SOLID WASTE MANAGEMENT UNIT 4 INTERIM MEASURE WORK PLAN

HONEYWELL CHESTERFIELD FACILITY
CHESTER, VIRGINIA

Prepared for:
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January 30, 2015

Honeywell

Honeywell
P.O. Box 1057
Morristown, NJ 07962-1057

January 30, 2015

VIA EMAIL AND REGULAR MAIL

Russell H. Fish
Office of Remediation
U.S. Environmental Protection Agency
1650 Arch Street
Philadelphia, PA 19103-2029

Re: Honeywell Chesterfield Facility, Chester, VA
SWMU 4 IM Work plan

Dear Mr. Fish:

We are pleased to submit the Interim Measures (IM) work plan for Solid Waste Management unit 4 (SWMU 4) for the Honeywell Chesterfield Site, Chester, Virginia under an Facility Lead Agreement, which was entered into between Honeywell and EPA on January 20, 2000.

The work plan proposes isolation in place of the remaining waste using capping, containment, and institutional controls. We looked at a number of potentially applicable technologies but given the physical characteristics of SWMU 4, the distribution of contaminants, and the fact that this is an operating industrial facility under Honeywell's control, we believe containment is the appropriate remedy. It will meet IM Objectives, will be fully protective of potential receptors, and will limit any additional contaminant movement.

We are looking forward to your review and suggest a meeting to discuss any questions and next steps in order to make this a success.

Please feel free to call me at 973-722-1656 if you have any questions.

Sincerely,

Prashant K. Gupta
Remediation Manager

Enclosures

cc: Erich Weissbart, P.G.
Jutta Schneider – VADEQ

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APPENDICES

1.0 INTRODUCTION

On behalf of Honeywell, Amec Foster Wheeler Environment & Infrastructure, Inc. (AMEC) is submitting this Interim Measure (IM) Work Plan (WP) outlining the development, design and implementation of an IM at Solid Waste Management Unit (SWMU) 4 at Honeywell's Chesterfield facility (the Facility or Site) in Chester, Virginia (See Figure 1).

The IM WP is organized as follows:

- Section 2.0 – Summary of Background Information. This section provides a description of SWMU 4 and a summary of relevant background information and data analyses;
- Section 3.0 - Interim Measures Objectives. This section describes the proposed IM, specifies the objectives of the interim measure, discusses how it meets those objectives and the general criteria for selection of a RCRA corrective measure, and how it will integrate with the long-term solution at the Facility. It includes:
    - Discussion of the overall management approach;
    - Discussion of the technical approach; and,
    - A preliminary schedule.
- Section 4.0 – Community Relations Plan.

2.0 SUMMARY OF BACKGROUND INFORMATION

2.1 SITE RCRA HISTORY AND SWMU 4 DESCRIPTION

Site RCRA History

The Chesterfield Facility (Facility) is an active nylon resins manufacturing plant located at 4101 Bermuda Hundred Road in the county of Chesterfield, Commonwealth of Virginia. The Facility is located on the southern shoulder of a large meander of the James River, situated near its confluence with the Appomattox River, and is comprised of approximately 552 acres of land (Figure 1). SWMU 4 is located in a relatively remote area in the central portion of the property (Figure 2). Honeywell companies have operated the facility since purchasing the property in 1954.

The Facility has historically manufactured nylon 6 fiber and resin. The manufacturing processes conducted at the Facility produced some waste materials managed by disposal in on-site solid waste management units (SWMUs) which included SWMU 4.

In June 1985, Allied Chemical Corporation submitted information to US Environmental Protection Agency (USEPA) on eighteen SWMUs within the Facility boundary; USEPA identified a subset of eleven SWMUs from which releases were possible. Subsequent activities under the RCRA program include:

- 1986, USEPA issued a public notice, fact sheet, and draft RCRA permit
- July 1993, AlliedSignal received a draft Screening Site Inspection Prioritization – Level I Report for the Site from the Commonwealth of Virginia.
- March 1994, AlliedSignal Fibers submitted additional information on the SWMUs to USEPA.
- 1999, the Commonwealth of Virginia evaluated Environmental Indicators (EIs) for the Facility. The Facility was designated as Insufficient Information (IN) indicating that additional information was necessary to complete the EI.
- December 1999, USEPA Region III offered Honeywell the opportunity to proceed with RCRA Corrective Action under the Facility Lead Program.
- January 20, 2000, Honeywell submitted a Letter of Commitment for the Facility Lead Agreement.

The following RCRA Facility Investigation Reports have been produced under the Facility Lead Agreement

- *Draft Data Summary Report, RCRA Corrective Action Program Honeywell – Chesterfield, VA Facility;* Montgomery Watson Harza; dated April 2002.

- *RFI Data Summary Report Honeywell Chesterfield Facility Chester, VA;* Montgomery Watson Harza; dated October 2003, revised January 2004.

- *Phase III RFI Data Summary Report Honeywell Chesterfield Facility Chester, VA;* Montgomery Watson Harza; dated March 2005, revised by MACTEC Engineering and Consulting, Inc. October 2006.

- *Final Phase IV RCRA Facility Investigation Report Honeywell Chesterfield Facility Chester, VA;* MACTEC Engineering and Consulting, Inc.; dated January 2007, revised October 2007.

- *Phase V RCRA Facility Investigation Report Honeywell Chesterfield Facility Chester Virginia;* MACTEC Engineering and Consulting, Inc.; dated April 2008.

- *Conceptual Site Model for Dense Non-Aqueous Phase Liquid and Marl, Honeywell Chesterfield Facility, Chester, Virginia*; MACTEC Engineering and Consulting, Inc.; dated September 2009

- *SWMU 4 MIP Investigation, Honeywell Chesterfield Facility, Chesterfield, Virginia*; Letter report to Russell H. Fish (USEPA) from Richard Karr (AMEC); dated June 24, 2013.

- *SWMU 4 Groundwater Investigation*; Letter report to Russell H. Fish (USEPA) from Richard Karr (AMEC); dated June 28, 2013.

- *Chesterfield Groundwater Study, Vertical Plume Delineation*; Letter report to Erich Weissbart (USEPA) from Richard Karr (AMEC); dated January 6, 2014.

- *Chesterfield Groundwater Study, Vertical Plume Delineation*; Letter report to Erich Weissbart (USEPA) from Richard Karr (AMEC); dated February 28, 2014.

- *Chesterfield Groundwater Study, Horizontal and Vertical Plume Delineation*; Letter report to Erich Weissbart (USEPA) from Richard Karr (AMEC); dated July 2, 2014.

SWMU 4 Description

SWMU 4 is also known as the former acid pond, which was an unlined unit into which laboratory wastes were reportedly placed. The former pond was approximately 102 feet by 52 feet by 6 feet deep. The SWMU 4 footprint identified by previous investigators is a rectangle measuring 100 feet by 125 feet or 12,500 SF in area (see Figure 2). SWMU 4 is currently a grass covered field that slopes gently to the east toward the western cooling water ditch.

The former acid pond was reportedly utilized between 1961 and 1974 for the disposal of laboratory liquid wastes. The unit reportedly received formic, perchloric, sulfuric, hydrochloric, and phosphoric acids, as well as mineral oils, cresols, and benzene. In 1975, the liquid was pumped out of the pond and transported to an off-site disposal facility. It is reported that approximately 1 foot of remaining sludge in the bottom of the pond (5 to 6 feet bgs) was allowed to air dry, and the pond was backfilled with local clean soils and vegetated.

Historical investigations of SWMU 4 have identified an area of subsurface soil impacts by volatile organic compound (VOCs) and semi-volatile organic compounds (SVOCs) that exceed USEPA Regional Screening Levels (RSL)[1]. This area extends to approximately 180 feet north from the northern corner of the current SWMU footprint and encompasses an area of approximately 54,000 ft^2. Outside of the current SWMU footprint, impacts are primarily below the water table which occurs at approximately 12 feet to 14 feet below ground surface (bgs)[2]. As discussed in Section 2.5 below, some contaminant concentration data suggest the potential presence of dense non-aqueous phase liquid (DNAPL) both within and outside of the SWMU footprint.

While a broad spectrum of VOC and SVOC compounds account for the soil impacts associated with SWMU 4, approximately 90% of the estimated in-place soil VOC mass is comprised of 1,1,1-trichloroethane (1,1,-TCA), tetrachloroethene (PCE), and trichloroethene (TCE). Similarly, more than 96% of the estimated in-place soil SVOC mass is comprised of 1,1-biphenyl and caprolactam. The mass of VOCs and SVOCs identified within or near SWMU 4 suggests that the SWMU received chlorinated VOCs, caprolactam and biphenyl as well as acidic wastes.

2.2 SUBSURFACE HYDROGEOLOGY

Appendix A contains boring logs from soil borings, monitoring wells and piezometers historically installed within SWMU 4 and its vicinity.

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[1] USEPA Regional Screening Level (RSL) Summary Table (TR=1E-6, HQ=1), November 2013

[2] Depth-to-water measurements in monitoring wells in and adjacent to SWMU 4 exhibit seasonal or annual water level fluctuation.

Stratigraphy

The Facility is situated over the Virginia Coastal Plan aquifer sequence of alluvial sediments present between the piedmont physiographic province in Virginia and the Atlantic coastline. This unconsolidated sequence of aquifers and silt/clay confining units extends vertically downward over 400 feet to bedrock at the Site location.

At SWMU 4, the uppermost stratum is a Recent alluvium material extending from ground surface (approximately 20.5 feet MSL) to a depth of 18 feet to 19.5 feet bgs. An average thickness of 18 feet is assumed for the Recent alluvium in the SWMU 4 vicinity. This Recent alluvium is described in boring logs as brown, fine grained, silty sands to poorly graded fine to medium sands[3]. It is likely that these sediments were deposited by the James River as a consequence of its meanders migrating downstream. Groundwater occurs under water table conditions at a depth of approximately 12 feet to 14 feet bgs (saturated thickness of approximately 4.5 feet to 6.5 feet). Annual or seasonal water table elevation fluctuations of 1.5 feet or greater are typical, with over 2.7 feet recorded in the historical investigations at the Site.

Directly underlying the Recent alluvium at SWMU 4 is a dark grey silty clay material. Formation elevations at the site correlate with USGS mapping to suggest that this dark grey material represents the eroded upper surface of the Potomac Confining Unit, an early Cretaceous-aged deposit. Its upper surface elevation ranges from 0 feet to 2 feet MSL beneath SWMU 4 area, or approximately 18 feet to 20 feet bgs. The surface has been incised by the James River and represents an erosional unconformity marking the transition from Recent to Cretaceous alluvial sequences. Encounter with the upper surface of this unit is readily identified in boring logs and is described as dark grey, firm to stiff, silt to silty clay with small shells included. The dark grey Potomac Confining Unit is laterally extensive over the southern portion of the Site and is present beneath SWMU 4, however it appears completely eroded approximately 250 feet north of SWMU 4, being only a few inches thick near MW-127S and absent at the location of MW-128S. Figure 3 is a contour map of the elevation of the top of this unit as encountered in borings near SWMU 4.

Boring logs for monitoring well MW-103D, MW-104D, and MW-105D, located in and adjacent to SWMU 4 indicate the thicknesses of this dark grey silty clay of the Potomac Confining Unit are approximately 5.5 feet, 4.5 feet and 4.5 feet, respectively. Immediately beneath the dark grey silty clay of the unit are grey clay to silty clay materials with inter-bedded intervals of silty sand to clayey sand, probably belonging to the Potomac Aquifer Unit. Beginning at approximately 60 feet bgs are sediments described in boring logs as stiff

[3] Boring logs from MW-104S and MW-104D in the center of the SWMU footprint indicate a mottled olive brown silt material was encountered from 4.4 feet to 10 feet bgs. This material may be the remains of sludge allowed to air dry within the SWMU prior to backfilling in 1975.

grey, mostly silty clay to sandy clay with trace of gravel. At around 110 feet bgs an interval of resistance due to large cobbles is present.

Aquifer Characteristics

Aquifer characteristic data for the Recent alluvium material, as measured by slug tests in shallow monitoring wells screened within this unit, are available from the Phase II and Phase III RFI reports. Similar data are available from monitoring wells screened within the Potomac Unit. These data are summarized in Table 1 with values for locations in close physical proximity to SWMU 4 shaded.

The geometric mean hydraulic conductivity in the Recent alluvium 1.54E-3 cm/sec (4.48 ft/day) in wells proximal to SWMU 4. The geometric mean hydraulic conductivity in the underlying Potomac Unit is 9.02E-5 cm/sec (2.62E-1 ft/day) in wells within and immediately adjacent to SWMU 4.

Groundwater Flow Direction

Groundwater flow in the Recent alluvium beneath SWMU 4 and in its immediate vicinity is nearly due north toward monitoring well couplet MW-128. The estimated horizontal flow gradient between MW-104S and MW-128S along this flow path is 0.005 ft/ft.

Groundwater flow direction in the Potomac Unit is radial in the area north of SWMU 4. This localized radial flow may be reflective of hydraulic communication through the Potomac Confining Unit north of SWMU 4[4]. Horizontal flow gradients within this unit vary with direction, and range from 0.002 ft/ft to 0.007 ft/ft.

Groundwater elevations in the recent alluvium and underlying Potomac Unit at and proximal to SWMU 4 are nearly identical, being only slightly higher in the Recent alluvium.

2.3 SOILS IMPACTS – MAGNITUDE AND EXTENT NEAR SWMU 4

Delineation of soil impacts associated with SWMU 4 was completed during the Phase II and Phase III RFI work. Table 2 and Table 3, respectively, are soil VOC and SVOC data collected during these investigations. Figure 4 depicts the lateral extent of soil impacts for all parameters detected above the respective Impact-to-Groundwater RSL. The delineated

[4] In March 2005, Montgomery Watson Harza (MWH), a previous consultant to Honeywell, conducted electrical resistivity surveys along several transects between SWMU 4 and the cooling water ditch to its north (Figure 5). These surveys identified potential "windows" through the upper surface of the Potomac Confining Unit north of SWMU 4. None were identified near SWMU 4.

area is approximately 54,000 ft^2. The vertical extent extends to the upper surface of the Potomac Confining Unit.

2.4 GROUNDWATER IMPACTS – MAGNITUDE/EXTENT NEAR SWMU 4

Recent Alluvium

The magnitude and extent of groundwater impacts in the immediate vicinity and down gradient of SWMU 4 are described by data collected during the Phase IV RFI work conducted in October 2006[5]. Table 3 and Table 4, respectively, provide summaries of laboratory analytical data for groundwater VOC and SVOC concentrations for samples collected in October 2006 during the Phase IV RFI. Similar to the results for soil data discussed in Section 2.3, prominent VOCs are 1,1,1-TCA, PCE, TCE and their respective daughter products. Prominent SVOCs in this data set include several phenolic compounds, caprolactam and 1,4-dioxane; concentrations of dissolved SVOCs are lower and do not approach the levels observed in the VOC data set.

Concentrations of some dissolved VOCs approach or exceed 1% of their respective solubility limits in proximity to SWMU 4 and in the plume extending away from SWMU 4 toward the north. These data add to the lines of evidence indicating the presence of residual DNAPL in the subsurface and to its location.

Potomac Aquifer Unit

Tables 3 and 4 also provide groundwater quality data for wells screened in the Potomac Unit immediately below SWMU 4 and in close proximity. In this data set, all VOCs are below MCLs and only two marginally exceed RSLs for tap water. No SVOCs exceed RSLs for Tap Water. These data are a line of evidence that significant vertical migration of VOCs and SVOCs is not occurring directly beneath the SWMU 4 footprint.

The dark grey Potomac Confining Unit is absent approximately 250 feet north of SWMU 4. Studies conducted in 2014 delineated groundwater impacts to depths approaching 115 feet bgs at the locations of the MW-128 and MW-131 well clusters, with concentrations substantially attenuated below 80 feet bgs to 100 feet bgs. These locations are over 700 feet and 1,300 feet north and down gradient of SWMU 4. The depth of these impacts suggest

[5] A full round of groundwater samples were collected from 42 on-site monitoring wells in November 2014. The resulting analytical data are undergoing data validation and will be presented in two groundwater monitoring reports expected to be submitted to USEPA in February, 2015.

that the plume may be density driven[6] and that it enters the Potomac Aquifer where the Potomac Confining Unit terminates.

2.5 DNAPL OCCURRENCE AND ITS EXTENT

DNAPL

DNAPL does not occur as a continuous "plume" in the subsurface but rather in dispersed patterns of residual saturation that spread both laterally and vertically through the subsurface, and potentially in discrete "pools" where the strata are conducive[7]. Mapping the three-dimensional occurrence of DNAPL residual saturation in the subsurface with accuracy is impracticable.

It is, however, possible to estimate the outer boundaries of areas where potential DNAPL residual saturation is present in the subsurface using multiple lines of evidence. The multiple lines of evidence employed herein include visual observations of staining or free product in boring logs, groundwater concentrations approaching 1% of compound solubility limits, membrane interface probe (MIP) instrument responses, and calculated threshold concentrations for partitioning and threshold saturation concentrations. A detailed discussion of the application of some of these techniques is provided in Appendix B.

The analyses presented in Appendix B provides a screening tool to estimate the potential extent of residual DNAPL, but should not be used alone to define the extent. Areas defined by this line of evidence alone simply enclose VOC and SVOC concentration values that are sufficiently high to exceed the estimated partitioning capacity of the soil. It must be combined with other lines of evidence such as MIP data, visual observations and groundwater data to decrease uncertainties introduced by the movement patterns and pooling nature of DNAPL.

The subsurface was divided into 6 foot depth intervals: 0 feet to 6 feet bgs, 6 feet to 12 feet bgs, and 12 feet to the top of the Potomac Confining Unit at approximately 18 feet[8]. The areas within each depth interval where soil concentration data indicate the potential presence of DNAPL were delineated (Figure 5). The surface areas for the potential DNAPL regions within their respective depth intervals are:

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[6] SWMU 4 was originally an acid pond. Historical Total Dissolved Solids and pH data from groundwater suggest that leachate from the SWMU entering groundwater may have a density differential sufficient to cause it to sink.

[7] DNAPL "pools" could occur where DNAPL saturation is higher than residual saturation levels.

[8] The presence of DNAPL in the 0 ft. to 6 ft. bgs interval may seem unlikely. However, when the former acid pond was backfilled the bottom sludge remained in place. Additionally, as can be seen on Figure 8, much of the area of suspected DNAPL presence is outside of the footprint of the SWMU.

- 0 feet to 6 feet bgs 3,480 ft^2
- 6 feet to 12 feet bgs 6,590 ft^2
- 12 feet to 18 feet bgs 29,910 ft^2

The 12 feet to 18 feet bgs potential DNAPL region has been expanded outward in Figure 12 to include the locations of PZ-04-15, PZ-04-16, PZ04-17, and PZ-04-18 as DNAPL has been historically observed in these piezometers[9]. Figure 6 depicts the profile of the potential DNAPL regions in the subsurface along selected cross-sections.

Comparison to Membrane Interface Probe Data

Figure 5 also depicts the May 2013 membrane interface probe (MIP) survey locations where DNAPL was indicated by instrument responses overlaid on the extent of potential DNAPL based on soil concentration data. There is reasonable agreement between the lines of evidence representing interpreted MIP results and the area where soil concentrations indicate possible DNAPL.

[9] No DNAPL observations were recorded in the boring logs for these piezometers. However, soundings conducted in 2007 identified potential DNAPL accumulations in these piezometers. See Table 3, *Conceptual Site Model for Dense Non-Aqueous Phase Liquid and Marl, Honeywell Chesterfield Facility, Chesterfield, Virginia*; prepared by MACTEC Engineering and Consulting, Inc.; Dated September 2009. These measurements indicating DNAPL accumulations have never been replicated.

3.0 INTERIM MEASURE OBJECTIVES

The proposed IM was selected to reduce or minimize threats to human health and the environment in the short term and, to the extent practicable, integrate with (or become) a final corrective measure. The specific objectives of the IM include:

- Reduce exposure risk of human and environmental receptors to contaminants within SWMU 4.
- To the extent practicable, stabilize or reduce contaminant loading that resulted in the current three-dimensional extent and magnitude of groundwater impacts associated with SWMU 4;

Additionally, the IM should meet general criteria for selection of RCRA Corrective Measures:

- Long-term effectiveness;
- Toxicity, mobility and volume reduction;
- Short-term effectiveness;
- Implementability; and,
- Cost

3.1 PROPOSED IM

The proposed IM is a containment/cover system surrounding SWMU 4 and associated impacted soils. A cross-section depicting a typical containment/cover system as proposed herein is depicted as Figure 7.

Reduces Exposure

The SWMU is located in an area of the property remote from the manufacturing operations and is not subject to regular traffic or occupation by site personnel. Consequently, current exposure risk is inherently low. The containment/cover system will enhance this isolation and further reduce exposure risk, and following implementation additional institutional controls can be put in place. Potential receptors that are currently expected at or in the immediate vicinity of SWMU 4 are:

- **Site workers** – The remedy is protective of the siteworkers that may be in the area for mowing, maintenance, and for operations and maintenance of the nearby truck trailer park and hazardous waste storage pad;
- **Construction workers** – Could potentially be present in the area in the future. Work on the containment/cover system or routine O&M could result in exposure

risk, but such risk can be mitigated with institutional controls (i.e., requirements for PPE while working in the area) ;

- **Trespassers** – Similar to site workers, exposure risk is reduced with the containment/cover system in place; and,
- **Wildlife** –The cover system can be maintained to prevent exposure to burrowing, browsing and grazing wildlife.

Reduces Contaminant Loading

This IM will be effective in reducing contaminant loading to the aquifer and should enhance the rate of natural attenuation of the down gradient plume. A containment wall keyed into the underlying aquitard minimizes lateral movement of dissolved VOCs and SVOCs in groundwater to areas outside of the containment. Thus, loading to the aquifer by continued addition of contaminant mass is effectively minimized. The impermeable cover system minimizes infiltration, thus reducing the volume of generated leachate. Finally, maintenance of a hydraulic gradient inward through the containment wall and upward through the Potomac Confining Unit will reduce the potential for migration of contaminants to the exterior of the containment. This IM is one of the most effective means of mitigating contaminant loading to groundwater outside of the containment.

Short and Long Term Effectiveness

The containment/cover system meets both short-term and long-term effectiveness. Its ability to reduce the potential for groundwater movement from the interior to the exterior of the containment is effective immediately and is not diminished over the long-term. Similarly, the cover system's ability to minimize infiltration is effective in the short-term and is not diminished over the long-term. Available data suggest that the Potomac Confining Unit is continuous and at least 3 feet to 5 feet thick in the area of SWMU 4, sufficient to provide a keying unit and a long-term barrier beneath the containment area.

Toxicity, Mobility and Volume Reduction

The containment/cover system will reduce the mobility of and exposure to the VOCs and SVOCs in soil by an engineered containment system. This prevents contact with impacted soil by potential receptors. It isolates these compounds preventing their entry into groundwater down gradient of the containment, which will enhance the rate of groundwater quality improvement over time.

Additionally, some volume reduction can be affected by continuing DNAPL recovery efforts as has been historically conducted in MW-104S and potentially in other wells where mobile DNAPL might accumulate. This will also mitigate the potential for vertical migration of the DNAPL.

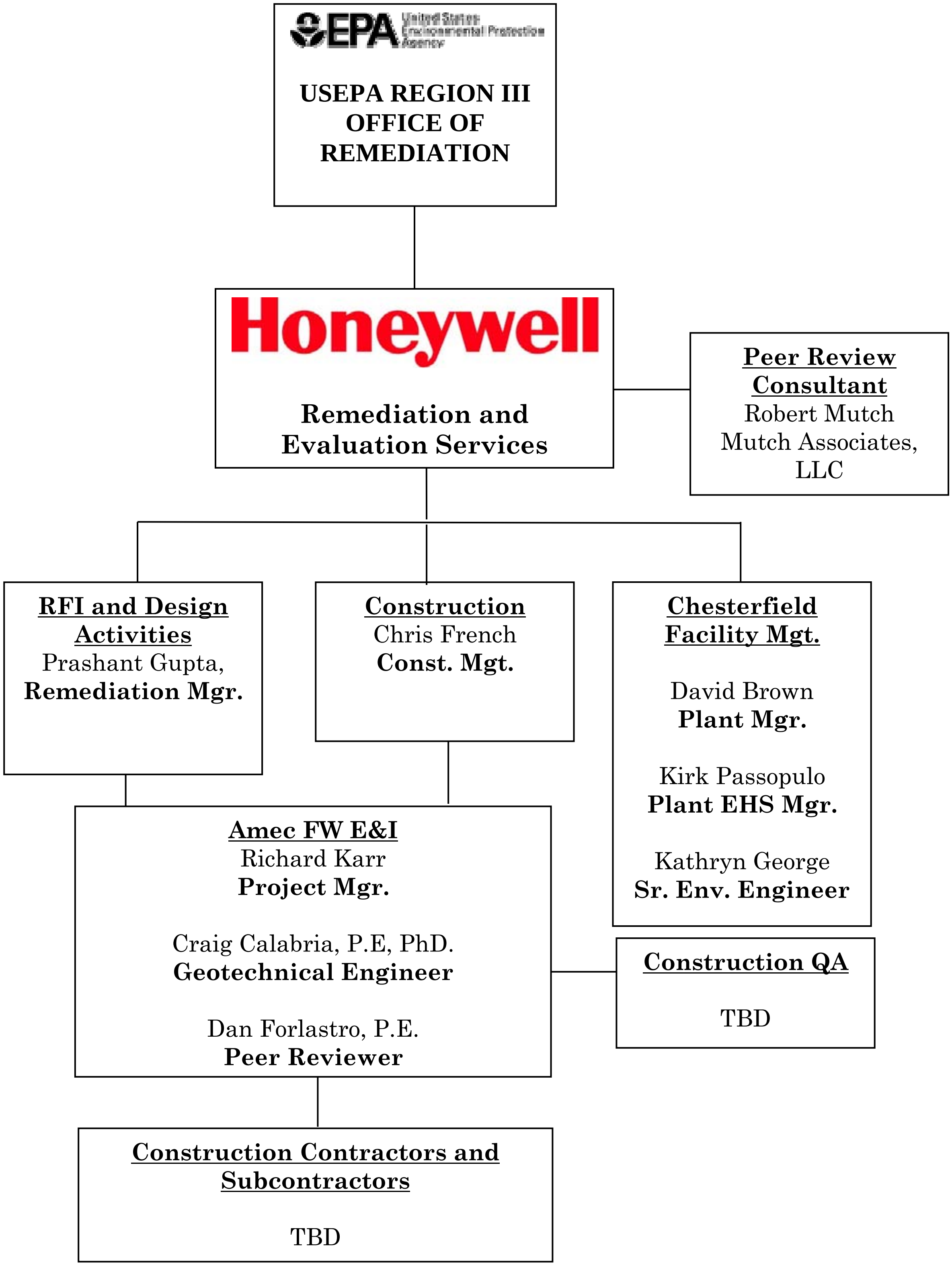
Implementability and Cost

This IM is readily implementable using commonly applied design and construction techniques. Pre-design data and testing will be necessary to assess items such as: the depth of installation; thickness of the Potomac Confining Unit along the containment wall alignment; the percentage of fines in native soils; compatibility of the contaminants with bentonite, and bench scale testing to address extracted leachate. Additionally, NPDES discharge limits may have to be developed for treated leachate discharge.

Several in situ treatment technologies using thermal, physical, and/or biologic processes were evaluated with capital cost both lower and higher than the proposed containment/cover system. However, their effectiveness in meeting the specific objectives of this IM and the general criteria for selection of RCRA Corrective Measures in this application was moderate or low. Additionally, several did not offer the potential of significant improvement in down gradient groundwater quality. A removal alternative was also considered, however the estimated costs were of a factor of 5 greater than the proposed containment/cover system, and ancillary impacts such as risk from multiple material handling and transport risks. The containment/cover system provides an overall sustainable approach.

3.2 OVERALL MANAGEMENT APPROACH

An organization chart for the project depicting proposed project responsibilities is presented below:


EPA United States Environmental Protection Agency
USEPA REGION III OFFICE OF REMEDIATION
Honeywell
Remediation and Evaluation Services
Peer Review Consultant
Robert Mutch
Mutch Associates, LLC
RFI and Design Activities
Prashant Gupta,
Remediation Mgr.
Construction
Chris French
Const. Mgt.
Chesterfield Facility Mgt.
David Brown
Plant Mgr.
Kirk Passopulo
Plant EHS Mgr.
Kathryn George
Sr. Env. Engineer
Amec FW E&I
Richard Karr
Project Mgr.
Craig Calabria, P.E, PhD.
Geotechnical Engineer
Dan Forlastro, P.E.
Peer Reviewer
Construction QA
TBD
Construction Contractors and Subcontractors
TBD

Honeywell reserves the right to identify and retain other consultants and contractors, and otherwise modify this organizational structure, as may be necessary or appropriate to successfully execute this project.

3.3 TECHNICAL APPROACH

The proposed containment/cover system IM surrounding SWMU 4 and associated impacted soils will meet the specific and general objectives for SWMU 4 outlined in Section 3.0. Conceptually, the IM will consist of a vertical hydraulic barrier wall, with a hydraulic conductivity of approximately 10^{-6} cm/sec, extending from surface downward through the Recent alluvium and keyed into the Potomac Confining Unit. The barrier wall containment will be installed around the approximate 54,000 SF area of impacted soils. Figure 8 depicts the approximate conceptual alignment of the barrier wall to enclose the impacted soils.

To reduce or eliminate precipitation infiltration into the interior of the containment, an impermeable multi-layer membrane cover system will be constructed over the area enclosed by the barrier wall. The cover system will extend over the entire area of the containment and will be keyed into native soils. Sufficient fill will be placed over the area prior to construction of the cover system to ensure a grade that provides adequate surface drainage. The multi-layer cover will consist of a welded HDPE or similar continuous impermeable membrane overlain by a geocomposite drainage layer, common fill and top soil. Stabilizing vegetative growth will be established on the cover to prevent erosion.

The cover design will include grading to convey surface water runoff off the cover in lined swales that drain to the western cooling water ditch. Similarly, the geocomposite drainage layer will be designed so that infiltrating precipitation reaching the upper surface of the impermeable membrane will be drained and conveyed to the western cooling water ditch. These design details will be resolved as part of the 30% Design Package.

An inward gradient will be maintained inside of the containment barrier wall by means of an interior dewatering system to lower and maintain groundwater levels in the interior of the barrier wall. An appropriate head differential between exterior and interior of the containment will be developed as part of the 30% Design Package. Verification of this differential will be achieved by means of permanent piezometers installed in the interior and exterior of the containment.

Effluent from the dewatering system may be treated by a small system constructed as part of the IM and discharged, or may be collected and transported for disposal offsite. Detailed analyses of inflow rates will be necessary as part of the design process to assess the cost effectiveness of onsite treatment versus offsite disposal. Preliminary estimates suggest maintenance effluent rates, following initial dewatering, of less than 1 gpm. Bench-scale treatability studies will be necessary to develop the most appropriate treatment process option if that approach proves cost effective. If an onsite treatment system is incorporated into the design, treated groundwater will be discharged to the Western Cooling Water Ditch under a modified facility NPDES permit. Following construction, appropriate institutional controls will be emplaced to restrict land use and activities within the IM footprint.

Several DNAPL recovery wells have been installed in and proximal to the SWMU. The casings of these wells and MW-104S will be extended upward through the cover system during construction so that they can continue to be monitored at regular intervals for accumulations of DNAPL. Any DNAPL that accumulates within them will be removed and disposed as has been the practice since November 2013.

The details and specifications of the IM will be developed during the design phase of the project. The barrier wall design is expected to call for construction using a native soil/bentonite slurry. The design may also consider interlocking HDPE sheets, epoxy coated sheet pile, Waterloo Barrier® sheets or other similar materials depending upon compatibility test results. If sieve tests show that sufficient fines (i.e., > 20% passing a 200 sieve) are not present in the Recent alluvium unit to support a bentonite-soil slurry wall, it will be necessary to import soil with fines from offsite. This will be verified during pre-design field investigation activities.

Pre-Design Investigation Activities

Additional pre-design investigation activities will be necessary to collect design basis data and support preparation of design and construction contract documents. Currently, these include the following:

1. A cone penetrometer boring program will be conducted along the proposed barrier wall alignment to map the stratigraphy and, in particular, the surface topography of the Potomac Confining Unit. This program will consist of advancing a cone penetrometer from surface to the top of the Potomac Confining Unit with continuous data collection and recording. Cone penetrometer locations will be laid out along the barrier wall alignment at 30-foot intervals. If field data indicates, this interval may be reduced.
2. A series of five (5) test borings will be advanced through the Recent alluvium to the upper surface of the Potomac Confining Unit. Grab samples of the alluvium from both the vadose zone and saturated section will be collected for grain size analyses to assess the percentage of fines in the materials. Samples will be collected from both the unsaturated and saturated sections of the Recent alluvium within each boring.
3. A preliminary compatibility test following ASTM D-5890 using groundwater from MW-104S indicates compatibility with bentonite. However, compatibility testing

will be conducted using the design specified bentonite mixture and potential mix water.

4. Bench scale treatability testing of groundwater from the wells that are within the containment area to identify potential treatment options.

Health and Safety Plan

Prior to commencement of field investigation activities, AMEC will prepare a Health and Safety Plan (HASP) to ensure that potential hazards to field staff involved in individual tasks are recognized and appropriate measures are implemented to prevent injury or exposure to hazardous materials. Job Hazard Analyses (JHA) will be performed for each task and the plan will include measures to mitigate these hazards. As new tasks are planned or identified in the future, AMEC will update the HASP to incorporate additional JHAs. The AMEC HASP, along with updated JHAs as appropriate, will be submitted to USEPA for its information.

Data Collection Quality Assurance Plan

Data collection and quality assurance will be conducted in accordance with the Part III - Quality Assurance/Quality Control of the Facility Lead RCRA Corrective Action Work Plan dated January 2001. AMEC will provide an addendum to USEPA for pre-design data not contemplated in that document.

Data Management Plan

Data management will be conducted in accordance with the Part IV – Data Management Plan of the Facility Lead RCRA Corrective Action Work Plan dated January 2001. AMEC will provide an addendum to USEPA for data management activities arising from the pre-design data not contemplated in that document.

Design Plans and Specifications

Following USEPA approval of the proposed SWMU 4 IM, a set of design plans and specifications will be prepared for USEPA review. The design plans and specifications will include as appropriate:

- Discussion of the design basis and design strategy, technical factors of importance, any assumptions made, potential sources of error, and potential operations and maintenance problems that may be encountered;
- Detailed technical design drawings;
- Written specifications;
- Tables of materials, material balances, and equipment;
- Sample calculations;

- Results of modeling conducted to support the design.
- Results of laboratory or field tests; and,
- References used or relied upon.

Design plans and specifications will be submitted for USEPA review and approval at the 30% and 100% completion stage.

Interim Measures Construction Quality Assurance Plan

Concurrent with development of the SWMU 4 IM design plans and specifications, an IM Construction Quality Assurance plan (CQAP) will be prepared. The IM CQAP will be submitted to USEPA for review and approval prior to commencement of construction activities. The CQAP will include as appropriate:

- Construction Quality Assurance Objectives that define responsibility and authority, sample or measurement protocols and required accuracy, and documentation requirements;
- Construction Inspection Activities – to include description of required types of inspections during construction; and, their respective scope and required documentation for the following inspections:
  - Pre-construction;
  - Routine;
  - Pre-final; and,
  - Final.
- Quality assurance sampling or testing;
- Documentation requirements.

SWMU 4 IM Operations and Maintenance Plan

Following USEPA approval of the SWMU 4 IM, an Operations and Maintenance (O&M) plan will be prepared for USEPA review. The O&M plan will include as appropriate:

- Startup and operator training;
- Description of normal O&M tasks;
- Description of routine discharge permit monitoring and testing;
- Incorporation by reference and continued implementation of the SWMU 4 Groundwater Monitoring Plan approved by USEPA by email dated October 15, 2014.
- Descriptions of equipment; and,
- Record keeping and reporting.

Reports

It is anticipated that several reports to USEPA may be necessary during implementation of the SWMU 4 IM resulting from execution of this work plan. These include:

- Progress reports – Proposed at a frequency of one per calendar quarter from USEPA approval of this work plan. Content will be consistent with that outlined in the RCRA guidance document EPA/530-SW-88-029, Appendix E dated June 1988.
- 30% Design Package – drawings and specifications.
- 100% Design Package – drawings and specifications.
- Draft IM Completion Report
- Final IM Completion Report

3.4 SCHEDULE

Figure 12 depicts the proposed preliminary schedule for IM activities. This schedule will be updated and included with each progress report submitted to USEPA.

3.5 PERSONNEL AND QUALIFICATIONS

The following AMEC personnel will play key roles in the SWMU 4 IM design and implementation:

Richard C. Karr –Project Manager

Drexel University, MS (Engineering Geology emphasis)
University of Nebraska at Omaha, B.S – Geology

Mr. Karr will serve as the project manager and principal point of contact for execution of the technical project. With over 30 years of experience and an Associate with AMEC, Mr. Karr's project management responsibilities span the entire reach of project implementation, and delivery. He will be responsible for schedule management, technical direction and oversight, and final quality control on the project. Mr. Karr will ensure that proper and consistent AMEC resources and expertise are brought to bear.

Mr. Karr has managed or been a key team member on over 100 site characterization and remediation projects. His professional practice is focused in groundwater hydraulics, contaminant fate and transport, and remedial design and construction. He has performed many complex data analyses leading to remedial designs for groundwater and soil remediation projects. He has managed remediation construction projects of up to $30MM.

Craig Calabria, PhD., P.D – Geotechnical Engineer

Drexel University, B.S., M.S

University of Salford (Manchester, UK), PhD.

Specialized by education and experience in geotechnical/geoenvironmental engineering, Dr. Calabria has more than thirty-five years' experience in the construction industry and engineering consulting. He is a Registered Professional Engineer in five states.

Dr. Calabria has performed conceptual and detailed design for landfills and surface impoundments. He has developed closure plans, groundwater control system plans and implemented remedial investigations for operating and abandoned industrial sites. He has performed groundwater studies, including development of groundwater monitoring programs for industrial and municipal sites. Dr. Calabria has been responsible for developing innovative cover systems associated with the closure of hazardous waste and solid waste landfills and surface impoundments in North America and Europe.

Robert J. Bukowski, P.E., LEED AP, CPESC – Project Engineer

University of Massachusetts Lowell: M.S., Civil Engineering
Worcester Polytechnic Institute: B.S., Civil Engineering

Mr. Bukowski brings over 20 years of experience in a variety of civil and environmental engineering design and construction projects. Mr. Bukowski has performed conceptual and detailed design, as well as construction oversight for in-situ remediation systems including in-situ air sparing, soil vapor extraction, groundwater pump & treat, multi-phase extraction, and thermal remediation. He has developed design drawings, specifications, and construction cost-estimates for a variety of site development projects that include stormwater management and utility design. He has also performed design and construction oversight for landfill closure, and for landfill redevelopment to accommodate solar PV systems.

Mr. Bukowski is a registered professional engineer in eight states, he is a LEED Accredited Professional, having been involved in sustainable site design for development projects. He is also a Certified Professional in Erosion and Sediment Control, having prepared Stormwater Pollution Prevention Plans (SWPPPs) in several states.

Daniel Forlastro, P.E. – Peer Reviewer

University of Pittsburgh: BS, Civil Engineering

Mr. Forlastro has over 28 years of experience providing project management, engineering design, and construction management services on a variety of civil and environmental projects. Mr. Forlastro has been responsible for managing all phases of projects including conception and investigation, design, construction, and operation and maintenance. As a

Principal Engineer at AMEC, Mr. Forlastro is also responsible for negotiating with regulatory agencies, project budgets and schedules, and personnel management.

Over the course of his career, Mr. Forlastro has fulfilled the roles of principal engineer and project manager, working at times for engineering consultants and contractors. Mr. Forlastro is able to manage both the engineering design and construction phase of projects. Mr. Forlastro has also managed turnkey environmental projects with civil aspects such as landfill and impoundment closures and low-permeability barrier wall installations for various clients with responsibility for completing and receiving approval of the engineering design and then constructing the project to meet that approved design. Mr. Forlastro has detailed engineering knowledge and construction experience for a multitude of civil and environmental projects featuring various technologies and methods.

4.0 COMMUNITY RELATIONS PLAN

4.1 OVERVIEW OF THE COMMUNITY RELATIONS PROCESS

The USEPA will be in the lead role for providing the public with timely information related to the remediation activities at the Honeywell facility at Chesterfield, Virginia. These activities are being undertaken pursuant to the Federal Resource Conservation and Recovery Act (RCRA), and USEPA guidance on effective public involvement has been incorporated into this plan.

Public involvement activities will include, but will not be limited to:

- Input into the USEPA fact sheet,
- Establishing a repository of information,
- Preparing public notices as needed for remediation activities,
- Supporting and participating in public meetings, and
- Designating contact people for information requests.

4.2 COMMUNITY RELATIONS PROGRAM ELEMENTS

The goal of the community relations program is to ensure that the public understands the remediation activities, respond to public concerns and include the public in the decision-making process. The public involvement activities listed in Section 4.1 (i.e., preparing and updating a fact sheet, establishing a repository of information, preparing public notices, and supporting/participating in public meetings) are described in more detail below.

Fact Sheet

Honeywell will provide updates to the USEPA for the facility fact sheet posted to their Website as needed.

Repository of Information

The following locations will be repositories for important project information and will be accessible by the public. Available information typically will include documents such as orders, agreements, work plans, corrective action reports, agency correspondence, fact sheets and public meeting announcements.

U.S. EPA Region III
Land & Chemicals Division - RCRA
1650 Arch Street-11th Floor
Philadelphia, PA 19103
(215) 814-3226

Chesterfield County Library

9501 Lori Rd
Chesterfield, VA 23832
(804) 748-1604

Library Hours

Monday: 10 a.m.-9 p.m.
Tuesday: 10 a.m.-9 p.m.
Wednesday: 10 a.m.-9 p.m.
Thursday: Central Library is open 1-9 p.m. (All other branches CLOSED.)
Friday: 10 a.m.-5 p.m.
Saturday: 10 a.m.-5 p.m.
Sunday: CLOSED

Public Notice

Notices will be published in the Chesterfield Observer as needed to comply with agency requirements and the state of Virginia.

Public Meetings and Stakeholder Outreach

Honeywell will organize meetings with community groups and the public as required by state and federal permitting requirements, and as otherwise may be necessary or appropriate to further the purposes of this community relations plan.

4.3 CONTACT LIST

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Honeywell Communications
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Morristown, NJ 07962
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4.4 COMMUNITY RELATIONS PLAN UPDATE PROCESS

This plan is intended to provide a formal yet flexible process for guiding the public information and involvement process during corrective action at the Site. If amendments to the plan are necessary or appropriate to accommodate changes to the corrective action process, the plan will be updated from time to time to include these amendments.

TABLES

Table 1
Hydraulic Conductivity Values
SWMU 4 Interim Measure Work Plan
Honeywell Chesterfield Facility
Chesterfield, VA

Wells Screened in Recent Alluvium		Wells Screened in Potomac Confining Unit		
Well Number	Hydraulic Conductivity (cm/sec) - Average of Falling and Rising Tests	Well Number	Hydraulic Conductivity (cm/sec) - Average of Falling and Rising Tests	Reported
MW-100S	6.48E-03	MW-100D	8.16E-06	Phase II RFI Report
MW-101S	3.86E-03	MW-101D	3.05E-03	Phase II RFI Report
MW-105S	3.08E-03	MW-105D	9.02E-05	Phase II RFI Report
MW-106S	6.05E-02	MW-106D	3.55E-04	Phase II RFI Report
MW-107S	3.28E-03	MW-107D	8.47E-04	Phase II RFI Report
MW-110S	7.03E-03	MW-108D	2.91E-03	Phase II RFI Report
MW-111S	1.55E-02	MW-109D	3.30E-03	Phase II RFI Report
MW-112S	1.93E-02	MW-110D	1.00E-02	Phase II RFI Report
MW-114S	1.17E-02	MW-111D	7.74E-03	Phase II RFI Report
		MW-116D	1.91E-03	Phase II RFI Report
		MW-117D	6.71E-04	Phase II RFI Report
		MW-118D	4.50E-03	Phase II RFI Report
MW-1R	3.95E-04	MW-121D	2.79E-05	Phase III RFI Report
MW-51R	5.42E-03	MW-122D	4.51E-05	Phase III RFI Report
MW-53R	8.48E-03			Phase III RFI Report
MW-120S	4.83E-03			Phase III RFI Report
MW-121S	1.57E-04			Phase III RFI Report
MW-122S	6.47E-04			Phase III RFI Report
MW-123S	1.05E-03			Phase III RFI Report
MW-124S	1.14E-03			Phase III RFI Report

Note: Green shaded values are locations close in proximity to SWMU 4 on the Site.

