HYPERGOL MAINTENANCE FACILITY
HAZARDOUS WASTE SOUTH STAGING AREAS, SWMU 070
ANNUAL REPORT
YEAR 9
KENNEDY SPACE CENTER, FLORIDA

Prepared for:

National Aeronautics and Space Administration
Kennedy Space Center, Florida

January 2015
Revision 0

Prepared by:

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CORRECTIVE MEASURES IMPLEMENTATION
ANNUAL REPORT, YEAR 9
FOR THE
HYPERGOL MAINTENANCE FACILITY
HAZARDOUS WASTE SOUTH STAGING AREAS
SWMU 070
AT THE
JOHN F. KENNEDY SPACE CENTER, FLORIDA
Revision 0

Prepared for:
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This report was prepared in accordance with sound professional practices. The figures, tables, and text have been reviewed and certified by a Professional Engineer registered in the State of Florida.

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PREFACE

This document presents the Corrective Measures Implementation (CMI) Year 9 Annual Report for the implementation of corrective measures at the Hypergol Maintenance Facility (HMF) Hazardous Waste South Staging Areas at Kennedy Space Center, Florida. The work is being performed by Tetra Tech, Inc., for the National Aeronautics and Space Administration (NASA) under Basic Ordering Agreement (BOA) NNK09CA04B, Delivery Order (DO) 12. Mr. Harry Plaza, P.E., of NASA's Environmental Assurance Branch is the Remediation Project Manager for John F. Kennedy Space Center. The Tetra Tech Program Manager is Mr. Mark Speranza, P.E., and the Tetra Tech Project Manager is Robert Simcik, P.E.

Approved: _____

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ACRONYMS AND ABBREVIATIONS

AGWMR	Annual Groundwater Monitoring Report
bls	below land surface
BOA	Basic Ordering Agreement
CM	Corrective Measures
CMI	Corrective Measures Implementation
CMO	Corrective Measures Objective
DO	Delivery Order
DPT	direct-push technology
FDEP	Florida Department of Environmental Protection
GCTL	Groundwater Cleanup Target Level
HMF	Hypergol Maintenance Facility
KSC	Kennedy Space Center
KSCRT	Kennedy Space Center Remediation Team
MNA	monitored natural attenuation
MNA-DV	Monitored Natural Attenuation Default Value
NASA	National Aeronautics and Space Administration
NFA	no further action
RCRA	Resource Conservation and Recovery Act
SAP	Sampling and Analysis Plan
SCTL	Soil Cleanup Target Level
TCFM	trichlorofluoromethane
µg/L	microgram per liter
VC	vinyl chloride
VOC	volatile organic compound

SECTION 1

INTRODUCTION

1.1 OVERVIEW

This Corrective Measures Implementation (CMI) Year 9 Annual Groundwater Monitoring Report (AGWMR) for the Hypergol Maintenance Facility (HMF) Hazardous Waste South Staging Areas was prepared by Tetra Tech, Inc., for the National Aeronautics and Space Administration (NASA) under Basic Ordering Agreement (BOA) NNK09CA04B, Delivery Order (DO) 12. This CMI Report has been prepared as part of the Resource Conservation and Recovery Act (RCRA) corrective action program being implemented at Kennedy Space Center (KSC).

1.2 PURPOSE

The purpose of this CMI Year 9 AGWMR is to present the actions taken and results obtained during the ninth year of implementation of Corrective Measures (CM) at HMF. Groundwater monitoring activities were conducted in accordance with the CMI Work Plan (Tetra Tech, 2005a) and CMI Site-Specific Safety and Health Plan (Tetra Tech, 2005b). Groundwater monitoring activities detailed in this Year 9 report include pre-startup sampling in February 2014 (prior to restarting the air sparging system) and quarterly performance monitoring in March, July, and September 2014. December 2013 results were presented in the CMI Year 8 AGWMR. The Year 10 AGWMR will present the results of quarterly sampling conducted in December 2014 and March, July, and September 2015.

The results of the first 6 months of CMI (including system installation) and the first 6 months of system operation were presented in the CMI Construction Completion and Semi-Annual HMF Hazardous Waste South Staging Areas Report (Tetra Tech, 2006a), and the results of the second 6 months of the first year of CMI were presented in the CMI Annual Report (Tetra Tech, 2006b). The results for the second year of CMI were presented in the System Expansion Construction Completion and Second Annual Report (Tetra Tech, 2007a and 2007b), and results of the third

through eighth years of CMI were presented in the Years 3 through 8 Annual Reports (Tetra Tech, 2008; 2009; 2010; 2011; 2013; and 2014).

1.3 CORRECTIVE MEASURES OBJECTIVE

The objective of the CM at HMF is to reduce concentrations of contaminants of concern (trichlorofluoromethane [TCFM], vinyl chloride [VC], and aluminum) in groundwater at the site to less than the Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Levels (GCTLs) for TCFM and VC or to the upper range of the KSC background values for aluminum (see Table 1-1). Air sparging was recommended and approved for remediation of the TCFM plume, which is defined as areas with concentrations of TCFM in excess of the GCTL (2,100 micrograms per liter [µg/L]) and Monitored Natural Attenuation (MNA) Default Value (MNA-DV) (21,000 µg/L). MNA was selected as the presumptive remedy for monitoring aluminum and VC exceedances of applicable Corrective Measures Objectives (CMOs). Based on reductions in concentrations to less than cleanup levels, no further action (NFA) was approved for VC and aluminum in October 2010 and September 2006, respectively.

