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Performance Evaluation Report (PER) for the A-Area Burning/Rubble Pits (731-A, -1A) and Rubble Pit (731-2A) and the Miscellaneous Chemical Basin/Metals Burning Pit (731-4A, -5A) Operable Unit (OU)

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TABLE OF CONTENTS

LIST OF FIGURES

LISTOF TABLES

LIST OF APPENDICES

LIST OF ABBREVIATIONS AND ACRONYMS

~	approximate, approximately
<, ≤	less than, less than or equal to
>, ≥	greater than, greater than or equal to
%	percent
ABRP	A-Area Burning/Rubble Pits and Rubble Pit
ABV	A-Area Burning/Rubble Pit Vadose Zone *(well prefix)*
AHT	A-Area Hidden Trench *(well prefix)*
AQP	air quality permit
ARV	A-Area Recovery Vapor *(well prefix)*
ASH	A-Area Ash-Pile *(well prefix)*
asl	above sea level
ASVE	active soil vapor extraction
B&K	Bruel and Kjaer
bgs	below ground surface
cfm	cubic feet per minute
cis-1,2-DCE	cis-1,2-dichloroethylene
CM	contaminant migration
CMI/RAIP	Corrective Measures Implementation/Remedial Action Implementation Plan
CO_2	carbon dioxide
COC	constituent of concern
conc.	concentration
CY	calendar year
ft	feet or foot
ft^3/min	cubic feet per minute
hr	hour
IROD	Interim Record of Decision
kg	kilogram
kg/m^3	kilogram per cubic meter
km	kilometer
lb	pound
lb/hr	pounds per hour
lb/yr	pounds per year
LLC	limited liability company
µg/kg	microgram per kilogram
µg/L	microgram per liter
m	meter
m^3/hr	cubic meter per hour

LIST OF ABBREVIATIONS AND ACRONYMS *(Continued/End)*

MAAZ	M-Area Aquifer Zone
MBP	Metals Burning Pit
MCB	Miscellaneous Chemical Basin
MCL	maximum contaminant level
MCSV	Miscellaneous Chemical Soil Vapor *(well prefix)*
mi	mile
NA	not applicable
ND	non-detect
NR	not received
OU	operable unit
PCE	tetrachloroethylene
ρCi/g	picocuries per gram
PCR	Post-Construction Report
PER	Performance Evaluation Report
ppmV	parts per million by volume
ppb	parts per billion
PSVE	passive soil vapor extraction
RA	remedial action
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RFI/RI/BRA	RCRA Facility Investigation/Remedial Investigation Report with Baseline Risk Assessment
RG	remedial goal
ROD	Record of Decision
SCDHEC	South Carolina Department of Health and Environmental Control
SEMS	Superfund Enterprise Management System
SRNS	Savannah River Nuclear Solutions, LLC
SRS	Savannah River Site
SVE	soil vapor extraction
SVEU	soil vapor extraction unit
TCE	trichloroethylene
USEPA	U.S. Environmental Protection Agency
UTM	Universal Transverse Mercator
VOC	volatile organic compound
WSRC	Washington Savannah River Company LLC

1.0 INTRODUCTION

This Performance Evaluation Report (PER) addresses remedial system performance at the consolidated A-Area Burning/Rubble Pits (731-A, -1A) and Rubble Pit (731-2A) (ABRP) and Miscellaneous Chemical Basin (MCB)/Metals Burning Pit (MBP) (731-4A, 5A) Operable Unit (OU) for calendar year (CY) 2017. Monitoring requirements for ABRP/MCB/MBP are identified in the Corrective Measure Implementation/Remedial Action Implementation Plan (CMI/RAIP) (WSRC 2006) and Post-Construction Report (PCR) for the ABRP/MCB/MBP OU (SRNS 2009a). For additional information, refer to previous PERs (SRNS 2009b, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017a and WSRC 2008).

The ABRP/MCB/MBP OU is located approximately (~) 2.4-kilometers (km [1.5-miles {mi}]) south of M Area and 4.8-km (3-mi) east of the Savannah River Site (SRS) boundary, in the Upper Three Runs watershed (Figure 1). The ABRP/MCB/MBP OU comprises several waste sites. This PER specifically addresses the remedial actions (RAs) conducted at the ABRP Trench (vadose zone soil) Subunit and the 731-4A MCB Vadose Zone Subunit. The RA for all ABRP/MCB/MBP OU subunits are summarized in Section 2.

The Trench Subunit (outlined in blue on Figure 2), located beneath the A-Area Ash Pile (788-2A), has been identified as a source for volatile organic compound (VOC) contamination. Trichloroethylene (TCE) was identified as a contaminant migration (CM) constituent of concern (COC) for the Trench Subunit. Contamination leaching from this area has impacted vadose zone soils and groundwater beneath ABRP. A detailed facility description is provided in the Resource Conservation and Recovery Act (RCRA) Facility Investigation/Remedial Investigation Report with Baseline Risk Assessment (RFI/RI/BRA) (WSRC 1997) and the Addendum to the Revision 1.2, RFI/RI/BRA (WSRC 2003a).

The MCB (731-4A) Subunit (Figure 2) is believed to have been a disposal site for solvents and oils based on contamination in the vadose zone and groundwater beneath the area. TCE and tetrachloroethylene (PCE) were identified as CM COCs at MCB.

Groundwater is not part of the ABRP/MCB/MBP OU. The Core Team representatives from the U.S. Environmental Protection Agency (USEPA), South Carolina Department of Health and Environmental Control (SCDHEC), and U.S. Department of Energy - SRS, agreed to transfer responsibility for the ABRP/MCB/MBP groundwater from the Federal Facility Agreement to the RCRA program as part of the M-Area VOC plume under the *2000 RCRA Part B Permit Renewal Application: M-Area and Metallurgical Laboratory Hazardous Waste Management Facilities Postclosure* (SRNS 2017b). A brief discussion of the ABRP/MCB/MBP groundwater monitoring data is provided below. A map showing the locations of the MBP/MCB Airlift Recirculation / Multi-Stage Aerator Wells and the MCB Monitoring Well Network is provided in Figure 3. For more details, refer to the *Annual 2016 M-Area and Metallurgical Laboratory Hazardous Waste Management Facilities Groundwater Monitoring and Corrective Action Report* (SRNS 2017c).

Monitoring wells screened in the water table aquifer (M-Area Aquifer Zone [MAAZ]) near the ABRP and MCB source areas have historically shown elevated levels of PCE and TCE contamination. TCE and PCE concentrations observed in the monitoring wells located in the Lost Lake Aquifer Zone are impacted from upgradient M-Area sources in addition to ABRP/MCB sources. In the Upper Lost Lake Aquifer Zone, wells near the source areas have had historically elevated TCE concentrations that have decreased with time indicating less M-Area influence. Monitoring wells in the Lower Lost Lake Aquifer Zone have had stable TCE concentrations with minimal change over time indicating more influence from upgradient M-Area sources.

Soil vapor extraction (SVE) is designed to reduce the vadose zone source term and has a delayed impact on groundwater contamination by inhibiting further contamination. SRS expects to see a long-term impact on groundwater contamination from SVE operations in shallower groundwater; however, deeper groundwater impacts from this system may be less apparent due to commingling of the plumes. Therefore, it is important to focus on the MAAZ (water table aquifer) wells when evaluating the effectiveness of the vadose zone remedial actions. MAAZ wells near the ABRP source have decreasing VOC trends indicating mass depletion of the source. PCE is below the groundwater maximum contaminant level (MCL) in all eight MAAZ wells and TCE exceeds the MCL in only two wells.

2.0 REMEDIAL ACTIONS

The final RAs are ongoing for the ABRP Trench Subunit and the MCB Vadose Zone Subunit. In 2017 the ABRP RA was comprised of active SVE (ASVE) and passive SVE (PSVE) with MicroBlowers™ and BaroBalls™. In 2017 the MCB RA was comprised of PSVE with MicroBlowers™ and BaroBalls™. Performance of these RAs is the subject of this PER.

The RAs and the regulatory decision documents for the eleven ABRP/MCB/MBP OU subunits (Figure 2) are listed below:

ABRP Area Subunits

- Trench (vadose zone soil) Subunit — RA is ongoing. The final RA (WSRC 2007, SRNS 2009a) consists of operating ASVE (an SVE unit [SVEU] connected to three wells) and PSVE 10 wells equipped with MicroBlowers™ and 13 wells equipped with BaroBalls™) (Figure 4). The ASVE and PSVE meet the remedial action objective (RAO) to prevent migration of TCE contamination in soil to groundwater at a concentration above the MCL of 5 µg/L. The final remedial goal (RG) for TCE in the soil at the Trench subunit is 610 µg/kg.
- 731-2A Rubble Pit Subunit — RA is complete (WSRC 2000, WSRC 2003b). The RA for benzo(a)pyrene contamination in surface soil at the 731-2A Rubble Pit consisted of a 0.3-meter (m [1-feet {ft}]) thick soil cover.
- 788-2A Ash Pile Subunit — RA is complete (SRNS 2009a). The RA for arsenic, selenium, potassium-40, radium-226, radium-228, thorium-228 and uranium-238 contamination in the 788-2A Ash Pile was a minimum 0.6-m (2-ft) thick vegetative soil cover and institutional controls (i.e., land use controls). The RA meets the RAOs to prevent human exposure to COCs that present a risk to future industrial workers and to prevent ecological exposure to COCs that present a hazard to ecological receptors. The soil RGs at the 788-2A Ash Pile subunit are 9,753 µg/kg for arsenic, 15,280 µg/kg for selenium, 1.60 ρCi/g for potassium-40, 0.0255 ρCi/g for radium-226 1.83 ρCi/g for radium-228, 1.69 ρCi/g for thorium-228, and 1.79 ρCi/g for uranium-238.
- 731-A Burning/Rubble Pit Subunit — No RA required (WSRC 2000)

- 731-1A Burning/Rubble Pit Subunit — No RA required (WSRC 2000)
- Potential Pit Subunit — No RA required (WSRC 2000)
- Depressional Area Subunit — No RA required (WSRC 2000)
- Ash Scatter Area/Ditch Subunit — No RA required (WSRC 2001)

MCB/MBP Subunits

- 731-4A MCB Vadose Zone Subunit — RA is ongoing. The 26 PSVE wells installed as part of the interim RA (WSRC 1999, WSRC 2002a) were deemed sufficient to meet the RAOs of the final RA (Figure 5) (WSRC 2007, SRNS 2009a) to prevent migration of TCE and PCE contamination in soil to groundwater at a concentration above the MCLs (5 µg/L for each). The RGs for TCE and PCE in the soil at the MCB Vadose Zone subunit are 344 µg/kg for each compound.
- 731-4A MCB Surface Soil Subunit —RA is complete (WSRC 1999, WSRC 2002a). The RA for soil containing polychlorinated biphenyls at MCB was excavation and off-SRS disposal.
- 731-5A MBP Surface Soil Subunit — RA is complete (WSRC 1999, WSRC 2002a). The RA for elevated levels of aluminum in MBP surface soils was excavation and off-SRS disposal.

2.1 ABRP Trench Subunit

2.1.1 Treatment Area

The treatment area for the ABRP Trench Subunit was established by the ABRP/MCB/MBP CMI/RAIP (WSRC 2006) based on the soil RG of 610 µg/kg for TCE concentration contour as shown in Figure 4. To identify the areas exceeding the RG, the CMI/RAIP composited the sampling results provided by extensive soil sampling and cone penetrometer characterization conducted between 1996 and 2004. This sampling provided sufficient data to identify the contaminated area and SVE design requirements.

2.1.2 Historical Information

Characterization

VOC contamination (i.e., TCE, PCE, cis-1,2-dichloroethylene [cis-1,2-DCE]) in groundwater was initially addressed in 2000 by an Interim Record of Decision (IROD) (WSRC 2000) as an interim action at the ABRP OU. Characterization of the Trench Subunit occurred in April 2001 (WSRC 2003a). Following characterization activities, an Explanation of Significant Difference (WSRC 2001) to the IROD was issued in 2002 to expand the SVE portion of the interim action to include the Trench Subunit where VOCs were identified at levels that would likely leach to groundwater. In 2002, the CM analysis of the Trench Subunit revealed that although TCE, PCE, and cis-1,2-DCE were present in vadose zone soils, only TCE was present at levels that could potentially migrate to groundwater above the MCL. Thus, the Addendum to the RFI/RI/BRA for the ABRP (WSRC 2002b) and the 2007 Record of Decision (ROD) identified TCE as the only CM COC in the Trench Subunit. The approved ROD for the ABRP/MCB/MBP OU (WSRC 2007) selected phased SVE as the RA for the Trench Subunit vadose zone and a soil cover as the RA for the A-Area Ash Pile (788-2A).

Characterization indicated the Trench Subunit contaminant plume is migrating laterally along a perched water table to a point where it has impacted the MAAZ (WSRC 2005a). The path of migration goes across the area of the Potential Pit. The Potential Pit was previously characterized and there are no problems warranting action for near-surface soils (WSRC 1997). The wells of the SVE system (interim and final RAs) established at the potential pit are treating deep, vadose-zone contamination migrating from the Trench Subunit.

Configuration Changes

During the operational life of SVE at ABRP, many modifications to the system have been made to adjust to changing field conditions. These changes are listed in Table 1. For further details regarding construction of the SVE at ABRP, refer to the PCR (SRNS 2009a). Historical configuration changes to the SVE at ABRP are provided in more detail in the PERs.

Rebound testing was conducted on September 5, 2012, which indicated that the VOC removal at the ABRP Trench Subunit is mostly diffusion limited (SRNS 2017a).

Zone of Influence testing was performed on December 4, 2015, to provide data to increase efficiency of VOC removal in the vadose soils after 14 wells were disconnected from the SVEU. As a result, MicroBlowers™ were modified (SRNS 2017a).

2.1.3 Current Configuration

The ABRP RA operated both ASVE and PSVE systems in 2017. The ASVE system consisted of a SVEU with a 25-horsepower Roots™ blower, condensate removal system, control instrumentation and piping. Piping to the well bank included three ASVE wells, ASH-06, AHT-08B and AHT-11A. The ASVE was permanently shut down in December 2017. See Section 4.1 for a discussion of the technical basis to remove the ASVE system from service. The PSVE system uses 23 wells consisting of 10 wells equipped with MicroBlowers™ powered by photovoltaic units and 13 wells equipped with BaroBalls™. The locations of the wells are shown in Figure 4. Construction details for the SVE wells are shown in Table 2.

The ABRP Trench is 4.6-m (15-ft) wide by 91.4-m (300-ft) long, most of which is overlain by about 6.1 m (20 ft) of compacted ash. The ABRP Trench is between 2.4-m and 4.6-m (8- to 15-ft) deep. The three wells located in the ABRP Trench Subunit are AHT-05, -06 and ASH-06.

Twelve wells are located in the Ash Pile Subunit and include wells AHT-7A, -7B through AHT-12A, -12B, clustered in sets of two. Ten single wells are located in the Potential Pit Subunit along the northern, cleared edge in an east to west orientation and include wells ABV-01, ARV-1D1, -2D1, -2D2, and -2D3, and AHT-13 through AHT-17. One well, ARV-3D3, is located in the Rubble Pit Subunit.

2.1.4 Sampling Methods and Results

Two sampling methods, compliance and performance, were used for the ASVE system. Compliance sampling requirements for the ASVE system are shown in Table 3. Performance sampling requirements are shown in Table 4. Performance sampling for the SVEU and the

individual well heads is required to be on a quarterly basis; however, the monthly sampling frequency at the SVEU is set by the Compliance Sampling Requirements. For further sampling details see previous PERs.

Biannual TCE production data for the duration of operation are given for the individual ASVE wells in Table 5 and for the ASVE system in Table 6. The ABRP ASVE system initially removed a total of 36.89 kilogram (kg) [81.32 pounds (lb)] of TCE in the second half of 2008. The TCE extraction quantity has since decreased to 0.35 kg (0.77 lb) for the first half of 2017and 0.19 kg (0.43 lb) for the second half of 2017. The system has removed a total of 65.3 kg (143.97 lb) of TCE since start of operations on June 25, 2008.

System and individual well production rates have diminished markedly since the start of operations indicating that mobile VOCs in the vadose zone have been depleted appreciably. During 2017, the TCE production rate for the SVE system was only about 0.49% (1.26E-04 lb/hr) of the production rate during 2008 (2.59E-02 lb/hr) (Table 6). The decrease in production rates is illustrated in Figure 6 for the system overall and in Figure 7 for the individual SVE wells. It is expected that the production rate will continue to decline at a steady rate.

Figure 8 shows the flow rate through each of the wells since startup in 2008. Except for well ASH-06, the flow rates from the wells have remained relatively stable since 2012 and is consistent with the flow rate from the SVEU system. Well ASH-06 experienced a small increase in TCE concentrations with readings slightly above non-detect levels of 0.16 ppmV and 0.24 ppmV in 2016 (Appendix A). The small increase was most likely due to the conversion of nearby wells to MicroBlowers™ and BaroBalls™ in 2015 (Figure 4, Table 1). The impact of converting nearby wells was more apparent at ASH-06 because of its longer screen length of 30.5 m (100 ft) versus screen lengths of 12.2 m (40 ft) and 7.6 m (25 ft) at wells AHT-11A and AHT-08B, respectively.

Figure 9 includes the TCE concentrations for sampling events throughout the history of the ASVE system, which indicates a steadily decreasing well exhaust gas TCE concentration. The vadose zone has moved to a diffusion limited state resulting in diminishing returns for the energy used by the ASVE system.

TCE concentrations at the MicroBlowers™ and BaroBalls™ wells have decreased significantly during ASVE system operation. Prior to ASVE operation, MicroBlowers™ sample results averaged about 25 ppmV and BaroBalls™ sample results averaged about 0.75 ppmV in 2007. In 2017, only two wells (ABV-01 and ARV-2D2) out of ten MicroBlowers™ wells had a detectable sample result (0.036 and 0.034 ppmV) and only one well (AHT-06) out of 13 BaroBalls™ wells had a detectable sample result (0.041 ppmV). After the Core Team agreed in 2015 to begin transitioning 15 wells from ASVE to PSVE, MicroBlowers™ were placed into operation at five former SVE wells, AHT-07B, -08A, -11B, -13 and -14, and BaroBalls™ were placed into operation at ten wells, AHT-07A, -09A, -09B, -10A, -10B, -12A, -12B, -15, -16 and -17.

Quarterly TCE MicroBlowers™ well exhaust gas TCE results are listed in Table 7 and quarterly BaroBalls™ well exhaust gas TCE results are listed in Table 8. MicroBlowers™ and BaroBalls™ combined extracted less than (<) 0.01 lb of TCE in 2017.

The VOC mass (PCE and TCE) removed from the SVE wells was estimated from the vapor-phase concentrations, flow rates and operational period. This method, like the method used in a study of SVE and air sparging (Holbrook et al. 1998), calculates mass removal by converting soil gas concentrations to mass removal rates using the extraction flow rate and the Ideal Gas Law. The data used in the calculations are provided in Appendix A. The generalized equation for mass removal is given in Equation 1.

$$\mathbf{M = C \times Q \times T} \qquad \text{(Equation 1)}$$

where,

M = cumulative mass removed (kg)
C = vapor concentration (kg/m^3)
Q = extraction flow rate (m^3/hr)
T = operational period (hr)

2.1.5 Operational Issues

The SVEU for the ASVE system does not run 100% of the time. Actual hours of operation, as recorded on operator round sheets for each sampling interval, are shown in Appendix A. In 2017,

there was one SVEU shutdown event greater than one week. A description of the outage is provided below. Refer to Table 9 for a listing of all SVEU shutdown events.

- In November 2017, a blockage in the flame arrestor caused a back pressure on the discharge flow. Maintenance removed the blockage within the arrestor and the system was placed back into service. Total out-of-service time was 275 hours.

Consistent with notifications for other SRS remediation systems outages, the Savannah River Nuclear Solutions Environmental Compliance Authority notifies the USEPA and SCDHEC when the system is out-of-service for seven consecutive (not cumulative) days. USEPA and SCDHEC was notified of the ABRP OU SVE system outage and return-to-service via email in November 2017 (SRNS 2017d, 2017e).

2.2 MCB Subunit

2.2.1 Treatment Area

The treatment area for the MCB Subunit was established by the IROD (WSRC 1999) based on the soil RG of 344 µg/kg for TCE and PCE concentration contours and is shown in Figure 5. The areas were identified by extensive characterization and sampling history at the MCB Subunit since 1996. This sampling provided sufficient data to identify the location of ASVE in high VOC concentration area (>50 ppmV, defined for this OU as a hot spot area), the location of PSVE in lower concentration areas (<50 ppmV) and the SVE design requirements.

2.2.2 Historical Information

At MCB, the upper 9 to 11 m (30 to 35 ft) of the vadose zone consists of fine-grained sediments (the Upland Unit). Capillary forces within the sediments tend to restrict migration of contaminants. Characterization data at MCB showed that VOCs disposed of at the surface have migrated downward into the Upland Unit where further migration downward into the underlying sandy soils is limited. The MCB SVE wells are screened in the sandy zone below the Upland Unit and have been able to remove VOC mass at a rate approximately equal to the downward migration rate from the Upland Unit, with some variation, as demonstrated by a diffusion rate study conducted by the Savannah River National Laboratory (WSRC 2005b) and as evidenced by the

relative stability in soil-gas concentration seen across the MCB Subunit. The diffusion rate study completed in 2004 demonstrated that some residual VOC contamination remains entrapped within the Upland Unit and continues to diffuse slowly downward where it is removed by PSVE wells. Diffusion is affected by many variables that can change over time. The CM study (WSRC 2005a) provided a scientific basis for a rate calculation based upon discrete measurements. The diffusion rates calculated were 2.1 lb/yr TCE and 0.9 lb/yr PCE. For the period of the study, the corresponding mass removal rate by the PSVE wells was estimated to be 2.1 lb/yr TCE and 1.2 lb/yr PCE. Within the limits of analysis, the numbers are approximately equal. This indicates that VOCs are being removed from the vadose zone at about the same rate as they migrate down from the Upland Unit. Some variation naturally exists due to changing atmospheric and subsurface conditions.

2.2.3 Current Configuration

Since December 10, 2008, the MCB Subunit RA operates a network of 27 PSVE wells consisting of 25 wells equipped with BaroBalls™ and two wells, MCSV-07 and MCSV-17, equipped with MicroBlowers™. The MCB PSVE system has a long-documented history of continual mass removal, resulting in a steadily contracting soil-gas plume in the permeable soils below the less permeable Upland Unit. Locations of the wells are shown on Figure 5. Construction details of these wells are provided in Table 10. The PSVE system at MCB operates under the same principles and limitations discussed for PSVE operations at the Trench Subunit.

2.2.4 SVE Results

Analytical results of sampling from MCB PSVE wells are provided in Tables 11, 12, 13 and 14. MicroBlowers™ effectiveness is apparent as the soil-gas concentrations of TCE and PCE from wells MSCV-07 and MSCV-17 have declined significantly after increasing significantly in years prior to conversion in December 2008. Sample results from both wells tend to be consistent, slightly above the lower lab detection limits, and both wells always have concentrations <5 ppmV since 2008. If either well shows three consecutive quarters of results that are less than detection limits (non-detect), they will be converted back to BaroBalls™.

Four wells (MCSV-07, -17, -25, -27) continue to produce TCE, but at low rates. From 2011 to 2017, the following average and maximum TCE concentrations were recorded:

- MCSV-07 had an average exhaust gas TCE concentration of 0.70 ppmV, with a high value of 1.153 ppmV in 2017. MCSV-07 remains stable in sampled exhaust gas concentrations.
- MCSV-17 had an average exhaust gas TCE concentration of 0.97 ppmV, with a high value of 1.734 ppmV in 2011. MCSV-17 remains stable in sampled exhaust gas concentrations.
- MCSV-25 had an average exhaust gas TCE concentration of 0.30 ppmV, with a high value of 1.228 ppmV in 2011. MCSV-25 remains stable in sampled exhaust gas concentrations.
- MCSV-27 had an average exhaust gas TCE concentration of 0.24 ppmV, with a high value of 1.122 ppmV in 2011. MCSV-27 remains stable and decreasing (last three samples were non-detects) in sampled exhaust gas concentrations.

If concentrations from the MCB BaroBalls™ wells (MCSV-25 and MCSV-27) indicate an upward trend for VOC concentrations, the wells will be converted to MicroBlowers™.

Quarterly PCE results for MicroBlowers™ and BaroBalls™ well exhaust gas are listed in Tables 11 and 12 and quarterly TCE results are listed in Tables 13 and 14. MicroBlowers™ and BaroBalls™ combined extracted approximately 1.5 pounds of TCE in 2017.

Wells near the dilute edge of the plume produce very little contaminant removal, as evidenced by sampling. Ten of the SVE wells were capped in 2005 for rebound testing (Tables 12 and 14). Some of the capped wells were subsequently opened and sampled in 2006. The wells showed small increases in soil-gas concentration but no spike, indicating that most of the VOC contamination has been removed. These wells were returned to passive service as a conservative measure.

3.0 CLOSURE CRITERIA FOR WASTE UNITS WITH SVE SYSTEMS

SRS is committed to SVE operations until the RGs are achieved. The closure criteria for determining when to terminate SVE operations is based on the attainment of the RGs/RAOs. The RAO will be met when residual TCE and PCE contamination in the vadose zone is reduced below

RGs in accordance with the action plan described in the ABRP/MCB/MBP OU CMI/RAIP (WSRC 2006). RGs/RAOs will be verified based on the measurement and evaluation of residual solvent contamination in soil media.

4.0 CONCLUSIONS/RECOMMENDATIONS

4.1 ABRP Trench Subunit Conclusion

Currently, there are 10 wells equipped with MicroBlowers™ and 13 wells equipped with BaroBalls™. This system is functioning as expected.