Table 2
Phase III Soil Analytical Results
SWMU 4 Interim Measure Work Plan
Honeywell Chesterfield Facility
Chesterfield, VA

Compound	Regional Screening Level Industrial Soil [A]	Protection of Groundwater Risk-based SSL [B]	SB-04-12 10/18/2004 3-4'	SB-04-13 10/18/2004 6-7'	SB-04-13 10/18/2004 8-9'	SB-04-13 10/18/2004 16.3-17.3'	SB-04-14 10/18/2004 6.5-7.5'	SB-04-14 10/18/2004 14-15'	SB-04-14 10/18/2004 17-18'	SB-04-15 10/18/2004 6-7'	SB-04-15 10/18/2004 10-11'	SB-04-15 10/18/2004 18.3-19.3'	SB-04-16 10/18/2004 1.5-2.5'	SB-04-16 10/18/2004 3-4'	SB-04-16 10/18/2004 17.8-18.8'	SB-04-17 10/18/2004 5.0-6.0'	SB-04-17 10/18/2004 10.3-11.3'	SB-04-19 10/18/2004 5-6'
Volatile Organic Compounds (ug/kg)																		
1,1,1-TRICHLOROETHANE	38,000,000	2,600	9	41	***15000000***	***84000***	***9300***	***260000***	***35000***	1300	***18000***	***38000***	82	400	14	***3400J***	***5300J***	8
1,1,2,2-TETRACHLOROETHANE	2,800	0.026	6U	6U	***31000J***	***430J***	320U	***1000J***	***980***	***18J***	560U	600U	5U	***2J***	6U	***12J***	***6J***	6U
1,1,2-TRICHLOROETHANE	5,300	0.077	6U	6U	***18000J***	1200U	320U	2700U	660U	***36***	560U	600U	***12***	***27***	***3J***	***7***	***13***	6U
1,1,2-TRICHLOROTRIFLUOROETHAN	180,000,000	130,000	12U	12U	27000J	2300U	560J	1600J	1300U	2J	1100U	1200U	2J	9J	12U	28	9J	12U
1,1-DICHLOROETHANE	17,000	0.680	***65***	***5J***	***1200000***	***2100***	***1200***	***6800***	***740***	***160***	***350J***	***2000***	***98***	***140J***	***120***	***1400J***	***2600J***	***2J***
1,1-DICHLOROETHENE	1,100,000	92	6U	6U	***65000***	***610J***	***430***	***1000J***	***380J***	75	***410J***	***1700***	36	***240***	14	61	***140***	6U
1,2,4-TRICHLOROBENZENE	99,000	2.9	6U	***5J***	34000U	***390J***	***100J***	2700U	660U	6U	560U	***220J***	2J	5U	6U	***18***	6U	6U
1,2-DICHLOROBENZENE	9,800,000	270	6U	2J	34000U	***1500***	***1200***	***6400***	***740***	3J	560U	***1300***	9	10	5J	3J	2J	6U
1,2-DICHLOROETHANE	2,200	0.042	6U	6U	***11000J***	1200U	320U	2700U	660U	***8***	560U	600U	5U	***9***	***17***	***6J***	***47***	6U
1,3-DICHLOROBENZENE	NS	NS	6U	2J	34000U	1200U	320U	2700U	660U	6U	560U	600U	5U	5U	6U	6U	6U	6U
1,4-DICHLOROBENZENE	12,000	0.40	6U	6U	34000U	1200U	320U	2700U	660U	6U	560U	600U	5U	5U	6U	6U	6U	6U
2-BUTANONE	200,000,000	1,000	12R	24L	69000U	2300U	630U	5500U	1300U	11R	1100U	1200U	11R	260L	12R	12R	11R	12R
4-METHYL-2-PENTANONE	53,000,000	230	12U	12U	69000U	2300U	630U	5500U	1300U	10J	1100U	1200U	11U	9J	12U	12U	6J	12U
ACETONE	630,000,000	2,400	17J	90L	***140000R***	4700U	1300U	11000U	2600U	690J	2200U	2400U	54L	510J	37L	18J	78L	50L
BENZENE	5,400	0.200	6U	1J	34000U	1200U	320U	***410J***	***72J***	***6***	560U	600U	***2J***	***7***	***2J***	***0.7J***	***4J***	6U
CARBON DISULFIDE	3,700,000	210	6U	1J	34000U	1200U	320U	2700U	660U	6U	560U	600U	5U	1J	2J	1J	6U	6U
CHLOROBENZENE	1,400,000	49	6U	6U	34000U	1200U	320U	2700U	660U	6U	560U	600U	5U	2J	6U	6U	6U	6U
CHLOROETHANE	NS	NS	8	62	34000U	1200U	320U	2700U	660U	5J	560U	600U	5U	8	180J	10	520J	6U
CHLOROFORM	1,500	0.053	6U	6U	***85000***	***930J***	320U	2700U	***250J***	***10***	560U	600U	***2J***	***15***	6U	***48***	***99***	6U
CHLOROMETHANE	500,000	49	6U	6U	34000U	1200U	320U	2700U	660U	6U	560U	600U	5U	5U	3J	6U	5J	6U
CIS-1,2-DICHLOROETHENE	2,000,000	8.2	***38***	1J	***32000J***	***9400***	***2300***	***51000***	***3400***	***5000***	***8200***	***8200***	***900***	***1800***	***290J***	***5000J***	***5800J***	8
CYCLOHEXANE	29,000,000	13,000	6U	14	***54000***	600J	760	1900J	270J	2J	560U	560J	2J	6	2J	6U	4J	6U
ETHYLBENZENE	27,000	1.5	6U	***5J***	34000U	***1000J***	***470***	***5900***	***1300***	***85***	***3400***	***2800***	***7***	***29***	***4J***	6U	***3J***	6U
ISOPROPYLBENZENE	11,000,000	640	6U	6U	34000U	1200U	85J	2700U	660U	4J	180J	130J	5U	1J	6U	6U	6U	6U
METHYL ACETATE	1,000,000,000	3,200	6U	6U	34000U	1200U	320U	2700U	660U	6U	560U	600U	5U	4J	6U	6U	6U	6U
METHYLCYCLOHEXANE	NS	NS	6U	6U	34000U	1200U	320U	2700U	660U	1J	560U	520J	2J	3J	6U	6U	6U	6U
METHYLENE CHLORIDE	960,000	2.5	6U	6U	34000U	1200U	320U	2700U	660U	***4J***	560U	600U	***3J***	***6***	***17***	***34***	***170***	6U
TETRACHLOROETHENE	110,000	4	***9***	***42***	***11000000***	***68000***	***3200***	***5100***	***70000***	***430***	***110000***	***54000***	***150***	***1500***	6U	***260J***	***20***	***6J***
TOLUENE	45,000,000	590	6U	10	***150000***	***1600***	540	***11000***	***1600***	180	***2800***	***3100***	20	100	50	2J	66	6U
TRANS-1,2-DICHLOROETHENE	690,000	25	6U	6U	34000U	1200U	320U	2700U	660U	5J	560U	600U	5	7	3J	17	14	6U
TRICHLOROETHENE	6,400	0.160	***7***	***1J***	***150000***	***26000***	***670***	***59000***	***6300***	***630***	***16000***	***16000***	***58***	***480***	6U	***230***	***730J***	***13***
TRICHLOROFLUOROMETHANE	3,400,000	690	6U	6U	***21000J***	1200U	320U	2700U	660U	6U	560U	600U	5U	5U	6U	6U	4J	6U
VINYL CHLORIDE	1,700	0.006	6U	6U	34000U	1200U	320U	2700U	660U	***3J***	560U	600U	***4J***	***18***	***170***	***20***	***150***	6U
XYLENES, TOTAL	10,000,000	2,700,000	6U	11	15000J	4600	3800	29000	5900	380	15000	11000	19	130	18	6U	12	6U

Notes:
[A] - EPA Region III Regional Screening Level (RSL) for Industrial Soil, November 2013.
[B] - EPA Region III Protection of Groundwater Risk based Soil Screening Level (SSL), November 2013.
NS - No established criteria listed on November 2013 EPA Region III RSL Table.
1200 Bold and italicized value indicates an exceedance of the Protection of Groundwater SSL.
1200 Bold, italicized and shaded value indicates an exceedance of the Industrial RSL Criteria.
U - Analyte was not detected above the indicated reporting limit.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
J - The reported concentration for this analyte is an estimated value.
R - Result is rejected.
UL - Analyte was not detected, the indicated reporting limit may be biased low.
UJ - Analyte was not detected, the indicated reporting limit is an estimate.

Prepared by: MT 05/20/14
Checked by: RK 05/23/14

Table 2
Phase III Soil Analytical Results
SWMU 4 Interim Measure Work Plan
Honeywell Chesterfield Facility
Chesterfield, VA

Compound	Regional Screening Level Industrial Soil [A]	Protection of Groundwater Risk-based SSL [B]	SB-04-19 10/18/2004 8-9'	SB-04-19 10/18/2004 18.5-19.5'	SB-04-20 10/18/2004 6-7'	SB-04-20 10/19/2004 17-18'	SB-04-21 10/19/2004 2-3'	SB-04-21 10/19/2004 6.6-7.6'	SB-04-22 10/19/2004 3-4'	SB-04-22 10/19/2004 13-14'	SB-04-22 10/19/2004 19.5-20'	SB-04-23 10/19/2004 9-10'	SB-04-23 10/19/2004 11-12'	SB-04-23 10/19/2004 16.6-17.6'	SB-04-24 10/19/2004 3-4'	SB-04-25 10/19/2004 6-7'	SB-04-25 10/19/2004 16.5-17.5'	SB-04-25 10/19/2004 18-19'
Volatile Organic Compounds (ug/kg)																		
1,1,1-TRICHLOROETHANE	38,000,000	2,600	10	2J	12	***1500000***	1J	***21000***	9	***1700000***	81J	72	2300	330	5U	12	***73000***	140J
1,1,2,2-TETRACHLOROETHANE	2,800	0.026	6U	6U	6U	***2900J***	5U	250U	5U	***20000***	340UL	***9J***	***71J***	310U	5U	7U	***730J***	360UL
1,1,2-TRICHLOROETHANE	5,300	0.077	6U	6U	6U	13000U	5U	250U	5U	12000U	340UL	***8***	6U	310U	5U	7U	1100U	360UL
1,1,2-TRICHLOROTRIFLUOROETHAN	180,000,000	130,000	12U	11U	12U	26000U	10U	500U	10U	25000U	680UL	12U	12U	620U	9U	14U	2100U	720UL
1,1-DICHLOROETHANE	17,000	0.680	***6J***	6U	***4J***	***4900J***	***25***	***8600***	***220***	***90000***	***11000L***	***590***	***2900***	***380***	***8***	***160***	***1000J***	***7500L***
1,1-DICHLOROETHENE	1,100,000	92	6U	6U	6U	***6400J***	5U	75J	5U	***53000***	340UL	5J	31	310U	5U	7U	***400J***	360UL
1,2,4-TRICHLOROBENZENE	99,000	2.9	6U	6U	***67***	***4200J***	5U	250U	5U	12000U	340UL	6U	***32***	310U	5U	***4J***	***1200***	360UL
1,2-DICHLOROBENZENE	9,800,000	270	6U	6U	34	***2700J***	5U	250U	5U	***2700J***	340UL	7	85	270J	5U	7U	***860J***	360UL
1,2-DICHLOROETHANE	2,200	0.042	6U	6U	6U	13000U	5U	250U	5U	***3500J***	340UL	***6***	***13***	310U	5U	***6J***	1100U	360UL
1,3-DICHLOROBENZENE	NS	NS	6U	6U	680	13000U	5U	250U	5U	12000U	340UL	6U	1J	310U	5U	7U	1100U	360UL
1,4-DICHLOROBENZENE	12,000	0.40	6U	6U	***1200***	13000U	5U	250U	5U	12000U	340UL	6U	***4J***	310U	5U	7U	1100U	360UL
2-BUTANONE	200,000,000	1,000	12R	11R	6J	26000U	10U	500U	10R	25000U	350J	81L	12R	620U	4J	14R	2100U	410J
4-METHYL-2-PENTANONE	53,000,000	230	12U	11U	12U	26000U	10U	500U	10U	25000U	680UL	5J	12U	620U	9U	14U	2100U	720UL
ACETONE	630,000,000	2,400	24R	42L	25L	***51000R***	22L	1000R	20L	***50000R***	***4200L***	83L	70L	1200R	19L	18J	***4200R***	***4600L***
BENZENE	5,400	0.200	6U	6U	3J	13000U	5U	250U	***2J***	12000U	***280J***	***6J***	***20***	***40J***	5U	***3J***	1100U	***220J***
CARBON DISULFIDE	3,700,000	210	6U	6U	7	13000U	5U	250U	5U	12000U	340UL	2J	6U	310U	5U	2J	1100U	360UL
CHLOROBENZENE	1,400,000	49	6U	6U	10	13000U	5U	250U	5U	12000U	340UL	6U	6	310U	5U	7U	1100U	360UL
CHLOROETHANE	NS	NS	6U	6U	120	13000U	51	3200J	2500L	12000J	380J	270	680	220J	5U	2000	1100U	360UL
CHLOROFORM	1,500	0.053	6U	6U	6U	***4400J***	5U	***55J***	5U	***52000***	340UL	***11***	***36***	310U	5U	7U	1100U	360UL
CHLOROMETHANE	500,000	49	6U	6U	6U	13000U	5U	250U	5U	12000U	340UL	6U	6U	310U	5U	7U	1100U	360UL
CIS-1,2-DICHLOROETHENE	2,000,000	8.2	***18***	6U	4J	***20000***	2J	***4400***	5J	***54000***	***18000L***	***810***	***3300***	***1400***	***31***	***35***	***8600***	***1800L***
CYCLOHEXANE	29,000,000	13,000	6U	6U	73	6800J	2J	900	100	***43000***	340UL	9	110	70J	5U	49	850J	360UL
ETHYLBENZENE	27,000	1.5	6U	6U	***4J***	13000U	5U	250U	5U	***2500J***	***160J***	***7***	***150***	***680***	5U	7U	***1600***	360UL
ISOPROPYLBENZENE	11,000,000	640	6U	6U	6U	13000U	5U	250U	5U	12000U	340UL	6U	13	310U	5U	7U	1100U	360UL
METHYL ACETATE	1,000,000,000	3,200	6U	6U	6U	13000U	5U	160J	5U	12000U	140J	6U	6U	310U	5U	7U	480J	400L
METHYLCYCLOHEXANE	NS	NS	6U	6U	1J	13000U	5U	250U	1J	12000U	340UL	6U	18	80J	5U	7U	710J	360UL
METHYLENE CHLORIDE	960,000	2.5	6U	6U	6U	13000U	5U	***170J***	***10***	12000U	340UL	***37***	***76***	310U	5U	***29***	1100U	360UL
TETRACHLOROETHENE	110,000	4	2J	6U	***13***	***1500000***	2J	***2900***	***7***	***1300000***	***2300L***	4J	***130***	***67J***	2J	***15***	***4400***	***1900L***
TOLUENE	45,000,000	590	6U	6U	3J	***15000***	5U	***760***	14	***63000***	***1500L***	50	***990***	440	5U	41	***5600***	330J
TRANS-1,2-DICHLOROETHENE	690,000	25	6U	6U	6U	13000U	5U	250U	1J	12000U	***140J***	2J	7	310U	5U	5J	1100U	360UL
TRICHLOROETHENE	6,400	0.160	***5J***	6U	6U	***130000***	5U	***480***	***4J***	***120000***	***1800L***	***3J***	***280***	310U	***5***	***2J***	***7700***	***1000L***
TRICHLOROFLUOROMETHANE	3,400,000	690	6U	6U	6U	13000U	5U	250U	5U	***5000J***	340UL	6U	3J	310U	5U	7U	1100U	360UL
VINYL CHLORIDE	1,700	0.006	6U	6U	6U	13000U	***9***	***590***	***7***	12000U	340UL	***36***	***120***	310U	5U	***52***	1100U	360UL
XYLENES, TOTAL	10,000,000	2,700,000	6U	6U	13	6600J	5U	120J	1J	12000J	680L	43	3600	2900	5U	6J	7500	200J

Notes:
[A] - EPA Region III Regional Screening Level (RSL) for Industrial Soil, November 2013.
[B] - EPA Region III Protection of Groundwater Risk based Soil Screening Level (SSL), November 2013.
NS - No established criteria listed on November 2013 EPA Region III RSL Table.
1200 Bold and italicized value indicates an exceedance of the Protection of Groundwater SSL.
1200 Bold, italicized and shaded value indicates an exceedance of the Industrial RSL Criteria.
U - Analyte was not detected above the indicated reporting limit.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
J - The reported concentration for this analyte is an estimated value.
R - Result is rejected.
UL - Analyte was not detected, the indicated reporting limit may be biased low.
UJ - Analyte was not detected, the indicated reporting limit is an estimate.

Prepared by: MT 05/20/14
Checked by: RK 05/23/14

Table 2
Phase III Soil Analytical Results
SWMU 4 Interim Measure Work Plan
Honeywell Chesterfield Facility
Chesterfield, VA

Compound	Regional Screening Level Industrial Soil [A]	Protection of Groundwater Risk-based SSL [B]	SB-04-26	SB-04-26	SB-04-26	SB-04-27	SB-04-27	SB-04-27	SB-04-28	SB-04-29	SB-04-30	SB-04-30	SB-04-30	SB-04-31	SB-04-31	SB-04-31	SB-04-32	SB-04-32	SB-04-33
			10/19/2004	10/19/2004	10/19/2004	10/20/2004	10/20/2004	10/20/2004	10/20/2004	10/20/2004	10/20/2004	10/20/2004	10/20/2004	10/20/2004	10/20/2004	10/20/2004	10/20/2004	10/20/2004	10/21/2004
			6-7'	15-16'	17-18'	6-7'	13-14'	16.7-17.7'	1-2'	6.7-7.7'	2-3'	18-19'	19-20'	5-6'	17.5-18.5'	18.5-19.5'	2-3'	19.5-19.5'	3-4'
Volatile Organic Compounds (ug/kg)																			
1,1,1-TRICHLOROETHANE	38,000,000	2,600	600J	***330000***	1900L	3J	2J	4J	2J	270	48	***940000***	540UL	***120000***	***2500000***	820J	490L	***170000***	340
1,1,2,2-TETRACHLOROETHANE	2,800	0.026	280UJ	***1000J***	250UL	5U	5UL	6U	4U	5U	***2J***	31000U	540UL	23000U	130000U	3700U	***4J***	5200U	230U
1,1,2-TRICHLOROETHANE	5,300	0.077	280UJ	2700U	250UL	5U	5UL	6U	4U	***1J***	***3J***	31000U	540UL	23000U	130000U	3700U	***29***	5200U	230U
1,1,2-TRICHLOROTRIFLUOROETHAN	180,000,000	130,000	560UJ	5300U	510UL	11U	11UL	12U	9U	6J	10U	62000U	1100UL	46000U	250000U	7400U	11U	10000U	470U
1,1-DICHLOROETHANE	17,000	0.680	***360J***	***4300***	***130J***	5U	5UL	***4J***	***2J***	***270***	***5***	***8000J***	***31000L***	23000U	***30000J***	***28000***	***98***	***2800J***	***300***
1,1-DICHLOROETHENE	1,100,000	92	280UJ	***1800J***	250UL	5U	5UL	6U	4U	5U	5U	31000U	540UL	***6000J***	***40000J***	3700U	23	***2700J***	90J
1,2,4-TRICHLOROBENZENE	99,000	2.9	***530J***	2700U	250UL	5U	5UL	6U	4U	***49***	1J	31000U	540UL	23000U	130000U	3700U	***3J***	***1200J***	230U
1,2-DICHLOROBENZENE	9,800,000	270	280UJ	***3500***	110J	5U	5UL	6U	4U	5J	5U	***6300J***	540UL	23000U	130000U	3700U	74	***4000J***	230U
1,2-DICHLOROETHANE	2,200	0.042	280UJ	2700U	250UL	5U	5UL	6U	4U	***3J***	5U	31000U	540UL	23000U	130000U	3700U	***2J***	5200U	230U
1,3-DICHLOROBENZENE	NS	NS	280UJ	2700U	250UL	5U	5UL	6U	4U	28	5U	31000U	540UL	23000U	130000U	3700U	2J	5200U	230U
1,4-DICHLOROBENZENE	12,000	0.40	280UJ	2700U	250UL	5U	5UL	6U	4U	***5J***	5U	31000U	540UL	23000U	130000U	3700U	***7***	5200U	230U
2-BUTANONE	200,000,000	1,000	560UJ	5300U	510UL	11U	11UL	12R	9R	22L	17L	62000U	870J	46000U	250000U	7400U	29L	10000U	230J
4-METHYL-2-PENTANONE	53,000,000	230	560UJ	5300U	510UL	11U	11UL	12U	9U	10J	10U	62000U	1100UL	46000U	250000U	7400U	11U	10000U	470U
ACETONE	630,000,000	2,400	1100R	***11000R***	1000R	300L	22R	23J	27L	25L	91L	***120000R***	***5800L***	***92000R***	***500000R***	***7500J***	48L	***21000R***	***13000L***
BENZENE	5,400	0.200	280UJ	2700U	250UL	5U	5UL	6U	4U	***9***	5U	31000U	***210J***	23000U	130000U	3700U	***3J***	5200U	230U
CARBON DISULFIDE	3,700,000	210	280UJ	2700U	250UL	5U	5UL	2J	4U	6	5U	31000U	540UL	23000U	130000U	3700U	5U	5200U	230U
CHLOROBENZENE	1,400,000	49	280UJ	2700U	250UL	5U	5UL	6U	4U	2J	5U	31000U	540UL	23000U	130000U	3700U	5U	5200U	230U
CHLOROETHANE	NS	NS	280UJ	2700U	250UL	5U	5UL	6U	4U	3300L	5U	31000U	610J	23000U	130000U	3700U	5U	2700J	230U
CHLOROFORM	1,500	0.053	280UJ	2700U	250UL	5U	5UL	6U	4U	***1J***	***1J***	31000U	540UL	23000U	130000U	3700U	***8***	5200U	***56J***
CHLOROMETHANE	500,000	49	280UJ	2700U	250UL	5U	5UL	6U	4U	5U	5U	31000U	540UL	23000U	130000U	3700U	5U	5200U	230U
CIS-1,2-DICHLOROETHENE	2,000,000	8.2	***2800J***	***70000***	***1400L***	5U	5UL	3J	4U	***180***	***98***	***83000***	***11000L***	***13000J***	***110000J***	***22000***	***270L***	***22000***	***1100***
CYCLOHEXANE	29,000,000	13,000	280UJ	920J	64J	5U	5UL	6U	4U	13	5U	31000U	540UL	23000U	130000U	3700U	12	4100J	230U
ETHYLBENZENE	27,000	1.5	***280J***	***10000***	***140J***	5U	5UL	6U	4U	***5J***	5U	***7600J***	540UL	23000U	130000U	3700U	5U	***6300***	230U
ISOPROPYLBENZENE	11,000,000	640	280UJ	2700U	250UL	5U	5UL	6U	4U	1J	5U	31000U	540UL	23000U	130000U	3700U	5U	5200U	230U
METHYL ACETATE	1,000,000,000	3,200	280UJ	2700U	250UL	5U	5UL	6U	4U	5U	5U	31000U	390J	23000U	130000U	3700U	5U	5200U	230J
METHYLCYCLOHEXANE	NS	NS	280UJ	810J	99J	5U	5UL	6U	4U	5U	5U	31000U	540UL	23000U	130000U	3700U	1J	5200U	230U
METHYLENE CHLORIDE	960,000	2.5	280UJ	2700U	250UL	5U	5UL	6U	4U	***8***	2J	31000U	***220J***	23000U	130000U	3700U	***3J***	5200U	230U
TETRACHLOROETHENE	110,000	4	280UJ	***510000***	***180J***	4J	3J	6U	3J	***510L***	***960L***	***3200000***	***640L***	***820000***	***3400000***	***4800***	***13000L***	***200000***	***3400***
TOLUENE	45,000,000	590	140J	***20000***	170J	5U	5UL	6U	4U	160	2J	***26000J***	***1500L***	***4700J***	***32000J***	***1200J***	6	***6400***	50J
TRANS-1,2-DICHLOROETHENE	690,000	25	280UJ	2700U	250UL	5U	5UL	6U	4U	4J	5U	31000U	540UL	23000U	130000U	3700U	4J	5200U	230U
TRICHLOROETHENE	6,400	0.160	280UJ	***340000***	***490L***	5U	5UL	6U	4U	***26***	***87***	***280000***	***8500L***	***56000***	***440000***	***1100J***	***630L***	***140000***	***580***
TRICHLOROFLUOROMETHANE	3,400,000	690	280UJ	2700U	250UL	5U	5UL	6U	4U	5U	5U	31000U	540UL	23000U	130000U	3700U	5U	5200U	230U
VINYL CHLORIDE	1,700	0.006	***58J***	2700U	250UL	5U	5UL	6U	4U	***18***	5U	31000U	540UL	23000U	130000U	3700U	5U	5200U	230U
XYLENES, TOTAL	10,000,000	2,700,000	1500J	46000	630L	5U	5UL	6U	4U	20	1J	33000	450J	5900J	130000U	3700U	5U	31000	100J

Notes:
A - EPA Region III Regional Screening Level (RSL) for Industrial Soil, November 2013.
B - EPA Region III Protection of Groundwater Risk based Soil Screening Level (SSL), November 2013.
NS - No established criteria listed on November 2013 EPA Region III RSL Table.
1200 Bold and italicized value indicates an exceedance of the Protection of Groundwater SSL.
1200 Bold, italicized and shaded value indicates an exceedance of the Industrial RSL Criteria.
U - Analyte was not detected above the indicated reporting limit.
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J - The reported concentration for this analyte is an estimated value.
R - Result is rejected.
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Prepared by: MT 05/20/14
Checked by: RK 05/23/14

Table 2
Phase III Soil Analytical Results
SWMU 4 Interim Measure Work Plan
Honeywell Chesterfield Facility
Chesterfield, VA

Compound	Regional Screening Level Industrial Soil [A]	Protection of Groundwater Risk-based SSL [B]	SB-04-33 10/21/2004 14-15'	SB-04-33 10/21/2004 18.9-19.9'	SB-04-36 10/21/2004 3-4'	SB-04-36 10/21/2004 16.6-17.6'	SB-04-36 10/21/2004 17.6-18.6'	SB-04-37 10/21/2004 5-6'	SB-04-37 10/21/2004 18-19'	SB-04-37 10/21/2004 19-20'	SB-04-38 10/21/2004 3-4'	SB-04-38 10/21/2004 16.5-17.5'	SB-04-38 10/21/2004 19-20'	SB-04-39 10/22/2004 5-6'	SB-04-39 10/22/2004 11-12'	SB-04-39 10/22/2004 17.5-18.5'	SB-04-40 10/22/2004 8-9'	SB-04-40 10/22/2004 18-19'	SB-04-40 10/22/2004 19-20'
Volatile Organic Compounds (ug/kg)																			
1,1,1-TRICHLOROETHANE	38,000,000	2,600	770L	160	***9200***	***620000***	1500	***3000***	***5600000***	570	550	***6900J***	350U	***28000J***	***490000***	***410000***	580L	***700000***	330UL
1,1,2,2-TETRACHLOROETHANE	2,800	0.026	280UL	6U	220U	***3000***	430U	250U	***18000***	310U	240U	5U	350U	***180J***	***29000***	4800U	270UL	***3000J***	330UL
1,1,2-TRICHLOROETHANE	5,300	0.077	280UL	***3J***	220U	1200U	430U	250U	13000U	310U	240U	5U	350U	270UJ	6000U	4800U	270UL	5200U	330UL
1,1,2-TRICHLOROTRIFLUOROETHAN	180,000,000	130,000	570UL	3J	440U	2400U	860U	510U	27000U	620U	490U	25	700U	540UJ	12000U	9600U	550UL	10000U	660UL
1,1-DICHLOROETHANE	17,000	0.680	***590L***	***94J***	***2800***	***7800***	***9900***	***1400***	***58000***	***2200***	***590***	***1400J***	***500***	***1700J***	***2900J***	***3800J***	***670L***	***9000***	***7000L***
1,1-DICHLOROETHENE	1,100,000	92	***500L***	***350J***	***470***	***4700***	430U	***320***	***34000***	310U	***240J***	***280***	350U	***630J***	***9300***	***5500***	***260J***	***13000***	330UL
1,2,4-TRICHLOROBENZENE	99,000	2.9	280UL	6U	220U	***1100J***	430U	250U	***6100J***	310U	240U	***39***	350U	***81J***	***17000***	4800U	270UL	5200U	330UL
1,2-DICHLOROBENZENE	9,800,000	270	280UL	6U	220U	***2400***	92J	250U	***30000***	310U	240U	***500J***	350U	270UJ	***34000***	4800U	270UL	***1700J***	330UL
1,2-DICHLOROETHANE	2,200	0.042	280UL	***3J***	220U	1200U	430U	250U	13000U	310U	240U	***42***	350U	270UJ	6000U	4800U	270UL	5200U	330UL
1,3-DICHLOROBENZENE	NS	NS	280UL	6U	220U	1200U	430U	250U	13000U	310U	240U	38	350U	270UJ	6000U	4800U	270UL	5200U	330UL
1,4-DICHLOROBENZENE	12,000	0.40	280UL	6U	220U	1200U	430U	250U	13000U	310U	240U	***53***	350U	270UJ	***1600J***	4800U	270UL	5200U	330UL
2-BUTANONE	200,000,000	1,000	570UL	45L	440U	2400U	590J	630	27000U	380J	490U	10R	300J	300J	12000U	9600U	550UL	10000U	660UL
4-METHYL-2-PENTANONE	53,000,000	230	570UL	11U	440U	2400U	860U	510U	27000U	620U	490U	10U	700U	540UJ	12000U	9600U	550UL	10000U	660UL
ACETONE	630,000,000	2,400	1100R	22R	870R	***4800R***	***2800L***	***4800L***	***54000R***	***3800L***	1500L	80L	***3000L***	680J	***24000R***	***19000R***	1100R	***21000R***	***5500L***
BENZENE	5,400	0.200	280UL	***7***	220U	***320J***	***150J***	250U	***3600J***	***100J***	240U	***56***	***71J***	270UJ	6000U	4800U	270UL	5200U	***160J***
CARBON DISULFIDE	3,700,000	210	280UL	3J	220U	1200U	430U	250U	13000U	310U	240U	7	350U	270UJ	6000U	4800U	270UL	5200U	330UL
CHLOROBENZENE	1,400,000	49	280UL	6U	220U	1200U	430U	250U	13000U	310U	240U	23	350U	270UJ	6000U	4800U	270UL	5200U	330UL
CHLOROETHANE	NS	NS	280UL	51	220U	730J	180J	250U	20000	140J	240U	2000J	350U	200J	6000U	4800U	270UL	5200U	230J
CHLOROFORM	1,500	0.053	***71J***	***34***	***390***	***1600***	430U	***270***	***3100J***	310U	***84J***	***3J***	350U	***550J***	***7300***	***1500J***	***77J***	***2600J***	330UL
CHLOROMETHANE	500,000	49	280UL	6U	220U	1200U	430U	250U	13000U	310U	240U	5U	350U	270UJ	6000U	4800U	270UL	5200U	330UL
CIS-1,2-DICHLOROETHENE	2,000,000	8.2	***1200L***	***250J***	***10000***	***52000***	***11000***	***3300***	***360000***	***6900***	***1200***	***2900J***	***4800***	***4700J***	***5700J***	***17000***	***1000L***	***35000***	***11000L***
CYCLOHEXANE	29,000,000	13,000	280UL	3J	63J	2800	430U	250U	***46000***	310U	240U	2100J	350U	180J	1500J	4800U	270UL	1800J	330UL
ETHYLBENZENE	27,000	1.5	280UL	***2J***	***45J***	***3300***	***86J***	250U	***44000***	310U	240U	***750J***	350U	***95J***	***10000***	4800U	270UL	***2000J***	330UL
ISOPROPYLBENZENE	11,000,000	640	280UL	6U	220U	1200U	430U	250U	13000U	310U	240U	69	350U	270UJ	6000U	4800U	270UL	5200U	330UL
METHYL ACETATE	1,000,000,000	3,200	280UL	6U	270	1200U	580	720	13000U	210J	310	5U	350U	350J	6000U	4800U	270UL	5200U	280J
METHYLCYCLOHEXANE	NS	NS	280UL	6U	220U	340J	430U	250U	3800J	310U	240U	210	350U	270UJ	6000U	4800U	270UL	5200U	330UL
METHYLENE CHLORIDE	960,000	2.5	280UL	***5J***	220U	1200U	430U	250U	13000U	310U	240U	***20***	350U	270UJ	6000U	4800U	270UL	5200U	330UL
TETRACHLOROETHENE	110,000	4	***1100L***	***290***	***2000***	***810000***	***2300***	***3800***	***1900000***	***1100***	***3000***	***670J***	***83J***	***13000J***	***1400000***	***430000***	***570L***	***600000***	330UL
TOLUENE	45,000,000	590	280UL	7	430	***15000***	***870***	110J	***130000***	150J	240U	***1400J***	350U	***860J***	***20000***	***3800J***	270UL	***8900***	***600L***
TRANS-1,2-DICHLOROETHENE	690,000	25	280UL	4J	220U	1200U	430U	250U	13000U	310U	240U	23	350U	270UJ	6000U	4800U	270UL	5200U	330UL
TRICHLOROETHENE	6,400	0.160	***650L***	***490J***	***880***	***110000***	***960***	***2000***	***5500000***	***1500***	***610***	***600J***	350U	***1800J***	***23000***	***39000***	***350L***	***92000***	330UL
TRICHLOROFLUOROMETHANE	3,400,000	690	280UL	3J	220U	1200U	430U	250U	13000U	310U	240U	9	350U	270UJ	6000U	4800U	270UL	5200U	330UL
VINYL CHLORIDE	1,700	0.006	280UL	***50***	220U	1200U	430U	250U	***2700J***	310U	240U	***180***	350U	270UJ	6000U	4800U	270UL	5200U	***68J***
XYLENES, TOTAL	10,000,000	2,700,000	280UL	7	150J	15000	410J	56J	190000	76J	54J	3100J	350U	500J	54000	1100J	270UL	8100	110J

Notes:
[A] - EPA Region III Regional Screening Level (RSL) for Industrial Soil, November 2013.
[B] - EPA Region III Protection of Groundwater Risk based Soil Screening Level (SSL), November 2013.
NS - No established criteria listed on November 2013 EPA Region III RSL Table.
1200 Bold and italicized value indicates an exceedance of the Protection of Groundwater SSL.
1200 Bold, italicized and shaded value indicates an exceedance of the Industrial RSL Criteria.
U - Analyte was not detected above the indicated reporting limit.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
J - The reported concentration for this analyte is an estimated value.
R - Result is rejected.
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Prepared by: MT 05/20/14
Checked by: RK 05/23/14

Table 2
Phase III Soil Analytical Results
SWMU 4 Interim Measure Work Plan
Honeywell Chesterfield Facility
Chesterfield, VA

Compound	Regional Screening Level Industrial Soil [A]	Protection of Groundwater Risk-based SSL [B]	SB-04-41	SB-04-41	SB-04-41	SB-04-42	SB-04-42	SB-04-42	SB-04-43	SB-04-43	SB-04-43	SB-04-44	SB-04-44	SB-04-44	SB-04-45	SB-04-45	SB-04-45	SB-04-46	SB-04-46
			10/22/2004	10/22/2004	10/22/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004
			14-15'	16.5-17.5'	17.5-18.5'	3-4'	8-9'	18.6-19.6'	5-6'	17-18'	19-20'	11-12'	18-19'	19-20'	6-7'	13-14'	16.5-17.5'	8-9'	16.8-17.8'
Volatile Organic Compounds (ug/kg)																			
1,1,1-TRICHLOROETHANE	38,000,000	2,600	120	460	340UJ	***20000J***	***320000***	***430000***	***5100J***	***3000000***	96J	520	***2200000***	410L	***43000***	***5200L***	240J	150	6U
1,1,2,2-TETRACHLOROETHANE	2,800	0.026	6U	***27J***	340UJ	***100J***	2900U	***5200J***	240UJ	***39000***	330UL	6U	***5400J***	290UL	2500U	270UL	270UL	***1J***	6U
1,1,2-TRICHLOROETHANE	5,300	0.077	6U	***4J***	340UJ	260UJ	2900U	11000U	240UJ	24000U	330UL	6U	26000U	290UL	2500U	***62J***	270UL	6U	6U
1,1,2-TRICHLOROTRIFLUOROETHAN	180,000,000	130,000	11U	11U	690UJ	520UJ	5800U	22000U	470UJ	49000U	660UL	11U	53000U	580UL	5000U	540UL	540UL	12U	12U
1,1-DICHLOROETHANE	17,000	0.680	***94***	***230***	***1500J***	***2400J***	***7400***	***3300J***	***5400J***	***28000***	***6900L***	***2200***	***130000***	***11000L***	***740J***	***89J***	***500L***	***44***	6U
1,1-DICHLOROETHENE	1,100,000	92	***120***	34	340UJ	***400J***	***5400***	***10000J***	***240J***	***98000***	330UL	54	***50000***	290UL	***1300J***	***210J***	***190J***	7	6U
1,2,4-TRICHLOROBENZENE	99,000	2.9	6U	6U	340UJ	260UJ	***1300J***	11000U	240UJ	24000U	330UL	6U	26000U	290UL	2500U	270UL	270UL	6U	6U
1,2-DICHLOROBENZENE	9,800,000	270	6U	7	340UJ	260UJ	2900U	11000U	240UJ	24000U	330UL	6U	***12000J***	78J	***500J***	270UL	270UL	6U	6U
1,2-DICHLOROETHANE	2,200	0.042	6U	***9***	340UJ	260UJ	2900U	11000U	240UJ	24000U	330UL	***2J***	26000U	290UL	2500U	270UL	270UL	6U	6U
1,3-DICHLOROBENZENE	NS	NS	6U	6U	340UJ	260UJ	2900U	11000U	240UJ	24000U	330UL	6U	26000U	290UL	2500U	270UL	270UL	6U	6U
1,4-DICHLOROBENZENE	12,000	0.40	6U	6U	340UJ	260UJ	2900U	11000U	240UJ	24000U	330UL	6U	26000U	290UL	2500U	270UL	270UL	6U	6U
2-BUTANONE	200,000,000	1,000	11R	190L	690UJ	520UJ	5800U	22000U	470UJ	49000U	680L	77L	53000U	360J	5000U	530J	540UL	6J	12R
4-METHYL-2-PENTANONE	53,000,000	230	11U	11U	690UJ	520UJ	5800U	22000U	470UJ	49000U	660UL	11U	53000U	580UL	5000U	540UL	540UL	12U	12U
ACETONE	630,000,000	2,400	23R	92L	2100J	1000R	***12000R***	***44000R***	950R	***97000R***	***6400L***	8J	***110000R***	***4100L***	***10000R***	2000L	1100R	31L	41L
BENZENE	5,400	0.200	6U	***4J***	***130J***	260UJ	2900U	11000U	***38J***	24000U	***78J***	***2J***	***4700J***	***150J***	2500U	270UL	270UL	6U	6U
CARBON DISULFIDE	3,700,000	210	6U	1J	340UJ	260UJ	2900U	11000U	240UJ	24000U	330UL	3J	26000U	290UL	2500U	270UL	270UL	6U	6U
CHLOROBENZENE	1,400,000	49	6U	6U	340UJ	260UJ	2900U	11000U	240UJ	24000U	330UL	6U	26000U	290UL	2500U	270UL	270UL	6U	6U
CHLOROETHANE	NS	NS	4J	230	340UJ	260UJ	2900U	11000U	590J	24000U	220J	150	21000J	420L	2500U	270UL	1100L	5J	6U
CHLOROFORM	1,500	0.053	***4J***	***8***	340UJ	***77J***	2900U	***3500J***	***58J***	***14000J***	330UL	***9***	26000U	290UL	2500U	270UL	270UL	6U	6U
CHLOROMETHANE	500,000	49	6U	6U	340UJ	260UJ	2900U	11000U	240UJ	24000U	330UL	6U	26000U	290UL	2500U	270UL	270UL	6U	6U
CIS-1,2-DICHLOROETHENE	2,000,000	8.2	***100***	***1800***	***9000J***	***13000J***	***73000***	***12000***	***2000J***	***100000***	***4800L***	***1200***	***380000***	***15000L***	***9600***	***740L***	***3700L***	***72***	6U
CYCLOHEXANE	29,000,000	13,000	6U	4J	340UJ	260UJ	2900U	11000U	260J	8300J	330UL	3J	7300J	290UL	2500U	270UL	270UL	6U	6U
ETHYLBENZENE	27,000	1.5	6U	***10***	340UJ	260UJ	2900U	11000U	240UJ	24000U	330UL	6U	***48000***	***150J***	***3900***	270UL	270UL	6U	6U
ISOPROPYLBENZENE	11,000,000	640	6U	6U	340UJ	260UJ	2900U	11000U	240UJ	24000U	330UL	6U	26000U	290UL	2500U	270UL	270UL	6U	6U
METHYL ACETATE	1,000,000,000	3,200	6U	6U	160J	110J	2900U	11000U	290J	24000U	330J	6U	26000U	180J	2500U	360L	140J	6U	6U
METHYLCYCLOHEXANE	NS	NS	6U	6U	340UJ	260UJ	2900U	11000U	240UJ	24000U	330UL	6U	26000U	290UL	2500U	270UL	270UL	6U	6U
METHYLENE CHLORIDE	960,000	2.5	6U	***8***	340UJ	260UJ	2900U	11000U	240UJ	24000U	330UL	***17***	26000U	290UL	2500U	270UL	270UL	6U	***18***
TETRACHLOROETHENE	110,000	4	***97***	***140***	340UJ	***490J***	***300000***	***590000***	***480J***	***2100000***	***170J***	***8***	***1300000***	***770L***	***200000***	***3100L***	***62J***	3J	3J
TOLUENE	45,000,000	590	6U	73	170J	210J	***5200***	***4600J***	***740J***	***36000***	130J	6	***130000***	***1300L***	***2700***	120J	130J	6U	6U
TRANS-1,2-DICHLOROETHENE	690,000	25	6U	7	340UJ	***79J***	2900U	11000U	240UJ	24000U	330UL	3J	26000U	290UL	2500U	270UL	270UL	6U	6U
TRICHLOROETHENE	6,400	0.160	***41***	***1100***	340UJ	***120J***	***36000***	***18000***	***160J***	***160000***	330UL	***16***	***1400000***	***420L***	***16000***	***1000L***	270UL	***8***	6U
TRICHLOROFLUOROMETHANE	3,400,000	690	5J	6U	340UJ	260UJ	2900U	11000U	110J	***11000J***	330UL	7	26000U	290UL	2500U	270UL	270UL	6U	6U
VINYL CHLORIDE	1,700	0.006	***6J***	***20***	***150J***	***140J***	2900U	11000U	***160J***	24000U	330UL	***55***	26000U	290UL	2500U	270UL	***140J***	6U	6U
XYLENES, TOTAL	10,000,000	2,700,000	6U	44	340UJ	260UJ	2900U	11000U	240UJ	12000J	330UL	4J	200000	700L	22000	58J	270UL	6U	6U

Notes:

[A] - EPA Region III Regional Screening Level (RSL) for Industrial Soil, November 2013.

[B] - EPA Region III Protection of Groundwater Risk based Soil Screening Level (SSL), November 2013.

NS - No established criteria listed on November 2013 EPA Region III RSL Table.

1200 Bold and italicized value indicates an exceedance of the Protection of Groundwater SSL.

1200 Bold, italicized and shaded value indicates an exceedance of the Industrial RSL Criteria.

U - Analyte was not detected above the indicated reporting limit.

L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.

J - The reported concentration for this analyte is an estimated value.

R - Result is rejected.

UL - Analyte was not detected, the indicated reporting limit may be biased low.

UJ - Analyte was not detected, the indicated reporting limit is an estimate.