1.4 SYSTEM OVERVIEW

Air sparging system operation began in September 2005, and after 1 month of operation, TCFM concentrations had been reduced by 87.2 percent (approximately 173 pounds of TCFM removed). Free product was observed during the fourth month of system operation. Because TCFM concentrations in monitoring well HMF-MW5I had not decreased to less than the MNA-DV and appeared to be stagnant, additional investigation in this area was recommended. An additional direct-push technology (DPT) investigation was conducted in October 2006 to determine whether residual soil contamination existed in the area of HMF-MW5I, to refine the understanding of lithologic conditions in the area, and to attempt to delineate the extent of TCFM groundwater contamination in the area. Results of the DPT investigation indicated that TCFM in groundwater was contained within the existing system treatment area, and no free product was observed. Maximum residual TCFM concentrations were located between wells HMF-MW5I and NLP-IW4I. TCFM concentrations in soil were less than the FDEP residential Soil Cleanup

Target Level (SCTL), but maximum concentrations, detected near HMF-MW5I at 36 to 40 feet below land surface (bls), exceeded the SCTL based on leachability to groundwater. Based on the delineation efforts during the DPT investigation, it was decided that additional shallow air sparging wells would be installed in the area around HMF-MW5I above a low-permeability lithologic layer that was thought to possibly be impacting the effectiveness of the original sparging wells in this area.

The first system expansion was completed in March 2007 and included installation of six additional sparging wells to address contamination in the HMF-MW5I area. From March 2008 to August 2010, the system was operated as needed when rebounding occurred to attempt to reduce TCFM concentrations to less than the GCTL. The system expansion efforts were very successful. TCFM concentrations in all monitoring wells have been less than the MNA-DV since March 2010. A significant system failure occurred in August 2010, air sparging operations ceased, and the rental system was removed from the site; however, all system wells and the piping network remained in place for future use if needed. In March 2011, TCFM concentrations in all wells were less than the GCTL for the first time without the system operating to reduce concentrations, although concentrations rebounded in June 2011, and the TCFM concentration in NLP-IW41 again exceeded the GCTL. In October 2011, the KSC Remediation Team (KSCRT) reached consensus to expand the system to address residual contamination in the area of NLP-IW4I (Meeting Minute 1110-M05, Decision 1110-D24). System expansion activities were completed in 2012, and the modified system with new sparging wells in the NLP-IW4I area operated from October 2012 to March 2013. TCFM concentrations during the December 2012 and March 2013 quarterly events were less than the GCTL in all wells sampled, and based on these results, the system was not restarted after it was shut down on March 25, 2013, for the March sampling event. Because TCFM concentrations increased to greater than the GCTL at NLP-IW4I during the September and December 2013 events, KSCRT consensus was reached at the February 2014 meeting to restart the system with modified operating parameters and operate it for 5 months to evaluate potential rebound (Meeting Minute 1402-M12, Decision 1402-D43). The modified system began operations on February 19, 2014,

and continued to operate for approximately 5 months until July 2, 2014.

1.5 CMI ANNUAL REPORT ORGANIZATION

Section 1: Introduction – This section provides a brief overview of the report and discusses the purpose and objective of the report.

Section 2: System Operation, Maintenance, and Evaluation – This section summarizes the efforts associated with operation and maintenance of the system. This section discusses any deviations and provides explanations for such deviations from the approved plan and specifications.

Section 3: Groundwater Monitoring – This section presents the results of the groundwater sampling events conducted during the reporting period and compares these results to previous sampling results. The efforts associated with groundwater monitoring to evaluate the effectiveness of the treatment system are also presented in this section.

Section 4: Observations and Recommendations – This section presents observations regarding the current status of the CMI and remedial system operation and provides recommendations regarding the CMI.

Section 5: References – This section provides a listing of the references cited in or applicable to this report.

Table 1-1. Site-Specific Cleanup Levels for the HMF

Contaminant of Concern	GCTL (µg/L)	MNA-DV (µg/L)	CMO (µg/L)
Trichlorofluoromethane	2,100	21,000	2,100
Vinyl chloride	1	100	1
Aluminum	200	2,000	1,300(1)

1 CMO represents the upper range of KSC background for aluminum.
µg/L – Micrograms per liter.
GCTL – Groundwater Cleanup Target Level (Table 1, Chapter 62-777, F.A.C.).
MNA-DV – Monitored Natural Attenuation Default Value.

SECTION 2

SYSTEM OPERATION, MAINTENANCE, AND EVALUATION

This section describes the current status of the remedial system and the activities conducted related to the air sparging system throughout the ninth year of the CMI. A summary of the system operation and major activities conducted throughout the 9 years of implementation is presented in calendar format in Appendix A.

