ANNUAL GROUNDWATER MONITORING REPORT

Hazardous Waste Management Units 5, 7, 10 and 16 CALENDAR YEAR 2010

RADFORD ARMY AMMUNITION PLANT RADFORD, VIRGINIA

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EXECUTIVE SUMMARY

This document presents the Annual Groundwater Monitoring Report for calendar year 2010 for Hazardous Waste Management Units (HWMUs) 5, 7, 10, and 16 located at the Radford Army Ammunition Plant (Radford AAP) in Radford, Virginia. The Annual Groundwater Monitoring Report was compiled in accordance with the requirements specified in the Final Hazardous Waste Post-Closure Care Permit dated October 4, 2002, for HWMUs 5, 7, 10, and 16. This Annual Groundwater Monitoring Report evaluates the analytical data from Second Quarter 2010 and Fourth Quarter 2010 for each Unit.

HWMU-5

The calendar year 2010 groundwater monitoring events served as the first and second semiannual Corrective Action (CA) groundwater monitoring events for HWMU-5 conducted in accordance with Permit Module VI – *Groundwater Corrective Action & Monitoring Program for Unit 5*, which was approved by the Virginia Department of Environmental Quality (VDEQ) in the *Final Class 3 Hazardous Waste Permit Modification* dated November 5, 2009. Plume monitoring well 5W12A was installed in February 2010.

During Second Quarter 2010, trichloroethene (TCE) was detected in point of compliance well 5W5B at a concentration less than the GPS of 5 μ g/l. However, during Fourth Quarter 2010, TCE was detected in well 5W5B at a concentration greater than the GPS of 5 μ g/l. However, no daughter products of TCE were detected in well 5W5B during the 2010 monitoring events. The observed concentration fluctuations of TCE in point of compliance well 5W5B are consistent with typical historical concentration fluctuations of TCE in that well. TCE was not detected at concentrations greater than the GPS in any other wells comprising the CA monitoring network during the calendar year 2010 monitoring events, and no daughter products of TCE were detected in the wells comprising the CA monitoring network. In accordance with the Permit, the effectiveness of the corrective action (monitored natural attenuation [MNA]) was assessed, found to be effective, and no additional action is required.

An Alternate Source Demonstration (ASD) for cobalt was submitted in October 2010. In correspondence dated December 20, 2010, the VDEQ stated that the ASD did not conclusively demonstrate that the cobalt concentrations detected in POC well 5WC21 were caused by natural variation in the groundwater. However, VDEQ agreed that no changes to the groundwater corrective action and monitoring program at Unit 5 are necessary.

HWMU-7

Based on an evaluation of the groundwater analytical data and additional information for HWMU-7, no constituents were detected in the point of compliance wells at concentrations greater than their respective GPSs during calendar year 2010. Therefore, no further action is recommended at this time.

The Appendix IX constituent chloroform was detected in upgradient well 7W12B and in point of compliance wells 7WCA and 7W11B during Second Quarter 2010. Chloroform will not be added to the Compliance Monitoring Constituent List for HWMU-7 based on the June 14,

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2007 concurrence by the VDEQ with the ASD for chloroform at HWMU-7 submitted on January 31, 2007. No additional Appendix IX constituents were detected during Second Quarter 2010; therefore, no changes to the Groundwater Monitoring List for the Unit are required.

An evaluation of the plume monitoring well data indicates that the concentrations of total barium in plume monitoring wells 7W10B and 7W10C were greater than the site-specific background concentration. Additionally, the concentrations of total cobalt in plume monitoring well 7W13 were greater than the site-specific background concentration. As stated previously, higher total barium and total cobalt concentrations in downgradient plume monitoring wells relative to background at HWMU-7 may be the result of natural variations in trace element distribution in groundwater. In addition, these concentrations are consistent with previous barium and cobalt concentrations detected these wells. Therefore, no further action regarding the total barium concentrations detected in plume monitoring wells 7W10B and 7W10C or the total cobalt concentrations detected in plume monitoring well 7W13 is recommended at this time.

During Fourth Quarter 2010, total arsenic was initially detected in plume monitoring well 7W13 at a concentration of 20.2 μ g/l, which is greater than the site-specific background concentration of 10 μ g/l. On December 16, 2010, a verification sample and a blind field duplicate were collected from well 7W13 in order to confirm or refute the initial concentration. Based on the verification results and historical data, the final result for total arsenic in well 7W13 for Fourth Quarter 2010 was reported as not detected at or above the background value (and QL) of 10 μ g/l. Therefore, no further action with respect to total arsenic in well 7W13 is necessary at this time. Total arsenic will continue to be monitored in plume monitoring well 7W13 during the upcoming semiannual monitoring event for HWMU-7.

In correspondence to the VDEQ dated August 9, 2007, Radford AAP submitted a Class 3 permit modification for the Post-Closure Care Permit for HWMUs 5, 7, 10, and 16. The permit modification included an amended closure plan for HMWU-7. Upon incorporation of the Class 3 permit modification into the Permit, Radford AAP will finalize the closure report for HWMU-7. The closure report will include a clean closure evaluation for soil and groundwater at the Unit.

HWMU-10

Based on an evaluation of the groundwater analytical data and additional information for HWMU-10, no constituents were detected at concentrations greater than their respective GPSs during calendar year 2010. Therefore, no further action is recommended at this time.

No additional Appendix IX constituents were detected during Second Quarter 2010; therefore, no changes to the Groundwater Monitoring List for the Unit are required.

HWMU-16

Based on an evaluation of the groundwater analytical data and additional information for HWMU-16, no constituents were detected at concentrations greater than their respective GPSs during calendar year 2010. Therefore, no further action is recommended at this time.

The Appendix IX constituents benzene, 1,1-dichloroethene, and tetrahydrofuran were detected in upgradient well 16C1 during Second Quarter 2010. However, as 16C1 is the background well for HWMU-16, the detected benzene, 1,1-dichloroethene, and tetrahydrofuran concentrations appear to be derived from a source upgradient of the Unit. As a result, benzene, 1,1-dichloroethene, and tetrahydrofuran will not be added to the Groundwater Monitoring List for the Unit. No additional Appendix IX constituents were confirmed in the point of compliance wells during Second Quarter 2010; therefore, no changes to the Groundwater Monitoring List for the Unit are required.

The evaluation of the plume monitoring well data indicated that the concentrations of total barium upgradient well 16C1 and in plume monitoring wells 16-1, 16-2, 16-3, 16-5, and 16SPRING were greater than the site-specific background concentration. As stated previously, higher total barium concentrations in downgradient plume monitoring wells relative to background are likely due to natural variations in trace element distribution in groundwater. Upgradient well 16C1 is screened in limestone while downgradient plume monitoring wells 16-1, 16-2, 16-3, and 16-5 are screened in shale and fault breccia. Such differing lithologic formations would be expected to contain very different trace element distributions. Therefore, no further action regarding the 2010 total barium concentrations detected in plume monitoring wells 16-1, 16-2, 16-3, and 16-5 and in spring sampling location 16SPRING is recommended at this time.

1.0 INTRODUCTION

This document presents the Annual Groundwater Monitoring Report for calendar year 2010 for Hazardous Waste Management Units (HWMUs) 5, 7, 10, and 16 located at the Radford Army Ammunition Plant (Radford AAP) in Radford, Virginia. The Annual Groundwater Monitoring Report was compiled in accordance with the requirements specified in the Final Hazardous Waste Post-Closure Care Permit dated October 4, 2002, for HWMUs 5, 7, 10, and 16.

The Annual Groundwater Monitoring Report presents the following set of information for each Unit: basic information and unit identification, a description of the groundwater monitoring plan, a discussion of groundwater movement, potentiometric surface maps, a table of groundwater elevations, and detailed statistical evaluations of the analytical data.

Please note that the sampling frequency for HWMUs 5, 7, 10, and 16 was changed from quarterly to semiannual in the VDEQ-approved Class 1 Permit Modification dated June 14, 2007. Therefore, this Annual Groundwater Monitoring Report evaluates the analytical data from Second Quarter 2010 and Fourth Quarter 2010 for each Unit. Copies of correspondence relating to groundwater monitoring activities conducted at HWMUs 5, 7, 10, and 16 during calendar year 2010 are included (on CD-ROM) in **Appendix G**.

1.1 HWMU-5

HWMU-5 is a closed lined neutralization pond. The Unit received certification for closure in 1989. As stated in Permit Condition I.K.1 of the Final Post-Closure Care Permit, the Compliance Period during which the Groundwater Protection Standard applies to HWMU-5 is 19 years, beginning on the effective date of the original Post-Closure Care Permit for HWMU-5 (October 28, 2001) and continuing until October 28, 2020. The Second Quarter 2010 groundwater monitoring event served as the first semiannual Corrective Action (CA) groundwater Corrective Action & Monitoring Program for Unit 5, which was approved by the VDEQ in the Final Class 3 Hazardous Waste Permit Modification dated November 5, 2009. This report is the ninth complete Annual Groundwater Monitoring Report submitted to the Virginia Department of Environmental Quality (VDEQ) for this Unit during the Compliance Period, and the first complete Annual Groundwater Monitoring Report submitted to the VDEQ under the Groundwater Corrective Action & Monitoring Program.

1.2 HWMU-7

HWMU-7 is a closed unlined holding and neutralization basin. The Unit received certification for closure in 1990. As stated in Permit Condition I.K.2, the Compliance Period during which the Groundwater Protection Standard applies to HWMU-7 is 18 years, beginning on the effective date of the original Post-Closure Care Permit for HWMU-7 (October 30, 1999) and continuing until October 30, 2017. This report is the eleventh complete Annual Groundwater Monitoring Report submitted to the VDEQ for this Unit during the Compliance Period.

1.3 HWMU-10

HWMU-10 is a closed equalization basin for the biological treatment system. The Unit received certification for closure in 1998. As stated in Permit Condition I.K.3, the Compliance Period during which the Groundwater Protection Standard applies to HWMU-10 is 18 years, beginning on the effective date of the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Management Units 5, 7, 10, and 16 (October 4, 2002) and continuing until October 4, 2020. This report is the ninth Annual Groundwater Monitoring Report submitted to the VDEQ for this Unit during the Compliance Period.

1.4 HWMU-16

HWMU-16 is a closed hazardous waste landfill. The Unit received certification for closure in 1993. As stated in Permit Condition I.K.4, the Compliance Period during which the Groundwater Protection Standard applies to HWMU-16 is 13 years, beginning on the effective date of the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Management Units 5, 7, 10, and 16 (October 4, 2002) and continuing until October 4, 2015. This report is the ninth Annual Groundwater Monitoring Report submitted to the VDEQ for this Unit during the Compliance Period.

2.0 HWMU-5 ANNUAL GROUNDWATER MONITORING REPORT

2.1 Waste Management Unit Information

Unit Name: Hazardous Waste Management Unit 5 (HWMU-5)
Owner/Operator: United States Army/Alliant Techsystems Inc.

Unit Location: Radford AAP Main Plant Area, Radford, Virginia

Class: Hazardous Waste Management Unit Type: Closed Lined Neutralization Pond

2.2 Groundwater Monitoring Plan

Monitoring Network:

Upgradient Well: 5W8B

Point of Compliance Wells: 5W5B, 5W7B, 5WC21, 5WC22, 5WC23

Plume Monitoring Wells: 5W12A

Observation Wells: S5W5, S5W7, 5W9A, 5W10A, 5W11A, 5WCA, S5W6,

S5W8, 5WC11, 5WC22

Monitoring Status: Corrective Action Monitoring Program

CY 2010 Monitoring Events:

Second Quarter 2010: April 21-22, 2010 Fourth Quarter 2010: October 26-27, 2010

The calendar year 2010 groundwater monitoring events served as the first and second semiannual Corrective Action (CA) groundwater monitoring events for HWMU-5 conducted in accordance with Permit Module VI – *Groundwater Corrective Action & Monitoring Program for Unit 5*, which was approved by the Virginia Department of Environmental Quality (VDEQ) in the *Final Class 3 Hazardous Waste Permit Modification* dated November 5, 2009. As required by the *Final Class 3 Hazardous Waste Permit Modification*, plume monitoring well 5W12A was installed in February 2010 in support of the Natural Attenuation Remedy implemented as the CA method for trichloroethene (TCE) concentrations present in groundwater at the Unit. As part of the Natural Attenuation Remedy, plume monitoring well 5W12A replaces plume monitoring wells S5W5, S5W7, 5W9A, 5W10A, and 5W11A, which in turn were reclassified as observation wells used for the measurement of static water levels only. Copies of the November 5, 2009 *Final Class 3 Hazardous Waste Permit Modification* and the March 3, 2010 *Monitoring Well Installation Report* for well 5W12A are included (on CD-ROM) in **Appendix G**.

2.3 Groundwater Movement

The monitoring wells at HWMU-5 are screened entirely within either weathered carbonate bedrock residuum or alluvium or across the weathered residuum/carbonate bedrock interface. The static water level measurements gathered during the 2010 semiannual monitoring

events are summarized in **Table 1**. Groundwater fluctuations ranged from 0.17 to 2.72 feet during the 2010 groundwater monitoring events. As shown on the HWMU-5 Potentiometric Surface Maps (**Appendix A-1**), groundwater movement beneath the site is generally to the northeast.

Darcian flow conditions were assumed for the alluvium, residuum, and carbonate bedrock beneath HWMU-5. As a result, the groundwater velocities were calculated by multiplying the hydraulic conductivity (determined from previously conducted slug tests) by the average hydraulic gradient across the site and dividing by an assumed effective porosity for the aquifer. The average hydraulic gradient was determined by superimposing three evenly spaced flow line vectors over the potentiometric surface map, measuring their lengths, calculating the head differential over the distances measured, and dividing the head differential by the length of the flow line vectors. The three calculated gradients were then averaged to a single value. Using this method, the average groundwater hydraulic gradient across the site based on Fourth Quarter 2010 groundwater elevations was calculated to be 0.029 ft/ft. Historical slug test data for the site yielded an average hydraulic conductivity of 5.25 x 10⁻⁵ ft/second. This value is consistent with literature values for carbonate rock and for clayey, silty sand and gravel alluvium and residuum (Domenico and Schwartz, 1990).

The estimated groundwater velocity across the site was calculated to be approximately 0.33 ft/day or 120 ft/year based on the following:

- Average hydraulic conductivity of 5.25 x 10⁻⁵ ft/second.
- Average hydraulic gradient of 0.029 ft/ft.
- Assumed effective porosity of 0.40, based on a representative range of porosities for carbonate rock, weathered residuum, and clayey, silty sand and gravel alluvium (Domenico and Schwartz, 1990).

The actual groundwater flow velocities in the carbonate bedrock may vary as much as one to two orders of magnitude from the velocity presented above depending on water level conditions and the distribution of solution features.

2.4 Groundwater Analytical Data Evaluation

The calendar year 2010 groundwater monitoring events served as the first and second semiannual Corrective Action (CA) groundwater monitoring events for HWMU-5 conducted in accordance with Permit Module VI – *Groundwater Corrective Action & Monitoring Program for Unit 5*, which was approved by the VDEQ in the *Final Class 3 Hazardous Waste Permit Modification* dated November 5, 2009. Specifically, the Second Quarter 2010 and Fourth Quarter 2010 events served as the first and second semiannual monitoring events in which all of the wells in the CA groundwater monitoring network were sampled for the constituents listed in Appendix J to Permit Attachment 2 (Groundwater Corrective Action Targeted Constituents - GPS and Semiannual Monitoring List for HWMU-5). The Second Quarter 2010 event also served as the first annual monitoring event in which the point of compliance wells at HWMU-5 were sampled for the constituents listed in Appendix K to Permit Attachment 2 (Groundwater Corrective Action Annual Monitoring List).

The laboratory analytical results for the 2010 monitoring events are summarized in **Appendix A-2** (Groundwater Corrective Action Targeted Constituents - GPS and Semiannual Monitoring List) and in **Appendix A-3** (Groundwater Corrective Action Annual Monitoring List). The laboratory analytical results for the 2010 monitoring events are included on CD-ROM in **Appendix E**. The analytical data were validated in accordance with SW-846, *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*, and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*. Data validation reports are included in **Appendix E**. Copies of field notes recorded during sample collection are included on CD-ROM in **Appendix F**.

2.4.1 Semiannual Monitoring for Corrective Action Targeted Constituents

During the Second Quarter 2010 and Fourth Quarter 2010 monitoring events, groundwater samples collected from all of the wells in the CA groundwater monitoring network were analyzed for the constituents listed in Appendix J to Permit Attachment 2. The CA Targeted Constituents consist of TCE and its daughter products: 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene (cDCE), trans-1,2-dichloroethene (tDCE), and vinyl chloride (VC). Additionally, groundwater samples collected during the first year of CA monitoring are analyzed for the monitored natural attenuation (MNA) indicator parameters: ethane, ethene, methane, nitrate, nitrite, sulfate, sulfite, and total organic carbon (TOC). The laboratory analytical results for the MNA indicator parameters are summarized in **Appendix A-2**.

During Second Quarter 2010, TCE was detected in POC wells 5W5B, 5WC21, 5WC22, and 5WC23 at concentrations ranging from 2.6 μ g/l to 4.4 μ g/l, which are less than the GPS of 5 μ g/l (**Appendix A-2**). TCE was not detected in any of the other wells in the CA groundwater monitoring network. Additionally, the TCE daughter products were not detected in any of the wells comprising the CA groundwater monitoring network.

During Fourth Quarter 2010, TCE was detected in POC wells 5WC21, 5WC22, and 5WC23 at concentrations ranging from 3.9 μ g/l to 4 μ g/l, which are less than the GPS of 5 μ g/l (**Appendix A-2**). However, TCE was detected in POC well 5W5B at a concentration of 7.3 μ g/l, which is greater than the GPS of 5 μ g/l (**Appendix A-2**). TCE was not detected in any of the other wells in the CA groundwater monitoring network. Additionally, the TCE daughter products were not detected in any of the wells comprising the CA groundwater monitoring network.

Of the MNA indicator parameters, nitrate, sulfate, and TOC were detected in all of the wells comprising the CA groundwater monitoring network during both 2010 monitoring events; no other MNA indicator parameters were detected (**Appendix A-2**).

2.4.2 Annual Monitoring List - Comparison to Groundwater Protection Standards

During Second Quarter 2010, groundwater samples collected from the POC wells for HWMU-5 were analyzed for the constituents listed in Appendix K to Permit Attachment 2 (Groundwater Corrective Action Annual Monitoring List). Annual monitoring for the constituents listed in Appendix K is required in order to evaluate whether additional hazardous

constituents that are not the targets for the current Corrective Action (e.g., TCE and its daughter products) are present at concentrations greater than the Groundwater Protection Standards (GPS) for the Unit.

As part of the November 5, 2009 Final Class 3 Hazardous Waste Permit Modification, the GPS for HWMU-5 were revised to incorporate the January 2009 VDEQ Alternate Concentration Limits (ACLs). As a result, the GPS for total cobalt was reduced from the previous VDEQ ACL used in the original Permit (313 μ g/l) to the HWMU-5 background concentration of 7 μ g/l. During Second Quarter 2010, total cobalt was detected in point of compliance well 5WC21 at a concentration of 70.4 μ g/l, which is greater than the revised GPS of 7 μ g/l (**Appendix A-3**). Cobalt is an additional hazardous constituent that is not a target of the current Corrective Action for the Unit. Total cobalt has never been detected in groundwater at HWMU-5 at concentrations greater than the previous GPS. Furthermore, the total cobalt concentration detected in well 5WC21 is consistent with historical data for that well.

On October 8, 2010, Radford AAP submitted to the VDEQ an alternate source demonstration (ASD) evaluating whether total cobalt concentrations detected in POC well 5WC21 were due to natural variability in the groundwater. In correspondence dated December 20, 2010, the VDEQ stated that the ASD did not conclusively demonstrate that the cobalt concentrations detected in POC well 5WC21 were caused by natural variation in the groundwater. However, due to the declining cobalt concentrations and the fact that Radford AAP is already implementing a monitored natural attenuation program to address organics in the vicinity of several wells, including well 5WC21, the VDEQ agreed that the ongoing corrective action monitoring program is sufficient to address the cobalt concentrations detected in well 5WC21 which were greater than the proposed new GPS. Therefore, the VDEQ determined that no changes to the groundwater corrective action and monitoring program at Unit 5 were necessary, and directed Radford AAP to continue monitoring under the existing groundwater monitoring program. Copies of the October 8, 2010 ASD for cobalt and subsequent correspondence are included (on CD-ROM) in **Appendix G**.

No other additional hazardous constituents that are not targets for the current Corrective Action for the Unit were detected at concentrations greater than their respective GPS during Second Quarter 2010. TCE was not detected in any of the point of compliance wells at concentrations greater than its GPS. Additionally, no daughter products of TCE were detected in any of the point of compliance wells.

2.4.3 Annual Monitoring List – Verification of Estimated Values

A footnote presented in Appendix K to Permit Attachment 2 indicates that verification is required for constituents detected at concentrations less than the Quantitation Limit (QL) if their associated GPS are 1) based on background values equal to the QL, and 2) are greater than the applicable risk-based concentrations (i.e., ACL or RBC). In these instances, verification must be conducted using an alternate low-level analytical method in order to confirm or refute the observed initial detections. If a concentration greater than the low-level analytical method QL is observed, then the GPS for that constituent will be updated, if warranted.

During Second Quarter 2010, p-nitroaniline and nitrobenzene (which have GPS based on background values equal to their respective QLs) were detected in point of compliance wells 5WC21, 5WC22, and/or 5WC23 at concentrations less than their respective QLs (**Table 2**). As a result, Radford AAP conducted a verification event using an alternate low-level analytical method to confirm or refute the observed initial detections. The subject constituents were not detected in any of the verification samples at concentrations greater than their respective low-level analytical method QLs; therefore, no further action is warranted.

2.5 Annual Evaluation of Effectiveness of Corrective Action

In accordance with Sections VI.B.6, VI.J.4.f and VI.J.4.g and other applicable sections of the *Final Class 3 Hazardous Waste Permit Modification* dated November 5, 2009, Radford AAP performed an annual evaluation of the effectiveness of the Corrective Action Program (CAP) (monitored natural attenuation [MNA] program) for calendar year 2010. MNA is the current remedial measure implemented at the Unit to address TCE in groundwater at concentrations greater than the GPS. In accordance with the applicable sections of the Permit, the evaluation includes the following:

- Construction of long-term concentration plots of constituents of concern (COCs) detected at concentrations greater than their respective GPS.
- Calculation of a Point Attenuation Rate for each detected COC and determination of an updated compliance (MNA remedial) timeframe prediction based on revised point attenuation rates determined from concentration versus time graphs using the principles and methods presented in Section 7.4 of Permit Attachment 2, Appendix I (CAP).
- Comparison of updated MNA remedial timeframe to the 2019 MNA remedial timeframe (MNA goal per CAP).
- Determination of the effectiveness of the Current Remedial Measure.

2.5.1 Construction of Long-term Concentration Plots of COCs

In accordance with the Permit, graphs of natural-log concentration versus time for monitoring wells exhibiting current detections of TCE and degradation products (current COCs) at concentrations greater than their respective GPS values were constructed (**Appendix A-4**). During Second Quarter 2010, TCE was detected in point of compliance well 5W5B at a concentration less than the GPS of 5 µg/l. However, during Fourth Quarter 2010, TCE was detected in well 5W5B at a concentration greater than the GPS of 5 µg/l. TCE was not detected at concentrations greater than the GPS in any other wells comprising the CA monitoring network during the calendar year 2010 monitoring events. The observed concentration fluctuations of TCE in point of compliance well 5W5B are consistent with typical historical concentration fluctuations of TCE in that well. In accordance with the Permit, a long-term concentration plot of the natural-log concentration of TCE in well 5W5B versus time was constructed. A linear regression line shows clearly decreasing trends in TCE concentration in well 5W5B over time (**Appendix A-4**). An isoconcentration map illustrating TCE concentrations detected in groundwater during the Fourth Quarter 2010 event is included in **Appendix A-4**.

TCE was detected in monitoring wells 5WC21, 5WC22 and 5WC23 during both 2010 monitoring events at concentrations less than the GPS of 5 μ g/l. Therefore, no concentration

plots were required for TCE in those wells. The TCE concentrations in 5WC21, 5WC22 and 5WC23 continue to show consistent decrease in comparison with their historical data (**Appendix A-4**).

To date no daughter products of TCE (i.e., other COCs) have been detected in the groundwater samples collected at from the wells comprising the CA monitoring network at HWMU-5.

Overall, the above evaluation shows that concentrations of TCE are decreasing in the groundwater at the Unit. Therefore, the current remedial measure (MNA) is performing effectively in addressing the TCE concentrations in groundwater at the Unit.

2.5.2 Calculation of Point Attenuation Rates and Updated Compliance (MNA Remedial) Timeframe

TCE is the only current COC detected at concentrations greater than its GPS at the Unit (specifically, in well 5W5B). Therefore an updated point attenuation rate was calculated for TCE concentration in well 5W5B. The updated point attenuation rate is 0.0006, which is based on a linear regression, where the slope of the regression represents the attenuation rate, k_{point} (see attached MNA Effectiveness Evaluation Concentration Trend Graph and Point Attenuation Rate Constant Calculation for TCE in Well 5W5B; **Appendix A-4**). The data set used to calculate the point attenuation rate encompasses TCE concentrations detected in well 5W5B from the last 16 monitoring events beginning with April 18, 2005 to the present (October 26, 2010).

The updated MNA Compliance timeframe was calculated using the following equation:

$$t = -[ln(C_{goal}/C_{start})]/k_{point}$$

whereas:

t = predicted GPS remedial time frame

 $C_{goal} = GPS$ concentration (5 μ g/l)

 $C_{\text{start}} = \text{current constituent concentration } (7.3 \,\mu\text{g/l})$

 k_{point} = natural attenuation rate (0.0006)

 $t = -[\ln(5/7.3)]/0.0006$ t = 1.73 years

The calculated current MNA timeframe (date) is mid-2012.

The current MNA timeframe is less than that 2019 MNA goal (MNA remedial timeframe presented in the CAP) and less than the 2026 MNA ineffective date (as specified in the CAP). Therefore, the current remedy is considered effective and no additional action is required.

2.6 Recommendations

During Second Quarter 2010, trichloroethene (TCE) was detected in point of compliance well 5W5B at a concentration less than the GPS of 5 μ g/l. However, during Fourth Quarter

2010, TCE was detected in well 5W5B at a concentration greater than the GPS of 5 μg/l. However, no daughter products of TCE were detected in well 5W5B during the 2010 monitoring events. The observed concentration fluctuations of TCE in point of compliance well 5W5B are consistent with typical historical concentration fluctuations of TCE in that well. TCE was not detected at concentrations greater than the GPS in any other wells comprising the CA monitoring network during the calendar year 2010 monitoring events, and no daughter products of TCE were detected in the wells comprising the CA monitoring network. In accordance with the Permit, a long-term concentration plot of the natural-log concentration of TCE in well 5W5B versus time was constructed. A linear regression line shows clearly decreasing trends in TCE concentration in well 5W5B over time. Based on the data collected to date, the current calculated compliance timeframe for corrective action (monitored natural attenuation [MNA]) is mid-2012, which is less than the MNA remedial timeframe goal of 2019 as presented in the Permit, and less than the 2026 MNA ineffective date as specified in the Permit. Therefore, the current remedial measure (MNA) is performing effectively in addressing the TCE concentrations in groundwater at the Unit, and no additional action is required.

In correspondence dated December 20, 2010, the VDEQ stated that the October 8, 2010 ASD for cobalt in groundwater did not conclusively demonstrate that the cobalt concentrations detected in POC well 5WC21 were caused by natural variation in the groundwater. However, due to the declining cobalt concentrations and the fact that Radford AAP is already implementing a monitored natural attenuation program to address organics in the vicinity of several wells, including well 5WC21, the VDEQ agreed that the ongoing corrective action monitoring program is sufficient to address the cobalt concentrations detected in well 5WC21 which were greater than the proposed new GPS. Therefore, the VDEQ determined that no changes to the groundwater corrective action and monitoring program at Unit 5 were necessary, and directed Radford AAP to continue monitoring under the existing groundwater monitoring program.

3.0 HWMU-7 ANNUAL GROUNDWATER MONITORING REPORT

3.1 Waste Management Unit Information

Unit Name: Hazardous Waste Management Unit 7 (HWMU-7) **Owner/Operator:** United States Army/Alliant Techsystems Inc.

Unit Location: Radford AAP Main Plant Area, Radford, Virginia

Class: Hazardous Waste Management Unit

Type: Closed Unlined Holding and Neutralization Basin

3.2 Groundwater Monitoring Plan

Monitoring Network:

Upgradient Well: 7W12B

Point of Compliance Wells: 7WCA, 7MW6, 7W11B

Plume Monitoring Wells: 7W9C, 7W10B, 7W10C, 7W13

Observation Wells: 7MW5, 7W9B, 7W11

Monitoring Status: Compliance Monitoring Program

CY 2010 Monitoring Events:

Second Quarter 2010: April 19-20, 2010 Fourth Quarter 2010: October 25-26, 2010

3.3 Groundwater Movement

The monitoring wells at HWMU-7 are screened entirely within alluvium, weathered carbonate bedrock residuum, or carbonate bedrock or across the interfaces between two of the listed strata. The static water level measurements gathered during the 2010 semiannual monitoring events are summarized in **Table 2**. Groundwater fluctuations ranged from 0.49 to 3.07 feet annually. As shown on the HWMU-7 Potentiometric Surface Maps (**Appendix B-1**), groundwater movement beneath the site is generally to the west towards the New River and to the northeast and southwest toward the unnamed intermittent drainages that flow into the New River north and south of the site.

Darcian flow conditions were assumed for the alluvium, residuum, and carbonate bedrock beneath HWMU-7. As a result, the groundwater velocities were calculated by multiplying the hydraulic conductivity (determined from previously conducted slug tests) by the average hydraulic gradient across the site, and dividing by an assumed effective porosity for the aquifer materials. The average hydraulic gradient was determined by superimposing three evenly spaced flow line vectors over the potentiometric surface map, measuring their lengths, calculating the head differential over the distances measured, and dividing the head differential by the length of the flow line vectors. The three calculated gradients were then averaged to a single value. Using this method, the average groundwater hydraulic gradient across the site

based on the Fourth Quarter 2010 groundwater elevations was calculated to be 0.008 ft/ft. Historical slug test data for the site yielded an average hydraulic conductivity of 5.1 x 10⁻⁶ ft/second. This value is consistent with literature values for carbonate rock and for clayey, silty sand and gravel alluvium and residuum (Domenico and Schwartz, 1990).

The estimated groundwater velocity across the site was calculated to be approximately 8.81×10^{-3} ft/day or 3.2 ft/year, based on the following:

- Average hydraulic conductivity of 5.1 x 10⁻⁶ ft/second.
- Average hydraulic gradient of 0.008 ft/ft.
- Assumed effective porosity of 0.40, based on a representative range of porosities for carbonate rock, weathered residuum, and clayey, silty sand and gravel alluvium (Domenico and Schwartz, 1990).

The actual groundwater flow velocities in the carbonate bedrock may vary as much as one to two orders of magnitude from the velocity presented above depending on water level conditions and the distribution of solution features.

3.4 Groundwater Analytical Data Evaluation

The groundwater samples collected from the compliance monitoring network during the 2010 semiannual monitoring events were analyzed for the constituents listed in Appendix E to Attachment 3 of the Final Post-Closure Care Permit, plus copper (which was added to the constituent list for HWMU-7 following Third Quarter 2003) and zinc (which was added to the constituent list for HWMU-7 following Second Quarter 2004). In addition, groundwater samples were collected from the upgradient well and the point of compliance wells for the annual monitoring for the constituents listed in Appendix IX of 40 CFR Part 264. The laboratory analytical results for the 2010 monitoring events are included in **Appendix B-2** (point of compliance wells) and in **Appendix B-3** (plume monitoring wells). The laboratory analytical results for the 2010 monitoring events also are included in electronic format in **Appendix E**. The analytical data were validated in accordance with SW-846, *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*. Data validation reports are included in **Appendix E**. Copies of field notes recorded during sample collection are included on CD-ROM in **Appendix F**.

3.4.1 Comparison to Groundwater Protection Standards

As specified in Permit Condition V.J.2.i, the 2010 groundwater analytical data for the upgradient well and the point of compliance wells were compared to the GPSs for HWMU-7 listed in Appendix G of Permit Attachment 3. In accordance with Permit Condition V.I.2, Radford AAP performed a simple empirical comparison of the upgradient well and the point of compliance well data to the GPSs (**Appendix B-2**).

As shown in **Appendix B-2**, no constituents were detected at concentrations greater than their respective GPSs.

3.4.2 Comparison to Background Concentrations

As specified in Permit Condition V.O, the 2010 groundwater analytical data for the plume monitoring wells were compared to the background concentrations for HWMU-7. The original background concentrations as presented in the Groundwater Quality Assessment Report for HWMU-7 dated August 1998 are listed in Appendix F of Permit Attachment 3. However, in correspondence dated October 31, 2007, the VDEQ indicated that Radford AAP should statistically recalculate the background concentration values for HWMU-7 as part of the clean closure evaluation for the Unit. In February 2008, Draper Aden Associates recalculated background values for all plume monitoring well constituents at HWMU-7. For the calendar year 2010 semiannual monitoring events, Radford AAP performed a simple empirical comparison of the plume monitoring well data to the site-specific background concentrations presented in Appendix F of Permit Attachment 3, as well as the February 2008 revised background values presented in the pending Class 3 Permit Modification for HWMUs 5, 7, 10, and 16 (Appendix B-3).

As shown in **Appendix B-3**, total barium concentrations detected in plume monitoring well 7W10B during both 2010 semiannual monitoring events were greater than the Permitspecified background concentration of 64 μ g/l as well as the February 2008 revised background concentration of 41 μ g/l. Additionally, the total barium concentrations detected in plume monitoring well 7W10C during both 2010 semiannual monitoring events were greater than the February 2008 revised background concentration of 41 μ g/l, but less than the Permit-specified background concentration of 64 μ g/l. However, all of the total barium concentrations detected in wells 7W10B and 7W10C were more than an order of magnitude below the USEPA MCL for barium of 2,000 μ g/l. Higher total barium concentrations in downgradient plume monitoring wells relative to background at HWMU-7 may be the result of natural variations in trace element distribution in groundwater. In addition, these concentrations are consistent with previous barium concentrations detected these wells.

As also shown in **Appendix B-3**, total cobalt concentrations detected in plume monitoring well 7W13 during both 2010 semiannual monitoring events were greater than the February 2008 revised background concentration of 5 μ g/l, but less than the Permit-specified background concentration of 17 μ g/l. A higher total cobalt concentration in downgradient plume monitoring well 7W13 relative to background at HWMU-7 may be the result of natural variations in trace element distribution in groundwater. In addition, the total cobalt concentrations detected in well 7W13 are consistent with previous cobalt concentrations detected in this well.

During Fourth Quarter 2010, total arsenic was initially detected in plume monitoring well 7W13 at a concentration of 20.2 μ g/l, which is greater than the site-specific background concentration of 10 μ g/l. On December 16, 2010, a verification sample and a blind field duplicate were collected from well 7W13 in order to confirm or refute the initial concentration. Total arsenic was detected in the verification sample and in the blind field duplicate at concentrations of 10.1 μ g/l and 10.6 μ g/l, respectively. However, the laboratory sample duplicate did not exhibit a total arsenic concentration greater than the quantitation limit (QL) of

10 μ g/l. Radford AAP notified the VDEQ regarding these results on January 11, 2011; in electronic correspondence dated January 19, 2011, the VDEQ recommended the collection of four (4) independent samples from well 7W13 during the first semiannual monitoring event for 2011 in order to confirm the presence and concentration of total arsenic. However, further review of historical arsenic data for plume monitoring well 7W13 indicate that total arsenic has not been detected at concentrations greater than the site-specific background of 10 μ g/l during the previous 23 monitoring events (since Second Quarter 2003; data collected prior to Second Quarter 2003 were not validated and are considered suspect). Based on the historical data, and due to the fact that total arsenic was not consistently detected at a concentration greater than 10 μ g/l in the December 16, 2010 verification sample, blind field duplicate, and laboratory duplicate, the final result for total arsenic in well 7W13 for Fourth Quarter 2010 was reported as not detected at or above the background value (and QL) of 10 μ g/l.

In summary:

- Total arsenic was detected in the verification sample from well 7W13 at a concentration of 10.1 μ g/l;
- Total arsenic was not detected at a concentration equal to or greater than the QL of 10 µg/l in the laboratory duplicate obtained from the same container as the verification sample for well 7W13;
- Historical data for the previous 23 monitoring events indicate that total arsenic has not been detected in well 7W13 at concentrations equal to or greater than 10 µg/l.

Because total arsenic was not consistently detected at a concentration equal to or greater than the QL of $10~\mu g/l$ in two aliquots **obtained from the same container**, and historically has not been detected at a concentration equal to or greater than the QL in this well, Radford AAP concludes that total arsenic has not been reliably detected at a concentration greater than background in well 7W13. Therefore, no further action with respect to total arsenic in well 7W13 is necessary at this time.

No other constituent concentrations detected in the plume monitoring wells were greater than their respective background concentrations.

In accordance with the requirements of Permit Condition V.K.3, the established background values and the computations used to determine the background values are included in **Appendix B-4**. This includes both the background values and computations associated with Appendix F of Permit Attachment 3 (excerpted from the Groundwater Quality Assessment Report for HWMU-7 dated August 1998), as well as the February 2008 revised background values presented in the pending Class 3 Permit Modification for HWMUs 5, 7, 10, and 16.

3.4.3 Annual Monitoring for Constituents Listed in Appendix IX of 40 CFR Part 264

During Second Quarter 2009, the groundwater samples collected from the upgradient well and the point of compliance wells were analyzed for the constituents listed in Appendix IX to 40 CFR Part 264 in accordance with Permit Condition V.J.2.e. Upon receipt of the Second Quarter 2010 analytical data, Radford AAP notified the VDEQ of the detection of one additional

Appendix IX constituent (chloroform) that was not listed in Appendix E of Permit Attachment 3 (Unit 7 – Groundwater Compliance Monitoring (Quarterly) Constituent List). Chloroform was detected in upgradient well 7W12B and in point of compliance wells 7WCA and 7W11B. However, Radford AAP did not verify the chloroform concentrations detected in wells 7W12B, 7WCA, and 7W11B based on the June 14, 2007 concurrence by the VDEQ with the Alternate Source Demonstration (ASD) for chloroform at HWMU-7 submitted on January 31, 2007, which identified an upgradient off-site source for chloroform in groundwater. Therefore, chloroform will not be added to the Groundwater Monitoring List for the Unit.

No additional Appendix IX constituents were detected during Second Quarter 2010. Therefore, no changes to the Groundwater Monitoring List for the Unit are required.

3.5 Recommendations

Based on an evaluation of the groundwater analytical data and additional information for HWMU-7, no constituents were detected in the point of compliance wells at concentrations greater than their respective GPSs during calendar year 2010. Therefore, no further action is recommended at this time.

The Appendix IX constituent chloroform was detected in upgradient well 7W12B and in point of compliance wells 7WCA and 7W11B during Second Quarter 2010. Chloroform will not be added to the Compliance Monitoring Constituent List for HWMU-7 based on the June 14, 2007 concurrence by the VDEQ with the ASD for chloroform at HWMU-7 submitted on January 31, 2007. No additional Appendix IX constituents were detected during Second Quarter 2010; therefore, no changes to the Groundwater Monitoring List for the Unit are required.

An evaluation of the plume monitoring well data indicates that the concentrations of total barium in plume monitoring wells 7W10B and 7W10C were greater than the site-specific background concentration. Additionally, the concentrations of total cobalt in plume monitoring well 7W13 were greater than the site-specific background concentration. As stated previously, higher total barium and total cobalt concentrations in downgradient plume monitoring wells relative to background at HWMU-7 may be the result of natural variations in trace element distribution in groundwater. In addition, these concentrations are consistent with previous barium and cobalt concentrations detected these wells. Therefore, no further action regarding the total barium concentrations detected in plume monitoring wells 7W10B and 7W10C or the total cobalt concentrations detected in plume monitoring well 7W13 is recommended at this time.

During Fourth Quarter 2010, total arsenic was initially detected in plume monitoring well 7W13 at a concentration of 20.2 μ g/l, which is greater than the site-specific background concentration of 10 μ g/l. On December 16, 2010, a verification sample and a blind field duplicate were collected from well 7W13 in order to confirm or refute the initial concentration. Total arsenic was detected in the verification sample and in the blind field duplicate at concentrations of 10.2 μ g/l and 10.6 μ g/l, respectively. However, the laboratory sample duplicate did not exhibit a total arsenic concentration greater than the QL of 10 μ g/l. Review of historical arsenic data for plume monitoring well 7W13 indicate that total arsenic has not been detected at concentrations greater than the site-specific background of 10 μ g/l during the previous 23 monitoring events (since Second Quarter 2003; data collected prior to Second

Quarter 2003 were not validated and are considered suspect). Based on the historical data, and due to the fact that total arsenic was not consistently detected at a concentration greater than 10 μ g/l in the December 16, 2010 verification sample, blind field duplicate, and laboratory duplicate, the final result for total arsenic in well 7W13 for Fourth Quarter 2010 was reported as not detected at or above the background value (and QL) of 10 μ g/l.

In summary:

- Total arsenic was detected in the verification sample from well 7W13 at a concentration of 10.1 µg/l;
- Total arsenic was not detected at a concentration equal to or greater than the QL of 10 µg/l in the laboratory duplicate obtained from the same container as the verification sample for well 7W13;
- Historical data for the previous 23 monitoring events indicate that total arsenic has not been detected in well 7W13 at concentrations equal to or greater than 10 μg/l.

Because total arsenic was not consistently detected at a concentration equal to or greater than the QL of 10 μ g/l in two aliquots **obtained from the same container**, and historically has not been detected at a concentration equal to or greater than the QL in this well, Radford AAP concludes that total arsenic has not been reliably detected at a concentration greater than background in well 7W13. Therefore, no further action with respect to total arsenic in well 7W13 is necessary at this time. Total arsenic will continue to be monitored in plume monitoring well 7W13 during the upcoming semiannual monitoring event for HWMU-7.

In correspondence to the VDEQ dated August 9, 2007, Radford AAP submitted a Class 3 permit modification for the Post-Closure Care Permit for HWMUs 5, 7, 10, and 16. The permit modification included an amended closure plan for HMWU-7. Upon incorporation of the Class 3 permit modification into the Permit, Radford AAP will finalize the closure report for HWMU-7. The closure report will include a clean closure evaluation for soil and groundwater at the Unit.

4.0 HWMU-10 ANNUAL GROUNDWATER MONITORING REPORT

4.1 Waste Management Unit Information

Unit Name: Hazardous Waste Management Unit 10 (HWMU-10)

Owner/Operator: United States Army/Alliant Techsystems Inc.

Unit Location: Radford AAP Main Plant Area, Radford, Virginia

Class: Hazardous Waste Management Unit

Type: Closed Equalization Basin for the Biological Treatment System

4.2 Groundwater Monitoring Plan

Monitoring Network:

Upgradient Well: 10D4

Point of Compliance Wells: 10MW1, 10DDH2R, 10D3, 10D3D

Plume Monitoring Wells: none Observation Wells: none

Monitoring Status: Compliance Monitoring Program

CY 2010 Monitoring Events:

Second Quarter 2010: April 27-28, 2010 Fourth Quarter 2010: October 20, 2010

4.3 Groundwater Movement

The monitoring wells at HWMU-10 are screened either across the alluvium/limestone bedrock interface or entirely within bedrock. The static water level measurements gathered during the 2010 semiannual monitoring events are summarized in **Table 3**. Groundwater fluctuations ranged from 0.12 to 4.01 feet annually. As shown on the HWMU-10 Potentiometric Surface Maps (**Appendix C-1**), groundwater movement beneath the site is generally to the north towards the New River.

Darcian flow conditions were assumed for the alluvium and limestone bedrock beneath HWMU-10. As a result, the groundwater velocities were calculated by multiplying the hydraulic conductivity (determined from previously conducted slug tests) by the average hydraulic gradient across the site and dividing by an assumed effective porosity for the aquifer materials. The average hydraulic gradient was determined by superimposing three evenly spaced flow line vectors over the potentiometric surface map, measuring their lengths, calculating the head differential over the distances measured, and dividing the head differential by the length of the flow line vectors. The three calculated gradients were then averaged to a single value. Using this method, the average groundwater hydraulic gradient across the site based on Fourth Quarter 2010 groundwater elevations was calculated to be 0.017 ft/ft. Historical slug test data for the site yielded an average hydraulic conductivity of 4.9 x 10⁻⁴ ft/second. This value is consistent with

literature values for limestone and for clayey, silty sand and gravel alluvium (Domenico and Schwartz, 1990).

The estimated groundwater velocity across the site was calculated to be approximately 1.8 ft/day or 656 ft/year, based on the following:

- Average hydraulic conductivity of 4.9 x 10⁻⁴ ft/second.
- Average hydraulic gradient of 0.017 ft/ft.
- Assumed effective porosity of 0.40, based on a representative range of porosities for limestone and for clayey, silty sand and gravel alluvium (Domenico and Schwartz, 1990).

The actual groundwater flow velocities in the carbonate bedrock may vary as much as one to two orders of magnitude from the velocity presented above depending on water level conditions and the distribution of solution features.

4.4 Groundwater Analytical Data Evaluation

The groundwater samples collected from the compliance monitoring network during the 2010 semiannual monitoring events were analyzed for the constituents listed in Appendix E to Attachment 4 of the Final Post-Closure Care Permit, plus cobalt and vanadium (which were added to the constituent list for HWMU-10 following Second Quarter 2004) and acetone and 2-propanol (which were added to the constituent list for HMWU-10 following Second Quarter 2005). In addition, groundwater samples were collected from the upgradient well and the point of compliance wells for the annual monitoring for the constituents listed in Appendix IX of 40 CFR Part 264. The laboratory analytical results for the 2010 monitoring events are included in Appendix C-2. The laboratory analytical results for the 2010 monitoring events also are included in electronic format in Appendix E. The analytical data were validated in accordance with SW-846, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. Data validation reports are included in Appendix E. Copies of field notes recorded during sample collection are included on CD-ROM in Appendix F.

4.4.1 Comparison to Groundwater Protection Standards

As specified in Permit Condition V.J.3.i, the 2010 groundwater analytical data for the upgradient well and the point of compliance wells were compared to GPSs for HWMU-10 listed in Appendix G of Permit Attachment 4. In accordance with Permit Condition V.I.2, Radford AAP performed a simple empirical comparison of the upgradient well and the point of compliance well data to the GPSs (**Appendix C-2**). As shown in **Appendix C-2**, none of the constituent concentrations detected in the upgradient well and in the point of compliance wells were greater than their respective GPSs.

4.4.2 Comparison to Background Concentrations

Only the analytical data from plume monitoring wells are compared to background concentrations. However, the compliance monitoring network at HWMU-10 is composed entirely of point of compliance wells. Therefore, the analytical data from HWMU-10 is not compared to background concentrations.

4.4.3 Annual Monitoring for Constituents Listed in Appendix IX of 40 CFR Part 264

During Second Quarter 2010, the groundwater samples collected from the upgradient well and the point of compliance wells were analyzed for the constituents listed in Appendix IX to 40 CFR Part 264 in accordance with Permit Condition V.J.3.e. No additional Appendix IX constituents, which are not listed in Appendix E of Permit Attachment 4 (Unit 10 – Groundwater Compliance Monitoring (Quarterly) Constituent List), were detected during the Second Quarter 2010 groundwater monitoring event. Therefore, no changes to the Groundwater Monitoring List for the Unit are required.

4.5 Recommendations

Based on an evaluation of the groundwater analytical data and additional information for HWMU-10, no constituents were detected at concentrations greater than their respective GPSs during calendar year 2010. Therefore, no further action is recommended at this time.

No additional Appendix IX constituents were detected during Second Quarter 2010; therefore, no changes to the Groundwater Monitoring List for the Unit are required.

5.0 HWMU-16 ANNUAL GROUNDWATER MONITORING REPORT

5.1 Waste Management Unit Information

Unit Name: Hazardous Waste Management Unit 16 (HWMU-16)

Owner/Operator: United States Army/Alliant Techsystems Inc.

Unit Location: Radford AAP Main Plant Area, Radford, Virginia

Class: Hazardous Waste Management Unit Type: Closed Hazardous Waste Landfill

5.2 Groundwater Monitoring Plan

Monitoring Network:

Upgradient Well: 16C1

Point of Compliance Wells: 16WC1A, 16WC1B, 16MW8, 16MW9

Plume Monitoring Wells: 16-1, 16-2, 16-3, 16-5, 16WC2B, 16SPRING

Observation Wells: 16WC2A, 16C3, 16CDH3

Monitoring Status: Compliance Monitoring Program

CY 2010 Monitoring Events:

Second Quarter 2010: April 14-15, 2010 Fourth Quarter 2010: October 13-14, 2010

5.3 Groundwater Movement

The monitoring wells at HWMU-16 are screened entirely within either carbonate bedrock or weathered carbonate bedrock residuum, or across the residuum/bedrock interface. The static water level measurements gathered during the 2010 semiannual monitoring events are summarized in **Table 4**. Groundwater fluctuations ranged from 0.02 to 11.35 feet annually. As shown on the HWMU-16 Potentiometric Surface Maps (**Appendix D-1**), groundwater movement beneath the site is generally to the northeast.

Darcian flow conditions were assumed for the weathered residuum and carbonate bedrock beneath HWMU-16. As a result, the groundwater velocities were calculated by multiplying the hydraulic conductivity (determined from previously conducted slug tests) by the average hydraulic gradient across the site and dividing by an assumed effective porosity for the aquifer materials. The average hydraulic gradient was determined by superimposing three evenly spaced flow line vectors over the potentiometric surface map, measuring their lengths, calculating the head differential over the distances measured, and dividing the head differential by the length of the flow line vectors. The three calculated gradients were then averaged to a single value. Using this method, the average groundwater hydraulic gradient across the site based on Fourth Quarter 2010 groundwater elevations was calculated to be 0.089 ft/ft. Historical slug test data for the site yielded an average hydraulic conductivity of 7.87 x 10⁻⁵ ft/second. This

value is consistent with literature values for carbonate rock and for clay and silt residuum (Domenico and Schwartz, 1990).

The estimated groundwater velocity across the site was calculated to be approximately 1.51 ft/day or 551 ft/year based on the following:

- Average hydraulic conductivity of 7.87 x 10⁻⁵ ft/second.
- Average hydraulic gradient of 0.089 ft/ft.
- Assumed effective porosity of 0.40, based on a representative range of porosities for carbonate rock and clay and silt residuum (Domenico and Schwartz, 1990).

The actual groundwater flow velocities in the carbonate bedrock may vary as much as one to two orders of magnitude from the velocity presented above depending on water level conditions and the distribution of solution features.

5.4 Groundwater Analytical Data Evaluation

The groundwater samples collected from the compliance monitoring network during the 2010 semiannual monitoring events were analyzed for the constituents listed in Appendix E to Attachment 5 of the Final Post-Closure Care Permit, plus chloroethane, diethyl ether, dimethyl ether, and methylene chloride (which were added to the constituent list for HWMU-16 following Third Quarter 2003), and 1,1,2-trichloro-1,2,2-trifluoroethane (which was added to the constituent list for HWMU-16 following Second Quarter 2004). In addition, groundwater samples were collected from the upgradient well and the point of compliance wells for the annual monitoring for the constituents listed in Appendix IX of 40 CFR Part 264. The laboratory analytical results for the 2010 monitoring events are included in Appendix D-2 (point of compliance wells) and in **Appendix D-3** (plume monitoring wells). The laboratory analytical results for the 2010 monitoring events also are included in electronic format in Appendix E. The analytical data were validated in accordance with SW-846, USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, and USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. Data validation reports are included in Appendix E. Copies of field notes recorded during sample collection are included on CD-ROM in Appendix F.

5.4.1 Comparison to Groundwater Protection Standards

As specified in Permit Condition V.J.4.i, the 2010 groundwater analytical data for the upgradient well and the point of compliance wells were compared to GPSs for HWMU-16 listed in Appendix G of Permit Attachment 5. In accordance with Permit Condition V.I.2, Radford AAP performed a simple empirical comparison of the upgradient well and the point of compliance well data to the GPSs (**Appendix D-2**).

As shown in **Appendix D-2**, no constituents were detected at concentrations greater than their respective GPSs.

5.4.2 Comparison to Background Concentrations

As specified in Permit Condition V.O, the 2010 groundwater analytical data for the plume monitoring wells were compared to the background concentrations for HWMU-16 listed in Appendix F of Permit Attachment 5. In accordance with Permit Condition V.I.2, Radford AAP performed a simple empirical comparison of the plume monitoring well data to the background concentrations (**Appendix D-3**).

As shown in **Appendix D-3**, total barium concentrations detected in upgradient well 16C1 during Second Quarter 2010 and in plume monitoring wells 16-1, 16-2, and 16-3 and in spring sampling location 16SPRING during both 2010 semiannual monitoring events were greater than the background concentration of 175.4 μ g/l. In addition, the total barium concentration detected in plume monitoring well 16-5 during Fourth Quarter 2010 was greater than the background concentration of 175.4 μ g/l. However, all of the total barium concentrations detected in the plume monitoring wells were well below the USEPA MCL for barium of 2,000 μ g/l. Furthermore, higher barium concentrations in downgradient plume monitoring wells relative to background may be the result of natural variations in trace element distribution in groundwater. As illustrated in the boring logs for the compliance network monitoring wells (Appendix H of Permit Attachment 5), upgradient well 16C1 is screened in limestone while downgradient plume monitoring wells 16-1, 16-2, 16-3, and 16-5 are screened in shale and fault breccia. Such differing lithologic formations would be expected to contain very different trace element distributions.

No other constituent concentrations detected in the plume monitoring wells were greater than their respective background concentrations. In accordance with the requirements of Permit Condition V.K.3, the established background values and the computations used to determine the background values are included in **Appendix D-4**. The background values and associated computations are taken from the Groundwater Quality Assessment Report for HWMU-16 dated August 1999.

5.4.3 Annual Monitoring for Constituents Listed in Appendix IX of 40 CFR Part 264

During Second Quarter 2010, the groundwater samples collected from the upgradient well and the point of compliance wells were analyzed for the constituents listed in Appendix IX to 40 CFR Part 264 in accordance with Permit Condition V.J.4.e. Upon receipt of the Second Quarter 2010 analytical data, Radford AAP notified the VDEQ of the detection of four additional Appendix IX constituents (4,4'-DDD, benzene, 1,1-dichloroethene, and tetrahydrofuran) that were not listed in Appendix E of Permit Attachment 5 (Unit 16 – Groundwater Compliance Monitoring (Quarterly) Constituent List). Benzene, 1,1-dichloroethene, and tetrahydrofuran were detected in upgradient well 16C1. However, as 16C1 is the background well for HWMU-16, the benzene, 1,1-dichloroethene, and tetrahydrofuran concentrations detected in the well appear to be derived from a source upgradient of the Unit. Additionally, benzene and 1,1-dichloroethene were initially detected in point of compliance well 16MW9, and 4,4'-DDD was initially detected in point of compliance well 16MW9 for benzene and 1,1-dichloroethene and well 16WC1B for 4,4'-DDD in order to confirm or refute the additional Appendix IX constituent detections in the point of compliance wells.

Benzene, 1,1-dichloroethene, and 4,4'-DDD were not confirmed in the subject point of compliance wells at concentrations greater than their respective detection limits. As a result, 4,4'-DDD, benzene, and 1,1-dichloroethene were not be added to the Groundwater Monitoring List for the Unit. Furthermore, sampling of well 16C1 for Appendix IX constituents is not required per the Post-Closure Care Permit for the Unit; therefore, tetrahydrofuran was not be added to the Groundwater Monitoring List for the Unit.

No additional Appendix IX constituents were detected during Second Quarter 2010. Therefore, no changes to the Groundwater Monitoring List for the Unit are required.

5.5 Recommendations

Based on an evaluation of the groundwater analytical data and additional information for HWMU-16, no constituents were detected at concentrations greater than their respective GPSs during calendar year 2010. Therefore, no further action is recommended at this time.

The Appendix IX constituents benzene, 1,1-dichloroethene, and tetrahydrofuran were detected in upgradient well 16C1 during Second Quarter 2010. However, as 16C1 is the background well for HWMU-16, the detected benzene, 1,1-dichloroethene, and tetrahydrofuran concentrations appear to be derived from a source upgradient of the Unit. As a result, benzene, 1,1-dichloroethene, and tetrahydrofuran will not be added to the Groundwater Monitoring List for the Unit. No additional Appendix IX constituents were confirmed in the point of compliance wells during Second Quarter 2010; therefore, no changes to the Groundwater Monitoring List for the Unit are required.

The evaluation of the plume monitoring well data indicated that the concentrations of total barium upgradient well 16C1 and in plume monitoring wells 16-1, 16-2, 16-3, 16-5, and 16SPRING were greater than the site-specific background concentration. As stated previously, higher total barium concentrations in downgradient plume monitoring wells relative to background are likely due to natural variations in trace element distribution in groundwater. Upgradient well 16C1 is screened in limestone while downgradient plume monitoring wells 16-1, 16-2, 16-3, and 16-5 are screened in shale and fault breccia. Such differing lithologic formations would be expected to contain very different trace element distributions. Therefore, no further action regarding the 2010 total barium concentrations detected in plume monitoring wells 16-1, 16-2, 16-3, and 16-5 and in spring sampling location 16SPRING is recommended at this time.

SIGNATURE/CERTIFICATION

Prepared by:	
Name:	Ross G. Miller, Senior Project Geologist
Signature:	For Into
Company:	Draper Aden Associates
Address:	2206 South Main Street
City/State/Zip:	Blacksburg, Virginia 24060-6600
Virginia Professional	Certification:
prepared in accordanc	prepared or supervised preparation of the attached report, that it has been e with industry standards and practices, and that the information contained accurate to the best of my knowledge.

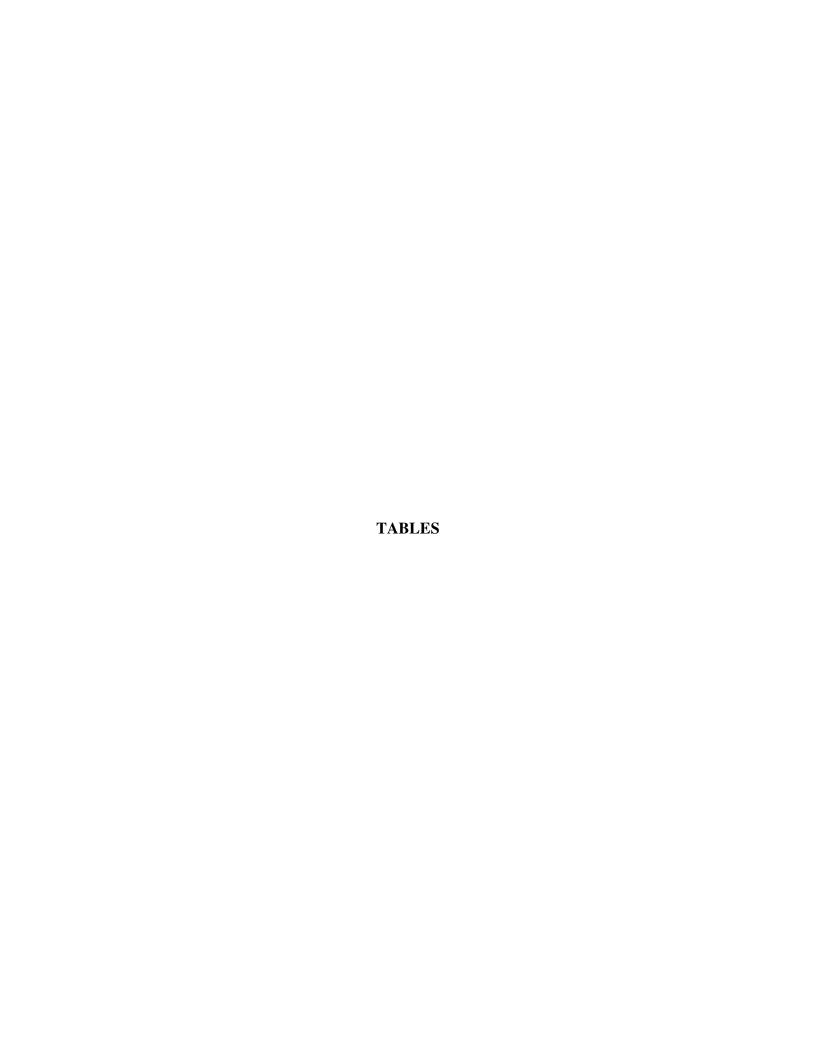


TABLE 1 HWMU-5 GROUNDWATER ELEVATIONS - 2010 RADFORD ARMY AMMUNITION PLANT RADFORD, VIRGINIA

MONITORING	ELEVATION SECOND QUARTER 2010		FOURTH QU	JARTER 2010	
WELL ID	TOP OF WELL	DTW	GW ELEV	DTW	GW ELEV
5W8B	1789.58	14.76	1774.82	15.00	1774.58
5W5B	1775.13	9.39	1765.74	10.27	1764.86
5W7B	1774.78	9.12	1765.66	9.99	1764.79
5WC21	1774.43	9.44	1764.99	9.69	1764.74
5WC22	1774.45	9.45	1765.00	9.66	1764.79
5WC23	1773.84	8.86	1764.98	9.08	1764.76
5W12A	1772.46	11.20	1761.26	12.39	1760.07
S5W5	1772.31	8.24	1764.07	9.46	1762.85
S5W7	1776.08	11.50	1764.58	11.89	1764.19
5W9A	1762.20	1.87	1760.33	3.40	1758.80
5W10A	1771.40	13.32	1758.08	16.04	1755.36
5W11A	1766.20	10.37	1755.83	14.43	1751.77
5WC11	1788.92	16.01	1772.91	16.25	1772.67
5WC12	1788.96	15.68	1773.28	15.98	1772.98
5WCA	1779.05	13.25	1765.80	13.91	1765.14
S5W6	1771.43	7.08	1764.35	8.21	1763.22
S5W8	1783.68	12.14	1771.54	12.31	1771.37

NOTES:

DTW: Depth to water from top of casing. GW ELEV: Groundwater elevation.

All elevations in feet above mean sea level.

TABLE 2 HWMU-7 GROUNDWATER ELEVATIONS - 2010 RADFORD ARMY AMMUNITION PLANT RADFORD, VIRGINIA

MONITORING	ELEVATION	SECOND QUARTER 2010		FOURTH QU	JARTER 2010
WELL ID	TOP OF WELL	DTW	GW ELEV	DTW	GW ELEV
7W12B	1717.31	24.23	1693.08	24.86	1692.45
7WCA	1715.40	24.46	1690.94	25.03	1690.37
7MW6	1715.30	25.30	1690.00	26.58	1688.72
7W11B	1715.90	24.52	1691.38	25.19	1690.71
7W9C	1704.45	13.61	1690.84	14.55	1689.90
7W10B	1706.65	14.89	1691.76	15.67	1690.98
7W10C	1709.30	18.32	1690.98	21.39	1687.91
7W13	1705.42	17.79	1687.63	19.36	1686.06
7W9B	1712.49	22.30	1690.19	22.76	1689.73
7MW5	1716.20	24.52	1691.68	25.01	1691.19
7W11	1714.82	23.46	1691.36	24.25	1690.57

NOTES:

DTW: Depth to water from top of casing. GW ELEV: Groundwater elevation.

All elevations in feet above mean sea level.

TABLE 3 HWMU-10

GROUNDWATER ELEVATIONS - 2010 RADFORD ARMY AMMUNITION PLANT RADFORD, VIRGINIA

MONITORING	ELEVATION	SECOND QUARTER 2010		FOURTH QU	JARTER 2010
WELL ID	TOP OF WELL	DTW	GW ELEV	DTW	GW ELEV
10D4	1714.38	22.78	1691.60	22.90	1691.48
10DDH2R	1704.38	17.74	1686.64	21.42	1682.96
10D3	1702.95	16.07	1686.88	20.08	1682.87
10D3D	1702.64	16.38	1686.26	19.86	1682.78
10MW1	1703.62	15.81	1687.81	19.72	1683.90

NOTES:

DTW: Depth to water from top of casing. GW ELEV: Groundwater elevation.

All elevations in feet above mean sea level.

TABLE 4 HWMU-16 GROUNDWATER ELEVATIONS - 2010 RADFORD ARMY AMMUNITION PLANT RADFORD, VIRGINIA

MONITORING	ELEVATION SECOND QUARTER 2010 FOURTI		SECOND QUARTER 2010		JARTER 2010
WELL ID	TOP OF WELL	DTW	GW ELEV	DTW	GW ELEV
16C1	1840.14	48.42	1791.72	50.15	1789.99
16MW8	1815.82	70.67	1745.15	74.58	1741.24
16MW9	1808.88	62.14	1746.74	67.09	1741.79
16WC1A	1812.61	64.21	1748.40	70.28	1742.33
16WC1B	1812.95	64.34	1748.61	70.70	1742.25
16-1	1815.82	41.21	1774.61	47.40	1768.42
16-2	1810.99	55.75	1755.24	55.77	1755.22
16-3	1824.77	55.60	1769.17	56.94	1767.83
16-5	1742.60	3.38	1739.22	3.20	1739.40
16WC2B	1818.71	50.76	1767.95	54.92	1763.79
16WC2A	1820.05	DRY	DRY	DRY	DRY
16C3	1822.22	57.11	1765.11	68.46	1753.76
16CDH3	1825.60	DRY	DRY	DRY	DRY
SPRING	na	na	na	na	na

NOTES:

DTW: Depth to water from top of casing. GW ELEV: Groundwater elevation. All elevations in feet above mean sea level.

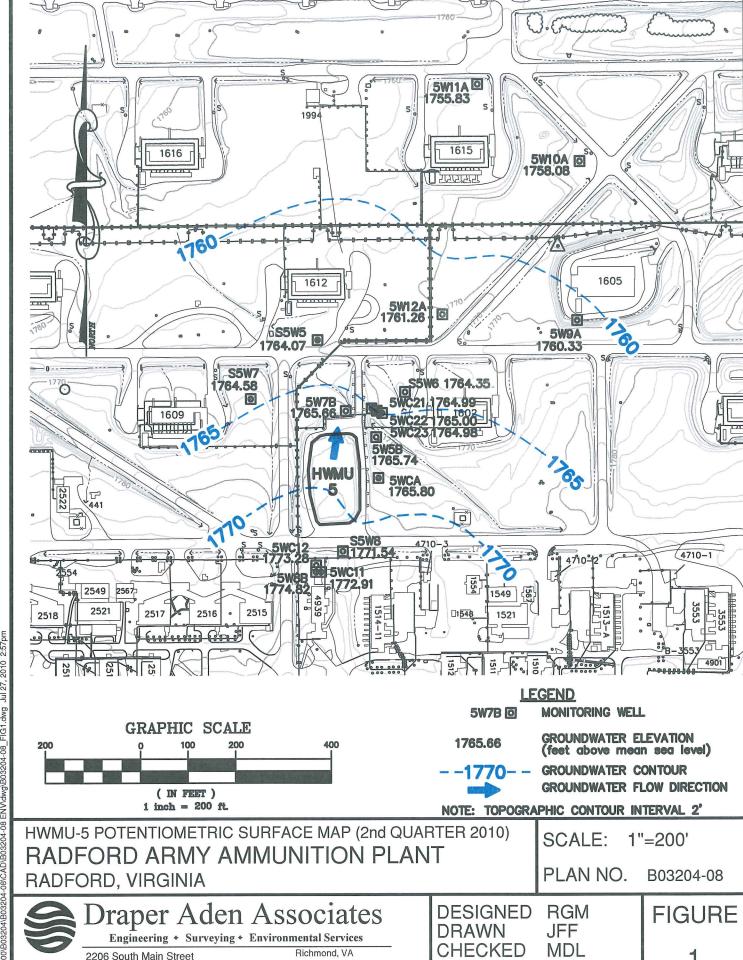
na: Not applicable.

APPENDIX A

HWMU-5

APPENDIX A-1

HWMU-5 POTENTIOMETRIC SURFACE MAPS SECOND QUARTER 2010 FOURTH QUARTER 2010



Charlottesville, VA

Hampton Roads, VA

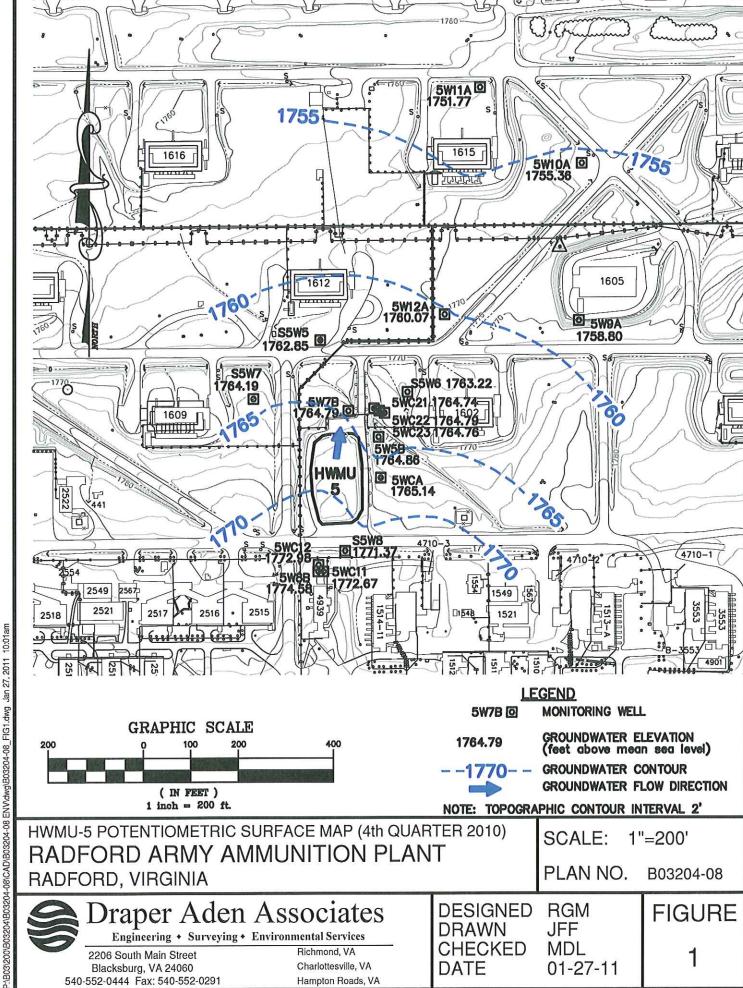
07-27-10

DATE

P:\B03\200\B03204\B03204-08\CAD\B03204-08 ENV\dwg\B03204-08_FIG1.dwg Jul 27, 2010 2:57pm

Blacksburg, VA 24060

540-552-0444 Fax: 540-552-0291



Hampton Roads, VA

540-552-0444 Fax: 540-552-0291

APPENDIX A-2

HWMU-5 2010 LABORATORY ANALYTICAL RESULTS GROUNDWATER CORRECTIVE ACTION TARGETED CONSTITUENTS GPS AND SEMIANNUAL MONITORING LIST

Summary of Semiannual Target Analyte Monitoring Results Appendix J Corrective Action Monitoring Plan - Targeted Constituents

Hazardous Waste Management Unit 5 Radford Army Ammunition Plant, Radford, Virgini

 $Upgradient \ well = 5W8B$

Analyte/Quarter	5W8B Q	5W5B Q	5W7B Q	5WC21 Q	5WC22 Q	5WC23 Q	5W12A Q	QL	Permit QL	GPS	DL	Permit DL	UNIT	Method
1,1-Dichloroethene						CAS# 75-35-4	l	<u>, </u>		·		-		
Second Quarter 2010	U	U	U	U	U	U	U	1	1	7	0.1	0.44	ug/l	8260B
Fourth Quarter 2010	U	U	U	U	U	U	U	1	1	7	0.1	0.44	ug/l	8260B
cis-1,2-Dichloroethene			,		,	CAS# 156-59-2	?							
Fourth Quarter 2010	U	U	U	U	U	U	U	1	1	70	0.1	0.1	ug/l	8260B
Second Quarter 2010	U	U	U	U	U	U	U	1	1	70	0.1	0.1	ug/l	8260B
trans-1,2-Dichloroethene	:					CAS# 156-60-5	5							
Second Quarter 2010	U	U	U	U	U	U	U	1	1	100	0.1	0.8	ug/l	8260B
Fourth Quarter 2010	U	U	U	U	U	U	U	1	1	100	0.1	8.0	ug/l	8260B
Trichloroethene						CAS# 79-01-6								
Second Quarter 2010	U	2.6	U	4.2	4.4	4.3	U	1	1	5	0.1	0.177	ug/l	8260B
Fourth Quarter 2010	U	7.3	U	4	4	3.9	U	1	1	5	0.1	0.177	ug/l	8260B
Vinyl chloride				1	1	CAS # 75-01-4								<u>'</u>
Second Quarter 2010	U	U	U	U	U	U	U	1	1	2	0.1	0.1	ug/l	8260B
Fourth Quarter 2010	U	U	U	U	U	U	U	1	1	2	0.1	0.1	ug/l	8260B
Total Organic Carbon						CAS#								
Second Quarter 2010	0.17 J	0.71 J	0.34 J	0.6 J	0.42 ј	0.56 J	0.57 J	1			0.13		mg/l	9060A
Fourth Quarter 2010	U	0.72 J	0.46 J	0.52 J	0.49 J	0.39 J	0.35 J	1			0.25		mg/L	9060A
Ethane						CAS # 74-84-0								<u> </u>
Fourth Quarter 2010	U	U	U	U	U	U	U	5			1		ug/l	RSK175
Second Quarter 2010	U	U	U	U	U	U	U	5			1		ug/l	RSK175
Ethene		1	I		I	CAS# 74-85-1	I		1				I	
Second Quarter 2010	U	U	U	U	U	U	U	5			1		ug/l	RSK175I
Fourth Quarter 2010	U	U	U	U	U	U	U	5			1		ug/l	RSK175
Methane	1	T	1	1	1	CAS # 74-82-8	1	1	1				1	-1
Fourth Quarter 2010	U	U	U	U	U	U	U	15			5		ug/l	RSK175
Second Quarter 2010	U	U	U	U	U	U	U	15			5		ug/l	RSK175

Summary of Semiannual Target Analyte Monitoring Results Appendix J Corrective Action Monitoring Plan - Targeted Constituents

Hazardous Waste Management Unit 5 Radford Army Ammunition Plant, Radford, Virgini

 $Upgradient \ well = 5W8B$

Analyte/Quarter	5W8B Q	5W5B Q	5W7B Q	5WC21 Q	5WC22 Q	5WC23 Q	5W12A Q	QL	Permit QL	GPS	DL	Permit DL	UNIT	Method
Nitrate as N				'		CAS# 14797-6	5-0					'		
Second Quarter 2010	1.8	8.7	1.7	8.3	9.8	9.8	0.7	0.1			0.023		mg/l	9056A
Fourth Quarter 2010	1.4	12.8 J	2.3 J	7.7 J	8.9 J	9	0.6 J	0.1			0.023		mg/L	9056A
Nitrite as N						CAS# 14797-5	5-8							<u> </u>
Fourth Quarter 2010	U	U J	U J	UJ	UJ	U	U J	0.1			0.012		mg/L	9056A
Second Quarter 2010	U	U	U	U	U	U	U	0.1			0.012		mg/l	9056A
Sulfate						CAS# 18785-7	2-3							·
Second Quarter 2010	2.5 J	257 J	30 J	234 J	221 J	217 J	6 J	1			0.12		mg/l	9056A
Fourth Quarter 2010	1.7	285	52.8	228	198	202	12.4	1			0.12		mg/L	9056A
Sulfide						CAS# 18496-2	5-8							·
Fourth Quarter 2010	U	U	U	U	U	U	U	3000			2000	·	ug/L	9034
Second Quarter 2010	U	U	U	U	U	U	U	3000			2000		ug/l	9034

Summary of Semiannual Target Analyte Monitoring Results Appendix J Corrective Action Monitoring Plan - Targeted Constituents

Hazardous Waste Management Unit 5 Radford Army Ammunition Plant, Radford, Virgini

 $Upgradient\ well = 5W8B$

												,		
Analyte/Quarter	5W8B Q	5W5B Q	5W7B Q	5WC21 Q	5WC22 Q	5WC23 Q	5W12A Q	QL	Permit QL	GPS	DL	Permit DL	UNIT	Method

Definitions:

Results are reported to the permit detection limit.

