells (SAW-2, SAW-4, SAW-5, SAW-6, SAW-7, and SAW-8). Figures 5c and 5d depict groundwater elevations from the deep Springfield Plateau Aquifer wells gauged during the recent and previous monitoring events, respectively. Wells SAW-6 and SAW-8

are characterized as having a very slow groundwater recovery when compared to the other four deep SAW wells.

The deep-bedrock SAW wells are completed so to segregate the screen from the shallow and intermediate groundwater zones in the Springfield Plateau Aquifer. The historical potentiometric surface maps derived from measured fluid levels indicate the groundwater in the deep portion of the Springfield Plateau Aquifer flows generally to the west and has an apparent gradient of approximately 0.03 ft per foot. Seasonal variations are expected and the potentiometric surface will continue to be monitored and evaluated at the deep SAW locations.

6.2 Groundwater Quality

Groundwater concentration maps were prepared for the recent monitoring event. Analytical results for the monitoring event conducted in July 1999 provide a baseline for groundwater quality prior to start-up of the HVE system.

The COPCs in groundwater identified in the Remedial Investigation Report are listed in Table 3a. VOC concentrations detected in groundwater for the recent monitoring event are provided on Table 3b. Groundwater concentration maps prepared for selected COPCs include figures 6 through 14. These figures provide detected concentrations of Total BTEX, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, tetrachloroethene (PCE), trichloroethene (TCE), and the primary CVOC degradation products cis-1,2-dichloroethene (cis-1,2-DCE), 1,1-dichloroethane, 1,2-dichloroethane, and vinyl chloride.

A review of concentration maps for COPC's detected in groundwater samples collected from the wells indicate elevated concentrations of these analytes in the former bulk tank truck loading/chemical handling area (Central Unit) and former drum rinse areas (Northwest Unit) shown on Figure 4.

The initial BTEX and CVOC concentrations detected in Wells MW-5, MW-6, and MW-8 were elevated. These wells are located in the central portion of the site in the vicinity where bulk chemical handling was conducted. These operations included the former blend tank, former drum filling area, former drum filling room in the northwest corner of the warehouse, and the former bulk tank truck loading area. BTEX and CVOC concentrations previously detected

in shallow extraction wells E51, E52, and E53 confirmed the presence of a source area in the vicinity of the former bulk chemical handling area.

Elevated concentrations of CVOCs detected in Wells MW-1 and MW-11 indicate the former drum rinse area is a source of impacts to groundwater. In addition, the elevated CVOC concentrations observed in wells MW-5, MW-6, MW-8, and MW-9 indicated that the former bulk chemical handling area is a potential source of CVOC impacts to groundwater.

The source of elevated BTEX (Figure 6) concentrations detected in Wells MW-3 and MW-4, located in the former rail spur, may be the nearby former bulk chemical handling area.

Analytical results are obtained for the upper-bedrock extraction well E7B (Rail Spur Unit). Groundwater quality data for the upper bedrock was first obtained in January 2004 (baseline concentrations) prior to the vacuum enhanced withdrawal of groundwater from the upper-bedrock extraction wells. Analytical results of groundwater samples from MW-17 and MW-22 indicate that BTEX have migrated downgradient to these offsite monitoring well locations.

The presence of elevated CVOC concentrations in the upper bedrock is confirmed by analytical results of the historical groundwater samples from the upper bedrock extraction wells E42B, E45B, and E47B (Northwest Unit). The historical presence of TCE, cis-1, 2-DCE, and vinyl chloride in these upper bedrock extraction wells suggest that the active degradation of PCE (MW-1) is taking place in the source area. Upper bedrock monitoring wells were installed to monitor groundwater quality between Wells MW-1 and E47B. Analytical results for the MW-17, MW-19, and MW-22 historical groundwater samples indicate TCE and degraded CVOCs (see cis-1, 2-Dichloroethene, 1,1-dichloroethane, and vinyl chloride) have migrated downgradient to these offsite well locations.

Historical analytical data indicate the presence of elevated concentrations of BTEX (Figure 6) in the deep SAW-2 monitoring well. Groundwater withdrawal from the SAW-2 well is conducted on an intermittent basis in conjunction with O&M visits. The well was completed at a depth of 188 – 208 ft bgs in September 2002. Approximately 76 gallons of impacted groundwater were removed from the SAW-2 well during the period between January and May 2014. Approximately 3,624 gallons of impacted groundwater have been

extracted from the SAW-2 since it was completed as a monitoring well in September 2002. Well development forms for the SAW-2 well are provided in Appendix B. Groundwater purged from the SAW-2 well is placed in the surge tank and treated at the air stripper.

With the exception of SAW-2, the recent analytical results for the deep bedrock samples indicate detected concentrations of chloroform and 1,1-DCA in SAW-6, and cis-1,2-DCE and vinyl chloride in SAW-7. All detected analyte concentrations were below the laboratory reporting limit with the exception of vinyl chloride (1.8 ug/L) in SAW-7.

6.2.1 VOC Concentration Trends

The fluctuation in VOC concentrations in monitoring wells over time is a function of seasonal groundwater elevation conditions, drawdown due to the HVE system resulting in an expanded smear zone, and the withdrawal of impacted groundwater from nearby extraction wells. The effective reduction of VOC concentrations due to the extended operation of the interim HVE system is apparent in several monitoring wells. These monitoring wells are located in proximity of the operable extraction wells (Table 5).

A reduction of BTEX concentrations and related petroleum hydrocarbon constituents has occurred in onsite monitoring wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-8, E7B, and SAW-3. Toluene, ethylbenzene, and xylenes are the primary BTEX constituents detected in these wells (Table 3b and Appendix A). BTEX and other petroleum hydrocarbon constituents are providing a carbon source which acts to enhance and accelerate the reductive dechlorination of the chlorinated compounds present in the vicinity of these wells.

Based on the elevated concentrations for degradation products of PCE and TCE, mainly cis-1, 2-DCE, 1, 1-dichloroethane, 1, 2-dichloroethane, and vinyl chloride, it is apparent that the PCE and TCE are being naturally degraded through reductive dechlorination processes active in the facility subsurface.

Detected concentrations of BTEX (Figure 6) and CVOCs in well MW-17 indicate the downgradient migration of these analytes to an adjacent property has occurred. The historical measured groundwater elevations in well MW-17 are near the top of the bedrock surface. Migration of impacted groundwater

from the Brenntag site toward the MW-17 location appears to have occurred primarily along a preferential flow path at the interface of the residuum and underlying weathered bedrock surface. Based on the absence of PCE and TCE in MW-17, and the presence of their degradation products, it is evident that active reductive de-chlorination processes are remediating the chlorinated chemicals of concern that have migrated offsite to the north. A fluctuation of vinyl chloride concentrations is noted at Well MW-22. This may be due in part to a smear zone created by the seasonal change in groundwater elevation.

The laboratory reporting limit of analytes reported for MW-17 may be elevated due to a required sample dilution. As a result, the contours for various figures depicting VOC concentrations may be inferred in the vicinity of Well MW-17.

6.3 Laboratory Quality Control

Laboratory quality control samples, including two field duplicate samples and two trip blanks, are used to confirm the groundwater monitoring results for each event. The quality control results were reviewed to determine if any data required qualification or other corrective actions were necessary. The results of the data package review are included in Appendix C.

6.4 Data Validation

The analytical laboratory data reports, including the data packages, quality control results, and chains of custody, were reviewed to determine if any laboratory corrective actions were necessary. Data packages were reviewed for the correct analytical procedures and reporting limits, compliance with holding times, rinse blanks and trip blanks less than reporting limits, field duplicates within acceptable relative percent difference limits, matrix spike/matrix spike duplicates within control limits, and method blanks less than reporting limits (Appendix C). All data validated for this report meet minimum data quality objectives criteria and are considered usable. No data qualification was required.

7.0 High Vacuum Extraction System

The initial stage of the HVE system was installed in July 1999 and start up procedures for the system were conducted in January 2000. This is the first of four groups of HVE wells and is referenced as the central unit. This unit is

located between the warehouse and new tank farm (Figure 4). Three additional groups of HVE wells were subsequently installed and initial operation of the expanded HVE system began in December 2000. These three groups of HVE wells are referenced as the loading dock unit, rail spur unit, and northwest unit. Continuous operation of the expanded HVE system began in the spring of 2001. The HVE system consists of four major components: 1) the four extraction well units; 2) a dual phase extraction system; 3) a groundwater treatment system; and 4) a permitted outfall to the publicly owned treatment works (POTW) via the sanitary sewer.

As designed, the HVE system induces a vacuum at the recovery wells to withdraw both soil vapors and groundwater from the subsurface. Chemicals of concern are removed as a dissolved component in the groundwater, as vapors, and through in-situ biodegradation.

Goals of the HVE system are to remove the chemicals of potential concern from unsaturated soils, the dewatered smear zone, and groundwater, and to 1) to prohibit the vertical migration of VOCs to the underlying bedrock of the Springfield Plateau Aquifer, and 2) provide hydraulic control so to mitigate downgradient migration of impacted groundwater.

7.1 System Operation Evaluation

ARCADIS was retained by Brenntag to conduct operations and maintenance (O&M) activities of the HVE system in June 2001. The goals of the O&M activities are to obtain the maximum possible run time for the system, and to optimize system performance in achieving both the remediation and hydraulic control goals. The O&M activities fall into two major categories, 1) routine maintenance necessary to ensure maximum operation, and 2) collection of data necessary in evaluating the system performance.

7.1.1 HVE System Operation

ARCADIS contracted Karst Consulting (Springfield, MO) in 2008 to provide O&M services. As a result, an increase of the system run time and overall performance has occurred. Typical O&M activities necessary to keep the system operating efficiently include the following:

- Checking system hour meters to document run time.

- Checking and maintaining seal oil levels in the vapor discharge separator.

- Checking and replacing cartridge and bag filters on the treated groundwater discharge.

- Checking and cleaning the air stripper.

- Checking pressure gauges and when necessary either back flushing or replacing the granular activated carbon.

- Checking, and when necessary, cleaning or replacing level switches, site gauges, flow meters, valves, and gauges.

In addition to these tasks, repairs to equipment are conducted on an as needed basis. Data obtained during all field tasks are documented in daily logs completed during each site visit. Daily logs of the recent HVE system operation are summarized in Table 4, Table 5, and Table 6. Historical tables of the HVE system operation are provided in Appendix A (on CD).

Modifications or repairs to the system conducted during the current monitoring report period include;

- Removed two steel, epoxy lined granulated carbon vessels which had developed numerous “pitted” rust holes.
- Installed two stainless steel granulated carbon vessels.

Presently the system is operated as follows:

- A reduced number of extraction wells are operated at any one time. The system is not capable of maintaining a sufficient vacuum to operate all fifty-seven extraction wells at the same time. This has been accomplished by shutting off wells in areas where levels of VOCs impacts to groundwater are low, and by shutting off at least one group of wells at all times.

- Preferential use of extraction wells screened in the residuum and located on bedrock surface “lows” has resulted in a higher inlet vacuum

pressure and drawdown of the groundwater table to the maximum extent possible.

- Presently, groundwater and vapor is also extracted from three upper-bedrock extraction wells. These include E7B located in the Rail Spur Unit, and E42B, and E47B located in the Northwest Unit. Due to the markedly high silt production, E45B was turned off in November 2012.

- A total of 17 extraction wells were in operation prior to the recent groundwater sampling event (Table 5). Extraction wells that were open prior to the recent sampling event include; E7B in the Rail Spur Unit, E39, E40, E44, E48, E42B, and E47B in the Northwest Unit, and ten shallow extraction wells in the Central Unit. Eight wells in the Central Unit are completed in the residuum and two are completed across the residuum and upper bedrock (Figure 4).

7.1.2 HVE System Monitoring

Pertinent system operating data are obtained during the periodic O&M visits and recorded in historical tables provided in Appendix A (on CD) The recent operating data include the system run time (Table 4), groundwater production volumes (Table 5), and vacuum readings at the system inlet and at the vacuum pumps (Table 6).

In addition to the weekly monitoring information, monitoring of the HVE system includes the semi-annual collection and analysis of a HVE vapor discharge sample, a groundwater influent sample, and a treated groundwater effluent sample. Groundwater elevation data collected during the groundwater sampling events is utilized to indicate the resultant drawdown of the water table due to extended operation of the HVE system.

The accumulated monitoring information is utilized to determine the HVE system effectiveness in 1) containing migration of impacted groundwater, and 2) the removal of the volatile chemicals of concern.

7.2 HVE System Evaluation

7.2.1 Groundwater Production

The groundwater extraction at the facility serves a number of purposes, including containment of the dissolved VOC impacted-groundwater plume, recovery and treatment of VOC impacted-groundwater, lowering the water table, and improving the effectiveness of the soil vapor extraction component of the remediation system.

The recovery of VOC impacted-groundwater is determined by the number of extraction wells operating at any given time. As discussed above, the number of extraction wells operating has varied over time. However, a total of 17 extraction wells were operated during the recent report period. A recent operation summary of the individual extraction well units is provided in Table 5.

Monthly discharge volumes for the months of January 2014 through May 2014 are provided on Table 5. Approximately 194,332 gallons of treated groundwater was discharged to the City of Springfield sanitary sewer during this period. The average discharge flow rate of treated groundwater for the recent report period is 0.95 gallons per minute (gpm).

A groundwater influent sample was collected on April 25, 2014. The influent sample results are summarized in Table 7. Assuming a constant groundwater VOC concentration, a total of approximately 0.08 lbs of dissolved VOCs were removed since the previous influent sample was collected. An estimated total of 33.59 lbs of dissolved VOCs have been removed by pumping groundwater through December 2013 (Table 8).

Historical analytical results provided on Table 7 for TPH-Diesel Fuel and TPH-Motor Oil is compromised by the historic occurrence of hydraulic oil intermittently released from the liquid ring pumps during the early years of operation. This periodically occurred when the inlet vacuum fell below approximately 15-inches of mercury. The liquid ring pumps were rebuilt during the summer of 2008. In addition to other equipment modifications, this resulted in a marked reduction in the periodic loss of inlet vacuum pressure and resultant loss of hydraulic oil. In turn, the analytical data indicates a marked reduction of the influent sample TPH concentrations.

7.2.2 Vapor Production

As noted above, the number of extraction wells in operation varies with time. However, a total of 17 extraction wells were operated during the recent report period. As both groundwater and vapors are removed from any well in operation, the numbers of wells from which vapors are produced are the same as those producing groundwater.

There is no direct measurement device for measuring the rate of vapor production. An approximate average flow was estimated based on manufacturer specifications for the extraction blowers. An average vapor production rate of 200 standard cubic feet per minute (scfm) was estimated.

A vapor discharge sample was collected on April 25, 2014. Analytical results of the VOCs detected in the sample are summarized in Table 9. A total mass of VOCs recovered as vapor was estimated based on the vapor discharge sample results and an average flow rate of 200 scfm. An estimated total of 28.59 lbs of VOCs were removed for the period since the previous vapor discharge sample was collected (Table 10). An estimated cumulative total of 1,160.60 lbs of VOCs have been removed as vapor through the current report period.

7.2.3 Estimated Mass Removal

An estimated cumulative total of 33.59 lbs and 1,160.60 lbs of VOCs have been removed by means of groundwater and vapor production, respectively. As of May 30, 2014, approximately 1,222.86 lbs of VOCs have been removed by the HVE system.

8.0 Treated Groundwater Discharge Monitoring

VOC impacted-groundwater from the HVE system is treated at the tray stripper and pumped through granular activated carbon before it is discharged to the POTW. The volume of groundwater extracted by the HVE system is metered before discharged to the POTW (Table 5). Routine monitoring of the treated groundwater discharged from the HVE system includes the cumulative volume and run time. These historical data were used to calculate an average discharge flow rate of 0.95 gpm for the groundwater treatment system (Table 5). As of May 30, 2014, approximately 5,212,689 gallons of treated

groundwater have been discharged to the POTW since start-up of the HVE system. A summary of the pressure gauge data for the filters and carbon drums is provided in Table 6.

As of December 2009, the City of Springfield requires semi-annual sampling frequency to monitor the treated groundwater discharge (April and October). Analytical results of effluent samples collected from treated groundwater discharged from the HVE system are provided in Table 11 and Table 12. The historical treated groundwater discharge sample data results are as follow.

- Treated groundwater sample concentrations for all analytes continued to be less than the stipulated permit limits for discharge to the POTW.

- Results from the pH analysis of effluent samples from the HVE treatment system indicate pH levels are within the permissible standard unit range.

9.0 Sub-slab Vapor Extraction System

A sub-slab vapor extraction (SSVE) system was installed and placed in operation on November 6, 2009. The SSVE system is located in the northwest portion of the warehouse and is independent of the HVE system. The SSVE system has operated approximately 98% of the period since start up (Table 13).

A summary of the SSVE effluent sample analytical results and the estimated mass removal are provided on Table 14. A sample of the SSVE effluent is collected on an annual basis and the last sample was collected on October 18, 2013.

10.0 Recommendations

Based on the results of the recent groundwater monitoring event, ARCADIS recommends the following:

- Continue operation of the HVE system for the removal of total fluids and vapor.

- Continue operation of the SSVE system for the removal of soil vapor beneath a portion of the warehouse.

- Continue the groundwater monitoring and reporting program approved by the MDNR in a letter dated November 14, 2011.

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Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

Well Name	Date Installed	Well Material	Top of Vault/Ground (ft amsl)	Top of Casing (ft amsl)	Well Diameter (inches)	Bentonite Interval (ft bgs)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Top of Screen (ft amsl)	Bottom of Screen (ft amsl)	Screen Size (inches)	Borehole Diameter (inches)	Boring Depth (ft bgs)	Top of Bedrock (ft bgs)	Top of Bedrock (ft amsl)
Shallow Springfield Plateau Aquifer Monitoring Wells															
MW-1	5/31/95	SS	1289.26	1288.84	2	7-10	12.2	22.2	1277.06	1267.06	0.010	6	22.5	22.5	1266.8
MW-2	5/31/95	SS	1288.91	1288.39	2	4-6.2	8.2	18.2	1280.71	1270.71	0.010	6	19.5	19.5	1269.4
MW-3	6/1/95	SS	1288.58	1287.85	2	2-4.7	6.7	16.7	1281.88	1271.88	0.010	6	17	17.3	1271.3
MW-4	6/1/95	SS	1287.78	1288.29	2	1-3.5	4.6	14.6	1283.18	1273.18	0.010	6	14.9	14.3	1273.5
MW-5	6/1/95	SS	1289.22	1288.49	2	3.5-6.5	8.5	18.5	1280.72	1270.72	0.010	6	18.8	18.8	1270.4
MW-6	6/1/95	SS	1288.97	1288.73	2	0.5-3.5	5	15	1283.97	1273.97	0.010	6	15.3	15.3	1273.7
MW-7	7/15/99	PVC	1289.02	1291.96	2	2.5-4	5	20	1284.02	1269.02	0.020	8	20	19.7	1269.3
MW-8	7/14/99	PVC	1288.89	1288.56	2	1.25-2.5	3.5	16	1285.39	1272.89	0.020	8	16	15.6	1273.3
MW-9	7/15/99	PVC	1288.89	1288.39	2	3-6.5	8	23	1280.89	1265.89	0.020	8	23.5	23	1265.9
MW-10	7/15/99	PVC	1288.59	1288.07	2	2.5-4	5	20	1283.59	1268.59	0.020	8	20	20	1268.6
MW-11	7/14/99	PVC	1288.09	1290.79	2	2.5-4	4	19	1284.09	1269.09	0.020	8	19	19	1269.1
MW-12	7/14/99	PVC	1287.92	1291.03	2	2.5-4	4.75	19.75	1283.17	1268.17	0.020	8	19	19.75	1268.2
MW-13	7/15/99	PVC	1284.23	1283.63	2	1.25-2.25	3	13	1281.23	1271.23	0.020	8	13	12	1272.2
MW-14	9/10/02	PVC	1286.01	1285.63	2	5-8	10	45	1276.01	1241.01	0.020	6	45.5	21	1265.0
MW-15	9/10/02	PVC	1288.55	1287.93	2	7-10	8.5	43.5	1280.05	1245.05	0.020	6	45.5	12.5	1276.1
MW-16	9/11/02	PVC	1277.69	1277.17	2	7-10	9.5	44.5	1268.19	1233.19	0.020	6	45	28.5	1249.2
MW-17	9/11/02	PVC	1277.38	1276.89	2	7-10	10	45	1267.38	1232.38	0.020	6	45	29	1248.4
MW-18	9/11/02	PVC	1287.72	1287.71	2	7-10	10	45	1277.72	1242.72	0.020	6	45.6	14.5	1273.2
MW-19	4/28/05	PVC	1275.56	1275.35	2	2-12	15	45	1260.56	1230.56	0.010	6	45.5	27.5	1248.1
MW-20	4/28/05	PVC	1276.82	1276.41	2	2-19	20.5	40.5	1256.32	1236.32	0.010	6	41	29	1247.8
MW-21	3/15/07	PVC	1285.08	1284.74	2	1-13	14.8	44.8	1270.28	1240.28	0.010	6	44.8	23	1262.1
MW-22	3/16/07	PVC	1272.67	1272.14	2	1-9	10.5	40.5	1262.17	1232.17	0.010	6	40.5	7	1265.7
MW-23	5/21/07	PVC	1282.86	1282.59	2	1-11	14.2	44.2	1268.66	1238.66	0.010	6	45	20	1262.9
MW-24	5/22/07	PVC	1265.81	1265.20	2	1-9	10.5	40.5	1255.31	1225.31	0.010	6	40.5	20	1245.8
MW-25	4/26/10	PVC	1277.97	1277.54	2	2-8	10	40	1267.97	1237.97	0.010	6	40.5	13	1265.0
MW-26	4/23/10	PVC	1280.84	1280.25	2	2-12.5	15	45	1265.84	1235.84	0.010	6	45.5	23	1257.8
MW-27	4/20/10	PVC	1287.80	1287.41	2	3-8	10	45	1277.80	1242.80	0.010	6	46	13	1274.8
MW-28B	4/27/10	PVC	1289.54	1288.08	2	2-22	24	44	1265.54	1245.54	0.010	6	45	19	1270.5
MW-29B	4/25/10	PVC	1288.10	1287.70	2	2-18	20	45	1268.10	1243.10	0.010	6	45.5	16	1272.1
MW-30B	4/25/10	PVC	1288.32	1286.79	2	3-18	20	45	1268.32	1243.32	0.010	6	45.5	19.5	1268.8
MW-31B	4/25/10	PVC	1288.00	1287.14	2	3-18	20	45	1268.00	1243.00	0.010	6	45.5	19	1269.0

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Shallow Springfield Plateau Aquifer Monitoring Wells (cont.)															
SAW-1	7/25/00	S\OH	1288.97	1288.61	6.25\@30'	OH	30	42.5	*1258.97*	*1246.47*	OH	10\5.6	42.5	16.5	1272.5
SAW-3	7/26/00	S\OH	*1288.67*	1288.30	6.25\@30'	OH	30	44	1258.67	1244.67	OH	10\5.6	44	19.5	1269.2
Former HVE Pilot Test Wells - New Tank Farm															
EW-1N	8/1/95	PVC/SS	1291.52	1290.72	6		*5*	*23.55*	*1285.72*	*1267.17*					
EW-2S	8/1/95	PVC/SS	1291.67	1292.41	6		*5*	*20.80*	*1287.41*	*1271.61*					
Deep Springfield Plateau Aquifer Monitoring Wells															
(SAW-2)	*7/25/00*	*S\OH*	*1277.94*	*1277.41*	*6.25\@25'*	*OH*	*25*	*208*	*1252.94*	*1069.94*	*OH*	*10\5.6*	*208*	*13.9*	
SAW-2	9/11/02	S80 PVC	1283.91	1283.52	2	177.6-182	188	208	1095.91	1075.91	0.020	10\5.6	208	13.9	1270.0
SAW-4	3/15/07	S80 PVC	1285.11	1284.74	6"@60' 2"	176-180	190	210	1095.11	1075.11	0.020	10\6	210	15	1270.1
SAW-5	3/13/07	S80 PVC	1279.16	1278.86	6"@60' 2"	168-173	185	205	1094.16	1074.16	0.020	10\6	205	13	1266.2
SAW-6	4/22/10	S80 PVC	1285.01	1284.70	6"@59' 2"	178-183	185	205	1100.01	1080.01	0.010	10\6	206	14	1271.0
SAW-7	4/24/10	S80 PVC	1288.61	1288.41	6"@59' 2"	165-170	172	212	1116.61	1076.61	0.010	10\6	213	16	1272.6
SAW-8	7/17/10	S80 PVC	*1286.83*	1286.35	6"@59' 2"	177-182	185	205	1101.83	1081.83	0.010	10\6	206	21	1265.8
ERD Pilot Test - Injection Wells (NW Unit)															
IW-1	4/28/05	PVC/SS	1289.00	1288.50	2	8.5-10.5	11.5	21.5	1277.90	1267.90	0.010	6	22	16.5	1272.5
IW-2	4/28/05	PVC/SS	1289.09	1288.56	2	8-11	12	22	1277.09	1267.09	0.010	6	22	N.E.	
IW-3	4/28/05	PVC/SS	1289.27	1288.83	2	9-11	12	22	1277.27	1267.27	0.010	6	22	N.E.	
IW-4	4/28/05	PVC/SS	1290.21	1289.64	2	9-11	12	22	1278.21	1268.21	0.010	6	22	N.E.	
IW-5	4/28/05	PVC/SS	1290.15	1289.72	2	9-11	12	22	1278.15	1268.15	0.010	6	22	20	1270.2
IW-6	1/24/07	PVC/SS	1288.71	1288.33	2	3-7.4	9.5	19.5	1279.21	1269.21	0.010	8	19.5	18.5	1270.2
IW-7	1/29/07	PVC/SS	1289.41	1289.08	2	2-8	10	20	1279.41	1269.41	0.010	6	20	N.E.	
IW-8	1/29/07	PVC/SS	1289.72	1289.42	2	2-8	10	20	1279.72	1269.72	0.010	6	20	N.E.	

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Extraction Wells - Northwest Unit															
E36		PVC	1288.31	*1287.05*			8.5	18.5	1279.81	1269.81			18.5		1269.8
E37		PVC	1288.08	*1286.76*			8.5	18.5	1279.58	1269.58			18.5		1269.6
E38			1287.33	*1286.00*	2		8.5	15.5	1278.83	1271.83			15.5		1271.8
E39			1287.54	*1286.31*			9.5	14.5	1278.04	1273.04			14.5		1273.0
E40			1288.52	*1286.90*	2		10.5	20.5	1278.02	1268.02			20.5		1268.0
E41			1288.90	*1287.55*			9	19	1279.90	1269.90			19.0		1269.9
E42	Pulled						8.5	12.5					12.5	Chert?	
E42B	1/13/04	PVC	1289.08	*1288.21*	2	2.5 - 18	19.5 btoc	44.5 btoc	1268.71	1243.71	0.010	6	45.0	17.00	1272.1
E43			1288.53	*1287.19*			9.5	14.5	1279.03	1274.03			14.5		1274.0
E44			1288.84	*1287.62*	2		9	19	1279.84	1269.84			19.0		1269.8
E45	Pulled						8.5	10.5					10.5		
E45B	4/26/10	PVC	1287.59	*1286.23*	2	3-18	20	40	1266.23	1246.23	0.010	6	42.0	10	1277.6
E46			1289.71	*1288.67*			9	17	1280.71	1272.71			17.0		1272.7
E47	Pulled						9	17					17.0		
E47B	1/13/04	PVC	1288.53	*1287.54*	2	3 - 19	19.25 btoc	44.25 btoc			0.010	6	45.0	17.00	1271.5
E48			1289.83	*1288.68*	2		8.5	18.5	1281.33	1271.33			18.5		1271.3
E49			1289.97	*1288.81*			8.5	12.5	1281.47	1277.47			12.5		1277.5
E50			1288.60	*1287.54*			8.5	10.5	1280.10	1278.10			10.5		1278.1
Extraction Wells - Central Unit															
EW4		SS	1288.77		2	3-5.5	7	22	1281.77	1266.77		8	22	16.00	1272.8
EW5	7/16/99	SS	1289.51		2	2-3.5	4	19	1285.51	1270.51		8	19	19.00	1270.5
EW7"D"	7/16/99	SS	1289.95		2	3-6	9	19	1280.95	1270.95		8	19	19.00	1271.0
EW8"C"	7/16/99	SS	1288.78		2	2.25-3.5	3.5	13.5	1285.28	1275.28		8	13.5	13.50	1275.3
EW9"B"	7/16/99	SS	1289.53		2	2.25-3.5	6.5	16.5	1283.03	1273.03		8	19.5	16.50	1273.0
E11		SS	1288.61				6.5	9	1282.11	1279.61			9.0		1279.6
E12		SS	1288.48				8	18	1280.48	1270.48			18.0		1270.5
E13		SS	1288.57				7.5	9	1281.07	1279.57			9.0		1279.6
E14"A"	7/16/99	SS	1288.79				9.5	19.5	1279.29	1269.29			19.5		1269.3
E32"E"	7/16/99	SS	1289.42				13	23	1276.42	1266.42			23.0		1266.4
E51	4/25/05	PVC	1288.83		2	2-5	6	26	1282.83	1262.83	0.010	6	26	16.5	1272.3
E52	4/27/05	PVC	1288.98		2	3-6	8	23	1280.98	1265.98	0.010	6	26	17	1272.0
E53	4/27/05	PVC	1289.55		2	3-6	7	17	1282.55	1272.55	0.010	6	22	17	1272.6

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Extraction Wells - Rail Spur Unit															
E4		PVC	1285.04				10	20	1275.04	1265.04			20.0		1265.0
E5		PVC	1285.20				9.5	19.5	1275.70	1265.70			19.5		1265.7
E6		PVC	1285.14				9.5	14.5	1275.64	1270.64			14.5		1270.6
E7	Pulled	PVC					9.5	14.5					14.5		
E7B	1/13/04	PVC	1286.00	*1285.31*	2	3 * 19	19.5 btoc	44.5 btoc	1265.81	1240.81	0.010	6	45.0	17.00	1269.0
E8		PVC	1285.10				9.5	19.5	1275.60	1265.60			19.5		1265.6
E9		PVC	1285.08				9	11.5	1276.08	1273.58			11.5		1273.6
E10		PVC	1285.24				7.5	8.5	1277.74	1276.74			8.5		1276.7
E33		PVC	1289.69				10.5	20.5	1279.19	1269.19			20.5		1269.2
E34		PVC	1289.51				8.5	13.5	1281.01	1276.01			13.5		1276.0
Extraction Wells - Loading Dock															
E1		PVC	1285.45				8.5	18.5	1276.95	1266.95			18.5		1267.0
E2		PVC	1285.10				7	8	1278.10	1277.10			8.0		1277.1
E3		PVC	1285.64				8	17	1277.64	1268.64			17.0		1268.6
E15		SS	1289.31				8.5	13.5	1280.81	1275.81			13.5		1275.8
E16		SS	1288.85				9.5	17	1279.35	1271.85			17.0		1271.9
E17		PVC	1289.02				10	17.5	1279.02	1271.52			17.5		1271.5
E18		PVC	1284.82				11	21	1273.82	1263.82			21.0		1263.8
E19		PVC	1284.62				8	17	1276.62	1267.62			17.0		1267.6
E20		PVC	1284.52				7.5	12.5	1277.02	1272.02			12.5		1272.0
E21		PVC	1284.18				8	15	1276.18	1269.18			15.0		1269.2
E22		PVC	1284.67				9.5	16.5	1275.17	1268.17			16.5		1268.2
E23		PVC	1284.32				9	17	1275.32	1267.32			17.0		1267.3
E24		PVC	1284.55				8	12.5	1276.55	1272.05			12.5		1272.1
E25		PVC	1284.70				9.5	15.5	1275.20	1269.20			15.5		1269.2
E26		PVC	1284.68				8.5	13.5	1276.18	1271.18			13.5		1271.2
E27		PVC	1284.84				9.5	19.5	1275.34	1265.34			19.5		1265.3
E28		PVC	1284.51				8.5	10.5	1276.01	1274.01			10.5		1274.0
E29		PVC	1284.97				8.5	9.5	1276.47	1275.47			9.5		1275.5
E30		PVC	1283.90				13.5	23.5	1270.40	1260.40			23.5		1260.4
E31		PVC	1284.03				8	13	1276.03	1271.03			13.0		1271.0

Table 1. Well Completion Summary,
Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

Well Name	Date Installed	Well Material	Top of Vault/Ground (ft amsl)	Top of Casing (ft amsl)	Well Diameter (inches)	Bentonite Interval (ft bgs)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Top of Screen (ft amsl)	Bottom of Screen (ft amsl)	Screen Size (inches)	Borehole Diameter (inches)	Boring Depth (ft bgs)	Top of Bedrock (ft bgs)	Top of Bedrock (ft amsl)

Notes:

Top of Casing Elevation, Top of Vault Elevation, and Location for all Monitoring Wells Were Obtained by Heithous Engineering in May and July 2010.

Top of Vault Elevation and Location for all (57) Extraction Wells Were Obtained on May 5, 2010.

New Survey is Tied to the Missouri DNR Survey Monument: Seminole, Elevation 1274.31

Bearings Based on Grid North as Established by Missouri Coordinate System of 1983, Central Zone.

Top of Casing Elevation for Extraction Wells in NW Unit (in italics) were obtained by ARCADIS in January 2010.

OH = Open Hole N.E. = Not Encountered SS = Stainless Steel PVC = Poly Vinyl Chloride S = Steel

Groundwater Monitoring Well Network - Screen Interval

Shallow Soil (residuum)	15 wells	MWs 1 - 13, EW-1N, and EW-2S (onsite)
Shallow Soil and Upper Bedrock	14 wells	MWs 14 - 27 (offsite)
Upper Bedrock	6 wells	SAW-1, SAW-3, and MWs 28B - 31B (onsite)
Deep Bedrock	6 wells	SAW-2 (onsite) and SAW-4 through SAW-8 (offsite)

21 monitoring wells are located on the Brenntag facility. 20 monitoring wells are located on the adjacent properties.

Extraction Well Network Summary (57 total)

Shallow Extraction Wells (51 total) are completed within the soil/residuum and bottom of screen is at or near the top of bedrock.
Extraction Wells E51 and E52 are completed with screens across the soil/residuum and upper bedrock.
Extraction Wells E7B, E42B, E45B, and E47B are completed with screens within the upper bedrock (below bedrock surface).