Prepared by: MT 05/20/14
Checked by: RK 05/23/14

Table 2
Phase III Soil Analytical Results
SWMU 4 Interim Measure Work Plan
Honeywell Chesterfield Facility
Chesterfield, VA

Compound	Regional Screening Level Industrial Soil [A]	Protection of Groundwater Risk-based SSL [B]	SB-04-47 10/25/2004 13-14'	SB-04-47 10/25/2004 18.6-19.6'	SB-04-47 10/25/2004 19.6-20'	SB-04-48 10/26/2004 13-14'	SB-04-48 10/26/2004 15.5-16.5'	SB-04-48 10/26/2004 16.5-17.5'	SB-04-49 10/26/2004 10-11'	SB-04-49 10/26/2004 14.5-15.5'	SB-04-49 10/26/2004 15.5-16'	SB-04-50 10/26/2004 9-10'	SB-04-50 10/26/2004 16-17'	SB-04-51 10/26/2004 9-10'	SB-04-51 10/26/2004 13.5-14.5'	SB-04-51 10/26/2004 15-16'
Volatile Organic Compounds (ug/kg)																
1,1,1-TRICHLOROETHANE	38,000,000	2,600	700L	***6500000***	14	6J	120L	***2800000***	3J	***1600000***	***94000***	1J	6U	5U	5U	7U
1,1,2,2-TETRACHLOROETHANE	2,800	0.026	5U	***23000J***	8U	6U	6UL	***12000J***	5U	***7300J***	***740J***	5U	6U	5U	5U	7U
1,1,2-TRICHLOROETHANE	5,300	0.077	5U	65000U	8U	6U	***7L***	33000U	5U	26000U	1700U	5U	6U	5U	5U	7U
1,1,2-TRICHLOROTRIFLUOROETHAN	180,000,000	130,000	11U	130000U	15U	12U	12UL	67000U	11U	52000U	3300U	10U	12U	11U	10U	15U
1,1-DICHLOROETHANE	17,000	0.680	***530L***	***220000***	***13000L***	***11***	***210L***	***270000***	5U	***55000***	***26000***	5U	6U	***1J***	5U	7U
1,1-DICHLOROETHENE	1,100,000	92	28	***140000***	69	6U	1J	***75000***	5U	***42000***	***1500J***	5U	2J	5U	5U	2J
1,2,4-TRICHLOROBENZENE	99,000	2.9	5U	65000U	8U	6U	2J	33000U	5U	26000U	1700U	5U	6U	5U	5U	7U
1,2-DICHLOROBENZENE	9,800,000	270	5U	***18000J***	4J	6U	21L	***23000J***	5U	26000U	***460J***	5U	6U	5U	5U	7U
1,2-DICHLOROETHANE	2,200	0.042	5U	65000U	***30***	6U	6UL	33000U	5U	26000U	1700U	5U	6U	5U	5U	7U
1,3-DICHLOROBENZENE	NS	NS	5U	65000U	8U	6U	6UL	33000U	5U	26000U	1700U	5U	6U	5U	5U	7U
1,4-DICHLOROBENZENE	12,000	0.40	5U	65000U	8U	6U	***1J***	33000U	5U	26000U	1700U	5U	6U	5U	5U	7U
2-BUTANONE	200,000,000	1,000	21	130000U	710	12R	26L	67000U	11R	52000U	3300U	10U	12R	11R	6J	80L
4-METHYL-2-PENTANONE	53,000,000	230	11U	130000U	12J	12U	12UL	67000U	11U	52000U	3300U	10U	12U	11U	10U	9J
ACETONE	630,000,000	2,400	26L	***260000R***	***5100L***	24R	17J	***130000R***	14J	***100000R***	***5600J***	16J	24R	11J	23L	***3700L***
BENZENE	5,400	0.200	***1J***	***7600J***	***130***	6U	***6L***	***9300J***	5U	26000U	***230J***	5U	***2J***	5U	***0.6J***	***22***
CARBON DISULFIDE	3,700,000	210	5U	65000U	4J	6U	1J	33000U	5U	26000U	1700U	5U	6U	5U	5U	7U
CHLOROBENZENE	1,400,000	49	5U	65000U	3J	6U	6UL	33000U	5U	26000U	1700U	5U	6U	5U	5U	7U
CHLOROETHANE	NS	NS	36	65000U	310	6U	27L	28000J	5U	26000U	1700U	5U	6U	3J	5U	7U
CHLOROFORM	1,500	0.053	***6***	65000U	8U	6U	6UL	33000U	5U	26000U	1700U	***3J***	6U	5U	5U	7U
CHLOROMETHANE	500,000	49	5U	65000U	8U	6U	6UL	33000U	5U	26000U	1700U	5U	6U	5U	5U	7U
CIS-1,2-DICHLOROETHENE	2,000,000	8.2	***420L***	***670000***	***14000L***	***9***	***1700L***	***590000***	1J	***120000***	***21000***	5U	***30***	5U	5U	***43***
CYCLOHEXANE	29,000,000	13,000	5U	***23000J***	31	6U	6L	10000J	5U	26000U	1700U	5U	6U	5U	5U	7U
ETHYLBENZENE	27,000	1.5	5U	***21000J***	***34***	6U	***57L***	***68000***	5U	26000U	***370J***	5U	6U	5U	5U	***10***
ISOPROPYLBENZENE	11,000,000	640	5U	65000U	8U	6U	2J	33000U	5U	26000U	1700U	5U	6U	5U	5U	7U
METHYL ACETATE	1,000,000,000	3,200	5U	65000U	8U	6U	6UL	33000U	5U	26000U	2000	5U	6U	5U	5U	7U
METHYLCYCLOHEXANE	NS	NS	5U	65000U	2J	6U	12L	33000U	5U	26000U	1700U	5U	6U	5U	5U	7U
METHYLENE CHLORIDE	960,000	2.5	***5J***	65000U	***44***	***5J***	***6L***	33000U	***7***	26000U	1700U	5U	***8***	2J	***9***	***6J***
TETRACHLOROETHENE	110,000	4	***11***	***7000000***	***74***	1J	***16L***	***3000000***	5U	***1600000***	***160000***	2J	***28***	5U	4J	7U
TOLUENE	45,000,000	590	5U	***160000***	410	6U	92L	***210000***	5U	***22000J***	***2600***	5U	6U	5U	5U	8
TRANS-1,2-DICHLOROETHENE	690,000	25	4J	65000U	***41***	6U	6UL	33000U	5U	26000U	1700U	5U	6U	5U	5U	7U
TRICHLOROETHENE	6,400	0.160	***19***	***1700000***	***35***	6U	***4J***	***1900000***	5U	***180000***	***9100***	5U	***85***	5U	5U	7U
TRICHLOROFLUOROMETHANE	3,400,000	690	3J	65000U	8U	6U	6UL	33000U	5U	26000U	1700U	5U	6U	5U	5U	7U
VINYL CHLORIDE	1,700	0.006	***8***	65000U	***120***	6U	6UL	33000U	5U	26000U	1700U	5U	***3J***	5U	5U	***5J***
XYLENES, TOTAL	10,000,000	2,700,000	5U	83000	86	6U	250L	300000	5U	11000J	1500J	5U	6U	5U	5U	7U

Notes:

[A] - EPA Region III Regional Screening Level (RSL) for Industrial Soil, November 2013.

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Prepared by: MT 05/20/14
Checked by: RK 05/23/14

Table 2
Phase III Soil Analytical Results
SWMU 4 Interim Measure Work Plan
Honeywell Chesterfield Facility
Chesterfield, VA

Compound	Regional Screening Level Industrial Soil [A]	Protection of Groundwater Risk-based SSL [B]	SB-04-12 10/18/2004 3-4'	SB-04-13 10/18/2004 6-7'	SB-04-13 10/18/2004 8-9'	SB-04-13 10/18/2004 16.3-17.3'	SB-04-14 10/18/2004 6.5-7.5'	SB-04-14 10/18/2004 14-15'	SB-04-14 10/18/2004 17-18'	SB-04-15 10/18/2004 6-7'	SB-04-15 10/18/2004 10-11'	SB-04-15 10/18/2004 18.3-19.3'	SB-04-16 10/18/2004 1.5-2.5'	SB-04-16 10/18/2004 3-4'	SB-04-16 10/18/2004 17.8-18.8'	SB-04-17 10/18/2004 5.0-6.0'	SB-04-17 10/18/2004 10.3-11.3'	SB-04-19 10/18/2004 5-6'
Semi-Volatile Organic Compounds (ug/kg)																		
1,1-BIPHENYL	210,000	8.7	410U	***520***	***4100000***	***370000***	***280000***	***920000***	***620000***	***1200***	***4700***	***700000***	***440000***	***330000***	***750***	***410J***	***360000***	410U
1,4-DIOXANE	17,000	0.14	1200U	1200U	***6000J***	1200U	1300U	1200U	1200U	***500J***	1300U	1200U	11000U	***340J***	1200U	1300U	1200U	***570J***
2,4,5-TRICHLOROPHENOL	62,000,000	3,300	410U	410U	4300U	380U	430U	390U	110J	400U	420U	390U	3700U	380U	390U	430U	390U	410U
2,4-DIMETHYLPHENOL	12,000,000	320	410U	410U	4300U	66J	***3800***	390U	***11000***	400U	420U	130J	3700U	380U	390U	430U	***700***	410U
2-CHLOROPHENOL	5,100,000	57	410U	410U	***1800J***	380U	43J	390U	***170J***	400U	420U	***69J***	3700U	380U	390U	430U	***160J***	410U
2-METHYLNAPHTHALENE	2,200,000	140	410U	***150J***	***12000***	140J	***490***	***2600***	***690***	400U	420U	***800***	***460J***	380U	390U	430U	***300J***	410U
2-METHYLPHENOL	31,000,000	580	410U	410U	***17000***	63J	***3300***	390U	***1900***	400U	420U	270J	3700U	380U	390U	430U	***2300***	410U
2-NITROANILINE	6,000,000	62	410U	410U	4300U	380U	430U	390U	400U	400U	420U	390U	3700U	380U	390U	430U	390U	410U
2-NITROPHENOL	NS	NS	410U	410U	4300U	380U	430U	390U	350J	400U	420U	390U	3700U	380U	390U	430U	390U	410U
4-CHLOROPHENYL PHENYL ETHER	NS	NS	410U	410U	4300U	380U	430U	390U	55J	400U	420U	100J	3700U	380U	390U	430U	390U	410U
4-METHYLPHENOL	62,000,000	1,100	410U	410U	***3700J***	380U	***2500***	390U	***1200***	160J	420U	420	***1200J***	380U	390U	430U	***2500***	410U
4-NITROPHENOL	NS	NS	1000U	1000U	11000U	960U	1100U	980U	1000U	990U	1000U	970U	9300U	960U	990U	1100U	980U	1000U
ACENAPHTHENE	33,000,000	4,100	410U	180J	4300U	380U	430U	390U	400U	400U	420U	57J	980J	380U	390U	430U	390U	410U
ACENAPHTHYLENE	NS	NS	410U	410U	4300U	380U	430U	390U	400U	400U	420U	390U	3700U	380U	390U	430U	390U	410U
ANILINE	300,000	3.9	410U	410U	4300U	380U	430U	390U	400U	400U	420U	390U	3700U	380U	390U	430U	390U	410U
ANTHRACENE	170,000,000	42	410U	***43J***	4300U	380U	430U	***180J***	400U	400U	420U	390U	***520J***	380U	390U	430U	390U	410U
BENZALDEHYDE	100,000,000	330	410U	410U	4300U	380U	430U	390U	400U	400U	420U	390U	3700U	380U	390U	430U	390U	410U
BENZO(A)ANTHRACENE	2,100	10	410U	***64J***	4300U	380U	430U	***420***	400U	400U	420U	390U	***3700J***	***44J***	390U	430U	390U	410U
BENZO(A)PYRENE	210	3.5	410U	***45J***	4300U	380U	430U	***250J***	400U	400U	420U	390U	***1900J***	380U	390U	430U	390U	410U
BENZO(B)FLUORANTHENE	2,100	35	410U	***85J***	4300U	380U	430U	***630***	400U	400U	420U	390U	***7700***	***65J***	390U	430U	390U	410U
BENZO(G,H,I)PERYLENE	NS	NS	410U	410U	4300U	380U	430U	150J	400U	400U	420U	390U	4300	380U	390U	430U	390U	410U
BENZO(K)FLUORANTHENE	21,000	350	410U	410U	4300U	380U	430U	240J	400U	400U	420U	390U	***3600J***	380U	390U	430U	390U	410U
BIS(2-ETHYLHEXYL)PHTHALATE	120,000	1,100	410U	410U	***3500J***	200J	430U	410	230J	400U	420U	260J	3700U	380U	390U	430U	120J	410U
BUTYLBENZYL PHTHALATE	910,000	200	410U	410U	4300U	380U	430U	120J	92J	400U	420U	130J	3700U	380U	390U	430U	390U	410U
CAPROLACTAM	300,000,000	1,900	410U	650	***29000000***	***6800***	***11000***	390U	1600	***36000***	1300	***3700***	1700J	**32000**	300J	200J	390U	55J
CARBAZOLE	32000	140000	410U	410U	920J	380U	430U	210J	400U	400U	420U	390U	1600J	380U	390U	430U	390U	410U
CHRYSENE	210,000	1,100	410U	77J	4300U	380U	430U	690	400U	400U	420U	390U	***6100***	59J	390U	430U	390U	410U
DI-N-BUTYL PHTHALATE	62,000,000	1,700	410U	410U	4300U	380U	430U	440	400U	400U	420U	390U	3700U	380U	390U	430U	390U	410U
DI-N-OCTYL PHTHALATE	6,200,000	44,000	410U	410U	4300U	380U	430U	110J	400U	400U	420U	390U	3700U	380U	390U	430U	390U	410U
DIBENZO(A,H)ANTHRACENE	210	11	410U	410U	4300U	380U	430U	***79J***	400U	400U	420U	390U	***740J***	380U	390U	430U	390U	410U
DIBENZOFURAN	1,000,000	110	410U	***130J***	***9700***	***390***	***340J***	***2800***	***560***	400U	420U	***770***	***910J***	***190J***	390U	430U	***240J***	410U
DIMETHYL PHTHALATE	780000000	1000000000	410U	410U	4300U	380U	430U	390U	400U	400U	420U	390U	3700U	380U	390U	430U	390U	410U
FLUORANTHENE	22,000,000	70,000	410U	180J	790J	51J	430U	1700	65J	400U	420U	390U	8900	95J	390U	430U	390U	410U
FLUORENE	22,000,000	4,000	410U	140J	1300J	380U	430U	380J	57J	400U	420U	58J	910J	380U	390U	430U	390U	410U
INDENO(1,2,3-CD)PYRENE	2,100	200	410U	410U	4300U	380U	430U	120J	400U	400U	420U	390U	***3100J***	380U	390U	430U	390U	410U
N-NITROSODIPHENYLAMINE	350,000	57	410U	***1900***	***1200000***	***970***	***490***	***2100***	***670***	***96J***	420U	***360J***	***3200J***	57J	390U	430U	***200J***	410U
NAPHTHALENE	18,000	0.47	410U	***840***	***12000***	***240J***	***420J***	***2800***	***950***	400U	420U	***570***	***720J***	***150J***	390U	430U	***270J***	410U
NITROBENZENE	24,000	0.079	410U	410U	4300U	380U	430U	390U	***130J***	400U	420U	390U	3700U	380U	390U	430U	390U	410U
PENTACHLOROPHENOL	2,700	0.36	1000U	1000U	***2500J***	960U	***320J***	***910J***	***350J***	990U	1000U	970U	***3300J***	960U	990U	1100U	***400J***	1000U
PHENANTHRENE	5300	24000	410U	240J	3600J	120J	52J	2700	130J	400U	420U	110J	7100	120J	390U	430U	390U	410U
PHENOL	180,000,000	2,600	410U	410U	***21000***	350J	1700	270J	310J	360J	420U	270J	***4000***	500	70J	430U	900	410U
PYRENE	17,000,000	9,500	410U	140J	4300U	47J	430U	690	52J	400U	420U	390U	8400	74J	390U	430U	390U	410U

Notes:

A - EPA Region III Regional Screening Level (RSL) for Industrial Soil, November 2013.

B - EPA Region III Protection of Groundwater Risk based Soil Screening Level (SSL), November 2013.

NS - No established criteria listed on November 2013 EPA Region III RSL Table.

1200 Bold and italicized value indicates an exceedance of the Protection of Groundwater SSL.

1200 (shaded) Bold, italicized and shaded value indicates an exceedance of the Industrial RSL Criteria.

U - Analyte was not detected above the indicated reporting limit.

L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.

J - The reported concentration for this analyte is an estimated value.

R - Result is rejected.

UL - Analyte was not detected, the indicated reporting limit may be biased low.

UJ - Analyte was not detected, the indicated reporting limit is an estimate.

Prepared by: MT 05/20/14
Checked by: RK 05/23/14

Table 2
Phase III Soil Analytical Results
SWMU 4 Interim Measure Work Plan
Honeywell Chesterfield Facility
Chesterfield, VA

Compound	Regional Screening Level Industrial Soil A	Protection of Groundwater Risk-based SSL B	SB-04-19 10/18/2004 8-9'	SB-04-19 10/18/2004 18.5-19.5'	SB-04-20 10/18/2004 6-7'	SB-04-20 10/19/2004 17-18'	SB-04-21 10/19/2004 2-3'	SB-04-21 10/19/2004 6.6-7.6'	SB-04-22 10/19/2004 3-4'	SB-04-22 10/19/2004 13-14'	SB-04-22 10/19/2004 19.5-20'	SB-04-23 10/19/2004 9-10'	SB-04-23 10/19/2004 11-12'	SB-04-23 10/19/2004 16.6-17.6'	SB-04-24 10/19/2004 3-4'	SB-04-25 10/19/2004 6-7'	SB-04-25 10/19/2004 16.5-17.5'	SB-04-25 10/19/2004 18-19'
Semi-Volatile Organic Compounds (ug/kg)																		
1,1-BIPHENYL	210,000	8.7	420U	***170J***	***1700***	***1300000***	***85J***	***700***	***180J***	***4900000***	***85000***	***1400***	***130000***	***110000***	***300J***	***2700***	***230000***	***130000***
1,4-DIOXANE	17,000	0.14	1300U	1200U	1200U	11000U	1100U	1200U	1100UJ	25000U	***530J***	1300U	1300U	1200U	1200U	6300U	12000U	***860J***
2,4,5-TRICHLOROPHENOL	62,000,000	3,300	420U	400U	380U	3800U	380U	400U	380UJ	***7500J***	460U	430U	440U	400U	390U	2100U	4000U	500U
2,4-DIMETHYLPHENOL	12,000,000	320	420U	400U	380U	***24000***	380U	400U	380UJ	***33000***	460U	430U	440U	400U	390U	2100U	4000U	500U
2-CHLOROPHENOL	5,100,000	57	420U	400U	380U	***650J***	380U	400U	380UJ	8400U	***430J***	430U	***84J***	400U	390U	2100U	4000U	***920***
2-METHYLNAPHTHALENE	2,200,000	140	420U	400U	48J	***3100J***	380U	400U	380UJ	***8600***	110J	430U	***330J***	110J	390U	2100U	***420J***	***230J***
2-METHYLPHENOL	31,000,000	580	420U	400U	380U	***27000***	380U	400U	380UJ	***18000***	350J	64J	510	400U	390U	2100U	4000U	500U
2-NITROANILINE	6,000,000	62	420U	400U	380U	3800U	380U	400U	380UJ	8400U	460U	430U	440U	***100J***	390U	2100U	4000U	500U
2-NITROPHENOL	NS	NS	420U	400U	380U	3800U	380U	400U	380UJ	8400U	460U	430U	440U	400U	390U	2100U	4000U	500U
4-CHLOROPHENYL PHENYL ETHER	NS	NS	420U	400U	380U	3800U	380U	400U	380UJ	8400U	460U	430U	440U	400U	390U	2100U	4000U	500U
4-METHYLPHENOL	62,000,000	1,100	420U	400U	380U	***26000***	380U	97J	380UJ	***15000***	780	200J	800	400U	390U	2100U	4000U	500U
4-NITROPHENOL	NS	NS	1100U	990U	960U	9400U	960U	1000U	940UJ	21000U	1200U	1100U	1100U	990U	970U	5200U	9900U	1300U
ACENAPHTHENE	33,000,000	4,100	420U	400U	61J	3800U	380U	400U	380UJ	1400J	460U	430U	440U	400U	390U	2100U	4000U	500U
ACENAPHTHYLENE	NS	NS	420U	400U	380U	3800U	380U	400U	380UJ	8400U	460U	430U	440U	400U	390U	2100U	4000U	500U
ANILINE	300,000	3.9	420U	400U	380U	3800U	380U	400U	380UJ	8400U	460U	430U	440U	400U	390U	2100U	4000U	500U
ANTHRACENE	170,000,000	42	420U	400U	***80J***	3800U	***59J***	40J	***64J***	8400U	460U	430U	440U	400U	390U	2100U	4000U	500U
BENZALDEHYDE	100,000,000	330	420U	400U	380U	3800U	380U	400U	380UJ	8400U	460U	430U	440U	400U	390U	2100U	4000U	500U
BENZO(A)ANTHRACENE	2,100	10	420U	400U	***190J***	3800U	***140J***	***75J***	***250J***	8400U	460U	430U	440U	400U	390U	***210J***	4000U	500U
BENZO(A)PYRENE	210	3.5	420U	400U	***160J***	3800U	***190J***	***68J***	***200J***	8400U	460U	430U	440U	400U	390U	***210J***	4000U	500U
BENZO(B)FLUORANTHENE	2,100	35	420U	400U	***220J***	3800U	***270J***	***110J***	***240J***	8400U	460U	430U	440U	400U	***46J***	***280J***	4000U	500U
BENZO(G,H,I)PERYLENE	NS	NS	420U	400U	97J	3800U	120J	52J	110J	8400U	460U	430U	440U	400U	390U	2100U	4000U	500U
BENZO(K)FLUORANTHENE	21,000	350	420U	400U	82J	3800U	130J	400U	120J	8400U	460U	430U	440U	400U	390U	2100U	4000U	500U
BIS(2-ETHYLHEXYL)PHTHALATE	120,000	1,100	420U	400U	380U	3800U	380U	400U	380UJ	***3800J***	150J	140J	320J	550	390U	2100U	4000U	160J
BUTYLBENZYL PHTHALATE	910,000	200	420U	400U	380U	3800U	380U	400U	380UJ	8400U	460U	430U	440U	400U	390U	2100U	4000U	500U
CAPROLACTAM	300,000,000	1,900	420U	130J	86J	***5200***	72J	46J	380UJ	8400U	***150000***	***2800***	130J	400	390U	240J	4000U	***520000***
CARBAZOLE	32000	140000	420U	400U	380U	3800U	380U	42J	380UJ	8400U	460U	430U	440U	400U	390U	2100U	4000U	500U
CHRYSENE	210,000	1,100	420U	400U	220J	3800U	190J	94J	250J	8400U	460U	430U	440U	400U	41J	280J	4000U	500U
DI-N-BUTYL PHTHALATE	62,000,000	1,700	420U	400U	380U	3800U	380U	160J	380UJ	8400U	460U	430U	440U	400U	390U	2100U	4000U	500U
DI-N-OCTYL PHTHALATE	6,200,000	44,000	420U	400U	380U	3800U	380U	400U	380UJ	8400U	460U	430U	200J	400U	390U	2100U	4000U	500U
DIBENZO(A,H)ANTHRACENE	210	11	420U	400U	380U	3800U	***42J***	400U	380UJ	8400U	460U	430U	440U	400U	390U	2100U	4000U	500U
DIBENZOFURAN	1,000,000	110	420U	400U	41J	***2200J***	380U	400U	380UJ	***9200***	110J	430U	***220J***	***130J***	390U	2100U	4000U	***200J***
DIMETHYL PHTHALATE	780000000	1000000000	420U	400U	380U	3800U	380U	160J	380UJ	8400U	460U	430U	440U	400U	390U	2100U	4000U	500U
FLUORANTHENE	22,000,000	70,000	420U	400U	570	3800U	220J	210J	410J	8400U	460U	430U	440U	400U	46J	440J	4000U	500U
FLUORENE	22,000,000	4,000	420U	400U	70J	3800U	380U	52J	380UJ	8400U	460U	430U	440U	400U	390U	2100U	4000U	500U
INDENO(1,2,3-CD)PYRENE	2,100	200	420U	400U	110J	3800U	150J	56J	110J	8400U	460U	430U	440U	400U	390U	2100U	4000U	500U
N-NITROSODIPHENYLAMINE	350,000	57	420U	400U	***190J***	***2300J***	380U	***69J***	380UJ	***14000***	***110J***	***95J***	***660***	***87J***	390U	***460J***	4000U	***250J***
NAPHTHALENE	18,000	0.47	420U	400U	***130J***	***3500J***	380U	400U	380UJ	***15000***	***120J***	430U	***270J***	***87J***	390U	2100U	4000U	***230J***
NITROBENZENE	24,000	0.079	420U	400U	380U	3800U	380U	400U	380UJ	8400U	460U	430U	440U	400U	390U	2100U	4000U	500U
PENTACHLOROPHENOL	2,700	0.36	1100U	990U	960U	9400U	960U	1000U	940UJ	***4600J***	1200U	1100U	***220J***	990U	970U	5200U	9900U	1300U
PHENANTHRENE	5300	24000	420U	400U	380J	3800U	130J	290J	170J	1600J	460U	430U	47J	400U	390U	320J	4000U	500U
PHENOL	180,000,000	2,600	420U	400U	380U	***7100***	380U	400U	380UJ	1400J	430J	81J	260J	140J	390U	2100U	4000U	500U
PYRENE	17,000,000	9,500	420U	400U	460	3800U	190J	170J	360J	8400U	460U	430U	440U	400U	46J	370J	4000U	500U

Notes:
A - EPA Region III Regional Screening Level (RSL) for Industrial Soil, November 2013.
B - EPA Region III Protection of Groundwater Risk based Soil Screening Level (SSL), November 2013.
NS - No established criteria listed on November 2013 EPA Region III RSL Table.
1200 Bold and italicized value indicates an exceedance of the Protection of Groundwater SSL.
1200 Bold, italicized and shaded value indicates an exceedance of the Industrial RSL Criteria.
U - Analyte was not detected above the indicated reporting limit.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
J - The reported concentration for this analyte is an estimated value.
R - Result is rejected.
UL - Analyte was not detected, the indicated reporting limit may be biased low.
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Prepared by: MT 05/20/14
Checked by: RK 05/23/14

Table 2
Phase III Soil Analytical Results
SWMU 4 Interim Measure Work Plan
Honeywell Chesterfield Facility
Chesterfield, VA

Compound	Regional Screening Level Industrial Soil [A]	Protection of Groundwater Risk-based SSL [B]	SB-04-26 10/19/2004 6-7'	SB-04-26 10/19/2004 15-16'	SB-04-26 10/19/2004 17-18'	SB-04-27 10/20/2004 6-7'	SB-04-27 10/20/2004 13-14'	SB-04-27 10/20/2004 16.7-17.7'	SB-04-28 10/20/2004 1-2'	SB-04-29 10/20/2004 6.7-7.7'	SB-04-30 10/20/2004 2-3'	SB-04-30 10/20/2004 18-19'	SB-04-30 10/20/2004 19-20'	SB-04-31 10/20/2004 5-6'	SB-04-31 10/20/2004 17.5-18.5'	SB-04-31 10/20/2004 18.5-19.5'	SB-04-32 10/20/2004 2-3'	SB-04-32 10/20/2004 19.5-19.5'	SB-04-33 10/21/2004 3-4'
Semi-Volatile Organic Compounds (ug/kg)																			
1,1-BIPHENYL	210,000	8.7	***43000***	***550000***	***230000***	420U	***56J***	***570***	***43J***	***60000***	***48J***	***660000***	***1300000***	***110000***	***380000***	***140000***	***560***	***300000***	***1900000***
1,4-DIOXANE	17,000	0.14	1300U	1200U	1200U	1300U	1200U	1100U	1100U	12000U	1100U	1200U	***920J***	***1200***	1300U	***470J***	***310J***	***130J***	12000U
2,4,5-TRICHLOROPHENOL	62,000,000	3,300	420U	410U	380U	420U	400U	380U	370U	4000U	380U	390U	480U	390U	430U	490U	380U	420U	3900U
2,4-DIMETHYLPHENOL	12,000,000	320	420U	200J	39J	420U	400U	380U	370U	***520J***	380U	***6200J***	***1500***	390U	***380J***	190J	380U	420U	3900U
2-CHLOROPHENOL	5,100,000	57	420U	***160J***	380U	420U	400U	380U	370U	4000U	380U	***640***	***3500***	***62J***	***160J***	***2100***	380U	***77J***	3900U
2-METHYLNAPHTHALENE	2,200,000	140	420U	***550***	***210J***	420U	400U	380U	370U	***680J***	380U	***1600***	***1900***	***260J***	***830***	***260J***	53J	***570***	***670J***
2-METHYLPHENOL	31,000,000	580	420U	410U	380U	420U	400U	380U	370U	***960J***	380U	***31000***	***5200***	390U	280J	***1300***	380U	91J	3900U
2-NITROANILINE	6,000,000	62	420U	410U	380U	420U	400U	380U	370U	4000U	380U	390U	480U	390U	430U	490U	380U	420U	3900U
2-NITROPHENOL	NS	NS	420U	410U	380U	420U	400U	380U	370U	4000U	380U	390U	480U	390U	430U	490U	380U	420U	3900U
4-CHLOROPHENYL PHENYL ETHER	NS	NS	420U	410U	380U	420U	400U	380U	370U	4000U	380U	50J	480U	390U	430U	490U	380U	420U	3900U
4-METHYLPHENOL	62,000,000	1,100	420U	460	110J	420U	400U	380U	370U	***1800J***	380U	***26000***	***9500***	***1500***	550	2700	380U	250J	960J
4-NITROPHENOL	NS	NS	1100U	1000U	960U	1000U	990U	940U	930U	9900U	950U	970U	1200U	970U	1100U	1200U	950U	1100U	9600U
ACENAPHTHENE	33,000,000	4,100	420U	410U	380U	420U	400U	380U	370U	4000U	380U	390U	190J	390U	430U	490U	380U	420U	3900U
ACENAPHTHYLENE	NS	NS	420U	410U	380U	420U	400U	380U	370U	4000U	380U	390U	320J	390U	430U	490U	380U	420U	3900U
ANILINE	300,000	3.9	420U	410U	380U	420U	400U	380U	370U	4000U	380U	390U	480U	390U	430U	490U	380U	420U	3900U
ANTHRACENE	170,000,000	42	420U	410U	380U	420U	400U	380U	370U	4000U	380U	390U	480U	390U	430U	490U	380U	420U	3900U
BENZALDEHYDE	100,000,000	330	420U	410U	380U	420U	400U	380U	370U	4000U	380U	390U	480U	390U	430U	490U	380U	420U	3900U
BENZO(A)ANTHRACENE	2,100	10	420U	410U	380U	420U	400U	380U	***100J***	4000U	380U	390U	480U	390U	430U	490U	380U	420U	3900U
BENZO(A)PYRENE	210	3.5	420U	410U	380U	420U	400U	380U	***91J***	4000U	380U	390U	480U	390U	430U	490U	380U	420U	3900U
BENZO(B)FLUORANTHENE	2,100	35	420U	410U	380U	420U	400U	380U	***130J***	4000U	380U	390U	***59J***	***70J***	430U	490U	***82J***	420U	3900U
BENZO(G,H,I)PERYLENE	NS	NS	420U	410U	380U	420U	400U	380U	65J	4000U	380U	390U	480U	390U	430U	490U	43J	420U	3900U
BENZO(K)FLUORANTHENE	21,000	350	420U	410U	380U	420U	400U	380U	51J	4000U	380U	390U	480U	390U	430U	490U	380U	420U	3900U
BIS(2-ETHYLHEXYL)PHTHALATE	120,000	1,100	420U	190J	380U	420U	400U	130J	130J	4000U	380U	470	720	380J	300J	***3600***	280J	230J	3900U
BUTYLBENZYL PHTHALATE	910,000	200	420U	410U	380U	420U	400U	380U	370U	4000U	380U	130J	180J	87J	430U	490U	380U	420U	3900U
CAPROLACTAM	300,000,000	1,900	97J	400J	73J	420U	230J	580	370U	***26000***	380U	***31000***	***460000***	***30000***	***8900***	***150000***	47J	***15000J***	***42000***
CARBAZOLE	32000	140000	420U	410U	380U	420U	400U	380U	370U	4000U	380U	390U	480U	390U	430U	490U	380U	420U	3900U
CHRYSENE	210,000	1,100	420U	410U	380U	420U	400U	380U	96J	4000U	380U	390U	63J	61J	430U	490U	55J	420U	3900U
DI-N-BUTYL PHTHALATE	62,000,000	1,700	420U	410U	380U	420U	400U	380U	370U	4000U	380U	240J	240J	83J	430U	490U	380U	420U	3900U
DI-N-OCTYL PHTHALATE	6,200,000	44,000	420U	410U	380U	420U	400U	380U	370U	4000U	380U	390U	480U	390U	430U	490U	380U	420U	3900U
DIBENZO(A,H)ANTHRACENE	210	11	420U	410U	380U	420U	400U	380U	370U	4000U	380U	390U	480U	390U	430U	490U	380U	420U	3900U
DIBENZOFURAN	1,000,000	110	420U	***400J***	***180J***	420U	400U	380U	370U	4000U	380U	***760***	***1800***	110J	***560***	***240J***	380U	***420***	***1100J***
DIMETHYL PHTHALATE	780000000	1000000000	420U	410U	380U	420U	400U	380U	370U	4000U	380U	390U	480U	390U	430U	490U	380U	420U	3900U
FLUORANTHENE	22,000,000	70,000	420U	410U	380U	420U	400U	380U	190J	4000U	380U	49J	480U	83J	430U	490U	53J	420U	3900U
FLUORENE	22,000,000	4,000	420U	410U	380U	420U	400U	380U	370U	4000U	380U	49J	100J	390U	430U	490U	380U	420U	3900U
INDENO(1,2,3-CD)PYRENE	2,100	200	420U	410U	380U	420U	400U	380U	57J	4000U	380U	390U	480U	390U	430U	490U	380U	420U	3900U
N-NITROSODIPHENYLAMINE	350,000	57	45J	***98J***	44J	420U	400U	380U	370U	***1800J***	***130J***	***890***	***1700***	***520***	***520***	***200J***	***400***	***420J***	3900U
NAPHTHALENE	18,000	0.47	420U	***730***	***210J***	420U	400U	380U	370U	***600J***	380U	***2100***	***2800***	***660***	***880***	***290J***	***110J***	***600***	***690J***
NITROBENZENE	24,000	0.079	420U	410U	380U	420U	400U	380U	370U	4000U	380U	***560***	480U	390U	430U	490U	380U	420U	3900U
PENTACHLOROPHENOL	2,700	0.36	1100U	1000U	960U	1000U	990U	940U	930U	9900U	950U	***220J***	***510J***	970U	1100U	1200U	950U	1100U	9600U
PHENANTHRENE	5300	24000	420U	72J	380U	420U	400U	380U	120J	460J	380U	110J	230J	110J	65J	490U	75J	58J	470J
PHENOL	180,000,000	2,600	310J	230J	120J	420U	400U	380U	370U	520J	120J	***7500J***	***2800***	390U	320J	920	160J	180J	670J
PYRENE	17,000,000	9,500	420U	410U	380U	420U	400U	380U	170J	4000U	380U	390U	480U	61J	430U	490U	47J	420U	3900U

Notes:
[A] - EPA Region III Regional Screening Level (RSL) for Industrial Soil, November 2013.
[B] - EPA Region III Protection of Groundwater Risk based Soil Screening Level (SSL), November 2013.
NS - No established criteria listed on November 2013 EPA Region III RSL Table.
1200 Bold and italicized value indicates an exceedance of the Protection of Groundwater SSL.
1200 Bold, italicized and shaded value indicates an exceedance of the Industrial RSL Criteria.
U - Analyte was not detected above the indicated reporting limit.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
J - The reported concentration for this analyte is an estimated value.
R - Result is rejected.
UL - Analyte was not detected, the indicated reporting limit may be biased low.
UJ - Analyte was not detected, the indicated reporting limit is an estimate.

Prepared by: MT 05/20/14
Checked by: RK 05/23/14

Table 2
Phase III Soil Analytical Results
SWMU 4 Interim Measure Work Plan
Honeywell Chesterfield Facility
Chesterfield, VA

Compound	Regional Screening Level Industrial Soil [A]	Protection of Groundwater Risk-based SSL [B]	SB-04-33	SB-04-33	SB-04-36	SB-04-36	SB-04-36	SB-04-37	SB-04-37	SB-04-37	SB-04-38	SB-04-38	SB-04-38	SB-04-39	SB-04-39	SB-04-39	SB-04-40	SB-04-40	SB-04-40
			10/21/2004	10/21/2004	10/21/2004	10/21/2004	10/21/2004	10/21/2004	10/21/2004	10/21/2004	10/21/2004	10/21/2004	10/21/2004	10/22/2004	10/22/2004	10/22/2004	10/22/2004	10/22/2004	10/22/2004
			14-15'	18.9-19.9'	3-4'	16.6-17.6'	17.6-18.6'	5-6'	18-19'	19-20'	3-4'	16.5-17.5'	19-20'	5-6'	11-12'	17.5-18.5'	8-9'	18-19'	19-20'
Semi-Volatile Organic Compounds (ug/kg)																			
1,1-BIPHENYL	210,000	8.7	***110J***	***150J***	***12000***	***70000***	***100000***	***630***	***310000***	***150000***	***460***	***210000***	***290J***	***110000***	***1800000***	***400000***	***400J***	***35000***	***710***
1,4-DIOXANE	17,000	0.14	1300U	1300U	12000U	1200U	***370J***	***1500***	11000U	***260J***	1200U	1200U	***290J***	6300U	5800U	5500U	1300U	1200U	1400U
2,4,5-TRICHLOROPHENOL	62,000,000	3,300	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	1900U	1800U	420U	410U	460U
2,4-DIMETHYLPHENOL	12,000,000	320	430U	440U	3900U	***760***	120J	410U	3800U	440U	410U	390U	480U	2100U	***8800***	***3300***	420U	180J	110J
2-CHLOROPHENOL	5,100,000	57	430U	440U	3900U	50J	***710***	410U	3800U	***1400***	410U	390U	***890***	2100U	***14000***	***350J***	420U	410U	***2100***
2-METHYLNAPHTHALENE	2,200,000	140	430U	440U	3900U	***150J***	***160J***	410U	***760J***	***330J***	410U	***340J***	480U	***920J***	***11000***	***1300J***	420U	53J	460U
2-METHYLPHENOL	31,000,000	580	430U	440U	3900U	***1300***	490	410U	3800U	230J	410U	390U	340J	***620J***	***44000***	***2800***	420U	360J	***1000***
2-NITROANILINE	6,000,000	62	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	1900U	1800U	420U	410U	460U
2-NITROPHENOL	NS	NS	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	1900U	1800U	420U	410U	460U
4-CHLOROPHENYL PHENYL ETHER	NS	NS	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	1900U	1800U	420U	410U	460U
4-METHYLPHENOL	62,000,000	1,100	430U	440U	3900U	***1300***	490	410U	3800U	630	450	90J	810	750J	***63000***	***4700***	420U	490	***1500***
4-NITROPHENOL	NS	NS	1100U	1100U	9800U	980U	1200U	1000U	9500U	1100U	1000U	980U	1200U	5200U	4800U	4600U	1000U	1000U	1200U
ACENAPHTHENE	33,000,000	4,100	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	1900U	1800U	420U	410U	460U
ACENAPHTHYLENE	NS	NS	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	1900U	1800U	420U	410U	460U
ANILINE	300,000	3.9	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	1900U	1800U	420U	410U	460U
ANTHRACENE	170,000,000	42	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	1900U	1800U	420U	410U	460U
BENZALDEHYDE	100,000,000	330	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	1900U	1800U	420U	410U	460U
BENZO(A)ANTHRACENE	2,100	10	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	1900U	1800U	420U	410U	460U
BENZO(A)PYRENE	210	3.5	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	1900U	1800U	420U	410U	460U
BENZO(B)FLUORANTHENE	2,100	35	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	1900U	1800U	420U	410U	460U
BENZO(G,H,I)PERYLENE	NS	NS	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	1900U	1800U	420U	410U	460U
BENZO(K)FLUORANTHENE	21,000	350	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	1900U	1800U	420U	410U	460U
BIS(2-ETHYLHEXYL)PHTHALATE	120,000	1,100	1100	440U	3900U	390U	480U	410U	3800U	280J	410U	150J	480U	2100U	***3100***	1800U	420U	410U	460U
BUTYLBENZYL PHTHALATE	910,000	200	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	***1300J***	1800U	420U	410U	460U
CAPROLACTAM	300,000,000	1,900	430U	72J	3900U	***15000***	***270000***	***110000***	1400J	***73000***	***31000***	240J	***54000***	810J	***640000***	***8000***	160J	1100	***89000***
CARBAZOLE	32000	140000	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	1900U	1800U	420U	410U	460U
CHRYSENE	210,000	1,100	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	1900U	1800U	420U	410U	460U
DI-N-BUTYL PHTHALATE	62,000,000	1,700	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	700J	1800U	420U	410U	460U
DI-N-OCTYL PHTHALATE	6,200,000	44,000	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	790J	1800U	420U	410U	460U
DIBENZO(A,H)ANTHRACENE	210	11	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	1900U	1800U	420U	410U	460U
DIBENZOFURAN	1,000,000	110	430U	440U	3900U	***140J***	***210J***	410U	***620J***	***280J***	410U	***360J***	480U	***400J***	***2700***	***720J***	420U	67J	460U
DIMETHYL PHTHALATE	780000000	1000000000	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	1900U	1800U	420U	410U	460U
FLUORANTHENE	22,000,000	70,000	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	1900U	1800U	420U	410U	460U
FLUORENE	22,000,000	4,000	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	390J	430J	1800U	420U	410U	460U
INDENO(1,2,3-CD)PYRENE	2,100	200	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	1900U	1800U	420U	410U	460U
N-NITROSODIPHENYLAMINE	350,000	57	430U	440U	3900U	***160J***	***230J***	410U	***550J***	***180J***	410U	***240J***	480U	***1700J***	***5600***	***630J***	420U	57J	460U
NAPHTHALENE	18,000	0.47	430U	440U	3900U	***120J***	***150J***	410U	***870J***	***350J***	410U	***320J***	480U	***280J***	***6100***	***990J***	420U	***41J***	460U
NITROBENZENE	24,000	0.079	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	***1300J***	1800U	420U	410U	460U
PENTACHLOROPHENOL	2,700	0.36	1100U	1100U	9800U	980U	1200U	1000U	9500U	1100U	1000U	980U	1200U	5200U	***2500J***	4600U	1000U	1000U	1200U
PHENANTHRENE	5300	24000	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	41J	480U	880J	710J	1800U	420U	410U	460U
PHENOL	180,000,000	2,600	430U	440U	3900U	610	500	410U	3800U	310J	240J	190J	270J	1000J	***21000***	1400J	420U	330J	700
PYRENE	17,000,000	9,500	430U	440U	3900U	390U	480U	410U	3800U	440U	410U	390U	480U	2100U	300J	1800U	420U	410U	460U

Notes:
A - EPA Region III Regional Screening Level (RSL) for Industrial Soil, November 2013.
B - EPA Region III Protection of Groundwater Risk based Soil Screening Level (SSL), November 2013.
NS - No established criteria listed on November 2013 EPA Region III RSL Table.
1200 Bold and italicized value indicates an exceedance of the Protection of Groundwater SSL.
1200 Bold, italicized and shaded value indicates an exceedance of the Industrial RSL Criteria.
U - Analyte was not detected above the indicated reporting limit.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
J - The reported concentration for this analyte is an estimated value.
R - Result is rejected.
UL - Analyte was not detected, the indicated reporting limit may be biased low.
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Prepared by: MT 05/20/14
Checked by: RK 05/23/14

Table 2
Phase III Soil Analytical Results
SWMU 4 Interim Measure Work Plan
Honeywell Chesterfield Facility
Chesterfield, VA

Compound	Regional Screening Level Industrial Soil A	Protection of Groundwater Risk-based SSL B	SB-04-41	SB-04-41	SB-04-41	SB-04-42	SB-04-42	SB-04-42	SB-04-43	SB-04-43	SB-04-43	SB-04-44	SB-04-44	SB-04-44	SB-04-45	SB-04-45	SB-04-45	SB-04-46	SB-04-46
			10/22/2004	10/22/2004	10/22/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004	10/25/2004
			14-15'	16.5-17.5'	17.5-18.5'	3-4'	8-9'	18.6-19.6'	5-6'	17-18'	19-20'	11-12'	18-19'	19-20'	6-7'	13-14'	16.5-17.5'	8-9'	16.8-17.8'
Semi-Volatile Organic Compounds (ug/kg)																			
1,1-BIPHENYL	210,000	8.7	420U	***25000***	***83J***	***330000***	***210000***	***180000***	***31000***	***1200000***	***1600***	***57J***	***600000***	***42000***	***210000***	***4500***	***2500***	420U	400U
1,4-DIOXANE	17,000	0.14	1300U	1100U	***310J***	12000U	12000U	5800U	1200U	5600U	***610J***	1300U	1200U	***310J***	***530J***	***810J***	***210J***	1200U	1200U
2,4,5-TRICHLOROPHENOL	62,000,000	3,300	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
2,4-DIMETHYLPHENOL	12,000,000	320	420U	380U	460U	3900U	4100U	***3100***	400U	***4600***	79J	440U	400U	430U	410U	390U	420U	420U	400U
2-CHLOROPHENOL	5,100,000	57	420U	380U	***1600***	3900U	4100U	***1900J***	400U	***1400J***	***430J***	440U	400U	***810***	410U	***360J***	***130J***	420U	400U
2-METHYLNAPHTHALENE	2,200,000	140	420U	43J	460U	***430J***	4100U	***480J***	***200J***	***2200***	460U	440U	***980***	58J	410U	390U	420U	420U	400U
2-METHYLPHENOL	31,000,000	580	420U	380U	***700***	3900U	4100U	***7500***	43J	***4400***	460J	440U	400U	170J	410U	290J	160J	420U	400U
2-NITROANILINE	6,000,000	62	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
2-NITROPHENOL	NS	NS	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
4-CHLOROPHENYL PHENYL ETHER	NS	NS	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
4-METHYLPHENOL	62,000,000	1,100	420U	380U	***1600***	3900U	4100U	***9300***	330J	***4700***	840	440U	180J	480	410U	580	270J	420U	400U
4-NITROPHENOL	NS	NS	1100U	950U	1200U	9800U	10000U	4800U	990U	4700U	1200U	1100U	990U	1100U	1000U	300J	1000U	1000U	990U
ACENAPHTHENE	33,000,000	4,100	420U	380U	460U	3900U	4100U	1900U	40J	530J	460U	440U	400U	430U	410U	390U	420U	420U	400U
ACENAPHTHYLENE	NS	NS	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
ANILINE	300,000	3.9	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
ANTHRACENE	170,000,000	42	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
BENZALDEHYDE	100,000,000	330	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	110J	420U	420U	400U
BENZO(A)ANTHRACENE	2,100	10	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
BENZO(A)PYRENE	210	3.5	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
BENZO(B)FLUORANTHENE	2,100	35	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
BENZO(G,H,I)PERYLENE	NS	NS	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
BENZO(K)FLUORANTHENE	21,000	350	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
BIS(2-ETHYLHEXYL)PHTHALATE	120,000	1,100	420U	380U	460U	3900U	***1400J***	1900U	690	***1900***	260J	440U	370J	430U	410U	390U	420U	420U	400U
BUTYLBENZYL PHTHALATE	910,000	200	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
CAPROLACTAM	300,000,000	1,900	420U	870	***50000***	540J	4100U	***56000***	400U	1900U	***8200***	440U	400U	***3300***	***340000***	***84000***	***6300***	420U	120J
CARBAZOLE	32000	140000	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
CHRYSENE	210,000	1,100	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
DI-N-BUTYL PHTHALATE	62,000,000	1,700	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
DI-N-OCTYL PHTHALATE	6,200,000	44,000	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
DIBENZO(A,H)ANTHRACENE	210	11	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
DIBENZOFURAN	1,000,000	110	420U	49J	460U	***860J***	4100U	***440J***	110J	***2000***	460U	440U	***1000***	46J	***170J***	390U	420U	420U	400U
DIMETHYL PHTHALATE	780000000	1000000000	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
FLUORANTHENE	22,000,000	70,000	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
FLUORENE	22,000,000	4,000	420U	380U	460U	3900U	4100U	1900U	210J	1900U	460U	440U	64J	430U	410U	390U	420U	420U	400U
INDENO(1,2,3-CD)PYRENE	2,100	200	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
N-NITROSODIPHENYLAMINE	350,000	57	420U	49J	460U	***2700J***	***1600J***	***430J***	***620***	***3000***	460U	440U	***600***	430U	410U	41J	420U	420U	400U
NAPHTHALENE	18,000	0.47	420U	380U	460U	***1100J***	***650J***	***580J***	***130J***	***2100***	460U	440U	***1100***	***66J***	***93J***	390U	420U	420U	400U
NITROBENZENE	24,000	0.079	420U	380U	460U	3900U	4100U	1900U	400U	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U
PENTACHLOROPHENOL	2,700	0.36	1100U	950U	1200U	9800U	10000U	4800U	990U	4700U	1200U	1100U	990U	1100U	1000U	980U	1000U	1000U	990U
PHENANTHRENE	5300	24000	420U	380U	460U	3900U	4100U	1900U	690	2700	460U	440U	350J	430U	410U	390U	420U	420U	400U
PHENOL	180,000,000	2,600	420U	120J	1100	3900U	410J	***5100***	200J	850J	270J	49J	180J	210J	270J	1200	360J	420U	400U
PYRENE	17,000,000	9,500	420U	380U	460U	3900U	4100U	1900U	42J	1900U	460U	440U	400U	430U	410U	390U	420U	420U	400U

Notes:

A - EPA Region III Regional Screening Level (RSL) for Industrial Soil, November 2013.