After Core Team approval of the 2017 PER (SRNS 2017a), the transition to fully PSVE (described below) was completed when the ABRP Trench SVEU ended operations in December 2017. The last three remaining ASVE wells will be converted to MicroBlowers™ operation in 2018. The technical basis for shutting down the SVEU is that the ASVE system had reached a point of diminishing returns as indicated by the following:

- Soil-gas vapor samples have reached a very low (near) asymptotic levels
- Energy expended in extraction of VOCs and equivalent carbon production is very high compared to the actual amount of VOCs extracted (Figure 6).
- The soil formation is considered “diffusion limited” and energy intensive ASVE methods are not as efficient as PSVE.

Soil-gas vapor samples from AHT-11A continued for a fourth consecutive year with all non-detect sampling results. AHT-8B samples have been near non-detect levels (i.e., 0.2 ppmV) for the last four years (Figure 9). ASH-06 experienced a small increase in TCE concentrations with readings slightly above non-detect levels of 0.16 ppmV and 0.24 ppmV in 2016 (See Appendix A). The small increase was most likely due to the conversion of nearby wells (see Figure 4) to MicroBlowers™ and BaroBalls™ in 2015 (see Table 1). The impact of converting nearby wells was more apparent at ASH-06 because of its longer screen length of 30.5 m (100 ft) versus screen lengths of 12.2 m (40 ft) and 7.6 m (25 ft) at wells AHT-11A and AHT-08B, respectively.

The soil formation is considered "diffusion limited". The ASVE system removed 36.89 kg (81.32 lb) of TCE during the second half of 2008, and has continually decreased every half year (except 2011 first half) to the current removal of only 0.20 kg (0.43 lb) of TCE in the second half of 2017. The emissions rates from the SVEU are well below the permit limits contained in the Title V Air Permit (SCDHEC 2007). At these levels, PSVE removal of TCE is much more efficient than the energy intensive ASVE methods.

Compliance sampling (Table 3) was discontinued after shutdown of the active SVEU in December 2017. An internal exemption from air permitting was obtained based on the Potential to Emit calculation that determined the ABRP PSVE (i.e., well sources fitted with MicroBlowers™ and BaroBalls™) is an Insignificant Activity. Emissions, including trace constituent emissions, will be reported, as required, in the annual Air Emissions Inventory. Performance monitoring (Table 4) of the MicroBlowers™ and BaroBalls™ will continue until RGs are achieved.

4.2 MCB Subunit Conclusion

The PSVE system at the MCB Subunit continues to perform well and remains a cost-effective treatment technology in removing low concentration VOC contaminants. The PSVE system continues to capture and remove residual VOC contamination as it diffuses slowly from the fine-grained Upland Unit near the surface, thereby preventing the downward migration to groundwater.

Extensive characterization and sampling history have been documented at the MCB Subunit since 1996. MCB PSVE wells will continue to be monitored closely to watch for any upward trends in concentrations; concentrations are expected to continue to decrease with source depletion. However, if upward trending is conclusively identified at any well, MicroBlowers™ will be installed to ensure protection of underlying groundwater. For example, during 2006 through 2008, an increase was seen at wells MCSV-07 and MCSV-17. Subsequently, MicroBlowers™ were installed on these wells. MCSV-07 and/or MCSV-17 will be converted back to BaroBalls™ if three consecutive quarterly results are less than detection limits.

Declining exhaust concentrations indicate contaminant mass is being removed as it diffuses downward from the Upland Unit, depleting the VOC source. An increase in soil-gas concentration

would indicate that VOC mass is migrating downward from the fine-grained Upland Unit at a faster rate than it is being removed by PSVE. The continued reduction in concentrations of TCE being emitted from the PSVE system are indicative that overall soil-gas concentrations in the permeable sands under the Upland Unit continue to decline over time. Therefore, more mass is being removed than is diffusing down from the Upland Unit which is protective of underlying groundwater.

4.3 Overall Recommendations

The RAs at the ABRP Trench Subunit and the MCB Vadose Zone Soils Subunit continue to remove VOCs and make progress toward RGs as expected.

Sampling of all wells at the ABRP Trench Subunit and the MCB Subunit will continue until the RGs are achieved as stated in the ROD (WSRC 2007). After vapor gas sampling indicates VOCs are no longer being removed or concentrations indicate VOCs are nearly depleted, confirmation soil sampling will be performed per a Core Team approved sampling plan to verify RGs have been met. If the confirmation soil sampling indicates RGs are not met, PSVE will continue.

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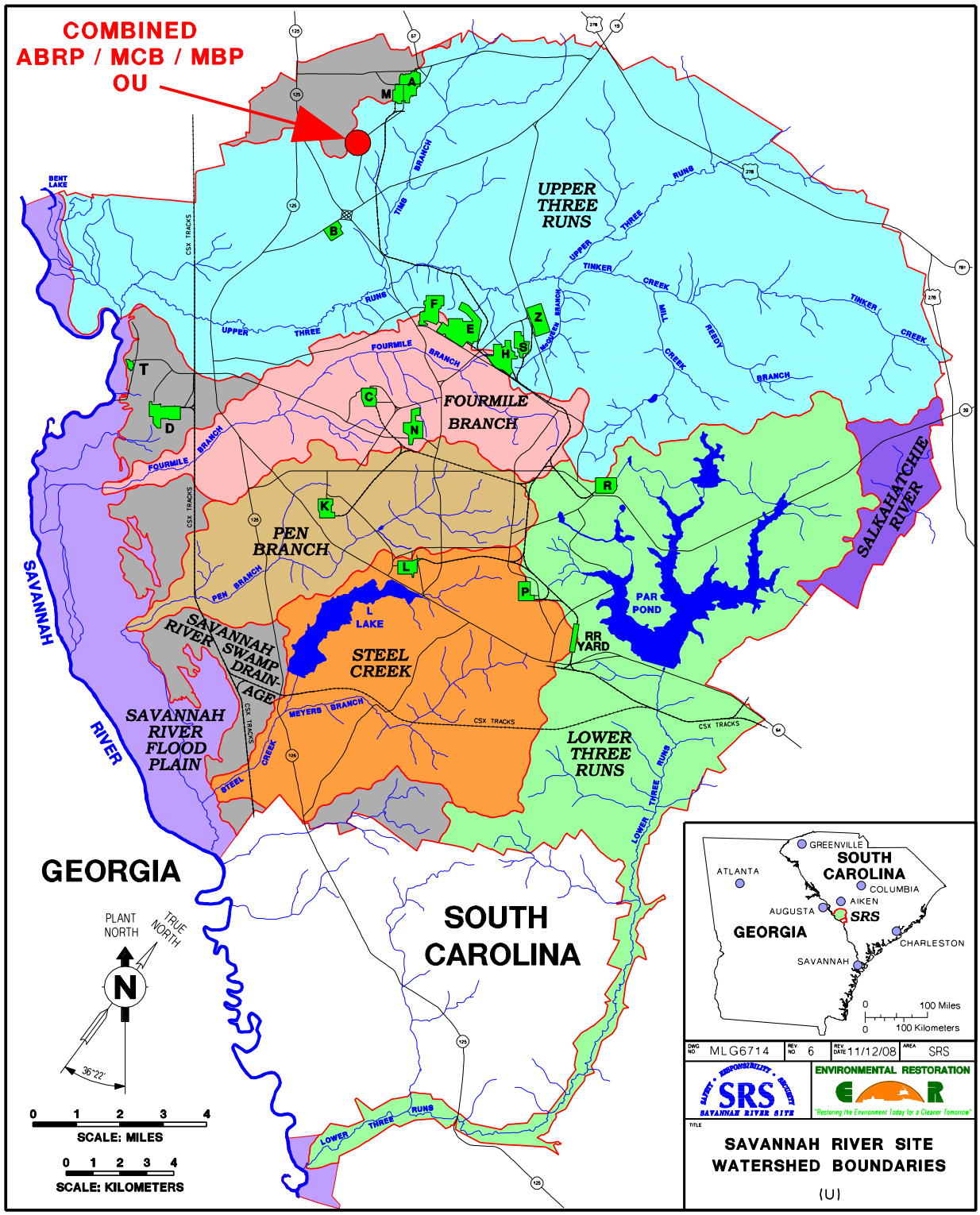

Figure 1. Location of the ABRP/MCB/MBP OU at Savannah River Site

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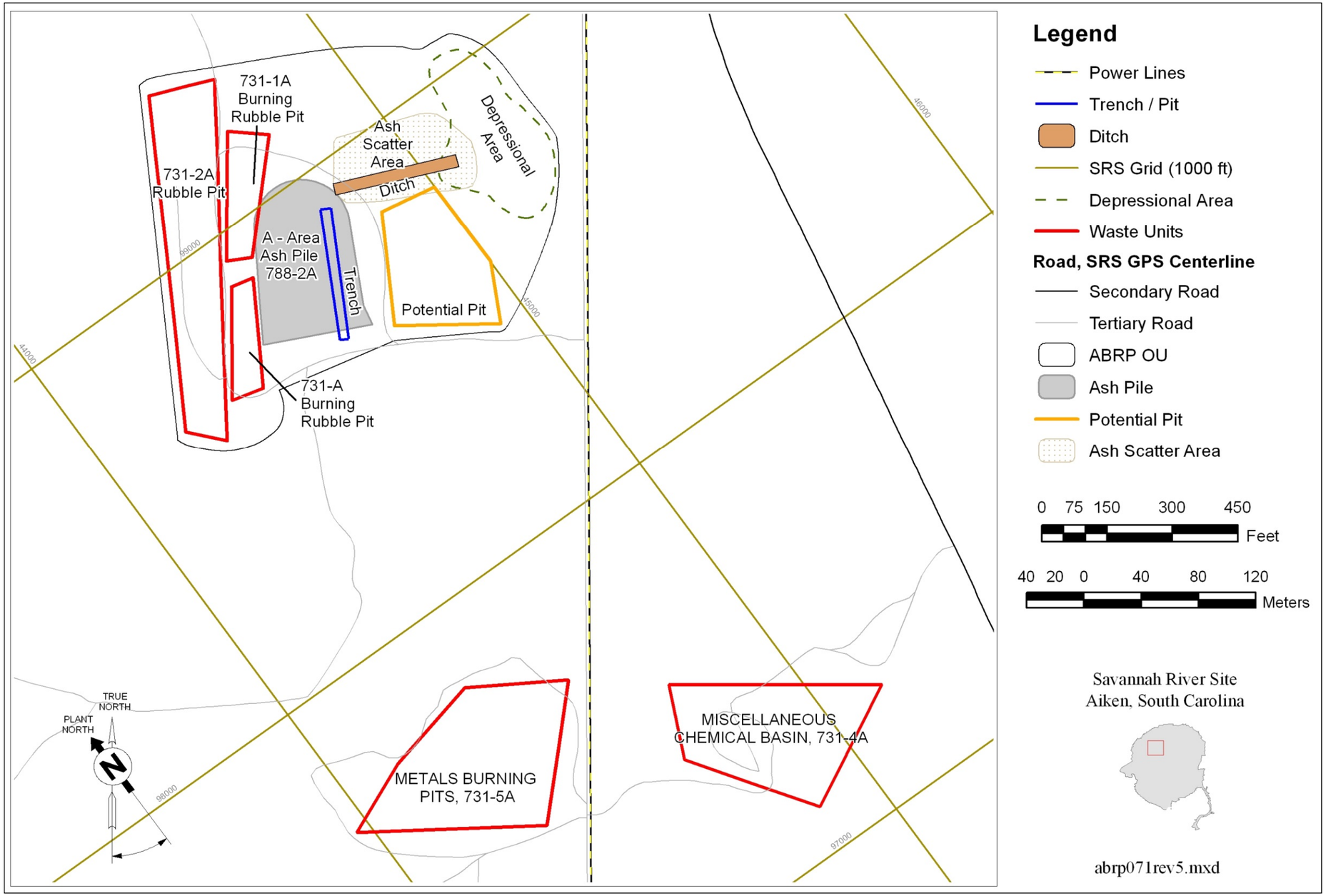

Figure 2. ABRP/MCB/MBP OU Subunits at Savannah River Site

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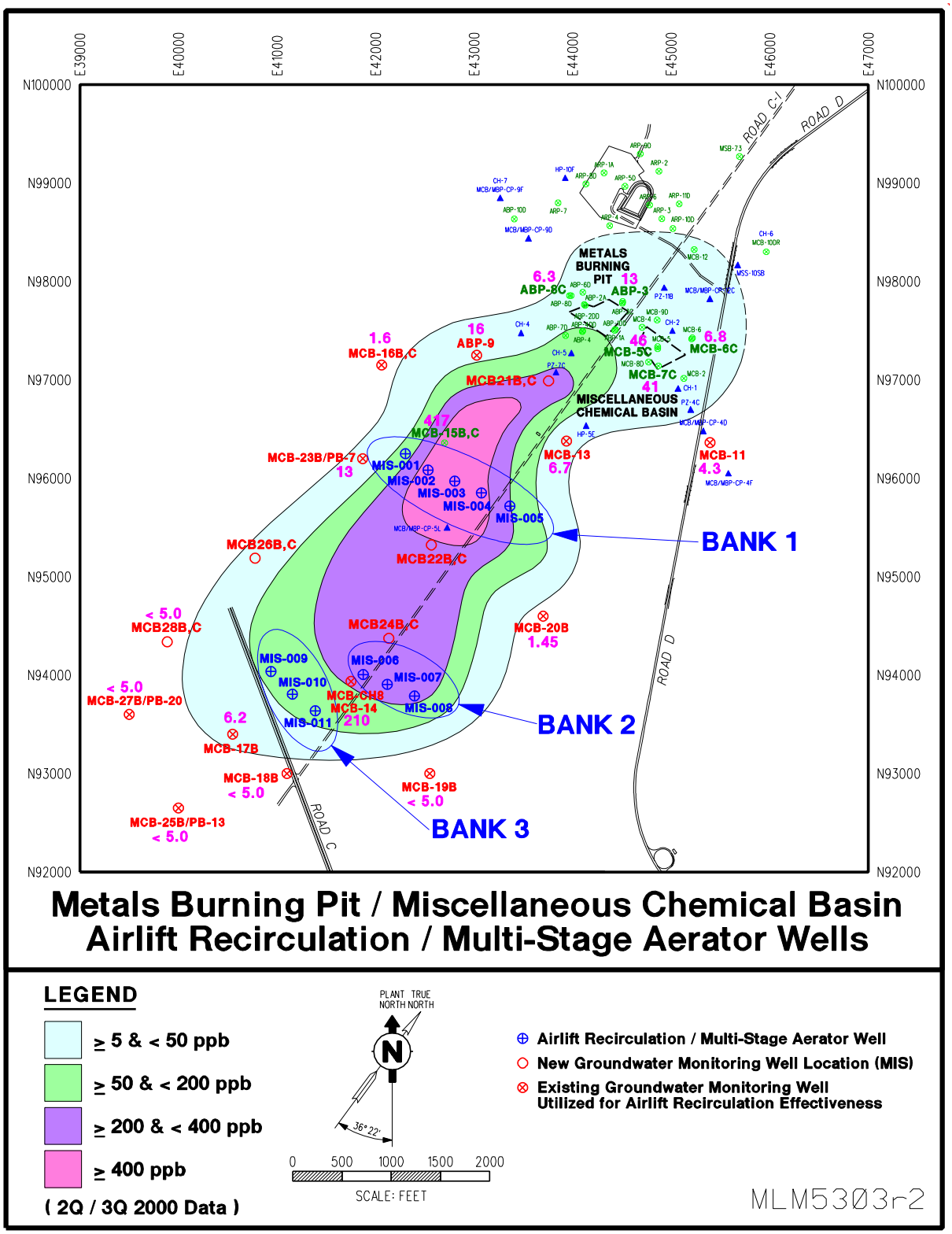

Figure 3. Map of the MCB Airlift Recirculation Well Banks

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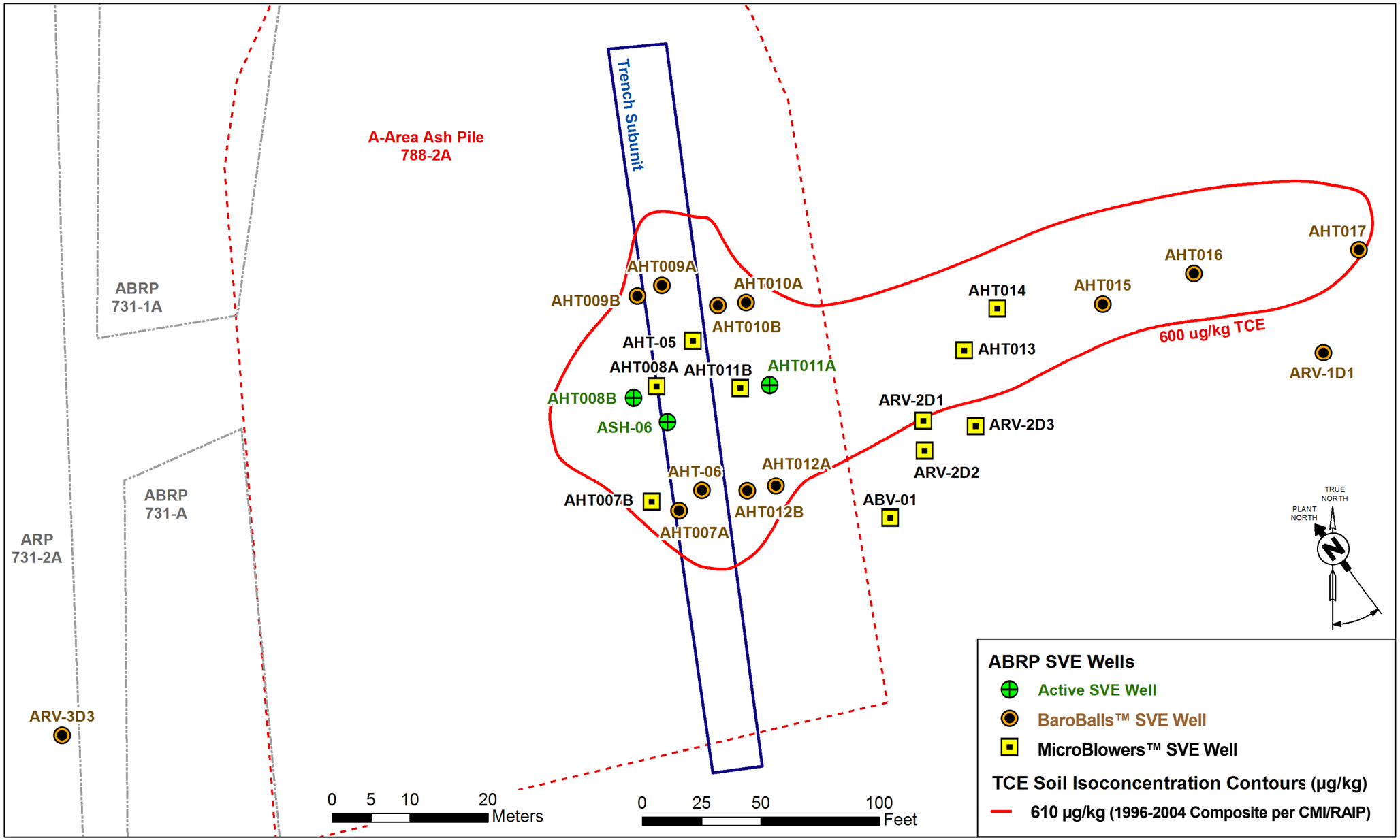

Figure 4. ABRP Vadose Zone Well Configuration and Treatment Area

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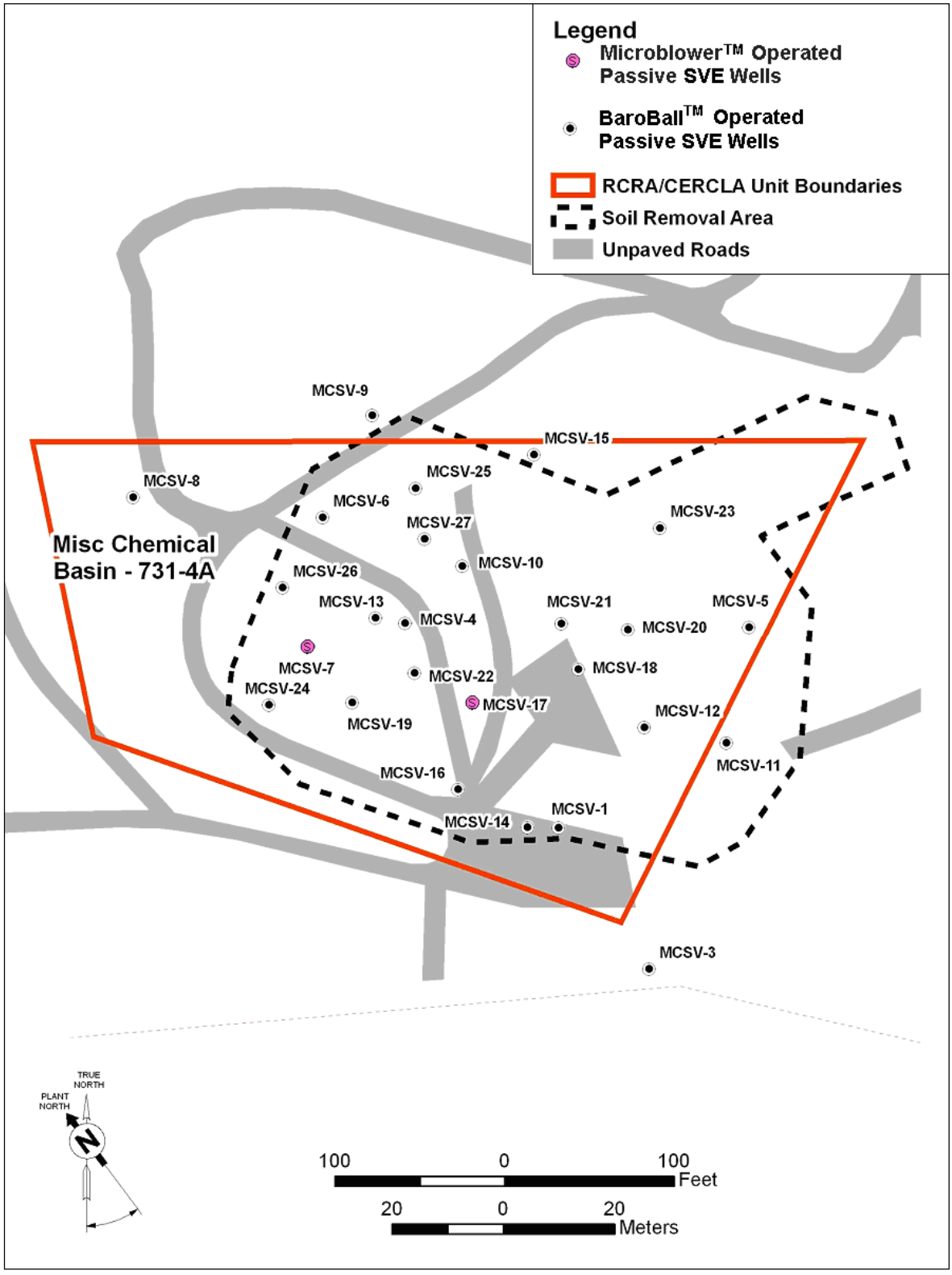