Table 2. Summary of Recent Semi-Annual Fluid-level Measurements
Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

Well Number	Well Location	Date Measured	Top Of CasiNg (ft)	Screened Interval (ft bTOC)	Depth to Water (ft bTOC)	Water Level Elevation (ft)	Depth to PSH (ft bTOC)	PSH Level Elevation (ft)	PSH Thickness (ft)	Corrected Water Level Elevation (ft)
Shallow Monitoring Wells										
MW-1	Brenntag	4/22/14	1288.84	11.8-21.8	17.43	1271.41				1271.41
		10/14/13	1288.84	11.8-21.8	12.49	1276.35				1276.35
MW-2	Brenntag	4/22/14	1288.39	7.7-17.7	14.60	1273.79				1273.79
		10/14/13	1288.39	7.7-17.7	11.57	1276.82				1276.82
MW-3	Brenntag	4/22/14	1287.85	6.0-16.0	11.41	1276.44				1276.44
		10/14/13	1287.85	6.0-16.0	8.47	1279.38				1279.38
MW-4	Brenntag	4/22/14	1288.29	4.6-14.6	7.49	1280.80				1280.80
		10/14/13	1288.29	4.6-14.6	5.09	1283.20				1283.20
MW-5	Brenntag	4/22/14	1288.49	7.8-17.8	9.39	1279.10				1279.10
		10/14/13	1288.49	7.8-17.8	5.85	1282.64				1282.64
MW-6	Brenntag	4/22/14	1288.73	4.8-14.8	15.62	1273.11				1273.11
		10/14/13	1288.73	4.8-14.8	11.22	1277.51				1277.51
MW-7	Brenntag	4/22/14	1291.96	8.0-23.0	17.18	1274.78				1274.78
		10/14/13	1291.96	8.0-23.0	16.36	1275.60				1275.60
MW-8	Brenntag	4/22/14	1288.56	3.2-15.7	14.26	1274.30				1274.30
		10/14/13	1288.56	3.2-15.7	12.63	1275.93				1275.93
MW-9	Brenntag	4/22/14	1288.39	7.5-22.5	13.11	1275.28				1275.28
		10/14/13	1288.39	7.5-22.5	11.23	1277.16				1277.16
MW-10	Brenntag	4/22/14	1288.07	4.5-19.5	DRY	DRY				DRY
		10/14/13	1288.07	4.5-19.5	11.12	1276.95				1276.95
MW-11	Brenntag	4/22/14	1290.79	6.7-21.7	DRY	DRY				DRY
		10/14/13	1290.79	6.7-21.7	20.98	1269.81				1269.81
MW-12	Brenntag	4/22/14	1291.03	7.9-22.9	18.93	1272.10				1272.10
		10/14/13	1291.03	7.9-22.9	16.58	1274.45				1274.45
MW-13	Brenntag	4/22/14	1283.63	2.4-12.4	9.64	1273.99				1273.99
		10/14/13	1283.63	2.4-12.4	8.76	1274.87				1274.87
MW-14	Acme	4/22/14	1285.63	9.6-44.6	23.50	1262.13				1262.13
		10/14/13	1285.63	9.6-44.6	20.82	1264.81				1264.81
MW-15	Acme	4/22/14	1287.93	7.9-42.9	32.07	1255.86				1255.86
		10/14/13	1287.93	7.9-42.9	31.65	1256.28				1256.28
MW-16	Back 3	4/22/14	1277.17	9.0-44.0	28.88	1248.29				1248.29
		10/14/13	1277.17	9.0-44.0	28.80	1248.37				1248.37
MW-17	BBC	4/22/14	1276.89	9.5-44.5	27.17	1249.72				1249.72
		10/14/13	1276.89	9.5-44.5	27.11	1249.78				1249.78
MW-18	Blake	4/22/14	1287.71	10.0-45.0	11.43	1276.28				1276.28
		10/14/13	1287.71	10.0-45.0	10.62	1277.09				1277.09

Table 2. Summary of Recent Semi-Annual Fluid-level Measurements
Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

Well Number	Well Location	Date Measured	Top Of CasiNg (ft)	Screened Interval (ft bTOC)	Depth to Water (ft bTOC)	Water Level Elevation (ft)	Depth to PSH (ft bTOC)	PSH Level Elevation (ft)	PSH Thickness (ft)	Corrected Water Level Elevation (ft)
MW-19	City of Springfield	4/22/14	1275.35	14.8-44.8	29.55	1245.80				1245.80
		10/14/13	1275.35	14.8-44.8	29.55	1245.80				1245.80
MW-20	City of Springfield	4/22/14	1276.41	20.1-40.1	29.98	1246.43				1246.43
		10/14/13	1276.41	20.1-40.1	29.93	1246.48				1246.48
MW-21	Back 3	4/22/14	1284.74	14.5-44.5	30.61	1254.13				1254.13
		10/14/13	1284.74	14.5-44.5	29.92	1254.82				1254.82
MW-22	Back 3	4/22/14	1272.14	10.0-4.0	25.60	1246.54				1246.54
		10/14/13	1272.14	10.0-4.0	25.60	1246.54				1246.54
MW-23	BBC	4/22/14	1282.59	14.0-44.0	25.59	1257.00				1257.00
		10/14/13	1282.59	14.0-44.0	22.40	1260.19				1260.19
MW-24	BBC	4/22/14	1265.20	9.9-39.9	21.20	1244.00				1244.00
		10/14/13	1265.20	9.9-39.9	21.29	1243.91				1243.91
MW-25	Dyke Lumber	4/22/14	1277.54	9.6-39.6	27.44	1250.10				1250.10
		10/14/13	1277.54	9.6-39.6	27.36	1250.18				1250.18
MW-26	Dyke Lumber	4/22/14	1280.25	14.4-44.4	22.00	1258.25				1258.25
		10/14/13	1280.25	14.4-44.4	21.78	1258.47				1258.47
MW-27	Blake	4/22/14	1287.41	9.6-44.6	11.05	1276.36				1276.36
		10/14/13	1287.41	9.6-44.6	9.70	1277.71				1277.71
MW-28B	Brenntag	4/22/14	1288.08	22.5-42.5	17.05	1271.03				1271.03
		10/14/13	1288.08	22.5-42.5	12.35	1275.73				1275.73
MW-29B	Brenntag	4/22/14	1287.70	19.6-44.6	24.98	1262.72				1262.72
		10/14/13	1287.70	19.6-44.6	20.71	1266.99				1266.99
MW-30B	Brenntag	4/22/14	1286.79	18.5-43.5	24.40	1262.39				1262.39
		10/14/13	1286.79	18.5-43.5	18.18	1268.61				1268.61
MW-31B	Brenntag	4/22/14	1287.14	19.1-44.1	19.21	1267.93				1267.93
		10/14/13	1287.14	19.1-44.1	14.95	1272.19				1272.19
SAW-1 (Open-Hole)	Acme	4/22/14	1288.61	29.6-42.1	21.10	1267.51				1267.51
		10/14/13	1288.61	29.6-42.1	18.66	1269.95				1269.95
SAW-3 (Open-Hole)	Brenntag	4/22/14	1288.30	29.6-43.6	14.82	1273.48				1273.48
		10/14/13	1288.30	29.6-43.6	12.54	1275.76				1275.76
Former Pilot Test Wells										
TF EW-1N	Brenntag	4/22/14	1290.72	TD 23.47	12.70	1278.02				1278.02
		10/14/13	1290.72	TD 23.47	8.15	1282.57				1282.57
TF EW-2S	Brenntag	4/22/14	1292.41	TD 20.35	6.23	1286.18				1286.18
		10/14/13	1292.41	TD 20.35	5.70	1286.71				1286.71

Table 2. Summary of Recent Semi-Annual Fluid-level Measurements
Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

Well Number	Well Location	Date Measured	Top Of CasiNg (ft)	Screened Interval (ft bTOC)	Depth to Water (ft bTOC)	Water Level Elevation (ft)	Depth to PSH (ft bTOC)	PSH Level Elevation (ft)	PSH Thickness (ft)	Corrected Water Level Elevation (ft)
Bedrock Extraction Wells										
E7B	Brenntag	4/22/14	*1285.31*	TD 44.75	26.00	1259.31				*1259.31*
		10/14/13	*1285.31*	TD 44.75	21.35	1263.96				*1263.96*
"Deep" Bedrock Wells										
SAW-2	Brenntag	4/22/14	1283.52	187.6-207.6	44.74	1238.78				1238.78
		10/14/13	1283.52	187.6-207.6	25.63	1257.89				1257.89
SAW-4	Back 3	4/22/14	1284.74	189.6-209.6	39.37	1245.37				1245.37
		10/14/13	1284.74	189.6-209.6	39.04	1245.70				1245.70
SAW-5	Foster Mfg.	4/22/14	1278.86	184.7-204.7	25.35	1253.51				1253.51
		10/14/13	1278.86	184.7-204.7	24.24	1254.62				1254.62
SAW-6	Foster Mfg.	4/22/14	1284.70	184.7-204.7	27.96	1256.74				1256.74
		10/14/13	1284.70	184.7-204.7	26.54	1258.16				1258.16
SAW-7	Acme Brick	4/22/14	1288.41	171.8-211.8	40.27	1248.14				1248.14
		10/14/13	1288.41	171.8-211.8	39.47	1248.94				1248.94
SAW-8	Acme Brick	4/22/14	1286.35	171.8-211.8	28.17	1258.18				1258.18
		10/14/13	1286.35	171.8-211.8	25.44	1260.91				1260.91

Top of Casing Elevation was Revised with Survey Data Obtained on May 5, 2010 Based on Missouri - State Plane Coordinates.

NM Not Measured
PSH Phase Separated Hydrocarbons.
TOC Top of casing.
ft Feet.
ft bTOC Feet below top of casing.
Datum = Benchmark #592 (1278.04 AMSL).
Specific gravity of 0.80 used for PSH.
Screened interval for SAW-1 & 3 is the "open hole" below surface casing.

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Table 3a. Summary of COPCs in RI Groundwater Samples from Springfield Plateau Aquifer Monitoring Wells
Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri

Well Name Sample Date Dilution Factor	USEPA RSL [a] (ug/L)	MCLs (ug/L)	Shallow		Deep	
			Exceeds RSLs Tap Water	Exceeds MCLs	Exceeds RSLs Tap Water	Exceeds MCLs
Acetone	22000					
Benzene	**0.41**	**5**	**X**	**X**	**X**	**X**
Bromobenzene	88					
Bromochloromethane						
Bromodichloromethane	**0.12**	**80**	**X**			
Bromoform	8.5	80				
Bromomethane	8.7					
2-Butanone (MEK)	7100	**RSL** - USEPA Regional Screening Levels for tapwater, November 2010.				
N-Butylbenzene	**1.5**		**X**	**NA**		
sec-Butylbenzene	**1.5**	**MCL** - USEPA Maximum Contaminant Level.	**X**	**NA**		
tert-Butylbenzene	**1.5**		**X**	**NA**		
Carbon Tetrachloride	**0.44**	**5**	**X**			
Chlorobenzene	91	100				
Chloroethane	21000					
Chloroform	**0.19**	**80**	**X**	**X**		
Chloromethane	190					
2-Chlorotoluene	730					
4-Chlorotoluene	2600					
Dibromochloromethane	0.15	80				
1,2-Dibromo-3-Chloropropane	**0.00032**	**0.2**			**X**	**X**
1,2-Dibromoethane	0.0065	0.05				
Dibromomethane	8.2					
1,2-Dichlorobenzene	370	600				
1,3-Dichlorobenzene	370					
1,4-Dichlorobenzene	**0.43**	**75**	**X**		**X**	
Dichlorodifluoromethane	390					
1,1-Dichloroethane	**2.4**		**X**	**NA**	**X**	**NA**
1,2-Dichloroethane	**0.15**	**5**	**X**	**X**	**X**	
1,1-Dichloroethene	340	7				
cis-1,2-Dichloroethene	**73**	**70**	**X**	**X**	**X**	**X**
trans-1,2-Dichloroethene	110	100				
1,2-Dichloroethene, Total	330					
1,2-Dichloropropane	**0.39**	**5**	**X**			
1,3-Dichloropropane	730					
2,2-Dichloropropane	0.39					
1,1-Dichloropropene						
cis-1,3-Dichloropropene	0.43					
trans-1,3-Dichloropropene	0.43					
Ethylbenzene	**1.5**	**700**	**X**		**X**	
Hexachlorobutadiene	0.86					
2-Hexanone	**47**		**X**	**NA**		
Isopropylbenzene	680					
p-Isopropyltoluene	680					
4-Methyl-2-Pentanone	2000					
Methylene Chloride	**4.8**	**5**	**X**	**X**	**X**	**X**
Naphthalene	**0.14**		**X**	**NA**	**X**	**NA**
N-Propylbenzene	1300					
Styrene	1600	100				
1,1,1,2-Tetrachloroethane	**0.52**		**X**	**NA**		
1,1,2,2-Tetrachloroethane	**0.067**		**X**	**NA**		
Tetrachloroethene	**0.11**	**5**	**X**	**X**		
Toluene	**2300**	**1000**	**X**	**X**		
1,2,3-Trichlorobenzene	29					
1,2,4-Trichlorobenzene	2.3	70				
1,1,1-Trichloroethane	9100	200				
1,1,2-Trichloroethane	**0.24**	**5**	**X**	**X**		
Trichloroethene	**2**	**5**	**X**	**X**		
Trichlorofluoromethane	1300					
1,2,3-Trichloropropane	**0.00072**		**X**	**NA**		
1,2,4-Trimethylbenzene	**15**		**X**	**NA**	**X**	**NA**
1,3,5-Trimethylbenzene	**370**		**X**	**NA**		
Vinyl chloride	**0.016**	**2**	**X**	**X**	**X**	**X**
m,p-Xylene	1200					
o-Xylene	1200					
Xylenes, Total	**200**	**10000**	**X**		**X**	

COPCs (bold print) - Chemicals of Potential Concern

ug/L - micrograms per liter, equivalent to parts per billion.

G:\Aproject\BRENNTAG\OK12552014\REPORTS\1SA14\TABLES\[1SA14 T3a_SUMRY COPCs RI GW SMPLS-RSLs_MCLs.xlsx]COPCs RI GW

Table 3a. Summary of COPCs in RI Groundwater Samples from Springfield Plateau Aquifer Monitoring Wells
Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri

Footnotes:

1,2-dichloroethene (total) is reported as a separate analysis and may or may not reflect the total cis- and trans-1,2-dichloroethene. Results may appear to be rounded off because the laboratory is reporting data to 2 significant digits, which in turn reflects the level of uncertainty of the lab results.

Xylenes(total) is reported as a separate analysis and may or may not reflect the total of m-, p-, and o-xylenes. Results may appear to be rounded off because the laboratory is reporting data to 2 significant digits, which in turn reflects the level of uncertainty of the lab results.

RSL - USEPA Regional Screening Levels for tapwater, November 2010.

MCL - USEPA Maximum Contaminant Level.

ARCADIS

Table 3b. Summary of First Semi-Annual 2014 Groundwater Analytical Data
Brennta/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri

Well Name Sample Date chemical_name	USEPA RSL (ug/L)	MCLs (ug/L)	MW-1 4/24/2014 (ug/L)	MW-3 4/24/2014 (ug/L)	MW-4 4/24/2014 (ug/L)	MW-5 4/24/2014 (ug/L)	MW-9 4/24/2014 (ug/L)	MW-15 4/24/2014 (ug/L)	MW-15 DUP-2 4/24/2014 (ug/L)	MW-17 4/23/2014 (ug/L)	MW-19 4/24/2014 (ug/L)	MW-21 4/23/2014 (ug/L)	MW-22 4/23/2014 (ug/L)	MW-23 4/23/2014 (ug/L)	MW-27 4/24/2014 (ug/L)	MW-28B 4/23/2014 (ug/L)	MW-29B 4/23/2014 (ug/L)	MW-31B 4/23/2014 (ug/L)	SAW-1 4/23/2014 (ug/L)	SAW-1 DUP-1 4/23/2014 (ug/L)	SAW-2 4/23/2014 (ug/L)	SAW-4 4/23/2014 (ug/L)	SAW-5 4/23/2014 (ug/L)	SAW-6 4/23/2014 (ug/L)	SAW-7 4/23/2014 (ug/L)
Acetone	22000		< 2000 U	< 10 U	< 20 U	< 10 U	< 10 U	< 10 U	< 10 U	< 100 U	< 10 U	**3.5** J	< 10 U	< 10 U	< 10 U	< 1000 U	< 50 U	< 100 U	< 10 U	< 10 U	**180**	< 10 U	< 10 U	< 10 U	< 10 U
Benzene	0.41	5	< 200 U	< 1.0 U	**0.66** J	**2.5**	**0.95** J	**13**	**15**	**11**	< 1.0 U	**0.20** J	**12**	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	**11**	**9.1**	**55**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromobenzene	88		< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromochloromethane			< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromodichloromethane	0.12	80	< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform	8.5	80	< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	8.7		< 400 U	< 2.0 U	< 4.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 20 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 200 U	< 10 U	< 20 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
2-Butanone (MEK)	7100		< 1000 U	< 5.0 U	< 10 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 50 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 600 U	< 30 U	< 60 U	< 6.0 U	< 6.0 U	**77**	< 6.0 U	< 6.0 U	< 6.0 U	< 6.0 U
N-Butylbenzene	1.5		< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.58** J	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
sec-Butylbenzene	1.5		< 200 U	< 1.0 U	**13**	< 1.0 U	**1.0**	**1.1**	**1.2**	**7.8** J	< 1.0 U	**0.20** J	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	**1.6**	**1.4**	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	1.5		< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	**0.61** J	**0.24** J	**0.21** J	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	**0.19** J	**0.19** J	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon Tetrachloride	0.44	5	< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	91	100	< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	**0.45** J	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroethane	21000		< 400 U	< 2.0 U	**1.1** J	**4.6**	< 2.0 U	**21**	**18**	**85**	< 2.0 U	< 2.0 U	**19**	< 2.0 U	< 2.0 U	< 200 U	< 10 U	< 20 U	**6.1**	**7.1**	**91**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Chloroform	0.19	80	**68** J	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	**0.21** J	< 1.0 U
Chloromethane	190		< 400 U	< 2.0 U	< 4.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 20 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 200 U	< 10 U	< 20 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
2-Chlorotoluene	730		< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Chlorotoluene	2600		< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromochloromethane	0.15	80	< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dibromo-3-Chloropropane	0.00032	0.2	< 400 U	< 2.0 U	< 4.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 20 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 500 U	< 25 U	< 50 U	< 5.0 U	< 5.0 U	< 25 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dibromoethane	0.0065	0.05	< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromomethane	8.2		< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichlorobenzene	370	600	< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	**3.1**	**3.6**	< 10 U	< 1.0 U	**0.26** J	**0.17** J	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	**2.1**	**2.1**	**11**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichlorobenzene	370		< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	0.43	75	< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	**0.45** J	**0.45** J	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	**0.22** J	**0.32** J	**1.2** J	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane	390		< 400 U	< 2.0 U	< 4.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 20 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 200 U	< 10 U	< 20 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
1,1-Dichloroethane	2.4		< 200 U	**1.4**	**8.3**	**25**	**3.6**	**0.40** J	**0.50** J	**4.3** J	**0.59** J	**3.5**	**52**	< 1.0 U	< 1.0 U	< 100 U	**3.7** J	**2.7** J	**0.84** J	**0.73** J	**10**	< 1.0 U	< 1.0 U	**0.52** J	< 1.0 U
1,2-Dichloroethane	0.15	5	< 200 U	< 1.0 U	< 2.0 U	**1.6**	**4.3**	< 1.0 U	**0.46** J	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethene	340	7	**49** J	< 1.0 U	< 2.0 U	**1.8**	**0.76** J	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	**0.32** J	< 1.0 U	< 1.0 U	**140**	**2.1** J	< 10 U	< 1.0 U	< 1.0 U	**6.1**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,2-Dichloroethene	73	70	**1400**	< 1.0 U	**2.1**	**11**	**290**	**0.32** J	**0.39** J	< 10 U	**1.3**	< 1.0 U	**4.9**	**0.39** J	< 1.0 U	**2000**	**530**	**480**	**0.34** J	**0.34** J	**490**	< 1.0 U	< 1.0 U	< 1.0 U	**0.56** J
trans-1,2-Dichloroethene	110	100	< 100 U	< 0.50 U	< 1.0 U	**0.27** J	< 5.0 U	**2.2**	**2.6**	< 5.0 U	< 0.50 U	**0.21** J	**1.5**	< 0.50 U	< 0.50 U	< 100 U	**1.1** J	< 10 U	**9.1**	**7.4**	**2.9** J	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethene, Total	330		**1400**	< 1.0 U	**2.1**	**11**	**290**	**2.6**	**3.0**	< 10 U	**1.3**	< 1.0 U	**6.4**	**0.39** J	< 1.0 U	**2000**	**510**	**640**	**9.4**	**7.8**	**500**	< 1.0 U	< 1.0 U	< 1.0 U	**0.56** J
1,2-Dichloropropane	0.39	5	< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichloropropane	730		< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2,2-Dichloropropane	0.39		< 1000 U	< 5.0 U	< 10 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 50 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloropropene			< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,3-Dichloropropene	0.43		< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene	0.43		< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 300 U	< 15 U	< 30 U	< 3.0 U	< 3.0 U	< 15 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U
Ethylbenzene	1.5	700	< 200 U	< 1.0 U	**53**	**0.19** J	< 1.0 U	**0.16** J	**0.19** J	**350**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	**0.22** J	**0.17** J	**180**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Hexachlorobutadiene	0.86		< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Hexanone	47		< 1000 U	< 5.0 U	< 10 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 50 U	< 5.0 U	**2.1** J	< 5.0 U	< 5.0 U	< 5.0 U	< 500 U	< 25 U	< 50 U	< 5.0 U	< 5.0 U	< 25 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Isopropylbenzene	680		< 200 U	< 1.0 U	**79**	**0.21** J	**0.24** J	**4.6**	**4.2**	**160**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	**6.4**	**6.9**	**8.6**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
p-Isopropyltoluene	680		< 200 U	< 1.0 U	**6.9**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**2.7** J	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Methyl-2-Pentanone	2000		< 1000 U	< 5.0 U	< 10 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 50 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 500 U	< 25 U	< 50 U	< 5.0 U	< 5.0 U	**290**	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Methylene Chloride	4.8	5	< 400 UB	< 2.0 U	< 4.0 UB	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UB	< 20 UB	< 2.0 U	< 2.0 UB	< 2.0 UB	< 2.0 UB	< 2.0 U	< 430 UB	< 20 UB	< 20 UB	< 2.0 U	< 2.0 U	< 10 UB	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Naphthalene	0.14		< 200 U	< 1.0 U	**11**	< 1.0 U	< 1.0 U	**7.6**	**11**	**24**	< 1.0 U	< 1.0 U	**0.45** J	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	**11**	**11**	**52**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
N-Propylbenzene	1300		< 200 U	< 1.0 U	**69**	< 1.0 U	< 1.0 U	**3.1**	**3.3**	**230**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	**3.7**	**3.6**	**12**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene	1600	100	< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,1,2-Tetrachloroethane	0.52		**83** J	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	0.067		< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	0.11	5	**77000**	< 1.0 U	< 2.0 U	< 1.0 U	**1.2**	< 1.0 U	< 1.0 U	< 10 U	**0.44** J	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**12000**	**7.0**	**3.7** J	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	2300	1000	< 200 U	< 1.0 U	**1.7** J	< 1.0 U	< 1.0 U	< 1.0 U	**0.19** J	**300**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	**0.19** J	**0.25** J	**1500**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichlorobenzene	29		< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	2.3	70	< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,1-Trichloroethane	9100	200	< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	0.24	5	**120** J	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	**1.0**	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichloroethene	2	5	**650**	< 1.0 U	< 2.0 U	< 1.0 U	**27**	< 1.0 U	< 1.0 U	< 10 U	**2.9**	< 1.0 U	**0.83** J	< 1.0 U	< 1.0 U	**4300**	**1400**	**2400**	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichlorofluoromethane	1300		< 400 U	< 2.0 U	< 4.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 20 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 200 U	< 10 U	< 20 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
1,2,3-Trichloropropane	0.00072		< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 250 U	< 13 U	< 25 U	< 2.5 U	< 2.5 U	< 13 U	< 2.5 U	< 2.5 U	< 2.5 U	< 2.5 U
1,2,4-Trimethylbenzene	15		< 200 U	< 1.0 U	**640**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**560**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	**93**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	370		< 200 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**470**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	**0.19** J	**43**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Vinyl chloride	0.016	2	< 200 U	< 1.0 U	**0.97** J	**30**	**70**	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	**0.20** J	**110**	< 1.0 U	< 1.0 U	**340**	**0.65** J	< 10 U	**0.73** J	**0.97** J	**210**	< 1.0 U	< 1.0 U	< 1.0 U	**1.8**
m,p-Xylene	1200		< 400 U	< 2.0 U	**110**	< 2.0 U	< 2.0 U	**0.95** J	**0.83** J	**3800**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 200 U	< 10 U	< 20 U	**0.42** J	**0.45** J	**770**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
o-Xylene	1200		< 200 U	< 1.0 U	**7.5** J	**0.29** J	**0.56** J	< 1.0 U	< 1.0 U	**640**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 100 U	< 5.0 U	< 10 U	< 1.0 U	< 1.0 U	**170**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Xylenes, Total	200	10000	< 400 U	< 2.0 U	**120**	**0.29** J	**0.56** J	**0.95** J	**0.83** J	**4400**	< 2.0 U	< 2.0 U	**0.32** J	< 2.0 U	< 2.0 U	< 200 U	< 10 U	< 20 U	**0.42** J	**0.45** J	**940**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U

Table 3b. Summary of First Semi-Annual 2014 Groundwater Analytical Data
Brennta/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri

Well Name Sample Date chemical_name	USEPA RSL (ug/L)	MCLs (ug/L)	SAW-8 4/23/2014 (ug/L)		TF EW-2S 4/24/2014 (ug/L)		E7B 4/23/2014 (ug/L)		TB 4/23/2014 (ug/L)		TB 4/25/2014 (ug/L)	
Acetone	22000		< 10	U	< 10	U	< 40	U	< 10	U		
Benzene	0.41	5	< 1.0	U	**0.40**	J	**1.2**	J	< 1.0	U		
Bromobenzene	88		< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
Bromochloromethane			< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
Bromodichloromethane	0.12	80	< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
Bromoform	8.5	80	< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
Bromomethane	8.7		< 2.0	U	< 2.0	U	< 8.0	U	< 2.0	U		
2-Butanone (MEK)	7100		< 6.0	U	< 5.0	U	< 24	U	< 6.0	U		
N-Butylbenzene	1.5		< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
sec-Butylbenzene	1.5		< 1.0	U	< 1.0	U	**8.9**		< 1.0	U		
tert-Butylbenzene	1.5		< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
Carbon Tetrachloride	0.44	5	< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
Chlorobenzene	91	100	< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
Chloroethane	21000		< 2.0	U	< 2.0	U	**2.7**	J	< 2.0	U		
Chloroform	0.19	80	< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
Chloromethane	190		< 2.0	U	< 2.0	U	< 8.0	U	< 2.0	U		
2-Chlorotoluene	730		< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
4-Chlorotoluene	2600		< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
Dibromochloromethane	0.15	80	< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
1,2-Dibromo-3-Chloropropane	0.00032	0.2	< 5.0	U	< 2.0	U	< 20	U	< 5.0	U		
1,2-Dibromoethane	0.0065	0.05	< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
Dibromomethane	8.2		< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
1,2-Dichlorobenzene	370	600	< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
1,3-Dichlorobenzene	370		< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
1,4-Dichlorobenzene	0.43	75	< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
Dichlorodifluoromethane	390		< 2.0	U	< 2.0	U	< 8.0	U	< 2.0	U		
1,1-Dichloroethane	2.4		< 1.0	U	**2.2**		**2.9**	J	< 1.0	U	< 5.0	U
1,2-Dichloroethane	0.15	5	< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
1,1-Dichloroethene	340	7	< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
cis-1,2-Dichloroethene	73	70	< 1.0	U	**4.1**		**0.75**	J	< 1.0	U		
trans-1,2-Dichloroethene	110	100	< 1.0	U	< 0.50	U	< 4.0	U	< 1.0	U		
1,2-Dichloroethene, Total	330		< 1.0	U	**4.1**		< 4.0	U	< 1.0	U		
1,2-Dichloropropane	0.39	5	< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
1,3-Dichloropropane	730		< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
2,2-Dichloropropane	0.39		< 1.0	U	< 5.0	U	< 4.0	U	< 1.0	U		
1,1-Dichloropropene			< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
cis-1,3-Dichloropropene	0.43		< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
trans-1,3-Dichloropropene	0.43		< 3.0	U	< 1.0	U	< 12	U	< 3.0	U		
Ethylbenzene	1.5	700	< 1.0	U	**0.18**	J	**120**		< 1.0	U	< 5.0	U
Hexachlorobutadiene	0.86		< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
2-Hexanone	47		< 5.0	U	< 5.0	U	< 20	U	< 5.0	U		
Isopropylbenzene	680		< 1.0	U	< 1.0	U	**130**		< 1.0	U		
p-Isopropyltoluene	680		< 1.0	U	< 1.0	U	**6.5**		< 1.0	U		
4-Methyl-2-Pentanone	2000		< 5.0	U	< 5.0	U	< 20	U	< 5.0	U		
Methylene Chloride	4.8	5	< 2.0	U	< 2.0	U	< 8.0	UB	< 2.0	U		
Naphthalene	0.14		< 1.0	U	**0.81**	J	**20**		< 1.0	U		
N-Propylbenzene	1300		< 1.0	U	**0.38**	J	**110**		< 1.0	U		
Styrene	1600	100	< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
1,1,1,2-Tetrachloroethane	0.52		< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
1,1,2,2-Tetrachloroethane	0.067		< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
Tetrachloroethene	0.11	5	< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
Toluene	2300	1000	< 1.0	U	< 1.0	U	**2.9**	J	< 1.0	U	< 5.0	U
1,2,3-Trichlorobenzene	29		< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
1,2,4-Trichlorobenzene	2.3	70	< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
1,1,1-Trichloroethane	9100	200	< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
1,1,2-Trichloroethane	0.24	5	< 1.0	U	< 1.0	U	**7.4**		< 1.0	U		
Trichloroethene	2	5	< 1.0	U	< 1.0	U	< 4.0	U	< 1.0	U		
Trichlorofluoromethane	1300		< 2.0	U	< 2.0	U	< 8.0	U	< 2.0	U		
1,2,3-Trichloropropane	0.00072		< 2.5	U	< 1.0	U	< 10	U	< 2.5	U		
1,2,4-Trimethylbenzene	15		< 1.0	U	< 1.0	U	**710**		< 1.0	U		
1,3,5-Trimethylbenzene	370		< 1.0	U	**0.17**	J	**1500**		< 1.0	U		
Vinyl chloride	0.016	2	< 1.0	U	**8.9**		< 4.0	U	< 1.0	U	< 10	U
m,p-Xylene	1200		< 2.0	U	< 2.0	U	**600**		< 2.0	U		
o-Xylene	1200		< 1.0	U	< 1.0	U	**23**	J	< 1.0	U		
Xylenes, Total	200	10000	< 2.0	U	**0.21**	J	**620**		< 2.0	U		

Table 3b. Summary of First Semi-Annual 2014 Groundwater Analytical Data
Brennta/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri

Footnotes:

VOCs	Volatile Organis Compounds analyzed by USEPA Method 8260B.
	All wells are sampled by means of a Hydrasleeve (grab sampler).
ug/L	All table values shown in micrograms per liter, equivalent to parts per billion.
<	Not detected at or above laboratory practical quantitative limit, as shown.
Bold	Bold values indicate detected constituent concentrations.
RSL	USEPA Regional Screening Levels for tapwater, November 2010.
MCL	Maximum Contaminant Level from National Primary Drinking Water Standards, as determined by the U. S. Environmental Protection Agency dated July 2002.

*** List of Analyte Synonyms;**
Bromochloromethane = Chlorobromomethane
Bromoform = Tribromomethane
sec-Butylbenzene = 2-Phenylbtane
Dibromochloromethane = Chlorodibromomethane
Dichlorodifluoromethane = CFC-12
Hexachlorobutadiene = (Hexachloro-1,3-)Butadiene
2-Hexanone = Methyl N-Butyl Ketone
Methylene Chloride = Dichloromethane
Trichlorofluoromethane = CFC-11

1,2-dichloroethene (total) is reported as a separate analysis and may or may not reflect the total cis- and trans-1,2-dichloroethene. Results may appear to be rounded off because the laboratory is reporting data to 2 significant digits, which in turn reflects the level of uncertainty of the lab results.

Xylenes(total) is reported as a separate analysis and may or may not reflect the total of m , p-, and o-xylenes. Results may appear to be rounded off because the laboratory is reporting data to 2 significant digits, which in turn reflects the level of uncertainty of the lab results.

Data Flags:

J	Result is less than the reporting limit (RL) but greater than or equal to the method detection limit (MDL) and the concentration is an approximate value.
D	Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples.
B	Compound was found in the blank and sample.
U	Non detect

Table 4. Historical Operation and Maintenance Summary, HVE System,
Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

DATE	TIME	INLET VACUUM PI-1101 ("HG)	OIL LEVEL - V11 INITIAL	FINAL	VOLUME ADDED	CUMULATIVE RUN TIME (HOURS) LIQUID RING PUMPS PUMP 120A	PUMP 120B	INCREMENTAL RUN TIME (HOURS) LIQUID RING PUMPS PUMP 120A	PUMP 120B	APPROX. DOWN TIME (HOURS)	APPROX. TIME INTERVAL (HOURS)	% RUN TIME	REMARKS
1/2/14	15:13	21	FULL	FULL	0	8985.4	41016.8	47.6	47.5	0.0	47.6	100.00%	MK-RS OK. PLUG 2 PINHOLES ON LAG GAC VESSEL. CLEAN AS INF FLOW MTR.
1/6/14	16:32		FULL	FULL	0	9082.4	41113.8	97.0	97.0	0.3	97.3	99.67%	MK- NO ALARMS, HI SURGE TANK. SOLENOID BYPASS OPEN, AS INF PUMP OFF. LRPs ON.
1/7/14	14:55												MK-CHECK TORPEDO HEATER, ATTEMPT TO RESTART RS, NO FLOW-**STILL FROZEN**
1/8/14	14:22	21	FULL	FULL	0	9082.4	41113.8	0.0	0.0	45.8	45.8	0.00%	MK- CLEAN INF MTR, RESTART TRANSFER PUMP. 1517 - RETURN & RESTART LRPs
1/9/14	17:43	20	FULL	FULL	0	9108.8	41140.3	26.4	26.5	0.9	27.3	96.89%	MK-RS OK.
1/13/14	13:49		FULL	FULL	0	9200.9	41232.4	92.1	92.1	0.0	92.1	100.00%	MK-RS OK. **SHUT DOWN FOR SYSTEM CLEANING. PULL-CLEAN EW STINGERS**
1/14/14	9:25	22	FULL	FULL	0	9220.6	41252.0	19.7	19.6	-0.1	19.6	100.00%	MK-RS OK. **REPLACE TOP OF LEAD GAC, RESTART RS AFTER CLEANING.**
1/17/14	14:37	22	FULL	FULL	0	9265.3	41296.7	44.7	44.7	32.5	77.2	57.90%	MK-RS OK. **SOLENOID OPEN, SURGE TANK HI ALARM, UNPLUG TRANSFER PUMP**
1/20/14	7:43	22	FULL	FULL	0	9330.4	41361.8	65.1	65.1	0.0	65.1	100.00%	MK-RS OK.
1/22/14	15:49	20	FULL	FULL	0	9386.5	41417.9	56.1	56.1	0.0	56.1	100.00%	MK-RS OK. **SOLENOID OPEN, SURGE TANK HI ALARM, UNPLUG TRANSFER PUMP**
1/24/14	15:25	22	FULL	FULL	0	9434.1	41465.5	47.6	47.6	0.0	47.6	100.00%	MK-RS OK. **REPLACE PRESSURE GAUGE ON AS INF LINE**
1/27/14	15:07	18	FULL	FULL	0	9505.8	41537.2	71.7	71.7	0.0	71.7	100.00%	MK-RS OK.
1/31/14	15:01	22	FULL	FULL	0	9601.7	41633.1	95.9	95.9	0.0	95.9	100.00%	MK-RS OK.
January 2014								**663.9**	**663.8**	**79.5**	**743.4**	**89.3%**	31.0
2/3/14	14:43	22	FULL	FULL	0	9673.4	41704.8	71.7	71.7	0.0	71.7	100.00%	MK-RS OK. **E42B WELL VAULT DAMAGED BY SNOW PLOW.**
2/5/14	16:25	21	FULL	FULL	0	9723.1	41754.5	49.7	49.7	0.0	49.7	100.00%	MK-RS OK.
2/6/14	14:25	21	FULL	FULL	0	9745.2	41776.5	22.1	22.0	-0.1	22.0	100.00%	MK-RS OK.
2/10/14	15:37	21	FULL	FULL	0	9842.3	41873.7	97.1	97.2	0.1	97.2	100.00%	MK-RS OK.
2/12/14	14:00	22	FULL	FULL	0	9888.7	41920.1	46.4	46.4	0.0	46.4	100.02%	MK-RS OK.
2/14/14	13:22	20	FULL	FULL	0	9936.1	41967.5	47.4	47.4	0.0	47.4	100.09%	MK-RS OK. **BAIL SAW-2 ON 2/13/14.**
2/17/14	16:16	20	FULL	FULL	0	10011.0	42042.4	74.9	74.9	0.0	74.9	100.00%	MK-RS OK.
2/19/14	16:58	20	FULL	FULL	0	10059.7	42091.1	48.7	48.7	0.0	48.7	100.00%	MK-RS OK. **CONCRETE AT MW-9 IS BREAKING UP**
2/21/14	15:22	20	FULL	FULL	0	10106.2	42137.5	46.5	46.4	-0.1	46.4	100.00%	MK-RS OK. CHANGE FILTERS
2/24/14	15:22	20	FULL	FULL	0	10178.1	42209.4	71.9	71.9	0.1	72.0	99.86%	MK-RS OK.
2/26/14	16:22	19	FULL	FULL	0	10227.1	42258.4	49.0	49.0	0.0	49.0	100.00%	MK-RS OK.
2/28/14	12:46	20	FULL	FULL	0	10271.4	42302.8	44.3	44.4	0.1	44.4	100.00%	MK-RS OK.
February 2014								**669.7**	**669.7**	**0.1**	**669.8**	**100.0%**	27.9
3/3/14	15:59	22	FULL	FULL	0	10346.7	42378.0	75.3	75.2	-0.1	75.2	100.11%	MK-RS OK.
3/5/14	15:29	23	FULL	FULL	0	10394.2	42425.5	47.5	47.5	0.0	47.5	100.00%	MK-RS OK.
3/7/14	16:17	20	FULL	FULL	0	10442.9	42474.3	48.7	48.8	0.1	48.8	100.00%	MK-RS OK.
3/12/14	14:47	20	FULL	FULL	0	10560.5	42591.8	117.6	117.5	-0.1	117.5	100.00%	MK-RS OK. **ADJUST DST.** CHANGE BAG FILTER
3/14/14	16:59	20	FULL	FULL	0	10610.7	42642.0	50.2	50.2	0.0	50.2	100.00%	MK-RS OK.
3/17/14	14:35	20	FULL	FULL	0	10648.7	42680.0	38.0	38.0	31.6	69.6	54.60%	MK-**RS DOWN V-190 HL AS.** REMOVE 4" LEAD GAC & BF. CLEAN KO TANK&TRPUMP CV
3/21/14	13:00	21	FULL	FULL	0	10720.9	42752.2	72.2	72.2	22.2	94.4	76.47%	MK-RS OK. DRAIN LAG GAC FOR VESSEL CHANGE OUT NEXT WEEK. BAIL SAW-2
3/26 and 3/27/14													**BB- SHUT DOWN FOR SYSTEM CLEANING. INSTALL NEW SS CARBON VESSELS.**
3/28/14	9:17	20	FULL	FULL	0	10837.3	42868.5	116.4	116.3	47.9	164.3	70.79%	MK-RS OK. **BACKFLUSH GAC VESSELs, REPLACE CARTRIDGES, RESTART SYSTEM**
3/31/14	13:47	21	FULL	FULL	0	10913.8	42945.0	76.5	76.5	0.0	76.5	100.00%	MK-RS OK.
March 2014								**1741.2**	**1741.0**	**101.7**	**1842.9**	**94.5%**	76.8
4/2/14	16:41	21	FULL	FULL	0	10964.7	42995.9	50.9	50.9	0.0	50.9	100.00%	MK-RS OK.
4/4/14	10:11	19	FULL	FULL	0	11006.1	43037.4	41.4	41.5	0.1	41.5	100.00%	MK-RS OK.
4/7/14	13:17	20	FULL	FULL	0	11081.3	43112.5	75.2	75.1	-0.1	75.1	100.00%	MK-RS OK.
4/9/14	11:11	21	FULL	FULL	0	11127.2	43158.4	45.9	45.9	0.0	45.9	100.00%	MK-RS OK.
4/14/14	16:59	19	FULL	FULL	0	11253.0	43284.2	125.8	125.8	0.0	125.8	100.00%	MK-RS OK. BAIL SAW-2 ON 4/17/14
4/16/14	15:35	21	FULL	FULL	0	11299.6	43330.8	46.6	46.6	0.0	46.6	100.00%	MK-RS OK. REPLACE BAG & CARTRIDGE FILTERS
4/22/14	14:59	21	FULL	FULL	0	11443.0	43474.2	143.4	143.4	0.0	143.4	100.00%	MK-RS OK. **1SA14 GWM EVENT**
4/24/14	13:23	20	FULL	FULL	0	11489.4	43520.6	46.4	46.4	0.0	46.4	100.00%	MK-RS OK.
4/28/14	16:22	20	FULL	FULL	0	11588.5	43619.6	99.1	99.0	0.0	99.0	100.00%	MK-RS OK.
4/30/14	16:59	20	FULL	FULL	0	11637.0	43668.2	48.5	48.6	0.0	48.6	100.00%	MK-RS OK.