First Corrective Action Monitoring Event Second Quarter 2010:

QL Denotes laboratory quantitation limit.

Permit QL Denotes permit quantitation limit.

DL Denotes laboratory detection limit.

Permit DL Denotes permit detection limit.

U denotes not detected at or above the permit detection limit or QL.

UA denotes not detected at or above the adjusted detection limit or adjusted OL.

J Denotes result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above the detection limit or QL and detection limit and QL are estimated. When used with "UA"

(i.e., "UAJ"), denotes analyte not detected at or above adjusted detection limit and adjusted detection limit and OL are estimated.

UN Denotes analyte concentration is less than the QL and/or five times the blank concentration. Not reliably detected due to blank contamination.

R Denotes result rejected.

Q Denotes data validation qualifier. X Denotes mass spectral confirmation not obtained-result suspect.

CAS# Denotes Chemical Abstract Services registration number.

GPS Denotes Groundwater Protection Standards listed in Appendix J of Module VI-Groundwater

Corrective Action & Monitoring Program for Unit 5 (approved by the VDEQ in the

Final Class 3 Hazardous Waste Permit Modification dated November 5, 2009) which was incorporated into the

Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5, 7, 10, and 16 (October 4, 2002).

"-" denotes not sampled.

Note:

For 4Q 2010 - Samples 5W5B, 5WC21, 5WC22, 5WC23 were analyzed and reported in dilution; OL and DL do not reflect dilution factor.



Comprehensive Data Validation Report



Sample/Blind Field Duplicate Results Greater Than the Quantitation Limit

Facility: HWMU-5 Monitoring Event: Fourth Quarter 2010

	Laboratory Result	Validated Result	QL	
Sample ID	(ug/L) Q	(ug/L) C	(ug/L)	Validation Notes
)B				
ancaster Laboratories, L	ancaster, PA			
5WC21	4	4	1	No action taken.
5WDUP	3.9	3.9	1	No action taken. Blind field duplicate for 5WC21 (4.0 ug/l). RPD < 10.
5A				
estAmerica, North Cant	on, OH			
5WC21	7.7	7.7 J	0,1	Sample analyzed outside holding time criteria.
5WDUP	7.6	7.6 J	0.1	Sample analyzed outside holding time criteria.
5WC21	228	228	1	Sample analyzed in dilution 1:2. Actual QL 2 ug/l; DL 0.24 ug/l.
5WDUP	227	227	1	Sample analyzed in dilution 1:2. Actual QL 2 ug/l; DL 0.24 ug/l. Blind field duplicate for 5WC21.
	SWC21 SWC21 SWDUP SA SWC21 SWDUP SA SWC21 SWDUP SWC21 SWDUP SWC21	Sample ID Result (ug/L) Q	Result (ug/L) Q (ug/L) Q OB Anneaster Laboratories, Lancaster, PA 5WC21	Result Result

Definitions:

Data Validation Qualifiers:

QL Denotes permit quantitation limit. Q Denotes data qualifier.

J Denotes analyte reported at or above quantitation limit and associated result is estimated.

APPENDIX A-3

HWMU-5 2010 LABORATORY ANALYTICAL RESULTS GROUNDWATER CORRECTIVE ACTION ANNUAL MONITORING LIST

Summary of Annual Target Analyte Monitoring Results Appendix K Corrective Action Monitoring Plan - Targeted Constituents Hazardous Waste Management Unit 5 Radford Army Ammunition Plant, Radford, Virginia

$Upgradient\ well = 5W8B$

Analyte/Quarter	5W8B Q	5W5B Q	5W7B Q	5WC21 Q	5WC22 Q	5WC23 Q	QL	Permit QL	GPS	DL	Permit DL	UNIT	Method
Antimony						CAS# 7440-36	-0						
Second Quarter 2010	-	U	U	U	U	U	1	1	6	0.4	0.4	ug/l	6020
Arsenic	-1		1		1	CAS # 7440-38	-2		ı			'	-'
Second Quarter 2010	-	U	U	U	U	U	10	10	10	2	2	ug/l	6020
Barium		1	I.	1		CAS# 7440-39-	-3		I		1		
Second Quarter 2010	-	37.7	41.6	15.2	27.9	23	10	10	2,000	1	1	ug/l	6020
Beryllium		1	I.	1		CAS# 7440-41	-7		I		1		
Second Quarter 2010	-	U	U	1.5	U	U	1	1	4	0.2	0.2	ug/l	6020
Cadmium	I	1	I	1	ı	CAS # 7440-43	-9		I				
Second Quarter 2010	-	U	U	0.53 J	0.24 J	U	1	1	5	0.2	0.2	ug/l	6020
Chromium	_U	I	1	I	ı	CAS# 7440-47-	-3	1	I		1	1	
Second Quarter 2010	-	U	1 J	5.6	U	U	5	5	100	1	1	ug/l	6020
Cobalt	ı	ı	ı	ı	ı	CAS# 7440-48-	-4	1	I	ı	1	1	1
Second Quarter 2010	-	U	2.8 J	70.4	4.6 J	3.5 J	5	5	7	1	1	ug/l	6020
Copper	I	1	I	1	ı	CAS # 7440-50-	-8		I				
Second Quarter 2010	-	U	1.3 J	5.3	U	U	5	5	1,300	1	1	ug/l	6020
Lead	I	1	I	1	ı	CAS# 7439-92-	-1		I				
Second Quarter 2010	-	U	0.56 J	U	U	0.31 J	1	1	15	0.2	0.2	ug/l	6020
Mercury	U	1	I	1		CAS# 7439-97-	-6	1	ı		1		
Second Quarter 2010	-	U	U	U	U	U	2	2	2	0.2	0.2	ug/l	7470A
Nickel		1	I.	1		CAS# 7440-02-	-0		I				
Second Quarter 2010	-	U	U	31.7	6.5 J	5 J	10	10	313	2	2	ug/l	6020
Selenium	I	1	I	1	ı	CAS # 7782-49-	-2		I				
Second Quarter 2010	-	12.3	U	U	U	U	10	10	50	3	3	ug/l	6020
Silver	ļ	Ţ	Į.	Ţ	ı	CAS# 7440-22	-4	ı	Į.	ı	ļ	ı	ı
Second Quarter 2010	-	U	U	U	U	U	2	2	78.25	0.2	0.2	ug/l	6020
Thallium	ı	ı	ı	ı	ı	CAS# 7440-28	-0	1	I	ı	1	1	1
Second Quarter 2010	-	U	U	U	U	U	1	1	2	0.2	0.2	ug/l	6020
Vanadium	- I	1	1	1	1	CAS# 7440-62-	-2	1	1		Г	1	_1
Second Quarter 2010	-	U	U	U	U	U	10	10	109.55	1	1	ug/l	6020
Zinc	I	1	I	1	ı	CAS# 7440-66	-6	1	I	1	1	1	
Second Quarter 2010	_	U	8.7 J	40	U	U	10	10	4,695	3	3	ug/l	6020

Summary of Annual Target Analyte Monitoring Results Appendix K Corrective Action Monitoring Plan - Targeted Constituents Hazardous Waste Management Unit 5 Radford Army Ammunition Plant, Radford, Virginia

$Upgradient\ well = 5W8B$

Analyte/Quarter	5W8B Q	5W5B Q	5W7B Q	5WC21 Q	5WC22 Q	5WC23 Q	QL	Permit QL	GPS	DL	Permit DL	UNIT	Method
Acetone						CAS# 67-64-1					,		
Second Quarter 2010	-	U	U	U	U	U	10	10	8,750.2	3	3	ug/l	8260B
bis(2-Ethylhexyl)phthalate			1			CAS# 117-81-7	7	'					,
Second Quarter 2010	=	U	U	U	U	U	6	6	10	1.5	1.5	ug/l	8270C
2-Butanone	I	I		1		CAS# 78-93-3	1		1		1	1	
Second Quarter 2010	-	U	U	U	U	U	10	10	2,667.6	1	1	ug/l	8260B
Chloroform						CAS # 67-66-3							
Second Quarter 2010	-	0.3 J	4.4	0.6 J	0.6 J	0.6 J	1	1	80	0.1	0.1	ug/l	8260B
Dichlorodifluoromethane						CAS # 75-71-8							
Second Quarter 2010	-	U	U	0.2 J	0.3 J	0.4 J	1	1	142.27	0.1	0.28	ug/l	8260B
1,2-Dichloroethane						CAS# 107-06-2	?						,
Second Quarter 2010	-	U	U	U	U	U	1	1	5	0.1	0.147	ug/l	8260B
Diethyl ether	i.	i.	"			CAS# 60-29-7	•	i.	·		Ţ	i	,
Second Quarter 2010	-	0.5 J	U	3.2 J	7 J	5.5 J	12	12	7,300	0.1	0.39	ug/l	8260B
Diethyl phthalate			1			CAS# 84-66-2							'
Second Quarter 2010	-	U	U	U	U	U	10	10	12,520	0.56	0.5	ug/l	8270C
2,4-Dinitrotoluene			1			CAS# 121-14-2	?						'
Second Quarter 2010	-	U	U	2 J	0.74 J	0.8 J	10	10	31.3	0.58	0.6	ug/l	8270C
2,6-Dinitrotoluene						CAS# 606-20-2	?						,
Second Quarter 2010	-	U	U	U	U	U	10	10	15.65	0.66	0.7	ug/l	8270C
Methylene chloride						CAS# 75-09-2		•					
Second Quarter 2010	-	U	U	U	U	U	1	1	5	0.2	0.182	ug/l	8260B
o-Nitroaniline					-	CAS# 88-74-4						•	
Second Quarter 2010	-	U	U	U	1.7 J	2.2 J	10	10	110	0.69	0.7	ug/l	8270C
p-Nitroaniline	ı	ı	'			CAS# 100-01-6	3	,		"	1	1	,
Second Quarter 2010	-	U	U	U	1.5 J	1.4 J	20	20	20	1.3	1.3	ug/l	8270C
Nitrobenzene	i.	i.	"			CAS# 98-95-3	•	i.	·		Ţ	i	,
Second Quarter 2010	-	U J	U J	0.9 J	1.1 J	U J	10	10	10	0.8	0.8	ug/l	8270C
Toluene						CAS# 108-88-3	3						
Second Quarter 2010	-	U	U	U	U	U	1	1	1,000	0.1	0.1	ug/l	8260B
Xylenes (Total)			•			CAS # 1330-20-	7		1			•	
Second Quarter 2010	-	U	U	U	U	U	3	3	10,000	0.1	0.208	ug/l	8260B

Summary of Annual Target Analyte Monitoring Results Appendix K Corrective Action Monitoring Plan - Targeted Constituents

Hazardous Waste Management Unit 5

Radford Army Ammunition Plant, Radford, Virginia

 $Upgradient \ well = 5W8B$

Analyte/Quarter	5W8B Q	5W5B Q	5W7B Q	5WC21 Q	5WC22 Q	5WC23 Q	QL	Permit QL	GPS	DL	Permit DL	UNIT	Method

Definitions:

Results are reported to the permit detection limit.

First Corrective Action Monitoring Event Second Quarter 2010:

QL Denotes laboratory quantitation limit.

Permit QL Denotes permit quantitation limit.

DL Denotes laboratory detection limit.

Permit DL Denotes permit detection limit.

U denotes not detected at or above the permit detection limit or QL.

UA denotes not detected at or above the adjusted detection limit or adjusted QL.

- J Denotes result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above the detection limit or QL and detection limit and QL are estimated. When used with "UA"
- (i.e., "UAJ"), denotes analyte not detected at or above adjusted detection limit and and adjusted detection limit and QL are estimated.
- UN Denotes analyte concentration is less than the QL and/or five times the blank concentration. Not reliably detected due to blank contamination.
- **R** Denotes result rejected.
- Q Denotes data validation qualifier. X Denotes mass spectral confirmation not obtained-result suspect.

CAS# Denotes Chemical Abstract Services registration number.

GPS Denotes Groundwater Protection Standards listed in Appendix K of Module VI-Groundwater Corrective Action & Monitoring Program for Unit 5 (approved by the VDEQ) in the

Final Class 3 Hazardous Waste Permit Modification dated November 5, 2009) which was incorporated into the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5, 7, 10, and 16 (October 4, 2002). "—" denotes not sampled.

Event Notes:

Second Quarter 2010 – For nitrobenzene and/or p-nitroaniline detections in 5WC21, 5WC22 and 5WC23, less than the QL, a verification event was performed on 7/9/2010 using a low level method of analysis to verify the result. The verification result was less than the QL associated with the low level method and the original result was reported and no further action is required.



Comprehensive Data Validation Report



Sample/Blind Field Duplicate Results Greater Than the Quantitation Limit

Facility: HWMU-5 Monitoring Event: Second Quarter 2010

	L	_aboratory Result	Validated Result	QL	
Analyte	Sample ID	(ug/L) Q	(ug/L) Q	(ug/L)	Validation Notes
Method: 6020					
Laboratory: Compu	Chem, a Division of	Liberty Analt	yical, Cary, NC	,	
Barium	5WC21	15.2	15.2	10	No action taken. RPD <10.
	5WDUP	15.9	15.9	10	No action taken. Field duplicate of 5WC21. RPD < 10.
Beryllium	5WC21	1.5	1.5	1	No action taken. RPD <10.
	5WDUP	1.6	1.6	1	No action taken. Field duplicate of 5WC21. RPD < 10.
Chromium	5WC21	5.6	5.6	5	No action taken. RPD <10.
	5WDUP	5.9	5.9	5	No action taken. Field duplicate of 5WC21. RPD <10.
Cobalt	5WC21	70.4	70.4	5	No action taken. RPD <10.
	5WDUP	73.6	73.6	5	No action taken. Field duplicate of 5WC21. RPD <10.
Copper	5WC21	5.3	5.3	5	No action taken. RPD <10.
	5WDUP	5.5	5.5	5	No action taken. Field duplicate of 5WC21. RPD <10.
Nickel	5WC21	31.7	31.7	10	No action taken. RPD <10.
	5WDUP	32.7	32.7	10	No action taken. Field duplicate of 5WC21. RPD <10.
Zinc	5WC21	40	40	10	No action taken. RPD <10.
	5WDUP	41.8	41.8	10	No action taken. Field duplicate of 5WC21. No action taken. RPD <10.
Method: 8260B					
Laboratory: Lancas	ter Laboratories, La	ncaster, PA			
Trichloroethene	5WC21	4.2	4.2	1	No action taken. No action taken. Field duplicate of 5WC21. RPD <10.
	5WDUP	4.3	4.3	1	No action taken. Field duplicate of 5WC21. RPD < 10.
Method: 9056A					
Laboratory: TestAm	erica, North Cantor	n, <i>ОН</i>			
Nitrate as N	5WC21	8.3	8.3	0.1	No action taken. Field duplicate of 5WC21, RPD <10.
	5WDUP	8.7	8.7	0.1	No action taken. Field duplicate of 5WC21. RPD <10.
Sulfate	5WC21	234	234 Ј	1	Field duplicate precision for sulfate was greater than 20 RPD (21 RPD). Reported result is estimated. Analyzed at a 1:2 dilution. Actual QL is 2 mg/l.
	5WDUP	289	289 J	1	Field duplicate of 5WC21. RPD 21. Field duplicate precision for sulfate was greater than 20 RPD (21 RPD). Reported result is estimated. Analyzed at a 1:2 dilution. Actual QL is 2 mg/l.

Comprehensive Data Validation Report



Sample/Blind Field Duplicate Results Greater Than the Quantitation Limit

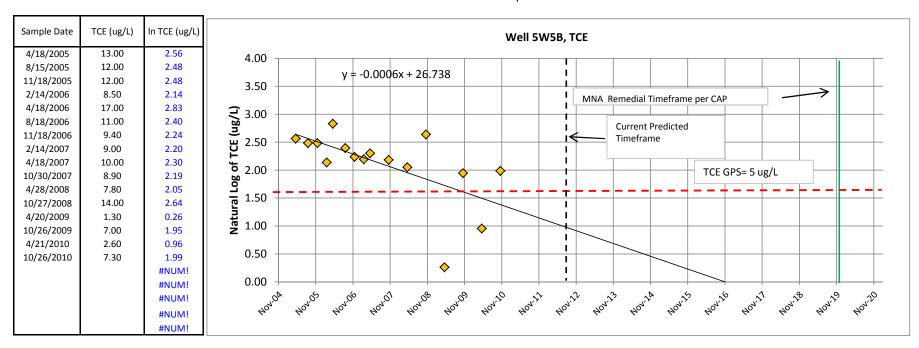
Facility: HWMU-5	Monitoring Event:	Second Quarter 2010

Analyte Sample ID (ug/L) Q (ug/L) Validation Notes Definitions: Data Validation Qualifiers: QL Denotes permit quantitation limit. Q Denotes data qualifier.		L	aboratory. Result	Validated Result	QL	
Definitions: Data Validation Qualifiers:	Analyte	Sample ID	(ug/L) Q	(ug/L) Q	(ug/L)	Validation Notes
Data Validation Qualifiers:						
Data Validation Qualifiers:						
· ·						
OL Denotes permit quantitation limit. O Denotes data qualifier	Definitions:					
		ifiers:				

APPENDIX A-4

MNA EFFECTIVENESS EVALUATION
(CONCENTRATION TREND GRAPH, POINT ATTENUATION RATE
CALCULATION, DATA TREND GRAPHS, TCE ISOCONCENTRATION MAP)

MNA Effectiveness Evaluation - Concentration Trend Graph and Point Attenuation Rate Calculation



Last 16	rounds	TCE GPS	Estima	ted Rate and T	ime Required	Current MNA Timeframe	MNA Goal (per CAP)	MNA Ineffective Date
First Event	Last Event		Rate	Rate	Time	Prediction	IVINA Goal (per CAP)	(per CAP)
First Event	Last Event	ug/L	(per day)	(per year)	(years)	Frediction		
4/18/2005	10/26/2010	5.000	0.0006	0.219	1.73	July-2012	October-2019	December-2026

Effectiveness Evaluation for MNA Remedy

- 1) Is the current MNA remedial timeframe prediction less than the 2019 MNA Goal?
- 2) Is the current MNA remedial timeframe prediction less than the 2026 MNA ineffective date?

<u>Status</u>

yes

yes

Condition

If 'yes', then the remedy is considered effective and no additional action is required. If 'no' for three consecutive years, then contingency measures will be implemented as defined in the CAP.

If 'yes', the remedy will be considered effective. If 'no' for three consecutive monitoring years, then an alternate remedial approach will be implemented as defined in the CAP.

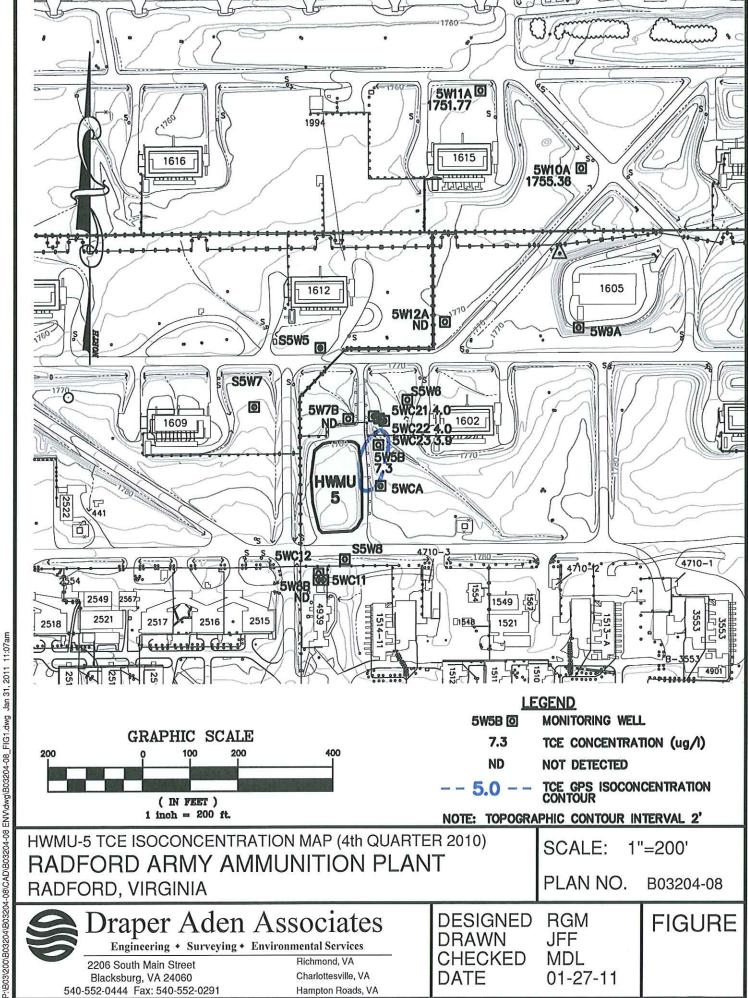
Date of Evaluation		Predicted Remedial Timeframe											
	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	vc								
Well 5W5B													
4/22/2009	October-2010	NA	NA	NA	NA								
10/1/2009	NP	NA	NA	NA	NA								
10/26/2010	July-2012	NA	NA	NA	NA								
10/3/2011													
10/3/2012		-											
10/4/2013													
10/5/2014													
10/6/2015													
10/6/2016													
10/7/2017													
10/8/2018													
10/9/2019													
Well ID													
4/22/2009													
10/1/2009													
10/2/2010													
10/3/2011													
10/3/2012													
10/4/2013													
10/5/2014													
10/6/2015													
10/6/2016													
10/7/2017													
10/8/2018													
10/9/2019													

Notes:

NA - Not Applicable

NP - Not Performed

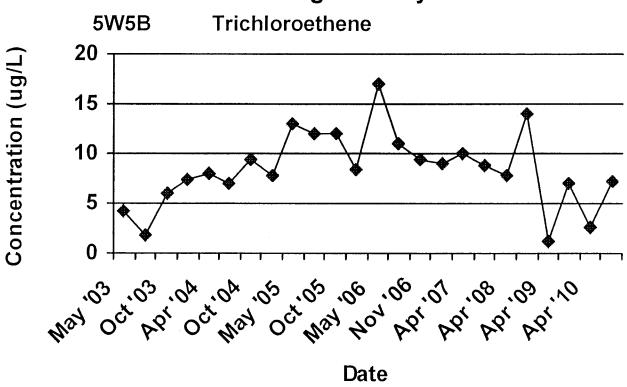
Date of Evaluation - Refers to the date of the last monitoring event of the calendar year, the data for which was used in the evaluation

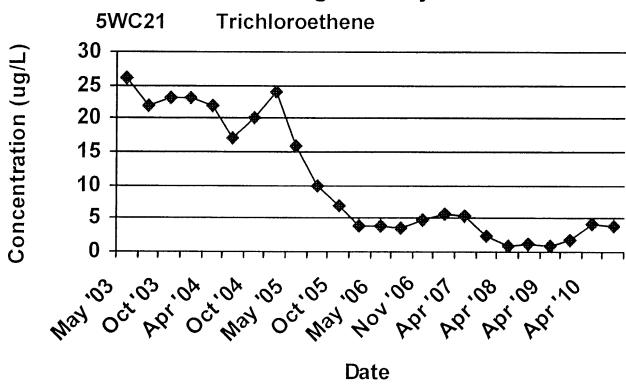


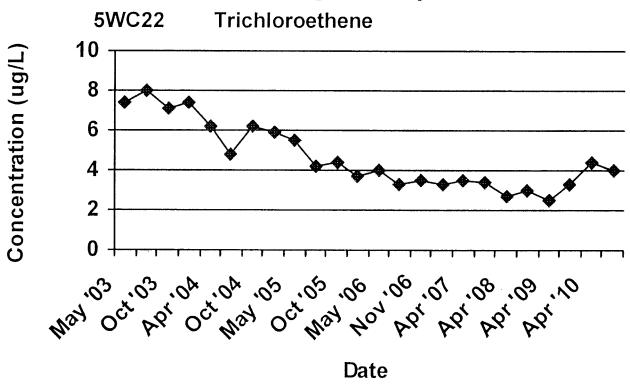
Hampton Roads, VA

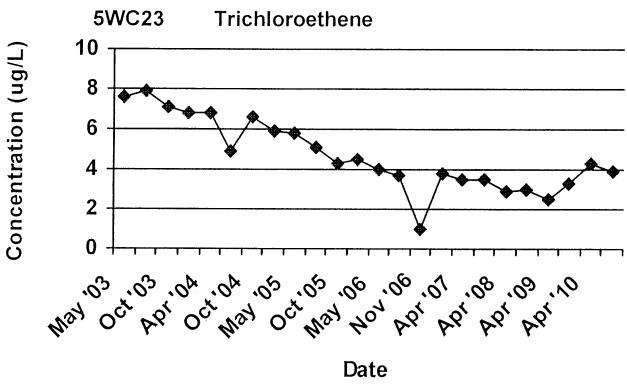
Blacksburg, VA 24060

540-552-0444 Fax: 540-552-0291







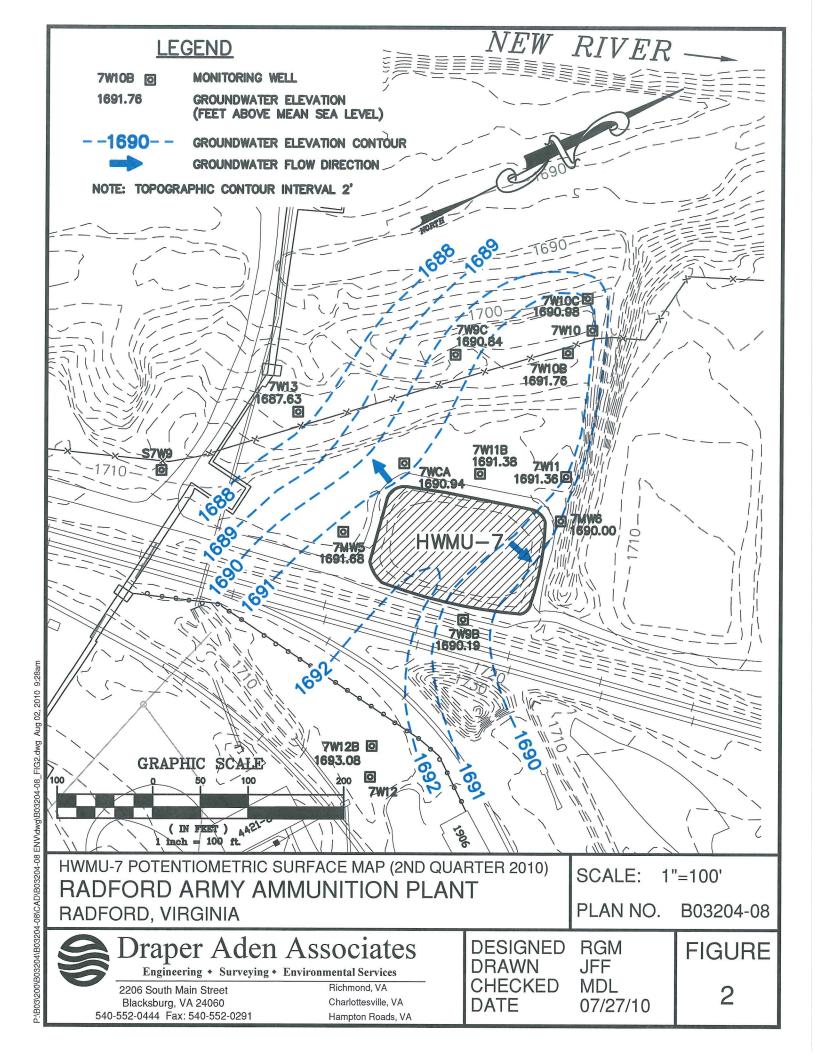


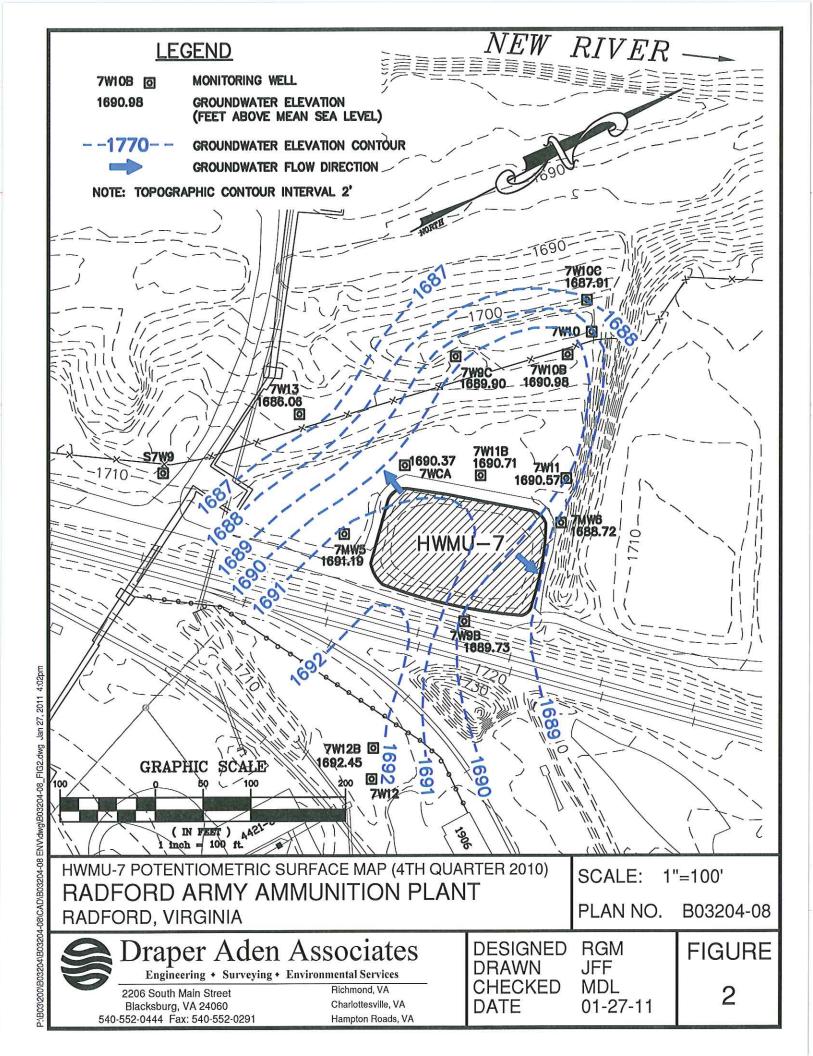
APPENDIX B

HWMU-7

APPENDIX B-1

HWMU-7 POTENTIOMETRIC SURFACE MAPS SECOND QUARTER 2010 FOURTH QUARTER 2010





APPENDIX B-2

HWMU-7 2010 LABORATORY ANALYTICAL RESULTS POINT OF COMPLIANCE WELLS

Target Analyte Monitoring Results - HWMU-7 Point of Compliance Wells Radford Army Ammunition Plant, Radford, Virginia Upgradient well = 7W12B

Analtye/Quarter	7W12B Q	7MW6 Q	7WCA Q	7W11B Q	QL	GPS	Background	Method
Antimony						С	AS#	7440-36-0
Second Quarter 2010	U	U	U	U	1	6	1	6020
Fourth Quarter 2010	U	U	U	1.1	1	6	1	6020
Arsenic						C	AS#	7440-38-2
Second Quarter 2010	U	U	U	U	10	10	10	6020
Fourth Quarter 2010	U	U	U	U	10	10	10	6020
Barium						C	AS#	7440-39-3
Second Quarter 2010	31	17.8	25.5	48	10	2000	41	6020
Fourth Quarter 2010	31.2	18.5	22	46	10	2000	41	6020
Beryllium						C	AS#	7440-41-7
Second Quarter 2010	U	U	U	U	1	_		6020
Cadmium	_		_		•		AS#	7440-43-9
Second Quarter 2010	U	U	U	U	1	5	1	6020
Fourth Quarter 2010	U	U	U	U	1	5	1	6020
Chromium		Ŭ	Ŭ	Ŭ	'		AS#	7440-47-3
Second Quarter 2010	4.5 J	U	U	U	5	100	9.9	6020
Fourth Quarter 2010	7.2	U	U	U	5	100	9.9	6020
	7.2	U	U	U	Э		AS#	7440-48-4
Cobalt Second Quarter 2010	111	U	4.2 J	1.6 J	_	1	A3# 5	1
Fourth Quarter 2010	U	U	4.2 J U	1.6 J U	5	156.65	5	6020 6020
	U	U	U	U	5	156.65		7440-50-8
Copper	441		40.1		_		AS#	1
Second Quarter 2010	1.4 J	U	1.2 J	U	5	1300	5	6020
Fourth Quarter 2010	U	U	U	U	5	1300	5	6020
Lead	1	1			1	T	AS#	7439-92-1
Second Quarter 2010	U	U	0.21 J	U	1	15	1	6020
Fourth Quarter 2010	U	U	U	U	1	15	1	6020
Mercury		1	1	ı		C	AS#	7439-97-6
Second Quarter 2010	U	U	U	U	2	2	2	7470 <i>A</i>
Fourth Quarter 2010	U	U	U	U	2	2	2	7470 <i>A</i>
Nickel						C	AS#	7440-02-0
Second Quarter 2010	U	2.3 J	11.8	U	10	313	10	6020
Fourth Quarter 2010	U	U	14.4	U	10	313	10	6020
Selenium						C	AS#	7782-49-2
Second Quarter 2010	U	U	U	U	10	50	10	6020
Fourth Quarter 2010	U	U	U	U	10	50	10	6020
Silver			-			C	AS#	7440-22-4
Second Quarter 2010	U	U	U	U	2	78.25	2	6020
Fourth Quarter 2010	U	U	U	U	2	78.25	2	6020
Thallium	<u> </u>	1	1	1		C	AS#	7440-28-0
Second Quarter 2010	U	U	U	U	1	2	1	6020
Fourth Quarter 2010	U	U	U	U	1	2	1	6020
Tin	1	II.	I.	I.	1	C	AS#	7440-31-5
Second Quarter 2010	U	U	U	U	15	-		6010E
Vanadium		<u> </u>	<u> </u>	<u> </u>		C	AS#	7440-62-2
Second Quarter 2010	U	U	U	U	10			6020

Target Analyte Monitoring Results - HWMU-7 Point of Compliance Wells Radford Army Ammunition Plant, Radford, Virginia

 $Upgradient \ well = 7W12B$

Analtye/Quarter	7W12B Q	7MW6 Q	7WCA Q	7W11B Q	QL	GPS	Background	Method
Zinc						C	'AS#	7440-66-6
Second Quarter 2010	4.7 J	6 J	4.8 J	4.6 J	10	4695	10.9	6020
Fourth Quarter 2010	U	U	U	U	10	4695	10.9	6020
Cyanide						C	AS#	57-12-5
Second Quarter 2010	U	U	U	U	20	200	20	9012A
Fourth Quarter 2010	U	U	U	U	20	200	20	9012A
Sulfide						('AS#	Q1314
Second Quarter 2010	U	U	U	U	3000	-		9034
Total Recoverable Pheno			_		0000		AS#	C-020
Second Quarter 2010	U	U	U	U	50		115 "	9066
	Ŭ .		ŭ	ŭ	30		AS#	83-32-9
Acenaphthene Second Quarter 2010	U	U	U	U	10		AS#	8270C
	U	U	U	U	10		140 #	208-96-8
Acenaphthylene	1	1					CAS#	1
Second Quarter 2010	U	U	U	U	10	-	146."	8270C
Acetone	1	T	T	1		l e	AS#	67-64-1
Second Quarter 2010	U	U	U	U	10	-		8260B
Acetonitrile						C	AS#	75-05-8
Second Quarter 2010	U	U	U	U	100	-		8260B
Acetophenone						C	'AS#	98-86-2
Second Quarter 2010	U	U	U	U	10	-		8270C
2-Acetylaminofluorene						C	AS#	53-96-3
Second Quarter 2010	U	U	U	U	10	-		8270C
Acrolein						C	'AS#	107-02-8
Second Quarter 2010	UJ	U J	U J	U J	25	-		8260B
Acrylonitrile						C	AS#	107-13-1
Second Quarter 2010	U	U	U	U	10	-		8260B
Aldrin						(AS#	309-00-2
Second Quarter 2010	U	U	U	U	0.05			8081A
	Ŭ.		Ŭ	ŭ	0.03		AS#	107-05-1
Allyl chloride Second Quarter 2010	U	Lu				1	A3 #	8260B
	U	U	U	U	10	-	146 #	
4-Aminobiphenyl	1	T		I		ı	AS#	92-67-1
Second Quarter 2010	U	U	U	U	10	-		8270C
Aniline	1	1	1	T.		C	CAS#	62-53-3
Second Quarter 2010	UJ	U J	U J	U J	10	-		8270C
Anthracene						C	AS#	120-12-7
Second Quarter 2010	U	U	U	U	10	-		8270C
Aramite						C	'AS#	140-57-8
Second Quarter 2010	U	U	U	U	10	-		8270C
Benzene	1	1	I .	II.		C	AS#	71-43-2
Second Quarter 2010	U	U	U	U	1	-		8260B
Benzo[a]anthracene		1	<u> </u>	II.		•	AS#	56-55-3
Second Quarter 2010	U	U	U	U	10	-		8270C
Benzo[b]fluoranthene		1					AS#	205-99-2
Second Quarter 2010	U	U	U	U	10			8270C
	J		J	Ŭ	10		CAS#	207-08-9
Benzo[k]fluoranthene	U	U		1		·	A10 #	_07-00-9

Target Analyte Monitoring Results - HWMU-7 Point of Compliance Wells Radford Army Ammunition Plant, Radford, Virginia Upgradient well = 7W12B

Analtye/Quarter	7W12B Q	7MW6 Q	7WCA Q	7W11B Q	QL	GPS	Background	Method
Benzo[ghi]perylene						(CAS#	191-24-2
Second Quarter 2010	U	U	U	U	10	-		82700
Benzo(a)pyrene						(CAS#	50-32-8
Second Quarter 2010	U	U	U	U	10	-		82700
1,4-Benzenediamine						(CAS#	106-50-3
Second Quarter 2010	UJ	U J	U J	U J	50	-		82700
Benzyl alcohol						(CAS#	100-51-6
Second Quarter 2010	UJ	U J	U J	U J	10	-		82700
alpha-BHC						(CAS#	319-84-6
Second Quarter 2010	U	U	U	U	0.05	-		8081
beta-BHC						(CAS#	319-85-7
Second Quarter 2010	U	U	U	U	0.05	-		8081
delta-BHC						(CAS#	319-86-8
Second Quarter 2010	UJ	U J	U J	U J	0.05	-		8081
gamma-BHC	1	<u>I</u>	I .				CAS#	58-89-9
Second Quarter 2010	U	U	U	U	0.05	-		8081 <i>A</i>
bis(2-Chloroethoxy)metha	ane						CAS#	111-91-1
Second Quarter 2010	U	U	U	U	5	_		82700
bis(2-Chloroethyl)ether			_				CAS#	111-44-4
Second Quarter 2010	U	U	U	U	5	-		82700
bis(2-Chloro-1-methylethy			_				CAS#	108-60-1
Second Quarter 2010	U	U	U	U	10		115 "	82700
bis(2-Ethylhexyl)phthalate	_		_		10		CAS#	117-81-7
Second Quarter 2010	U	U	U	U	5	6	6	82700
Fourth Quarter 2010	U	U	U	U	6	6	6	82700
Bromobenzene			J	J	-		CAS#	108-86-1
Second Quarter 2010	U	U	U	U	1	_		8260E
	O	U	O .	U			CAS#	74-97-5
Bromochloromethane Second Quarter 2010	U	U	U	U			A3#	8260E
	U	U	U	U	1	-	7464	75-27-4
Bromodichloromethane	111	1		1 11		1	CAS#	1
Second Quarter 2010	U	U	U	U	1	-	7 A G #	75-25-2
Bromoform	1	I		l		1	CAS#	1
Second Quarter 2010	U	U	U	U	1	-	2.0.0	8260E
4-Bromophenyl phenyl et	1	I	1				CAS#	101-55-3
Second Quarter 2010	U	U	U	U	10	-		82700
n-Butyl alcohol	1	T.	II	1		ı	CAS#	71-36-3
Second Quarter 2010	U	U	U	U	50	-		8260E
tert-Butyl alcohol	1	1	I.	1		1	CAS#	75-65-0
Second Quarter 2010	U	U	U	U	200	-		8260E
n-Butylbenzene			1			(CAS#	104-51-8
Second Quarter 2010	U	U	U	U	1	-		8260E
sec-Butylbenzene						(CAS#	135-98-8
Second Quarter 2010	U	U	U	U	1	-		8260E
tert-Butylbenzene						-	CAS#	98-06-6
Second Quarter 2010	U	U	U	U	1	_		8260E

Target Analyte Monitoring Results - HWMU-7 Point of Compliance Wells Radford Army Ammunition Plant, Radford, Virginia

 $Upgradient \ well = 7W12B$

Analtye/Quarter	7W12B Q	7MW6 Q	7WCA Q	7W11B Q	QL	GPS	Background	Method
Butyl benzyl phthalate						C	'AS#	85-68-7
Second Quarter 2010	U	U	U	U	10	3130	10	8270C
Fourth Quarter 2010	U	U	U	U	10	3130	10	8270C
Carbon disulfide		I.				C	AS#	75-15-0
Second Quarter 2010	U	U	U	U	10	-		8260B
Carbon tetrachloride						C	'AS#	56-23-5
Second Quarter 2010	U	U	U	U	1	-		8260B
Chlordane	-					C	AS#	57-74-9
Second Quarter 2010	U	U	U	U	0.86	-		8081A
p-Chloroaniline						C	AS#	106-47-8
Second Quarter 2010	U	U	U	U	10	-		8270C
Chlorobenzene						('AS#	108-90-7
Second Quarter 2010	U	U	U	U	1	-		8260B
Chlorobenzilate						- 0	AS#	510-15-6
Second Quarter 2010	U	U	U	U	10			8270C
p-Chloro-m-cresol					10	(AS#	59-50-7
Second Quarter 2010	U	U	U	U	10		115 "	8270C
Chloroethane	"		Ü	Ü	10		AS#	75-00-3
Second Quarter 2010	U	U	U	U	1		13 "	8260B
	U	U	O	O	'		'AS#	67-66-3
Chloroform Second Quarter 2010	2.0	U	0.6 J	0.46 J			A3 #	8260B
	2.0	U	0.0 0	0.40 0	1		140 #	110-75-8
2-Chloroethyl vinyl ether	1 11 1		11 1	11 1			CAS#	1
Second Quarter 2010	UJ	U J	U J	U J	20	-	140.#	8260B
2-Chloronaphthalene	T	1				1	CAS#	91-58-7
Second Quarter 2010	U	U	U	U	10	-	146 "	8270C
2-Chlorophenol	1	1		l		ı	AS#	95-57-8
Second Quarter 2010	U	U	U	U	10	-		8270C
4-Chlorophenyl phenyl et	1	T.		I		ι	AS#	7005-72-3
Second Quarter 2010	U	U	U	U	10	-		8270C
Chloroprene		1		1		C	'AS#	126-99-8
Second Quarter 2010	U	U	U	U	10	-		8260B
2-Chlorotoluene						C	AS#	95-49-8
Second Quarter 2010	U	U	U	U	1	-		8260B
4-Chlorotoluene						C	AS#	106-43-4
Second Quarter 2010	U	U	U	U	1	-		8260B
Chrysene						- 0	AS#	218-01-9
Second Quarter 2010	U	U	U	U	10	-		8270C
Cyclohexane						C	AS#	110-82-7
Second Quarter 2010	U	U	U	U	1	-		8260B
2,4-Dichlorophenoxyacet	c acid					C	AS#	94-75-7
Second Quarter 2010	U	U	U	U	5	-		8151A
4,4'-DDD	1	I .		I.		C	'AS#	72-54-8
Second Quarter 2010	U	U	U	U	0.1	-		8081A
4.4'-DDE		1				C	AS#	72-55-9
Second Quarter 2010	U	U	U	U	0.1	-		8081A
4,4'-DDT							AS#	50-29-3
T,T 001								

Target Analyte Monitoring Results - HWMU-7 Point of Compliance Wells Radford Army Ammunition Plant, Radford, Virginia Upgradient well = 7W12B

Analtye/Quarter	7W12B Q	7MW6 Q	7WCA Q	7W11B Q	QL	GPS	Background	Method
Diallate							CAS#	2303-16-4
Second Quarter 2010	U	U	U	U	10	-		82700
Dibenz(a,h)anthracene						(CAS#	53-70-3
Second Quarter 2010	U	U	U	U	10	-		82700
Dibenzofuran						(CAS#	132-64-9
Second Quarter 2010	U	U	U	U	10	-		82700
Dibromochloromethane							CAS#	124-48-1
Second Quarter 2010	U	U	U	U	1	-		8260E
1,2-Dibromo-3-chloropro	pane						CAS#	96-12-8
Second Quarter 2010	U	U	U	U	1	-		8260E
1,2-Dibromoethane							CAS#	106-93-4
Second Quarter 2010	U	U	U	U	1			8260E
Di-n-butyl phthalate			_	_	•		CAS#	84-74-2
Second Quarter 2010	U	U	U	U	10			82700
	J		J	Ŭ	10		CAS#	95-50-1
1,2-Dichlorobenzene Second Quarter 2010	U	U	U	U	4	T	υπ στο π	93-30-1 8260E
	U	U	U	U	1	-	CAS#	541-73-1
1,3-Dichlorobenzene	11	111	11	11		1	LAS#	1
Second Quarter 2010	U	U	U	U	1	-	CA C #	8260E
1,4-Dichlorobenzene	1	1		1		1	CAS#	106-46-7
Second Quarter 2010	U	U	U	U	1	-		8260E
3,3'-Dichlorobenzidine	1	T.	I	1		-	CAS#	91-94-1
Second Quarter 2010	U	U	U	U	10	-		82700
trans-1,4-Dichloro-2-bute		1	I .	1			CAS#	110-57-6
Second Quarter 2010	U	U	U	U	10	-		8260E
Dichlorodifluoromethane			1				CAS#	75-71-8
Second Quarter 2010	U	U	U	U	1	-		8260E
1,1-Dichloroethane						(CAS#	75-34-3
Second Quarter 2010	U	U	U	U	1	-		8260E
1,2-Dichloroethane						(CAS#	107-06-2
Second Quarter 2010	U	U	U	U	1	-		8260E
1,1-Dichloroethene						(CAS#	75-35-4
Second Quarter 2010	U	U	U	U	1	-		8260B
trans-1,2-Dichloroethene)					(CAS#	156-60-5
Second Quarter 2010	U	U	U	U	1	-		8260E
2,4-Dichlorophenol						(CAS#	120-83-2
Second Quarter 2010	U	U	U	U	10	-		8270C
2,6-Dichlorophenol		1				-	CAS#	87-65-0
Second Quarter 2010	U	U	U	U	10	-		82700
1,2-Dichloropropane							CAS#	78-87-5
Second Quarter 2010	U	U	U	U	1	_		8260E
1,3-Dichloropropane					'		CAS#	142-28-9
Second Quarter 2010	U	U	U	U	1			8260E
	0	J	J	J	1		CAS#	594-20-7
2,2-Dichloropropane Second Quarter 2010	U	11	U	U		1	UAD#	
	U	U	U	U	1	-	CAC#	8260E
1,1-Dichloropropene	1	1				•	CAS#	563-58-6
Second Quarter 2010	U	U	U	U	1	-		8260E

Target Analyte Monitoring Results - HWMU-7 Point of Compliance Wells Radford Army Ammunition Plant, Radford, Virginia

 $Upgradient \ well = 7W12B$

Analtye/Quarter	7W12B Q	7MW6 Q	7WCA Q	7W11B Q	QL	GPS	Background	Method
cis-1,3-Dichloropropene						C	CAS#	0061-01-5
Second Quarter 2010	U	U	U	U	1	-		8260B
trans-1,3-Dichloropropen	е					(CAS#	0061-02-6
Second Quarter 2010	U	U	U	U	1	-		8260E
Dieldrin						C	CAS#	60-57-1
Second Quarter 2010	U	U	U	U	0.1	-		8081A
Diethyl ether						(CAS#	60-29-7
Second Quarter 2010	U	U	U	U	12.5	-		8260E
Diethyl phthalate						(CAS#	84-66-2
Second Quarter 2010	U	U	U	U	10	-		8270C
O,O-Diethyl O-2-pyrazinyl						(CAS#	297-97-2
Second Quarter 2010	U	U	U	U	10	-		8270C
Dimethoate						(CAS#	60-51-5
Second Quarter 2010	U	U	U	U	10	-		8270C
Dimethyl ether						(CAS#	115-10-6
Second Quarter 2010	U	U	U	U	12.5	-		8260B
p-(Dimethylamino)azober	nzene					(CAS#	60-11-7
Second Quarter 2010	U	U	U	U	10	-		8270C
7,12-Dimethylbenz[a]anth	racene					(CAS#	57-97-6
Second Quarter 2010	U	U	U	U	10	-		8270C
3,3'-Dimethylbenzidine						(CAS#	119-93-7
Second Quarter 2010	U	U	U	U	10	-		8270C
a,a-Dimethylphenethylam	ine					(CAS#	122-09-8
Second Quarter 2010	UJ	U J	U J	U J	50	-		8270C
2,4-Dimethylphenol						(CAS#	105-67-9
Second Quarter 2010	U	U	U	U	10	-		8270C
Dimethyl phthalate						(CAS#	131-11-3
Second Quarter 2010	U	U	U	U	10	-		8270C
m-Dinitrobenzene						(CAS#	99-65-0
Second Quarter 2010	U	U	U	U	10	-		8270C
4,6-Dinitro-o-cresol						(CAS#	534-52-1
Second Quarter 2010	U	U	U	U	10	-		8270C
2,4-Dinitrophenol						(CAS#	51-28-5
Second Quarter 2010	UJ	U J	U J	U J	10	31.3	10	8270C
Fourth Quarter 2010	UJ	U J	U J	U J	10	31.3	10	8270C
2,4-Dinitrotoluene						(CAS#	121-14-2
Second Quarter 2010	U	U	U	U	10	31.3	10	8270C
Fourth Quarter 2010	U	U	U	U	10	31.3	10	8270C
2,6-Dinitrotoluene						(CAS#	606-20-2
Second Quarter 2010	U	U	U	U	10	15.65	10	8270C
Fourth Quarter 2010	U	U	U	U	10	15.65	10	8270C
Dinoseb						(CAS#	88-85-7
Second Quarter 2010	U	U	U	U	2.5	-		8151A
Di-n-octyl phthalate		1			<u> </u>		CAS#	117-84-0
Second Quarter 2010	U	U	U	U	10	-		8270C
1,4-Dioxane		1			<u> </u>	(CAS#	123-91-1
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Target Analyte Monitoring Results - HWMU-7 Point of Compliance Wells Radford Army Ammunition Plant, Radford, Virginia Upgradient well = 7W12B

Disulfoton CAS # 38 38 38 38 38 38 38	Analtye/Quarter	7W12B Q	7MW6 Q	7WCA Q	7W11B Q	QL	GPS	Background	Method
Second Quarter 2010	henylamine						(CAS#	122-39-4
Second Quarter 2010		U	U	U	U	10	-		82700
Endosulfan	ulfoton						(CAS#	298-04-4
Second Quarter 2010	econd Quarter 2010	U	U	U	U	10	-		82700
Endosulfan II	dosulfan I		1				(CAS#	959-98-8
Second Quarter 2010	econd Quarter 2010	U	U	U	U	0.05	-		8081
Endosulfan sulfate	dosulfan II						(CAS#	33213-65-9
Second Quarter 2010	econd Quarter 2010	U	U	U	U	0.1	-		8081/
Second Quarter 2010	dosulfan sulfate						(CAS#	1031-07-8
Second Quarter 2010	econd Quarter 2010	U	U	U	U	0.1	-		8081
Second Quarter 2010	drin						- (CAS#	72-20-8
Ethyl acetate		U	U	U	U	0.1	_		8081
Second Quarter 2010						• • • • • • • • • • • • • • • • • • • •		CAS#	141-78-6
Endrin aldehyde	·	U	U	U	U	10	T		82601
Second Quarter 2010					_	10		CAS#	7421-93-4
Ethanol		U J	U.J	U.J	U. J	0.1	1		8081/
Second Quarter 2010		0 0	0 0	0 0	0 0	0.1		CAS#	64-17-5
Ethylbenzene	-	11 1	I 11 1	1 11 1	11 1	050	1	JAB #	82608
Second Quarter 2010		0 0	0 0	0 0	0 0	250		74 C #	100-41-4
Second Quarter 2010	_	- 11	11	11	11			A3 #	8260
Second Quarter 2010 U U U U U U U U U		U	U	U	U	ļ		746.4	97-63-2
Second Quarter 2010	-		Lu				1	AS#	1
Second Quarter 2010		U	U	U	U	10		0.4.0.#	8260
Second Quarter 2010	•		1	1			1	CAS#	62-50-0
Second Quarter 2010		U	U	U	U	10		a. a. "	8270
Second Quarter 2010	•		T	1	1	ı	1	CAS#	75-21-8
Second Quarter 2010		U J	U J	U J	U J	100			82601
Second Quarter 2010	<u> </u>	ı.	1	ı	<u> </u>	1		CAS#	52-85-7
Second Quarter 2010		U	U	U	U	10			8270
Second Quarter 2010				1	1			CAS#	206-44-0
Second Quarter 2010	econd Quarter 2010	U	U	U	U	10			8270
Heptachlor	orene						(CAS#	86-73-7
Second Quarter 2010	econd Quarter 2010	U	U	U	U	10	-		8270
Heptachlor epoxide	otachlor						(CAS#	76-44-8
No.000 No.0000 No.0000 No.0000 No.0000 No.0000 No.0000 No.0000 No.0000 No.0000 No.00000 No.00000 No.00000 No.00000 No.000000 No.00000000 No.000000000000000000000000000000000000	econd Quarter 2010	U	U	U	U	0.05	-		8081
Nexachlorobenzene CAS # 1	otachlor epoxide						(CAS#	1024-57-3
Second Quarter 2010	econd Quarter 2010	U	U	U	U	0.05	-		8081
Name	cachlorobenzene						(CAS#	118-74-1
Second Quarter 2010	econd Quarter 2010	U	U	U	U	10	-		8270
Hexachlorocyclopentadiene	cachlorobutadiene						(CAS#	87-68-3
Second Quarter 2010	econd Quarter 2010	U	U	U	U	1	-		8260
Second Quarter 2010	cachlorocyclopentadien	1e	1	1	1	1	•	CAS#	77-47-4
Second Quarter 2010 U U U U 10 -	<u> </u>	1	U	U	U	10	-		8270
Second Quarter 2010 U U U U 10 -	cachloroethane		1	1	1	1		CAS#	67-72-1
		U	U	U	U	10	-		8260
LIEAGUIDO DUIGITE	cachlorophene	1	1	1		-		CAS#	70-30-4
Second Quarter 2010	·	U J	U J	U J	U J	40			82700

Target Analyte Monitoring Results - HWMU-7 Point of Compliance Wells Radford Army Ammunition Plant, Radford, Virginia Upgradient well = 7W12B

Analtye/Quarter	7W12B Q	7MW6 Q	7WCA Q	7W11B Q	QL	GPS	Background	Method
Hexachloropropene						(CAS#	1888-71-7
Second Quarter 2010	U	U	U	U	10	-		82700
2-Hexanone					l .	(CAS#	591-78-6
Second Quarter 2010	U	U	U	U	10	-		8260E
Indeno[1,2,3-cd]pyrene						(CAS#	193-39-5
Second Quarter 2010	U	U	U	U	5	-		82700
Isobutyl alcohol						(CAS#	78-83-1
Second Quarter 2010	U	U	U	U	200	-		8260
Isodrin						(CAS#	465-73-6
Second Quarter 2010	U	U	U	U	10	_		82700
Isophorone							CAS#	78-59-1
Second Quarter 2010	U	U	U	U	10	_		82700
Isopropylbenzene							CAS#	98-82-8
Second Quarter 2010	U	U	U	U	1	<u> </u>		82608
Isopropylether					'		CAS#	108-20-3
Second Quarter 2010	U	U	U	U	10		J. 1.15 II	8260
			0		10		CAS#	99-87-6
4-Isopropyltoluene Second Quarter 2010	U	U	U	U		<u> </u>		8260
	U	U	U	U	1		CAS#	120-58-1
Isosafrole Second Quarter 2010	1	Lu	1 11			1	CAS#	1
	U	U	U	U	10	-	Q 4 Q #	82700
Kepone	1	T	1			1	CAS#	143-50-0
Second Quarter 2010	UJ	U J	U J	U J	10	-	a. a. "	8270
Methacrylonitrile	T	T	1	T			CAS#	126-98-7
Second Quarter 2010	U	U	U	U	100	-		8260
Methapyrilene	1	1	ı	1			CAS#	91-80-5
Second Quarter 2010	U	U	U	U	10	-		8270
Methoxychlor	1		1	1			CAS#	72-43-5
Second Quarter 2010	U	U	U	U	0.5	-		8081
Bromomethane							CAS#	74-83-9
Second Quarter 2010	U	U	U	U	1	-		8260
Chloromethane						(CAS#	74-87-3
Second Quarter 2010	U	U	U	U	1	-		82601
3-Methylcholanthrene						(CAS#	56-49-5
Second Quarter 2010	U	U	U	U	10	-		82700
2-Butanone						(CAS#	78-93-3
Second Quarter 2010	U	U	U	U	10	-		8260
lodomethane						(CAS#	74-88-4
Second Quarter 2010	U	U	U	U	10	-		8260
Methyl methacrylate	1	1	1	1			CAS#	80-62-6
Second Quarter 2010	U	U	U	U	10	-		8260
Methyl methane sulfonate	<u> </u>	1	1	1	1		CAS#	66-27-3
Second Quarter 2010	U	U	U	U	10	_		8270
2-Methylnaphthalene	1	1	1	1	-		CAS#	91-57-6
Second Quarter 2010	U	U	U	U	10	_		8270
Methyl parathion			1				CAS#	298-00-0
Second Quarter 2010	U	U	U	U	10	<u> </u>		82700
SSSONIA QUANTO 2010	"	~	~	~	10	1 -		02700

Target Analyte Monitoring Results - HWMU-7 Point of Compliance Wells Radford Army Ammunition Plant, Radford, Virginia

 $Upgradient \ well = 7W12B$

Analtye/Quarter	7W12B Q	7MW6 Q	7WCA Q	7W11B Q	QL	GPS	Background	Method
4-Methyl-2-pentanone						(CAS#	108-10-1
Second Quarter 2010	U	U	U	U	10	-		8260B
2-Methylphenol						(CAS#	95-48-7
Second Quarter 2010	U	U	U	U	10	-		8270C
3 & 4-Methylphenol						(CAS# 08-39-4	p 106-44-5
Second Quarter 2010	U	U	U	U	20	-		8270C
Methyl tert-butyl ether				I .		(CAS#	1634-04-4
Second Quarter 2010	U	U	U	U	10	-		8260B
Dibromomethane						(CAS#	74-95-3
Second Quarter 2010	U	U	U	U	1	-		8260B
Methylene chloride				1		(CAS#	75-09-2
Second Quarter 2010	U	U	U	U	1	-		8260B
Naphthalene						(CAS#	91-20-3
Second Quarter 2010	U	U	U	U	1	-		8260B
1,4-Naphthoquinone						(CAS#	130-15-4
Second Quarter 2010	U	U	U	U	10			8270C
1-Naphthylamine						(CAS#	134-32-7
Second Quarter 2010	U	U	U	U	10	_		8270C
2-Naphthylamine						(CAS#	91-59-8
Second Quarter 2010	U	U	U	U	10			8270C
o-Nitroaniline						(CAS#	88-74-4
Second Quarter 2010	U	U	U	U	10	<u> </u>	110 "	8270C
m-Nitroaniline					10		CAS#	99-09-2
Second Quarter 2010	U	U	U	U	10	-		8270C
p-Nitroaniline		J			10		CAS#	100-01-6
Second Quarter 2010	U	U	U	U	10		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	8270C
Nitrobenzene		J			10		CAS#	98-95-3
Second Quarter 2010	U	U	U	U	10			8270C
	0	U	· ·	0	10		CAS#	88-75-5
o-Nitrophenol Second Quarter 2010	U	U	U	U	10		λAS π	8270C
	U	O	0	- O	10		CAS#	100-02-7
p-Nitrophenol Second Quarter 2010	U	U	U	U	40		20	8270C
Fourth Quarter 2010	υJ	U J	U J	UJ	10 10	50	20	8270C 8270C
	0 0	0 0	0 0	0 0	10	50	CAS#	56-57-5
4-Nitroquinoline-1-oxide	T 11	U	ш	111	50	1	A3#	1
Second Quarter 2010	U	U	U	U	50		740#	8270C 924-16-3
N-Nitrosodi-n-butylamine Second Quarter 2010	U	U	U	U	40		CAS#	8270C
	U	U	U	U	10		7464	55-18-5
N-Nitrosodiethylamine	1					1	CAS#	T
Second Quarter 2010	U	U	U	U	10	-	7.40 #	8270C
N-Nitrosodimethylamine				1		1	CAS#	62-75-9
Second Quarter 2010	UJ	U J	U J	U J	10	-	7.5.5	8270C
N-Nitrosodiphenylamine		I	T	1	I	1	CAS#	86-30-6
Second Quarter 2010	U	U	U	U	10	-		8270C
N-Nitrosodipropylamine	1	1		1	1	(CAS#	621-64-7
Second Quarter 2010	U	U	U	U	10	-		8270C
N-Nitrosomethylethylami	ine					C	CAS#	10595-95-6
Second Quarter 2010	U	U	U	U	10	-		8270C

Target Analyte Monitoring Results - HWMU-7 Point of Compliance Wells Radford Army Ammunition Plant, Radford, Virginia Upgradient well = 7W12B

All Results in ug/L.

Analtye/Quarter	7W12B Q	7MW6 Q	7WCA Q	7W11B Q	QL	GPS	Background	Method
N-Nitrosomorpholine						(CAS#	59-89-2
Second Quarter 2010	U	U	U	U	10	-		82700
N-Nitrosopiperidine						(CAS#	100-75-4
Second Quarter 2010	U	U	U	U	10	-		8270
N-Nitrosopyrrolidine						(CAS#	930-55-2
Second Quarter 2010	U	U	U	U	10	-		8270
5-Nitroso-o-toluidine						(CAS#	99-55-8
Second Quarter 2010	U	U	U	U	10	-		8270
Parathion						(CAS#	56-38-2
Second Quarter 2010	U	U	U	U	10	-		8270
Pentachlorobenzene							CAS#	608-93-5
Second Quarter 2010	U	U	U	U	10	-		8270
Pentachloroethane							CAS#	76-01-7
Second Quarter 2010	U	U	U	U	10	-		8260
Pentachloronitrobenzen	е	1		1			CAS#	82-68-8
Second Quarter 2010	U	U	U	U	10	_		8270
Pentachlorophenol				1	-		CAS#	87-86-5
Second Quarter 2010	U	U	U	U	10	_		8270
Phenacetin							CAS#	62-44-2
Second Quarter 2010	U	U	U	U	10	_		8270
Phenanthrene							CAS#	85-01-8
Second Quarter 2010	U	U	U	U	10	_		8270
Phenol			_				CAS#	108-95-2
Second Quarter 2010	U	U	U	U	10	_		8270
Phorate			_				CAS#	298-02-2
Second Quarter 2010	U	U	U	U	10			8270
2-Picoline	, i		ŭ		10		CAS#	109-06-8
Second Quarter 2010	U	U	U	U	10	<u> </u>		8270
Pronamide	Ŭ	Ü	ŭ	Ŭ	10		CAS#	23950-58-5
Second Quarter 2010	U	U	U	U	10		CAS #	8270
1-Propanol	Ŭ	Ü	ŭ	Ŭ	10		CAS#	71-23-8
Second Quarter 2010	UJ	U J	U J	UJ	100	<u> </u>	CAS #	8260
	- 0		5 0	0 0	100		CAS#	67-63-0
2-Propanol Second Quarter 2010	U	U	U	U	100	<u> </u>	U110 #	8260
Propionitrile	J	J	J		100		CAS#	107-12-0
Second Quarter 2010	U	U	U	U	100		υ πιο π	8260
	U	J	J	3	100		CAS#	103-65-1
n-Propylbenzene Second Quarter 2010	U	U	U	U	4	-	υ π ι #	8260
	U	U	U	U	1		CAC#	
Pyrene Second Quarter 2010	U	U	U	U		1	CAS#	129-00-0
	U	U	U	U	10	-	CA C #	8270 110-86-1
Pyridine	1	l	I	I		1	CAS#	T.
Second Quarter 2010	UJ	U J	U J	U J	10	-	0.4.0.#	8270
Safrole	1 11	1	1	I		1	CAS#	94-59-7
Second Quarter 2010	U	U	U	U	10	-	0.10.11	8270
Silvex	1	1	I	T			CAS#	93-72-1
Second Quarter 2010	U	U	U	U	2.5	-		8151.

Target Analyte Monitoring Results - HWMU-7 Point of Compliance Wells Radford Army Ammunition Plant, Radford, Virginia Upgradient well = 7W12B

All Results in ug/L.

Analtye/Quarter	7W12B Q	7MW6 Q	7WCA Q	7W11B Q	QL	GPS	Background	Method
Styrene						(CAS#	100-42-5
Second Quarter 2010	UJ	U J	U J	U J	1	-		8260B
Sulfotep						(CAS#	3689-24-5
Second Quarter 2010	UJ	U J	U J	U J	5	-		8270C
2,4,5-Trichlorophenoxyac	etic acid					(CAS#	93-76-5
Second Quarter 2010	U	U	U	U	2.5	-		8151A
1,2,4,5-Tetrachlorobenzer	ne					(CAS#	95-94-3
Second Quarter 2010	U	U	U	U	10	-		8270C
1,1,1,2-Tetrachloroethane)					(CAS#	630-20-6
Second Quarter 2010	U	U	U	U	1	-		8260B
1,1,2,2-Tetrachloroethane)					(CAS#	79-34-5
Second Quarter 2010	U	U	U	U	1	-		8260B
Tetrachloroethene						(CAS#	127-18-4
Second Quarter 2010	U	U	U	U	1	-		8260B
Tetrahydrofuran		1		1		(CAS#	109-99-9
Second Quarter 2010	U	U	U	U	25	-		8260B
2,3,4,6-Tetrachloropheno							CAS#	58-90-2
Second Quarter 2010	U	U	U	U	10	-		8270C
Toluene							CAS#	108-88-3
Second Quarter 2010	U	U	U	U	1	_		8260B
o-Toluidine							CAS#	95-53-4
Second Quarter 2010	U	U	U	U	10	_	1	8270C
Toxaphene					.0		CAS#	8001-35-2
Second Quarter 2010	U	U	U	U	2.5			8081A
1,2,3-Trichlorobenzene							CAS#	87-61-6
Second Quarter 2010	U	U	U	U	1	_		8260B
1,2,4-Trichlorobenzene							CAS#	120-82-1
Second Quarter 2010	U	U	U	U	1			8260B
1,1,1-Trichloroethane					•		CAS#	71-55-6
Second Quarter 2010	U	U	U	U	1			8260B
1,1,2-Trichloroethane			_		•		CAS#	79-00-5
Second Quarter 2010	U	U	U	U	1		1	8260B
Trichloroethene			_				CAS#	79-01-6
Second Quarter 2010	U	U	U	U	1	<u> </u>	1	8260B
Trichlorofluoromethane			ŭ		'		CAS#	75-69-4
Second Quarter 2010	U	U	U	U	1		115 "	8260B
2,4,5-Trichlorophenol	Ŭ		ŭ	Ŭ	'		CAS#	95-95-4
Second Quarter 2010	U	U	U	U	10	_		8270C
	Ŭ		J		10		CAS#	88-06-2
2,4,6-Trichlorophenol Second Quarter 2010	U	U	U	U	10		π	8270C
					10		CAS#	96-18-4
1,2,3-Trichloropropane Second Quarter 2010	U	U	U	U	4		.A3#	8260B
			U	U	1		CAS#	76-13-1
1,1,2-Trichloro-1,2,2-Triflu Second Quarter 2010	Joroetnane	9 U	U	U		1	A3#	1
		U	U	U	1	-	746#	8260B 126-68-1
O,O,O-Triethyl phosphoro		l II		1 11	40		CAS#	1
Second Quarter 2010	U	U	U	U	10	-		8270C

Target Analyte Monitoring Results - HWMU-7 Point of Compliance Wells Radford Army Ammunition Plant, Radford, Virginia Upgradient well = 7W12B

All Results in ug/L.