The first year of system operation resulted in significant overall contaminant reduction; however, the area near HMF-MW5I had minimal TCFM reduction and therefore, in March 2007, additional shallow sparging wells were installed in this area. The addition of the shallow system wells had a significant impact, especially in the area of HMF-MW5I. Additional modifications to the system were made in September 2007, which enabled Zone #4 to be placed back into operation, and the cycling time of the well zone groups was revised from 12 hours to 4 hours. Modifications to the groundwater sampling program in May 2008 decreased the sampling frequency of source wells and the shallow well to bi-monthly and changed the cycling time from well groups (two zones at a time) every 4 hours to individual well groups on a 21-minute alternating schedule. The system was operated periodically at this well group cycling time schedule during the fourth and fifth years of system operation. System failure occurred on 27 August 2010, and the air sparging rental unit was removed from the site; groundwater monitoring activities continued.

Based on team consensus reached during the KSCRT meeting on 27 October 2010, it was recommended that the air sparging system remain off line after system failure and that an appropriate long-term monitoring program be established (Meeting Minute 1010-M04, Decision D07). During subsequent monitoring, TCFM concentrations were less than the GCTL in all wells except NLP-IW4I, at which concentrations had rebounded. At the KSCRT meeting in October 2011, it was decided that system operations should resume with additional sparging

wells in the NLP-IW41 area to address continued exceedances of the TCFM GCTL in this well, with the objective of site closure (Meeting Minute 1110-M05, Decision D14).

Continuation of the concept of sparging at various depths to attempt to establish different air pathways and impact the potential continuing source was proposed for the NLP-IW4I area. Three sparging wells were installed at unique depths (other than current system well depths) in the area of monitoring well NLP-IW4I, including ASW-38 at 42 to 44 feet bls, ASW-39 at 32 to 34 feet bls, and ASW-40 at 29 to 31 feet bls. The sparging interval for ASW-38 is half the distance between the top of the deep sparging well and the bottom of the shallow sparging well in the immediate area of NLP-IW4I. The objective of ASW-38 was to add another system well below the monitoring well but at a different interval than existing sparging wells. The ASW-39 sparging interval splits the 35-foot depth, which is the top depth of the NLP-IW4I well screen and location of the top of a potential less-permeable zone. The sparging interval for ASW-40 interval is in the zone above the monitoring well in a formation identified as containing shells or shell fragments. The intent of this well was to create some disturbance in this area as well as to treat any contamination that might have been undetected previously.

The remedial system remained off line until October 2012 when the modified system with the three new sparging wells in the NLP-IW4I area was put into operation. On January 15, 2013, operation of the shallow and intermediate wells was revised to a cycle of 2 hours on and 4 hours off as an energy-saving measure. The secondary compressor used to supply deep wells had been cycling for 2 hours on and 2 hours off since operation with that compressor began. TCFM concentrations during the December 2012 and March 2013 quarterly events were less than the GCTL in all wells sampled, and based on these results, the system was not restarted after it was shut down on March 25 for the March 2013 sampling event. However, concentrations at NLP-IW4I increased to greater than the GCTL in September 2013 and increased further in December 2013, and based on these results, consensus was reached at the February 2014 KSCRT meeting to restart the system, with modified operations as follows (Meeting Minute 1402-M12, Decision 1402-D43):

- Use of existing equipment to aggressively sparge individual wells in the NLP-IW4I area for longer durations than during previous operations.

- Use of a secondary compressor to provide continuous air flow to selected wells on alternating 2-day cycles, allowing increased contact time while maintaining the benefits of cycling. Emphasis was placed on deep wells ASW-11 and ASW-38, and other sparging wells in the area were incorporated in the cycling rotation to encourage movement into the zone being monitored.

- Incorporation of monitoring well NLP-IW4I into the cycling rotation as a sparging well. After 1 year of post-active remediation, NLP-IW4I can be used as a compliance point again and will be used as a system performance monitoring well before that time.

The decision at the February 2014 KSCRT meeting was to operate the system with these modified parameters for 5 months to evaluate potential rebound. If rebound was detected, it was recommended that the site transitions to long-term monitoring only (no air sparging operations).

The objective of 2014 operation of the air sparging system was to attempt to address residual contamination around NLP-IW4I by concentrating sparging efforts in nearby wells and by injecting air into NLP-IW4I itself. Operations began with combined sparging to NLP-IW4I and co-located ASW-11 continuously for 5 days from February 19 to 23; subsequent operations generally involved sparging of one nearby well at a time for 2 consecutive days and then alternating to another nearby well. Once per month, NLP-IW4I and ASW-11 were again sparged together for at least 4 days (6 days in June). Sparging wells in the cycling rotation included deep wells ASW-07, ASW-11, ASW-15, and ASW-38 and shallow wells ASW-34, ASW-35, and ASW-39. During 2014, the system operated for 123 days, 95 days with sparging to individual wells and 28 days with combined sparging to NLP-IW4I and ASW-11. NLP-IW4I and ASW-11 were also sparged individually for 18 and 15 days, respectively, and therefore one or both of these wells were sparged for 61 days, approximately 50 percent of the 123 days of 2014

operation. ASW-7 was sparged for a total of 16 days, ASW-15, ASW-34, and ASW-35 for 10 days each, and ASW-38 and ASW-39 for 8 days each. The system operated continuously except for a 7-day period in June when a compressor failed and was replaced.