Figure 5. Miscellaneous Chemical Basin SVE Wells

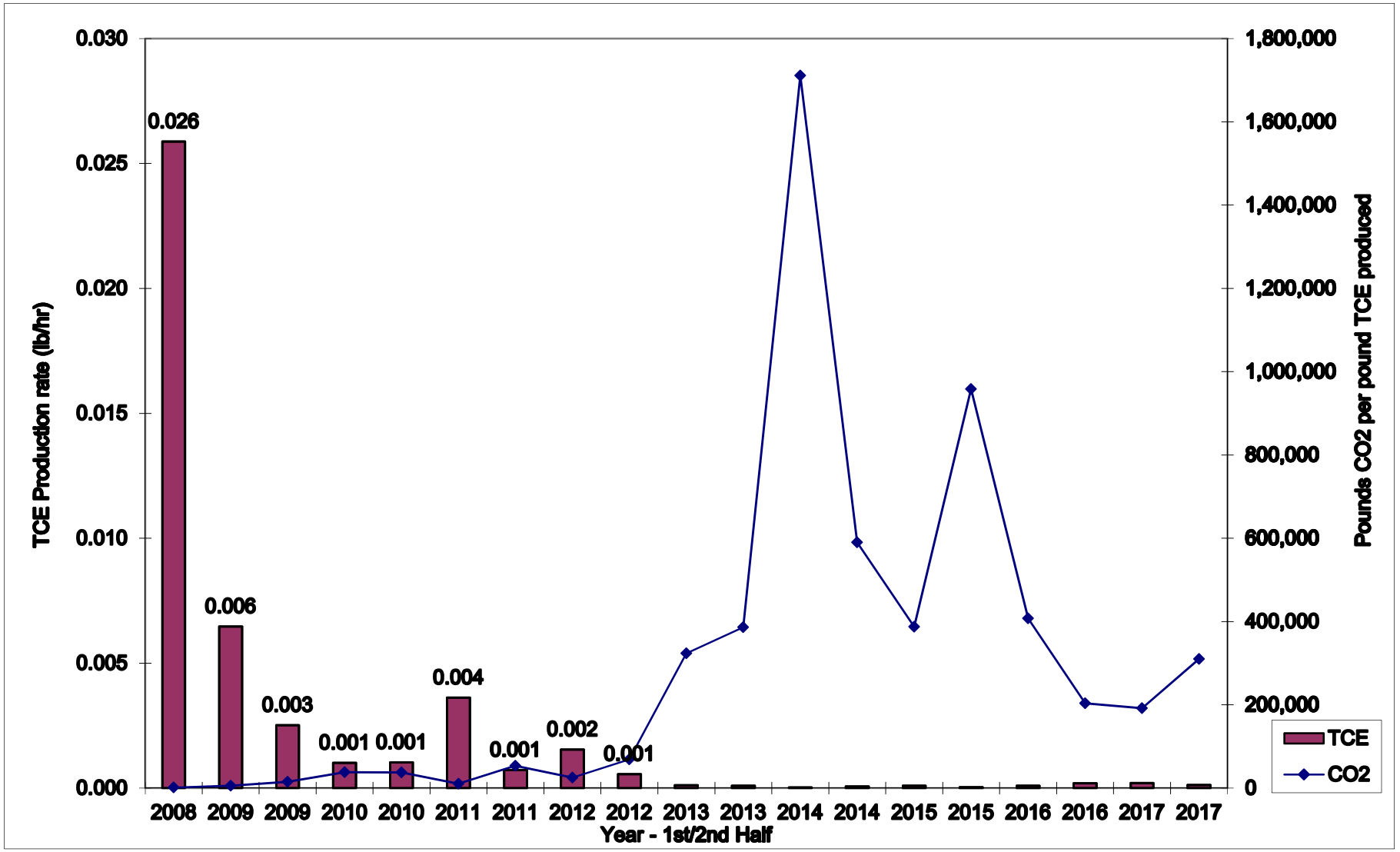
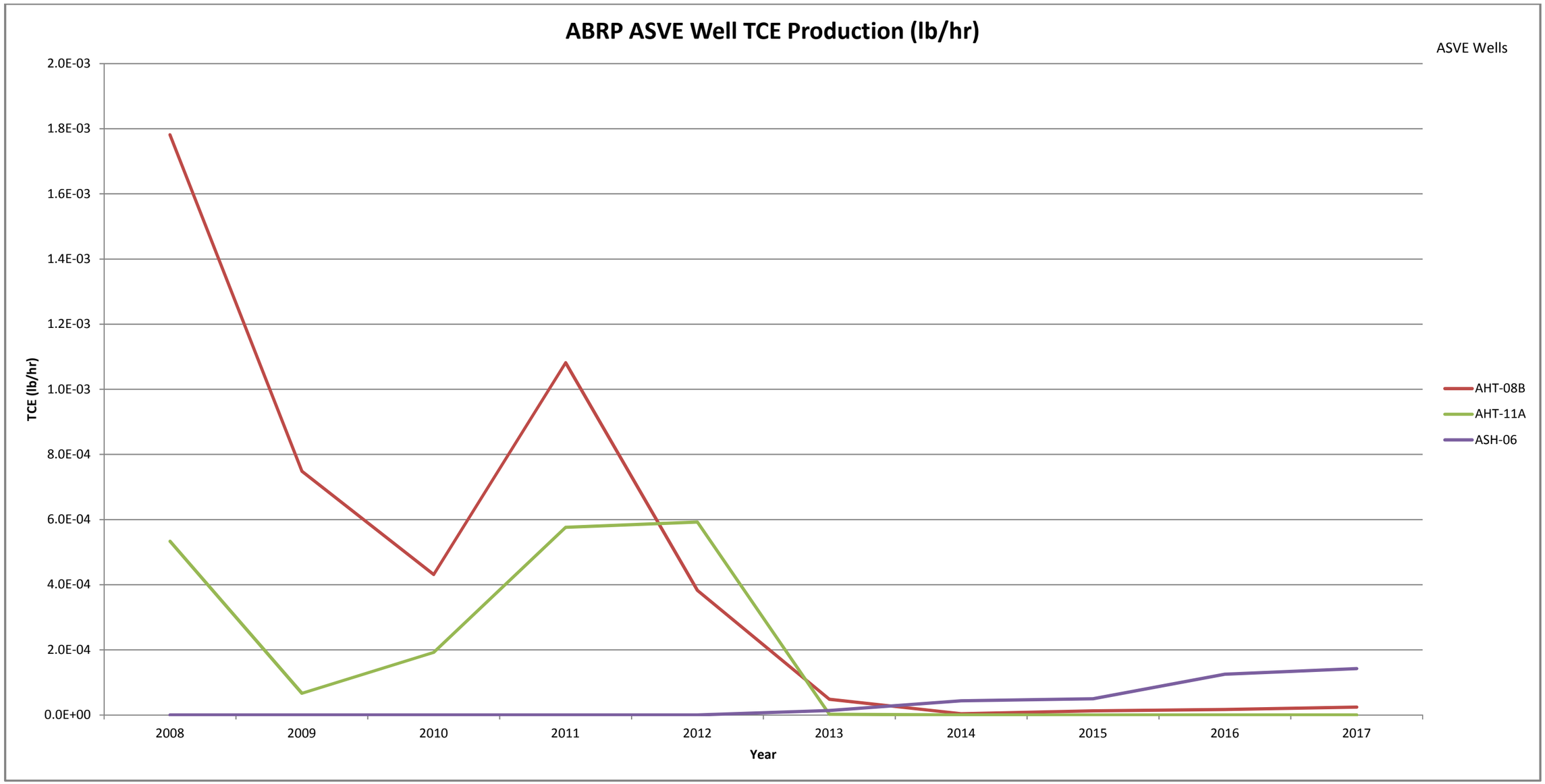


Figure 6. ABRP Active SVE System TCE Production Rates (with Consequent CO_2 Production)



Note: ASH-06 operated with BaroBalls™ in 2008 to 2012. ASVE operation ended in December 2017.

Figure 7. ABRP Phased SVE (Active) Well TCE Production Rates

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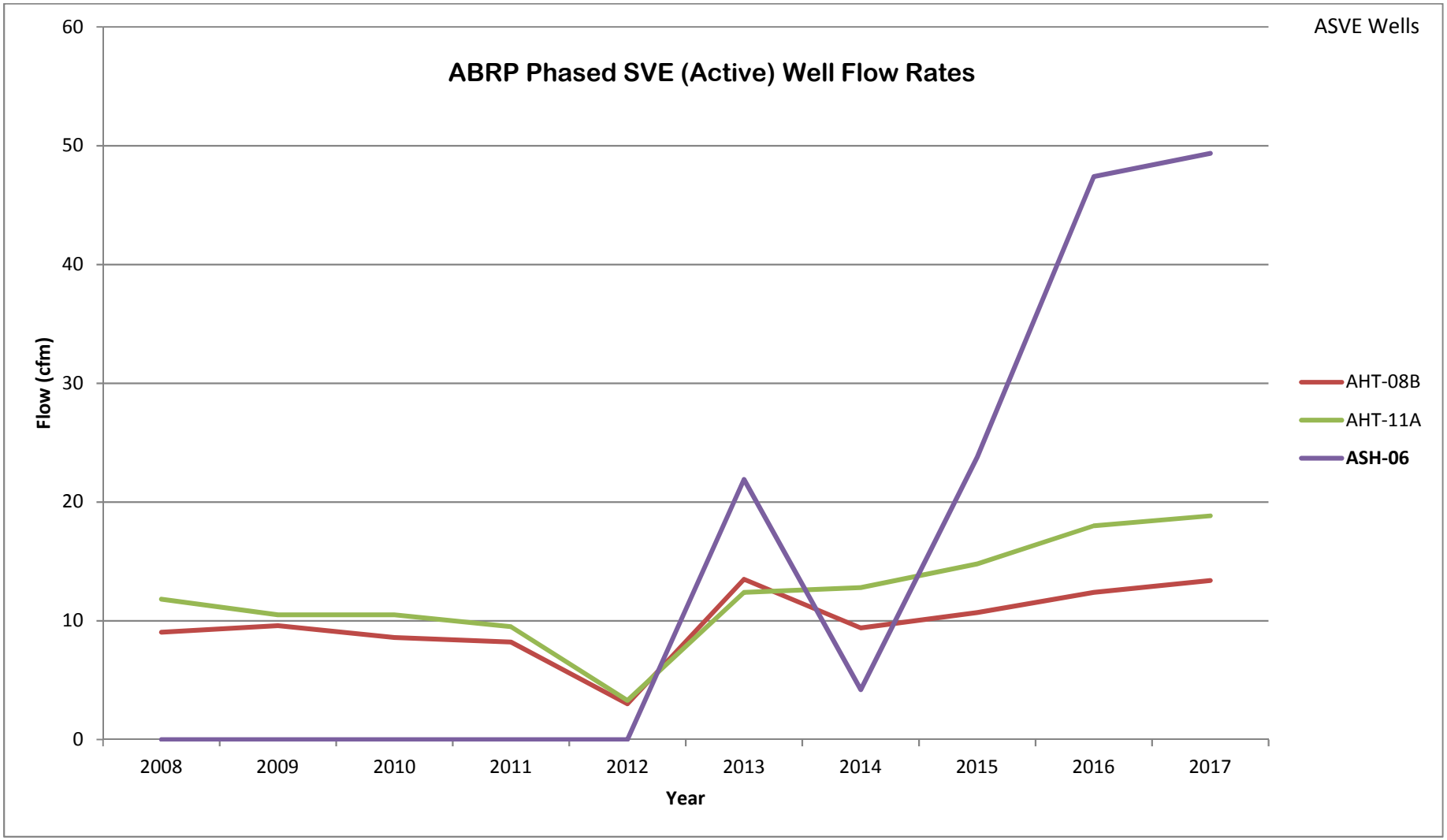
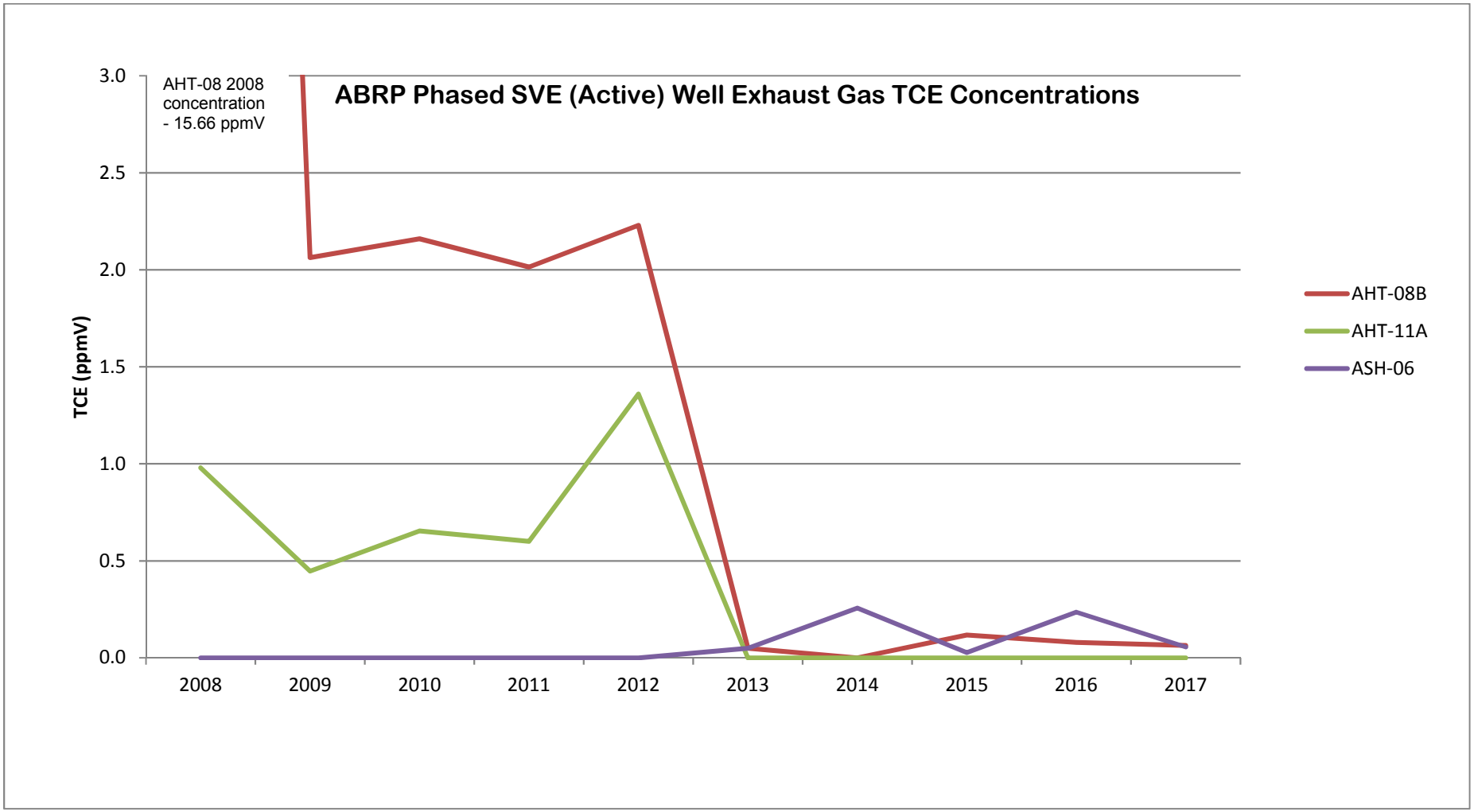


Note: ASH-06 operated with BaroBalls™ in 2008 to 2012. ASVE operation ended in December 2017.

Figure 8. ABRP Phased SVE (Active) Well Flow Rates



Note: ASH-06 operated with BaroBalls™ in 2008 to 2012. ASVE operation ended in December 2017.

Figure 9. ABRP Phased SVE (Active) Well Exhaust Gas TCE Concentrations

Table 1. Historical ABRP SVE Operating Configurations

Interim Remedial Action (WSRC 2000)		
Originally, 9 wells fitted with BaroBalls™		
ABV-01, AHT-05, AHT-06, ARV-1D1, ARV-2D1, -2D2, -2D3, -3D3, ASH-06		
Start Date	**End Date**	**Technology**
10/5/2001	12/3/2001	PSVE w/ BaroBalls™
12/3/2001	12/17/2001	4 wells (ABV-01, AHT-05, AHT-06, ASH-06) connected to ASVE
12/17/2001	9/1/2002	All 9 wells PSVE w/ BaroBalls™
Explanation of Significant Differences (WSRC 2001)		
Operate 4 SVE wells in the Trench/Pit Area		
(ABV-01, AHT-05, AHT-06, ASH-06)		
Start Date	**End Date**	**Technology**
9/1/2002	7/15/2003	4 wells (ABV-01, AHT-05, AHT-06, ASH-06) converted to MicroBlowers™
7/15/2003	9/16/2003	4 wells (ABV-01, AHT-05, AHT-06, ASH-06) connected to SVEU
9/16/2003	12/18/2003	4 wells (ABV-01, AHT-05, AHT-06, ASH-06) capped for rebound test
12/18/2003	11/28/2007	2 wells (ABV-01, AHT-05) converted to MicroBlowers™
12/18/2003	11/28/2007	2 wells (AHT-06, ASH-06) converted to BaroBalls™
11/28/2007	8/7/2008	Operation Suspended
Final Remedial Action (WSRC 2007)		
17 wells added and connected to SVEU		
AHT-07A, -07B, -08A, -08B, -09A, -09B, -10A, -10B, -11A, -11B, -12A, -12B, -13, -14, -15, -16, -17		
Start Date	**End Date**	**Technology**
06/23/2008	12/13/2017	ASVE
8/7/2008	Current	2 wells (ARV-2D1, -2D3) converted to MicroBlowers™, Operations Intermittent
10/01/2009	Current	1 well (ARV-2D2) converted to MicroBlowers™, Operations Intermittent
	11/17/2015	10 wells (AHT-07A, -09A, -09B, -10A, -10B, -12A, -12B, -15, -16, -17) converted to BaroBalls™
	12/7/2015	5 wells (AHT-07B, -08A, -11B, 13, -14) converted to MicroBlowers™
4/4/2013	12/13/2017	1 well (ASH-06) added to SVEU
	12/13/2017	3 wells (AHT-08B, -11A, ASH-06) shutdown
Current Configuration - 10 MicroBlowers™, 13 BaroBalls™, 3 shut down		

Table 2. ABRP Well Construction Details

Well ID	East Coordinate (UTM)	North Coordinate (UTM)	Ground Surface	Screen Top	Screen Bottom	Screen Length
			(ft asl)	*(ft bgs)*		*(ft)*
Installed for Interim RA in 2003						
ABV-01	431,051.581	3,686,482.763	340.7	73	123	50
ASH-06	431,022.923	3,686,495.167	360.7	40	140	100
AHT-05 – upper screen	431,026.137	3,686,505.643	359.3	50	70	20
– middle screen				90	100	10
– lower screen				120	140	20
AHT-06 – upper screen	431,027.323	3,686,486.373	361.2	45	80	35
– middle screen				95	105	10
– lower screen				120	125	5
Installed for Final RA in 2008						
AHT-7A	431,024.385	3,686,483.710	357.04	82.2	102.2	20
AHT-7B	431,020.836	3,686,484.858	357.43	45.7	70.7	25
AHT-8A	431,021.492	3,686,499.696	357.42	82.8	102.8	20
AHT-8B	431,018.533	3,686,498.220	357.69	45.4	70.4	25
AHT-9A	431,022.143	3,686,512.833	357.29	82.6	102.6	20
AHT-9B	431,019.003	3,686,511.452	357.52	46.0	71.0	25
AHT-10A	431,033.003	3,686,510.600	355.79	81.0	121.0	40
AHT10B	431,029.389	3,686,510.231	356.16	30.4	70.4	40
AHT-11A	431,036.050	3,686,499.890	355.39	80.4	120.4	40
AHT-11B	431,032.284	3,686,499.523	356.04	30.6	70.6	40
AHT-12A	431,036.846	3,686,486.939	355.81	80.4	120.4	40
AHT-12B	431,033.168	3,686,486.297	356.06	30.4	70.4	40
AHT-13	431,061.061	3,686,504.415	340.63	79.9	109.9	30
AHT-14	431,065.313	3,686,509.809	340.19	80.1	115.1	35
AHT-15	431,078.882	3,686,510.377	338.72	74.7	119.7	45

Table 2. ABRP Well Construction Details *(Continued)*

Well ID	East Coordinate (UTM)	North Coordinate (UTM)	Ground Surface	Screen Top	Screen Bottom	Screen Length
			(ft asl)	*(ft bgs)*		*(ft)*
Installed for Final RA in 2008 (cont'd)						
AHT-16	431,090.604	3,686,514.312	337.64	80.0	120.0	40
AHT-17	431,111.851	3,686,517.379	335.95	95.0	120.0	25
Installed for Sparging System in 2001						
ARV-1D1	431,107.28	3,686,504.15	337.99	97.05	117.12	20.07
ARV-1D2	431,106.85	3,686,499.89	337.96	96.60	116.50	19.90
ARV-1D3	431,112.66	3,686,503.08	337.44	93.70	133.80	40.10
ARV-2D1	431,055.82	3,686,495.32	340.79	97.00	107.12	10.12
ARV-2D2	431,055.97	3,686,491.45	340.66	97.00	117.08	20.08
ARV-2D3	431,062.53	3,686,494.61	340.25	106.96	117.00	10.04
ARV-3D1	430,948.38	3,686,457.29	350.44	100.88	121.00	20.12
ARV-3D2	430,947.90	3,686,453.26	350.49	101.00	111.11	10.11
ARV-3D3	430,944.96	3,686,454.78	350.72	105.00	115.06	10.06
ARV-4D1	430,946.09	3,686,501.62	350.00	106.75	126.87	20.12
ARV-4D2	430,946.22	3,686,497.46	349.94	115.24	125.29	10.05
ARV-4D3	430,943.01	3,686,498.91	350.28	115.00	125.04	10.04
ARV-5D1	430,943.05	3,686,557.91	349.35	110.00	130.08	20.08
ARV-5D2	430,944.24	3,686,553.81	349.18	110.00	130.12	20.12
ARV-5D3	430,940.69	3,686,554.81	349.61	113.50	143.68	30.18
ARV-6D1	430,946.95	3,686,483.83	350.18	110.00	130.14	20.14
ARV-6D2	430,946.75	3,686,479.48	350.25	110.25	130.39	20.14
ARV-6D3	430,943.31	3,686,482.38	350.33	106.00	126.18	20.18
ARV-7D1	430,944.63	3,686,533.01	349.62	107.00	117.12	10.12
ARV-7D2	430,943.83	3,686,528.32	349.91	115.45	125.60	10.15
ARV-7D3	430,941.18	3,686,530.50	350.07	115.00	125.05	10.05

Table 2. ABRP Well Construction Details *(Continued/End)*

Well ID	East Coordinate (UTM)	North Coordinate (UTM)	Ground Surface	Screen Top	Screen Bottom	Screen Length
			(ft asl)	*(ft bgs)*		*(ft)*
Installed for Sparging System in 2001 (cont'd)						
ARV-8D1	430,903.32	3,686,462.86	350.65	108.00	128.10	20.10
ARV-8D2	430,902.72	3,686,461.02	350.66	112.00	132.13	20.13
ARV-8D3	430,896.44	3,686,463.66	350.35	114.50	144.70	30.20
ARV-9D1	430,901.07	3,686,492.47	349.71	112.00	132.12	20.12
ARV-9D2	430,901.09	3,686,496.75	349.45	112.00	132.14	20.14
ARV-9D3	430,893.65	3,686,493.31	350.29	112.00	132.12	20.12
ARV-10D1	430,896.57	3,686,530.10	348.64	107.00	127.12	20.12
ARV-10D2	430,896.27	3,686,534.61	348.64	107.00	127.12	20.12
ARV-10D3	430,889.35	3,686,530.87	349.54	106.59	126.71	20.12

asl – above sea level
bgs – below ground surface
ft – feet
ABV – A-Area Burning/Rubble Pit Vadose Zone
AHT – A-Area Hidden Trench
ARV – A-Area Recovery Vapor
UTM – Universal Transverse Mercator

Table 3. ABRP SVEU Compliance Sampling Requirements

Applicable Permit	Sample Location	Sample Media	Analytes to Sample	Frequency	Limit/ Standard	Comments
AQP	SVE Exhaust	Vapor	VOC emissions (TCE, PCE, c-DCE)	Monthly per Permit Conditions*	N/A	12-month rolling sum for all SVE units carried under permit ≤39.9

Condition g6.B.1 of the air quality permit (AQP) applies to operation of individual SVEs and states:
Savannah River Site shall determine the VOC emissions from these sources as follows:

a. When the emissions for the measured constituents are greater than or equal to 70% of the maximum potential emissions for that unit, sampling is performed at least **monthly**.

b. When the emissions for the measured constituents are less than or equal to (≤) 69% of the maximum potential emissions for that unit, sampling is performed at least **bimonthly**.

c. When the emissions for the measured constituents are ≤49% of the maximum potential emissions for that unit, sampling is performed at least **quarterly**.

d. When the emissions for the measured constituents are ≤29% of the maximum potential emissions for that unit, sampling is performed at least **semiannually**.

*** Note: g6.B.1 conflicts with g6.B.2, which states that air sampling shall be performed MONTHLY to revalidate the emissions factor. Therefore, the more conservative g6.B.2 was complied with, instead of g6.B.1.**

Table 4. ABRP SVE Wells and SVEU Performance Sampling Requirements (WSRC 2006)

Sample Location	Sample Media	Sample Parameters	Minimum Frequency*	Comments
SVE Unit	Vapor	Effluent Flow Rate	Quarterly	Air flow per flow meter reading.
		TCE, PCE	Quarterly	Vapor analyses with portable gas analyzer (e.g., B&K or Innova) or other approved equipment/technique.
Well heads	Vapor	Air Flow Rate, Vacuum	Quarterly	Vacuum per gauge reading at wellheads. Flow rate with portable flow meter.
		TCE, PCE	Quarterly	Vapor analyses with portable gas analyzer (e.g., B&K or Innova) or other approved equipment/technique.

*Note:
Minimum performance sampling for the SVEU and the individual well heads is required quarterly; however, sampling frequency is monthly at the SVEU as required by the Compliance Sampling Requirements (Table 3).

Minimum frequency may be increased at Design Authority discretion. Actual monitoring does exceed minimum requirements. The SVEU and well heads are sampled daily for flow rate and vacuum pressure and MicroBlowers™ are sampled monthly for flowrate and pressure.

Innova – Innova Electronics Corp

Table 5. ABRP Trench SVE System Well TCE Production Data

Well ID	TCE Extracted *(lb)*																			
	Total	2008	2009		2010		2011		2012		2013		2014		2015		2016		2017	
		2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half
AHT-07A	3.37	3.24	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a	n/a
AHT-07B	7.09	4.95	0.65	0.36	0.27	0.25	0.36	0.00	0.12	0.04	0.00	0.00	0.00	0.00	0.06	0.01	n/a	n/a	n/a	n/a
AHT-08A	6.53	5.16	0.28	0.00	0.00	0.10	0.56	0.10	0.25	0.06	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a	n/a
AHT-08B	24.37	5.55	3.56	0.91	1.44	1.51	6.61	1.87	1.34	0.58	0.25	0.35	0.02	0.00	0.03	0.06	0.06	0.06	0.09	0.08
AHT-09A	0.68	0.62	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a	n/a
AHT-09B	3.40	1.80	0.70	0.51	0.23	0.06	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a	n/a
AHT-10A	6.63	4.75	0.97	0.43	0.30	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a	n/a
AHT-10B	6.10	4.29	1.10	0.46	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a	n/a
AHT-11A	11.77	1.64	0.18	0.22	0.35	0.96	3.63	0.88	3.23	0.64	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AHT-11B	23.02	8.77	10.01	3.41	0.17	0.02	0.43	0.20	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a	n/a
AHT-12A	1.04	0.86	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a	n/a
AHT-12B	0.66	0.53	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a	n/a
AHT-13	19.04	15.32	1.37	0.40	0.36	0.36	0.66	0.12	0.44	0.01	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a	n/a
AHT-14	17.96	14.99	0.99	0.00	0.00	0.19	0.90	0.02	0.84	0.03	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a	n/a
AHT-15	6.89	6.23	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a	n/a
AHT-16	2.13	1.80	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a	n/a
AHT-17	0.98	0.82	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a	n/a	n/a	n/a
ASH-06	2.66	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.09	0.04	0.03	0.20	0.29	0.06	0.30	0.62	0.68	0.34
Total of All Wells	**143.32**	**81.32**	**21.45**	**6.71**	**3.37**	**3.62**	**13.26**	**3.03**	**6.42**	**1.37**	**0.37**	**0.06**	**0.05**	**0.20**	**0.38**	**0.13**	**0.36**	**0.68**	**0.77**	**0.43**

lb – pounds
n/a – not applicable

– operation ended in December 2017.