Analtye/Quarter	7W12B Q	7MW6 Q	7WCA Q	7W11B Q	QL	GPS	Background	Method
1,2,4-Trimethylbenzene						(CAS#	95-63-6
Second Quarter 2010	U	U	U	U	1	-		8260B
1,3,5-Trimethylbenzene	1	"	l .	"		(CAS#	108-67-8
Second Quarter 2010	U	U	U	U	1	-		8260B
sym-Trinitrobenzene						(CAS#	99-35-4
Second Quarter 2010	UJ	U J	U J	U J	10	-		8270C
Vinyl acetate	1	"	l .	"		(CAS#	108-05-4
Second Quarter 2010	U	U	U	U	10	-		8260B
Vinyl chloride	1	"	l	"		(CAS#	75-01-4
Second Quarter 2010	U	U	U	U	1	-		8260B
Xylenes (Total)			I .		1	(CAS#	1330-20-7
Second Quarter 2010	U	U	U	U	3	-		8260B

Target Analyte Monitoring Results - HWMU-7 Point of Compliance Wells Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 7W12B

All Results in ug/L.

1 7 10					~ ~			
Analtye/Quarter	7W12R ()	7MW6 ()	7W('A ()	7WIIR O	OI.	GPS	Background	Method
Tirunye, Quarter	, ,,,,,,,,,	7111110 2	7 11 021 2	/ // IID 2	22	OI D	Duckground	michiou

Definitions:

The following definitions apply to results reported for Appendix IX monitoring events.

All Appendix IX monitoring results for compliance wells are reported to the detection limit.

QL Denotes permit required quantitation limit.

U denotes not detected at or above the detection limit.

UA denotes not detected at or above the adjusted detection limit.

J Denotes result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above the detection limit and detection limit and QL are estimated. When used with "UA"

(i.e., "UAJ"), denotes analyte not detected at or above adjusted detection limit and adjusted detection limit and QL are estimated.

UN Denotes analyte concentration is less than the quantitation limit and/or five times the blank concentration. Not reliably detected due to blank contamination. This qualifier used only for Appendix IX monitoring event when compliance well results are reported to at or above the project detection limit.

R Denotes result rejected.

Q Denotes data validation qualifier.

Background Denotes background concentrations listed in the pending Class 3 Permit Modification for the Post-Closure Care Permit for HWMUs 5, 7, 10 and 16.

CAS# Denotes Chemical Abstract Services registration number.

GPS Denotes groundwater protection standard.

The following definitions apply to results reported for non-Appendix IX monitoring events. All non-Appendix IX monitoring results for compliance wells are reported to at or above the quantitation limit.

QL Denotes permit required quantitation limit.

U Denotes analyte not detected at or above QL.

UA Denotes analyte not detected at or above adjusted sample QL.

J Denotes result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above QL and QL is estimated. When used with "UA" (i.e., "UAJ"), denotes analyte not detected at or above adjusted QL and adjusted QL is estimated.

R Denotes result rejected.

O Denotes data validation qualifier.

Background Denotes background concentrations listed in the pending Class 3 Permit Modification for the Post-Closure Care Permit for HWMUs 5, 7, 10 and 16.

CAS# Denotes Chemical Abstract Services registration number.

GPS Denotes groundwater protection standard.

Appendix IX Groundwater Monitoring Events:

Third Quarter 2003, Second Quarter 2004, Second Quarter 2005, Third Quarter 2006, Second Quarter 2007,

Second Quarter 2008, Second Quarter 2009, Second Quarter 2010

All Appendix IX results evaluated and reported to detection limit.

-9/29/2003: Verification sampling event for 7MW6, 7W11B, 7W12B, 7WCA (copper and zinc).

Verification results reported in this table for copper and zinc.

-6/21-22/2004: Verification sampling event for 7MW6, 7W11B, 7W12B, 7WCA.

Verification results reported in this table for chloroform (7W12B).

-3/23/2005: Verification sampling event for 7MW6. Verification results reported in this table for bis(2-ethylhexyl)phthalate).

-7/26/2005: Verification sampling event for 7MW6, 7W11B, 7W12B, 7WCA (ethyl acetate), 7W11B (beta-BHC), and 7MW6 (alpha-BHC). All Verification results reported as not detected. Verification results reported.
-Sept 2006: Verification sampling event for 7W12B and 7W11B 3Q2006 for chloroform. Initial results reported in this table for chloroform (7W11B,

-July 17, 2008: Verification sampling event for 7W13 arsenic and cobalt. 7W9C cobalt

-June 11, 2009, Verification sampling event for 7MW6 Diethyl ether. Analyte not detected. Verification results reported.

Comprehensive Data Validation Report



Sample/Blind Field Duplicate Results Greater Than the Quantitation Limit

Facility: HWMU-7 Monitoring Event: Second Quarter 2010

	L	aboratory. Result	Validated Result	QL	
Analyte	Sample ID	(ug/L) Q	(ug/L) Q	(ug/L)	Validation Notes
Method: 6020					
Laboratory: CompuCh	em, a Division o		enter en natural de la contraction de la contrac		
Barium	7WCA	25.5	25.5	10	No action taken. Sample duplicate for 7WDUP. RPD <20.
	7WDUP	24.6	24.6	10	No action taken. Blind field duplicate for 7WCA. RPD <20.
Nickel	7WCA	11.8	11.8	10	No action taken. Sample duplicate for 7WDUP. RPD <20.
	7WDUP	11.3	11.3	10	No action taken. Blind field duplicate for 7WCA. RPD <20.

Definitions: QL Denotes permit quantitation limit. Q Denotes data qualifier. J Denotes analyte reported at or above QL limit and associated result is estimated.

Comprehensive Data Validation Report



Sample/Blind Field Duplicate Results Greater Than the Quantitation Limit

Facility: HWMU-7 Monitoring Event: Fourth Quarter 2010

	L	aboratory Result	Validated Result	QL	
Analyte	Sample ID	(ug/L) Q	(ug/L) Q	(ug/L)	Validation Notes
Method: 6020					
Laboratory: CompuChe	em, a Division of			in the second	
Barium	7WCA	22	22	10	No action taken. Field duplicate result was 22.7 ug/l. RPD <10.
	7WDUP	22.7	22.7	10	No action taken. Field duplicate of 7WCA. RPD <10.
Nickel	7WCA	14.4	14.4	10	No action taken. Field duplicate result was 14.7 ug/l. RPD <10.
	7WDUP	14.7	14.7	10	No action taken. Field duplicate of 7WCA. RPD <10.

Definitions: QL Denotes permit quantitation limit. Q Denotes data qualifier. J Denotes analyte reported at or above QL limit and associated result is estimated.

APPENDIX B-3

HWMU-7 2010 LABORATORY ANALYTICAL RESULTS PLUME MONITORING WELLS

Target Analyte Monitoring Results At or Above Permit Quantitation Limit HWMU 7 Plume Monitoring Wells

Radford Army Ammunition Plant, Radford, Virginia

All Results in ug/L.

 $Upgradient \ well = 7W12B$

Analyte/Quarter	7W12B Q	7W9C Q	7W10B Q	7W10C Q	7W13 Q	QL	Background	GPS	Method	CAS#
Antimony							•		,	
Second Quarter 2010	U	U	U	U	U	1	1	6	6020	7440-36-
Fourth Quarter 2010	U	U	U	U	U	1	1	6	6020	7440-36-
Arsenic										
Second Quarter 2010	U	U	U	U	U	10	10	10	6020	7440-38-
Fourth Quarter 2010	U	U	U	U	U	10	10	10	6020	7440-38-
Barium	0	O .	O		U	10	10	10	0020	7440-30
	31	18.9	67.4	44.5	11.7	10	41	2000	6020	7440-39-
Second Quarter 2010	31.2	20.6	71.7	46.9	20.1	10	41	2000	6020	7440-39-
Fourth Quarter 2010	31.2	20.0	71.7	40.9	20.1	10	41	2000	6020	7440-39-
Cadmium	1					Ι .				7440 40
Second Quarter 2010	U	U	U	U	U	1	1	5	6020	7440-43-
Fourth Quarter 2010	U	U	U	U	U	1	1	5	6020	7440-43-
Chromium	1		1		1	1			1	
Second Quarter 2010	4.5 J	U	U	U	U	5	9.9	100	6020	7440-47-
Fourth Quarter 2010	7.2	U	U	U	U	5	9.9	100	6020	7440-47-
Cobalt										
Second Quarter 2010	U	U	U	U	11.2	5	5	156.65	6020	7440-48-
Fourth Quarter 2010	U	U	U	U	16.4	5	5	156.65	6020	7440-48-
Copper	1					1	1		1	
Second Quarter 2010	1.4 J	U	U	U	U	5	5	1300	6020	7440-50-
Fourth Quarter 2010	U	U	U	U	U	5	5	1300	6020	7440-50-
Lead										
Second Quarter 2010	U	U	U	U	U	1	1	15	6020	7439-92-
Fourth Quarter 2010	U	U	U	U	U	1	1	15	6020	7439-92-
Mercury										
Second Quarter 2010	U	U	U	U	U	2	2	2	7470A	7439-97-
Fourth Quarter 2010	U	U	U	U	U	2	2	2	7470A	7439-97-
	_		_		_		_			
Nickel	U	U	U	U	U	10	10	313	6020	7440-02-
Second Quarter 2010	U	U	U	U	U	10	10	313	6020	7440-02-
Fourth Quarter 2010	U	U	U	U	U	10	10	313	6020	7440-02-
Selenium	1					1 40	40			7700 40
Second Quarter 2010	U	U	U	U	U	10	10	50	6020	7782-49-
Fourth Quarter 2010	U	U	U	U	U	10	10	50	6020	7782-49-
Silver	1		1		ı	T	1		1	
Second Quarter 2010	U	U	U	U	U	2	2	78.25	6020	7440-22-
Fourth Quarter 2010	U	U	U	U	U	2	2	78.25	6020	7440-22-
Thallium										
Second Quarter 2010	U	U	U	U	U	1	1	2	6020	7440-28-
Fourth Quarter 2010	U	U	U	U	U	1	1	2	6020	7440-28-
Zinc										
Second Quarter 2010	4.7 J	U	U	U	U	10	10.9	4695	6020	7440-66-
Fourth Quarter 2010	U	U	U	U	U	10	10.9	4695	6020	7440-66-
Cyanide										
Second Quarter 2010	U	U	U	U	U	20	20	200	9012A	57-12-5
Fourth Quarter 2010	U	U	U	U	U	20	20	200	9012A	57-12-5
bis(2-Ethylhexyl)ph	thalate									
Second Quarter 2010	U	U	U	U	U	5	6	6	8270C	117-81-7
Fourth Quarter 2010	U	U	U	U	U	6	6	6	8270C	117-81-7
		J	J	<u> </u>	3	J	U		02700	. 17-01-7
Butyl benzyl phthal	1	- 11	11	11	11	40	10	0400	00700	05.00.7
Second Quarter 2010	U	U	U	U	U	10	10	3130	8270C	85-68-7
Fourth Quarter 2010	U	U	U	U	U	10	10	3130	8270C	85-68-7

Target Analyte Monitoring Results At or Above Permit Quantitation Limit HWMU 7 Plume Monitoring Wells

Radford Army Ammunition Plant, Radford, Virginia

All Results in ug/L.

 $Upgradient \ well = 7W12B$

Analyte/Quarter	7W12B Q	7W9C Q	7W10B Q	7W10C Q	7W13 Q	QL	Background	GPS	Method	CAS#
2,4-Dinitrophenol										
Second Quarter 2010	UJ	U	U	U	U	10	10	31.3	8270C	51-28-5
Fourth Quarter 2010	UJ	UJ	UJ	UJ	UJ	10	10	31.3	8270C	51-28-5
2,4-Dinitrotoluene										
Second Quarter 2010	U	U	U	U	U	10	10	31.3	8270C	121-14-2
Fourth Quarter 2010	U	U	U	U	U	10	10	31.3	8270C	121-14-2
2,6-Dinitrotoluene										
Second Quarter 2010	U	U	U	U	U	10	10	15.65	8270C	606-20-2
Fourth Quarter 2010	U	U	U	U	U	10	10	15.65	8270C	606-20-2
p-Nitrophenol										
Second Quarter 2010	U	U	U	U	U	10	20	50	8270C	100-02-7
Fourth Quarter 2010	UJ	UJ	υJ	UJ	UJ	10	20	50	8270C	100-02-7

Definitions:

All plume monitoring well results reported to at or above the permit quantitation limit except for the upgradient well during the Appendix IX monitoring Event. During the Appendix IX monitoring event, results for the upgradient well are reported to the

- Q Denotes data validation qualifier.
- QL Denotes permit required quantitation limit.
- U Denotes analyte not detected at or above QL.
- UA Denotes analyte not detected at or above adjusted sample QL.
- J Denotes result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above QL and QL is estimated. When used with "UA" (i.e., "UAJ"), denotes analyte not detected at or above adjusted QL and adjusted QL is estimated.
- UN Denotes analyte concentration is less than the quantiation limit and five times the blank concentration.

 Not reliably detected due to blank contamination. This qualifier used only for Appendix IX monitoring event when compliance well results are reported to at or above the project detection limit.
- R Denotes result rejected.

Background Denotes background concentrations listed in the pending Class 3 Permit Modification for the Post-Closure Care Permit for HWMUs 5, 7, 10 and 16.

CAS# Denotes Chemical Abstract Services registration number. GPS Denotes groundwater protection standard. Notes:

-January 2005: Verification sampling event for 7MW13 4Q2004 arsenic. Verification results reported in this table for arsenic (7W13).

-March 2006: Verification sampling event for 7MW13 1Q2006 arsenic. Verification results reported in this table for arsenic (7W13).

-July 2006: Verification sampling event for 7MW13 2Q2006 arsenic. Verification results reported in this table for arsenic (7W13).

-Sept 2006: Verification sampling event for 7W12B 3Q2006 chloroform. Initial results reported in this table for chloroform (7W12B).

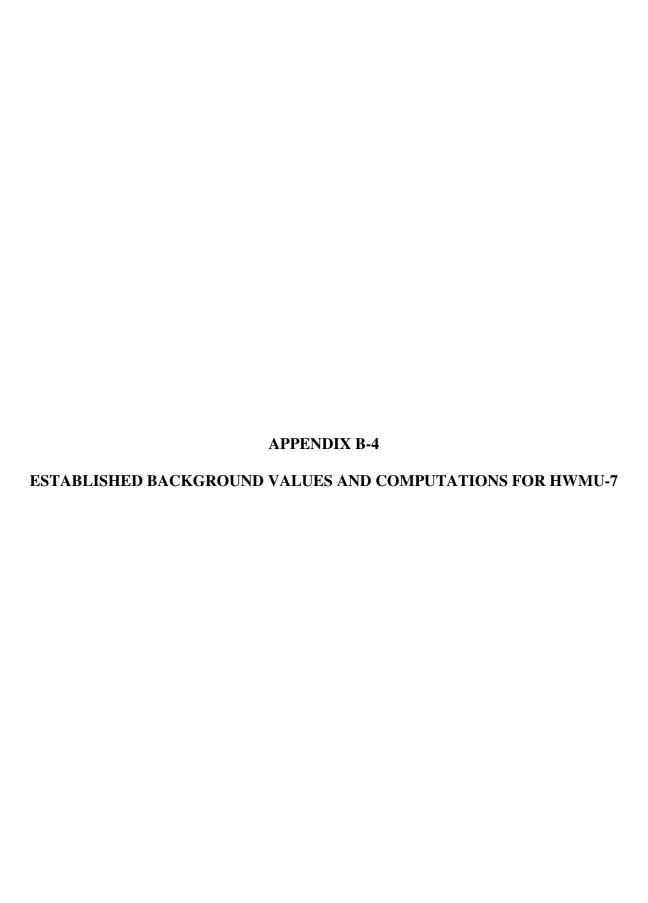
July 17, 2007: Verification sampling event for 7W13 arsenic-verification event result reported, highest of four quadruplicate results, 7W13 cobalt-original result reported. 7W9C cobalt- Verification result reported.

-Dec 17, 2008: Verification sampling event for 7W13 . cobalt-Original result reported.

-June 28, 2010 - Verification sampling event for 7W13. cobalt-Original result reported.

Also, verification sampling event for 7W13. cobalt-verification result reported.

 $Dec\ 16, 2010-\ Verification\ sampling\ event\ for\ 7W13\ .\ arsenic-\ Verification\ result\ reported.$



April 1995 letter from the DEQ to J. Redder, Hercules, Inc. (now Alliant TechSystems, Inc.). The lists incorporate requirements outlined in the Virginia Hazardous Waste Management Regulations (VR 672-10-1) Sections 9.5.C and 9.5.D. These include the Indicator Parameters, Ground Water Quality Parameters, EPA Interim Primary Drinking Water Standards, Known Hazardous Waste Constituents, and Detected VHWMR Appendix 10.6 Constituents. A demonstration was made to the DEQ that several hazardous waste constituents had not been detected for six consecutive quarters. As a result, these constituents have not been analyzed for on a regular basis. These are highlighted in the **Table 3-1**.

Additional parameters have not been detected in any of the wells. During the meeting between Alliant and DEQ on 21 May 1996, DEQ suggested that the recommendations to temporarily cease sampling additional constituents that had not been detected in six or more consecutive sampling events made in the GWQAP addendum submitted 3 November 1995 would better be addressed in the post closure permitting process. Therefore, those additional constituents will not be addressed in this report.

3.4 UNIT 7 GROUND WATER BACKGROUND VALUES

As requested in the DEQ's 23 July letter, background values were calculated for each parameter .

As discussed with DEQ, Alliant believes the analytical data to be questionable in some cases. DEQ has agreed in a 9 April 1996 letter to C. Jake (Alliant) that only total metals will be measured, as described in an EPA Region III guidance on ground water sampling in karst terrain. Another case of questionable data involves an increase in Total Organic Carbon (TOC) concentrations by a factor of 10. As such, the TOC concentrations from 1995 through 1997 were used to calculate the background values. Table 3-2 presents the *Historical Maximum Values*, which were used to develop the isocontour maps.

As requested in the DEQ's 23 July 1998 letter, using the data from well 7W12B, background values were calculated for each parameter in the ground water monitoring program. However, as a result of the 21 May 1996 meeting and subsequent telephone conversations, these background values are being submitted in accordance with the regulations and shown on the isocontour maps but were not utilized for purposes of this report.

Additionally, calculations of background values based on the 95% confidence, 95% coverage upper tolerance limit require that data distributions be normal or lognormal. Some of the data do not fulfill this requirement

3.5 UNIT 7 STATISTICAL ANALYSIS

Statistical evaluations for Unit 7 are performed annually and submitted as part of the Annual Reporting requirements found in the VHWMR Section 9.5. As a result of the 21 May 1996 meeting between Alliant and DEQ, Alliant has established background ground water concentrations for the upgradient well, 7W12B utilizing the Virginia DEQ "Guidance on Statistical Methods for Ground Water Data Analysis at a Solid Waste or Hazardous Waste Site, Version 2.0, 1995". In response to Mr. Glenn von Gonten's letter dated 23 July, 1998, Alliant has revised the background concentrations to include sample data collected in 1997. These values can be found in Table 3-3. Methods used for background concentration computation and statsistical analysis are described below.

The following parameters were 100% Non-Detected in 20 or more sampling events. The downgradient well data points were compared to the laboratory PQLs in a nonparametric statistical manner or to the applicable MCL or VGWPS (if one exists). Background values were then estimated by using the laboratory PQL for that constituent.

11

Parameter	PQL (ppb)	Sample Size	% Non- Detect	MCL or VGWPS (ppb)
2,4-DNT	0.2	22	100	None
2,6-DNT	0.1	22	100	None
2,4 Dinitrophenol	11	11	100	None
Benzyl Alcohol	8	8	100	None
Cyanide	20	20	100	5
Bis(2- ethyl hexyl) phthalate	9	9	100	None
2 - Nitrophenol	9	9	100	None
4 - Nitrophenol	9	9	100	None
Acetone	100	14	100	None
Antimony	30	14	100	None
Vanadium-	40	20	100	None

The following parameter has log-normally distributed data with between 15 and 50 percent Non-Detect values. As such, Cohen's Method was used as an adjustment for the mean and standard deviation, as recommended in the DEQ guidance. Results of the background analysis are summarized in Table 3-4

Parameter	Sample	% Non-
·	Size	Detect
Lead	23	34

The following parameters have data with greater than 50% Non-Detects, a minimum sample size of twenty (20). The data were non-normally distributed as indicated using a data distribution statistical method. According to Mr. Glenn von Gonten, DEQ in a 30 July 1996 telephone conversation, the maximum value detected will be used for plume delineation purposes for those constituents with greater than 50% non-detected values. An isocontour map for Total Organic Halides could not

be created because only one sampling point maximum concentration exceeded the background value.

Parameter	Sample Size	% Non- Detect
Arsenic	23	91.3
Cadmium	23	60.9
Chromium	23	56.5
Cobalt	20	65.5
Mercury	23	82.6
Nickel	20	85
Selenium	23	82.6
Thallium	20	70
Total Organic Halides	48	62.5

The following parameters do not have greater than four (4) sampling events and therefore could not be included in this (plume) evaluation:

- 2,4-D
- Gross Beta
- Radium
- Sulfate

The following parameters have between 15 and 50 percent Non-Detect values, and do not have normal or log-normal data distributions. Thus, Cohen's Method could not be used. Per the DEQ's 23 July letter, background concentrations were computed by calculating an upper tolerance limit based on 95% coverage, at a 95% confidence level. It should be noted that upper tolerance limits are not typically used unless the data are normally or log-normally distributed. Background concentration analysis data is summarized in Table 3-4.

ParameterSample Size% Non-DetectsTotal Organic Carbon36.27.2%Silver2347.8%

The remaining parameters have less than 15% Non-Detect values and no data manipulation was required. Computation data for barium, copper, specific conductivity, and zinc are summarized in Table 3-4

Parameter	Sample Size	% Non- Detect
Copper	20	0
PH	92	0
Barium	23	13
Specific Conductivity	92	0
Zinc	20	0

Table 3-3 Unit 7 Background Values

	·	
Parameter	Units	Background Value
2,4-DNT	Ppb	0.2
2,6-DNT	Ppb	0.1
Acetone	Ppb	100
Antimony	Ppb	30
Arsenic	Ppb	2.0
Barium	Ppb	64
Cadmium	Ppb	0.4
Chromium	Ppb	34
Cobalt	Ppb	17
Copper	Ppb	49
Cyanide	Ppb	5
Lead	Ppb	14
Mercury	Ppb	0.350
Nickel	Ppb	63
PH	SU	7
Selenium	Ppb	20
Silver	Ppb	2.13
Specific Conductivity	Umhos/sec	1,025
Thallium	Ppb	4
Total Organic Halides	ppb	21
Total Organic Carbon	Ppb	3930
Vanadium	Ppb	40
Zinc	Ppb	217

STATISTICAL SUMMARY OF BACKGROUND WATER QUALITY DATA

Date	Barium	Copper	Silver	Zinc	Lead	TOC	
3/31/92	1.00		0.10		0.50	100	SpCor
6/30/92	1.00		0.10		0.50		730.00
9/30/92	1.00		0.10		0.50		706.00
12/31/92	35.00	50.00	0.30	253.00	19.00		370.00
3/31/93	27.00	16.00	0.40	17.00	0.50		798.00
6/30/93	31.00	10.00	0.10	126.00	0.50		722.00
9/30/93	38.00	6.00	0.30	81.00	4.00		715.00
12/31/93	40.00	7.00	0.10	144.00	0.50		895.00
3/31/94	27.00	10.00	0.30	29.00	2.00		918.00
6/30/94	35.00	3.00	0.70	26.00	5.00		723.00
9/30/94	59.00	2.00	0.50	26.00	12.00		750.00
12/31/94	44.00	2.00	3.10	55.00	3.00		891.00
3/30/95	40.00	10.00	0.10	10.20	1.00		880.00
6/29/95	36.00	9.30	0.10	20.00	1.40	žs.	822.00
9/30/95	30.00	2.00	0.10	11.00	0.50	4050 80	740.00
12/31/95	37.00	10.00	1.90	49.00	6.00	1250.00	610.00
3/31/96	31.00	8.00	0.10	55.00	2.00	875.00	840.00
6/30/96	26.00	3.00	0.10	1.00	0.50	500.00	652.00
9/30/96	35.00	14.00	0.10	24.00	4.00	2000.00	608.00
12/31/96	32.00	3.00	0.30	113.00	6.00	500.00	758.00
3/31/97	40.00	16.00	0.40	105.00	6.00	2000.00	768.00
6/30/97	32.00	55.00	0.30	135.00	3.00	1000.00	750.00
9/30/97	43.00	29.00	1.20	45.00	3.00	3000.00 500.00	720.00 850.00
Number of Samples	23.00	20.00	00.00				
Mean	31.35	20.00	23.00	20.00	23.00	9.00	23.00
Standard Deviation	13.91	13.27	0.47	66.26	3.54	1291.67	748.52
Shapiro-Wilk W	0.84	14.92	0.71	63.06	4.38	870.52	119.05
Normal Distribution	No.	0.70	0.57	0.84	0.70	0.87	0.89
K	2.33	No	No	No	No	Yes	Yes
· UTL	2.33 63.74	2.40	2.33	2.40	2.33	3.03	2.33
٠.٠	03.74	49.01	2.13	217.35	13.74	3930.23	1025.79

Notes:

K = Tolerance factor for one-sided normal tolerance interval with probability level of 95% and 95% coverage.

ULT = Upper Tolerance Limit.

Appendix IX Constituents Detected Since Permit Issuance HWMUs 5, 7, 10, and 16 Radford Army Ammunition Plant

Unit	Quarter Initially Detected	Constituent	Background Calculated or QL?	Background (ug/L)	GPS Required? (261 Appendix VIII)	Proposed GPS (ug/L)	Source
		Chromium	QL	5	yes	100	USEPA MCL
		Diethyl Ether	QL	12	no	NA	NA
HMWU-5	Fourth Quarter 2003	2-Nitroaniline	QL	20	no	NA	NA
HIVIVV U-3		4-Nitroaniline	QL	20	yes	20	Background/QL
		Nitrobenzene	QL	10	yes	10	Background/QL
	Third Quarter 2006	Dichlorodifluoromethane	QL	1	yes	125.2	VDEQ ACL
HWMU-7	Third Quarter 2003	Copper	Calculated	49	no	NA	NA
HVVIVIU-7	Second Quarter 2004	Zinc	Calculated	217	no	NA	NA
	First Quarter 2003	Cobalt	QL	5	no	NA	NA
HWMU-10	Second Quarter 2003	Vanadium	QL	10	no	NA	NA
	Second Quarter 2005	Acetone	QL	10	no	NA	NA
	Second Quarter 2005	2-Propanol	QL	50	no	NA	NA
		Chloroethane	Calculated	20.7	yes	20.7	Background/QL
	Second Quarter 2003	Diethyl Ether	Calculated	75.5	no	NA	NA
HWMU-16		Dimethyl Ether	Calculated	17.0	no	NA	NA
	Third Quarter 2003	Methylene Chloride	Calculated	13.95	no*	NA	NA
	Second Quarter 2004	1,1,2-Trichloro-1,2,2-trifluoroethane	Calculated	1.2	no*	NA	NA

- HWMU-5: The additional Appendix IX constituents detected in the downgradient point of compliance wells were not detected above their respective Quantitation Limits (QLs) in the upgradient well. As a result, background concentrations for those constituents were set as equal to their respective QLs. In accordance with the Permit (Condition V.J.1.g.), GPS are proposed for those additional Appendix IX constituents that are listed in Appendix VIII of 40 CFR Part 261 (chromium, 4-nitroaniline, nitrobenzene, and dichlorodifluoromethane). No GPS are proposed for the additional Appendix IX constituents that are not listed in Appendix VIII of 40 CFR Part 261 (diethyl ether and 2-nitroaniline).
- HWMU-7: Background concentrations for the additional Appendix IX constituents detected in the downgradient point of compliance wells (copper and zinc) were previously calculated and submitted to the VDEQ in the August 1998 *Groundwater Quality Assessment Report for HWMU-7* prepared by ERM, Inc. In accordance with the Permit (Condition V.J.2.g.), no GPS are proposed for the additional Appendix IX constituents (copper and zinc), as they are not listed in Appendix VIII of 40 CFR Part 261.
- HWMU-10: The additional Appendix IX constituents detected in the downgradient point of compliance wells were not detected above their respective Quantitation Limits (QLs) in the upgradient well. As a result, background concentrations for those constituents were set as equal to their respective QLs. In accordance with the Permit (Condition V.J.3.g.), no GPS are proposed for the additional Appendix IX constituents (cobalt, vanadium, acetone, and 2-propanol), as they are not listed in Appendix VIII of 40 CFR Part 261.
- HWMU-16: Background concentrations for additional Appendix IX constituents chloroethane, diethyl ether, dimethyl ether, and methylene chloride were calculated using data collected from upgradient well 16C1 during the period from Third Quarter 2003 through Third Quarter 2004. The background concentration for additional Appendix IX constituent 1,1,2-trichloro-1,2,2-trifluoroethane was calculated using data collected from upgradient well 16C1 during the period from Second Quarter 2004 through Third Quarter 2006. In accordance with the Permit (Condition V.J.4.g.), GPS are proposed for additional Appendix IX constituents that are listed in Appendix VIII of 40 CFR Part 261 (chloroethane). No GPS are proposed for the additional Appendix IX constituents that are not listed in Appendix VIII of 40 CFR Part 261 (diethyl ether and dimethyl ether).

 *Methylene chloride and 1,1,2-trichloro-1,2,2-trifluoroethane should not be added to the Groundwater Monitoring List for HWMU-16, as these constituents were only detected in the upgradient well for the Unit, and not in the downgradient point of compliance wells.

CONSTITUENT BACKGROUND VALUES FOR THE COMPLIANCE GROUNDWATER MONITORING PROGRAM

HWMU-7 RADFORD ARMY AMMUNITION PLANT RADFORD, VIRGINIA

Prepared for:

Alliant Techsystems Inc.
Radford Army Ammunition Plant
Route 114
Radford, Virginia 24141-0100

Prepared by:

Draper Aden Associates 2206 South Main Street Blacksburg, Virginia 24060 (540) 552-0444

February 2008 DAA Job No. B03204-122

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RADFORD ARMY AMMUNITION PLANT – HWMU-7 CALCULATION OF CONSTITUENT BACKGROUND VALUES

Draper Aden Associates recalculated background values for the plume monitoring well constituents of the groundwater monitoring program for Hazardous Waste Management Unit No. 7 (HWMU-7) located at the Radford Army Ammunition Plant (Radford AAP) in Radford, Virginia. Background values were calculated for all plume monitoring well constituents.

The background values for HWMU-7 plume monitoring well constituents were calculated using the analytical data for upgradient well 7W12B using data from Second Quarter 2003 through Second Quarter 2007 (available most recent data with one exception-cyanide includes 4th Quarter 2007 data). Inter-well upper prediction limits (UPL) were calculated on the background data for the target parameters in accordance with the facility permit and VHWMR (40 CFR 264.97(h)). Where applicable, the background value calculations were based on site-wide 95% confidence, 95% coverage upper prediction intervals. The calculated background values for all target constituents are listed on **Table 1**.

Background Data and Background Value Calculations

The constituents listed below were 100% non-detected (<LOQ) in the background well. The background values for these constituents were established as equal to their quantitation limits (QL).

Background Value = Quantitation Limit (QL)						
Constituent	Sample Size	% Non-Detects	QL (µg/l)	Background Value (µg/l)		
Antimony	17	100	1	1		
Arsenic	17	100	10	10		
Cadmium	17	100	1	1		
Cobalt	17	100	5	5		
Copper	16	100	5	5		
Lead	17	100	1	1		
Mercury	17	100	2	2		
Nickel	17	100	10	10		
Selenium	17	100	10	10		
Silver	17	100	2	2		
Thallium	17	100	1	1		
Cyanide	18	100	20	20		
Bis(2-ethylhexyl)phthalate	17	100	6	6		
Butyl benzyl phthalate	17	100	10	10		
2,4-Dinitrophenol	17	100	10	10		
2,4-Dinitrotoluene	17	100	10	10		
2,6-Dinitrotoluene	17	100	10	10		
p-Nitrophenol	17	100	10	10		

Non-parametric prediction intervals were computed for the constituents for which the data from upgradient well 7W-12B satisfied one of the following two criteria, per VDEQ regulations and guidance as well as USEPA guidance:

- Percentage of non-detects was greater than or equal to 50 and less than 100; or
- Percentage of non-detects was less than 50, but data was not normally distributed in original or log-transformed mode.

Only one result for zinc was reported above its LOQ. The reported result (10.9 μ g/l) is the NUPL for zinc. The non-parametric prediction limit computation for chromium is presented in **Appendix A**.

Background Value = UPL of Non-parametric Prediction Interval (NUPL)					
			QL	NUPL	Background Value
Parameter	Sample Size	% Non-Detects	(µg/l)	(µg/l)	(μg/l)
Chromium	17	12	5	9.9	9.9
Zinc	14	93	10	10.9	10.9

The following constituent (barium) exhibited normally distributed background data with less than 0% non-detects. One sided parametric prediction interval was computed on the background data for barium. The background value for barium was set as equal to its UPL. The background concentration calculations were based on a site wide 95% confidence, 95% coverage upper prediction intervals. The background and relevant statistical data for barium is summarized below. The prediction interval computation is presented in **Appendix A**.

Background Value = UPL of one-sided Prediction Interval						
	QL UPL Background Value					
Parameter	Sample Size	% Non-Detects	(µg/l)	$(\mu g/l)$	(μg/l)	
Barium	17	17 0 10 41.0 41.0				

TABLE 1

HWMU-7 CALCULATED BACKGROUND VALUES

Constituent	Background Value (µg/l unless otherwise noted)				
Antimony	1				
Arsenic	10				
Barium	41.0				
Cadmium	1				
Chromium	9.9				
Cobalt	5				
Copper	5				
Lead	1				
Mercury	2				
Nickel	10				
Selenium	10				
Silver	2				
Thallium	1				
Zinc	10.9				
Cyanide	20				
Bis(2-ethylhexyl)phthalate	6				
Butyl benzyl phthalate	10				
2,4-Dinitrophenol	10				
2,4-Dinitrotoluene	10				
2,6-Dinitrotoluene	10				
p-Nitrophenol	10				

APPENDIX A

HWMU-7
BACKGROUND VALUE CALCULATIONS
STATISTICAL COMPUTATIONS FOR BARIUM AND CHROMIUM

RAAP-HWMU-7 - Background Calculation - December 2007

17-Dec-07

Y2K Correction dates are as shown in table below.

Actual Event	Date Used in Stat Software
2003-Qtr2	8/1/1999
2003-Qtr3	8/2/1999
2003-Qtr4	8/3/1999
2004-Qtr1	8/4/1999
2004-Qtr2	8/5/1999
2004-Qtr3	8/6/1999
2004-Qtr4	8/7/1999
2005-Qtr1	8/8/1999
2005-Qtr2	8/9/1999
2005-Qtr3	8/10/1999
2005-Qtr4	8/11/1999
2006-Qtr1	8/12/1999
2006-Qtr2	8/13/1999
2006-Qtr3	8/14/1999
2006-Qtr4	8/15/1999
2007-Qtr1	8/16/1999
2007-Qtr2	8/17/1999

Notes:

1) Background data was computed for all target constituents using the 2Q 2003 - 2Q 2007 data for background well 7W12B. Background data was 100% <LOQ for all target parameters except barium, chromium and zinc. Zinc had only one reported result > LOQ.

Statistical computations using GRITS/STAT V5.0 performed only for barium and chromium, as applicable.

 $P.^{\circ}B03|200|B03204|B03204-122|WORK|HWMU-7\ Closure\ Rpt-Recalculation\ of\ Background\ [HWMU-7\ StatDate\ correction\ December\ 2007\ background\ recalc.xls]Sheet1$

Normality Tests

Report Printed: 12-17-2007 16:02

Facility: RAAPHWMU7 Haz. Waste Unit 7 - RAAP

Address:

City:Radford ST:VA Zip:24141

County: MONTGOMERY

Contact:

Phone: () -

Permit Type:Detection

Constituent:Ba Barium, total

CAS Number: 7440-39-3

MCL: 0.000 ppb

ACL: 0.000 ppb

Detect Limit: 2.000 ppb

Start Date:Aug 01 1999 End Date:Aug 17 1999

Normality Test on Observations for wells listed below:

Well:7W12B Position:Upgradient Observations:17

 Scale
 Minimum
 Maximum
 Mean
 Std Dev

 Original:
 32.800
 39.800
 36.253
 1.875

 Log:
 3.490
 3.684
 3.589
 0.052

Pooled Statistics

Observations: 17

Statistic Original Log Scale Scale 36.253 Mean: 3.589 Std Dev: 1.875 0.052 Skewness: -0.019 -0.150 Kurtosis: -0.236 -0.251 Minimum: 32.800 3.490 Maximum: 39.800 3.684 CV: 0.052 0.014

Shapiro-Wilk Statistics

Test 5% Critical 1% Critical Scale Statistic Value Value Original: 0.9602 0.8920 0.8510

Log: 0.9592

0.8920

0.8510

* Indicates statistically significant evidence of non-normality. $\ensuremath{\mathsf{GRIT}}/\ensuremath{\mathsf{STAT}}$ Version 5.0

Parametric Prediction Interval Report Printed December 17,2007

Page 1

```
Facility: Haz. Waste Unit 7 - RAAP
Parameter: Barium, total (CAS Number: 7440-39-3)
```

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

```
Observations (n): 17 Shapiro-Wilk (W): 0.9602 Critical W, \alpha=0.01: 0.8510 Mean: 36.253 ppb Std Dev: 1.875 ppb DF: 16 Conf. Level (1-\alpha): 0.9500 Future Samples (k): 4 t 1 - \alpha 2.4729 Kappa: 2.5446 UL: 41.024 ppb LL: -\infty
```

Normality Tests

Report Printed: 12-17-2007 16:05

Facility: RAAPHWMU7 Haz. Waste Unit 7 - RAAP

Address:

City:Radford ST:VA Zip:24141

County: MONTGOMERY

Contact:

Phone:() -

Permit Type:Detection

Constituent:Cr Chromium, total

CAS Number: 7440-47-3

MCL: 0.000 ppb ACL: 0.000 ppb

ACL: 0.000 ppb Detect Limit: 1.000 ppb

Start Date: Aug 01 1999 End Date: Aug 17 1999

Normality Test on Observations for wells listed below:

Well:7W12B Position:Upgradient Observations:17

 Scale
 Minimum
 Maximum
 Mean
 Std Dev

 Original:
 0.500
 9.900
 6.612
 2.648

 Log:
 -0.693
 2.293
 1.672
 0.909

Pooled Statistics

Observations: 17

Statistic Original Log Scale Scale 6.612 Mean: 1.672 Std Dev: 2.648 0.909 Skewness: -1.317* -2.191* Kurtosis: 1.110 3.139 Minimum: 0.500 -0.693 Maximum: 9.900 2.293 CV: 0.401 0.543

Shapiro-Wilk Statistics

Test 5% Critical 1% Critical Scale Statistic Value Value Original: 0.8293* 0.8920 0.8510

Log: 0.5707*

0.8920 0.8510

* Indicates statistically significant evidence of non-normality. $\ensuremath{\mathsf{GRIT}}/\ensuremath{\mathsf{STAT}}$ Version 5.0

Nonparametric Prediction Interval

Report Printed December 17,2007

Facility:Haz. Waste Unit 7 - RAAP

Parameter: Chromium, total (CAS Number: 7440-47-3)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n): 17

Conf. Level $(1-\alpha)$: 94.440% N/A

UL: 9.900 ppb

LL: 0.000

Report Produced by GRITS/STAT 5.01

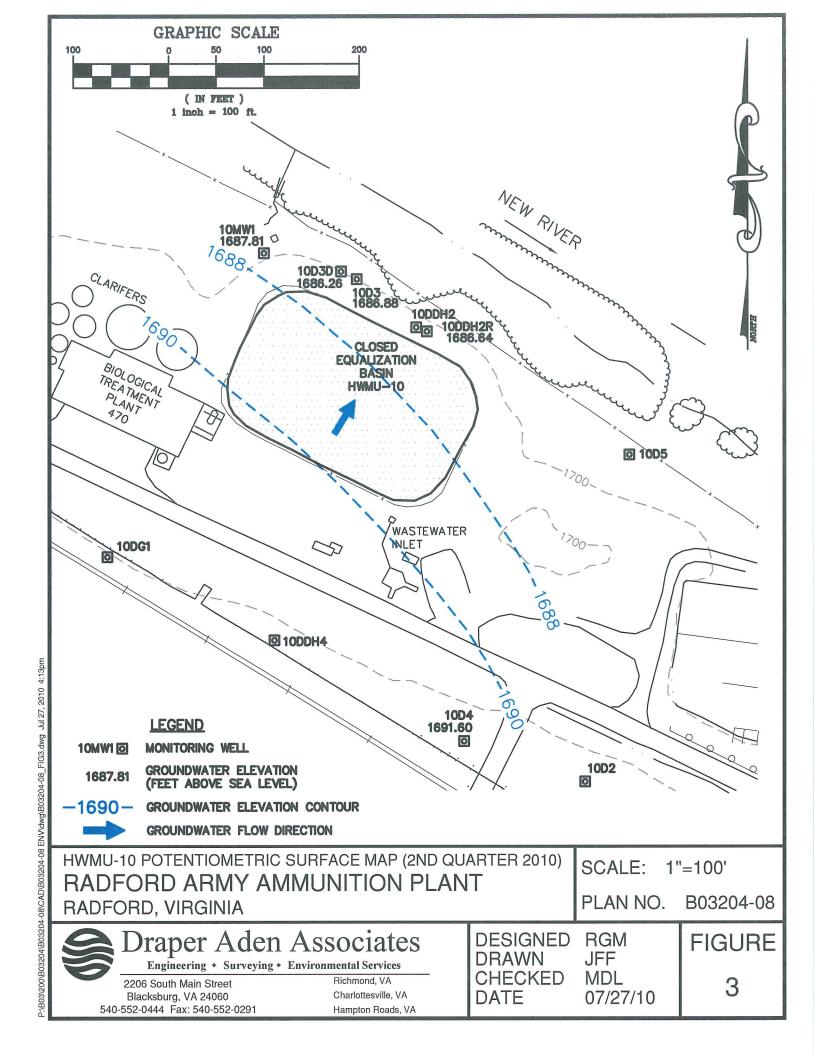
Page 1

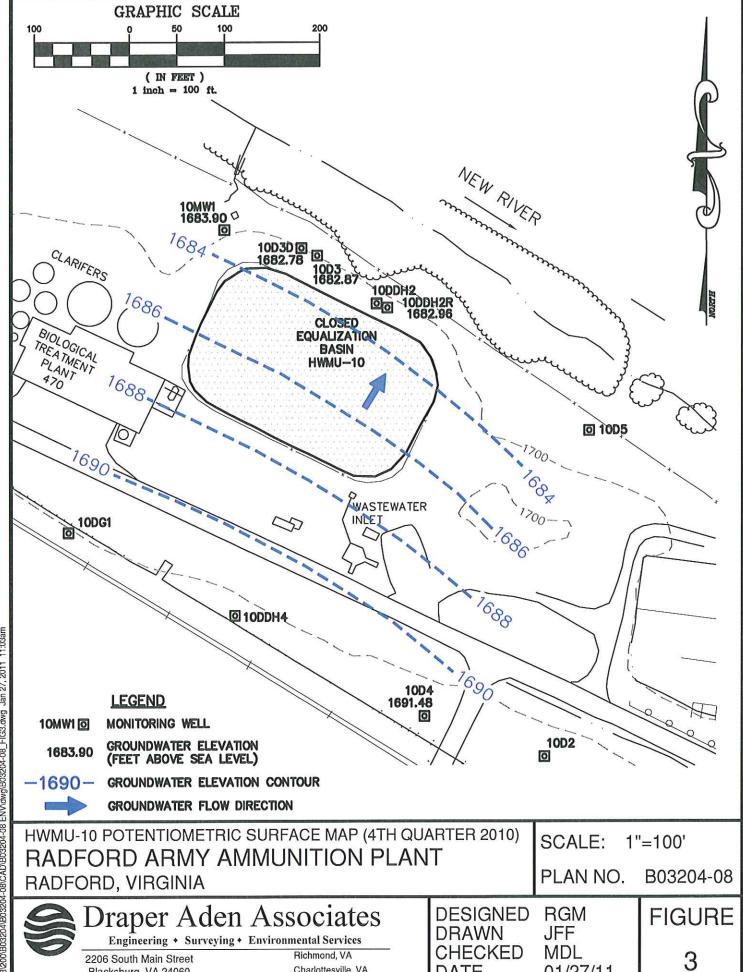
APPENDIX C

HWMU-10

APPENDIX C-1

HWMU-10 POTENTIOMETRIC SURFACE MAPS SECOND QUARTER 2010 FOURTH QUARTER 2010





Charlottesville, VA

Hampton Roads, VA

DATE

01/27/11

P:\B03\200\B03204\B03204-08\CAD\B03204-08 ENV\dwg\B03204-08_FIG3.dwg Jan 27, 2011 11:03am

Blacksburg, VA 24060

540-552-0444 Fax: 540-552-0291

APPENDIX C-2

HWMU-10 2010 LABORATORY ANALYTICAL RESULTS POINT OF COMPLIANCE WELLS

Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 10D4

Analyte/Quarter	10D4 Q	10D3 Q	10D3D Q	10DDH2R Q	10MWI Q	QL	GPS	Method
Antimony				CAS #	7440-36-0			
Second Quarter 2010	U	U	U	U	U	1	-	6020
Arsenic				CAS #	7440-38-2			
Second Quarter 2010	U	U	U	U	U	10	50	6020
Fourth Quarter 2010	U	U	U	U	U	10	50	6020
Barium				CAS #	7440-39-3		I	
Second Quarter 2010	117	87.9	43	44.3	69.2	10	2000	6020
Fourth Quarter 2010	127	92.6	53.3	49.1	86.2	10	2000	6020
Beryllium				CAS #	7440-41-7		I	
Second Quarter 2010	U	U	U	U	U	1	-	6020
Cadmium				CAS #	7440-43-9		I	
Second Quarter 2010	U	U	U	U	U	1	-	6020
Chromium				CAS #	7440-47-3			
Second Quarter 2010	5.6	2 J	U	1.4 J	2.8 J	5	100	6020
Fourth Quarter 2010	5.3	U	U	U	U	5	100	6020
Cobalt				CAS #	7440-48-4		I_	
Second Quarter 2010	1.2 J	U	U	U	U	5	-	6020
Fourth Quarter 2010	U	U	U	U	U	5	-	6020
Copper				CAS #	7440-50-8			
Second Quarter 2010	3.1 J	U	U	U	U	5	1300	6020
Fourth Quarter 2010	U	U	U	U	U	5	1300	6020
Lead				CAS #	7439-92-1		I	
Fourth Quarter 2010	1	U	U	U	U	1	15	6020
Second Quarter 2010	1.9	U	U	U	U	1	15	6020
Mercury				_	7439-97-6	·	.0	0020
Fourth Quarter 2010	U	U	U	U	U	2	2	7470A
Second Quarter 2010	U	U	U	U	U	2	2	7470A
Nickel				_	7440-02-0	_		
Fourth Quarter 2010	U	U	U	U	U	10	313	6020
Second Quarter 2010	2.3 J	U	U	U	U	10	313	6020
Selenium				CAS#	7782-49-2			
Fourth Quarter 2010	U	U	U	U	U	10	50	6020
Second Quarter 2010	U	U	U	U	U	10	50	6020
Silver				-	7440-22-4			
Second Quarter 2010	U	U	U	U	U	2	78.25	6020
Fourth Quarter 2010	U	U	U	U	U	2	78.25	6020
Thallium					7440-28-0	_		
Second Quarter 2010	U	U	U	U	U	1	_	6020
Tin					7440-31-5	•		
Second Quarter 2010	U	U	U	U	U	15	-	6010B
Vanadium		- O			7440-62-2	10		00100
Second Quarter 2010	4.6 J	U	U	U	U	10	-	6020
Fourth Quarter 2010	4.6 J	U	U	U	U	10	-	6020
	U	U	U		7440-66-6	10	-	0020
Second Quarter 2010	10.4	26 1	EO I	ı		10	ACOF	6000
Second Quarter 2010	13.4	3.6 J	5.2 J	3.9 J	U	10	4695	6020
Fourth Quarter 2010	10 J	25.8 J	U J	U J	U J 18496-25-8	10	4695	6020
Sulfide				CAS#	10430-23-8			

Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 10D4

Analyte/Quarter	10D4 Q	10D3 Q	10D3D Q	10DDH2R Q	10MW1 Q	QL	GPS	Method
Cyanide				CAS #	57-12-5			
Second Quarter 2010	U	U	U	U	U	20	200	9012A
Fourth Quarter 2010	U	U	U	U	U	20	200	9012A
Total Recoverable Phen	olics			CAS #	C-020			
Second Quarter 2010	U	UN	UN	U N	UN	50	-	9066
Acenaphthene				CAS #	83-32-9		-	
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Acenaphthylene				CAS #	208-96-8		-	
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Acetone				CAS #	67-64-1		-	
Second Quarter 2010	U	U	260	U	U	10	-	8260B
Fourth Quarter 2010	U	U	17000	U	U	10	-	8260B
Acetonitrile				CAS #	75-05-8		-	
Second Quarter 2010	U	U	U	U	U	100	-	8260B
Acetophenone				CAS #	98-86-2	"		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
2-Acetylaminofluorene				CAS #	53-96-3			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Acrolein				CAS#	107-02-8	1		
Second Quarter 2010	UJ	UJ	U J	UJ	UJ	25	-	8260B
Acrylonitrile				CAS#	107-13-1		"	
Second Quarter 2010	U	U	U	U	U	10	-	8260B
Aldrin				CAS #	309-00-2			
Second Quarter 2010	U	U	U	U	U	0.05	-	8081A
Allyl chloride				CAS #	107-05-1			
Second Quarter 2010	U	U	U	U	U	10	-	8260B
4-Aminobiphenyl				CAS #	92-67-1			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Aniline				CAS #	62-53-3			
Second Quarter 2010	U J	UJ	U J	UJ	U J	10	-	8270C
Anthracene				CAS #	120-12-7			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Aramite				CAS #	140-57-8			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Benzene				CAS #	71-43-2			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Benzo[a]anthracene				CAS #	56-55-3			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Benzo[b]fluoranthene				CAS #	205-99-2			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Benzo[k]fluoranthene				CAS #	207-08-9			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Benzo[ghi]perylene					191-24-2	-		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Benzo(a)pyrene					50-32-8			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
1,4-Benzenediamine	<u> </u>	<u> </u>			106-50-3	10		32700
ı,¬-Denzeneuidiiiile				0.10 #				

Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 10D4

Analyte/Quarter	10D4 Q	10D3 Q	10D3D Q	10DDH2R Q	10MW1 Q	QL	GPS	Method
Benzyl alcohol				CAS #	100-51-6			
Second Quarter 2010	UJ	U J	UJ	UJ	U J	10	-	8270C
alpha-BHC				CAS #	319-84-6			
Second Quarter 2010	U	U	U	U	U	0.05	-	8081A
beta-BHC					319-85-7	0.00		
Second Quarter 2010	U	U	U	U	U	0.05	-	8081A
delta-BHC		Ŭ	J		319-86-8	0.00		000
Second Quarter 2010	U	U	U	U	U	0.05	_	8081A
gamma-BHC		J	U		58-89-9	0.00		000171
Second Quarter 2010	U	U	U	U	U	0.05	-	8081A
bis(2-Chloroethoxy)meth	_	J	U		111-91-1	0.00		000171
Second Quarter 2010	U	U	U	U U	U	5	_	8270C
	U	U	U	=	111-44-4	3	-	6270G
bis(2-Chloroethyl)ether				1	1	-		00700
Second Quarter 2010	U	U	U	U CAS #	U 108-60-1	5	-	8270C
bis(2-Chloro-1-methyleth		11	- 11		1 1	10		00700
Second Quarter 2010	U	U	U	U CAS #	U 117-81-7	10	-	8270C
bis(2-Ethylhexyl)phthala				1	1 1		1	60706
Second Quarter 2010	U	U	U	U	U	5	-	8270C
Bromobenzene	1	1	1	1	108-86-1	1		
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Bromochloromethane		1	1	CAS #	74-97-5			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Bromodichloromethane				CAS #	75-27-4			
Fourth Quarter 2010	U	U	U	U	U	1	80	8260B
Second Quarter 2010	U	U	U	U	U	1	80	8260B
Bromoform				CAS #	75-25-2			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
4-Bromophenyl phenyl e	ther			CAS #	101-55-3		·	
Second Quarter 2010	U	U	U	U	U	10	-	8270C
2-Butanone				CAS #	78-93-3			
Fourth Quarter 2010	U	U	U	U	U	10	691.08	8260B
Second Quarter 2010	U	U	U	U	U	10	691.08	8260B
n-Butyl alcohol				CAS #	71-36-3			
Second Quarter 2010	U	U	U	U	U	50	-	8260B
tert-Butyl alcohol				CAS #	75-65-0			
Second Quarter 2010	U	U	U	U	U	200	-	8260B
n-Butylbenzene	1			CAS #	104-51-8		I	
Second Quarter 2010	U	U	U	U	U	1	-	8260B
sec-Butylbenzene				CAS #	135-98-8			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
tert-Butylbenzene					98-06-6	-		
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Butyl benzyl phthalate		J	J		85-68-7	,		32000
Second Quarter 2010	U	U	U	U U	U	10	-	8270C
Carbon disulfide	J	U	U		75-15-0	10	-	02/00
	111	11	11	1	1	10		90000
Second Quarter 2010	U	U	U	U CAS #	U	10	-	8260B
Carbon tetrachloride	1	I	1	I	56-23-5	. 1	1	
Second Quarter 2010	U	U	U	U	U	1	-	8260B

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Upgradient well = 10D4

Analyte/Quarter	10D4 Q	10D3 Q	10D3D Q	10DDH2R Q	10MW1 Q	QL	GPS	Method
Chlordane				CAS #	57-74-9			
Second Quarter 2010	U	U	U	U	U	0.86	-	8081A
p-Chloroaniline	1	II.	1	CAS #	106-47-8			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Chlorobenzene				CAS #	108-90-7			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Chlorobenzilate	1			CAS #	510-15-6			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
p-Chloro-m-cresol				CAS #	59-50-7			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Chloroethane				CAS #	75-00-3			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Chloroform				CAS #	67-66-3			
Second Quarter 2010	15	6.5	6.1	0.8 J	13	1	80	8260B
Fourth Quarter 2010	8.7	4.7	U	U	10	1	80	8260B
2-Chloroethyl vinyl ether		l .	_		110-75-8			
Second Quarter 2010	UJ	UJ	UJ	UJ	UJ	20	-	8260B
2-Chloronaphthalene					91-58-7			02000
Second Quarter 2010	U	U	U	U	U	10	_	8270C
2-Chlorophenol					95-57-8	, 0		02,00
Second Quarter 2010	U	U	U	U	U	10	_	8270C
4-Chlorophenyl phenyl e	_	Ü		_	7005-72-3	10		02700
Second Quarter 2010	U	U	U	U	U	10	_	8270C
Chloroprene	U	J	U	_	126-99-8	10		02700
Second Quarter 2010	U	U	U	U	U	10	_	8260B
2-Chlorotoluene		O	U	_	95-49-8	10	_	02000
Second Quarter 2010	U	U	U	U	U	1	_	8260B
4-Chlorotoluene		J	U	-	106-43-4	'		02000
Second Quarter 2010	U	U	U	U	U	1	_	8260B
	U	U	U	_	218-01-9	'	-	02000
Chrysene Second Quarter 2010	U	U	U	U	U	10	_	8270C
	U	U	U	_	110-82-7	10	-	02700
Cyclohexane Second Quarter 2010	U	U	U	U U	U	1	_	8260B
	_	U	U		94-75-7	ļ	-	02000
2,4-Dichlorophenoxyace	1	- 11	111	I	1	F		8151A
Second Quarter 2010	U	U	U	U CAS #	72-54-8	5	-	AICIO
4,4'-DDD			11	1	1	0.1		00014
Second Quarter 2010	U	U	U	U	72-55-9	0.1	-	8081A
4,4'-DDE				ı	1	0.4		00014
Second Quarter 2010	U	U	U	U CAS#	U 50.20.2	0.1	-	8081A
4,4'-DDT	1	l	1	1	50-29-3	0.1		2221
Second Quarter 2010	U	U	U	U	U	0.1	-	8081A
Diallate	T	l	1	ı	2303-16-4		-	
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Dibenz(a,h)anthracene	T	II.	T	II.	53-70-3	1	T.	
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Dibenzofuran		1	1	1	132-64-9		TI	
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Dibromochloromethane				CAS #	124-48-1			

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Analyte/Quarter	10D4 Q	10D3 Q	10D3D Q	10DDH2R Q	10MW1 Q	QL	GPS	Method
1,2-Dibromo-3-chloropr	opane			CAS #	96-12-8			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,2-Dibromoethane	1		1	CAS #	106-93-4	1	"	
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Di-n-butyl phthalate	1		1	CAS #	84-74-2	1		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
1,2-Dichlorobenzene				CAS #	95-50-1			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,3-Dichlorobenzene				CAS #	541-73-1			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,4-Dichlorobenzene				CAS #	106-46-7		Į.	
Second Quarter 2010	U	U	U	U	U	1	-	8260B
3,3'-Dichlorobenzidine				CAS #	91-94-1			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
trans-1,4-Dichloro-2-but	ene			CAS #	110-57-6			
Second Quarter 2010	U	U	U	U	U	10	-	8260B
Dichlorodifluoromethan	ie			CAS #	75-71-8			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,1-Dichloroethane				CAS #	75-34-3			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,2-Dichloroethane				CAS #	107-06-2			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,1-Dichloroethene				CAS #	75-35-4			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
trans-1,2-Dichloroethen	е			CAS #	156-60-5			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
2,4-Dichlorophenol				CAS #	120-83-2			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
2,6-Dichlorophenol					87-65-0			
Second Quarter 2010	U	U	U	U	U	10	_	8270C
1,2-Dichloropropane	ŭ	Ū	Ū	_	78-87-5	.0		02.00
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,3-Dichloropropane				-	142-28-9	-		
Second Quarter 2010	U	U	U	U	U	1	-	8260B
2,2-Dichloropropane					594-20-7	-		
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,1-Dichloropropene		- C		-	563-58-6	•		02002
Second Quarter 2010	U	U	U	U	U	1	_	8260B
cis-1,3-Dichloropropene		J		_	10061-01-5	•		02002
Second Quarter 2010	U	U	U	U	U	1	_	8260B
trans-1,3-Dichloroprope		U		_	10061-02-6	•		02002
Second Quarter 2010	U	U	U	U	U	1	_	8260B
Dieldrin	5	5	J		60-57-1	'	-	02000
Second Quarter 2010	U	U	U	U U	U	0.1	-	8081A
	U	U	U		60-29-7	U. I	-	0001A
Diethyl ether	11	11	11	1	1 1	10.5		POEND
Second Quarter 2010	U	U	U	U CAS #	U 84-66-2	12.5	-	8260B
Diethyl phthalate				CAS#	J- 00-2			

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Analyte/Quarter	10D4 Q	10D3 Q	10D3D O	10DDH2R Q	10MW1 (Q = QL	GPS	Method
	~	10D3 Q	10202 Q		297-97-2	Z QL	OI 5	тети
O,O-Diethyl O-2-pyrazin Second Quarter 2010	ı yı U	U	U	U U	U	10	-	8270C
Dimethoate		O	U		60-51-5	10	_	02700
Second Quarter 2010	U	U	U	U U	U	10		8270C
	U	U	U		115-10-6	10	-	82700
Dimethyl ether		11	11	I	T.	10.5		00000
Second Quarter 2010	U	U	U	U CAS #	U 60-11-7	12.5	-	8260B
p-(Dimethylamino)azob Second Quarter 2010	1	11		1		10		00700
	U	U	U	U CAS #	57-97-6	10	-	8270C
7,12-Dimethylbenz[a]an		- 11	111	ı	1	10		00700
Second Quarter 2010	U	U	U	U CAS #	U 119-93-7	10	-	8270C
3,3'-Dimethylbenzidine				ı	1	10		20720
Second Quarter 2010	. U	U	U	U	U	10	-	8270C
a,a-Dimethylphenethyla			1	1	122-09-8		I I	
Second Quarter 2010	UJ	U J	U J	U J	U J	50	-	8270C
2,4-Dimethylphenol			1	1	105-67-9	1		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Dimethyl phthalate		Ti T		1	131-11-3	T.	1	
Second Quarter 2010	U	U	U	U	U	10	-	8270C
m-Dinitrobenzene		1	1	1	99-65-0	1		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
1,6-Dinitro-o-cresol				CAS #	534-52-1			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
2,4-Dinitrophenol				CAS #	51-28-5			
Second Quarter 2010	UJ	UJ	UJ	UJ	UJ	10	-	8270C
2,4-Dinitrotoluene				CAS #	121-14-2			
Second Quarter 2010	U	U	U	U	U	10	31.3	8270C
Fourth Quarter 2010	U	U	U	U	U	10	31.3	8270C
2,6-Dinitrotoluene				CAS #	606-20-2			
Fourth Quarter 2010	U	U	U	U	U	10	15.65	8270C
Second Quarter 2010	U	U	U	U	U	10	15.65	8270C
Dinoseb				CAS #	88-85-7			
Second Quarter 2010	U	U	U	U	U	2.5	-	8151A
Di-n-octyl phthalate				CAS #	117-84-0			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
1,4-Dioxane				CAS #	123-91-1	'		
Second Quarter 2010	U	U	U	U	U	200	-	8260B
Diphenylamine				CAS #	122-39-4			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Disulfoton				CAS #	298-04-4		1	
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Endosulfan I				CAS #	959-98-8			
Second Quarter 2010	U	U	U	U	U	0.05	-	8081A
Endosulfan II		<u> </u>		CAS #	33213-65-9		<u> </u>	
Second Quarter 2010	U	U	U	U	U	0.1	-	8081A
Endosulfan sulfate		-		_	1031-07-8			
Second Quarter 2010	UJ	UJ	UJ	U J	UJ	0.1	-	8081A
Endrin		- 0	0 0		72-20-8	5.1		330171
Second Quarter 2010	U	U	U	U	U	0.1	_	8081A
Gecond Quarter 2010	U	U	U	U	U	0.1	-	000 I A

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Analyte/Quarter	10D4 Q	10D3 Q	10D3D Q	10DDH2R Q	10MW1 Q	QL	GPS	Method
Ethyl acetate				CAS #	141-78-6			
Second Quarter 2010	U	U	U	U	U	10	-	8260B
Endrin aldehyde				CAS #	7421-93-4			
Second Quarter 2010	UJ	UJ	UJ	UJ	UJ	0.1	-	8081A
Ethanol				CAS #	64-17-5			
Second Quarter 2010	UJ	UJ	UJ	UJ	UJ	250	-	8260B
Ethylbenzene				CAS #	100-41-4			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Ethyl methacrylate					97-63-2	-		
Second Quarter 2010	U	U	U	U	U	10	-	8260B
Ethyl methanesulfonate					62-50-0			
Second Quarter 2010	U	U	U	U	U	10	_	8270C
Ethylene oxide	J	J	J		75-21-8	10		02700
Second Quarter 2010	UJ	U J	UJ	UJ	UJ	100	-	8260B
Famphur	0 0	0 0	0 0		52-85-7	100	-	02000
Second Quarter 2010	U	U	U	U U	U	10	-	8270C
Fluoranthene	U	U	U		206-44-0	10	-	6270C
			11			10	_	00700
Second Quarter 2010	U	U	U	U CAS #	86-73-7	10	-	8270C
Fluorene	I	I	1					22722
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Heptachlor	l	l	1		76-44-8			
Second Quarter 2010	U	U	U	U	U	0.05	-	8081A
Heptachlor epoxide	II	I .	1		1024-57-3	1	1	
Second Quarter 2010	U	U	U	U	U	0.05	-	8081A
Hexachlorobenzene	II.	I .			118-74-1			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Hexachlorobutadiene	1	1	1	CAS #	87-68-3			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Hexachlorocyclopentadi	ene	1		CAS #	77-47-4			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Hexachloroethane				CAS #	67-72-1			
Second Quarter 2010	U	U	U	U	U	10	-	8260B
Hexachlorophene				CAS #	70-30-4			
Second Quarter 2010	UJ	UJ	U J	UJ	UJ	40	-	8270C
Hexachloropropene				CAS #	1888-71-7			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
2-Hexanone				CAS #	591-78-6			
Second Quarter 2010	U	U	U	U	U	10	-	8260B
Indeno[1,2,3-cd]pyrene				CAS #	193-39-5		,	
Second Quarter 2010	U	U	U	U	U	5	-	8270C
Isobutyl alcohol			1	CAS #	78-83-1			
Second Quarter 2010	U	U	U	U	U	200	-	8260B
Isodrin	II.	II.	1	CAS #	465-73-6			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Isophorone	<u>I</u>	I .		CAS #	78-59-1			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
sopropylbenzene	=	-	-		98-82-8			
- Copi OpyiDeliZelle	U	U	U	U	U		ı	8260B

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Analyte/Quarter	10D4 Q	10D3 Q	10D3D Q	10DDH2R Q	10MW1 Q	QL	GPS	Method
Isopropylether				CAS #	108-20-3			
Second Quarter 2010	U	U	U	U	U	10	-	8260B
4-Isopropyltoluene				CAS #	99-87-6			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Isosafrole				CAS #	120-58-1			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Kepone				CAS #	143-50-0			
Second Quarter 2010	UJ	UJ	U J	U J	U J	10	-	8270C
Methacrylonitrile				CAS #	126-98-7			
Second Quarter 2010	U	U	U	U	U	100	-	8260B
Methapyrilene				CAS #	91-80-5			
Second Quarter 2010	UJ	UJ	U J	U J	UJ	10	-	8270C
Methoxychlor				CAS #	72-43-5			
Second Quarter 2010	U	U	U	U	U	0.5	-	8081A
Bromomethane	1	I	1	CAS #	74-83-9			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Chloromethane				CAS #	74-87-3			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
3-Methylcholanthrene				CAS #	56-49-5			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
lodomethane				CAS #	74-88-4			
Second Quarter 2010	U	U	U	U	U	10	-	8260B
Methyl methacrylate				CAS #	80-62-6			
Second Quarter 2010	U	U	U	U	U	10	-	8260B
Methyl methane sulfona	te				66-27-3			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
2-Methylnaphthalene				CAS #	91-57-6			
Second Quarter 2010	U	U	U	U	U	10	_	8270C
Methyl parathion		_			298-00-0			
Second Quarter 2010	U	U	U	U	U	10	_	8270C
4-Methyl-2-pentanone	_		_		108-10-1			
Second Quarter 2010	U	U	U	U	U	10	_	8260B
2-Methylphenol			_		95-48-7			
Second Quarter 2010	U	U	U	U	U	10	_	8270C
3 & 4-Methylphenol	J		J		m 108-39-4			02.00
Second Quarter 2010	U	U	U	U	U	20	_ [8270C
Methyl tert-butyl ether	J		J		1634-04-4			02.00
Second Quarter 2010	U	U	U	U	U	10	_	8260B
Dibromomethane	ŭ	Ü	J		74-95-3	10		02000
Second Quarter 2010	U	U	U	U	U	1	_ 1	8260B
Methylene chloride	Ü	J	U		75-09-2	•		02000
Second Quarter 2010	U	U	U	U	U	1	_	8260B
	U	U	U		91-20-3	'		02000
Naphthalene Second Quarter 2010	U	U	U	U U	U	1	-	8260B
	J	J			130-15-4	1	-	02000
1,4-Naphthoquinone Second Quarter 2010	U	U	U	U U	U	10	-	8270C
	U	U	U		134-32-7	10	-	02/00
1-Naphthylamine				CAS#	107 02-7			

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Analyte/Quarter	10D4 Q	10D3 Q	10D3D Q	10DDH2R Q	10MW1 Q	QL	GPS	Method
2-Naphthylamine				CAS #	91-59-8			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
o-Nitroaniline				CAS #	88-74-4			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
m-Nitroaniline				CAS #	99-09-2			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
p-Nitroaniline				CAS #	100-01-6			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Nitrobenzene	_		_		98-95-3			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
o-Nitrophenol					88-75-5			
Second Quarter 2010	U	U	U	U	U	10	_	8270C
p-Nitrophenol	U	U	U		100-02-7	10		02700
Second Quarter 2010	U	U	U	U	U	10	-	8270C
		U	U		56-57-5	10	-	02700
4-Nitroquinoline-1-oxid	1	- 11	111	1	T I	F0.		90700
Second Quarter 2010	U	U	U	U	924-16-3	50	-	8270C
N-Nitrosodi-n-butylamir	1	I	1	1	1 1		<u> </u>	2272
Second Quarter 2010	U	U J	U J	U	U	10	-	8270C
N-Nitrosodiethylamine	1	I	1	1	55-18-5		I I	
Second Quarter 2010	U	U	U	U	U	10	-	8270C
N-Nitrosodimethylamin	1	I	1	ı	62-75-9		1	
Second Quarter 2010	UJ	U J	UJ	UJ	UJ	10	-	8270C
N-Nitrosodiphenylamin	е	1		CAS #	86-30-6			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
N-Nitrosodipropylamine	•			CAS #	621-64-7			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
N-Nitrosomethylethylan	nine			CAS #	10595-95-6			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
N-Nitrosomorpholine				CAS #	59-89-2			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
N-Nitrosopiperidine				CAS #	100-75-4			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
N-Nitrosopyrrolidine	,			CAS #	930-55-2			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
5-Nitroso-o-toluidine				CAS #	99-55-8			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Parathion				CAS #	56-38-2			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Pentachlorobenzene				CAS #	608-93-5			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Pentachloroethane				CAS #	76-01-7			
Second Quarter 2010	U	U	U	U	U	10	-	8260B
Pentachloronitrobenzer	-			_	82-68-8			02000
Second Quarter 2010	U	U	U	U	U	10	_	8270C
Pentachlorophenol	U	U	U	_	87-86-5	10	-	02/00
Second Quarter 2010	U	U	U	U U	U U	10		8270C
	U	U	U	_	62-44-2	10	-	82/00
Phenacetin	1			I	1			
Second Quarter 2010	U	U	U	U	U	10	-	8270C

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Analyte/Quarter	10D4 Q	10D3 Q	10D3D Q	10DDH2R Q	10MW1 Q	QL	GPS	Method
Phenanthrene				CAS #	85-01-8			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Phenol	1	1	1	CAS #	108-95-2			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Phorate				CAS #	298-02-2			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
2-Picoline				CAS #	109-06-8			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Pronamide			_		23950-58-5			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
1-Propanol		, ,			71-23-8	. •		02.00
Second Quarter 2010	UJ	U J	UJ	UJ	UJ	100	-	8260B
2-Propanol	0 0	0 0	0 0		67-63-0	100		02000
Second Quarter 2010	U	U	470	U U	U	100	_	8260B
Fourth Quarter 2010	U	U	45000	U	U	100 100	-	8260B 8260B
	U	U	45000	_	107-12-0	100	-	ŏ∠00B
Propionitrile	111		11	1	1	100	1	00005
Second Quarter 2010	U	U	U	U	U	100	-	8260B
n-Propylbenzene	1	1		1	103-65-1	. 1	1	
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Pyrene	1 -	1 .	T	1	129-00-0	1	1	
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Pyridine	1	1	1	CAS #	110-86-1			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Safrole				CAS #	94-59-7			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Silvex				CAS #	93-72-1			
Second Quarter 2010	U	U	U	U	U	2.5	-	8151A
Styrene				CAS #	100-42-5			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Sulfotep				CAS #	3689-24-5			
Second Quarter 2010	UJ	UJ	U J	U J	UJ	5	-	8270C
2,4,5-Trichlorophenoxya	cetic acid			CAS #	93-76-5			
Second Quarter 2010	U	U	U	U	U	2.5	-	8151A
1,2,4,5-Tetrachlorobenzo	ene		1		95-94-3			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
1,1,1,2-Tetrachloroethan			-		630-20-6	. •		
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,1,2,2-Tetrachloroethan				_	79-34-5	'		02000
Second Quarter 2010	U	U	U	U U	U	1	-	8260B
	U	U	U	_	127-18-4	I	-	02000
Tetrachloroethene	1 11	11	- 11	1	U	4	1	00000
Second Quarter 2010	U	U	U	U CAS#	109-99-9	1	-	8260B
Tetrahydrofuran	1	1		1		6-	<u> </u>	
Second Quarter 2010	U	U	U	U	U 50.00.0	25	-	8260B
2,3,4,6-Tetrachlorophen		1 .	T	II.	58-90-2	1	1	
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Toluene	1	1	1	1	108-88-3			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
					95-53-4			



Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 10D4

Analyte/Quarter	10D4 Q	10D3 Q	10D3D Q	10DDH2R Q	10MW1 Q	QL	GPS	Method
Toxaphene				CAS #	8001-35-2			
Second Quarter 2010	U	U	U	U	U	2.5	-	8081A
1,2,3-Trichlorobenzene	I .			CAS #	87-61-6			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,2,4-Trichlorobenzene				CAS #	120-82-1		1	
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,1,1-Trichloroethane			1	CAS #	71-55-6			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,1,2-Trichloroethane				CAS #	79-00-5		1	
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Trichloroethene				CAS #	79-01-6		1	
Second Quarter 2010	U	U	U	U	U	1	5	8260B
Fourth Quarter 2010	U	U	U	U	U	1	5	8260B
Trichlorofluoromethane			1	CAS #	75-69-4			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
2,4,5-Trichlorophenol				CAS #	95-95-4			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
2,4,6-Trichlorophenol				CAS #	88-06-2			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
1,2,3-Trichloropropane				CAS #	96-18-4			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,1,2-Trichloro-1,2,2-Trifl	uoroetha	ne		CAS #	76-13-1			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
O,O,O-Triethyl phosphor	othioate			CAS #	126-68-1			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
1,2,4-Trimethylbenzene				CAS #	95-63-6			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,3,5-Trimethylbenzene				CAS #	108-67-8			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
sym-Trinitrobenzene				CAS #	99-35-4			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Vinyl acetate				CAS #	108-05-4			
Second Quarter 2010	U	U	U	U	U	10	-	8260B
Vinyl chloride				CAS #	75-01-4			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Xylenes (Total)	•			CAS #	1330-20-7			
Second Quarter 2010	U	U	U	U	U	3	10000	8260B
Fourth Quarter 2010	U	U	U	U	U	3	10000	8260B
	•	•		•			·	

Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 10D4

All Results in ug/L.