Table 4. Historical Operation and Maintenance Summary, HVE System,
Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

DATE	TIME	INLET VACUUM PI-1101 ("HG)	OIL LEVEL - V11 INITIAL	FINAL	VOLUME ADDED	CUMULATIVE RUN TIME (HOURS) LIQUID RING PUMPS PUMP 120A	PUMP 120B	INCREMENTAL RUN TIME (HOURS) LIQUID RING PUMPS PUMP 120A	PUMP 120B	APPROX. DOWN TIME (HOURS)	APPROX. TIME INTERVAL (HOURS)	% RUN TIME	REMARKS
April 2014								**723.2**	**723.2**	**0.0**	**723.2**	**100.0%**	30.1
5/2/14	16:05	21	FULL	FULL	0	11684.1	43715.3	47.1	47.1	0.0	47.1	100.00%	MK-RS OK.
5/5/14	17:47	21	FULL	FULL	0	11757.8	43788.9	73.7	73.6	0.0	73.7	100.00%	MK-RS OK.
5/9/14	10:23	20	FULL	FULL	0	11820.1	43851.2	62.3	62.3	26.3	88.6	70.32%	MK-RS DOWN V-190 HL STRIPPER. NEW FLTRS, CLEAN AS INF MTR, RESTART AT 1028.
5/16/14	15:17	21	FULL	FULL	0	11992.9	44024.1	172.8	172.9	0.1	172.9	100.00%	MK-SD RS, CLEAN KO TANK SENSORS. RESTART AT 1530.
5/19/14	15:48	22	FULL	FULL	0	12045.1	44076.2	52.2	52.1	20.3	72.5	71.85%	MK-RS DOWN V-190 HL STRPR. REPAIR LEAK AT FLOW MTR ADAPTER AFTER SURGE TANK.
5/21/14	16:24	22	FULL	FULL	0	12093.6	44124.8	48.5	48.6	0.1	48.6	100.00%	MK-RS OK.
5/27/14	14:54	22	FULL	FULL	0	12236.2	44267.3	142.6	142.5	-0.1	142.5	100.00%	MK-RS OK. BAIL SAW-2 ON 5/28/14
5/30/14	16:06	22	FULL	FULL	0	12309.4	44340.5	73.2	73.2	0.0	73.2	100.00%	MK-RS OK.CLEAN KO TANK SENSORS & AS FLOW MTR, RESTART 1655, FLOW AT E7B/E45B
May 2014							\	**672.4**	**672.3**	**46.7**	**719.1**	**93.5%**	30.0

ARCADIS - REMEDIATION SYSTEM OPERATION	**78759.2**	**34313.9**	**113763.6**	**69.23%**
CJE - REMEDIATION SYSTEM OPERATION	**4394.9**	**5610.5**	**10004.6**	**43.93%**
CUMULATIVE REMEDIATION SYSTEM OPERATION	**83154.1**	**40614.2**	**123768.2**	**67.19%**

Table 5. Historical Summary of Flowmeter Located Before Discharge to POTW, HVE System, Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

	FLOWMETER BEFORE DISCHARGE TO POTW							REMARKS
	CUMULATIVE VOLUME		INCREMENTAL VOLUME		METERED	APPROX.	AVERAGE	
DATE TIME	FQ1-2202 TOTAL 1 (GALS)	FQ1-2202 TOTAL 2 (GALS)	DELTA 1 (GALS)	DELTA 2 (GALS)	DISCHARGE FLOWRATE (GPM)	RUN TIME (HOURS)	DISCHARGE FLOWRATE (GPM)	
1/2/14 15:13	207331	207331	2597	2597	NM	47.5	0.91	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
1/6/14 16:32	211147	211147	3816	3816	NM	97.0	0.66	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
1/8/14 14:22	211163	211163	16	16	5.97	0.0		(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
1/9/14 17:43	212721	212721	1558	1558	6.82	26.5	0.98	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
1/13/14 13:49	220313	220313	7592	7592	5.92	92.1	1.37	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
1/14/14 9:25	222489	222489	2176	2176	4.99\12.86	19.6	1.85	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
1/17/14 14:35	223571	223571	1082	1082	12.88	44.7	0.40	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
1/20/14 7:41	229347	229347	5776	5776	12.52	65.1	1.48	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
1/22/14 15:49	232804	232804	3457	3457	12.14	56.1	1.03	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
1/24/14 15:25	235856	235856	3052	3052	11.86	47.6	1.07	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
1/27/14 15:07	240064	240064	4208	4208	11.23	71.7	0.98	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
1/31/14 15:01	245753	245753	5689	5689	11.06	95.9	0.99	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
2/3/14 14:43	250301	250301	4548	4548	10.73	71.7	1.06	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
2/5/14 16:25	252999	252999	2698	2698	10.41	49.7	0.90	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
2/6/14 14:25	254361	254361	1362	1362	10.35	22.0	1.03	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
2/10/14 15:37	259086	259086	4725	4725	10.01	97.2	0.81	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
2/12/14 14:00	261378	261378	2292	2292	9.78	46.4	0.82	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
2/14/14 13:22	263826	263826	2448	2448	9.51	47.4	0.86	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
2/17/14 16:16	267756	267756	3930	3930	8.52	74.9	0.87	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
2/19/14 16:58	270385	270385	2629	2629	7.54	48.7	0.90	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
2/21/14 15:22	272543	272543	2158	2158	6.93\9.32	46.4	0.78	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
2/24/14 15:22	275789	275789	3246	3246	8.35	71.9	0.75	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
2/26/14 16:22	277937	277937	2148	2148	7.63	49.0	0.73	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
2/28/14 12:46	279707	279707	1770	1770	7.23	44.4	0.66	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
3/3/14 15:59	282823	282823	3116	3116	6.20	75.3	0.69	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
3/5/14 15:29	284616	284616	1793	1793	6.22	47.5	0.63	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
3/7/14 16:17	287213	287213	2597	2597	5.32	48.8	0.89	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
3/12/14 14:47	293349	293349	6136	6136	3.34\3.55	117.5	0.87	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
3/14/14 17:02	294731	294731	1382	1382	3.21	50.2	0.46	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
3/17/14 14:35	294784	294784	53	53	0\12.24	69.6	0.01	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
3/21/14 13:00	300936	300936	6152	6152	11.88	72.2	1.42	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
3/28/14 9:17	308887	308887	7951	7951	13.59	116.3	1.14	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
3/31/14 13:47	313195	313195	4308	4308	13.45	76.5	0.94	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)

Table 5. Historical Summary of Flowmeter Located Before Discharge to POTW, HVE System, Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

	FLOWMETER BEFORE DISCHARGE TO POTW							REMARKS
	CUMULATIVE VOLUME		INCREMENTAL VOLUME		METERED	APPROX.	AVERAGE	
DATE TIME	FQ1-2202 TOTAL 1 (GALS)	FQ1-2202 TOTAL 2 (GALS)	DELTA 1 (GALS)	DELTA 2 (GALS)	DISCHARGE FLOWRATE (GPM)	RUN TIME (HOURS)	DISCHARGE FLOWRATE (GPM)	
4/2/14 16:41	315740	315740	2545	2545	13.40	50.9	0.83	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
4/4/14 10:11	317406	317406	1666	1666	13.17	41.5	0.67	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
4/7/14 13:17	320289	320289	2883	2883	12.88	75.1	0.64	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
4/9/14 11:11	322392	322392	2103	2103	12.41	45.9	0.76	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
4/14/14 16:59	327782	327782	5390	5390	10.64	125.8	0.71	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
4/16/14 15:35	329877	329877	2095	2095	10.33\13.24	46.6	0.75	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
4/22/14 14:59	337867	337867	7990	7990	12.18	143.4	0.93	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
4/24/14 13:23	340467	340467	2600	2600	12.01	46.4	0.93	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
4/28/14 16:22	347221	347221	6754	6754	11.53	99.0	1.14	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
4/30/14 16:59	350819	350819	3598	3598	11.15	48.6	1.23	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
5/2/14 16:05	353900	353900	3081	3081	10.43	47.1	1.09	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
5/5/14 17:47	358648	358648	4748	4748	9.02	73.7	1.07	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
5/9/14 10:23	362095	362095	3447	3447	12.09	62.3	0.92	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
5/16/14 15:17	375332	375332	13237	13237	9.44	172.8	1.28	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
5/19/14 15:48	379370	379370	4038	4038	3.72\11.04	52.2	1.29	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
5/21/14 16:24	382832	382832	3462	3462	10.96	48.5	1.19	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
5/27/14 14:54	393874	393874	11042	11042	7.97	142.6	1.29	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)
5/30/14 16:06	399066	399066	5192	5192	5.71\10.64	73.2	1.18	(E7B)(E42B,E47B)(E4,5,7,9,12,14,32,51,52,53)(E39,40,44,48)

Produced from 7/22/13 to Date	**467,493**	
Produced from 1/24/08 to 7/22/13	**2,567,031**	**Rebuilt Meter**
Produced from 12/4/06 To 1/24/08	**238,004**	**Rebuilt Meter**
Produced from 1/17/05 to 12/4/06	**360,219**	**New Meter**
Produced from 6/26/01 to 1/17/05	**1,233,100**	**Reset Meter**
Produced from Start Up through 6/26/01	**346,843**	
Metered Gallons of Groundwater Discharged	**5,212,689**	

Table 5. Historical Summary of Flowmeter Located Before Discharge to POTW, HVE System, Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

		FLOWMETER BEFORE DISCHARGE TO POTW							REMARKS
		CUMULATIVE VOLUME		INCREMENTAL VOLUME		METERED	APPROX.	AVERAGE	
DATE	TIME	FQ1-2202 TOTAL 1 (GALS)	FQ1-2202 TOTAL 2 (GALS)	DELTA 1 (GALS)	DELTA 2 (GALS)	DISCHARGE FLOWRATE (GPM)	RUN TIME (HOURS)	DISCHARGE FLOWRATE (GPM)	
				Gallons	Gallons		Run Time (Hours)	Average Flowrate (gpm)	
Cumulative - Start up through 6/26/01					346843				
CUMULATIVE JULY 2001				30121	30121		308.2	1.63	
CUMULATIVE AUGUST 2001				Meter Down			402.0		
CUMULATIVE SEPTEMBER 2001				36362			598.6	1.01	
CUMULATIVE OCTOBER 2001				71419			517.2	2.30	
CUMULATIVE NOVEMBER 2001				36508	144289		488.7	1.25	4Q 2001
CUMULATIVE DECEMBER 2001				44548			330.6	2.25	
CUMULATIVE JANUARY 2002				31095			436.4	1.19	
CUMULATIVE FEBRUARY 2002				46212	121855		475.2	1.62	1Q 2002
CUMULATIVE MARCH 2002				0			0.00	0.00	
CUMULATIVE APRIL 2002				52460			377.3	2.32	
CUMULATIVE MAY 2002				46857	99317		204.5	3.82	2Q 2002
CUMULATIVE JUNE 2002				28178			281.5	1.67	
CUMULATIVE JULY 2002				58960			556.7	1.77	
CUMULATIVE AUGUST 2002				28283	115421		563.0	3.42	3Q 2002
CUMULATIVE SEPTEMBER 2002				5166			241.9	0.36	
CUMULATIVE OCTOBER 2002				19451			453.1	0.72	
CUMULATIVE NOVEMBER 2002				47641	72258		561.0	1.42	4Q 2002
CUMULATIVE DECEMBER 2002				39053			542.7	1.20	
CUMULATIVE JANUARY 2003				30557			391.5	1.30	
CUMULATIVE FEBRUARY 2003				25784	95394		452.7	0.95	1Q 2003
CUMULATIVE MARCH 2003				57342			672.6	1.42	
CUMULATIVE APRIL 2003				16760			376.6	0.74	
CUMULATIVE MAY 2003				33806	107908		463.0	1.22	2Q 2003
CUMULATIVE JUNE 2003				38583			376.2	1.71	
CUMULATIVE JULY 2003				10177			91.7	1.85	
CUMULATIVE AUGUST 2003				34006	82766		418.1	1.36	3Q 2003
CUMULATIVE SEPTEMBER 2003				47832			615.6	1.29	
CUMULATIVE OCTOBER 2003				21189			841.5	0.42	
CUMULATIVE NOVEMBER 2003				11660	80681		315.0	0.62	4Q 2003
CUMULATIVE DECEMBER 2003				17603			401.3	0.73	

Table 5. Historical Summary of Flowmeter Located Before Discharge to POTW, HVE System, Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

		FLOWMETER BEFORE DISCHARGE TO POTW							REMARKS
		CUMULATIVE VOLUME		INCREMENTAL VOLUME		METERED	APPROX.	AVERAGE	
DATE	TIME	FQ1-2202 TOTAL 1 (GALS)	FQ1-2202 TOTAL 2 (GALS)	DELTA 1 (GALS)	DELTA 2 (GALS)	DISCHARGE FLOWRATE (GPM)	RUN TIME (HOURS)	DISCHARGE FLOWRATE (GPM)	
		CUMULATIVE JANUARY 2004		19780			506.1	0.65	
		CUMULATIVE FEBRUARY 2004		20471	57854		487.0	0.70	1Q 2004
		CUMULATIVE MARCH 2004		33617			482.6	1.16	
		CUMULATIVE APRIL 2004		20006			526.7	0.63	
		CUMULATIVE MAY 2004		31920	85542		403.3	1.32	2Q 2004
		CUMULATIVE JUNE 2004		21392			577.3	0.62	
		CUMULATIVE JULY 2004		28783			329.7	1.46	
		CUMULATIVE AUGUST 2004		14762	64937		329.6	0.75	3Q 2004
		CUMULATIVE SEPTEMBER 2004		5310			196.4	0.45	
		CUMULATIVE OCTOBER 2004		33072			762.1	0.72	
		CUMULATIVE NOVEMBER 2004		25587	63969		366.7	1.16	4Q 2004
		CUMULATIVE DECEMBER 2004		3930			42.6	1.54	
		CUMULATIVE JANUARY 2005		10477			209.1	0.84	
		CUMULATIVE FEBRUARY 2005		4621	19028		103.9	0.74	1Q 2005
		CUMULATIVE MARCH 2005		22484			549.0	0.68	
		CUMULATIVE APRIL 2005		26454			562.1	0.78	
		CUMULATIVE MAY 2005		17632	66570		613.5	0.48	2Q 2005
		CUMULATIVE JUNE 2005		15438			572.6	0.45	
		CUMULATIVE JULY 2005		10900			784.4	0.23	
		CUMULATIVE AUGUST 2005		12049	38386		695.7	0.29	3Q 2005
		CUMULATIVE SEPTEMBER 2005		12823			564.6	0.38	
		CUMULATIVE OCTOBER 2005		9013			473.2	0.32	
		CUMULATIVE NOVEMBER 2005		22570	44406		430.4	0.87	4Q 2005
		CUMULATIVE DECEMBER 2005		73			0.4	3.04	
		CUMULATIVE JANUARY 2006		0			0.0	0.00	
		CUMULATIVE FEBRUARY 2006		10327	10400		368.4	0.47	1Q 2006
		CUMULATIVE MARCH 2006		1251			72.9	0.29	
		CUMULATIVE APRIL 2006		13483			448.3	0.50	
		CUMULATIVE MAY 2006		34577	49311		533.2	1.08	2Q 2006
		CUMULATIVE JUNE 2006		16086			688.5	0.39	
		CUMULATIVE JULY 2006		1124			17.7	1.06	
		CUMULATIVE AUGUST 2006		40520	57730		665.0	1.02	3Q 2006
		CUMULATIVE SEPTEMBER 2006		26289			544.0	0.81	
		CUMULATIVE OCTOBER 2006		32759			795.9	0.69	
		CUMULATIVE NOVEMBER 2006		23270	82318		420.5	0.92	4Q 2006
		CUMULATIVE DECEMBER 2006		41544			342.8	2.02	

Table 5. Historical Summary of Flowmeter Located Before Discharge to POTW, HVE System, Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

		FLOWMETER BEFORE DISCHARGE TO POTW							REMARKS
		CUMULATIVE VOLUME		INCREMENTAL VOLUME		METERED	APPROX.	AVERAGE	
DATE	TIME	FQ1-2202 TOTAL 1 (GALS)	FQ1-2202 TOTAL 2 (GALS)	DELTA 1 (GALS)	DELTA 2 (GALS)	DISCHARGE FLOWRATE (GPM)	RUN TIME (HOURS)	DISCHARGE FLOWRATE (GPM)	
		CUMULATIVE JANUARY 2007		8276			62.6	2.20	
		CUMULATIVE FEBRUARY 2007		1871			9.1	3.43	
		CUMULATIVE MARCH 2007		5716	57407		154.5	0.62	1Q 2007
		CUMULATIVE APRIL 2007		18673			564.9	0.55	
		CUMULATIVE MAY 2007		14037			460.1	0.51	
		CUMULATIVE JUNE 2007		27987	60697		516.2	0.90	2Q 2007
		CUMULATIVE JULY 2007		10741			312.7	0.57	
		CUMULATIVE AUGUST 2007		23429			632.0	0.62	
		CUMULATIVE SEPTEMBER 2007		17105	51275		247.1	1.15	3Q 2007
		CUMULATIVE OCTOBER 2007		2654			38.8	1.14	
		CUMULATIVE NOVEMBER 2007		21671			683.0	0.53	
		CUMULATIVE DECEMBER 2007		32300	56625		428.2	1.26	4Q 2007
		CUMULATIVE JANUARY 2008		24510			314.6	1.30	
		CUMULATIVE FEBRUARY 2008		26266			308.1	1.42	
		CUMULATIVE MARCH 2008		22448	73225		163.2	2.29	1Q 2008
		CUMULATIVE APRIL 2008		57787			656.2	1.47	
		CUMULATIVE MAY 2008		38025			562.2	1.13	
		CUMULATIVE JUNE 2008		45116	140928		482.6	1.56	2Q 2008
		CUMULATIVE JULY 2008		37896			462.5	1.37	
		CUMULATIVE AUGUST 2008		2946			71.1	0.69	
		CUMULATIVE SEPTEMBER 2008		31105	71947		424.0	1.22	3Q 2008
		CUMULATIVE OCTOBER 2008		33249			692.9	0.80	
		CUMULATIVE NOVEMBER 2008		32466			819.9	0.66	
		CUMULATIVE DECEMBER 2008		26686	92401		373.2	1.19	4Q 2008
		CUMULATIVE JANUARY 2009		26040			352.7	1.23	
		CUMULATIVE FEBRUARY 2009		30096			583.0	0.86	
		CUMULATIVE MARCH 2009		20168	76304		777.8	0.43	1Q 2009
		CUMULATIVE APRIL 2009		23445			639.2	0.61	
		CUMULATIVE MAY 2009		29370			670.9	0.73	
		CUMULATIVE JUNE 2009		7848	60663		608.3	0.22	2Q 2009
		CUMULATIVE JULY 2009		9410			740.0	0.21	
		CUMULATIVE AUGUST 2009		27655			687.4	0.67	
		CUMULATIVE SEPTEMBER 2009		20919	57984		668.4	0.52	3Q 2009
		CUMULATIVE OCTOBER 2009		36025			587.8	1.02	
		CUMULATIVE NOVEMBER 2009		28579			627.4	0.76	
		CUMULATIVE DECEMBER 2009		34128	98732		685.8	0.83	4Q 2009

Table 5. Historical Summary of Flowmeter Located Before Discharge to POTW, HVE System, Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

		FLOWMETER BEFORE DISCHARGE TO POTW							REMARKS
		CUMULATIVE VOLUME		INCREMENTAL VOLUME		METERED	APPROX.	AVERAGE	
DATE	TIME	FQ1-2202 TOTAL 1 (GALS)	FQ1-2202 TOTAL 2 (GALS)	DELTA 1 (GALS)	DELTA 2 (GALS)	DISCHARGE FLOWRATE (GPM)	RUN TIME (HOURS)	DISCHARGE FLOWRATE (GPM)	
		CUMULATIVE JANUARY 2010		35697			597.4	1.00	
		CUMULATIVE FEBRUARY 2010		50355			629.8	1.33	
		CUMULATIVE MARCH 2010		54252	140304		648.8	1.39	1Q 2010
		CUMULATIVE APRIL 2010		61897			557.7	1.85	
		CUMULATIVE MAY 2010		32386			495.1	1.09	
		CUMULATIVE JUNE 2010		37793	132076		445.6	1.41	2Q 2010
		CUMULATIVE JULY 2010		42778			591.6	1.21	
		CUMULATIVE AUGUST 2010		24291			712.5	0.57	
		CUMULATIVE SEPTEMBER 2010		66087	133156		585.9	1.88	3Q 2010
		CUMULATIVE OCTOBER 2010		29319			624.2	0.78	
		CUMULATIVE NOVEMBER 2010		56441			460.2	2.04	
		CUMULATIVE DECEMBER 2010		18012	103772		719.0	0.42	4Q 2010
		CUMULATIVE JANUARY 2011		61264			682.7	1.50	
		CUMULATIVE FEBRUARY 2011		75495			344.4	3.65	
		CUMULATIVE MARCH 2011		75205	211964		607.4	2.06	1Q 2011
		CUMULATIVE APRIL 2011		47538			520.4	1.52	
		CUMULATIVE MAY 2011		45977			564.1	1.36	
		CUMULATIVEJUNE 2011		20018	113533		720.1	0.46	2Q 2011
		CUMULATIVE JULY 2011		21641			603.7	0.60	
		CUMULATIVE AUGUST 2011		40668			655.9	1.03	
		CUMULATIVE SEPTEMBER 2011		27569	89878		662.1	0.69	3Q 2011
		CUMULATIVE OCTOBER 2011		29981			669.9	0.75	
		CUMULATIVE NOVEMBER 2011		76966			615.8	2.08	
		CUMULATIVE DECEMBER 2011		48500	155447		656.1	1.23	4Q 2011
		CUMULATIVE JANUARY 2012		32241			548.7	0.98	
		CUMULATIVE FEBRUARY 2012		52841			672.5	1.31	
		CUMULATIVE MARCH 2012		62161	147243		578.3	1.79	1Q 2012
		CUMULATIVE APRIL 2012		61168			713.6	1.43	
		CUMULATIVE MAY 2012		45755			616.1	1.24	
		CUMULATIVE JUNE 2012		44850	151773		657.0	1.14	2Q 2012
		CUMULATIVE JULY 2012		26539			572.1	0.77	
		CUMULATIVE AUGUST 2012		33457			759.5	0.73	
		CUMULATIVE SEPTEMBER 2012		59425	119421		536.7	1.85	3Q 2012
		CUMULATIVE OCTOBER 2012		65439			714.8	1.53	
		CUMULATIVE NOVEMBER 2012		36965			705.4	0.87	
		CUMULATIVE DECEMBER 2012		34205	136609		645.7	0.88	4Q 2012

Table 5. Historical Summary of Flowmeter Located Before Discharge to POTW, HVE System, Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

		FLOWMETER BEFORE DISCHARGE TO POTW							REMARKS
		CUMULATIVE VOLUME		INCREMENTAL VOLUME		METERED	APPROX.	AVERAGE	
DATE	TIME	FQ1-2202 TOTAL 1 (GALS)	FQ1-2202 TOTAL 2 (GALS)	DELTA 1 (GALS)	DELTA 2 (GALS)	DISCHARGE FLOWRATE (GPM)	RUN TIME (HOURS)	DISCHARGE FLOWRATE (GPM)	
		CUMULATIVE JANUARY 2013		35161			673.0	0.87	
		CUMULATIVE FEBRUARY 2013		43814			597.5	1.22	
		CUMULATIVE MARCH 2013		54271	133246		653.8	1.38	
		CUMULATIVE APRIL 2013		59554			673.6	1.47	
		CUMULATIVE MAY 2013		33401			521.4	1.07	
		CUMULATIVE JUNE 2013		35891	128846		664.0	0.90	1st Half 2013
		CUMULATIVE JULY 2013		30856			756.8	0.68	
		CUMULATIVE AUGUST 2013		47302			719.8	1.10	
		CUMULATIVE SEPTEMBER 2013		41561			693.2	1.00	
		CUMULATIVE OCTOBER 2013		46311			542.5	1.42	
		CUMULATIVE NOVEMBER 2013		59755			687.5	1.45	
		CUMULATIVE DECEMBER 2013		59812	285597		747.1	1.33	2nd Half 2013
		CUMULATIVE JANUARY 2014		41019			663.8	1.03	
		CUMULATIVE FEBRUARY 2014		33954			669.7	0.85	
		CUMULATIVE MARCH 2014		33488			673.9	0.83	
		CUMULATIVE APRIL 2014		37624			723.2	0.87	
		CUMULATIVE MAY 2014		48247	194332		672.4	1.20	1st Half 2014
		CUMULATIVE METERED DISCHARGE (Gallons)			5,212,689		78,713	1.10	
		1st Half 2014			194332		3403.0	0.95	1st Half 2014
					Gallons		Hours	gpm	

G:\Aproject\BRENNTAG\OK12552014\REPORTS\1SA14\TABLES\[1SA14 T4T5T6.SUMRY O&M HVE.xls]Stripper Effluent Meter

Table 6. Historical Summary of Pressure Gauges, HVE System
Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

									FILTER F-220			GAC VESSELS		DISCHARGE	REMARKS
DATE	TIME	LRP OIL TEMP. T-1302 (F)	KO TANK VACUUM PI-1102 ("HG)	LRP VACUUM PI-1201A ("HG)	LRP VACUUM PI-1201B ("HG)	STRIPPER SUMP PI-1902 ("H2O)	STRIPPER INFLUENT PI-1801 PSI	INFLUENT FLOWRATE FQ1-1802 (GPM)	INITIAL PRESSURE (PSIG) PI-2201	FINAL PRESSURE (PSIG) PI-2201	WAS FILTER CHANGED? (Y/N)	LEAD PRESSURE (PSIG) PI-2301	LAG PRESSURE (PSIG) PI-2302	OUTLET PRESSURE (PSIG) PI-2303	
1/2/14	15:13	140	21	19	20	30	28	3	40\37	39\37	Y(B)	28\20	7\6	0	REPLACE BAG FILTER.
1/6/14	16:32	NM	NM	NM	NM	NM	NM	NM	NM	40\41	N	28	6	0	RS DOWN - NO ALARMS. FROZEN
1/8/14	14:22	140	21	18	19	27	NM	4	NM	38\37	Y(B&C)	42\41	6\7	0	REPLACE BAG & CARTRIDGE FILTERS.
1/9/14	17:43	140	20	18	19	28	NM	3	37\33		N	38	5	0	
1/13/14	13:49	140	22	20	20	30	NM	4	37\34		N	38	5	0	CLEAN RS
1/14/14	9:25	140	22	20	20	30	NM	4	39\36	36\21	Y(B&C)	41\25	6\6	0	
1/17/14	14:35	140	20	18	18	28	NM	5	36\21		N	25	5	0	HI SURGE TANK ALARM, TRANSFER PUMP PLUGGED
1/20/14	7:41	140	19	19	18	28	NM	5	37\22		N	25	5	0	
1/22/14	15:49	140	20	18	19	30	NM	5	37\23		N	25	5	0	
1/24/14	15:25	140	22	20	20	30	NM	6	37\23		N	25	5	0	REPLACE PRESS GAUGE PI-1902 ON AS INF LINE
1/27/14	15:07	140	18	17	18	29	27	5	38\24		N	27	5	0	
1/31/14	15:01	140	22	20	20	30	26	5	38\24		N	36	5	0	
2/3/14	14:43	140	22	20	20	30	26	5	38\25		N	27	5	0	
2/5/14	16:25	140	21	19	20	30	27	5	38\26		N	28	5	0	
2/6/14	14:25	140	21	19	20	30	26	5	38\26		N	28	5	0	
2/10/14	15:37	140	21	19	20	31	27	5	38\26		N	28	5	0	
2/12/14	14:00	140	22	20	20	30	27	5	38\25		N	27	4	0	
2/14/14	13:22	140	20	19	19	30	26	5	38\26		N	28	4	0	
2/17/14	16:16	140	20	18	18	31	26	5	38\27		N	29	3	0	
2/19/14	16:58	142	20	18	18	31	26	5	38\27		N	29	3	0	CONCRETE AT MW-9 IS BREAKING UP
2/21/14	15:22	147	20	18	18	31	26	5	39\27	38\32	Y(B&C)	30\26	3\4	0	REPLACE BAG & CARTRIDGE FILTERS.
2/24/14	15:22	142	20	18	18	30	26	5	38\34		N	38	4	0	
2/26/14	16:22	140	19	17	18	31	27	5	39\36		N	40	3	0	
2/28/14	12:46	140	20	18	18	30	27	4	39\36		N	41	3	0	
3/3/14	15:59	140	22	21	20	29	28	4	40\38		N	43	3	0	
3/5/14	15:29	140	23	23	21	30	27	3	39\38		N	42	2	0	
3/7/14	16:17	140	20	19	18	31	27	3	39\39		N	43	2	0	
3/12/14	14:47	144	20	19	19	31	27	3	40\41	40\42	Y(B)	46\46	2\2	0	REPLACE BAG FILTER.
3/14/14	17:02	144	20	19	18	31	27	3	40\42		N	47	2	0	
3/17/14	14:35	140	20	18	18	30	27	6	40\43	36\21	N	21	NM	0	REMOVE 4" CRUSTED GAC FROM TOP OF LEAD VESSE
3/21/14	13:00	144	21	20	18	30	26	6	36\22		N	21	NM	0	REMOVE LAG GAC FROM SYSTEM
3/28/14	9:17	142	20	19	19	27	26	6		35\18	Y(B&C)	23	5	0	RS CLEANING. REPLACE GAC VESSELS, RESTART RS.
3/31/14	13:47	142	21	19	18	31	27	6	36\19		N	22	5	0	
4/2/14	16:41	150	21	19	18	30	26	6	35\19		N	21	2	0	
4/4/14	10:11	140	19	18	18	30	27	6	36\20		N	22	5	0	
4/7/14	13:17	142	20	19	18	31	27	6	36\19		N	21	4	0	
4/9/14	11:11	142	21	19	19	32	27	6	36\19		N	21	4	0	
4/14/14	16:59	140	19	18	19	30	27	6	38\19		N	20	3	0	
4/16/14	15:35	140	21	20	19	31	27	6	37\18		Y(B&C)	19\24	3\5	0	REPLACE BAG & CARTRIDGE FILTERS.
4/22/14	14:59	148	21	20	18	30	26	6	37\22		N	25	4	0	
4/24/14	13:23	146	20	19	19	31	27	6	37\22		N	25	4	0	
4/28/14	16:22	144	20	20	19	32	27	6	37\22		N	25	4	0	
4/30/14	16:59	140	20	19	18	32	27	6	38\22		N	25	4	0	

Table 6. Historical Summary of Pressure Gauges, HVE System
Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

									FILTER F-220			GAC VESSELS		DISCHARGE	REMARKS
DATE	TIME	LRP OIL TEMP. T-1302 (F)	KO TANK VACUUM PI-1102 ("HG)	LRP VACUUM PI-1201A ("HG)	LRP VACUUM PI-1201B ("HG)	STRIPPER SUMP PI-1902 ("H2O)	STRIPPER INFLUENT PI-1801 PSI	INFLUENT FLOWRATE FQ1-1802 (GPM)	INITIAL PRESSURE (PSIG) PI-2201	FINAL PRESSURE (PSIG) PI-2201	WAS FILTER CHANGED? (Y/N)	LEAD PRESSURE (PSIG) PI-2301	LAG PRESSURE (PSIG) PI-2302	OUTLET PRESSURE (PSIG) PI-2303	
5/2/14	16:05	144	21	19	19	32	27	6	38\21		N	25	3	0	
5/5/14	17:47	162	21	20	19	31	26	6	38\18		N	22	3	0	
5/9/14	10:23	142	20	19	19	29	27	5		37\24	Y(B&C)	28	4	0	NEW BAG & CARTRIDGE FILTERS. CLEAN AS INF MTR
5/16/14	15:17	144	21	19	19	31	27	5	38\21		N	23	3	0	CLEAN KO TANK SENSORS. RESTART 1530
5/19/14	15:48	148	22	21	20	28	27	5	41\12	37\27	Y(B)	16\28	2\4	0	FIX LEAK ON FLOW MTR ADAPTER AFTER SURGE TAN
5/21/14	16:24	154	22	21	20	31	27	5	37\25		N	26	4	0	
5/27/14	14:54	148	22	20	20	31	26	5	39\30		N	25	3	0	
5/30/14	16:06	150	22	21	20	32	27	5	40\28	38\28	Y(B&C)	23\32	2\4	0	NEW B/C FLTRS, CLEAN KO TNK SENSORS & AS INF MT

G:\Aproject\BRENNTAG\OK12552014\REPORTS\1SA14\TABLES\[1SA14 T4T5T6.SUMRY O&M HVE.xls]Pn B = Bag C = Cartridge * = Pressure gauge is bad.

Table 7. Summary of Groundwater Influent Sample Results, HVE System.
Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

Date Collected	HVE Unit(s) On	TPH-Motor Oil (mg/l)	TPH-Diesel Fuel (mg/l)	TPH-Gasoline (mg/l)	Acetone (mg/l)	Benzene (mg/l)	Bromomethane (mg/l)	2-Butanone (MEK) (mg/l)	n-Butylbenzene (mg/l)	sec-Butylbenzene (mg/l)	t-Butylbenzene (mg/l)	Chloroethane (mg/l)	Chloroform (mg/l)	Chloromethane (mg/l)	2-Chlorotoluene (mg/l)	1,2-Dichlorobenzene (mg/l)	1,4-Dichlorobenzene
INF20140425		<480	510	55 J*	19 B	<1	<2	4.0 J	<1	<1	<1	<2	<1	<2	<1	<1	<1
INF20131018	C/NW/EB's	<480	720	81 JB	37	<1	<2	19	<1	<1	<1	<2	<1	<2	<1	0.17 J	<1
INF20130502	C/NW/EB's	<480	910	55 J	4.2	<1	<2	<5	<1	<1	<1	<2	<1	<2	<1	<1	<1
INF20121005	C/NW/EB's	<100	930	41 J	3.9 J,B	<1	<2	0.96 J	<1	<1	<1	<2	<1	<2	<1	<1	<1
INF20120419	C/NW/EB's	<100	620	42 J	43	<1	<2	2.4 J	<1	<1	<1	<2	<1	<2	<1	<1	<1
INF20111117	C/NW/EB's	<100	550	ISV	51 D	0.16 J	<2	1.4 J	<1	<1	<1	0.30 J	0.16 J	<2	<1	<1	<1
INF20110819	C/NW/EB's	<100	1,000	27 J	15B	<1	<2	<5	<1	<1	<1	<2	<1	<2	<1	<1	<1
INF20110513	C/NW/EB's	<100	640	560	20	0.026 J	<2	<5	<1	<1	<1	0.73 J	0.16 J	<2	<1	<1	<1
INF20110217	C/NW/EB's	<100	750	150	27	0.083 J	<2	3.7 J	<1	<1	<1	0.16 J	<1	0.68 J	<1	<1	<1
INF20101104	C/NW/EB's	<100	340	<100	<10	0.074 J	<2	<5	<1	<1	<1	0.24 J	<1	0.25 J,B	<1	<1	<1
INF20100806	C/NW/EB's	<100	<100	<100	7.5 J,B	<1	<2	<5	<1	<1	<1	<2	<1	0.15 J,B	<1	<1	<1
INF20100513	C/NW/EB's	2,100	1,500	250	36	0.29 J	0.25 J	2.5 J	<1	<1	<1	0.16 J	2	<2	1.8	<1	<1
INF20100205	C/NW/EB's	3,500	2,400	<100	29	0.32 J	0.22 JB	3.2 J	<1	<1	<1	0.31 J	<1	0.55 J		<1	<1
INF111909	C/NW/EB's	<100	730	190	51 D	0.2 J	0.53 JB	<5	<1	<1	<1	0.34 J	<1	0.26 J		<1	<1
INF082009	C/NW/EB's	<100	390	140	76 J,D	0.17 J	<2	<5	<1	<1	<1	0.56 J	<1	0.25 J		<1	<1
INF050109	C/E7B/E47B	<100	380	<100	260 J,B,D	0.17 J	<2	1.2 J	<1	<1	<1	<2	<1	0.52 J		<1	<1
INF020609	C/E7B/E47B	<100	<100	<100	220 D	0.016 J	<2	220 D	<1	<1	<1	<2	<1	0.16 J		<1	0.13 J
INF110708	C/E7B/E47B	1,300	2,000	140	270 D	0.067 J	<2	46 J,D	<1	6	<1	<2	<1	0.08 J,B		0.4 J	<1
INF082208	C/E7B/E47B	5,100 D	<1000	<100	120 B,D	<1	<2	22	<1	<1	<1	0.84 J	<1	0.39 J		<1	<1
INF052208	C/E7B/E47B	10,000 D	6,500 D	160	170 D	<1	<2	50 D	<1	<1	<1	<2	<1	<2		0.7 J	<2
INF030408	C/E7B	20,000 D	15,000 D	750	12	0.69 J	<2	4.2 J	<1	<1	<1	0.33 J	<1	<2		1.4	0.25 J
INF112607	C/E7B	6,200,000 D	<5000	<100	19	<1	<2	<5	<1	0.65 J	<1	0.19 J	<1	<2		<1	
INF091407	C/E7B	120,000 D	<1000	430	280 D	<1	<2	130 D	<1	<1	<1	0.23 J	<1	3.1		0.72 J	
INF060707	C/E7B	6,900	<100	<100	2.6 J	<1	<2	<5	<1	<1	<1	<2	<1			<1	
INF032207	C/E7B	66,000 D*			3.9 J	<1	<2	<5	<1	<1	<1	<2	<1			<1	
INF032207	C/NW/EB's	33,000 E	<100	120	3.1 J	<1	<2	<5	<1	2.8	<1	<2	<1			<1	
INF112106	C/NW/EB's	1,100	<100	910	80 J,D	<1	<2	<5	<1	<1	<1	<2	<1			<1	
INF080306	C/NW/EB's	1,000	340	<100	80	<5	<10	15 J	<5	<5	<5	<10	<5			<5	
INF050406	C/E7B/E47B	3,000	1,100	490	550 B	1.9 J,B	<50	60 J	<25	<25	<25	<50	<25			<25	
INF020106	C/E7B/E47B	40,000 D	31,000 D	440	99	<5	<10	35	<5	<5	<5	2.7 J	<5			<5	
INF110405	C/E7B/E47B	<100	12,000 D	420	450 J,D	<250	<500	<1000	<250	<250	<250	<500	<250			<250	
INF080405	C/E7B/E47B	8,400 B	3,600 B	<100	100	0.97 J	<10	8.5 J	<5	<5	<5	<10	<5			<5	
INF051205	NW/E7B	7,700	<100	<100	<20	<5	2 JB	<20	<5	<5	<5	<10	<5			<5	
INF021705	NW/E7B	57,000 D	<100	<100	3.8 J	0.3 J	<5	<20	<5	<5	<5	<5	0.81 J			<5	
INF102804	NW/E7B	<100	<100	<100	15 J	<5	<10	<20	<5	<5	<5	<10	<5			<5	
INF072904	C/NW/RS/EB's	2,100	<100	<100	53	<5	<10	<20	<5	<5	<5	1.9 J	<5			<5	
INF050504	LD/C/NW/RS/EB	<100	1,130	500	440	<1	<5	280	<5	<5	<5	<5	<5			<5	
INF020504	EBW	3,100	<100	10 J	410	<29	<57	1000	<29	<29	<29	<57	<29			<29	
INF111903	NW/LD/C	<100	3,500	5,300	1,300	2.8 J	<20	<50	<10	<10	<10	2.7 J	<10			<10	
INF073103		2,800	3,000	<100	810	0.39 J	<2	220	<1	<1	<1	0.94 J	<1			0.22 J	
INF051403	NW/LD/C/RS	9,200	8,400	4,200	1200	<1	<13	510	<6.7	<6.7	<6.7	1.4 J	<6.7			<6.7	
INF032003	NW/LD/C	32,000 B,D	12,000 D	<100	980	<1	-	<100	6.8 J	<25	<25	<50	<25			<25	
INF110602	NW/LD/C		560	638	1400	1.3	<1	390	<1	<1	<1	2.7	<1			0.4 J	
INF081402	NW/LD/C			<5	530	0.7 J	<1	150	0.62 J	<1	<1	1.2	<1			<1	
INF051502	LD/C			800	1200	<10	<10	490	<10	<10	<10		<10			<10	
INF021502	LD/C				1100	<50	<50	<500					<50			<50	
INF112801	NW/LD/C				840	1.0	<5.0	430					1.5			1.3	
INF110901	NW/LD/C				550	11	1.6	270					<1.0			<1.0	
INF072601	LD/C				2300	6.4	<5.0	1400					<5.0			<5.0	
INF091500	?				NA	<3.0	<5.0	NA					<3.0			<3.0	
INF022101	RS				560	<100	<100	640	<100	<100	<100		<100			<100	
INF022101	NW				880	<100	<100	120	<100	<100	<100		<100			<100	
INF022101	LD				950	<100	<100	960	<100	<100	<100		<100			<100	
INF022101	C				1500	<200	<200	730	<200	<200	<200		<200			<200	
INF022101	LD/C				1200	<100	<100	910	<100	<100	<100		<100			<100	
INF032500	C				<20	5.2	<5	1200	17	<5	<5		<5			<5	
INF032400	C				<20	8.3	<5	1200	<5	2.4 J	15		<5			<5	