Table 6. ABRP Trench SVE System Operation Summary

Period		TCE Total Pounds Extracted	SVEU Hours of Operation	TCE Pounds per Hour of Operation
2008	2nd Half	81.32	3,143	2.59E-02
2009	1st Half	21.45	3,315	6.47E-03
	2nd Half	6.71	2,662	2.52E-03
2010	1st Half	3.37	3,323	1.01E-03
	2nd Half	3.62	3,493	1.03E-03
2011	1st Half	13.26	3,661	3.62E-03
	2nd Half	3.03	4,178	7.26E-04
2012	1st Half	6.42	4,148	1.55E-03
	2nd Half	1.37	2,435	5.63E-04
2013	1st Half	0.37	3,043	1.20E-04
	2nd Half	0.39	3,830	1.01E-04
2014	1st Half	0.05	2,333	2.28E-05
	2nd Half	0.20	3,097	6.61E-05
2015	1st Half	0.38	3,811	1.01E-04
	2nd Half	0.13	3,233	4.07E-05
2016	1st Half	0.36	3,762	9.57E-05
	2nd Half	0.68	3,570	1.91E-04
2017	1st Half	0.77	3,804	2.03E-04
	2nd Half	0.43	3,383	1.26E-04
Total Production		**144.32**	**64,225**	**2.25E-03**

Reference: SRNS Operator Round Sheets

Table 7. ABRP Trench MicroBlowers™ Well Exhaust Gas TCE Results

Collection Date	Station ID — TCE *(ppmV)*					
	ABV-01[1]	AHT-05[1]	ARV-2D1[2]	ARV-2D2[3]	ARV-2D3[2]	ASH-06[1]
10/17/2005	30	27.9	**	***	**	87.330
1/4/2006	29.987	29.929	**	***	**	97.494
4/17/2006	29.974	31.957	**	***	**	107.659
8/28/2006	27.702	32.292	**	***	**	58.957
10/12/2006	26.104	30.227	**	***	**	36.869
1/17/2007	27.302	31.093	**	***	**	46.688
4/19/2007	28.5	34.503	**	***	**	71.700
7/18/2007	25.015	15.046	**	***	**	39.847
10/23/2007	27.683	21.676	**	***	**	26.609
9/23/2008	0.057	0.023	0.068	***	0.134	0.016
11/17/2008	0.007	0.031	0.021	***	0.076	ND
1/27/2009	0.045	0.226	0.014	***	ND	ND
4/21/2009	ND	ND	ND	***	ND	ND
7/16/2009	ND	0.119	ND	***	ND	ND
10/26/2009	ND	ND	ND	ND	ND	ND
1/19/2010	ND	ND	ND	ND	ND	ND
7/19/2010	ND	ND	ND	ND	ND	8.640
1/18/2011	ND	ND	ND	ND	ND	ND
4/18/2011	ND	ND	ND	ND	ND	10.218
7/12/2011	ND	ND	ND	ND	ND	43.769
10/19/2011	ND	ND	ND	ND	ND	14.838
1/24/2012	ND	ND	ND	ND	ND	9.195
4/23/2012	ND	ND	ND	ND	ND	38.244
7/16/2012	ND	ND	ND	ND	ND	57.557
10/16/2012	ND	ND	ND	ND	ND	27.504
1/14/2013	ND	ND	ND	ND	ND	14.900
4/15/2013	ND	ND	ND	ND	ND	3.290
7/17/2013	ND	ND	ND	ND	ND	[4]
11/19/2013	ND	ND	ND	ND	ND	[4]
2/19/2014	ND	ND	ND	ND	ND	[4]
4/22/2014	ND	ND	ND	ND	ND	[4]
8/12/2014	ND	ND	ND	ND	ND	[4]
10/14/2014	ND	ND	ND	ND	ND	[4]
2/9/2015	ND	ND	ND	ND	ND	[4]
4/28/2015	ND	ND	ND	ND	ND	[4]
7/21/2015	ND	0.104	ND	ND	ND	[4]
12/8/2015	ND	ND	ND	ND	ND	[4]
2/8/2016	ND	ND	ND	ND	0.036	[4]
5/17/2016	ND	ND	ND	0.049	ND	[4]
9/13/2016	ND	ND	ND	ND	ND	[4]
12/12/2016	ND	ND	ND	0.068	ND	[4]
2/13/2017	0.036	ND	ND	0.034	ND	[4]
5/16/2017	ND	ND	ND	ND	ND	[4]
9/14/2017	ND	ND	ND	ND	ND	[4]
12/13/2017	ND	ND	ND	0.033	ND	[4]

Table 7. ABRP Trench MicroBlowers™ Well Exhaust Gas TCE Results *(Continued/End)*

Collection Date	Station ID — TCE *(ppmV)*				
	AHT-07B[5]	**AHT-08A[5]**	**AHT-11B[5]**	**AHT-13[5]**	**AHT-14[5]**
2/9/2016	ND	ND	ND	ND	ND
5/16/2016	ND	ND	ND	ND	ND
9/12/2016	ND	ND	ND	ND	ND
12/12/2016	ND	ND	ND	ND	ND
2/13/2017	ND	ND	ND	ND	ND
5/16/2017	ND	ND	ND	ND	ND
9/14/2017	ND	ND	ND	ND	ND
12/13/2017	ND	ND	ND	ND	ND

Note:
ABV – A-Area Burning/Rubble Pit Vadose Zone
AHT – A-Area Hidden Trench
ARV – A-Area Recovery Vapor
ASH – A-Area Ash Pile
ND – non-detect
ppmV – parts per million by volume

Well History Notes:
[1] ABV-01, AHT-05 and ASH-06 were converted to a MicroBlowers™ SVE well on 9/1/2002
[2] ARV-2D1 and ARV-2D3 was converted to a MicroBlowers™ SVE well in 8/7/2008
[3] ARV-2D2 was converted to a MicroBlowers™ SVE well in Q3, 2009
[4] ASH-06 was converted to ASVE in April 2013
[5] AHT-07B, -08A, -11B, -13, -14 were converted to a MicroBlowers™ SVE well on 12/7/15

Table 8. ABRP PSVE BaroBalls™ Well Exhaust Gas TCE Results

Collection Date	Station ID — TCE *(ppmV)*				
	AHT-06	ARV-1D1	ARV-2D2	ARV-3D3	ASH-06
10/17/2005	ND	1.55	79.5	1.05	87.330
1/4/2006	ND	1.445	75.073	1.689	97.494
4/17/2006	14.308	1.59	88.868	2.565	107.659
8/28/2006	44.583	1.358	56.672	3.125	58.957
10/12/2006	5.31	0.955	51.06	2.248	36.869
1/17/2007	2.606	1.13	54.02	1.47	46.688
4/19/2007	ND	0.623	45.571	0.995	71.700
7/18/2007	1.079	0.62	43.143	0.5526	39.847
10/23/2007	0.057	0.703	40.715	0.876	26.609
9/23/2008	1.079	0.02	0.132	ND	0.016
11/17/2008	0.057	0.018	0.128	ND	ND
1/27/2009	0.097	0.006	0.659	ND	ND
4/21/2009	ND	ND	ND	ND	ND
7/16/2009	ND	ND	ND	ND	ND
10/26/2009	ND	ND	*	ND	ND
1/19/2010	ND	ND	*	ND	ND
7/19/2010	ND	ND	*	ND	8.640
1/18/2011	ND	ND	*	ND	ND
4/18/2011	0.269	ND	*	ND	10.218
7/12/2011	ND	ND	*	ND	43.769
10/19/2011	ND	ND	*	ND	14.838
1/24/2012	0.745	ND	*	ND	9.195
4/23/2012	0.140	ND	*	ND	38.244
7/16/2012	ND	ND	*	ND	57.557
10/16/2012	0.202	ND	*	ND	27.504
1/14/2013	ND	ND	*	ND	14.900
4/15/2013	ND	ND	*	ND	**
7/17/2013	ND	ND	*	ND	**
11/19/2013	ND	ND	*	ND	**
2/19/2014	ND	ND	*	ND	**
4/22/2014	ND	ND	*	ND	**
8/12/2014	ND	ND	*	ND	**
10/14/2014	ND	ND	*	ND	**
2/9/2015	ND	ND	*	ND	**
4/28/2015	ND	ND	*	ND	**
7/21/2015	ND	ND	*	ND	**
12/8/2015	ND	ND	*	ND	**
2/8/2016	ND	ND	*	ND	**
5/17/2016	ND	ND	*	ND	**
9/13/2016	0.091	ND	*	ND	**
12/12/2016	0.045	ND	*	ND	**
2/13/2017	0.132	ND	*	ND	**
5/16/2017	0.041	ND	*	ND	**
9/14/2017	ND	ND	*	ND	**
12/13/2017	ND	ND	*	ND	**

Table 8 ABRP PSVE BaroBalls™ Well Exhaust Gas TCE Results *(Continued/End)*

Collection Date	Station ID — TCE *(ppmV)*				
	AHT-07A	**AHT-09A**	**AHT-09B**	**AHT-10A**	**AHT-10B**
2/9/2016	0.067	ND	0.031	0.067	0.045
5/16/2016	0.054	ND	ND	ND	ND
9/12/2016	ND	ND	ND	ND	ND
12/12/2016	0.042	ND	ND	0.032	ND
2/13/2017	ND	ND	ND	ND	ND
5/16/2017	ND	ND	ND	ND	ND
9/14/2017	ND	ND	ND	ND	ND
12/13/2017	ND	ND	ND	ND	ND
	AHT-12A	**AHT-12B**	**AHT-15**	**AHT-16**	**AHT-17**
2/9/2016	ND	ND	ND	ND	ND
5/16/2016	ND	ND	ND	ND	ND
9/12/2016	ND	ND	ND	ND	ND
12/12/2016	ND	ND	ND	ND	ND
2/13/2017	ND	ND	ND	ND	ND
5/16/2017	ND	ND	ND	ND	ND
9/14/2017	ND	ND	ND	ND	ND
12/13/2017	ND	ND	ND	ND	ND

Note:
AHT – A-Area Hidden Trench
ASH – A-Area Ash Pile
ppmV – parts per million by volume
ARV – A-Area Recovery Vapor
ND – non-detect

Well History Notes:
AHT-06, ARV-1D1, ARV-2D2, ARV-3D3 and ASH-06 were converted to BaroBalls™ in 2001.
*- ARV-2D2 was converted to a MicroBlowers™ SVE well in Q3, 2009
**- ASH-06 was converted to a ASVE well on 4/4/2013
AHT-07A, -09A, -09B, -10A, -10B, -12A, -12B, -15, -16, -17 were converted to BaroBalls™ on 11/17/2015.

Table 9. ABRP ASVE Significant Shutdown Events

Date	Reason for Shutdown (greater than one week)	Corrective Measures*
November 2009 – January 2010	Blower failure	New blower was installed.
July and August, 2010	Electrical problems and blower oil contaminants	N/A
December, 2010	Freezing of the condensate collection tank	N/A
Week of January 12, 2011	Maintenance outage	N/A
Week of April 4, 2011	Maintenance outage	N/A
Week of June 13, 2011	Maintenance outage	N/A
December 31, 2012 – February 13, 2013	System's mass flow controller was degraded and the mass flow transmitter was reconfigured to correct the problem.	Mass flow transmitter was reconfigured.
March 4 – 11, 2013	The mass flow transmitter failed the calibration test and was replaced with a spare mass flow transmitter.	A calibrated spare mass flow transmitter was installed.
November 4, 2013 – February 10, 2014	Replaced leaky carbon steel condensate drum with stainless steel.	Stainless steel condensate drum was installed.
June 9, 2014 – June 17, 2014	The mass flow transmitter failed the calibration test and a portable instrument was installed for use until a replacement could be obtained.	A calibrated mass flow transmitter was installed.
June 23, 2014 – September 11, 2014	The installation of the replacement mass flow transmitter.	Installed a calibrated mass flow transmitter.
January – February 2015	High condensate levels in the knockout tank. (296 hours) As a precautionary measure, the SVEU was shutdown to prevent high condensate levels during freezing weather for 109 hours.	N/A
November – December 2015	The SVEU was placed in standby for 491 hours to allow the conversion of 15 wells to either MicroBlowers™ or BaroBalls™.	N/A
January 2016	Leaky blower. (250 hours)	Blower replaced
February 2016 and December 2016	High Condensate. (179 and 130 hours, respectively)	
September 2016	Flow Meter out of calibration. (173 hours)	Calibration of Flow Meter at Calibration Shop
November 2016	Unit would not restart. (405 hours)	Human Machine Interface replaced
November 7 – 20, 2017	Blockage in the flame arrestor caused high back pressure on the discharge flow. (275 hours)	Removed the blockage in the arrestor and thoroughly cleaned exhaust piping.

*- See Operational Issues in Section 2.1.5 for further details concerning the relevant corrective measures taken in the operation and maintenance improvement program to preclude shutdown events from reoccurring.

Table 10. MCB SVE Well Construction Details

Well ID	East Coordinate (UTM)	North Coordinate (UTM)	Ground Surface	Screen Top	Screen Bottom	Screen Length
			(ft asl)	*(ft bgs)*		*(ft)*
MCSV-1	431,353.543	3,686,134.387	336.11	unknown		
MCSV-3	431,369.808	3,686,108.869	331.169	80	95	15
MCSV-3A				57	72	15
MCSV-4 – upper screen	431,326.036	3,686,171.426	337.083	15	30	15
MCSV-4 – intermediate screen				35	40	5
MCSV-4 – intermediate screen				45	50	5
MCSV-4 – intermediate screen				55	60	5
MCSV-4 – intermediate screen				65	70	5
MCSV-4 – lower screen				75	80	5
MCSV-5	431,387.721	3,686,170.675	330.978	60	90	30
MCSV-6 – upper screen	431,311.184	3,686,190.540	338.85	15	25	10
MCSV-6 – intermediate screen				30	35	5
MCSV-6 – intermediate screen				40	45	5
MCSV-6 – intermediate screen				50	55	5
MCSV-6 – intermediate screen				60	65	5
MCSV-6 – lower screen				70	80	10
MCSV-7 – upper screen	431,308.585	3,686,167.041	338.62	15	50	35
MCSV-7 – lower screen				75	80	5
MCSV-8	431,277.191	3,686,194.175	339.887	51	81	30
MCSV-9	431,320.147	3,686,209.038	337.55	50	80	30
MCSV-10	431,336.278	3,686,181.809	336.564	15	55	40
MCSV-11	431,383.657	3,686,149.697	330.341	55	85	30
MCSV-12	431,368.997	3,686,152.466	332.922	55	85	30
MCSV-13	431,320.744	3,686,172.337	338.071	20	50	30
MCSV-14	431,347.959	3,686,134.427	336.498	68	88	20
MCSV-15 – upper screen	431,349.123	3,686,201.887	334.411	50	70	20
MCSV-15 – lower screen				80	100	20

Table 10. MCB SVE Well Construction Details *(Continued/End)*

Well ID	East Coordinate (UTM)	North Coordinate (UTM)	Ground Surface	Screen Top	Screen Bottom	Screen Length
			(ft asl)	*(ft bgs)*		*(ft)*
MCSV-16	431,335.487	3,686,141.283	336.761	40	70	30
MCSV-17 – upper screen	431,338.008	3,686,157.116	336.821	15	50	35
MCSV-17 – lower screen				75	80	5
MCSV-18	431,357.083	3,686,162.966	334.199	55	70	15
MCSV-19 – upper screen	431,316.481	3,686,156.959	337.746	15	50	35
MCSV-19 – lower screen				75	80	5
MCSV-20	431,365.996	3,686,170.283	333.381	55	70	15
MCSV-21	431,354.048	3,686,171.351	334.523	55	70	15
MCSV-22	431,327.679	3,686,162.193	337.088	20	70	50
MCSV-23	431,371.738	3,686,188.657	332.497	55	75	20
MCSV-24	431,301.588	3,686,156.502	339.139	60	90	30
MCSV-25 – upper screen	431,327.922	3,686,195.857	337.024	55	70	15
MCSV-25 – lower screen				80	95	15
MCSV-26 – upper screen	431,304.040	3,686,177.862	339.546	30	35	5
MCSV-26 – lower screen				70	85	15
MCSV-27	431,329.482	3,686,186.662	336.89	64	99	35

asl – above sea level
bgs – below ground surface
ft – feet
MCSV – Miscellaneous Chemical Soil Vapor
UTM – Universal Transverse Mercator

Table 11. MCB PCE Results for Passive SVE BaroBalls™ and MicroBlowers™ Wells (Last 10 years – 2008 thru 2017)

Collection Date	Station ID — PCE Soil-Gas Concentration *(ppmV)*							
	MCSV-01	MCSV-03A	MCSV-04	MCSV-05	MCSV-06	MCSV-07	MCSV-08	MCSV-09
4/18/2008	ND		0.040	0.010	ND	5.354		0.020
6/26 & 29/2008			0.018	0.02	0.002	5.524	0.016	0.016
9/22/2008	0.013	0.014	0.596	0.026	0.040	0.195	0.003	0.019
11/17/2008	0.004	0.013	0.226	0.026	0.009	5.995	0.008	0.010
1/27/2009	0.008	ND	0.348	ND	0.039	6.370	0.007	
4/21/2009	0.014	ND	0.380	0.041	0.536	0.720	0.003	0.036
7/16/2009	0.003	ND		0.016	0.015	2.506	0.007	0.006
10/26 & 28/2009	ND	ND	0.082	ND	ND	0.116	ND	ND
1/19/2010	ND	ND	ND	ND	ND	0.785	ND	ND
4/19/2010	ND	ND	ND	ND	ND	0.429	ND	ND
7/19/2010	ND	ND	ND	ND	ND	1.432	ND	ND
10/19/2010	ND	ND	ND	ND	ND	1.065	ND	ND
1/18 & 19/2011	ND	ND	ND	ND	ND	0.576	ND	ND
4/18/2011	ND	ND	ND	ND	ND	0.558	ND	ND
7/12/2011	ND	ND	ND	ND	ND	0.421	ND	ND
10/19/2011	ND	ND	ND	ND	ND	0.861	ND	ND
1/24/2012	ND	ND	ND	ND	ND	ND	ND	ND
4/23/2012	ND	ND	ND	ND	ND	0.740	ND	ND
7/16 & 17/2012	ND	ND	ND	ND	ND	0.605	ND	ND
10/16/2012	ND	ND	ND	ND	ND	0.693	ND	ND
1/14/2013	ND	ND	ND	ND	ND	0.887	ND	ND
4/15/2013	ND	ND	ND	ND	ND	0.704	ND	ND
7/17/2013	ND	ND	ND	ND	ND	0.562	ND	ND
11/18/2013	ND	ND	ND	ND	ND	1.320	ND	ND
2/19/2014	ND	ND	ND	ND	ND	0.382	ND	ND
4/22/2014	ND	ND	ND	ND	ND	0.543	ND	ND
8/12/2014	ND	ND	ND	ND	ND	1.001	ND	ND
10/14/2014	ND	ND	ND	ND	ND	0.957	ND	ND
2/9/2015	ND	ND	ND	ND	ND	0.888	ND	ND
4/28/2015	ND	ND	ND	ND	ND	0.558	ND	ND
7/21/2015	ND	ND	ND	ND	ND	0.828	ND	ND
12/8/2015	ND	ND	ND	ND	ND	0.787	ND	ND
2/9/2016	ND	ND	ND	ND	ND	1.083	ND	ND
5/17/2016	ND	ND	ND	ND	ND	0.068	ND	ND
9/13/2016	ND	ND	ND	ND	ND	1.393	ND	ND
12/14/2016	ND	ND	ND	ND	ND	0.285	ND	ND
2/14/2017	ND	ND	ND	ND	ND	1.492	ND	ND
5/16/2017	ND	ND	ND	ND	ND	ND	ND	ND
9/14/2017	ND	ND	ND	ND	ND	ND	ND	ND
12/13/2017	ND	ND	ND	ND	ND	ND	ND	ND

ND Non-Detect
MCSV Miscellaneous Chemical Soil Vapor
MicroBlowers™

Table 11. MCB PCE Results for Passive SVE BaroBalls™ and MicroBlowers™ Wells (Last 10 years – 2008 thru 2017) *(Continued)*

Collection Date	Station ID — CE Soil-Gas Concentration *(ppmV)*								
	MCSV-10	MCSV-11	MCSV-12	MCSV-13	MCSV-14	MCSV-15	MCSV-16	MCSV-17	MCSV-18
4/18/2008	0.000	ND	ND	0.058	ND	ND	0.000	0.180	ND
6/26 & 29/2008	0.049	0.002	0.011	0.341	0.003	0.008	0.007	0.157	
9/22/2008	0.012	0.002	0.007	0.044	0.002	0.008	0.003	0.038	0.004
11/17/2008	0.042	0.003	0.009	0.007	0.002	0.005	0.002	0.078	0.005
1/27/2009		0.011	ND		ND	0.002	ND	0.069	ND
4/21/2009	0.024	ND	0.004	0.033	ND	ND	ND	0.046	0.008
7/16/2009	ND	0.007	0.006	ND	ND	ND	ND	0.050	ND
10/26 & 28/2009	ND	ND	ND	ND	ND	ND	ND	ND	ND
1/19/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/19/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/19/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND
10/19/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND
1/18 & 19/2011	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/18/2011	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/12/2011	ND	ND	ND	ND	ND	ND	ND	ND	ND
10/19/2011	ND	ND	ND	ND	ND	ND	ND	ND	ND
1/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/23/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/16 & 17/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND
10/16/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND
1/14/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/15/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/17/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND
11/18/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/19/2014	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/22/2014	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/12/2014	ND	ND	ND	ND	ND	ND	ND	ND	ND
10/14/2014	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/9/2015	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/28/2015	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/21/2015	ND	ND	ND	ND	ND	ND	ND	ND	ND
12/8/2015	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/9/2016	ND	ND	ND	0.859	ND	ND	ND	ND	ND
5/17/2016	ND	ND	ND	ND	ND	ND	ND	0.030	ND
9/13/2016	ND	ND	ND	ND	ND	ND	ND	0.033	ND
12/14/2016	ND	ND	ND	ND	ND	ND	ND	0.033	ND
2/14/2017	ND	ND	ND	0.065	ND	ND	ND	ND	ND
5/16/2017	ND	ND	ND	ND	ND	ND	ND	0.035	ND
9/14/2017	ND	ND	ND	ND	ND	ND	ND	0.031	ND
12/13/2017	ND	ND	ND	ND	ND	ND	ND	0.031	ND

ND Non-Detect
MCSV Miscellaneous Chemical Soil Vapor
MicroBlowers™

Table 11. MCB PCE Results for Passive SVE BaroBalls™ and MicroBlowers™ Wells (Last 10 years – 2008 thru 2017) *(Continued/End)*

Collection Date	Station ID — PCE Soil-Gas Concentration *(ppmV)*								
	MCSV-19	MCSV-20	MCSV-21	MCSV-22	MCSV-23	MCSV-24	MCSV-25	MCSV-26	MCSV-27
4/18/2008	0.020	0.040	ND	0.010	0.000		ND	ND	0.210
6/26 & 29/2008	0.02	0.051	0.08	0.034	0.006	0.008	0.054	0.249	0.304
9/22/2008	0.022	0.017	0.055	0.015	0.007	0.002	0.017	0.170	1.866
11/17/2008	0.061	0.011	0.038	0.021	0.008	0.003	0.006	0.058	0.064
1/27/2009	0.054	ND	0.007	0.004	0.012	0.004		0.101	0.114
4/21/2009	ND	0.031	0.017	0.056	0.005	ND	0.182	0.193	0.274
7/16/2009	ND	ND	0.003	0.011	0.006	0.002	0.025	0.043	0.012
10/26 & 28/2009	ND	ND	ND	ND	ND	ND	0.224	ND	0.129
1/19/2010	ND	ND	ND	ND	ND	ND	0.101	ND	ND
4/19/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/19/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND
10/19/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND
1/18 & 19/2011	ND	ND	ND	ND	ND	ND	ND	ND	0.072
4/18/2011	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/12/2011	ND	ND	ND	0.041	ND	ND	ND	ND	ND
10/19/2011	ND	ND	ND	ND	ND	ND	0.087	ND	0.069
1/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/23/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/16 & 17/2012	ND	ND	ND	ND	ND	ND	0.046	ND	0.044
10/16/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND
1/14/2013	ND	ND	ND	ND	ND	ND	0.050	ND	ND
4/15/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/17/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND
11/18/2013	ND	ND	0.031	ND	ND	ND	0.034	ND	ND
2/19/2014	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/22/2014	ND	ND	ND	ND	ND	ND	0.038	ND	ND
8/12/2014	ND	ND	ND	ND	ND	ND	0.043	ND	0.034
10/14/2014	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/9/2015	ND	ND	ND	ND	ND	ND	0.048	ND	ND
4/28/2015	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/21/2015	ND	ND	ND	ND	ND	ND	ND	ND	ND
12/8/2015	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/9/2016	ND	0.032	0.031	ND	ND	ND	0.044	ND	0.030
5/17/2016	ND	ND	0.030	ND	ND	ND	ND	NR	NR
9/13/2016	ND	0.029	ND	ND	ND	ND	ND	ND	ND
12/14/2016	ND	0.041	ND	ND	ND	ND	0.047	ND	ND
2/14/2017	ND	ND	ND	ND	ND	ND	0.037	ND	ND
5/16/2017	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/14/2017	ND	ND	ND	ND	ND	ND	ND	ND	ND
12/13/2017	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND Non-Detect
NR not received
MCSV Miscellaneous Chemical Soil Vapor