Analyte/Quarter 10D4 Q 10D3 Q 10D3D Q 10DDH2R Q 10MW1 Q QL GPS Method

Definitions:

QL Denotes permit required quantitation limit.

U Denotes analyte not detected at or above QL.

UA Denotes analyte not detected at or above adjusted sample QL.

J Denotes associated result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above QL and QL is estimated. When used with "UA" (i.e., "UAJ"), denotes analyte not detected at or above adjusted QL and adjusted QL is estimated.

UN Denotes analyte concentration is less than the quantiation limit and five times the blank concentration. Not reliably detected due to blank contamination. This qualifier used only for Appendix IX monitoring event when results are reported to at or above the detection limit.

R Denotes result rejected.

Q Denotes data validation qualifier.

CAS# Denotes Chemical Abstract Services registration number.

 $\textbf{GPS} \ \ Denotes \ Groundwater \ Protection \ Standards \ listed \ in \ Appendix \ G \ \ to \ Attachment \ 4 \ in \ the \ Final \ Hazardous \ Waste \ Post-Closure \ \ Care \ Permit for \ Hazardous \ Waste \ Units \ 5, \ 7, \ 10, \ and \ 16 \ (October \ 4, 2002).$

For cobalt, vanadium, acetone and 2-propanol, these analytes are not listed in Appendix VIII to 40 CFR Part 261; therefore, GPSs will not be established for these constituents.

NS denotes not sampled.

NA denotes not analyzed.

"-" denotes not detected (pre-2nd Quarter 2003) or not available / not sampled (beginning 2nd Quarter 2003).

Appendix IX Monitoring Events:

First Quarter 2003, Second Quarter 2004, Second Quarter 2005,

Third Quarter 2006, Second Quarter 2007, Second Quarter 2008, Second Quarter 2009, Second Quarter 2010

For Appendix IX monitoring, compliance well results reported/evaluated to detection limit. See data validation Qualifier definitions noted below.

The following definitions apply to results reported for Appendix IX monitoring events. All Appendix IX monitoring results for compliance wells are reported to the detection limit.

QL Denotes permit required quantitation limit.

U denotes not detected at or above the detection limit or QL.

UA denotes not detected at or above the adjusted detection limit or adjusted QL.

J Denotes result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above the detection limit or QL and detection limit and QL are estimated. When used with "UA" (i.e., "UAJ"), denotes analyte not detected at or above adjusted detection limit or adjusted QL and adjusted detection limit and adjusted QL are estimated.

UN Denotes analyte concentration is less than the quantitation limit and/or five times the blank concentration. Not reliably detected due to blank contamination. This qualifier used only for Appendix IX monitoring event when compliance well results are reported to at or above the project detection limit.

Verification events: 12/12/03, 06/17/04, 7/25/2005.

6/17/04. Verification event. Acetone: 10D3D was not detected during verification event. Verification event result reported.
7/25/05. Verification event. All wells: ethyl acetate. 10D3D: alpha-BHC, acetone and 2-propanol. All verification results: Not detected except for acetone and 2-propanol. Verification results presented in table.

7/17/2008. Verification event. 10MW1. Technical chlordane, diethyl phthalate. Verification results reported-all not detected. 6/11/2009 – Verification event, 10DDH2R, Diethyl ether, Verification results reported in table-all not detected.



Comprehensive Data Validation Report



Sample/Blind Field Duplicate Results Greater Than the Quantitation Limit

Facility: HWMU-10 Monitoring Event: Second Quarter 2010

		Laboratory Result	Validated Result	QL	
Analyte	Sample ID	(ug/L) Q	(ug/L) Q	(ug/L)	Validation Notes
Method: 6020					
Laboratory: CompuCher	m, a Division o	f Liberty Analy	vtical, Cary, NC		
Barium	10D3	87.9	87.9	10	No action taken.
	10DUP	86.9	86.9	10	No action taken. Field duplicate for 10D3, RPD < 10.
Method: 8260B					
Laboratory: Lancaster L	aboratories, La	ancaster, PA			
Chloroform	10D3	6.5	6.5	1	No action taken.
	10DUP	6.3	6.3	1	No action taken. Field duplicate for 10D3. RPD <10.

Definitions:

QL Denotes permit quantitation limit.

Q Denotes data qualifier.

J Denotes analyte reported at or above QL and associated result is estimated.

Comprehensive Data Validation Report



Sample/Blind Field Duplicate Results Greater Than the Quantitation Limit

Facility: HWMU-10 Monitoring Event: Fourth Quarter 2010

		Laborato Result	•	Validat Resu		QL	
Analyte	Sample ID	(ug/L)	Q	(ug/L)) Q	(ug/L)	Validation Notes
Method: 6020		An incompany		elt 7			
Laboratory: CompuChen	ı, a Division oj	Liberty A	nalyti	cal, Cary	, NC	Statistic is booking by Salabar 1270 c	
Barium	10D3	92.6		92.6		10	No action taken. Fiels duplicate RPD was <10.
	10DUP	89.1		89.1		10	No action taken. Field duplicate of 10D3. RPD <10.
Zinc	10D3	25.8		25.8	J	10	Zinc not detected in field duplicate. Result is estimated.
Method: 8260B							
Laboratory: Lancaster La	aboratories, La	ncaster, P.	A				
Chloroform	10D3	4.7		4.7		1	No action taken. Field duplicate result was 4.9 ug/l. RPD <10.
	10DUP	4.9		4.9		1	No action taken. Field duplicate of sample 10D3. RPD <10.

Definitions:

QL Denotes permit quantitation limit.

Q Denotes data qualifier.

J Denotes analyte reported at or above QL and associated result is estimated.

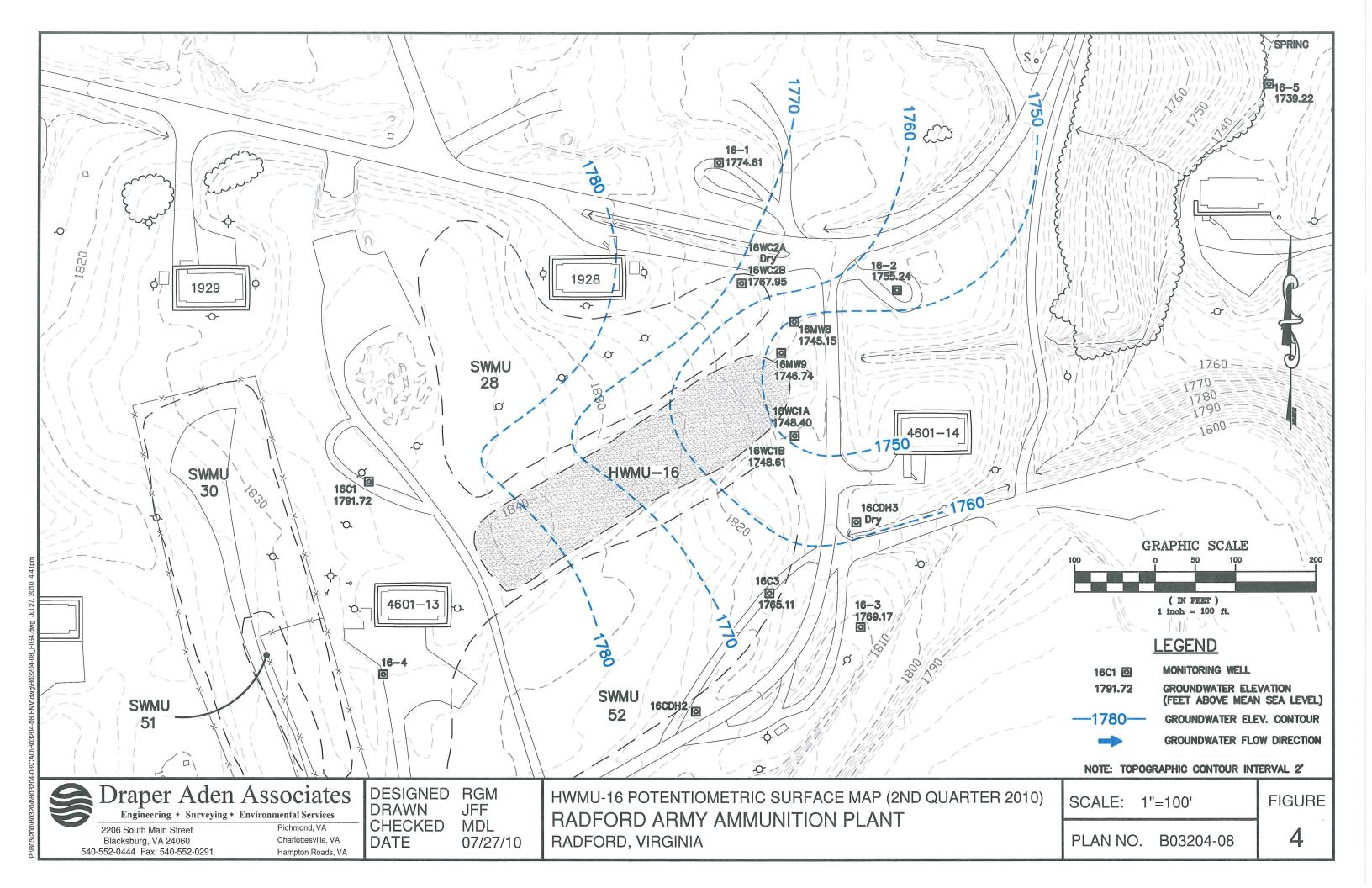


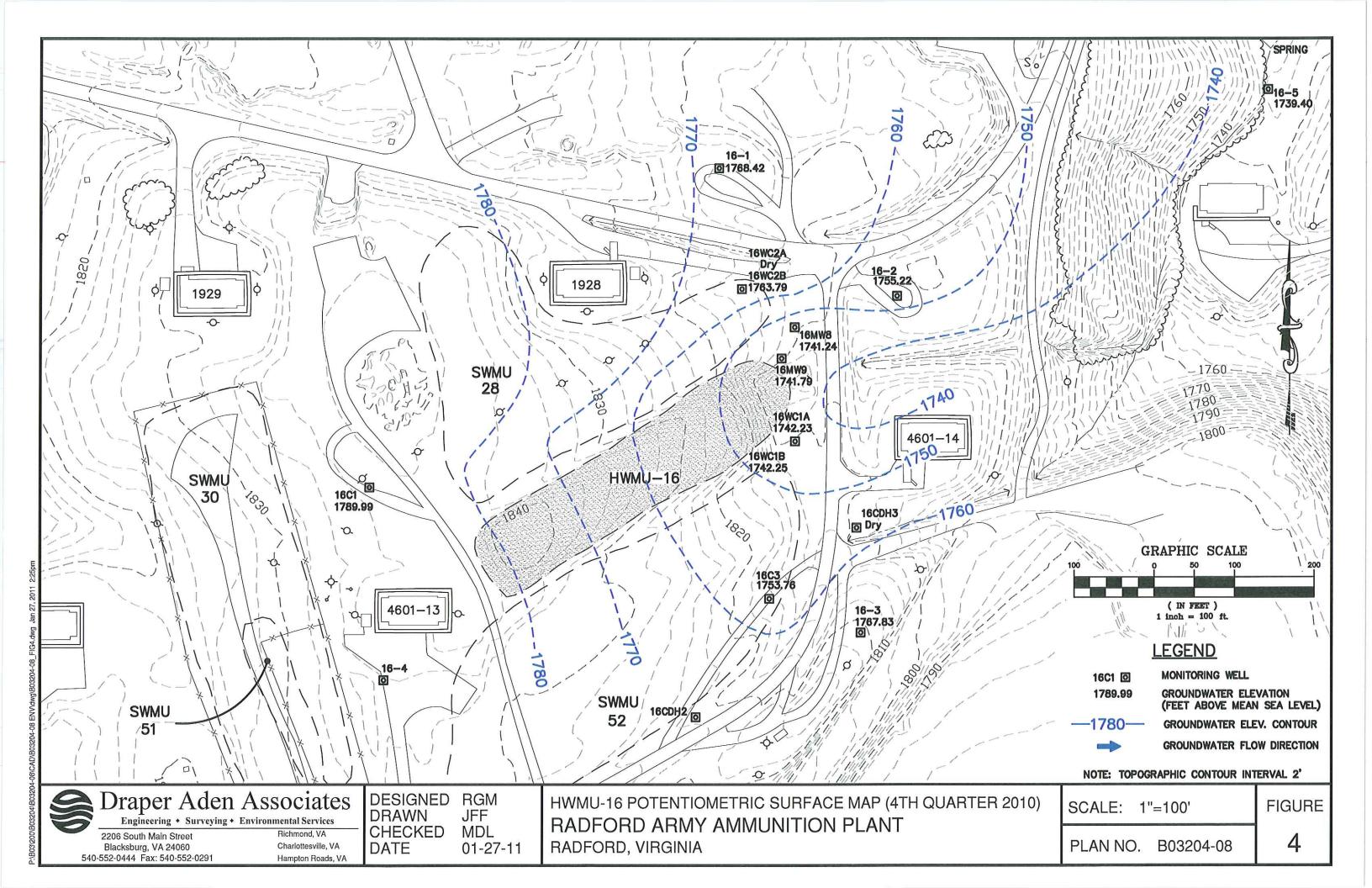
APPENDIX D

HWMU-16

APPENDIX D-1

HWMU-16 POTENTIOMETRIC SURFACE MAPS SECOND QUARTER 2010 FOURTH QUARTER 2010





APPENDIX D-2

HWMU-16 2010 LABORATORY ANALYTICAL RESULTS POINT OF COMPLIANCE WELLS

Upgradient well = 16C1

Analtye/Ouarter	16C1	16MW8	16MW9	16WC1A	16WC1B		GPS	Method
Antimony						7440-36-0		
Second Quarter 2010	U	U	U	U	U	1	6	6020
Fourth Quarter 2010	U	U	U	U	U	1	6	6020
Arsenic		-			CAS#	7440-38-2		
Second Quarter 2010	U	U	U	U	U	10	50	6020
Fourth Quarter 2010	U	U	U	U	U	10	50	6020
Barium					CAS#	7440-39-3		
Second Quarter 2010	148 J	85.9 J	572 J	208 J	136 J	10	2000	6020
Fourth Quarter 2010	200	98.9	563	199	103	10	2000	6020
Beryllium					CAS#	7440-41-7		
Second Quarter 2010	U	U	U	U	U	1	4	6020
Fourth Quarter 2010	U	U	U	U	U	1	4	6020
						7440-43-9	-	0020
Second Quarter 2010	U	0.22 J	U	U	0.22 J	1	5	6020
Fourth Quarter 2010	U	U	U	U	U	1	5	6020
Chromium						7440-47-3		
Second Quarter 2010	U	U	U	U	U	5	100	6020
Fourth Quarter 2010	U	U	U	U	U	5	100	6020
Cobalt					CAS#	7440-48-4		
Second Quarter 2010	U	10.1	3.1 J	9	4.1 J	5	313	6020
Fourth Quarter 2010	U	U	U	5.6	U	5	313	6020
Copper					CAS#	7440-50-8		
Second Quarter 2010	U	11.1	U	U	U	5	1300	6020
Fourth Quarter 2010	U	22.7	U	U	U	5	1300	6020
		22.1	0	0			1300	0020
ead Second Quarter 2010	U	1.7	U	U	CAS#	7439-92-1 1	15	0000
		1.7					15	6020
Fourth Quarter 2010	U	3.4	U	U	U	1	15	6020
Mercury					CAS#	7439-97-6		
Second Quarter 2010	U	U	U	U	0.38 J	2	2	7470
Fourth Quarter 2010	U	U	U	U	U	2	2	7470
Nickel					CAS#	7440-02-0		
Second Quarter 2010	4 J	10.4	9.4 J	3.4 J	7.6 J	10	313	6020
Fourth Quarter 2010	U	U	U	U	U	10	313	6020
Selenium					CAS#	7782-49-2		
Second Quarter 2010	U	U	U	U	U	10	50	6020
Fourth Quarter 2010	U	U	U	U	U	10	50	6020
		0	-				30	0020
Silver		0.0 1			CAS#	7440-22-4	70.05	0000
Second Quarter 2010	U	0.6 J	U	U	U	2	78.25	6020
Fourth Quarter 2010	U	U	U	U	U	2	78.25	6020
hallium					CAS#	7440-28-0		
Second Quarter 2010	U	U	U	U	U	1	-	6020
<u> </u>					CAS#	7440-31-5		
Second Quarter 2010	U	U	U	U	U	15	-	6010
/anadium					CAS#	7440-62-2		
Second Quarter 2010	U	U	U	U	U	10	109.55	6020
Fourth Quarter 2010	U	U	U	U	U	10	109.55	6020
linc	-				CAS#			
Second Quarter 2010	U	44.1	U	4 J	11.2	10	4695	6020
Fourth Quarter 2010	U	68.7	15	U	U	10	4695	6020
Sulfide					CAS#			
Second Quarter 2010	U	U	U	U	U	3000	-	9034
Cyanide						57-12-5		
Second Quarter 2010	U	U	U	U	U	20	-	9012
cenaphthene					CAS#	83-32-9		
Second Quarter 2010	U	U	U	U	U	10	-	82700



Upgradient well = 16C1

Analtye/Ouarter	16C1	16MW8	16MW9	16WC1A	16WC1B	OL	GPS	Method
Acenaphthylene					CAS#	208-96-8		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Acetone					CAS#	67-64-1		
Second Quarter 2010	U	U	U	U	U	10	223.57	8260B
Acetonitrile					CAS#	75-05-8		
Second Quarter 2010	U	U	U	U	U	100	-	8260B
Acetophenone					CAS#	98-86-2		
Second Quarter 2010	U	U	U	U	U U	10	_	8270C
	-				CAS#	53-96-3		
2-Acetylaminofluorene Second Quarter 2010	U	U	U	U	U U	10	_	8270C
	0		0					02700
A <u>crolein</u>					CAS#	107-02-8		00000
Second Quarter 2010	UJ	U J	U J	U J	U J	25	-	8260B
Acrylonitrile					CAS#	107-13-1		
Second Quarter 2010	U	U	U	U	U	10	-	8260B
Aldrin					CAS#	309-00-2		
Second Quarter 2010	U	U	U	U	U	0.05	-	8081A
Allyl chloride					CAS#	107-05-1		
Second Quarter 2010	U	U	U	U	U	10	-	8260B
4-Aminobiphenyl					CAS#	92-67-1		
Second Quarter 2010	U	U	U	U	U CAS#	10	-	8270C
	-					62-53-3		
Aniline Second Quarter 2010	U J	U J	U J	U J	CAS#	10		8270C
	0 0	0 0	0 0	0 0				02700
Anthracene					CAS#	120-12-7		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Aramite					CAS#	140-57-8		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Benzene					CAS#	71-43-2		
Second Quarter 2010	0.22 J	U	U	U	U	1	-	8260B
Benzo[a]anthracene					CAS#	56-55-3		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Benzo[b]fluoranthene					CAS#	205-99-2		
Second Quarter 2010	U	U	U	U	U U	10	_	8270C
						207-08-9		02,00
Benzo[k]fluoranthene Second Quarter 2010	U	U	U	U	CAS#	10	-	8270C
	U	<u> </u>	U				-	02/00
Benzo[ghi]perylene					CAS#	191-24-2		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Benzo(a)pyrene					CAS#	50-32-8		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
1,4-Benzenediamine					CAS#	106-50-3		
Second Quarter 2010	U J	UJ	U J	UJ	U J	50	-	8270C
Benzyl alcohol					CAS#	100-51-6		
Second Quarter 2010	U J	U J	U J	U J	U J	10	-	8270C
alpha-BHC Second Quarter 2010	U	U	U	U	CAS#	<i>319-84-6</i> 0.05	_	8081A
	<u> </u>	U	U	<u> </u>			-	0001A
beta-BHC			- 11		CAS#	319-85-7		
Second Quarter 2010	U	U	U	U	U	0.05	-	8081A
delta-BHC					CAS#	319-86-8		
Second Quarter 2010	UJ	UJ	UJ	U J	U J	0.05	-	8081A
gamma-BHC	-				CAS#	58-89-9		
Second Quarter 2010	U	U	U	U	U	0.05	-	8081A
bis(2-Chloroethoxy)methane					CAS#	111-91-1		
Second Quarter 2010	U	U	U	U	U	5	-	8270C
					CAC#	111-44-4		
bis(2-Chloroethyl)ether Second Quarter 2010	U	U	U	U	U CAS#	5	_	8270C
							_	02700
bis(2-Chloro-1-methylethyl)eth					CAS#	108-60-1		00700
Second Quarter 2010	U	U	U	U	U	10	-	8270C

Upgradient well = 16C1

Analtye/Ouarter	16C1	16MW8	16MW9	16WC1A	16WC1B		GPS	Method
is(2-Ethylhexyl)phthalate						117-81-7		
Second Quarter 2010	U	U	U	U	U	10	10	8270
romobenzene					CAS#	108-86-1		
Second Quarter 2010	U	U	U	U	U	1	-	8260
romochloromethane					CAS#	74-97-5		
Second Quarter 2010	U	U	U	U	U CAS#	1		8260
	U	<u> </u>	U					0200
Bromodichloromethane					CAS#			
Second Quarter 2010	U	U	U	U	U	1	-	8260
Bromoform					CAS#	75-25-2		
Second Quarter 2010	U	U	U	U	U	1	-	8260
-Bromophenyl phenyl ether					CAS#	101-55-3		
Second Quarter 2010	U	U	U	U	U	10	_	8270
2-Butanone						78-93-3	201.00	2000
Second Quarter 2010	U	U	U	U	U	10	691.08	8260
Fourth Quarter 2010	U	U	U	U	U	10	691.08	8260
-Butyl alcohol					CAS#	71-36-3		
Second Quarter 2010	U	U	U	U	U U	50	-	8260
ert-Butyl alcohol	- 11	- 11	- 11	- 11	CAS#			0000
Second Quarter 2010	U	U	U	U	U	200	-	8260
-Butylbenzene					CAS#	104-51-8		
Second Quarter 2010	U	U	U	U	U	1	-	8260
ec-Butylbenzene					CAS#	135-98-8		
Second Quarter 2010	U	U	U	U	U	1	-	8260
ert-Butylbenzene					CAS#			2000
Second Quarter 2010	U	U	U	U	U	1	-	8260
Butyl benzyl phthalate					CAS#	85-68-7		
Second Quarter 2010	U	U	U	U	U	10	-	8270
Carbon disulfide					CAS#	75-15-0		
Second Quarter 2010	U	U	U	U	U	10	_	8260
Carbon tetrachloride						56-23-5		0000
Second Quarter 2010	U	U	U	U	U	1	5	8260
Fourth Quarter 2010	U	U	U	U	U	1	5	8260
Chlordane					CAS#	57-74-9		
Second Quarter 2010	U	U	U	U	U	0.86	-	8081
					G+6 #	106-47-8		
-Chloroaniline Second Quarter 2010		- 11	U					0070
Second Quarter 2010	U	U	U	U	U	10	-	8270
Chlorobenzene					CAS#	108-90-7		
Second Quarter 2010	U	U	U	U	U	1	-	8260
Chlorobenzilate					CAS#	510-15-6		
Second Quarter 2010	U	U	U	U	U U	10	-	8270
								0270
-Chloro-m-cresol						59-50-7		
Second Quarter 2010	U	U	U	U	U	10	-	8270
Chloroethane					CAS#	75-00-3		
Second Quarter 2010	5.2	U	3.6	0.16 J	U	1	-	8260
Fourth Quarter 2010	4.9	U	2.7	U	U	1		8260
	4.5	U	۷.1	U			-	8260
Chloroform					CAS#	67-66-3		
Second Quarter 2010	U	U	U	U	U	1	80	8260
-Chloroethyl vinyl ether					CAS#	110-75-8		
Second Quarter 2010	U J	U J	U J	UJ	U J	20	-	8260
						91-58-7		
-Chloronaphthalene	- 11	- 11	- 11	- 11	CAS#			0070
Second Quarter 2010	U	U	U	U	U	10	-	8270
-Chlorophenol					CAS#	95-57-8		
Second Quarter 2010	U	U	U	U	U	10	-	8270
-Chlorophenyl phenyl ether					CAS#	7005-72-3		
Second Quarter 2010	U	U	U	U	U U	10	_	8270
	J	J	J	J			-	02/0
Chloroprene					CAS#	126-99-8		
Second Quarter 2010	U	U	U	U	U	10		8260



Upgradient well = 16C1

2-Chlorotoluene Second Quarter 2010 4-Chlorotoluene		16MW8	16MW9	16WC1A	16WC1B	OL	GPS	Method
					CAS#	95-49-8		
I-Chlorotoluene	U	U	U	U	U	1	-	8260E
					CAS#	106-43-4		
Second Quarter 2010	U	U	U	U	U	1	-	8260E
					G+C #	218-01-9		
Chrysene Second Quarter 2010	U	U	U	U	U CAS#	10		82700
		U	U			10	-	02/00
Cyclohexane					CAS#			
Second Quarter 2010	U	U	U	U	U	1	-	8260E
2,4-Dichlorophenoxyacetic ac	id				CAS#	94-75-7		
Second Quarter 2010	U	U	U	U	U	5	-	8151 <i>A</i>
4,4'-DDD					CAS#	72-54-8		
Second Quarter 2010	U	U	U	U	U	0.1	-	8081 <i>A</i>
4,4'-DDE					CAS#	72-55-9		
Second Quarter 2010	U	U	U	U	U U	0.1	-	8081 <i>A</i>
								00017
4,4'-DDT						50-29-3		
Second Quarter 2010	U	U	U	U	U	0.1	-	8081A
Diallate						2303-16-4		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Dibenz(a,h)anthracene					CAS#	53-70-3		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Dibenzofuran					CAS#	132-64-9		
Second Quarter 2010	U	U	U	U	U U	10	_	8270C
								02700
Dibromochloromethane					CAS#			00000
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,2-Dibromo-3-chloropropane)				CAS#	96-12-8		
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,2-Dibromoethane					CAS#	106-93-4		
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Di-n-butyl phthalate					CAS#	84-74-2		
Second Quarter 2010	U	U	U	U	U U	10	_	8270C
								02700
1,2-Dichlorobenzene					CAS#			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,3-Dichlorobenzene						541-73-1		
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,4-Dichlorobenzene					CAS#	106-46-7		
Second Quarter 2010	U	U	U	U	U	1	-	8260B
3,3'-Dichlorobenzidine					CAS#	91-94-1		
Second Quarter 2010	U	U	U	U	U U	10		8270C
								02700
trans-1,4-Dichloro-2-butene						110-57-6		00000
Second Quarter 2010	U	U	U	U	U	10	-	8260B
Dichlorodifluoromethane					CAS#	75-71-8		
Second Quarter 2010	0.49 J	U	U	U	U	1	46.5	8260B
Fourth Quarter 2010	UJ	UJ	UJ	UJ	U J	1	46.5	8260B
1,1-Dichloroethane					CAS#			
Second Quarter 2010	7.7	U	10	0.48 J	U CAS#	1	296.08	8260B
2230114 QUALIOI £010								
	8.5	U	8.6	1.4	U	1	296.08	8260B
Fourth Quarter 2010					CAS#			
Fourth Quarter 2010			U	U	U	1	5	
Fourth Quarter 2010	U	U	U		•	•	3	8260B
Fourth Quarter 2010 1,2-Dichloroethane Second Quarter 2010	U	U	U		CAS#	75-35-4	5	8260B
Fourth Quarter 2010 1,2-Dichloroethane Second Quarter 2010	U 0.32 J	U	U	U			-	
Fourth Quarter 2010 1,2-Dichloroethane Second Quarter 2010 1,1-Dichloroethene Second Quarter 2010				U	CAS#	<i>75-35-4</i>		
Fourth Quarter 2010 1,2-Dichloroethane Second Quarter 2010 1,1-Dichloroethene Second Quarter 2010 trans-1,2-Dichloroethene	0.32 J	U	U		CAS#	75-35-4 1 156-60-5		8260B
Fourth Quarter 2010 1,2-Dichloroethane Second Quarter 2010 1,1-Dichloroethene Second Quarter 2010 trans-1,2-Dichloroethene Second Quarter 2010				U	CAS# U CAS# U	75-35-4 1 156-60-5		8260B
Fourth Quarter 2010 1,2-Dichloroethane Second Quarter 2010 1,1-Dichloroethene Second Quarter 2010 trans-1,2-Dichloroethene Second Quarter 2010 2,4-Dichlorophenol	0.32 J U	U	U	U	CAS # U CAS # U CAS #	75-35-4 1 156-60-5 1 120-83-2		8260B 8260B
Fourth Quarter 2010 1,2-Dichloroethane Second Quarter 2010 1,1-Dichloroethene Second Quarter 2010 trans-1,2-Dichloroethene Second Quarter 2010	0.32 J	U	U		CAS# U CAS# U	75-35-4 1 156-60-5		8260B 8260B
1,2-Dichloroethane Second Quarter 2010 1,1-Dichloroethene Second Quarter 2010 trans-1,2-Dichloroethene Second Quarter 2010 2,4-Dichlorophenol	0.32 J U	U	U	U	CAS # U CAS # U CAS #	75-35-4 1 156-60-5 1 120-83-2	-	8260B 8260B 8260B 8270C



Upgradient well = 16C1

1. 10	1401	1616000	1 < 1 (1111)	1 awat i	1 CWC1D	0.7	ana	14.4.1
Analtye/Quarter	16C1	16MW8	16MW9	16WC1A	16WC1B	<i>OL</i>	GPS	Method
1,2-Dichloropropane Second Quarter 2010	U	U	U	U	CAS#	<i>78-87-5</i>		8260E
	U	U	U	0		-	-	02000
1,3-Dichloropropane					CAS#	142-28-9		2222
Second Quarter 2010	U	U	U	U	U	1	-	8260E
2,2-Dichloropropane					CAS#	594-20-7		
Second Quarter 2010	U	U	U	U	U	1	-	8260E
1,1-Dichloropropene					CAS#	563-58-6		
Second Quarter 2010	U	U	U	U	U	1	-	82601
cis-1,3-Dichloropropene					CAS#	10061-01-5		
Second Quarter 2010	U	U	U	U	U	1	-	82601
					CAS#	10061-02-6		
rans-1,3-Dichloropropene Second Quarter 2010	U	U	U	U	CAS#	1		82601
								02001
Dieldrin					CAS#	60-57-1		
Second Quarter 2010	U	U	U	U	U	0.1	-	8081
Diethyl ether					CAS#	60-29-7		
Second Quarter 2010	22.8 J	UJ	26.2	UJ	U J	12.5	-	8260E
Fourth Quarter 2010	33	U	28	U	U	12.5	-	8260E
						84-66-2		
Diethyl phthalate Second Quarter 2010	U	U	U	U	CAS#	10	12,520	82700
	U	U	U	0			12,320	02/00
O,O-Diethyl O-2-pyrazinyl					CAS#	297-97-2		
Second Quarter 2010	U	U	U	U	U	10	-	82700
Dimethoate					CAS#	60-51-5		
Second Quarter 2010	U	U	U	U	U	10	-	82700
Dimethyl ether					CAS#	115-10-6		
Second Quarter 2010	7.7 J	U	12.6	0.46 J	0.35 J	12.5	-	8260E
Fourth Quarter 2010	U	U	U	U	U	12.5	_	82601
								02001
o-(Dimethylamino)azobenzene					CAS#	60-11-7		
Second Quarter 2010	U	U	U	U	U	10	-	82700
7,12-Dimethylbenz[a]anthracer	ne				CAS#	57-97-6		
Second Quarter 2010	U	U	U	U	U	10	-	82700
3,3'-Dimethylbenzidine					CAS#	119-93-7		
Second Quarter 2010	U	U	U	U	U	10	-	82700
a,a-Dimethylphenethylamine					CAS#	122-09-8		
Second Quarter 2010	U J	UJ	U J	U J	U J	50	_	82700
								02700
2,4-Dimethylphenol					CAS#	105-67-9		
Second Quarter 2010	U	U	U	U	U	10	-	82700
Dimethyl phthalate					CAS#	131-11-3		
Second Quarter 2010	U	U	U	U	U	10	-	82700
m-Dinitrobenzene					CAS#	99-65-0		
Second Quarter 2010	U	U	U	U	U	10	-	82700
					CAS#	534-52-1		
1,6-Dinitro-o-cresol Second Quarter 2010	U	U	U	U	U U	10	_	82700
								02700
2,4-Dinitrophenol					CAS#	51-28-5		
Second Quarter 2010	U J	UJ	UJ	U J	U J	10	-	82700
2,4-Dinitrotoluene					CAS#	121-14-2		
Second Quarter 2010	U	U	U	U	U	10	31.3	82700
Fourth Quarter 2010	U	U	U	U	U J	10	31.3	82700
2,6-Dinitrotoluene					CAS#	606-20-2		
Second Quarter 2010	U	U	U	U	U CAS#	10	15.65	82700
Fourth Quarter 2010	U	U	U	U	U J	10	15.65	82700
Dinoseb					CAS#	88-85-7		
Second Quarter 2010	U	U	U	U	U	2.5	-	8151/
Di-n-octyl phthalate					CAS#	117-84-0		
Second Quarter 2010	U	U	U	U	U	10	-	82700
					CAS#	123-91-1		
1,4-Dioxane Second Quarter 2010	U	U	U	U	U CAS#	200		8260E
Gecond Quarter 2010	U	J	U	J	U	200	-	02005



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		1						
Analtye/Ouarter	16C1	16MW8	16MW9	16WC1A	16WC1B		GPS	Method
Diphenylamine					CAS#	122-39-4		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Disulfoton					CAS#	298-04-4		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Endosulfan I					CAS#	959-98-8		
Second Quarter 2010	U	U	U	U	U	0.05	_	8081A
Endosulfan II					CAS#	33213-65-9		
Second Quarter 2010	U	U	U	U	U	0.1	-	8081A
Endosulfan sulfate					CAS#	1031-07-8		
Second Quarter 2010	UJ	UJ	UJ	U J	U J	0.1	-	8081A
Endrin					CAS#	72-20-8		
Second Quarter 2010	U	U	U	U	U	0.1	-	8081A
						141-78-6		
Ethyl acetate	- 11	U	U	U	CAS#			2000
Second Quarter 2010	U	U	U	U	U	10		8260B
Endrin aldehyde					CAS#	7421-93-4		
Second Quarter 2010	UJ	UJ	UJ	UJ	U J	0.1	-	8081A
Ethanol					CAS#	64-17-5		
Second Quarter 2010	U J	U J	U J	U J	U J	250	-	8260B
					CAS#	100-41-4		
Ethylbenzene Second Quarter 2010	U	U	U	U	U CAS#	100-41-4	70	ggenD
								8260B
Fourth Quarter 2010	U	U	U	U	U	1	70	8260B
Ethyl methacrylate					CAS#	97-63-2		
Second Quarter 2010	U	U	U	U	U	10	-	8260B
Ethyl methanesulfonate					CAS#	62-50-0		
Second Quarter 2010	U	U	U	U	U U	10		8270C
Ethylene oxide					CAS#	75-21-8		
Second Quarter 2010	U J	U J	UJ	U J	U J	100	-	8260B
Famphur					CAS#	52-85-7		_
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Fluoranthene					CAS#	206-44-0		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
					- C+C //			
Fluorene	U	U	U	U	CAS#	10	-	00700
Second Quarter 2010	U	U	U	0	0		-	8270C
Heptachlor					CAS#	76-44-8		
Second Quarter 2010	U	U	U	U	U	0.05	-	8081A
Heptachlor epoxide					CAS#	1024-57-3		
Second Quarter 2010	U	U	U	U	U	0.05	-	8081A
Hexachlorobenzene					CAS#	118-74-1		
Second Quarter 2010	U	U	U	U	U U	10	_	8270C
								02700
Hexachlorobutadiene						87-68-3		
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Hexachlorocyclopentadiene					CAS#	77-47-4		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Hexachloroethane					CAS#	67-72-1		
Second Quarter 2010	U	U	U	U	U U	10	-	8260B
								32000
Hexachlorophene				11 :	CAS#	70-30-4		
Second Quarter 2010	UJ	UJ	UJ	U J	U J	40	-	8270C
Hexachloropropene					CAS#	1888-71-7		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
2-Hexanone					CAS#	591-78-6		
Second Quarter 2010	U	U	U	U	U	10	-	8260B
		-	=	-				
Indeno[1,2,3-cd]pyrene					CAS#	193-39-5		00700
Second Quarter 2010	U	U	U	U	U	5	-	8270C
Isobutyl alcohol					CAS#	78-83-1		
Second Quarter 2010	U	U	U	U	U	200	-	8260B
Isodrin					CAS#	465-73-6		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
	-	-	-	-	-	-		



 $Upgradient \ well = 16C1$

Analtye/Ouarter	16C1	16MW8	16MW9	16WC1A	16WC1B	OL	GPS	Method
sophorone					CAS#	78-59-1		
Second Quarter 2010	U	U	U	U	U	10	-	82700
sopropylbenzene					CAS#	98-82-8		
Second Quarter 2010	U	U	U	U	U U	1	-	82601
	-	-	-	-				
Second Quarter 2010	11	- 11			CAS#	108-20-3		0000
Second Quarter 2010	U	U	U	U	U	10	-	8260
-Isopropyltoluene					CAS#	99-87-6		
Second Quarter 2010	U	U	U	U	U	1	-	8260
sosafrole					CAS#	120-58-1		
Second Quarter 2010	U	U	U	U	U	10	-	8270
(epone					CAS#	143-50-0		
Second Quarter 2010	UJ	UJ	U J	U J	U J	10		8270
	0 0	0 0	0 0	0 0				0270
lethacrylonitrile					CAS#	126-98-7		
Second Quarter 2010	U	U	U	U	U	100	-	8260
lethapyrilene					CAS#	91-80-5		
Second Quarter 2010	U	U	U	U	U	10	-	8270
lethoxychlor					C10#	72-43-5		
Second Quarter 2010	U	U	U	U	U	0.5		8081
	J	U	U	U			-	0001
Bromomethane					CAS#			
Second Quarter 2010	U	U	U	U	U	1	-	8260
hloromethane					CAS#	74-87-3		
Second Quarter 2010	U	U	U	U	U	1	2.11	8260
Fourth Quarter 2010	U	U	U	U	U	1	2.11	8260
	U	U	-	J			4.11	0200
-Methylcholanthrene						56-49-5		
Second Quarter 2010	U	U	U	U	U	10	-	8270
odomethane					CAS#	74-88-4		
Second Quarter 2010	U	U	U	U	U	10	-	8260
lethyl methacrylate					CAS#	80-62-6		
Second Quarter 2010	U	U	U	U	U CAS#	10	_	8260
							-	0200
lethyl methane sulfonate					CAS#	66-27-3		
Second Quarter 2010	U	U	U	U	U	10	-	8270
-Methylnaphthalene					CAS#	91-57-6		
Second Quarter 2010	U	U	U	U	U	10	-	8270
lethyl parathion					CAS#	298-00-0		
Second Quarter 2010	U	U	U	U	U CAS#	10	_	8270
		<u> </u>						32,0
-Methyl-2-pentanone					CAS#			
Second Quarter 2010	U	U	U	U	U	10	-	8260
-Methylphenol					CAS#	95-48-7		
Second Quarter 2010	U	U	U	U	U	10	-	8270
& 4-Methylphenol					CAS#	m 108-39-4	p 106-44-5	
Second Quarter 2010	U	U	U	U	U CAS#	20	-	8270
							-	0270
lethyl tert-butyl ether					CAS#	1634-04-4		
Second Quarter 2010	U	U	U	U	U	10	<u> </u>	8260
					CAS#	74-95-3		
ibromomethane			U	U	U	1	-	8260
Second Quarter 2010	U	U	U		0			
Second Quarter 2010	U	U				75-09-2		
Second Quarter 2010 lethylene chloride				П	CAS#	75-09-2		8260
Second Quarter 2010 lethylene chloride Second Quarter 2010	4.9	U	U	U	CAS#	1	-	
Second Quarter 2010 ethylene chloride				U U	CAS#		-	
Second Quarter 2010 lethylene chloride Second Quarter 2010 Fourth Quarter 2010	4.9	U	U		CAS#	1	-	
Second Quarter 2010 lethylene chloride Second Quarter 2010 Fourth Quarter 2010	4.9	U	U		CAS# U	1 1	-	8260
Second Quarter 2010 lethylene chloride Second Quarter 2010 Fourth Quarter 2010 laphthalene Second Quarter 2010	4.9 5.5	U U	U	U	CAS# U U CAS#	1 1 91-20-3 1	-	8260
Methylene chloride Second Quarter 2010 Fourth Quarter 2010 Maphthalene Second Quarter 2010 A-Naphthoquinone	4.9 5.5 U	U U	U U	U	CAS # U U CAS # U CAS #	1 1 91-20-3 1 130-15-4	-	8260 8260
Second Quarter 2010 flethylene chloride Second Quarter 2010 Fourth Quarter 2010 laphthalene Second Quarter 2010 ,4-Naphthoquinone Second Quarter 2010	4.9 5.5	U U	U	U	CAS# U U CAS#	1 1 91-20-3 1 130-15-4	-	8260 8260
Second Quarter 2010 lethylene chloride Second Quarter 2010 Fourth Quarter 2010 laphthalene Second Quarter 2010 .4-Naphthoquinone Second Quarter 2010	4.9 5.5 U	U U U	U U U	U U	CAS # U	1 1 91-20-3 1 130-15-4	-	8260 8260
Second Quarter 2010 Iethylene chloride Second Quarter 2010 Fourth Quarter 2010 Iaphthalene Second Quarter 2010 ,4-Naphthoquinone	4.9 5.5 U	U U	U U	U	CAS# U U CAS# U CAS# U	1 1 91-20-3 1 130-15-4	-	82601 82601 82601 82700
Second Quarter 2010 lethylene chloride Second Quarter 2010 Fourth Quarter 2010 laphthalene Second Quarter 2010 4-Naphthoquinone Second Quarter 2010 -Naphthylamine	4.9 5.5 U	U U U	U U U	U U	CAS # U	1 1 91-20-3 1 130-15-4 10 134-32-7	-	8260 8260 8270



Upgradient well = 16C1

Analtye/Ouarter	16C1	16MW8	16MW9	16WC1A	16WC1B		GPS	Method
o-Nitroaniline						88-74-4		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
m-Nitroaniline					CAS#	99-09-2		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
p-Nitroaniline					CAS#	100-01-6		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Nitrobenzene					CAS#	98-95-3		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
o-Nitrophenol					CAS#	88-75-5		
Second Quarter 2010	U	U	U	U	U U	10		8270C
						100-02-7		02700
p-Nitrophenol Second Quarter 2010	U		U	U	CAS#			00700
	U	U	U	U	U	10	-	8270C
4-Nitroquinoline-1-oxide					CAS#	56-57-5		
Second Quarter 2010	U	U	U	U	U	50	-	8270C
N-Nitrosodi-n-butylamine					CAS#	924-16-3		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
N-Nitrosodiethylamine					CAS#	55-18-5		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
N-Nitrosodimethylamine					CAS#	62-75-9		
Second Quarter 2010	U J	UJ	U J	U J	U J	10		8270C
								02700
N-Nitrosodiphenylamine					CAS#	86-30-6		20720
Second Quarter 2010	U	U	U	U	U	10	-	8270C
N-Nitrosodipropylamine					CAS#	621-64-7		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
N-Nitrosomethylethylamine					CAS#	10595-95-6		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
N-Nitrosomorpholine					CAS#	59-89-2		
Second Quarter 2010	U	U	U	U	U U	10	-	8270C
N-Nitrosopiperidine					CAS#	100-75-4		
Second Quarter 2010	U	U	U	U	U CAS#	10	_	8270C
								02700
N-Nitrosopyrrolidine					CAS#	930-55-2		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
5-Nitroso-o-toluidine					CAS#	99-55-8		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Parathion					CAS#	56-38-2		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Pentachlorobenzene					CAS#	608-93-5		
Second Quarter 2010	U	U	U	U	U	10	_	8270C
					CAC#	76-01-7		
Pentachloroethane Second Quarter 2010	U	U	U	U	CAS#	10		8260B
				<u> </u>				0200B
Pentachloronitrobenzene					CAS#			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
P <u>entachlorophenol</u>					CAS#	87-86-5		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Phenacetin					CAS#	62-44-2		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Phenanthrene					CAS#	85-01-8		
Second Quarter 2010	U	U	U	U	U U	10	_	8270C
								02,00
Phenol Second Quarter 2010	11		11	11		108-95-2		00700
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Total Recoverable Phenolics						C-020		
Second Quarter 2010	U	U	U	U	U	50	-	9066
Phorate					CAS#	298-02-2		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
2-Picoline					CAS#	931-19-1		
Second Quarter 2010	U	U	U	U	U CAS#	10	_	8270C
COOMIG QUARTER ZUTU	5	J	5	3	3	10		32700

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Analtye/Ouarter	16C1	16MW8	16MW9	16WC1A	16WC1B		GPS	Method
Pronamide						23950-58-5		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
1-Propanol					CAS#	71-23-8		
Second Quarter 2010	UJ	U J	UJ	U J	U J	100	-	8260B
2-Propanol					CAS#	67-63-0		
Second Quarter 2010	U	U	U	U	U	100	-	8260B
Propionitrile					CAS#	107-12-0		
Second Quarter 2010	U	U	U	U	U	100	-	8260B
n-Propylbenzene					CAS#	103-65-1		
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Pyrene					CAS#	129-00-0		
Second Quarter 2010	U	U	U	U	U CAS#	10	_	8270C
								02700
Pyridine	11 1	11 1	11 1		CAS#	110-86-1		00700
Second Quarter 2010	UJ	UJ	UJ	U J	U J	10		8270C
Safrole					CAS#			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Silvex					CAS#	93-72-1		
Second Quarter 2010	U	U	U	U	U	2.5	-	8151A
Styrene					CAS#	100-42-5		
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Sulfotep					CAS#	3689-24-5		
Second Quarter 2010	UJ	UJ	UJ	U J	U J	5	-	8270C
					CAS#			
2,4,5-Trichlorophenoxyacetic Second Quarter 2010	U	U	U	U	U CAS#	2.5		8151A
								0131A
1,2,4,5-Tetrachlorobenzene	- 11				CAS#	95-94-3		00700
Second Quarter 2010	U	U	U	U	U	10	-	8270C
1,1,1,2-Tetrachloroethane					CAS#			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,1,2,2-Tetrachloroethane					CAS#	79-34-5		
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Tetrachloroethene					CAS#	127-18-4		
Second Quarter 2010	0.40 J	U	U	U	U	1	5	8260B
Fourth Quarter 2010	U	U	U	U	U	1	5	8260B
		*		-		109-99-9		
Tetrahydrofuran Second Quarter 2010	13.7 J	U	U	U	U CAS#	25	-	8260B
	13.7 J	0	U	U			-	02000
2,3,4,6-Tetrachlorophenol					CAS#			
Second Quarter 2010	U	U	U	U	U	10	-	8270C
Toluene					CAS#	108-88-3		
Second Quarter 2010	U	U	U	U	U	1	1000	8260B
Fourth Quarter 2010	U	U	U	U	U	1	1000	8260B
o-Toluidine					CAS#	95-53-4		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
					G+G#			
Toxaphene Second Quarter 2010	U	U	U	U	CAS#	2.5		8081A
	U	U	U	U			-	0001A
1,2,3-Trichlorobenzene					CAS#			
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,2,4-Trichlorobenzene					CAS#	120-82-1		
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,1,1-Trichloroethane					CAS#	71-55-6		
Second Quarter 2010	0.79 J	U	U	U	U	1	200	8260B
Fourth Quarter 2010	U	U	U	U	U	1	200	8260B
		-	-					-22000
1,1,2-Trichloroethane Second Quarter 2010	U	U	U	U	CAS#	79-00-5 1	_	8260B
	U	U	J	J				o∠00B
Trichloroethene					CAS#			
Second Quarter 2010	0.23 J	U	U	U	U	1	5	8260B
Fourth Quarter 2010	U	U	U	U	U	1	5	8260B



Upgradient well = 16C1

Analtye/Ouarter	16C1	16MW8	16MW9	16WC1A	16WC1B	OL	GPS	Method
Trichlorofluoromethane					CAS#	75-69-4		
Second Quarter 2010	U	U	U	U	U	1	469.5	8260B
Fourth Quarter 2010	U	U	U	U	U	1	469.5	8260B
2,4,5-Trichlorophenol					CAS#	95-95-4		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
2,4,6-Trichlorophenol					CAS# 8	88-06-2		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
1,2,3-Trichloropropane					CAS#	96-18-4		
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,1,2-Trichloro-1,2,2-Trifluor	oethane				CAS#	76-13-1		
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Fourth Quarter 2010	U	U	U	U	U	1	-	8260B
O,O,O-Triethyl phosphorothi	oate				CAS#	126-68-1		
Second Quarter 2010	U	U	U	U	U	10	-	8270C
1,2,4-Trimethylbenzene					CAS#	95-63-6		
Second Quarter 2010	U	U	U	U	U	1	-	8260B
1,3,5-Trimethylbenzene					CAS#	108-67-8		
Second Quarter 2010	U	U	U	U	U	1	-	8260B
sym-Trinitrobenzene					CAS#	99-35-4		
Second Quarter 2010	UJ	UJ	UJ	U J	U J	10	-	8270C
Vinyl acetate					CAS#	108-05-4		
Second Quarter 2010	U	U	U	U	U	10	-	8260B
Vinyl chloride					CAS#	75-01-4		
Second Quarter 2010	U	U	U	U	U	1	-	8260B
Xylenes (Total)					CAS#	1330-20-7		
Second Quarter 2010	U	U	U	U	U	3	10000	8260B
Fourth Quarter 2010	U	U	U	U	U	3	10000	8260E

 $Upgradient \ well = 16C1 \qquad \qquad All \ Results \ in \ ug/L.$

Analtve/Ouarter 16C1 16MW8 16MW9 16WC1A 16WC1B OL GPS Method

Definitions:

The following definitions apply to results reported for Appendix IX monitoring events.

All Appendix IX monitoring results for compliance wells are reported to the detection limit.

Appendix IX Monitoring Events: 3Q2003, 2Q-2004, 2Q-2005, 3Q2006, 2Q2007, 2Q2008, 2Q2009, 2Q 2010

QL Denotes permit required quantitation limit.

U denotes not detected at or above the detection limit.

UA denotes not detected at or above the adjusted detection limit.

J Denotes result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above the detection limit and detection limit and QL are estimated. When used with "UA" (i.e., "UAJ"), denotes analyte not detected at or above adjusted detection limit and adjusted detection limit and QL are estimated.

UN Denotes analyte concentration is less than the quantitation limit and/or five times the blank concentration. Not reliably detected due to blank contamination. This qualifier used only for Appendix IX monitoring event when compliance well results are reported to at or above the project detection limit.

R Denotes result rejected.

Q Denotes data validation qualifier. X Denotes mass spectral confirmation not obtained-result suspect.

Background Denotes background concentrations listed in Appendix F to Attachment 5 in the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5, 7, 10, and 16 (October 4, 2002), where applicable. CAS# Denotes Chemical Abstract Services registration number.

GPS Denotes Groundwater Protection Standards listed in Appendix G to Attachment 5 in the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5, 7, 10, and 16 (October 4, 2002).

NS denotes not sampled. NA denotes not analyzed.

"-" denotes not detected (pre-2nd Quarter 2003) or not available / not sampled (beginning 2nd Quarter 2003).

The following definitions apply to results reported for non-Appendix IX monitoring events. All non-Appendix IX monitoring results for compliance wells are reported at or above the quantitation limit.

QL Denotes permit required quantitation limit.

U Denotes analyte not detected at or above QL.

UA Denotes analyte not detected at or above adjusted sample QL.

J Denotes result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above QL and QL is estimated. When used with "UA" (i.e., "UAJ"), denotes analyte not detected at or above adjusted QL and adjusted QL is estimated.

R Denotes result rejected.

Q Denotes data validation qualifier.

Background Denotes background concentrations listed in Appendix F to Attachment 5 in the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5, 7, 10, and 16 (October 4, 2002), where applicable. **CAS#** Denotes Chemical Abstract Services registration number.

GPS Denotes Groundwater Protection Standards listed in Appendix G to Attachment 5 in the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5, 7, 10, and 16 (October 4, 2002).

NOTE:

Fourth Quarter 2008:

Due to laboratory error all HWMU 16 samples were analyzed using Method 8260B 5 ml purge instead of a 25 ml purge which resulted in a higher QL. For these samples, all results were evaluated to the detection limit, which is comparable to the permit QL. Results below the laboratory QL but at or above the permit QL are reported and qualified as estimated. Second Quarter 2009:

Verification event 6/11/2009 - 16MW8 for acetone. Verification result reported as not detected. 4/ 2010 event -Per DEQ, tin analyzed by Method 6010B instead of Method 6020. Verification event: 16MW9 1,1-dichloroethene and benzene. 16WC1B 4,4-DDD. Verification result reported as not detected.



Comprehensive Data Validation Report



Sample/Blind Field Duplicate Results Greater Than the Quantitation Limit

Facility: HWMU-16 Monitoring Event: Second Quarter 2010

	L	aboratory.	Validate Resul		QL	
Analyte	Sample ID	(ug/L) Q	(ug/L) Q	(ug/L)	Validation Notes
Method: 6020						
Laboratory: CompuCh	em, Cary, NC					
Barium	16WC1A	208	208	J	10	Serial dilution result > 10 % difference (11%). Result is estimated.
	16WDUP	210	210	J	10	Serial dilution result > 10 % difference (11%). Result is estimated. Field duplicate for 16WC1A. RPD <10.
Cobalt	16WC1A	9	9		5	No action taken.
	16WDUP	7.6	7.6		5	No action taken. Field duplicate for 16WC1A. RPD <20.

Definitions:

Data Validation Qualifiers:

QL Denotes permit quantitation limit. Q Denotes data qualifier.

J Denotes analyte reported at or above quantitation limit and associated result is estimated.

Comprehensive Data Validation Report



Sample/Blind Field Duplicate Results Greater Than the Quantitation Limit

Facility: HWMU-16 Monitoring Event: Fourth Quarter 2010

	L	aboratory. Result	Validated Result	QL	
Analyte	Sample ID	(ug/L) Q	(ug/L) Q	(ug/L)	Validation Notes
Method: 6020					
Laboratory: CompuC	hem, a Division of	Liberty Anal	ytical, Cary, NC		
Barium	16WC1A	199	199	10	No action taken. Field duplicate result was 202 ug/l. RPD <10.
	16WDUP	202	202	10	No action taken. Field duplicate of 16WC1A. RPD <10.
Cobalt	16WC1A	5.6	5.6	5	No action taken. Field duplicate result was 5.4 ug/l. RPD <10.
	16WDUP	5.4	5.4	5	No action taken. Field duplicate of 16WC1A. RPD < 10.
Method: 8260B					
Laboratory: Lancaste	er Laboratories, La	ncaster, PA			
1,1-Dichloroethane	16WC1A	1.4	1.4	1	No action taken.
	16WDUP	1.5	1.5	1	No action taken. Field duplicate of 16WC1A, RPD <10.
Definitions: Data Validation Qualifie QL Denotes permit quan		otes data qualit	ìer.		

J Denotes analyte reported at or above quantitation limit and associated result is estimated.

APPENDIX D-3

HWMU-16 2010 LABORATORY ANALYTICAL RESULTS PLUME MONITORING WELLS

Target Analyte Monitoring Results At Or Above Permit Quantitation Limit HWMU-16 Plume Monitoring Wells

Radford Army Ammunition Plant, Radford, Virginia

All Results in ug/L.

Upgradient well = 16C1

Analtye/Quarter	16C1 Q	16-1 Q	16-2 Q	16-3 Q	16-5 Q	16WC2B Q	16SPRING Q	QL	Background	Method
Antimony						CAS # 7440)-36-0			
Second Quarter 2010	U	U	U	U	U	U	U	1	3	6020
Fourth Quarter 2010	U	U	U	U	U	U	U	1	3	6020
Arsenic	CAS #7440-38-2									
Second Quarter 2010	U	U	U	U	U	U	U	10	1	6020
Fourth Quarter 2010	U	U	U	U	U	U	U	10	1	6020
Barium		1		1		CAS # 7440)-39-3			
Second Quarter 2010	148 J	183	238	694	171	113	195	10	175.4	6020
Fourth Quarter 2010	200	195	276	737	182	128	300	10	175.4	6020
Beryllium						CAS # 7440)-41-7			
Second Quarter 2010	U	U	U	U	U	U	U	1	0.7	6020
Fourth Quarter 2010	U	U	U	U	U	U	U	1	0.7	6020
Cadmium						CAS #7440	1-43-9			
Second Quarter 2010	U	U	U	U	U	U U	U	1	0.2	6020
Fourth Quarter 2010	U	U	U	U	U	U	U	1	0.2	6020
Chromium						CAS #7440				
Second Quarter 2010	U	U	U	U	U	U U	U	5	6.2	6020
Fourth Quarter 2010	U	U	U	U	U	U	U	5	6.2	6020
Cobalt						CAS #7440				
Second Quarter 2010	U	U	U	U	U	U U	U	5	5	6020
Fourth Quarter 2010	U	U	U	U	U	U	U	5	5	6020
_	J		ŭ		ŭ			Ū	ŭ	
Copper Second Quarter 2010	U	U	U	U	U	<i>CAS #7440</i>	U	5	13	6020
Fourth Quarter 2010	U	U	U	U	U	U	U	5	13	6020
Lead	J		Ŭ		J			J	10	
Second Quarter 2010	U	U	U	U	U	<i>CAS # 7439</i>	J-92-1 U	1	10	6020
Fourth Quarter 2010	U	U	U	U	U	U	U	1	10	6020
Mercury	Ū		ŭ		ŭ	CAS #7439			10	
Second Quarter 2010	U	U	U	U	U	U U	U	2	0.2	7470A
Fourth Quarter 2010	U	U	U	U	U	U	U	2	0.2	7470A
	U		o o	U	J			_	0.2	74707
Nickel Second Quarter 2010	4 J	U	U	U	U	<i>CAS #7440</i>	0-02-0 U	10	16	6020
Fourth Quarter 2010	4 J U	U	U	U	U	U	U	10	16 16	6020
	U	U	U	U	U			10	16	0020
Selenium Second Quarter 2010	U	U	U	U	U	<i>CAS #7782</i>	2-49-2 U	10	1	6020
	U	U	U	U	U	U	U	10	1	
Fourth Quarter 2010	U	U	U	U	U			10	ı	6020
Silver	1					CAS #7440	1		0.5	
Second Quarter 2010	U	U	U	U	U	U	U	2	0.5	6020
Fourth Quarter 2010	U	U	U	U	U	U	U	2	0.5	6020
Vanadium			1			CAS #7440	1			
Second Quarter 2010	U	U	U	U	U	U	U	10	151	6020
Fourth Quarter 2010	U	U	U	U	U	U	U	10	151	6020
Zinc	П	1		T	II.	CAS #7440		ı	1 1	
Second Quarter 2010	U	U	U	U	U	U	U	10	51	6020
Fourth Quarter 2010	U	U	U	U	U	U	U	10	51	6020
2-Butanone	1				ı	CAS # 78-9		1		
Second Quarter 2010	U	U	U	U	U	U	U	10	1.1	8260B
Fourth Quarter 2010	U	U	U	U	U	U	U	10	1.1	8260B

Target Analyte Monitoring Results At Or Above Permit Quantitation Limit HWMU-16 Plume Monitoring Wells

Radford Army Ammunition Plant, Radford, Virginia

All Results in ug/L.

Upgradient well = 16C1

Analtye/Quarter	16C1 Q	16-1 Q	16-2 Q	16-3 Q	16-5 Q	16WC2B Q	16SPRING Q	QL	Background	Method	
Carbon tetrachlorid	е			CAS #56-2	3-5						
Second Quarter 2010	U	U	U	U	U	U	U	1	0.2	8260B	
Fourth Quarter 2010	U	U	U	U	U	U	U	1	0.2	8260B	
Chloroethane					CAS #75-00-3						
Second Quarter 2010	5.2	U	U	U	U	U	U	1	20.7	8260B	
Fourth Quarter 2010	4.9	U	U	U	U	U	U	1	20.7	8260B	
Dichlorodifluorome	thane					CAS #75-7	1-8				
Second Quarter 2010	0.49 J	U	U	U	U	U	U	1	46.5	8260B	
Fourth Quarter 2010	U J	UJ	U J	UJ	UJ	UJ	U J	1	46.5	8260B	
1,1-Dichloroethane						CAS # 75-3	4-3				
Second Quarter 2010	7.7	U	U	U	U	U	U	1	9.5	8260B	
Fourth Quarter 2010	8.5	U	U	U	U	U	U	1	9.5	8260B	
Diethyl ether			1	1		CAS #60-2	9-7				
Second Quarter 2010	22.8 J	U	U	U	U	UJ	U	12.5	75.5	8260B	
Fourth Quarter 2010	33	U	U	U	U	U	U	12.5	75.5	8260B	
Dimethyl ether	I	l	1	1	l	CAS # 115-	10-6	1	1		
Second Quarter 2010	7.7 J	U	U	U	U	U	U	12.5	17.0	8260B	
Fourth Quarter 2010	U	U	U	U	U	U	U	12.5	17.0	8260B	
2,4-Dinitrotoluene			1	1		CAS # 121-	14-2				
Second Quarter 2010	U	U	U	U	U	U	U	10	0.1	8270C	
Fourth Quarter 2010	U	U	U	U	U	U	U	10	0.1	8270C	
2,6-Dinitrotoluene						CAS #606-	20-2				
Second Quarter 2010	U	U	U	U	U	U	U	10	0.11	8270C	
Fourth Quarter 2010	U	U	U	U	U	U	U	10	0.11	8270C	
Ethylbenzene						CAS # 100-	41-4				
Second Quarter 2010	U	U	U	U	U	U	U	1	0.1	8260B	
Fourth Quarter 2010	U	U	U	U	U	U	U	1	0.1	8260B	
Chloromethane				1		CAS #74-8	7-3				
Second Quarter 2010	U	U	U	U	U	U	U	1	0.3	8260B	
Fourth Quarter 2010	U	U	U	U	U	U	U	1	0.3	8260B	
Methylene chloride						CAS # 75-0	9-2				
Second Quarter 2010	4.9	U	U	U	U	U	U	1	13.95	8260B	
Fourth Quarter 2010	5.5	U	U	U	U	U	U	1	13.95	8260B	
Tetrachloroethene					CAS # 127-	18-4					
Second Quarter 2010	0.40 J	U	U	U	U	U	U	1	0.7	8260B	
Fourth Quarter 2010	U	U	U	U	U	U	U	1	0.7	8260B	
Toluene						CAS # 108-	88-3				
Second Quarter 2010	U	U	U	U	U	U	U	1	0.1	8260B	
Fourth Quarter 2010	U	U	U	U	U	U	U	1	0.1	8260B	
1,1,1-Trichloroethan	ie					CAS #71-5	5-6				
Second Quarter 2010	0.79 J	U	U	U	U	U	U	1	9.2	8260B	
Fourth Quarter 2010	U	U	U	U	U	U	U	1	9.2	8260B	
Trichloroethene		1			1	CAS # 79-0	1-6				
Second Quarter 2010	0.23 J	U	U	U	U	U	U	1	0.1	8260B	
Fourth Quarter 2010	U	U	U	U	U	U	U	1	0.1	8260B	
Trichlorofluorometh			1	1		CAS #75-6			1		
Second Quarter 2010	U	U	U	U	U	U	9-4 U	1	11.3	8260B	
22222 200.10. 2010	_	1	_	_	1	1 -	_		1	1 00 D	

Target Analyte Monitoring Results At Or Above Permit Quantitation Limit HWMU-16 Plume Monitoring Wells

Radford Army Ammunition Plant, Radford, Virginia

All Results in ug/L.

Upgradient well = 16C1

Analtye/Quarter	16C1 Q	16-1 Q	16-2 Q	16-3 Q	16-5 Q	16WC2B Q	16SPRING Q	QL	Background	Method
1,1,2-Trichloro-1,2,2-Trifluoroethane CAS #76-13-1										
Second Quarter 2010	U	U	U	U	U	U	U	1	1.2	8260B
Fourth Quarter 2010	U	U	U	U	U	U	U	1	1.2	8260B
Xylenes (Total) CAS #1330-20-7										
Second Quarter 2010	U	U	U	U	U	U	U	3	0.2	8260B
Fourth Quarter 2010	U	U	U	U	U	U	U	3	0.2	8260B

Definitions:

All plume monitoring well results reported to at or above the permit quantitation limit except for the upgradient well during the Appendix IX monitoring Event. During this event, results for the upgradient well are reported to the detection limit.

- **Q** Denotes data validation qualifier.
- QL Denotes permit required quantitation limit.
- U Denotes analyte not detected at or above QL.
- UA Denotes analyte not detected at or above adjusted sample QL.
- J Denotes result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above QL and QL is estimated. When used with "UA" (i.e., "UAJ"), denotes analyte not detected at or above adjusted QL and adjusted QL is estimated.
- UN Denotes analyte concentration is less than the quantiation limit and five times the blank concentration.
 Not reliably detected due to blank contamination. This qualifier used only for Appendix IX monitoring event when compliance well results are reported to at or above the project detection limit.
- R Denotes result rejected.

Background Denotes background concentrations listed in Appendix F to Attachment 5 in the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5, 7, 10, and 16 (October 4, 2002).

CAS# Denotes Chemical Abstract Services registration number.

GPS Denotes groundwater protection standard.

NS denotes not sampled. NA denotes not analyzed. "-"denotes not detected (pre-2nd Quarter 2003) or not available / not sampled (beginning 2nd Quarter 2003).

Notes:

4Q2004. No data for 16-1 8270C-semivolatiles. Well dry-insufficient sample volume.

4Q2006 - No data for 16-1; well dry.

4Q2008- No data for 16-1; well dry.

2Q2009- No data for 16-1; well dry.

NOTE:

Fourth Quarter 2008

Due to laboratory error all HWMU 16 samples were analyzed using Method 8260B 5 ml purge instead of a 25 ml purge which resulted in a higher QL. For these samples, all results were evaluated to the detection limit, which is comparable to the permit QL. Results below the laboratory QL but at or above the permit QL are reported and qualified as estimated.



	APPENDIX D-4		
ESTABLISHED BACKGROUND	VALUES AND CO	MPUTATIONS FOR	HWMU-16

- It was not understood why the majority of fluorescein detections were considered false positive detections. The basis of this observation is unclear considering a lack of background and laboratory confirmation results.
- It was not apparent why certain samples were selected for laboratory confirmation and others were not. There was no apparent consistency in the selection of samples for laboratory confirmation.
- Samples were submitted for confirmation laboratory analyses three months or more
 following the collection of the samples in the field. No information was provided
 regarding the custody and/or storage of the samples. The samples were submitted to the
 analytical laboratory with incomplete chain-of-custody (COC), and the COC
 documentation was not completed by the laboratory.

In summary, the data from the study do not provide the basis for meaningful interpretation. Any attempt to formulate conclusions from the data as presented regarding the presence of preferred or predominant groundwater flow patterns is not warranted or recommended.

3.3 HWMU-16 GROUNDWATER MONITORING ANALYTE LIST

The groundwater monitoring analyte list for HWMU-16 is presented in Table 1 (Appendix B). The list represents the subset of the constituents listed in Appendix III of 40 CFR Part 261 that previously have been detected in the groundwater and/or that are reasonably expected to be in or derived from waste contained in HWMU-16. As discussed in Section 3.5.2 below, 12 inorganic constituents and two explosive/propellant constituents have been detected in the groundwater monitoring network for HWMU-16 at statistically significant concentrations above the Unit's calculated background concentrations. The inorganic constituents may be derived from the aquifer formation materials; however, the two explosive/propellant constituents (2,4-Dinitrotoluene and 2,6-Dinitrotoluene) are byproducts of wastes derived from explosives. Therefore, the two explosive/propellant constituents detected could only be from HWMU-16.

The concentration limits established for the hazardous constituents also are listed in Table 1. The concentration limits represent either background concentrations calculated for the constituents in this GWQAR, Maximum Concentrations of Constituents for Ground-water Protection listed in Table 1 of 40 CFR 264.94, USEPA Drinking Water Standard Maximum Contaminant Levels (MCLs), or alternate concentration limits (ACLs) established by the VDEQ (July 1998). Certain organic constituents on the list do not have USEPA MCLs or VDEQ ACLs; they also do not have calculated background concentrations because they have not been detected in the Unit's upgradient well. Therefore, the concentration limits for these constituents are equal to their respective method detection limits.

As Alliant discussed with the VDEQ in the past, the reliability of previous laboratory analytical data - particularly dissolved metals data - appeared to be questionable in some cases. In an April 9, 1996 letter to C. Jake (Alliant), the VDEQ agreed that only total metals concentrations in groundwater would be measured, as described in a USEPA Region III guidance on groundwater sampling in karst terrain. Therefore, all references to metals concentrations in this GWQAR refer to total metals concentrations.

3.4 HWMU-16 GROUNDWATER BACKGROUND CONCENTRATIONS

Background concentrations were calculated for each constituent in the groundwater monitoring program using the analytical data from 1996 through 1998 for upgradient well 16C1.

The background concentration calculations were based on site wide 95% confidence, 95% coverage upper prediction intervals. The calculated background concentrations are listed in Table 2 (Appendix B). The background concentrations were used to construct the outermost closing contours on the Isoconcentration Maps (Appendix A).