The modified system operated for approximately 5 months from February 19 to July 1, 2014 (see Table 2-1). During the July 2014 quarterly monitoring event, 8 days after the system was turned off, the TCFM concentration at HMF-MW5I rebounded to greater than the GCTL, and during the September 2014 event, 12 weeks after system shutdown, TCFM concentrations at NLP-IW41 and HMF-MW5I had increased to greater than the GCTL.

Figure 2-1 shows the layout of the treatment system and locations of monitoring wells.

2.1 FUGITIVE EMISSIONS AND AIR QUALITY MONITORING

When the system was operational prior to system failure in 2010, air sampling was conducted to verify the transfer of TCFM from water to air, and real-time air monitoring was conducted during system evaluations and groundwater sampling events using a flame ionization detector to monitor air quality. Air sampling and monitoring were discontinued after startup of the modified system in 2012 because no air issues were identified during initial system operation when groundwater concentrations were significantly greater than those detected during recent groundwater monitoring events.

2.2 SYSTEM EVALUATIONS AND MAINTENANCE

Prior to 2010, evaluations of treatment system operating parameters and system maintenance activities specified in the Operation and Maintenance Plan submitted with the CMI Work Plan (Tetra Tech, 2005a) were generally conducted bi-weekly when the system was operational. System evaluations and maintenance did not take place from August 2010 until after the modified system became operational in October 2012. During Year 7, 11 system evaluations were conducted when the system was operational, and during Year 8, 14 system evaluations

were conducted when the system was operational. During Year 9, observations of system operations and adjustments were frequent because wells receiving air changed often (generally every 2 days), and detailed system evaluations were conducted as needed. In addition, periodic mowing of the site and general site maintenance were conducted in conjunction with the quarterly sampling events.

For each system evaluation, the first activity conducted was a site walkthrough to determine if any disturbances to the area, wells, system, or units occurred since the previous evaluation. The only routine maintenance required for the air sparging unit is to verify that the air filter is free of obstructions and to replace the filter as needed. A thorough check of all equipment was conducted to verify that no mechanical problems exist (e.g., leaks, ruptures, loose fittings, etc.). If any adjustments were required to equalize the air flow, they were conducted at that time, and any observations of bubbling caused by system operation were recorded and addressed as needed. A final walkthrough was conducted, and the system was secured until the next evaluation.

There was one unscheduled shutdown during this reporting period, from June 10 to 17, when a compressor failed and had to be replaced, but no other maintenance was required other than routine maintenance activities. The system was shut off on July 1, 2014, after 5 months of operation per the February 2014 KSCRT decision (Meeting Minute 1402-M12, Decision 1402-D43), and remains off.