Table 12. MCB PCE Results for Passive SVE BaroBalls™ and MicroBlowers™ Wells (First Four Years – 2004 thru 2007)

Collection Date	Station ID — PCE Soil-Gas Concentration *(ppmV)*								
	MCSV-01	MCSV-03A	MCSV-04	MCSV-05	MCSV-06	MCSV-07	MCSV-08	MCSV-09	MCSV-10
2/24/2004	0.007		0.570	0.014	0.070	1.294	0.004	0.015	0.050
3/16/2004			0.637		0.043	0.843			0.043
3/31/2004	0.004		0.941	0.008	0.038	0.091		0.008	0.034
6/10/2004	0.007		18.601	0.045	0.111	0.126	0.014	0.013	0.058
8/5/2004	0.006		3.602	0.006	0.061	0.246	0.002	0.006	0.051
9/7/2004	0.004	0.002		0.006	0.056	0.752	0.007	0.004	0.040
12/7/2004	0.005	0.002	2.539	0.010	0.212	1.016	0.002	0.007	0.044
1/5/2005	0.006	0.007	1.424	0.012	0.142	0.656	0.002	0.006	0.037
2/16/2005			0.828			0.542			0.040
3/23/2005			1.493		0.118	0.869			
7/7/2005			2.050		0.022	5.775			0.071
8/30/2005			2.536		NR	5.624			0.101
9/26/2005			2.009		0.037	6.469			0.122
10/6 & 7/2005			2.909		1.033	8.247			0.164
1/30/2006			1.270		0.040	4.308			0.083
5/2/2006			0.918		0.010	7.550			0.064
6/26/2006			1.963	0.123	0.052	5.624			0.080
11/15/2006	0.003	0.037	0.677	0.018	0.025	5.893		0.032	0.075
11/30/2006	0.042	0.355	0.018	0.107	0.115	0.018		0.345	0.146
12/15/2006	0.024	0.063	0.904	0.035	0.052	3.992		0.049	0.080
9/27/2007	0.081			0.022	0.056	7.063		0.044	

	MCSV-11	MCSV-12	MCSV-13	MCSV-14	MCSV-15	MCSV-16	MCSV-17	MCSV-18	MCSV-19
2/24/2004	0.020	0.023	4.158	0.003	0.006			0.016	0.051
3/16/2004			9.980				0.063		0.042
3/31/2004	0.015	0.011	5.704	0.002	0.004		0.019	0.017	0.045
6/10/2004	0.018	0.016	3.672	0.021	0.018		0.032		0.066
8/5/2004		0.012	11.154	0.002	0.003	0.026			0.162
9/7/2004	0.010	0.009	6.459	0.020	0.010		0.057	0.024	0.064
12/7/2004	0.014	0.013	3.565		0.004		0.025		0.112
1/5/2005	0.015		9.207	0.002	0.004		0.033		0.064
2/16/2005			1.112				0.014		0.030
3/23/2005			6.979				0.025		0.090
7/7/2005			1.897				0.031		0.119
8/30/2005			5.751				NR		0.193
9/26/2005			1.568				0.059		0.212
10/6 & 7/2005	0.591		3.955				0.724		0.789
1/30/2006			6.119				0.068	0.043	0.043
5/2/2006			0.727				0.055		0.033
6/26/2006		0.032	3.292						0.077
11/15/2006		0.014	1.818	0.010	0.009	0.009	0.064		0.048
11/30/2006		0.031	0.001	1.055	0.997	0.579	5.368		0.111
12/15/2006		0.016	2.815	0.017	0.011	0.019	0.105		0.074
9/27/2007	0.267	0.028		0.060	0.010	0.013	0.022	0.160	

MCSV Miscellaneous Chemical Soil Vapor
NR not received
Capped for Rebound Testing

Table 12. MCB PCE Results for Passive SVE BaroBall™ and MicroBlowers™ Wells (First Four Years – 2004 thru 2007) *(Continued/End)*

Collection Date	Station ID — PCE Soil-Gas Concentration *(ppmV)*							
	MCSV-20	MCSV-21	MCSV-22	MCSV-23	MCSV-24	MCSV-25	MCSV-26	MCSV-27
2/24/2004	0.053	0.060	0.048	0.007	0.011	0.110	0.073	
3/16/2004			0.050			0.081	0.051	0.311
3/31/2004	0.040	0.043	0.029	0.005	0.008	0.062	0.043	
6/10/2004	0.063	0.071	0.058	0.006	0.016	0.055	0.124	
8/5/2004	0.038	0.042	0.062	0.006	0.008	0.053	0.090	0.014
9/7/2004	0.039	0.037		0.004	0.006		0.090	
12/7/2004	0.052	0.036	0.262	0.007	0.012	0.030	0.142	0.265
1/5/2005	0.034	0.037	0.088	0.005	0.009	0.040	0.084	0.183
2/16/2005			0.037			0.016	0.094	0.138
3/23/2005			0.051				0.135	
7/7/2005			0.113			0.056	0.196	0.026
8/30/2005			0.157			0.096	0.176	0.208
9/26/2005			0.254			0.080	0.286	0.337
10/6 & 7/2005		0.112	0.83			2.488	0.962	0.468
1/30/2006		0.065	0.154			0.087	0.384	0.081
5/2/2006			0.063			0.042	0.241	0.013
6/26/2006		0.083	0.238				0.330	0.067
11/15/2006	0.053	0.047	0.085	0.011	0.019	0.055	0.328	0.037
11/30/2006	0.381	1.910	0.197	0.185	0.165	0.183	0.108	0.004
12/15/2006	0.053	0.063	0.152	0.011	0.014	0.073	0.337	0.050
9/27/2007	0.085			0.158	0.014	0.020	0.504	

MCSV Miscellaneous Chemical Soil Vapor Capped for Rebound Testing

Table 13. MCB TCE Results for Passive SVE BaroBall™ and MicroBlowers™ Wells (Last 10 years – 2008 thru 2017)

Collection Date	Station ID — TCE Soil-Gas Concentration *(ppmV)*							
	MCSV-01	MCSV-03A	MCSV-04	MCSV-05	MCSV-06	MCSV-07	MCSV-08	MCSV-09
4/18/2008	0.110		0.020	0.050	0.030	4.354		0.060
6/26 & 29/2008			0.082	0.013	0.006	4.605	0.009	0.045
9/22/2008	0.037	0.212	3.159	0.086	0.052	1.088	0.006	0.064
11/17/2008	0.027	0.186	1.332	0.045	0.020	5.909	0.010	0.042
1/27/2009	0.071	ND	1.385	ND	0.054	4.904	0.009	
4/21/2009	0.134	ND	1.088	0.356	0.627	0.737	ND	0.159
7/16/2009	0.026	ND		0.086	0.026	2.104	0.009	0.033
10/26 & 28/2009	ND	ND	0.584	ND	ND	ND	ND	ND
1/19/2010	ND	0.139	0.289	ND	ND	0.793	ND	ND
4/19/2010	ND	ND	ND	ND	ND	0.429	ND	ND
7/19/2010	ND	ND	ND	ND	ND	1.160	ND	ND
10/19/2010	ND	ND	ND	ND	ND	0.855	ND	0.187
1/18 & 19/2011	ND	0.174	ND	ND	ND	0.442	ND	0.129
4/18/2011	ND	ND	ND	ND	ND	0.430	ND	ND
7/12/2011	ND	ND	ND	ND	ND	0.427	ND	ND
10/19/2011	ND	ND	ND	0.145	ND	0.718	ND	ND
1/24/2012	ND	ND	ND	ND	ND	ND	ND	ND
4/23/2012	ND	ND	ND	ND	ND	0.962	ND	ND
7/16 & 17/2012	ND	ND	ND	ND	ND	0.566	ND	0.193
10/16/2012	ND	ND	ND	ND	ND	0.667	ND	ND
1/14/2013	ND	0.111	ND	ND	ND	0.891	ND	ND
4/15/2013	ND	ND	ND	ND	ND	0.739	ND	ND
7/17/2013	ND	ND	ND	ND	ND	0.698	ND	ND
11/18/2013	ND	0.122	ND	ND	ND	1.080	ND	ND
2/19/2014	ND	0.130	ND	ND	ND	0.520	ND	ND
4/22/2014	ND	0.134	ND	ND	ND	0.581	ND	ND
8/12/2014	ND	ND	ND	ND	ND	0.780	ND	ND
10/14/2014	ND	ND	ND	ND	ND	0.831	ND	ND
2/9/15	ND	ND	ND	0.099	ND	0.660	ND	ND
4/28/15	ND	ND	ND	ND	ND	0.533	ND	ND
7/21/15	ND	ND	ND	0.070	ND	0.829	ND	ND
12/8/15	ND	0.099	ND	0.123	ND	0.772	ND	0.103
2/8/16	ND	0.184	0.069	0.099	0.044	0.803	ND	0.142
5/17/16	ND	0.092	ND	ND	ND	0.081	ND	ND
9/13/16	ND	0.086	0.083	0.047	ND	1.002	ND	ND
12/14/16	ND	0.229	0.070	0.079	ND	0.192	ND	0.074
2/14/17	ND	0.260	0.057	0.075	ND	1.023	ND	0.094
5/16/17	ND	ND	0.029	ND	ND	1.153	ND	ND
9/14/17	ND	0.060	ND	ND	ND	1.047	ND	ND
12/13/17	ND	ND	0.057	ND	ND	1.130	ND	ND

ND Non-Detect
MCSV Miscellaneous Chemical Soil Vapor
MicroBlowers™

Table 13. MCB TCE Results for Passive SVE BaroBalls™ and MicroBlowers™ Wells (Last 10 years – 2008 thru 2017) *(Continued)*

Collection Date	Station ID — TCE Soil-Gas Concentration *(ppmV)*								
	MCSV-10	MCSV-11	MCSV-12	MCSV-13	MCSV-14	MCSV-15	MCSV-16	MCSV-17	MCSV-18
4/18/2008	0.010	ND	0.030	0.076	0.050	0.010	0.020	7.510	0.030
6/26 & 29/2008	0.264	0.009	0.06	0.588	0.038	0.027	0.065	6.795	
9/22/2008	0.070	0.006	0.087	0.088	0.012	0.044	0.043	2.078	0.054
11/17/2008	0.245	0.007	0.068	0.033	0.006	0.030	0.006	3.816	0.052
1/27/2009		0.019	ND		ND	0.015	0.022	3.196	0.022
4/21/2009	0.119	ND	0.044	0.026	ND	0.010	0.013	1.205	0.073
7/16/2009	ND	0.008	0.011	ND	ND	ND	ND	1.346	ND
10/26 & 28/2009	ND	ND	ND	ND	ND	ND	ND	2.153	ND
1/19/2010	ND	ND	ND	ND	ND	ND	ND	0.708	ND
4/19/2010	ND	ND	ND	ND	ND	ND	ND	0.900	ND
7/19/2010	ND	ND	ND	ND	ND	ND	ND	0.734	ND
10/19/2010	ND	ND	ND	ND	ND	ND	ND	1.346	ND
1/18 & 19/2011	ND	ND	ND	ND	ND	ND	ND	0.05	ND
4/18/2011	ND	ND	ND	ND	ND	ND	ND	0.868	ND
7/12/2011	ND	ND	ND	ND	ND	ND	ND	1.045	ND
10/19/2011	ND	ND	ND	ND	ND	ND	ND	1.734	ND
1/24/2012	ND	ND	ND	ND	ND	ND	ND	0.428	ND
4/23/2012	ND	ND	ND	ND	ND	ND	ND	0.972	ND
7/16 & 17/2012	ND	ND	ND	ND	ND	ND	ND	1.182	ND
10/16/2012	ND	ND	ND	ND	ND	ND	ND	0.897	ND
1/14/2013	ND	ND	ND	ND	ND	ND	ND	0.896	ND
4/15/2013	ND	ND	ND	ND	ND	ND	ND	0.810	ND
7/17/2013	ND	ND	ND	ND	ND	ND	ND	0.931	ND
11/18/2013	ND	ND	ND	ND	ND	ND	ND	0.972	ND
2/19/2014	ND	ND	ND	ND	ND	ND	ND	0.878	ND
4/22/2014	ND	ND	ND	ND	ND	ND	ND	0.765	ND
8/12/2014	ND	ND	ND	ND	ND	ND	ND	1.057	ND
10/14/2014	ND	ND	ND	ND	ND	ND	ND	1.121	ND
2/9/15	ND	ND	ND	ND	ND	ND	ND	1.112	ND
4/28/15	ND	ND	ND	ND	ND	ND	ND	0.744	ND
7/21/15	ND	0.045	ND	ND	ND	ND	ND	1.018	ND
12/8/15	ND	ND	ND	ND	ND	ND	ND	0.983	0.029
2/8/16	ND	ND	ND	0.132	ND	ND	ND	1.125	0.028
5/17/16	ND	ND	ND	ND	ND	ND	ND	0.954	ND
9/13/16	ND	ND	ND	ND	ND	ND	ND	1.361	ND
12/14/16	ND	ND	ND	0.033	ND	ND	ND	0.993	ND
2/14/17	ND	ND	ND	0.119	ND	ND	ND	1.063	0.027
5/16/17	ND	ND	ND	ND	ND	ND	ND	0.987	ND
9/14/17	ND	ND	ND	ND	ND	ND	ND	1.180	ND
12/13/17	ND	ND	ND	ND	ND	ND	ND	1.057	ND

ND Non-Detect
MCSV Miscellaneous Chemical Soil Vapor
MicroBlowers™

Table 13. MCB TCE Results for Passive SVE BaroBalls™ and MicroBlowers™ Wells (Last 10 years – 2008 thru 2017) *(Continued/End)*

Collection Date	Station ID — TCE Soil-Gas Concentration *(ppmV)*								
	MCSV-19	MCSV-20	MCSV-21	MCSV-22	MCSV-23	MCSV-24	MCSV-25	MCSV-26	MCSV-27
4/18/2008	0.030	0.100	0.040	0.030	0.010		0.010	ND	0.540
6/26 & 29/2008	0.026	0.138	1.251	0.208	0.016	0.045	0.269	0.243	0.993
9/22/2008	0.071	0.029	0.786	0.033	0.013	0.013	0.061	0.191	1.949
11/17/2008	0.170	0.008	0.244	0.029	0.013	0.028	0.024	0.061	0.434
1/27/2009	0.183	ND	0.026	0.007	0.007	0.041		0.107	0.727
4/21/2009	ND	0.014	0.034	0.107	ND	0.014	1.503	0.218	1.522
7/16/2009	ND	ND	ND	ND	ND	0.006	0.260	0.066	0.173
10/26 & 28/2009	ND	ND	ND	ND	ND	ND	2.57	ND	1.874
1/19/2010	ND	ND	ND	ND	ND	ND	1.530	ND	0.331
4/19/2010	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/19/2010	ND	ND	ND	ND	ND	ND	0.210	ND	ND
10/19/2010	ND	ND	ND	ND	ND	ND	ND	ND	1.001
1/18 & 19/2011	ND	ND	ND	ND	ND	ND	ND	ND	1.122
4/18/2011	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/12/2011	ND	ND	ND	ND	ND	ND	0.357	ND	0.124
10/19/2011	ND	ND	ND	ND	ND	ND	1.228	ND	1.122
1/24/2012	ND	ND	ND	ND	ND	ND	0.217	ND	ND
4/23/2012	ND	ND	ND	ND	ND	ND	ND	ND	0.220
7/16 & 17/2012	ND	ND	ND	ND	ND	ND	0.747	ND	0.895
10/16/2012	ND	ND	ND	ND	ND	ND	0.142	ND	0.374
1/14/2013	ND	ND	ND	ND	ND	ND	0.807	ND	ND
4/15/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/17/2013	ND	ND	ND	ND	ND	ND	ND	ND	0.163
11/18/2013	ND	ND	ND	ND	ND	ND	0.507	ND	0.213
2/19/2014	ND	ND	ND	ND	ND	ND	0.291	ND	0.139
4/22/2014	ND	ND	ND	ND	ND	ND	0.672	ND	0.281
8/12/2014	ND	ND	ND	ND	ND	ND	0.542	ND	0.490
10/14/2014	ND	ND	ND	ND	ND	ND	0.205	ND	ND
2/9/15	ND	ND	ND	ND	ND	ND	0.588	ND	0.457
4/28/15	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/21/15	ND	ND	ND	ND	ND	ND	0.333	ND	0.063
12/8/15	ND	ND	ND	ND	ND	ND	0.147	ND	0.318
2/8/16	ND	ND	ND	0.056	ND	ND	0.612	ND	0.369
5/17/16	ND	ND	ND	ND	ND	ND	0.043	ND	ND
9/13/16	ND	ND	ND	ND	ND	ND	ND	ND	0.074
12/14/16	ND	ND	ND	0.035	ND	ND	0.371	ND	ND
2/14/17	ND	ND	ND	ND	ND	ND	0.371	ND	0.317
5/16/17	ND	ND	ND	ND	ND	ND	0.028	ND	ND
9/14/17	ND	ND	ND	ND	ND	ND	0.049	0.059	ND
12/13/17	ND	ND	ND	ND	ND	ND	0.097	ND	ND

ND Non-Detect
MCSV Miscellaneous Chemical Soil Vapor

Table 14. MCB TCE Results for Passive SVE BaroBalls™ and MicroBlowers™ Wells (First Four Years – 2004 thru 2007)

Collection Date	Station ID — TCE Soil-Gas Concentration *(ppmV)*								
	MCSV-01	MCSV-03A	MCSV-04	MCSV-05	MCSV-06	MCSV-07	MCSV-08	MCSV-09	MCSV-10
2/24/2004	0.007		2.310	0.050	0.183	0.547	0.003	0.031	0.284
3/16/2004			3.551		0.158	0.577			0.286
3/31/2004	0.005		3.085	0.026	0.112	0.306		0.021	0.195
6/10/2004	NR		37.345	0.052	0.227	0.098	0.008	0.029	0.231
8/5/2004	0.008		11.379	0.030	0.314	0.462	0.006	0.038	0.710
9/7/2004	0.011	0.009		0.023	0.143	0.466	0.020	0.021	0.302
12/7/2004	0.018	0.010	7.119	0.018	0.237	0.389	NR	0.018	0.220
1/5/2005	0.011	0.034	6.190	0.020	0.212	0.350	NR	0.016	0.226
2/16/2005			5.095			0.340			0.207
3/23/2005			6.053		0.171	0.412			
7/7/2005			7.373		0.048	3.145			0.432
8/30/2005			14.000		0.162	4.848			0.889
9/26/2005			7.768		0.067	3.705			0.771
10/6 & 7/2005			15.478		0.899	5.275			1.268
1/30/2006			5.689		0.123	3.227			0.481
5/2/2006			3.947		0.033	4.997			0.236
6/26/2006			8.918	0.572	0.088	3.685			0.255
11/15/2006	0.007	0.411	3.363	0.023	0.062	4.322		0.058	0.521
11/30/2006	0.302	0.414	0.059	0.290	0.269	0.026		0.081	0.348
12/15/2006	0.041	0.531	4.670	0.038	0.118	2.879		0.067	0.529
9/27/2007	0.483			0.009	0.068	5.439		0.061	
	MCSV-11	MCSV-12	MCSV-13	MCSV-14	MCSV-15	MCSV-16	MCSV-17	MCSV-18	MCSV-19
2/24/2004	0.180	0.251	4.674	0.017	0.037			0.129	0.088
3/16/2004			11.465				1.408		0.117
3/31/2004	0.085	0.084	6.445	0.012	0.025		0.691	0.163	0.075
6/10/2004	0.092	0.148	3.742	0.019	0.030		1.309		0.094
8/5/2004		0.204	14.074	0.031	0.043	3.059			0.378
9/7/2004	0.103	0.126	10.914	0.035	0.030		3.327	0.267	0.121
12/7/2004	0.085	0.083	3.696		0.026		1.438		0.121
1/5/2005	0.084		9.929	0.008	0.026		2.060		0.082
2/16/2005			1.598				0.505		0.066
3/23/2005			6.681				1.134		0.086
7/7/2005			2.594				1.960		0.206
8/30/2005			10.232				3.693		0.508
9/26/2005			2.250				2.965		0.331
10/6 & 7/2005	0.517		7.321				3.386		0.777
1/30/2006			7.589				4.562	0.509	0.076
5/2/2006			0.997				3.227		0.074
6/26/2006		0.052	4.351						0.118
11/15/2006		0.071	3.681	0.042	0.041	0.124	4.416		0.163
11/30/2006		0.024	NR	0.831	0.818	0.853	1.247		0.099
12/15/2006		0.074	4.217	0.050	0.045	0.203	7.557		0.229
9/27/2007	1.373	0.104		0.080	0.042	0.039	0.108	8.019	

ND Non-Detect
NR not received
Capped for Rebound Testing

Table 14. MCB TCE Results for Passive SVE BaroBalls™ and MicroBlowers™ Wells (First Four Years – 2004 thru 2007) *(Continued/End)*

Collection Date	Station ID — TCE Soil-Gas Concentration *(ppmV)*							
	MCSV-20	MCSV-21	MCSV-22	MCSV-23	MCSV-24	MCSV-25	MCSV-26	MCSV-27
2/24/2004	0.067	0.207	1.029	0.039	0.059	0.558	0.066	
3/16/2004			1.574			0.537	0.079	3.061
3/31/2004	0.054	0.159	0.477	0.027	0.043	0.312	0.053	
6/10/2004	0.082	0.217	0.674	0.026	0.079	0.168	0.092	
8/5/2004	0.195	0.448	2.147	0.066	0.107	0.714	0.189	0.245
9/7/2004	0.083	0.183		0.029	0.053		0.092	
12/7/2004	0.054	0.150	3.766	0.025	0.049	0.130	0.088	2.210
1/5/2005	0.048	0.133	2.533	0.022	0.038	0.199	0.074	2.093
2/16/2005			0.636			0.094	0.080	1.367
3/23/2005			1.289				0.099	
7/7/2005			2.413			0.343	0.202	0.195
8/30/2005			4.985			1.023	0.214	2.893
9/26/2005			2.415			0.493	0.306	2.543
10/6 & 7/2005		0.179	6.656			2.663	0.814	3.053
1/30/2006		0.282	2.576			0.526	0.449	0.537
5/2/2006			0.932			0.239	0.266	0.049
6/26/2006		0.318	3.603				0.257	0.297
11/15/2006	0.089	0.460	1.334	0.035	0.079	0.393	0.394	0.238
11/30/2006	0.251	0.230	0.637	0.648	0.575	0.243	0.076	0.006
12/15/2006	0.103	0.590	2.456	0.037	0.086	0.483	0.440	0.284
9/27/2007	0.229			1.834	0.026	0.077	0.552	

ND Non-Detect Capped for Rebound Testing

APPENDIX A

A-Area Burning/Rubble Pits (ABRP)
Trench Active Soil Vapor Extraction (SVE)
System Sample Data

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Appendix A. ABRP Trench Active SVE System Sample Data

Well ID	Date	Flow Rate *(ft^3/min)*	TCE Concentration *(ppmV)*	Hours on Unit at Start	Operating Time *(hr)*
AHT-07A	6/25/2008	1.35	65.99	2,683.0	
	6/30/2008	1.50	Use next conc.	2,802.5	119.5
	7/16/2008	6.00	29.77	3,094.0	291.5
	8/5/2008	19.00	12.85	3,404.1	310.1
	8/12/2008	18.20	1.20	3,574.4	170.3
	9/24/2008	16.40	0.82	4,488.5	914.1
	9/25/2008	16.40	0.50	4,534.2	45.7
	9/29/2008	16.50	0.25	4,630.5	96.3
	9/30/2008	17.20	0.01	4,654.2	23.7
	10/7/2008	15.90	0.57	4,821.2	167.0
	10/21/2008	14.91	0.58	5,065.3	244.1
	10/30/2008	13.53	0.59	5,121.2	55.9
	11/5/2008	15.80	0.53	5,266.9	145.7
	12/2/2008	14.00	0.47	5,568.2	301.3
	12/31/2008	15.37	Use next conc.	5,826.1	257.9
	1/27/2009	14.30	0.76	5,851.0	24.9
	2/3/2009	15.00	0.51	5,997.1	146.1
	3/5/2009	17.00	0.31	6,472.7	475.6
	3/9/2009	23.70	Use next conc.	13.0	13.0
	4/20/2009	14.00	0.15	1,019.3	1,006.3
	6/30/2009	14.90	Use next conc.	2,668.7	1,649.4
	7/20/2009	16.80	ND	3,137.1	468.4
	11/9/2009	13.10	ND	5,308.2	2,171.1
	12/31/2009	13.10	Use next conc.	5,330.4	22.2
	1/20/2010	11.70	0.37	5,364.3	33.9
	3/25/2010	15.80	Use next conc.	6,552.0	1,187.7
	4/20/2010	15.00	ND	524.7	524.7
	6/30/2010	15.00	Use next conc.	2,101.6	1,576.9
	7/21/2010	12.60	ND	2,415.5	313.9
	8/5/2010	11.40	Use next conc.	2,580.6	165.1
	10/20/2010	9.70	ND	1,612.0	1,612.0
	12/31/2010	14.40	Use next conc.	3,014.1	1,402.1
	1/24/2011	14.10	ND	3,328.9	314.8
	4/4/2011	24.30	Use next conc.	4,949.9	1,621.0
	4/25/2011	8.00	ND	2,903.4	307.2
	6/30/2011	15.30	Use next conc.	4,321.8	1,418.4
	7/11/2011	13.10	ND	4,489.5	167.7
	10/6/2011	12.60	Use next conc.	6,530.5	2,041.0
	10/18/2011	6.50	ND	316.1	316.1
	12/31/2011	10.90	Use next conc.	1,969.5	1,653.4