Date Collected	1,1-Dichloroethane (mg/l)	1,2-Dichloroethane (mg/l)	cis-1,2-Dichloroethene (mg/l)	trans-1,2-Dichloroethene (mg/l)	1,1-Dichloroethene (mg/l)	1,2-Dichloroethene (total) (mg/l)	Ethylbenzene (mg/l)	Isopropylbenzene (mg/l)	p-Isopropyltoluene (mg/l)	Methylene Chloride (mg/l)	4-Methyl-2-pentanone (mg/l)	Naphthalene (mg/l)	n-Propylbenzene (mg/l)	Tetrachloroethene (mg/l)	Toluene (mg/l)	1,1,1-Trichloroethane (mg/l)	Trichloroethene (mg/l)	1,2,4-Trimethylbenzene (mg/l)	1,3,5-Trimethylbenzene (mg/l)	Vinyl Chloride mg/l	Total Xylenes (mg/l)
INF20140425	<1	<1	0.76 J	<1	<1		<1	<1	<1	<1	8.0	5.8	0.17 J	<1	2.6	<1	0.29 J	0.88 J	0.39 J	<2	5.5
INF20131018	<1	<1	1.3	<1	<1		<1	0.19 J	<1	<1	<5	13	0.26 J	<1	4.4	<1	0.30 J	2.7	1.5	<2	12.3
INF20130502	0.18 J	<1	0.98 J	<1	<1	0.98 J	<1	0.30 J	<1	<1	<5	4.4 B	0.45 J	<1	2.8	<1	0.34 J	2.9	1.6	<1	8.8
INF20121005	0.21 J	<1	2.5	<0.5	<1	2.5	<1	<1	<1	3.7 J,B	<5	4.5 B	0.13 J	0.27 J	1.4	<1	0.96	0.92	1.1	<1	5.5
INF20120419	0.23 J	0.35 J	3.6	<0.5	<1	3.6	1.2	0.31 J	<1	<5	<5	7.1	0.43 J	0.38 J	3.7	<1	1.2	3.2	1.8	<1	11.0
INF20111117	0.71 J	0.35 J	20	<0.5	0.12 J	20	2.5	0.70 J	<1	1.5 J,B	<5	5.6	0.88 J	<1	14	<1	7	7.7	5.6	0.39 J	29.0
INF20110819	0.35J	<1	1.3	<0.5	<1	1.3	0.74 J	0.32J	<1	<5	<5	4.5 B	<1	0.32J	2.2	0.25 J	0.53 J	3.5	1.9	<1	6.4
INF20110513	2.3	0.63 J	38	<0.5	0.39 J	38	6.5	3.8	<1	0.34 J,B	2.7 J	7.2	4.5	1.8	18	0.14 J	16	38	31	0.50 J	95.0
INF20110217	0.45 J	0.13 J	8.7	<0.5	0.11 J	8.7	2.6	0.98 J	<1	<5	10	4.8	1.1	1.1	6.1	<1	4	10	6	0.10 J	22.0
INF20101104	0.40 J	<1	3.4	<0.5	<1	3.4	<1	<1	<1	0.30 J,B	1.6 J	1.6	<1	8.5	1.3	<1	2.1	1.1	1.9	0.70 J	4.2
INF20100806	0.33 J	<1	4.4	<0.5	<1	4.4	0.3 J	<1	<1	<5	<5	0.97 J	<1	<1	0.94 J	<1	2.2	0.2 J	1.1	0.37 J	3.3
INF20100513	1.1	0.31 J	19	<0.5	<1	19	6.5	3.3	<1	<5	9.1	17	3.4	1.8	35	<1	6.9	23	16	0.23 J	69
INF20100205	1.5	0.45 J	15	0.11 J	0.29 J	15	16.0	6.2	<1	<5	16	19	8.5	0.28 J	59 D	0.17 J	1.9	53 D	33	0.21 J	120 D
INF111909	1.2	0.44 J	18	<0.5	0.21 J	18	4.3	1.3	<1	<5	8.1	6.7	1.5	0.2 J	22	0.1 J	22	15	10	0.54 J	51
INF082009	1.3	0.33 J	24	<0.5	0.37 J	24	4.6	0.88 J	<1	<5	<5	2.9	1.1	<1	19	<1	11	7.4	6.5	0.35 J	41
INF050109	1.4	0.44 J	24	<0.5	0.25 J	24	3.2	1.2	<1	<5	4.2 J	4.8	1.1	0.64J,B	18	0.14 J	11	10	12	0.27 J	53
INF020609	1.5	0.3 J	7.7	<0.5	<1	7.7	3.8	1.4	<1	<5	<5	18	1.6	<1	29	<1	0.45 J	18	12	<1	62
INF110708	0.88 J	<1	5.1	<0.5	<1	5.1	2.4	0.79 J	<1	<5	34 J,D	22	1.2	<1	17	0.28 J	0.86 J	8.9	5.6	<1	33
INF082208	1.2	<1	7.2	<0.5	<1	7.2	0.3 J	<1	<1	<5	11	3.2	<1	4.7	2.3	0.59 J	1.1	0.38 J	1	1.3	4
INF052208	1.1	0.19 J	7.7	0.16 J	<1	7.9	1.1	<1	<1	0.46 J	<5	15	<1	0.72 J	12	<1	1.5	2	4.5	<1	23
INF030408	6	0.52 J	15		0.24 J	15	26.0	3.2	<1	0.3 JB	<5	30	4.0	0.86 J	99 D	1.1	<1	30	20	<1	200 D
INF112607	1.3	<1	1.2			1.2	0.78 J	<1	<1	<5 J	4.4 J	1.5	<1	<1	7.8	1.1	0.38 J	0.96 J	1.3	<1	12
INF091407	2.2	0.34 J	8.4			8.4	6.6	0.6 J	<1	0.67 J	77 D	35 D	1.0	<1	54 D	0.73 J	<1	9.1	4.7	<1	70
INF060707	0.88 J	<1	0.54 J			0.54 J	0.33 J	<1	<1	<5	2.1 J	0.84 J	<1	<1	1.8	0.69 J	<1	0.43 J	0.68 J	<1	3.0
INF032207	1.1	<1	1.2			1.2	<1	0.47 J	<1	<5	<5	1.6	0.16 J	<1	6.4	0.9 J	0.29 J	3	3.3	<1	25
INF032207	1.8	<1	1.5			1.5	<1	0.50 J	<1	<5	<5	1.9	0.26 J	<1	5.2	1.5	0.2 J	3.7	3.8	<1	23
INF112106	<1	<1	<1			<1	<1	<1	<1	<5	<5	<1	<1	24	<1	<1	<1	<1	<1	<1	<2
INF080306	1.1 J	<5	10			10	0.71 J	<5	<5	2.7 JB	<20	<5	<5	2.3 J	5.9 B	0.98 J	5.6	1.7 J	1.5 J	<5	8.3 J
INF050406	7.7 J	<25	80			80	9.0 J	<25	<25	<25	<100	14 J	<25	1.9 J	85	<25	14 J	33 B	18 J,B	<25	82
INF020106	2.9 J	<5	6.1			6.1 J	1.9 J	<5	<5	<5	20	9.8	<5	8	18	<5	<5	6.3	18	<5	31
INF110405	<250	<250	<250			<500	<250	<250	<250	<250	<1000	<250	<250	<250	26 J,D	<250	<250	<250	<250	<250	<500
INF080405	1.4 J	<5	1.5 J			1.5 J	1.1	<5	<5	<10	9.8 J	<5	<5	<5	15	2.2 J	0.86 J	0.87 J	0.85 J	<5	13
INF051205	<5	<5	6.6			6.6 J	0.55 J	0.49 J	<5	3.6 JB	<20	<5	<5	1.4 J	4.8 J	<5	3.9 J	2.5 J	7.1	<5	2.7 J
INF021705	0.66 J	<5	55			55	2.4 J	1.2 J	0.28 J	<5	<20	0.74 J	1.4 J	39	17	<5	36	6.8	14	<5	22
INF102804	<5	<5	9.4			9.4 J	1.9 J	0.44 J	<5	<5	9.2 J	<5	0.54 J	<5	6	<5	2.7 J	2.7 J	2.2 J	<5	11
INF072904	<5	<5	5.6			5.6 J	2.7 J	<5	<5	11	7.8 J	<5	0.68 J	<5	16	<5	<5	4.9 J	3.9 J	<5	34
INF050504	<5	<5	19				5.6	<5	<5	<5	180	12	<5	<5	57	<5	<5	6.1	5.4	<5	39
INF020504	<29	<29	46			46	6.8 J	<29	<29	15 JB	79 J	<29	<29	<29	33	<29	11 J	9.7 J	8 J	<29	39 J
INF111903	4.7 J	<10	32			32	4.9 J	2.4 J	<10	4 JB	150	5.8 J	<10	<10	53	<10	2.5 J	9.1 J	19	<10	56
INF073103	2.9	<1	12			12	2.8	0.20 J	<1	0.61 J	54	10	0.18 J	2.3	37	0.43 J	3.1 J	2.1	1.8	<1	27
INF051403	9.1	<6.7	41				10	<6.7	<6.7	21 J	250	20	<6.7	2 J	110 E	<6.7	3.6 J	5.5 J	8	<6.7	86
INF032003	15 J	<25	62				18	<25	<25	15 JB	140	46 B	<25	<25	160 E	<25	5.1 J	33	22 J	<25	134
INF110602	6.1	0.93 J	27				6.8	1.9	<1	4	160	18	1.4	38	110	0.62 J	3.0	9.6	8.1	2.2	73
INF081402	7.9	0.59 J	20				4.9	<1	<1	3.6	45	20	<1	4.1	45	1.6	4.9	6.4	6.3		72
INF051502	12	<10	38				11	<10	<10	26	250	43	<10	<10	89	<10	<10	<10	<10		90
INF021502	<50	<50	<50				15 J	<50		<50	<500	<50	<50	<50	65	<50	<50	<50	<50		36 J
INF112801	15	2.1	69				26	2.4		24	220	74	3.0	11	160	3.9	15	26	13		175
INF110901	8.5	1.0	18				4.4	5.6		16	<100	15	<1.0	1.6	45	2.3	2.6	4.0	3.1		55
INF072601	26	<5.0	<5.0				25	<5.0		73	570	51	<5.0	<5.0	280	<5.0	<5.0	19	8.9		179
INF091500	11	<3.0	NA				3.0	NA		<10	NA	NA	NA	<3.0	<3.0	<3.0	<3.0	NA	NA		NA
INF022101	<100	<100	85 J				42 J	<100	<100	<400	220	48 J	<100	<100	130	<100	<100	43 J	<100		212 J
INF022101	<100	<100	100				<100	<100	<100	190 J	<200	<200	<100	<100	<100	<100	<100	<100	<100		68
INF022101	<100	<100	98 J				45 J	<100	<100	240 J	550	<200	<100	<100	210	<100	<100	<100	<100		184 J
INF022101	<200	<200	280				200	<200	<200	550 J	460	140 J	<200	<200	1200	<200	<200	140 J	<200		980
INF022101	130	<100	190				160	<100	<100	480	700	68 J	<100	<100	1200	<100	<100	56 J	<100		780
INF032500	72	13	92				130	11	<5	29	<10	200	18	16	950	16	8.8	95	43		920
INF032400	56	9.7	83				100	13	2.6	21	<10	260	19	49	1100	10	9.1	110	49		780

NA - Not available ISV - Insufficient Sample Volume ug/l - Micrograms per liter.

HVE Units: RS = Rail Spur, NW = North West, LD = Loading Dock, C = Central, EBW=Extraction Bedrock Wells

11/9/01 - Turn off 22 wells (3-RS, 6-NW, 10-LD, and 3-C) due to shallow construction and/or proximity to SAW-2.

INF022101 Sample Names: **CIR1** = Central HVE Unit, **CIR2** = Rail Spur HVE Unit, **CIR3** = NW HVE Unit, **CIR4** = Loading Dock HVE Unit, **CIR14** = Central and Loading Dock HVE Units

J - Estimated result, less than reporting limit. B - Method blank contamination. The associated method blank contains the target analyte at a reportable level.

D - Result was obtained from the analysis of a dilution. E - Estimated result, concentration exceeded calibration range.

ARCADIS

Table 8. Mass Removed as Dissolved Phase
Brenntag-Springfield, Missouri.

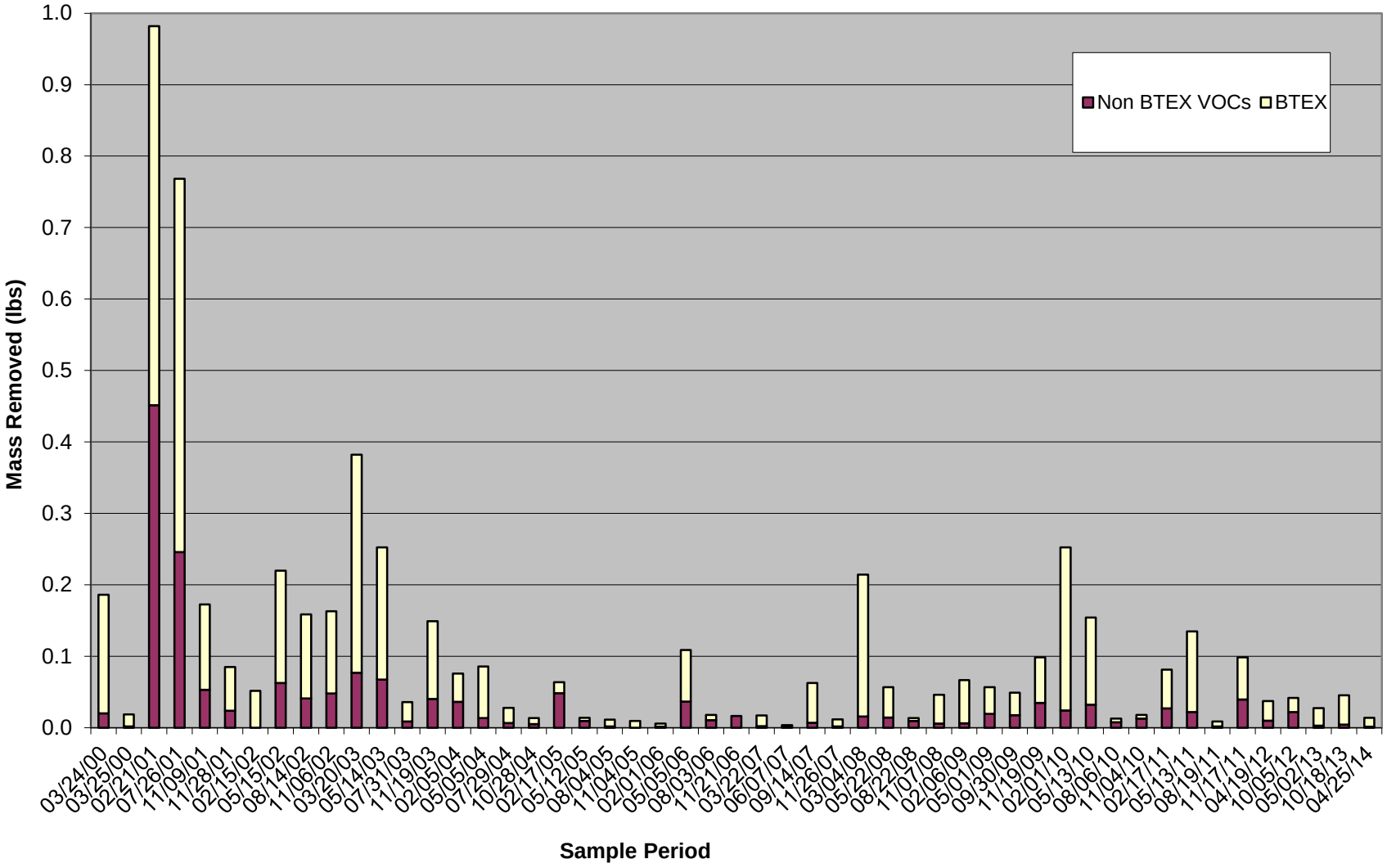

Table 9. Summary of Air Discharge Sample Results, HVE System.
Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

Date Collected	Acetone	Benzene	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	Dichlorodifluoromethane	1,2 Dichlorobenzene	1,3 Dichlorobenzene	1,4-Dichlorobenzene	1,1-Dichloroethane	1,2 Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	Ethylbenzene	Hexachloro-1,3-butadiene	2-Hexanone	Isopropylbenzene
	Method TO-15M																		
	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3
AIR20140425	0.075	0.0230	<0.023	<0.0.017	0.0098	0.0024 J	0.0011 J	0.0025 J	0.019 J	<0.022	0.0034 J	0.0550	0.0032 J	0.014 J	0.320	0.60	<0.04	<0.015	0.190
AIR20131018	0.162 B	0.0151 J	<0.0789	<0.0578	0.0158 J	<0.0613	<0.0259	<0.0621	<0.0251	<0.00754	<0.00754	0.0760	<0.0508	0.0290 J	0.481	1.12	<0.134	<0.0514	0.2320
AIR20130502	0.0870 B	0.0367	<0.00645	<0.00472	0.0183	0.00127 J	0.00133 J	0.00270 J	0.00415 J	<0.00617	<0.00617	0.0535	0.00310 J	0.0234	0.218	0.261	<0.0109	0.00138 J	0.2490
AIR20121005	0.0315 B	0.0115	<0.0271	<0.0198	0.0520	0.00229 J	0.00128 J	0.00283 J	0.00934 J,B	<0.0259	<0.0259	0.0884	0.00888 J	0.0293	0.852	0.448	<0.0459	<0.0176	0.3340
AIR20120419	0.150 B	0.0370	<0.0303	<0.0222	0.0543	0.00267 J	0.000924 J	<0.0238	<0.0264	<0.0289	<0.0289	0.1120	0.00584 J	0.0449	0.876	0.826	<0.0513	<0.0197	0.2620
AIR20111117	0.0699 B	0.0365	<0.0276	<0.0202	0.0282	0.0115 J	0.00108 J	0.00246 J	<0.0264	<0.0264	<0.0264	0.0389	0.00441 J	0.0219	0.606	0.242	<0.0469	<0.0018	0.0876
AIR20110819	0.0906B	0.0191	<0.0302	<0.0221	0.0114J	<0.0234	<0.00992	<0.0237	<0.00321	<0.00289	<0.00289	0.0413	<0.0194	0.0179J	0.0982	0.156	<0.0512	<0.0197	0.0563
AIR20110513	0.0596 B	0.0207	0.000724 J	<0.00424	0.0106	0.00171J	0.00107 J	0.00257 J	<0.00554	<0.00554	<0.00554	0.0202	<0.00373	0.015	0.201	0.203	<0.00349	<0.00377	0.198
AIR20110217	<0.0228	<0.0179		<0.0121	<0.0232	<0.0198	<0.00544	<0.0174	<0.0324	<0.0308	<0.0353	0.0888 J	<0.00744	<0.0183	0.696	0.488	<0.0463	<0.0179	0.218
AIR20101104	0.0848 J	0.0508 J		<0.0134	0.116 J	<0.0219	<0.00601	<0.0192	<0.0357	<0.0340	<0.0390	0.164 J	<0.00822	0.105 J	2.490	0.807	<0.0511	<0.0197	0.115 J
AIR20100806	0.0869 B	0.00615 J		<0.0113	0.0470	<0.0119	0.00186 J	0.00284 J	<0.0147	<0.0147	<0.0147	0.112	0.00406 J	0.05610	0.570 RA	0.568	<0.0261	<0.010	0.0802
AIR20100513	0.250	0.0393 J		<0.210	<0.120	0.0813 J	<0.0942		<0.274	<0.274	<0.274	0.036	<0.0356	<0.181	0.570	0.356	<0.486	<0.187	0.281
AIR20100204	0.0162 JB	0.0106 J		<0.0405	0.0289	<0.043	<0.0182		<0.053	<0.053	<0.053	0.055	<0.0356	0.0465	0.305	0.513	<0.0939	<0.0361	0.579
AIR20091119	0.101 B	0.024 J		<0.124	0.0447 J	<0.132	<0.0557		<0.162	<0.162	<0.162	0.0918 J	<0.109	0.0619 J	0.398	0.282	<0.288	<0.110	0.325
AIR082009	0.0876 B	0.0330		<0.0228	0.0302	<0.0242	<0.0102		<0.0297	<0.0297	<0.0297	0.0726 J	<0.020	0.0875	0.792	0.469	<0.0528	<0.0203	0.267
AIR050109	0.0819	0.0228		<0.00216	0.0078	<0.00229	0.00131		<0.00282	<0.00282	<0.00282	0.0214	0.00114 J	0.0228	0.235	0.128	<0.005	<0.00192	0.166
AIR020609	0.0855	0.0119		<0.0120		<0.0128	<0.00540		<0.0157	<0.0157	<0.0157	0.0164	<0.0106	0.0022	0.034	0.055		<0.0107	0.080
AIR110708	0.202 B	0.0174 J		<0.00866	0.0204 J	<0.00657	<0.00341		0.0116 J	<0.014	<0.0106	0.122	<0.0085	0.0197 J	0.423	0.643	<0.0353	<0.0111	0.554
AIR082208	0.195 B	0.0290		<0.00252	0.0376	0.00133 J	0.00147		0.0254	<0.00329	0.0046	0.227	0.00390	0.0220	0.384	0.378	<0.0146	<0.00224	0.358
AIR052208	0.0184 B	0.0312		<0.00280	0.0224	<0.00385	0.00273 JB		0.019	<0.00352	<0.00868	0.162	0.00671 J	0.0384	0.849	0.524	<0.0139	<0.0023	0.134
AIR030408	0.0685 B	0.0282		<0.00276	0.0327	<0.00372	<0.000981		0.041	<0.00341	<0.00841	0.538	<0.00269	0.0727	1.130	0.78	<0.0134	0.00289	0.139
AIR112607	0.0883 B	0.0326 J		<0.0156	<0.0297	<0.0254	<0.00697		<0.0414	<0.0394	<0.0452	0.160	<0.00954	<0.0234	0.192	0.0666 J	<0.0593		<0.0244
AIR091407	0.602	0.0551 J		<0.0148	0.0754	<0.0241	0.0251 JB		<0.0394	<0.0374	<0.043	0.428	<0.00906	0.0866 J	1.22	1.66	<0.0564		0.198
AIR060707		0.0389 J		<0.0159	0.0505 J	<0.0259	<0.00713		<0.0424	<0.0403	<0.0462	0.446	<0.00975	0.0310 J	0.302	0.276	<0.0606		
AIR032207		0.0389 J		<0.0163	0.0518 J	<0.0266	0.0184 JB		<0.0434	<0.0413	<0.0474	0.164	<0.00999	<0.0245	0.0919 J	0.797	<0.0621		
AIR112106		0.0589 J		0.0146	0.0868	<0.0239	<0.00657		<0.0391	<0.0371	<0.0426	0.173	<0.00898	0.0583 J	1.070	0.461 B	<0.0559		
AIR080306		0.0523 J		<0.0157	0.114	0.0266 J	<0.00706		<0.0419	<0.0399	<0.0457	0.457	<0.0313	0.167	3.410	0.508	<0.0600		
AIR050406		0.0414 J		<0.0189	0.09	<0.037	<0.0807		<0.0245	<0.0211	<0.0354	0.125	<0.0313	0.0396 J	0.9320	0.157	<0.062		
AIR020106		0.0914 J		<0.0368	0.185 J	<0.0948	<0.0781		<0.0124	<0.0798	<0.082	0.518 J	<0.0924	<0.096	0.0613	1.740	<0.284		
AIR110405		0.0956 J		<0.0385	<0.0994	<0.0992	<0.0817		<0.129	<0.0835	<0.0858	0.369	<0.0967	<0.1	1.03	0.859	<0.298		
AIR080405		<0.0265		<0.0379	<0.0977	<0.0975	<0.0803		<0.127	<0.0821	<0.0843	0.465 J	<0.0951	<0.0987	0.330 J	0.447 J	<0.292		
AIR051205		0.0377		<0.00156	<0.0011	0.00597 J	<0.000843		<0.00163	<0.00162	<0.00155	0.0125	<0.00105	0.015	0.326	0.0732	<0.00546		
AIR021705		<0.0273		<0.0391	<0.0907	<0.0905	<0.0746		<0.118	<0.0762	<0.0783	<0.0562	<0.0883	<0.0917	2.34	0.192J	<0.272		
AIR102804		0.0515		<0.0678	<0.481	<0.0515	<0.0608		<0.0762	<0.072	<0.0702	0.114 J	<0.276	0.211 J	2.41	1.0	<0.0996		
AIR072904		0.0364		<0.608	<0.431	<0.0462	<0.545		<0.0684	<0.0646	<0.0630	0.451 J	<0.248	0.109 J	0.238 J	<0.0434	<0.0893		
AIR050504		<0.0353		<0.0589	<0.418	<0.0448	<0.0529		<0.0663	<0.0626	<0.061	0.398 J	<0.240	<0.0534	1.31	0.656 J	<0.0866		
AIR020504		<0.037		<0.0618	<0.438	<0.047	<0.0555		<0.0696	<0.0657	<0.0641	0.364 J	<0.252	0.0726 J	4.3	0.898 J	<0.0909		
AIR111903		0.0429 J		<0.00121	<0.000989	<0.00127	0.00295 J		<0.00156	<0.00156	<0.00157	<0.00106	<0.00106	<0.00114	0.00459	0.0751	<0.00841		
AIR092503		0.155 J		<0.0209	0.0992 J	0.259 J	<0.18		<0.0268	<0.0498	0.121 JB	0.614 J	<0.156	<0.079	5.28	1.1 J	<0.0475 B		
AIR051403		0.237		0.751	1.22	0.648 J	<87.6		0.125	0.0587	0.0816	3.810	0.152 J	0.878 J	10.2	5.79	0.116		
AIR021203		0.064		0.198	0.269	0.235	<0.008			0.053	0.522	1.010		0.326	3.350	1.920	0.569		
AIR110602		<0.13		<0.13	<0.13		<0.13					1.649		<0.13	3.070	<0.13			
AIR082102		0.005		0.001	<0.00072		0.001					<0.00069		<0.00069	<0.00069	0.010			
AIR051502					1.367							9.071		1.091	19.794	10.617			
AIR022202					0.383							1.361			6.867	1.194			
AIR120301					0.547							2.144			8.079	3.849			
AIR080201					0.574							2.515			3.110	0.752			

Date Collected	Methylene chloride	Naphthalene	N-Butylbenzene	n-Propylbenzene	Styrene	t-Butylbenzene	Tetrachloroethene	Toluene	1,2,4 Trichlorobenzene	1,1,1-Trichloroethane	Trichloroethene	Trichlorofluoromethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl Chloride	Total Xylenes	TNMHC	Methane
	Method TO-15M																TO-12M	TO-3M
	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	ug/m3
AIR20140425	0.023	0.240	<0.020	0.260	<0.016	--	0.270	1.50	<0.028	0.040	0.290	<0.021	0.810	0.460	0.0320	3.310	18.0 B	--
AIR20131018	<0.0436	0.0994	<0.0689	0.329	<0.0535	--	0.203	3.95 RA,B	<0.0931	0.0581 J	0.250	<0.0705	1.220	0.865	0.0412	7.260 RA	13.70 B	--
AIR20130502	0.00185 J	0.0778	<0.00563	0.236 RA	<0.0183	--	0.133	0.838	<0.00761	0.0605	0.169	0.00145 J	0.608	0.456	0.0395	2.397 RA	4.70 B	--
AIR20121005	0.00665 J	0.300 B	0.0236	0.535	<0.0183	--	0.621	0.932	<0.0320	0.0841	0.823	<0.0242	0.478	1.090	0.122	3.991	<0.705	--
AIR20120419	0.00503 J	0.258 B	0.0639	0.394	<0.0205	--	0.528	1.750	<0.0357	0.177	0.825	<0.027	1.270	0.907	0.109	4.770	15.40	--
AIR20111117	0.00137 J	0.0161 J		0.104	<0.0187	--	0.0105 J	0.943	<0.0326	0.00554 J	0.680	<0.0247	0.377	0.316	0.142	1.672	6.83	--
AIR20110819	<0.0167	0.0114J		0.0735	<0.0205	--	0.109	0.418	<0.0356	0.102	0.133	<0.027	0.303	0.207	0.0116J	1.009	8.11	--
AIR20110513	0.000686 J	0.0053		0.147 RA	<0.00392	--	0.0779	0.228 RA	<0.00305	0.00444 J	0.293 RA	0.00151J	0.585	0.542	0.0217	1.167	4.61	--
AIR20110217	0.0646 J,B	<0.0730		0.315	<0.0224	--	0.619	1.710	<0.0845	0.132 J	1.610		1.020	0.771	0.719	2.884	20.60	--
AIR20101104	0.0680 J,B	<0.0806		0.0914 J	<0.0247	--	0.516	0.741	<0.0939	0.218 J	4.570		0.246	0.251	0.234	2.521	15.30	--
AIR20100806	0.00896	0.016		0.093	<0.194	--	0.270	0.421	<0.0182	0.1900	1.090 RA		0.377	0.365	0.126	1.580	9.18 B	--
AIR20100513	0.0404 JB	<0.239		0.278	<0.194	--	0.390	3.27	<0.087	<0.249	0.858		0.821	1.010	0.0198 J	4.478	<0.705	--
AIR20100204	<0.0306	<0.0462		0.541	<0.0375	--	0.0197 J	2.02	<0.0654	0.0161 J	0.116		1.150	0.893	0.0498	3.460	9.07 B	--
AIR20091119	<0.0937	<0.141		0.237	<0.115	--	<0.183	2.53	<0.179	<0.147	0.110 J		0.443	0.434	0.0206 J	2.675	7.53 B	--
AIR082009	<0.0172	<0.0259		0.163	<0.0211	--	0.0829	1.54	<0.0367	0.0349	0.966		0.416	0.459	0.0430	2.725	5.64	--
AIR050109	0.000767 J	0.008		0.077	<0.002	--	0.0167	0.529	<0.00348	0.0056	0.279		0.177	0.293	0.0185	1.014	2.0	--
AIR020609	<0.00909	0.00492 J		0.035	<0.0111	--	<0.0177	0.449	<0.0194	0.00445 J	0.00249 J		0.128	0.104	<0.00669	0.757	1.53 J	--
AIR110708	<0.00976	0.0685 J		0.422	<0.00552	--	0.0339 J	4.10	<0.0696	0.1330	0.327		1.440	1.290	0.0133 J	7.22	18.1	--
AIR082208	0.0032	0.266		0.266	<0.00233	--	0.2970	1.76	<0.0203	0.4190	0.342		0.802	0.596	0.0416	2.29	13.2	--
AIR052208	0.0344	0.106		0.151	<0.00222	--	0.0151	2.91	<0.00924	0.0492	0.356		0.584	0.572	0.0349	4.20	14.1	--
AIR030408	0.00703 J	1.19		0.209	<0.00215	--	0.00586 J	7.68	<0.00894	0.189	0.00953 J		1.34	0.905	0.224	7.15	10.6 B	--
AIR112607	0.07 JB	<0.0936		<0.0293	<0.0286	--	<0.036	1.46	<0.108	0.438	<0.027		<0.0293	<0.0352	<0.017	0.3738 J	9.4	--
AIR091407	0.102 B	0.236		0.266	<0.0272	--	<0.0342	11.7 ER	<0.103	0.592	<0.0256		0.749	0.660	0.0179 J	11.59	37.5	--
AIR060707	0.0685 JB				<0.0293	--	0.0393 J	2.35	<0.111	0.459	0.0380 J		0.158	0.251	<0.0174	1.827	14.4	--
AIR032207	0.100 JB				<0.030	--	0.0504 J	1.52	<0.113	0.641	0.0463 J		0.658	0.637	<0.0178	6.500	30.6	--
AIR112106	0.0483 JB				<0.027	--	0.540	2.15 B	<0.102	0.252	0.816		0.589	0.670	0.0458 J	2.802	13.1	--
AIR080306	0.0598 JB				<0.0290	--	3.950	3.26	<0.109	1.550	4.500		0.813	1.010	0.166	4.940	26.0	--
AIR050406	0.0507 JB				<0.0212	--	<0.0385	1.66	<0.0321	<0.0205	0.577		0.134	0.167	<0.0904		6.3	--
AIR020106	<0.140				<0.0621	--	<0.130	11.1 ER	<0.0184	1.420	0.313 J		1.770	1.950	0.071 J	15.24	95.5 B	--
AIR110405	<0.147				<0.065	--	<0.136	11.5	<0.192	0.807	0.325		1.130	0.750 J	<0.0701	7.46	67.2	--
AIR080405	<0.144				<0.0638	--	<0.134	7.26	<0.189	2.74	<0.085		0.236 J	0.406 J	<0.0689	4.43	30.1 B	--
AIR051205	0.0034 J				<0.00138	--	0.343	0.68	0.00676 J	<0.00166	0.558		0.273	0.257	<0.000654	0.839	3.34 B	--
AIR021705	<0.134				<0.0593	--	2.29	0.663	<0.175	<0.0959	4.1		0.571J	0.773J	<0.064	4.13J	25.4	--
AIR102804	<0.0838				<0.229	--	1.64 J	3.68	<0.070	0.161 J	2.38		1.08 J	1.14 J	<0.0557	5.21	40.0	--
AIR072904	<0.0751				<0.206	--	<0.942	1.47	<0.0627	<0.784	<0.103		0.107 J	0.202 J	<0.0499	0.956	16.0	--
AIR050504	<0.0728				<0.199	--	<0.0913	11.40	<0.0608	<0.076	<0.0996		0.503 J	0.493 J	<0.0484	4.9	31.7	--
AIR020504	<0.0764				<0.209	--	1.04 J	6.36	<0.0638	0.207 J	2.3		0.401 J	0.361 J	0.277 J	4.41	22.1	--
AIR111903	<0.000916				<0.00111	--	0.043 J	0.275	<0.00587	<0.00141	0.00524		0.0536	0.0314 J	<0.000661	0.530	1270	--
AIR092503	<0.06				<0.078 B	0.739 JB	8.67	<0.0169	<0.048	0.879 J	4.2		0.739 JB	0.457 J	<0.538	7.41	2934	--
AIR051403	2.9				0.0822	2.320	1.66 J	61.6	0.182	1.45 J	2.52		2.32	2.37	0.144	39.38	164	--
AIR021203	0.549				0.185	1.320	1.340	14.3		0.698	1.680		<0.022	1.220	0.032	11.980	65.4	--
AIR110602	<0.13						<0.13	4.989		<0.13	<0.13		<0.13	<0.13		1.946	9.58	--
AIR082102	0.078						0.005	0.211		<0.00061	<0.00059		0.030	0.009		0.041	1.50	5
AIR051502	9.201						2.142	72.92		1.779			3.455	2.504		65.914	241.67	32
AIR022202	0.920						2.695	12.665		<0.13			<0.13	<0.13		6.016		
AIR120301	<0.14						2.557	29.552		1.279			0.751	0.801		16.058		
AIR080201	2.513						<0.14	31.087		0.945			<0.14	<0.14		3.451		

Notes: TNMHC - Total non-methane hydrocarbons. mg/m3 - milligrams per cubic meter. B - Analyte detected in method blank. J - Result > or = MDL and <PQL. R - Result reported elsewhere. Non Detect is reported as <RL (reporting limit)

G:\Aproject\BRENNTAG\OK12552014\REPORTS\1SA14\TABLES\[1SA14 T7T9T11T12 RS LAB DATA.xls]TBL 9 AIR EFF

ARCADIS

Table 10. Mass Removed as Vapor
Brenntag-Springfield, Missouri.