3.5 HWMU-16 STATISTICAL ANALYSIS

Statistical evaluations for HWMU-16 are performed annually and submitted to the VDEQ in accordance with the annual reporting requirements specified in 40 CFR 265.94. As part of this GWQAR, statistical evaluations were performed on Fourth Quarter 1998 analytical data in accordance with the procedures and guidance provided in the following documents:

- Title 40 of the Code of Federal Regulations, 40 CFR 264.97 and 264.98;
- VDEQ Guidance for statistical analysis titled "Data Analysis Plan," undated;
- Interim Final Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, USEPA, April 1989;
- Addendum to Interim Final Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, USEPA, July 1992; and
- Statistical Methods for Groundwater Monitoring, Gibbons, R.D., 1994.

Statistical threshold values were computed for the 54 constituents for which HWMU-16 is currently monitored based on the concentrations of those constituents in upgradient (background) well 16C1. All data starting with First Quarter 1996 to Fourth Quarter 1998 were used for this purpose. The 1996 through 1998 monitoring data have been submitted previously to the VDEQ by Alliant in quarterly monitoring reports; therefore, the data are not listed in this GWQAR. Statistical comparisons were performed for the Fourth Quarter 1998 data set. Comparison statistical analyses were performed for all constituents which were detected in any downgradient well during that event.

3.5.1 Background Data and Statistical Comparisons

Statistical analyses were performed using the analytical results from upgradient well 16C1 data as background data. Based on the percentage of non-detects and the distribution of the background data, methods of statistical comparisons varied. Background average, standard deviation and other descriptive statistical data were computed for all constituents and are presented in Appendix C.

The constituents listed below were 100% non-detected in the background data. The background threshold levels (BTLs) for these constituents were established as equal to their detection limits (DL). Detections of these constituents in the downgradient wells during Fourth Quarter 1998 were compared to these BTLs.

Backgro	und Threshold Leve	el (BTL) = Detecti	on Limit (DL)						
Parameter Sample Size % Non-Detects (µg/l) BTL (µg/l)									
Antimony	12	100	3	3					
Arsenic	12	100	1	1					
Bromoform	12	100	0.3	0.3					
Carbon tetrachloride	12	100	0.2	0.2					
Chlorobenzene	12	100	0.1	0.1					
Chloromethane	12	100	0.3	0.3					
Cyanide	12	100	10	10					

Background Threshold Level (BTL) = Detection Limit (DL)								
DL BTL								
Parameter	Sample Size	% Non-Detects	(μ g/l)	(μg/l)				
Di-n-butyl phthalate	12	100	5	5				
1,2-Dichloroethane	12	100	0.1	0.1				
trans-1,2-Dichloroethene	12	100	0.1	0.1				
1,4-Dichlorobenzene	12	100	0.1	0.1				
Ethylbenzene	12	100	0.1	0.1				
Mercury	12	100	0.2	0.2				
Methyl ethyl ketone	12	100	1.1	1.1				
Selenium	12	100	1	1				
1,1,2,2-Tetrachloroethane	12	100	0.3	0.3				
1,1,2-Trichloroethane	12	100	0.5	0.5				
Trichloroethene	12	100	0.1	0.1				
Toluene	12	100	0.1	0.1				
2378-TCDF	12	100	0.0485 ppt	0.0485 ppt				
12378-PECDF	12	100	0.0439 ppt	0.0439 ppt				
23478-PECDF	12	100	0.0417 ppt	0.0417 ppt				
123478-HXCDF	12	100	0.0390 ppt	0.0390 ppt				
123678-HXCDF	12	100	0.0377 ppt	0.0377 ppt				
234678-HXCDF	12	100	0.0428 ppt	0.0428 ppt				
123789-HXCDF	12	100	0.0415 ppt	0.0415 ppt				
1234678-HPCDF	12	100	0.0615 ppt	0.0615 ppt				
1234789-HPCDF	12	100	0.0709 ppt	0.0709 ppt				
OCDF	12	100	0.1307 ppt	0.1307 ppt				

Non-parametric prediction intervals were computed for all of the constituents for which the data from background well 16C1 satisfied one of the following two criteria, per VDEQ regulations and guidance as well as USEPA guidance:

- Percentage of non-detects was greater than or equal to 50 and less than 100; or
- Percentage of non-detects was less than 50, but data was not normally distributed in original or log-transformed mode.

The background threshold levels for these constituents were set as equal to their upper prediction limits (UPLs). The background and relevant statistical data for these constituents are summarized below. The confidence level and false positive rate were calculated based on the number of background data points available and number of future comparisons. For all constituents, the confidence level was determined to be equal to 0.933, and the false positive rate was equal to 0.067. Since the upper control limit of a non-parametric interval cannot be adjusted for multiple comparisons and inadequate number of background data, the number of resampling events required was adjusted to account for the high error rates inherent in those situations. The number of confirmation resamples required for all constituents is 2. The background and relevant statistical data for these constituents are summarized below. Associated statistical computations are presented in Appendix C.

BTL = Upper Prediction Limit of Non-parametric Prediction Interval w/false positive rate=0.067						
Parameter	Sample Size	% Non-Detects	DL _ (μg/l)	BTL (μg/l)		
Beryllium	12	75	0.2	0.7		
Cadmium	12	75	2 0.1	0.2		
Cobalt	12	75	1	5		
Copper	12	50	1	13		
1,1-Dichloroethane	12	0	0.2	9.5		
2,4-Dinitrotoluene	12	92	0.08	0.10		

BTL = Upper Prediction Limit of Non-parametric Prediction Interval w/false positive rate=0.067						
Parameter	Sample Size	% Non-Detects	DL (μg/l)	. BTL (μg/l)		
2,6-Dinitrotoluene	12	75	0.08	0.11		
Lead	12	42	, 1	10		
Nickel	12	92	15	16		
Silver	12	75	0.2	0.5		
Thallium	12	67	: 1	6		
TOC	12	75	1000	7000		
1,1,1-Trichloroethane	12	17	. 0.3	9.2		
Vanadium	12	83	4	151		
Vinyl Chloride	12	92	0.1	0.1		
Xylene (total)	12	92	0.1	0.2		
Zinc	12	50	5	51		

Chromium exhibited normally distributed data (excluding non-detects) with between 25% and 50% non-detects in the background well. The mean and standard deviation of the background data for chromium were adjusted using Cohen's Maximum Likelihood Estimator Method (1959, 1961). A one-sided parametric prediction interval was then computed for chromium based on the adjusted mean and standard deviation. The Upper Prediction Limit was set as the BTL for chromium. The background and relevant statistical data for chromium are summarized below. Cohen's adjustment computations and prediction interval computations are presented in Appendix C.

BTL = Upper Prediction Limit of Prediction Interval w/false positive rate=0.05							
Original Mean = 3.54, Original SD = 1.933 Adjusted Mean = 3.642. Adjusted SD = 1.95							
AC	ijusteu Mean – 3.0	042. Adjusted SD	= 1.95				
Parameter Sample Size % Non-Detects (ug/l) (ug/l)							
ParameterSample Size% Non-Detects(μg/l)(μg/l)Chromium122516.2							

The following constituents exhibited normally distributed background data with less than 25% non-detects. One sided parametric prediction intervals were computed on the background data for all of these constituents. The UPLs for these constituents were set as their respective BTLs, with one exception. For pH, a two-sided parametric prediction interval was computed; therefore, the BTL for pH consisted of a range between the lower prediction limit (LPL) and the upper prediction limit. The background concentration calculations were based on a site wide 95% confidence, 95% coverage upper prediction intervals. When adjusted for multiple comparisons of the background data, the minimum required false positive rate was below 1% (0.01). A 99% confidence level (0.01 false positive rate) was used for all individual comparisons, which with the most conservative assumptions provided a site-wide false positive rate of >0.05 for all constituents. The background and relevant statistical data for these constituents are summarized below. The prediction interval computations for these constituents are presented in Appendix C.

BTL = UPL of one-sided Prediction Interval (exception pH) w/site-wide false positive rate>0.05 (individual comparisons false positive rate=0.01) BTL for pH = LPL - UPL of two-sided Prediction Interval								
Parameter Sample Size % Non-Detects (µg/l) (µg/l)								
Barium	12	0	2	175.4				
Dichlorodifluoromethane	12	8	0.3	46.5				
Tetrachloroethene 12 17 0.1 0.7								
TOX	12	17	5	42.2				

BTL = UPL of one-sided Prediction Interval (exception pH) w/site-wide false positive rate>0.05 (individual comparisons false positive rate=0.01) BTL for pH = LPL - UPL of two-sided Prediction Interval								
Parameter Sample Size % Non-Detects (μg/l) (μg/l) Trichlorofluoromethane 12 0 0.5 11.3								
Specific Conductivity 8 0 1 μS/cm 672 μS/cm								
pH	8	0	0.1 pH units	5.7 to 7.9 pH units				

3.5.2 Results of Statistical Comparisons

The following table lists the constituents which were detected during the Fourth Quarter 1998 event at concentrations exceeding their respective background threshold levels (BTLs), and the downgradient wells in which they were detected.

Parameter	Monitoring Well(s)
Arsenic	16-5, 16WC2B
Barium	16-2, 16-3, 16-5, 16WC1A, 16WC1B, 16WC2B, 16SPRING
Beryllium	16WC1B, 16WC2B
Cadmium	16WC1B
Chromium	16-3, 16-5, 16WC1B, 16WC2B
Cobalt	16-5, 16WC1B, 16WC2B
Copper	16-5, 16WC1B, 16WC2B
Lead	16WC1B
Mercury	16WC1B
Nickel	16-5, 16WC1A, 16WC2B
Selenium	16-5, 16WC1B, 16WC2B
Zinc	16WC1B
2,4-Dinitrotoluene	16-3, 16-5, 16WC1B, 16WC2B, 16SPRING
2,6-Dinitrotoluene	16WC1A, 16WC1B

Any HWMU-16 target constituents not listed above were not detected in the downgradient monitoring wells at concentrations exceeding their respective BTLs.

3.6 HWMU-16 PLUME DELINEATIONS

In accordance with VDEQ instructions presented during the May 19, 1999 meeting between Alliant and the VDEQ, Isoconcentration Maps were produced to depict constituent plumes in the groundwater beneath the site (Appendix A). In order to evaluate the shape and position of constituent plumes over time, historical Isoconcentration Maps were developed using the historical maximum concentrations for the constituents monitored at the site for the time periods of 1992 through 1995 and 1996 through 1998. The historical maximum concentrations for these time periods are listed in Tables 3 and 4, respectively (Appendix B).

Groundwater analytical data collected prior to 1992 were not included in the evaluation of historical maximum concentrations. The data collected prior to 1992 are considered unreliable due to "order-of-magnitude" variations in parameter concentrations from quarter to quarter, as well as a general lack of laboratory QA/QC. Additionally, the groundwater monitoring analyte lists prior to 1992 did not include many of the parameters on the current groundwater monitoring analyte list for HWMU-16.

TABLE 2 HWMU-16 Calculated Background Values

Constituent	Background Concentration
	(μg/l unless otherwise noted)
Antimony	3
Arsenic	1
Barium	175.4
Beryllium	0.7
Cadmium	0.2
Chromium	6.2
Cobalt	5
Copper	13
Lead	. 10
Mercury	0.2
Nickel	16
Selenium	1
Silver	0.5.
Thallium	6 '
Vanadium	151
Zinc	51
Bromoform	0.3
Carbon Tetrachloride	0.2
Chlorobenzene	0.1
Chloromethane	0.3
1,4-Dichlorobenzene	0.1
Dichlorodifluoromethane	46.5
1,1-Dichloroethane	9.5
1,2-Dichloroethane	0.1
trans-1,2-Dichloroethene	0.1
Ethylbenzene	0.1
Methyl Ethyl Ketone	1.1
1,1,2,2-Tetrachloroethane	0.3 ,
Tetrachloroethene	0.7
Toluene	0.1
1,1,1-Trichloroethane	9.2
1,1,2-Trichloroethane	0.5
Trichloroethene	0.1
Trichlorofluoromethane	11.3
Vinyl Chloride	0.1
Xylenes (total)	0.2

TABLE 2 HWMU-16 Calculated Background Values

Constituent	Background Concentration (μg/l unless otherwise noted)
Di-n-butylphthalate	5
2,4-Dinitrotoluene	0.10
2,6-Dinitrotoluene	0.11
2378-TCDF	0.0485 ppt
12378-PECDF	0.0439 ppt
23478-PECDF	0.0417 ppt
123478-HXCDF	0.0390 ppt
123678-HXCDF	0.0377 ppt
234678-HXCDF	0.0428 ppt
123789-HXCDF	0.0415 ppt
1234678-HPCDF	0.0615 ppt
1234789-HPCDF	0.0709 ppt
OCDF	0.1307.ppt
Cyanide	10 7
Total Organic Carbon (x4)	7000
Total Organic Halides (x4)	42.2
Specific Conductivity	672 μS/cm
pH	5.7 to 7.9 pH units

Appendix IX Constituents Detected Since Permit Issuance HWMUs 5, 7, 10, and 16 Radford Army Ammunition Plant

Unit	Quarter Initially Detected	Constituent	Background Calculated or QL?	Background (ug/L)	GPS Required? (261 Appendix VIII)	Proposed GPS (ug/L)	Source
		Chromium	QL	5	yes	100	USEPA MCL
		Diethyl Ether	QL	12	no	NA	NA
HMWU-5	Fourth Quarter 2003	2-Nitroaniline	QL	20	no	NA	NA
HIVIVV U-3		4-Nitroaniline	QL	20	yes	20	Background/QL
		Nitrobenzene	QL	10	yes	10	Background/QL
	Third Quarter 2006	Dichlorodifluoromethane	QL	1	yes	125.2	VDEQ ACL
HWMU-7	Third Quarter 2003	Copper	Calculated	49	no	NA	NA
HVVIVIU-7	Second Quarter 2004	Zinc	Calculated	217	no	NA	NA
	First Quarter 2003	Cobalt	QL	5	no	NA	NA
HWMU-10	Second Quarter 2003	Vanadium	QL	10	no	NA	NA
	Second Quarter 2005	Acetone	QL	10	no	NA	NA
	Second Quarter 2005	2-Propanol	QL	50	no	NA	NA
		Chloroethane	Calculated	20.7	yes	20.7	Background/QL
	Second Quarter 2003	Diethyl Ether	Calculated	75.5	no	NA	USEPA MCL NA NA Background/QL Background/QL VDEQ ACL NA NA NA NA NA NA
HWMU-16		Dimethyl Ether	Calculated	17.0	no	NA	NA
	Third Quarter 2003	Methylene Chloride	Calculated	13.95	no*	NA	NA
	Second Quarter 2004	1,1,2-Trichloro-1,2,2-trifluoroethane	Calculated	1.2	no*	NA	NA

- HWMU-5: The additional Appendix IX constituents detected in the downgradient point of compliance wells were not detected above their respective Quantitation Limits (QLs) in the upgradient well. As a result, background concentrations for those constituents were set as equal to their respective QLs. In accordance with the Permit (Condition V.J.1.g.), GPS are proposed for those additional Appendix IX constituents that are listed in Appendix VIII of 40 CFR Part 261 (chromium, 4-nitroaniline, nitrobenzene, and dichlorodifluoromethane). No GPS are proposed for the additional Appendix IX constituents that are not listed in Appendix VIII of 40 CFR Part 261 (diethyl ether and 2-nitroaniline).
- HWMU-7: Background concentrations for the additional Appendix IX constituents detected in the downgradient point of compliance wells (copper and zinc) were previously calculated and submitted to the VDEQ in the August 1998 *Groundwater Quality Assessment Report for HWMU-7* prepared by ERM, Inc. In accordance with the Permit (Condition V.J.2.g.), no GPS are proposed for the additional Appendix IX constituents (copper and zinc), as they are not listed in Appendix VIII of 40 CFR Part 261.
- HWMU-10: The additional Appendix IX constituents detected in the downgradient point of compliance wells were not detected above their respective Quantitation Limits (QLs) in the upgradient well. As a result, background concentrations for those constituents were set as equal to their respective QLs. In accordance with the Permit (Condition V.J.3.g.), no GPS are proposed for the additional Appendix IX constituents (cobalt, vanadium, acetone, and 2-propanol), as they are not listed in Appendix VIII of 40 CFR Part 261.
- HWMU-16: Background concentrations for additional Appendix IX constituents chloroethane, diethyl ether, dimethyl ether, and methylene chloride were calculated using data collected from upgradient well 16C1 during the period from Third Quarter 2003 through Third Quarter 2004. The background concentration for additional Appendix IX constituent 1,1,2-trichloro-1,2,2-trifluoroethane was calculated using data collected from upgradient well 16C1 during the period from Second Quarter 2004 through Third Quarter 2006. In accordance with the Permit (Condition V.J.4.g.), GPS are proposed for additional Appendix IX constituents that are listed in Appendix VIII of 40 CFR Part 261 (chloroethane). No GPS are proposed for the additional Appendix IX constituents that are not listed in Appendix VIII of 40 CFR Part 261 (diethyl ether and dimethyl ether).

 *Methylene chloride and 1,1,2-trichloro-1,2,2-trifluoroethane should not be added to the Groundwater Monitoring List for HWMU-16, as these constituents were only detected in the upgradient well for the Unit, and not in the downgradient point of compliance wells.

Statistical Computations – RAAP HWMU-16 – 1,1,2-Trichloro-1,2,2-Trifluoroethane

In accordance with the facility permit and VHWMR, statistical background concentration is being established for 1,1,1-Trichloro-1,2,2-Trifluoroethane. Inter-well upper prediction limits (UPL) were calculated on the background data for this target parameter in accordance with the facility permit and VHWMR (40 CFR 264.97(h)). Background data for this target parameter consisted of all data for the background well 16C1 collected from 2nd quarter 2004 through 3rd quarter 2006.

Discussion of Tests for Normality

The power of a statistical tool to account for false positive and false negative results, while accurately detecting true statistical variations for a facility under scrutiny depends on numerous factors, one of which is the distribution of the data. A great number of statistical tools are based on the assumption that data are normally distributed. Hence the distribution of the sample population for parameters evaluated under this statistical analysis is first determined. Sample populations are tested for normal distribution using several normality tests. "Groundwater Information Tracking System with Statistical Analysis Capability" (GRITS/STAT) v5.0 was the software used to run these statistical tests. GRITS/STAT is an analytical software package provided by the USEPA. The distributions of the data sets were verified in the original mode as well as in log-transformed mode. The normality of the data set was evaluated using the Shapiro-Wilk test for normality.

Discussion of Prediction Interval Tests

Normality tests are performed prior to running parametric tests (tests that require that the data be normal). Results of the normality tests show that the background data for 1,1,2-Trichloro-1,2,2-Trifluoroethane is non-normally distributed. Non-parametric UPL (NUPL) was constructed on the background data for this parameter. The confidence levels of NUPLs are typically approximate and estimated to be around 91%.

Summary of UPL

Parameter	Background Data Distribution	Type of UPL	Multiple Comparisons/year	UPL (μg/l)
1,1,2-Trichloro-1,2,2-	Non-Normal	NUPL	N/A	1.2
Trifluoroethane				

Statistical Computations – RAAP HWMU-16

In accordance with the facility permit and VHWMR, statistical background concentrations are being established for the four new target parameters chloroethane, diethyl ether, dimethyl ether and methylene chloride. These four target parameters were added to the facility monitoring program during the 3rd quarter 2003 monitoring event. Inter-well upper prediction limits (UPL) were calculated on the background data for the target parameters in accordance with the facility permit and VHWMR (40 CFR 264.97(h)). Background data for these target parameters consisted of all data for the background well 16C1 collected from 3rd quarter 2003 through 3rd quarter 2004.

Discussion of Tests for Normality

The power of a statistical tool to account for false positive and false negative results, while accurately detecting true statistical variations for a facility under scrutiny depends on numerous factors, one of which is the distribution of the data. A great number of statistical tools are based on the assumption that data are normally distributed. Hence the distribution of the sample population for parameters evaluated under this statistical analysis is first determined. Sample populations were tested for normal distribution using several normality tests. "Groundwater Information Tracking System with Statistical Analysis Capability" (GRITS/STAT) v5.0 was the software used to run these statistical tests. GRITS/STAT is an analytical software package provided by the USEPA. The distributions of the data sets were verified in the original mode as well as in log-transformed mode. The normality of the data sets was evaluated using the Shapiro-Wilk test for normality.

Discussion of Prediction Interval Tests

Normality tests are performed prior to running parametric tests (tests that require that the data be normal). A 99% confidence parametric inter-well UPL was computed for each of the four target parameters that showed normally distributed background data. Results of the normality tests show that the background data for chloroethane, diethyl ether and methylene chloride are normally distributed, and the background data for dimethyl ether is non-normally distributed. Non-parametric UPL (NUPL) was constructed on the background data for dimethyl ether, and parametric UPLs (PUPL) were constructed on the background data for chloroethane, diethyl ether and methylene chloride. No adjustments to the error rates were made to the NUPLs for multiple comparisons. Adjustment for 10 comparisons per year (considering 10 compliance monitoring wells at the facility and 4 quarters of data for each year, and considering historic detects, 10 is considered a representative number for multiple comparisons per year) was made to the PUPLs. The confidence levels of NUPLs are well less than 95%. Any statistically significant increase (SSI) must be confirmed by verification sampling.

Summary of UPLs

Parameter	Background	Type	Multiple	UPL (μg/l)
	Data Distribution	of UPL	Comparisons/year	
Chloroethane	Normal	PUPL	10	20.7
Diethyl ether	Normal	NUPL	10	75.5
Dimethyl ether	Non-normal	PUPL	N/A	17.0
Methylene Chloride	Normal	PUPL	10	13.95

RAAP-HWMU-16 - Statistical Analysis - Notes

1) Y2K Correction dates are as shown in table below.

Actual Event	Date Used in Stat Software	
2000-Qtr1	12/13/1999	
2000-Qtr2	12/14/1999	
2000-Qtr3	12/15/1999	
2000-Qtr4	12/16/1999	
2001-Qtr1	12/17/1999	
2003-Qtr3	12/18/1999	
2003-Qtr4	12/19/1999	
2004-Qtr1	12/20/1999	
2004-Qtr2	12/21/1999	
2004-Qtr3	12/22/1999	

Interwell Tests:

2) Background data for target parameters chloroethane, diethyl ether, dimethyl ether and methylene chloride were evaluated using Shapiro-Wilk test. Background data showed normal distribution for chloroethane, diethyl ether and methylene chloride. Parametric interwell 99% confidence upper prediction limits were computed for parameters with normally distributed background data. Dimethyl ether background data was non-normally distributed. Therefore non-parametric Upper Prediction Limit (UPL) was computed for dimethyl ether.

3) No adjustments for multiple comparisons could be made for non-parametric UPLs. Adjustments were made to the parametric UPLs for 10 future comparisons per year to account for multiple compliance monitoring wells and quarterly event data. Any Statistically significant increase (SSI) must be confirmed by verification sampling.

E:\Ross Work\Radford AAP Archives\HWMU-16\[HWMU16StatDate correction.xls]Sheet1

Normality Tests

Report Printed: 02-02-2005 13:49

Facility: RAAPHWMU16 Haz. Waste Unit 16 - RAAP

Address:

City:Radford

ST:VA Zip:24141

County: PULASKI

Contact:

Phone:() -

Permit Type:Detection

Constituent: ClEthane Chloroethane

CAS Number: 75-00-3

MCL:

0.000 ppb

ACL:

0.000 ppb

Detect Limit:

2.000 ppb

Start Date: Mar 31 1996 End Date:Dec 22 1999

Normality Test on Observations for wells listed below:

Well:16C1

Position: Upgradient Observations: 5

Scale Original: Minimum 1.000

Maximum 6.400

Mean 4.340

Std Dev

Log:

0.000

1.856

1.303

2.078 0.749

Pooled Statistics

Observations:

5

Statistic

Log Original Scale Scale

Mean: Std Dev: 4.340 2.078 1.303 0.749

Skewness: Kurtosis:

-0.810

-1.296* -0.011

Minimum: Maximum: -0.5551.000

0.000

CV:

6.400 0.479

1.856 0.575

Shapiro-Wilk Statistics

Test 5% Critical 1% Critical Scale Statistic

Value

Value

Original:

0.9037

0.7620

0.6860

Log: 0.7615* 0.7620 0.6860

* Indicates statistically significant evidence of non-normality. GRIT/STAT Version 5.0

Facility:Haz. Waste Unit 16 - RAAP Parameter:Chloroethane(CAS Number:75-00-3)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

```
Observations (n):
   Shapiro-Wilk
                        (W):
                                   0.9037
 Critical W,\alpha=0.01:
                                   0.6860
                       Mean: 4.340 ppb
                                 2.078 ppb
                  Std Dev:
                          DF:
                                 0000 0.99
 Conf. Level (1-\alpha):
                                       10
Future Samples (k):
            t - 1 - \alpha - :
\left[ \begin{array}{c} - \\ k \end{array} \right]
                                    7.1732
                                    7.8579
                     Kappa:
                          UL: 20.669 ppb
                          LL: -∞
```

Normality Tests

Report Printed: 02-02-2005 13:49

Facility: RAAPHWMU16 Haz. Waste Unit 16 - RAAP

Address:

City:Radford

ST:VA Zip:24141

County: PULASKI

Contact:

Phone:() -

Permit Type: Detection

Constituent: DEthEth Diethyl ether

CAS Number:

MCL:

0.000 ppb

ACL:

0.000 ppb

Detect Limit:

24.000 ppb

Start Date: Mar 31 1996 End Date: Dec 22 1999

Normality Test on Observations for wells listed below:

Well:16C1

Position: Upgradient Observations: 5

Scale Original: Minimum 12.000

Maximum 30.000

Mean 21.200

Std Dev 6.907

Log:

2.485

3.401

3.007

0.355

Pooled Statistics

Observations:

5

Statistic Original Scale

3.007 21.200 Mean: Std Dev: 6.907 0.355 -0.122-0.491Skewness: -1.140-1.024**Kurtosis:**

Minimum:

12.000

2.485

Maximum:

30.000

3.401

CV:

0.326

0.118

Log Scale

Shapiro-Wilk Statistics

Test 5% Critical 1% Critical

Scale Statistic Original:

0.9768

Value 0.7620 Value 0.6860 Log: 0.9507 0.7620 0.6860

* Indicates statistically significant evidence of non-normality. GRIT/STAT Version 5.0

Parametric Prediction Interval Report Printed February 2,2005

Page 1

Facility:Haz. Waste Unit 16 - RAAP Parameter:Diethyl ether(CAS Number:- -)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

```
Observations (n):
                 (W):
  Shapiro-Wilk
                           0.9768
 Critical W,\alpha = 0.01:
                           0.6860
                  Mean: 21.200 ppb
                          6.907 ppb
              Std Dev:
                     DF:
                          0.99
 Conf. Level (1-\alpha):
                              10
Future Samples (k):
          t - 1 - \alpha - 1
                            7.1732
                 Kappa:
                            7.8579
                     UL: 75.470 ppb
                     LL: -∞
```

Normality Tests

Report Printed: 02-02-2005 13:53

Facility: RAAPHWMU16 Haz. Waste Unit 16 - RAAP

Address:

City:Radford ST:VA Zip:24141

County: PULASKI

Contact:

Phone:() -

Permit Type: Detection

Constituent: DMethEth Dimethyl ether

CAS Number: - -

MCL: 0.000 ppb ACL: 0.000 ppb Detect Limit: 24.000 ppb

Start Date:Mar 31 1996 End Date:Dec 22 1999

Normality Test on Observations for wells listed below:

Well:16C1 Position: Upgradient Observations:5

 Scale
 Minimum
 Maximum
 Mean
 Std Dev

 Original:
 12.000
 17.000
 13.000
 2.236

 Log:
 2.485
 2.833
 2.555
 0.156

Pooled Statistics

Observations: 5

Original Statistic Log Scale Scale 2.555 13.000 Mean: 2.236 0.156 Std Dev: 1.500* Skewness: 1.500* 0.250 0.250**Kurtosis:** Minimum: 12.000 2.485 2.833 17.000 Maximum: 0.061 CV: 0.172

Shapiro-Wilk Statistics

Test 5% Critical 1% Critical Scale Statistic Value Value Original: 0.5521* 0.7620 0.6860 Log: 0.5521* 0.7620 0.6860

* Indicates statistically significant evidence of non-normality. GRIT/STAT Version 5.0

Nonparametric Prediction Interval Report Printed February 2,2005

Facility:Haz. Waste Unit 16 - RAAP Parameter:Dimethyl ether(CAS Number:- -)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):

5

Conf. Level $(1-\alpha)$:

33.330%

UL: 17.000 ppb LL: 0.000

Report Produced by GRITS/STAT 5.01

Page 1

Normality Tests

Report Printed: 02-02-2005 13:54

Facility: RAAPHWMU16 Haz. Waste Unit 16 - RAAP

Address:

City:Radford

ST:VA Zip:24141

County:PULASKI

Contact:

Phone:() -

Permit Type: Detection

Dichloromethane (Methylene chloride) Constituent: MeCl

CAS Number: 75-09-2

MCL:

0.000 ppb

ACL:

0.000 ppb

Detect Limit:

2.000 ppb

Start Date: Mar 31 1996 End Date:Dec 22 1999

Normality Test on Observations for wells listed below:

Well:16C1 Position: Upgradient Observations: 5

Scale Original: Minimum 4.100

Maximum 6.800

Mean 5.800 1.037

Std Dev

Log:

1.411

1.917 1.743 0.197

Pooled Statistics

Observations:

5

Statistic	Original	Log
	Scale	Scale
Mean:	5.800	1.743
Std Dev:	1.037	0.197
Skewness:	-0.925	-1.088*
Kurtosis:	-0.436	-0.263
Minimum:	4.100	1.411
Maximum:	6.800	1.917
CV:	0.179	0.113

Shapiro-Wilk Statistics

Test 5% Critical 1% Critical

Scale Statistic

Original: 0.8964

Value 0.7620 Value 0.6860 Log: 0.8519 0.7620 0.6860

 $\mbox{*}$ Indicates statistically significant evidence of non-normality. GRIT/STAT Version 5.0

Parametric Prediction Interval Report Printed February 2,2005

Page 1

Facility:Haz. Waste Unit 16 - RAAP Parameter:Dichloromethane (Methylene chloride(CAS Number:75-09-2)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

```
Observations (n):
                     (W):
  Shapiro-Wilk
                              0.8964
 Critical W,\alpha=0.01:
                              0.6860
                    Mean: 5.800 ppb
                             1.037 ppb
                Std Dev:
                       DF:
                            0.95000.99
 Conf. Level (1-\alpha):
Future Samples (k):
                                  10
           t<sub>-1</sub> - α<sub>-1</sub>:
                                7.1732
                   Kappa:
                                7.8579
                       UL: 13.947 ppb
                       LL: -∞
```

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 16C1

All Results in ug/L.

Analtye/Quarter	16C1	16MW8	16MW9	16WC1A	16WC1B	OL	GPS	Method
Chloroethane						75-00-3		
Third Quarter 2003	6.4	U	4.8	U	U	1	20.7	8260B
Fourth Quarter 2003	5.7	U	2.6	1.1	U	1	20.7	8260B
First Quarter 2004	υJ	UJ	UJ	U J	UJ	1	20.7	8260B
Second Quarter 2004	4.4	U	2.4	0.63 J	U	1	20.7	8260B
Third Quarter 2004	4.2	υ	2	U	U	1	20.7	8260B
Fourth Quarter 2004	4.9	U	2.5	U	U	1	20.7	8260B
First Quarter 2005	7.6 J	UJ	3.7 J	U J	U J	1	20.7	8260B
Second Quarter 2005	υJ	U	υJ	U	U	1	20.7	8260B
Third Quarter 2005	4.7 J	Uj	U	UJ	υJ	1	20.7	8260B
Fourth Quarter 2005	4.6 J	U	2.6 J	U	ប	1	20.7	8260B
First Quarter 2006	5.3	υ	U	U	U	1	20.7	8260B
Second Quarter 2006	5 J	U	2 J	υ	U	1	20.7	8260B
Third Quarter 2006	5	U	0.7 J	0.7 J	U	1	20.7	8260B
Fourth Quarter 2006	5.8	U	1	U	υ	1	20.7	8260B
First Quarter 2007	6.1	U	1	U	U	1	20.7	8260B
Second Quarter 2007	5.2	U	1.4	U	U	1	20.7	8260B
Diethyl ether					CAS#	60-29-7		
Third Quarter 2003	12 J	U	12 J	U	U	12	-	8260B
Fourth Quarter 2003	30	U	14	U	U	12	-	8260B
First Quarter 2004	24	U	U	U	U	12	-	8260B
Second Quarter 2004	23 J	UJ	13 J	UJ	UJ	12	-	8260B
Third Quarter 2004	17	U	U	U	U	12	-	8260B
Fourth Quarter 2004	24	υJ	U	U	UJ	12	-	8260B
First Quarter 2005	29	U	14	U	U	12	-	8260B
Second Quarter 2005	20	UJ	9.2	UJ	UJ	12	-	8260B
Third Quarter 2005	30	U	15	U	U	12	-	8260B
Fourth Quarter 2005	25	U	18	U	Ü	12	-	8260B
First Quarter 2006	19	U	U	U	U	12	-	8260B
Second Quarter 2006	17	U	U	U	Ũ	12.5	-	8260B
Third Quarter 2006	33	1.5 J	4.3 J	4.6 J	U	12.5	-	8260B
Fourth Quarter 2006	20	U	U	U	U	12.5	-	8260B
First Quarter 2007	21	U	U	U	U	12.5		8260B
Second Quarter 2007	17 J	1.5 J	5.7 J	2.1 J	fi fi	12.5	-	8260B
Dimethyl ether					CAS#	115-10-6		
Third Quarter 2003	6.6 J	U	9.9 J	U	U	12	-	8260B
Fourth Quarter 2003	U	U	U	U	U	12	-	8260B
First Quarter 2004	17 J	Uj	13 J	UJ	n 1	12	-	8260B
Second Quarter 2004	υJ	U J	6.6 J	υJ	υJ	12	-	8260B
Third Quarter 2004	UJ	UJ	UJ	UJ	U J	12	-	8260B
Fourth Quarter 2004	16 J	UJ	12 J	U	υJ	12	-	8260B
First Quarter 2005	26	U	25	U	U	12	-	8260B
Second Quarter 2005	15	U	14	U	U	12	-	8260B
Third Quarter 2005	13	U	U	U	U	12	-	8260B
Fourth Quarter 2005	υ	υ	U	U	U	12	-	8260B
First Quarter 2006	U	. U	U	U	U	12	-	8260B
Second Quarter 2006	U	U	υ	U	U	12.5	-	8260B
Third Quarter 2006	11 J	UJ	3.2 J	2.8 J	υJ	12.5	-	8260B
Fourth Quarter 2006	U	U	U	U	U	12.5	-	8260B
First Quarter 2007	U	υ	U	U	U	12.5	-	8260B
Second Quarter 2007	11 J	U	7 J	2.6 J	1.2 J	12.5	-	8260B

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 16C1

All Results in ug/L.

Analtye/Quarter	16C1	16MW8	16MW9	16WC1A	16WC1B	OL.	GPS	Method
Methylene chloride			<u> </u>		CAS#			
Third Quarter 2003	4.1	U	U	U	U	1	13.95	8260B
Fourth Quarter 2003	6.8	U	U	U	U	1	13.95	8260B
First Quarter 2004	6.4	U	U	U	U	1	13.95	8260B
Second Quarter 2004	5.7	U	บ	U	U	1	13.95	8260B
Third Quarter 2004	6	U A	U A	U A	U A	1	13.95	8260B
Fourth Quarter 2004	6.4	U	U	U	U	1	13.95	8260B
First Quarter 2005	6.8 J	U	υ	U	U	1	13.95	8260B
Second Quarter 2005	6.3	U	U	U	U	1	13.95	8260B
Third Quarter 2005	6.2	U	U	U	U	1	13.95	8260B
Fourth Quarter 2005	4.7	U	U	U	U	1	13.95	8260B
First Quarter 2006	4.9	U	U	U	U	1	13.95	8260B
Second Quarter 2006	7	U	U	U	U	1	13.95	8260B
Third Quarter 2006	UΝ	UN	UN	UN	UN	1	13.95	8260B
Fourth Quarter 2006	U A	U	U	U A	U	1	13.95	8260B
First Quarter 2007	6.3	υ	U	U	U	1	13.95	8260B
Second Quarter 2007	3.4	U	U	U	U	1	13.95	8260B
1,1,2-Trichloro-1,2,2-Trifluc	roethane		•		CAS # 7	6-13-1		
Third Quarter 2003	U	U	U	U	U	1	-	8260B
Second Quarter 2004	1.2	UJ	υJ	U J	Uj	1	-	8260B
Third Quarter 2004	Ü	υ	U	U	U	1	•	8260B
Fourth Quarter 2004	U	U	U	U	U	1	-	8260B
First Quarter 2005	1	U	U	U	U	1	*	8260B
Second Quarter 2005	U	U	U	U	U	1	-	8260B
Third Quarter 2005	υ	U	υ	U	U	1	•	8260B
Fourth Quarter 2005	U	υ	U	U	U	1	-	8260B
First Quarter 2006	U	υ	U	U	U	1	-	8260B
Second Quarter 2006	Ü	U	U	U	U	1	-	8260B
Third Quarter 2006	U	U	U	U	U	1	-	8260B
Fourth Quarter 2006	U	U	U	U	U	1	-	8260B
First Quarter 2007	U	υ	U	U	U	1	-	8260B
Second Quarter 2007	U	U	U	U	U	1	-	8260B

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 16C1

All Results in ug/L.

Analtye/Quarter	16C1	16MW8	16MW9	16WC1A	16WC1B	OL	GPS	Method
L								

Definitions: QL Denotes permit required quantitation limit. U Denotes analyte not detected at or above QL UA Denotes analyte not detected at or above adjusted sample QL. J Denotes associated result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above QL and QL is estimated. When used with "UA" (i.e., "UAJ"), denotes analyte not detected at or above adjusted QL and adjusted QL is estimated. UN Denotes analyte concentration is less than the quantiation limit and five times the blank concentration. Not reliably detected due to blank contamination. This qualifier used only for Appendix IX monitoring event when results are reported to at or above the project detection limit. R Denotes result rejected. Q Denotes data validation qualifier. CAS# Denotes Chemical Abstract Services registration number. X Denotes mass spectral confirmation not obtained-result suspect.

GPS Denotes Groundwater Protection Standards listed in Appendix G to Attachment 5 in the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5, 7, 10, and 16 (October 4, 2002).

NS denotes not sampled. NA denotes not analyzed. "-" denotes not detected (pre-2nd Quarter 2003) or not available / not sampled (beginning 2nd Quarter 2003).

Notes

-Appendix IX Groundwater Monitoring Events:

Third Quarter 2003, Second Quarter 2004, Second Quarter 2005, Third Quarter 2006, Second Quarter 2007
For Appendix IX monitoring events, all results evaluated to detection limit. See laboratory data deliverable for detection limit.

-9/30/2003: Verification sampling event for 16C1 (heptachlor) and 16C1B (Endrin). Verification results: all results reported not detected to detection limit. Original results 0.067 µg/l and 0.39 µg/l, respectively. Confirmation results reported in this table. -9/30/2003: Verification sampling event for 16C1 (chloroethane, ethyl ether, methyl ether, methylene chloride) and 16MW9 (chloroethane, ethyl ether, methyl ether, methyl ether, methyl ether). Verification results: all results confirmed original analysis. Original results reported in this table.

-June 21, 2004: Verification event for 8260B 16C1 (1,1-dichloroethene and 1,1,2-trichloro-1,2,2-trifluoroethane).

Verification results: all not detected except 1,1,2-trichloro-1,2,2-trifluoroethane added to quarterly analyte list beginning 3Q 2004.

Due to laboratory error, Appendix IX results for semivolatiles (Method 8270C) will be presented in 3Q 2004. Verification event results for 16WC1B and 16C1 (8081A) — all verification results were not confirmed.

07/27-28/2005. Verification event for 16WC1B (Mercury Method 7470A.) Not detected in verification sample.

Also, verification event for 16C1, 16WC1B-8081A. and 16C1, 16MW9, 16WC1A-ethanol. All verification results not detected. Verification results used.

06/19/2007. Verification event for 16WC1B and 16MW9 thallium Not detected in verification sample. Verification results used.

APPENDIX E

LABORATORY ANALYTICAL RESULTS – YEAR 2010 (CD-ROM)

APPENDIX F

FIELD NOTES (CD-ROM)

APPENDIX G

CORRESPONDENCE (CD-ROM)

APPENDIX E

LABORATORY ANALYTICAL RESULTS – YEAR 2010 (CD-ROM)



Appendix IX Monitoring Event

Monitoring Event: Second Quarter 2010

	Analyte	Quantitation Limit/QL (ug/L)	Detection Limit/DL (ug/L)
Method: 60)10B		
Laboratory:	CompuChem, a Division of I	Liberty Analytical, Cary, NC	
Tin		15	4.8
Method: 60)20		
Laboratory:	CompuChem, a Division of I	Liberty Analytical, Cary, NC	表表示。 第15章 15章 15章 15章 15章 15章 15章 15章 15章 15章
Antimony		1	0.4
Arsenic		10	2
Barium		10	1
Beryllium		1	0.2
Cadmium		1	0.2
Chromium		5	1
Cobalt		5	1
Copper		5	1
Lead		I	0.2
Nickel		10	2
Selenium		10	3
Silver		2	0.2
Thallium		1	0.2
Vanadium		10	1
Zinc		10	3
Method: 74	170A		
Laboratory:	CompuChem, a Division of I	Liberty Analytical, Cary, NC	。 1988年1987年1986年1988年1988年1988年1988年1987年1987年1987年1988年1988
Mercury		2	0.2
Method: 80)81A		
Laboratory:	CompuChem, a Division of L	Liberty Analytical, Cary, NC	
Aldrin		0.05	0.005
alpha-BHC		0.05	0.0049
beta-BHC		0.05	0.005
delta-BHC		0.05	0.005
gamma-BHC		0.05	0.006
Chlordane		0.86	0.86
4,4'-DDD		0.1	0.005
4,4'-DDE		0.1	0.005
4,4'-DDT		0.1	0.005
Dieldrin		0.1	0.0026
Endosulfan I		0.05	0.005
Endosulfan II	[0.1	0.0043
Endosulfan sı		0.1	0.005
Endrin		0.1	0.0055
Endrin aldehy	vde	0.1	0.005
Heptachlor	•	0.05	0.045
Heptachlor es	poxide	0.05	0.0055
	·		
Methoxychlor	r	0.5	0.025

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Appendix IX Monitoring Event

Monitoring Event: Second Quarter 2010

Analyte	Quantitation Limit/QL (ug/L)	Detection Limit/DL (ug/L)	
Method: 8151A			
Laboratory: CompuChem, a Division of Lie			
2,4-Dichlorophenoxyacetic acid	5	3	
Dinoseb	2.5	0.9	
Silvex	2.5	0.6	
2,4,5-Trichlorophenoxyacetic acid	2.5	0.7	

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Appendix IX Monitoring Event

Monitoring Event: Second Quarter 2010

Analyte	Quantitation Limit/QL (ug/L)	Detection Limit/DL (ug/L)
Method: 8260B		
Laboratory: Lancaster Laboratory, Lancaster, P.	A	
Acetone	10	3
Acetonitrile	100	31.67
Acrolein	25	5
Acrylonitrile	10	1
Allyl chloride	10	0.82
Benzene	1	0.1
Bromobenzene	1	0.1
Bromochloromethane	1	0.18
Bromodichloromethane	1	0.1
Bromoform	1	0.106
n-Butyl alcohol	50	20
tert-Butyl alcohol	200	50
n-Butylbenzene	1	0.1
sec-Butylbenzene	1	0.1
tert-Butylbenzene	1	0.108
Carbon disulfide	10	0.4
Carbon tetrachloride	1	0.16
Chlorobenzene	1	0.1
Chloroethane	1	0.1
Chloroform	1	0.1
2-Chloroethyl vinyl ether	20	0.45
Chloroprene	10	0.46
2-Chlorotoluene	1	0.1
4-Chlorotoluene	1	0.1
Cyclohexane	1	0.18
Dibromochloromethane	1	0.1
1,2-Dibromo-3-chloropropane	1	0.204
1,2-Dibromoethane	1	0.1
1,2-Dichlorobenzene	1	0.1
1,3-Dichlorobenzene	1	0.1
1,4-Dichlorobenzene	1	0.1
trans-1,4-Dichloro-2-butene	10	1
Dichlorodifluoromethane	1	0.148
1,1-Dichloroethane	1	0.135
1,2-Dichloroethane	1	0.147
1,1-Dichloroethene	1	0.223
trans-1,2-Dichloroethene	1	0.162
1,2-Dichloropropane	1	0.107
1,3-Dichloropropane	1	0.1
2,2-Dichloropropane	1	0.283
1,1-Dichloropropene	1	0.132
cis-1,3-Dichloropropene	1	0.1
trans-1,3-Dichloropropene	1	0.1
Diethyl ether	12.5	1.11
Dimethyl ether	12.5	0.1
1,4-Dioxane	200	45.48
Ethyl acetate	10	1
Ethanol	250	52
Ethylbenzene	1	0.1
Ethyl methacrylate	10	0.81
Ethylene oxide	100	20

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Appendix IX Monitoring Event

Monitoring Event: Second Quarter 2010

Analyte	Quantitation Limit/QL (ug/L)	Detection Limit/DL (ug/L)	
Method: 8260B			
Laboratory: Lancaster Laboratory, Lancaster, P.	A		
Hexachloroethane	10	0.11	
2-Hexanone	10	1	
Isobutyl alcohol	200	10	
Isopropylbenzene	1	0.1	
Isopropylether	10	0.6	
4-Isopropyltoluene	1	0.1	
Methacrylonitrile	100	9.75	
Bromomethane	1	0.542	
Chloromethane	. 1	0.2	
2-Butanone	10	1	
Iodomethane	10	0.58	
Methyl methacrylate	10	3.58	
4-Methyl-2-pentanone	10	1	
Methyl tert-butyl ether	10	0.39	
Dibromomethane	1	0.1	
Methylene chloride	1	0.2	
Naphthalene	i	0.126	
Pentachloroethane	10	0.8	
1-Propanol	100	20	
2-Propanol	100	50	
Propionitrile	100	10.22	
n-Propylbenzene	1	0.1	
Styrene	1	0.1	
1,1,1,2-Tetrachloroethane	1	0.1	
1,1,2,2-Tetrachloroethane	1	0.184	
Tetrachloroethene	1	0.1	
Tetrahydrofuran	25	2	
Toluene	1	0.1	
1,2,3-Trichlorobenzene	1	0.1	
1,2,4-Trichlorobenzene	1	0.13	
1,1,1-Trichloroethane	i	0.13	
1,1,2-Trichloroethane	1	0.1	
Trichloroethene	1	0.177	
Trichlorofluoromethane	1	0.176	
1,2,3-Trichloropropane	1	0.3	
1,1,2-Trichloro-1,2,2-Trifluoroethane	1	0.2	
1,2,4-Trimethylbenzene	1	0.201	
1,3,5-Trimethylbenzene	1	0.152	
Vinyl acetate	10	3.29	
Vinyl chloride	10	0.153	
Xylenes (Total)	3	0.208	
Ayrenes (10tai)	ی	0.200	

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Appendix IX Monitoring Event

Monitoring Event: Second Quarter 2010

Analyte	Quantitation Limit/QL (ug/L)	Detection Limit/DL (ug/L)
Method: 8270C		
Laboratory: CompuChem, a Division of Liber	ty Analytical, Cary, NC	
Acenaphthene	10	0.63
Acenaphthylene	10	0.75
Acetophenone	10	0.83
2-Acetylaminofluorene	10	0.51
4-Aminobiphenyl	10	0.53
Aniline	10	0.75
Anthracene	10	0.54
Aramite	10	0.73
Benzo[a anthracene	10	1.3
Benzo[b]fluoranthene	10	1.4
Benzo k fluoranthene	10	0.76
Benzo[ghi]perylene	10	1.2
Benzo(a)pyrene	10	1.3
1,4-Benzenediamine	50	50
Benzyl alcohol	10	0.58
bis(2-Chloroethoxy)methane	5	1.3
bis(2-Chloroethyl)ether	5	0.92
bis(2-Chloro-1-methylethyl)ether	10	0.64
bis(2-Ethylhexyl)phthalate	5	1.5
4-Bromophenyl phenyl ether	10	0.54
	10	1.5
Butyl benzyl phthalate	10	0.7
p-Chloroaniline Chlorobenzilate	10	0.51
	10	0.53
p-Chloro-m-cresol	10	0.87
2-Chloronaphthalene	10	0.95
2-Chlorophenol	10	0.59
4-Chlorophenyl phenyl ether	10	1.3
Chrysene	10	0.62
Diallate Diagram (Charles and Charles and		
Dibenz(a,h)anthracene	10	1.2
Dibenzofuran	10	0.57
Di-n-butyl phthalate	10	1.4
3,3'-Dichlorobenzidine	10	0.52
2,4-Dichlorophenol	10	0.74
2,6-Dichlorophenol	10	0.82
Diethyl phthalate	10	0.56
O,O-Diethyl O-2-pyrazinyl	10	0.54
Dimethoate	10	0.58
p-(Dimethylamino)azobenzene	10	0.57
7,12-Dimethylbenz[a]anthracene	10	0.57
3,3'-Dimethylbenzidine	10	4
a,a-Dimethylphenethylamine	50	25
2,4-Dimethylphenol	10	1.1
Dimethyl phthalate	10	0.55
m-Dinitrobenzene	10	0.73
4,6-Dinitro-o-cresol	10	0.55
2,4-Dinitrophenol	10	1.1
2,4-Dinitrotoluene	10	0.58
2,6-Dinitrotoluene	10	0.66
Di-n-octyl phthalate	10	1.3
Diphenylamine	10	1
Disulfoton	10	0.46

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Appendix IX Monitoring Event

Monitoring Event: Second Quarter 2010

Analyte	Quantitation Limit/QL (ug/L)	Detection Limit/DL (ug/L)
Method: 8270C		
Laboratory: CompuChem, a Division of L	iberty Analytical, Cary, NC	的一个人,但是一个人,但是一个人,他们就是一个人,他们就是一个人,他们也没有一个人,他们也没有一个人,他们也没有一个人,他们也没有一个人,他们也没有一个人,他们 第一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们就
Ethyl methanesulfonate	10	0.85
Famphur	10	5
Fluoranthene	10	0.6
Fluorene	10	0.69
Hexachlorobenzene	10	0.63
Hexachlorocyclopentadiene	10	0.68
Hexachlorophene	40	20
Hexachloropropene	10	0.74
Indeno[1,2,3-cd]pyrene	5	0.5
Isodrin	10	0.51
Isophorone	10	1.1
Isosafrole	10	1.3
Kepone	10	5
Methapyrilene	10	5
3-Methylcholanthrene	10	0.7
Methyl methane sulfonate	10	0.56
	10	0.62
2-Methylnaphthalene	10	0.54
Methyl parathion		
2-Methylphenol	10	0.51
3 & 4-Methylphenol	20	0.63
1,4-Naphthoquinone	10	0.13
1-Naphthylamine	10	1.4
2-Naphthylamine	10	0.94
o-Nitroaniline	10	0.69
m-Nitroaniline	10	0.63
p-Nitroaniline	10	1.3
Nitrobenzene	10	0.8
o-Nitrophenol	10	0.99
p-Nitrophenol	10	0.5
4-Nitroquinoline-1-oxide	50	0.42
N-Nitrosodi-n-butylamine	10	0.33
N-Nitrosodiethylamine	10	0.81
N-Nitrosodimethylamine	10	0.63
N-Nitrosodiphenylamine	10	0.62
N-Nitrosodipropylamine	10	1.1
N-Nitrosomethylethylamine	10	1
N-Nitrosomorpholine	10	0.6
N-Nitrosopiperidine	10	0.69
N-Nitrosopyrrolidine	10	0.55
5-Nitroso-o-toluidine	10	0.55
Parathion	10	0.57
Pentachlorobenzene	10	0.67
Pentachloronitrobenzene	10	0.69
Pentachlorophenol	10	0.84
Phenacetin	10	0.46
Phenanthrene	10	0.55
Phenol	10	0.56
Phorate	10	0.74
2-Picoline	10	0.83
Pronamide	10	0.53
Pyrene	10	1.4
Pyridine	10	0.98

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Summary of Quantitation Limits and Detection Limits



Appendix IX Monitoring Event

Monitoring Event: Second Quarter 2010

Analyte	Quantitation Limit/QL (ug/L)	Detection Limit/DL (ug/L)	
Method: 8270C			
Laboratory: CompuChem, a Division of Liberty Au	nalytical, Cary, NC		
Safrole	10	0.64	
Sulfotep	5	0.67	
1,2,4,5-Tetrachlorobenzene	10	0.8	
2,3,4,6-Tetrachlorophenol	10	0.65	
o-Toluidine	10	0.73	
2,4,5-Trichlorophenol	10	0.75	
2,4,6-Trichlorophenol	10	0.57	
O,O,O-Triethyl phosphorothioate	10	0.9	
sym-Trinitrobenzene	10	5	
Method: 9012A			
Laboratory: CompuChem, a Division of Liberty Ar	nalytical, Cary, NC	ykt i ni fil fil frigued fundag fårn, foren en reknyk i nokyskum mi nommødnifteftingstadefteftig frangskeftif	er en en en en krijfelijk filog princasi vilik en
Cyanide	20	3.5	
Method: 9034			
Laboratory: TestAmerica, North Canton, OH	Social impirel 98/4 militar 2002 de judida 2001 e 200 de 2015 de 1922 e 2000.	akt uitstellikking kataming plotte to kan se ka	
Sulfide	3000	2000	
Method: 9066			
Laboratory: CompuChem, a Division of Liberty Ar	aalytical, Cary, NC		danaminani mandini mandani manda (1)
Total Recoverable Phenolics	50	5	

APPENDIX F FIELD NOTES (CD-ROM)

4/14/10	RAAP. 803204-68	FB#9	4/14/10		RAAP 803204-08 DASUSEC		<i>F</i> -
	DAS/KEC				DASIGHE		
	ont.) (cond(us) sorth pt. orp(us)		W-14-7(Cont.)				
	Readings Stable	- Is	(1340) Readings	5table	- 1 12 16		
(1200)	3.68 681 7.65 6.75 77.5 Post R	inge Readings		530 6.25		19 Post	Purge Read
	(eadings Stable 3.68 681 7.65 6.75 77.5 Poot P. Sample Time (1155)	<u> </u>	San	ple Time	(345)		
S_q	mples Collected (3) 8240, (2) 8011, (+) TM		Damples	Collected! (3))8260, (2)8011,	(1)774	
						L. Harris	
FAL-3							
DTW-5	57,75 Bagin Purge (1208)	<u>:</u>	\$721716		LEVEZ TABL	1 1 1 1 1 1	
Post Purge DI	W-58.11 Initial Purge-Clear	<u> </u>	WELL	Drw	Post Purge DT		tes
Time Temp	(E) Condlus) DOM/L pH ORPHW) Parget	Desc	16-1	41.21	48,10		
(1210) 14,6	5 1182 4.40 6.63 65.8 0.37 Mi	n Clear	16-3	55.75	55,79		
(1215) 14,81		Clear	16-3	55.60V	60.93	 	
(1220) 149		SI. Claudy	16-5	3,38	/3,32		
(1295) 15,28	1/61 2,64 6,60 61.7	SI. Cloudy	16WC2B	50.76	55.35		
(1230)154	1 1154 2,56 6,60 60,8	51. Cloudy	16 mw 8	70.67	71.65		
(1235)154	3 1151 2:49 6:59 61.0	S1. Cloudy	16 WC1B	64.34			
(1240)15,3	7 1153 2.41 6.59 60.7 "	51. Cloudy	16 WOIA	64,21	66.34		
11240 Da	lung of Statela	.	16 mw9	62.14	63.54		
(1255)154	6 1157 264 658 61.5 Rot Pa Sample Time (1245)	rge Reading	1601				
	Sample Time (1245)	3	-16C3	57, 11	SWL	ONLY	
50	mples Collecks: (3) 2240, (2) 8011, (1) MM		- 16DDH3	DRY		114	
	The state of the s	50 E	- 16weaa			11	
WELL-7			-				
Drw-6	15.64 Regin Parer (1309)		16-31				
Post Purge Di	15.64 Begin Purge (1309) 10-2571 Initial Purge - Clear		D1W-55 6)	Bealn	Purge (1	403)
Timo Tom	() Condius) Dong/L OH ORPLAN) Para	ok Desc	Post Parge DTW-	60.93	In fall	Purae - C	lear
(1310) 13.6	7 598 7.52 6,24 57.4 0.3	lmin Clear	Time Temo(2)	Cond(us)]	50 9/2 DH	ORPUND	Purgek D
(1315) 13.0	9 573 6.30 5.98 64.3	Chear	(1405) 1425	247	7,94 7,74	46.4	0,3 /min C
(1320) 12.7			(1410) 1427	248	6.81 7.77	46.1	10 0
(1325)12.6		' Clear	(1415)14.28	***, -, -	6,67 7,77	46.4	11 (
(1330)12.8			(1420)1450		42 7.78	46.0	111 6
(1335)12.3			(14a5)14.39	247 4	,45 7,80	46.6	'
(1340) 12.3			(1430)14,54		.54 7.81	47.3	" 6
VIN WY 1900	39	<u> </u>	<u> </u>		(40)		

4]14[10			RAH	+ <i>P</i>			FBAY
			B0320 DA5/	r 1			
16-3(Ctno						
Cr		gs Stab	Le				:
(1445)		247	6:69	7,79	47,6 0	65 + Runge	Reading
		Sample	Time (1435)			
	Samo	es Colle	ctedi(6) 8240, (2)8011 (d	2)8270,0	a)TM
	,						, , , , , , , , , , , , , , , , , , ,
16-1					. i		,
DTW	- 41.21		(Bagin Rung	c(1 5 03)		
Post Parge	DTW-48,	10	Init	ial Purge			
Time !	Temp(2)	ond(us) D				mek D	es C
	13.93		3.61 7	07 66	19 00	Main Cl	eav
(1545)	<i>14</i> ,35	456 7	1.95 7.	00 64	10	" Ch	ear
(1515)	14.37	462	126 71	05 61	1 '	' Ch	ecsi .
(1520)	13,86	462 7	10 71	10 57	16-1	Ch	eew
(1505)	13,74	461 7	13 71	09 57	,4	Cle	ar
(1530)/	3,63	465 7	07 7.1	09 56	2 '	CL	ev
(1530)	Reading	s Stak	le				
(1542)	13,52	452 7	7,39 7,	07 54	.7 Pos	Lurge	Reading
		Sami	le Tin	e (153	75)		
	Samole	es Colle	efed! (3	18240,6	2)8270,	(1)TM	
	7			,			
16-2						<u></u>	
Dtw	-55,75		<u> </u>	egin Pur	ge (1554	<u>) </u>	
35 Perge DT	w-55.7	9	Initia	y Runge	- Clear	_	
Time T	emple) C	nd(us) D	org/L		/ 1 /	lingek	Desc
_ 1	356 4	48 9	1,92 -	7.13	54.0 0	13 /mira	Clear
		,44	,84	6.97	56.0	P	Clear
(1405) 13	.81 6	33 4	.45	0.97	55.8	11	Clear
(1610)13	93 6	08 6	,34 4	.98 8	4.6	11	Clear
(1615)14		93 6			3.8	11	C ear
(1620)14			26 4	,97 5	4.0		Clear
		Stable					
(1634) 13		22 6.º	17 2	10 52	4 Post R	lige Read	ding
			<u> </u>	<u>リー</u>		-	<u> </u>

4/14/10	KHHP 803204-02	·	FBH
	803204-08 DAS KAC		
16-2 (cont)			
	ine (1625)		
Samples Colle	Red (3) 8260 (2) 8270, (1) 74	1	
16-54			
Drw-338	Begin Purge (16	(0)	
0/0 5 30	32 In tight Runge - Cl	000	
Post Ruge Drw-13.			
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	(us) DOTE pH DRP(UN)	Jugek Di 34 min	Desc
(1650) 12:61 50			Clear
(1655) 12.19 50	4 3.05 7.17 48.6	11	Clear
(1700) 12,10 50		li li	Clear
(1705)12,09 5a	4 3.03 7.21 43.4	tı	Clear
(1710)11.97 52	3 2.91 7.23 42.5	44	Chair
(1715)11.96 52	3 2.77 7,23 42.1		Clear
(1715) Readings	Stahle		
(1729)12.14 524	3.30 7,21 48,1 /2	ot River	e Roading
	mple Time (1720)	1114	
5 70	Necked! (3) 8240, (a) 8270, (Drew	
Jampies Co	120, 120, 120, 120, 120, 120, 120, 120,		
		++++	
		++++	
		+	
14 Spring	100		
Temple) (adlus Dorge pt c	RR(m)	
12.32	59 7.94 7.08 4	15. H	
San	ple Time (1735)		
Samples	Collected (3)8240, (2)8270,	(1) m	
		++++	

115110			KHAP				FB#9
			803201 DAS/C	13.11			
General.	Notes		2				
	ther -						
_ 1	_	tection.	Nitrile	aloves			!
_			650 N	9 /			
- 0H	4,00 = 1	4.01	7.00 = 7.0	00 ,10	,00 = 9.	91	r
- Com	luctinity	1 reals	1413	s in 141	3 45 54	V.	
	70 = 10			7,,,,		<u> </u>	
		I	زلم الم	Le uco	1 0+ 000	th well	
				n each		wo.,	
/		_	1	icated	1 .	ماناء	
							200
MI Jamaj	IRD COTTE	U160 57	pred and	LI anapor	red 071 JC	e in coo	15 T
16WC2B	· /			-			
			77	-i. 0	1042		
_	50.76		- De	gin Purge	(40 TX)		
st Purge D	1W-25.2	<u>۱</u> ۱ ۱ ۳	1014	igin Purge al Purge	- Clear	L N	
Time Te		110000		2.7	100	001- 102	25C
0845) 10			138 7			Imia Cle	
0850)/	113 J	<u> </u>	70 6.			Ch	
0855)1				r	.3	Cle	
0900)/				54 39		Cle	
0905)				57 37	<u> </u>	Cle	
				6 37	>	Cle	
6915)6				5 34,	8 "	Cle	ar
		Stab					
(0929)16		24 1,1		2 36	4 Post	Purge Rea	ling
			7me (0	920)			
\$			edi (3)8:		8270, (1	MY	
				,	·		
K Repla	aced	water	level	port	Hole	Dugs	
K Repla	for	FAL-	3 and	16-	3)	•
				,			
			(4	رن			

4/15/10	KHAP	1-10#Y
	RAAP 08 DAS/408	
Nomw &		
Drw-70.67	Begin Punge (0954)	
Post Purge DIW-71.65	In that Purge Clear	
Time Temp(2) Condus Do	5/1 pH ORP(nw) Purgek	Desc
(6955) 12,49 129 5,9		Clear
(1000 12,59 127 5.15	8 5,28 102.9 11	Clear
(1005)12.62 128 2.5	1 5.36 90.3	Clear
(1010)12.67 127 3.88	8 5,37 82 7 "	Clear
(1015)12.84 128 1.40	5,37 86.9	Clear
(1020)13,04 129 1,02		Clear
(1025)13,19 129 0,95		clear
(1030)13,28 128 0,91		clear
(1030) Readings Stable		
(1059)14.28 134 1,18	5,35 67, 3 Post Ruge	Reading
Sample Time ((035)	J
Sandes Collected 13)8	1260, WSulfide, (1) TM, (1)c,	v. (1) 9065
	(2) 8151, (2) 82 70 (2) 8081	
16MW91		
DTW-62.14	Bogin Flurge (1114)	
Post Purge DTW -63,54	Initial Purge-Clear	
Time Temple Constitus	DOMIL OH ORPOWIPERS	ek Desc
(1115) 13.35 695	7.80 6.54 22.5 0.3	
(1120) 13.05 859	2.76 6.40 26.1	Clear
(1125)/3/11 896	1.60 6.37 23.8 "	Clear
(130)/3.35 930	1, 32 6,35 29,3 "	Clear
(1135)13,48 935	1, 23 6,34 32.2 "	Clear
	123 6.31 35,3 1	Clear
(1145)18,27 951 1	125 4.30 34.8	Clear
(1145) Readings Stable		
	50 6.33 24.1 Post	Purge Roadine
Sample Time		
San ase Charles	(3)8210, (2) Sulfide, (1) Tru, (1	04.109865
JOHN (NOS CO I MECHELI)		18081
	Tatorol I children to I th	<u></u>

* 4/15/10	RAAP	FB#9	4/15/W	RAAP	F8# 1
	BO3204-08 DAS/CJB			803204708 DAS/CIB	
16WCIAV					
DTW-64.21	Begin Purge (122))	16WC1B		
Post Parge DTW-66.3	4 Initial Purge-Cle	ar	52	imple Time (1450)	
Time Temple Condle	6) DOTAL pH ORP(MO) Pu	mel Desc	Sample	imple Time (1450) Collected: (3)2260, (2)5a	Ifide, (I) mili) an
(1230) 1338 555		Min Clear		(1)9065,127851	1, (2) \$270, (2) 8081
(Ja35) 13.52 420	6,71 6,65 34,5 1	Clear			
(1240) 13,43 66	1 4.20 6.60 33.4	Crear			
(1245) 13,38 696	2.15 6.58 38.6	Citar	1601		
(1250)13,30 711	2.01 6.60 36.1	Civai	DTW + 48,47	Begin Ruge In that Para	(1520)
(1255)/3,27 716	1.96 6.62 35.6 "	. Clear	Post Purse DTW+		e-Clear
(1255) Readings	Stable		Time Temple)		MMD) Phrack Dos
(1400) 14,03 747	1,31 6.80 12.8 Pos	it Runge Reading	(1525) 1572	7.32.1.1	11.4 0.3 min Clear
.5	anale Time (1300)		(1530) 15.57		9. 4 " Clear
Samples	Collected (9) 8260, (4) Sulfide, (3)	m, (3) CN, (3) 9065	(1535) 14.81	605 2.88 6.10 3	7 4 11 Clear
	(4) 815, (6) 8270, (6)8081	(1540) 15.54	- 7 - 7 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 	2.4 " Clear
KGW D4P			(15 45) 15 47	····································	48 11 Clear
Sa	mple Time (1315)		(1550) (5.5)	▗▀ ᠯ┈ ╎▝ ▎ ▕ ▘ ▎ ┈╬┈╎ ╒ ┞┈┆═┠╩╎┈╎┈╠═╬┈╎	32 11 Clear
59mples	: Collected: (3)8260.(2) Sattide.	(1)m, 1)tw/(1)9065	(1555) 15.54		2,9 11 Clear
	(2)8151, (2)8270,	(3)8081	(1555) Reading	s stable	
16WC1B			(1630) 15,48	539 2.04 4.17 3	5 d Post Perry Readin
DTW -64.34	Bagin Purge (1413	5)			
Post Parge DTW-64:	13 Initial Purge-Cle	ar	Samy	he Time (1600)	
Time Temple (ond(us) DOME pH ORP/M		& Sarons	les Collected: (3)8260, (a) sulfide, (1) 7m, (1)
(1416) 14,66	394 8.15 6.34 55.1	0.34 min Clear		1045, (2) 8151, (2) 8270	, @18881
(, , , , , , , , , , , , , , , , , , ,	350 4.96 5.99 67.3	" Clear			
	327 2,64 5,86 68.7	11 Clear	6		
	322 1.96 523 66.4	" Clear			
	310 1.87 5.81 64.3	" Clear			
	06 1.79 5.78 62.0	" Clear			
(1445) 15.75 3	02 1,70 5,77 61,1	11 Clear			
(1445) Readin					
(1508) 5.48 3	83 ,95 \$,28 50.7		}		
` <u> </u>				76	
	(1)				

4/19/10	BO3209-CB DAS/TRE	FB# 9	, 4/19/10	RAAP Bo3304+08 DAS/70€	FBA
	DA6/70E			DAS/TOE	
General Notes		· ·	74123		
Weather-	Gurmy, Leo's		(1103) 15,15	651 7,13 7,50 100,3	Post Runge Readin
PPE-Eye	Protection, Nitrilo gloves, He	urd Hats		Samole Time (1045)	
Califerations	Protection, Nitrilo gloves, He YOI 650 MDS		. Sample	5 Collected: (3) 82 40 (2) Sulfide,	(1) TM (1) CN, (1) 90
pH: 4,00 =	=4,00 7,00=6,99 10	,00 = 10,00	, /	(2)8270, (2)8151,	(3)8081
Conductiv	ity reads 1413 us in	1413 us std			
Do % =			7W9C		
			Drw-13.61	Begin Purge (1/3	3)
Statio	: Water Level Table	- Unit 7	Post Punge DTW-14	.76 In Fiel Runge-Cle	ar
WELL	DTW Postflinge DTW		Time Temp(c)	30 Hours to the promul	Punck Desc
7w/aB	24,23, 24,28		(1135) 13,41	1102 417 700 8911	0.3 Tuin Clear
7W9C	13.61 16.76		(1140) 13,33	1120 215 6.96 91.6	11 Clear
7W/0B	14.89 15.58		(1145)/3,23	1140 1.74 6.91 92.9	" Clear
7W10C	18.32 , 21.42	•	(1150)13.09	1155 1,50 6,85 95,5	" Clear
7W13	17.79 , 20.15		(1155) 13,17	165 1,46 6,83 96,7	" Clear
- 7mw6	25.30', 29.66		(1200)131212	174 1,40 683 97,0	" Clear
7W11B	24,52 24,53		(1205)13,30	1177 1138 6.23 97.3	11 Clear
7WCA	24,46		(1205) Readings	Stable	
· 7w98	22.30 DTW ON	Ly	(1218)1B.09	1189 1.36 6.93 94.0 Ps	st Purge Roading
0 7W11	23.46			imple Time (1210)	
· 7mw5	24,52		Samples	Collected: (1) Try, (1) CN, (2) 8	iano III
7W12B			7W10B		
DTW-24,23	Begin Purge (1012)	D7W -14,89	Bogin Purge (12:	35)
Post Purge DIW -24,	R Initial Purge-	Clear	Post Runge Drus - 15	58 Initial Pura + CI	ear
Post Purge DTW -24 Time Temple) (1015) 14.31	Cordina LOH DOULL ORPLE	W lungek Desc	Time Tomple Con	drug to 4/2 pt crown	Brock Desc
(1015) 14,31	700 7.95 8.42 141.3	0,34 min Clear	(1245) 12.47 8	60 2.91 6.98 98.2 44 1.85 6.88 101.3	0.37min Clear
(1020) 14.50	690 7.26 7.80 134,0		1245)12.22 8	60 2.91 6.98 98.2 44 1.85 6.88 101.3	" Clear
(1025) 14,75	667 7.34 7.36 126.5	111		41 1.64 6.86 101.8	" Clear
[1030] 14,96	662 7.22 7.40 123.			41 1,39 8,86 102.0	" clear
(1035) 15,18	658 7.15 7.42 121.9			13 1.30 6.86 101.9	" Clear
7 1 -	657 7.12 7.45 119.		(1305)12.44 84		" Clear
(1040) Reading	- P1 (1)	11	(1310)12.58 84		" Clear
	5 Stable (91)				