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)****

Well ID	Date	Flow Rate *(ft^3/min)*	TCE Concentration *(ppmV)*	Hours on Unit at Start	Operating Time *(hr)*
AHT-07A	1/10/2012	11.00	ND	2,207.6	238.1
	4/16/2012	12.70	ND	4,483.9	2,276.3
	6/30/2012	10.23	Use next conc.	6,117.2	1,633.3
	7/31/2012	11.38	ND	2.2	203.9
	10/22/2012	14.00	ND	1,272.4	1,270.2
	12/31/2012	11.80	Use next conc.	2,233.6	961.2
	2/20/2013	9.70	ND	2,398.8	165.2
	4/16/2013	10.00	ND	3,544.0	1,145.2
	6/30/2013	12.30	Use next conc.	5,276.7	1,732.7
	7/8/2013	12.50	ND	5,470.7	194.0
	11/19/2013	6.00	ND	1,758.9	2,571.3
	12/31/2013	14.20	Use next conc.	6,535.1	6,535.1
	3/24/2014	12.00	ND	377.2	377.2
	4/16/2014	13.00	ND	898.4	521.2
	6/30/2014	16.80	Use next conc.	2,333.2	1,434.8
	8/11/2014	13.60	ND	3,171.2	838.0
	10/13/2014	15.19	ND	4,596.4	1,425.2
	12/31/2014	13.70	Use previous conc.	5,430.0	833.6
	2/11/2015	13.82	ND	6,029.3	599.3
	4/16/2015	13.50	ND	909.6	1,431.3
	6/30/2015	15.35	Use previous conc.	2,690.4	1,780.8
	7/20/2015	16.10	ND	3,408.2	717.8
	**	**	**	**	**

**** converted to BaroBalls™ in November 2015**
***** For ABRP MicroBlowers™, see Table7. For ABRP BaroBalls™, see Table 8**
AHT – A-Area Hidden Trench
conc. – concentration
ft^3/min – cubic feet per minute
hr – hour
ND – non-detect
ppmV – parts per million by volume

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration ($ppmV$)	Hours on Unit at Start	Operating Time (hr)
AHT-07B	6/25/2008	8.08	31.94	2,683.0	
	6/30/2008	12.00	Use next conc.	2,802.5	119.5
	7/16/2008	10.00	35.24	3,094.0	291.5
	8/5/2008	11.00	9.88	3,404.1	310.1
	8/13/2008	10.20	6.82	3,595.8	191.7
	9/24/2008	12.40	3.26	4,488.5	892.7
	9/25/2008	12.40	3.19	4,534.2	45.7
	9/29/2008	13.00	0.48	4,630.5	96.3
	9/30/2008	13.80	0.01	4,654.2	23.7
	10/7/2008	12.50	3.36	4,821.2	167.0
	10/21/2008	18.63	2.22	5,065.3	244.1
	10/30/2008	20.19	2.47	5,121.2	55.9
	11/5/2008	12.40	3.64	5,266.9	145.7
	12/2/2008	18.00	2.22	5,568.2	301.3
	12/31/2008	14.28	Use next conc.	5,826.1	257.9
	1/27/2009	19.70	2.64	5,851.0	24.9
	2/3/2009	15.00	3.12	5,997.1	146.1
	3/5/2009	12.00	2.76	6,472.7	475.6
	3/9/2009	12.00	Use next conc.	13.0	13.0
	4/20/2009	4.00	1.76	1,019.3	1,006.3
	6/30/2009	12.30	Use next conc.	2,668.7	1,649.4
	7/20/2009	11.80	ND	3,137.1	468.4
	11/9/2009	22.30	0.35	5,308.2	2,171.1
	12/31/2009	22.30	Use next conc.	5,330.4	22.2
	1/20/2010	19.40	0.71	5,364.3	33.9
	3/25/2010	13.70	Use next conc.	6,552.0	1,187.7
	4/20/2010	13.00	0.35	524.7	524.7
	6/30/2010	13.00	Use next conc.	2,101.6	1,576.9
	7/21/2010	14.60	0.22	2,415.5	313.9
	8/5/2010	11.00	Use next conc.	2,580.6	165.1
	10/20/2010	10.90	0.35	1,612.0	1,612.0
	12/31/2010	11.80	Use next conc.	3,014.1	1,402.1
	1/24/2011	19.70	0.27	3,328.9	314.8
	4/4/2011	19.50	Use next conc.	4,949.9	1,621.0
	4/25/2011	16.00	0.43	2,903.4	307.2
	6/30/2011	20.20	Use next conc.	4,321.8	1,418.4
	7/11/2011	13.70	ND	4,489.5	167.7
	10/6/2011	13.40	Use next conc.	6,530.5	2,041.0
	10/18/2011	12.20	ND	316.1	316.1
	12/31/2011	10.60	Use next conc.	1,969.5	1,653.4
	1/10/2012	11.50	ND	2,207.6	238.1

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration (*ppmV*)	Hours on Unit at Start	Operating Time (*hr*)
AHT-07B	4/16/2012	13.30	0.19	4,483.9	2,276.3
	6/30/2012	14.76	Use next conc.	6,117.2	1,633.3
	7/31/2012	14.76	ND	2.2	203.9
	10/22/2012	13.00	0.12	1,272.4	1,270.2
	12/31/2012	3.59	Use next conc.	2,233.6	961.2
	2/20/2013	14.30	ND	2,398.8	165.2
	4/16/2013	13.70	ND	3,544.0	1,145.2
	6/30/2013	13.40	Use next conc.	5,276.7	1,732.7
	7/8/2013	13.50	ND	5,470.7	194.0
	11/19/2013	13.00	ND	1,758.9	2,571.3
	12/31/2013	14.70	Use next conc.	6,535.1	6,535.1
	3/24/2014	12.00	ND	377.2	377.2
	4/16/2014	12.00	ND	898.4	521.2
	6/30/2014	14.30	Use next conc.	2,333.2	1,434.8
	8/11/2014	17.00	ND	3,171.2	838.0
	10/13/2014	13.48	ND	4,596.4	1,425.2
	12/31/2014	18.80	Use previous conc.	5,430.0	833.6
	2/11/2015	11.79	ND	6,029.3	599.3
	4/16/2015	13.60	0.07	909.6	1,431.3
	6/30/2015	14.36	Use previous conc.	2,690.4	1,780.8
	7/20/2015	15.20	0.05	3,408.2	717.8
	**	**	**	**	**

**** converted to MicroBlowers™ in November 2015**

AHT – A-Area Hidden Trench
conc. – concentration
ft^3/min – cubic feet per minute
hr – hour
ND – non-detect
ppmV – parts per million by volume

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration ($ppmV$)	Hours on Unit at Start	Operating Time (hr)
AHT-08A	6/25/2008	2.40	24.68	2,683.0	
	6/30/2008	2.60	33.28	2,802.5	119.5
	7/16/2008	4.00	33.28	3,094.0	291.5
	8/5/2008	37.00	10.46	3,404.1	310.1
	8/13/2008	29.10	8.13	3,595.8	191.7
	9/24/2008	25.30	1.10	4,488.5	892.7
	9/25/2008	25.30	0.64	4,534.2	45.7
	9/29/2008	24.90	0.06	4,630.5	96.3
	9/30/2008	24.90	0.22	4,654.2	23.7
	10/7/2008	24.10	0.75	4,821.2	167.0
	10/21/2008	20.69	0.74	5,065.3	244.1
	10/30/2008	23.04	0.63	5,121.2	55.9
	11/5/2008	24.30	0.64	5,266.9	145.7
	12/2/2008	19.00	0.59	5,568.2	301.3
	12/31/2008	18.83	Use next conc.	5,826.1	257.9
	1/27/2009	22.10	0.68	5,851.0	24.9
	2/3/2009	21.00	0.54	5,997.1	146.1
	3/5/2009	29.00	0.33	6,472.7	475.6
	3/9/2009	34.40	Use next conc.	13.0	13.0
	4/20/2009	33.00	0.20	1,019.3	,006.3
	6/30/2009	33.00	ND	2,668.7	1,649.4
	7/20/2009	28.20	ND	3,137.1	468.4
	11/9/2009	26.10	ND	5,308.2	2,171.1
	12/31/2009	26.10	Use next conc.	5,330.4	22.2
	1/20/2010	21.00	0.17	5,364.3	33.9
	3/25/2010	26.30	Use next conc.	6,552.0	1,187.7
	4/20/2010	26.00	ND	524.7	524.7
	6/30/2010	26.00	ND	2,101.6	1,576.9
	7/21/2010	25.40	ND	2,415.5	313.9
	8/5/2010	20.00	Use next conc.	2,580.6	165.1
	10/20/2010	16.50	ND	1,612.0	1,612.0
	12/31/2010	19.30	Use next conc.	3,014.1	1,402.1
	1/24/2011	21.20	0.18	3,328.9	314.8
	4/4/2011	42.50	Use next conc.	4,949.9	1,621.0
	4/25/2011	33.00	0.25	2,903.4	307.2
	6/30/2011	32.80	0.14	4,321.8	1,418.4
	7/11/2011	18.00	0.14	4,489.5	167.7
	10/6/2011	13.10	Use next conc.	6,530.5	2,041.0
	10/18/2011	11.60	ND	316.1	316.1
	12/31/2011	17.70	Use next conc.	1,969.5	1,653.4

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration (*ppmV*)	Hours on Unit at Start	Operating Time (*hr*)
AHT-08A	1/10/2012	17.10	0.15	2,207.6	238.1
	4/16/2012	15.10	0.33	4,483.9	2,276.3
	6/30/2012	14.35	Use next conc.	6,117.2	1,633.3
	7/31/2012	13.57	ND	2.2	203.9
	10/22/2012	20.00	0.11	1,272.4	1,270.2
	12/31/2012	2.80	Use next conc.	2,233.6	961.2
	2/20/2013	15.70	ND	2,398.8	165.2
	4/16/2013	11.40	ND	3,544.0	1,145.2
	6/30/2013	14.20	Use next conc.	5,276.7	1,732.7
	7/8/2013	14.40	ND	5,470.7	194.0
	11/19/2013	11.00	ND	1,758.9	2,571.3
	12/31/2013	17.90	Use next conc.	6,535.1	6,535.1
	3/24/2014	16.00	ND	377.2	377.2
	4/16/2014	18.00	ND	898.4	521.2
	6/30/2014	20.10	Use next conc.	2,333.2	1,434.8
	8/11/2014	15.40	ND	3,171.2	838.0
	10/13/2014	20.68	ND	4,596.4	1,425.2
	12/31/2014	16.80	Use previous conc.	5,430.0	833.6
	2/11/2015	42.68	ND	6,029.3	599.3
	4/16/2015	17.80	ND	909.6	1,431.3
	6/30/2015	20.42	Use previous conc.	2,690.4	1,780.8
	7/20/2015	23.30	ND	3,408.2	717.8
	**	**	**	**	**

**** converted to MicroBlowers™ in December 2015**

AHT – A-Area Hidden Trench
conc. – concentration
ft^3/min – cubic feet per minute
hr – hour
ND – non-detect
ppmV – parts per million by volume

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration (*ppmV*)	Hours on Unit at Start	Operating Time (*hr*)
AHT-08B	6/25/2008	4.01	3.28	2,683.0	
	6/30/2008	6.30	2.88	2,802.5	119.5
	7/16/2008	7.00	2.88	3,094.0	291.5
	8/6/2008	4.00	9.85	3,428.1	334.1
	8/13/2008	2.30	11.72	3,595.8	167.7
	9/24/2008	7.30	11.58	4,488.5	892.7
	9/25/2008	7.30	12.91	4,534.2	45.7
	9/29/2008	31.70	9.59	4,630.5	96.3
	9/30/2008	2.00	0.02	4,654.2	23.7
	10/7/2008	2.20	13.64	4,821.2	167.0
	10/21/2008	7.78	13.51	5,065.3	244.1
	10/30/2008	9.61	0.59	5,121.2	55.9
	11/5/2008	8.10	15.94	5,266.9	145.7
	12/2/2008	10.00	15.66	5,568.2	301.3
	12/31/2008	9.03	Use next conc.	5,826.1	257.9
	1/27/2009	12.70	15.30	5,851.0	24.9
	2/3/2009	9.00	15.56	5,997.1	146.1
	3/5/2009	10.00	12.83	6,472.7	475.6
	3/9/2009	10.00	Use next conc.	13.0	13.0
	4/20/2009	9.00	9.13	1,019.3	1,006.3
	6/30/2009	8.80	ND	2,668.7	1,649.4
	7/20/2009	9.40	ND	3,137.1	468.4
	11/9/2009	9.60	2.06	5,308.2	2,171.1
	12/31/2009	9.60	Use next conc.	5,330.4	22.2
	1/20/2010	8.40	1.85	5,364.3	33.9
	3/25/2010	10.20	Use next conc.	6,552.0	1,187.7
	4/20/2010	9.00	2.59	524.7	524.7
	6/30/2010	9.00	1.73	2,101.6	1,576.9
	7/21/2010	9.60	1.73	2,415.5	313.9
	8/5/2010	7.20	Use next conc.	2,580.6	165.1
	10/20/2010	7.90	2.16	1,612.0	1,612.0
	12/31/2010	8.60	Use next conc.	3,014.1	1,402.1
	1/24/2011	10.00	3.04	3,328.9	314.8
	4/4/2011	17.50	Use next conc.	4,949.9	1,621.0
	4/25/2011	11.00	7.55	2,903.4	307.2
	6/30/2011	11.80	3.96	4,321.8	1,418.4
	7/11/2011	8.50	3.96	4,489.5	167.7
	10/6/2011	6.80	Use next conc.	6,530.5	2,041.0
	10/18/2011	6.20	2.02	316.1	316.1
	12/31/2011	8.20	Use next conc.	1,969.5	1,653.4

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration (*ppmV*)	Hours on Unit at Start	Operating Time (*hr*)
AHT-08B	1/10/2012	7.90	3.83	2,207.6	238.1
	4/16/2012	7.00	3.55	4,483.9	2,276.3
	6/30/2012	6.34	Use next conc.	6,117.2	1,633.3
	7/31/2012	5.58	ND	2.2	203.9
	10/22/2012	8.00	2.23	1,272.4	1,270.2
	12/31/2012	3.00	Use next conc.	2,233.6	961.2
	2/20/2013	17.60	1.81	2,398.8	165.2
	4/16/2013	6.40	0.67	3,544.0	1,145.2
	6/30/2013	5.80	Use next conc.	5,276.7	1,732.7
	7/8/2013	5.90	0.17	5,470.7	194.0
	11/19/2013	6.00	0.05	1,758.9	2,571.3
	12/31/2013	13.50	Use next conc.	6,535.1	6,535.1
	3/24/2014	9.00	0.18	377.2	377.2
	4/16/2014	8.00	0.11	898.4	521.2
	6/30/2014	9.60	Use next conc.	2,333.2	1,434.8
	8/11/2014	7.70	ND	3,171.2	838.0
	10/13/2014	8.82	ND	4,596.4	1,425.2
	12/31/2014	9.40	Use previous conc.	5,430.0	833.6
	2/11/2015	12.10	ND	6,029.3	599.3
	4/16/2015	9.20	0.05	909.6	1,431.3
	6/30/2015	8.78	Use previous conc.	2,690.4	1,780.8
	7/20/2015	10.70	0.04	3,408.2	717.8
	12/9/2015	10.20	0.12	5,585.2	2,177.0
	12/31/2015	OOS	Use previous conc.	5,923.2	338.0
	2/9/2016	15.58	0.08	6,469.5	546.3
	5/16/2016	9.25	0.07	2,100.9	2,149.4
	6/30/2016	10.43	Use previous conc.	3,166.9	1,066.0
	9/12/2016	6.5	0.07	4,943.0	1,776.1
	12/12/2016	16.4	0.08	6,474.5	1,531.5
	12/31/2016	12.4	Use previous conc.	193.2	261.7
	2/13/2017	18.20	0.05	350.5	157.3
	5/15/2017	13.80	0.09	2,923.4	2,572.9
	6/29/2017	12.30	Use previous conc.	3,997.6	1,074.2
	9/13/2017	14.92	0.09	5,736.2	1,738.6
	12/11/2017	15.95	0.06	835.4	1,644.2
	**	**	**	**	**

****converted to MicroBlowers™ in December 2017**

AHT – A-Area Hidden Trench
conc. – concentration
ft^3/min – cubic feet per minute
hr – hour
ND – non-detect
OOS – out of service
ppmV – parts per million by volume

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration ($ppmV$)	Hours on Unit at Start	Operating Time (hr)
AHT-09A	6/25/2008	2.88	3.40	2,683.0	
	6/30/2008	3.60	7.79	2,802.5	119.5
	7/16/2008	3.00	7.79	3,094.0	291.5
	8/13/2008	13.00	1.55	3,595.8	501.8
	9/24/2008	11.90	0.66	4,488.5	892.7
	9/25/2008	11.90	0.69	4,534.2	45.7
	9/29/2008	11.90	0.14	4,630.5	96.3
	9/30/2008	12.50	0.23	4,654.2	23.7
	10/7/2008	12.20	0.50	4,821.2	167.0
	10/21/2008	10.11	0.41	5,065.3	244.1
	10/30/2008	6.08	0.37	5,121.2	55.9
	11/5/2008	12.60	0.33	5,266.9	145.7
	12/2/2008	11.00	0.34	5,568.2	301.3
	12/31/2008	11.50	Use next conc.	5,826.1	257.9
	1/27/2009	11.20	0.43	5,851.0	24.9
	2/3/2009	12.00	0.25	5,997.1	146.1
	3/5/2009	13.00	0.13	6,472.7	475.6
	3/9/2009	15.30	Use next conc.	13.0	13.0
	4/20/2009	14.00	0.09	1,019.3	1,006.3
	6/30/2009	13.80	ND	2,668.7	1,649.4
	7/20/2009	12.40	ND	3,137.1	468.4
	11/9/2009	10.30	ND	5,308.2	2,171.1
	12/31/2009	10.30	Use next conc.	5,330.4	22.2
	1/20/2010	9.70	0.21	5,364.3	33.9
	3/25/2010	12.40	Use next conc.	6,552.0	1,187.7
	4/20/2010	12.00	ND	524.7	524.7
	6/30/2010	12.00	ND	2,101.6	1,576.9
	7/21/2010	11.60	ND	2,415.5	313.9
	8/5/2010	11.70	Use next conc.	2,580.6	165.1
	10/20/2010	9.30	ND	1,612.0	1,612.0
	12/31/2010	10.20	Use next conc.	3,014.1	1,402.1
	1/24/2011	10.30	ND	3,328.9	314.8
	4/4/2011	19.80	Use next conc.	4,949.9	1,621.0
	4/25/2011	13.00	ND	2,903.4	307.2
	6/30/2011	14.30	ND	4,321.8	1,418.4
	7/11/2011	9.60	ND	4,489.5	167.7
	10/6/2011	7.50	Use next conc.	6,530.5	2,041.0
	10/18/2011	7.10	ND	316.1	316.1
	12/31/2011	9.20	Use next conc.	1,969.5	1,653.4
	6/25/2008	2.88	3.40	2,683.0	

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration (*ppmV*)	Hours on Unit at Start	Operating Time (*hr*)
AHT-09A	1/10/2012	9.30	ND	2,207.6	238.1
	4/16/2012	9.40	ND	4,483.9	2,276.3
	6/30/2012	5.76	Use next conc.	6,117.2	1,633.3
	7/31/2012	6.21	ND	2.2	203.9
	10/22/2012	11.00	ND	1,272.4	1,270.2
	12/31/2012	2.70	Use next conc.	2,233.6	961.2
	2/20/2013	6.40	ND	2,398.8	165.2
	4/16/2013	8.00	ND	3,544.0	1,145.2
	6/30/2013	8.00	Use next conc.	5,276.7	1,732.7
	7/8/2013	8.30	ND	5,470.7	194.0
	11/19/2013	8.00	ND	1,758.9	2,571.3
	12/31/2013	9.10	Use next conc.	6,535.1	6,535.1
	3/24/2014	1.43	ND	377.2	377.2
	4/16/2014	9.00	ND	898.4	521.2
	6/30/2014	10.60	Use next conc.	2,333.2	1,434.8
	8/11/2014	7.60	ND	3,171.2	838.0
	10/13/2014	10.13	ND	4,596.4	1,425.2
	12/31/2014	11.30	Use previous conc.	5,430.0	833.6
	2/11/2015	15.25	ND	6,029.3	599.3
	4/16/2015	37.70	ND	909.6	1,431.3
	6/30/2015	9.61	Use previous conc.	2,690.4	1,780.8
	7/20/2015	11.20	ND	3,408.2	717.8
	**	**	**	**	**

**** converted to BaroBalls™ in November 2015.**

AHT – A-Area Hidden Trench
conc. – concentration
ft^3/min – cubic feet per minute
hr – hour
ND – non-detect
ppmV – parts per million by volume

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration ($ppmV$)	Hours on Unit at Start	Operating Time (hr)
AHT-09B	6/25/2008	6.59	13.53	2,683.0	
	6/30/2008	8.70	9.77	2,802.5	119.5
	7/16/2008	8.00	9.77	3,094.0	291.5
	8/7/2008	15.40	4.24	3,451.3	357.3
	8/13/2008	1.50	4.79	3,595.8	144.5
	9/24/2008	13.70	1.50	4,488.5	892.7
	9/25/2008	13.70	1.59	4,534.2	45.7
	9/29/2008	14.10	0.64	4,630.5	96.3
	9/30/2008	14.90	0.47	4,654.2	23.7
	10/7/2008	13.70	1.23	4,821.2	167.0
	10/21/2008	12.56	1.13	5,065.3	244.1
	10/30/2008	8.82	1.24	5,121.2	55.9
	11/5/2008	13.90	1.21	5,266.9	145.7
	12/2/2008	16.00	1.03	5,568.2	301.3
	12/31/2008	15.14	Use next conc.	5,826.1	257.9
	1/27/2009	3.50	1.00	5,851.0	24.9
	2/3/2009	14.00	1.25	5,997.1	146.1
	3/5/2009	15.00	1.19	6,472.7	475.6
	3/9/2009	16.30	Use next conc.	13.0	13.0
	4/20/2009	17.00	1.29	1,019.3	1,006.3
	6/30/2009	16.00	ND	2,668.7	1,649.4
	7/20/2009	14.50	ND	3,137.1	468.4
	11/9/2009	15.40	0.72	5,308.2	2,171.1
	12/31/2009	15.40	Use next conc.	5,330.4	22.2
	1/20/2010	13.90	0.75	5,364.3	33.9
	3/25/2010	14.20	Use next conc.	6,552.0	1,187.7
	4/20/2010	14.00	0.28	524.7	524.7
	6/30/2010	14.00	0.16	2,101.6	1,576.9
	7/21/2010	12.70	0.16	2,415.5	313.9
	8/5/2010	13.40	Use next conc.	2,580.6	165.1
	10/20/2010	10.60	ND	1,612.0	1,612.0
	12/31/2010	11.20	Use next conc.	3,014.1	1,402.1
	1/24/2011	14.80	0.18	3,328.9	314.8
	4/4/2011	23.10	Use next conc.	4,949.9	1,621.0
	4/25/2011	14.00	ND	2,903.4	307.2
	6/30/2011	17.80	0.14	4,321.8	1,418.4
	7/11/2011	11.10	0.14	4,489.5	167.7
	10/6/2011	9.10	Use next conc.	6,530.5	2,041.0
	10/18/2011	8.30	ND	316.1	316.1
	12/31/2011	10.50	Use next conc.	1,969.5	1,653.4

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration (*ppmV*)	Hours on Unit at Start	Operating Time (*hr*)
AHT-09B	1/10/2012	10.30	ND	2,207.6	238.1
	4/16/2012	8.40	ND	4,483.9	2,276.3
	6/30/2012	10.49	Use next conc.	6,117.2	1,633.3
	7/31/2012	9.63	ND	2.2	203.9
	10/22/2012	11.00	ND	1,272.4	1,270.2
	12/31/2012	2.20	Use next conc.	2,233.6	961.2
	2/20/2013	16.30	ND	2,398.8	165.2
	4/16/2013	7.80	ND	3,544.0	1,145.2
	6/30/2013	6.60	Use next conc.	5,276.7	1,732.7
	7/8/2013	6.70	ND	5,470.7	194.0
	11/19/2013	5.00	ND	1,758.9	2,571.3
	12/31/2013	8.40	Use next conc.	6,535.1	6,535.1
	3/24/2014	7.00	ND	377.2	377.2
	4/16/2014	7.00	ND	898.4	521.2
	6/30/2014	9.40	Use next conc.	2,333.2	1,434.8
	8/11/2014	8.40	ND	3,171.2	838.0
	10/13/2014	7.41	ND	4,596.4	1,425.2
	12/31/2014	9.00	Use previous conc.	5,430.0	833.6
	2/11/2015	11.32	ND	6,029.3	599.3
	4/16/2015	8.80	ND	909.6	1,431.3
	6/30/2015	9.36	Use previous conc.	2,690.4	1,780.8
	7/20/2015	17.90	ND	3,408.2	717.8
	**	**	**	**	**

**** converted to BaroBalls™ in November 2015**

AHT – A-Area Hidden Trench
conc. – concentration
ft^3/min – cubic feet per minute
hr – hour
ND – non-detect
ppmV – parts per million by volume