B - EPA Region III Protection of Groundwater Risk based Soil Screening Level (SSL), November 2013.

NS - No established criteria listed on November 2013 EPA Region III RSL Table.

1200 Bold and italicized value indicates an exceedance of the Protection of Groundwater SSL.

1200 Bold, italicized and shaded value indicates an exceedance of the Industrial RSL Criteria.

U - Analyte was not detected above the indicated reporting limit.

L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.

J - The reported concentration for this analyte is an estimated value.

R - Result is rejected.

UL - Analyte was not detected, the indicated reporting limit may be biased low.

UJ - Analyte was not detected, the indicated reporting limit is an estimate.

Prepared by: MT 05/20/14
Checked by: RK 05/23/14

Table 2
Phase III Soil Analytical Results
SWMU 4 Interim Measure Work Plan
Honeywell Chesterfield Facility
Chesterfield, VA

Compound	Regional Screening Level Industrial Soil [A]	Protection of Groundwater Risk-based SSL [B]	SB-04-47	SB-04-47	SB-04-47	SB-04-48	SB-04-48	SB-04-48	SB-04-49	SB-04-49	SB-04-49	SB-04-50	SB-04-50	SB-04-51	SB-04-51	SB-04-51
			10/25/2004	10/25/2004	10/25/2004	10/26/2004	10/26/2004	10/26/2004	10/26/2004	10/26/2004	10/26/2004	10/26/2004	10/26/2004	10/26/2004	10/26/2004	10/26/2004
			13-14'	18.6-19.6'	19.6-20'	13-14'	15.5-16.5'	16.5-17.5'	10-11'	14.5-15.5'	15.5-16'	9-10'	16-17'	9-10'	13.5-14.5'	15-16'
Semi-Volatile Organic Compounds (ug/kg)																
1,1-BIPHENYL	210,000	8.7	410U	***48000***	***29000***	***180J***	***11000***	***570000***	360U	***130000***	***53000***	420U	450U	390U	390U	490U
1,4-DIOXANE	17,000	0.14	1200U	1200U	***590J***	1200U	1200U	14000U	1100U	1200U	***670J***	1200U	1300U	1200U	1200U	***470J***
2,4,5-TRICHLOROPHENOL	62,000,000	3,300	410U	200J	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
2,4-DIMETHYLPHENOL	12,000,000	320	410U	400U	510U	390U	400U	4700U	360U	180J	470U	420U	450U	390U	390U	490U
2-CHLOROPHENOL	5,100,000	57	410U	400U	***1000***	390U	400U	4700U	360U	***110J***	***350J***	420U	450U	390U	390U	490U
2-METHYLNAPHTHALENE	2,200,000	140	410U	91J	510U	390U	400U	***1100J***	360U	***260J***	79J	420U	450U	390U	390U	490U
2-METHYLPHENOL	31,000,000	580	410U	400U	400J	390U	400U	4700U	360U	260J	270J	420U	450U	390U	390U	490U
2-NITROANILINE	6,000,000	62	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
2-NITROPHENOL	NS	NS	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
4-CHLOROPHENYL PHENYL ETHER	NS	NS	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
4-METHYLPHENOL	62,000,000	1,100	410U	400U	430J	390U	400U	4700U	360U	560	470UJ	420U	450U	390U	390U	490J
4-NITROPHENOL	NS	NS	1000U	1000U	1300U	980U	990U	12000U	910U	970U	1200U	1000U	1100U	980U	970U	1200U
ACENAPHTHENE	33,000,000	4,100	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
ACENAPHTHYLENE	NS	NS	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
ANILINE	300,000	3.9	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
ANTHRACENE	170,000,000	42	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
BENZALDEHYDE	100,000,000	330	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
BENZO(A)ANTHRACENE	2,100	10	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
BENZO(A)PYRENE	210	3.5	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
BENZO(B)FLUORANTHENE	2,100	35	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
BENZO(G,H,I)PERYLENE	NS	NS	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
BENZO(K)FLUORANTHENE	21,000	350	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
BIS(2-ETHYLHEXYL)PHTHALATE	120,000	1,100	410U	140J	510U	390U	400U	4700U	360U	170J	470U	420U	450U	390U	390U	490U
BUTYLBENZYL PHTHALATE	910,000	200	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
CAPROLACTAM	300,000,000	1,900	49J	470	***370000***	260J	260J	***19000***	42J	***32000***	***380000***	57J	450U	390U	120J	***4100***
CARBAZOLE	32000	140000	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
CHRYSENE	210,000	1,100	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
DI-N-BUTYL PHTHALATE	62,000,000	1,700	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
DI-N-OCTYL PHTHALATE	6,200,000	44,000	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
DIBENZO(A,H)ANTHRACENE	210	11	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
DIBENZOFURAN	1,000,000	110	410U	***120J***	55J	390U	400U	***680J***	360U	***290J***	110J	420U	450U	390U	390U	490U
DIMETHYL PHTHALATE	780000000	1000000000	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
FLUORANTHENE	22,000,000	70,000	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
FLUORENE	22,000,000	4,000	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
INDENO(1,2,3-CD)PYRENE	2,100	200	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
N-NITROSODIPHENYLAMINE	350,000	57	410U	***130J***	510U	390U	400U	***630J***	360U	***360J***	***120J***	420U	450U	390U	390U	490U
NAPHTHALENE	18,000	0.47	410U	***120J***	510U	390U	400U	***1200J***	360U	***270J***	***85J***	420U	450U	390U	390U	490U
NITROBENZENE	24,000	0.079	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U
PENTACHLOROPHENOL	2,700	0.36	1000U	***250J***	1300U	980U	990U	12000U	910U	970U	1200U	1000U	1100U	980U	970U	1200U
PHENANTHRENE	5300	24000	410U	230J	510U	390U	99J	4700U	360U	100J	470U	420U	450U	390U	390U	490U
PHENOL	180,000,000	2,600	410U	120J	610	390U	130J	4700U	360U	180J	58J	420U	450U	390U	390U	89J
PYRENE	17,000,000	9,500	410U	400U	510U	390U	400U	4700U	360U	390U	470U	420U	450U	390U	390U	490U

Notes:
[A] - EPA Region III Regional Screening Level (RSL) for Industrial Soil, November 2013.
[B] - EPA Region III Protection of Groundwater Risk based Soil Screening Level (SSL), November 2013.
NS - No established criteria listed on November 2013 EPA Region III RSL Table.
1200 Bold and italicized value indicates an exceedance of the Protection of Groundwater SSL.
1200 Bold, italicized and shaded value indicates an exceedance of the Industrial RSL Criteria.
U - Analyte was not detected above the indicated reporting limit.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
J - The reported concentration for this analyte is an estimated value.
R - Result is rejected.
UL - Analyte was not detected, the indicated reporting limit may be biased low.
UJ - Analyte was not detected, the indicated reporting limit is an estimate.

Prepared by: MT 05/20/14
Checked by: RK 05/23/14

Table 3
Phase IV Groundwater VOC Analytical Results
SWMU 4 Interim Measure Work Plan
Honeywell Chesterfield Facility
Chesterfield, VA

Field Sample ID: / Date Sampled:	Regional Screening Level Tapwater [A]	Regional Screening Level MCL [B]	MW-103S 10/16/2006	MW-104S 10/16/2006	MW-105S 10/16/2006	MW-123S 10/17/2006	MW-124S 10/17/2006	MW-125S 10/17/2006	MW-126S 10/17/2006	MW-127S 10/17/2006	MW-128S 10/18/2006	NW12-1-01 10/17/2006	PZ-04-01 10/18/2006	PZ-04-04 10/18/2006	PZ-04-05 10/18/2006	PZ-04-12 10/17/2006	PZ-04-13 10/19/2006	MW-103D 10/17/2006	MW-104D 10/17/2006
Volatile Organic Compounds (ug/L)																			
1,1,1-TRICHLOROETHANE	7500	200	57	***170000***	5	***65000***	ND (< 170)	2.2	0.63 J	1.5	***17000***	16 J	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	0.79 J	ND (< 1)	0.21 J
1,1,2,2-TETRACHLOROETHANE	0.066	NS	ND (< 25)	ND (< 3300)	2	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
1,1,2-TRICHLOROETHANE	0.24	5	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
1,1,2-TRICHLOROTRIFLUOROETHANE	53,000	NS	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
1,1-DICHLOROETHANE	2.4	NS	13 J	13000	3.5	17000	68 J	18	ND (< 1)	1.6	1900	160	100 J	4.1	1.3	14000	ND (< 1)	ND (< 1)	2.9
1,1-DICHLOROETHENE	2.6	7	***11 J***	***6500***	0.79 J	***2400***	***540***	4.6	0.21 J	1.5	***2400***	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
1,2,4-TRICHLOROBENZENE	0.99	70	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
1,2-DIBROMO-3-CHLOROPROPANE	0.00032	0.2	ND (< 50)	ND (< 6700)	ND (< 2)	ND (< 3300)	ND (< 330)	ND (< 2)	ND (< 2)	ND (< 2)	ND (< 1700)	ND (< 17)	ND (< 500)	ND (< 2)	ND (< 2)	ND (< 10000)	ND (< 2)	ND (< 2)	ND (< 2)
1,2-DIBROMOETHANE	0.0065	0.05	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
1,2-DICHLOROBENZENE	280	600	ND (< 25)	ND (< 3300)	0.4 J	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	0.27 J	ND (< 830)	ND (< 17)	ND (< 250)	0.71 J	0.2 J	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
1,2-DICHLOROETHANE	0.15	5	ND (< 25)	ND (< 3300)	0.32 J	ND (< 1700)	ND (< 170)	0.88 J	ND (< 1)	ND (< 1)	ND (< 830)	2.7 J	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
1,2-DICHLOROPROPANE	0.38	5	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
1,3-DICHLOROBENZENE	NS	NS	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
1,4-DICHLOROBENZENE	0.42	75	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	2	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
2-BUTANONE	4,900	NS	ND (< 250)	ND (< 33000)	ND (< 10)	ND (< 17000)	ND (< 1700)	ND (< 10)	ND (< 10)	ND (< 10)	ND (< 8300)	ND (< 170)	ND (< 2500)	0.49 J	1.6 J	ND (< 50000)	ND (< 10)	ND (< 10)	ND (< 10)
2-HEXANONE	34	NS	ND (< 250)	ND (< 33000)	ND (< 10)	ND (< 17000)	ND (< 1700)	ND (< 10)	ND (< 10)	ND (< 10)	ND (< 8300)	ND (< 170)	ND (< 2500)	ND (< 10)	ND (< 10)	ND (< 50000)	ND (< 10)	ND (< 10)	ND (< 10)
4-METHYL-2-PENTANONE	1,000	NS	ND (< 250)	ND (< 33000)	ND (< 10)	ND (< 17000)	ND (< 1700)	ND (< 10)	ND (< 10)	ND (< 10)	ND (< 8300)	ND (< 170)	ND (< 2500)	ND (< 10)	ND (< 10)	ND (< 50000)	ND (< 10)	ND (< 10)	ND (< 10)
ACETONE	12,000	NS	29 B	3200 B	ND (< 10)	2200 B	ND (< 1700)	ND (< 10)	ND (< 10)	ND (< 10)	ND (< 8300)	32 B	240 B	11 B	19 B	ND (< 50000)	1.6 B	ND (< 10)	0.86 B
BENZENE	0.39	5	ND (< 25)	ND (< 3300)	ND (< 1)	***1300 J***	ND (< 170)	3.9	ND (< 1)	ND (< 1)	ND (< 830)	***8.5 J***	ND (< 250)	***7.9***	0.72 J	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
BROMODICHLOROMETHANE	0.12	80	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
BROMOFORM	7.9	80	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
BROMOMETHANE	7	NS	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
CARBON DISULFIDE	720	NS	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	2	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
CARBON TETRACHLORIDE	0.39	5	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
CHLOROBENZENE	72	100	ND (< 25)	ND (< 3300)	2.8	ND (< 1700)	ND (< 170)	0.35 J	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	0.43 J	0.21 J	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
CHLORODIBROMOMETHANE	0.15	80	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
CHLOROETHANE	21,000	NS	52	5100	27	8000	ND (< 170)	1.7	ND (< 1)	0.39 J	2900	620	4200	14	17 J	7500	ND (< 1)	ND (< 1)	ND (< 1)
CHLOROFORM	0.19	80	ND (< 25)	***2500 J***	ND (< 1)	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
CHLOROMETHANE	190	NS	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	0.15 J	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
CIS-1,2-DICHLOROETHENE	28	70	***91***	***81000***	12	***94000***	***1700***	38	0.67 J	24	***4100***	***150***	ND (< 250)	4.7	0.78 J	***190000***	0.5 J	0.36 J	2.5
CIS-1,3-DICHLOROPROPENE	0.41	NS	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
CYCLOHEXANE	13,000	NS	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	0.28 J	ND (< 1)	0.51 J	ND (< 830)	ND (< 17)	ND (< 250)	0.5 J	ND (< 1)	ND (< 5000)	0.56 J	ND (< 1)	ND (< 1)
DICHLORODIFLUOROMETHANE	190	NS	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
ETHYLBENZENE	1.3	700	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	0.22 J	ND (< 1)	0.25 J	220 J	ND (< 17)	ND (< 250)	ND (< 1)	0.52 J	ND (< 5000)	0.52 J	ND (< 1)	ND (< 1)
ISOPROPYLBENZENE	390	NS	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
METHYL ACETATE	16,000	NS	ND (< 250)	ND (< 33000)	ND (< 10)	ND (< 17000)	ND (< 1700)	ND (< 10)	ND (< 10)	ND (< 10)	ND (< 8300)	ND (< 170)	ND (< 2500)	ND (< 10)	ND (< 10)	ND (< 50000)	ND (< 10)	ND (< 10)	ND (< 10)
METHYL TERT-BUTYL ETHER	12	NS	ND (< 120)	ND (< 17000)	ND (< 5)	ND (< 8300)	ND (< 830)	ND (< 5)	ND (< 5)	ND (< 5)	ND (< 4200)	ND (< 83)	ND (< 1200)	ND (< 5)	ND (< 5)	ND (< 25000)	ND (< 5)	ND (< 5)	ND (< 5)
METHYLCYCLOHEXANE	NS	NS	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
METHYLENE CHLORIDE	9.9	5	***9.3 B***	***1500 B***	ND (< 1)	***990 B***	***150 B***	ND (< 1)	ND (< 1)	ND (< 1)	***1700 B***	***7.6 B***	***460 B***	0.19 B	ND (< 1)	***4400 B***	ND (< 1)	ND (< 1)	ND (< 1)
STYRENE	1,100	100	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
TETRACHLOROETHENE	9.7	5	***1500***	***31000***	0.43 J	***14000***	***70 J***	4.7	1.8 J	3.3	***13000***	***5.2 J***	ND (< 250)	0.24 J	0.34 J	ND (< 5000)	4.4	0.38 J	0.55 J
TETRAHYDROFURAN	3,200	NS	ND (< 120)	ND (< 17000)	ND (< 5)	8300	ND (< 830)	0.73 B	ND (< 5)	ND (< 5)	ND (< 4200)	ND (< 83)	ND (< 1200)	0.53 B	0.61 B	ND (< 25000)	ND (< 5)	ND (< 5)	ND (< 5)
TOLUENE	860	1,000	ND (< 25)	***2000 J***	0.24	***1900***	ND (< 170)	0.35 J	ND (< 1)	0.95 B	700 J	26	52 J	0.56 J	0.58 J	***1800 B***	0.23 J	0.2 B	0.21 J
TRANS-1,2-DICHLOROETHENE	86	100	ND (< 25)	ND (< 3300)	1.2	ND (< 1700)	ND (< 170)	1.3	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	0.5 J	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
TRANS-1,3-DICHLOROPROPENE	0.41	NS	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
TRICHLOROETHENE	0.44	5	***380***	***42000***	***22***	***6100***	***3200***	2.2	2 J	0.52 J	***8100***	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	0.75 J	ND (< 1)	1.7
TRICHLOROFLUOROMETHANE	1,100	NS	ND (< 25)	ND (< 3300)	ND (< 1)	ND (< 1700)	ND (< 170)	ND (< 1)	ND (< 1)	ND (< 1)	ND (< 830)	ND (< 17)	ND (< 250)	ND (< 1)	ND (< 1)	ND (< 5000)	ND (< 1)	ND (< 1)	ND (< 1)
VINYL CHLORIDE	0.015	2	***48***	***2000 J***	***17***	***1900***	***200 J***	***18***	ND (< 1)	1.5	***650 J***	***130***	ND (< 250)	***3.7***	ND (< 1)	***11000***	ND (< 1)	ND (< 1)	ND (< 1)
XYLENES, TOTAL	190	10,000	ND (< 50)	ND (< 6700)	ND (< 2)	ND (< 3300)	ND (< 330)	0.51 J	ND (< 2)	0.95 J	770 J	9.8 J	ND (< 500)	ND (< 2)	1.6 J	ND (< 10000)	1.5 J	ND (< 2)	ND (< 2)

Notes:

ug/L - micrograms per liter.

J - Value shown was reported below the laboratory reporting limit but above the method detection limit at an estimated concentration.

B- Compound was detected in blank.

[A] - EPA Region III Regional Screening Level for Tapwater, November 2013.

[B] - EPA Region III Regional Screening Level Maximum Contaminant Level, November 2013.

ND (< 1) - Compound was not detected at concentrations above the laboratory reporting limit.

1700 Bold and italicized typeface indicates concentration exceed the MCL for groundwater.

Shaded Cell indicates concentration exceeds the Regional Screening Level for Tapwater.

Prepared by: MT 05/23/14
Checked by: RK 05/23/14

Table 4
Phase IV Groundwater SVOC Analytical Results
SWMU 4 Interim Measure Work Plan
Honeywell Chesterfield Facility
Chesterfield, VA

Field Sample ID: / Date Sampled:	Regional Screening Level Tapwater [A]	Regional Screening Level MCL [B]	MW-103S	MW-104S	MW-105S	MW-123S	MW-124S	MW-125S	MW-126S	MW-127S	MW-128S	NW12-1-01	PZ-04-01	PZ-04-04	PZ-04-05	PZ-04-12	PZ-04-13	MW-103D	MW-104D
Date Sampled:			10/16/2006	10/16/2006	10/16/2006	10/17/2006	10/17/2006	10/17/2006	10/17/2006	10/17/2006	10/18/2006	10/17/2006	10/18/2006	10/18/2006	10/18/2006	10/17/2006	10/19/2006	10/17/2006	10/17/2006
Semi-Volatile Organic Compound (ug/L)																			
1,1'-BIPHENYL	0.83	NS	ND (< 9.5)	1400 J	210	1600 J	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	1600	5.5 J	120	20	ND (< 9.7)	970	13	ND (< 9.4)	ND (< 9.6)
1,4-DIOXANE	0.67	NS	ND (< 9.5)	340	42 J	830 J	44	58	11 J	7.3 J	74	59	59	60	34	1000	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
2,2'-OXYBIS(1-CHLOROPROPANE)	NS	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
2,4,5-TRICHLOROPHENOL	890	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
2,4,6-TRICHLOROPHENOL	3.5	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
2,4-DICHLOROPHENOL	35	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
2,4-DIMETHYLPHENOL	270	NS	ND (< 9.5)	2800	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	190	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
2,4-DINITROPHENOL	30	NS	ND (< 48)	ND (< 480)	ND (< 240)	ND (< 480)	ND (< 50)	ND (< 50)	ND (< 52)	ND (< 47)	ND (< 240)	ND (< 50)	ND (< 49)	ND (< 100)	ND (< 48)	ND (< 470)	ND (< 48)	ND (< 47)	ND (< 48)
2,4-DINITROTOLUENE	0.2	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
2,6-DINITROTOLUENE	0.042	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
2-CHLORONAPHTHALENE	550	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
2-CHLOROPHENOL	71	NS	ND (< 9.5)	110	ND (< 47)	510	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	3.3 J	ND (< 20)	ND (< 9.7)	47 J	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
2-METHYLNAPHTHALENE	27	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
2-METHYLPHENOL	720	NS	ND (< 9.5)	4300	ND (< 47)	64 J	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	13 J	ND (< 10)	5.8 J	ND (< 20)	ND (< 9.7)	1000	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
2-NITROANILINE	150	NS	ND (< 48)	ND (< 480)	ND (< 240)	ND (< 480)	ND (< 50)	ND (< 50)	ND (< 52)	ND (< 47)	ND (< 240)	ND (< 50)	ND (< 49)	ND (< 100)	ND (< 48)	ND (< 470)	ND (< 48)	ND (< 47)	ND (< 48)
2-NITROPHENOL	NS	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
3,3'-DICHLOROBENZIDINE	0.11	NS	ND (< 48)	ND (< 480)	ND (< 240)	ND (< 480)	ND (< 50)	ND (< 50)	ND (< 52)	ND (< 47)	ND (< 240)	ND (< 50)	ND (< 49)	ND (< 100)	ND (< 48)	ND (< 470)	ND (< 48)	ND (< 47)	ND (< 48)
3-NITROANILINE	NS	NS	ND (< 48)	ND (< 480)	ND (< 240)	ND (< 480)	ND (< 50)	ND (< 50)	ND (< 52)	ND (< 47)	ND (< 240)	ND (< 50)	ND (< 49)	ND (< 100)	ND (< 48)	ND (< 470)	ND (< 48)	ND (< 47)	ND (< 48)
4,6-DINITRO-2-METHYLPHENOL	1.2	NS	ND (< 48)	ND (< 480)	ND (< 240)	ND (< 480)	ND (< 50)	ND (< 50)	ND (< 52)	ND (< 47)	ND (< 240)	ND (< 50)	ND (< 49)	ND (< 100)	ND (< 48)	ND (< 470)	ND (< 48)	ND (< 47)	ND (< 48)
4-BROMOPHENYL PHENYL ETHER	NS	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
4-CHLORO-3-METHYLPHENOL	1,100	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
4-CHLOROANILINE	0.32	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
4-CHLOROPHENYL PHENYL ETHER	NS	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
4-METHYLPHENOL	1,400	NS	ND (< 9.5)	3000	ND (< 47)	970 J	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	46 J	2.85 J	15	ND (< 20)	ND (< 9.7)	2400	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
4-NITROANILINE	3.3	NS	ND (< 48)	ND (< 480)	ND (< 240)	ND (< 480)	ND (< 50)	ND (< 50)	ND (< 52)	ND (< 47)	ND (< 240)	ND (< 50)	ND (< 49)	ND (< 100)	ND (< 48)	ND (< 470)	ND (< 48)	ND (< 47)	ND (< 48)
4-NITROPHENOL	NS	NS	ND (< 48)	ND (< 480)	ND (< 240)	ND (< 480)	ND (< 50)	ND (< 50)	ND (< 52)	ND (< 47)	ND (< 240)	ND (< 50)	ND (< 49)	ND (< 100)	ND (< 48)	ND (< 470)	ND (< 48)	ND (< 47)	ND (< 48)
ACENAPHTHENE	400	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
ACENAPHTHYLENE	NS	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
ACETOPHENONE	1,500	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
ANILINE	12	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
ANTHRACENE	1,300	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
ATRAZINE	0.26	3	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
BENZALDEHYDE	1,500	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
BENZO(A)ANTHRACENE	0.029	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
BENZO(A)PYRENE	0.0029	0.2	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
BENZO(B)FLUORANTHENE	0.029	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
BENZO(G,H,I)PERYLENE	NS	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
BENZO(K)FLUORANTHENE	0.29	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
BIS(2-CHLOROETHOXY)METHANE	46	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
BIS(2-CHLOROETHYL)ETHER	0.012	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
BIS(2-ETHYLHEXYL)PHTHALATE	4.8	6	1.5 J	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
BUTYLBENZYL PHTHALATE	NS	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
CAPROLACTAM	7,700	NS	ND (< 9.5)	10000	ND (< 47)	60000	3.8 J	170	0.95 J	15	98	9 J	ND (< 9.8)	ND (< 20)	0.88 J	570	1.5 J	ND (< 9.4)	1.1 J
CARBAZOLE	NS	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
CHRYSENE	2.9	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
DI-N-BUTYL PHTHALATE	670	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
DI-N-OCTYL PHTHALATE	160	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
DIBENZO(A,H)ANTHRACENE	0.0029	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
DIBENZOFURAN	5.8	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
DIETHYL PHTHALATE	11,000	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
DIMETHYL PHTHALATE	NS	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
FLUORANTHENE	630	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
FLUORENE	220	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
HEXACHLOROBENZENE	0.042	1	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
HEXACHLOROBUTADIENE	0.26	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
HEXACHLOROCYCLOPENTADIENE	22	50	ND (< 48)	ND (< 480)	ND (< 240)	ND (< 480)	ND (< 50)	ND (< 50)	ND (< 52)	ND (< 47)	ND (< 240)	ND (< 50)	ND (< 49)	ND (< 100)	ND (< 48)	ND (< 470)	ND (< 48)	ND (< 47)	ND (< 48)
HEXACHLOROETHANE	0.79	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
INDENO(1,2,3-CD)PYRENE	0.029	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
ISOPHORONE	67	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
N-NITROSO-DI-N-PROPYLAMINE	0.0093	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
N-NITROSODIPHENYLAMINE	10	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	33 J	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
NAPHTHALENE	0.14	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	18 J	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
NITROBENZENE	0.12	NS	ND (< 9.5)	25 J	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
PENTACHLOROPHENOL	0.035	1	ND (< 48)	ND (< 480)	ND (< 240)	ND (< 480)	ND (< 50)	ND (< 50)	ND (< 52)	ND (< 47)	ND (< 240)	ND (< 50)	ND (< 49)	ND (< 100)	ND (< 48)	ND (< 470)	ND (< 48)	ND (< 47)	ND (< 48)
PHENANTHRENE	NS	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
PHENOL	4,500	NS	ND (< 9.5)	1000 J	ND (< 47)	380	ND (< 9.9)	8.8 J	ND (< 10)	3.8 J	34 J	3.1 J	26	ND (< 20)	ND (< 9.7)	1000	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)
PYRENE	87	NS	ND (< 9.5)	ND (< 97)	ND (< 47)	ND (< 95)	ND (< 9.9)	ND (< 10)	ND (< 10)	ND (< 9.4)	ND (< 47)	ND (< 10)	ND (< 9.8)	ND (< 20)	ND (< 9.7)	ND (< 94)	ND (< 9.5)	ND (< 9.4)	ND (< 9.6)

Notes:

ug/L - micrograms per liter.

J - Value shown was reported below the laboratory reporting limit but above the method detection limit at an estimated concentration.

B- Compound was detected in blank.

[A] - EPA Region III Regional Screening Level for Tapwater, November 2013.

[B] - EPA Region III Regional Screening Level Maximum Contaminant Level, November 2013.

ND (< 1) - Compound was not detected at concentrations above the laboratory reporting limit.

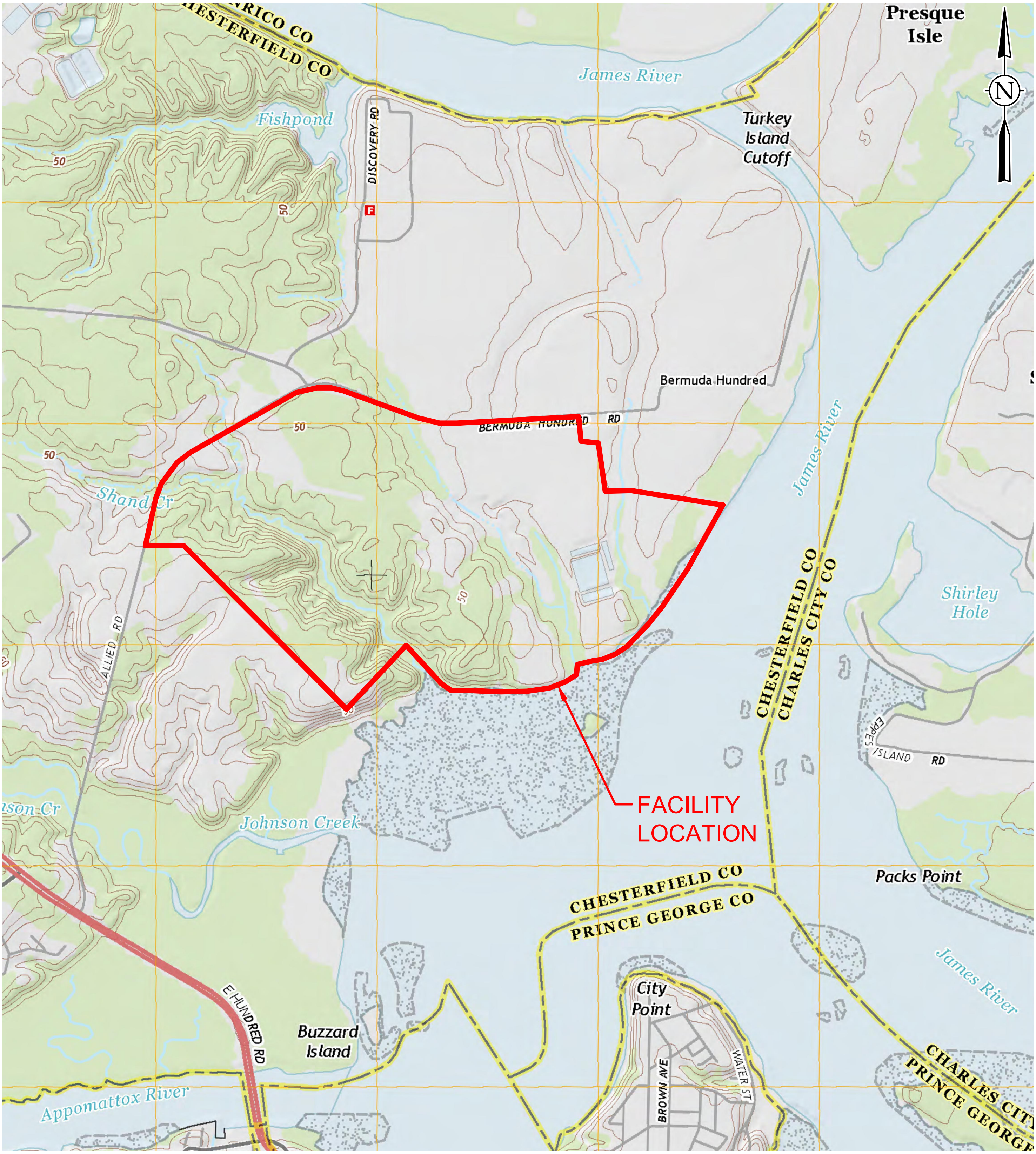
1700 Bold and italicized typeface indicates concentration exceed the MCL for groundwater.

Shaded Cell indicates concentration exceeds the Regional Screening Level for Tapwater.

Prepared by: MT 05/23/14
Checked by: RK 05/23/14

Honeywell

FIGURES



REFERENCE: USGS 7.5-MINUTE QUADRANGLE MAP "HOPEWELL, VA", REVISED 2013.

P:\Honeywell - Chesterfield\SWMU4 IM\2014 SWMU 4 IM WP\Figures\Fig 1 Site Location Map 2015-01-26.dwg Mon, 26 Jan 2015 - 4:17pm Steve.Mazza Layout: Figure 1

Amec Foster Wheeler Environment & Infrastructure, Inc. 751 Arbor Way, Suite 180 Blue Bell, PA 19422 Tel. 610-828-8100 www.amecfw.com amec foster wheeler	CLIENT Honeywell	PROJECT SWMU 4 INTERIM MEASURE WORK PLAN CHESTERFIELD FACILITY CHESTER, VIRGINIA	PROJECT NO.: 7772140016 REVISION NO.: 0 DATE: JANUARY 2015
PROJECTION / DATUM: UTM83-18F 0 1000' 2000' SCALE: 1" = 2,000'	PREPARED BY: SPM 01/26/2015 CHECKED BY: RK 01/27/2015 REVIEWED BY: RK 01/27/2015	TITLE SITE LOCATION AND TOPOGRAPHIC MAP	FIGURE NO.: 1

NOTES

1. MAP ENTITLED "CHESTERFIELD PLANT BOUNDARY PLOT", CAD DWG 001A1095, BY AUSTIN BROCKENBROUGH AND ASSOCIATES, CHESTER, VA, UPDATED 2/16/94.
2. TOPO.DWG AND STREAM.DWG FILES EXTRACTED FROM CHESTERFIELD COUNTY, WA GIS SYSTEM DATED 5/22/00.
3. AERIAL IMAGERY IS FROM 2005 HENRICO COUNTY AERIAL IMAGE PROGRAM.

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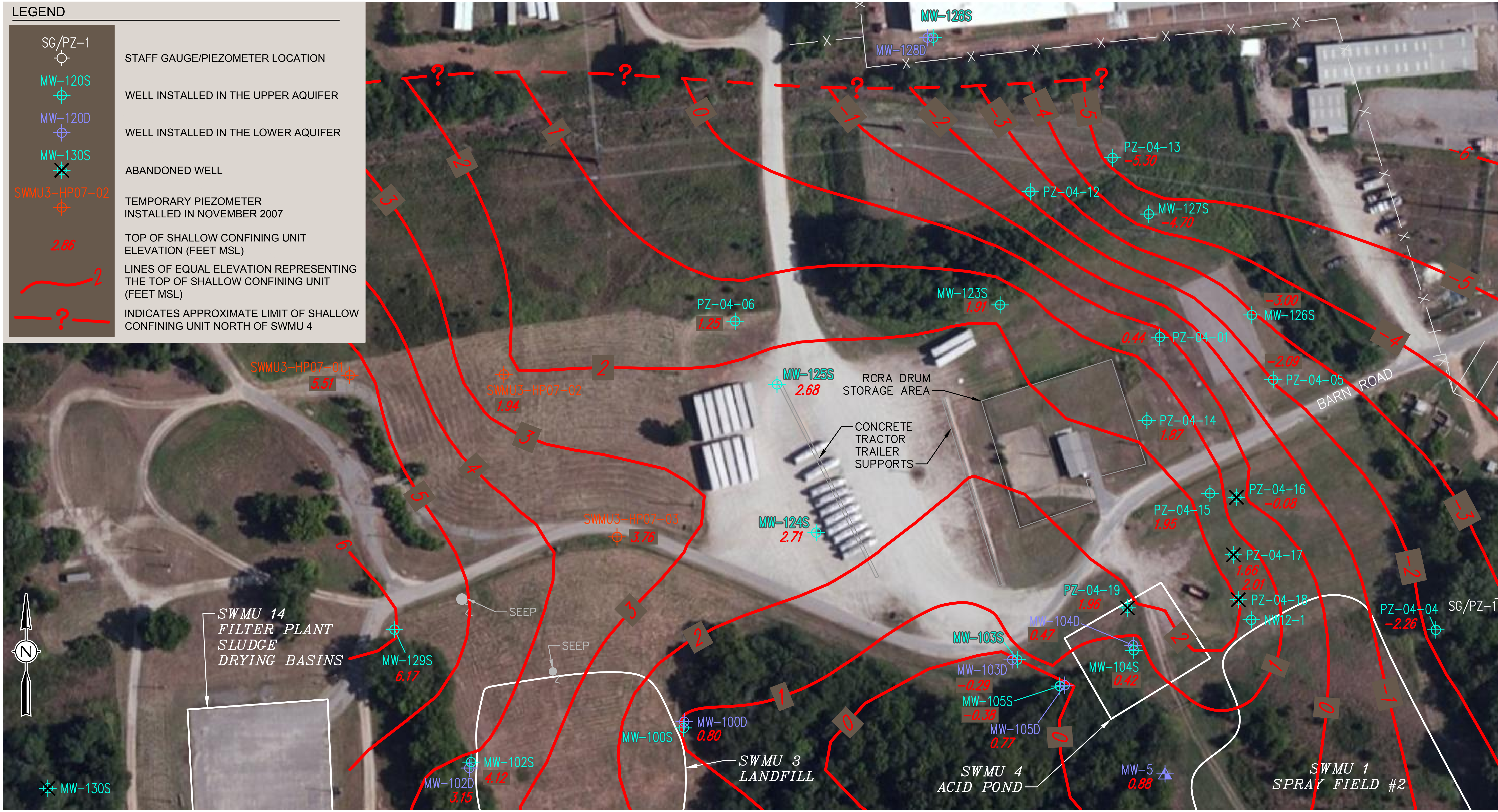
CLIENT	Honeywell
PROJECT	SWMU 4 INTERIM MEASURE WORK PLAN CHESTERFIELD FACILITY CHESTER, VIRGINIA
PROJECT NO.:	7772140016
REV. NO.:	0
DATE:	JANUARY 2015
PROJECTION / DATUM:	VA83-SF
PREPARED BY:	SPM 01/22/2015
CHECKED BY:	RK 01/22/2015
REVIEWED BY:	RK 01/22/2015
SCALE:	0 250' 500' SCALE: 1" = 500'
TITLE	SWMU 4 LOCATION
FIGURE NO.:	2

FILE: P:\HONEYWELL – CHESTERFIELD\SWMU4 IM\2014 SWMU 4 IM WP\FIGURES\FIG 2 SWMU4 LOCATION 2015–01–22.DWG, DATE: 01/26/2015 Layout: Fig 2 SWMU 4 Location



FILE: P:\HONEYWELL – CHESTERFIELD\SWMU4 IM\2014 SWMU 4 IM WP\FIGURES\FIG 3 CONTOUR MAP OF TOP OF SHALLOW CONFINING UNIT 2015-01-27.DWG, DATE: 01/27/2015 Layout: Fig 3 Contour Map Potomac Confining Unit

REFERENCES

1. MAP ENTITLED "CHESTERFIELD PLANT BOUNDARY PLOT", CAD DWG 001A1095, BY AUSTIN BROCKENBROUGH AND ASSOCIATES, CHESTER, VA, UPDATED 2/16/94.
2. AERIAL IMAGERY IS FROM THE ESRI WORLD IMAGERY BASE MAP.
3. TOP OF SHALLOW CONFINING UNIT ELEVATION DATA AND CONTOUR LINES SOURCE: FIGURE 3, CONCEPTUAL SITE MODEL FOR DENSE NON-AQUEOUS PHASE LIQUID AND MARL, HONEYWELL CHESTERFIELD FACILITY, CHESTERFIELD, VA; PREPARED BY MACTEC ENGINEERING AND CONSULTING, INC.; DATED SEPTEMBER 2009.

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CLIENT: Honeywell

PROJECT: SWMU 4 INTERIM MEASURE WORK PLAN, CHESTERFIELD FACILITY, CHESTER, VIRGINIA

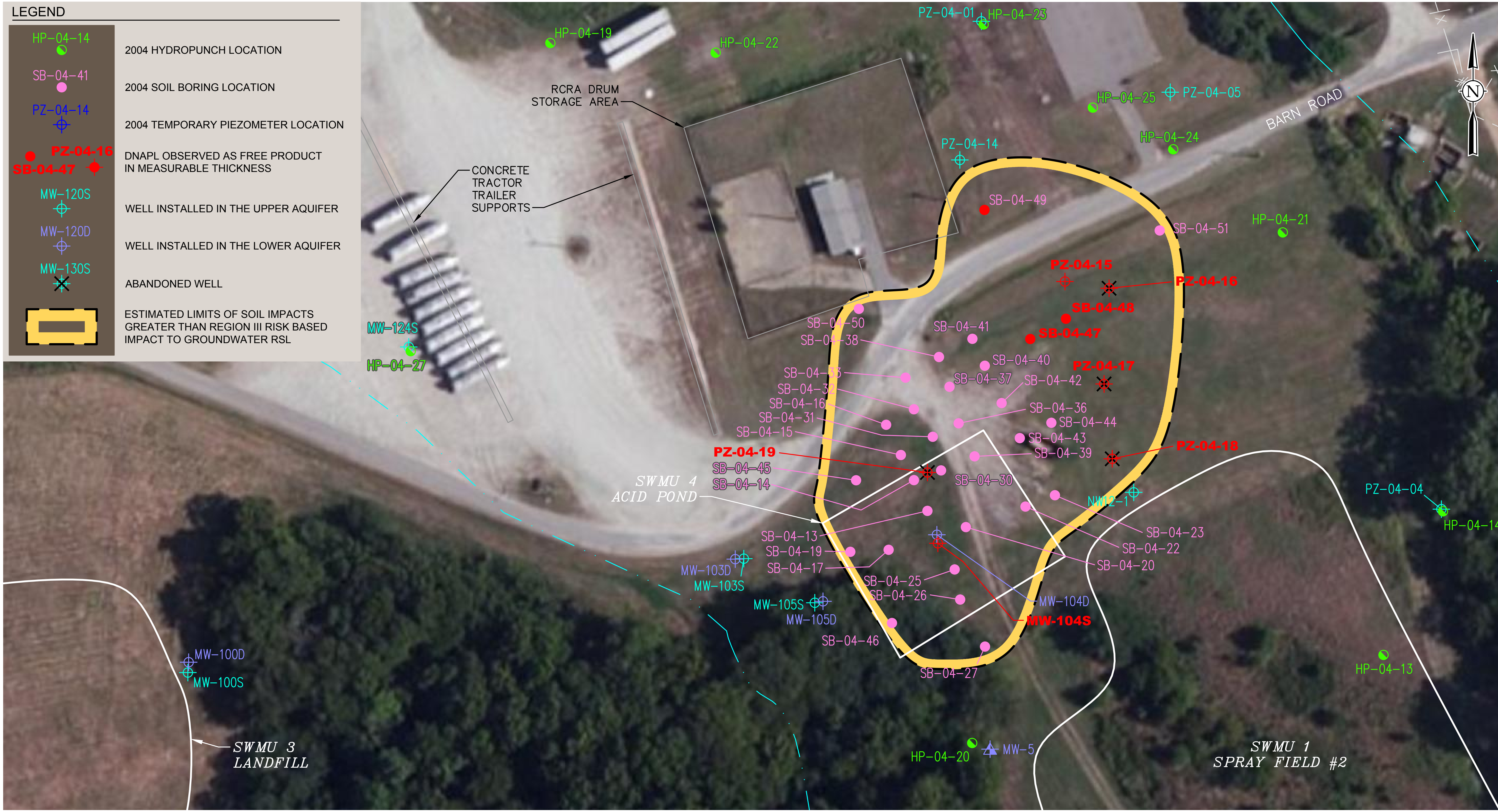
PROJECT NO.: 7772140016
REV. NO.: 0
DATE: JANUARY 2015

PROJECTION / DATUM: VA83-SF
PREPARED BY: SPM 01/27/2015
CHECKED BY: RK 01/27/2015
REVIEWED BY: RK 01/27/2015

0 50' 100'
SCALE: 1" = 100'

TITLE: CONTOUR MAP OF TOP OF SHALLOW CONFINING UNIT

FIGURE NO.: 3



REFERENCES

1. MAP ENTITLED "CHESTERFIELD PLANT BOUNDARY PLOT", CAD DWG 001A1095, BY AUSTIN BROCKENBROUGH AND ASSOCIATES, CHESTER, VA, UPDATED 2/16/94.
2. TOPO.DWG AND STREAM.DWG FILES EXTRACTED FROM CHESTERFIELD COUNTY, VA GIS SYSTEM DATED 5/22/00.
3. AERIAL IMAGERY IS FROM THE ESRI WORLD IMAGERY BASE MAP.
3. SOIL DATA SOURCE: TABLE 4, PHASE III DATA SUMMARY REPORT, HONEYWELL CHESTERFIELD FACILITY, CHESTER, VA; PREPARED BY MWH AMERICAS, INC.; DATED MARCH 2005.