7/19/10	КННГ 803д04-08 D48/78€	F8# 9	4/20/10	KAAP	FB+
72408/1	D45/70€			1045/70E	
7WIOB (Cont.) (1310) Readings	0111		General Notes Weather-S	╃┼╏╏ ╗╫ ╀╬╅╇╇╇╇	
(1322) 12.98	844 1.39 6.79 100,0 Po	of Purge Reading	Opening of	thry 603	
(1000,) 10.78	844 1.39 (6.79 /00.0 Po Sample Time (1315)	of rulge Reading	Calibrations	Hacton, Nitrile gloves Hand Hats	
S/ac	Collected! (1) TM, (1)CN, (2)2070		- pH: 4.00-		
- Sampies	Conscita: (1) INC, II CN, (4) 800 10				JMY POX C J
7W10C			- Do % =_		
DTW-18.32	Begin Purge (134	9)	· Dedicated H	bing and well skints used at each	well
Post Parge DTW-	1.42 Initial Purge-			decored between each well	
Time Temple)	Condius) DOME OH ORPHIN PU	urdek DosC	· Punge water	signosed of at dedicated location	onsile
(1350) 13,50	785 1.89 7.20 91.4 0.0		· All samples	collected stored and transported in a	plens on I
(1355) 13,23	785 0.94 7.18 92.7	11 Clear			
(1400) 13,16	783 0.82 7/18 92,0	11 Clear			
(1405) 13,05	783 0.74 7.18 91,5	" Clear	74/3		
(1410)13,04	781 0.65 7.18 90.8	Clear	D7W-17.79	Begin Punge (0939)	
(1415) 13,15	782 0.59 7,17 93.9	Clear	Post Purge DTW-2	2,15 Initial Purge - Clear	
(1420) 13.08	781 0.57 7.18 90.7	Clear	Time Temple Co	ond Ous Do"3/2 OH ORP(MV) PurgeK	
(1425)13,01	782 0.59 7.18 90.1	Clear		424 4.28 7.47 69.3 039 min	
(1425) Readings	Stable		7	434 454 7.42 -5.0 11	Clear
(1440) 1345	784 0,61 7,21 96.4 Pc	st Punge Reading		439 2,90 7,39 -23.1 "	Clear
S	mph Time (1430)			30 253 736 -27.6 "	Clear
Samples	Collected! (1) TM, (1) CN, (2) 827	0	1000 1/8,10 14	28 239 7.36 -20.3 "	Clear
			(1010)13,20 14/ (1010)13,23 14/	25 2.31 7.33 -18.5 "	Clear
			(1010)13,23 14/	24 2,30 7.32 -16.3 "	Clear
			(1010) Readings (1028) 13,38 14	Stable	
			(1028)/5,38 /4/	30 2.45 7.33 -3.4 Post Pu	nge Roadi
			5	imple Time (1015)	
			Sample	es Collected (1) TM (1) CN, (a) 8	770
			PH probe wa	Planction on VST 650 MDB	1 6,17
		·	Continued p	Handorp readings with Myni	4 4110
				╎╎╏╎╎╎╏╟╏╏╏	
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and the second second	·	in the second se			

4/20/10	KAAP 803204-09 DAS/704	F8#9	4/20/10	RAAP B03204+08 DASITRE	FBHS
	DAS/70E				
7mw6,	0 0 0				
	5,30 Bagin Runge (1122) w-in 166 Initial Runge - Clear		7wca 1		
Past Rurge DT	w-onlike Initial Kurge-Clear	1/2 =	Drus-24,4	Begin Punge (146 25,09 Initial Punge C	lear
Time Ten	nple (and/aus) Dong/L pH orp(aw) Pu	mek Desc	Post Parge DTW-2	Condius Domy DH ORMUNI	
		Muin Clear	(1425) 13 98		Ostmin Clear
	93 1834 187 1136 -113	Crear	(1480) 13,91	1145 2.41 6.85 44 50	Clear
(1140) 14	12 1850 1171 1121 7117	1 Clear Clear	(1435) 14,06	1315 1.10 6.82 66	Clear
(1145)14.		ii '	(1440)/3,81	1325 099 623 76	" Clean
(1150)141		" Clear " Clear	(1445)/3.95	1307 1,03 6,82 84	l' Clear
(1155)14,0	73 /839 110 7,25 - 118 19 adings Stable	Gear	(1450)/3.96	1295 1103 6.80 89	11 Clear
(1218)14.	10 1986 1.12 7.36 -97 Post	Purge Reading	(1455)14.17	1286 1.06 4.80 91	11 Clear
(1010)171	Sample Time (1200)	Targe Reading	(1455) Read in		
420	ples Collected: (3/8260, 12) Sulfide, LIDTM, (Day (1) 9065	(1530)14.32	1266 1.20 6.87 91 Ros	+ Purge Reading
3477	(2)8270, (2)8151, (2)808	11	9,1-1-1-1	Sample Time (1500)	
	(2)80.2)(278131)(27830		Sam	ples Collected (3) 8260, (2) Sul	fide (1) that () cr
7WIIB				(1)9065 (2)827	10, (2) 8151, (2) 808
DTW-6	24,52 Begin Purge (1242)				
Post Purge DTW	-24.53 Initial Purger Clear				
Time le	mp(E) (ondius) Dorge pt DREMIN) Pu	mek Desc	7W DUP		
(1245) 13	87 801 3.82 6.58 56 0	34min Clear		Sample Time (1515)	
(1250) 13.		Clear	5am	ples Collected (3) 8240, (2) Sul	file, (1) TM, (1) Co
(1255) 13,	69 535 1.07 4.37 84 1	li Clear		(1) 9045, (2) 827	0, (a) 8151, (a) 8081
(1300)13.		' Clear			
(1305)13,5		l Clear			
(1310)/3.	76 539 1.02 635 51	Clear			
(1315)/3,	75 550 1.05 6.37 47	Clear			
(1315) Re	adinal Stable				
(1404)14	14 560 1,37 6,48 26 Post	Purge Roading			
	Sample Time (1320) mples Collected (9)8260,(
Sav	mples Collected (9)82co,(
	-1				

11/21110			'KHF	1r			1-844	4121110
4/21/10			B03204	08			T	
7	1 01 1		DAS / 74	E				5w8
	1 Noks		101 1	. ~ (11,6,			7
We	afner-	Sunny	1605 j t	urning M	1/1 1	211	1/2	Post R
	- Eyel	Pretection	, /V) 17116	groces, Ha	NHATS,	ofton =	24115	
<u>Call</u>	Dra Tions	- YSI 6	בי מנוען 20	myran i	L COLLA	neier		1020
- 2 H 3	4.00 =	4.00	1,00- 1	,00 /	112	11		1025
		reads	17/1	15 In 19	713.45	7 0		1030
- 70	10=	100	۱ ۱	12. (-		1	()	7/024
· Dedical	ed tuk	ing an	d well	8 Kirts	used at	each	well	1000
· All equi	oment de	coned b	ze tween	each we		{		linua
· Purge wa	rter disp	sed st'	it dedico	led loca	ron onsi	46.		(1050
· All Samp	es colle	cted st	ened and	transport	ed in coo	lers on	1CE	(1050
	, , , ,	, , , ,	,					(/050
	Static	Water		Table -			<u> </u>	(1111
WELL	- ,	DIM	, Past	Purge Dtu		ntes		-
_5W8B		14.76		5,33				
5W7B		9,12		9.16				ط. ا
5W5B		9,39	1	0.19				5W5
5WC21		9,44	/	7,49				
<u>5wcaq</u>		9,45	,	9,52				Post Ru
5 WC23		8,864		8,89		ļ		Tine
<u>SWIZA</u>		11,20	/	11,23				(॥५५)
55W7		11,50	D	TW ON	LY			(1150
<u>55W5</u>		8,24	,	И			<u> </u>	(1155
5W9A		1.87	/	(1				(1200
5WIOA		13.32	,	11				(1205
5WITA		10,37		11				(Jaic
5WCA		13,25		11				(1214
S5W6		7,08		11				(1215
S5W8		12.14		Tt.				(12/38
5WC11		16.01		11				
5WC12		15,68		tı		•		
· · · · · · · · · · · · · · · · · · ·			5					
			1.5	53				

4/21/10	KMHr 1 B03204-08	FB#
	DAS/70E	
5w884		
DTW-14.76	Begin Parge (1014	
fost Runge Drus 15.33	I hittel turge-cre	
Time Fomple Condlus De		ungek Desc
		34min Clear
} 	4/ 5.94 179	Ti Crear
\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	46 4.82 171	Clear
7-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	42 4.80 68	Clear
	44 4.80 167	" Clear
7		" Clear
	44 4.81 164	Clear
(1050) Readings Stable (1111) 13,06 63 7.	48 4.77 163 Pos	6 Qual Parking
5ample Tim	(1055)	t Ringe Roading
Sample 1 m	(3)8240, (3) B5K175, (1) Su	A. 1 19056 12 TOS
Jampies Cantores.	1070045, 107601, 1,4 11,100	
5W5B		
D7w-9,39	Bæjin Purge (11)	4()
Post Purge Dru-10.19	Initial Purge - 61	ear
Time Temple Condlus) 1	nors/4 sitt organ)	Purgek Dese
(1145) 11.94 435	5.55 5.48 225 0	34/min Clear
(i150) 11.46 471	3,49 5,53 212	l' Clear
(1155) 1153 482	3.20 5.56 212	n Clear
(1200) 1149 684	3.18 5.57 213 3.21 5.58 210	" Clear
(1205) 11 25 487	3,21 5,58 210	" Clear
Market 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	3,19 5,58 208	Clear
	3.18 5.59 206	l' Clear
(1215) Readings Stock		
		+ Ringe Reading
	le Time (1220)	1, 70, 10, 11, 19, 1
Samples Collect		(1) Salfide (1) 905
		D-1702
	54)	1

4/21/10			RAAI	V			FB#9	4/22/10		KHH1 1808294-08		FBH
,	,	G	03204-0 DAS/79)8 E						DAS/TOE		
5W7B '									letes .	 		
DTW-	9.12			egin Purg				Weathe				
ost Punge I	JW-9.16		Init	a Purgo	Clear			PPE-Eye	Protection, W. Ante			
Time T	Temp(c) (ondlus)	DOM/L	DH G	DEP(m)	urge K I		Calibrati	T		Whamek!	+
(1300)	10:30	145	8.84	5.26		0.34min	Clear				- 18.00	
(1305)	10,35	140	8.15	5.09	242	11	Clear		fivily reads 14	13 LIS in 1415	1415 5 5	
(13/0)	10.36	137	8,10	5,06	238	11	Clear	- 00% =				
(1315)	10.50	135	8.00	5.06	<i>a</i> 37	1	Clear				dateach well	
(1320)	11.18		7,89	5.07	236	- ,,	Clear		nent decored be			
(1325)	11,33	134	7.82	5.10	239	(1	Clear		ver disposed p	f a t dedicated	location on site	
			7,85	5.07	241		Clear	· All same	les collected ste	ted and transp	corled in coldiers	on ice
(1330)	Reading		ble_							100		
(1403)			8.19	5.20	237 Post	Purge Re	ading_	Sweal			1.00	
		Sample T	ine (13	3 <i>5</i>)				Dnu- 9		Begin Runge	(0,486)	
	Sampl	es Coll	ected! (9)8260, (9) RSK 17	5,(3)Sal	fide	(3-9.49	Initial Ringe		
			(3)90	56,(b)T	C, (3)Th	1,(@)&2	70 ,	Time Ten		"IL ptt ore		56
									53 5,97 3.46			lear
<u>5WIAA</u>					,	<u> </u>	<u> </u>		95 415 1196			ear
DTW-	11,20		B	egin Purg	je (1433))		(0950) 13.0				lear
Post Parge I	MW-11-22		This		- Clear		<u> </u>	(0955) /3,3				ear
Time:	Temple) Co	md(us)	DONUL		RP(MU)		Desc	(1000) 13,5				ear
(1435)	13,09	400	9,29	6.60	180	0,34 min	1	(100\$) 13.3			 	
	12.58	304		6.90	163	"	Clear	1010 113.4		3.66 325	-	al
	12:54		8.47	7,01	160	n	Clear		dings Stable	3.6H 337	Poot Purge Read	
<u>(1450)</u>	1		8.46		61	11	Clear	(1053)13.73			Poot Purge Read	711,73
(1455)			2,44	<i>6.83</i>	142	11	Clear		Sample Time	(10/5)	4 (6:1) () () () ()	
(5 ∞)					160		Clear	San	ples Collected (3)8	960 (3) KSK1/5, (1)	Sulfide, ()9050	P
				6.82	62	11	Clear)-m. (2)8270,1	(x) 10°C	
	Readings					10 -	1.0	F-1.2.0			+	
(1522)				6.81	161 Pos	t Kunge R	<u> </u>	5 W DUP				
		Sample	Time (1510)		'-	 		Sample Time			11000
	Samples	Collect	led: (3)8a	(3)R			1)9056	' Samp'	les Collected 18)K3(60) (18) (25 K17)	5 (1) Sulfide (1)	1926
			6	5	(a) TO	<u></u>	<u> </u>	. [] [] [TITE (I) IM	(a) 8270 (a) TOO	
_			. Q.					·		, , , , , , , , , , , , , , , , , , ,		

4/22/10	RAAP 803204-08	FB#9	4/27/10	KAAP B03204-08 DA5/70E	F8# ^c
	BO3204-08 DAS 170E		General Dates	DA5/70E	
<u>5mc33</u>	2 2 1		The same of the sa	Ly Juny, Scathered Showers,	EA - (A)
	9.45 Begin Punge (1107)		20 F E & DAT	etien Witrile gloves Cont	50 403
96t Nurge U	TW-9,52 Initial Purge-Clear	Desc_	Calinations	YSIT 450 MDS & Myron 2	(ul frame for
7	3.66 873 219 6.56 235 03 m		- att- 4,00 = 4,0	0 7,00 = 7,00 10.00	-10.00
	179 926 0199 6.77 201 11	Clear	- Conductivity		
/	3.81 960 0.76 6.80 187 "	Clear	- Do % = 100		
	92 967 0,75 6.80 183 "	Clear	· Dedicated tubing		each well
	1.00 968 0.73 6.82 176 "	Clear	· All equipment &	reconed between each wel	
	4.13 971 0.76 683 173 11	Chear	· furge water disp	osed of at dedicated loca	tion onsite
	4,20 971 076 6.83 169 11	Clear	· All samples collec	led, stored and transporte	d on ice in cook
(1140)1	Radings Stable				
(1204)	14,59 983 0,80 6.90 162 Vost K	irge Reading		aler level table	
	Somale Time (1145)	"	Dru'		Notes
-4-	Samples College (3) 8240, (2) RSK175, (1) 541	fide, (1)9056	13MW 1 20.1		
	(1) TM, (2) 8270, (2) TO	<u> </u>	13mu2 20.0	8 20.85	
<u>5wa3'</u>	1	.)	13mw3 1272 13mw4 16,37		
	-8,86 Begin Purge (122)		13MW4 16.37 13MW5 15.9		
Post Yung	Temple Condins Dough pt cro(m) Pu	ngek Desc	13MW6 15.51		
	Temple Condino DOUS L pt cro(m) Pu 13.06 921 5:167 7:22 156 0.	34min Clear	13 Mw 7 15.54		
(1225) (1230)		Clear			
(1235)	12.85 996 1.12 4.88 167	Clear	13mw3		
(1240)	13.15 997 1.05 6.86 164	" Clear	DW-1292	Bagin Purge (071	1)
(1245)	13.32 1001 1.08 6.84 164	" Clear	Post Purge DTW - 107.9"	In Hall Purge - C/E	av
,		11 Clear	Time Tamp (2) Cono	(Lus) Doroll of ORAM	
(1255		11 Clear	(07/5) 11.72 (4/5		0,39min Clear
(1255)	Readings Stable		(0720) 11.76 (39		" Clear
(1318)	13,74 1007 1.10 6.88 155 Rost	Purge Reading	(0725) 11.76 647		l' Clear
	Sample Time (1300)		0730 11.79 654		Clear
	Samples Collected: (3)8240, (3) R5K175, (1) Sal	fide, (1)9056	(0735) 11177 656		" Clear
	(DTM, (2)8270	1,(2)TOC	(0740) 1174 657		1 1 4 647
:	(57)		(0 740) Roading 5 Sta	04 <u> </u>	
	Official and	, , , , , , , , , , , , , , , , , , ,			

4/27/10 15 HHr R03204-08	F0#4	4/27/10	/c	1944 15294-08		F-B
BO3204-08 DAS/702				AS/TOE		++++
13mw3 (Cont.) (Condlus) DO "9/L pit onl	0 0 /2	10mw1	 		, , , , ,	+++-
(0810) 11.88 456 6.56 6.98 142 Pos-	t Purge Reading	D7W-15.		Bogin Runge		++++
Sample Time (0745)		Post Purge Dru-	14.03]	In Ala Maryo	- Clear	Desc
Samples Collected: (3)8240, (2)5416de (2)8280, (2)	8332/8330		andlus andle	pH coephu	Dangel .	Clear
(2)8081/8082, (2)8151,(1)314.0,(1) TM, (1)C	N (2)8270	2	426 9.92	7.25 157	0.37min	
		V	427 9.51	7.29 153		Clean
13mw4		(1025) 12.91	436 9.50	7.28 157		Clea
DTW - 16.37 Begin Rurge (0823)	·	1030 12.87	427 9.49	7.32 145	11111	Clear
Post Purge DTW-16.43 Intral Purge- Clear		(1035)12.48		7.43 142	1	
Time Temple Condlaws DOGL AH DRRUW Rungek	Desc		447 9.53	7,40 143		Clear
(0825) 12.15 453 6,70 6,98 145 8.34m			427 9,51	7,35 148		Clear
(0230) 12,16 482 6.56 6.82 145	Clear	(1845) Readings	Stable	2112		
(0835) 12,15 492 6.59 6.82 149 "	Clear		420 9.63	7.40 147	Post Parge	Kead inc
(0840) 1217 496 6.60 6.81 152 "	Clear	7	mple Time (1	(50)		
(0845) 1220 497 660 6.78 151 "	Clear	Samples Co	Hec led (18) 826	6, (3) Tru, (3) CA	(3) 9065 (0	18/5/
(0850) 12 19 497 661 678 149 "	Clear	.	(6)8270, (4)8021, (4)808	1 147 341410	<u>e</u>
(0850) Roadings Stable	0 1					
(0929) 1216 475 6.83 6.78 157 Post Pur	ge Keading			1 11		
Sample Time (0855)		Stat		vel Table -		+++
Samples Collected; (3) 8260, (2) Sulfide (2) 8280, (1) (1) CN, (2) 8270, (2) 8151, (2) 8021/8082, (2)	TM, (1) 314,0	WEZL		Purge DTW	Notes	
(1)(N, (2)8170, (2)8151, (2)8031/8082, (2)	8330/8332	100DH2R	17,74	7.76		
		[1003				+++
		10030	16.38	6,45		
13mw DaP		IONWI	15.81	16,03		+
Sample Time (0910)	()	1004				
Samples Collected: (3) 8240, (2) Sulfide, (3) 8880, (1)7	74, (113/4,0					
(1)(N,(2)847),(3)8151,(2)8081/8082,(2)2	7336 / 8332					
						++++
				 - - - - 		++++
(59)						

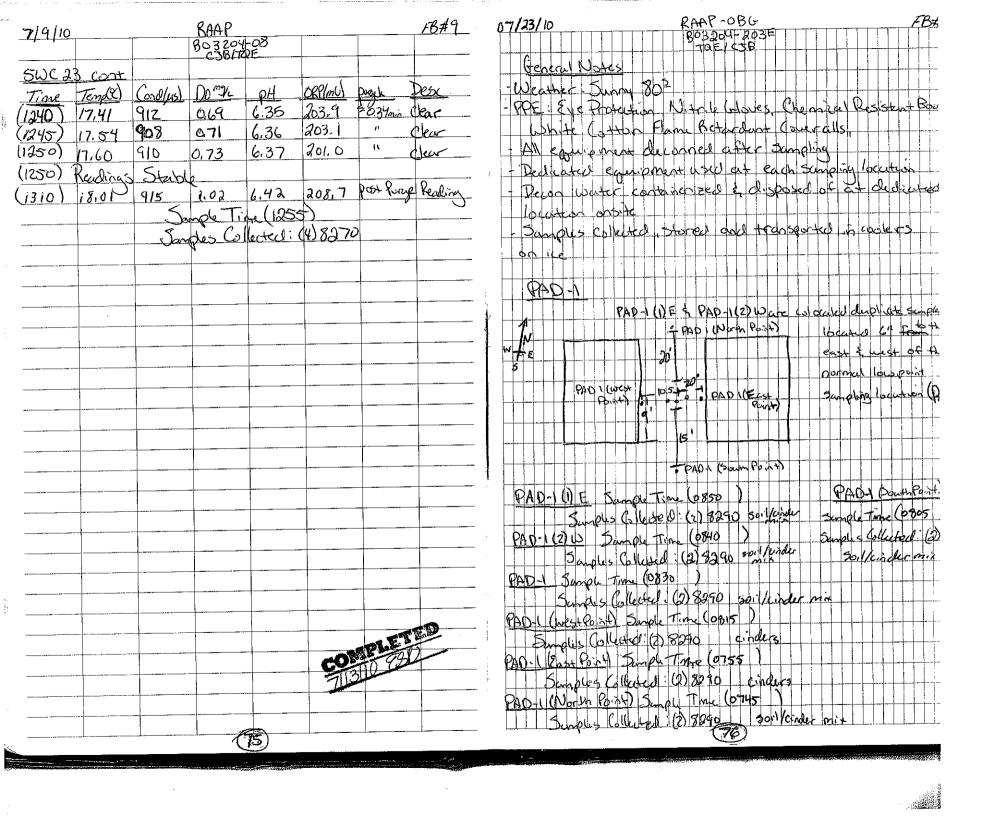
" 4/27/10	RAAP .	FB#9	4/28/10	RAAP	FB#
7/2///0	RAAP BO3204 B8 DAS/TOE		· // // // // // // // // // // // // //	B03204-08 D46/170=	
10DDH2R V	<i>DAY I GE</i>		General Notes		
TODURAL .	Bagin Runge (1218)		(3) (2)		
DTW- 17,74	Tili Dan Clear		Box of Pale	tion, Nitrile gloves, Catton Suits, Rubber books, 1 VSI 650 MDS / Rypan L Ultrameter	ay duly 910
Post Punge DTW-17.76	Condays) Domy/L att ORP/AND Pu	nek Desc	Cal Am Augus	VST 450 50 DE / Alvana / Altrangett	4423114
7		Vain Clear	- AH: 4 Ch =	4.00, 7.00 = 7.01, 10,00 - 10,00	
(1230) 11.56	599 3.11 7.13 /59 0.3 654 1.00 7.24 142	Clear		y reads 1413 us in 1413 us 5td	-
(1235) 11,19 (1240) 10.98) Clear	- 00% = 16		
	644 0.95 7,20 122 6 26 0.98 7.16 116	Clear		bing and well skirts used at each c	11/9
7		Clear	All aut L	decomed be tween each well	
		" Clear	a Rus equipment	is posed of at dedicated location on sile	
		" Clear	o All sample	Recked shored and fransported on ice i	
(1300) 10,97		Clear	AII SAMPLES CO	illecka sibiles and franciscos es on ice i	71 6000
(1305) 10.98		Clear	13 11406		
(1310) 11.02	5.39 1,74 6,97 122 s Stable	Gear	15/100 - 15.5	Begin Ringe (0704)	
	515 196 4.85 127		Post funge DTW-	605 In hal Runge-Clear	
(1334) 10,92	515 196 4.85 127		Time Temple	and hus Do Mile Ott SRPland Ruge	K Dosc
	ample Time (1315)	1324 122015	(0705) 11.56	791 4134 7112 137 034	in Clear
Samples	Collected: (4)8240, (2)541file, (1)TM, (2)8151, (2)8270, (2)8081, (2)	angi	(0710) 1195	825 354 7,00 139	Clear
-	(3)8(51) (2)8310, (3)8081 , (2)	8081	(0715) 12.10	231 3.44 7.05 140 1	clear
			(0720) 12.16	831 3,44 7.04 143 11	Clear
			(0725) 12,19	831 3,44 7.04 143 11 830 3.39 7.02 144 11	clear
			(0730) /2.17	228 3,37 7.00 144	Clear
		·	(C730 Raadings	57able 1100 177	CLEGU
			(C750) Nacialing	820 3.53 7.05 146 Post Dur	and Parties
				Le Time (0735)	y creating
			Shim	1.1./2)02, a (2) C (2) (2) (2) (3) The	1 1 1 () ()
			Jampies Col	Leled (3) 8260, (2) Sulfide, (2) 8480, (1) TW (1) 314,0 (2) 8081 / 8082 (2) 8151, (2)	0227/72:
				7117 91710 19 70 4011 97 99 10 7013 119	
			PAD-I	Dup-L	
					(0800)
				Samples Collected: 5 amples Collect	
				Samples Collected: 5 amples Collect (4) 8290 (4) 8290	
	(di)	<u> </u>		(ca)	1.1
	N 1949				and to self-tents

4/28/10		RAI BO3204 PAS/1	9/		FB	3#9	4/28/10	11111188	RAAP BAGITOE			FB#
		PAS/7	95						DASITOE	1111		
10D3D V							LODUR					
DTW-16.	38	Begi	in Purgel	1351)		!	59	mple Time (1	555)			
Post Purge DTW-11		Initial	Purge-	Clear W	rotten legg" o	dor	Samples	Collected: (6)80	60, (2) Sulfi	de (2)80	1 (1)	7W, (1)CN
Time Temp	(E) (fond (us) DC		pH Of	PP(My) fu	rgek Desc 34min Clear", 17 u	· · · · · · · · · · · · · · · · · · ·		(2)8151,	(1)8270, (1)	18081, (1)9065	
(1365) 1411			<u>;71 -</u>	19700	34min Clear "	poor						
(1400) 14,2	2 647 2	,07 7	,46 -	190	11 . [4		1004				+++	
(1405) 14.4			45 -	180	n R		Drw - 227	78	Bogin Pu	. 11		
(1410) 14.61				-174	(' N	·	Post Pringe DTW-		Initial Pa			
(1415) 14,3				160	11		Time trouple		1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	ORP(MU)	Ruge	
(1420) 14,20	642 3.	15 7.		157	11 10		(1630) 14,32	337 6.37		80 90	0.3 Ym	
(1425) 14.0	7 638 3	.21 7.	41 -	155	11		(1635) 14,36	332 4,80		90	ŧa	SICland
(1425) Read	lings Stable	<u>. </u>					(1440) 14.51	328 3.69		101		51.Cloud
(1448) 14.39	632 3	51 7		-149	T		(1445) 14.30	326 3.63	6.91	104	4/	51 Cloud
	Samole T	Time (1	1430) Po	st Purge	Reading		(1650 13.90	325 3.63		107		SI, Cloud
San	ples Collected	16)8260	(2) Sulfi	de (a)80	81, (1) TM,1	(1)CN	(1655) 13.96	324 3.66 5 Stable	6.93	108		SI. Clous
/	(2)	8151 (2)8270. (2) <i>8</i> 081,1	1)9065	-	(1655) Reading	s Stable			, j	
1003 V			<u>, , , , , , , , , , , , , , , , , , , </u>		1		(1716)14.23	328 3.78			Post R	inge Readin
DTW-16.0	7/	Ber	in Purge	(1503)				Sample Tra	ze (1700)	5.		
Post Purge DIW-1	6.14	Triti	in Purge al Purge	-Clear	·		5a	mples Collected	(6)8240,	(a)501Cl	de, (2)	8081 (1)7
Time Tem	(E) Condlus) i	DOMO/L	pt c	KP(MV)	Purgek Des	<u></u>		1' (1) Co	3,(1)9065	,(2)219	1, (3).	3270
(1505) 13,0		4.64	7.42 -	- 85	0.3/min Clea	v			a)8081			
(1510) 15,2		4,02	7.35	1	" Clear	<u>-</u>						
(1515) 141		3.40	7,42	30	Clear							
(1520) 14,		3,22	7.41	54	Chear							
(1525) 14,		3,22	7.36	63	11 Clear	-						
(1530) 14.1		3,20	7.36	66	" Clear							
(1585) 14,		3,25	7.37	70	11 Clea							
	dings Stabl											
	73 550		7.45	82 Par	st Purge Read	line						
	Samuela	Time	1540)			9					OM	LETE
	ples Collecte	L: (6)21	60,(0)50	lfide la	18081, (1) TM.	(1)CN					5 2010	LETED ESC
San	(2)81	151 (a)	2270 (2) . (&O&	(1)9065							
	1 ~ 781	, <u> </u>	L ,	(· · ·) ·								
<u> </u>	1	(la	3						(66)			

6/28/10	R	AHY		FB# 9	4/28/10	RAAY	F8# 9
·	8032	04.68 C/KAL				uen ficario	
General No	1e5					DASIKAC	
ا ا ما	12.11. <i>(</i> 14.	dy 805		,	16mw9		
PPE-	Eve Profestion.	Nitrile 9/0	us, Hard Hat.	5	Drw-65.65	Bogi	n Parge (1156)
Calibr	n Hons - X5I	- 650 M	5		Post Ringe DTW-1	66.30 Initial	Ringe-Clear
oHI H	BO + 7.00	つんのこんの	0 10,00 ~		Time lense Co	nothers Do of 1 AH	ORANW) Rugekgow Desc
- Conduc	tivity reads	1412 450	n 140Ress St	\mathcal{J}	(1200) 17.58 8	09 9.74 6.55	2010 0,3 Ymin Clear
1 - Dola -	- 1/00%				(1205) 17.08 8	96 5.00 6.37	178.2 1 Clear
. Dedica	ted tabing and me	Uskirts used at	each well.			13 2.40 6.32	148.0 " Clear
· All en	uipment deconned	between each	well.			07 1,68 6,40	137,0 " Clear
Payme to	valendispused of a	+ dedicated la	cotton ousite.			102 1,49 6,39	132.8 " Clear
All	amples collected	stredard to	usported in coolers	مه زحد.	(1225) 16.30 8	92 1,25 6,40	1289 " Clear
3	20100100					63 1,80 6,40	1262 " Clear
						66 1.18 6,39	128.6 " Clear
					(1235) Readings	Stable	
TW13						Sample Time (12	40)
DIM-19	130	Bear	M PURAE (104)	\$		comples Collected! (6	2240
Post Parge DTV			MARGE- CLE		(1245)16.19 8	60 1.26 6.40	121,9 Post Ruige Readi
			RAMU) BURGELK			0 110	1977 I GOT LAIGE SALES
Time Temp(0			25.0 03 min		16WC18Y		
			78.3	c lear on		2 Barr	Para (1954)
(053) 13,91 (100) 13,65	,		36.2	CLEAR	Post Parge DTW 6	004 -	Purge (1254)
	1366			CLEAR	1051 range 0100 to		
13.74 (13.74)		1.17 6.96	1220 "	CLEAR		5139 6.03	1820 Ous Vinju Chegar
(110) 13,74			7.	Clear			
1115 13.80			116.2	1	(1300)16,16 3 (1305)15,74 3	399 1,75 5,79 380 1,30 5,75	194,9 " Clear
1120) 13.78	/353	1.34 6.94	116,3	Clear	1300 1500	280 1.30 5.75 73 1.02 5.75	1987 " Claw
(1120) Reads	ng Stable	1 / 115 3	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		(1310)15,90 2	73 0.93 5.76	199,9 () Clear
	Semple Semple	Done (1/25)	}			74 0.86 5.79	
San	rples Collected	(2)TM		`		19 0.06 3.77	
		i			(1325) 16,07 5 (1325) Readings.	73 0.81 5,80	201,6 11 Clear
[113 5] 150	7 1350 1.	64 6.95 11	7. Mast Parge Re	walnes .	(1325) Readings.	2+ab/0 / / / / / / / / / / / / / / / / / /	}
						Sample Time (133) 5 Collected (2) 8081	/
					Derng le	s (offectal) (a) 208/	
	7	(89)			(1345)16.90 3	18 1135 550	2321 Root Rugo Read
The state of the s			A Continue of the State of the Continue of the State of the State of the Continue of the Conti				Andread of the second of

6/28/10	PMP	F8#9 4/3	28110	RAAP	F8#
WIGOIN	RAAP BO3204-08 DAG/KIC			B03201-08	
	DNSING			0/13/12	
16 D4P		, ,	10DDHAR V		
	ample Time (1340)		D7W-17.76	Begin Purge (1	5/8/
5 amρ	Sample Time (1340) Les Collected (4)8081		of Parge DTW-19.75 Time Temple Condlus	20 % pH ORPAN)	
. , , , , ,		7	Time Temple Conditions 1515) 17.43 492	6.99 6.81 160.6	Surge K Desc 0.5 min Clear
10mw1	13 Begin Purge (14)	<u> </u>	1520 1824 575	6.99 6.81 160.6 5.20 6.89 180.7	" Clear
Post Auge DTW-			1525) 18,10 615	Hi95 4.89 185.3	Clear
Time France	Condlus Dorok pt ORKIN		1530)17,87 619	4.46 6,88 186,1	" Clear
(1410) 18,20	391 9.44 720 197.6		1535)14,78 592 1540)16,48 550	4,14 6,73 184,0	Clear
(1415) 18,34	393 8.90 7.14 241.5	" Clear	1540)16,48 550	3.89 6.62 185.2	" Clear
(1420) 18,16		U Clear (1545 1627 525	3,90 6,57 182,9	il Cloar
(1425) 18.28	392 8.73 7,02 2705	Clear		4.01 6.57 190.8	" Clear
(1430) 18.00	394 8.76 701 276.7	<u>Clear</u> (1550 Roadwas S	hable 117 107 0	
(1435) 17.96	391 8.45 694 281,9	" Clear (1612)16.48 577	3.43 6.47 197.9 Time (1555)	Post Ringe Keash
(1440)17.95		" Clear Clear	Sample	Mecked: (1) 9066	
(1445)17,90 (1445) Readin	391 8.41 6.87 735, 3	Clear	Jampies Ca	recruit, 1000	
(1503)17,78	294 870 676 2866	Post Puras Readings			
(1303)11178	394 8.70 6.76 286.6 Sample Time (1450)	J. J	10 Dup 2		
S	amples Collected: (1)9066	·	Sa	mple Time (1405)	*
			Sample	5 Collected (1) 9066	
c			<u> </u>	 	
10-DUP1					
	Sample Time (1500)				
	comples Collected (1) 9066	·			
		.			
	(1))			(AS)	
		A consequence of the control of the			

71910 KAR	FB#4	7/9/10	KAAY	FB#
7/9/10 C28 48/1705			(78 20 172E	
Ceneral Notes		1510(27 V		
- wather suncy 80= 90=	· · · · · · · · · · · · · · · · · · ·	DTW 10 3 3		1031)
- PPF: Eve Hotertion Nitrile Gloves		Prosper DTW 1026	-	Clear Rue le Desir
- Calibrations: USI 650 MDS DH: 400 = 4100 7.00 = 7.00 10.00 = 9.	<i>a1</i>	1035) 16.73	9/3 /26 6/5	3/6,5 = 6,3/micle
		(1040) 16,53	906 0.72 6.18	286 4 da
Contenctioning reads 14/12 us in 14/13 as	St4	(1045) 16.48	903 9,59 6,22	260.4 " Can
- Dedicated Tubing and well skirts used at ea	ach well	(1050) 16.88	899 0.45 617	251,0 " Vea
- All equipment deconed between each well		(1055) 17,24	901 0.40 6.17	237,0 " den
- Puraz wated disposed of at declicated location	ensitk	(1/00) 17,25	901 0.35 6.19	228.0 " (100
- All San plas Collected, Stored, and transported	in contes	(105) 17.25	901 0.33 6.20	217.6 " Claus
onice		(1110) 1732	901 032 4.21	209. 4 " C/G.
		(1115) /7,4/	900 631 620	204.4 11 Clear
SWCZIV		(1120) 17 65	900 031 618	1995 10 Clear
Drw. O.Zi Begin Pung (0915	<u> </u>		901 0.31 6.18 table	195.1 " Clear
Past Purce DTW: 70.29 Insteal Plage: Clear		(1/25) Readings S (1/4/) 16.95		209, 4 Post Purce R.
Time Tempter Cand (us) DO Mg/L DH CRP(mu) Program	le Desc 34min Clear	1 1/1/4/6/75	5 mg (1/30)	20 17 10ST (43: 14)
7			Samples Collated: (4) 82.	70
(0925) 17.10 589 2.21 3.49 362.2 " (0930) 17.27 590 1.56 3.47 376.6 "	Clear			
(0935) 1751 589 1.42 3.47 384.1 "		500 c 23 23 1		
(0940) 17.68 588 1,12 347 389.9 "		DTW: 9.45	Begin Pura	e (115B)
(0945) 18, 17 589 0.96 3.47 392,2 "		Post Penze OTW:	In Fiel Par	Q Clau
(0950) 18.66 589 0.84 3.48 393.2 11			Consult py	RP(n) Punger Desc
(0955) 18.75 589 0.79 3.50 389, 4 "	clear		965 5.07 6.88	1716 4834 cles
(1000) 19.87 589 0.80 3.51 388.4 "	Clear	(1205) 18.87	957 2.92 6.79	193,2 4 clea
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	* Pueu Peading			204, 4 4 Clear
(1017) 1857 599 1,00 3.48 378.4		(1220) 8.64		209.2 11 clca.
Sample Time (1005) Samples Collected: (4) 8270		(1220) 8 64 (1225) 8 27 (1230) 1701	123 1.18 6.40 1113 0.92 6.46	
- Simples Calletted. CT Od 10		(1230)	940 0.82 6.38	206.4 " Clear
		(1235) 17.37	90% 0,75 6,94	208.0 " Clear 206.9 " Clear 206.0 " Clear
73)			79	

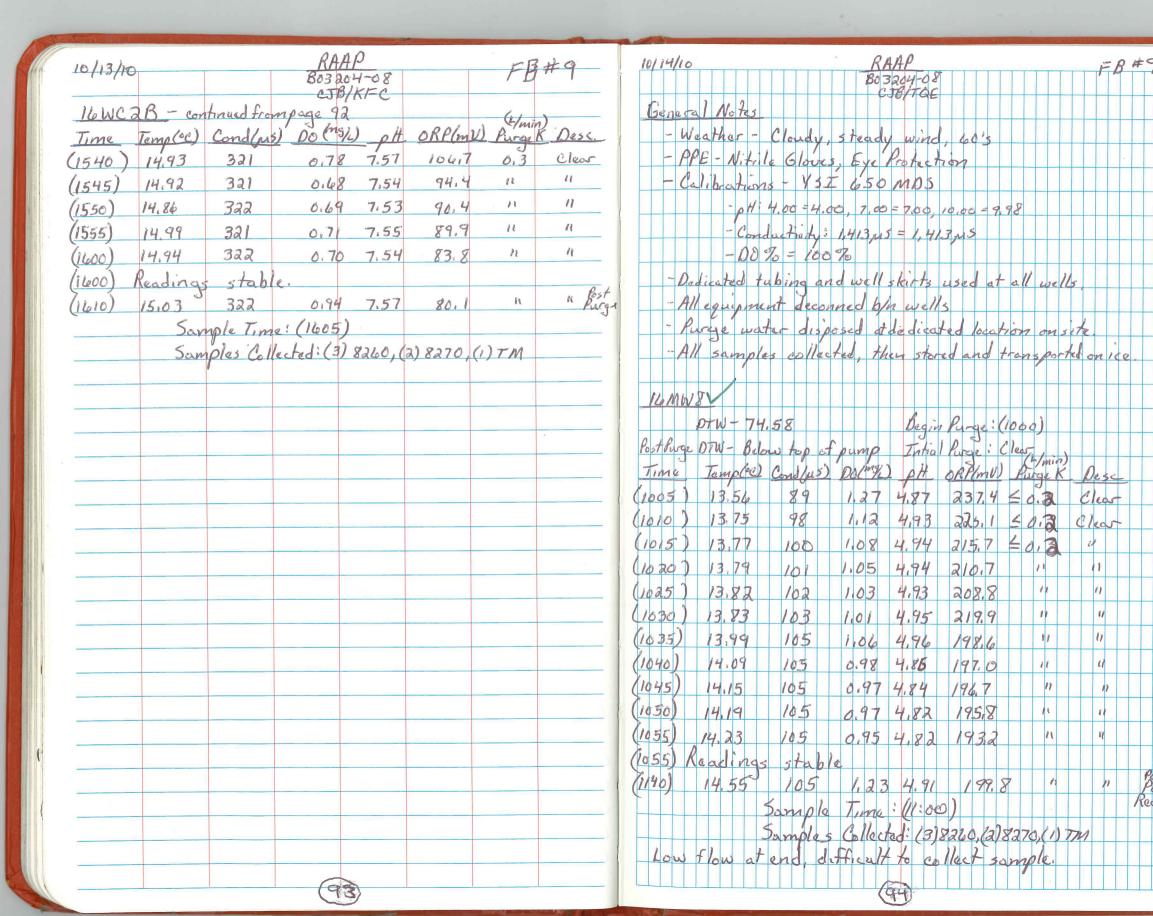


10/13/10		RAAP		FB#9
10/13/10		B03204-08		
CIA	1	CJB/KFC	TOE KFC Bioligio	
General No	Mostly clour			1
	itrile gloves,		16 / 1	
	4.5		10 00 = 9 9 9	
	1		H13.5	
	Conductivity:		,-11 5/45	
	DO 70 = 100	ag potential and a second a second and a second a second and a second	1 1 1 11	.)
- Dedicate	tubing and	I WELL SKIFTS	used at all we	LIIS
All equi	ipment de co	nned betwe	en wells	on site
- Purge	water dispo	see at acat	cated location	and in ice
All sav	upies collect	ed, then sto	red and transp	perrue in icc.
21	1. 1.1 /	1711	- 11 - 4 11.	
	tic Water L		The same of the sa	
Well	DTW	Post Purge DT	Notes	
16-1	47.40	51.80		
16-2	55,77 56,94	55.87		
16-3		71.05		
16-5	3.20	3.22		
16WCaB	54.92	66.68	6	
16 MW8	74.58	Below top a	pump	
16C1B	76.70	71.32		
16CIA	76.28	71,11		
16MW9	67.09	47.54		
16C1	50.15	50,17		
1603	68.46	-	GW Not sample	d
1600H3	Dry		n h h	
16WCZA	Dry		/\ (\)	
	,			
		(P2)		

	Will have
10/13/10 RAAP FB#9	
B03204-08	
C3B/KFC	
16-31	
DTW - 56.94 Begin Perge! (10:15)	
Polt V. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
(1020) 14,27 251 6.83 7.62 215.6 03 Clear	
(1025) 14.52 247 6.59 7.75 219.4 "	
(1030) 14.65 245 6.54 7.77 223.7 " "	
(1035) 15.02 241 6,71 7.81 2318 "	
(1040) 14.32 239 6.53 7.80 241.8 " "	
(1045) 14.16 238 645 7.83 249.2 11 11	
C1050\$ 14.12 236 6.46 7.85 256.2 " "	
(1055) 14,30 235 6.61 7.81 263.8 "	
(1100) 14.27 237 6.76 7.79 271.0 × 11	
(1105) READINGS STABLE Ready	Je
(1125) 14.30 235 6.76, 7.86 279.2 " "	G.
SAMPLE TIME (110)	
Somples Collected: (6) 8260, (2) 8011, (2) 82700 (1) tm,	
(1) two Hg	
& (Souples collected for both units 353 & 16 from	
this should well	
06-17	
DTW-47,40 Begin Progre (11:40)	
Postowije DTW- 5/80 Initial Prize Clear	
hint temp(C) Cond(ns) PU(YL) att UKT(mV) Riege (C) 10e9C.	
(1150) 1507 465 7.04 7.07 317.8 0.3 min Cleus	,
(1155) 15.49 477 7.02 7.09 318.0 11 11	
(1200) 15.23 482 7.06 7.10 318.8	
(1205) 14.97 484 7.07 7.09 319.4 11 11	
(1210) 15.00 484 7.06 7.69 319,7 11 11	
(1215) 15.00 H84 7.06 7.69 319.7 11 (() (1215) 15.18 483 7.07 7.07 320.8 11	

10/13/10		RA	AP			FB#9
		CJB B332	KFC 4-NV			
16-1 - continue	ed from	page 90	1 00		ś : 2	
Time Temp(°C)		/		RP(MV) P	rock D	v 5 C
(1220) 15,22	484		7.08 3	14.7	3 /min C	lear
(1220) Readings	stable				N.	Й
(1230) 15.22	486	7, 17	7.03 3	17.7	h	0(
	ple Tim	e: (1225))			
				8270, ()TN)	
16-2~	-				3.	
DTW -55,	77		Begin Pu	rge : (12:4	5)	
PostPurge DTW- 55.			Initial Pur	ge: Cleo	5	
Time Temples (DO(mg/L)	of ORPI	mv) Pura	nin) e K Des	<
(12:50) 14.41	644	/	69 319	< 1	Ymin Clea	
(12:55) 14.26	670		64 316.		11	
(13:00) 14.96	473	4.64 6	45 312.		1)	
(13:05) 15.22	675	4.72 6	.61 309.	9 11	1	
(13:10) 15.21	477	4.79 6	.60 308	, 2	11	
(13:15) 14.98	674	4.77 6	.42 30	7.4	1 //	
(13:20) 15.51	677	4.84 6	.69 30	7.4 11	fi	
(13:25) 15,25	<i>475</i>	4.91 6	.69 30	8.8	11	
(13:30) 15.18	472	4.93 4	169 31	5.1 11		
(13:30) Readings	stable	who	.54 310	7.8	į ii	
(13.45) OF 3 10 15,62	654	5,17 (.54 316	18	. 1	
13:45 M	ple Tim	e: (1335	-)			
Sam	ples Coll	ected: (3)	8240,(2)	8270,(1)	TM	
	V					4
16-5		,		4		
DTW- 3,20			Begin Pu	ge : (1400)		
Post Purge DTW - 3.22				wys: Clea	~	
0	to page	92		J)
	1 5	•				
		6	8		¥.	0
		(01	1)			

		Harper To the comband which	AND AND A STREET
10/13/10	RAAP 803204-08		FB#9
	803204-08 CJB/KFC		
	(32)///		
16-5 - continued	from page 91		
	ad (us) Do (mg/z) pit	ORP(mV) Runge K	
		J.	Desc.
		224.4 6.3	Clear
1 1115	523 2.25 7.14	a23.5 //	11
	522 2.04 7.13	222.7	11
1,1125	522 1.89 7.14	221.7 n	11
1 2 . 2	522 1.83 7,14	223.2 ii	11
	522 1.63 7.14	222.1 11	11
	522 1.49 7.13	222.0 11	u
	521 1.42 7.14	221,4	11
	521 1.38 7.14	221.3	n
(1445) Readings sta	ble		
10000	521 1.60 7.15	222.0 /1	1)
	Time: (1450)		
Sample Samples		(2) 22 20 (1)	
	Collected: (3) 8260, (a) 8270, (1) TM	
Spring 16			
	ond/us) Do (mg/2)	11 6/10	un)
(1504) 14.32			
		10 113.2	TB 10/13/10
	Time: (1505)		
Samples (Collected: (3) 8260, (2)8270, (1) 7M	
Kewc2BV			
DTW-54,92	Begin Pura	e: (1510)	
Bost Rarge DTW - 66.68	Initial Pu		
Time Temp(20) Cond	(MS) DO(19/2) OH DI	001 11 6	250
(1515) 15.59 321			les
(1520) 15.27 323		204.3	il
(1525) 14.85 321		177. 1 n	46
(1530) 15.06 322		53.9 11	11
(1535) 15.67 324			
	92	127.4	11
/ 2	73		
NA PROPERTY OF THE PARTY OF THE			



10/13/10		R	AAP				FB#9
		803	204-00 BiTQL	8		Ĭ	
16 MW9 V		63	D/ / QE	5			
DTW - 67	109	*)	Begin	Pur	ys: (120	e)	*
Post Purga DTW - 67	.54		Initial	Pure	e: Clear	7	
Time Temple	Cond(pus)	DO(ME)	p#	<	RP(mV) P	[WILLIAM]	Desc.
(1205) 14.98	712	8.31	6.75			0.3	Clear
(1210) 14.54	782	7.89	6.70	2	99.5	11	<i>h</i>
(1215) 14.40	811	7,19	4.65	25	18.4	11	//
(1220) 15.07	879	5.25	6.54	a	07.6	11	ee .
(1225) 15,73	930	1.73	6.49	10	45:1	11	6
(1230) 15,86	935	1.58	6.49	13	32.0	ħ	11
(1235) 15.77	939	1.44	6.50	11	7,9	11	21
(1240) 14.45	937	1.40	6.51	10	9.3	11	h
(1245) 15.03	930	1.25	6.49	10	14.3	21	u
(1250) 15.13	924	1.13	6.49	10	0,0	11	/)
(1255) 15.23	927	1.18	6.50	9	18:6	11	ej
(255) Readings	stable.						
	938	1.44	6.50	1	03.7	11	If
Sa	mple Ti	me: (130	0)				Y
	nples Calle			(a)	8270 (1)	TM	
	g .		,)
16WCIAV					_		
DTW - 76	.28		Begin	Purg	e: (1315))	
Post Purge DTW - 71.	11		Initial	Pure	e: Cleas	-	<u> </u>
0		00/mg/)	at c	ORP	(mw Pura	eKD	esc.
(1320) 15.62	578			23	3,4 0,3		lear
(1325) 14,77	707	3.41 (,86	235	2.4 "	cl	lew
(1330) 14,73	713	2.55 (0.36	224	, ("	1	
(1335) 14.86	718	1,90 6	37	149	d	17	
(1340) 14.62	719	1,55	.88	105	10 11	/)	
(1345) 14.37	7/7		.89	56.	5 11	11	
(1350) 14.45	717	0,99 6	,90	49		ŧi.	
<i>></i> <				47.	8 11	1	,
-continued	on page 9	160	3				
	. 4	(9	5				

10/13/10	RAAP	FB#9
	803204-88 CJB/TGE	
16 WCIA - continued		
Time Tample Condas	from page 95 i) no (my) ptt applimul Purge	K Desc.
(1355) Keadings stab	/e	
(1440) 15.12 724	1,75 7.03 38.1 0.3	Clear
Dample 1	ine: (1400)	
Jamples Col	Mected: (9)8260, (1)8270, (3)1	
16 W-Disp (From	16 wc 1 A)	
Sample Time: (1)		
	1: (3) 8260, (2) 8270, (1) TM	
16WC1BY		
07W-70.70	Begin Purge: (1500)	
Post Parge 07W-71,32	Initial Purge: Clear	
	Initia / Rura: Clear, 00 (mg/s) pH 0 RP(mV) Purge K 5.24 6.58 243.5 0.3	Desc
	5.24 6.58 243.5 0.3 2.41 6.52 239.3	Claus
(1515) 15,00 492	1.82 6.44 234.1 "	er
(1520) 14.86 461	1.55 6.37 230.0 "	1)
(1525) 14,81 445	1.40 2.34 227.5 11	11
	2.02 6.29 223.7 "	η
	,08 6.34 222.7 11	(/
(1540) 15,01 444 1	./2 6.33 222.1	D .
(1540) Readings stabi	10.	
(1550) 13.91 454 1	.32 6.38 243,4 "	18
Jample 1	me: (15:45) Mected: (3) 8260,(2) 8270,(1) TA	2
Sarrigres Co	MECHEN (3) 6 200, (2) 6 270, (1) 1 /	
The second secon		

	RAAP	FB#9	10/18/10	RAAP	FB#9
10/13/10	803204-08 CJB/TQE	FD#		B03201-08	
1601	CJB/IQE		GENERAL NOTES		
DTW - 50:15	Begin Parge: (14	000)	Weather -	Clear-409s	
0 +0 - DTUI - 50.17	Tritial Parge Cle	ar	· PPE-Whi	te octton flamevetordant cover	als Mitrile
Time Temp(°C) Cond(us)	Initial Purge: Cla DO(mg/) pH ORP(mV) Pu	Tmin) Desc.	Graves	, Exchiotection Steel ted boots	
(1605) 15,19 488	9,25 6,80 269,6 0			ms 151 600 MDS	
(1610) 14.44 669	2.53 6.44 272.4	11 //	plt	1.00 = 4.00 7.00 = 7.00 10.00 =	
(1615) 14.94 706	1.84 6.45 265.7	n n	Conductiv	Hy reads 1413 ns in a 1413h	s standard
(1620) 15.04 722	1.57 6.45 262.6	11 11		100 70	
(1625) 15,26 730	1,44 6.44 259.3	11 11	0.13	tabing and well skints usal at all	wells.
(1630) 15,29 731	1.42 4.44 258.4	11 11		nent deconned between vell	
(1635) 15,27 735	1.42 6.44 258,0	11 7/	A 13 1 1	evaisposed of at dedicated locat	
(1635) Readings stabl	2.	21 11	THE SAVIED	es collected. Then stored and tro	AND THE ON ICC.
	1.70 6.58 271.1		BMW3		
Samp	les Collected: (3) 8260,((2) \$27A (1) TM		12.30 Both Phyge 3	725
Jamp	162 Collected, (2) 8400,(a) 8070 (() 7777	bothuge DTW-	13.70 Initralling ?	Clear
)	TIME Temp(+C).		rge R Clear
			(0725) 15.92		0.3 Clear
			Note: Debris fro	in stormwater over Flowing wel	I head during
				s caused a dense mat of pi	
1			other sinal	fines of plant mother to form	a layer at
			the surface	e of the water column. It I deployments of the bailer to	took a bailer
			and severa	I deployments at the bailer to	bust through
		<u> </u>		as mat in order to take coll	
	1	1	(07.35) 14.82	605 4185 694 2850 0.	
			1 0 0	608 4.84 6.97 264.1 17	
4				608 4.88 1.99 230.1 1	11
				608 4.91 6.98 229.7 11	n
		FTED		608 4.92 6.96 229.6 "	£1
	CO	DETER DESU	(0755) Readings		
	11119		(0210) 16.68 6	10 4,92 4.96 233, 2 1	4/
	65		- continued on	page 89.	
	95			98	

RUAAP B03204-08 CJB/1474 10/20/10 F.B.#9 FB#9 RAAD \$03204+08 CJB/14FC 10/19/10 · Weather - Overcast, vainy 50's · PPE - Mitrile gloves exe protection, work boots - CAUBRATIONS: 451 650 Call 10/19/10 Repaired defective pump tit ting on well head due to stress olt: 4.00= 4.00, 7.00= 7.00, 10.00= 10.00

Conductivity reads 1413 ms in a 1413 ms standard.

DO 7. = 99.8 7.

Dedicated tubing and well skirts used at all nells crack in existing hardware lemons defeative part, applied to be tope to Litting and recured onto well cap. All equipment deconved between wells.
Private noter disposed of at dedicated location on site.
All samples collected, stand and transported on ice. Event took approx. hour. Static Water Level Table - Unit 10 Well Post Purge DTW orn 10 DDHAR 21.42 22.14 20.12 1003 20.08 10 030 19.84 19.87 10 MW1 19,72 20,00 10 D4 LOMWI Begin Purge (10:25) Initial Purge? Clear pH ORP(mv) Purge X DTW-19.72 PastPrize DTW-20.00 Time Temp(C°) DO (Mg/L) Cond(ns) 10:35) 14.66 429 10:40) 14.67 7.35 6.01 429 10:45) 14.68 5.77 7.36 430 7,36 7,35 5,70 5,70 430 10:50) 14.68 10 55) 14.69 303.0 11:00 14.70 5,69 7.37 429 306.9 (11:05) 14.78 7.37 430 310.8 (11:05) Readings stable 7.39 430 5,69 322.0 (105) (106)

COBD		TR HOL	10/20/10 RAAP FB#9
10/10 10/1	10/20/10 RAAP	,B, #O	10/20176 10/20176 10/20176
Sample Firms: (1110)	CSB/KFC		16030
Samples Collected: (1) 22 20, (1) TM, (2) 2870, (1) CN (1) 28 20, (1) TM, (2) 2870, (1) CN (1) 28 20, (1) TM, (2) 2870, (1) CN (1) 28 20, (1) TM, (2) 2870, (1) CN (1) 28 20, (1) TM, (2) 2870, (1) CN (1) 28 20, (1) CN (1)	10MW1	9	
DODHAR DTW 31.42 Bagin Regis (0:25) Tank Alloys (1:25) Tank Al	Sample Time: (11:10)		
1000H2R	Samples Collected: (6) 8260, (1) TM, (2) 82 10, (1) EN		
Best Regs (1125) Best Regs (1126) Best Regs (1127) Best R			
Bothog ATW: 22.16 Time Temples Condition DOMES At a CREMIN Process Dose (11:30) 13.47 665 1.60 7.20 299.2 0 3 Clear (11:35) 13.74 662 1.84 7.19 281.1 " (11:40) 13.76 663 1.94 7.18 282.9 " (11:40) 13.76 663 1.94 7.18 282.9 " (11:40) 13.76 663 1.94 7.18 287.9 " (11:40) 13.76 664 1.84 2.13 7.12 287.9 " (11:40) 13.76 666 2.41 7.13 287.9 " (11:55) 13.77 664 2.41 7.13 287.9 " (11:55) 13.76 666 2.41 7.13 287.9 " (11:55) 13.76 666 2.41 7.13 287.9 " (11:55) 13.76 666 2.41 7.13 287.9 " (11:55) 13.76 666 2.41 7.13 287.2 " (11:55) 13.76 666 2.41 7.13 287.3 " (11:55) 13.76 666 2.41 7.13 287.3 " (11:55) 13.76 666 2.41 7.13 287.3 " (11:55) 13.76 666 2.41 7.13 287.3 " (11:55) 13.76 666 2.41 7.13 287.3 " (11:55) 13.76 666 2.41 7.13 287.3 " (12:56) 13.89 671 2.99 7.12 294.8 " (12:56) 13.89 671 2.99 7.12 294.8 " (12:57) 14.80 673 3.06 7.12 293.8 " (12:58) 14.80 673 3.06 7.12 293.8 " (12:59) 14.06 679 3.15 7.11 286.1 " Sample Inve (12:20) Sample Scalled Condition Mary of the Relation Research Condition Mary of the Relation Research Time Time Part of the Sample Condition Mary of the Relation Research Time Time Part of the Sample Condition Mary of the Sa	10 DDH2RV		
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(11:35) 13:14 662 1.84 7.14 291.1 11 11 11 11 11 11 11 11 11 11 11 11	1031 14 ge 11 10 101	Desc	1003
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(13:00) 13.83 670 2.90 7.13 291.3 11 11 (1425) 14.56 623 3.04 7.27 110.9 12 11 (12:05) 13.89 671 2.97 7.12 291.8 11 11 (1425) 14.36 623 3.04 7.27 110.9 12 10.0 13.96 672 3.09 7.12 292.6 11 11 (1430) 14.29 625 2.99 7.22 128.9 11 11 (1430) 14.29 625 2.99 7.22 128.9 11 11 (1430) 14.29 625 2.99 7.22 128.9 11 11 (1430) 14.29 625 2.99 7.22 128.9 11 11 (1440) 14.64 627 2.99 7.22 128.9 11 11 11 11 11 11 11 11 11 11 11 11 11	7 11 7 11 7 11	1)	(1415) 14,95 651 3.56 1.18 87.1
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Sample Time: (12:20) Sample Time: (12:20) Sample Scallected: (12) \$260, (3) TM, (6) \$270, (3) CN (1455) 14.70 668 2.90 7.27 153.9 n n n n n n n n n n n n n n n n n n	(12:15) Readings stable	11 Post	
Sample Time: (12:20) Samples Collected: (18) 8260, (3) TM, (6) 8270, (3) CN [1455] 14.70 688 291 7.27 1539 1 11 11 [1500] 14.71 669 2.88 7.23 158.7 14 14 [1500] 14.71 669 2.88 7.23 158.7 14 14 [1500] 14.71 669 2.88 7.24 176.7 14 14 [1500] 14.71 673 3.52 7.24 176.7 14 16 [1500] 14.79 673 3.52 7.24 176.7 14 176.7 14 16 [1500] 14.79 673 3.52 7.24 176.7 14 16 [1500] 14.79 673 3.52 7.24 176.7 14 16 [1500] 14.79 673 3.52 7.24 176.7 14 16 [1500] 14.79 673 3.52 7.24 176.7 14 16	(12:56) 14.06 679 3.15 7.11 286.1	Sample	222 22 180 11
10D3D DTW: 19.86 Begin Ruge: (12:55) Time Temple: Condins Dolly Pt ORPland Ruge: (2007 (13:05) 14.44 675 2.25 7.35 -76.7 " " (13:40) 14.48 684 208 7.37 -121.5 " " (13:20) 15.29 688 2.19 7.37 -133.9 " " (1505) 14.67 670 3.01 7.24 176.7 " " (1505) Readings stable. (1505) Readings stable. (1505) Readings stable. (1506) 14.67 670 3.01 7.24 176.7 " " (1507) 14.67 673 3.52 7.24 176.7 " " (1508) 14.79 673 3.52 7.24 176.7 " " Sample Time: (15:10) DUP Sample Time: (5:20) (13:40) 14.72 686 208 7.35 -132.1 " " Sample Time: (5:20) (13:20) 15.29 688 2.19 7.37 -133.9 " "	Sample Time: (12:20)	70 /3\ (4)	
[1505] 14.67 670 3.01 7.24 162.0 "" DTW: 19.86 Begin River: (12:55) Post River DTW: 19.87 Initial River: Clear Time Temp(t) Cond(us) Dolmy) plt ORPINI Farget Desc. (13:00) 14.59 670 2.04 7.27 -114.0 0.3 Clear (13:05) 14.44 675 2.25 7.35 -76.7 " (13:40) 14.48 684 208 7.37 -121.5 " (13:20) 15.29 686 208 7.37 -133.9 " (13:20) 15.29 688 2.19 7.39 -138.9 " (13:20) 15.	Samples Collected ~ (18) 8260, (3) 1111, (6) 82	10(3)(0	
DTW: 19.86 Begin Kingt: (12:55) Linitial Ringt: (12:56) Liniti		H	(1505) 14.67 670 3.01 7.24 162.0 11 "
Post Purge DTW: 19.87 Time Temp(&) Cond(as) Do(m4L) ptt DRP(bnV) Purge K Desc. (13:00) 14.59 670 2.04 7.27 -114.6 0.3 Clear (13:05) 14.44 675 2.25 7.35 - 76.7 11 " (13:40) 14.48 684 2.08 7.37 - 121.5 11 " (13:15) 14.72 686 208 7.35 - 132.1 11 " (13:20) 15.29 688 2.19 7.37 - 133.9 " "" Timitial Rurge: Clear (15:0) Sample Time: (15:0)	10D3D V		(1505) Readings stable.
Time Temples Cond(us) 00/m42 ptt 088(mV) Parack Desc. (13:00) 14.59 670 2.04 7.27 -114.6 0.3 Clear (13:05) 14.44 675 2.25 7.35 -76.7 " (13:60) 14.48 684 208 7.37 -121.5 " (13:15) 14.72 686 208 7.35 -132.1 " (13:20) 15.29 688 2.19 7.37 -133.9 " " Sample Time: (520) Samples Collected (6) 8260 (1) TM, (2) 8270 (1) CN	DTW: 19.86 Degin large (14.55)		(530) 14.79 673 3.52 7.24 176.7 11 1 55mple
(13:00) 14.59 670 2.04 7.27 -1/4.6 0.3 Clear (13:05) 14.44 675 2.25 7.35 -76.7 11 11 11 11 11 11 11 11 11 11 11 11 11	Post Purge DTW: (4.8) (4.8) (4.8) (4.8) (4.8) (4.8) (4.8) (4.8) (4.8) (4.8) (4.8) (4.8) (4.8) (4.8) (4.8) (4.8)	ζ,	
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(13:20) 15:29 688 2.19 7.37 -133.9 " " Samples Collected (6) 8260 (1) /M, (2) 8270 (1)			Sample Time: (520)
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	The state of the s		(08)

10/20/10	A STATE OF THE PARTY OF THE PAR	RA	AP			FB#9	10/25/10 RAAP F.B. #9
1004		B032	04-08 B/TOE			PUT	B03204-08
p7w: 22	Q.A.	CST	Brain Pr	rge: (15.	35)		e Weather Crevast
			TritalP	Car : Cl	BS) Chin		oPPE: Hitrile Gloves, Exe Protection
Post Purgo DTW: 22.	Calles	Do (mg/L)	nH	DRP/mil)	D. Gming)	Dosc	· Calibrations: 451 650
Time Temp(°C) (1540) 16.50	381	3.52	6.88	202.9	0.31/mi	Cloudy	9H: 4100 - 4100, 7.00 = 7.00, 10.00 = 9.99
(1545) 16.67	394	3,24	6.83	203,2	11	11	Conductivity: reads 1413 hs in a 1413 hs standard
(1550) 16.75	396	3.34	6.86	201.4	1/1	21	00% = 99.8%
(1555) 16.81	395	3,52	6.87	200,9	11	11	· Dedicated tubing and well skirts used at all wells
(1600) 16.52	396	3.50	4.85	2021)	81	51. Cloudy	. All equipment deconned between wells
(1605) 16.46	394	3.49.	6.83	204.7	1/	Clear	· Privac natur dis pised of at didicated location on site.
(1610) 16.43	397	3.48	4.82	213.9	. /1	l)	. All camples collected and stored transported on ice
(1615) 16.48	397	3,47	6.80	215.3	21	/1	
(1620) 16.46	397	3.46	6.82	217.9	- 11	1)	STATIC WATER-LEVEL TARKE-UNITY
(1625) 16.59	397	3.40	6.80	220.0	11	11	were Dru Post Phece Dru Pages
(1625) Readings	stable						DW12B 2436 2494
(1635) 1691	395	3.56	6.77	227.8	16	11 Post	TW9C 14,55 16,89
	Sample 7	me (16					WOB 15.67 16.08
	Samples (Mected	: (4)824	0,(1)TM	(2)8270	(1) EN	7WIOC 21.39 21.55
						<u> </u>	TW13 19.34 21.42
						<u> </u>	71MW 6 24.58 26.98
						\ <u> </u>	TWILB 25.19 25.23
						Y	TWCA 25.03 25.70
						1)	- other wells on page 114
							7WIZB V
	-				10	\	Diw-2486 Regin Purq: (0955)
				¥			
<u> </u>						-,	LIME TEMP (C) CINALUS) DOMENTA DE PARA PRESENTA INTER
							14.56 662 12.30 7.05 316 1 7.05 316 1
							(1005) 14.39 670 8.63 7.09 324.1 4
					ETE	2	(1010) 14,33 6.76 7.26 7.30 331,0 7 7
				TIA III)	85V -		[1015] 14131 677 6.93 7.09 334.7 4 4
				11119110			(1020) 14.35 676 6.83 7.11 339.7
	1						(1025) 14.36 675 6.71 7.13 341.2 " "
		1	59)	-			(1030) 14143 674 6.68 7.14 3430 11 11 11 11 11 11 11 11 11 11 11 11 11
		(10					(NO)

10 25/10)			AAD	Major and American State of the Control of the Cont		F. B. #9	10/25/10			RUAA	P	Combacta Lieta a la company		F. B#9
1-1-0/10			130	3204-08 JB/10E	1.10	9					B03204	-08			FILE
7612	B-cont							7210	B		44	CLL			
Time	/ 0	Condles	00 mg/c	PH	ORP(ms)	Dack	Desc		15.67		3-	in Du	nge: (130:	5	
(1035) 14.44	672	6.66	7.12	3467	0.3 /min	data-		DRW-16.0	8	7	1 frei 1 7		lear	
(1040) 14.46	674	6.69	7.11	344.6	11	h	Time	Temp(x)	Cond (as)	Dama			n) puzzl	Desc
(1040)	1	s State	1	. W.			* *	(1310	14,44	957	4.82	6.98			Clear
(1103	114.35	5 670		7.10	329.7	Post Pos	le Republica	(1315	14.64	970	4,50	6.98			ii ii
		-	le Time	(1045	1			(1320)	14.95	977	4.34	698			1/4
	5		Collected		(2) 87	70, (1) CA	1 - A " 6 "	(1325	14.98	979	4,32	6.9			/1
T He	avy rain o	lurine p	urge //	ght rown	during s.	ample		(1330	15.15	981	4.31	6.9			11
7 W9	/	0,	,		3	•		(1335)	15.24	989	4,08	4.97		7 /1	Pr
	- 14.55	,			ye (11:30			(1340)	15.44	989	4.18	7.00		11	. 4
Post Pury	DTW-16,	89		Initial	Proge = Cl	eer		(1345)	15:52	989	4.17	7.00	289,4	1 1	4
Time	Tempel	(onl(us)	DO 19/L	PH	ORP(m)	puryek	Desc	(1350)	15,60	990	4,17	7,06	288,9	7	
(11:35		1208	8.84	7.09	224.9	0.3	Clear	(1350)	Readings	stable					
(11:40) 13.99	1212	8.62	7.08	223,7	fi	η	(1400)	15,76	981	4.47	6,98	2850	5 Post so	suple Readings
(1145) 13:96	1214	8,31	7.06	221.1	0.3	/1 A 1 24			Samp	le Time	(1355	V		
(1150) 13,94	1216	8,01	7.01	221.6	11	11 on po			Sample	5 Collect	ed: (1)	TM, (2)82	70,(1)c	V
(1155) 13,97	1216	7,02	7.00	aa1. 7	0.3	Clear								
(1200	,	1242	5,54	6.97	212.0	(è	1/	760101							
(1205) 13.62	1254	4.94	6,93	199.8	e,	11	Drw-			Beg	in Purge	(1410)	14 19 1	
(1210)	13.72	1254	4.45	6.96	190.2	Pk .	. 4	Post Pinge	DW-21	35	Livit	ial Purge	Clear	v_	
(1215	1	1256	4,46	6.97	169,1	11	"	Time	Tempo	Conlas	A C MAG		ORP(mV)	purek	Desc
(1220)		1256	4.26	6.97	157.8	/4	4	1415		808		7.28	-26.3	0.3	Clear
(1225)	14.19	1254	4,21	6,97	147.0	6.0		(1420)		810	2.70	7.26	+10.2	11	it
(1230)	14.26	1251	4.15	6.97	144.1	/ (R1	(1425)		808		7.23	24.2	11	11
(1235)	14.31	1247	4,19	6,97	141.0	1		(1430)		808		7.25	24.4	se	11
(1240)	14.39	1242	4.14	6.94	140,1	γ.	46	(1435)		808	3.04	7,26	35.0	it	11
(1240)	Readings		01	1	in-	A	- 3	(1440)		807	3:19	7, 25	29.7	ĝŧ	11
(1252)	14.20	1239	4.52	6.96	128,1	post su	nple	(1445)		207		7.26	29,2	Pu	0
-		Danple	Time (12	45	A) ms					806		7.26	29.7	11	et .
		Janples 1	Collected 1	4)7 M, 6	1), 0768(1	I) SN			14.00	804		7.27	30.5	11	l j
	,	=						(1500)		804		7.24	30.2	24	[1]
				HI				Cont	nued on	page 113	1.12				

· · · · · · · · · · · · · · · · · · ·			RAA	P		F	8#9
10/25/10			B0320				
)		TRE			
7W100	-	tinued fro	1 9		ORP(mV)	(Umin) Purge K	Desc.
Time I		Condens	3.38	/	32.1	0.3	Clear
and the same of th	14.38	803	5:38	110	Jan	0. 3	0,700
(1505) Re	- 1	stable.	4,17	7.23	35.10	Post Sample	Reading
(1520) 14	1.51				.).,	1031 00011	J
		Sample	(me. (/2	(10)	2)~274	(1) 02/	
		Samples 1	Collected	-(1)TM,(2)8210,	1) (1)	
	/						
7MW6V					1		
D	TW: 26.	58		Begin Pur	ge: (15	35)	
Post Purge Di	TW:			Initial 1	luge: Cl	ear	
	emp(cc)	Cond(us)	DO/mg/L)	pH C	RP(mV)	arge K D	esc.
196	15.40	1714	28,1		3.9	0.7	lear
	15.78	1698	2.89	7.34 -	32.5	12	1)
1	14,00	1681	2.99	7,33	-48.6	il	1)
	15,97	1636	3.11		-58.9	11	n
	15.87	16 16	3,27	7.33	- 56, 1	į l	71
	15.71	1590	3.18		-57.9	41	11
		1581	5.01		-55.8	71	111
	15,77	1589	3,44	7,43	-50,9	15	11
1	15.56		3.43	7,44	- 47.8	21	ll
	15.46	1591		7.42	-45.5	11	et .
(1625)	15,74	1603	3.45	1.70	73.5		1
(1625) R (1645) I	eading	5 stabl	e	- 117	FIIQ	Post funcion	nple disa
(1645) 1.	5,93	1613	3.98	7,47	-54.9	283	, recours
		Sample	Time!	(1630)		10/2	5/10
	*	Samples	Collect	ef: (1) TM	n,(z)82	10/2 10/2 70,(1) CN	7
		,					
						11	<u> </u>
							\
	+						
A			(113			