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration (*ppmV*)	Hours on Unit at Start	Operating Time (*hr*)
AHT-10A	6/25/2008	6.38	9.45	2,683.0	
	6/30/2008	7.90	9.95	2,802.5	119.5
	7/16/2008	10.00	9.95	3,094.0	291.5
	9/24/2008	15.40	5.54	4,488.5	1,394.5
	9/25/2008	15.40	4.46	4,534.2	45.7
	9/29/2008	15.50	1.23	4,630.5	96.3
	9/30/2008	16.00	0.07	4,654.2	23.7
	10/7/2008	25.70	3.80	4,821.2	167.0
	10/21/2008	12.19	3.63	5,065.3	244.1
	10/30/2008	13.44	4.20	5,121.2	55.9
	11/5/2008	15.80	3.33	5,266.9	145.7
	12/2/2008	13.00	3.81	5,568.2	301.3
	12/31/2008	12.12	Use next conc.	5,826.1	257.9
	1/27/2009	13.30	6.69	5,851.0	24.9
	2/3/2009	16.00	3.45	5,997.1	146.1
	3/5/2009	19.00	1.56	6,472.7	475.6
	3/9/2009	38.80	Use next conc.	13.0	13.0
	4/20/2009	24.00	0.89	1,019.3	1,006.3
	6/30/2009	18.20	ND	2,668.7	1,649.4
	7/20/2009	20.10	ND	3,137.1	468.4
	11/9/2009	11.30	0.82	5,308.2	2,171.1
	12/31/2009	11.30	Use next conc.	5,330.4	22.2
	1/20/2010	11.20	1.81	5,364.3	33.9
	3/25/2010	20.30	Use next conc.	6,552.0	1,187.7
	4/20/2010	18.00	0.25	524.7	524.7
	6/30/2010	18.00	0.18	2,101.6	1,576.9
	7/21/2010	15.00	0.18	2,415.5	313.9
	8/5/2010	13.00	Use next conc.	2,580.6	165.1
	10/20/2010	11.60	0.20	1,612.0	1,612.0
	12/31/2010	13.80	Use next conc.	3,014.1	1,402.1
	1/24/2011	14.00	0.16	3,328.9	314.8
	4/4/2011	28.20	Use next conc.	4,949.9	1,621.0
	4/25/2011	7.00	ND	2,903.4	307.2
	6/30/2011	39.90	ND	4,321.8	1,418.4
	7/11/2011	12.10	ND	4,489.5	167.7
	10/6/2011	7.70	Use next conc.	6,530.5	2,041.0
	10/18/2011	8.00	ND	316.1	316.1
	12/31/2011	12.00	Use next conc.	1,969.5	1,653.4
	1/10/2012	12.00	ND	2,207.6	238.1
	4/16/2012	8.30	ND	4,483.9	2,276.3

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate *(ft^3/min)*	TCE Concentration *(ppmV)*	Hours on Unit at Start	Operating Time *(hr)*
AHT-10A	6/30/2012	7.77	Use next conc.	6,117.2	1,633.3
	7/31/2012	5.75	ND	2.2	203.9
	10/22/2012	15.00	ND	1,272.4	1,270.2
	12/31/2012	3.10	Use next conc.	2,233.6	961.2
	2/20/2013	10.40	ND	2,398.8	165.2
	4/16/2013	7.20	ND	3,544.0	1,145.2
	6/30/2013	10.40	Use next conc.	5,276.7	1,732.7
	7/8/2013	10.40	ND	5,470.7	194.0
	11/19/2013	6.00	ND	1,758.9	2,571.3
	12/31/2013	13.20	Use next conc.	6,535.1	6,535.1
	3/24/2014	14.00	ND	377.2	377.2
	4/16/2014	13.00	ND	898.4	521.2
	6/30/2014	14.70	Use next conc.	2,333.2	1,434.8
	8/11/2014	12.60	ND	3,171.2	838.0
	10/13/2014	15.46	ND	4,596.4	1,425.2
	12/31/2014	12.50	Use previous conc.	5,430.0	833.6
	2/11/2015	11.67	ND	6,029.3	599.3
	4/16/2015	14.20	ND	909.6	1,431.3
	6/30/2015	14.35	Use previous conc.	2,690.4	1,780.8
	7/20/2015	16.30	ND	3,408.2	717.8
	**	**	**	**	**

**** converted to BaroBalls™ in November 2015**

AHT – A-Area Hidden Trench
conc. – concentration
ft^3/min – cubic feet per minute
hr – hour
ND – non-detect
ppmV – parts per million by volume

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration ($ppmV$)	Hours on Unit at Start	Operating Time (hr)
AHT-10B	6/25/2008	1.29	82.29	2,683.0	
	6/30/2008	2.70	104.85	2,802.5	119.5
	7/16/2008	3.00	104.85	3,094.0	291.5
	8/13/2008	21.10	2.57	3,595.8	501.8
	9/24/2008	26.80	1.98	4,488.5	892.7
	9/25/2008	26.80	2.03	4,534.2	45.7
	9/29/2008	23.70	0.02	4,630.5	96.3
	9/30/2008	23.30	0.42	4,654.2	23.7
	10/7/2008	30.20	1.70	4,821.2	167.0
	10/21/2008	21.56	1.70	5,065.3	244.1
	10/30/2008	13.44	1.55	5,121.2	55.9
	11/5/2008	25.50	1.43	5,266.9	145.7
	12/2/2008	22.00	1.37	5,568.2	301.3
	12/31/2008	7.23	Use next conc.	5,826.1	257.9
	1/27/2009	28.50	1.47	5,851.0	24.9
	2/3/2009	25.00	1.27	5,997.1	146.1
	3/5/2009	26.00	1.20	6,472.7	475.6
	3/9/2009	28.70	Use next conc.	13.0	13.0
	4/20/2009	33.00	0.95	1,019.3	1,006.3
	6/30/2009	29.10	ND	2,668.7	1,649.4
	7/20/2009	34.80	ND	3,137.1	468.4
	11/9/2009	26.60	0.38	5,308.2	2,171.1
	12/31/2009	26.60	Use next conc.	5,330.4	22.2
	1/20/2010	26.00	0.39	5,364.3	33.9
	3/25/2010	30.40	Use next conc.	6,552.0	1,187.7
	4/20/2010	25.00	0.24	524.7	524.7
	6/30/2010	25.00	ND	2,101.6	1,576.9
	7/21/2010	29.70	ND	2,415.5	313.9
	8/5/2010	25.10	Use next conc.	2,580.6	165.1
	10/20/2010	21.60	ND	1,612.0	1,612.0
	12/31/2010	24.80	Use next conc.	3,014.1	1,402.1
	1/24/2011	27.60	ND	3,328.9	314.8
	4/4/2011	47.00	Use next conc.	4,949.9	1,621.0
	4/25/2011	33.00	ND	2,903.4	307.2
	6/30/2011	21.40	ND	4,321.8	1,418.4
	7/11/2011	20.80	ND	4,489.5	167.7
	10/6/2011	17.20	Use next conc.	6,530.5	2,041.0
	10/18/2011	16.90	ND	316.1	316.1
	12/31/2011	23.80	Use next conc.	1,969.5	1,653.4

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate *(ft^3/min)*	TCE Concentration *(ppmV)*	Hours on Unit at Start	Operating Time *(hr)*
AHT-10B	1/10/2012	21.60	ND	2,207.6	238.1
	4/16/2012	18.80	ND	4,483.9	2,276.3
	6/30/2012	19.15	Use next conc.	6,117.2	1,633.3
	7/31/2012	15.10	ND	2.2	203.9
	10/22/2012	23.00	ND	1,272.4	1,270.2
	12/31/2012	12.20	Use next conc.	2,233.6	961.2
	2/20/2013	36.30	ND	2,398.8	165.2
	4/16/2013	16.50	ND	3,544.0	1,145.2
	6/30/2013	17.50	Use next conc.	5,276.7	1,732.7
	7/8/2013	17.70	ND	5,470.7	194.0
	11/19/2013	12.00	ND	1,758.9	2,571.3
	12/31/2013	18.20	Use next conc.	6,535.1	6,535.1
	3/24/2014	17.00	ND	377.2	377.2
	4/16/2014	17.00	ND	898.4	521.2
	6/30/2014	19.80	Use next conc.	2,333.2	1,434.8
	8/11/2014	18.40	ND	3,171.2	838.0
	10/13/2014	19.72	ND	4,596.4	1,425.2
	12/31/2014	18.60	Use previous conc.	5,430.0	833.6
	2/11/2015	16.43	ND	6,029.3	599.3
	4/16/2015	18.50	ND	909.6	1,431.3
	6/30/2015	19.81	Use previous conc.	2,690.4	1,780.8
	7/20/2015	21.10	ND	3,408.2	717.8
	**	**	**	**	**

**** converted to BaroBalls™ in November 2015**

AHT – A-Area Hidden Trench
conc. – concentration
ft^3/min – cubic feet per minute
hr – hour
ND – non-detect
ppmV – parts per million by volume

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration ($ppmV$)	Hours on Unit at Start	Operating Time (hr)
AHT-11A	6/25/2008	4.17	3.36	2,683.0	
	6/30/2008	5.30	2.79	2,802.5	119.5
	7/16/2008	6.00	2.79	3,094.0	291.5
	8/19/2008	19.40	2.88	3,739.1	645.1
	9/24/2008	14.10	1.61	4,488.5	749.4
	9/25/2008	14.10	1.56	4,534.2	45.7
	9/29/2008	14.70	0.16	4,630.5	96.3
	9/30/2008	56.50	0.42	4,654.2	23.7
	10/7/2008	11.70	1.11	4,821.2	167.0
	10/21/2008	14.92	1.18	5,065.3	244.1
	10/30/2008	12.60	1.36	5,121.2	55.9
	11/5/2008	13.30	1.01	5,266.9	145.7
	12/2/2008	12.00	0.98	5,568.2	301.3
	12/31/2008	11.82	Use next conc.	5,826.1	257.9
	1/27/2009	11.90	1.83	5,851.0	24.9
	2/3/2009	12.00	0.79	5,997.1	146.1
	3/5/2009	13.00	0.42	6,472.7	475.6
	3/9/2009	14.20	Use next conc.	13.0	13.0
	4/20/2009	14.00	0.29	1,019.3	1,006.3
	6/30/2009	13.70	ND	2,668.7	1,649.4
	7/20/2009	11.40	ND	3,137.1	468.4
	11/9/2009	10.50	0.45	5,308.2	2,171.1
	12/31/2009	10.50	Use next conc.	5,330.4	22.2
	1/20/2010	10.10	1.02	5,364.3	33.9
	3/25/2010	12.30	Use next conc.	6,552.0	1,187.7
	4/20/2010	10.00	0.31	524.7	524.7
	6/30/2010	10.00	0.64	2,101.6	1,576.9
	7/21/2010	11.50	0.64	2,415.5	313.9
	8/5/2010	10.60	Use next conc.	2,580.6	165.1
	10/20/2010	9.30	0.65	1,612.0	1,612.0
	12/31/2010	10.50	Use next conc.	3,014.1	1,402.1
	1/24/2011	11.10	2.22	3,328.9	314.8
	4/4/2011	20.30	Use next conc.	4,949.9	1,621.0
	4/25/2011	15.00	3.31	2,903.4	307.2
	6/30/2011	13.30	2.20	4,321.8	1,418.4
	7/11/2011	10.10	2.20	4,489.5	167.7
	10/6/2011	7.70	Use next conc.	6,530.5	2,041.0
	10/18/2011	7.50	0.60	316.1	316.1
	12/31/2011	9.50	Use next conc.	1,969.5	1,653.4

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration (*ppmV*)	Hours on Unit at Start	Operating Time (*hr*)
AHT-11A	1/10/2012	10.40	1.76	2,207.6	238.1
	4/16/2012	8.20	5.70	4,483.9	2,276.3
	6/30/2012	10.06	Use next conc.	6,117.2	1,633.3
	7/31/2012	10.14	2.65	2.2	203.9
	10/22/2012	13.00	1.36	1,272.4	1,270.2
	12/31/2012	3.30	Use next conc.	2,233.6	961.2
	2/20/2013	10.40	0.83	2,398.8	165.2
	4/16/2013	9.20	ND	3,544.0	1,145.2
	6/30/2013	9.50	Use next conc.	5,276.7	1,732.7
	7/8/2013	9.70	ND	5,470.7	194.0
	11/19/2013	7.00	ND	1,758.9	2,571.3
	12/31/2013	12.40	Use next conc.	6,535.1	6,535.1
	3/24/2014	12.00	ND	377.2	377.2
	4/16/2014	11.00	ND	898.4	521.2
	6/30/2014	12.80	Use next conc.	2,333.2	1,434.8
	8/11/2014	13.10	ND	3,171.2	838.0
	10/13/2014	12.62	ND	4,596.4	1,425.2
	12/31/2014	12.80	Use previous conc.	5,430.0	833.6
	2/11/2015	11.34	ND	6,029.3	599.3
	4/16/2015	11.90	ND	909.6	1,431.3
	6/30/2015	12.19	Use previous conc.	2,690.4	1,780.8
	7/20/2015	14.80	ND	3,408.2	717.8
	12/9/2015	14.40	ND	5,585.2	2,177.0
	12/31/2015	OOS	Use previous conc.	5,923.2	338.0
	2/9/2016	23.14	ND	6,469.5	546.3
	5/16/2016	14.17	ND	2,100.9	2,149.4
	6/30/2016	17.60	Use previous conc.	3,166.9	1,066.0
	9/12/2016	9.60	ND	4,943.0	1,776.1
	12/12/2016	15.85	ND	6,474.5	1,531.5
	12/31/2016	18.00	Use previous conc.	193.2	261.7
	2/13/2017	32.50	ND	350.5	157.3
	5/15/2017	19.70	ND	2,923.4	2,572.9
	6/29/2017	18.00	Use previous conc.	3,997.6	1,074.2
	9/13/2017	20.89	ND	5,736.2	1,738.6
	12/11/2017	22.40	ND	835.4	1,644.2
	**	**	**	**	**

****converted to MicroBlowers™ in December 2017**

AHT – A-Area Hidden Trench
conc. – concentration
ft^3/min – cubic feet per minute
hr – hour
ND – non-detect
OOS – out of service
ppmV – parts per million by volume

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration (*ppmV*)	Hours on Unit at Start	Operating Time (*hr*)
AHT-11B	6/25/2008	3.40	4.52	2,683.0	
	6/30/2008	4.00	1.95	2,802.5	119.5
	7/16/2008	4.00	1.95	3,094.0	291.5
	8/19/2008	28.80	4.79	3,739.1	645.1
	9/23/2008	24.80	6.10	4,488.5	749.4
	9/25/2008	24.80	4.96	4,534.2	45.7
	9/29/2008	24.60	0.25	4,630.5	96.3
	9/30/2008	24.80	1.55	4,654.2	23.7
	10/7/2008	26.60	5.52	4,821.2	167.0
	10/21/2008	25.86	5.23	5,065.3	244.1
	10/30/2008	26.59	5.20	5,121.2	55.9
	11/5/2008	22.50	5.99	5,266.9	145.7
	12/2/2008	25.00	8.09	5,568.2	301.3
	12/31/2008	25.80	Use next conc.	5,826.1	257.9
	1/27/2009	28.50	9.23	5,851.0	24.9
	2/3/2009	24.00	8.99	5,997.1	146.1
	3/5/2009	27.00	11.52	6,472.7	475.6
	3/9/2009	27.30	Use next conc.	13.0	13.0
	4/20/2009	28.00	10.24	1,019.3	1,006.3
	6/30/2009	26.50	ND	2,668.7	1,649.4
	7/20/2009	29.70	ND	3,137.1	468.4
	11/9/2009	29.10	2.56	5,308.2	2,171.1
	12/31/2009	29.10	Use next conc.	5,330.4	22.2
	1/20/2010	26.70	2.04	5,364.3	33.9
	3/25/2010	25.20	Use next conc.	6,552.0	1,187.7
	4/20/2010	20.00	0.16	524.7	524.7
	6/30/2010	20.00	ND	2,101.6	1,576.9
	7/21/2010	21.70	ND	2,415.5	313.9
	8/5/2010	16.00	Use next conc.	2,580.6	165.1
	10/20/2010	17.00	ND	1,612.0	1,612.0
	12/31/2010	20.60	Use next conc.	3,014.1	1,402.1
	1/24/2011	25.90	ND	3,328.9	314.8
	4/4/2011	36.70	Use next conc.	4,949.9	1,621.0
	4/25/2011	25.00	0.16	2,903.4	307.2
	6/30/2011	25.50	0.27	4,321.8	1,418.4
	7/11/2011	19.90	0.27	4,489.5	167.7
	10/6/2011	15.70	Use next conc.	6,530.5	2,041.0
	10/18/2011	16.80	ND	316.1	316.1
	12/31/2011	20.10	Use next conc.	1,969.5	1,653.4

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate *(ft^3/min)*	TCE Concentration *(ppmV)*	Hours on Unit at Start	Operating Time *(hr)*
AHT-11B	1/10/2012	19.30	ND	2,207.6	238.1
	4/16/2012	19.40	0.13	4,483.9	2,276.3
	6/30/2012	20.40	Use next conc.	6,117.2	1,633.3
	7/31/2012	17.41	0.11	2.2	203.9
	10/22/2012	23.00	ND	1,272.4	1,270.2
	12/31/2012	9.90	Use next conc.	2,233.6	961.2
	2/20/2013	19.00	ND	2,398.8	165.2
	4/16/2013	16.20	ND	3,544.0	1,145.2
	6/30/2013	19.70	Use next conc.	5,276.7	1,732.7
	7/8/2013	20.20	ND	5,470.7	194.0
	11/19/2013	13.00	ND	1,758.9	2,571.3
	12/31/2013	14.30	Use next conc.	6,535.1	6,535.1
	3/24/2014	15.00	ND	377.2	377.2
	4/16/2014	15.00	ND	898.4	521.2
	6/30/2014	17.40	Use next conc.	2,333.2	1,434.8
	8/11/2014	19.60	ND	3,171.2	838.0
	10/13/2014	17.11	ND	4,596.4	1,425.2
	12/31/2014	32.30	Use previous conc.	5,430.0	833.6
	2/11/2015	16.17	ND	6,029.3	599.3
	4/16/2015	16.50	ND	909.6	1,431.3
	6/30/2015	20.32	Use previous conc.	2,690.4	1,780.8
	7/20/2015	26.50	ND	3,408.2	717.8
	**	**	**	**	**

**** converted to MicroBlowers™ in December 2015**

AHT – A-Area Hidden Trench
conc. – concentration
ft^3/min – cubic feet per minute
hr – hour
ND – non-detect
ppmV – parts per million by volume

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration ($ppmV$)	Hours on Unit at Start	Operating Time (hr)
AHT-12A	6/25/2008	1.40	2.76	2,683.0	
	6/30/2008	2.00	1.97	2,802.5	119.5
	7/16/2008	2.00	1.97	3,094.0	291.5
	8/18/2008	1.16	16.10	3,721.4	627.4
	9/23/2008	6.80	1.12	4,488.5	767.1
	9/25/2008	6.80	0.99	4,534.2	45.7
	9/29/2008	8.00	0.04	4,630.5	96.3
	9/30/2008	8.20	0.01	4,654.2	23.7
	10/7/2008	7.90	0.39	4,821.2	167.0
	10/21/2008	9.44	1.24	5,065.3	244.1
	10/30/2008	12.31	1.37	5,121.2	55.9
	11/5/2008	58.80	1.15	5,266.9	145.7
	12/2/2008	10.00	1.07	5,568.2	301.3
	12/31/2008	12.37	Use next conc.	5,826.1	257.9
	1/27/2009	12.50	1.39	5,851.0	24.9
	2/3/2009	11.00	0.92	5,997.1	146.1
	3/5/2009	12.00	0.49	6,472.7	475.6
	3/9/2009	13.70	Use next conc.	13.0	13.0
	4/20/2009	12.00	0.31	1,019.3	1,006.3
	6/30/2009	13.00	ND	2,668.7	1,649.4
	7/20/2009	12.60	ND	3,137.1	468.4
	11/9/2009	15.00	ND	5,308.2	2,171.1
	12/31/2009	15.00	Use next conc.	5,330.4	22.2
	1/20/2010	10.00	0.14	5,364.3	33.9
	3/25/2010	12.30	Use next conc.	6,552.0	1,187.7
	4/20/2010	10.00	ND	524.7	524.7
	6/30/2010	10.00	ND	2,101.6	1,576.9
	7/21/2010	12.30	ND	2,415.5	313.9
	8/5/2010	12.30	Use next conc.	2,580.6	165.1
	10/20/2010	8.30	ND	1,612.0	1,612.0
	12/31/2010	10.10	Use next conc.	3,014.1	1,402.1
	1/24/2011	11.70	ND	3,328.9	314.8
	4/4/2011	19.50	Use next conc.	4,949.9	1,621.0
	4/25/2011	12.00	ND	2,903.4	307.2
	6/30/2011	14.80	ND	4,321.8	1,418.4
	7/11/2011	9.80	ND	4,489.5	167.7
	10/6/2011	7.10	Use next conc.	6,530.5	2,041.0
	10/18/2011	6.20	ND	316.1	316.1
	12/31/2011	10.00	Use next conc.	1,969.5	1,653.4

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration (*ppmV*)	Hours on Unit at Start	Operating Time (*hr*)
AHT-12A	1/10/2012	9.40	ND	2,207.6	238.1
	4/16/2012	10.20	ND	4,483.9	2,276.3
	6/30/2012	8.27	Use next conc.	6,117.2	1,633.3
	7/31/2012	7.47	ND	2.2	203.9
	10/22/2012	12.00	ND	1,272.4	1,270.2
	12/31/2012	10.00	Use next conc.	2,233.6	961.2
	2/20/2013	7.10	ND	2,398.8	165.2
	4/16/2013	7.80	ND	3,544.0	1,145.2
	6/30/2013	7.20	Use next conc.	5,276.7	1,732.7
	7/8/2013	7.10	ND	5,470.7	194.0
	11/19/2013	7.00	ND	1,758.9	2,571.3
	12/31/2013	10.20	Use next conc.	6,535.1	6,535.1
	3/24/2014	8.00	ND	377.2	377.2
	4/16/2014	10.00	ND	898.4	521.2
	6/30/2014	10.90	Use next conc.	2,333.2	1,434.8
	8/11/2014	10.50	ND	3,171.2	838.0
	10/13/2014	11.33	ND	4,596.4	1,425.2
	12/31/2014	10.60	Use previous conc.	5,430.0	833.6
	2/11/2015	10.75	ND	6,029.3	599.3
	4/16/2015	10.50	ND	909.6	1,431.3
	6/30/2015	12.06	Use previous conc.	2,690.4	1,780.8
	7/20/2015	12.40	ND	3,408.2	717.8
	**	**	**	**	**

**** converted to BaroBalls™ in November 2015**

AHT – A-Area Hidden Trench
conc. – concentration
ft^3/min – cubic feet per minute
hr – hour
ND – non-detect
ppmV – parts per million by volume

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration (*ppmV*)	Hours on Unit at Start	Operating Time (*hr*)
AHT-12B	6/25/2008	1.43	5.74	2,683.0	
	6/30/2008	0.20	19.68	2,802.5	119.5
	7/16/2008	1.00	19.68	3,094.0	291.5
	8/18/2008	13.17	0.68	3,721.4	627.4
	9/23/2008	66.30	0.14	4,488.5	767.1
	9/25/2008	66.30	0.11	4,534.2	45.7
	9/29/2008	58.80	0.04	4,630.5	96.3
	9/30/2008	57.80	0.01	4,654.2	23.7
	10/7/2008	55.30	0.02	4,821.2	167.0
	10/21/2008	68.74	0.12	5,065.3	244.1
	10/30/2008	69.71	0.11	5,121.2	55.9
	11/5/2008	58.80	0.11	5,266.9	145.7
	12/2/2008	66.00	0.07	5,568.2	301.3
	12/31/2008	60.10	Use next conc.	5,826.1	257.9
	1/27/2009	73.70	0.09	5,851.0	24.9
	2/3/2009	64.00	0.09	5,997.1	146.1
	3/5/2009	62.00	0.07	6,472.7	475.6
	3/9/2009	62.10	Use next conc.	13.0	13.0
	4/20/2009	61.00	0.05	1,019.3	1,006.3
	6/30/2009	57.40	ND	2,668.7	1,649.4
	7/20/2009	64.40	ND	3,137.1	468.4
	11/9/2009	68.00	ND	5,308.2	2,171.1
	12/31/2009	68.00	Use next conc.	5,330.4	22.2
	1/20/2010	68.00	ND	5,364.3	33.9
	3/25/2010	72.50	Use next conc.	6,552.0	1,187.7
	4/20/2010	64.00	ND	524.7	524.7
	6/30/2010	64.00	ND	2,101.6	1,576.9
	7/21/2010	68.20	ND	2,415.5	313.9
	8/5/2010	61.60	Use next conc.	2,580.6	165.1
	10/20/2010	54.70	ND	1,612.0	1,612.0
	12/31/2010	66.20	Use next conc.	3,014.1	1,402.1
	1/24/2011	68.30	ND	3,328.9	314.8
	4/4/2011	102.00	Use next conc.	4,949.9	1,621.0
	4/25/2011	94.00	ND	2,903.4	307.2
	6/30/2011	99.60	ND	4,321.8	1,418.4
	7/11/2011	54.30	ND	4,489.5	167.7
	10/6/2011	48.00	Use next conc.	6,530.5	2,041.0
	10/18/2011	40.30	ND	316.1	316.1
	12/31/2011	62.70	Use next conc.	1,969.5	1,653.4