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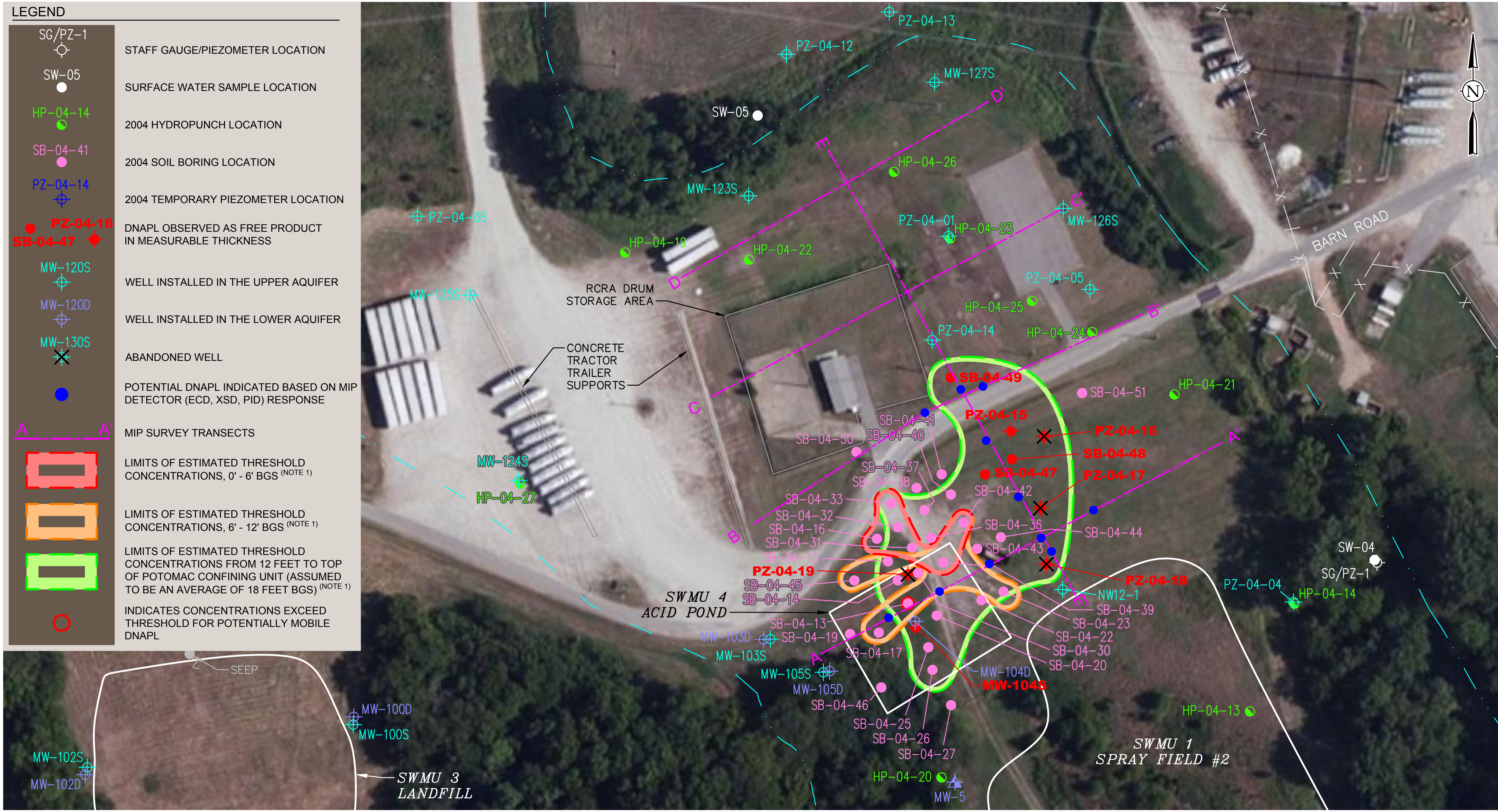
CLIENT: Honeywell	PROJECT: SWMU 4 INTERIM MEASURE WORK PLAN, CHESTERFIELD FACILITY, CHESTER, VIRGINIA	PROJECT NO.: 7772140016	REV. NO.: 0
PROJECTION / DATUM: VA83-SF	PREPARED BY: SPM 01/27/2015	DATE: JANUARY 2015	
SCALE: 1" = 60' (0, 30', 60')	CHECKED BY: RK 01/27/2015	TITLE: SWMU 4 - EXTENT OF SOIL IMPACTS	FIGURE NO.: 4
	REVIEWED BY: RK 01/27/2015		

FILE: P:\HONEYWELL – CHESTERFIELD\SWMU4 IM\2014 SWMU 4 IM WP\FIGURES\FIG 4 EXTENT OF SOIL IMPACTS 2015-01-27.DWG, DATE: 01/27/2015 Layout: Fig 4 SWMU 4 Extent of Soil Impacts



FILE: P:\HONEYWELL – CHESTERFIELD\SWMU4 IM\2014 SWMU 4 IM WP\FIGURES\FIG 5 EXTENT OF DNAPL IN PLAN VIEW 2015-01-27.DWG, DATE: 01/28/2015 Layout: CM AREA LAYOUT

NOTES

1. DNAPL LIMITS BASED ON THRESHOLD SATURATION CALCULATIONS USING 2004 PHASE III RFI DATA FOR VOCS AND SVOCS IN SOIL.

REFERENCES

1. MAP ENTITLED "CHESTERFIELD PLANT BOUNDARY PLOT", CAD DWG 001A1095, BY AUSTIN BROCKENBROUGH AND ASSOCIATES, CHESTER, VA, UPDATED 2/16/94.
2. TOPO.DWG AND STREAM.DWG FILES EXTRACTED FROM CHESTERFIELD COUNTY, WA GIS SYSTEM DATED 5/22/00.
3. AERIAL IMAGERY IS FROM THE ESRI WORLD IMAGERY BASE MAP.

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CLIENT: Honeywell

PROJECT: SWMU 4 INTERIM MEASURE WORK PLAN
CHESTERFIELD FACILITY
CHESTER, VIRGINIA

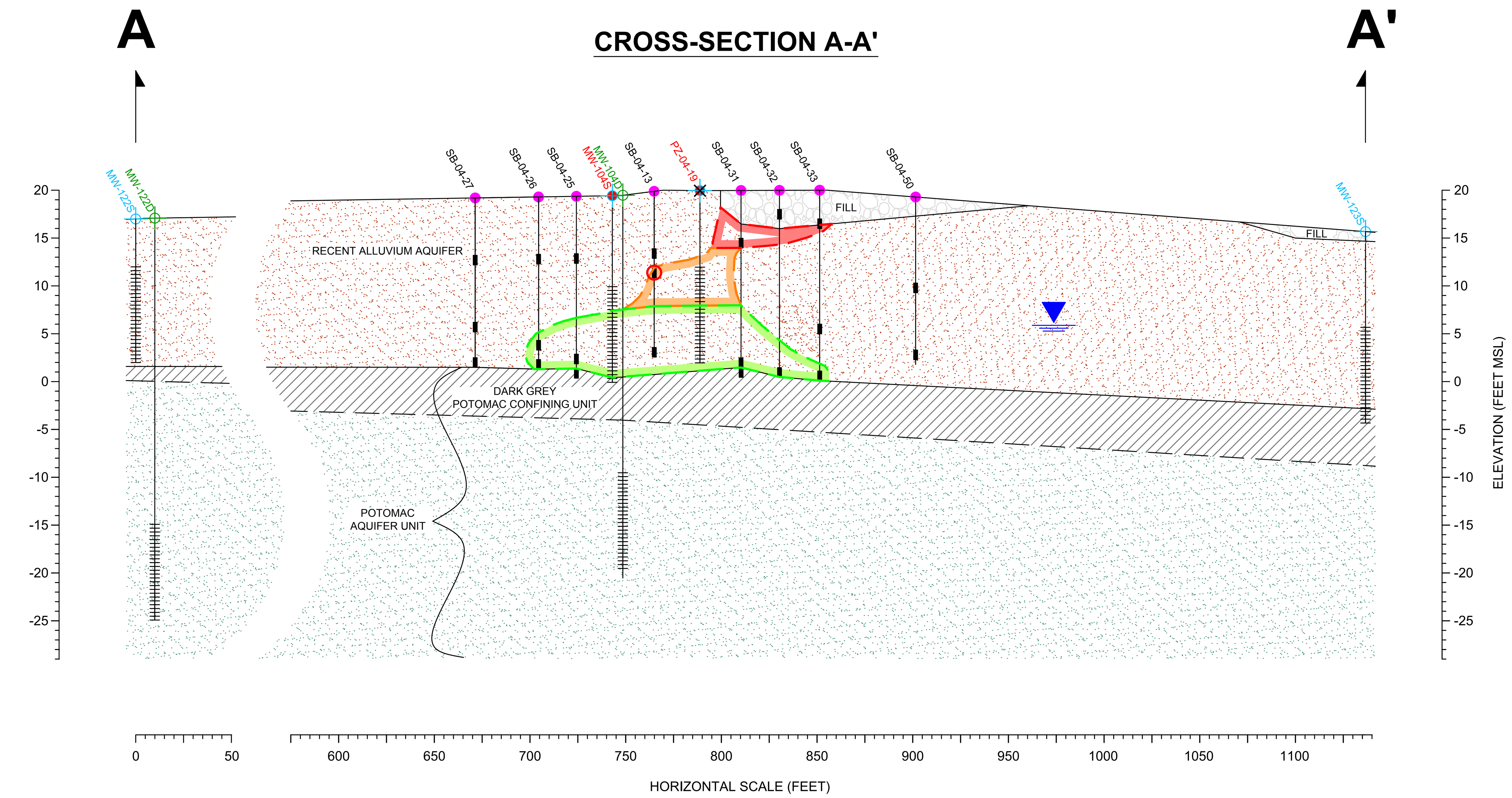
PROJECT NO.: 7772140016
REV. NO.: 0
DATE: JANUARY 2015

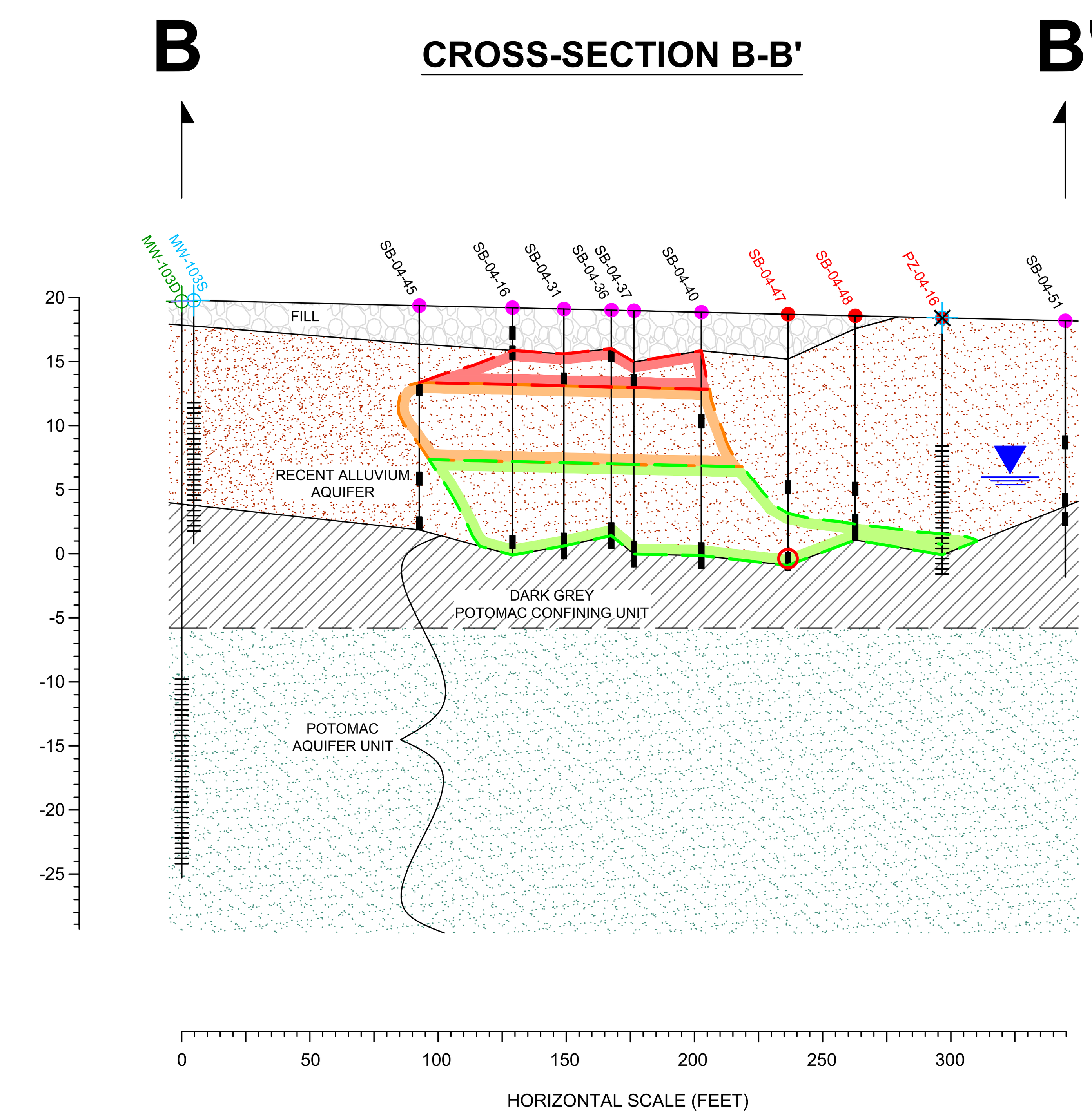
PROJECTION / DATUM: VA83-SF
PREPARED BY: SPM 01/27/2015
CHECKED BY: RK 01/27/2015
REVIEWED BY: RK 01/27/2015

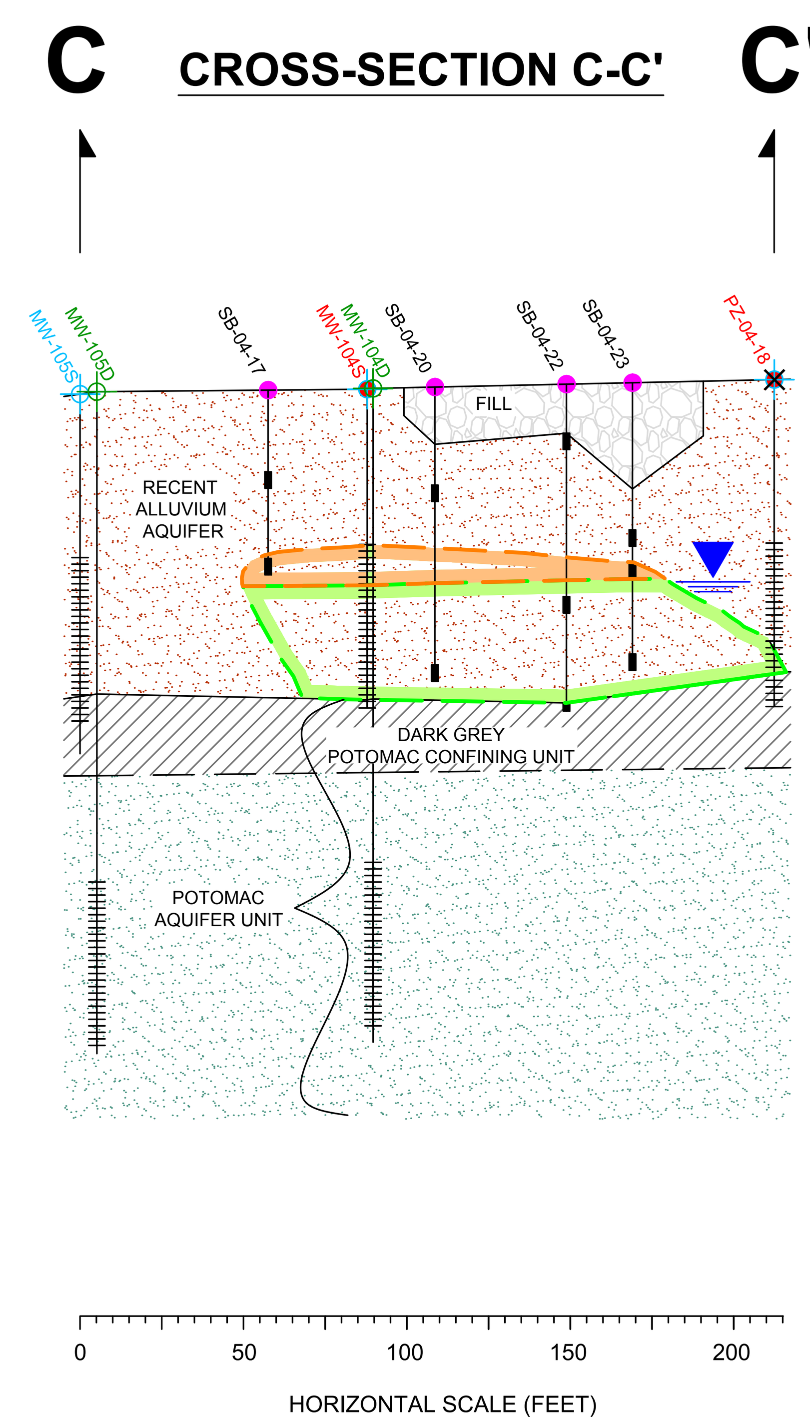
0 40' 80'
SCALE: 1" = 80'

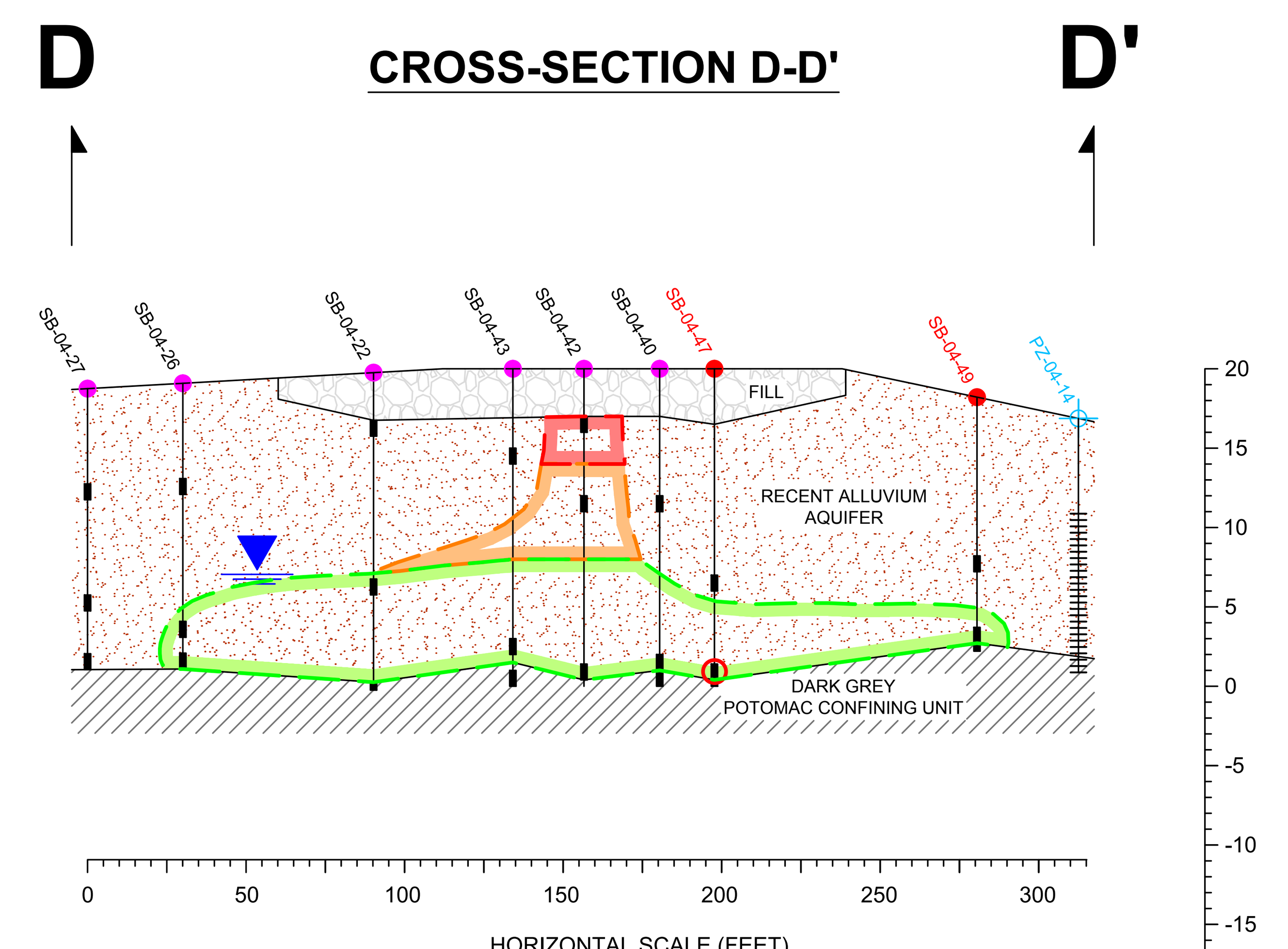
TITLE: EXTENT OF DNAPL IN PLAN VIEW

FIGURE NO.: 5







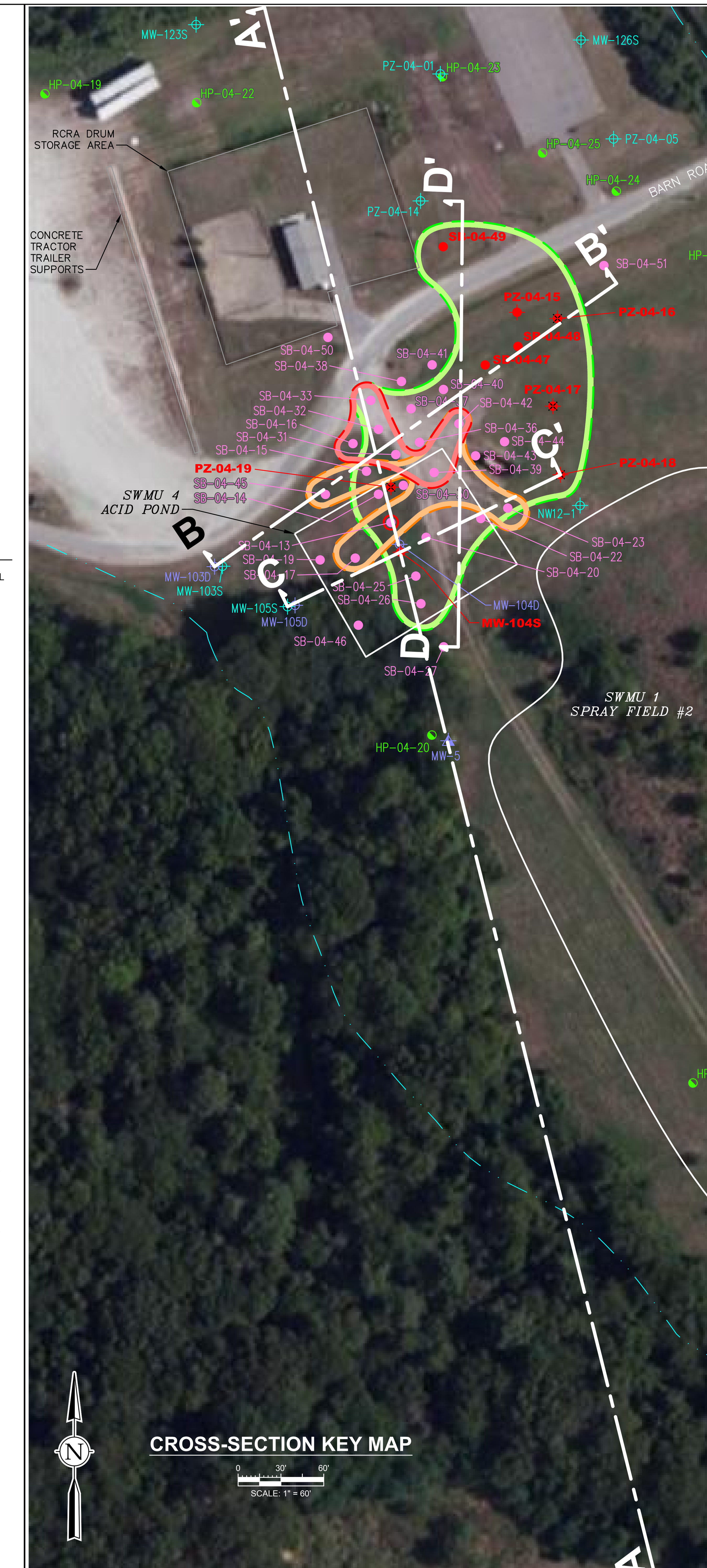


LEGEND

HP-04-14	2004 HYDROPUNCH LOCATION
SB-04-41	2004 SOIL BORING LOCATION
PZ-04-14	2004 TEMPORARY PIEZOMETER LOCATION
PZ-04-16 / SB-04-47	DNAPL OBSERVED AS FREE PRODUCT IN MEASURABLE THICKNESS
MW-120S	WELL INSTALLED IN THE UPPER AQUIFER
MW-120D	WELL INSTALLED IN THE LOWER AQUIFER
MW-130S	ABANDONED WELL
	LIMITS OF ESTIMATED THRESHOLD CONCENTRATIONS, 0' - 6' BGS (NOTE 1)
	LIMITS OF ESTIMATED THRESHOLD CONCENTRATIONS, 6' - 12' BGS (NOTE 1)
	LIMITS OF ESTIMATED THRESHOLD CONCENTRATIONS FROM 12 FEET TO TOP OF POTOMAC CONFINING UNIT (ASSUMED TO BE AN AVERAGE OF 18 FEET BGS) (NOTE 1)
	INDICATES CONCENTRATIONS EXCEED THRESHOLD FOR POTENTIALLY MOBILE DNAPL
	2004 ANALYTICAL SOIL SAMPLE INTERVAL
	REPRESENTATIVE DEPTH TO WATER TABLE. ANNUALLY AND SEASONALLY VARIABLE AT 12 FEET TO 14 FET BGS

SOIL DESCRIPTIONS (NOTE 2)

- **RECENT ALLUVIUM AQUIFER** - RECENT ALLUVIAL DEPOSITS CONSISTING OF SILTY SANDS WITH INTERBEDDED SILTS AND SILTY CLAYS
- **DARK GREY POTOMAC CONFINING UNIT**
- **POTOMAC AQUIFER UNIT** - CLAY TO SILTY CLAY WITH SANDY INTERBEDS



NOTES

1. DNAPL LIMITS BASED ON THRESHOLD SATURATION CALCULATIONS USING 2004 PHASE III RFI DATA FOR VOCS AND SVOCS IN SOIL.
2. SOIL DESCRIPTIONS BASED ON THE U.S. GEOLOGICAL SURVEY PAPER TITLED *THE VIRGINIA COASTAL PLAIN HYDROGEOLOGIC FRAMEWORK*, 2006.

REFERENCES

1. MAP ENTITLED "CHESTERFIELD PLANT BOUNDARY PLOT", CAD DWG 001A1095, BY AUSTIN BROCKENBROUGH AND ASSOCIATES, CHESTER, VA, UPDATED 2/16/94.
2. TOPO.DWG AND STREAM.DWG FILES EXTRACTED FROM CHESTERFIELD COUNTY, WA GIS SYSTEM DATED 5/22/00.
3. AERIAL IMAGERY IS FROM THE ESRI WORLD IMAGERY BASE MAP.

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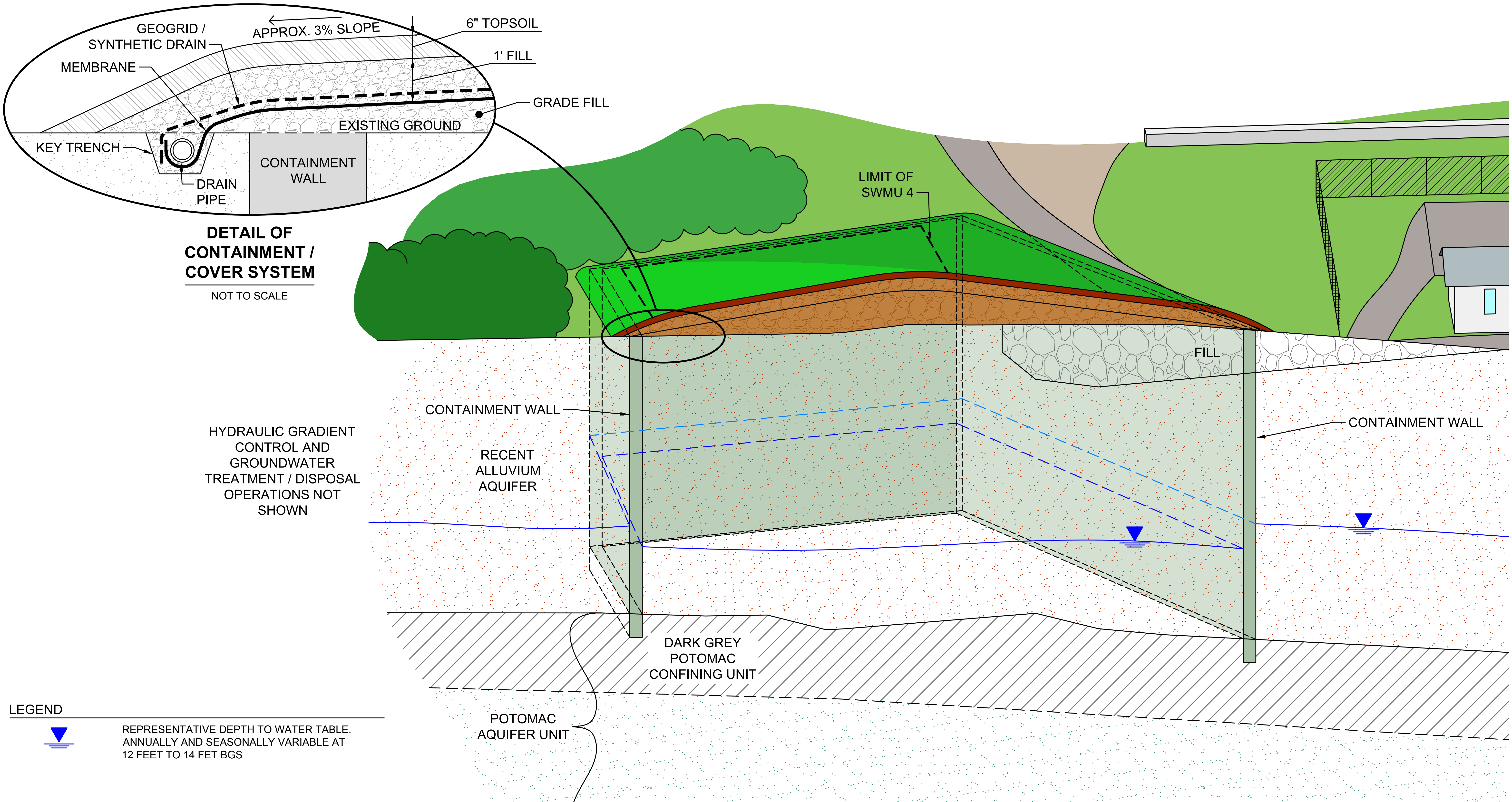
Tel. 610-828-8100
www.amecfw.com

CLIENT: Honeywell	PROJECT: SWMU 4 INTERIM MEASURE WORK PLAN, CHESTERFIELD FACILITY, CHESTER, VIRGINIA	PROJECT NO.: 7772140016	REV. NO.: 0
PROJECTION / DATUM: VA83-SF	PREPARED BY: SPM 01/27/2015; CHECKED BY: RK 01/27/2015; REVIEWED BY: RK 01/27/2015	TITLE: EXTENT OF DNAPL IN CROSS-SECTION	DATE: JANUARY 2015; FIGURE NO.: 6

FILE: P:\HONEYWELL - CHESTERFIELD\SWMU4 IM\2014 SWMU 4 IM WP\FIGURES\FIG 6 EXTENT OF DNAPL IN CROSS-SECTION 2015-01-27.DWG, DATE: 01/28/2015, Layout: CM AREA LAYOUT



DETAIL OF CONTAINMENT / COVER SYSTEM

NOT TO SCALE

LEGEND

REPRESENTATIVE DEPTH TO WATER TABLE. ANNUALLY AND SEASONALLY VARIABLE AT 12 FEET TO 14 FET BGS

SOIL DESCRIPTIONS (NOTE 2)

RECENT ALLUVIUM AQUIFER - RECENT ALLUVIAL DEPOSITS CONSISTING OF SILTY SANDS WITH INTERBEDDED SILTS AND SILTY CLAYS

DARK GREY POTOMAC CONFINING UNIT

POTOMAC AQUIFER UNIT - CLAY TO SILTY CLAY WITH SANDY INTERBEDS

NOTES

1. DNAPL LIMITS BASED ON THRESHOLD SATURATION CALCULATIONS USING 2004 PHASE III RFI DATA FOR VOCS AND SVOCS IN SOIL.
2. SOIL DESCRIPTIONS BASED ON THE U.S. GEOLOGICAL SURVEY PAPER TITLED *THE VIRGINIA COASTAL PLAIN HYDROGEOLOGIC FRAMEWORK*, 2006.

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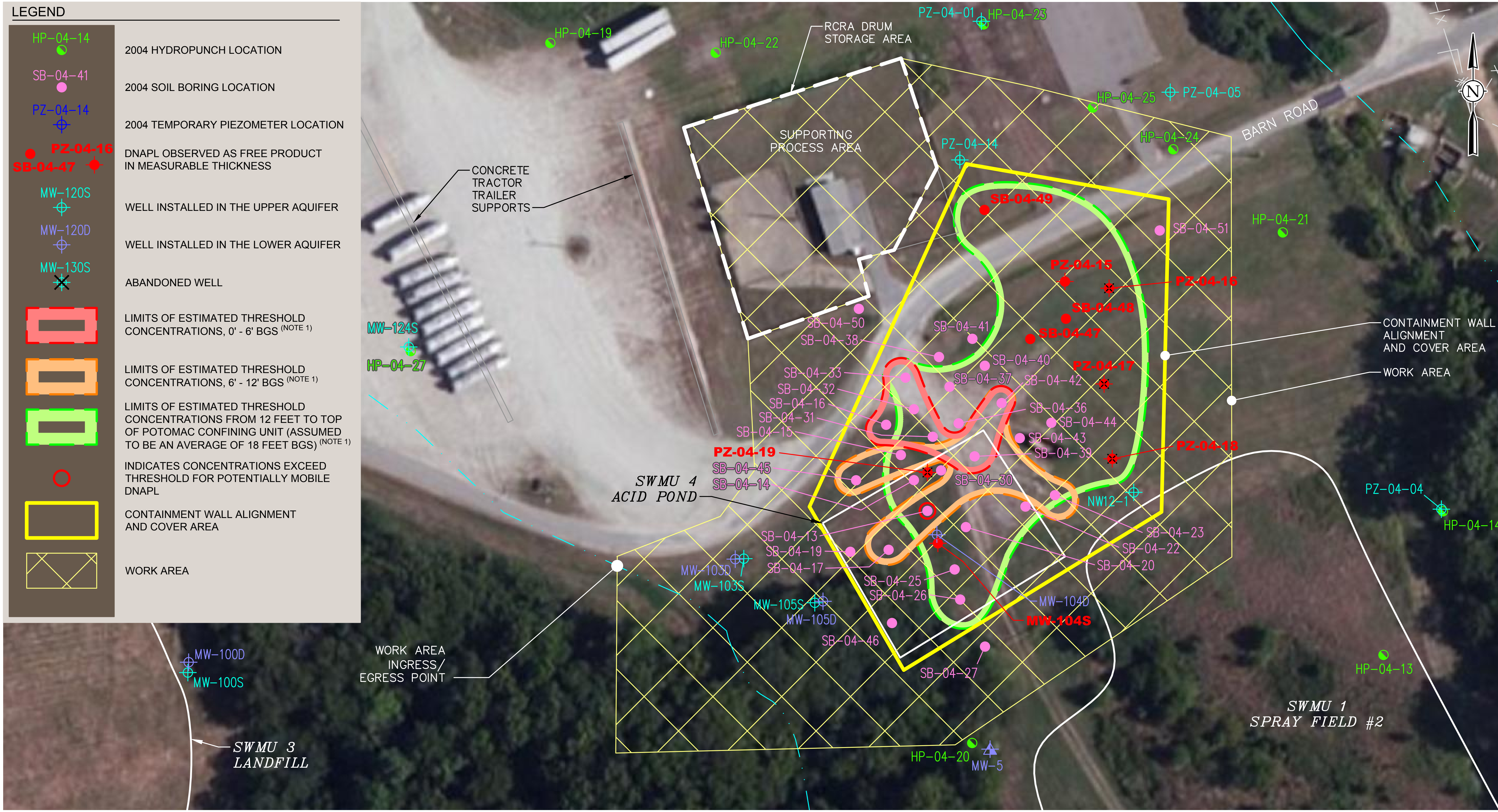
CLIENT	Honeywell
PROJECT	SWMU 4 INTERIM MEASURE WORK PLAN, CHESTERFIELD FACILITY, CHESTER, VIRGINIA
PROJECT NO.:	7772140016
REV. NO.:	0
DATE:	JANUARY 2015
PROJECTION / DATUM:	N/A
SCALE	NOT TO SCALE
PREPARED BY:	SPM 01/28/2015
CHECKED BY:	RK 01/28/2015
REVIEWED BY:	RK 01/28/2015
TITLE	TYPICAL CONTAINMENT / COVER SYSTEM CROSS-SECTION
FIGURE NO.:	7

FILE: P:\HONEYWELL – CHESTERFIELD\SWMU4 IM\2014 SWMU 4 IM WP\FIGURES\FIG 7 TYP CONTAINMENT COVER SYSTEM CROSS-SECTION 2015-01-28.DWG, DATE: 01/29/2015 Layout: CM AREA LAYOUT



NOTES

1. DNAPL LIMITS BASED ON THRESHOLD SATURATION CALCULATIONS USING 2004 PHASE III RFI DATA FOR VOCS AND SVOCS IN SOIL.
2. A TEMPORARY BYPASS TO BARN ROAD WILL BE CONSTRUCTED. ALIGNMENT TO BE DETERMINED IN CONSULTATION WITH OPERATIONS MANAGEMENT.

REFERENCES

1. MAP ENTITLED "CHESTERFIELD PLANT BOUNDARY PLOT", CAD DWG 001A1095, BY AUSTIN BROCKENBROUGH AND ASSOCIATES, CHESTER, VA, UPDATED 2/16/94.
2. TOPO.DWG AND STREAM.DWG FILES EXTRACTED FROM CHESTERFIELD COUNTY, WA GIS SYSTEM DATED 5/22/00.
3. AERIAL IMAGERY IS FROM THE ESRI WORLD IMAGERY BASE MAP.

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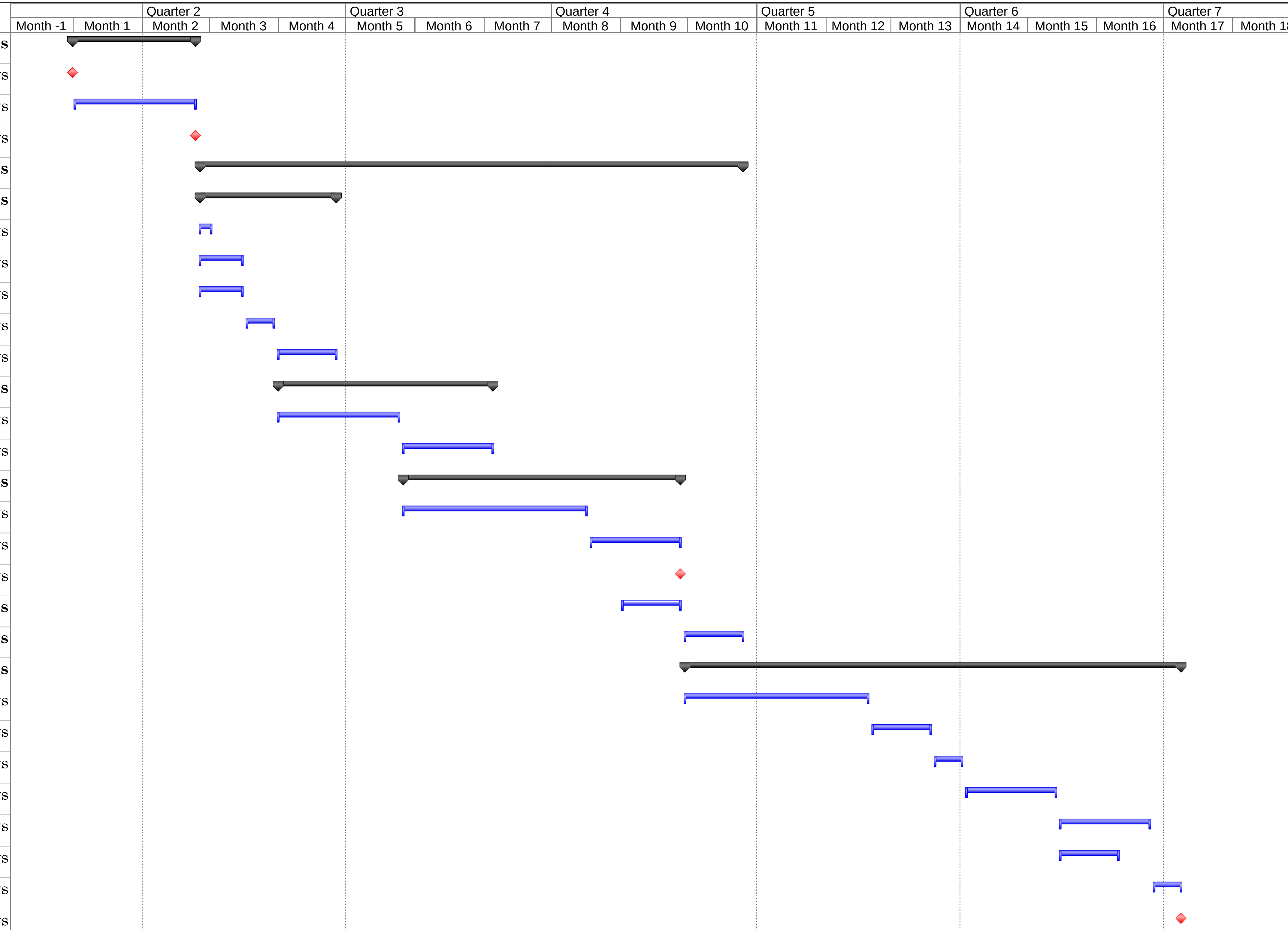
www.amecfw.com

PROJECTION / DATUM:	VA83-SF
PREPARED BY:	SPM 01/26/2015
CHECKED BY:	RK 01/26/2015
REVIEWED BY:	RK 01/26/2015
SCALE:	1" = 60' (0, 30', 60')
CLIENT	Honeywell
PROJECT	SWMU 4 INTERIM MEASURE WORK PLAN, CHESTERFIELD FACILITY, CHESTER, VIRGINIA
PROJECT NO.:	7772140016
REV. NO.:	0
DATE:	JANUARY 2015
TITLE	IM AREA AND PRELIMINARY SLURRY WALL ALIGNMENT
FIGURE NO.:	8

FILE: P:\HONEYWELL - CHESTERFIELD\SWMU4 IM\2014 SWMU 4 IM WP\FIGURES\FIG 8 PROP IM AREA AND SLURRY WALL ALIGNMENT 2015-01-26.DWG, DATE: 01/27/2015 Layout: CM AREA LAYOUT

Figure 9
Preliminary Interim Measure Implementation Schedule
SWMU 4 Interim Measure Work Plan
Honeywell Chesterfield Facility
Chesterfield, VA

ID	Task Name	Duration
1	**Interim Measure Work Plan**	**40 days**
2	Interim Measure WP Submittal	0 days
3	EPA Review IM Work Plan	40 days
4	EPA Approval of IM WP	0 days
5	**Interim Measure Design**	**175 days**
6	**Design CP Field Investigation**	**45 days**
7	H&S Plan	5 days
8	Data Collection QA Plan Addendum	15 days
9	Data Management Plan Addendum	15 days
10	CP Field Investigation	10 days
11	Data Reduction	20 days
12	**30% Design**	**70 days**
13	Draft 30% Design Package	40 days
14	EPA Review 30% Design	30 days
15	**100% Design**	**90 days**
16	Draft Final Design	60 days
17	EPA Review Final Design	30 days
18	EPA Approve Final Design	0 days
19	**Construction QA Plan**	**20 days**
20	**IM Operations and Maintenance Plan**	**20 days**
21	**Construction**	**160 days**
22	Procurement	60 days
23	Construction Mobilization	20 days
24	Site Preparation	10 days
25	Barrier Wall Construction	30 days
26	Cover system Construction	30 days
27	Treatment System Construction	20 days
28	Contractor demobilization	10 days
29	Construction Complete	0 days



Project: 7772140016
Date: Fri 1/30/15

Task | Milestone | Summary

Appendix A
Boring Logs

SWMU 4 Boring Logs
Corrective Measure Study
Honeywell Chesterfield Facility
Chester, VA

Boring Logs Included:

1. MW-103S
2. MW-103D
3. MW-104S
4. MW-104D
5. MW-105S
6. MW-105D
7. NW-12-1
8. PZ-04-14
9. PZ-04-15
10. PZ-04-16
11. PZ-04-17
12. PZ-04-18
13. PZ-04-19
14. SB-04-13
15. SB-04-14
16. SB-04-15
17. SB-04-16
18. SB-04-17
19. SB-04-19
20. SB-04-20
21. SB-04-22
22. SB-04-23
23. SB-04-25
24. SB-04-26
25. SB-04-27
26. SB-04-30
27. SB-04-31
28. SB-04-32
29. SB-04-33
30. SB-04-36
31. SB-04-37
32. SB-04-38
33. SB-04-39
34. SB-04-40
35. SB-04-41
36. SB-04-42
37. SB-04-43
38. SB-04-44
39. SB-04-45
40. SB-04-46
41. SB-04-47
42. SB-04-48
43. SB-04-49
44. SB-04-50
45. SB-04-51

MWH MONTGOMERY WATSON HARZA

MWH Americas, Inc.
335 Phoenixville Pike
Malvern, Pennsylvania 19355

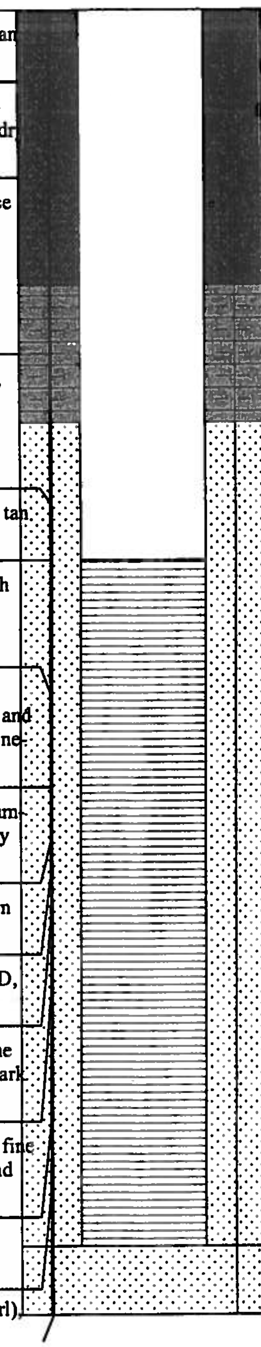
Well ID: MW-103S

Project Name:	Honeywell - Chesterfield
Location:	Chester, VA
Project Number:	2110898
Date Started:	7/23/03
Date Finished:	7/23/03
Drilling Company:	Eichelberger's Inc.
Drilling Method:	Hollow Stem Auger
Sampling Method:	Split Spoon
Boring Location:	West Side of Acid Pond
Ground Elevation (ft/msl):	19.78'
Total Depth (ft):	19.0'
Boring Diameter (in):	6 1/4"
Water Level During Drilling (ft/bgs):	10.1'
Weather Conditions:	Overcast, 87 deg. F
Logged By:	S. Bouclier

Depth (ft)	Blow Counts	Recovery (inches)	PID Reading
0-2	2, 7, 44, 5	18	0.0, 0.0, 0.0
5-7	2, 4, 5, 7	24	0.0, 0.0, 0.0, 0.0
10-12	4, 6, 5, 6	18	0.0, 0.0, 0.0
15-17	2, 3, 3, 1	14	0.0, 0.0, 0.0
17-19	50/1	1	0.0

Lithology	Geologic Description
SILT	SILT: 0.0-0.8' Dark brown, SILT, trace fine-grained sand an gravel, moist, firm, abundant rootlets.
SAND AND GRAVEL	SAND AND GRAVEL: 0.8-2.0' Light gray to white, fine-grained SAND and medium to coarse-grained GRAVEL, dr very compact, concrete-like.
SILT	SILT: 2.0-5.0' Medium brown, SILT, trace mica, very trace clay, damp, soft.
SILT	SILT: 5.0-7.2' Medium orangish brown, SILT, trace mica, dry, firm. Trace tan mottles from 6.0' to 6.5'.
SILT	SILT: 7.2-8.0' Medium orangish brown with light grayish tan mottles, SILT, trace mica, dry, firm.
SILT	SILT: 8.0-10.0' Medium orangish brown with light grayish tan mottles, SILT, little to trace mica, dry, firm.
SILT	SILT: 10.0-11.3' Medium orangish brown with trace light grayish tan mottles, SILT, little to trace fine-grained sand and mica, moist to wet, firm. Interbedded lenses of silt and fine-grained sand, sand lenses are saturated.
SAND	SAND: 11.3-12.0' Medium orangish brown, fine to medium-grained SAND, trace silt and mica, saturated, loose, poorly sorted.
SILT	SILT: 12.0-12.4' Medium orangish brown with dark brown mottles, SILT, very trace fine-grained sand, dry, firm.
SAND	SAND: 12.4-13.0' Reddish brown, medium-grained SAND, some fine-grained sand, trace mica, saturated, loose.
SAND	SAND: 13.0-14.0' Dark tan, medium-grained SAND, some fine-grained sand, trace mica, saturated, loose. Lense of dark gray silt at 13.8'.
SAND	SAND: 14.0-16.0' Dark tan, coarse-grained SAND, some fine to medium-grained sand, trace medium-grained gravel and mica, saturated, loose, poorly sorted.
SILT	SILT: 16.0-17.0' Black, SILT, little clay and mica, damp, soft.
SILT	SILT: 17.0-19.0' Light gray, SILT, trace white shells (marl), dry, very firm.