Table 2-1. 2014 System Operation

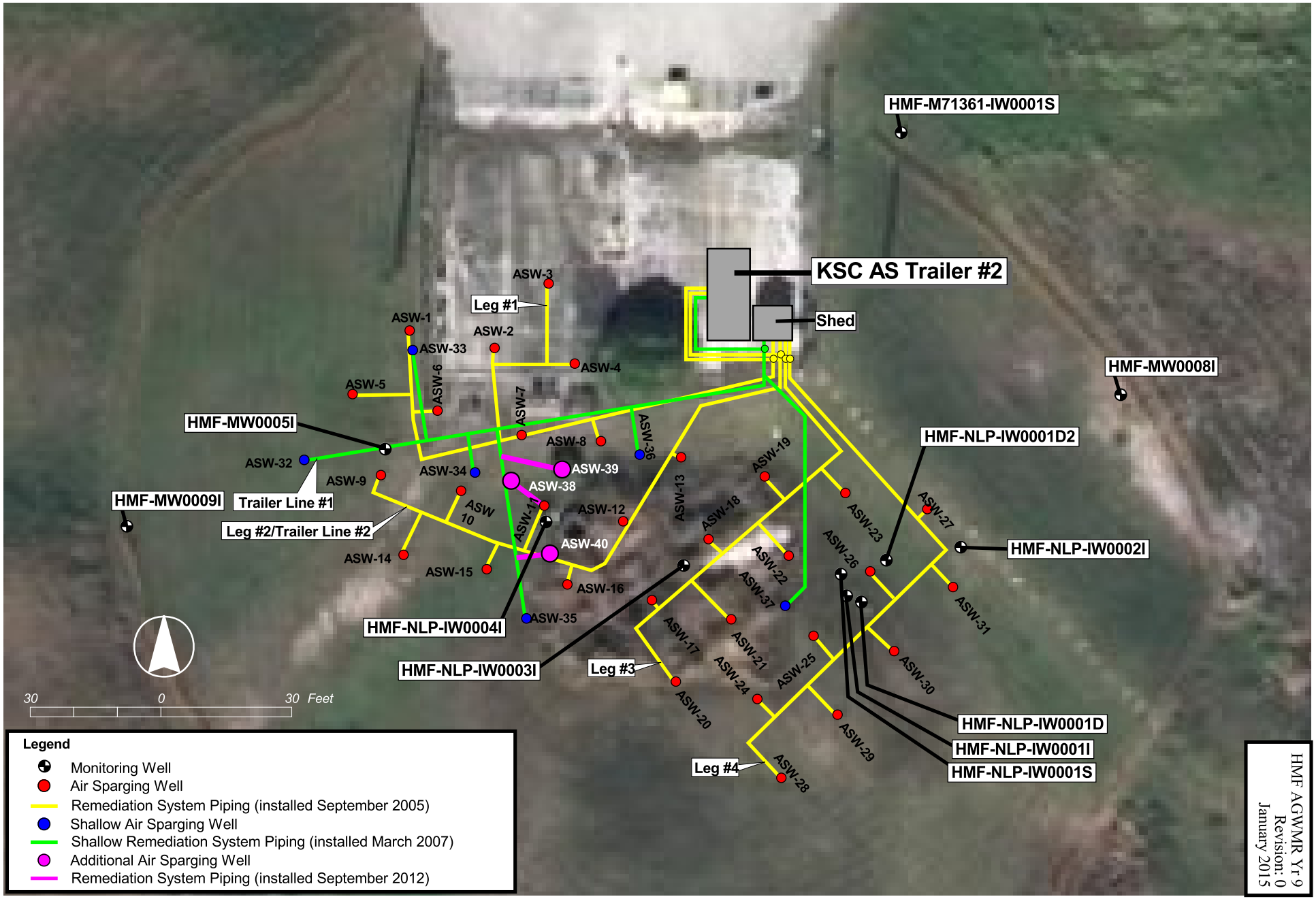
Date	MW-04I (35'- 40')	ASW-11 (TD: 48')	ASW-7 (TD: 48')	ASW-15 (TD: 48')	ASW-38 (TD: 44')	ASW-34 (TD: 40')	ASW-35 (TD: 40')	ASW-39 (TD: 35')
February 19-23	ON	ON						
February 24-25	ON							
February 26-27		ON						
February 28-March 1				ON				
March 2-3					ON			
March 4-5			ON					
March 6-7	ON							
March 8-9						ON		
March 10-11							ON	
March 12-13		ON						
March 14-15								ON
March 16-17			ON					
March 18-21	ON	ON						
March 22-23				ON				
March 24-25	ON							
March 26		ON						
March 27	System turned off in preparation for groundwater sampling event.							
March 28-29					ON			
March 30-31			ON					
April 1-2	ON							
April 3-4						ON		
April 5-6							ON	
April 7-8		ON						
April 9-10								ON
April 11-12			ON					
April 13-16	ON	ON						
April 17-18				ON				
April 19-20	ON							
April 21-22		ON						
April 23-24					ON			
April 25-26			ON					
April 27-28	ON							
April 29-30						ON		

Table 2-1. 2014 System Operation (continued)

Date	MW-04I (35'- 40')	ASW-11 (TD: 48')	ASW-7 (TD: 48')	ASW-15 (TD: 48')	ASW-38 (TD: 44')	ASW-34 (TD: 40')	ASW-35 (TD: 40')	ASW-39 (TD: 35')
May 1-2							ON	
May 3-4		ON						
May 5-6								ON
May 7-8			ON					
May 9-12	ON	ON						
May 13-14				ON				
May 15-16	ON							
May 17-18		ON						
May 19-20					ON			
May 21-22			ON					
May 23-24	ON							
May 25-26						ON		
May 27-28							ON	
May 29-30		ON						
May 31-June 1								ON
June 2-3			ON					
June 4-7	ON	ON						
June 8-9				ON				
June 10-11	Off							
June 12-13		Off						
June 14-15					Off			
June 16-17			Off					
June 18-19	ON							
June 20-21						ON		
June 22-23							ON	
June 24-30	ON	ON						
July 1	System turned off in preparation for groundwater sampling event.							
July 10	Groundwater sampling event (four source wells) conducted.							

Yellow indicates air flow.
TD = Total depth.
System off line from June 10 to 17, 2014, due to compressor failure.

FIGURE 2-1 SYSTEM WELL LOCATION AND PIPING LAYOUT
SWMU 70, KENNEDY SPACE CENTER, FLORIDA



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SECTION 3

GROUNDWATER MONITORING

This section presents the results of groundwater sampling to support evaluation of the effectiveness of the air sparging system.

3.1 GROUNDWATER SAMPLING

Groundwater sampling was conducted in accordance with the Project-Specific Sampling and Analysis Plan (SAP) submitted with the CMI Work Plan (Tetra Tech, 2005a). The SAP initially identified that eight wells would be sampled for analysis of volatile organic compounds (VOCs) by SW-846 Method 8260B. Two additional wells (HMF-MW8I and HMF-MW9I) were installed and included in the original monthly monitoring well program. One well (NLP-IW2I) was not functioning; therefore, it was not sampled until it was replaced on 23 January 2007 prior to the seventeenth monthly groundwater sampling event. Three wells (M71410-IW1S, M71411-IW1I, and NLP-IW1D) were to be sampled in conjunction with the MNA semi-annual and annual sampling program; however, because aluminum and VC analyses are no longer required, monitoring wells M71410-IW1S and M71411-IW1I were eliminated from the sampling program. Based on consensus reached during the KSCRT Meeting on 27 October 2010, the Year 6 groundwater monitoring events included sampling of nine wells, including quarterly sampling in December 2010 and March and June 2011 of three source area wells (NLP-IW1I, NLP-IW4I, and HMF-MW5I) and the shallow well (NLP-IW1S) and sampling of four perimeter wells (HMF-MW-6I through HMF-MW-9I) and the deep well (NLP-IW1D) during the September 2011 annual event. During the seventh year of groundwater monitoring, five sampling events were conducted, including quarterly events in December 2011, March 2012, June 2012 (which also served as the baseline sampling event prior to startup of the modified air sparging system), and December 2012. An additional event was conducted in November 2012 after 1 month of operation of the modified system. Quarterly events included sampling of four wells, three source area wells (NLP-IW1I, NLP-IW4I, and HMF-MW5I) and the shallow well