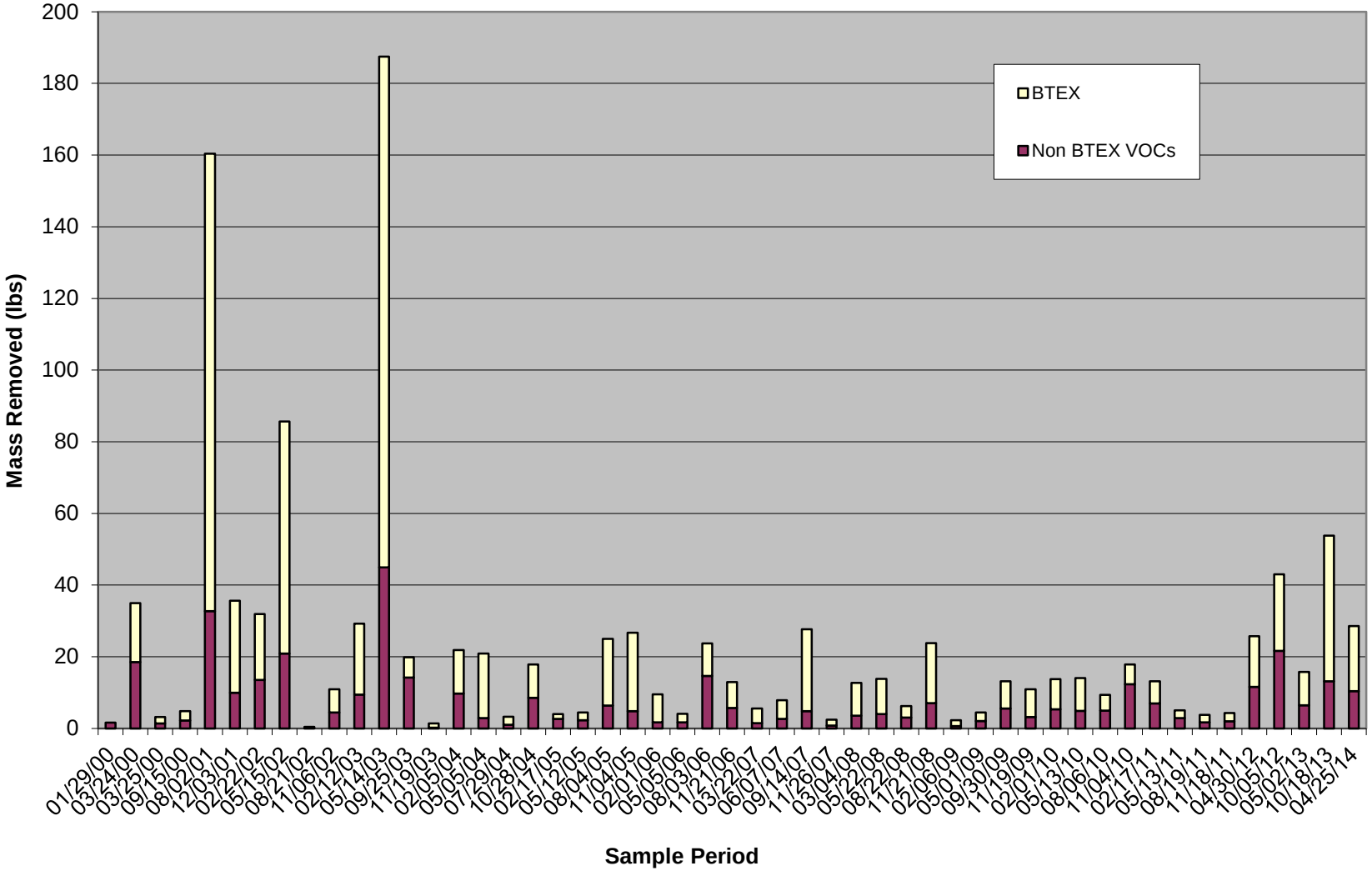

Table 11. Summary of Treated Groundwater Discharge Sample Results, HVE System.
Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

Date Collected	Nickel, Total	Zinc, Total	Oil and Grease HEM	Oil & Grease Animal/Vegetable	Ammonia As N	SGT-HEM, TPH	Flash Point	1,1-Dichloroethane	Ethylbenzene	Toulene	Vinyl Chloride	PH	Field PH
	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	degrees	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(su)	(su)
[1]Daily Maximum	**5.79**	**6.54**	**NA**	**100**	**NA**	**NA**	**>140 F**	**NA**	**NA**	**NA**	**NA**	**5.0 -12.5**	**5.0 -12.5**
4/25/14	0.0034 J	<0.020	<5.1	--	<0.10	--	>160	<0.005	<0.005	<0.005	<0.010	8.06	--
10/18/13	0.0055 J	0.0050 J	11	--	<0.10	--	>160	<0.005	<0.005	<0.005	<0.010	7.69	--
5/2/13	0.016	0.055	<4.7	--	<0.10	--	>160	<0.005	<0.005	<0.005	<0.010	7.71	--
10/5/12	0.0062 J	0.013 J	<4.7	--	<0.10	--	>160	<0.005	<0.005	<0.005	<0.010	8.25	--
4/19/12	0.0069 J	0.0086 J	3.4 JB	--	0.064 JB	--	>160	<0.005	<0.005	<0.005	<0.010	7.81	--
11/17/11	0.0035 J	0.0055 J	1.6 JB	--	<0.10	--	>160	<0.005	<0.005	<0.005	<0.010	7.95	--
5/13/11	0.0046 J	0.0080 J	2.0 JB	--	0.024	--	>160	<0.005	<0.005	<0.005	<0.010	7.56	--
11/4/10	0.0022 J	0.0063 J	1.7 J	--	0.041 J	--	>160	<0.0015	<0.0022	<0.0022	<0.0013	7.86	--
5/13/10	0.0074 J	0.017 J	2.3 JB	--	--	--	>160	<0.0015	<0.0022	<0.0022	<0.0013	7.63	--
2/5/10	0.0031 B	<0.020	2.4 B	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.7	--
11/19/09	0.0056 B	0.0055 B	<5.0	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.7	--
8/20/09	0.0043 B	<0.020	9.6	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	8	--
5/1/09	0.0042 B,J	0.0069 B	4.5 B	--	--	--	>180	<0.005	<0.005	<0.005	<0.010	7.6	--
4/3/09	0.0084 B	0.012 B	3.7 B	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	8	--
3/6/09	0.009 B	0.016 B	4.2 BJ	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.9	--
2/6/09	0.0012 B	<0.020	6.7 J	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.5	--
1/9/09	0.0012 B	<0.020	2.3 B	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.8	--
12/5/08	0.0021 B	<0.020	<5.0	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.9	--
11/7/08	0.0067 B	0.0088 B	2.0 BJ	--	0.031B	--	>160	<0.005	<0.005	<0.005	<0.010	8.1	--
10/3/08	0.026 B	0.026	3.4 B	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.6	--
9/12/08	0.020 B	0.0068 B	13	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.7	--
8/22/08	0.064 B	0.040 B	1.4 B	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7	--
7/14/08	0.014 B	0.0088 B	2.4 B	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.6	--
6/3/08	0.017 B	<0.020	4.8 BJ	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	8	--
5/22/08	0.016 B	<0.020	3.0 B	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.8	--
4/4/08	0.031 B	0.037	4.3 B	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.9	--
3/4/08	0.012	0.018	3.2 B	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	8.4	--
2/4/08	0.0098 B	0.0078 B	1.9 B	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.7	--
1/8/08	0.030 B	0.014 B	4.5 B	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.1	--

Table 11. Summary of Treated Groundwater Discharge Sample Results, HVE System.
Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

Date Collected	Nickel, Total	Zinc, Total	Oil and Grease HEM	Oil & Grease Animal/Vegetable	Ammonia As N	SGT-HEM, TPH	Flash Point	1,1-Dichloroethane	Ethylbenzene	Toulene	Vinyl Chloride	PH	Field PH
	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	degrees	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(su)	(su)
[1]Daily Maximum	**5.79**	**6.54**	**NA**	**100**	**NA**	**NA**	**>140 F**	**NA**	**NA**	**NA**	**NA**	**5.0 -12.5**	**5.0 -12.5**
12/5/07	0.013 B	0.0063 B	1.9 B	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.7	--
11/16/07	0.019 B	0.0088 B	1.9 B	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	8.0	--
10/23/07	0.031 B	0.015 B	<5.0	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.3	--
9/14/07	0.035 B	0.016 BJ	4.0 B	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.7	--
8/6/07	0.026 B	0.013 BJ	3.5 B	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.6	--
7/13/07	0.011 B	0.0094 B	3.5 B	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.8	--
6/7/07	<0.040	0.010 B	2.0 BJ	--	0.76	--	>160	<0.005	<0.005	<0.005	<0.010	7.6	--
5/22/07	0.011 B	0.030	<5.0	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.7	--
4/6/07	<0.040	0.011 B	1.7 B	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.9	--
3/22/07	0.038 B	0.082 J	3.0 BJ	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.3	--
12/26/06	0.013 B	0.013 B	<5.0	--	0.36	--	>160	<0.005	<0.005	<0.005	<0.010	7.4	--
12/5/06	<0.040	0.010 B	<5.0	--	0.025 B	--	>160	<0.005	<0.005	<0.005	<0.010	7.5	--
11/21/06	0.022 B	0.063 J	1.6 BJ	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.7	--
10/24/06	<0.040	0.0055 B	1.9 B	--	--	--	>160	<0.005	<0.005	0.00041 J	<0.010	8.1	--
9/22/06	0.0080 B	0.0051 BJ	3.6 B	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	8.2	--
8/3/06	0.044	0.0083 B	<5.0	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.5	--
7/7/06	0.034 B	0.016 BJ	<5.0	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.7	--
6/14/06	0.028 B	0.017 B	1.7 B	--	0.21	--	>160	<0.005	<0.005	<0.005	<0.010	7.6	--
5/4/06	0.018 B	0.028	<5.0	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	8.1	--
4/18/06	0.006 B	0.005	1.9 BJ	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	8.0	--
2/20/06	0.016	0.096	<5.0	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.8	--
1/30/06	0.0046 B	<0.020	<5.0	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	8.7	--
12/21/05	0.038 B	0.046	<5.0	--	0.07	--	>160	<0.005	<0.005	<0.005	<0.010	9.7	--
11/4/05	0.02 B	<0.02	6.5	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.8	--
10/19/05	0.041 J	<0.02	<0.72	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.6	--
9/21/05	0.027 B	0.038	150	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	8.1	--
8/4/05	0.065	0.018	0.99 B	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.7	7.7
7/12/05	0.08	0.019 B	1.9 BJ	--	0.24	--	>160	<0.005	<0.005	<0.005	<0.010	7.6	--
6/16/05	0.049	0.0097 B	1.2 BJ	--	0.028 B	--	>160	<0.005	<0.005	<0.005	<0.010	7.4	--

Table 11. Summary of Treated Groundwater Discharge Sample Results, HVE System.
Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

Date Collected	Nickel, Total	Zinc, Total	Oil and Grease HEM	Oil & Grease Animal/Vegetable	Ammonia As N	SGT-HEM, TPH	Flash Point	1,1-Dichloroethane	Ethylbenzene	Toulene	Vinyl Chloride	PH	Field PH
	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	degrees	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(su)	(su)
[1]Daily Maximum	**5.79**	**6.54**	**NA**	**100**	**NA**	**NA**	**>140 F**	**NA**	**NA**	**NA**	**NA**	**5.0 -12.5**	**5.0 -12.5**
5/12/05	0.011 B	<0.02	1.3 B	--	0.034 B	--	>160	<0.005	<0.005	<0.005	<0.010	7.6	--
4/5/05	0.013 B	<0.02	4.1 B	--	<0.10	--	>160	<0.005	<0.005	<0.005	<0.010	8.5	8.6
3/15/05	0.12	0.60	450 J	--	--	--	>160	<0.005	<0.005	<0.005	<0.010	7.7	--
2/17/05	0.026	0.031	1.1	--	--	--	ND	<0.005	<0.005	<0.005	<0.010	7.1	--
1/17/05	0.014	0.01	4.3	--	--	--	>160 F	<0.005	<0.005	<0.005	<0.010	7.9	--
12/14/04	0.0068 B	<0.020	<5.0	--	--	--	>160 F	<0.005	<0.005	<0.005	<0.010	8.0	8.9
11/22/04	0.0091 B	0.010 BJ	0.8 B	--	<0.10	--	>160 F	<0.005	<0.005	<0.005	<0.010	7.6	--
10/5/04	0.0083 B	<0.020	<5.0	--	<0.10	--	>160 F	<0.005	<0.005	<0.005	<0.010	7.8	7.9
9/21/04	0.008 B	<0.020	1.7 B	--	0.43	--	>160 F	<0.005	<0.005	<0.005	<0.010	7.8	7.8
8/10/04	0.014 B	<0.020	0.96 B	--	0.34	--	>160 F	<0.005	<0.005	<0.005	<0.010	7.6	--
7/26/04	0.013 B	<0.020	0.79 B	--	0.15	--	>160 F	<0.005	<0.005	<0.005	<0.010	7.4	--
6/16/04	0.034 B	0.015 B	1.5B J	--	<0.1	--	>160 F	<0.005	<0.005	<0.005	<0.010	7.5	--
5/5/04	0.056	0.38	1.0 B	--	<0.1	--	>160 F	<0.005	<0.005	<0.005	<0.010	7.7	7.8
4/16/04	0.019 B	<0.020	1.0 B	--	<0.1	--	>160 F	<0.005	<0.005	<0.005	<0.010	7.9	8.0
3/4/04	0.026 B	0.032	97	--	<0.1	--	>200 F	<0.005	<0.005	<0.005	<0.010	7.8	8.3
2/5/04	0.032 B	0.021	8.4	--	<0.1	--	>160 F	<0.005	<0.005	<0.005	<0.010	7.7	--
1/21/04	0.031 B	0.029	7.7	--	--	--	>160 F	<0.005	<0.005	<0.005	<0.010	7.4	--
12/10/03	0.023 B	0.0092 B	5.2 J	--	<0.1	--	>160 F	<0.005	<0.005	<0.005	<0.010	7.8	--
11/18/03	0.020 B	<0.020	<5.0	--	--	--	>160 F	<0.005	<0.005	<0.005	<0.010	8.5	--
10/16/03	0.025 B	0.0085 B	1.1 JB	--	--	--	>160 F	<0.005	<0.005	<0.005	<0.010	7.9	--
9/9/03	0.022 B	<0.020	2.2 JB	--	--	--	>160 F	<0.005	<0.005	<0.005	<0.010	7.7	--
8/12/03	0.023 B	0.015 B	23 J	--	--	--	>160 F	<0.005	<0.005	<0.005	<0.010	7.7	--
7/30/03	0.047	0.042	2.6 JB	--	--	--	>160 F	<0.005	<0.005	<0.005	<0.010	7.6	--
6/23/03	0.021 B	<0.020	3.2 JB	--	--	--	>160 FJ	<0.005	<0.005	<0.005	<0.010	7.7	--
5/13/03	0.028 B	0.019 JB	3.3 JB	--	--	--	>160 FJ	<0.005	<0.005	<0.005	<0.005	7.4	--
4/29/03	0.050	0.079	<5.0	--	--	--	>160 FJ	<0.005	<0.005	<0.005	<0.010	7.3	--
3/31/03	0.033 B	0.052	20 J	--	--	--	>160 F	<0.005	<0.005	<0.005	<0.010	7.6	--
2/25/03	0.031B	0.03	37	--	--	--	>160 F	0.26J	<0.001	<0.001	<0.001	8.0	--
1/30/03	<0.03	<0.10	5.08	--	--	--	>210 F	<0.001	<0.001	<0.001	<0.001	7.6	--

Table 11. Summary of Treated Groundwater Discharge Sample Results, HVE System.
Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

Date Collected	Nickel, Total	Zinc, Total	Oil and Grease HEM	Oil & Grease Animal/Vegetable	Ammonia As N	SGT-HEM, TPH	Flash Point	1,1-Dichloroethane	Ethylbenzene	Toulene	Vinyl Chloride	PH	Field PH
	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	degrees	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(su)	(su)
[1]Daily Maximum	**5.79**	**6.54**	**NA**	**100**	**NA**	**NA**	**>140 F**	**NA**	**NA**	**NA**	**NA**	**5.0 -12.5**	**5.0 -12.5**
12/19/02	0.0837	<0.10	<5.0	--	--	--	>210 F	<0.001	<0.001	<0.001	<0.001	7.28	--
11/20/02	0.077	<0.10	<5.0	--	--	--	>210 F	<0.001	<0.001	<0.001	<0.001	7.82	--
10/31/02	0.495	0.131	<5.0	0.633	--	<5.0	>210 F	<0.001	<0.001	<0.001	<0.001	8.19	--
9/25/02	0.0303	<0.10	<5.0	0.118	--	<5.0	>94 C	<0.001	<0.001	<0.001	<0.001	7.31	--
8/29/02	0.0668	<0.10	<5.0	0.952	--	<5.0	>94 C	<0.001	<0.001	<0.001	<0.001	4.74	--
6/25/02	0.0564	<0.10	<5.0	1.44	--	<5.0	>95 C	<0.001	<0.001	<0.001	<0.001	7.22	--
6/12/02	0.0661	0.164	47.4	14.7	--	32.7	>94 C	<0.001	<0.001	<0.001	<0.001	7.55	7.6
5/28/02	0.0418	0.101	0.0538	0.016	--	0.0378	>94 C	<0.001	<0.001	<0.001	<0.001	7.06	--
5/15/02	0.045	0.056	6.0	<6.0	--	<6.0	>200 F	<0.005	<0.005	<0.005	<0.010	7.68	--
4/15/02	0.030	<0.010	12	3.0	--	9.0	>200 F	<0.005	<0.005	<0.005	<0.010	7.49	8.13
4/11/02	0.040	0.040	7.8	<5.0	--	<5.0	>200 F	<0.005	<0.005	<0.005	<0.010	7.68	8.14
1/22/02	0.050	0.080	74	38	--	36	>200 F	<0.005	<0.005	<0.005	<0.010	7.04	8.02
12/21/01	0.066	0.190	22	--	--	15	>200 F	<0.005	<0.005	<0.005	<0.010	7.19	8.01
11/14/01	0.023	0.041	--	--	--	<6.0	>200 F	<0.005	<0.005	<0.005	<0.010	7.61	--
10/18/01	0.041	0.020	--	--	--	6.4	>200 F	<0.005	<0.005	<0.005	<0.010	7.65	8.06
9/23/01	0.024	<0.0060	14	--	--	<6.0	>200 F	<0.005	<0.005	<0.005	<0.010	7.35	8.02
8/28/01	0.0417	<0.010	<5.0	0.449	--	<5.0	>94	< 0.001	< 0.001	< 0.001	< 0.001	7.58	--
8/26/01	0.0405	<0.010	<5.0	0.713	--	<5.0	>94	< 0.001	< 0.001	< 0.001	< 0.001	7.49	--
7/26/01	0.0322	<0.010	63.4	14.5	--	48.9	>94	< 0.001	< 0.001	< 0.001	< 0.001	8.23	--
7/12/01	<0.030	<0.010	<5.0	<5.0	--	5.45	>94	< 0.001	< 0.001	< 0.001	< 0.001	7.89	8.02
6/28/01	<0.030	<0.010	12	2.45	--	9.55	>94	<0.001	<0.001	<0.001	<0.001	7.57	7.16
6/26/01	0.045	<0.010	39.4	5.2	--	34.2	>94	< 0.001	< 0.001	< 0.001	< 0.001	7.52	8.02
6/20/01	<0.030	<0.010	9.16	4.63	--	<5.0	>94	< 0.001	< 0.001	< 0.001	< 0.001	8.00	8.05
3/21/01	0.0377	0.244	240*	56.0*	--	184*	>94	0.0015	< 0.001	0.0025	< 0.001	--	7.42
2/26/01	0.0316	<0.010	15.0*	4.90*	--	10.1*	>94	<0.001	<0.001	0.0014	<0.001	--	--

Table 11. Summary of Treated Groundwater Discharge Sample Results, HVE System.
Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

Date Collected	Nickel, Total (mg/l)	Zinc, Total (mg/l)	Oil and Grease HEM (mg/l)	Oil & Grease Animal/Vegetable (mg/l)	Ammonia As N (mg/l)	SGT-HEM, TPH (mg/l)	Flash Point degrees	1,1-Dichloroethane (mg/l)	Ethylbenzene (mg/l)	Toulene (mg/l)	Vinyl Chloride (mg/l)	PH (su)	Field PH (su)
[1]Daily Maximum	**5.79**	**6.54**	**NA**	**100**	**NA**	**NA**	**>140 F**	**NA**	**NA**	**NA**	**NA**	**5.0 -12.5**	**5.0 -12.5**
1/31/01	0.0453	<0.010	<5.0*	--	--	<5.0(413.1)	>94	<0.001	<0.001	<0.001	<0.001	--	--
10/24/00	0.082	0.086	5*	--	--	--	--	--	--	--	--	6.13	--
9/28/00	--	--	11*	--	--	--	<200	--	--	--	--	--	--
9/15/00	--	--	14*	--	--	1.0*	--	--	--	--	--	--	--
7/26/00^	--	--	<1.00*	<1.00*	--	--	--	--	--	--	--	--	--
7/24/00^	0.059	0.085	--	--	--	--	--	--	--	--	--	--	--
7/22/00^	--	--	--	--	--	--	--	--	--	--	--	6.6	--
7/27/00^	--	--	--	--	--	--	<70	--	--	--	--	--	--
7/1/00^	0.018	<0.010	--	--	--	--	--	--	--	--	--	--	--
6/27/00^	--	--	<1.00*	<1.00*	--	--	--	--	--	--	--	--	9.2
6/27/00^	--	--	--	--	--	--	--	--	--	--	--	--	--
6/14/00	--	--	420*	**115.00**	--	--	--	--	--	--	--	--	--
5/25/00	<0.100	0.130	820*		--	805 (418.1)	>205 F	--	--	--	--	7.8	--
4/28/00	<0.100	0.180	300*	80	--	220 (418.1)	>205 F	--	--	--	--	7.8	--

NA Not applicable.
mg/l Milligrams per liter.
Deg C^0 Degrees Celsius.
Deg F^0 Degrees Fahrenheit.
su Standard units.
* Analyses for Total Recoverable Oil & Grease by Method EPA 413.1; Animal/Veg by Method SM 5520C; and TPH by SM 5520B/F.
6/20/01 - 8/28/01 Samples analyzed for oil and grease, and TPH using EPA Method 1664.
GC/MS Volatiles Samples analyzed using EPA Method 8260.
[1] Daily maxmium limits for effluent limitations.
^ = Date of Analysis
< = Result is less than reporting limit.
B = Estimated result.
J = Method Blank (MB) Contamination. The associated MB contains the target analyte at a reportable level.

Table 12. Summary of Treated Groundwater Discharge Sample Results for RCRA Metals, HVE System. Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

Date Collected	Arsenic, Total (mg/l)	Cadmium, Total (mg/l)	Chromium, Total (mg/l)	Copper, Total (mg/l)	Cyanide, Total (mg/l)	Lead, Total (mg/l)	Mercury, Total (mg/l)	Phosphorus, Total (mg/l)
[1]Daily Maximum	**0.51**	**0.13**	**2.91**	**2.44**	**0.33**	**0.53**	**0.002**	**NA**
4/25/14	<0.015	<0.005	<0.010	<0.010	<0.010	<0.0030 [+]	<0.00020	0.013
10/18/13	<0.015	<0.005	<0.010	<0.010	0.003 JB	<0.0030	0.000031	<0.050
5/2/13	<0.015	<0.005	<0.010	0.0054 J	0.0024	<0.0030	<0.00020	<0.050
10/5/12	<0.015	<0.005	<0.010	0.0073	0.0029	<0.0030	<0.00020	<0.050
4/19/12	<0.015	<0.005	<0.010	<0.010	<0.0059 JB	<0.0030	<0.00020	<0.050
11/17/11	<0.015	0.00062 J	<0.010	0.0028 J	<0.010	<0.0030	<0.00020	0.0082 B,J
5/13/11	<0.0044	<0.00045	<0.00066	<0.0014	<0.0020	<0.0026	<0.000027	<0.050
11/4/10	<0.0044	<0.00045	<0.00066	0.0018 J	<0.0020	<0.0026	<0.000027	0.012 JB
5/13/10	<0.0044	<0.00045	<0.023	0.003 J	<0.0034 JB	<0.0026	<0.000027	0.0098 JB
11/19/09	<0.015	<0.005	<0.010	0.0018 B	<0.010	<0.003	<0.0002	0.025 B
5/1/09	0.0054 B	<0.005	<0.010	<0.010	<0.010	<0.003	<0.0002	<0.050
11/7/08	0.0050 B	<0.005	0.00069 B	<0.010	<0.010	<0.003	<0.0002	0.017 B,J
5/22/08	<0.015	0.00052 B	<0.010	<0.010	<0.010	<0.003	0.000035	<0.050
12/5/07	<0.015	<0.005	<0.010	<0.010	<0.010	<0.003	<0.0002	0.0095 B
6/7/07	<0.015	<0.005	<0.010	<0.010	<0.010	<0.003	<0.0002	<0.050
12/26/06	<0.015	<0.005	<0.010	<0.010	<0.010	<0.003	0.000033 B	0.020 B
6/14/06	<0.015	<0.005	<0.010	<0.010	<0.010	<0.003	<0.0002	0.027 BJ
12/21/05	0.033	<0.005	<0.010	0.011	<0.010	0.0034	<0.0002	0.15 J
6/16/05	<0.015	<0.005	0.0014 B	<0.010	0.019	0.0041	<0.0002	0.16 J
11/22/04	0.0037 B	<0.005	<0.010	<0.010	0.0076 B	<0.003	<0.0002	<0.050
8/10/04	<0.015	<0.005	<0.010	--	<0.010	--	--	--
6/16/04	<0.015	<0.005	<0.010	0.015 B	--	0.0021 B	<0.0002	0.028 B
11/18/03	<0.015	<0.005	<0.010	0.0014 B	--	<0.003	<0.0002	--
8/12/03	<0.015	<0.005	<0.010	0.0085 B	--	<0.003	0.000046 JB	--
7/30/03	<0.015	<0.005	<0.010	0.010	--	0.0051	<0.0002	--
6/23/03	<0.015	0.00063	<0.010	<0.010	<0.010	<0.003	0.00017	0.04 B
5/13/03	<0.015	<0.005	<0.010	0.0015 B	--	0.0038	0.000047	--
4/29/03	<0.015	<0.005	<0.010	0.028 J	--	0.0078	0.000019 B	--
11/20/02	<0.085	<0.005	<0.007	<0.01	<0.005	<0.050	0.000226	<0.500
5/28/02	<0.085	<0.005	0.0125	0.0386	<0.005	<0.050	<0.0002	0.924
11/14/01	<0.020	<0.002	0.006	<0.005	<0.005	<0.010	<0.0002	0.050
6/28/01	<0.085	<0.005	<0.007	<0.010	<0.000005	<0.050	<0.0002	<0.0005
10/24/00	<0.015	<0.002	<0.003	0.003	<0.010	<0.022	<0.0002	0.110
9/28/00	--	--	--	--	--	--	--	0.100
7/24/00[^]	<0.020	<0.004	<0.005	0.023	<0.020	<0.010	<0.0002	0.020
6/27/00[^]	0.220	<0.004	<0.005	<0.005	<0.020	<0.010	<0.0002	--
5/25/00	<0.020	<0.025	<0.100	<0.100	<0.100	<0.190	<0.002	<0.200
4/28/00	<0.020	<0.025	<0.100	<0.100	<0.100	<0.190	<0.002	--

NA - Not applicable mg/l - Milligrams per liter

[1] Daily maximum for effluent limitations < = Result is less than reporting limit.

^ - Date of analysis B = Estimated result.

J = Method Blank (MB) Contamination. The associated MB contains the target analyte at a reportable level.

[+] ICV, CCV, ICB, CCB, ISA, ISB, CRI, CRA, DLCK, or MRL standard: Instrument related QC exceeds the control limits.C49

G:\Aproject\BRENNTAG\OK12552014\REPORTS\1SA14\TABLES\[1SA14 T7T9T11T12 RS LAB DATA.xls]TBL 12 SA GW EFF

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Table 13. Operation and Maintenance Summary, Sub-slab Vapor Extraction System, Brenntag/HCI Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

DATE/TIME	SSVE METER READING (Hrs)	INCREMENTAL RUN TIME (Hrs)	APPROX. DOWN TIME (HOURS)	APPROX. TIME INTERVAL (HOURS)	% RUN TIME	REMARKS
11/6/09 16:00						SSVE System Start Up.
12/11/09 12:47	*836.78*	*836.78*		*836.8*	*100.0%*	Hour Meter Installed
12/15/09 11:25	94.63	94.63		*94.6*	100.0%	
12/21/09 13:00	240.25	145.6		*145.6*	100.0%	
12/31/09 11:00	478.24	238.0		*238.0*	100.0%	
1/13/10 15:44	795.06	316.8		*316.7*	100.0%	
1/29/10 15:01	1178.23	383.2		*383.3*	100.0%	
2/28/10 17:55	1901.18	723.0		*722.9*	100.0%	
3/31/10 14:05	2640.35	739.2		*740.2*	99.9%	Adjust DST.
4/30/10 16:27	3362.69	722.3		*722.4*	100.0%	
6/1/10 10:00	4124.26	761.6		*761.5*	100.0%	
7/1/10 12:12	4846.49	722.2		*722.2*	100.0%	
7/11/10 0:00						Blower destroyed by lightning.
7/12/10 9:41	5095.01	248.5	13.0	*261.5*	95.0%	
7/26/10 16:56	5095.15	0.1	343.1	*343.3*	0.04%	Start new SSVE blower.
8/31/10 12:37	5953.90	858.8	0.9	*859.7*	99.89%	
9/30/10 19:35	6680.88	727.0	0.0	*727.0*	100.00%	
11/1/10 10:43	7439.98	759.1	0.0	*759.1*	100.00%	
11/30/10 14:07	8140.41	700.4	0.0	*700.4*	100.00%	Adjust DST.
12/31/10 13:36	8883.89	743.5	0.0	*743.5*	100.00%	
1/31/11 12:07	9626.43	742.5	0.0	*742.5*	100.00%	
3/2/11 12:15	10346.54	720.1	0.0	*720.1*	100.00%	
3/30/11 15:54	11021.20	674.7	0.0	*674.7*	100.00%	Adjust DST.
4/30/11 15:37	11764.23	743.0	0.7	*743.7*	99.91%	
6/1/11 9:00	12525.65	761.4	0.0	*761.4*	100.00%	
6/30/11 16:03	13228.67	703.0	0.0	*703.0*	100.00%	
7/29/11 10:21	13918.94	690.3	0.0	*690.3*	100.00%	
8/31/11 15:42	14707.23	788.3	9.1	*797.3*	98.86%	
9/30/11 17:10	15428.73	721.5	0.0	*721.5*	100.00%	
10/31/11 17:12	16172.80	744.1	0.0	*744.0*	100.00%	
11/28/11 12:22	16840.95	668.2	0.0	*668.2*	100.00%	Adjust DST.
12/30/11 15:24	17611.97	771.0	0.0	*771.0*	100.00%	
4/18/12 16:16	20251.81	2639.8	0.0	*2639.9*	100.00%	Adjust DST.
9/21/12 15:17	23982.53	3730.7	12.3	*3743.0*	99.67%	Lightning strike, blower dead.
10/5/12 9:52	24006.45	23.9	306.7	*330.6*	7.24%	Replace blower 10/4/12
12/31/12 17:30	26103.05	2096.6	0.0	*2096.6*	100.00%	Adjust DST.
1/30/13 17:12	26822.77	719.7	0.0	719.7	100.00%	
2/27/13 12:13	27445.15	622.4	44.6	667.0	93.31%	Blower shut down for repairs.
4/1/13 14:44	28238.68	793.5	0.0	793.5	100.00%	Adjust DST.
5/1/13 10:12	28954.13	715.5	0.0	715.5	100.00%	
5/31/13 9:50	29673.79	719.7	0.0	719.6	100.00%	
6/17/13 16:59	30088.93	2643.8	1.0	2644.8	99.96%	
12/31/13 15:41	34816.59	4727.7	0.0	4727.7	100.00%	Adjust DST.
5/27/14 14:53	38342.84	3526.3	0.0	3526.2	100.00%	Adjust DST.
TOTALS		**41408.3**	**731.3**	**42140.5**	**98%**	

G:\Aproject\BRENNTAG\OK12552014\REPORTS\1SA14\TABLES\[1SA14 T13_SSVE OM SUMMARY.xlsx]Sheet1

Table 14. Summary of Sub-slab Vapor Extraction System Effluent Analytical Results and Estimated Mass Removal
Brenntag/HCL Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri

LAB SAMPLE		SSVE Start up Effluent		SSVE Effluent #2		SSVE Effluent #3		SSVE 20100204		SSVE 20100513		SSVE 20100806		SSVE 20101104		SSVE 20110217		SSVE 20120419		SSVE 20130502		SSVE 20131018
Date Collected		**11/6/2009**		**11/16/2009**		**12/7/2009**		**2/4/2010**		**5/13/2010**		**8/6/2010**		**11/4/2010**		**2/17/2011**		**4/19/2012**		**5/2/2013**		**10/18/2013**
Hourmeter (hrs)		0.07		239.78		743.91		2157.80		4511.80		6188.80		8348.78		10868.78		21088.61		29814.93		33013.85
Hours in Period			239.72		504.13		1413.89		2354.00		2040.00		2160.00		2520.00		10254.82		9072.00		4056.00	
System Operation Run Time (hrs)			239.72		504.13		1413.89		2354.00		1677.00		2159.98		2520.00		10219.83		8726.32		3198.92	
Percent Runtime in Period			100%		100%		100%		100%		82%		100%		100%		99.7%		96.2%		78.9%	
Elapsed Time (min)			14383.0		30247.8		84833.2		141240.0		100620.0		129598.8		151200.0		613189.8		523579.2		191935.2	
Flow (scfm)		120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00
Flow (m3/min)		3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40
SSVE Effluent Concentrations	M.W.	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
Acetone	58.1	**2060**	1032	**5.0**	10.4	**15.9**	10.9	**5.9**	10.4	**14.8**	11.8	**8.8**	12.2	**15.5**	11.9	**8.3**	8.6	**8.9**	161.0	**313**	161.8	**10.6**
Benzene	78.1	0.0	0.0	0.0	0.3	**0.5**	0.5	**0.4**	0.4	**0.3**	0.4	**0.5**	0.5	**0.6**	0.5	**0.4**	0.8	**1.3**	1.1	**1.0**	0.5	**0.0**
Benzyl chloride																	2.2	**2.2**	1.1	**0.0**	0.0	**0.0**
n,Butylbenzene																	1.2	**1.2**	0.6	**0.0**	0.0	**0.0**
Carbon Tetrachloride	153.8	0.0	0.0	0.0	0.2	**0.4**	0.6	**0.7**	0.7	**0.7**	0.7	**0.8**	0.8	**0.9**	0.8	**0.7**	0.4	**0.0**	0.0	**0.0**	0.0	**0.0**
Chlorobenzene																	0.5	**0.5**	0.2	**0.0**	0.0	**0.0**
Chloroform	119.4	**112**	57.6	**3.3**	2.9	**2.6**	2.1	**1.6**	4.4	**7.1**	6.8	**6.4**	5.7	**5.0**	3.4	**1.8**	3.9	**6.1**	5.7	**5.3**	5.5	**5.7**
Chloromethane	50.5	0.0	0.0	0.0	0.5	**1.1**	1.0	**0.9**	1.0	**1.1**	0.9	**0.8**	0.8	**0.8**	0.9	**1.0**	0.8	**0.7**	0.7	**0.8**	0.6	**0.5**
1,2-Dibromoethane (EDB)																	0.9	**0.9**	0.5	**0.0**	0.0	**0.0**
1,4-Dichlorobenzene																	1.5	**1.5**	0.7	**0.0**	0.0	**0.0**
Dichlorodifluoromethane	120.9	0.0	0.0	0.0	1.3	**2.6**	2.7	**2.8**	2.7	**2.7**	3.0	**3.3**	3.4	**3.5**	3.8	**4.1**	3.9	**3.6**	3.3	**3.1**	2.9	**2.8**
1,1-Dichloroethene																	0.3	**0.3**	0.1	**0.0**	0.0	**0.0**
1,2-Dichloroethane	99.0									**0.0**	0.3	**0.5**	0.3	**0.0**	0.0	**0.0**	0.2	**0.3**	0.2	**0.0**	0.0	**0.0**
1,2-Dichlorpropane																	0.4	**0.4**	0.2	**0.0**	0.0	**0.0**
Ethylbenzene	106.2	**225**	112.5	0.0	0.7	**1.3**	0.7	**0.0**	2.6	**5.1**	3.0	**0.8**	0.6	**0.3**	0.6	**0.8**	1.0	**1.2**	0.9	**0.7**	0.3	**0.0**
Hexachlorobutadiene																	3.7	**3.7**	1.8	**0.0**	0.0	**0.0**
2-Hexanone																	1.1	**1.1**	0.5	**0.0**	0.0	**0.0**
Methylene chloride	84.9	**41.2**	20.6	0.0	0.1	**0.3**	0.3	**0.4**	0.3	**0.2**	0.4	**0.6**	0.3	**0.0**	0.0	**0.0**	0.3	**0.5**	0.3	**0.0**	0.0	**0.0**
Naphthalene																	4.4	**4.4**	2.2	**0.0**	0.0	**0.0**
Tetrachloroethene	165.8	0.0	1.9	**3.8**	3.2	**2.7**	2.6	**2.5**	2.7	**3.0**	4.0	**5.0**	3.6	**2.3**	1.8	**1.4**	1.5	**1.6**	1.1	**0.6**	0.8	**1.0**
Toluene	92.1	**496**	248.9	**1.8**	4.9	**8.1**	4.8	**1.5**	2.4	**3.2**	3.0	**2.8**	2.1	**1.5**	2.1	**2.7**	5.5	**8.4**	5.9	**3.5**	2.6	**1.8**
1,2,4-Trichlorobenzene																	7.5	**7.5**	3.7	**0.0**	0.0	**0.0**
Trichloroethene	131.4	0.0	0.0	0.0	0.2	**0.3**	0.4	**0.4**	0.5	**0.5**	0.7	**0.9**	0.7	**0.5**	0.3	**0.0**	0.4	**0.7**	0.6	**0.5**	0.3	**0.0**
Trichlorofluoromethane	137.4	0.0	0.0	0.0	0.5	**1.1**	1.3	**1.5**	1.5	**1.4**	1.6	**1.7**	1.7	**1.7**	1.7	**1.8**	1.8	**1.9**	1.7	**1.5**	1.5	**1.5**
1,2,4-Trimethylbenzene	120.2	0.0	0.6	**1.3**	1.7	**2.1**	1.3	**0.4**	0.6	**0.9**	0.8	**0.8**	0.7	**0.7**	1.1	**1.5**	1.5	**1.5**	0.8	**0.0**	0.0	**0.0**
1,3,5-Trimethylbenzene	120.2	0.0	0.0	0.0	0.6	**1.1**	0.6	**0.0**	0.0	**0.0**	0.6	**1.2**	0.9	**0.6**	0.7	**0.7**	0.8	**0.9**	0.4	**0.0**	0.0	**0.0**
m-Xylene & p-Xylene	106.2	0.0	0.0	0.0	3.4	**6.7**	3.4	**0.0**	10.2	**20.3**	11.1	**1.8**	1.3	**0.9**	1.9	**2.9**	3.5	**4.2**	3.9	**3.5**	1.8	**0.0**
o-Xylene	106.2	**44.2**	22.1	0.0	1.4	**2.7**	1.4	**0.0**	3.3	**6.5**	4.0	**1.4**	0.9	**0.5**	1.0	**1.5**	1.6	**1.8**	1.6	**1.3**	0.7	**0.0**
Total VOCs (ug/m3)		2978.4	1496.7	15.1	32.3	49.6	34.4	19.1	43.5	67.8	52.9	38.0	36.6	35.2	32.3	29.5	60.1	67.1	201.0	334.8	179.3	23.8
Total Chlorinated VOCs (ug/m3)		153.2	80.1	7.0	9.1	11.1	11.0	10.9	13.8	16.7	18.1	19.4	17.0	14.6	12.7	10.8	29.1	31.4	21.6	11.8	11.6	11.5
Total BTEX (ug/m3)		765.2	383.5	1.8	10.6	19.4	10.6	1.9	18.7	35.5	21.4	7.2	5.5	3.8	6.0	8.2	12.5	16.9	13.5	10.1	5.9	1.8