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration (*ppmV*)	Hours on Unit at Start	Operating Time (*hr*)
AHT-12B	1/10/2012	58.60	ND	2,207.6	238.1
	4/16/2012	50.80	ND	4,483.9	2,276.3
	6/30/2012	40.13	Use next conc.	6,117.2	1,633.3
	7/31/2012	39.14	ND	2.2	203.9
	10/22/2012	56.00	ND	1,272.4	1,270.2
	12/31/2012	46.40	Use next conc.	2,233.6	961.2
	2/20/2013	52.30	ND	2,398.8	165.2
	4/16/2013	43.30	ND	3,544.0	1,145.2
	6/30/2013	47.60	Use next conc.	5,276.7	1,732.7
	7/8/2013	45.70	ND	5,470.7	194.0
	11/19/2013	34.00	ND	1,758.9	2,571.3
	12/31/2013	62.90	Use next conc.	6,535.1	6,535.1
	3/24/2014	56.00	ND	377.2	377.2
	4/16/2014	46.00	ND	898.4	521.2
	6/30/2014	54.30	Use next conc.	2,333.2	1,434.8
	8/11/2014	45.20	ND	3,171.2	838.0
	10/13/2014	48.40	ND	4,596.4	1,425.2
	12/31/2014	49.40	Use previous conc.	5,430.0	833.6
	2/11/2015	54.92	ND	6,029.3	599.3
	4/16/2015	51.70	ND	909.6	1,431.3
	6/30/2015	53.40	Use previous conc.	2,690.4	1,780.8
	7/20/2015	54.20	ND	3,408.2	717.8
	**	**	**	**	**

**** converted to BaroBalls™ in November 2015**

AHT – A-Area Hidden Trench
conc. – concentration
ft^3/min – cubic feet per minute
hr – hour
ND – non-detect
ppmV – parts per million by volume

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration ($ppmV$)	Hours on Unit at Start	Operating Time (hr)
AHT-13	6/25/2008	0.33	135.43	2,683.0	
	6/30/2008	1.30	127.09	2,802.5	119.5
	7/17/2008	2.90	127.09	3,098.5	296.0
	7/23/2008	92.00	38.00	3,175.5	77.0
	9/23/2008	32.50	4.16	4,488.5	1,313.0
	9/25/2008	32.50	4.03	4,534.2	45.7
	9/29/2008	28.20	2.18	4,630.5	96.3
	9/30/2008	28.80	1.55	4,654.2	23.7
	10/7/2008	27.70	4.20	4,821.2	167.0
	10/21/2008	28.80	3.62	5,065.3	244.1
	10/30/2008	34.33	5.19	5,121.2	55.9
	11/5/2008	26.00	3.78	5,266.9	145.7
	12/2/2008	25.00	4.49	5,568.2	301.3
	12/31/2008	30.87	Use next conc.	5,826.1	257.9
	1/27/2009	5.50	7.51	5,851.0	24.9
	2/3/2009	26.00	3.72	5,997.1	146.1
	3/5/2009	33.00	1.55	6,472.7	475.6
	3/9/2009	36.00	Use next conc.	13.0	13.0
	4/20/2009	31.00	0.81	1,019.3	1,006.3
	6/30/2009	30.80	ND	3,136.1	2,116.8
	7/20/2009	30.30	ND	3,137.1	1.0
	11/9/2009	32.40	0.27	5,308.2	2,171.1
	12/31/2009	32.40	Use next conc.	5,330.4	22.2
	1/20/2010	18.30	0.53	5,364.3	33.9
	3/25/2010	29.70	Use next conc.	6,552.0	1,187.7
	4/20/2010	30.00	0.14	524.7	524.7
	6/30/2010	30.00	0.20	2,101.6	1,576.9
	7/21/2010	30.00	0.20	2,415.5	313.9
	8/5/2010	23.00	Use next conc.	2,580.6	165.1
	10/20/2010	20.80	0.26	1,612.0	1,612.0
	12/31/2010	24.00	Use next conc.	3,014.1	1,402.1
	1/24/2011	24.30	0.17	3,328.9	314.8
	4/4/2011	34.60	Use next conc.	4,949.9	1,621.0
	4/25/2011	33.00	0.28	2,903.4	307.2
	6/30/2011	34.50	0.24	4,321.8	1,418.4
	7/11/2011	22.20	0.24	4,489.5	167.7
	10/6/2011	12.60	Use next conc.	6,530.5	2,041.0
	10/18/2011	14.00	ND	316.1	316.1
	12/31/2011	21.70	Use next conc.	1,969.5	1,653.4

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration (*ppmV*)	Hours on Unit at Start	Operating Time (*hr*)
AHT-13	1/10/2012	20.30	0.14	2,207.6	238.1
	4/16/2012	16.60	0.43	4,483.9	2,276.3
	6/30/2012	15.71	Use next conc.	6,117.2	1,633.3
	7/31/2012	14.45	0.17	2.2	203.9
	10/22/2012	23.00	ND	1,272.4	1,270.2
	12/31/2012	12.80	Use next conc.	2,233.6	961.2
	2/20/2013	16.00	ND	2,398.8	165.2
	4/16/2013	13.50	ND	3,544.0	1,145.2
	6/30/2013	17.80	Use next conc.	5,276.7	1,732.7
	7/8/2013	17.70	ND	5,470.7	194.0
	11/19/2013	15.00	ND	1,758.9	2,571.3
	12/31/2013	22.10	Use next conc.	6,535.1	6,535.1
	3/24/2014	2.00	ND	377.2	377.2
	4/16/2014	23.00	ND	898.4	521.2
	6/30/2014	22.50	Use next conc.	2,333.2	1,434.8
	8/11/2014	25.30	ND	3,171.2	838.0
	10/13/2014	22.86	ND	4,596.4	1,425.2
	12/31/2014	21.30	Use previous conc.	5,430.0	833.6
	2/11/2015	27.87	ND	6,029.3	599.3
	4/16/2015	21.10	ND	909.6	1,431.3
	6/30/2015	21.00	Use previous conc.	2,690.4	1,780.8
	7/20/2015	23.60	ND	3,408.2	717.8
	**	**	**	**	**

**** converted to MicroBlowers™ in December 2015**

AHT – A-Area Hidden Trench
conc. – concentration
ft^3/min – cubic feet per minute
hr – hour
ND – non-detect
ppmV – parts per million by volume

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration ($ppmV$)	Hours on Unit at Start	Operating Time (hr)
AHT-14	6/25/2008	3.33	123.93	2,683.0	
	6/30/2008	4.60	12.43	2,802.5	119.5
	7/31/2008	65.00	12.43	3,285.2	482.7
	8/4/2008	56.80	9.28	3,381.5	96.3
	8/11/2008	35.10	4.52	3,548.0	166.5
	9/23/2008	64.60	1.79	4,488.5	940.5
	9/25/2008	64.60	2.00	4,534.2	45.7
	9/29/2008	53.80	0.91	4,630.5	96.3
	9/30/2008	14.50	0.10	4,654.2	23.7
	10/7/2008	59.60	1.34	4,821.2	167.0
	10/21/2008	143.70	1.41	5,065.3	244.1
	10/30/2008	38.71	1.94	5,121.2	55.9
	11/5/2008	67.60	1.27	5,266.9	145.7
	12/2/2008	47.00	1.29	5,568.2	301.3
	12/31/2008	64.45	Use next conc.	5,826.1	257.9
	1/27/2009	20.20	1.90	5,851.0	24.9
	2/3/2009	48.00	1.09	5,997.1	146.1
	3/5/2009	55.00	0.62	6,472.7	475.6
	3/9/2009	58.10	Use next conc.	13.0	13.0
	4/20/2009	60.00	0.37	1,019.3	1,006.3
	6/30/2009	36.30	ND	2,668.7	1,649.4
	7/20/2009	55.20	ND	3,137.1	468.4
	11/9/2009	69.00	ND	5,308.2	2,171.1
	12/31/2009	69.00	Use next conc.	5,330.4	22.2
	1/20/2010	40.20	ND	5,364.3	33.9
	3/25/2010	74.40	Use next conc.	6,552.0	1,187.7
	4/20/2010	57.00	ND	524.7	524.7
	6/30/2010	57.00	ND	2,101.6	1,576.9
	7/21/2010	47.12	ND	2,415.5	313.9
	8/5/2010	48.10	Use next conc.	2,580.6	165.1
	10/20/2010	46.70	ND	1,612.0	1,612.0
	12/31/2010	49.10	Use next conc.	3,014.1	1,402.1
	1/24/2011	49.80	0.13	3,328.9	314.8
	4/4/2011	65.00	Use next conc.	4,949.9	1,621.0
	4/25/2011	54.00	0.18	2,903.4	307.2
	6/30/2011	70.80	0.19	4,321.8	1,418.4
	7/11/2011	37.60	0.19	4,489.5	167.7
	10/6/2011	22.20	Use next conc.	6,530.5	2,041.0
	10/18/2011	5.80	ND	316.1	316.1
	12/31/2011	38.90	Use next conc.	1,969.5	1,653.4

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration (*ppmV*)	Hours on Unit at Start	Operating Time (*hr*)
AHT-14	1/10/2012	43.40	ND	2,207.6	238.1
	4/16/2012	33.10	0.41	4,483.9	2,276.3
	6/30/2012	36.40	Use next conc.	6,117.2	1,633.3
	7/31/2012	39.20	0.16	2.2	203.9
	10/22/2012	40.00	ND	1,272.4	1,270.2
	12/31/2012	8.40	Use next conc.	2,233.6	961.2
	2/20/2013	25.30	ND	2,398.8	165.2
	4/16/2013	26.80	ND	3,544.0	1,145.2
	6/30/2013	33.50	Use next conc.	5,276.7	1,732.7
	7/8/2013	32.80	ND	5,470.7	194.0
	11/19/2013	31.00	ND	1,758.9	2,571.3
	12/31/2013	40.40	Use next conc.	6,535.1	6,535.1
	3/24/2014	4.00	ND	377.2	377.2
	4/16/2014	39.00	ND	898.4	521.2
	6/30/2014	43.00	Use next conc.	2,333.2	1,434.8
	8/11/2014	44.50	ND	3,171.2	838.0
	10/13/2014	38.82	ND	4,596.4	1,425.2
	12/31/2014	47.70	Use previous conc.	5,430.0	833.6
	2/11/2015	49.85	ND	6,029.3	599.3
	4/16/2015	50.70	ND	909.6	1,431.3
	6/30/2015	40.85	Use previous conc.	2,690.4	1,780.8
	7/20/2015	41.90	ND	3,408.2	717.8
	**	**	**	**	**

**** converted to MicroBlowers™ in December 2015.**

AHT – A-Area Hidden Trench
conc. – concentration
ft^3/min – cubic feet per minute
hr – hour
ND – non-detect
ppmV – parts per million by volume

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration ($ppmV$)	Hours on Unit at Start	Operating Time (hr)
AHT-15	6/25/2008	0.58	27.24	2,683.0	
	6/30/2008	1.30	4.12	2,802.5	119.5
	7/31/2008	82.00	4.12	3,285.2	482.7
	8/4/2008	71.10	2.83	3,381.5	96.3
	8/11/2008	90.60	0.07	3,548.0	166.5
	9/23/2008	74.10	0.73	4,488.5	940.5
	9/25/2008	74.10	0.89	4,534.2	45.7
	9/29/2008	58.00	0.38	4,630.5	96.3
	9/30/2008	58.90	0.01	4,654.2	23.7
	10/7/2008	63.30	0.65	4,821.2	167.0
	10/21/2008	60.60	0.73	5,065.3	244.1
	10/30/2008	96.60	0.25	5,121.2	55.9
	11/5/2008	163.00	0.62	5,266.9	145.7
	12/2/2008	53.00	0.67	5,568.2	301.3
	12/31/2008	60.51	Use next conc.	5,826.1	257.9
	1/27/2009	62.30	0.90	5,851.0	24.9
	2/3/2009	54.00	0.58	5,997.1	146.1
	3/5/2009	68.00	0.34	6,472.7	475.6
	3/9/2009	74.60	Use next conc.	13.0	13.0
	4/20/2009	68.00	0.21	1,019.3	1,006.3
	6/30/2009	70.00	ND	2,668.7	1,649.4
	7/20/2009	64.30	ND	3,137.1	468.4
	11/9/2009	68.00	ND	5,308.2	2,171.1
	12/31/2009	68.00	Use next conc.	5,330.4	22.2
	1/20/2010	57.70	ND	5,364.3	33.9
	3/25/2010	92.40	Use next conc.	6,552.0	1,187.7
	4/20/2010	65.00	ND	524.7	524.7
	6/30/2010	65.00	ND	2,101.6	1,576.9
	7/21/2010	56.70	ND	2,415.5	313.9
	8/5/2010	45.40	Use next conc.	2,580.6	165.1
	10/20/2010	38.70	ND	1,612.0	1,612.0
	12/31/2010	47.00	Use next conc.	3,014.1	1,402.1
	1/24/2011	46.20	ND	3,328.9	314.8
	4/4/2011	76.70	Use next conc.	4,949.9	1,621.0
	4/25/2011	60.00	ND	2,903.4	307.2
	6/30/2011	68.20	ND	4,321.8	1,418.4
	7/11/2011	47.50	ND	4,489.5	167.7
	10/6/2011	24.30	Use next conc.	6,530.5	2,041.0
	10/18/2011	24.10	ND	316.1	316.1
	12/31/2011	44.60	Use next conc.	1,969.5	1,653.4

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate *(ft^3/min)*	TCE Concentration *(ppmV)*	Hours on Unit at Start	Operating Time *(hr)*
AHT-15	1/10/2012	47.30	ND	2,207.6	238.1
	4/16/2012	36.30	ND	4,483.9	2,276.3
	6/30/2012	33.39	Use next conc.	6,117.2	1,633.3
	7/31/2012	37.21	ND	2.2	203.9
	10/22/2012	49.00	ND	1,272.4	1,270.2
	12/31/2012	18.90	Use next conc.	2,233.6	961.2
	2/20/2013	31.70	ND	2,398.8	165.2
	4/16/2013	29.20	ND	3,544.0	1,145.2
	6/30/2013	38.30	Use next conc.	5,276.7	1,732.7
	7/8/2013	39.00	ND	5,470.7	194.0
	11/19/2013	34.00	ND	1,758.9	2,571.3
	12/31/2013	42.60	Use next conc.	6,535.1	6,535.1
	3/24/2014	47.00	ND	377.2	377.2
	4/16/2014	42.00	ND	898.4	521.2
	6/30/2014	42.50	Use next conc.	2,333.2	1,434.8
	8/11/2014	42.30	ND	3,171.2	838.0
	10/13/2014	40.41	ND	4,596.4	1,425.2
	12/31/2014	55.10	Use previous conc.	5,430.0	833.6
	2/11/2015	90.15	ND	6,029.3	599.3
	4/16/2015	43.00	ND	909.6	1,431.3
	6/30/2015	42.72	Use previous conc.	2,690.4	1,780.8
	7/20/2015	44.20	ND	3,408.2	717.8
	**	**	**	**	**

**** converted to BaroBalls™ in November 2015**

AHT – A-Area Hidden Trench
conc. – concentration
ft^3/min – cubic feet per minute
hr – hour
ND – non-detect
ppmV – parts per million by volume

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration ($ppmV$)	Hours on Unit at Start	Operating Time (hr)
AHT-16	6/25/2008	4.60	12.32	2,683.0	
	6/30/2008	6.30	6.37	2,802.5	119.5
	7/17/2008	15.00	6.37	3,098.5	296.0
	9/23/2008	94.80	0.19	4,488.5	1,390.0
	9/25/2008	94.80	0.22	4,534.2	45.7
	9/29/2008	74.80	0.09	4,630.5	96.3
	9/30/2008	8.90	0.01	4,654.2	23.7
	10/7/2008	75.20	0.19	4,821.2	167.0
	10/21/2008	96.70	0.60	5,065.3	244.1
	10/30/2008	56.67	0.86	5,121.2	55.9
	11/5/2008	77.60	0.21	5,266.9	145.7
	12/2/2008	85.00	0.20	5,568.2	301.3
	12/31/2008	88.91	Use next conc.	5,826.1	257.9
	1/27/2009	95.20	0.19	5,851.0	24.9
	2/3/2009	86.00	0.16	5,997.1	146.1
	3/5/2009	100.00	0.11	6,472.7	475.6
	3/9/2009	90.50	Use next conc.	13.0	13.0
	4/20/2009	92.00	0.09	1,019.3	1,006.3
	6/30/2009	94.30	ND	2,668.7	1,649.4
	7/20/2009	90.40	ND	3,137.1	468.4
	11/9/2009	98.70	ND	5,308.2	2,171.1
	12/31/2009	98.70	Use next conc.	5,330.4	22.2
	1/20/2010	85.20	ND	5,364.3	33.9
	3/25/2010	109.00	Use next conc.	6,552.0	1,187.7
	4/20/2010	115.00	ND	524.7	524.7
	6/30/2010	115.00	ND	2,101.6	1,576.9
	7/21/2010	73.80	ND	2,415.5	313.9
	8/5/2010	79.40	Use next conc.	2,580.6	165.1
	10/20/2010	67.00	ND	1,612.0	1,612.0
	12/31/2010	95.40	Use next conc.	3,014.1	1,402.1
	1/24/2011	77.30	ND	3,328.9	314.8
	4/4/2011	103.70	Use next conc.	4,949.9	1,621.0
	4/25/2011	118.00	ND	2,903.4	307.2
	6/30/2011	101.30	ND	4,321.8	1,418.4
	7/11/2011	67.60	ND	4,489.5	167.7
	10/6/2011	57.60	Use next conc.	6,530.5	2,041.0
	10/18/2011	53.90	ND	316.1	316.1
	12/31/2011	96.20	Use next conc.	1,969.5	1,653.4

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration (*ppmV*)	Hours on Unit at Start	Operating Time (*hr*)
AHT-16	1/10/2012	99.70	ND	2,207.6	238.1
	4/16/2012	61.90	ND	4,483.9	2,276.3
	6/30/2012	54.34	Use next conc.	6,117.2	1,633.3
	7/31/2012	61.50	ND	2.2	203.9
	10/22/2012	94.00	ND	1,272.4	1,270.2
	12/31/2012	58.22	Use next conc.	2,233.6	961.2
	2/20/2013	70.00	ND	2,398.8	165.2
	4/16/2013	58.40	ND	3,544.0	1,145.2
	6/30/2013	62.40	Use next conc.	5,276.7	1,732.7
	7/8/2013	61.40	ND	5,470.7	194.0
	11/19/2013	49.00	ND	1,758.9	2,571.3
	12/31/2013	67.10	Use next conc.	6,535.1	6,535.1
	3/24/2014	85.00	ND	377.2	377.2
	4/16/2014	77.00	ND	898.4	521.2
	6/30/2014	69.20	Use next conc.	2,333.2	1,434.8
	8/11/2014	71.80	ND	3,171.2	838.0
	10/13/2014	67.01	ND	4,596.4	1,425.2
	12/31/2014	88.70	Use previous conc.	5,430.0	833.6
	2/11/2015	88.73	ND	6,029.3	599.3
	4/16/2015	92.70	ND	909.6	1,431.3
	6/30/2015	86.24	Use previous conc.	2,690.4	1,780.8
	7/20/2015	75.30	ND	3,408.2	717.8
	**	**	**	**	**

**** converted to BaroBalls™ in November 2015**

AHT – A-Area Hidden Trench
conc. – concentration
ft^3/min – cubic feet per minute
hr – hour
ND – non-detect
ppmV – parts per million by volume

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate (ft^3/min)	TCE Concentration ($ppmV$)	Hours on Unit at Start	Operating Time (hr)
AHT-17	6/25/2008	0.38	0.38	2,683.0	
	6/30/2008	1.20	0.32	2,802.5	119.5
	7/17/2008	23.70	0.32	3,098.5	296.0
	9/23/2008	53.50	0.10	4,488.5	1,390.0
	9/25/2008	53.50	0.12	4,534.2	45.7
	9/29/2008	41.40	0.01	4,630.5	96.3
	9/30/2008	43.00	0.05	4,654.2	23.7
	10/7/2008	39.00	0.15	4,821.2	167.0
	10/21/2008	43.70	0.15	5,065.3	244.1
	10/30/2008	41.97	9.73	5,121.2	55.9
	11/5/2008	32.00	0.15	5,266.9	145.7
	12/2/2008	36.00	0.14	5,568.2	301.3
	12/31/2008	47.58	Use next conc.	5,826.1	257.9
	1/27/2009	34.20	0.09	5,851.0	24.9
	2/3/2009	46.00	0.13	5,997.1	146.1
	3/5/2009	59.00	0.10	6,472.7	475.6
	3/9/2009	49.90	Use next conc.	13.0	13.0
	4/20/2009	56.00	0.08	1,019.3	1,006.3
	6/30/2009	55.20	ND	2,668.7	1,649.4
	7/20/2009	55.10	ND	3,137.1	468.4
	11/9/2009	53.20	ND	5,308.2	2,171.1
	12/31/2009	53.20	Use next conc.	5,330.4	22.2
	1/20/2010	51.40	ND	5,364.3	33.9
	3/25/2010	86.30	Use next conc.	6,552.0	1,187.7
	4/20/2010	49.00	ND	524.7	524.7
	6/30/2010	49.00	ND	2,101.6	1,576.9
	7/21/2010	51.40	ND	2,415.5	313.9
	8/5/2010	42.40	Use next conc.	2,580.6	165.1
	10/20/2010	30.00	ND	1,612.0	1,612.0
	12/31/2010	38.60	Use next conc.	3,014.1	1,402.1
	1/24/2011	39.50	ND	3,328.9	314.8
	4/4/2011	55.60	Use next conc.	4,949.9	1,621.0
	4/25/2011	58.00	ND	2,903.4	307.2
	6/30/2011	63.80	ND	4,321.8	1,418.4
	7/11/2011	44.50	ND	4,489.5	167.7
	10/6/2011	29.60	Use next conc.	6,530.5	2041.0
	10/18/2011	31.20	ND	316.1	316.1
	12/31/2011	50.00	Use next conc.	1,969.5	1,653.4

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued)*

Well ID	Date	Flow Rate *(ft^3/min)*	TCE Concentration *(ppmV)*	Hours on Unit at Start	Operating Time *(hr)*
AHT-17	1/10/2012	52.30	ND	2,207.6	238.1
	4/16/2012	42.90	ND	4,483.9	2,276.3
	6/30/2012	48.85	Use next conc.	6,117.2	1,633.3
	7/31/2012	48.50	ND	2.2	203.9
	10/22/2012	63.00	ND	1,272.4	1,270.2
	12/31/2012	46.90	Use next conc.	2,233.6	961.2
	2/20/2013	59.50	ND	2,398.8	165.2
	4/16/2013	44.00	ND	3,544.0	1,145.2
	6/30/2013	50.60	Use next conc.	5,276.7	1,732.7
	7/8/2013	49.70	ND	5,470.7	194.0
	11/19/2013	36.00	ND	1,758.9	2,571.3
	12/31/2013	46.30	Use next conc.	6,535.1	6,535.1
	3/24/2014	50.00	ND	377.2	377.2
	4/16/2014	41.00	ND	898.4	521.2
	6/30/2014	42.50	Use next conc.	2,333.2	1,434.8
	8/11/2014	44.10	ND	3,171.2	838.0
	10/13/2014	41.43	ND	4,596.4	1,425.2
	12/31/2014	47.80	Use previous conc.	5,430.0	833.6
	2/11/2015	50.16	ND	6,029.3	599.3
	4/16/2015	45.10	ND	909.6	1,431.3
	6/30/2015	53.70	Use previous conc.	2,690.4	1,780.8
	7/20/2015	51.30	ND	3,408.2	717.8
	**	**	**	**	**

**** converted to BaroBalls™ in November 2015**

AHT – A-Area Hidden Trench
conc. – concentration
ft^3/min – cubic feet per minute
hr – hour
ND – non-detect
ppmV – parts per million by volume

Appendix A. ABRP Trench Active SVE System Sample Data *(Continued/End)*

Well ID	Date	Flow Rate *(ft^3/min)*	TCE Concentration *(ppmV)*	Hours on Unit at Start	Operating Time *(hr)*
ASH-06	4/4/2013	20.00	Use next conc.	3,267.1	
	4/16/2013	20.00	0.31	3,544	276.9
	6/30/2013	17.5	Use next conc.	5,276.7	1,732.7
	7/8/2013	17.70	0.08	5,740.7	464.0
	11/19/2013	7.90	0.05	1,758.9	2,571.3
	12/31/2013	21.90	Use next conc.	382.0	382.0
	3/24/2014	0.00	0.24	377.2	377.2
	4/16/2014	20.00	ND	898.4	521.2
	6/30/2014	24.30	Use next conc.	2,333.2	1,434.8
	8/11/2014	20.80	ND	3,171.2	838.0
	10/13/2014	24.27	0.26	4,596.4	1,425.2
	12/31/2014	4.20	Use previous conc.	5,430.0	833.6
	2/11/2015	21.22	0.05	6,029.3	599.3
	4/16/2015	21.10	0.11	909.6	1,431.3
	6/30/2015	23.35	Use previous conc.	2,690.4	1,780.8
	7/20/2015	23.80	0.04	3,408.2	717.8
	12/9/2015	37.30	0.03	5,585.2	2,177.0
	12/31/2015	OOS	Use previous conc.	5,923.2	338.0
	2/9/2016	41.62	ND	6,469.5	546.3
	5/16/2016	45.06	0.10	2,100.9	2,149.4
	6/30/2016	48.94	Use previous conc.	3,166.9	1,066.0
	9/12/2016	27.40	0.16	4,943.0	1,776.1
	12/12/2016	53.02	0.24	6,474.5	1,531.5
	12/31/2016	47.40	Use previous conc.	193.2	261.7
	2/13/2017	57.50	ND	350.5	157.3
	5/15/2017	49.40	0.18	2,923.4	2,572.9
	6/29/2017	50.40	Use previous conc.	3,997.6	1,074.2
	9/13/2017	53.88	0.13	5,736.2	1,738.6
	12/11/2017	48.22	0.06	835.4	1,644.2
	**	**	**	**	**

****converted to MicroBlowers™ in December 2017**

ASH – A-Area Ash-Pile
conc. – concentration
ft^3/min – cubic feet per minute
hr – hour
ND – non-detect
OOS – out-of-service
ppmV – parts per million by volume

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