(NLP-IW1S). Only NLP-IW4I was sampled during the November 2012 event. During Year 8, quarterly events in March, June, and December 2013 included sampling of four wells, three source area wells (NLP-IW1I, NLP-IW4I, and HMF-MW5I) and the shallow well (NLP-IW1S), and the September 2013 annual event included sampling of the three source area wells (NLP-IW1I, NLP-IW4I, and HMF-MW5I), shallow well NLP-IW1S, four perimeter wells (HMF-MW-6I through HMF-MW-9I), and deep well NLP-IW1D. During Year 9, a pre-startup sampling event was conducted in February prior to the start of modified system operations, and subsequent quarterly events were conducted in March, July, and September 2014.

Year 9 groundwater samples were collected in accordance with the SAP and analyzed for TCFM by Accutest Laboratories in Orlando, Florida, according to the subcontract specifications. The TCFM results are summarized by event in Table 3-1 and by monitoring well in Table 3-2. Figure 3-1 provides a summary of TCFM results for September and March groundwater sampling events from 2005 through September 2011, for all Year 7 events (December 2011 and March, June, November, and December 2012, all Year 8 events (March, June, September, and December 2013), and all Year 9 events (February (pre-startup baseline), March, July, and September 2014). Figure 3-2 provides a graph of the analytical TCFM results from the source wells for the monitoring program beginning with the original baseline sampling event (September 2005), Figure 3-3 provides a summary of the TCFM results from this reporting period, and Figure 3-4 provides a graph of these results for the wells monitored quarterly. Copies of field logbook entries for Year 9 activities are provided in Appendix B, and copies of groundwater chain-of-custody forms, sample log sheets, and laboratory analytical data for the Year 9 events are provided in Appendix C.

3.1.1 PRE-STARTUP SAMPLING. Based on KSCRT consensus at the February 2014 meeting, NLP-IW4I and three sparing wells (ASW-34, ASW-38, and ASW-39) located north of NLP-IW4I were sampled on February 13, 2014, prior to startup of the system on February 19. The February 2014 TCFM concentration at NLP-IW4I was 14,600 µg/L, and the concentrations at the three sparging wells were 79.8, 20.8, and 4,160 µg/L at ASW-34, ASW-38, and ASW-39,

respectively. February 2014 results are included in Table 3-1, and the NLP-IW4I result is included in Table 3-1 and on Figure 3-1.

3.1.2 ONE HUNDRED-SECOND MONTH GROUNDWATER SAMPLING RESULTS.

The groundwater sampling event for the 102nd month of the monitoring program was conducted on March 27, 2014. The system was restarted with modified operational parameters (i.e., addressing residual contamination around NLP-IW4I by concentrating air in nearby wells and injecting air into NLP-IW4I itself) on February 19, 2014, 37 days before the March 2014 event. All TCFM concentrations during this event were less than the GCTL. As shown in Table 3-1, the March 2014 concentration of TCFM at source well NLP-IW4I, 26 µg/L, which was the lowest concentration to date and significantly less than concentrations during the last two quarterly events (6,730 and 10,300 µg/L). Concentrations at HMF-MW5I increased from less than 100 µg/L during the last eight events to 286 µg/L in March 2014. TCFM was detected at NLP-IW1I at 0.79 µg/L in March 2014, after not being detected during the previous two rounds, and TCFM concentrations at NLP-IW1S increased from 83.9 µg/L in December 2013 to 192 µg/L in March 2014. As a result of the significant decrease in concentrations at NLP-IW4I, the overall source area average TCFM concentration for this round was 104 µg/L, significantly less than during the 99th month event (3,444 µg/L), as shown in Table 3-1.

3.1.3 ONE HUNDRED-SIXTH MONTH GROUNDWATER SAMPLING RESULTS.

The air sparging system was shut down on July 1, 2014, after approximately 5 months of operation to evaluate potential rebound, as decided at the February 2014 KSCRT meeting. Four monitoring wells were sampled during the 106th month groundwater sampling event on 10 July 2014, 9 days after system shutdown. TCFM concentrations increased in three of the four wells sampled, including an order of magnitude increase at HMF-MW5I from 286 µg/L in March 2014 to 2,650 µg/L in July 2014, exceeding the GCTL of 2,100 µg/L. At NLP-IW4I, TCFM concentrations increased from 26 µg/L during the previous event to 123 µg/L. In the other source area well, NLP-IW1I, TCFM concentrations increased at from 0.79 to 51.2 µg/L. At shallow well NLP-IW1S, the TCFM concentration during this event (117 µg/L) was less than the

concentration during the previous event (192 µg/L). As a result of the increases in TCFM concentrations, especially at HMF-MW5I, the overall source area average TCFM concentration increased to 941 from 104 µg/L during the previous event.