Well Diagram



Remarks

crete pad
.5' bgs

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to 6.0' bgs

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to 8.0'

ch PVC,
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h 8.0' to
' bgs

and from
to 19.0'

ehole
h 19.0' bgs

Blow Counts	Recovery (inches)	PID Reading	Lithology	Geologic Description	Well Diagram	Remarks

MWH
MONTGOMERY WATSON HARZA

MWH Americas, Inc.
335 Phoenixville Pike
Malvern, Pennsylvania 19355

Well ID: MW-103D

Project Name:	Honeywell - Chesterfield
Location:	Chester, VA
Project Number:	2110898
Date Started:	7/10/03
Date Finished:	8/22/03
Drilling Company:	Eichelberger's Inc.
Drilling Method:	Hollow Stem Auger/Cable Tool
Sampling Method:	Split Spoon/Bailer
Boring Location:	West Sidde of Acid Pond
Ground Elevation (ft/msl):	19.71'
Total Depth (ft):	45.0'
Boring Diameter (in):	8 1/4"
Water Level During Drilling (ft/bgs):	32.5'
Weather Conditions:	Overcast, 88 deg. F
Logged By:	S. Bouclier/S. Knoflicek

Depth (ft)	Blow Counts	Recovery (inches)	PID Reading
0–2	3, 4, 5, 3	2	0.0
2–4	3, 3, 4, 3	NR	NR
4–6	4, 4, 5, 7	6	0.0, 0.0
6–8	3, 5, 9, 10	23	0.5, 2.2, 1.3, 0.4
8–10	12, 13, 15, 13	20	0.6, 0.2, 1.7, 0.8
10–12	3, 5, 6, 7	24	1.9, 9.0, 5.0, 4.9
12–14	7, 6, 5, 5	24	5.0, 2.0, 4.6, 5.1
14–16	3, 7, 9, 7	24	3.1, 2.9, 2.3, 1.8
16–18	2, 3, 5, 2	6	3.4
18–19+	50/4"	3	3.4

Geologic Description

SILT: 0.0-0.5' Dark brown, SILT, trace fine-grained sand, moist, firm, abundant rootlets.

SILT: 0.5-2.0' Dark brown, SILT, trace fine-grained sand, moist, firm.

SILT: 4.0-6.0' Medium brown, SILT, trace mica, very trace clay, damp, soft.

SILT: 6.0-7.2' Medium orangish brown, SILT, trace mica, dry, firm.

SILT: 7.2-8.0' Medium orangish brown with light grayish tan mottles, SILT, trace mica, dry, firm.

SILT: 8.0-10.1' Medium orangish brown with light grayish tan mottles, SILT, little to trace mica, dry, firm.

SILT: 10.1-11.7' Medium orangish brown with trace light grayish tan mottles, SILT, little fine-grained sand and mica, moist to wet, firm. Interbedded lenses of silt and fine-grained sand, sand lenses are saturated.

SAND: 11.7-12.0' Medium orangish brown, fine to medium-grained SAND, trace silt and mica, saturated, loose, poorly sorted.

SILT: 12.0-12.4' Medium orangish brown with dark brown mottles, SILT, very trace fine-grained sand, dry, firm.

SAND: 12.4-13.0' Reddish brown, medium-grained SAND, some fine-grained sand, trace mica, saturated, loose.

SAND: 13.0-14.0' Dark tan, medium-grained SAND, some fine-grained sand, trace mica, saturated, loose. Lense of dark gray silt at 13.8'.

SAND: 14.0-18.0' Dark tan, coarse-grained SAND, some medium-grained sand, trace fine-grained sand and mica, very trace fine-grained subrounded gravel, saturated, poorly sorted.

SANDSTONE: 18.0-20.0' Dark gray, SANDSTONE, dry, very compact.

Well Diagram

Remarks

Concrete pad to 0.5' bgs

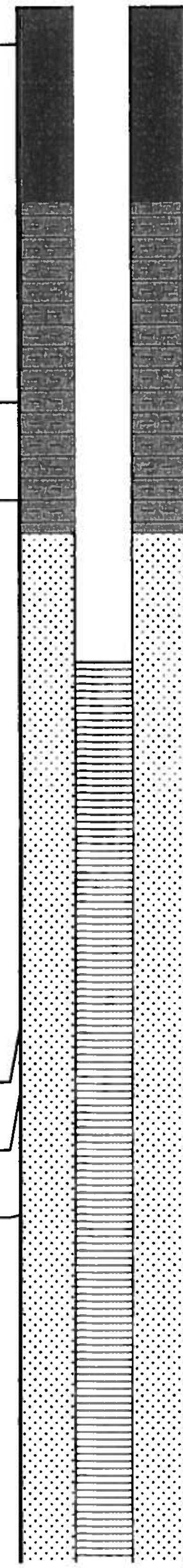
8-inch Sch. 80 steel surface casing to 25.0' bgs

Grout to 22.42' bgs

2-inch PVC riser to 29.5' bgs

Depth	Blow Counts	Recovery (inches)	PID Reading	Lithology	Geologic Description	Remarks
-20 to -25.5	50/3"	3	0.0		SILT: 20.0-25.5' Medium gray, SILT, trace white shells (marl), dry, very firm. Firm from 25.0' to 25.5'.	Bentonite from 22.42' to 27.5' bgs
-25.5 to -27	15 26 50 50/5"	24	0.0 0.0 0.0 0.0		SAND: 25.5-27.0' Greenish gray, coarse-grained SAND, trace medium-grained gravel, dry, compact, glauconitic.	Cable tool rig used to drill from 27.0' to 45.0'. Blow Counts, Recovery and PID readings could not be collected in this interval.
-27 to -36					SILT AND SAND: 27.0-36.0' Greenish gray, SILT and fine to coarse-grained SAND, saturated at 32.5', loose. SILT AND SAND: 27.0-36.0' Greenish gray, SILT and fine to coarse-grained SAND, saturated at 32.5', loose.	2-inch PVC, 0.010-inch slotted screen from 29.5' to 44.5' bgs #1 sand from 27.5' to 45.0' bgs
-36 to -38					SILT: 36.0-38.0' Greenish gray, SILT, trace medium-grained sand, dry.	
-38 to -43					SILT: 38.0-45.0' Greenish gray, SILT, trace medium-grained sand, trace fine to coarse-grained gravel.	

Well Diagram



Depth	Blow Counts	Recovery (inches)	PID Reading	Lithology	Geologic Description	Well Diagram	Remarks
44							
45							Borehole depth 45.0' bgs

MWH
MONTGOMERY WATSON HARZA

MWH Americas, Inc.
335 Phoenixville Pike
Malvern, Pennsylvania 19355

Well ID: MW-104S

Project Name:	Honeywell - Chesterfield
Location:	Chester, VA
Project Number:	2110898
Date Started:	7/24/03
Date Finished:	7/24/03
Drilling Company:	Eichelberger's Inc.
Drilling Method:	Hollow Stem Auger
Sampling Method:	Split Spoon
Boring Location:	Western Side of Acid Pond
Ground Elevation (ft/msl):	19.42'
Total Depth (ft):	19.5'
Boring Diameter (in):	6 1/4"
Water Level During Drilling (ft/bgs):	15.0'
Weather Conditions:	Overcast, humid, 90 deg. F
Logged By:	S. Bouclier

Depth (ft)	Blow Counts	Recovery (inches)	PID Reading
0-2	1, 3, 2, 3	16	0.0, 0.0, 0.0
5-7	1, 2, 2, 2	4	14.8
10-12	3, 7, 9, 12	17	1350, 1056, 1155
15-17	WOH, 1	8	218, 6803

Geologic Description

SILT: 0.0-0.2' Dark brown, SILT, trace fine-grained sand an gravel, moist, firm, abundant rootlets.

SAND AND GRAVEL: 0.2-0.4' White to light gray, fine-grained SAND and medium-grained GRAVEL, dry, loose, concrete-like.

SILT: 0.4-4.0' Medium orangish brown, SILT, trace fine-grained sand and mica, damp to dry, firm.

SILT: 4.0-4.4' Medium brown with creme colored to black mottles, SILT, trace fine-grained gravel, dry, firm.

SILT: 4.4-10.0' Olive brown with tan to gray mottles, SILT, trace clay and mica, dry, moderately firm.

SAND: 10.0-12.0' Medium brown, fine-grained SAND, trace mica, moist, loose. Color change to reddish tan from 11.0' to 11.2'. Lense of silt and slight solvent odor from 11.2' to 11.3'.

SILT: 12.0-12.5' Medium brown, SILT, trace fine-grained sand and gravel, moist, moderately firm to soft.

SAND: 12.5-14.0' Medium brown, fine-grained SAND, trace mica, damp, loose.

SAND: 14.0-15.4' Medium orangish brown, fine to medium-grained SAND, trace coarse-grained sand, gravel and mica, saturated, loose, solvent odor present.

SILT: 15.4-16.0' Grayish tan, SILT, little clay, trace mica, damp to dry, very soft.

SAND: 16.0-17.0' Orangish brown, medium-grained SAND, some fine-grained sand, trace coarse-grained sand and medium-grained gravel, saturated, loose, solvent odor. Lense of dark brown medium-grained sand at 17.0'.

SAND: 17.0-19.0' Medium to dark brown, medium to coarse-grained SAND, some fine-grained sand, wet, loose, poorly sorted.

Well Diagram

Remarks

crete pad .5' bgs

ch Sch. 80 l surface ng to 2.0'

ut to 4.5'

tonite from to 6.8' bgs

ch PVC to 9.5'

ch PVC, 0-inch ted screen n 9.5' to ' bgs

and from to 19.5'

ehole th 19.5'

Blow Counts	Recovery (inches)	PID Reading	Lithology	Geologic Description	Well Diagram	Remarks
				SILT: 19.0-19.5' Dark gray to black, SILT, some white shells (marl), dry, firm.		

MWH
MONTGOMERY WATSON HARZA

MWH Americas, Inc.
335 Phoenixville Pike
Malvern, Pennsylvania 19355

Well ID: MW-104D

Project Name:	Honeywell - Chesterfield	**Boring Location:**	Southeast Corner of Sprayfield #2
Location:	Chester, VA	**Ground Elevation (ft/msl):**	19.47'
Project Number:	2110898	**Total Depth (ft):**	40.0'
Date Started:	7/7/03	**Boring Diameter (in):**	8 1/4"
Date Finished:	8/25/03	**Water Level During Drilling (ft/bgs):**	29.0'
Drilling Company:	Eichelberger's Inc.	**Weather Conditions:**	Showers, 80 deg. F
Drilling Method:	Hollow Stem Auger/Cable Tool	**Logged By:**	S. Bouclier/S. Knoflicek
Sampling Method:	Split Spoon/Bailer		

Depth (ft)	Blow Counts	Recovery (inches)	PID Reading
0 to -2	2, 4, 32, 18	15	0.0, 0.0, 0.0
-2 to -4	4, 3, 3, 4	12	0.0, 0.0, 0.0
-4 to -6	3, 3, 4, 4	16	0.0, 0.0, 0.0
-6 to -8	1, 1, 2, 4	18	0.0, 0.0, 0.0, 0.0
-8 to -10	3, 3, 3, 4	18	0.0, 40.1, 76.7, 450
-10 to -12	5, 6, 7, 8	12	1267, 1424, 1015
-12 to -14	17, 17, 19, 16	12	1170, 1234
-14 to -16	10, 7, 9, 12	24	1351, 1414, 1802, 2903
-16 to -18	3, 3, 5, 6	12	4151, 9999, 1474
-18 to -20	3, 4, 9	18	8021, 1937

Geologic Description

SILT: 0.0-0.5' Dark brown, SILT, trace fine-grained sand and gravel, moist, firm, abundant rootlets.

SILT: 0.5-1.0' Dark brown, SILT, trace fine-grained sand and gravel, moist, firm.

SAND AND GRAVEL: 1.0-2.0' White to light gray, fine-grained SAND and coarse-grained GRAVEL, dry, very compact, concrete-like.

SILT: 2.0-4.0' Medium brown, SILT, trace fine-grained sand and gravel, moist, moderately firm to soft. Lense of white to light gray, fine-grained sand and coarse-grained gravel at 3.3'.

SILT: 4.0-4.4' Medium brown with creme colored to black mottles, SILT, trace fine-grained gravel, dry, firm.

SILT: 4.4-10.0' Olive brown with tan to gray mottles, SILT, trace clay and mica, dry, firm.

SAND: 10.0-12.0' Medium brown, fine-grained SAND, trace mica, damp, loose.

SILT: 12.0-12.5' Medium brown, SILT, trace fine-grained sand and gravel, moist, moderately firm to soft.

SAND: 12.5-14.0' Medium brown, fine-grained SAND, trace mica, damp, loose.

SAND: 14.0-15.5' Medium brown, fine-grained SAND, trace mica, damp, loose. Wet at 15.0'. Coarse-grained subrounded gravel at 15.5'.

SAND: 15.5-16.0' Medium brown, medium to coarse-grained SAND, some fine-grained sand, wet, loose, poorly sorted.

SAND: 16.0-19.0' Medium to dark brown, medium to coarse-grained SAND, some fine-grained sand, wet, loose, poorly sorted. Dark brown lense at 17.0'.

SILT: 19.0-23.5' Dark gray to black, SILT, some white shells

Well Diagram / Remarks

Concrete pad to 0.5' bgs.

8-inch Sch. 80 steel surface casing to 23.0' bgs

Grout to 25.0' bgs

2-inch PVC riser to 29.0' bgs

MWH
MONTGOMERY WATSON HARZA

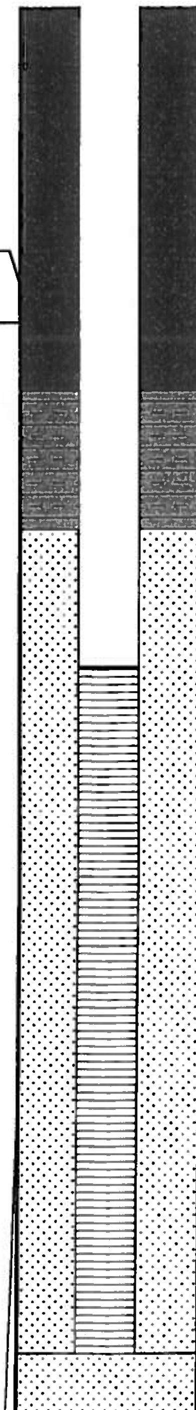
MWH Americas, Inc.
335 Phoenixville Pike
Malvern, Pennsylvania 19355

Well ID: MW-104D

Depth (ft)	Blow Counts	Recovery (inches)	PID Reading	Lithology / Geologic Description
-20	50/2'		515	(marl), dry, firm.
-20 to -22	1, 4, 4, 6	18	960, 205, 100, 45	
-22 to -24	13, 20, 47, 36	15	45, 54.2, 72.3	SAND: 23.5-24.0' Greenish gray, medium-grained SAND, dry, compact, glauconitic.
-24 to -40				SAND: 24.0-40.0' Greenish gray, fine to medium-grained SAND, some silt lenses, saturated at 29.0'.

SAND: 24.0-40.0' Greenish gray, fine to medium-grained SAND, some silt lenses, saturated at 29.0'.

Well Diagram



Remarks

Cable tool rig used to drill from 24.0' to 40.0'. Blow Counts, Recovery and PID readings could not be collected in this interval.

Bentonite from 25.0' to 27.0' bgs

#1 sand from 27.0' to 40.0" bgs

2-inch PVC, 0.010-inch slotted screen from 29.0' to 39.0' bgs

Borehole Depth 40.0' bgs

MWH
MONTGOMERY WATSON HARZA

MWH Americas, Inc.
335 Phoenixville Pike
Malvern, Pennsylvania 19355

Well ID: MW-105S

Project Name:	Honeywell - Chesterfield	**Boring Location:**	South Side of Acid Pond
Location:	Chester, VA	**Ground Elevation (ft/msl):**	19.12'
Project Number:	2110898	**Total Depth (ft):**	22.0'
Date Started:	7/10/03	**Boring Diameter (in):**	6 1/4"
Date Finished:	8/21/03	**Water Level During Drilling (ft/bgs):**	14.0'
Drilling Company:	Eichelberger's Inc.	**Weather Conditions:**	Overcast, 88 deg. F
Drilling Method:	Hollow Stem Auger	**Logged By:**	S. Bouclier/S. Knoflicek
Sampling Method:	Split Spoon		

Depth (ft)	Blow Counts	Recovery (inches)	PID Reading
0-2	2, 5, 5, 6	18	0.0, 0.0, 0.0
5-7	1, 3, 5, 6	18	0.0, 0.0, 0.0
10-12	2, 3, 5, 5	18	0.0, 0.0, 0.0
15-17	3, 5, 3, 2	10	0.0, 0.0

Geologic Description

SILT: 0.0-0.3' Medium brown, SILT, trace mica, very trace fine-grained sand, moist, abundant rootlets.

SILT: 0.3-0.7' Medium brown, SILT, trace mica, damp, moderately firm, some rootlets.

SAND AND GRAVEL: 0.7-1.0' Light gray to white, fine-grained SAND and medium-grained GRAVEL, dry, loose.

SILT: 1.0-4.0' Orangish brown with tan to light grayish brown mottles, SILT, little to trace fine-grained sand and mica, dry, firm.

SILT: 4.0-6.0' Orangish brown, SILT, trace mica, dry, firm. Lenses of fine-grained sand at 4.2'. Medium-grained gravel 4.8'.

SILT: 6.0-8.0' Light brown, SILT, trace mica, dry, moderately firm. Color change to reddish brown at 7.5'.

SILT: 8.0-10.0' Reddish brown, SILT, little mica, dry, firm. Light brown mottles from 8.4' to 10.5'.

SAND: 10.0-12.0' Grayish light to medium brown, fine-grained SAND, trace mica and lenses of fine-grained sand, some silt and little mica, moist to wet. loose.

SAND: 12.0-13.6' Grayish light brown, fine-grained SAND, trace mica, moist to wet. Lenses of bluish gray clay with some silt, damp, very soft at 12.7', 13.0' and 13.5'.

SAND: 13.6-15.0' Grayish light brown, medium-grained SAND, some coarse-grained sand, trace mica, wet, loose.

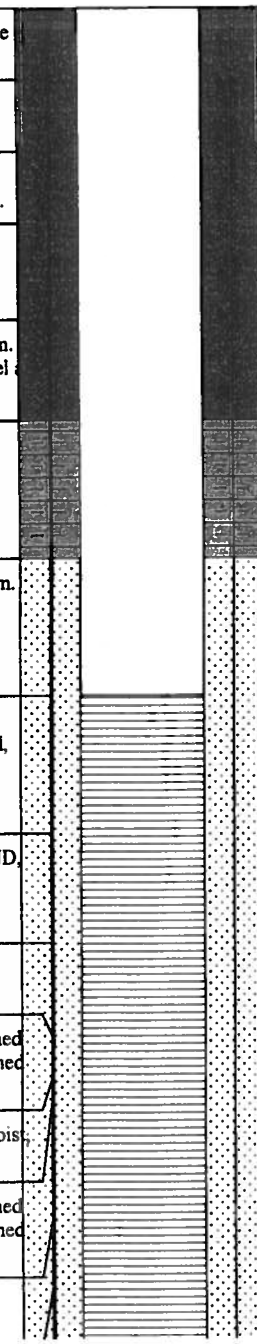
SAND: 15.0-15.5' Grayish medium brown, medium-grained SAND, some to little fine-grained sand, trace coarse-grained sand, saturated, loose.

SILT: 15.5-15.7' Light gray, SILT, trace clay, damp to moist, soft.

SAND: 15.7-17.5' Grayish medium brown, medium-grained SAND, some to little fine-grained sand, trace coarse-grained sand, saturated, loose.

SAND: 17.5-18.5' Grayish light brown, medium-grained SAND, some coarse-grained sand and medium-grained

Well Diagram



Remarks

crete pad
.5' bgs

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ng to 2.0'

ut to 6.0'

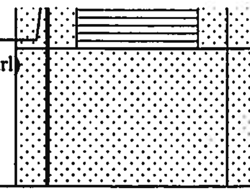
tonite from
' to 8.0' bgs

ch PVC
' to 10.0'

ch PVC,
0-inch
ed screen
n 10.0' to
' bgs

and from
to 20.0'

Depth	Blow Counts	Recovery (inches)	PID Reading	Lithology	Geologic Description	Well Diagram	Remarks
					gravel, trace mica, saturated. Purplish gray at 18.0'.		
-20	2		0.0		SILT: 18.5-22.0' Black, SILT, dry, firm. White shells (marl) from 19.5' to 22.0'.		
-21	3	22	0.0				
	5		0.0				ehole
-22	5		0.0				th 22.0'



MWH
MONTGOMERY WATSON HARZA

MWH Americas, Inc.
335 Phoenixville Pike
Malvern, Pennsylvania 19355

Well ID: MW-105D

Project Name: Honeywell - Chesterfield
Location: Chester, VA
Project Number: 2110898
Date Started: 7/10/03
Date Finished: 8/21/03
Drilling Company: Eichelberger's Inc.
Drilling Method: Hollow Stem Auger/Cable Tool
Sampling Method: Split Spoon/Bailer

Boring Location: South Side of Acid Pond
Ground Elevation (ft/msl): 19.27'
Total Depth (ft): 40.6'
Boring Diameter (in): 8 1/4"
Water Level During Drilling (ft/bgs): 28.5'
Weather Conditions: Overcast, 88 deg. F
Logged By: S. Bouclier/S. Knoflicek

Depth (ft)	Blow Counts	Recovery (inches)	PID Reading
0 to -2	2, 4, 6, 6	19	0.0, 0.0, 0.0
-2 to -4	6, 7, 7, 6	19	0.0, 0.0, 0.0
-4 to -6	6, 6, 5, 4	22	0.0, 0.0, 0.0, 0.0
-6 to -8	2, 3, 3, 4	16	0.0, 0.0, 0.0
-8 to -10	7, 6, 9, 9	24	0.0, 0.0, 0.0, 0.0
-10 to -12	1, 4, 5, 4	18	0.0, 1.0, 0.1, 0.0
-12 to -14	6, 7, 8, 8	24	0.0, 0.0, 0.0
-14 to -16	4, 2, 3, 3	16	0.3, 1.1, 0.5
-16 to -18	1, 1, 5, 17	8	0.1, 0.1
-18 to -19	5, 2, 2	20	0.5, 0.5, 2.1

Lithology / Geologic Description

SILT: 0.0-0.6' Dark brown, SILT, very trace fine-grained sand, moist, abundant rootlets. Medium-grained gravel at 0.5'.

SAND AND GRAVEL: 0.6-0.9' Grayish tan, fine-grained SAND and medium-grained GRAVEL, dry, loose.

SILT: 0.9-4.0' Orangish brown with light gray to red mottles, SILT, trace mica, dry, firm.

SILT: 4.0-6.0' Orangish brown, SILT, trace mica, dry, firm. Lenses of fine-grained sand at 4.2'. Medium-grained gravel at 4.8'.

SILT: 6.0-8.0' Light brown, SILT, trace mica, dry, moderately firm. Trace wood fragments at 7.0'. Color change to reddish brown at 7.5'.

SILT: 8.0-10.5' Reddish brown, SILT, little mica, dry, firm. Light brown mottles from 8.4' to 10.5'.

SAND: 10.5-12.0' Grayish light brown, fine-grained SAND, trace mica, moist to wet, loose.

SAND: 12.0-13.6' Grayish light brown, fine-grained SAND, trace mica, moist to wet. Lenses of bluish gray clay with some silt, damp, very soft at 12.7', 13.0', and 13.5'.

SAND: 13.6-18.0' Grayish light brown, medium-grained SAND, some coarse-grained sand, trace mica, wet, loose. Trace fine to medium-grained subrounded gravel at 17.0'.

SAND: 18.0-18.5' Grayish light brown, medium-grained SAND, some coarse-grained sand and medium-grained gravel, trace mica, saturated. Purplish gray at 18.0'.

SILT: 18.5-23.0' Black, SILT, dry, firm. White shells (marl) from 19.5' to 23.5'.

Well Diagram

Remarks

- Concrete pad to 0.5' bgs
- 8-inch Sch. 80 steel surface casing to 23.0' bgs
- Grout to 25.42' bgs
- 2-inch PVC riser to 30.17' bgs

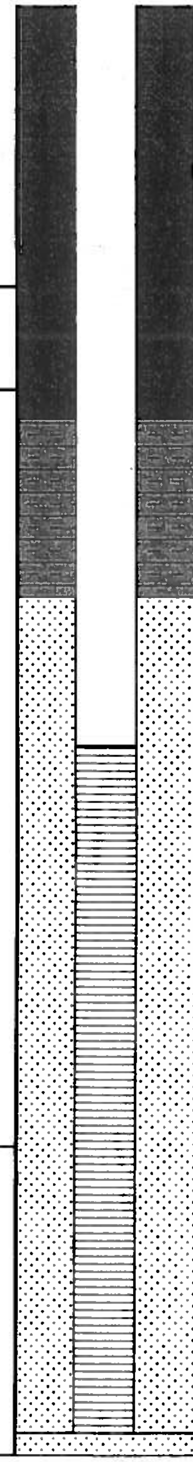
MWH
MONTGOMERY WATSON HARZA

MWH Americas, Inc.
335 Phoenixville Pike
Malvern, Pennsylvania 19355

Well ID: MW-105D

Depth	Blow Counts	Recovery (inches)	PID Reading	Lithology	Geologic Description	Remarks
-19.5 to -20	3		1.7			
-21.5	50/0	NR	NR			Cable tool rig used to drill from 25.0' to 40.6'. Blow Counts, Recovery and PID readings could not be collected in this interval.
-23 to -25	10 23 37 34	24	0.0 0.0 0.0 0.0		SAND: 23.5-25.0' Greenish gray, medium to coarse-grained SAND, dry, compact, glauconitic.	
-25 to -36					SAND: 25.0-36.0' Greenish gray, fine to coarse-grained SAND, some silt lenses, saturated at 28.5'.	Bentonite from 25.42' to 28.0' bgs #1 sand from 28.0' to 40.5' bgs 2-inch PVC, 0.010-inch slotted screen from 30.17' to 40.17' bgs
-36 to -40.5					SILT: 36.0-40.6' Greenish gray, lenses of SILT and fine-grained SAND.	Borehole Depth 40.5' bgs

Well Diagram



NUS CORPORATION
A Halliburton Company

PROJECT: ALLIED CHESTERFIELD
PROJECT NO.: 8911 BORING: NW12-1
ELEVATION: DATE: 8/23/88
FIELD GEOLOGIST: LYNN SCHOLL

SAMPLE NO.,TYPE * & DEPTH (ft)	BLOWS/SIX INCHES OR RQD (%)	SAMPLE RECOVERY/ SAMPLE LENGTH (ft)	MATERIAL MOISTURE & WATER DEPTH (ft)	MATERIAL DESCRIPTION* SOIL DENSITY/ CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENNESS	REMARKS
0'-2'	7	1.5'		DENSE	RUSTY BROWN W/BLACK	CLAY SILT; SLIGHTLY MOIST;		CHUNKS OF
	17					[SOME MICA THROUGHOUT; SOME		CONCRETE AT .5'
	22					GRAVELS]		SAMPLE # NW12-1-S1
	10							
5'-7'	5	1.4'		MEDIUM	RUSTY BROWN	CLAY SILT; SLIGHTLY MOIST;		STREAKS OF
	7			DENSE		[CRUMBLED EASILY] MICA		BROWN RUNNING
	17							THROUGHOUT
	18							SAMPLE # NW12-1-S2
8.5'-10.5'	2	1.4'		MEDIUM	RUSTY	CLAY SILT [0'-1']; MOIST + LOOSE		SPECKS OF YELLOW
	7			DENSE	BROWN	FINE GRAINED SAND + SILT [1'-1.4']		+ BROWN THRUOUT
	7					CONDENSATION AT 10'.		SAMPLE # NW12-1-S3
	11							
14'-16'	6	1.35'	▽15' 8/23/88	MEDIUM	BROWN + GREY	SILTY SAND; WET; [SOME MICA]		CONSISTENT
	4			DENSE		MEDIUM GRAINED		THROUGHOUT
	9							SAMPLE
	9							NW12-1-S4
20'-22'	9	.75'		VERY DENSE	BROWNISH GREY	COARSE SAND: [0'-.6'] SLIGHTLY MOIST,		HIGHLY CONSOLIDATED
	3				BLUISH GREEN GREY	CLAY SILT [.6'-.75'] SLIGHTLY MOIST		GREY SOIL CONTAINING
	51/4"*					[MARL = FOSSILIFEROUS CLAY SILT - GREY]		DECOMPOSING SHELLS W/ SPECKS
								OF LIGHT PINK + GREEN
								AT END OF CORE
								BARREL
								SAMPLE # NW12-1-S5

REMARKS * AUGER REFUSAL

BORING: NW12-1

SEE LEGEND ON BACK

PAGE 1 OF 1

NUS CORPORATION

FIELD WELL COMPLETION FORM

JOB NAME: ALLIED - CHESTERFIELD

JOB NUMBER: 8911 | PROJECT MANAGER: G. GARTSEFF

LOGGED BY: L. SCHOLL | EDITED BY:

WELL NAME: NW 12-1 | DATE: 8-23-88

DRILLING COMPANY: HARDIN - HUBER, INC.

EQUIPMENT: ☒ ______ INCH HOLLOW STEM AUGER ☐ ______ INCH ROTARY WASH | DRILLER: Don | HOURS DRILLED:

GALLONS OF WATER USED DURING DRILLING: ______ GALLONS

METHOD OF DECONTAMINATION PRIOR TO DRILLING: STEAM CLEAN

DEVELOPMENT

METHOD OF DEVELOPMENT:

DEVELOPMENT BEGAN DATE: ______ TIME:

YIELD:	TIME:	DATE:
GPM	FROM TO	
GPM	FROM TO	
GPM	FROM TO	
GPM	FROM TO	

TOTAL WATER REMOVED DURING DEVELOPMENT: ______ GALLONS

DESCRIPTION OF TURBIDITY AT END OF DEVELOPMENT: ☐ CLEAR ☐ SLIGHTLY CLOUDY ☐ MOD. TURBID ☐ VERY MUDDY

ODOR OF WATER:

WATER DISCHARGED TO: ☐ GROUND SURFACE ☐ TANK TRUCK ☐ STORM SEWERS ☐ STORAGE TANK ☐ DRUMS ☐ OTHER ______

DEPTH TO WATER AFTER DEVELOPMENT: ______ FEET

MATERIALS USED

______ SACKS OF ______ SAND

______ SACKS OF ______ CEMENT

______ GALLONS OF GROUT USED

______ SACKS OF POWDERED BENTONITE

______ POUNDS OF BENTONITE PELLETS

______ FEET OF ______ INCH PVC BLANK CASING

______ FEET OF ______ INCH PVC SLOTTED SCREEN

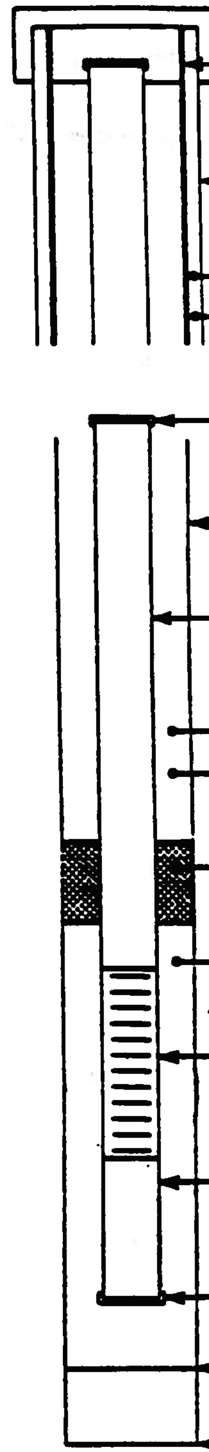
______ $YARD^3$ CEMENT-SAND (REDI-MIX) ORDERED

______ $YARD^3$ CEMENT-SAND (REDI-MIX) USED

CONCRETE PUMPER USED? ☐ NO ☐ YES

NAME ______

WELL COVER USED: ☒ LOCKING STEEL COVER ☐ CHRISTY BOX ☐ OTHER ______



☐ CHRISTY BOX

☒ LOCKING STEEL COVER

6 INCH DIAMETER STEEL CONDUCTOR CASING ______ to ______ feet

6 INCH DIAMETER BOREHOLE 0 to 22 feet

☒ BENTONITE-CEMENT SEAL OR ☐ 8-SACK CEMENT-SAND SEAL 0 to 5 feet

TOP OF CASING AT ______ FEET ABOVE AT BELOW GROUND LEVEL

6 INCH DIAMETER BOREHOLE 0 to 22 feet

2 INCH DIAMETER SCHEDULE 40 PVC BLANK CASING 0 to 10.5 feet

☒ BENTONITE-CEMENT SEAL OR ☐ 8-SACK CEMENT-SAND SEAL 0 to 5 feet

BENTONITE PELLET SEAL 5 to 7 feet

(NAME) (NUMBER) SAND PACK * 7 to 16.5 feet

2 INCH DIAMETER SLOTTED (.010 inch) SCREEN 10.5 to 20.5 feet

~~______ INCH DIAMETER SCHEDULE 40 PVC BLANK SILT TRAP ______ to ______ feet~~

BOTTOM WELL CAP 20.5 feet

HOLE CLEANED OUT TO 20.5 feet

BOTTOM OF BOREHOLE 22 feet

NOT TO SCALE

ADDITIONAL INFORMATION:
* Boring caved around screen from 16.5'-22.0'
WOR 15'

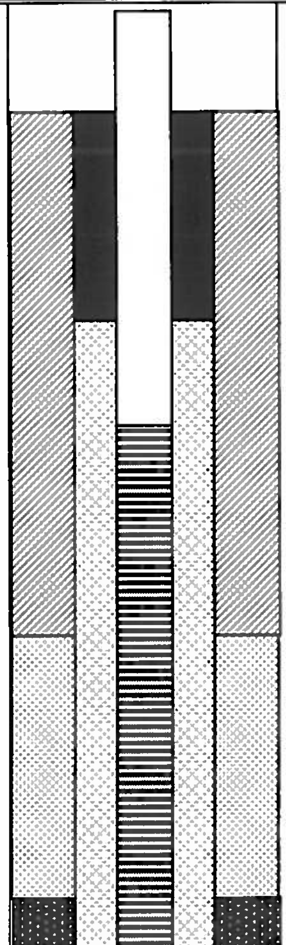
NW 12-1

MACTEC
Engineering & Consulting, Inc.
3205 Militia Hill Road, Plymouth Meeting, PA 19462

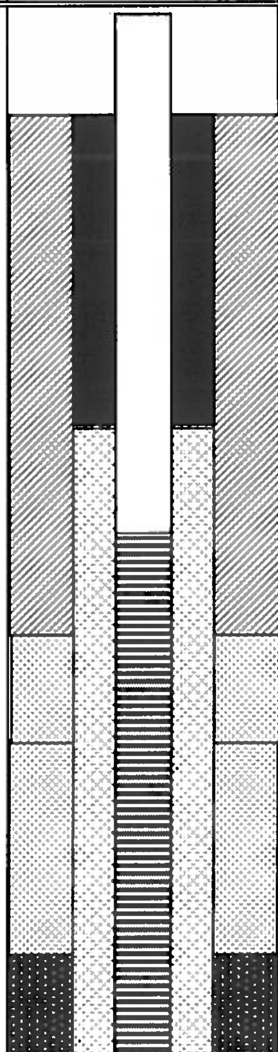
Project No.	3485060087.2100	**Page**	1 of 1
Boring No.	**PZ-04-14**	**Drilling Rig:**	CME All Terrain Rig
Contractor:	Fishburne Drilling	**Drilling Method:**	Hollow-Stem Auger
Drill Crew:	Sonny	**Sampling Method:**	2 ft. Split Spoon Sampler
Date Started:	9/28/2006	**Date Finished:**	9/28/2006
Logged by:	Charlie Charlesworth	**First water during drilling (feet bgs):**	10
Bentonite Grout:	NA		
Cement	NA		
Well Screen:	0.0020-Slot		

Project Name and Location:
Honeywell - Chesterfield
4101 Bermuda Hundred Road
Chester, VA

Surface Elevation:	16.873 ft. amsl
Top of Casing Elevation:	18.895 ft. amsl
Screened Interval:	6-16 ft
Sand Pack:	4-16 ft
Bentonite Seal	0-4 ft

DEPTH (feet)	SOIL OR GROUNDWATER SAMPLE INTERVAL (feet)	PID (ppm)	LITHOLOGY	SOIL DESCRIPTION
0		0		0-1 ft Organics
		-		
1		-		1-10 ft Brown Silt with Clay and Sand
		-		
2		-		
		-		
3		-		
		-		
4		-		
		-		
5		1.3		
		1.1		
6		0.7		
		1.8		
7		24.4		
		-		
8		-		
		-		
9		-		
		-		
10		9.8		10-16 ft Gray Sand, Wet
		5.7		
11		8.4		
		-		
12		45		
		153		
13		175		
		181		
14		2500		
		3000		
15		1200		15 ft Gray/Green Silt with shells (Marl)
		35		
16				16 ft Total Depth of Borehole

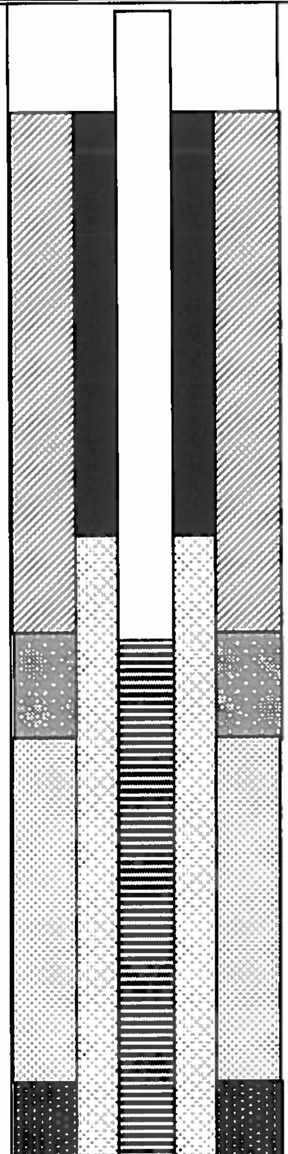
MACTEC *Engineering & Consulting, Inc.* 5205 Militia Hill Road, Plymouth Meeting, PA 19462	**Project No.** 3485060087.2100 **Boring No.** PZ-04-15 **Contractor:** Fishburne Drilling	**Page** 1 of 1 **Drilling Rig:** CME All Terrain Rig **Drilling Method:** Hollow-Stem Auger	
Project Name and Location: Honeywell - Chesterfield, 4101 Bermuda Hundred Road, Chester, VA	**Drill Crew:** Sonny **Date Started:** 9/27/2006	**Sampling Method:** 2 ft. Split Spoon Sampler **Date Finished:** 9/27/2006	
Surface Elevation: 18.419 ft. amsl **Top of Casing Elevation:** 21.070 ft. amsl	**Logged by:** Charlie Charlesworth	**First water during drilling (feet bgs):** 14	
Screened Interval: 8-18 ft **Sand Pack:** 6-18 ft **Bentonite Seal** 0-6 ft	**Bentonite Grout:** NA **Cement** NA **Well Screen:** 2-in. 0.0020-Slot		