Table 14. Summary of Sub-slab Vapor Extraction System Effluent Analytical Results and Estimated Mass Removal
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LAB SAMPLE	SSVE Start up Effluent	SSVE Effluent #2	SSVE Effluent #3	SSVE 20100204	SSVE 20100513	SSVE 20100806	SSVE 20101104	SSVE 20110217	SSVE 20120419	SSVE 20130502	SSVE 20131018
SSVE Mass Removal Rate (grams/day)	(grams/day)	(grams/day)	(grams/day)	(grams/day)	(grams/day)	(grams/day)	(grams/day)	(grams/day)	(grams/day)	(grams/day)	
Acetone	5.05	0.05	0.05	0.05	0.06	0.06	0.06	0.04	0.79	0.79	
Benzene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	
Benzyl chloride								0.01	0.01	0.00	
n,Butylbenzene								0.01	0.00	0.00	
Carbon Tetrachloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Chlorobenzene								0.00	0.00	0.00	
Chloroform	0.28	0.01	0.01	0.02	0.03	0.03	0.02	0.02	0.03	0.03	
Chloromethane	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
1,2-Dibromoethane (EDB)								0.00	0.00	0.00	
1,4-Dichlorobenzene								0.01	0.00	0.00	
Dichlorodifluoromethane	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.01	
1,1-Dichloroethene								0.00	0.00	0.00	
1,2-Dichloroethane								0.00	0.00	0.00	
1,2-Dichlorpropane								0.00	0.00	0.00	
Ethylbenzene	0.55	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	
Hexachlorobutadiene								0.02	0.01	0.00	
2-Hexanone								0.01	0.00	0.00	
Methylene chloride	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Naphthalene								0.02	0.01	0.00	
Tetrachloroethene	0.01	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.00	
Toluene	1.22	0.02	0.02	0.01	0.01	0.01	0.01	0.03	0.03	0.01	
1,2,4-Trichlorobenzene								0.04	0.02	0.00	
Trichloroethene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Trichlorofluoromethane	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
1,2,4-Trimethylbenzene	0.00	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	
1,3,5-Trimethylbenzene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
m-Xylene & p-Xylene	0.00	0.02	0.02	0.05	0.05	0.01	0.01	0.02	0.02	0.01	
o-Xylene	0.11	0.01	0.01	0.02	0.02	0.00	0.00	0.01	0.01	0.00	
SSVE Mass Removal (grams/day)											
Total VOCs (grams/day)	7.32	0.16	0.17	0.21	0.26	0.18	0.16	0.29	0.98	0.88	
Total Chlorinated VOCs (grams/day)	0.39	0.04	0.05	0.07	0.09	0.08	0.06	0.14	0.11	0.06	
Total BTEX (grams/day)	1.88	0.05	0.05	0.09	0.10	0.03	0.03	0.06	0.07	0.03	

Table 14. Summary of Sub-slab Vapor Extraction System Effluent Analytical Results and Estimated Mass Removal
Brenntag/HCL Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri

LAB SAMPLE	SSVE Start up Effluent	SSVE Effluent #2	SSVE Effluent #3	SSVE 20100204	SSVE 20100513	SSVE 20100806	SSVE 20101104	SSVE 20110217	SSVE 20120419	SSVE 20130502	SSVE 20131018
Mass Removal during Period (grams)	(grams)	(grams)	(grams)	(grams)	(grams)	(grams)	(grams)	(grams)	(grams)	(grams)	
Acetone	50.47	1.07	3.14	4.97	4.04	5.36	6.11	17.92	286.39	105.54	
Benzene	0.00	0.03	0.14	0.18	0.13	0.24	0.27	1.75	2.04	0.34	
Benzyl chloride								4.61	1.97	0.00	
n,Butylbenzene								2.46	1.05	0.00	
Carbon Tetrachloride	0.00	0.02	0.16	0.33	0.25	0.37	0.41	0.74	0.00	0.00	
Chlorobenzene								0.99	0.42	0.00	
Chloroform	2.82	0.30	0.61	2.10	2.31	2.51	1.74	8.21	10.17	3.61	
Chloromethane	0.00	0.05	0.29	0.50	0.32	0.34	0.46	1.68	1.25	0.40	
1,2-Dibromoethane (EDB)								1.97	0.84	0.00	
1,4-Dichlorobenzene								3.04	1.30	0.00	
Dichlorodifluoromethane	0.00	0.14	0.79	1.32	1.03	1.49	1.94	8.02	5.90	1.90	
1,1-Dichloroethene								0.60	0.25	0.00	
1,2-Dichloroethane								0.33	0.28	0.00	
1,2-Dichlorpropane								0.91	0.39	0.00	
Ethylbenzene	5.50	0.07	0.19	1.23	1.01	0.25	0.28	2.09	1.67	0.22	
Hexachlorobutadiene								7.67	3.27	0.00	
2-Hexanone								2.25	0.96	0.00	
Methylene chloride	1.01	0.01	0.09	0.14	0.14	0.13	0.00	0.52	0.45	0.00	
Naphthalene								9.11	3.89	0.00	
Tetrachloroethene	0.09	0.33	0.75	1.31	1.36	1.59	0.95	3.12	1.93	0.52	
Toluene	12.17	0.51	1.38	1.13	1.03	0.94	1.06	11.48	10.55	1.71	
1,2,4-Trichlorobenzene								15.59	6.65	0.00	
Trichloroethene	0.00	0.02	0.11	0.22	0.23	0.31	0.13	0.78	1.15	0.18	
Trichlorofluoromethane	0.00	0.06	0.38	0.71	0.54	0.74	0.88	3.83	3.01	0.97	
1,2,4-Trimethylbenzene	0.03	0.17	0.37	0.31	0.28	0.31	0.55	3.15	1.36	0.00	
1,3,5-Trimethylbenzene	0.00	0.06	0.16	0.00	0.21	0.41	0.35	1.63	0.76	0.00	
m-Xylene & p-Xylene	0.00	0.35	0.97	4.87	3.78	0.59	0.96	7.38	6.91	1.15	
o-Xylene	1.08	0.14	0.39	1.57	1.35	0.41	0.50	3.43	2.80	0.43	
Total VOCs (grams)	73.16	3.32	9.91	20.88	18.01	16.00	16.60	125.25	357.60	116.97	
Total Chlorinated VOCs (grams)	3.92	0.93	3.17	6.63	6.18	7.48	6.51	59.65	37.96	7.58	
Total BTEX (grams)	18.74	1.09	3.07	8.97	7.31	2.43	3.08	26.13	23.97	3.85	
Cumulative Total VOCs (grams)	11/6/2009 **73.16**	11/16/2009 **76.48**	12/7/2009 **86.39**	2/4/2010 **107.27**	5/13/2010 **125.27**	8/6/2010 **141.27**	11/4/2010 **157.88**	2/17/2011 **283.13**	4/19/2012 **640.73**	5/2/2013 **757.70**	10/18/2013
Cumulative Chlorinated VOCs (grams)	**3.92**	**4.85**	**8.02**	**14.64**	**20.82**	**28.30**	**34.81**	**94.46**	**132.42**	**249.39**	
Cumulative BTEX (grams)	**18.74**	**19.83**	**22.90**	**31.87**	**39.18**	**41.61**	**44.69**	**70.82**	**94.79**	**98.64**	

System Start up on 11/6/09 at 1600 hrs. Meter installed 12/11/09 at 1247 hrs. Unrecorded time interval between start up and meter install is 836.8 hours.

ug/m3 Micrograms per cubic meter
VOCs Volatile organic compounds
m3/min Cubic meters per minute
M.W. Molecular weight
scfm Standard cubic feet per minute

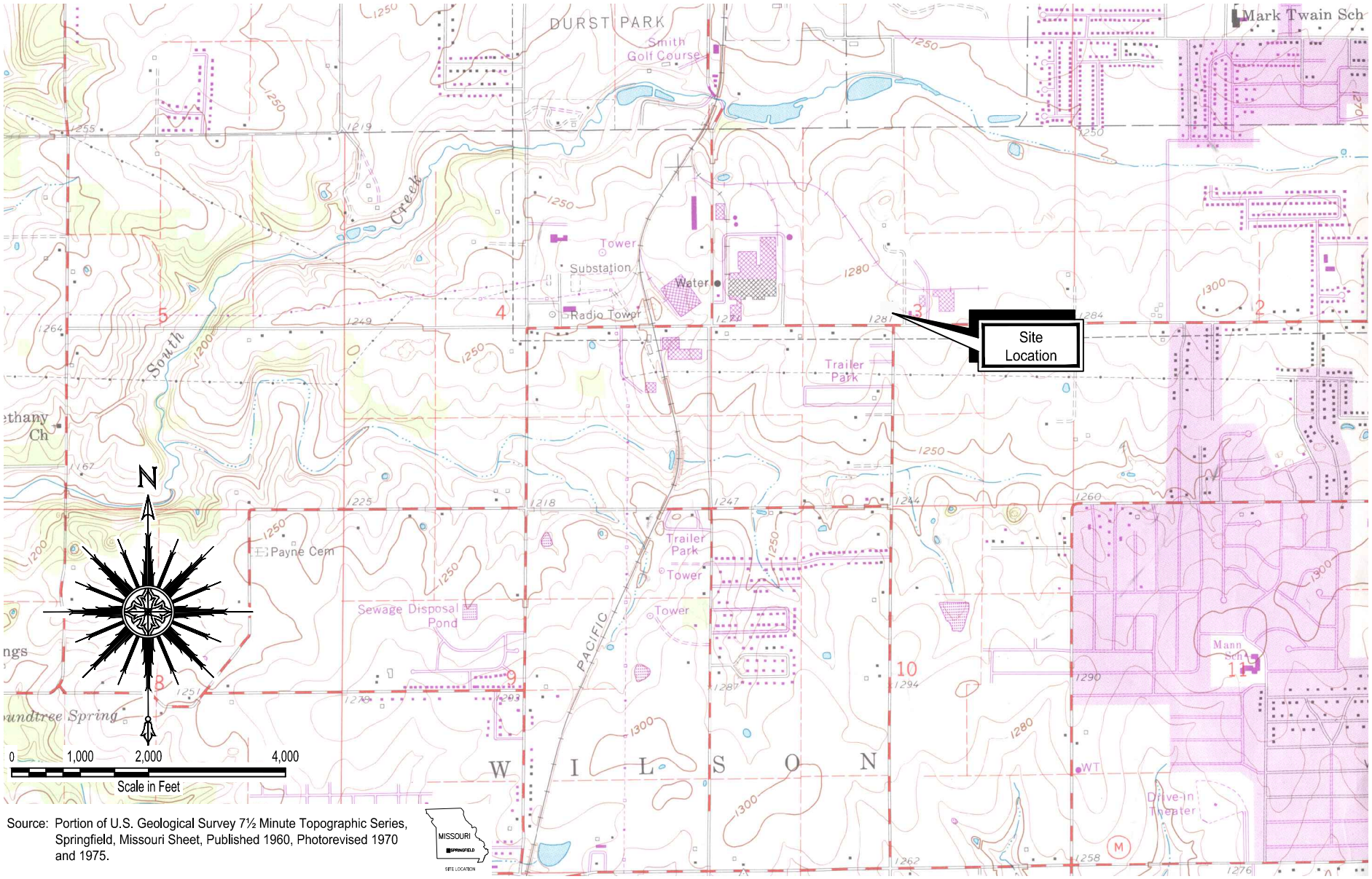
G:\Aproject\BRENNTAG\OK12552014\REPORTS\1SA14\TABLES\[1SA14 T14_SSVE ANALYTICAL MASS REMOVAL.xls]Footnotes

Table 14. Summary of Sub-Slab Vapor Extraction System Analytical Data,
Brenntag/HCl Chemtech, 2235 W. Battlefield Rd., Springfield, Missouri.

Footnotes:

	Concentration values less than the PQL or MDL are entered as "0.0"
ug/m^3	Micrograms per cubic meter.
MDL	Method detection limit.
PQL	Practical quantitation limit.
<	Less than.
J	Indicates an estimated value. This qualifier is used in organic data evaluation when mass spectral data indicate the presence of a compound that meets the identification criteria, but the result is less thatn the quantitation limit.
B	Analyte detected in method blank and concentration is less than method detection limit.
Bolded	values represent detected concentrations above the laboratory method detection limit.
NA	Not analyzed.
SSVE	Sub-slab vapor extraction system.

Samples were collected via a sampling port on the discharge side of the blower.



Source: Portion of U.S. Geological Survey 7½ Minute Topographic Series, Springfield, Missouri Sheet, Published 1960, Photorevised 1970 and 1975.

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Project Manager: W. French			Drawing Date: 21 June 2007
Task Manager: W. French			Figure: 1
Technical Review: W. French			

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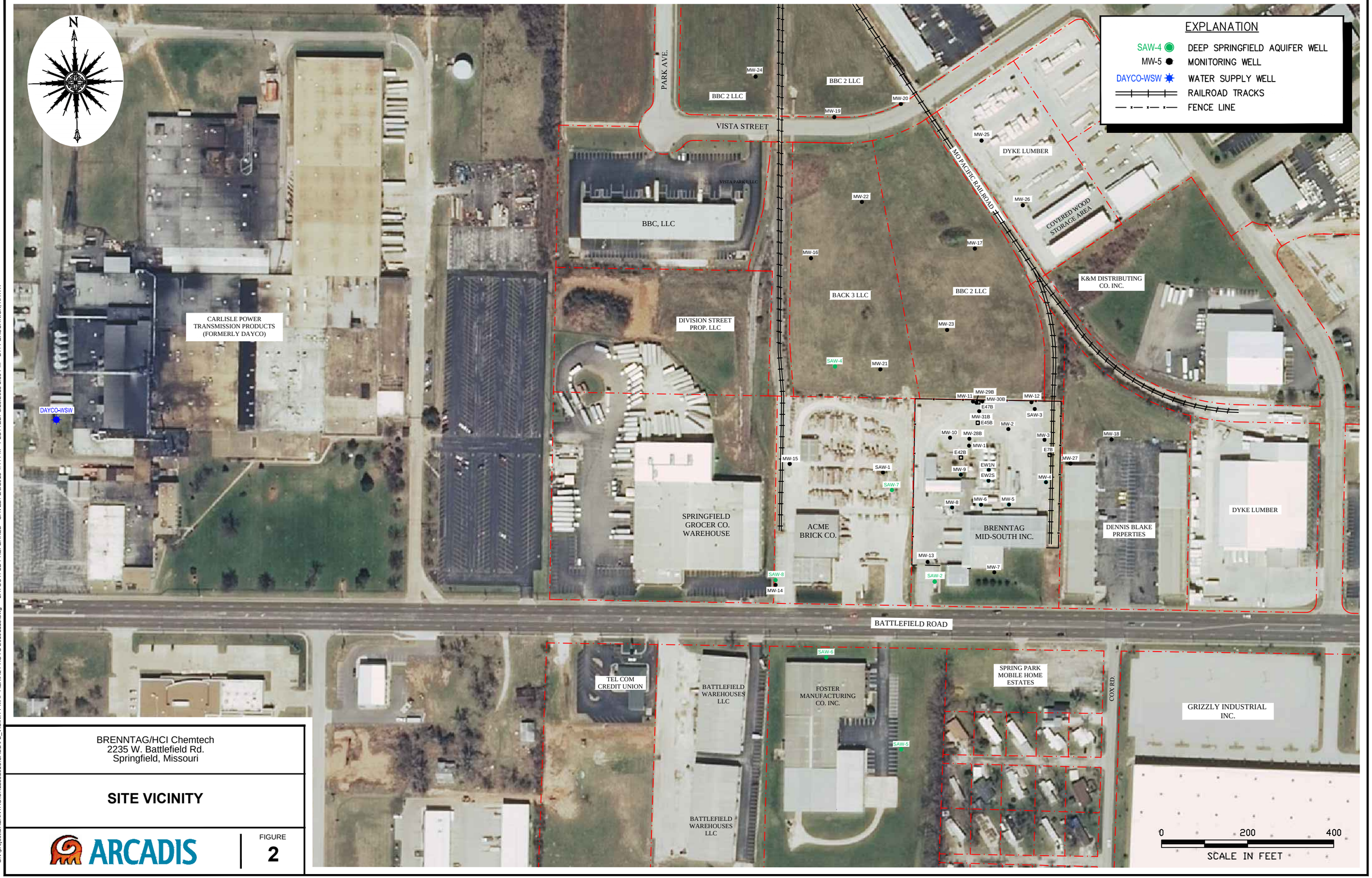

BRENNTAG/HCI Chemtech
2235 W. Battlefield Rd.
Springfield, Missouri

SITE VICINITY

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FIGURE
2

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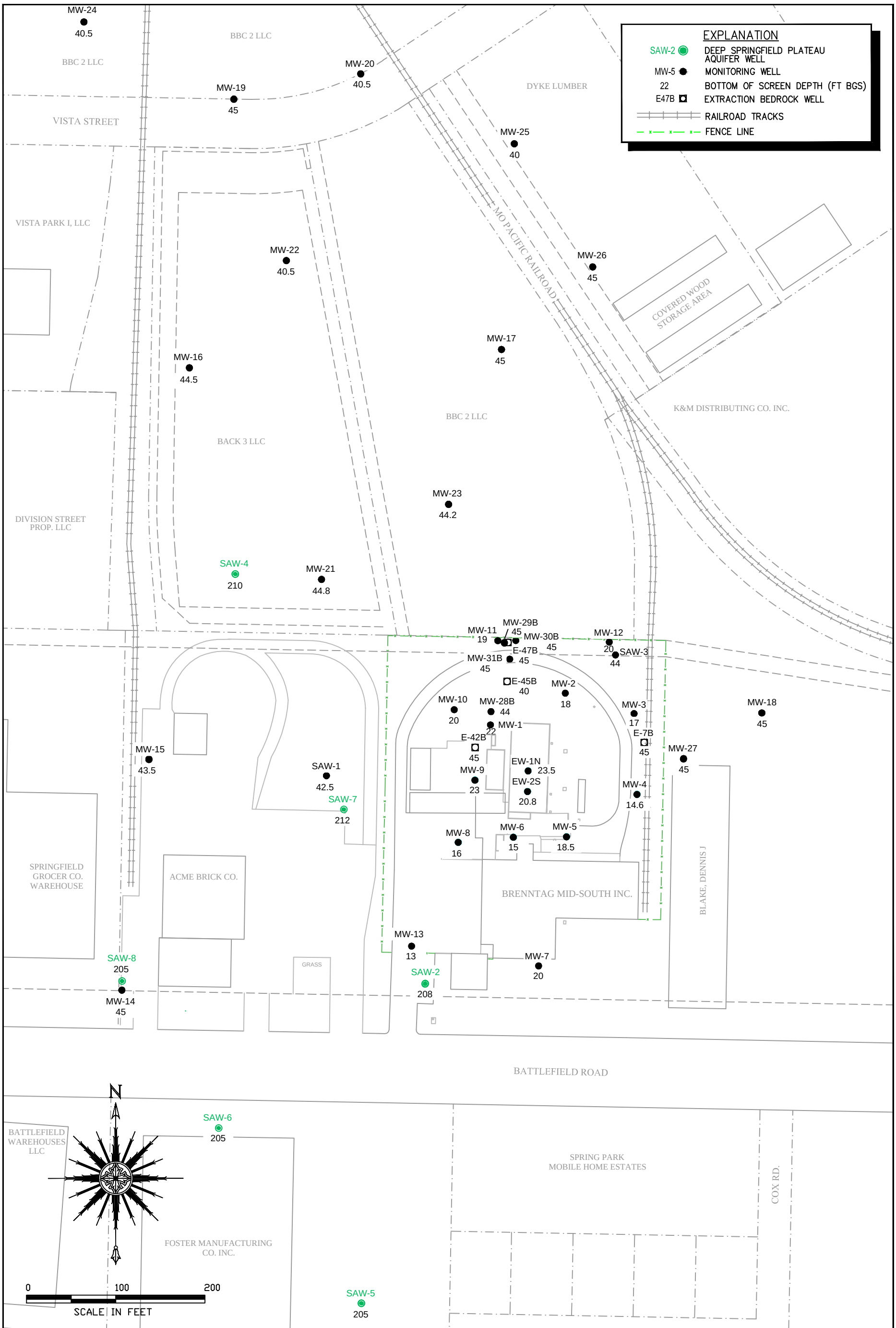

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Task Manager	W._FRENCH
Technical Review	W._FRENCH

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2235 W. Battlefield Rd.

Site Map

Springfield, Missouri

Project Number

Drawing Date
8-03-10

Figure
3

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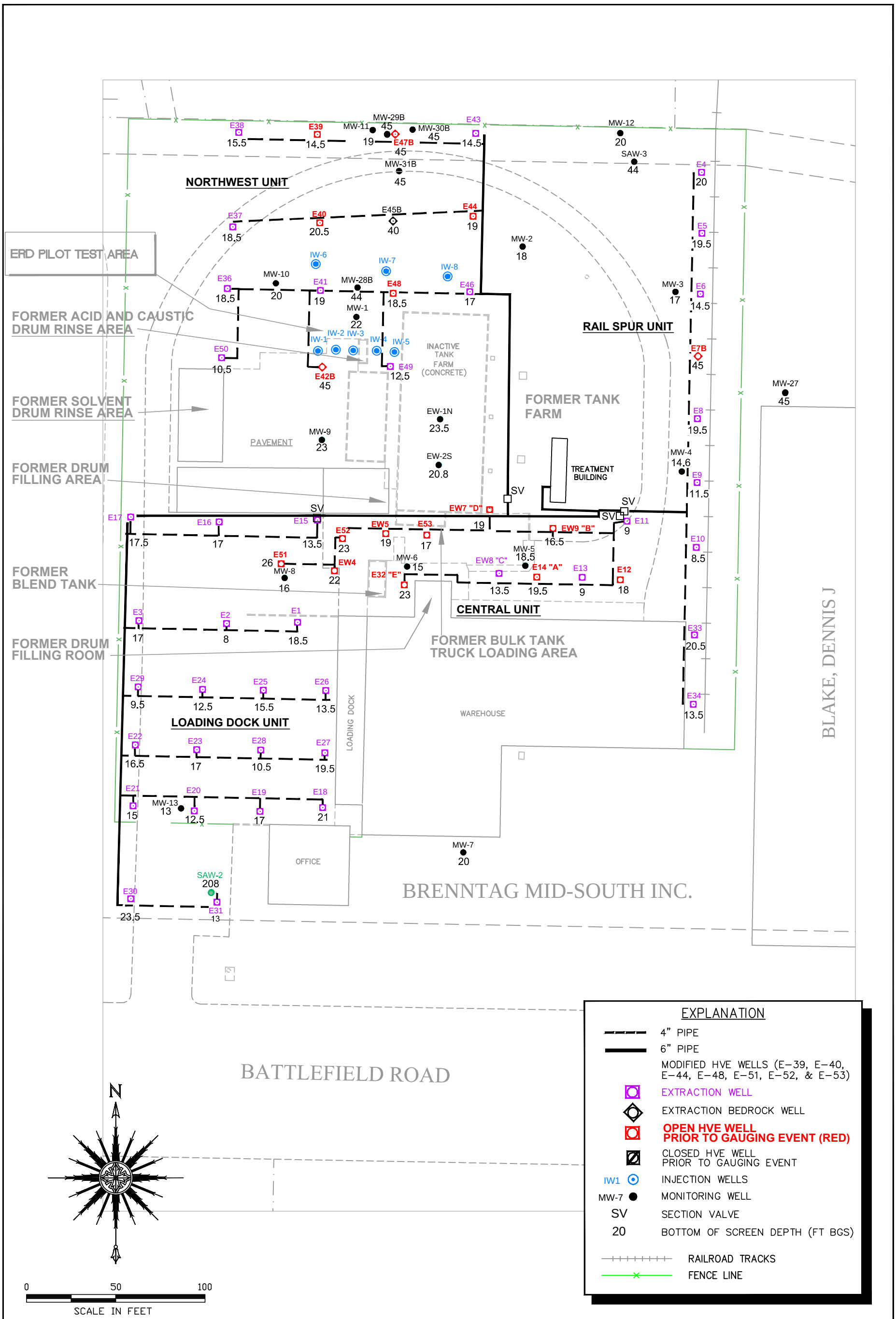

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Project Manager: W._FRENCH			Drawing Date: 6-20-2013
Task Manager: W._FRENCH			Figure: 4
Technical Review: W._FRENCH			

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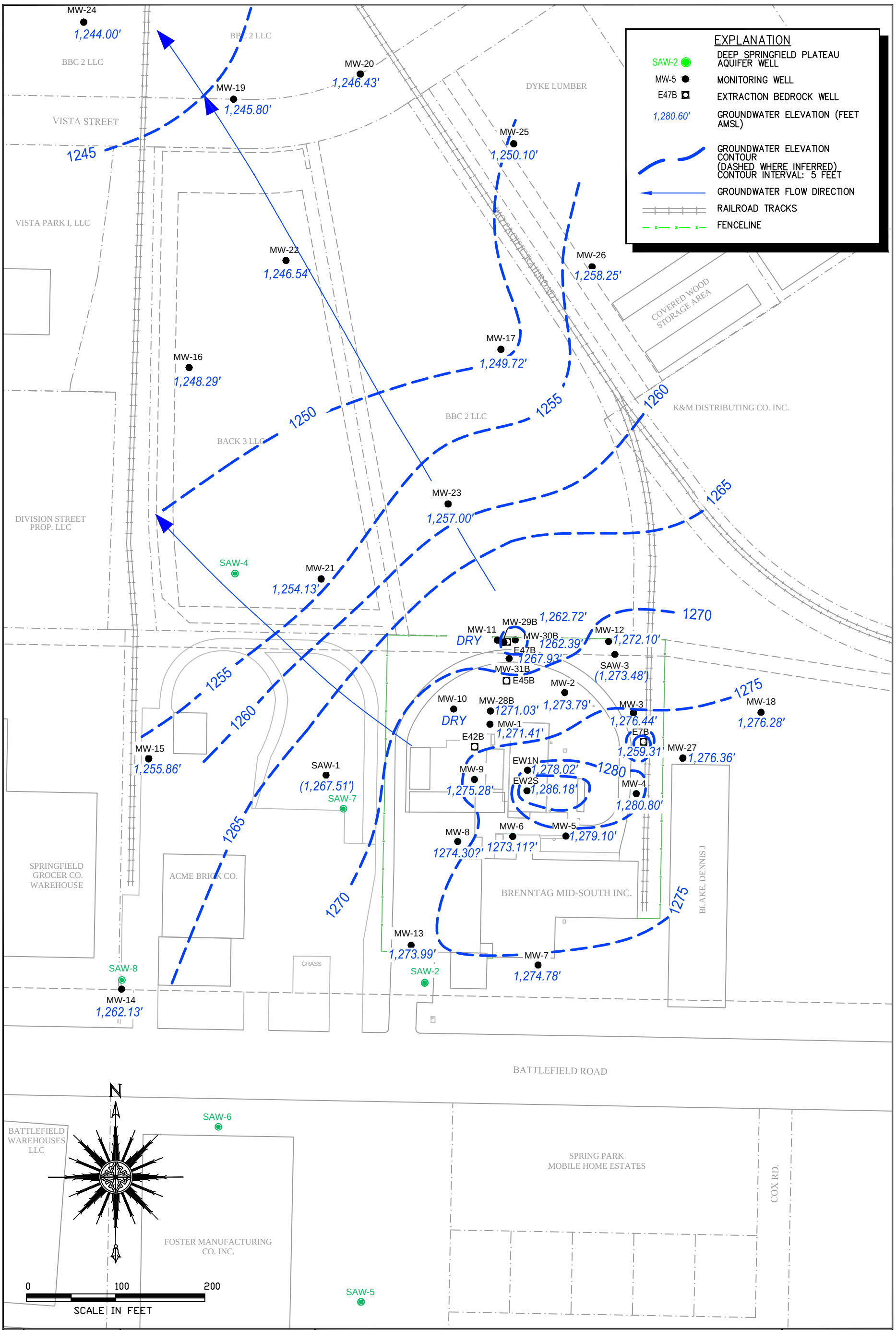

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Brenntag/HCI Chemtech
2235 W. Battlefield Rd.

Groundwater Elevation Map
April 22, 2014

Springfield, Missouri

Project Number	OK001255.2014
Drawing Date	6-6-14
Figure	5a

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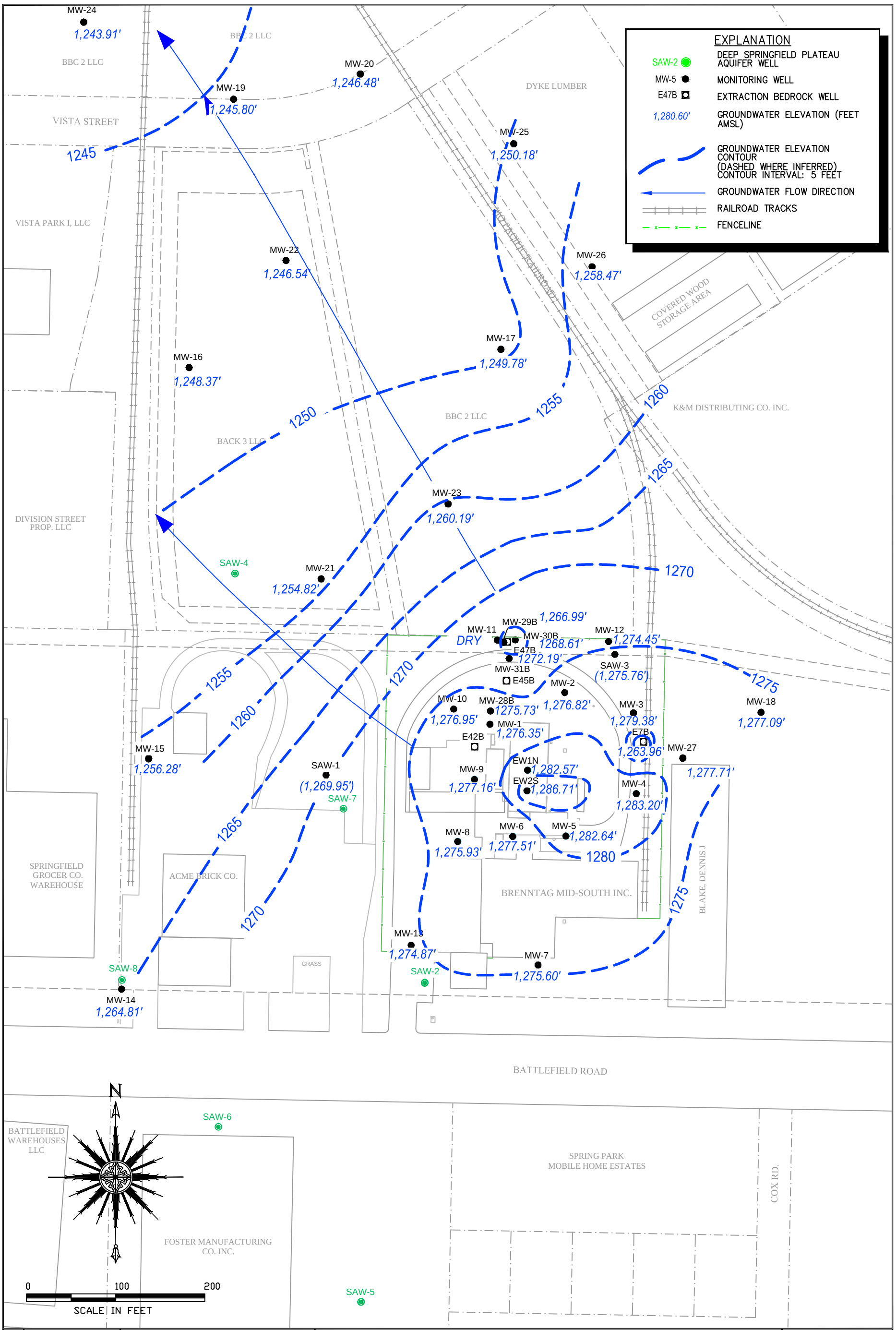

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Groundwater Elevation Map
October 14, 2013

Springfield, Missouri

Project Number	OK001255.2013
Drawing Date	12-12-13
Figure	5b

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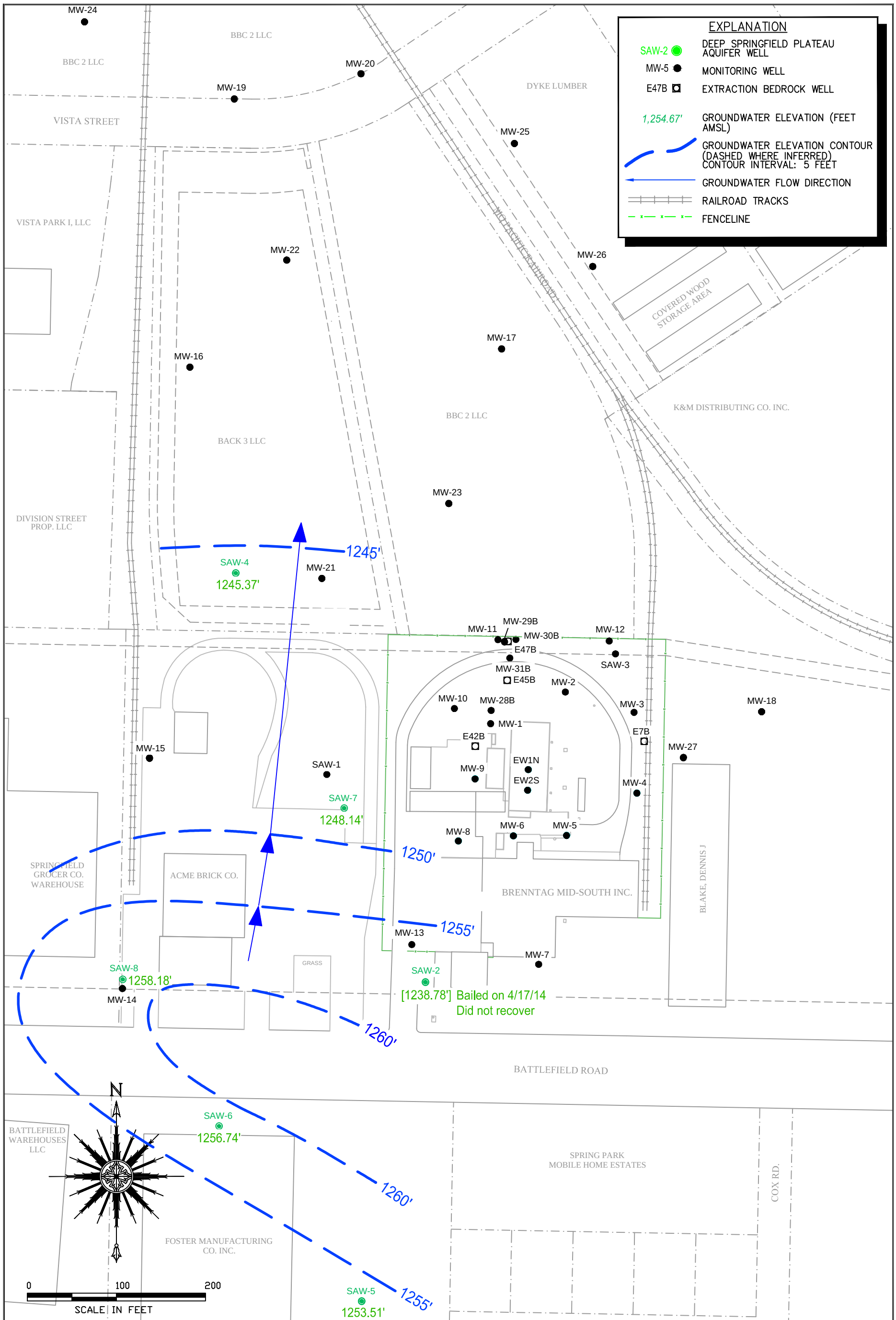

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Project Manager: W._FRENCH			Drawing Date: 6-6-14
Task Manager: W._FRENCH			Figure: 5c
Technical Review: W._FRENCH			

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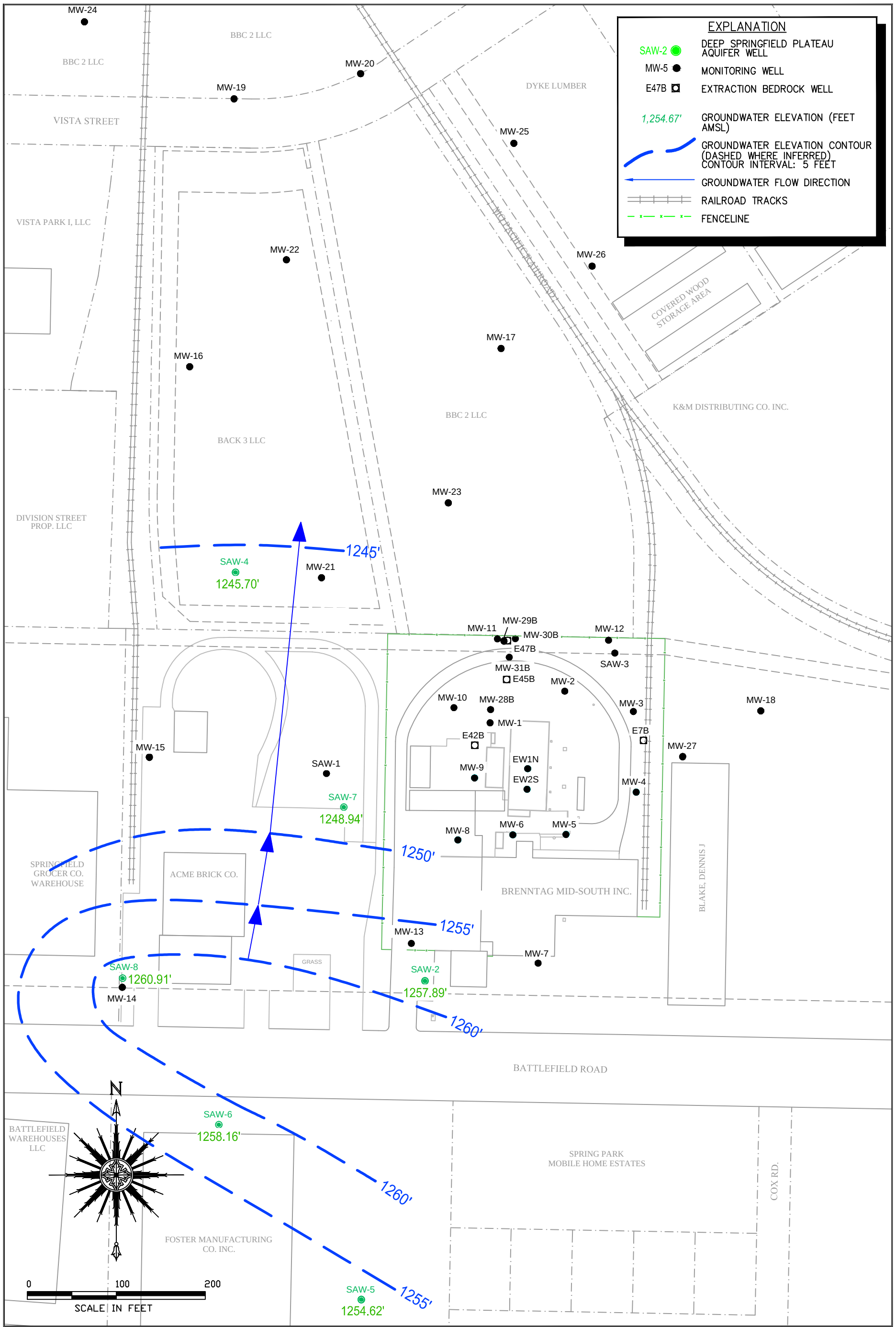