3.1.4 ONE HUNDRED-EIGHTH MONTH GROUNDWATER SAMPLING RESULTS.

Nine monitoring wells were sampled during the 108th month groundwater sampling event on 22 and 23 September 2014. The system had been off line for approximately 12 weeks prior to this groundwater sampling event. At NLP-IW4I, the TCFM concentration during this event (3,370 µg/L) was significantly greater than the concentration during the previous event (123 µg/L) and exceeded the GCTL for the first time since pre-startup sampling conducted in February 2014 prior to the resumption of system operations. The September 2014 TCFM concentration at HMF-MW5I, 2,130 µg/L, was slightly less than the concentration in July 2014, 2,650 µg/L, but continued to exceed the GCTL. In the other source area well, NLP-IW1I, the September 2014 TCFM concentration was 1.1 µg/L compared to 51.2 µg/L in July 2014. At NLP-IW1S, the TCFM concentration in September 2014, 132 µg/L, was greater than the July 2014 concentration of 117 µg/L. At the five additional wells sampled during this expanded annual event, TCFM concentrations increased at perimeter wells HMF-MW6I, HMF-MW8I, and HMF-MW9I and at deep well NLP-IW1D compared to the previous annual event in September 2013, and TCFM was not detected at HMF-MW7I during the September 2013 or 2014 events. The overall source area average TCFM concentration increased this round to 1,834 µg/L as a result of the significant increase at NLP-IW4I.

3.2 GROUNDWATER SAMPLING SUMMARY

The existing groundwater monitoring well network at the site consists of source area wells (subjected to direct treatment during initial system operation), perimeter monitoring wells, and one deep well to evaluate potential vertical migration. During the ninth year of groundwater monitoring, the three source area wells (NLP-IW1I, NLP-IW4I, and HMF-MW5I) and the shallow well (NLP-IW1S) were sampled during the February pre-startup event and March and July 2014 quarterly events, and these four wells in addition to four perimeter wells (HMF-MW6I

through HMF-MW9I) and deep well (NLP-IW1D) were sampled during the September 2014 annual event.

After 5 months of operation of the air sparging system with modified operational parameters, from February to July 2014, source area TCFM concentrations decreased, but they rebounded to concentrations greater than the GCTL at source area wells NLP-IW4I and HMF-MW5I. TCFM concentrations were greater than the GCTL during the July 2014 event at HMF-MW5I (9 days after system shutdown) and during the September 2014 event (12 weeks after system shutdown) at NLP-IW4I and HMF-MW5I. Concentrations at the other source area well (NLP-IW1I) and the shallow well fluctuated during this reporting period but remained significantly less than the GCTL, and TCFM concentrations also remained less than the GCTL in the four perimeter wells and the deep well sampled during the September 2014 sampling event.

Table 3-1. Groundwater TCFM Data Summary by Sampling Event

Monitoring Well	*Baseline Prior to System Startup (Sept-05)*	First Month (Oct-05)	Second Month (Nov-05)	Third Month (Dec-05)	Fourth Month (Jan-06) (1)	Fifth Month (Feb-06)	Sixth Month (Mar-06)	Seventh Month (Apr-06)	Eighth Month (May-06)
HMF-MW5I	***49,200***	**36,200**	**2,660**	**60,600**	**71,700**	**51,000**	**51,900**	**8,240**	**25,800**
HMF-MW6I	*2*	41.7	3.4	15.1	17.5	9.8	5	2.3	0.7
HMF-MW7I	*0.5*	6.3	37.1	10.7	11.4	20.5	17.3	28	2.3
HMF-MW8I	*NS*	NS	NS	NS	0.56	9.2	5	4.7	4.7
HMF-MW9I	*NS*	NS	NS	NS	4.7	0.69	3.2	5.3	10.5
NLP-IW2I	***3,080***	**3,710**	NS	NS	NS	NS	NS	NS	NS
NLP-IW1I	***400,000***	**48,400**	**3,660**	**9,190**	**184,000**	**34,600**	1,520	**3,950**	**2,320**
NLP-IW1S	*0.5*	721	57	9.3	15.8	37	36.2	25.2	8.8
NLP-IW4I	***396,000***	**23,500**	**21,200**	**54,700**	**49,700**	**9,230**	**27,200**	**34,800**	**2,380**
NLP-IW3I	*ND at 200 U*	0.50 U	24.5	10.6	0.54	0.5	0.5	1.8	1
Source wells are: NLP-IW1I, NLP-IW4I, HMF-MW5I									
Source well average concentration (µg/L)	281,733	36,033	9,173	41,497	101,800	31,610	26,873	15,663	10,167
Source area remaining soluble mass (lbs)	198.43	25.38	6.46	29.23	71.70	22.26	18.93	11.03	7.16
Source area removal from baseline (%)	NA	87.21	96.74	85.27	63.87	88.78	90.46	94.44	96.39