10/26/10	RAAP	FB#9
10/20/10	803204-08 CDB/T QE	
	V75/ 1.0	
General Notes!		
- Weather: Sunny 705	â a.	
- PPE: Nitrile gloves, ex - Call brations: YSI &	ye protection	
	7.00 = 7.00, 10.00 = 9.98	
Conductivity: 1,413,	15 = 1,413 M S	
DO 76 = 99, 9 76	7 17 8 72	
- Ordicated tubing and	well skirts used at all wells.	
- All equipment decein	ned between wells	
- Purge water despos	sud at at dedicated location or	r-site.
- HIII samples collected	and stored/ transported on ice	2
Static Water-Leve	1 Table - Unit 7	
	arge DTW Notes	
7W9B 22.76 DTW	only no sampling	
7W// 24.25 "	a n n	
7mw5 a5.01 1	11 74 71	
7 W 13 TOE 10/26110		
DTW: 19.36	R 1003	
Post Purge DTW: 21.42	Begin Parage: 1003 Initial Parae: Cloud of milley	
Time Tema(E) Cond(MS) 1	Octobe DH ORPHON Parse K	Desc
(1005) 1403 1321	00(mg/2) pH ORP(mV) Parge K 10,21 7.30 169.1 0.3	milky Ichoudy
	7.18 7.29 110.4 4	/e
	6.31 7.30 99.0	e _e
	7.30 39.1 ···	e) .
	1.78 7.29 87.1 1 1.20 7.29 89.7 "	St. Jourly
	3.96 .7.30 93.1 1	11
(1040) 15.37 1243	3.80 7.30 99.5	Sloudy
	3,51 7.30 /09.1 4	Clas
Continued on page 115	(14)	

10126110			RAAP				FB#9
IOINOLIO		В	03204-08	} E			
7112	0		00-1.	5			
7W13	Tempes	Condlus) 7	Domg/L	DH C	SRP(mV)	puryck (4/m)	Deso
Time (1050)	15.61	1245	3:31	7.30	110,0	8.34min	Ceur
	15.81	1245	3.35	7,30	109.1	k	clear
	5,78	1247	3,25	7.30	106,9	Pi	Clear
(1100)	Readin	y Stuble)				
(1125)	15.97	1249	3.28	7.31	102.1	Post Sam	pk
		Samo	ole Time	(1105)		
		Sump	les Colle	cticl: (1)	77M, (2)8	270, (1)	CXI
	/				-		
7W11B	√	,			1	2	
	DTW: 2			Begin P	rge: (1140)	
Post Purge	07W: 2	5, 23	a land		Purge: Clea	1001111	Δ.
Time	Tamp(°C)	Cond(u5)	DO (mg/L		ORP(mV)	J	Desc.
(1145)	16.58	819	5,61	6.57	258,7	0.3	Clear
(1156)	16.36	829	4.34	4.59	264.2	-1l	21
(1155)	16.64	8.30	4,01	6.59	361.7		11
(1200)	16.75	836	3.81	6.60	260.6	1-	1
(1205)	11.95	838	3.66	662	258.4	11	11
(1210)	17,32	839	3.57	6,42		11	ş i
(1215)	16.90	844	3.42	6.65	255.0	/1	//
(1220)	16.91	847	3,32	6.65	252.8	11	8/
(1225)	17.05	843	3.27	6.64	252.	11	11
(1230)	17,38	844	3.25	6.46	250.9	le	1,
(1235)	17.43	848	3,22	6,67	ol I i	16	
(12 35)	Readin			W A 2	2 2311	3 Pest S	ample
(240) (131	5) 17.67	846	3.48	6.6	2 246.	Recard	ne
			/	1			3
	5	ample In	ne?(1240	1: 63 ==	41 225	(2) 411	
	5	amples (» lected	(3) 77/	1,(6) 8270	, (3) CN	

1				(B)			
							AND THE PARTY OF T

10/26/10	RAAP	FB#9
	BO3 204-08	
TWCA (Wron	g time tripoto correct stort @ 1350 and p	urg e @ 1445)
DTW:	Begin Purge: (1350)	
Post Purge DTW: 25		
		min) e K Desc.
Time Temp(40)	1063 2.79 6.95 294.4 0.	3 Clear
(1900) 16.02	989 2.74 6.93 289.0	
(1305) 15.97	941 2.72 4.92 284.9	t.f
80	840 2,59 6,92 274.8	, ,,
		11
		2 23
1111		11
		11
	876 2.68 6.92 245.8	n o
(1435) 16.67	877 3.66 6.92 234.4	
(1440) 16.79	877 2.44 6.40 232.3	
(1445) 16.84	877 2.98 6.92 229.0	
(1445) Readings	stable.	
(1520) 17.03	878 3,23 693 232.0 Pos	t Sample Time
Sampl	e Time: (1450)	
Sample	5 (1) (1) 7m, (2) 8270, (1) CN	
7MW Dup		
	Trac: ((500)	
3	ime: (1500) 6 Meded: (1)7M, (2)8270, (1)CN	2
Damples	precied (1) m. persaro, cross	
	CO34P	ETED
		200

(114)

10/26/10			R	AAP				0		FB#9
10/20/10			B03	204-6	Sc					, (
			0-	BITOL	2					
Unit	5 - Sta	tic Wat	er Leve	1 Tab	le				,	
Well	DTW	Post 1	PLATOR DTW	Not	es					
5W8B	15,00	15.	49							
5W7B	9,99	loic	3							
5W5B	10.27	71.	oi							
5WC21	9.69	9,	69							
5WCZZ	4.66	9,1	ele							
5WC23	9.08	9,1	3							
5WIZA	12.39	12.	40							
S5W7	11.89	D	TW O	14 - 1	Vo se	mp?	inq			
55W5	9.46				1	11	7			
5W9A	3.40	9	1	17 1)	1)				
5W10A	14.04	١	1	1	ı	17				
5WIIA	14,43	ı	0	11 1	1	4.9				}
5WCA	13.91			1	l .	17				<u> </u>
S5W6	8.21	ı	i	9) 1	1	ti				1
S5W8	12,31	ě	į	11	l į	11			*	
5WCII	16,25	. (l É) j	N	()				
5WCI2	15.98	d	l .	11	h	ij				
		J				21				
5W5B	V ,									
	DTW: 10.	27		Begin	Pura	1e: (1540)		
Post Purge				Initio	al Pur	ge: C	legs	, 1		
Time			DO(mg/L)	o H	ORF	(mV)	Purg	cK	Desc	
	16.55	693	10.29	5.67	27	9.7	0.		Clear	
(1550)	16,84	688	5.48	5:67	28	2.6	0,	3	Clear	
(1555)	16.78	687	5.69	5,69	28	5,4	h))	
(1600)	16.70	691	4,29	5.70	28	7.7	11		1)	
(1605)	16,57	696	4.05	5,71	28	19.5	į į		11	
(1610)	14.58	699	3,89	5.72	29	10.9	11		11	
(1615)	16.54	704	3.75	5,72	2	92.8	11		11	
				B					TE WAR	

10/26/10	RAAP B03204-08 CJB/70E	FB#9
5W5B	CJB/TQE	
Time Tempec)	Cond(us) DO(mg/) pH ORP(mV) Progra	in)
(1420) 14,57	705 3.71 5.72 293 3 6.3	K. Desc
(1426) Reading	s Stable	Cieos
(1450) 16.60		uple Reading
		710 11 001119
Samp	le Time: (1630)	
Sampl	es Collected: (3) 8240, (2) RSK, (2) TOC. (i) Sulfide
(1.	Nitrate, Sulfate, 9056 Nitrite	
5w7B V		
DTW: 9,99	Begin Purge: (1700)	
Post Parys DTW: 10.03	Initial Purge Clear	1)
	no (us) DO(mg/s) pH ORP(mV) Pringe	K Desc.
(1705) 20 63	143 3.45 4.47 322.5 6.3	Clear
(1710) 20.80 (1715) 20.81	165 3.14 4.40 330.4 1	11
(1720) 20.93	166 3.07 4.37 334.4 a	11
(1725) 20.90		11
(1730) 20.88	165 2.92 4.34 341.3 11	11
(1735) ao. 84	164 2.93 4.29 346.5	es
(1740) 20.84	165 292 4,27 349,2	21
(1740) Readings sto	ble	
(3°00) 20.43	166 3.12 4.31 355,2 Rost Sa	uple Reading
Samp!		
Sample		(3) 50 Hide
(3)	1056 W trate Mitrite Sulfate	
	<u>(3)</u>	

10/27/10	The Late of Course		RA	AP			FB#9
10/27/10				04-08			
6	1 Notes:		Cool	TQE			
	Jeather:					4	
	PE: Nitril	le colonia	5 646	o co fact			
- C	librations	: V57 1	50 MD	3			
	200				00 = 9.98	3	
		hosty: 1					
		= 99.9		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
- /	dicated)	tuhing	and we	11 exist	s used o	t all we	lls.
- /A	Il equip	aciet 3	econned	hotuse	n wells	a	
- P	urge was	ac disc	osed o	fat do	disated	location	on-site.
- A	11 samp	105 00	loctal.	and sta	ad/trans	ported	on ice.
7.	Samy	nes ce i	rec. ea	area pio			
5621	1						
	. 9.69			Bean F	wage (08	(00)	
0 -	TW: 9.69			4 / .	Puraza: clos	9	
Time	Temp(C)	Cond (us)	00(mg/L)	ОН	ORP(mU)	Pungle (4mis)	Desc
(0805)	15,29	573	6.41	3.68	240.6	0.3	Cloudy
(0810)	15.38	572	6.32	3.47	241,7	/1	11
(0815)	15.40	572	6,27	3.66	243,1	/1	ei
(0820)		572	5,99	3.70	245.4	11	h.
(0825)	15.43	572	5.72	3.70	249.7	71	11
(0830)	15.43	572	5.42	3.71	252.9	11	71
(0835)	15,49	572	5.23	3.71	239.2	11	h
(0840)	15,59	572	4.68	3.71	269.1	71	Clear
(0845)	15.64	572	4.47	3,75	277.4	/ 1	1,
(0850)	15,70	572	4.36	3,75	282.3	£1	11
(0855)	15.90	571	4.25	3.77	290.2	į į	n
(0900)	16.14	572	4,11	3.78	295.1	11	11
(0905)	16.17	572	4,03	3.76	297.9	11	11
(0910)	16.23	571	4.00	3.79	a98.9	11	11
(0915)	16.29	571	4.16	3.80	299.8	11	l l
- 60	ntinued				× 17		
		10		(10)	* .		
				(119)			

10/27/10	RAAP	FB#9				
	803 204-68 CJB/T&E					
5WCal - conti	nued from Anne 119					
Time Tomple	Condais) Dolonge) pit applinu) Pa	min) gek Desc				
(0920) 16.37	571 3.94 3.80 309.6 0.					
(0923) 16.42	571 3.86 3.81 312.5 0.	3 Clear				
(0930) 16,41	571 3.84 3.21 313.6	2 2 2				
(0935) 16.35	571 3.81 3.81 314.1	11				
(0940) 16.20	571 3.71 3.81 317.4	n 2)				
(8940) Readings s	itable					
(1020) 16.37	572 4.08 3.82 328.6	e 21				
Sample	Time: (0945)					
Sample	s Collected: (3) 8260, (2) RSK, (2) TOC,	(1) 341 File,				
(1)1	litrite/Ntrate/Sulfate 9054					
5WDup						
Sample	Time: (1000)					
Samples	6 Collected: (3) 8260 (3) R3K, (2) TOC, (1)	sulfide,				
(i) a	Vitrite, Netrate, Sulfate 9656					
5weaa						
07W: 9,6	6 Begin Parge: (10:30)					
Post Rago DTW: 4.60	U U Vos					
Time Temploch	Condous Dolongie) pt ORPland Price	K Desc				
(1035) 15.52	824 3.46 6,74 320,1 03	51. Cloudy				
(1040) 15,37	864 2.64 6.76 315.0 17	18				
(1045) 15.40	863 3.63 6.73 308.5 "	18				
(10.50) 12.00	862 2.64 6.73 297.7 "	8 8				
(10.55) 16.36	862 2.70 6.73 290.3	31				
(1100) 16.64	863 2.64 6.73 282.6 11	citar				
(1105) 16.62	86.3 2.67 6.73 275.0 "	1)				
(1110) 16.66b	863 2.63 6.73 271.2 ") yc				
(1115) 1668	862 2.70 6.71 263.1 "	E)				
(1120) 16.95	861 2.69 6.73 266.7 11	4				
tontinued on page 121 (120)						

1 - 1 -	FB#9					
10/27/10	10/27/10 RAAP 803204-08					
5.1422 - 1	A -	ITAE gr 120				
5WC22 - contin	. /	J .	Cmv) Puc	nin) ve K Des	e	
Time Templee Cond	100	,71 25	0			
(THIE) THIE			1.3 0.	0.00		
(1.55)		,,10 d.J	113 01) (160	3	
3 .	table	10 21	1010	1 < 1	0.1:	
		.69 24	12.1 Pos	Trample	Reading	
Samp	le Time: (1135)			1 > 2	n:l	
	es Collected (3)8			$C_{j}(1)$ Sul	Fide	
(1)	Nitrate, Nitri	te, Sulfat	e 9054			
5WC23						
DTW: 9.08		Begin Pur	ge: (1155	')		
Post Purgo DTW: 9.13	S	Initial Pur	e: Cleas	(1/min)		
Et .	nd(es) DO(mg/2) pH	ORP(mV)	Purge K	Desc	
	888 4.67	6.97	274.5	0,3	Clear	
	882 2.94	6.71	270.7	11	t i	
	279 2.87	6.48	258.3	l1	11	
(1910)	886 277	6.66	248.3	21	11	
(1913)	278 2.81	6.66	243.5	21	n	
1000	878 2.81	6.65	239.1	11	17	
(10100)	375 2.78	6.64	235.0	21	11	
	874 2.71	6.66	230,2	71	11	
	876 2,71	6.66	222.0	11	11	
	274 2.74	6:66	220.1	11	Le .	
(12)		6.66	117.7	11	11	
(1000)		0.00	10 71 7		-	
	table.	117	7121	11	11	
	376 3.01	6.67	213,1			
Sample Time: (1255) Samples Collected: (3) 8260, (2) RSK, (2) TOC, (1) Sulfide						
Samj	oles Collected:	(3)8260,	$(a)RSK_{i}$	A)TOC, (I)	Dultide	
	(1) Nitrate, Nitri	te, Sultate	9056			
					1	
		121)				

10/27/10	RAAP	FB#9
	RAAP 803204-08 CJB/7QE	
5WIAA.		
DTW: 12.39	Begin Parge: (1320)	
Post Page DTW: 12.40	Truttin Proper Clear 31. M.	iky
	(4/min	Desc.
(1325) 17,74 17		Si. M. Iky
(1330) 17.65 2		Milky
	16 2.91 7.42 276,2 11	Milky
		Si. Millay
	46 2.85 7.44 277.1 "	11 11
	19 218) 1.1.1 21111	30 /8
(1350) 17.92 21		10 11
	13 0.81 117 3113	u u
7 3	13 2.79 7.42 277.4	
	42 2.79 7.41 2763 "	5th Clear
	able.	
(1425) 19.85 2	10 2.97 7.43 274.7 Pesi	Sample Reading
Sam	de Time: (1410)	3
Samp	es Collected: (3)8260, (2) R3K, (2)	TOC (1) Sulfide
	trate /Nitrite / Sulfate 9056	
5W8B1		
PTW: 15:00	Begin Purge: (1440) Initial Purge: Clagar US) DO(myL) pH ORP(mV) Purge K 6.79 5.08 281.6 0.3	
Post Purge DTW: 15.49	Tribal Purcus Clear	
Time Temples Cond	us) DO(my) pH ORP(mv) Parge K	Desc.
(1440) 17,40 56	6.79 5.08 281.6 0.3	Clear
(1445) 17.00 55	4.29 4.94 294.0 "	11
	3.52 4,93 305.9 11	11
		11
(1455) 14.95 54	3.75	11
(1900) 16.97 54	3101 110 333.2	15
(1505) 16.92 53	3.77 7, 10 331.6	37
(1510) 16.88 53	2.98 4.96 3H2 II	
(1515) 14.86 53	2,97 4.98 339.6	11
(1515) Readings stal		4
(1530) 14.90 53	3.03 4.97 346.1 11 age 123 (222)	
- continued on p	ge 120 (da)	

11/17/10 RAAP. B03204-08 CJO/TAE FB#9 10/27/10 5W8B Sample Time: (1520) Samples Collected: (3) 8240, (2) RSK, (2) TOC, (1) Sulfide (1) Nitrate/Nitrite/Sulfate 9056 (1) \$290,(Sample (1)8290, ((123)

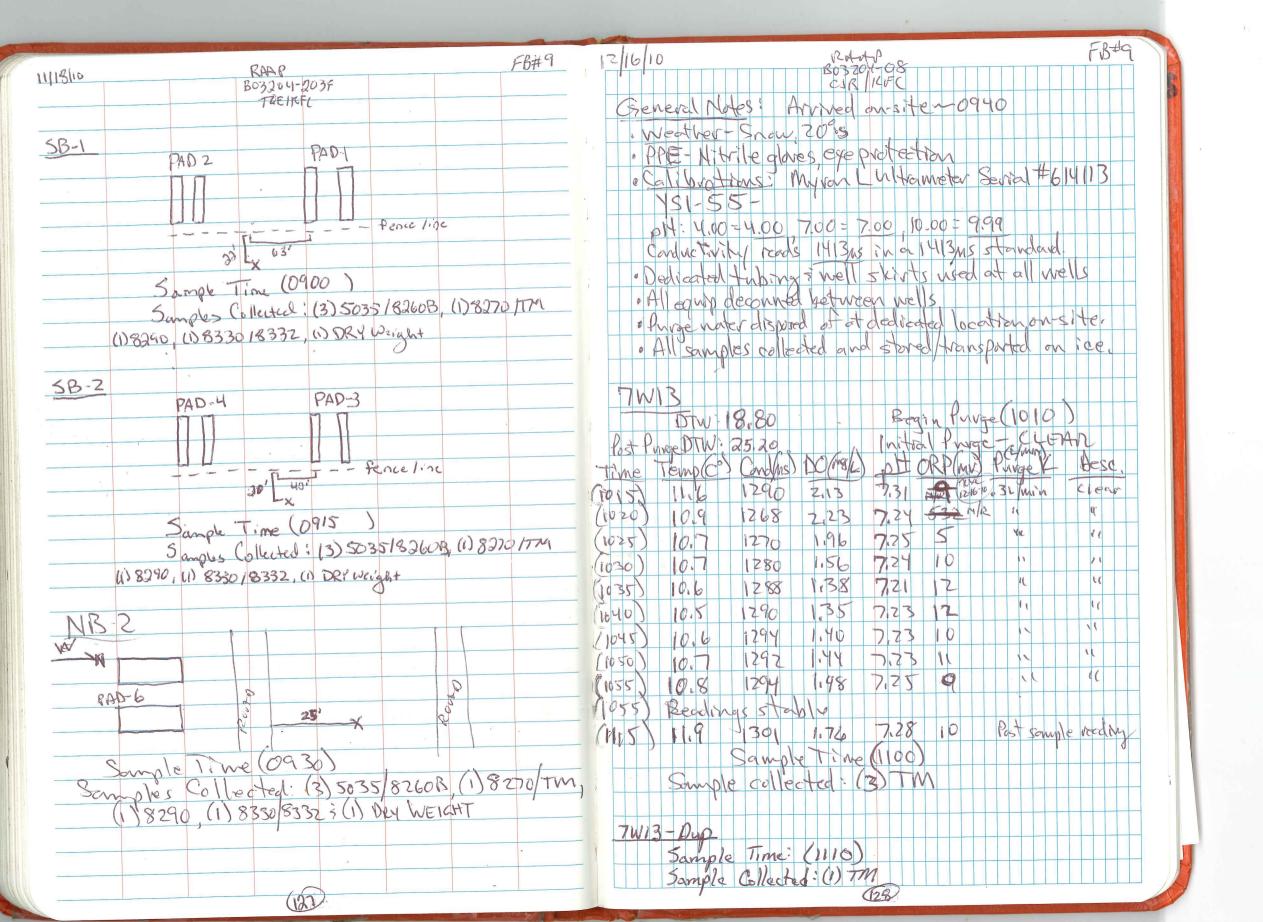
GENERAL West PPE cott · Famo x in · All PAD-1 SAM

> PAD-X Sav

PAD-2 SAMP

PAD-3 SAMP

SAMPLE (1) 8290,0



Cont. Cont. Cond. Stop Cont.	4/14/10	RAAP. 803204-68	FB#9	4/14/10-		RAAP 80304-08 DAS/XFC			F
(150) Readings Stable (1300) 1348 421 7145 415 77,5 foot Plung Readings Samples Time (1155) Samples Collected (S12240 (2)2011, (1) TM1 EBL-3 DTUI-57,75 Boyn Page (1400) Rot Pange DTUI-58,11 Timel Plungs Clear Time Tengle Online) Descript of the Arthur Plant Clear Time Tengle Online) Descript of the Online Plungs Descript Online 1323 1141 1151 2170 6:30 66:44 (1323) 1541 1151 2170 6:30 66:47 (1340) 1532 1151 2170 6:30 66:77 Sh. Clear 16:30 55:10 (1335) 1548 1151 2170 6:50 6:59 Sh. Clear 16:30 (1340) 1532 1151 2170 6:59 (1340) 1532 2171 6:59 (1340) 1532 2171 6:59 (1340) 1534 256 6:60 6:58 Sh. Clear 16:58 (1340) 1534 256 6:60 6:58 Sh. Clear 16:59 (1340) 1532 1151 2170 6:59 (1340) 1532 1151 2170 6:59 (1340) 1533 2171 6:59 (1340) 1534 256 6:60 6:58 Sh. Clear 16:58 Sh. Clear 16:58 (1340) 1534 256 6:60 6:58 Sh. Clear 16:59 (1340) 1532 1151 2170 6:59 (1340) 1534 256 6:60 6:58 Sh. Clear 16:59 Sh. Clear 16:59 (1340) 1532 1151 2170 6:59 (1340) 1533 2171 6:59 (1340) 1534 256 6:60 6:58 Sh. Clear 16:59		DAS/KEC				DASINEC			+
(1800) 13.88 43 7.15 1.75 77.5 1.5 77.5 77.5 1.5 77.5									+
### Samples Collected (3)8360 (2)801, (1)701 ###################################		Readings Stable	- 1	(1340) Keadings	Stable	r 1 12 15		1	\dashv
### Samples Collected (3)8360 (2)801, (1)701 ###################################	(1200)	13.68 481 7.65 6.75 77,5 Poot K	urge Readings	(1359) 12.41			TOST	Purge C	ead
### Samples Collected (3)8360 (2)801, (1)701 ###################################		Sample Time (1195)		San	ple Time	(1345)			$\dashv \downarrow$
DTU 57.75 Beign Russe (1808) Static Worker Levez Tacke Unit 16 Rost Russe (1808) In the Russe Clear Interpol Russe Clear Interpol Russe Clear Interpol Russe Russe (1807) Interpol Russe Russe (1807) Interpol Russe Russe (1807) Interpol Russe Russe (1807) Interpol Russe (\$	amples Collected (3)8240, (2)8011, (1) TM		Damples	Collected! (3	1)8760, (2)8011,	(1)774		-
DTU 57.75 Beign Russe (1808) Static Worker Levez Tacke Unit 16 Rost Russe (1808) In the Russe Clear Interpol Russe Clear Interpol Russe Clear Interpol Russe Russe (1807) Interpol Russe Russe (1807) Interpol Russe Russe (1807) Interpol Russe Russe (1807) Interpol Russe (l								$\dashv \downarrow$
Root Parge DTW - 58, 11			·						+
Time Engle (addus) De C pH CRP(W) Parcels Desc (1910) 14.05 118.2 4.60 (add 56.2 0.3 min Clear (14.3 55.15) 55.79 (all 18.1 19.4 3.70 6.60 66.4 11 Clear (14.3 55.16) 60.73 (add 66.4 11 Clear (14.3 6.5) 60.75 (add 66.3 6.5) 60.7	DTW	-57,75 Bagin Kurge (1208)	·.	\$ \$70710					+
1815 182	Post Purge I	DTW-58.11 Initial Purge-Clear		WELL	Drw		us illo	yes	
1815 182	Time Ten	uple (ordins) DOTL OH ORPHW) Rugger	. Desc	101	141.2		+		
(1330) 1490 1181 2.94 6.59 63.6 "51. Clearly 16.55 3.38" 13.32 (1335) 15.28 1161 2.64 6.60 6.1.7 "51. Clearly 16.00 2.1.7 "51. Clearly 16.00 2.1.7 "51. Clearly 16.00 2.1.7 "51. Clearly 16.00 2.1.7 "71.65 (1335) 15.44 1154 2.56 6.60 60.8 "51. Clearly 16.00 2.1.67 71.65 (1335) 15.43 1151 2.47 6.59 61.0 "51. Clearly 16.00 2.1.61 44.34 46.34 (1240) 15.32 1153 2.41 6.59 60.7 "51. Clearly 16.00 2.1.61 44.34 46.34 (1240) 15.32 1153 2.41 6.58 61.5 Rot Range Reading 16.00 2.1.61 43.54 (1255) 15.16 1157 2.64 6.58 61.5 Rot Range Reading 16.00 2.1.61 43.54 (1255) 15.16 1157 2.64 6.58 61.5 Rot Range Reading 16.00 2.1.61 43.54 (1255) 15.16 1157 2.64 6.58 61.5 Rot Range Reading 16.00 2.1.61 43.54 (1255) 15.16 1157 2.64 6.58 61.5 Rot Range Reading 16.00 2.1.61 43.5 11.57 2.64 6.58 61.5 Rot Range Reading 16.00 2.1.61 43.5 11.57 2.64 6.58 61.5 Rot Range Reading 16.00 2.1.61 43.5 11.57 2.64 6.58 61.5 Rot Range Reading 16.00 2.1.61 43.5 11.57 2.64 61.5 Rot Range Reading 16.00 2.1.61 43.5 11.57 2.64 61.5 Rot Range Reading 16.00 2.1.61 11.5 Rot	(1210) 14,	65 1182 4.40 6163 65.8 0.3 m		1678	55.75		1.		
(1335) 15.08 1161 2.64 6.60 6.17 'SI. Cloudy 16 wc 28 50.76 S5.25 (1330) 15.44 1154 2.56 6.00 6.58 "SI. Cloudy 16 wc 28 70.67 71.65 (1335) 15.43 1151 2.49 6.59 6.0 "SI. Cloudy 16 wc 18 6.15 2.49 6.59 6.0 "SI. Cloudy 16 wc 18 6.15 2.49 6.59 6.0 "SI. Cloudy 16 wc 18 6.15 2.49 6.59 6.0 "SI. Cloudy 16 wc 18 6.14 6.421 6.34 (1340) 15.32 1153 2.41 6.59 6.0 7 "SI. Cloudy 16 wc 18 6.14 6.421 6.354 (1340) 15.7 2.64 6.58 6.15 864 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	·			16-3	55.60				
(1330) 15.44 1154 2156 6.60 60.8 51. Cloudy (1430) 15.47 1154 2156 6.60 60.8 51. Cloudy (1433) 15.48 1151 2.49 6.59 6.10 51. Cloudy (1440) 15.32 1153 2.41 6.59 60.7 51. Cloudy (1440) 15.32 1153 2.41 6.59 60.7 51. Cloudy (1440) 16.41 44.21 66.34 (1440) 16.40 16.41 66.34 (1440) 16.40 16.41 66.34 (1440) 16.40 16.41 66.34 (1440) 16.41 66.34 66.							1-1-1-1		+
(1335) 1548 1151 2149 659 61.0 "SI. Cloudy" 16 WCIB 6434 (1344) 1532 1153 2141 659 60.7 "SI. Cloudy" 16 WCIA 64211 6634 (1340) Reading 5 Stable (1355) 1546 1157 2.64 658 61.5 Rost Runge Reading 16 Cl 57.11 500 ONLY 500	\					55.85			
(1340) 1532 1153 2.41 6.59 607 " SI. Cloudy 16 Wall 64:21 66:34 (1640) Reading Stable (1658) 1546 (1658) 1546 (1658) 1546 (1658) 1546 (1658) 1546 (1658) 1546 (1658) 1546 (1658) 1546 (1658) 1656 1668 (1668) 1656 1668 (1668) 1656 1668 (1668) 1656 1668 (1668) 1656 1668 (1668) 1656 1668 (1668) 1656 1668 (1668) 1656 1668 (1668) 1656 1668 (1668) 1656 1668 (1668) 1656 1668 (1668) 1656 1668 (1668) 1656 1668 (1668) 1656 1668 (1668) 1656 1668 (1668) 1668 1668 1668 1668 1668 1668 1668		44 1154 2,56 6,60 60.8	51. Cloudy			71.65			
(1346) Reading Stable. (1355) 15Hb 1157 2.64 658 b 1.5 Pot Parge Reading Samples Collected: (3)2260, (2) 8011, (1) 7M Samples Collected: (3)2260, (2) 8011, (1) 7M -16 DDH3 DRY -16 WC2A -17 DTW-45.71 -16 WC2A -18 DTW-45.71 -18 DDH3 DRY -18 WC2A -18 DDH3 DRY -18 WC2A -18 DDH3 DRY -18 WC2A -18		43 1151 2149 659 61,0	S1. Cloudy						+
(1340) Reading 5 Stable (1355) 15H6 1157 2.64 6.58 6 1.5 Rot Parge Reading Samples Timne (1345) Samples Collected (3) 2260, (2) 8011, (1) 7M NELL-7 DTW-25.64 Begin Parge (1309) Post Parge DTW-35.11 Jantial Parge - Clear Time Temple) Condius Domail pt reflux Parge New Parge DTW-55 160 Begin Parge (1403) Time Temple) Condius Domail pt reflux Parge DTW-60.93 Tantial Parge - Clear (1310) 13.67 Sq8 7.52 6.24 57.4 6.3 min Clear (1315) 13.09 573 6.30 5.99 64.3 " Clear (1320) 1273 536 5.92 5.91 69.4 " Clear (1330) 1285 2235 18 5.92 5.91 5.92 70.3 " Clear (1340) 12.55 22 2335 18 5.93 5.93 71.7 " Clear (1330) 1285 2235 18 5.93 5.93 71.7 " Clear (1330) 1285 2235 18 5.93 5.93 71.7 " Clear (1330) 1285 2235 18 5.93 5.93 71.7 " Clear (1330) 1285 2235 18 5.93 5.93 71.7 " Clear (1330) 1285 2235 18 5.93 5.93 71.7 " Clear (1340) 1230 520 603 605 69.6 " Clear (1350) 1291 2493 6.54 4.81 47.13 " Clear (1430) 1435) 1439 247 6.45 7.80 46.6 " Clear (1340) 1230 520 603 605 69.6 " Clear (1430) 1451 243 6.54 4.81 47.13 " Clear (1430) 1451 243 6.54 4.81 47.13 " Clear	(1240)15,	32 1153 2.41 6.59 60.7	51. Cloudy						
(1355) 15H(6 01157 2.64 6.68 6.5 Hot Purge Reading Samples Time (1245) Samples Collected: (3) 2260, (2) 80/1, (1) 7M NELL-7 DTW-25.64 Begin Rigge (1309) Cost Purge DTW-35.71 Tintial Runge - Clear Time Temple) Condius) Do ^{MS} L pH or New Parge K Desc (1310) 13.67 \$98 7.52 6.34 57.41 SWL ONLY 1403) 1403 Time Temple) Condius Do ^{MS} L pH or New Parge K Desc (1310) 13.67 \$98 7.52 6.30 5.92 6.4.3 11 Clear (1405) 14125 247 7.94 7.74 7.74 7.77	(1240)R	and in a classical	.		62.14	63.54			
MELL-7 DTW-25.64 Begin Ringe (1309) Cost Parge DTW-35.71 Time Temple) Condius Domaic OH ORPAN Parge Dear Down 60.93 Time Temple) Condius Domaic OH ORPAN Parge Dear Down 60.93 Time Temple) Condius Domaic OH ORPAN Parge Dear Dear Office	(1255)15	HG 01157 2.64 658 615 POST PO	inge Reading	1601					
MELL-7 DTW-25.64 Begin Ringe (1309) Cost Parge DTW-35.71 Time Temple) Condius Domaic OH ORPAN Parge Dear Down 60.93 Time Temple) Condius Domaic OH ORPAN Parge Dear Down 60.93 Time Temple) Condius Domaic OH ORPAN Parge Dear Dear Office		Sample Time (1245)	0 0			501	- ONLY		
WELL-7 DTW-25.64 Begin Ringe (1309) Post Ringe DTW-35.71 Tintial Ringe - Clear Time Rengle (Cond(us)) Dom9L pt or (Min) Ringe K Desc (1310) 13.67 S98 7.52 God4 57.4 G.34 min Clear (1335) 13.09 573 God 598 God 4.3 Clear (1405) 14125 DTW-55.60 Begin Ringe (1403) Dom9L pt or (1403) Dime Temple (100,93) Tintial Ringe Clear (1315) 13.09 573 God 598 God 698 G		Samples Collected: (3) 2260, (2) 80/1, (1) MM			DRY		 ',		
Begin Ringe (1309) Post Pringe Drw -35.71 Time Temple Condius Domal At ORP(M) Pringe K Desc (1310) 13.67 Sq8 7.52 Ci24 57.4 0.3 min Clear (1320) 12.73 536 5,92 5,91 5,92 70.3 "Clear (1330) 12.85 525 5,91 5,92 70.3 "Clear (1410) 14127 248 6.81 7.77 46.4 "Clear (1430) 12.85 5235[8 5,93 5,93 71.7 "Clear (1430) 14128 248 642 7.78 46.6 "Clear (1430) 14129 248 642 7.78 46.6 "Clear (1430) 14129 248 642 7.78 46.6 "Clear (1430) 14129 248 642 7.78 46.6 "Clear (1430) 14150 246 642 7.78 46.6 "Clear (1430) 14150 246 642 7.78 7.80 7.8		, , , , , , , , , , , , , , , , , , , ,	50 T g 4	- 16wc2A			 		
Begin Ringe (1309) Post Pringe Drw -35.71 Time Temple Condius Domal At ORP(M) Pringe K Desc (1310) 13.67 Sq8 7.52 Ci24 57.4 0.3 min Clear (1320) 12.73 536 5,92 5,91 5,92 70.3 "Clear (1330) 12.85 525 5,91 5,92 70.3 "Clear (1410) 14127 248 6.81 7.77 46.4 "Clear (1430) 12.85 5235[8 5,93 5,93 71.7 "Clear (1430) 14128 248 642 7.78 46.6 "Clear (1430) 14129 248 642 7.78 46.6 "Clear (1430) 14129 248 642 7.78 46.6 "Clear (1430) 14129 248 642 7.78 46.6 "Clear (1430) 14150 246 642 7.78 46.6 "Clear (1430) 14150 246 642 7.78 7.80 7.8	WELL-7	/							
Time Temple) Cond(us) Do ^{MS} IL pH ORP(us) Parge K Desc (1310) 13.67 S98 7.52 6.24 57.4 6.3 min Clear Imae Temple) Cond(us) Do ^{MS} L pH ORP(us) Parge K Desc (1315) 13.09 573 6.30 5.98 64.3 " Clear (1405) 14.25 247 7.94 7.74 46.4 6.3 min C (1320) 12.73 536 5.92 5.91 69.4 " Clear (1410) 14.27 248 6.81 7.77 46.1 " Clear (1335) 12.65 525 5.91 5.92 70.3 " Clear (1415) 14.28 248 6.67 7.77 46.4 " Clear (1430) 14.50 246 6.42 7.78 46.0 " Clear (1335) 12.37 511 5.99 6.00 70.4 " Clear (1435) 14.39 247 6.45 7.80 46.6 " Clear (1430) 12.30 520 6.03 6.05 69.6 " Clear (1430) 14.54 248 6.54 248 6.54 248 1 7.78	-WTG	-25.64 Begin Rurge (1309)							
Time Temple) Cond(us) Do ^{MS} IL pH ORP(us) Parge K Desc (1310) 13.67 S98 7.52 6.24 57.4 6.3 min Clear Imae Temple) Cond(us) Do ^{MS} L pH ORP(us) Parge K Desc (1315) 13.09 573 6.30 5.98 64.3 " Clear (1405) 14.25 247 7.94 7.74 46.4 6.3 min C (1320) 12.73 536 5.92 5.91 69.4 " Clear (1410) 14.27 248 6.81 7.77 46.1 " Clear (1335) 12.65 525 5.91 5.92 70.3 " Clear (1415) 14.28 248 6.67 7.77 46.4 " Clear (1430) 14.50 246 6.42 7.78 46.0 " Clear (1335) 12.37 511 5.99 6.00 70.4 " Clear (1435) 14.39 247 6.45 7.80 46.6 " Clear (1430) 12.30 520 6.03 6.05 69.6 " Clear (1430) 14.54 248 6.54 248 6.54 248 1 7.78	Post Purget	DTW -25/11 Initial Purge - Clear		27W-5516	2	Begin	Linge (403)	
(1315) (3.09 573 6.30 5.98 64.3 " Clear (1405) 1425 247 7.94 7.74 46.4 6.37 min C (1320) 12.73 536 5.92 5.91 69.4 " Clear (1410) 14.27 248 6.81 7.77 46.1 " C (1325) 12.65 525 5.91 5.92 70.3 " Clear (1415) 14.28 248 6.81 7.77 46.4 " C (1330) 12.85 623518 582 5.93 71.7 " Clear (1420) 14.50 246 6.42 7.78 46.0 " C (1335) 12.37 511 5.99 6.00 70.4 " Clear (1425) 14.39 247 6.45 7.80 46.6 " C (1340) 12.30 520 6.03 6.05 69.6 " Clear (1430) 14.54 248 6.54 248 6.54 248 1 47.33 " C	Time Te	mple) Cond(us) Dong/L OH ORP(uv) Paro	ek Desc	lost Parge DTW -	60.93	Inital	lurge - C	lear	
(1315) (3.09 573 6.30 5.98 64.3 " Clear (1405) 1425 247 7.94 7.74 46.4 6.3744 C (1320) 12.73 536 5.92 5.91 69.4 " Clear (1410) 1427 248 6.81 7.77 46.1 " C (1325) 12.65 525 5.91 5.92 70.3 " Clear (1410) 1428 248 6.81 7.77 46.4 " C (1330) 12.85 6293518 5.93 71.7 " Clear (1420) 14.50 246 6.42 7.78 46.0 " C (1335) 12.37 511 5.99 6.00 70.4 " Clear (1425) 14.39 247 6.45 7.80 46.6 " C (1340) 12.30 520 6.03 520 6.03 525 69.6 " Clear (1430) 14.54 248 6.54 248 6.54	(1310) 13	67 598 7.52 6,24 57.4 0.3	Imin Clear	Time Temp(2)	(and(lus)	DOPAL PH	ORP(M)	<i>furgek</i>	44
(1320) 12.73 536 5.92 5.91 69.4 " CHEAT (1410) 14.27 248 6.81 7.77 46.1 " C (1325) 12.65 525 5.91 5.92 70.3 " CHEAT (1410) 14.28 249 6.67 7.77 46.4 " C (1330) 12.85 23518 582 5.93 71.7 " CHEAT (1420) 14.50 246 6.42 7.78 46.0 " C (1335) 12.37 511 5.99 6.00 70.4 " CHEAT (1425) 14.39 247 6.45 7.80 46.6 " C (1340) 12.30 520 6.03 4.05 69.6 " CHEAT (1430) 14.54 248 6.54 248 4.54	(1315) 13.			(1405) 1425	247	7,94 7,74			_c/
(1330)12.85 × 293518 5.93 51.7 " Clear (1420)14.50 246 642 7.78 46.0 " C (1335)12.37 511 5.99 6.00 70.4 " Clear (1425)14.39 247 6.45 7.80 46.6 " C (1340)12.30 520 6.03 6.05 69.6 " Clear (1430)14.54 248 6.54 248 4.54		73 536 5.92 5.91 69.4 1	<u> (1891 : </u>		, , , , , , , , , , , , ,		46.1		C
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(1340) 12,30 520 6,03 6,05 69,6 " Clear (1430) 1415 6,54 48 47,13 " C		37 511 5,99 6.00 70.4	11 Clear	(1435)1439		6,45 7,80			$\mathcal{C}\iota$
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		(39)				70)			

4]14[10			RAH	+ <i>P</i>			FBAY
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16-3(Ctno						
Cr		gs Stab	Le				:
(1445)		247	6:69	7,79	47,6 0	65 + Runge	Reading
		Sample	Time (1435)			
	Samo	es Colle	ctedi(6) 8240, (2)8011 (d	2)8270,0	a)TM
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16-1					. i		,
DTW	- 41.21		(Bagin Rung	c(1 5 03)		
Post Parge	DTW-48,	10	Init	ial Purge			
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	13.93		3.61 7	07 66	19 00	Main Cl	eav
(1545)	<i>14</i> ,35	456 7	1.95 7.	00 64	10	" Ch	ear
(1515)	14.37	462	126 71	05 61	1 '	' Ch	ecsi .
(1520)	13,86	462 7	10 71	10 57	16-1	Ch	eew
(1505)	13,74	461 7	13 71	09 57	,4	Cle	ar
(1530)/	3,63	465 7	07 7.1	09 56	2 '	CL	ev
(1530)	Reading	s Stak	le				
(1542)	13,52	452 7	7,39 7,	07 54	.7 Pos	- Purge	Reading
		Sami	le Tin	e (153	75)		
	Samole	es Colle	efed! (3	18240,6	2)8270,	(1)TM	
	7			,			
16-2						<u></u>	
Dtw	-55,75		<u> </u>	egin Pur	ge (1554	<u>) </u>	
35 Perge DT	w-55.7	9	Initia	y Runge	- Clear	_	
Time T	emple) C	nd(us) D	org/L		/ 1 /	lingek	Desc
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		,44	,84	6.97	56.0	P	Clear
(1405) 13	.81 6	33 4	.45	0.97	55.8	11	Clear
(1610)13	93 6	08 6	,34 4	.98 8	4.6	11	Clear
(1615)14		93 6			3.8	11	C ear
(1620)14			26 4	,97 5	4.0		Clear
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4/14/10	KHHP 803204-02	·	FBH
	803204-08 DAS KAC		
16-2 (cont)			
	ine (1625)		
Samples Colle	Red (3) 8260 (2) 8270, (1) 74	1	
16-54			
Drw-338	Begin Purge (16	(0)	
0/0 5 30	32 In tight Runge - Cl	000	
Post Ruge Drw-13.			
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	(us) DOTE pH DRP(UN)	Jugek Di 34 min	Desc
(1650) 12:61 50			Clear
(1655) 12.19 50	4 3.05 7.17 48.6	11	Clear
(1700) 12,10 50		li li	Clear
(1705)12,09 5a	4 3.03 7.21 43.4	tı	Clear
(1710)11.97 52	3 2.91 7.23 42.5	44	Chair
(1715)11.96 52	3 2.77 7,23 42.1		Clear
(1715) Readings	Stahle		
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	mple Time (1720)	1114	
5 70	Necked! (3) 8240, (a) 8270, (Drew	
Jampies Co	120, 120, 120, 120, 120, 120, 120, 120,		
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		++++	
		+	
14 Spring	100		
Temple) (adlus Dorge pt c	RR(m)	
12.32	59 7.94 7.08 4	15. H	
San	ple Time (1735)		
Samples	Collected (3)8240, (2)8270,	(1) m	
		++++	

115110			KHAP				FB#9
			803201 DAS/C	13.11			
General.	Notes		2				
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16WC2B	· /			-			
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st Purge D	1W-25.2	<u>۱</u> ۱ ۱ ۳	1014	igin Purge al Purge	- Clear	L N	
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6915)6				5 34,	8 "	Cle	ar
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\$			edi (3)8:		8270, (1	MY	
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K Repla	aced	water	level	port	Hole	Dugs	
K Repla	for	FAL-	3 and	16-	3)	•
				,			
			(4	رن			

4/15/10	KHAP	1-10#Y
	RAAP 08 DAS/408	
Nomw &		
Drw-70.67	Begin Punge (0954)	
Post Purge DIW-71.65	In that Purge Clear	
Time Temp(2) Condus Do	5/1 pH ORP(nw) Purgek	Desc
(6955) 12,49 129 5,9		Clear
(1000 12,59 127 5.15	8 5,28 102.9 11	Clear
(1005)12.62 128 2.5	1 5.36 90.3	Clear
(1010)12.67 127 3.88	8 5,37 82 7 "	Clear
(1015)12.84 128 1.40	5,37 86.9	Clear
(1020)13,04 129 1,02		Clear
(1025)13,19 129 0,95		clear
(1030)13,28 128 0,91		clear
(1030) Readings Stable		
(1059)14.28 134 1,18	5,35 67, 3 Post Ruge	Reading
Sample Time ((035)	J
Sandes Collected 13)8	1260, WSulfide, (1) TM, (1)c,	v. (1) 9065
	(2) 8151, (2) 82 70 (2) 8081	
16MW91		
DTW-62.14	Bogin Flurge (1114)	
Post Purge DTW -63,54	Initial Purge-Clear	
Time Temple Constitus	DOMIL OH ORPOWIPERS	ek Desc
(1115) 13,35 695	7,80 6,54 22,5 0.3	
(1120) 13.05 859	2.76 6.40 26.1	Clear
(1125)/3/11 896	1.60 6.37 23.8 "	Clear
(130)/3.35 930	1, 32 6,35 29,3 "	Clear
(1135)13,48 935	1, 23 6,34 32.2 "	Clear
	123 6.31 35,3 1	Clear
(1145)18,27 951 1	125 4.30 34.8	Clear
(1145) Readings Stable		
	50 6.33 24.1 Post	Purge Roadine
Sample Time		
San ase Charles	(3)8210, (2) Sulfide, (1) Tru, (1	04.109665
JOHN (NOS CO I MECHELI)		18081
	Tatorol I children to I th	<u></u>

* 4/15/10	RAAP	FB#9	4/15/W	RAAP	F8# 1
	BO3204-08 DAS/CJB			803204708 DAS/CIB	
16WCIAV					
DTW-64.21	Begin Purge (122))	16WC1B		
Post Parge DTW-66.3	4 Initial Purge-Cle	ar	52	imple Time (1450)	
Time Temple) Condle	6) DOTAL pH ORP(MO) Pu	mel Desc	Sample	imple Time (1450) Collected: (3)2260, (2)5a	Ifide, (I) mili) an
(1230) 13,38 555		Min Clear		(1)9065,127851	1, (2) \$270, (2) 8081
(Ja35) 13.52 420	6,71 6,65 34,5 1	Clear			
(1240) 13,43 66	1 4.20 6.60 33.4 1	Crear			
(1245) 13,38 696	2.15 6.58 38.6	Citar	1601		
(1250)13,30 711	2.01 6.60 36.1	Civai	DTW + 48,47	Begin Ruge In that Para	(1520)
(1255)/3,27 716	1.96 6.62 35.6 "	. Clear	Post Purse DTW+		e-Clear
(1255) Readings	Stable		Time Temple)		MMD) Phrack Dos
(1406) 14,03 747	1,31 6.80 12.8 Pos	it Runge Reading	(1525) 1572	7.32.1.1	11.4 0.3 min Clear
.5	anale Time (1300)		(1530) 15.57		9. 4 " Clear
Samples	Collected (9)8260, (4) Sulfide, (3)	m, (3) CN, (3) 9065	(1535) 14.81	605 2.88 6.10 3	7 4 11 Clear
	(4) 815, (6) 8270, (6)8081	(1540) 15.54	- 7 - 7 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 	2.4 " Clear
KGW D4P			(15 45) 15 47	····································	48 11 Clear
Sa	mple Time (1315)		(1550) (5.5)	▗▀ ᠯ┈ ╎▝ ▗▀ᠯ┈ ╎ ▝ ▗▀▜ ▗▀▜ ▗▀▜ ▗▀▜ ▍ ▍ ▍ ▍ ▍ ▍ ▍ ▍ ▍ ▍ ▍ ▍ ▍ ▍ ▍ ▍ ▍ ▍ ▍	32 11 Clear
59mples	: Collected! (3)8260.(2) Sattide.	(1)m, 1)tw/(1)9065	(1555) 15.54		2,9 11 Clear
	(2)8151, (2)8270,	(3)8081	(1555) Reading	s stable	
16WC1B			(1630) 15,48	539 2.04 4.17 3	5 d Post Perry Readin
DTW -64.34	Bagin Purge (1413	5)			
Post Parge DTW-64:	13 Initial Purge-Cle	ar	Samy	he Time (1600)	
Time Temple (ond(us) DOME pH ORP(M		& Sarons	les Collected: (3)8260, (a) sulfide, (1) 7m, (1)
(1416) 14,66	394 8.15 6.34 55.1	0.34 min Clear		1045, (2) 8151, (2) 8270	, @18881
(, , , , , , , , , , , , , , , , , , ,	350 4.96 5.99 67.3	" Clear			
	327 2,64 5,86 68.7	11 Clear	6		
	322 1.96 523 66.4	" Clear			
	310 1.87 5.81 64.3	" Clear			
	06 1.79 5.78 62.0	" Clear			
(1445) 15.75 3	02 1,70 5,77 61,1	11 Clear			
(1445) Readin					
(1508) 5.48 3	83 ,95 \$,28 50.7		}		
` <u> </u>				76	
	(1)				

4/19/10	BO3209-CB DAS/TRE	FB# 9	, 4/19/10	RAAP Bo3304+08 DAS/70€	FBA
	DAS (70 E			DAS/TOE	
General Notes		· ·	74123		
Weather-	Gurmy, Leo's		(1103) 15,15	651 7,13 7,50 100,3	Post Runge Readin
PPE-Eye	Protection, Nitrilo gloves, He	urd Hats		Samole Time (1045)	
Califerations	Protection, Nitrilo gloves, He YOI 650 MDS		. Sample	5 Collected: (3) 82 40 (2) Sulfide,	(1) TM (1) CN, (1) 90
pH: 4,00 =	=4,00 7,00=6,99 10	,00 = 10,00	, /	(2)8270, (2)8151,	(3)8081
Conductiv	ity reads 1413 us in	1413 us std			
Do % =			7W9C		
			Drw-13.61	Begin Purge (1/3	3)
Statio	: Water Level Table	- Unit 7	Post Punge DTW-14	.76 In Fiel Runge-Cle	ar
WELL	DTW Postflinge DTW		Time Temp(c)	30 Hours to the promul	Punck Desc
7w/aB	24,23, 24,28		(1135) 13,41	1102 417 700 8911	0.3 Tuin Clear
7W9C	13.61, 16.76		(1140) 13,33	1120 215 6.96 91.6	11 Clear
7W/0B	14.89 15.58		(1145)/3,23	1140 1.74 6.91 92.9	" Clear
7W10C	18.32 , 21.42	•	(1150)13.09	1155 1,50 6,85 95,5	" Clear
7W13	17.79 , 20.15		(1155) 13,17	165 1,46 6,83 96,7	" Clear
- 7mw6	25.30', 29.66		(1200)131212	174 1,40 683 97,0	" Clear
7W11B	24,52 24,53		(1205)13,30	1177 1138 6.23 97.3	11 Clear
7WCA	24,46		(1205) Readings	Stable	
· 7w98	22.30 DTW ON	Ly	(1218)1B.09	1189 1.36 6.93 94.0 Ps	st Purge Roading
0 7W11	23.46	<u> </u>		imple Time (1210)	
· 7mw5	24,52		Samples	Collected: (1) Try, (1) CN, (2) 8	iano III
7W12B			7W10B		
DTW-24,23	Begin Purge (1012)	D7W-14,89	Bogin Purge (12:	35)
Post Purge DIW -24,	R Initial Purge-	Clear	Post Runge Drus - 15	58 Initial Pura + CI	ear
Post Purge DTW -24 Time Temple) (1015) 14.31	Cordina LOH DOULL ORPLE	W lungek Desc	Time Tomple Con	drug to 4/2 pt crown	Brock Desc
(1015) 14,31	700 7.95 8.42 141.3	0,34 min Clear	(1245) 12.47 8	60 2.91 6.98 98.2 44 1.85 6.88 101.3	0.37min Clear
(1020) 14.50	690 7,26 7.80 134,0		1245)12.22 8	60 2.91 6.98 98.2 44 1.85 6.88 101.3	" Clear
(1025) 14,75	667 7.34 7.36 126.5	111		41 1.64 6.86 101.8	" Clear
[1030] 14,96	662 7.22 7.40 123.			41 1,39 8,86 102.0	" clear
(1035) 15,18	658 7.15 7.42 121.9			13 1.30 6.86 101.9	" Clear
7 1 -	657 7.12 7.45 119.		(1305)12.44 84		" Clear
(1040) Reading	- P1 (1)	11	(1310)12.58 84		" Clear
	5 Stable (91)				
		المنافع			

7/19/10	КННГ 803д04-08 D48/78€	FB# 9	4/20/10	KAAP	FB+
72408/1	D45/70€			1045/70E	
7WIOB (Cont.) (1310) Readings	0111		General Notes Weather-S	╃┼╏╏ ╗╫ ╀╬╅╇╇╇╇	
(1322) 12.98	844 1.39 6.79 100,0 Po	of Purge Reading	Opening of	thry 603	
(1000,) 10.78	844 1.39 (6.79 /80.0 Po Sample Time (1315)	of rulge Reading	Calibrations	Hacton, Nitrile gloves Hand Hats	
S/ac	Collected! (1) TM, (1)CN, (2)2070		- pH: 4.00-		
- Sampies	Conscita: (1) INC, II CN, (4) 800 10				JMY POX C J
7W10C			- Do % =_		
DTW-18.32	Begin Purge (134	9)	· Dedicated the	bing and well skints used at each	well
Post Parge DTW-	1.42 Initial Purge-			decored between each well	
Time Temple)	Condius) DOME OH ORPHIN PU	urdek DosC	· Purae water	signosed of at dedicated location	onsile
(1350) 13,50	785 1.89 7.20 91.4 0.0		· All samples	collected stored and transported in a	plens on I
(1355) 13,23	785 0.94 7.18 92.7	11 Clear			
(1400) 13,16	783 0.82 7/18 92,0	11 Clear			
(1405) 13,05	783 0.74 7.18 91,5	" Clear	74/3		
(1410)13,04	781 0.65 7.18 90.8	Clear	D7W-17.79	Begin Punge (0939)	
(1415) 13,15	782 0.59 7,17 93.9	Clear	Post Purge DTW-2	2,15 Initial Purge - Clear	
(1420) 13.08	781 0.57 7.18 90.7	Clear	Time Temple Co	ond Ous Do"3/2 OH ORP(MV) PurgeK	
(1425)13,01	782 0.59 7.18 90.1	Clear		424 4.28 7.47 69.3 039 min	
(1425) Readings	Stable		7	434 454 7.42 -5.0 11	Clear
(1440) 1345	784 0,61 7,21 96.4 Pc	st Punge Reading		439 2,90 7,39 -23.1 "	Clear
S	mph Time (1430)			30 253 736 -27.6 "	Clear
Samples	Collected! (1) TM, (1) CN, (2) 827	0	1000 1/8,10 14	28 239 7.36 -20.3 "	Clear
			(1010)13,20 14/ (1010)13,23 14/	25 2.31 7.33 -18.5 "	Clear
			(1010)13,23 14/	24 2,30 7.32 -16.3 "	Clear
			(1010) Readings (1028) 13,38 14	Stable	
			(1028)/5,38 /4/	30 2.45 7.33 -3.4 Post Pu	nge Roadi
			5	imple Time (1015)	
			Sample	es Collected (1) TM (1) CN, (a) 8	770
			PH probe wa	Planction on VST 650 MDB	1 6,17
		·	Continued p	Handorp readings with Myni	4 4110
				╎╎╏╎╎╎╏╟╏╏╏	
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and the second second	·	in the second se			

4/20/10	KAAP 803204-09 DAS/704	F8#9	4/20/10	RAAP B03204+08 DASITRE	FBHS
	DAS/70E				
7mw6,	0 0 0				
	5,30 Bagin Runge (1122) w-in 166 Initial Runge - Clear		7wca 1		
Past Rurge DT	w-onlike Initial Kurge-Clear	1, 3	Drus-24,4	Begin Punge (146 25,09 Initial Punge C	lear
Time Ten	nple (and/aus) Dong/L pH orp(aw) Pu	mek Desc	Post Parge DTW-2	Condius Domy DH ORMUNI	
		Muin Clear	(1425) 13 98		Ostmin Clear
	93 1834 187 1136 -113	Crear	(1480) 13,91	1145 2.41 6.85 44 50	Clear
(1140) 14	12 1850 1171 1121 7117	1 Clear Clear	(1435) 14,06	1315 1.10 6.82 66	Clear
(1145)14.		ii '	(1440)/3,81	1325 099 623 76	" Clean
(1150)141		" Clear " Clear	(1445)/3.95	1307 1,03 6,82 84	l' Clear
(1155)14,0	73 /839 110 7,25 - 118 19 adings Stable	Gear	(1450)/3.96	1295 1103 6.80 89	11 Clear
(1218) 14.	10 1986 1.12 7.36 -97 Post	Purge Reading	(1455)14.17	1286 1.06 4.80 91	11 Clear
(1010)171	Sample Time (1200)	Targe Reading	(1455) Read in		
420	ples Collected: (3/8260, (2) Sulfide, (1) TM, (Day (1) 9005	(1530)14.32	1266 1.20 6.87 91 Ros	+ Purge Reading
3477	(2)8270, (2)8151, (2)808	11	9,1-1-1-1	Sample Time (1500)	
	(2)80.2)(278131)(27830		Sam	ples Collected (3) 8260, (2) Sul	fide (1) that () cr
7WIIB				(1)9065 (2)827	10, (2) 8151, (2) 808
DTW-6	24,52 Begin Purge (1242)				
Post Purge DTW	-24.53 Initial Purger Clear				
Time le	mp(E) (ondius) Dorge pt DREMIN) Pu	mek Desc	7W DUP		
(1245) 13	87 801 3.82 6.58 56 0	34min Clear		Sample Time (1515)	
(1250) 13.		Clear	5am	ples Collected (3) 8240, (2) Sul	file, (1) TM, (1) Co
(1255) 13,	69 535 1.07 4.37 84 1	li Clear		(1) 9045, (2) 827	10, (a) 8151, (a) 8081
(1300)13.		' Clear			
(1305)13,5		l Clear			
(1310)/3.	76 539 1.02 635 51	Clear			
(1315)/3,	75 550 1.05 6.37 47	Clear			
(1315) Re	adinal Stable				
(1404)14	14 560 1,37 6,48 26 Post	Purge Roading			
	Sample Time (1320) mples Collected (9)8260,(
Sav	mples Collected (9)82co,(
	-1				

11/21110			'KHF	1r			1-844	4121110
4/21/10			B03204	08			T	
7	1 01 1		DAS / 74	E				5w8
	1 Noks		101 1	. ~ (11,6,			7
We	afner-	Sunny	1605 j t	urning M	1/1 1	211	1/2	Post R
	- Eyel	Pretection	, /V) 17116	groces, Ha	NHATS,	ofton =	24115	
<u>Call</u>	Dra Tions	- YSI 6	בי מנוען 20	myran i	L COLLA	neier		1020
- 2 H 3	4.00 =	4.00	1,00- 1	,00 /	112	11		1025
		reads	17/1	15 In 19	713.45	7 0		1030
- 70	10=	100	۱ ۱	12. (-		1	()	7/024
· Dedical	ed tuk	ing an	d well	8 Kirts	used at	each	well	1000
· All equip	oment de	coned b	ze tween	each we		{		linua
· Purge wa	rter disp	sed st'	it dedico	led loca	ron onsi	46.		(1050
· All Samp	es colle	cted st	ened and	transport	ed in coo	lers on	1CE	(1050
	, , , ,	, , , ,	,					(/050
	Static	Water		Table -			<u> </u>	(1111
WELL	- ,	DIM	, Past	Purge Dtu		ntes		-
_5W8B		14.76		5,33				
5W7B		9,12		9.16				ط. ا
5W5B		9,39	1	0.19				5W5
5WC21		9,44	/	7,49				
<u>5wcaq</u>		9,45	,	7,52				Post Ru
5 WC23		8,864		8,89		ļ		Tine
<u>SWIZA</u>		11,20	/	11,23				(॥५५)
55W7		11,50	D	TW ON	LY			(1150
<u>55W5</u>		8,24	,	И			<u> </u>	(1155
5W9A		1.87	/	(1				(1200
5WIOA		13.32	,	11				(1205
5WITA		10,37		11				(Jaic
5WCA		13,25		11				(1214
S5W6		7,08		11				(1215
S5W8		12.14		Tt.				(12/38
5WC11		16.01		11				
5WC12		15,68		tı		•		
· · · · · · · · · · · · · · · · · · ·			5					
			1.5	53				

4/21/10	KMHr 1 B03204-08	FB#
	DAS/70E	
5w884		
DTW-14.76	Begin Parge (1014	
fost Runge Drus 15.33	I hittel turge-cre	
Time Fomple Condlus De		ungek Desc
		34min Clear
} 	4/ 5.94 179	Ti Crear
\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	46 4.82 171	Clear
7-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	42 4.80 68	Clear
	44 4.80 167	" Clear
7		" Clear
	44 4.81 164	Clear
(1050) Readings Stable (1111) 13,06 63 7.	48 4.77 163 Pos	6 Qual Parking
5ample Tim	(1055)	t Ringe Roading
Sample 1 m	(3)8240, (3) B5K175, (1) Su	A. 1 19056 12 TOS
Jampies Cantores.	1070045, 107601, 1, 4 111100	
5W5B		
D7w-9,39	Bæjin Purge (11)	4()
Post Purge Dru-10.19	Initial Purge - 61	ear
Time Temple Condlus) 1	nors/4 sitt organ)	Purgek Dese
(1145) 11.94 435	5.55 5.48 225 0	34/min Clear
(i150) 11.46 471	3,49 5,53 212	l' Clear
(1155) 1153 482	3.20 5.56 212	n Clear
(1200) 1149 684	3.18 5.57 213 3.21 5.58 210	" Clear
(1205) 11 25 487	3,21 5,58 210	" Clear
Market 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	3,19 5,58 208	Clear
	3.18 5.59 206	l' Clear
(1215) Readings Stock		
		+ Ringe Reading
	le Time (1220)	1, 70, 10, 11, 19, 1
Samples Collect		(1) Salfide (1) 905
		D-1702
	54)	1

4/21/10			RAAI	V			FB#9	4/22/10		KHH1 1808294-08		FBH
,	,	G	03204-0 DAS/79)8 E						DAS/TOE		
5W7B '									letes .	 		
DTW-	9.12			egin Purg				Weathe				
ost Punge I	JW-9.16		Init	a Purgo	Clear			PPE-Eye	Protection, W. Ante			
Time T	Temp(c) (ond(us)	DOM/L	DH G	DEP(m)	urge K I		Calibrati	T		Whamek!	+
(1300)	10:30	145	8.84	5.26		0.34min	Clear				- 18.00	
(1305)	10,35	140	8.15	5.09	242	11	Clear		fivily reads 14	13 LIS in 1415	1415 5 5	
(13/0)	10.36	137	8,10	5,06	238	11	Clear	- 00% =				
(1315)	10.50	135	8.00	5.06	<i>a</i> 37	1	Clear				dateach well	
(1320)	11.18		7,89	5.07	236	- ,,	Clear		nent decored be			
(1325)	11,33	134	7.82	5.10	239	(1	Clear		ver disposed p	f a t dedicated	location on site	
			7,85	5.07	241		Clear	· All same	les collected ste	ted and transp	corled in coldiers	on ice
(1330)	Reading		ble_							100		
(1403)			8.19	5.20	237 Post	Purge Re	ading_	Sweal			1.00	
		Sample T	ine (13	3 <i>5</i>)				Dnu- 9		Begin Runge	(0,486)	
	Sampl	es Coll	ected! (9)8260, (9) RSK 17	5,(3)Sal	fide	(3-9.49	Initial Ringe		
			(3)90	56,(b)T	C, (3)Th	1,(@)&2	70 ,	Time Ten		"IL ptt ore		56
									53 5,97 3.46			lear
<u>5WIAA</u>					,	<u> </u>	<u> </u>		95 415 1196			ear
DTW-	11,20		B	egin Purg	je (1433))		(0950) 13.0				lear
Post Parge I	MW-11-22		This		- Clear		<u> </u>	(0955) /3,3				ear
Time:	Temple) Co	md(us)	DONUL		RP(MU)		Desc	(1000) 13,5				ear
(1435)	13,09	400	9,29	6.60	180	0,34 min	1	(100\$) 13.3			 	
	12.58	304		6.90	163	"	Clear	1010 113.4		3.66 325	-	al
	12:54		8.47	7,01	160	n	Clear		dings Stable	3.6H 337	Poot Purge Read	
<u>(1450)</u>	1		8.46		61	11	Clear	(1053)13.73			Post Purge Read	711,73
(1455)			2,44	<i>6.83</i>	142	11	Clear		Sample Time	(10/5)	4 (6:1) () () () ()	
(3 ∞)					160		Clear	San	ples Collected (3)8	960 (3) KSK1/5, (1)	Sulfide, ()9050	P
				6.82	62	11	Clear)-m. (2)8270,1	(x) 10°C	
	Readings					10 -	1.0	F-1.2.0			+	
(1522)				6.81	161 Pos	t Kunge R	<u> </u>	5 W DUP				
		Sample	Time (1510)		'-	 		Sample Time			11000
	Samples	Collect	led: (3)8a	(3)R			1)9056	' Samp'	les Collected 18)K3(60) (18) (25 K17)	5 (1) Sulfide (1)	1926
			6	5	(a) TO	<u></u>	<u> </u>	. [] [] []		TITE (I) IM	(a) 8270 (a) TOO	
_			. Q.					·		, , , , , , , , , , , , , , , , , , ,		

4/22/10	RAAP 803204-08	FB#9	4/27/10	KAAP B03204-08 DA5/70E	F8# ^c
	BO3204-08 DAS 170E		General Dates	DA5/70E	
<u>5mc33</u>	2 2 1		The last of the la	Ly Juny, Scathered Showers,	EA - (A)
	9.45 Begin Punge (1107)		20 F E & DAT	etien Witrile gloves Cont	50 403
96t Nurge U	TW-9,52 Initial Purge-Clear	Desc_	Calinations	YSIT 450 MDS & Myron 2	(ul frame for
7	3.66 873 219 6.56 235 03 m		- att- 4,00 = 4,0	0 7,00 = 7,00 10.00	-10.00
	179 926 0199 6.77 201 11	Clear	- Conductivity		
/	3.81 960 0.76 6.80 187 "	Clear	- Do % = 100		
	92 967 0,75 6.80 183 "	Clear	· Dedicated tubing		each well
	1.00 968 0.73 6.82 176 "	Clear	· All equipment &	reconed between each wel	
	4.13 971 0.76 683 173 11	Chear	· furge water disp	osed of at dedicated loca	tion onsite
	4,20 971 076 6.83 169 11	Clear	· All samples collec	led, stored and transporte	d on ice in cook
(1140)1	Radings Stable			B e e e	
(1204)	14,59 983 0,80 6.90 162 Vost K	irge Reading		aler level table	
	Somale Time (1145)	"	Dru'		Notes
	Samples College (3) 8240, (2) RSK175, (1) 541	fide, (1)9056	13MW 1 20.1		
	(1) TM, (2) 8270, (2) TO	<u> </u>	13mu2 20.0	8 20.85	
<u>5wa3'</u>	1	.)	13mw3 1272 13mw4 16,37		
	-8,86 Begin Purge (122)		13MW4 16.37 13MW5 15.9		
Post Yung	Temple Condins Dough pt cro(m) Pu	ngek Desc	13MW6 15.51		
	Temple Condino DOUS L pt cro(m) Pu 13.06 921 5:167 7:22 156 0.	34min Clear	13 Mw 7 15.54		
(1225) (1230)		Clear			
(1235)	12.85 996 1.12 4.88 167	Clear	13mw3		
(1240)	13.15 997 1.05 6.86 164	" Clear	DW-1292	Bagin Purge (071	1)
(1245)	13.32 1001 1.08 6.84 164	" Clear	Post Purge DTW - 107.9"	In Hall Purge - C/E	av
,		11 Clear	Time Tamp (2) Cono	(Lus) Doroll of ORAM	
(1255		" Clear	(07/5) 11.72 (4/5		0,39min Clear
(1255)	Readings Stable		(0720) 11.76 (39		" Clear
(1318)	13,74 1007 1.10 6.88 155 Rost	Purge Reading	(0725) 11.76 647		l' Clear
	Sample Time (1300)		0730 11.79 654		Clear
	Samples Collected: (3)8240, (3) R5K175, (1) Sal	fide, (1)9056	(0735) 11177 656		" Clear
	(DTM, (2)8270	1,(2)TOC	(0740) 1174 657		1 1 4 647
:	(57)		(0 740) Roading 5 Sta	04 <u> </u>	
	Official and	, , , , , , , , , , , , , , , , , , ,			

4/27/10 15 HHr R03204-08	F0#Y	4/27/10	/c	1944 15294-08		F-B
BO3204-08 DAS/702				AS/TOE		++++
13mw3 (Cont.) (Condlus) DO "9/L pit onl	0 0 /2	10mw1	 		, , , , ,	+++-
(0810) 11.88 456 6.56 6.98 142 Pos-	t Purge Reading	D7W-15.		Bogin Runge		++++
Sample Time (0745)		Post Purge Dru-	14.03]	In Ala Maryo	- Clear	Desc
Samples Collected: (3)8240, (2)5416de (2)8280, (2)	8332/8330		andlus andle	pH coephu	Dangel .	Clear
(2)8081/8082, (2)8151,(1)314.0,(1) TM, (1)C	N (2)8270	2	426 9.92	7.25 157	0.37min	
		V	427 9.51	7.29 153		Clean
13mw4		(1025) 12.91	436 9.50	7.28 157		Clea
DTW - 16.37 Begin Rurge (0823)	·	1030 12.87	427 9.49	7.32 145	111111	Clear
Post Purge DTW-16.43 Intral Purge- Clear		(1035)12.48		7.43 142	1	
Time Temple Condlaws DOGL AH DRRUW Rungek	Desc		447 9.53	7,40 143		Clear
(0825) 12.15 453 6,70 6,98 145 8.34m			427 9,51	7,35 148		Clear
(0230) 12,16 482 6.56 6.82 145	Clear	(1845) Readings	Stable	2112		
(0835) 12,15 492 6.59 6.82 149 "	Clear		420 9.63	7.40 147	Post Parge	Kead inc
(0840) 1217 496 6.60 6.81 152 "	Clear	7	mple Time (1	(50)		
(0845) 1220 497 660 6.78 151 "	Clear	Samples Co	Hec ked (18) 826	6, (3) Tru, (3) CA	(3) 9065 (0	18/5/
(0850) 12 19 497 661 678 149 "	Clear	.	(6)8270, (4)8021, (4)808	1 147 341410	<u>e</u>
(0850) Roadings Stable	0 1					
(0929) 1216 475 6.83 6.78 157 Post Pur	ge Keading			1 11		
Sample Time (0855)		Stat		vel Table -		+++
Samples Collected; (3) 8260, (2) Sulfide (2) 8280, (1) (1) CN, (2) 8270, (2) 8151, (2) 8021/8082, (2)	TM, (1) 314,0	WEZL		Purge DTW	Notes	+++
(1)(N, (2)8170, (2)8151, (2)8031/8082, (2)	8330/8332	100DH2R	17,74	7.76		+++
		[1003				+++
		10030	16.38	6,45		
13mw DaP		IONWI	15.81	16,03		+
Sample Time (0910)	()	1004				
Samples Collected: (3) 8240, (2) Sulfide, (3) 8880, (1)7	74, (113/4,0					
(1)(N,(2)847),(3)8151,(2)8081/8082,(2)2	7336 / 8332					
						++++
				 - - - - 		++++
(59)						