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Potentiometric Surface Map
Deep Springfield Plateau Aquifer
October 14, 2013

Springfield, Missouri

Project Number	OK001255.2013
Drawing Date	12-12-13
Figure	5d

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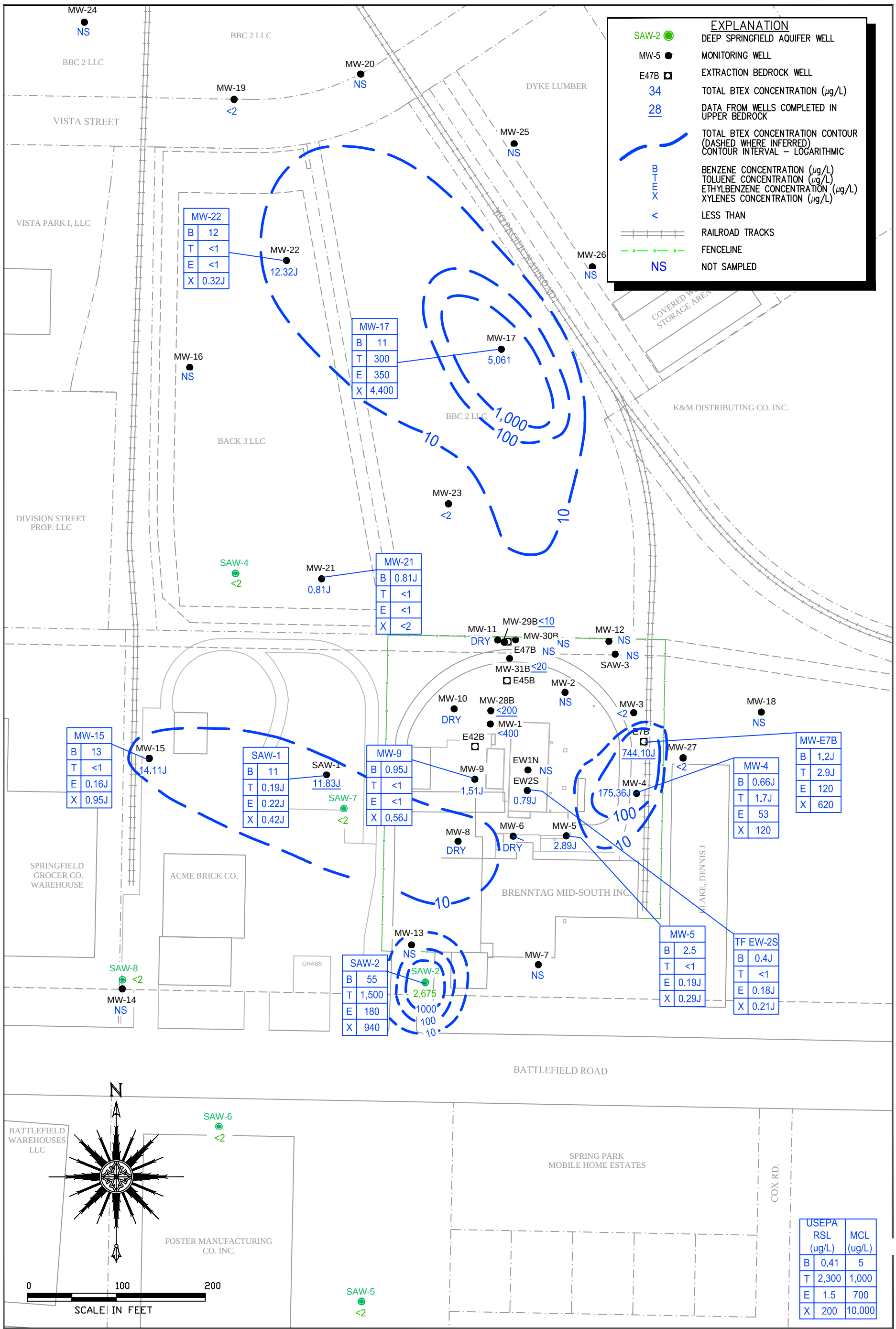

USEPA RSL (ug/L)		MCL (ug/L)
B	0.41	5
T	2,300	1,000
E	1.5	700
X	200	10,000

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Total BTEX Concentrations in Groundwater
April 23 - 24, 2014

Springfield, Missouri

Project Number: OK001255.2014
Drawing Date: 6-6-14
Figure: 6

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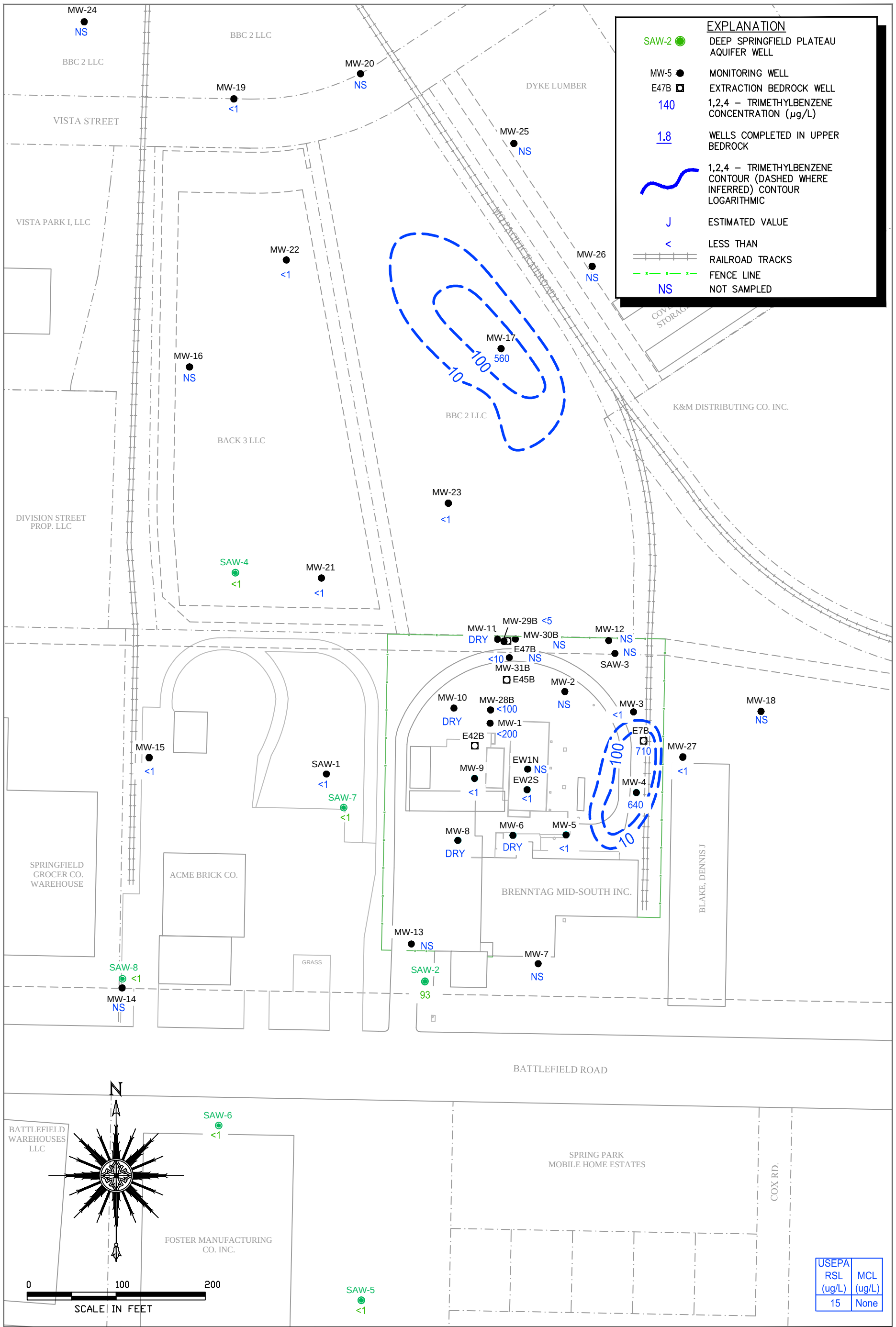

USEPA RSL (ug/L)	MCL (ug/L)
15	None

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1,2,4- Trimethylbenzene Concentrations in Groundwater April 23 - 24, 2014

Springfield, Missouri

Project Number: OK001255.2014
Drawing Date: 06-05-14
Figure: 7

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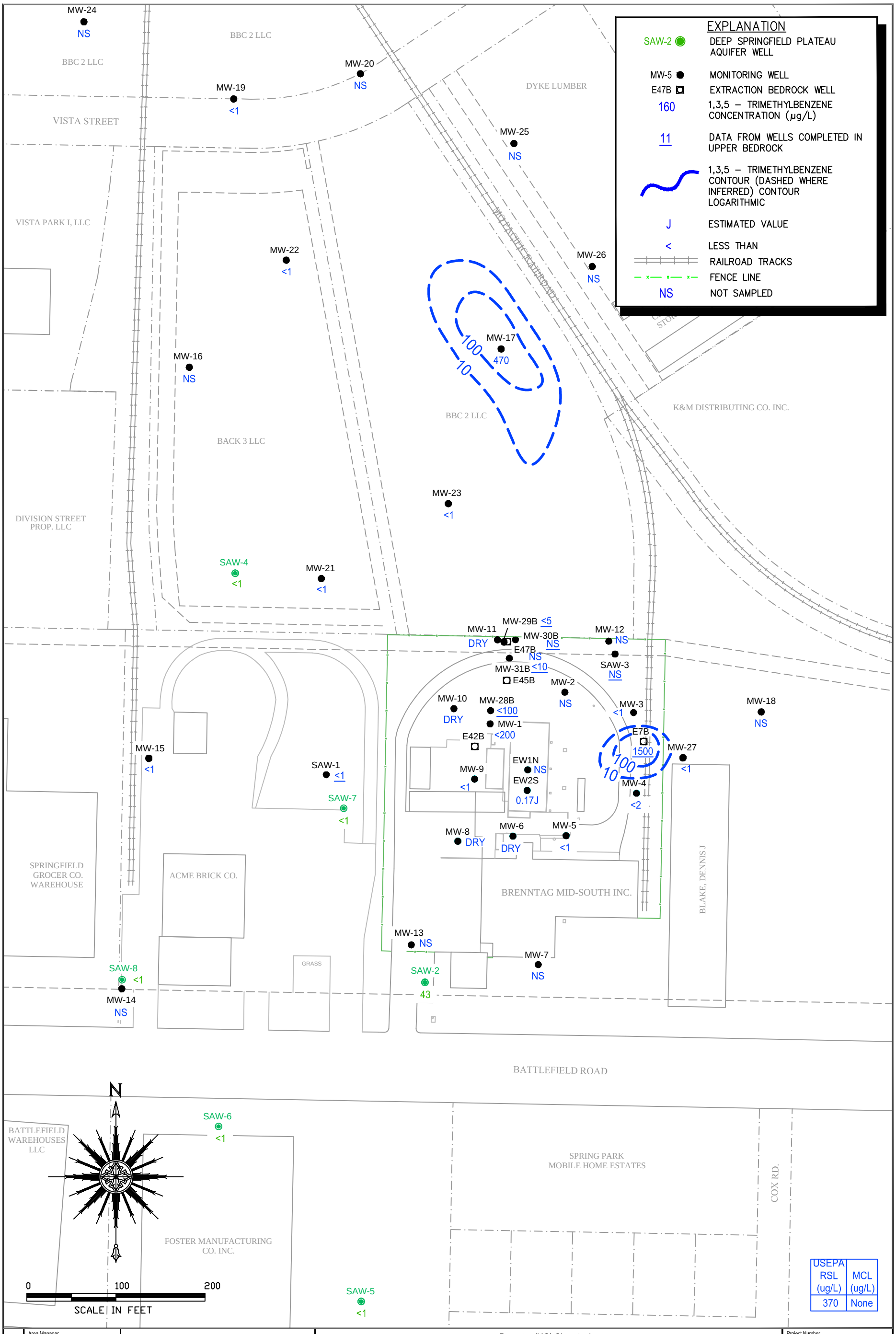

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1,3,5- Trimethylbenzene Concentrations in Groundwater April 23 - 24, 2014

Springfield, Missouri

Project Number	OK001255.2014
Drawing Date	06-04-14
Figure	8

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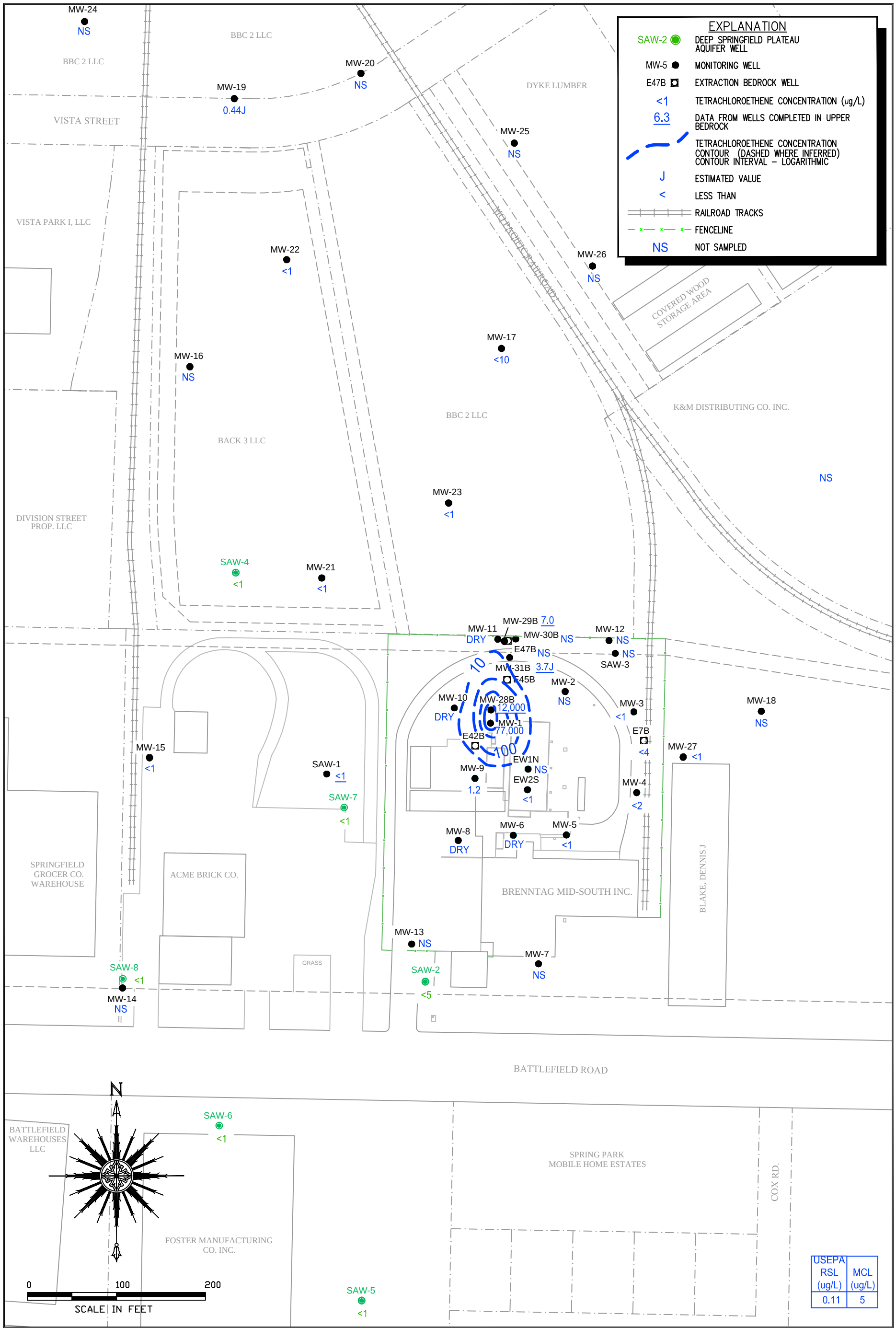

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Tetrachloroethene Concentrations in Groundwater
April 23 - 24, 2014

Springfield, Missouri

Project Number: OK001255.2014
Drawing Date: 6-6-14
Figure: 9

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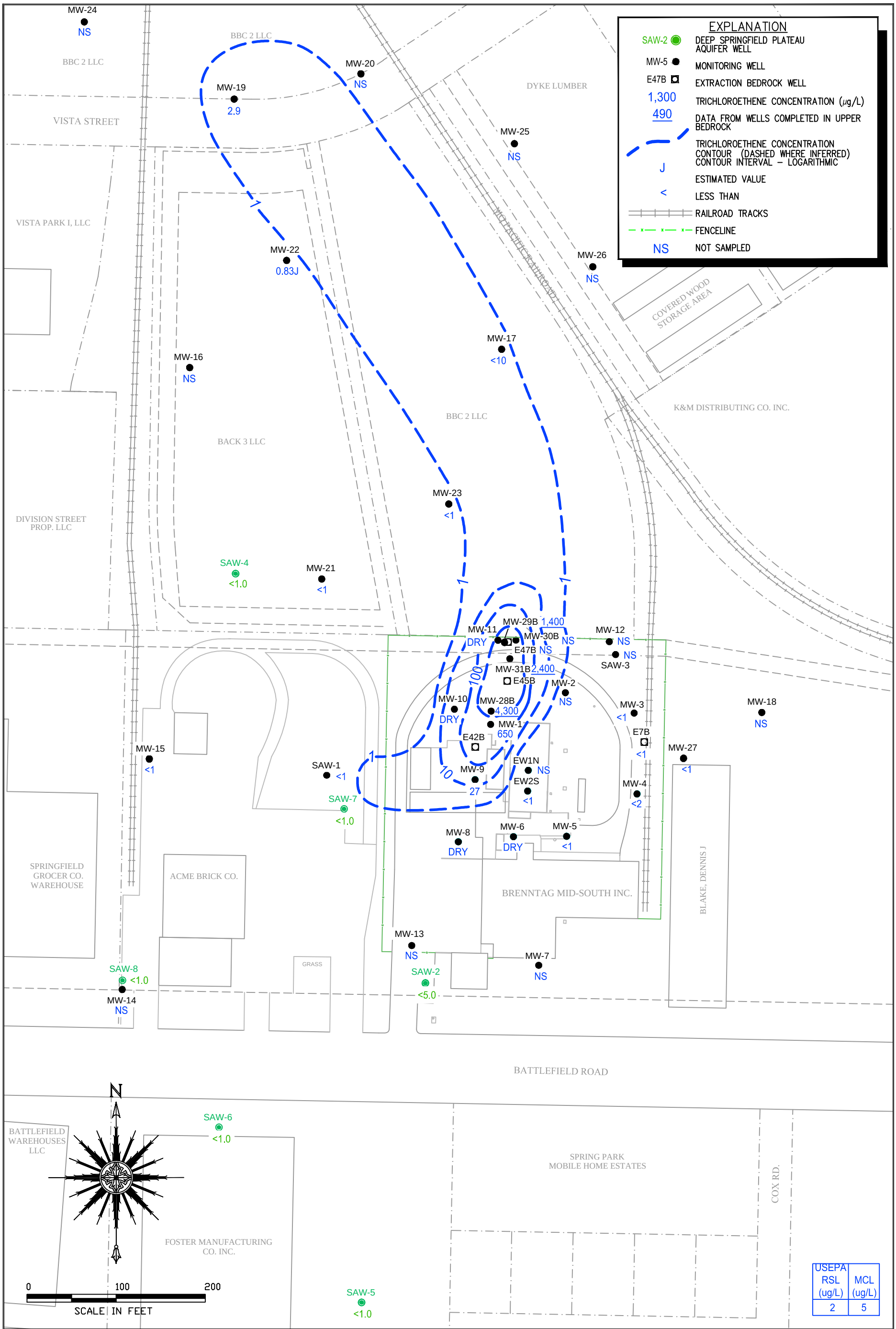

USEPA RSL (ug/L)	MCL (ug/L)
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Trichloroethene Concentrations in Groundwater
April 23 - 24, 2014

Springfield, Missouri

Project Number: OK001255.2014
Drawing Date: 6-6-14
Figure: 10

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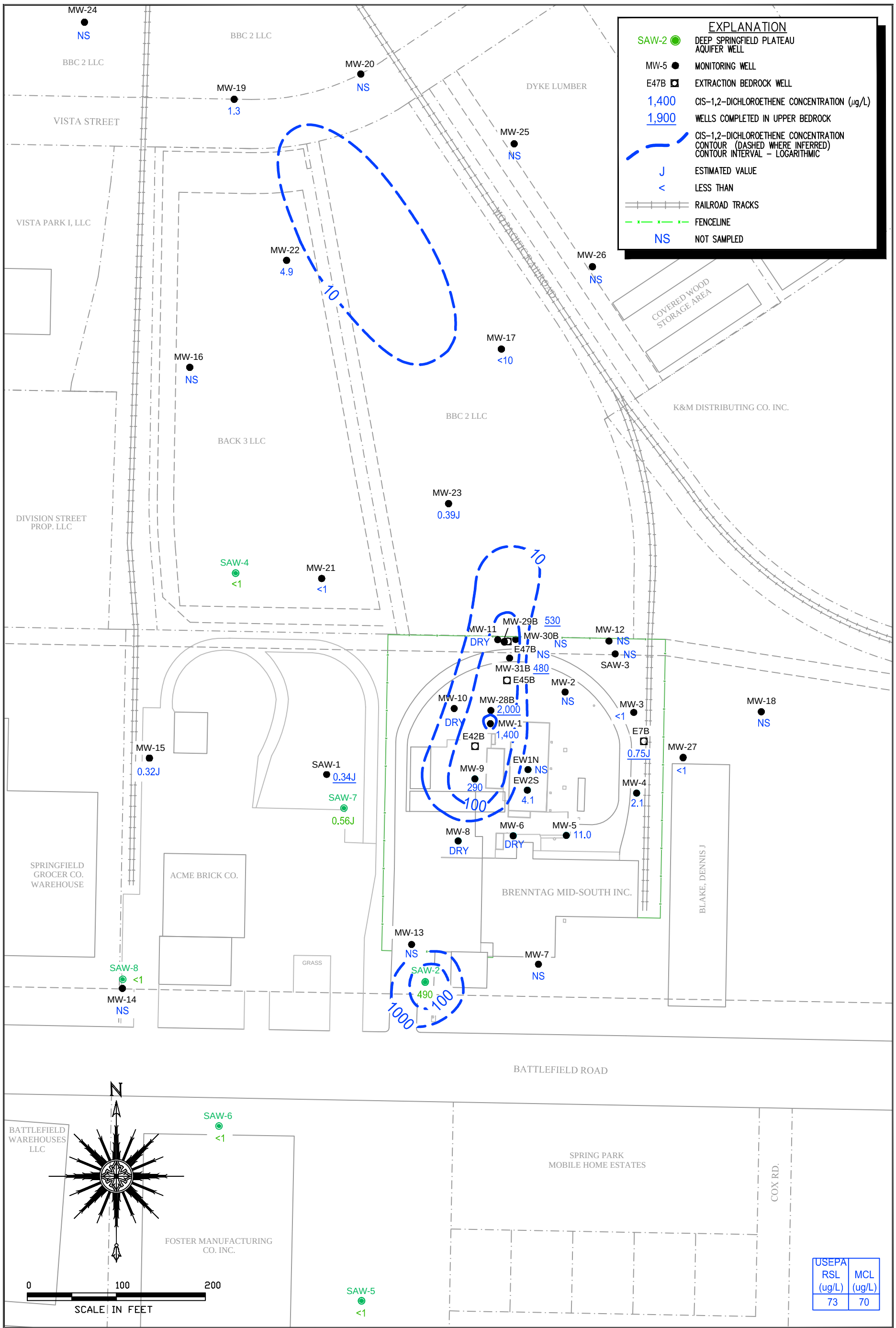

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cis-1, 2-Dichloroethene Concentrations in Groundwater
April 23 - 24, 2014

Springfield, Missouri

Project Number	OK001255.2014
Drawing Date	6-6-14
Figure	11

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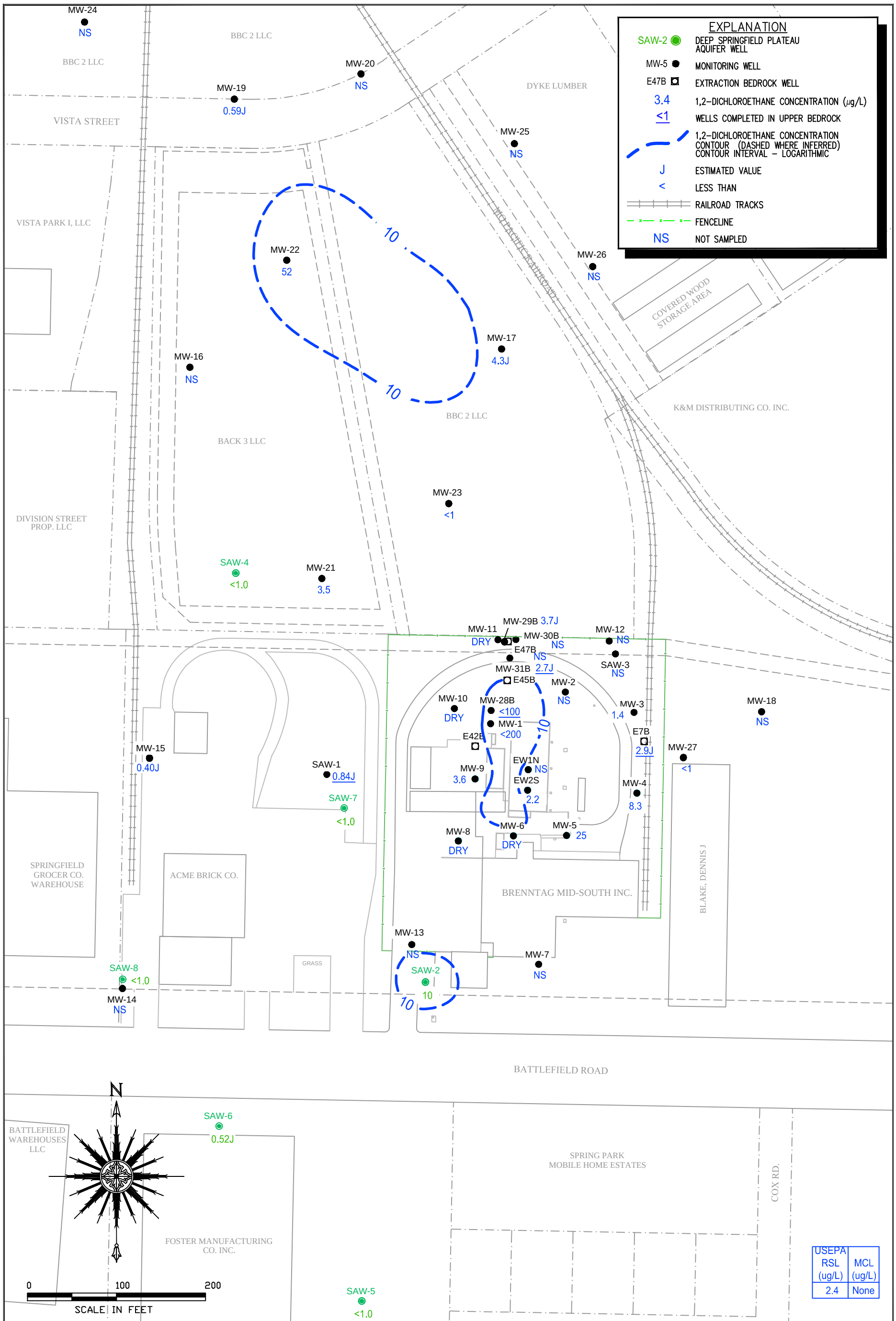

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1, 1-Dichloroethane Concentrations in Groundwater
April 23 - 24, 2014

Springfield, Missouri

Project Number: OK001255.2014
Drawing Date: 6-6-14
Figure: 12

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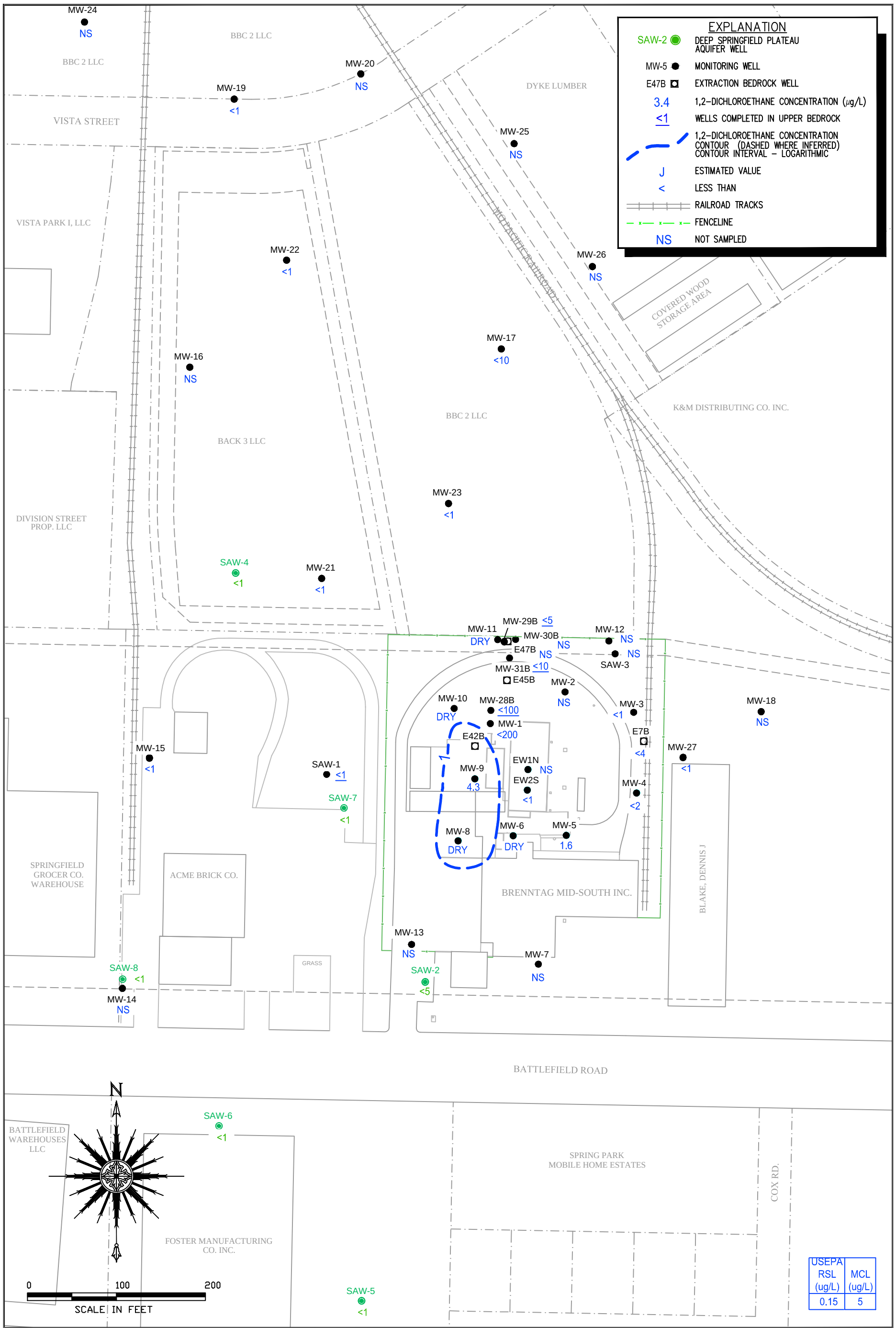

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1, 2-Dichloroethane Concentrations in Groundwater
April 23 - 24, 2014

Springfield, Missouri

Project Number	OK001255.2014
Drawing Date	6-6-14
Figure	13

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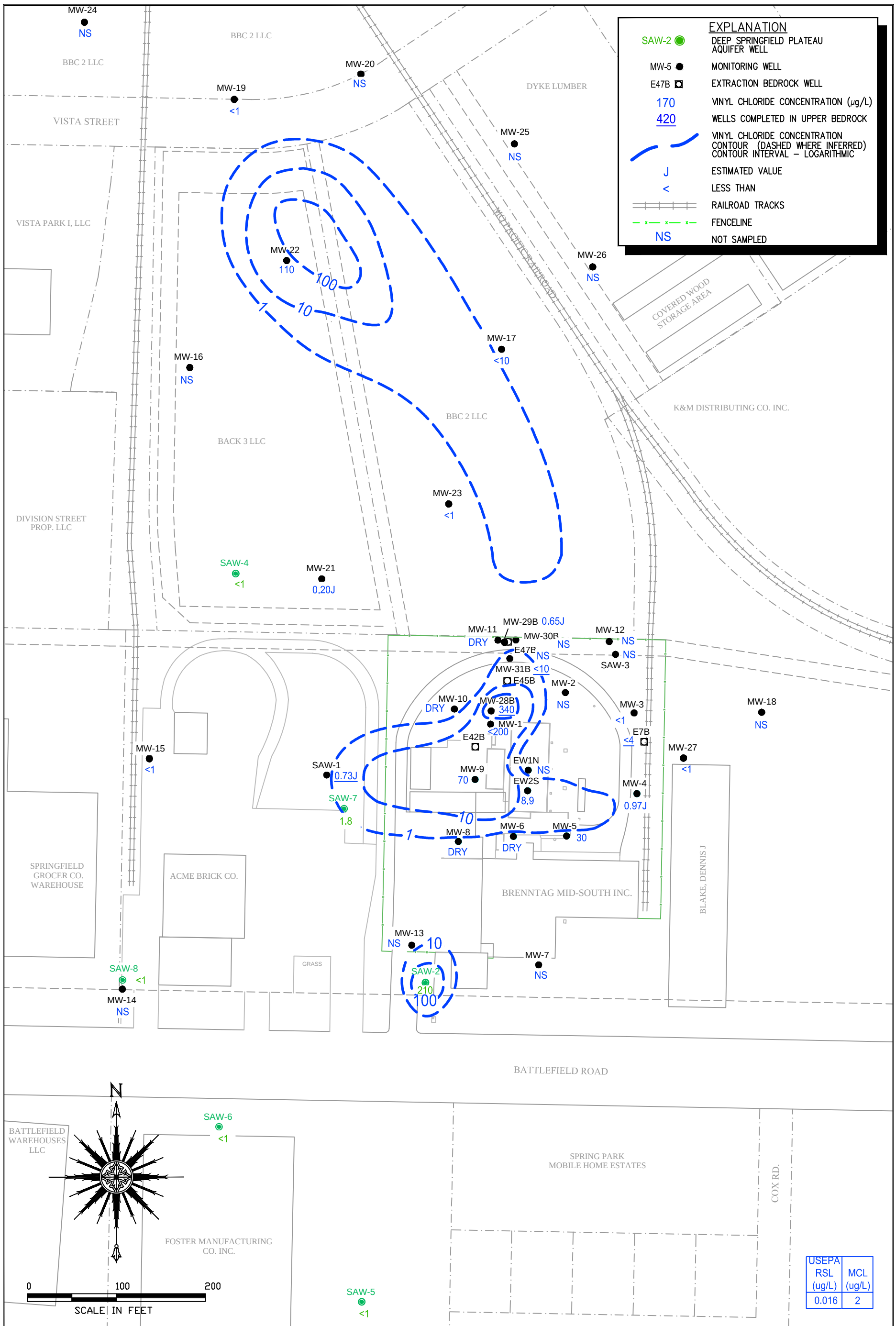

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Task Manager	W._FRENCH
Technical Review	W._FRENCH

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Vinyl Chloride Concentrations in Groundwater
April 23 - 24, 2014

Springfield, Missouri

Project Number	OK001255.2014
Drawing Date	6-6-14
Figure	14

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Appendix A

(PDF on CD)

A-1. Historical Summary of Fluid-Level Measurements.

A-2. Historical Summary of Volatile Organic Compounds Detected in Groundwater.

A-3. Laboratory Data Reports

A-4. Historical Operation and Maintenance Summary, HVE System.

A-5. Historical Summary of Flowmeter Located Before Discharge to POTW, HVE System.

A-6. Historical Summary of Pressure Gauges, HVE System.

Appendix B

Field Logs.

B-1. Well Gauging Log.

B-2. Well Development Form – SAW-2.