DEPTH (feet)	SOIL OR GROUNDWATER SAMPLE INTERVAL (feet)	PID (ppm)	LITHOLOGY	SOIL DESCRIPTION
				
0		0		0-1 ft Organics
		-		
1		-		1-10 ft Brown Silt
		-		
2		-		
		-		
3		-		
		-		
4		-		
		-		
5		1.1		
		1.2		
6		0.8		
		9.1		
7		-		
		-		
8		-		
		-		
9		-		
		-		
10		2.2		10-12 ft Brown Sand
		2.7		
11		2.8		
		3.2		
12		5.7		12-16 ft Gray Sand, wet
		18		
13		16		
		34		
14		100		
		-		
15		120		
		-		
16		100		16 ft Gray/Green Silt with shells (Marl)
		-		
17		-		
		-		
18				18 ft Total Depth of Borehole

MACTEC
Engineering & Consulting, Inc.
5205 Militia Hill Road, Plymouth Meeting, PA 19462

Project Name and Location: Honeywell - Chesterfield, 4101 Bermuda Hundred Road, Chester, VA		**Project No.**	3485060087.2100	**Page**	1 of 1
		Boring No.	PZ-04-16	**Drilling Rig:**	CME All Terrain Rig
		Contractor:	Fishburne Drilling	**Drilling Method:**	Hollow-Stem Auger
		Drill Crew:	Sonny	**Sampling Method:**	2 ft. Split Spoon Sampler
		Date Started:	9/27/2006	**Date Finished:**	9/27/2006
Surface Elevation:	18.419 ft. amsl				
Top of Casing Elevation:	20.044 ft. amsl	**Logged by:**	Charlie Charlesworth	**First water during drilling (feet bgs):**	14
Screened Interval:	10-20 ft	**Bentonite Grout:**	NA		
Sand Pack:	8-20 ft	**Cement**	NA		
Bentonite Seal	0-8 ft	**Well Screen:**	2-in. 0.0020-Slot		

DEPTH (feet)	SOIL OR GROUNDWATER SAMPLE INTERVAL (feet)	PID (ppm)	LITHOLOGY	SOIL DESCRIPTION
0		0		0-1 ft Organics
		-		
1		-		1-10 ft Brown Silt
		-		
2		-		
		-		
3		-		
		-		
4		-		
		-		
5		1.5		
		2.3		
6		1.7		
		1.1		
7		-		
		-		
8		-		
		-		
9		-		
		-		
10		1.9		10-12 ft Brown Silty Sand
		1.9		
11		2.5		
		1.9		
12		1.5		12-18.5 ft Gray to Dark Grey Sand
		1.9		
13		1.3		
		-		
14		1.9		
		2.1		
15		1.8		
		1.2		
16		10.5		
		20.8		
17		25.6		
		37.9		
18		100		
		98		18.5-20 ft Gray/Green Silt with shells (Marl)
19		105		
		123		
20				20 ft Total Depth of Borehole



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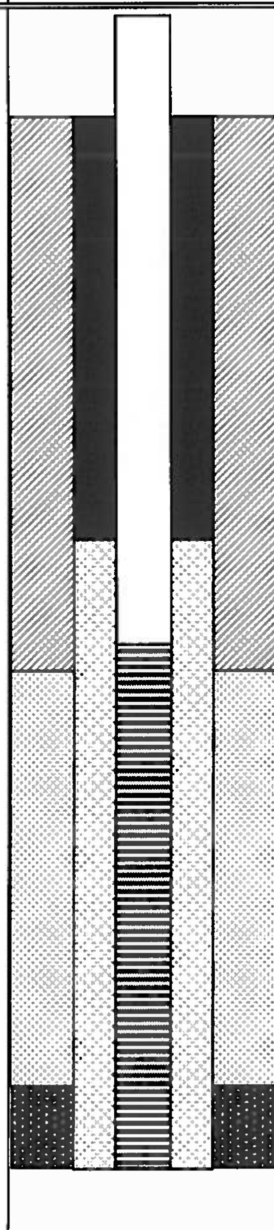
Engineering & Consulting, Inc.
5205 Militia Hill Road, Plymouth Meeting, PA 19462

Project No.	3485060087.2100	**Page**	1 of 1
Boring No.	**PZ-04-17**	**Drilling Rig:**	CME All Terrain Rig
Contractor:	Fishburne Drilling	**Drilling Method:**	Hollow-Stem Auger
Drill Crew:	Sonny	**Sampling Method:**	2 ft. Split Spoon Sampler
Date Started:	9/27/2006	**Date Finished:**	9/27/2006
Logged by:	Charlie Charlesworth	**First water during drilling (feet bgs):**	14
Bentonite Grout:	NA		
Cement	NA		
Well Screen:	2-in. 0.0020-Slot		

Project Name and Location:
Honeywell - Chesterfield
4101 Bermuda Hundred Road
Chester, VA

Surface Elevation:	20.16 ft msl
Top of Casing Elevation:	21.25 ft msl
Screened Interval:	10-20 ft
Sand Pack:	8-20 ft
Bentonite Seal	0-8 ft

DEPTH (feet)	SOIL OR GROUNDWATER SAMPLE INTERVAL (feet)	PID (ppm)	LITHOLOGY	SOIL DESCRIPTION
0		0		0-1 ft Organics
		-		
1		-		1-10 ft Brown Silt with little Sand
		-		
2		-		
		-		
3		-		
		-		
4		-		
		-		
5		1.4		
		3.6		
6		3.6		
		3.8		
7		-		
		-		
8		-		
		-		
9		-		
		-		
10		1.3		10-10.5 ft Brown Silt
		1.9		10.5-14 ft Brown, Fine-grained Sand
11		2.7		
		2.5		
12	12-14 ft Sample Taken	1.9		
		5.5		
13		5.1		
		4.7		
14		1.3		14-18.5 ft Gray Sand, wet
		4.9		
15		4.9		
		-		
16		1.5		
		1.6		
17		1.9		
		2.1		
18		49		
		106		18.5 ft Gray/Green Silt with shells (Marl)
19		250		
		250		
20				20 ft Total Depth of Borehole



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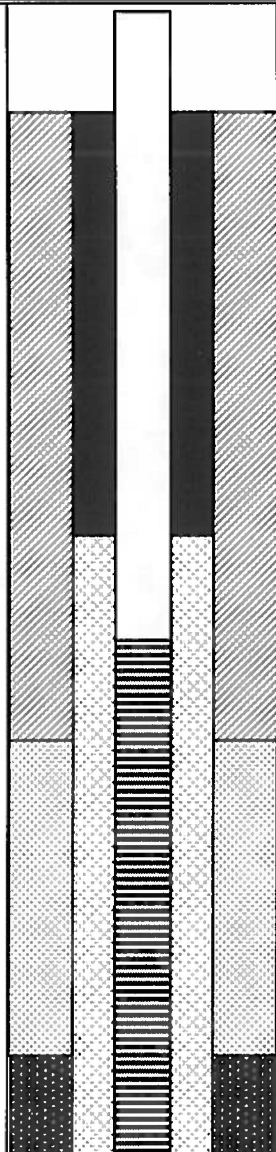
5205 Militia Hill Road, Plymouth Meeting, PA 19462

Project No.	3485060087.2100	**Page**	1 of 1
Boring No.	PZ-04-18	**Drilling Rig:**	CME All Terrain Rig
Contractor:	Fishburne Drilling	**Drilling Method:**	Hollow-Stem Auger
Drill Crew:	Sonny	**Sampling Method:**	2 ft. Split Spoon Sampler
Date Started:	9/27/2006	**Date Finished:**	9/27/2006
Logged by:	Charlie Charlesworth	**First water during drilling (feet bgs):**	14
Bentonite Grout:	NA		
Cement	NA		
Well Screen:	2-in. 0.0020-Slot		

Project Name and Location:
Honeywell - Chesterfield
4101 Bermuda Hundred Road
Chester, VA

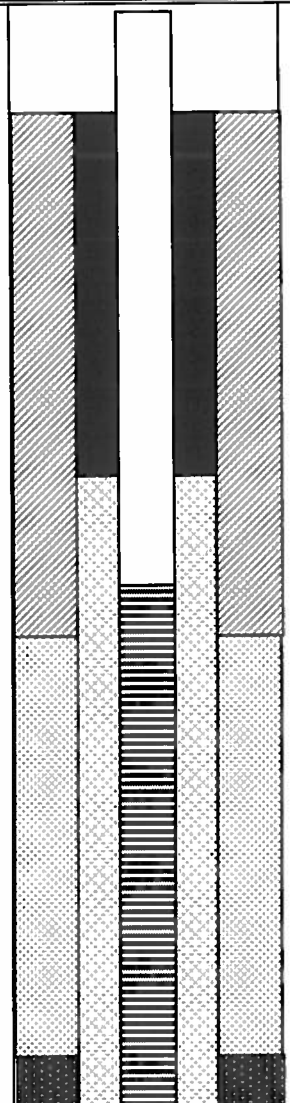
Surface Elevation:	20.008 ft. amsl
Top of Casing Elevation:	21.428 ft. amsl
Screened Interval:	10-20 ft
Sand Pack:	8-20 ft
Bentonite Seal	0-8 ft

LITHOLOGY



DEPTH (feet)	SOIL OR GROUNDWATER SAMPLE INTERVAL (feet)	PID (ppm)	SOIL DESCRIPTION
0		0	0-1 ft Organics
		-	
1		-	1-7 ft Brown Silt
		-	
2		-	
		-	
3		-	
		-	
4		-	
		-	
5		0	
		0	
6		0	
		-	
7		-	7-12 ft Brown Silt, Strong odor
		-	
8		-	
		-	
9		1.7	
		5	
10		1.2	
		3.1	
11		2.2	
		0.7	
12	12-14 ft Sample Taken	1.4	12-14 ft Brown Sand, moist to wet
		1.6	
13		2.1	
		1.7	
14		2.4	14-18 ft Brown to Grayish Brown Sand, wet
		-	
15		-	
		-	
16		3.0	
		3.2	
17		8.4	
		7.9	
18		35	18 ft Gray/Green Silt with shells (Marl)
		73.6	
19		100	
		84.7	
20		91.9	20 ft Total Depth of Borehole

MACTEC *Engineering & Consulting, Inc.* 5205 Militia Hill Road, Plymouth Meeting, PA 19462	**Project No.** 3485060087.2100 **Boring No.** PZ-04-19 **Contractor:** Fishburne Drilling	**Page** 1 of 1 **Drilling Rig:** CME All Terrain Rig **Drilling Method:** Hollow-Stem Auger	
Project Name and Location: Honeywell - Chesterfield, 4101 Bermuda Hundred Road, Chester, VA	**Drill Crew:** Sonny **Date Started:** 9/28/2006	**Sampling Method:** 2 ft. Split Spoon Sampler **Date Finished:** 9/28/2006	
Surface Elevation: 19.956 ft.amsl **Top of Casing Elevation:** 21.398 ft. amsl	**Logged by:** Charlie Charlesworth	**First water during drilling (feet bgs):** 14	
Screened Interval: 9-19 ft **Sand Pack:** 7-19 ft **Bentonite Seal** 0-7 ft	**Bentonite Grout:** NA **Cement** NA **Well Screen:** 2-in. 0.0020-Slot		

DEPTH (feet)	SOIL OR GROUNDWATER SAMPLE INTERVAL (feet)	PID (ppm)	LITHOLOGY	SOIL DESCRIPTION
0		-		0-1 ft Organics
		-		
1		-		1-10 ft Brown Silt
		-		
2		-		
		-		
3		-		
		-		
4		-		
		-		
5		-		
		-		
6		-		
		-		
7		-		
		-		
8		-		
		-		
9		-		
		-		
10		-		10-18 ft Brown Sand
		-		
11		-		
		-		
12		-		
		-		
13		-		
		-		
14		28		14 ft Brown Sand, Wet
		14		
15		10		
		35		
16		48		
		30		
17		35		
		122		
18		100		18 ft Gray/Green Silt with shells (Marl)
		187		
19		250		19 ft Total Depth of Borehole
		-		
		-		

MACTEC — SOIL BORING: SB-04-13

PROJECT Honeywell Chesterfield		**PROJECT LOCATION** Chesterfield, VA		**PROJECT NO.**
CLIENT Honeywell			**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	**START DATE** 10/18/2004	**FINISH DATE** 10/18/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH** 17.3	**CASING**	**AUGER**
SOIL DRILLED(FT) 17.3	**ROCK DRILLED(FT)**	**INSPECTOR**	**PIEZ** ☐ **BORING** ☐	**WELL** ☐

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
							0-5': brown, slightly sandy silt, moist					
1										0		Piezometer installed to depth of 14.3', screened from 4.3'-14.3'
2										0		
3									9:30	0		Sample collected 30062-0006-03
4										0		
5										0		
							5'-8.5': Olive green, clayey silt, moist					
6										0		
								10:20				Sample collected 30062-0006-03
7										0		
8										5.7		
							8.5'-8.7': Dark black product saturated, strong VOC/product smell, wet	9:45				Sample collected 30062-0006-02
9							8.7'-16': Tannish brown silt, moist, VOC/chlorinated smell			202		
10										100		
11										100		
12										98		
13										87		
												13.5' free phase product detected
14										65		
15										75		15'-15.5' free phase product detected
16										132		

MACTEC | SOIL BORING: SB-04-13

Depth (ft)	Sample #	Recovery	Sample Type	Sptli Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample			Remarks
17							16'-17.3': Greenish, fine to medium sand, strong chlorinated smell, wet		10:30	73		Sample collected 30062-0006-04
18							17.3' end of boring, refusal					
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												

MACTEC SOIL BORING: SB-04-14

PROJECT Honeywell Chesterfield		**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**	
CLIENT Honeywell			**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	**START DATE** 10/18/2004	**FINISH DATE** 10/18/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH** 18	**CASING**	**AUGER**
SOIL DRILLED(FT) 18 / **ROCK DRILLED(FT)**	**INSPECTOR**		**PIEZ** / **BORING**	**WELL**

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-10': brown slightly sandy silt, moist					
1										0		
2										0		
3										1.6		
4										0		
5										0		
6										0		
7									11:45	1.2		Sample collected 30062-0006-05
8										6.7		
9										3.7		
10							10'-13': Olive green, clayey silt, moist			23.7		
11										9.2		
12										57.2		
13							13'-15': Tannish brown, fine sand, with 2" layers of layey silt, some layers of rust			72.3		
14									11:50	354		Sample collected 30062-0006-06
15							15'-18': Tannish brown, silty fine to coarse sand, wet at 16'			180		
16										199		

Depth (ft)	Sample #	Recovery	Sample Type	Sptli Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample			Remarks
17									11:55	214		Sample collected 30062-0006-04
18										227		
19–34							18' End of boring, refusal					

MACTEC — SOIL BORING: SB-04-15

PROJECT Honeywell Chesterfield	**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**	
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	**START DATE** 10/18/2004 / **FINISH DATE** 10/18/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH** 19.3	**CASING** / **AUGER**
SOIL DRILLED(FT) 19.3 / **ROCK DRILLED(FT)**	**INSPECTOR**		**PIEZ** ☐ **BORING** ☐ **WELL** ☐

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-11': orangish brown, slightly sandy silt, moist					
1										0		
2										13		
3										80.5		
4										97		
5										68		
6									13:45	25		Sample Collected
7										30		
8										28		
9										70		
10									13:50	100		Sample Collected
11							11'-18': Tan and orange, slightly silty fine sand, moist, 2" lenses of silt, some rust colors at 2" lenses of silt, some rust colors at 11.5'			68		
12										33		
13							13'-15': Tannish brown, fine sand, with 2" layers of layey silt, some layers of rust			39		
14										55		
15							15'-18': Tannish brown, silty fine to coarse sand, wet at 16'			11		
16										36		

MACTEC — SOIL BORING: SB-04-15

Depth (ft)	Sample #	Recovery	Sample Type	Sptli Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample			Remarks
17										9.6		
18							18'-19.3': Dark black to grey fine to coarse sand, wet, visible product staining		13:55	13.9		Sample Collected
19							19.3' End of boring, refusal			64		
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												

MACTEC — SOIL BORING: SB-04-16

PROJECT Honeywell Chesterfield	**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**	
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	**START DATE** 10/18/2004 / **FINISH DATE** 10/18/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH** 18.8	**CASING** / **AUGER**
SOIL DRILLED(FT) 18.8 / **ROCK DRILLED(FT)**	**INSPECTOR**		**PIEZ** / **BORING** / **WELL**

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-11': orangish brown, slightly sandy silt, moist					
1										0		
2									14:50	2.4		Sample Collected
3									14:55	69.4		Sample Collected
4										3.3		
5										34.2		
6										25.4		
7										24.5		
8										13.9		
9										20.7		
10										29.6		
11							11'-18': Tan and orange, slightly silty fine sand, moist, 2" lenses of silt, some rust colors 2" lenses of silt, some rust colors at 11.5'			28.3		
12										31.7		
13							13'-15': Tannish brown, fine sand, with 2" layers of clayey silt, some layers of rust			18.1		
14										13		
15							15'-18': Tannish brown, silty fine to coarse sand, wet at 16'			14.3		
16										12.2		

MACTEC — SOIL BORING: SB-04-16

Depth (ft)	Sample #	Recovery	Sample Type	Sptli Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample			Remarks
17										4.5		
18							18'-19.3': Dark black to grey fine to coarse sand, wet, visible product staining		14:58	7.1		Sample Collected
19							18.8' End of boring, refusal					
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												

MACTEC — SOIL BORING: SB-04-17

PROJECT Honeywell Chesterfield	**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**	
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	**START DATE** 10/18/2004 / **FINISH DATE** 10/18/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH** 11.3	**CASING** / **AUGER**
SOIL DRILLED(FT) 11.3 / **ROCK DRILLED(FT)**	**INSPECTOR**		**PIEZ** / **BORING** / **WELL**

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-3': Brown, slightly silty sandy silt, concrete/brick fragments, moist					
1										0		
2										0		
3							3'-11.3': Orange brown, slightly clayey silt, moist			0		
4										5		
5									16:00	2.8		sample collected
6										12.6		
7										43.1		
8										44		
9										6.7		
10									16:05 16:10	8.8		sample collected duplicate sample collected
11										13 84.7		
11.3							11.3" end of boring, refusal					
12												
13												
14												
15												
16												

MACTEC	SOIL BORING: SB-04-19				PAGE 1 OF 2	
PROJECT Honeywell Chesterfield			**PROJECT LOCATION** Chesterfield, VA		**PROJECT NO.**	
CLIENT Honeywell					**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey		**DRILL RIG**		**START DATE** 10/18/2004	**FINISH DATE** 10/18/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER**	**WEIGHT** / **DROP**	**TOTAL DEPTH** 19.5		**CASING**	**AUGER**
SOIL DRILLED(FT) 19.5 / **ROCK DRILLED(FT)**	**INSPECTOR**				**PIEZ** / **BORING**	**WELL**

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-10': brown, slightly sandy silt, moist					
1										0		
2										0		
3										0		
4										0		
5										0		
									16:45			sample collected
6										0		
7										0		
8										0		
									16:50			sample collected
9										0		
10							10'-18': tan and orange, slightly silty fine sand, 2" lenses of silt, moint			0		
11										0		
12										0		
13										0		
14										0		
15										0		
16										0		

Depth (ft)	Sample #	Recovery	Sample Type	Split Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample			Remarks
17										0		
18							18'-19.5': tan and green, fine to coarse sand, wet			0		
19									16:55	0		sample collected
20							19.5' end of boring, refusal					
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												

MACTEC — SOIL BORING: SB-04-20

PROJECT Honeywell Chesterfield	**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**	
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	**START DATE** 10/19/2004 / **FINISH DATE** 10/19/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH** 17.9	**CASING** / **AUGER**
SOIL DRILLED(FT) 17.9 / **ROCK DRILLED(FT)**	**INSPECTOR**		**PIEZ** / **BORING** / **WELL**

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-3.5': brown, reworked silt with bricks, asphalt, and concrete, moist					
1										0		
2										0		
3										0		
3.5							3.5'-10': olive green, sandy silt, some fine gravel and bricks, moist					
4										0		
5										0		
6									9:00	0		sample collected
7										0		
8										0		
9										22.3		
10							10'-15': tannish brown slightly silty fine-medium sand, moist to wet at 14'			21		
11										74		
12										68		
13										90.3		
14										58.3		
15							15'-17.9': orangish brown, silty medium sand, wet			74		
16										68.9		

MACTEC	SOIL BORING: SB-04-20					PAGE 2 OF 2

Depth (ft)	Sample #	Recovery	Sample Type	Sptli Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample			Remarks
17									9:05	88.5		sample collected
18										123		
							17.9' end of boring, refusal					
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												

MACTEC SOIL BORING: SB-04-22

PROJECT Honeywell Chesterfield		**PROJECT LOCATION** Chesterfield, VA		**PROJECT NO.**	
CLIENT Honeywell				**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**		**START DATE** 10/19/2004	**FINISH DATE** 10/19/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH** 20		**CASING**	**AUGER**
SOIL DRILLED(FT) 20 / **ROCK DRILLED(FT)**	**INSPECTOR**			**PIEZ** / **BORING**	**WELL**

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-3': brown, sandy silt with bricks, concrete and gravel, fill, moist					
1										0		
2										0		
3							3'-10': olive green, clayey silt, some gravel, moist		11:05	0		sample collected
4										0		
5										0		
6												
7												
8												
9										79.7		
10							10'-14': tan silt, moist			62		
11												
12												
13									11:10	98.6		sample collected
14							14'-19.5': brown, medium to coarse sand, wet at 14'			91.6		
15										60.9		
16										18.7		

Depth (ft)	Sample #	Recovery	Sample Type	Sptli Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample			Remarks
17									9:05	45.1		sample collected
18										42.5		
19										54.3		
20							19.5'-20': black silt with shells, marl, moist		11:15	2.5		sample collected
							20' end of boring					
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												

MACTEC — SOIL BORING: SB-04-23

PROJECT Honeywell Chesterfield	**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**	
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	**START DATE** 10/19/2004 / **FINISH DATE** 10/19/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH** 17.6	**CASING** / **AUGER**
SOIL DRILLED(FT) 17.6 / **ROCK DRILLED(FT)**	**INSPECTOR**		**PIEZ** / **BORING** / **WELL**

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-6.5': brown, gravelly sand and silt, brick/concrete fragments, moist					
1										0		
2										0		
3									11:05	0		sample collected
4										0		
5										0		
6										0		
6.5							6.5'-10': olive green silt, some gravel, moist					
7										0		
8										0		
9										0		
10							10'-17.6': tan, fine to medium sand , some silt, moist		12:00	0		sample collected
11									12:05	10.8		sample collected
12										1.7		
13										2.1		
14							14'-19.5': brown, medium to coarse sand, wet at 14'			0		
15										0		
16										0		

MACTEC	SOIL BORING: SB-04-23	PAGE 2 OF 2

Depth (ft)	Sample #	Recovery	Sample Type	Sptli Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample			Remarks
17									12:10	10.5		sample collected
18							17.6' end of boring, refusal					
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												

MACTEC — SOIL BORING: SB-04-25

PROJECT Honeywell Chesterfield		**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	**START DATE** 10/19/2004 / **FINISH DATE** 10/19/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH** 19	**CASING** / **AUGER**
SOIL DRILLED(FT) 19 / **ROCK DRILLED(FT)**	**INSPECTOR**		**PIEZ** / **BORING** / **WELL**

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-0.5': brown, silty sand with some gravel, moist					
0.5							0.5'-6': orange brown silt, moist					
1										0		
2										0		
3										0		
4										0		
5										0		
									15:00			sample collected
6							6'-11': tanish brown fine sand, some areas of rusting, wet at 10'			2.6		
7										70.1		
8										75.8		
9										52.1		
10										64.8		
11							11'-18': grey to orange, medium to coarse sand, wet			82.4		
12										139		
13										82.4		
									11:10			sample collected
14										117		
15										112		
16										124		

MACTEC	SOIL BORING: SB-04-25			PAGE 2 OF 2

Depth (ft)	Sample #	Recovery	Sample Type	Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample			Remarks
17									15:05	146		sample collected
18							18'-19': black to grey silt with pink to white shells, marl		15:10	115		sample collected
19										6		
							19' end of boring					
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												

MACTEC	SOIL BORING: SB-04-26				PAGE 1 OF 2	
PROJECT Honeywell Chesterfield			**PROJECT LOCATION** Chesterfield, VA		**PROJECT NO.**	
CLIENT Honeywell					**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey		**DRILL RIG**		**START DATE** 10/19/2004	**FINISH DATE** 10/19/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER**	**WEIGHT**	**DROP**	**TOTAL DEPTH** 18	**CASING**	**AUGER**
SOIL DRILLED(FT) 18	**ROCK DRILLED(FT)**	**INSPECTOR**			**PIEZ** / **BORING**	**WELL**

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
							No description provided					
1										0		
2										0		
3										0		
4										0		
5										0		
6										0		
									17:00			sample collected
7										0		
8										2.6		
9										3.9		
10										10.5		
11										35.4		
12										50.4		
13										14.8		
14										32.8		
15										105		
									17:05			sample collected
16										85.5		

MACTEC	SOIL BORING: SB-04-26	PAGE 2 OF 2

Depth (ft)	Sample #	Recovery	Sample Type	Sptli Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample			Remarks
17									17:10	10		sample collected
18										20.1		
19							18' end of boring, marl					
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												

MACTEC	SOIL BORING: SB-04-27			PAGE 1 OF 2	
PROJECT Honeywell Chesterfield		**PROJECT LOCATION** Chesterfield, VA		**PROJECT NO.**	
CLIENT Honeywell				**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**		**START DATE** 10/20/2004	**FINISH DATE** 10/20/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH** 17.7		**CASING**	**AUGER**
SOIL DRILLED(FT) 17.7 / **ROCK DRILLED(FT)**	**INSPECTOR**			**PIEZ** / **BORING**	**WELL**

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-1.5': brown, sandy silt with roots, moist					
1										0		
							1.5'-10': orange brown silt, moist					
2										0		
3										0		
4										0		
5										0		
6									8:50	0		sample collected
7										0		
8										0		
9										0		
10							10'-15': orange brown, silty fine sand, moist to wet at 13'			0		
11										0		
12										0		
13									8:55	0		sample collected
14										0		
15							15'-15.5': Grey, clayey silt, wet			0		
							15.5'-17.7': grey, fine sand, wet					
16										0		

MACTEC	SOIL BORING: SB-04-27	PAGE 2 OF 2

Depth (ft)	Sample #	Recovery	Sample Type	Split Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample			Remarks
17									9:00	0		sample collected
							17.7': marl			0		
18							17.7' end of boring					
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												

MACTEC — SOIL BORING: SB-04-30

PROJECT: Honeywell Chesterfield	PROJECT LOCATION: Chesterfield, VA	PROJECT NO.:	
CLIENT: Honeywell		GROUND ELEV.:	CHECKED BY:
DRILLING CONTRACTOR: Marshall Miller	DRILLER'S NAME: Josh Bailey	DRILL RIG:	START DATE: 10/20/2004 / FINISH DATE: 10/20/2004
DRILLING METHOD: Geoprobe	SAMPLER HAMMER: / WEIGHT: / DROP:	TOTAL DEPTH: 20	CASING: / AUGER:
SOIL DRILLED(FT): 20 / ROCK DRILLED(FT):	INSPECTOR:		PIEZ / BORING / WELL

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-4': brown, sandy silt, trace brick/concrete fragments					
1										0		
2									13:15	0.8		sample collected
3										195		
4							4'-13': orange brown, slightly sandy silt, moist			29.4		
5										46.7		
6										31.8		
7										30.2		
8										39.9		
9										132		
10										45.1		
11										54.4		
12										131		
13							13'-19': fine to coarse silty sand			123		
14										183		
15										112		
16										158		

MACTEC — SOIL BORING: SB-04-30

Depth (ft)	Sample #	Recovery	Sample Type	Sptli Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample			Remarks
17										147		
18									13:20	150		sample collected
19							19'-20': grey silt with pinkish shells, marl		13:30	223		sample collected
20							20' end of boring			38.7		
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												

MACTEC — SOIL BORING: SB-04-31

PROJECT: Honeywell Chesterfield	PROJECT LOCATION: Chesterfield, VA	PROJECT NO.:	
CLIENT: Honeywell		GROUND ELEV.:	CHECKED BY:
DRILLING CONTRACTOR: Marshall Miller	DRILLER'S NAME: Josh Bailey	DRILL RIG:	START DATE: 10/20/2004
FINISH DATE: 10/20/2004			
DRILLING METHOD: Geoprobe	SAMPLER HAMMER / WEIGHT / DROP:	TOTAL DEPTH: 19.5	CASING: / AUGER:
SOIL DRILLED(FT): 19.5	ROCK DRILLED(FT):	INSPECTOR:	PIEZ / BORING / WELL

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-3.5': grey sandy gravel, concrete, moist					
1										88.7		
2										40.3		
3										157		
3.5							3.5'-17': orange brown, sandy silt, moist to wet at 17'					
4										103		
5									14:30	238		sample collected
6										63.3		
7										77		
8										52.8		
9										92.7		
10										180		
11										199		
12										84.2		
13										91.5		
14										59.2		
15										50.8		
16										99.3		

MACTEC — SOIL BORING: SB-04-31

Depth (ft)	Sample #	Recovery	Sample Type	Sptli Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample			Remarks
17							17'-18.5': grey, medium to coarse silty sand, some brown staining at 18' (NAPL?)			28.1		
18										27.3		
19							18.5'-19.5': greyish black silt with pink shells, marl			199		
20							19.5' end of boring, refusal			152		
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												

MACTEC — SOIL BORING: SB-04-32

PROJECT Honeywell Chesterfield		**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	**START DATE** 10/20/2004 / **FINISH DATE** 10/20/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH** 19.5	**CASING** / **AUGER**
SOIL DRILLED(FT) 19.5 / **ROCK DRILLED(FT)**	**INSPECTOR**		**PIEZ** / **BORING** / **WELL**

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-4': grey and brown, sandy gravel, brick/concrete fragments, moist					
1										82.5		
2									15:45	206		sample collected
3										33.8		
4							4'-16': tan and brown, sandy silt, moist			30.2		
5										39.9		
6										50		
7										65.7		
8										47.1		
9										35		
10										61.6		
11										26.1		
12										37.8		
13										39.9		
14										16.1		
15										14.9		
16										9.6		

Depth (ft)	Sample #	Recovery	Sample Type	Sptli Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample			Remarks
16–19.5							16'-19.5': grey, fine to coarse silty sand, some areas of staining at 18', wet at 16'					
17										22.9		
18										22.9		
19									15:50	204		sample collected
19.5							19.5': black and grey silt and pink shells, marl					
20							19.5 ft end of boring					
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												

MACTEC — SOIL BORING: SB-04-33

PROJECT Honeywell Chesterfield	**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**	
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	**START DATE** 10/21/2004 / **FINISH DATE** 10/21/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH** 19.9	**CASING** / **AUGER**
SOIL DRILLED(FT) 19.9 / **ROCK DRILLED(FT)**	**INSPECTOR**		**PIEZ** / **BORING** / **WELL**

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
							0-3': brown, gravelly silt, moist					
1										1.2		
2										30.1		
3										202		
							3'-13': orange brown, silt, moist		8:35			sample collected
4										24.1		
5										28.4		
6										26.2		
7										31		
8										19.2		
9										19.7		
10										32.2		
11										35.7		
12										19.3		
13										20.1		
							13'-15': tan silty fine sand					
14										6.3		
									8:40			sample collected
15										7.2		
							15'-16': grey and green banded, silty fine sand, moist					
16										3.4		

MACTEC

SOIL BORING: SB-04-33

Depth (ft)	Sample #	Recovery	Sample Type	Sptil Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample			Remarks
							16'-19.5': tan, silty fine sand, wet					
17										2.5		
18										2.5		
19										5.5		
									8:45			sample collected
							19.5'-19.9': green and grey, fine to medium sand, some silt, wet					
20							19.9' end of boring, marl			5.5		
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												

MACTEC — SOIL BORING: SB-04-36

PROJECT Honeywell Chesterfield	**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**	
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	**START DATE** 10/21/2004 / **FINISH DATE** 10/21/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH** 18.6	**CASING** / **AUGER**
SOIL DRILLED(FT) 18.6 / **ROCK DRILLED(FT)**	**INSPECTOR**		**PIEZ** / **BORING** / **WELL**

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-3': tan and grey, silty gravel, bricks and concrete, moist					
1										27.5		
2										29.7		
3										63.3		
							3'-15': orange brown, sandy silt, 2" seams of silt, moist to wet at 14'		9:45			sample collected
4										49.1		
5										103		
6										193		
7										128		
8										45.6		
9										160		
10										84		
11										59.4		
12										56.8		
13										44.2		
14										32.2		
15										42.2		
							15'-17': orange, fine to coarse, silty sand, wet					
16										53.4		

Depth (ft)	Sample #	Recovery	Sample Type	Sptli Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample			Remarks
17									9:50	18.7		sample collected
							17'-17.6': grey, coarse sand, wet, some areas of staining at 17.5'					
18							17.6'-18.6': grey to black silt, some shells, moist		9:55	32.1		sample collected
19							18.6' end of boring					
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												

MACTEC	SOIL BORING: SB-04-37			PAGE 1 OF 2	
PROJECT Honeywell Chesterfield		PROJECT LOCATION Chesterfield, VA		PROJECT NO.	
CLIENT Honeywell				GROUND ELEV.	CHECKED BY:
DRILLING CONTRACTOR Marshall Miller	DRILLER'S NAME Josh Bailey	DRILL RIG		START DATE 10/21/2004	FINISH DATE 10/21/2004
DRILLING METHOD Geoprobe	SAMPLER HAMMER / WEIGHT / DROP	TOTAL DEPTH 20		CASING	AUGER
SOIL DRILLED(FT) 20	ROCK DRILLED(FT)	INSPECTOR		PIEZ / BORING	WELL

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-4': grey to brown, silty gravel, concrete, moist					
1										291		
2										285		
3												
4							4'-17': orange brown, fine sandy silt, moist to wet at 11'					
5									12:00	70.3		sample collected
6										60.1		
7												
8												
9										28.8		
10										48.2		
11										84		
12										144		
13										10.7		
14										11.1		
15										9.8		
16										0.8		

Depth (ft)	Sample #	Recovery	Sample Type	Sptli Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample			Remarks
17							17'-19': grey, fine to coarse sand, moist, staining at 18.7'			64		
18									12:05	32		sample collected
19							19'-20': black to grey silt, pink shells, marl		12:10	192		sample collected
20										2.1		
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												

MACTEC — SOIL BORING: SB-04-38

PROJECT Honeywell Chesterfield	**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**	
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	
START DATE 10/21/2004	**FINISH DATE** 10/21/2004		
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH** 20	
CASING	**AUGER**		
SOIL DRILLED(FT) 20	**ROCK DRILLED(FT)**	**INSPECTOR**	
PIEZ ☐	**BORING** ☐	**WELL** ☐	

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-3.5': tan and grey, silty gravel, brick and concrete fragments, moist					
1										0		
2										17.1		
3									13:45	15		sample collected
4							3.5'-12': orange brown silt, moist			14		
5										0		
6										0		
7										13.4		
8										14.6		
9										0		
10										0		
11										0		
12							12'-16': grey, slightly sandy silt, moist			0		
13										0		
14										0		
15										0		
16										0		

MACTEC	SOIL BORING: SB-04-38	PAGE 2 OF 2

Depth (ft)	Sample #	Recovery	Sample Type	Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample			Remarks
16							16'-17.5': grey, fine to coarse sand, wet at 16'					
17									13:50	37.9		sample collected
17.5							17.5'-20': black to grey, silt with pink shells, dry, marl					
18										0		
19									13:55	0		sample collected
20							20' end of boring			0		
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												

MACTEC	SOIL BORING: SB-04-39		PAGE 1 OF 2
PROJECT Honeywell Chesterfield		**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	**START DATE** 10/22/2004 / **FINISH DATE** 10/22/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH: 19 ft**	**CASING** / **AUGER**
SOIL DRILLED(FT) 18.7 / **ROCK DRILLED(FT)** 0	**INSPECTOR** S. Knoflicek		**PIEZ** / **BORING** / **WELL**

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-3.0': tan and brown gravelly silt, moist					
1										0.8		
2										5.8		
3							3.0-11': tan to brown silt, moist			17.7		
4										9.2		
5										24.9		
5.5									8:30			sample colleted
6										28.8		
7										146		
8										263		
9										322		
10										291		
11							11-15': tannish brown to grey slightly sandy silt; some 1-inch seams of fine sand, moist			309		
11.5									8:35			sample collected
12										283		
13										339		
14										248		
15							15-16': orange-brown gravelly medium sand, wet			249		
16										193		

MACTEC	SOIL BORING: SB-04-39	PAGE 2 OF 2

Depth (ft)	Sample #	Recovery	Sample Type	Split Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
							16-18.5': grey to tan medium to coarse sand, wet					
17									08:40	243		sample collected
18							18-19': black to grey silt, some pink shells			1240		
19							19' end of boring - refusal			307		
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												

MACTEC — SOIL BORING: SB-04-40

PROJECT Honeywell Chesterfield	**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**	
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	**START DATE** 10/22/2004 / **FINISH DATE** 10/22/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH: 20 ft**	**CASING** / **AUGER**
SOIL DRILLED(FT) 20 / **ROCK DRILLED(FT)** 0	**INSPECTOR** S. Knoflicek		**PIEZ** / **BORING** / **WELL**

Depth (ft)	Sample #	Recovery	Spti Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-3.0': brown sandy gravel, some brick remnants, moist					
1										0.8		
2										22.4		
3							3.0-13': orange brown fine sandy silt, moist			18.0		
4										13.9		
5										4.5		
6										7.1		
7										11.3		
8										11.8		
									10:50			sample colleted
9										11.8		
10										6.7		
11										6.3		
12										4.5		
13							13-15.5': orange tan to grey silt; with 2-inch seams of fine sand, moist			5.0		
14										4.1		
15							15.5-19': brownish orange to grey fine to medium sand			3.2		
16										2.4		

Depth (ft)	Sample #	Recovery	Sample Type	Sptl Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
17										5.8		
18										6.2		
									10:55			sample collected
19									11:00	269		duplicate sample
							18-19': blackish grey silt, with pink shells					
									11:05			sample collected
20							20' end of boring			46.5		
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												

MACTEC	SOIL BORING: SB-04-41		
PROJECT Honeywell Chesterfield	**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**	
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	**START DATE** 10/22/2004 / **FINISH DATE** 10/22/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH: 19 ft**	**CASING** / **AUGER**
SOIL DRILLED(FT) 19 / **ROCK DRILLED(FT)** 0	**INSPECTOR** S. Knoflicek		**PIEZ** / **BORING** / **WELL**

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-1.5': brown to tan sand and gravel					
1										0.4		
1.5							1.5-13': orange brown silt, moist					
2										1.2		
3										2.5		
4										0.8		
5										1.2		
6										1.0		
7										0.0		
8										0.4		
9										0.0		
10										0.0		
11										0.0		
12										0.0		
13							13-15.5': orange tan to grey silt; with 2-inch seams of fine sand, moist			0.0		
14										0.0		
									12:15			sample collected
15										0.0		
15.5							15.5-17.5': orange brown to grey medium to coarse sand, wet					
16										0.0		

MACTEC							SOIL BORING: SB-04-41	PAGE 2 OF 2				
Depth (ft)	Sample #	Recovery	Sample Type	Split Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
17									12:20	16.9		sample collected
							17.5-18.5': black to grey silt, some shells, marl					
18										31.3		
									12:25			sample collected
19										129		
							19' end of boring - refusal					
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												

MACTEC — SOIL BORING: SB-04-42

PROJECT Honeywell Chesterfield	**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**	
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	**START DATE** 10/25/2004 / **FINISH DATE** 10/25/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH: 20 ft**	**CASING** / **AUGER**
SOIL DRILLED(FT) 20 / **ROCK DRILLED(FT)** 0	**INSPECTOR** S. Knoflicek		**PIEZ** ☐ **BORING** ☐ **WELL** ☐

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-3.0': dark brown and grey sandy gravel, chunks of concrete and asphalt, moist					
1										14		
2										7.7		
3							3.0-15.5': orange brown fine sandy silt, moist			6.0		
3.5									09:30			sample collected
4										6.7		
5										224		
6										113		
7										168		
8										314		
8.5									09:35			sample collected
9										237		
10										268		
11										257		
12										176		
13										240		
14										108		
15										69		
15.5							15.5-19.6': brown fine to medium sand, moist					
16										101		

Depth (ft)	Sample #	Recovery	Sample Type	Sptl Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
17										140		
18										231		
19									09:40	259		sample collected
							19.6-20': grey silt wth pink shells					
20							20' end of boring - refusal			22.5		
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												

MACTEC — SOIL BORING: SB-04-43

PROJECT Honeywell Chesterfield	**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**	
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	
		START DATE 10/25/2004	**FINISH DATE** 10/25/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH: 20 ft**	
		CASING	**AUGER**
SOIL DRILLED(FT) 20 / **ROCK DRILLED(FT)** 0	**INSPECTOR** S. Knoflicek	**PIEZ** / **BORING**	**WELL**

Depth (ft)	Sample #	Recovery	Spti Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
							0-1.0': grey and brown sandy gravel, moist					
1							1.0-15.0': tannish brown fine sandy silt, moist			0.0		
2										0.3		
3										1.0		
4										0.0		
5										14.0		
									11:15			sample collected
6										31.2		
7										29.8		
8										79.5		
9										94.3		
10										142		
11										154		
12										67.5		
13										101		
14										89.4		
15							15.0-18.5': grey to black fine to coarse sand, moist			164		
16										196		

Depth (ft)	Sample #	Recovery	Sample Type	Split Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
17										240		
									11:20			sample collected
18										193		
							18.5-20': grey silt wth some pinkish shells					
19										15.0		
									11:25			sample collected
20										16.1		
							20' end of boring					
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												

MACTEC — SOIL BORING: SB-04-44

PROJECT Honeywell Chesterfield	**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**	
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	**START DATE** 10/25/2004 / **FINISH DATE** 10/25/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH: 20 ft**	**CASING** / **AUGER**
SOIL DRILLED(FT) 20 / **ROCK DRILLED(FT)** 0	**INSPECTOR** S. Knoflicek		**PIEZ** ☐ **BORING** ☐ **WELL** ☐

Depth (ft)	Sample #	Recovery	Spti Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-3.0': brown silt and some gravel, brick and concrete fragments, moist					
1										0.0		
2										1.4		
3							3.0-14.0': orange brown silt, moist			1.7		
4										1.4		
5										0.3		
6										0.3		
7										0.3		
8										0.3		
9										0.3		
10										0.0		
11										0.3		
									12:20			sample collected
12										3.1		
13										0.0		
14							14.0-18.5': grey fine to medium sand, grading to orange and black, wet **One inch of product stain observed**			0.0		
15										0.0		
16										0.0		

MACTEC — SOIL BORING: SB-04-44

Depth (ft)	Sample #	Recovery	Sample Type	Sptl Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
17										0.0		
18										3.1		
									12:25			sample collected
							18.5-20': grey silt wth some pink shells, wet					
19										233		
									12:30			sample collected
20										67.5		
							20' end of boring					
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												

MACTEC — SOIL BORING: SB-04-45

PROJECT Honeywell Chesterfield	**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**	
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	**START DATE** 10/25/2004
FINISH DATE 10/25/2004			
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH: 17.5 ft**	**CASING** / **AUGER**
SOIL DRILLED(FT) 17.5	**ROCK DRILLED(FT)** 0	**INSPECTOR** S. Knoflicek	**PIEZ** / **BORING** / **WELL**

Depth (ft)	Sample #	Recovery	Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-3.0': brown silty gravel, some concrete fragments, moist					
1										0.0		
2										5.6		
3							3.0-11.0': orange brown silt, moist			61.9		
4										46.7		
5										50.1		
6										78.1		
									14:30			sample collected
7										23.5		
8										20.4		
9										18.3		
10										15.8		
11							11.0-17.5': brown and grey fine to medium sand with some silt, moist, wet at 16'			36.2		
12										158.0		
13										57.3		
									14:35			sample collected
14										31.6		
15										43.6		
16										19.7		

MACTEC	SOIL BORING: SB-04-45											PAGE 2 OF 2
Depth (ft)	Sample #	Recovery	Sample Type	Sptil Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
17									14:40	17.5		sample collected
18							17.5' end of boring (refusal)					
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												

MACTEC	SOIL BORING: SB-04-46		
PROJECT Honeywell Chesterfield	**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**	
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	**START DATE** 10/25/2004 / **FINISH DATE** 10/25/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH: 17.8 ft**	**CASING** / **AUGER**
SOIL DRILLED(FT) 17.8 / **ROCK DRILLED(FT)** 0	**INSPECTOR** S. Knoflicek		**PIEZ** / **BORING** / **WELL**

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-10.5': orange brown silt, moist					
1										0.0		
2										0.0		
3										0.0		
4										0.0		
5										0.0		
6										0.0		
7										0.0		
8										0.0		
									15:45			sample collected
9										0.0		
									15:50 15:55			sampled for matrix spike & dup
10										0.0		
10.5							10.5-17.7': orange to grey fine to coarse sand, moist, wet at 12'					
11										0.0		
12										0.0		
13										0.0		
									14:35			sample collected
14										0.0		
15										0.0		
16										0.0		

MACTEC	SOIL BORING: SB-04-46											PAGE 2 OF 2
Depth (ft)	Sample #	Recovery	Sample Type	Sptli Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
17									16:00	0.0		sample collected
							17.7-17.8': grey silt and pink shells, moist to wet					
18							17.8' end of boring (refusal)					
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												

MACTEC — SOIL BORING: SB-04-47

PROJECT Honeywell Chesterfield	**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**	
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey / **DRILL RIG**	**START DATE** 10/25/2004	**FINISH DATE** 10/25/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP** / **TOTAL DEPTH: 20.0 ft**	**CASING**	**AUGER**
SOIL DRILLED(FT) 20 / **ROCK DRILLED(FT)** 0	**INSPECTOR** S. Knoflicek	**PIEZ** / **BORING**	**WELL**