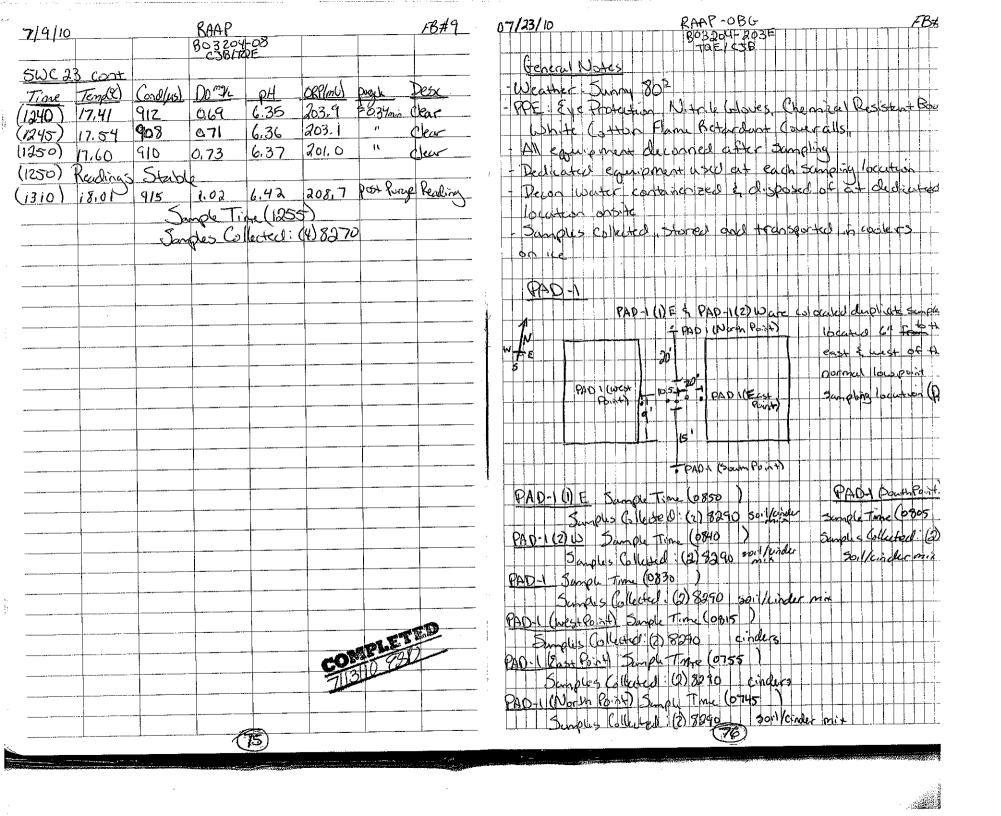
* 4/27/10	RAAP BO3204-08 DAS/TOE	F8#9	4/28/10 RAAP FB#
	DAS/TOE		DAS/TOE
IODDH2R V			General Notes
DTW-17.74	Bazin Purge (1218)		Weather - Warm & bugger
Post Purge DTW-17.76	Initial Purge-Clear		PRE-Exelo bection, Nitrile gloves, Catton Suits, Rubber Books, Face Shiel. Calibrations - VSI 650 MDS / Never L altrameter
Time Temple)	Condlaws Domy/L alt ORP(nw) f	luroek Desc	Coldrations VSI 650 MDS / Review & altransfer
(1230) 11.56	599 3.11 7/13 /59 0	34min Clear	- pH: 4.00 = 4.00, 7.00 = 7.01, 10,00 - 10,00
(1235) 11,19	454 400 7.24 142	11 Clear	- Conductivity reads 1413 us in 1413 us 5td
(1240) 10.98	644 0.95 7,20 122	" Clear	-00% = 100
(1245) 10.89	626 0.98 716 116	Clear	· Dediasted taking and well skirts used at each well
(1250) 10.85	593 1.15 7.09 114	Clear	· All equipment deconed be tween each well
(1255) 10.86	569 149 696 118	" Clear	· Punge water disposed of at dedicated location onside
(1300) 10,97	555 1.62 6.94 120	Clear	. • All samples collected stored and transported on ice in cooler
(1305) 10.98	546 1.68 6.96 120	Clear	
(1310) 11.02	539 1,74 6,97 122	Clear	13 mway
	: Stable		Drw - 15.51 Begin Ringe (0704)
	515 1.96 6.85 127		Post Runge DTW-1605 In the Runge Chear
(15-17 0110	emple Time (1315)		Time Tamore Condition Do Mark Oth DROPAND Russel Desc
Sander 1	(a)8161, (2)8270, (2)8081, (3)	1)2N (1)9065	(0705) 1150 791 H34 712 137 039mn Clear
Jumpies ((2)8151 (2)8270 (2)8681 (2	2)8081	(0710) 1195 825 3.54 7.00 139 1' Clear
	(4)/41013 (41/45) (41/45)	170	(0715) 12.10 231 3.44 7.05 140 1' clear
			(0720) 12.16 831 3,44 7.04 143 1' clear
			(0725) 12,19 830 3.39 7.02 144 " clear
			(0730) 12.17 228 3,37 7,00 144 " Clear
			(0730 Readings Stable
			(800) 820 3.53 7.05 146 Post Peroc Radine
			Sample Time (0735)
			Samples (alleded) 3) 8340, (2) Sulface (2) 8480, (1) tm. (1) (N
			5 amples Colected: (3)8260, (2)Sulfide (3)8280, (1) TM, (1)CN (2) 8270 (1) 314,0 (3) 8081/8082 (2)8151, (2)8332/83:
			PAD-1 Dup-1
			Sample Time (0759) Sample Time (0800)
			Samples Collected: Samples Collected
			Samples Collected: 5 amples Collected: (H) 8290
	(d)		
	# 1900 .	jes	

4/28/10		RAI BO3204 PAS/1	9/		FB	3#9	4/28/10	11111188	RAAP BAGITOE			FB#
		PAS/7	95						DASITOE	1111		
10D3D V							LODUR					
DTW-16.	38	Begi	in Purgel	1351)		!	59	mple Time (1	555)			
Post Purge DTW-11		Initial	Purge -	Clear W	rotten legg" o	dor	Samples	Collected: (6)80	60, (2) Sulfi	de (2)80	1 (1)	7W, (1)CN
Time Temp	(E) (fond (us) DC		pH 0	PP(My) fu	rgek Desc 34min Clear", 17 u	· · · · · · · · · · · · · · · · · · ·		(2)8151,	(1)8270, (1)	18081, (1)9065	
(1365) 1411			<u>;71 -</u>	19700	34min Clear "	poor						
(1400) 14,2	2 647 2	,07 7	,46 -	190	11 . [4		1004				+++	
(1405) 14.4			45 -	180	n R		Drw - 227	78	Bogin Pu	. 11		
(1410) 14.61				-174	(' N	·	Post Pringe DTW-		Initial Pa			
(1415) 14,3				160	11		Time trouple		1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	ORP(MU)	Ruge	
(1420) 14,20	642 3.	15 7.		157	11 10		(1630) 14,32	337 6.37		80 90	0.3 Ym	
(1425) 14.0	7 638 3	.21 7.	41 -	155	11		(1635) 14,36	332 4,80		90	ŧa	SICland
(1425) Read	lings Stable	<u>. </u>					(1440) 14.51	328 3.69		101		51.Cloud
(1448) 14.39	632 3	51 7		-149	T		(1445) 14.30	326 3.63	6.91	104	4/	51 Cloud
	Samole T	Time (1	1430) Po	st Purge	Reading		(1650 13.90	325 3.63		107		SI, Cloud
San	ples Collected	16)8260	(2) Sulfi	de (a)80	81, (1) TM,1	(1)CN	(1655) 13.96	324 3.66 5 Stable	6.93	108		SI. Clous
/	(2)	8151 (2)8270. (2) <i>8</i> 081,1	1)9065	The state of the s	(1655) Reading	s Stable			, j	
1003 V			<u>, , , , , , , , , , , , , , , , , , , </u>		1		(1716)14.23	328 3.78			Post R	inge Readin
DTW-16.0	7/	Ber	in Purge	(1503)				Sample Tra	ze (1700)	5.		
Post Purge DIW-1	6.14	Triti	in Purge al Purge	-Clear	·		5a	mples Collected	(6)8240,	(a)501Cl	de, (2)	8081 (1)7
Time Tem	(E) Condlus) i	DOMO/L	pt c	KP(MV)	Purgek Des	<u></u>		1' (1) Co	3,(1)9065	,(2)219	1, (3).	3270
(1505) 13,0		4.64	7.42 -	- 85	0.3/min Clea	v			a)8081			
(1510) 15,2		4,02	7.35	1	" Clear	<u>-</u>						
(1515) 141		3.40	7,42	30	Clear							
(1520) 14,		3,22	7.41	54	Chear							
(1525) 14,		3,22	7.36	63	11 Clear	-						
(1530) 14.1		3,20	7.36	66	" Clear							
(1585) 14,		3,25	7.37	70	11 Clea							
	dings Stabl											
	73 550		7.45	82 Par	st Purge Read	line						
	Samuela	Time	1540)			9					OM	LETE
	ples Collecte	L: (6)21	60,(0)50	lfide la	18081, (1) TM.	(1)CN					5 20 10	LETED ESC
San	(2)81	151 (a)	2270 (2) . (&O&	(1)9065							
	1 ~ 781	, <u> </u>	L ,	(· · ·) ·								
<u> </u>	1	(la	3						(66)			

6/28/10	R	AHY		FB# 9	4/28/10	RAAY	F8# 9
·	8032	04.68 C/KAL				uen ficario	
General No	1e5					DASIKAC	
ا ا ما	12.11. <i>(</i> 14.	dy 805		,	16mw9		
PPE-	Eve Profestion.	Nitrile 9/0	us, Hard Hat.	5	Drw-65.65	Bogi	n Parge (1156)
Calibr	n Hons - X5I	- 650 M	5		Post Ringe DTW-1	66.30 Initial	Ringe-Clear
oHI H	BO + 7.00	つんのこんの	0 10,00 ~		Time lense Co	nothers Do of 1 AH	ORANW) Rugekgow Desc
- Conduc	tivity reads	1412 450	n 140Ress St	\mathcal{J}	(1200) 17.58 8	09 9.74 6.55	2010 0,3 Ymin Clear
1 - Dola -	- 1/00%				(1205) 17.08 8	96 5.00 6.37	178.2 1 Clear
. Dedica	ted tabing and me	Uskirts used at	each well.			13 2.40 6.32	148.0 " Clear
· All en	uipment deconned	between each	well.			07 1,68 6,40	137,0 " Clear
Payme to	valendispused of a	+ dedicated la	cotton ousite.			102 1,49 6,39	132.8 " Clear
All	amples collected	stredard to	usported in coolers	مه زحد.	(1225) 16.30 8	92 1,25 6,40	1289 " Clear
3	20100100					63 1,80 6,40	1262 " Clear
						66 1.18 6,39	128.6 " Clear
					(1235) Readings	Stable	
TW13						Sample Time (12	40)
DIM-19	130	Bear	M PURAE (104)	\$		comples Collected! (6	2240
Post Parge DTV			MARGE- CLE		(1245)16.19 8	60 1.26 6.40	121,9 Post Ruige Readi
			RPMU) BURGELK			0 110	1977 I GOT LAIGE SALES
Time Temp(0			25.0 03 min		16WC18Y		
			78.3	c lear on		2 Barr	Para (1954)
(053) 13,91 (100) 13,65	,		36.2	CLEAR	Post Parge DTW 6	004 -	Purge (1254)
	1366			CLEAR	1051 range 0100 to		
13.74 (13.74)		1.17 6.96	1220 "	CLEAR		5139 6.03	1820 Ous Vinju Chegar
(110) 13,74			7.	Clear			
1115 13.80			116.2	1	(1300)16,16 3 (1305)15,74 3	399 1,75 5,79 380 1,30 5,75	194,9 " Clear
1120) 13.78	/353	1.34 6.94	116,3	Clear	1300 1500	280 1.30 5.75 73 1.02 5.75	1987 " Claw
(1120) Reads	ng Stable	1 / 115 3	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		(1310)15,90 2	73 0.93 5.76	199,9 () Clear
	Semple Semple	Done (1/25)	}			74 0.86 5.79	
San	rples Collected	(2)TM		`		19 0.06 3.77	
		i			(1325) 16,07 5 (1325) Readings.	73 0.81 5,80	201,6 11 Clear
[113 5] 150	7 1350 1.	64 6.95 11	7. Mast Parge Re	walnes .	(1325) Readings.	>+ab/e	}
						Sample Time (133) 5 Collected (2) 8081	/
					Derng le	s (offectal) (a) 208/	
	7	(89)			(1345)16.90 3	18 1135 550	2321 Root Rugo Read
The state of the s			Andreas of the production of the state of th				Andread of

6/28/10	PMP	F8#9 4/3	28110	RAAP	F8#
WIGOIN	RAAP BO3204-08 DAG/KIC			B03201-08	
	DNSING			0/13/12	
16 D4P		, ,	10DDHAR V		
	ample Time (1340)		D7W-17.76	Begin Purge (1	5/8/
5 amρ	Sample Time (1340) Les Collected (4)8081		of Parge DTW-19.75 Time Temple Condlus	20 % pH ORPAN)	
. , , , , ,		7	Time Temple Conditions 1515) 17.43 492	6.99 6.81 160.6	Surge K Desc 0.5 min Clear
10mw1	13 Begin Purge (14)	<u> </u>	1520 1824 575	6.99 6.81 160.6 5.20 6.89 180.7	" Clear
Post Auge DTW-			1525) 18,10 615	Hi95 4.89 185.3	Clear
Time France	Condlus Dorok pt ORRIND		1530)17,87 619	4.46 6,88 186,1	" Clear
(1410) 18,20	391 9.44 720 197.6		1535)14,78 592 1540)16,48 550	4,14 6,73 184,0	Clear
(1415) 18,34	393 8.90 7.14 241.5	" Clear	1540)16,48 550	3.89 6.62 185.2	" Clear
(1420) 18,16		U Clear (1545 1627 525	3,90 6,57 182,9	il Clour
(1425) 18.28	392 8.73 7,02 2705	Clear		4.01 6.57 190.8	" Clear
(1430) 18.00	394 8.76 701 276.7	<u>Clear</u> (1550 Roadwas S	hable 117 107 0	
(1435) 17.96	391 8.45 694 281,9	" Clear (1612)16.48 577	3.43 6.47 197.9 Time (1555)	Post Ringe Keash
(1440)17.95		" Clear Clear	Sample	Mecked: (1) 9066	
(1445)17,90 (1445) Readin	391 8.41 6.87 735, 3	Clear	Jampies Ca	recruit, 1000	
(1503)17,78	294 870 676 2866	Post Puras Readings			
(1303)11178	394 8.70 6.76 286.6 Sample Time (1450)	J. J	10 Dup 2		
S	amples Collected: (1)9066	·	Sa	mple Time (1405)	*
			Sample	5 Collected (1) 9066	
c			<u> </u>	 	
10-DUP1					
	Sample Time (1500)				
S	comples Collected (1) 9066	·			
		.			
	(1))			(AS)	
		A consequence of the control of the			

71910 KAR	FB#4	7/9/10	KAAY	FB#
7/9/10 C28 48/1705			(78) 200 10 =	
Ceneral Notes		1510(27 V		
- wather suncy 80= 90=	· · · · · · · · · · · · · · · · · · ·	DTW 10 3 3		1031)
- PPF: Eve Hotertion Nitrile Gloves		Prosper DTW 1026	-	Clear Rue le Desir
- Calibrations: USI 650 MDS DH: 400 = 4100 7.00 = 7.00 10.00 = 9.	<i>a1</i>	1035) 16.73	9/3 /26 6/5	3/6,5 = 6,3/micle
		(1040) 16,53	906 0.72 6.18	286 4 da
Contenctioning reads 14/12 us in 14/13 as	St4	(1045) 16.48	903 9,59 6,22	260.4 " Can
- Dedicated Tubing and well skirts used at ea	ach well	(1050) 16.88	899 0.45 617	251,0 " Vea
- All equipment deconed between each well		(1055) 17,24	901 0.40 6.17	237,0 " den
- Puraz wated disposed of at declicated location	ensitk	(1/00) 17,25	901 0.35 6.19	228.0 " (100
- All San plas Collected, Stored, and transported	in contes	(105) 17.25	901 0.33 6.20	217.6 " Claus
onice		(1110) 1732	901 032 4.21	209. 4 " C/G.
		(1115) /7,4/	900 631 620	204.4 11 Clear
SWCZIV		(1120) 17 65	900 031 618	1995 10 Clear
Drw. O.Zi Begin Pung (0915	<u> </u>		901 0.31 6.18 table	195,1 11 Clear
Past Purce DTW: 70.29 Insteal Plage: Clear		(1/25) Readings S (1/4/) 16.95		209, 4 Post Purce R.
Time Tempter Cand (us) DO Mg/L DH CRP(mu) Program	le Desc 34min Clear	1 1/1/4/6/75	5 mg (1/30)	20 17 10ST (43: 14)
7			Samples Collated: (4) 82.	70
(0925) 17.10 589 2.21 3.49 362.2 " (0930) 17.27 590 1.56 3.47 376.6 "	Clear			
(0935) 1751 589 1.42 3.47 384.1 "		500 c 23 23 1		
(0940) 17.68 588 1,12 347 389.9 "		DTW: 9.45	Begin Pura	e (115B)
(0945) 18, 17 589 0.96 3.47 392,2 "		Post Penze OTW:	In Fiel Par	Q Clau
(0950) 18.66 589 0.84 3.48 393.2 11			Consult py	RP(n) Punger Desc
(0955) 18.75 589 0.79 3.50 389, 4 "	clear		965 5.07 6.88	1716 4834 cles
(1000) 19.87 589 0.80 3.51 388.4 "	Clear	(1205) 18.87	957 2.92 6.79	193,2 4 dea
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	* Pueu Peading			204, 4 4 Clear
(1017) 1857 599 1,00 3.48 378.4		(1220) 8.64		209.2 11 clca.
Sample Time (1005) Samples Collected: (4) 8270		(1220) 8 64 (1225) 8 27 (1230) 1701	123 1.18 6.40 1113 0.92 6.46	
- Simples Collected . CT Od 10		(1230)	940 0.82 6.38	206.4 " Clear
		(1235) 17.37	90% 0,75 6,94	208.0 " Clear 206.9 " Clear 206.0 " Clear
73)			79	

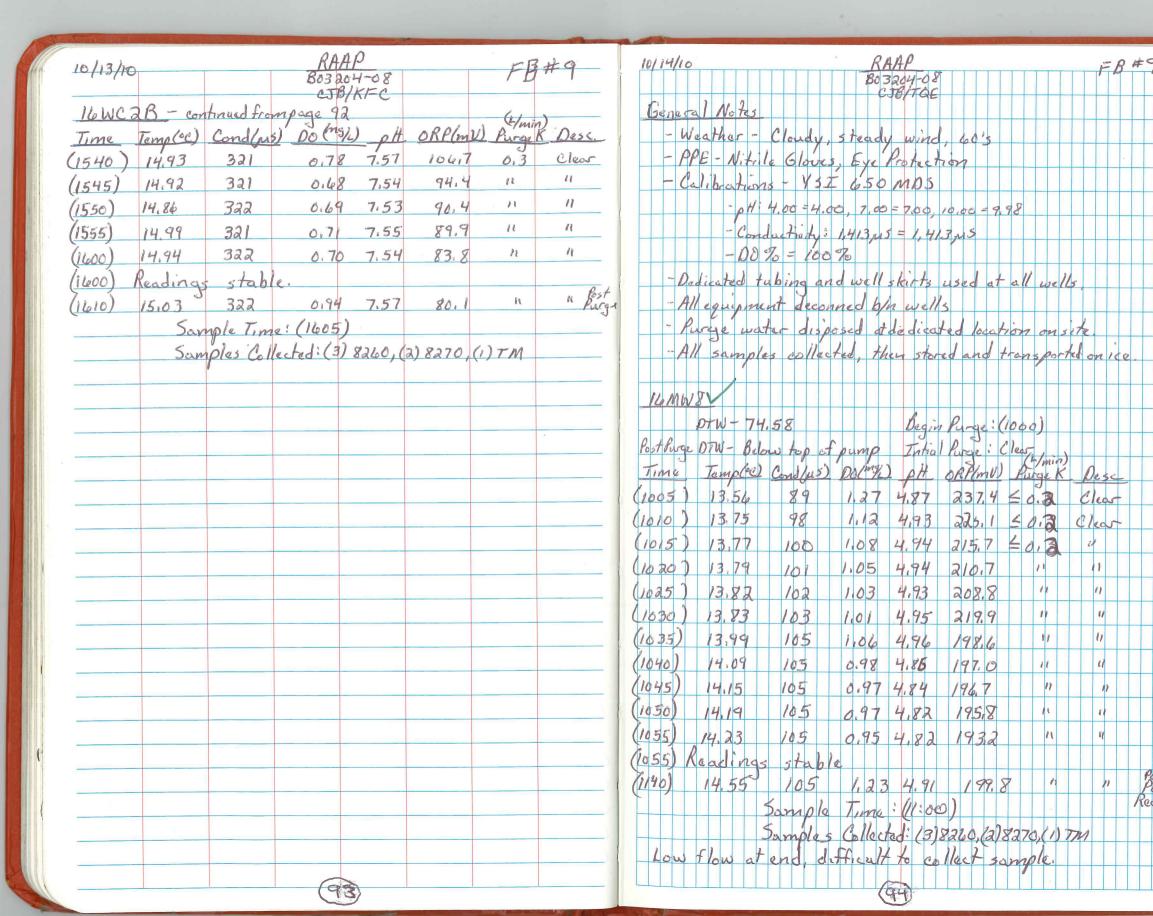


10/13/10		RAAP		FB#9
10/13/10		B03204-08		
CIA	1	CJB/KFC	TOE KFC Bioligio	
General No	Mostly clour			1
	itrile gloves,		16 / 1	
	4.5		10 00 = 9 9 9	
	1		H13.5	
	Conductivity:		,-11 5/45	
	DO 70 = 100	ag potential and a second a second and a second a second and a second	1 1 1 11	.) 7 .
- Dedicate	tubing and	I WELL SKIFTS	used at all we	LIIS
All equi	ipment de co	nned betwe	en wells	on site
- Purge	water dispo	see at acat	cated location	and in ice
All sav	upies collect	ed, then sto	red and transp	perrue in icc.
21	1. 1.1 /	1711	- 11 - 4 11.	
	tic Water L		The same of the sa	
Well	DTW	Post Purge DT	Notes	
16-1	47.40	51.80		
16-2	55,77 56,94	55.87		
16-3		71.05		
16-5	3.20	3.22		
16WCaB	54.92	66.68	6	
16 MW8	74.58	Below top a	pump	
16C1B	76.70	71.32		
16CIA	76.28	71,11		
16MW9	67.09	47.54		
16C1	50.15	50,17		
1603	68.46	-	GW Not sample	d
1600H3	Dry		n h h	
16WCZA	Dry		/\ (\)	
	,			
		(P2)		

	Will have
10/13/10 RAAP FB#9	
B03204-08	
C3B/KFC	
16-31	
DTW - 56.94 Begin Perge! (10:15)	
Polt V. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
(1020) 14,27 251 6.83 7.62 215.6 03 Clear	
(1025) 14.52 247 6.59 7.75 219.4 "	
(1030) 14.65 245 6.54 7.77 223.7 " "	
(1035) 15.02 241 6,71 7.81 2318 "	
(1040) 14.32 239 6.53 7.80 241.8 " "	
(1045) 14.16 238 645 7.83 249.2 11 11	
C1050\$ 14.12 236 6.46 7.85 256.2 " "	
(1055) 14,30 235 6.61 7.81 263.8 "	
(1100) 14.27 237 6.76 7.79 271.0 × 11	
(1105) READINGS STABLE Ready	Je
(1125) 14.30 235 6.76, 7.86 279.2 " "	G.
SAMPLE TIME (110)	
Somples Collected: (6) 8260, (2) 8011, (2) 82700 (1) tm,	
(1) two Hg	
& (Souples collected for both units 353 & 16 from	
this should well	
06-17	
DTW-47,40 Begin Progre (11:40)	
Postowije DTW- 5/80 Initial Physic Clear	
hint temp(C) Cond(ns) PU(YL) att UKT(mV) Riege (C) 10e9C.	
(1150) 1507 465 7.04 7.07 317.8 0.3 min Cleus	,
(1155) 15.49 477 7.02 7.09 318.0 11 11	
(1200) 15.23 482 7.06 7.10 318.8	
(1205) 14.97 484 7.07 7.09 319.4 11 11	
(1210) 15.00 484 7.06 7.69 319,7 11 11	
(1215) 15.00 H84 7.06 7.69 319.7 11 (1 (1215) 15.18 483 7.07 7.07 320.8 11	

10/13/10		RA	AP			FB#9
		CJB B332	KFC 4-NV			
16-1 - continue	ed from	page 90	1 00		ś : 2	
Time Temp(°C)		/		RP(MV) P	rock D	v 5 C
(1220) 15,22	484		7.08 3	14.7	3 /min C	lear
(1220) Readings	stable				N.	Й
(1230) 15.22	486	7, 17	7.03 3	17.7	h	0(
	ple Tim	e:(1225))			
				8270, ()TN)	
16-2~	-				3.	
DTW -55,	77		Begin Pu	rge : (12:4	5)	
PostPurge DTW- 55.			Initial Pur	ge: Cleo	5	
Time Temples (DO(mg/L)	of ORPI	mv) Pura	nin) e K Des	<
(12:50) 14.41	644	/	69 319	< 1	Ymin Clea	
(12:55) 14.26	670		64 316.		11	
(13:00) 14.96	473	4.64 6	45 312.		1)	
(13:05) 15.22	675	4.72 6	.61 309.	9 11	1	
(13:10) 15.21	477	4.79 6	.60 308	, 2	11	
(13:15) 14.98	674	4.77 6	.42 30	7.4	1 //	
(13:20) 15.51	677	4.84 6	.69 30	7.4 11	fi	
(13:25) 15,25	<i>475</i>	4.91 6	.69 30	8.8	11	
(13:30) 15.18	472	4.93 4	169 31	5.1 11		
(13:30) Readings	stable	who	.54 310	7.8	į ii	
(13.45) OF 3 10 15,62	654	5,17 (.54 316	18	. 1	
13:45 M	ple Tim	e: (1335	-)			
Sam	ples Coll	ected: (3)	8240,(2)	8270,(1)	TM	
	V					4
16-5		,		4		
DTW- 3,20			Begin Pu	ge : (1400)		
Post Purge DTW - 3.22				wys: Clea	~	
0	to page	92		J)
	1 5	•				
		6	8		¥.	
		(01	1)			

		Harper To the comband which	AND AND A STREET
10/13/10	RAAP 803204-08		FB#9
	803204-08 CJB/KFC		
	(32)///		
16-5 - continued	from page 91		
	ad (us) Do (mg/z) pit	ORP(mV) Runge K	
		J.	Desc.
		224.4 6.3	Clear
1 1115	523 2.25 7.14	a23.5 //	11
	522 2.04 7.13	222.7	11
1,1125	522 1.89 7.14	221.7 n	11
1 2 . 2	522 1.83 7,14	223.2 ii	11
	522 1.63 7.14	222.1 11	11
	522 1.49 7.13	222.0 11	u
	521 1.42 7.14	221,4	11
	521 1.38 7.14	221.3	n
(1445) Readings sta	ble		
10000	521 1.60 7.15	222.0 /1	1)
	Time: (1450)		
Sample Samples		(2) 22 20 (1)	
	Collected: (3) 8260, (a) 8270, (1) TM	
Spring 16			
	ond/us) Do (mg/2)	11 6/10	un)
(1504) 14.32			
		10 113.2	TB 10/13/10
	Time: (1505)		
Samples (Collected: (3) 8260, (2)8270, (1) 7M	
Kewc2BV			
DTW-54,92	Begin Pura	e: (1510)	
Bost Rarge DTW - 66.68	Initial Pu		
Time Temp(20) Cond	(MS) DO(19/2) OH DI	001 11 6	250
(1515) 15.59 321			les
(1520) 15.27 323		204.3	il
(1525) 14.85 321		177. 1 n	46
(1530) 15.06 322		53.9 4	11
(1535) 15.67 324			
	92	127.4	11
/ 2	73		
NA PROPERTY OF THE PARTY OF THE			



10/13/10		R	AAP			FB#9
10/15/10		803	204-08			
16 MW9 V		C.J.	BITQE			
pTW - 67	7.A.Q		B P.	rys! (120	m)	4
Post Purga DTW - 67				rge: Clear		
3		DO(ME)	4	SRP(mV) P	(Min)	
Time Temples) (1205) 14.98	712					SC.
	782	8.31 7.89		299.5	n h	ew
	811			198.4	n n	
(1215) 14.48	X79					
(1220) 15.07				207.6	**	
(1225) 15,73	930			45.1	11 6	
(1230) 15.86	935			132.0	n 11	
(1235) 15.77	939		0	17,9	//	
(1240) 14.45	937	- 10		109.3		
(1245) 15.03	930	1.25	1 110	164.3	11 lt	
(1250) 15.13	924	1.13		100,0	11 /1	
(1255) 15.23	927	1.18	6.50	98.6	11 4	
(255) Readings	stable.					
(1305) 13.46	938	1	6.50	103.7	/1 //	
Sa	mple Ti	me: (130	0)			
Say	nples Calle	cted: (3)	8260, (2	8270,(1)	TM	
	J					
16WC/AV						
DTW - 76	.28		Begin Pur	ge: (1315)))
Post Ruge 07W - 71,	11		Initial R	inge: Clear		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
	and (MS)	00/mg/)	att OR	Plan Pura	nin) e K Desc	<u> </u>
(1320) 15.62	578	/	-	33.4 0.3		
(1325) 14,77			-	32.4 "	Clear) {
(1330) 14,73	713	2,55 (14, ("	11	
(1335) 14.86	718			9.1	1)	N
(1340) 14.62	_			5.0 11	/1	(
(1345) 14.37				6.5 11	11	
(1350) 14.45	5			9.9 11	li	
(1355) 14,52				1.8 /1	11	
1	on page 9	Vin .				
		(9	3	I		

10/13/10	RAAP	FB#9
	803204-88 CJB/TGE	
16 WCIA - continued		
Time Tample Condas	from page 95 i) no (my) ptt applimul Purge	K Desc.
(1355) Keadings stab	/e	
(1440) 15.12 724	1,75 7.03 38.1 0.3	Clear
Dample 1	ine: (1400)	
Jamples Col	Mected: (9)8260, (1)8270, (3)1	
16 W-Disp (From	16 wc 1 A)	
Sample Time: (1)		
	1: (3) 8260, (2) 8270, (1) TM	
16WC1BY		
07W-70.70	Begin Purge: (1500)	
Post Parge 07W-71,32	Initial Pura: Clear	
	Initia / Rura: Clear, 100 (mg/s) pH 0 RP(mV) Purge K 5.24 6.58 243.5 0.3	Desc
	5.24 6.58 243.5 0.3 2.41 6.52 239.3	Claus
(1515) 15,00 492	1.82 6.44 234.1 "	er
(1520) 14.86 461	1.55 6.37 230.0 "	1)
(1525) 14,81 445	1.40 2.34 227.5 11	11
	2.02 6.29 223.7 "	η
	,08 6.34 222.7 11	(/
(1540) 15,01 444 1	./2 6.33 222.1	D .
(1540) Readings stabi	10.	
(1550) 13.91 454 1	.32 6.38 243,4 "	18
Jample 1	me: (15:45) Mected: (3) 8260,(2) 8270,(1) TA	2
Sarrigres Co	MECHEN (3) 6 200, (2) 6 270, (1) 17	
The second secon		

	RAAP	FB#9	10/18/10	RAAP	FB#9
10/13/10	803204-08 CJB/TQE	FD#		B03201-08	
1601	CJB/IQE		GENERAL NOTES		
DTW - 50:15	Begin Parge: (14	000)	Weather -	Clear-409s	
0 +0 - DTUI - 50.17	Tritial Parge Cle	ar	· PPE-Whi	te octton flamevetordant cover	als Mitrile
Time Temp(°C) Cond(us)	Initial Purge: Cla DO(mg/) pH ORP(mV) Pu	Tmin) Desc.	Graves	, Exchiotection Steel ted boots	
(1605) 15,19 488	9,25 6,80 269,6 0			ms 151 600 MDS	
(1610) 14.44 669	2.53 6.44 272.4	11 //	plt	1.00 = 4.00 7.00 = 7.00 10.00 =	
(1615) 14.94 706	1.84 6.45 265.7	n n	Conductiv	Hy reads 1413 ns in a 1413h	s standard
(1620) 15.04 722	1.57 6.45 262.6	11 11		100 70	
(1625) 15,26 730	1,44 6.44 259.3	11 11	0.13	tabing and well skints usal at all	wells.
(1630) 15,29 731	1.42 4.44 258.4	11 11		nent deconned between vell	
(1635) 15,27 735	1.42 6.44 258,0	it 7/	A 13 1 1	evaisposed of at dedicated locat	
(1635) Readings stabl	2.	21 11	THE SAVIED	es collected. Then stored and tro	AND THE ON ICC.
	1.70 6.58 271.1		BMW3		
Samp	les Collected: (3) 8260,((2) \$27A (1) TM		12.30 Both Phyge 3	725
Jamp	162 Collected, (2) 8400,(a) 8070 (() 7777	bothuge DTW-	13.70 Initralling ?	Clear
)	TIME Temp(+C).		rge R Clear
			(0725) 15.92		0.3 Clear
			Note: Debris fro	in stormwater over Flowing wel	I head during
				s caused a dense mat of pi	
1			other sinal	fines of plant mother to form	a layer at
			the surface	e of the water column. It I deployments of the bailer to	took a bailer
			and severa	I deployments at the bailer to	bust through
		<u> </u>		as mat in order to take coll	
	1	1	(07.35) 14.82	605 4185 694 2850 0.	
			1 0 0	608 4.84 6.97 264.1 17	
4				608 4.88 1.99 230.1 1	11
				608 4.91 6.98 229.7 11	n
		FTED		608 4.92 6.96 229.6 "	£1
	CO	DETER DESU	(0755) Readings		
	11119		(0210) 16.68 6	10 4,92 4.96 233, 2 1	4/
	65		- continued on	page 89.	
	95			98	

RUAAP B03204-08 CJB/1474 10/20/10 F.B.#9 FB#9 RAAD \$03204+08 CJB/14FC 10/19/10 · Weather - Overcast, vainy 50's · PPE - Mitrile gloves exe protection, work boots - CAUBRATIONS: 451 650 Call 10/19/10 Repaired defective pump tit ting on well head due to stress olt: 4.00= 4.00, 7.00= 7.00, 10.00= 10.00

Conductivity reads 1413 ms in a 1413 ms standard.

DO 7. = 99.8 7.

Dedicated tubing and well skirts used at all nells crack in existing hardware lemons defeative part, applied to be tope to Litting and recured onto well cap. All equipment deconved between wells.
Private noter disposed of at dedicated location on site.
All samples collected, stand and transported on ice. Event took approx. hour. Static Water Level Table - Unit 10 Well Post Purge DTW orn 10 DDHAR 21.42 22.14 20.12 10 DB 20.08 10 030 19.84 19.87 10 MW1 19,72 20,00 10 D4 LOMWI Begin Purge (10:25) Initial Purge? Clear pH ORP(mv) Purge X DTW-19.72 PastPrize DTW-20.00 Time Temp(C°) DO (Mg/L) Cond(ns) 10:35) 14.66 429 10:40) 14.67 7.35 6.01 429 10:45) 14.68 5.77 7.36 430 7,36 7,35 5,70 5,70 430 10:50) 14.68 10 55) 14.69 303.0 11:00 14.70 5,69 7.37 429 306.9 (11:05) 14.78 7.37 430 310.8 (11:05) Readings stable 7.39 430 5,69 322.0 (105) (106)

COBD		TR HOL	10/20/10 RAAP FB#9
10/10 10/1	10/20/10 RAAP	,B,#O	10/20176 10/20176 10/20176
Sample Firms: (1110)	CSB/KFC		16030
Samples Collected: (1) 22 20, (1) TM, (2) 2870, (1) CN (1) 28 20, (1) TM, (2) 2870, (1) CN (1) 28 20, (1) TM, (2) 2870, (1) CN (1) 28 20, (1) TM, (2) 2870, (1) CN (1) 28 20, (1) TM, (2) 2870, (1) CN (1) 28 20, (1) CN (1)	10MW1	9	
DODHAR DTW 31.42 Bagin Regis (0:25) Tank Alloys (1:25) Tank Al	Sample Time: (11:10)		
1000H2R	Samples Collected: (6) 8260, (1) TM, (2) 82 10, (1) EN		
Best Regs (1125) Best Regs (1126) Best Regs (1127) Best R			
Bothog ATW: 22.16 Time Temples Condition DOMES At a CREMIN Process Dose (11:30) 13.47 665 1.60 7.20 299.2 0 3 Clear (11:35) 13.74 662 1.84 7.19 281.1 " (11:40) 13.76 663 1.94 7.18 282.9 " (11:40) 13.76 663 1.94 7.18 282.9 " (11:40) 13.76 663 1.94 7.18 287.9 " (11:40) 13.76 664 1.84 2.13 7.12 287.9 " (11:40) 13.76 666 2.41 7.13 287.9 " (11:55) 13.77 664 2.41 7.13 287.9 " (11:55) 13.76 666 2.41 7.13 287.9 " (11:55) 13.76 666 2.41 7.13 287.9 " (11:55) 13.76 666 2.41 7.13 287.9 " (11:55) 13.76 666 2.41 7.13 287.3 " (11:55) 13.76 666 2.41 7.13 287.3 " (11:55) 13.76 666 2.41 7.13 287.3 " (11:55) 13.76 666 2.41 7.13 287.3 " (11:55) 13.76 666 2.41 7.13 287.3 " (11:55) 13.76 666 2.41 7.13 287.3 " (11:55) 13.76 666 2.41 7.13 287.3 " (12:56) 13.89 671 2.99 7.12 294.8 " (12:56) 13.89 671 2.99 7.12 294.8 " (12:57) 14.80 673 3.06 7.12 293.8 " (12:58) 14.80 673 3.06 7.12 293.8 " (12:59) 14.06 679 3.15 7.11 286.1 " Sample Inve (12:20) Sample Scalled Condition Mary of the Relation Rescues Condition Mary of the Relation Rescues Condition Rescues Cond	10 DDH2RV		
Time Temples Cerellas Marie of the Control According Description (11:30) 13:67 665 11:60 7:20 389.7 0.3 Clear (11:35) 13:74 665 11:84 7:14 291.1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	-::10		Sample Time (1340), Samples Collected (6) 8260, (1) TM, (2) 8270
(11:35) 13:14 662 1.84 7.14 291.1 11 11 11 11 11 11 11 11 11 11 11 11	1031 14 ge 11 10 101	Desc	1003
(11:35) 12.74 bb2 1.87 1.14 291.1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	202 2027 43		07W: 20.08 Begin Purge: (14:00)
(11:46) 13.76 663 1.94 7.12 228.9 11 1 (11:45) 13.77 664 2.13 7.12 271.9 11 11 (11:55) 13.76 666 2.44 7.13 287.9 11 11 (11:55) 13.76 666 2.44 7.13 287.9 11 11 (11:55) 13.76 666 2.44 7.13 287.3 11 11 (11:55) 13.76 666 2.44 7.13 287.3 11 11 (11:55) 13.76 6.66 2.44 7.13 287.3 11 11 (11:55) 13.76 6.66 2.44 7.13 287.3 11 11 (11:55) 13.76 6.76 2.46 7.47 289.3 11 11 (11:55) 13.87 6.77 289.9 7 11 (11:55) 13.87 6.77 289.9 7 11 (11:55) 13.88 6.70 2.90 7.13 281.3 11 11 (11:55) 13.89 6.70 2.90 7.13 281.3 11 11 (11:55) 13.89 6.70 2.70 2.70 7.12 281.2 11 11 11 (11:55) 14.80 6.70 2.90 7.12 282.6 11 11 (11:55) 14.80 6.70 2.90 7.12 282.6 11 11 (11:55) 14.80 6.70 2.90 7.22 128.9 11 11 11 (11:55) 14.80 6.70 2.90 7.22 128.9 11 11 11 11 (11:55) 14.80 6.70 2.90 7.22 128.9 11 11 11 11 (11:55) 14.80 6.70 2.90 7.22 128.9 11 11 11 11 11 11 11 11 11 11 11 11 11	(11:30) 13:01 403 11:00	li	(Vunia)
(11:45) 13.77 664 2.13 7.12 287.9 " " (11:45) 13.76 619 4.99 7.14 43.4 6.3 Clear (11:45) 13.76 6.66 2.41 7.13 287.9 " " (11:55) 13.76 6.66 2.41 7.13 287.9 " " (11:55) 13.76 6.66 2.41 7.13 287.9 " " (11:55) 13.76 6.66 2.41 7.13 281.3 " " (12:65) 13.83 6.70 2.90 7.13 281.3 " " (12:65) 13.83 6.70 2.90 7.13 281.3 " " (12:65) 13.84 6.72 3.09 7.12 282.6 " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " " (12:55) 14.36 66.3 3.04 7.22 110.4 " " " " (12:55) 14.36 7.24 110.4 " " " (12:55) 14.36 7.24 110.4 " " " (12:55) 14.36 7.24 110.4 " " " (12:55) 14.36 7.24 110.4 " " " (12:55) 14.36 7.24 110.4 " " " (12:55) 14.36 7.24 110.4 " " " (12:55) 14.36 7.24 110.4 " " (12:55) 14.36 7.24 110.4 " " " (12:55) 14.36 7.24 110.4 " " " (12:55) 14.36 7.24 110.4 " " (12:55) 14.36 7.24 110.4 " " " (12:55) 14.36 7.24 110.4 " " (12:55) 14.36 7.24 110.4 " " (12:55) 14.36 7.24 110.4 " " (12:55) 14.36 7.24 110.4 " " (12:55) 14.36 7.24 110.4 " " (12:55) 14.36 7.24 110.4 " " (12:55) 14.36 7.24 110.4 " " (12:55) 14.36 7.24 110.4 " " (12:55) 14.36 7.24 110.4 " " (12:55) 14.36 7.24 110.4 " " (1	(11.35) 13,14 000 7.00 7.00 7.00 9 11	1/	
(1150) 13.76 6.66 2.41 7.13 227.9 " " " (1410) 15-13 6.29 3.64 7.15 88.0 (1155) 13.76 6.68 2.66 7.14 229.2 " " " (1415) 14.95 6.51 3.36 7.17 29.7 " " " (1200) 13.43 6.70 2.90 7.12 291.8 " " " (1425) 14.36 6.53 3.64 7.22 110.9 " " " (1210) 13.96 6.7 3.09 7.12 292.6 " " " (1425) 14.36 6.5 3.04 7.22 110.9 " " " (1215) 14.36 6.5 3.04 7.22 110.9 " " " (1215) 14.36 6.5 3.04 7.22 110.9 " " " (1215) 14.36 6.5 3.04 7.22 110.9 " " " (1215) 14.36 6.5 3.04 7.22 110.9 " " " (1215) 14.36 6.5 3.04 7.22 110.9 " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (1215) 14.36 6.5 3.99 7.22 128.9 " " " " " (77.00	U	
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10D3D DTW: 19.86 Begin Ruge: (12:55) Time Temple: Condins Dolly Pt ORPland Ruge: (2007 (13:05) 14.44 675 2.25 7.35 -76.7 " " (13:40) 14.48 684 208 7.37 -121.5 " " (13:20) 15.29 688 2.19 7.37 -133.9 " " (1505) 14.67 670 3.01 7.24 176.7 " " (1505) Readings stable. (1505) Readings stable. (1505) Readings stable. (1506) 14.67 670 3.01 7.24 176.7 " " (1507) 14.67 673 3.52 7.24 176.7 " " (1508) 14.79 673 3.52 7.24 176.7 " " Sample Time: (15:10) DUP Sample Time: (5:20) (13:40) 14.72 686 208 7.35 -132.1 " " Sample Time: (5:20) (13:20) 15.29 688 2.19 7.37 -133.9 " "	Sample Time: (12:20)	70 /3\ (4)	
[1505] 14.67 670 3.01 7.24 162.0 "" DTW: 19.86 Begin River: (12:55) Post River DTW: 19.87 Initial River: Clear Time Temp(t) Cond(us) Dolmy) plt ORPINI Farget Desc. (13:00) 14.59 670 2.04 7.27 -114.0 0.3 Clear (13:05) 14.44 675 2.25 7.35 -76.7 " (13:40) 14.48 684 208 7.37 -121.5 " (13:20) 15.29 686 208 7.37 -133.9 " (13:20) 15.29 688 2.19 7.39 -138.9 " (13:20) 15.	Samples Collected ~ (18) 8260, (3) 1111, (6) 82	10(3)(0	
DTW: 19.86 Begin Kingt: (12:55) Linitial Ringt: (12:56) Liniti		H	(1505) 14.67 670 3.01 7.24 162.0 11 "
Post Purge DTW: 19.87 Time Temp(&) Cond(as) Do(m4) ptt DRP(bnV) Purge K Desc. (13:00) 14.59 670 2.04 7.27 -114.6 0.3 Clear (13:05) 14.44 675 2.25 7.35 - 76.7 11 " (13:40) 14.48 684 2.08 7.37 - 121.5 11 " (13:15) 14.72 686 208 7.35 - 132.1 11 " (13:20) 15.29 688 2.19 7.37 - 133.9 " "" Timitial Rurge: Clear (15:10) Sample Time: (15:10)	10D3D V		(1505) Readings stable.
Time Temples Cond(us) 00/m42 ptt 088(mV) Parack Desc. (13:00) 14.59 670 2.04 7.27 -114.6 0.3 Clear (13:05) 14.44 675 2.25 7.35 -76.7 " (13:60) 14.48 684 208 7.37 -121.5 " (13:15) 14.72 686 208 7.35 -132.1 " (13:20) 15.29 688 2.19 7.37 -133.9 " " Sample Time: (520) Samples Collected (6) 8260 (1) TM, (2) 8270 (1) CN	DTW: 19.86 Degin large (14.55)		(530) 14.79 673 3.52 7.24 176.7 11 1 55mple
(13:00) 14.59 670 2.04 7.27 -1/4.6 0.3 Clear (13:05) 14.44 675 2.25 7.35 -76.7 11 11 11 11 11 11 11 11 11 11 11 11 11	Post Purge DTW: (4.8) (4.8) (4.8) (4.8) (4.8) (4.8) (4.8) (4.8) (4.8) (4.8) (4.8) (4.8) (4.8) (4.8) (4.8) (4.8)	ζ,	
(13:05) 14.44 675 2.25 7.35 -76.7 11 11 11 11 11 11 11 11 11 11 11 11 11		N	Sample & Collected (6) 8260, (1) TM, (2) 870, (1) CN
(13:10) 14,48 684 208 7.37 - 121.5 11 11 11 Sample Time: (1520) (13:15) 14,72 686 208 7.35 -132.1 11 11 5 5 5 5 5 5 5 6 6 6 6 6 6 6 6 6			
(13:15) 14 72 686 208 7.35 -132.1 " " Samples Collected (6) 8260 (1) TM, (2) 8270 (1) CN (13:20) 15,29 688 2.19 7.37 -133.9 " "			
(13:20) 15:29 688 2.19 7.37 -133.9 " " Samples Collected (6) 8260 (1) /m, (2) 82701 (1)			Sample Time: (520)
(13:25) 15.61 691 2.18 7.35 - 133.9 12	(13:20) 15:29 688 2.19 7.37 -133.9 " "		Jamples Collected (6) 8d60 (1) 1111, (2) 8 270 (1)
	The state of the s		(08)

10/20/10	A STATE OF THE PARTY OF THE PAR	RA	AP			FB#9	10/25/10 RAAP F.B. #9
1004		B032	04-08 B/TOE			PUT	B03204-08
p7w: 22	Q.A.	CST	Brain Pr	rge: (15.	35)		e Weather Crevast
			TritalP	Car : Cl	BS) Chin		oPPE: Hitrile Gloves, Exe Protection
Post Purgo DTW: 22.	Calles	Do (mg/L)	nH	DRP/mil)	D. Gming)	Dosc	· Calibrations: 451 650
Time Temp(°C) (1540) 16.50	381	3.52	6.88	202.9	0.31/mi	Cloudy	9H: 4100 - 4100, 7.00 = 7.00, 10.00 = 9.99
(1545) 16.67	394	3,24	6.83	203,2	11	11	Conductivity: reads 1413 hs in a 1413 hs standard
(1550) 16.75	396	3.34	6.86	201.4	1/1	21	00% = 99.8%
(1555) 16.81	395	3,52	6.87	200,9	11	11	· Dedicated tubing and well skirts used at all wells
(1600) 16.52	396	3.50	4.85	2021)	81	51. Cloudy	. All equipment deconned between wells
(1605) 16.46	394	3.49.	6.83	204.7	1/	Clear	· Privac natur dis pised of at didicated location on site.
(1610) 16.43	397	3.48	4.82	213.9	. /1	l)	. All samples collected and stored transported on ice
(1615) 16.48	397	3,47	6.80	215.3	21	11	
(1620) 16.46	397	3.46	6.82	217.9	- 11	1)	STATIC WATER-LEVEL TARKE-UNITY
(1625) 16.59	397	3.40	6.80	220.0	11	11	were Dru Post Phece Dru Pages
(1625) Readings	stable						DW12B 2436 2494
(1635) 1691	395	3.56	6.77	227.8	16	11 Post	TW9C 14,55 16,89
	Sample 7	me (16					WOB 15.67 16.08
	Samples (Mected	: (4)824	0,(1)TM	(2)8270	(1) EN	7WIOC 21.39 21.55
						<u> </u>	TW13 19.34 21.42
						<u> </u>	71MW 6 24.58 26.98
						\ <u> </u>	TWILB 25.19 25.23
						Y	TWCA 25.03 25.70
						1)	- other wells on page 114
							7WIZB V
	-				10	\	Diw-2486 Regin Purq: (0955)
				¥			
<u> </u>						-,	LIME TEMP (C) CINALUS) DOMENTA DE PARA PRESENTA INTER
							14.56 662 12.30 7.05 316 1 7.05 316 1
							(1005) 14.39 670 8.63 7.09 324.1
					ETEL	2	(1010) 14,33 6.76 7.26 7.30 331,0 7 7
				TIA III)	85V -		[1015] 14131 677 6.93 7.09 334.7 4 4
				11119110			(1020) 14.35 676 6.83 7.11 339.7
	1						(1025) 14.36 675 6.71 7.13 341.2 " "
		1	59)	-			(1030) 14143 674 6.68 7.14 3430 11 11 11 11 11 11 11 11 11 11 11 11 11
		(10					(NO)

10 25/10)			AAD	Major and American State of the		F. B. #9	10/25/10			RUAA	P	Combacta Lieta a la company		F. B#9
1-1-0/10			130	3204-08 JB/10E	1.10	9					B03204	-08			FILE
7612	B-cont							7210	B		44	CLL			
Time	/ 0	Condles	00 mg/c	PH	ORP(ms)	Dack	Desc		15.67		3-	in Du	ne: (130:	5	
(1035) 14.44	672	6.66	7.12	3467	0.3 /min	data-		DRW-16.0	8	7	1 frei 1 7		lear	
(1040) 14.46	674	6.69	7.11	344.6	11	h	Time	Temp(x)	Cond (as)	Dama			n) puzzl	Desc
(1040)	1	s State	1	. W.			* *	(1310	14,44	957	4.82	6.98			Clear
(1103	114.35	5 670		7.10	329.7	Post Pos	le Republica	(1315	14.64	970	4,50	6.98			ii ii
		-	le Time	(1045	1			(1320)	14.95	977	4.34	698			1/4
	5		Collected		(2) 87	70, (1) CA	1 - A " 6 "	(1325	14.98	979	4,32	6.9			/1
T He	avy rain o	lurine p	urge //	ght rown	during s.	ample		(1330	15.15	981	4.31	6.9			11
7 W9	/	0,	,		3	•		(1335)	15.24	989	4,08	4.97		7 /1	Pr
	- 14.55	,			ye (11:30			(1340)	15.44	989	4.18	7.00		11	. 11
Post Pury	DTW-16,	89		Initial	Proge = Cl	eer		(1345)	15:52	989	4.17	7.00	289,4	1 1	4
Time	Tempel	(onl(us)	DO 19/L	PH	ORP(m)	puryek	Desc	(1350)	15,60	990	4,17	7,06	288,9	7	
(11:35		1208	8.84	7.09	224.9	0.3	Clear	(1350)	Readings	stable					
(11:40) 13.99	1212	8.62	7.08	223,7	fi	η	(1400)	15,76	981	4.47	6,98	2850	5 Post so	suple Readings
(1145) 13:96	1214	8,31	7.06	221.1	0.3	/1 A 1 24			Samp	le Time	(1355	V		
(1150) 13,94	1216	8,01	7.01	221.6	11	11 on po			Sample	5 Collect	ed: (1)	TM, (2)82	70,(1)c	V
(1155) 13,97	1216	7,02	7.00	aa1. 7	0.3	Clear								
(1200	,	1242	5,54	6.97	212.0	(è	1/	76010							
(1205) 13.62	1254	4.94	6,93	199.8	e,	11	Drw-			Beg	in Purge	(1410)	14 19 1	
(1210)	13.72	1254	4.45	6.96	190.2	Pk .	. 4	Post Pinge	DW-21	35	Livit	ial Purge	Clear	v_	
(1215	1	1256	4,46	6.97	169,1	11	"	Time	Tempo	Conlas	A C MAG		ORP(mV)	purek	Desc
(1220)		1256	4.26	6.97	157.8	/4	4	1415		808		7.28	-26.3	0.3	Clear
(1225)	14.19	1254	4,21	6,97	147.0	6.0		(1420)		810	2.70	7.26	+10.2	11	it
(1230)	14.26	1251	4.15	6.97	144.1	/ (R1	(1425)		808		7.23	24.2	11	11
(1235)	14.31	1247	4,19	6,97	141.0	1		(1430)		808		7.25	24.4	10	11
(1240)	14.39	1242	4.14	6.94	140,1	γ.	46	(1435)		808	3.04	7,26	35.0	it	11
(1240)	Readings		01	1	in-	A	- 3	(1440)		807	3:19	7, 25	29.7	ĝŧ	11
(1252)	14.20	1239	4.52	6.96	128,1	post su	nple	(1445)		207		7.26	29,2	Pu	0
-		Danple	Time (12	45	A) ms					806		7.26	29.7	11	et .
		Janples 1	Collected 1	4)7 M, 6	1), 0768(1	I) SN			14.00	804		7.27	30.5	11	l j
	,	=						(1500)		804		7.24	30.2	24	[1]
				HI				Cont	nued on	page 113	1.12				

· · · · · · · · · · · · · · · · · · ·			RAA	P		F	8#9
10/25/10			B0320				
)		TRE			
7W100	-	tinued fro	1 9		ORP(mV)	(Umin) Purge K	Desc.
Time I		Condens	3.38	/	32.1	0.3	Clear
and the same of th	14.38	803	5:38	110	Jan	0. 3	0,700
(1505) Re	- 1	stable.	4,17	7.23	35.10	Post Sample	Reading
(1520) 14	1.51				.).,	1031 00011	J
		Sample	(me. (/2	(10)	2)~274	(1) 02/	
		Samples 1	Collected	- (1)TM,(2)8210,	1) (1)	
	/						
7MW6V					1		
D	TW: 26.	58		Begin Pur	ge: (15	35)	
Post Purge Di	TW:			Initial 1	luge: Cl	ear	
	emp(cc)	Cond(us)	DO/mg/L)	pH C	RP(mV)	arge K D	esc.
196	15.40	1714	28,1		3.9	0.7	lear
	15.78	1698	2.89	7.34 -	32.5	12	1)
1	14,00	1681	2.99	7, 33	-48.6	il	1)
	15,97	1636	3.11		-58.9	11	n
	15.87	16 16	3,27	7.33	- 56, 1	į l	71
	15.71	1590	3.18		-57.9	41	11
		1581	5.01		-55.8	71	111
	15,77	1589	3,44	7,43	-50,9	15	11
1	15.56		3.43	7,44	- 47.8	21	ll
	15.46	1591		7.42	-45.5	11	et .
(1625)	15,74	1603	3.45	1.70	73.5		1
(1625) R (1645) I	eading	5 stabl	e	- 117	FIIQ	Post funcion	nple
(1645) 1.	5,93	1613	3.98	7,47	-54.9	283	, recours
		Sample	Time!	(1630)		10/2	5/10
		Samples	Collect	ef: (1) TM	n,(z)82	10/2 10/2 70,(1) CN	7
		,					
						11	<u> </u>
							\
	+						
\ 			(113			

10/26/10	RAAP	FB#9
10/20/10	803204-08 CDB/T QE	
	V75/ 1.0	
General Notes!		
- Weather: Sunny 705	â a.	
- PPE: Nitrile gloves, ex - Call brations: YSI &	ye protection	
	7.00 = 7.00, 10.00 = 9.98	
Conductivity: 1,413,	15 = 1,413 M S	
DO 76 = 99, 9 76	7 17 8 72	
- Ordicated tubing and	well skirts used at all wells.	
- All equipment decein	ned between wells	
- Purge water despos	sud at at dedicated location or	r-site.
- HIII samples collected	and stored/ transported on ice	2
Static Water-Leve	1 Table - Unit 7	
	arge DTW Notes	
7W9B 22.76 DTW	only no sampling	
7W// 24.25 "	a n n	
7mw5 a5.01 1	11 74 71	
7 W 13 TOE 10/26110		
DTW: 19.36	R 1003	
Post Purge DTW: 21.42	Begin Parage: 1003 Initial Parae: Cloud of milley	
Time Tema(E) Cond(MS) 1	Octobal Att ORPland Russe K	Desc
(1005) 1403 1321	00(mg/2) pH ORP(mV) Parge K 10,21 7.30 169.1 0.3	milky Ichoudy
	7.18 7.29 110.4 4	/e
	6.31 7.30 99.0	e _e
	7.30 39.1 ···	e) .
	1.78 7.29 87.1 1 1.20 7.29 89.7 "	St. Jourly
	3.96 .7.30 93.1 1	11
(1040) 15.37 1243	3.80 7.30 99.5	Sloudy
	3,51 7.30 /09.1 4	Clas
Continued on page 115	(14)	

10126110			RAAP				FB#9
IOINOLIO		В	03204-08	} E			
7112	0		00-1.	5			
7W13	Tempes	Condlus) 7	Domg/L	DH C	SRP(mV)	puryck (4/m)	Deso
Time (1050)	15.61	1245	3:31	7.30	110,0	8.34min	Ceur
	15.81	1245	3.35	7,30	109.1	k	clear
	5,78	1247	3,25	7.30	106,9	84	Clear
(1100)	Readin	y Stuble)				
(1125)	15.97	1249	3.28	7.31	102.1	Post Sam	pk
		Samo	ole Time	(1105)		
		Sump	les Colle	cticl: (1)	77M, (2)8	270, (1)	CXI
	/				-		
7W11B	√	,			1	2	
	DTW: 2			Begin P	rge: (1140)	
Post Purge	07W: 2	5, 23	a land		Purge: Clea	1001111	Δ.
Time	Tamp(°C)	Cond(u5)	DO (mg/L		ORP(mV)	J	Desc.
(1145)	16.58	819	5,61	6.57	258,7	0.3	Clear
(1156)	16.36	829	4.34	4.59	264.2	-1l	21
(1155)	16.64	8.30	4,01	6.59	361.7		11
(1200)	16.75	836	3.81	6.60	260.6	1-	1
(1205)	11.95	838	3.66	643	258.4	11	11
(1210)	17,32	839	3.57	6,42		11	ş i
(1215)	16.90	844	3.42	6.65	255.0	/1	//
(1220)	16.91	847	3,32	6.65	252.8	11	8/
(1225)	17.05	843	3.27	6.64	252.	11	11
(1230)	17,38	844	3.25	6.46	250.9	le	1,
(1235)	17.43	848	3,22	6,67	ol I i	16	
(12 35)	Readin			W A 2	2 211	3 Pest S	ample
(240) (131	5) 17.67	846	3.48	6.6	2 246.	Recard	ne
			/	1			3
	5	ample In	ne?(1240	1: 63 ==	41 225	(2) 411	
	5	amples (» lected	(3) 77/	1,(6) 8270	, (3) CN	
1				(B)			
							AND THE PARTY OF T

10/26/10	RAAP	FB#9
	BO3 204-08	
TWCA (Wron	g time tripoto correct start @ 1350 and p	urg e @ 1445)
DTW:	Begin Purge: (1350)	
Post Ruge DTW: 25		
		min) e K Desc.
Time Temp(40)	1063 2.79 6.95 294.4 0.	3 Clear
(1900) 16.02	989 2.74 6.93 289.0	
(1305) 15.97	941 2.72 4.92 284.9	t.f
80	840 2,59 6,92 274.8	, ,,
		11
		2 23
1111		11
		11
	876 2.68 6.92 245.8	n o
(1435) 16.67	877 3.66 6.92 234.4	
(1440) 16.79	877 2.44 6.40 232.3	
(1445) 16.84	877 2.98 6.92 229.0	
(1445) Readings	stable.	
(1520) 17.03	878 3,23 693 232.0 Pos	t Sample Time
Sampl	e Time: (1450)	
Sample	5 (1) (1) 7m, (2) 8270, (1) CN	
7MW Dup		
	Trac: ((500)	
3	ime: (1500) 6 Meded: (1)7M, (2)8270, (1)CN	2
Damples	precied (1) m. persaro, cross	
	CO34P	ETED
		200

(114)

10/26/10			R	AAP				0		FB#9
10/20/10			B03	204-6	Sc					, (
			0-	BITOL	2					
Unit	5 - Sta	tic Wat	er Leve	1 Tab	le				,	
Well	DTW	Post 1	PLATOR DTW	Not	es					
5W8B	15,00	15.	49							
5W7B	9,99	loic	3							
5W5B	10.27	71.	oi							
5WC21	9.69	9,	69							
5WCZZ	4.66	9,1	ele							
5WC23	9.08	9,1	3							
5WIZA	12.39	12.	40							
S5W7	11.89	D	TW O	14 - 1	Vo se	mp?	inq			
55W5	9.46				1	11	7			
5W9A	3.40	9	1	17 1)	1)				
5W10A	14.04	١	1	1	ı	17				
5WIIA	14,43	ı	0	11 1	1	4.9				}
5WCA	13.91			1	l .	17				<u> </u>
S5W6	8.21	ı	i	9) 1	1	ti				1
S5W8	12,31	ě	į	11	l į	11				
5WCII	16,25	. (l É) j	N	()				
5WCI2	15.98	d	l .	11	h	ij				
		J				21				
5W5B	V ,									
	DTW: 10.	27		Begin	Pura	1e: (1540)		
Post Purge				Initio	al Pur	ge: C	legs	, 1		
Time			DO(mg/L)	o H	ORF	(mV)	Purg	cK	Desc	
	16.55	693	10.29	5.67	27	9.7	0.		Clear	
(1550)	16,84	688	5.48	5:67	28	2.6	0,	3	Clear	
(1555)	16.78	687	5.69	5,69	28	5,4	h))	
(1600)	16.70	691	4,29	5.70	28	7.7	11		1)	
(1605)	16,57	696	4.05	5,71	28	19.5	į į		11	
(1610)	14.58	699	3,89	5.72	29	10.9	11		11	
(1615)	16.54	704	3.75	5,72	2	92.8	11		11	
				B					T What	

10/26/10	RAAP B03204-08 CJB/70E	FB#9
5W5B	CJB/TQE	
Time Tempec)	Cond(us) DO(mg/) pH ORP(mV) Progra	in)
(1420) 14,57	705 3.71 5.72 293.3 6.3	K. Desc
(1426) Reading	s Stable	Cieos
(1450) 16.60		uple Reading
		710 11 001119
Samp	le Time: (1630)	
Sampl	es Collected: (3) 8240, (2) RSK, (2) TOC. (i) Sulfide
(1.	Nitrate, Sulfate, 9056 Nitrite	
5w7B V		
DTW: 9,99	Begin Purge: (1700)	
Post Parys DTW: 10.03	Initial Purge Clear	1)
	no (us) DO(mg/s) pH ORP(mV) Pringe	K Desc.
(1705) 2063	143 3.45 4.47 322.5 6.3	Clear
(1710) 20.80 (1715) 20.81	165 3.14 4.40 330.4 1	11
(1720) 20.93	166 3.07 4.37 334.4 a	11
(1725) 20.90		11
(1730) 20.88	165 2.92 4.34 341.3 11	11
(1735) ao. 84	164 2.93 4.29 346.5	es
(1740) 20.84	165 292 4,27 349,2	21
(1740) Readings sto	ble	
(3°00) 20.43	166 3.12 4.31 355,2 Rost Sa	uple Reading
Samp!		
Sample		(3) 50 Hide
(3)	1056 W trate Mitrite Sulfate	
	<u>(3)</u>	

10/27/10			RA	40			FB#9
10/21110				04-08 TQE			
Conneco	1 Notes:		0501	1.012			
	Jeather:					4	
	PE: Nitril	e aloue	5. eve	orotect	ion		
	dibrations						
	57.00				00 = 9.98	7	
		Soity: 1,			632		
		= 99.9					
- [Pedicated	tuhina	and we	11 skiet	s used a	t all we	lls.
- A	llaming	rest de	canned	between	en wells.		
- P.	eguip?	ac disa	posed o	fatde	edicated	location	on-site.
- A	Il como	les col	locted	and sto	red/trans	parted	on ice.
	11 savig	ies ce i	166.00	Arto 2			
5621	/						
	9.69			Bear F	vage (08	00)	
0 -	TW: 9.69				Puraze: clou		
Time	Temp()	Cond (us)	Dolms/L	OH.	ORP(mU)	Pungh (4min)	Desc
(0805)	15,29	573	20.41	3.68	240.6	0.3	Cloudy
(0810)	15.38	572	6.32	3.47	241,7	11	11
(0815)	15.40	572	6.27	3.66	243.1	/1	er .
(0820)	15.41	572	5,99	3.70	245.4	11	n.
(0825)	15.43	572	5.72	3.70	249.7	11	11
(0830)	15.43	572	5.42	3.71	252.9	fl	11
(0235)	15,49	572	5,23	3.71	239.2	11	n
(0840)	15,59	572	4.48	3.71	269.1	71	Clear
(0845)	15.64	572	4.47	3,75	277.4	11	1,
(0850)	15,70	572	4.36	3,75	282.3	11	11
(0855)	15.90	57i	4.25	3.77	290.2	11	n
(0900)	16.14	572	4,11	3.78	295.1	15	11
(0905)	16.17	572	4,03	3.76	297.9	11	п
(0910)	16.23	571	4.00	3.79	a98.9	11	11
(0915)	16.29	571	4.14	3.80	299.8	11	11
- 4	ntinued		120		a. 1/		
	111000	- Juge			* .		
			((19)			

20/07/16	RAAP	FB#9
10/27/16	RA AP 803 804-68	
5WCal - cont	inual from Asse 119	
	Conduis) DOGOSE) pit ORPONU) Fire	min) ge K Desc
(0920) 16.37	571 3.94 3.80 309.4 8.	3 Clear
(0925) 16.42	571 3.86 3.81 312.5 0.3	3 Clear
(0930) 16,41	571 3.84 3.21 313.6	2.8
(0935) 16.35	571 3.81 3.81 314.1 "	"
(0940) 16.20	571 3.71 3.81 317.4 "	"
(0940) Readings		
(1020) 16.37	572 4.08 3.82 328.6 "	/ 1
	2 Time: (0945)	
	25 Collected: (3) 8260, (2) R5K, (2) TOC, (1) 341 File,
(1)	Nitrite/Nitrate/Sulfate 9056	
~ 10		
5W Dup		
	E Time: (1000)	4 . 0.1
	s Collected: (3) 8260 (3) R3K, (2) TOC, (1) 5	bultide,
	Vitrite, Netrate, Suitate 9656	
5weaa		
07W: 9,4	66 Begin Parge: (10:30)	
Post Pine OTN: 4.6		
Time Temples	Condinis) Dolmare) att ORPland Price	P Desc
(1035) 15.52	824 3.46 6.74 320.1 0.3	51.Cloudy
(1040) 15,37	864 2.64 6.76 315.0 17	N
(10 45) 15,40	863 2.63 6.73 308.5 "	19
(1050) 12.00	862 2.64 6.73 297.7 "	8.8
(1055) 16.36	862 2.70 6.73 290.3	34
(1100) 16.64	863 264 6.73 282.6 11	clear
(1105) 14.62	863 2.67 6.73 275.0 "	7)
(1110) 16.66	863 2.63 6.73 271.2 "	21
(1115) 1668	862 2.70 6.71 263.1 "	63
(1120) 16.95	861 2.69 6.73 266.7 11	()
-continued on	page 121 (120)	

1 - 1 -	RA	AP	20		FB#9
10/27/10		80-4			
5.1422 - 1	A -	ITAE gr 120			
5WC22 - contin	. /	J .	Cmv) Puc	nin) ve K Des	e
Time Templee Cond	100	,71 25	0		
(THIE) THIE			1.3 0.	0.00	
(1.55)		,,10 d.J	113 01) (160	3
3 .	table	10 21	1010	1 < 1	0.1:
		.69 24	12.1 Pos	Trample	Reading
Samp	le Time: (1135)			1 > 2	n:l
	es Collected (3)8			$C_{j}(1)$ Sul	Fide
(1)	Nitrate, Nitri	te, Sulfat	e 9054		
5WC23					
DTW: 9.08	>	Begin Pur	ge: (1155	')	
Post Purgo DTW: 9.13	S	Initial Pur	e: Cleas	(1/min)	
Et .	nd(es) DO(mg/2) pH	ORP(mV)	Purge K	Desc
	888 4.67	6.97	274.5	0,3	Clear
	882 2.94	6.71	270.7	11	t i
	279 2.87	6.48	258.3	l1	11
(1910)	886 277	6.66	248.3	21	11
(1913)	278 2.81	6.66	243.5	21	n
1000	878 2.81	6.65	239.1	11	17
(10100)	375 2.78	6.64	235.0	21	11
	874 2.71	6.66	230,2	71	11
	876 2,71	6.66	222.0	11	11
	274 2.74	6:66	220.1	11	Le .
(12)		6.66	117.7	11	11
(1000)		0.00	10 71 7		-
	table.	117	7121	11	11
	376 3.01	6.67	213,1		
Sam	ple Time: (15	(55)	(2) 5 412 1	Now 20 1:	151.
Samj	oles Collected!	(3)8260,	$(a)RSK_{i}$	A)TOC, (I)	Dultide
	(1) Nitrate, Nitri	te, Sultate	9056		
					1
		121)			

10/27/16		42		FB#9
	RA Boszol	1-08		
5 WIAA	CJD/	745		
DTW: 1	3 30	Regin Parge: (130		
		Initial Purpe: Cte	SI. Milk	y
Post Parge DTW: 1		4	(4/min)	
Time Temp(c)		ptt ORP(mv)	6,3	Desc. Si. Milky
(1325) 17,74	17.5 4.39	7.11 267.9	0,5	Milky
(1330) 17.65	236 3:15	7.36 274.0	2 0	
(1335) 17.79	246 2.91	7.42 276.2	46	Milky Si. Millay
(1340) 17.70	246 2.85	7.44 277.1		11 II
(1345) 17.81	245 2.83	7.4.3 277.4	h	71 15
(1350) 17.92	245 2.82	7.45 277.9	n	10 11
(1355) 18.25	243 2.81	7.44 377.4	11	
(1400) 18.75	243 2.79	7.42 277.4	11	
(1405) 19.02	242 2.79	7.41 276.3	74	st. Clear
(405) Readine	gs stable.			
(1425) 19.85	240 2.97	7.43 274.7	Post.	Sample Reading
	Sample Time: (14			
5	amples Collected:	(3)8260, (2) R	3K, (2) To	OC, (1) Sulfide
	(1) Nitrate / Nitrite	Sulfate 9056		
5W8B1				
DTW: 15	1.00	Begin Purge: (14 Initial Purge: Co DH ORP/MU)	140)	
Post Purge DTW: 15	5.49	Initial Purce C	lege	
Time Temple)	Condlais) Do (my)	H ORP(mV)	Grack 1	Desc.
(1440) 17,40	56 6.79 5	.08 281.6	0,3	Clear
(1445) 17.00		94 294,0	ii	24
(1450) 14.88		93 305.9	h	11
(1455) 14.95		92 320.1	и	11
(1900) 14.97		96 333.2	11	D.
(1505) 16.92		94 337.6	5.5	l)
(1510) 16.88		96 342.1	11	n
(1515) 14.86		98 339.6	8 6	i)
(15/5) R 1		10 32114		
(15/5) Readings	5 table. 53 3,03 4	97 346.1	(1	
(1530) 14.90	53 3.03 4 on page 123 12	27		

11/17/10 RAAP. B03204-08 CJO/TAE FB#9 10/27/10 GENERAL West 5W8B Sample Time: (1520) Samples Collected: (3) 8240, (2) RSK, (2) TOC, (1) Sulfide (1) Nitrate/Nitrite/Sulfate 9056 · Famo x in · All (1) \$290,(Sample (1)8290, ((123)

PPE cott

PAD-1 SAM

PAD-X

Sav

PAD-2 SAMP

PAD-3 SAMP

SAMPLE (1) 8290,0