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WELL GAUGING LOG

GW Sampling Depth Calculations

DATE: 4/22/2014

PROJECT NO: **OK001255.2014 T#1 1SA 2014**

PROJECT NAME: Brenntag - Springfield, MO

SITE LOCATION: Springfield, MO

PERSONNEL: B. Blue M. Kramer

LABORATORY: STL-Denver, St. Louis, & Austin

WELL NO.	DATE	TIME	MEASURING POINT (NTOC) ELEVATION (FT AMSL)	APPROX. TOP OF WELL SCREEN (FT BTOC)	APPROX. BOTTOM OF WELL SCREEN (FT BTOC)	**MEASURED WELL DEPTH (FT BTOC)**	SILT THICKNESS (FT)	**MEASURED DEPTH TO PRODUCT (FT BTOC)**	**MEASURED DEPTH TO WATER (FT BTOC)**	WATER COLUMN HEIGHT (FT)	Mid-Point Water Column (FT BTOC)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS
MW-1	4/22/14	1259	1288.84	11.8	21.8	**22.19**	-0.4		**17.43**	4.8	19.8	1271.41	
MW-2	4/22/14	1346	1288.39	7.7	17.7	**15.88**	1.8		**14.60**	1.3	15.2	1273.79	
MW-3	4/22/14	1355	1287.85	6.0	16.0	**16.40**	-0.4		**11.41**	5.0	13.9	1276.44	
MW-4	4/22/14	1400	1288.29	5.1	15.1	**16.01**	-0.9		**7.49**	8.5	11.8	1280.80	
MW-5	4/22/14	1405	1288.49	7.8	17.8	**17.66**	0.1		**9.39**	8.3	13.5	1279.10	
MW-6	4/22/14	1415	1288.73	4.8	14.8	**15.95**	-1.2		**15.62**	0.3	15.8	1273.11	No sample - dry
MW-7	4/22/14	1235	1291.96	7.9	22.9	**22.85**	0.1		**17.18**	5.7	20.0	1274.78	
MW-8	4/22/14	1430	1288.56	3.2	15.7	**14.95**	0.7		**14.26**	0.7	14.6	1274.30	No sample - dry
MW-9	4/22/14	1303	1288.39	7.5	22.5	**22.67**	-0.2		**13.11**	9.6	17.9	1275.28	
MW-10	4/22/14	1252	1288.07	4.5	19.5	**17.13**	2.4		**Dry**	Dry	Dry	Dry	No sample - dry
MW-11	4/22/14	1326	1290.79	6.7	21.7	**21.03**	0.7		**Dry**	Dry	Dry	Dry	No sample - dry
MW-12	4/22/14	1348	1291.03	7.9	22.9	**22.37**	0.5		**18.93**	3.4	20.7	1272.10	
MW-13	4/22/14	1424	1283.63	2.4	12.4	**12.60**	-0.2		**9.64**	3.0	11.1	1273.99	
MW-14	4/22/14	1225	1285.63	9.6	44.6	**43.04**	1.6		**23.50**	19.5	33.3	1262.13	
MW-15	4/22/14	1219	1287.93	7.9	42.9	**44.69**	-1.8		**32.07**	12.6	38.4	1255.86	
MW-16	4/22/14	1115	1277.17	9.0	44.0	**44.30**	-0.3		**28.88**	15.4	36.6	1248.29	
MW-17	4/22/14	1133	1276.89	9.5	44.5	**45.07**	-0.6		**27.17**	17.9	36.1	1249.72	
MW-18	4/22/14	1150	1287.71	10.0	45.0	**44.10**	0.9		**11.43**	32.7	27.8	1276.28	
MW-19	4/22/14	1050	1275.35	14.8	44.8	**44.93**	-0.1		**29.55**	15.4	37.2	1245.80	
MW-20	4/22/14	1050	1276.41	20.1	40.1	**40.62**	-0.5		**29.98**	10.6	35.3	1246.43	
MW-21	4/22/14	1126	1284.74	14.5	44.5	**40.31**	4.2		**30.61**	9.7	35.5	1254.13	
MW-22	4/22/14	1110	1272.14	10.0	40.0	**39.95**	0.0		**25.60**	14.4	32.8	1246.54	
MW-23	4/22/14	1129	1282.59	13.9	43.9	**44.28**	-0.3		**25.59**	18.7	34.9	1257.00	
MW-24	4/22/14	1045	1265.20	9.9	39.9	**40.39**	-0.5		**21.20**	19.2	30.8	1244.00	

MP = Measuring Point is North Side Top of Casing. All Samples Analyzed for Method 8260 "Brenntag VOC List"

ARCADIS

WELL GAUGING LOG

GW Sampling Depth Calculations

DATE: _____

PROJECT NO: **OK001255.2014 T#1 1SA 2014**

PROJECT NAME: Brenntag - Springfield, MO

SITE LOCATION: Springfield, MO

PERSONNEL: B. Blue

LABORATORY: STL-Denver, St. Louis, & Austin

WELL NO.	DATE	TIME	MEASURING POINT (NTOC) ELEVATION (FT AMSL)	APPROX. TOP OF WELL SCREEN (FT BTOC)	APPROX. BOTTOM OF WELL SCREEN (FT BTOC)	**MEASURED WELL DEPTH (FT BTOC)**	SILT THICKNESS (FT)	**MEASURED DEPTH TO PRODUCT (FT BTOC)**	**MEASURED DEPTH TO WATER (FT BTOC)**	WATER COLUMN HEIGHT (FT)	Mid-Point Water Column (FT BTOC)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS
MW-25	4/22/14	1140	1277.54	9.7	39.7	**40.32**	-0.65		**27.44**	12.9	33.9	1250.10	
MW-26	4/22/14	1144	1280.25	14.5	44.5	**45.21**	-0.70		**22.00**	23.2	33.6	1258.25	
MW-27	4/22/14	1154	1287.41	9.7	44.7	**45.10**	-0.39		**11.05**	34.1	28.1	1276.36	
MW-28B	4/22/14	1307	1288.08	22.6	42.6	**43.06**	-0.42		**17.05**	26.0	30.1	1271.03	
MW-29B	4/22/14	1329	1287.70	19.7	44.7	**44.40**	0.30		**24.98**	19.4	34.7	1262.72	
MW-30B	4/22/14	1335	1286.79	19.6	43.6	**44.10**	-0.53		**24.40**	19.7	34.3	1262.39	
MW-31B	4/22/14	1322	1287.14	19.2	44.2	**43.96**	0.28		**19.21**	24.8	31.6	1267.93	
TF EW-1N	4/22/14	1315	1290.72	5	22.8	**23.20**	-0.45		**12.70**	10.5	18.0	1278.02	
TF EW-2S	4/22/14	1313	1292.41	5	20.8	**20.08**	0.74		**6.23**	13.9	13.2	1286.18	
E7B	4/22/14		***1285.31***	19.5	44.5	**44.50**	0.00		**26.00**	18.5	35.3	1259.31	
SAW-1	4/22/14	1216	1288.61	29.6	42.1	**42.1**	0.00		**21.10**	21.0	31.6	1267.51	
SAW-3	4/22/14	1350	1288.30	29.6	43.6	**43.6**	0.00		**14.82**	28.8	29.2	1273.48	
Deep Springfield Aquifer Wells													
SAW-2	4/22/14	1231	1283.52	187.6	207.6				**44.74**			1238.78	Mid-point screen 198 ft bgs
SAW-4	4/22/14	1122	1284.74	189.6	209.6				**39.37**			1245.37	Mid-point screen 200 ft bgs
SAW-5	4/22/14	1200	1278.86	184.3	204.3				**25.35**			1253.51	Mid-point screen 195 ft bgs
SAW-6	4/22/14	1205	1284.70	184.3	204.3				**27.96**			1256.74	Mid-point screen 195 ft bgs
SAW-7	4/22/14	1214	1288.41	171.8	211.8				**40.27**			1248.14	Mid-point screen 192 ft bgs
SAW-8	4/22/14	1222	1286.35	184.5	204.5				**28.17**			1258.18	Mid-point screen 195 ft bgs

MP = Measuring Point is North Side Top of Casing. All Samples Analyzed for Method 8260 "Brenntag VOC List"

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Well Development Form

Project/No. Brenntag-Springfield, MO Well ID SAW-2 Date **4/21/11 - 5/28/14**

Screen Setting 188 -208' Measuring Point Description N.T.O.C. Casing Diameter (inches) 2"

Static Water Level See Below Well Materials: **x** PVC ___ St. Steel

Development Method: Pump On: ___ Volumes Purged **502 Gallons**

Total Depth 208' Pump Off: ___ **Cumulative Purge Volume: 3624 Gallons**

Centrifugal Submersible ___ Pump Intake: 198 Developed By: ARCADIS

Surge Block ___

Bailed **XX** Bailer Type: Plastic Other ___

Time/date	Recovery Hours/ Days	Units of Time	DTW	Gallons Purged	pH	Cond **umhos** ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP C	Remarks
4/21/2011											Bailed
	40654	days	23.36	22							
5/11/2011											Pumped
	20	days	21.47	30	7.8	750				21.4	**2Q 2011 Sampling Event**
6/14/2011											Bailed
	34	days	24.26	23							
7/6/2011											Bailed
	22	days	26.60	20							
8/18/2011											Bailed
	43	days	26.78	28	6.5	680				22.1	**3Q 2011 Sampling Event**
10/14/2011											Bailed
	57	days	26.24	21							
11/15/2011											Grab Sample - HydraSleeve
	32	days	23.84	0	8.2	660				17.8	**4Q 2011 Sampling Event**
12/28/2011											Bailed
	43	days	23.32	21							
4/24/2012											Bailed the week following the
	118	days	25.80	22							**1SA 2012 Sampling Event**
6/29/2012											Bailed
	66	days	27.37	21							
8/17/2012											Bailed
	49	days	28.04	20							
10/18/2012											Bailed
	62	days	23.22	21							**2SA 2012 Sampling Event**
1/23/2013											Bailed
	97	days	20.31	20							
3/8/2013											Bailed
	44	days	23.65	20							
4/30/2013											Bailed
	53	days	26.82	19							**1SA 2013 Sampling Event**
6/14/2013											Bailed
	45	days	21.50	21							
7/25/2013											Bailed
	41	days	25.43	20							
8/28/2013											Bailed
	34	days	24.16	20							
9/27/2013											Bailed
	30	days	25.36	20							**2SA 2013 Sampling Event**
11/6/2013											Bailed
	40	days	23.45	18							
12/19/2013											Bailed
	43	days	23.70	19							
2/13/2014											Bailed
	56	days	23.70	19							
3/21/2014											Bailed
	36	days	23.70	19							
4/17/2014											Bailed the week prior the
	27	days	23.70	19							**1SA 2014 Sampling Event**
5/28/2014											Bailed
	41	days	23.70	19							
Sub-total Gallons Removed				**502**							

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Well Development Form

Project/No. Brenntag-Springfield, MO Well ID SAW-2 Date **4/15/09 - 2/16/11**

Screen Setting 188 -208' Measuring Point Description N.T.O.C. Casing Diameter (inches) 2"

Static Water Level See Below Well Materials: **x** PVC ___ St. Steel

Development Method: Pump On: ___ Volumes Purged **397 Gallons**

Total Depth 208' Pump Off: ___ **Cumulative Purge Volume: 3122 Gallons**

Centrifugal ___ Submersible ___ Pump Intake: 187-188 Developed By: ARCADIS

Surge Block ___ Bailed **XX** Bailer Type: Plastic Other ___

Time/date	Recovery Hours/ Days	Units of Time	DTW	Gallons Purged	pH	Cond **umhos** ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP C	Remarks
4/15/2009											
	28	days	23.36								
				23							
5/4/2009											
	19	days	21.47								
				22	7.8	463				15.2	**2Q 2009 Sampling Event**
6/10/2009											
	38	days	24.66								
				21							
7/22/2009											
	42	days	25.37								
				23							
8/18/2009											**3Q 2009 Sampling Event**
	27	days	24.89								
				22							
9/30/2009											
	43	days	24.13								
				23							
10/28/2009											
	28	days	20.74								
				22							
11/16/2009											**4Q 2009 Sampling Event**
	19	days	24.07								
				29							
1/8/2010											
	53	days	25.38								
				29							
2/3/2010											**1Q 2010 Sampling Event**
	26	days	22.74								
				29							
3/24/2010											
	49	days	22.70								
				29							
5/12/2010											**2Q 2010 Sampling Event**
	49	days	25.70								
				20							
8/4/2010											**3Q 2010 Sampling Event**
	84	days	27.72								
				27							
11/3/2010											**4Q 2010 Sampling Event**
	91	days	27.02								
				27							
1/7/2011											
	65	days	26.70								
				21							
2/16/2011											**1Q 2011 Sampling Event**
	40	days	25.33								
				30							
Sub-total Gallons Removed				**397**							

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Well Development Form

Project/No. Brenntag-Springfield, MO Well ID SAW-2 Date **1/9/08 - 3/18/09**

Screen Setting 188 -208' Measuring Point Description N.T.O.C. Casing Diameter (inches) 2"

Static Water Level See Below Well Materials: **x** PVC ___ St. Steel

Development Method: Pump On: ___ Volumes Purged **370 Gallons**

Total Depth 208' Pump Off: ___

Centrifugal ___ Submersible ___ Pump Intake: 187-188 Developed By: ARCADIS

Surge Block ___ Bailed **XX** Bailer Type: Plastic Other ___

Time/date	Recovery Hours/ Days	Units of Time	DTW	Gallons Purged	pH	Cond **umhos** ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP C	Remarks
1/9/2008											
	43	days	24.81								
			179	25							
1/24/2008											
	15	days	24.17								
				30	7.8	463				15.2	
2/27/2008											
	34	days	16.98								
			190.49	32	7.04	1,254				14.55	**1Q 2008 Sampling Event**
3/25/2008											
	27	days	15.48								
			187.02	31	7.6	635				15.2	
5/21/2008											
	57	days	21.57								
				30	7.3	580				17.7	**2Q 2008 Sampling Event**
7/1/2008											
	41	days	17.10								
				31							
8/7/2008											
	37	days	35.50								
				21							
8/19/2008											
	12	days	28.80								
				20							**3Q 2008 Sampling Event**
10/3/2008											
	45	days	25.26								
				21							
10/16/2008											
	13	days	28.48								
				21							
11/25/2008											
	40	days	26.83								
				22							
12/19/2008											
	24	days	27.36								
				22							**4Q 2008 Sampling Event**
1/9/2009											
	21	days	26.02								
				22							
2/3/2009											
	25	days	26.45								
				22							**1Q 2009 Sampling Event**
3/18/2009											
	43	days	26.43								
				20							
Sub-total Gallons Removed				**370**							

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Well Development Form

Project/No. Brenntag-Springfield, MO Well ID SAW-2 Date **9/13/06 - 11/27/07**

Screen Setting 188 -208' Measuring Point Description N.T.O.C. Casing Diameter (inches) 2"

Static Water Level See Below Well Materials: **x** PVC ___ St. Steel

Development Method: Pump On: ___ Volumes Purged **372 Gallons**

Total Depth 208' Pump Off: ___

Centrifugal ___ Submersible **Sampling Event** Pump Intake: 187-188 Developed By: ARCADIS

Surge Block ___ Bailed **XX** Bailer Type: Plastic Other ___

Time/date	Recovery Hours/ Days	Units of Time	DTW	Gallons Purged	pH	Cond umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP C	Remarks
9/13/2006											
	480.0	hrs	27.75								
	1.33	hrs	196.76	29	7.8	649				15.2	
9/22/2006											
	216	hrs	27.12								
	1.5	hrs	196.56	30	7.8	651				16.2	
10/13/2006											
	504	hrs	28.19								
	1.5	hrs	196.56	29	7.1	646				16.9	
11/21/2006											
	936	hrs	26.20								**4Q 2006 Sampling Event**
	1.5	hrs	196.56	30	7.5	637				12.9	
12/12/2006											
	21	days	20.57	0							
	1.10	hrs	196.75	27	7.9	677				11.4	
1/4/2007											
	23	days		20							
3/21/2007											
	76	days	26.06	0							
	1.3	hrs	196.00	30	7.5	592				18.1	**1Q 2007 Sampling Event**
7/18/2007											
	119	days	35.42	0							
			196.63	29	7.9	658				17.62	**2Q 2007 Sampling Event**
7/24/2007											
	6	days	28.25	0							
			195.02	27.5	7.8	469				17.9	
8/15/2007											
	28	days	27.42	0							
			196.50	30	7.8	682				17.9	
9/12/2007											
	56	days	22.45	0							
			196.89	30	7.2	640				17.8	**3Q 2007 Sampling Event**
10/17/2007											
	35	days	26.20	0							
			197.10	30	7.8	782				15.8	
11/27/2007											
	41	days	28.22	0							
				30	7.33	542				16.7	**4Q 2007 Sampling Event**
Sub-total Gallons Removed				**372**							

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Well Development Form

Project/No. Brenntag-Springfield, MO Well ID SAW-2 Date **6/27/05 - 8/24/06**

Screen Setting 188 -208' Measuring Point Description N.T.O.C. Casing Diameter (inches) 2"

Static Water Level See Below Well Materials: **x** PVC ___ St. Steel

Development Method: Pump On: ___ Volumes Purged **487 Gallons**

Total Depth 208' Pump Off: ___

Centrifugal ___ Submersible ___ Pump Intake: 187-188 Developed By: ARCADIS

Surge Block ___ Bailed **XX** Bailer Type: Plastic Other ___

Time/date	Recovery Hours/ Days	Units of Time	DTW	Gallons Purged	pH	Cond umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP C	Remarks
6/27/2005											
	504.0	hrs	43.14								
	2.50	hrs		30							
7/12/2005											
	360	hrs	27.17								
	2.5	hrs	189.3	35	7.9	638				16.2	
8/3/2005											
	528	hrs	26.99								
	2.5	hrs	192.63	30	7.3	518				21.3	**3Q 2005 Sampling Event**
9/13/2005											
	984	hrs	44.48								
	1	hrs	198.47	35	7.8	365				17.2	
10/4/2005											
	504	hrs	42.83								
	2.5	hrs	190.12	30	7.2	509				21.9	
10/13/2005											
	216	hrs	45.19								
	2.1	hrs	194.21	35	7.4	506				21.3	
10/19/2005											
	120	hrs	27.68								
	2	hrs	198.20	29	7.4	608				20.3	
11/2/2005											
	336	hrs	27.90								
	1.5	hrs	198.20	29	7.4	600					**4Q 2005 Sampling Event**
1/4/2006											
	1512	hrs	28.10								
	1.25	hrs	189.69	30	7.4	598	CLR			15.2	
2/1/2006											
	672	hrs	44.21								
	1.5	hrs	198.20	26.5	7.6	622	Lt Gry			13.5	**1Q 2006 Sampling Event**
2/28/2006											
	648	hrs	28.65								
	2	hrs	198.02	30	7.6	682				17.2	
4/21/2006											
	1248	hrs	27.54								
	1.5	hrs	196.32	30	7.8	625				17.5	
5/2/2006											
	264	hrs	41.09								
	2	hrs	196.50	28	7.7	617				18.3	**2Q 2006 Sampling Event**
7/7/2006											
	1584	hrs	27.71								
	1.75	hrs	196.58	30	7.8	682				15.7	
8/3/2006											
	648	hrs	27.00								
	1.67	hrs	196.63	30	7.6	623				18.6	
8/24/2006											
	504	hrs	26.90								
	1.5	hrs	196.32	29	7.8	625				16.8	**3Q 2006 Sampling Event**
Sub-total Gallons Removed				**486.5**							

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Well Development Form

Project/No. Brenntag-Springfield, MO Well ID SAW-2 Date **6/8/04 - 6/6/05**

Screen Setting 188 -208' Measuring Point Description N.T.O.C. Casing Diameter (inches) 2"

Static Water Level See Below Well Materials: **x** PVC ___ St. Steel

Development Method: Pump On: Volumes Purged **320 Gallons**

Total Depth 208' Pump Off:

Centrifugal ___ Submersible **XX** Pump Intake: 187-188 Developed By: ARCADIS

Surge Block ___ Bailed ___ Bailer Type: Plastic Other Installed Pump in February 2004

Time/date	Recovery Hours/ Days	Units of Time	DTW	Gallons Purged	pH	Cond umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP C	Remarks
6/8/2004											
1300											
	504	hrs		28							
7/2/2004											
900											
	576	hrs		30							
7/20/2004											
800											
	432	hrs		28							
7/28/2004											
1905	192	hrs	33.65							18.1C	
2125	2.33	hrs	186.53	29	7.5	*58*		-128	11.2	64.6F	**3Q 2004 Sampling Event**
8/17/2004											
1130	461.67	hrs	28.90							16.9C	
1430	3.00	hrs	187.00	27	7.8	689				62.4F	
8/30/2004											
	312.00	hrs	29.57								
			187.21	30							
9/29/2004											
	720.00	hrs	26.88								
			198.52	32	7.8	820				17.6	
10/27/2004											
	672.00	hrs	46.80								
			187.21	26	7.6	613				18.2	**4Q 2004 Sampling Event**
1/7/2005											
	6048.0	hrs	24.65	30	7.8	834				17.6	
	3.50	hrs	189.6								
2/16/2005											
	960.0	hrs	21.27								
	3.25	hrs	186.36	31	7.6	622				13.2	**1Q 2005 Sampling Event**
3/15/2005											
	648.0	hrs	24.67								
	3.00	hrs	186.32	30	7.5	628				16.2	
4/15/2005											
	744.0	hrs	26.32								
	?	hrs	110.81	28	7.5	658				18.8	
6/6/2005											
	1248.0	hrs	29.32								
	2.50	hrs	187.2	29	7.8	863				17.6	**2Q 2005 Sampling Event**
Sub-total Gallons Removed				**320**							

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Well Development Form

Project/No. Brenntag-Springfield, MO Well ID SAW-2 Date **7/31/03 - 5/18/04**

Screen Setting 188 -208' Measuring Point Description N.T.O.C. Casing Diameter (inches) 2"

Static Water Level See Below Well Materials: **x** PVC ____ St. Steel

Development Method: Pump On: ____ Volumes Purged **490 Gallons**

Total Depth 208' Pump Off: ____

Centrifugal ____ Submersible ____ Pump Intake: ____ Developed By: ARCADIS

Surge Block ____ Bailed **XX** Bailer Type: Plastic Other ____

Time/date	Recovery Hours/ Days	Units of Time	DTW	Gallons Purged	pH	Cond umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP C	Remarks
7/31/2003											
800			25.62								static water level, begin bailing.
		hrs		35							Bailer restricted at 190.90 ft btoc
											3Q 2003 Sampling Event
8/18/2003											
1340	437.67	hrs	25.54		8.11					24.5	static water level, begin bailing.
1445	1.08	hrs	186.43	35	8.06					22.3	light gray
9/18/2003											
1130	740.75	hrs	27.80		8.00					22.7	static water level, begin bailing.
1245	1.25	hrs		35	8.14					19.5	
10/7/2003											
1153	455.63	hrs	27.82		7.53	670				19.1	static water level, begin bailing.
1229	0.6	hrs	112.21	15	7.65	645				17.1	
1321	0.9	hrs	184.63	32	7.69	643				17.7	brown, turbid, w/ HC odor.
10/30/2003											
735	546.23	hrs	26.16	0	7.56	651				15.8	
850	1.25	hrs	152.94	20	7.57	648				15.3	
930	0.67	hrs	184.76	28	7.72	653				15.6	
11/17/2003											**4Q 2003 Sampling Event**
1350			25.44	0	7.8	652				15.9	turbid
1630				45	7.8	659					
2/6/2004											
	1944	hrs		31							**1Q 2004 Sampling Event**
2/17/2004											
	264	hrs		26							**Begin Using a Downhole Pump**
3/3/2004											
	360	hrs	26.75	30	8.4	588				16.1	
3/23/2004											
	480	hrs	22.64	29	8.0	624				22	
4/16/2004											
	576	hrs	23.32	29	8.1	589				26	
4/29/2004											
	312	hrs	21.90	30							
5/5/2004											Sheen on water in collection tank?
	144	hrs	40.16	40	7.8	597				22.1	**2Q 2004 Sampling Event**
5/18/2004											
	312	hrs	24.10	30	7.9	746				19.1	
Sub-total Gallons Removed				**490**							

ARCADIS

Well Development Form

Project/No. Brenntag-Springfield, MO Well ID SAW-2 Date **1/14/03 - 5/14/03**

Screen Setting 188 -208' Measuring Point Description N.T.O.C. Casing Diameter (inches) 2"

Static Water Level See Below Well Materials: **x** PVC ___ St. Steel

Development Method: Pump On: Volumes Purged **257 Gallons**

Total Depth 208' Pump Off:

Centrifugal ___ Submersible ___ Pump Intake: Developed By: ARCADIS

Surge Block ___ Bailed **XX** Bailer Type: Plastic Other ___

Time/date	Hours/ Days	Units of Time	DTW	Gallons Purged	pH	Cond umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP C	Remarks
1/14/2003											
1230			23.72								static water level, begin bailing.
1445	2.25	hrs	188.18	30							Bailer restricted at 190.90 ft btoc
1/15/2003											
830	17.75	hrs	150.85		7.32	757				18	static water level, begin bailing.
935	1.08	hrs	188.32	10	7.27	703				13	
1/29/2003											
1540	342.08	hrs	26.06		7.69	799				12	static water level, begin bailing.
1645	1.08	hrs	184.09	30	7.40	755				14	
2/5/2003											
1402	165.28	hrs	34.37		7.44	736				11	static water level, begin bailing.
1545	1.7	hrs	186.81	28	7.47	719				13	
2/12/2003											
1430	168.47	hrs	32.19		7.80	674				16.4	static water level, begin bailing.
				30	7.8	671				16.4	**1Q 2003 Sampling Event**
2/18/2003											
945	139.25	hrs	31.97		7.35	701				15	static water level, begin bailing.
1105	1.33	hrs	186.14	28	7.58	761				14	
3/6/2003											
1530	388.42	hrs	20.64		7.33	699				17.5	static water level, begin bailing.
1640	1.17	hrs	186.23	35	7.38	705				17.9	
3/20/2003											
1450	334.17	hrs	25.23		7.34	683				15.5	static water level, begin bailing.
1600	1.1667	hrs	186.51	38	7.53	651				16.2	gray/turbid
5/14/2003											
1123	55	days	22.75		7.5	635				16.2	
1245	1.38	hrs	186.20	28	7.5	615				17.6	Light gray, no turbidity.
											2Q 2003 Sampling Event
Sub-total Gallons Removed				**257**							

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Well Development Form

Project/No. Brenntag-Springfield, MO Well ID SAW-2 Date **9/11/02 - 11/6/02**

Screen Setting 188 -208' Measuring Point Description N.T.O.C. Casing Diameter (inches) 2"

Static Water Level 29.58' BTOC on 9/24/02 Well Materials: **x** PVC ___ St. Steel

Development Method: Pump On: ___ Volumes Purged **430 Gallons**

Total Depth 208' Pump Off: ___

Centrifugal ___ Submersible ___ Pump Intake: ___ Developed By: ARCADIS

Surge Block ___ Bailed **x** Bailer Type: Plastic Other ___

Time/date	Minutes/ Days	Units of Time	DTW	Gallons Purged	pH	Cond umhos ms/cm	TURB (NTUs)	Redox (mV)	Diss. O2 (mg/L)	TEMP (C) or (F)	Remarks
9/11/02											**Completed as a 2-inch PVC MW.**
1305			19.35								static water level, begin pumping.
1401	56	min	200.03	290							shut down pump
1416	15	min	199.71								0.32 ft recovery in 15 min
1621	2.08	hrs	190.41								water level before bentonite hydration
1636	15.00	min	190.25								water level after bentonite hydration
9/12/02											
733	15.20	hrs	168.85	4.8							dk tan, bail to 206'
1310	4.62	hrs	177.70	5							start clear, finish gray
1400	start		NM								bail to 206'
1440	40	min		4							start clear, finish gray
1740	180	min	185.52								
1800	20	min	187.91	2							dK gray
9/13/02											
930	15.5	hrs	160.92								start clear, finish gray
955	25	min	192.30	5							
9/17/02											
1230	4.10	days	60.81								did not Bail
9/24/02											
1400	7.06	days	29.58								bail clear to 186' - 28 gals
1645	2.75	hrs	206.00	31							bail gray last 3 gals
9/25/02											
720	14.58	hrs	157.82								bail clear 8 gals
810	50	min	206.00	9							bail gray last 1 gal
1345	5.58	min	178.92								**Collect sample for lab analysis**
10/2/02											
1140	7.92	days	37.59								bail clear 25 gals
1315	95	min	198.42	29							bail gray last 4 gal
10/3/02											
1505	1.08	days	114.60								did not Bail
10/16/02											
1445	12.99	days	28.30								did not Bail
11/6/02											
930	20.78	days	24.79	50	7.1	726				8.2	**4Q 2002 Sampling Event**
Sub-total Gallons Removed				**430**							

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Groundwater Monitoring Report
First Semi-Annual 2014
Brenntag Mid-South, Inc.
Springfield, Missouri

Appendix C

Data Validation for Laboratory Data Reports

Brenntag - Springfield, MO First Semi-annual GWM Event 2014
QA/QC Sample Summary - April 2014

Sample Type	Field Name	Parent Name	TA Job Login
Unpreserved			
Duplicate	Dup-1 (4/23/14)	SAW-1 (4/23/14)	**J280-54637-1**
MS	SAW-1 MS (4/23/14)	SAW-1 (4/23/14)	
MSD	SAW-1 MSD (4/23/14)	SAW-1 (4/23/14)	
Preserved			
Duplicate	Dup-2 (4/24/14)	MW-15 (4/24/14)	
MS	MW-15 MS (4/24/14)	MW-15 (4/24/14)	
MSD	MW-15 MSD (4/24/14)	MW-15 (4/24/14)	
Duplicate			
MS			
MSD			
Field Blank GW	No longer required. Hydrasleeve Samplers	(VOCs Only)	
TB (Trip Blank)	4/23/2014	(VOCs Only)	
TB (Trip Blank)	4/24/2014	(VOCs Only)	

Sample Analyses That Do Not Require Data Validation

Remediation System GW Effluent	RSE20140425	J280-54744-1
Remediation System GW Influent	INF20140425	J160-6409-1
Soil Vapor Extraction Air Sample	AIR20140425	J320-7201-1
Sub-Slab Vapor Extraction Air Sample	SSVE	
Spent Carbon Composite	GAC	

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BRENNTAG MID-SOUTH – 2235 W. Battlefield RD. Springfield, MO
1st SEMIANNUAL GROUNDWATER MONITORING EVENT 2014
TESTAMERICA-DENVER REPORT 280-54637 and 280-54750
Level 2 Validation

ARCADIS U.S., Inc.
3850 N. Causeway Blvd.
Suite 990
Metairie, Louisiana 70002
Phone: (504) 832-4174
Fax: (504) 832-2145

ENVIRONMENT

Project Number:
OK001255.2014.00001

SDG NUMBER(S):	**280-54637 and 280-54750**
Sample Date(s):	April 23, 2014 – April 24, 2014
Sample Team:	ARCADIS
Sample Matrix:	Groundwater
Analyzing Laboratories:	TestAmerica – Denver
Analyses: Project-Specific Compound Lists:	**USEPA Methods:** 8260B (VOCs)
Report Content Level:	Contract Laboratory Program (CLP) Type

Review of field data, field notes, and sampling logs was conducted in this review. Analytical data were evaluated in accordance with applicable USEPA method-specific criteria and/or laboratory Standard Operating Procedures (SOPs), "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" (October 1999); the analytical laboratory Quality Assurance (QA) control limits, the project sampling and analysis plans, and professional judgment.

This data verification was performed at a **Level 2** and included review of data package completeness, Laboratory Control Samples and Method Blanks, Surrogate and Matrix Spike Recoveries, holding time compliance, field duplicate precision, and field QC sample evaluation. Only Quality Assurance/Quality Control (QA/QC) results and analytical data associated with analytes/compounds of interest were reviewed for this validation.

The data package review included analytical results and associated quality control data for all samples in the listed Sample Delivery Group(s) unless otherwise noted.

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The following samples were included in this validation:

SDG	Sample ID	Sample Type	Sample Collection Date	Parent Sample
280-54637	MW-28B	Water	04/23/14	
280-54637	MW-29B	Water	04/23/14	
280-54637	MW-31B	Water	04/23/14	
280-54637	SAW-1	Water	04/23/14	
280-54637	SAW-2	Water	04/23/14	
280-54637	SAW-4	Water	04/23/14	
280-54637	SAW-5	Water	04/23/14	
280-54637	SAW-6	Water	04/23/14	
280-54637	SAW-7	Water	04/23/14	
280-54637	SAW-8	Water	04/23/14	
280-54637	E7B	Water	04/23/14	
280-54637	DUP-1	Water	04/23/14	
280-54637	TRIP BLANK	Water	04/23/14	
280-54750	MW-1	Water	04/24/14	
280-54750	MW-3	Water	04/24/14	
280-54750	MW-4	Water	04/24/14	
280-54750	MW-5	Water	04/24/14	
280-54750	MW-9	Water	04/24/14	
280-54750	MW-15	Water	04/24/14	
280-54750	MW-17	Water	04/24/14	
280-54750	MW-19	Water	04/24/14	
280-54750	MW-21	Water	04/23/14	
280-54750	MW-22	Water	04/23/14	
280-54750	MW-23	Water	04/23/14	
280-54750	MW-27	Water	04/23/14	
280-54750	TF-EW-2S	Water	04/24/14	
280-54750	DUP-2	Water	04/24/14	
280-54750	TRIP BLANK	Water	Water	04/23/14

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FIELD DATA PACKAGE DOCUMENTATION

Field Sampling Log*	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sampling dates noted		X		X	
2. Sampling team indicated		X		X	
3. Sampling identification traceable to location collected		X		X	
4. Sample location		X		X	
5. Sample depth for water		X		X	
6. Collection technique (bailer, pump, etc.)		X		X	
7. Field sample preparation techniques		X		X	
8. Sample type (grab, composite)		X		X	
9. Sample container type		X		X	
10. Preservation methods		X		X	
11. Chain-of-Custody form completed		X		X	
12. Required analytical methods requested		X		X	
13. Field (water and soil) Sample Logs completed properly and signed		X		X	
14. Number and type of field QC samples collected (blanks, replicates, splits, etc.)		X		X	
15. Field equipment calibration		X		X	
16. Field equipment decontamination	X				X
17. Field parameter data		X		X	
18. Sample shipping		X		X	
19. Laboratory Task Order	X				X

QC - Quality Control
*Field Sampling Logs = Water Sampling Logs / Daily Logs

Comments:
All field data documentation was reviewed for the above referenced sampling event. Performance was acceptable.

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ANALYTICAL DATA PACKAGE DOCUMENTATION
GENERAL INFORMATION

	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt information		X		X	
2. Sample results		X		X	
3. Parameters analyzed		X		X	
4. Methods of analysis		X		X	
5. Reporting limits of analysis		X		X	
6. Master tracking list		X		X	
7. Sample collection date		X		X	
8. Laboratory sample received date		X		X	
9. Sample preservation		X		X	
10. Sample preparation/extraction date		X		X	
11. Sample analysis date		X		X	
12. Copy of Chain-of-Custody (COC) form signed by laboratory sample custodian		X		X	
13. Narrative summary of QA or sample problems provided		X		X	

QA - Quality Assurance

Comments:

All samples referenced in this report were analyzed by TestAmerica Laboratories (TA) of Denver.

9. Samples were received in good condition at the laboratory in two coolers on wet ice at 4.3 °C and 5.3 °C.

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VOLATILE ORGANIC COMPOUNDS

	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
1. Holding Times		X		X	
2. Reporting Limits		X		X	
3. Blanks					
A. Method Blanks		X	X		
B. Equipment Blanks	X				X
C. Field Blanks	X				X
D. Trip Blanks		X	X		
4. Laboratory Control Sample (LCS)		X		X	
5. Laboratory Control Sample Duplicate(LCSD)	X				X
6. LCS/LCSD Precision (RPD)	X				X
7. Matrix Spike (MS) %R		X		X	
8. Matrix Spike Duplicate (MSD) %R		X		X	
9. MS/MSD Precision (RPD)		X		X	
10. Surrogate Spike Recoveries		X		X	
11. Field Duplicate Comparison		X		X	

%R - Percent Recovery RPD - Relative Percent Difference

Comments:

Analyses were performed according to (United Stated Environmental Protection Agency) USEPA SW-846 Method 8260B. Data were reviewed utilizing method criteria and USEPA National Functional Guidelines for Organic Data review of October 1999 as guidance for data qualification. The quality indicators of this limited data review included holding times, associated blanks, matrix spike/matrix spike duplicate (MS/MSD) analysis, laboratory control sample and surrogate recoveries. Performance was acceptable, with the following exceptions and/or notes:

Note: The laboratory reported detections above the method detection limit (MDL) and below the quantitative reporting limit (RL) as estimated values flagged with a “J” qualifier.

The “E” qualifier was used by the laboratory to indicate that the results were reported above the calibration range. For sample E7B, the “E” will be changed to a “J” to indicate that the result is estimated because the dilution for this sample was analyzed outside the holding time.

1. Twenty four samples, two field duplicates, and two trip blanks were analyzed within the method specified hold time for preserved samples. No data qualification is required.

2. Several samples required secondary dilutions due to elevated concentrations of target analytes. There were no elevated reporting limits for non-detect results.

3A. Methylene chloride was detected in five method blanks. The associated field samples were qualified as non-detect for this compound if the sample concentrations were less than ten times the blank values.

3D. Methylene chloride was detected in the trip blank. The associated field samples were qualified as non-detect for this compound if the sample concentrations were less than ten times the blank values.

4-6. Six laboratory control samples (LCS) were prepared for analysis with this SDG. All compound recoveries were within control limits and no data qualification is required.

7-9. Sample MW-15 was used as the MS/MSD. The recoveries and RPDs were acceptable.

10. All surrogate recoveries were within the laboratory control limits.

11. Sample DUP-1 was collected as a field duplicate of SAW-1. The RPDs were acceptable at less than 40%.

Sample DUP-2 was collected as a field duplicate of MW-15. The RPDs were acceptable at less than 40%.

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VALIDATION QUALIFICATION SUMMARY

The following data qualifiers with applicable definitions were applied in this data validation:

UB – compound/analyte considered non-detect at the listed value due to associated blank contamination.

J – the analyte was identified, but the associated numerical value is an approximate concentration because the value is less than the quantitative value, matrix interference, or minor QC deficiencies associated with method performance.

UJ – the analyte was not detected above the reporting limit; however, the reported quantitation limit is approximate and may, or may not, represent the actual limit of quantitation necessary to accurately and precisely measure analyte in the sample.

R – the result is rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria; and the presence or absence of the analyte cannot be verified.

All other data satisfy validation criteria and are considered to be quantitative.

Sample ID	Parameter	Result	Units	Qualified Result	Reason
MW-28B	Methylene Chloride	430 B	ug/L	<430 UB	Blank Contamination
MW29B	Methylene Chloride	20 B	ug/L	<20 UB	Blank Contamination
MW-31B	Methylene Chloride	7.4 B	ug/L	<20 UB	Blank Contamination
SAW-2	Methylene Chloride	2.5 B	ug/L	<10 UB	Blank Contamination
E7B	Methylene Chloride	1.5 B	ug/L	<8 UB	Blank Contamination
MW-1	Methylene Chloride	390 JB	ug/L	<400 UB	Blank Contamination
MW-4	Methylene Chloride	1.6 JB	ug/L	<4 UB	Blank Contamination
MW-17	Methylene Chloride	14 JB	ug/L	<20 UB	Blank Contamination
MW-21	Methylene Chloride	0.38 JB	ug/L	<2 UB	Blank Contamination
MW-22	Methylene Chloride	0.93 J	ug/L	<2 UB	Blank Contamination
DUP-2	Methylene Chloride	0.96 J	ug/L	<2 UB	Blank Contamination

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VALIDATION PERFORMED BY:	Rachelle Borne
SIGNATURE:	Rachelle Borne
DATE:	June 4, 2014