Depth (ft)	Sample #	Recovery	Spti Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-3.5': brown silt and gravel (fill), moist					
1										0.0		
2										0.0		
3										0.0		
3.5							3.5-14': orange brown silt, moist					
4										0.0		
5										0.0		
6										0.0		
7										0.0		
8										0.0		
9										0.0		
10										0.0		
11										0.0		
12										0.0		
13										0.0		
									17:15			sample collected
14							14.0-19.6': grey sand, wet at 14'			0.0		
15										1.3		
16										10.8		

MACTEC	SOIL BORING: SB-04-47											PAGE 2 OF 2
Depth (ft)	Sample #	Recovery	Sample Type	Sptil Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
17										9.4		
18										5.6		
19									17:20 17:25	251		sample collected dup sample collected
							Seam of free product at 19.5 ft		17:30			sample collected
20							19.6-20': grey silt with pink shells, moist			47.5		
							20.0' end of boring					
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												

MACTEC — SOIL BORING: SB-04-48

PROJECT: Honeywell Chesterfield	PROJECT LOCATION: Chesterfield, VA	PROJECT NO.:	
CLIENT: Honeywell		GROUND ELEV.:	CHECKED BY:
DRILLING CONTRACTOR: Marshall Miller	DRILLER'S NAME: Josh Bailey	DRILL RIG:	START DATE: 10/26/2004
			FINISH DATE: 10/26/2004
DRILLING METHOD: Geoprobe	SAMPLER HAMMER / WEIGHT / DROP	TOTAL DEPTH: 17.5 ft	CASING / AUGER
SOIL DRILLED(FT): 17.5	ROCK DRILLED(FT): 0	INSPECTOR: S. Knoflicek	PIEZ / BORING / WELL

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0-1							0-1.0': dark brown sandy gravel, moist					
1							1.0-10.5': orange brown sandy silt, moist			0.0		
2										0.0		
3										0.0		
4										0.0		
5										0.0		
6										0.0		
7										0.0		
8										0.0		
9										0.0		
10										0.0		
10.5							10.5-17.5: fine to medium sand, wet					
11										0.0		
12										0.0		
13										0.0		
									11:45			sample collected
14										0.0		
15										0.0		
16									11:50	0.0		sample collected

MACTEC	SOIL BORING: SB-04-48	PAGE 2 OF 2

Depth (ft)	Sample #	Recovery	Sample Type	Sptl Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
17										0.0		
							One-inch thick DNAPL product above marl		11:55			sample collected
							17.5' end of boring (refusal) [marl in drill shoe]					
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												

MACTEC	SOIL BORING: SB-04-49	PAGE 1 OF 1

PROJECT Honeywell Chesterfield	**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**
CLIENT Honeywell	**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**
START DATE 10/26/2004	**FINISH DATE** 10/26/2004	
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH: 16 ft**
CASING	**AUGER**	
SOIL DRILLED(FT) 16	**ROCK DRILLED(FT)** 0	**INSPECTOR** S. Knoflicek
PIEZ	**BORING**	**WELL**

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
							0-10': orange brown silt, moist					
1										0.0		
2										0.0		
3										0.0		
4										0.0		
5										0.0		
6										0.0		
7										0.0		
8										0.0		
9										0.0		
10										0.0		
							10.0-15.5: green to grey silty fine to medium sand, moist; wet at 11 ft		14:00			sample collected
11										0.0		
12										25.7		
13										3.8		
14										2.6		
15									14:05	231.0		sample collected
							One half inch of product on top of marl					
							15.5-16.0': dark grey silt, some shells, moist					
16									14:10	35.7		sample collected

16' end of boring

MACTEC

SOIL BORING: SB-04-50

PROJECT Honeywell Chesterfield		**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	**START DATE** 10/26/2004 / **FINISH DATE** 10/26/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH: 18.5 ft**	**CASING** / **AUGER**
SOIL DRILLED(FT) 18.5 / **ROCK DRILLED(FT)** 0	**INSPECTOR** S. Knoflicek		**PIEZ** / **BORING** / **WELL**

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-2.0': grey gravel, some silt, moist					
1										0.0		
2							2.0-11': orange brown silt, moist			0.0		
3										0.0		
4										0.0		
5										0.0		
6										0.0		
7										0.0		
8										0.0		
9										0.0		
									14:50			sample collected
10										0.0		
11							11-16: orange brown to grey interbedded silt and fine to medium sands (3" thick), moist			0.0		
12										0.0		
13										0.0		
14										0.0		
15										0.0		
16										0.0		

MACTEC — SOIL BORING: SB-04-50

Depth (ft)	Sample #	Recovery	Sample Type	Split Spoon Blows Per 6"	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
17							16-17.5': grey fine sand and silt, wet		14:55	0.0		sample collected
18							17.5-18':orange tan weathered marl, grading to silt with sand lenses			0.0		
19							18.5' end of boring (refusal)					
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												

MACTEC	SOIL BORING: SB-04-51		PAGE 1 OF 1
PROJECT Honeywell Chesterfield		**PROJECT LOCATION** Chesterfield, VA	**PROJECT NO.**
CLIENT Honeywell		**GROUND ELEV.**	**CHECKED BY:**
DRILLING CONTRACTOR Marshall Miller	**DRILLER'S NAME** Josh Bailey	**DRILL RIG**	**START DATE** 10/26/2004 / **FINISH DATE** 10/26/2004
DRILLING METHOD Geoprobe	**SAMPLER HAMMER** / **WEIGHT** / **DROP**	**TOTAL DEPTH: 16 ft**	**CASING** / **AUGER**
SOIL DRILLED(FT) 16 / **ROCK DRILLED(FT)** 0	**INSPECTOR** S. Knoflicek		**PIEZ** / **BORING** / **WELL**

Depth (ft)	Sample #	Recovery	Sptli Spoon Blows Per 6"	Water Level	Sample Interval	Graphic Log	Sample Description	USGS Group Symbol	Time of Sample	P.I.D. PPM Sample	P.I.D. PPM Head Space	Remarks
0							0-6': orange brown cememted silty medium sand, moist					
1										0.0		
2										0.0		
3										0.0		
4										0.0		
5										0.0		
6							6-14.5': orange to grey fine ro coarse sand, moist to wet (@ 10 ft)			0.0		
7										0.0		
8										0.0		
9										0.0		
									16:10			sample collected
10										0.0		
11										0.0		
12										0.0		
13										0.0		
14									16:15	0.0		sample collected
14.5							14.5-16.0': grey silt with shells, moist					
15										0.0		
									16:20			sample collected
16										0.0		

16' end of boring

Appendix B
Analyses of Soil Data SWMU 4

Appendix B
Analyses of Soil Data SWMU 4
Honeywell Chesterfield Facility

Table of Contents

Appendix B
Analyses of Soil and Groundwater Data
SWMU 4
Honeywell Chesterfield Facility

1.0 DNAPL OCCURRENCE AND ITS EXTENT

1.1 DNAPL

There is evidence of potential DNAPL presence in the subsurface at SWMU 4 and in its immediate vicinity. DNAPL has historically been observed to accumulate in thicknesses up to 0.5 feet in monitoring well MW-104S, located in the central area of the SWMU. Soundings in 2007 using an interface probe identified potential measureable accumulations of DNAPL in piezometers PZ-04-15, PZ-04-16, PZ-04-17, and PZ-04-18[1]. Logs of soil borings (SB-04-13, SB-04-15, SB-04-16, SB-04-31, SB-04-32, SB-04-36, SB-04-37, SB-04-44, SB-04-47, SB-04-48, and SB-04-49) contain references of staining suggestive of DNAPL or observations of residual DNAPL. The observed concentrations of some VOC and SVOC parameters in saturated and unsaturated soil samples approach or exceed saturation threshold levels. Groundwater concentrations of some VOC parameters exceed 1% of their respective solubility limits. Instrument response data collected from the MIP survey conducted in 2013 also suggest potential DNAPL presence. All of these observations are lines of evidence used to delineate the approximate location of residual saturation DNAPL.

In September 2009, Honeywell collected a sample of the DNAPL that accumulated in MW-104S and submitted the material to a laboratory for analyses. The analytical results are provided in Attachment B1. Using those data it was possible to estimate the mole fraction of identified VOC and SVOC constituents comprising approximately 23% of the total mass present. The mole fraction for other unidentified individual constituents is unknown[2]. The results are presented in the following table:

---

[1] Table 3, *Conceptual Site Model for Dense Non-Aqueous Phase Liquid and Marl, Honeywell Chesterfield Facility, Chesterfield, Virginia*; prepared by MACTEC Engineering and Consulting, Inc.; Dated September 2009.

[2] The laboratory analyses required dilution factors of up to 1,000. Detection limits were elevated by a corresponding factor. Consequently, 23% of the total mass present was identified as specific compounds. A small portion of the mass is composed of non-specific tentatively identified compounds. Other minor components of the DNAPL were probably undetected due to the dilution factor.

Estimate of Mole Fraction From Identified DNAPL Components

Compound	Concentration (ug/kg)	Compound g/mole	Moles/kg	Mole fraction of Identified Compounds	Mole Fraction of total Mass
diphenyl ether	141,000,000	170.21	0.8284	0.571	0.1324
1,1-biphenyl	50,000,000	154.21	0.3242	0.223	0.0518
1,1,1-trichloroethane	21,000,000	133.4	0.1574	0.108	0.0252
tetrachloroethene	12,400,000	165.83	0.0748	0.052	0.0120
trichloroethene	2,720,000	131.39	0.0207	0.014	0.0033
1,1-dichloroethane	906,000	98.96	0.0092	0.006	0.0015
cis-1,2-dichloroethene	800,000	96.95	0.0083	0.006	0.0013
2-methylphenol	573,000	108.14	0.0053	0.004	0.0008
2,4-dimethylphenol	505,000	122.16	0.0041	0.003	0.0007
3&4 methylphenol	412,000	108.14	0.0038	0.003	0.0006
toluene	299,000	92.14	0.0032	0.002	0.0005
total xylene	196000	106.16	0.0018	0.001	0.0003
chloroform	187,000	119.38	0.0016	0.001	0.0003
1,1-dichloroethene	87,100	96.94	0.0009	0.001	0.0001
cyclohexane	74,400	84.16	0.0009	0.001	0.0001
1,1,2,2-tetrachloroethane	140,000	167.848	0.0008	0.001	0.0001
naphthalene	104,000	128.7	0.0008	0.001	0.0001
2-methylnaphthalene	114,000	142.197	0.0008	0.001	0.0001
phenol	74,400	94.111	0.0008	0.001	0.0001
1,2-dichlorobenzene	101,000	147.01	0.0007	0.000	0.0001
N-nitrosodiphenylamine	43,500	74.081	0.0006	0.000	0.0001
freon 113	109,000	187.376	0.0006	0.000	0.0001
ethylbenzene	44,300	106.17	0.0004	0.000	0.0001
dibenzofuran	54,000	168.19	0.0003	0.000	0.0001
trichorofluoromethane	25,600	137.37	0.0002	0.000	0.0000
2-chlorophenol	16,900	128.56	0.0001	0.000	0.0000
pentachlorophenol	30,500	266.34	0.0001	0.000	0.0000
1,2,4-trichlorobenzene	20,100	181.45	0.0001	0.000	0.0000
1,1,2-trichloroethane	13,500	133.4	0.0001	0.000	0.0000
bis(2-ethylhexyl)phthalate	28,900	390.56	0.0001	0.000	0.0000
phenanthrene	10,500	178.23	0.0001	0.000	0.0000
di-n-butyl phthalate	13,200	278.34	0.0000	0.000	0.0000
fluorene	3,900	166.223	0.0000	0.000	0.0000
fluoranthene	3,080	202.26	0.0000	0.000	0.0000
pyrene	1,990	202.25	0.0000	0.000	0.0000
Totals:	232,111,870		1.4513	1.000	0.232

Notes:

1. Concentration values reported from sample collected at MW-104S on Sept 14, 2009.
2. Sample analyses reported by Accutest Laboratories.

As can be seen from the table above, six compounds (diphenyl ether, 1,1-biphenyl, 1,1,1-trichloroethane, tetrachloroethene, trichloroethene, and 1,1dichloroethane) comprise 97.5% of the mole fraction of identified compounds.

The 2009 laboratory DNAPL analysis also included measurement of density and viscosity of the material. The measured density was 1.0 g/ml. The viscosity was measured at 4.8 centistokes (cS).

1.2 THRESHOLD DNAPL SATURATION CONCENTRATIONS

USEPA's Soil Screening Guidance (1996) Equation 9 provides a means of estimating the threshold concentration at which the absorptive limits of the soil particles, the solubility limits of the soil pore water and saturation of soil pore air have been reached. Above this concentration, the soil contaminant may be present as a DNAPL residual saturation in the soil matrix. The equation was subsequently modified by Kueper and Davies to account for the effective solubility of individual DNAPL components in a mixture as determined by Raoult's Law[3]. Relevant equations are as follows:

Raoult's Law

$$C_i = m_i S_i$$ **Equation 2**

Where:
C_i = Effective solubility of DNAPL component (mg/L)
m_i = mole fraction of DNAPL component (dimensionless)
S_i = Single component solubility of chemical in water (mg/L)

Chemical Concentration at Partitioning Threshold[4]

$$C_i^T = \left(\frac{C_i}{\rho_b}\right)(K_d \rho_b + \theta_w + H'\theta_a)$$ **Equation 3**

Where:
C^T = Threshold concentration of contaminant (i) in soil (mg/kg)
C_i = Effective solubility of contaminant (mg/L)
ρ_b = Soil dry bulk density (default value of 1.5 kg/L)
K_d = Soil-water partitioning coefficient (K_{oc} x f_{oc})
θ_w = Water filled porosity (default value of 0.15)
H' = Dimensionless Henry's Law constant (H x 41)
θ_a = Air filled porosity (n - θ_w)
n = Total soil porosity (default value of 0.43)
K_{oc} = Compound specific organic carbon partitioning coefficient
f_{oc} = Fraction organic carbon (default value 0.006)

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[3] Assessment and Delineation of DNAPL Source Zones at Hazardous Waste Sites; Bernard H. Kueper and Kathryn L. Davies; USEPA Groundwater Issue.

[4] Values mentioned in variable definitions in Equation 3 were default values provided in USEPA Soil Screening Guidance (1996) at Section 2.4.4, Equation 9.

Equation 2 and 3 above were used to estimate concentrations at partitioning threshold for each of the six major DNAPL component VOCs and SVOCs identified above. Because site-specific data values were lacking for some variables in Equation 3, default values recommended in USEPA's Soil Screening Guidance were used. Additionally, estimated mole fractions account for only approximately 23% of the total DNAPL mass; this introduces some uncertainty in the resulting values of C_i and C^T. The details of these calculations are provided in Attachment B1 and summarized as follows:

Compound	Water solubility (mg/L)	Mole Fraction	K_{oc}	H'	$C^T{}_i$ (mg/kg)	$C^T{}_i$ (µg/kg)
diphenyl ether	21	0.571	1950	2.8E-04	141.4	141,441
1,1-biphenyl	6	0.223	8560	0.0123	68.9	98,982
1,1,1-trichloroethane	1,330	0.108	135	0.7052	150.3	150,300
tetrachloroethene	150	0.052	210	0.7544	11.6	11,600
trichloroethene	1,100	0.0143	126	0.4223	14.7	14,700
1,1--dichloroethane	5060	0.006	31.6	0.230	10.62	10,620

Comparing the above calculated values for $C^T{}_i$ to Site soil data provides a screening tool to estimate potential residual DNAPL extent, but should not be used alone to define the extent of DNAPL. It must be combined with other lines of evidence such as MIP data, visual observations and groundwater data to decrease uncertainties introduced by the ganglial movement patterns and pooling nature of DNAPL. Areas defined by this line of evidence simply enclose VOC and SVOC concentration values that are sufficiently high to exceed the estimated partitioning capacity of the soil. The concentrations so derived by this method are typically an order of magnitude lower than concentrations in soils saturated with free product (see Equation 4 below).

The subsurface was divided into 6 foot depth intervals: 0 feet to 6 feet bgs, 6 feet to 12 feet bgs, and 12 feet to the top of the Potomac Confining Unit at approximately 18 feet[5]. The calculated value of C^T for each of the above parameters was compared to soil concentration data within the respective depth intervals and a boundary was drawn to enclose all soil concentrations exceeded C^T. The resulting areas, along with other lines of evidence, suggest where potential DNAPL exists within each depth interval (Figure 5 of the report). The surface areas for the potential DNAPL regions within their respective depth intervals are:

- 0 feet to 6 feet bgs 3,480 ft^2

[5] The presence of DNAPL in the 0 ft. to 6 ft. bgs interval may seem unlikely. However, when the former acid pond was backfilled the bottom sludge remained in place. Additionally, as can be seen on Figure 5 of the report, much of the area of suspected DNAPL presence is outside of the footprint of the SWMU.

- 6 feet to 12 feet bgs 6,590 ft^2
- 12 feet to 18 feet bgs 29,910 ft^2

The 12 feet to 18 feet bgs potential DNAPL region has been expanded to include the locations of PZ-04-15, PZ-04-16, PZ04-17, and PZ-04-18 as DNAPL has been historically observed in these piezometers[6]. Figure 6 of the report depicts the profile of the potential DNAPL regions in the subsurface along selected cross-sections.

1.3 ABOVE PARTITIONING THRESHOLD CONCENTRATIONS

Kueper and Davies also provide an equation for computing the concentrations in soil corresponding to threshold DNAPL saturation. At these soil concentrations and above it is likely that DNAPL is not only present but has reached a degree of saturation that it is potentially a mobile phase.

The relevant equation is as follows:

$$C_D = \frac{S_r \phi \rho_N 10^6}{\rho_b} + C^T \qquad \textbf{Equation 4}$$

Where: C_D = Soil concentration at threshold DNAPL saturation (mg/kg)
S_r = Threshold DNAPL saturation percent (set at 0.05)
Φ = effective porosity (assumed to be 0.20 at the Site)
ρ_N = DNAPL density (measured at 1.0 kg/L by laboratory)
ρ_b = Bulk soil density (default value of 1.5) (kg/L)
C^T = Concentration in soil at partitioning threshold (mg/kg)

Equation 4 was used to calculate concentrations at threshold DNAPL saturation for each of the six major DNAPL component VOCs and SVOCs identified above. Because site-specific data values were lacking for some variables in Equation 4, and assumed value for effective porosity and a default value of 1.5 for bulk soil density recommended in USEPA's Soil Screening Guidance were used. A conservative threshold saturation level of 5% (0.05) of pore space was selected[7]. The results of these calculations are provided in Attachment B1 and summarized as follows:

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[6] No DNAPL observations were recorded in the boring logs for these piezometers. However, soundings conducted in 2007 identified potential DNAPL accumulations in these piezometers. See Table 3, *Conceptual Site Model for Dense Non-Aqueous Phase Liquid and Marl, Honeywell Chesterfield Facility, Chesterfield, Virginia*; prepared by MACTEC Engineering and Consulting, Inc.; Dated September 2009. These measurements indicating DNAPL accumulations have never been replicated.

[7] USEPA soil screening guidance recommends use of a value between 0.05 and 0.10.

Compound	Mole Fraction	C^t_i (mg/kg)	C_D (mg/kg)
diphenyl ether	0.571	141.4	6,810
1,1-biphenyl	0.223	68.98	6,740
1,1,1-trichloroethane	0.108	150.3	6,800
Tetrachloroethene	0.052	11.6	6,700
Trichloroethene	0.0143	14.7	6,700
1,1—dichloroethane	0.006	10.62	6,680

Comparing the above calculated values for C_D to Site soil data identified one location (Boring location SB-04-13, 8 ft.- 9 ft. depth interval) where the concentration of one of these VOCs (1,1,1-trichloroethane) exceed its estimated C_D (i.e., mobility) threshold. This location and depth is identified on Figures 5 and 6 of the report.

ATTACHMENT B1

DNAPL Analytical Results and Threshold Calculations

Report of Analysis

Client Sample ID:	104S-DNAPL		
Lab Sample ID:	JA28119-1	Date Sampled:	09/14/09
Matrix:	SO - Oil	Date Received:	09/16/09
Method:	SW846 8260B	Percent Solids:	n/a
Project:	Honeywell-Chesterfield, Chester, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	D159937.D	8	09/28/09	TDN	n/a	n/a	VD6432
Run #2	D159850.D	50	09/25/09	TDN	n/a	n/a	VD6428

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	10.0 g	10.0 ml	1.0 ul
Run #2	10.0 g	10.0 ml	1.0 ul

VOA TCL List (OLM4.2)

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	400000	89000	ug/kg	
71-43-2	Benzene	ND	40000	14000	ug/kg	
75-27-4	Bromodichloromethane	ND	200000	10000	ug/kg	
75-25-2	Bromoform	ND	200000	6000	ug/kg	
74-83-9	Bromomethane	ND	200000	16000	ug/kg	
78-93-3	2-Butanone (MEK)	ND	400000	79000	ug/kg	
75-15-0	Carbon disulfide	ND	200000	12000	ug/kg	
56-23-5	Carbon tetrachloride	ND	200000	22000	ug/kg	
108-90-7	Chlorobenzene	ND	200000	14000	ug/kg	
75-00-3	Chloroethane	ND	200000	46000	ug/kg	
67-66-3	Chloroform	187000	200000	13000	ug/kg	J
74-87-3	Chloromethane	ND	200000	6600	ug/kg	
110-82-7	Cyclohexane	74400	200000	6000	ug/kg	J
96-12-8	1,2-Dibromo-3-chloropropane	ND	400000	22000	ug/kg	
124-48-1	Dibromochloromethane	ND	200000	4400	ug/kg	
106-93-4	1,2-Dibromoethane	ND	40000	5500	ug/kg	
95-50-1	1,2-Dichlorobenzene	101000	200000	11000	ug/kg	J
541-73-1	1,3-Dichlorobenzene	ND	200000	11000	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	200000	13000	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	200000	38000	ug/kg	
75-34-3	1,1-Dichloroethane	906000	200000	5500	ug/kg	
107-06-2	1,2-Dichloroethane	ND	40000	14000	ug/kg	
75-35-4	1,1-Dichloroethene	87100	200000	26000	ug/kg	J
156-59-2	cis-1,2-Dichloroethene	800000	200000	9600	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	200000	18000	ug/kg	
78-87-5	1,2-Dichloropropane	ND	200000	5200	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	200000	5300	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	200000	3800	ug/kg	
100-41-4	Ethylbenzene	44300	40000	15000	ug/kg	
76-13-1	Freon 113	109000	200000	22000	ug/kg	J
591-78-6	2-Hexanone	ND	200000	39000	ug/kg	
98-82-8	Isopropylbenzene	ND	200000	21000	ug/kg	

ND = Not detected   MDL - Method Detection Limit   J = Indicates an estimated value
RL = Reporting Limit   B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range   N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	104S-DNAPL			
Lab Sample ID:	JA28119-1		**Date Sampled:**	09/14/09
Matrix:	SO - Oil		**Date Received:**	09/16/09
Method:	SW846 8260B		**Percent Solids:**	n/a
Project:	Honeywell-Chesterfield, Chester, VA			

VOA TCL List (OLM4.2)

CAS No.	Compound	Result	RL	MDL	Units	Q
79-20-9	Methyl Acetate	ND	200000	33000	ug/kg	
108-87-2	Methylcyclohexane	ND	200000	26000	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	40000	11000	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	200000	32000	ug/kg	
75-09-2	Methylene chloride	ND	200000	8900	ug/kg	
100-42-5	Styrene	ND	200000	4300	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	140000	200000	12000	ug/kg	J
127-18-4	Tetrachloroethene	12400000 [a]	1300000	36000	ug/kg	
109-99-9	Tetrahydrofuran	ND	400000	34000	ug/kg	
108-88-3	Toluene	299000	40000	12000	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	20100	200000	14000	ug/kg	J
71-55-6	1,1,1-Trichloroethane	21000000 [a]	1300000	32000	ug/kg	
79-00-5	1,1,2-Trichloroethane	13500	200000	7400	ug/kg	J
79-01-6	Trichloroethene	2720000	200000	21000	ug/kg	
75-69-4	Trichlorofluoromethane	25600	200000	9200	ug/kg	J
75-01-4	Vinyl chloride	ND	200000	7100	ug/kg	
	m,p-Xylene	143000	80000	19000	ug/kg	
95-47-6	o-Xylene	53300	40000	19000	ug/kg	
1330-20-7	Xylene (total)	196000	80000	19000	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	92%	92%	67-127%
17060-07-0	1,2-Dichloroethane-D4	94%	93%	65-132%
2037-26-5	Toluene-D8	97%	98%	74-129%
460-00-4	4-Bromofluorobenzene	93%	93%	62-138%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
92-52-4	Biphenyl	21.45	600000	ug/kg	JN
101-84-8	Diphenyl ether	21.61	1300000	ug/kg	JN
	Total TIC, Volatile		1900000	ug/kg	J

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	104S-DNAPL		
Lab Sample ID:	JA28119-1	**Date Sampled:**	09/14/09
Matrix:	SO - Oil	**Date Received:**	09/16/09
Method:	SW846 8270C SW846 3580A	**Percent Solids:**	n/a
Project:	Honeywell-Chesterfield, Chester, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F83669.D	1	09/23/09	NAP	09/18/09	OP39965	EF3958
Run #2	M67715.D	5	09/24/09	LP	09/18/09	OP39965	EM2520
Run #3	M67718.D	1000	09/24/09	LP	09/18/09	OP39965	EM2520

	Initial Weight	Final Volume
Run #1	0.50 g	1.0 ml
Run #2	0.50 g	1.0 ml
Run #3	0.50 g	1.0 ml

ABN TCL List (CLP4.2 list)

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	16900	10000	1700	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	10000	2400	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	10000	2100	ug/kg	
105-67-9	2,4-Dimethylphenol	505000 [a]	50000	12000	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	40000	22000	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	40000	2100	ug/kg	
95-48-7	2-Methylphenol	573000 [a]	20000	11000	ug/kg	
	3&4-Methylphenol	412000 [a]	20000	13000	ug/kg	
88-75-5	2-Nitrophenol	ND	10000	2100	ug/kg	
100-02-7	4-Nitrophenol	ND	20000	2600	ug/kg	
87-86-5	Pentachlorophenol	30500	20000	2600	ug/kg	
108-95-2	Phenol	74400	4000	1500	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	10000	2200	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	10000	2700	ug/kg	
83-32-9	Acenaphthene	ND	2000	1100	ug/kg	
208-96-8	Acenaphthylene	ND	2000	860	ug/kg	
98-86-2	Acetophenone	ND	10000	980	ug/kg	
62-53-3	Aniline	ND	4000	530	ug/kg	
120-12-7	Anthracene	ND	2000	900	ug/kg	
1912-24-9	Atrazine	ND	10000	1300	ug/kg	
56-55-3	Benzo(a)anthracene	ND	2000	1200	ug/kg	
50-32-8	Benzo(a)pyrene	ND	2000	830	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	2000	1100	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	2000	970	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	2000	1000	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	4000	1100	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	4000	990	ug/kg	
92-52-4	1,1'-Biphenyl	50000000 [b]	4000000	1000000	ug/kg	
101-84-8	Diphenyl ether	141000000 [b]	4000000	1000000	ug/kg	
100-52-7	Benzaldehyde	ND	10000	5800	ug/kg	

ND = Not detected   MDL - Method Detection Limit   J = Indicates an estimated value
RL = Reporting Limit   B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range   N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	104S-DNAPL		
Lab Sample ID:	JA28119-1	**Date Sampled:**	09/14/09
Matrix:	SO - Oil	**Date Received:**	09/16/09
Method:	SW846 8270C SW846 3580A	**Percent Solids:**	n/a
Project:	Honeywell-Chesterfield, Chester, VA		

ABN TCL List (CLP4.2 list)

CAS No.	Compound	Result	RL	MDL	Units	Q
91-58-7	2-Chloronaphthalene	ND	4000	890	ug/kg	
106-47-8	4-Chloroaniline	ND	10000	810	ug/kg	
86-74-8	Carbazole	ND	4000	850	ug/kg	
105-60-2	Caprolactam	ND	4000	1600	ug/kg	
218-01-9	Chrysene	ND	2000	920	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	4000	1000	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	4000	940	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	4000	1000	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	4000	1300	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	4000	1100	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	4000	900	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	10000	3500	ug/kg	
123-91-1	1,4-Dioxane	ND	4000	1100	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	2000	950	ug/kg	
132-64-9	Dibenzofuran	54000	4000	930	ug/kg	
84-74-2	Di-n-butyl phthalate	13200	4000	1200	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	4000	880	ug/kg	
84-66-2	Diethyl phthalate	ND	4000	900	ug/kg	
131-11-3	Dimethyl phthalate	ND	4000	950	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	28900	4000	1000	ug/kg	
206-44-0	Fluoranthene	3080	2000	910	ug/kg	
86-73-7	Fluorene	3900	2000	940	ug/kg	
118-74-1	Hexachlorobenzene	ND	4000	1100	ug/kg	
87-68-3	Hexachlorobutadiene	ND	2000	960	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	40000	1900	ug/kg	
67-72-1	Hexachloroethane	ND	10000	1300	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	2000	740	ug/kg	
78-59-1	Isophorone	ND	4000	1800	ug/kg	
91-57-6	2-Methylnaphthalene	114000	4000	900	ug/kg	
88-74-4	2-Nitroaniline	ND	10000	1500	ug/kg	
99-09-2	3-Nitroaniline	ND	10000	810	ug/kg	
100-01-6	4-Nitroaniline	ND	10000	1300	ug/kg	
91-20-3	Naphthalene	104000	2000	870	ug/kg	
98-95-3	Nitrobenzene	ND	4000	900	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	4000	1200	ug/kg	
86-30-6	N-Nitrosodiphenylamine	43500	10000	1400	ug/kg	
85-01-8	Phenanthrene	10500	2000	990	ug/kg	
129-00-0	Pyrene	1990	2000	880	ug/kg	J

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	104S-DNAPL		
Lab Sample ID:	JA28119-1	**Date Sampled:**	09/14/09
Matrix:	SO - Oil	**Date Received:**	09/16/09
Method:	SW846 8270C SW846 3580A	**Percent Solids:**	n/a
Project:	Honeywell-Chesterfield, Chester, VA		

ABN TCL List (CLP4.2 list)

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 3	Limits
367-12-4	2-Fluorophenol	83%	71%	0% [c]	30-109%
4165-62-2	Phenol-d5	90%	72%	0% [c]	28-108%
118-79-6	2,4,6-Tribromophenol	107%	104%	0% [c]	28-125%
4165-60-0	Nitrobenzene-d5	99%	99%	0% [c]	28-113%
321-60-8	2-Fluorobiphenyl	79%	106%	0% [c]	38-107%
1718-51-0	Terphenyl-d14	70%	88%	0% [c]	31-116%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	alkane	2.18	240000	ug/kg	J
	alkane	2.53	210000	ug/kg	J
	alkane	2.83	400000	ug/kg	J
	alkane	3.24	160000	ug/kg	J
	Ethane, -tetrachloro-	3.41	110000	ug/kg	J
	C3 alkyl benzene	4.06	110000	ug/kg	J
	C3 alkyl benzene	4.50	180000	ug/kg	J
	alkane	4.56	280000	ug/kg	J
	alkane	4.88	130000	ug/kg	J
541-73-1	Benzene, 1,3-dichloro-	5.08	300000	ug/kg	JN
	alkane	5.47	110000	ug/kg	J
	alkane	6.00	320000	ug/kg	J
	Phenol, -dimethyl-	7.02	250000	ug/kg	J
	alkane	7.41	140000	ug/kg	J
90-12-0	Naphthalene, 1-methyl-	9.01	110000	ug/kg	JN
	alkane	11.45	200000	ug/kg	J
	alkane	12.59	320000	ug/kg	J
	alkane	13.71	190000	ug/kg	J
	alkane	14.76	120000	ug/kg	J
	alkane	15.78	140000	ug/kg	J
	unknown	16.53	110000	ug/kg	J
	unknown	16.63	100000	ug/kg	J
	unknown	21.67	97000	ug/kg	J
	Total TIC, Semi-Volatile		4327000	ug/kg	J

(a) Result is from Run# 2
(b) Result is from Run# 3
(c) Outside control limits due to dilution.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	104S-DNAPL		
Lab Sample ID:	JA28119-1	**Date Sampled:**	09/14/09
Matrix:	SO - Oil	**Date Received:**	09/16/09
		Percent Solids:	n/a
Project:	Honeywell-Chesterfield, Chester, VA		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Density	1.0		g/ml	1	09/29/09	LMM	ASTM DEF
Viscosity	4.8	0.50	cS	1	09/29/09	LMM	ASTM D445/6

RL = Reporting Limit

Honeywell Chesterfield Facility
SWMU 4
Chester, VA

Chemical Concentration in Soil Corresponding to Threshold DNAPL Saturation Relationships
(Assessment and Delineation of DNAPL Source Zones at Hazardous Waste Sites, Bernard H. Keuper and Kathryn Davis)

$$C_D = ((S_r \phi \rho_N 10^6)/\rho_b)_+ C^T$$

Where:
C_D = Soil concentration (mg/kg) corresponding to threshold DNAPL saturation
S_r = Threshold DNAPL satration (set between 0.05 and 0.10)
ρ_b = dry soil bulk density (g/cc)
ρ_N = DNAPL density(g/cc)
ϕ = effective porosity (unitless)
C^T = Amount of contaminant (mg/kg present is soil sample, in the aqueous, vapor and sorbed phases (Calculated for above and below water table)

And

$$C_i = m_i S_i$$

Where:
C_i = effective solubility in water (mg/L)
m_i = Mole Fraction in DNAPL (unitless)
S_i = Single component solubility of chemical in water (mg/L)

Component: 1,1,1-TCA

Input for Effective Solubility (C_i) Calculation (Raoult's Law) **$C_i = m_i S_i$**

m_i =	0.108	unitless
S_i =	1330	mg/L

Effective Solubility (C_i) = 144.26 mg/L

Calculation of C^T

$$C^T_i = (C_i/\rho_b)(K_d\rho_b + \theta_w + H'\theta_a)$$

Input Data:

C_i =	144.26	mg/L
n=	0.43	Total soil porosity (n) (default value)
ρ_b =	1.50	Soil dry bulk density (ρ_b)
K_{oc} =	135	for compound
f_{oc} =	0.006	fraction organic carbon (default value)
K_d =	0.81	K_{oc} x f_{oc}
θ_w =	0.15	water filled porosity (default value)
H' =	0.7052	Dimensionless Henrys law constant (H x 41)
θ_a =	0.28	air filled porosity (n - θ_w)

C^T_i =	**150.3**	**mg/kg**
	150,300	**µg/kg**

Calculation of C_D

S_r =	0.05
ρ_N =	1.00
ϕ =	0.20

$C_D = ((S_r\phi\rho_N 10^6/\rho_b) + C^T$

C_D = **6,800** **mg/kg** **6,800,000** **µg/kg**

Honeywell Chesterfield Facility
SWMU 4
Chester, VA

Chemical Concentration in Soil Corresponding to Threshold DNAPL Saturation Relationships
(Assessment and Delineation of DNAPL Source Zones at Hazardous Waste Sites, Bernard H. Keuper and Kathryn Davis)

$$C_D = ((S_r\,\phi\rho_N 10^6)/\rho_b)_+ C^T$$

Where:
C_D = Soil concentration (mg/kg) corresponding to threshold DNAPL saturation
S_r = Threshold DNAPL satration (set between 0.05 and 0.10)
ρ_b = dry soil bulk density (g/cc)
ρ_N = DNAPL density(g/cc)
ϕ = effective porosity (unitless)
C^T = Amount of contaminant (mg/kg present is soil sample, in the aqueous, vapor and sorbed phases (Calculated for above and below water table)

And

$$C_i = m_i S_i$$

Where:
C_i = effective solubility in water (mg/L)
m_i = Mole Fraction in DNAPL (unitless)
S_i = Single component solubility of chemical in water (mg/L)

Component: PCE

Input for Effective Solubility (C_i) Calculation (Raoult's Law) $C_i = m_i S_i$

m_i =	0.052	unitless
S_i =	150	mg/L

Effective Solubility (C_i) = 7.73 mg/L

Calculation of C^T

$$C^T_i = (C_i/\rho_b)(K_d\rho_b + \theta_w + H'\theta_a)$$

Input Data:

C_i =	7.73	mg/L
n=	0.43	Total soil porosity (n) (default value)
ρ_b =	1.50	Soil dry bulk density (ρ_b) (kg/L) - (default value)
K_{oc} =	210	for compound
f_{oc} =	0.006	fraction organic carbon (default value)
K_d =	1.26	K_{oc} x f_{oc}
θ_w =	0.15	water filled porosity (default value)
H' =	0.7544	Dimensionless Henrys law constant (H x 41)
θ_a =	0.28	air filled porosity (n - θ_w)

C^T_i =	**11.6**	**mg/kg**
	11,600	**µg/kg**

Calculation of C_D

S_r =	0.05
ρ_N =	1.00
ϕ =	0.20

$$C_D = ((S_r\phi\rho_N 10^6/\rho_b) + C^T$$

C_D = **6,700 mg/kg** **6,700,000 µg/kg**

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Chemical Concentration in Soil Corresponding to Threshold DNAPL Saturation Relationships
(Assessment and Delineation of DNAPL Source Zones at Hazardous Waste Sites, Bernard H. Keuper and Kathryn Davis)

$$C_D = ((S_r\,\phi\rho_N 10^6)/\rho_b)_+ C^T$$

Where: C_D = Soil concentration (mg/kg) corresponding to threshold DNAPL saturation
S_r = Threshold DNAPL satration (set between 0.05 and 0.10)
ρ_b = dry soil bulk density (g/cc)
ρ_N = DNAPL density(g/cc)
ϕ = effective porosity (unitless)
C^T = Amount of contaminant (mg/kg present is soil sample, in the aqueous, vapor and sorbed phases (Calculated for above and below water table)

And

$$C_i = m_i S_i$$

Where: C_i = effective solubility in water (mg/L)
m_i = Mole Fraction in DNAPL (unitless)
S_i = Single component solubility of chemical in water (mg/L)

Component: TCE

Input for Effective Solubility (C_i) Calculation (Raoult's Law) **$C_i = m_i S_i$**

m_i =	0.0143	unitless	**Effective Solubility (C_i) =**	15.69 mg/L
S_i =	1100	mg/L		

Calculation of C^T

$$C^T_i = (C_i/\rho_b)(K_d\rho_b + \theta_w + H'\theta_a)$$

Input Data:

C_i =	15.69	mg/L
n =	0.43	Total soil porosity (n) (default value)
ρ_b =	1.50	Soil dry bulk density (ρ_b) (kg/L) - (default value)
K_{oc} =	126	for compound
f_{oc} =	0.006	fraction organic carbon (default value)
K_d =	0.756	K_{oc} x f_{oc}
θ_w =	0.15	water filled porosity (default value)
H' =	0.4223	Dimensionless Henrys law constant (H x 41)
θ_a =	0.28	air filled porosity (n - θ_w)

C^T_i =	**14.7**	**mg/kg**
	14,700	**µg/kg**

Calculation of C_D

S_r =	0.05
ρ_N =	1.00
ϕ =	0.20

$C_D = ((S_r\phi\rho_N 10^6/\rho_b) + C^T$

C_D = **6,700 mg/kg** **6,700,000 µg/kg**

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Chemical Concentration in Soil Corresponding to Threshold DNAPL Saturation Relationships
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$$C_D = ((S_r\, \phi \rho_N 10^6)/\rho_b)_+ C^T$$

Where:
C_D = Soil concentration (mg/kg) corresponding to threshold DNAPL saturation
S_r = Threshold DNAPL satration (set between 0.05 and 0.10)
ρ_b = dry soil bulk density (g/cc)
ρ_N = DNAPL density(g/cc)
ϕ = effective porosity (unitless)
C^T = Amount of contaminant (mg/kg present is soil sample, in the aqueous, vapor and sorbed phases (Calculated for above and below water table)

And

$$C_i = m_i S_i$$

Where:
C_i = effective solubility in water (mg/L)
m_i = Mole Fraction in DNAPL (unitless)

Component: 1,1-DCA

Input for Effective Solubility (C_i) Calculation (Raoult's Law) **$C_i = m_i S_i$**

m_i = 0.006 unitless **Effective Solubility (C_i) =** 31.92 mg/L

S_i = 5060 mg/L

Calculation of C^T

$$C^T_i = (C_i/\rho_b)(K_d \rho_b + \theta_w + H'\theta_a)$$

Input Data:

C_i =	31.92	mg/L
n =	0.43	Total soil porosity (n) (default value)
ρ_b =	1.50	Soil dry bulk density
K_{oc} =	31.6	for compound
f_{oc} =	0.006	fraction organic carbon (default value)
K_d =	0.1896	K_{oc} x f_{oc}
θ_w =	0.15	water filled porosity (default value)
H' =	0.230	Dimensionless Henrys law constant (H x 41)
θ_a =	0.28	air filled porosity (n - θ_w)

C^T_i =	**10.62**	**mg/kg**
	10,620	**µg/kg**

Calculation of C_D

$$C_D = ((S_r \phi \rho_N 10^6/\rho_b) + C^T$$

S_r =	0.05	
ρ_N =	1.00	
ϕ =	0.20	

C_D = **6,680** **mg/kg** **6,680,000** **µg/kg**

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Chemical Concentration in Soil Corresponding to Threshold DNAPL Saturation Relationships
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$$C_D = ((S_r \phi \rho_N 10^6)/\rho_b)_+ C^T$$

Where: C_D = Soil concentration (mg/kg) corresponding to threshold DNAPL saturation
S_r = Threshold DNAPL satration (set between 0.05 and 0.10)
ρ_b = dry soil bulk density (g/cc)
ρ_N = DNAPL density(g/cc)
ϕ = effective porosity (unitless)
C^T = Amount of contaminant (mg/kg present is soil sample, in the aqueous, vapor and sorbed phases (Calculated for above and below water table)

And

$$C_i = m_i S_i$$

Where: C_i = effective solubility in water (mg/L)
m_i = Mole Fraction in DNAPL (unitless)

Component: 1,1-biphenyl

Input for Effective Solubility (C_i) Calculation (Raoult's Law) **$C_i = m_i S_i$**

m_i =	0.223	unitless	**Effective Solubility (C_i) =**	1.34	mg/L
S_i =	6	mg/L			

Calculation of C^T

$$C^T_i = (C_i/\rho_b)(K_d\rho_b + \theta_w + H'\theta_a)$$

Input Data:

C_i =	1.34	mg/L
n =	0.43	Total soil porosity (n) (default value)
ρ_b =	1.50	Soil dry bulk density
K_{oc} =	8,560	for compound
f_{oc} =	0.006	fraction organic carbon (default value)
K_d =	51.36	K_{oc} x f_{oc}
θ_w =	0.15	water filled porosity (default value)
H' =	0.0123	Henrys law constant (H x 41)
θ_a =	0.28	air filled porosity (n - θ_w)

C^T_i =	**68.98**	**mg/kg**
	68982	**µg/kg**

Calculation of C_D

$$C_D = ((S_r \phi \rho_N 10^6/\rho_b) + C^T$$

S_r =	0.05	
ρ_N =	1.00	
ϕ =	0.20	

C_D = **6,740** **mg/kg** **6,740,000** **µg/kg**

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Chemical Concentration in Soil Corresponding to Threshold DNAPL Saturation Relationships
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$$C_D = ((S_r \phi \rho_N 10^6)/\rho_b)_+ C^T$$

Where:
C_D = Soil concentration (mg/kg) corresponding to threshold DNAPL saturation
S_r = Threshold DNAPL satration (set between 0.05 and 0.10)
ρ_b = dry soil bulk density (g/cc)
ρ_N = DNAPL density(g/cc)
ϕ = effective porosity (unitless)
C^T = Amount of contaminant (mg/kg present is soil sample, in the aqueous, vapor and sorbed phases (Calculated for above and below water table)

And

$$C_i = m_i S_i$$

Where:
C_i = effective solubility in water (mg/L)
m_i = Mole Fraction in DNAPL (unitless)
S_i = Single component solubility of chemical in water (mg/L)

Component: Diphenyl Ether

Input for Effective Solubility (C_i) Calculation (Raoult's Law) $C_i = m_i S_i$

m_i =	0.571	unitless	**Effective Solubility (C_i) =**	11.99 mg/L
S_i =	21	mg/L		

Calculation of C^T

$$C^T_i = (C_i/\rho_b)(K_d\rho_b + \theta_w + H'\theta_a)$$

Input Data:

C_i =	11.99	mg/L
n =	0.43	Total soil porosity (n) (default value)
ρ_b =	1.50	Soil dry bulk density
K_{oc} =	1950	for compound
f_{oc} =	0.006	fraction organic carbon (default value)
K_d =	11.7	K_{oc} x f_{oc}
θ_w =	0.15	water filled porosity (default value)
H' =	2.80E-04	Dimensionless Henrys law constant (H x 41)
θ_a =	0.28	air filled porosity (n - θ_w)

C^T_i =	**141.4**	**mg/kg**
	141,441	**µg/kg**

Calculation of C_D

S_r =	0.05	
ρ_N =	1.00	
ϕ =	0.20	

$$C_D = ((S_r\phi\rho_N 10^6/\rho_b) + C^T$$

C_D = 6,810 mg/kg **6,810,000 µg/kg**