Table 3-1. Groundwater TCFM Data Summary by Sampling Event (continued)

Monitoring Well	Ninth Month (June-06)	Tenth Month (July-06)	Eleventh Month (Aug-06)	Twelfth Month (Sept-06)	Thirteenth Month (Oct-06)	Fourteenth Month (Nov-06)	Fifteenth Month (Dec-06)	Sixteenth Month (Jan-07)	Seventeenth Month (Feb-07)
HMF-MW5I	**87,900**	**75,700**	**42,800**	**34,800**	**18,600**	**89,500**	**51,500**	**81,200**	**78,100**
HMF-MW6I	0.5	0.5	0.5	2.7	2.7	2.7	1.6	0.5	0.5
HMF-MW7I	2	51.2	0.5	2.3	2.3	2.3	0.5	0.5	0.5
HMF-MW8I	0.5	0.5	0.5	0.5	0.5	0.73	0.84	4.4	0.5
HMF-MW9I	31.5	40.6	1.6	0.5	94.3	0.78	3.8	0.51	0.5
NLP-IW2I	NS	NS	NS	NS	NS	NS	NS	NS	0.5
NLP-IW1I	**4,180**	**15,700**	**9,380**	**8,790**	**3,930**	**14,900**	**4,260**	**14,800**	**12,400**
NLP-IW1S	3.4	14	384	701	**2,280**	**4,000**	2,010	**8,780**	**15,300**
NLP-IW4I	**17,000**	**40,600**	**6,370**	**48,900**	**25,700**	**21,400**	**12,500**	**45,800**	**65,300**
NLP-IW3I	0.5	14.9	0.5	0.87 I	11.2	19.8	0.5	0.5	0.5
Source wells are: NLP-IW1I, NLP-IW4I, HMF-MW5I									
Source well average concentration (µg/L)	36,360	44,000	19,517	30,830	16,077	41,933	22,753	47,267	51,933
Source area remaining soluble mass (lbs)	25.61	30.99	13.75	21.71	11.32	29.53	16.03	33.29	36.58
Source area removal from baseline (%)	87.09	84.38	93.07	89.06	94.29	85.12	91.92	83.22	81.57

Table 3-1. Groundwater TCFM Data Summary by Sampling Event (continued)

Monitoring Well	Eighteenth Month (Mar-07)	Nineteenth Month (Apr-07)	Twentieth Month (May-07)	Twenty-First Month (June-07)	Twenty-Second Month (July-07)	Twenty-Third Month (Aug-07)	Twenty-Fourth Month (Sept-07)	Twenty-Sixth Month (Nov-07)	Twenty-Eighth Month (Jan-08)
HMF-MW5I	**40,900**	**15,000**	**6,310**	**4,290**	**2,420**	826	**2,900**	698	547
HMF-MW6I	0.5	4	5.8	0.5	69.7	2.1	2.6	2.2	2.1
HMF-MW7I	40.3	2.6	2.9	0.5	7.1	4.2	6.1	4.8	4.3
HMF-MW8I	5.3	2.5	5.5	0.68	68.5	0.51	0.43 U	0.43 U	0.81
HMF-MW9I	3.8	2	5	0.92	117	1.7	1.9 I	3.2	1.2
NLP-IW2I	16 U	4.2	14.1	0.8 I	0.43 U	21.5	22.4	0.43 U	23.6
NLP-IW1I	**11,200 L**	**7,590**	447	**8,090**	**13,100**	**5,330**	**2,970**	**4,550**	1,140
NLP-IW1S	**7,430**	**7,540**	**3,890**	**3,830**	**9,640**	**4,320**	**2,870**	463	217
NLP-IW4I	**36,200**	**8,180**	583	**19,500**	**67,000**	**13,000**	**24,000**	**4,590**	**2,580**
NLP-IW3I	0.5	14.7	0.5	0.5	**13,600**	0.43	57.10	0.43 U	0.43 U
Source wells are: NLP-IW1I, NLP-IW4I, HMF-MW5I									
Source well average concentration (µg/L)	38,550	10,257	2,447	10,627	27,507	6,385	9,957	3,279	1,422
Source area remaining soluble mass (lbs)	27.15	7.22	1.72	7.48	19.37	4.50	7.01	2.31	1.00
Source area removal from baseline (%)	86.32	96.36	99.13	96.23	90.24	97.73	96.47	98.84	99.50

Table 3-1. Groundwater TCFM Data Summary by Sampling Event (continued)

Monitoring Well	Thirtieth Month (Mar-08)	Thirty-Second Month (May-08)	Thirty-Fourth Month (July-08)	Thirty-Sixth Month (Sept-08)	Thirty-Eighth Month (Nov-08)	Fortieth Month (Jan-09)	Forty-Second Month (Mar-09)	Forty-Fourth Month (May-09)	Forty-Fifth Month (July-09)
HMF-MW5I	469	519	69.6	35.1	328	178	290	309	82.2
HMF-MW6I	5.2	NS	NS	4.5	NS	NS	1.4 I	NS	NS
HMF-MW7I	7.5	NS	NS	11.4	NS	NS	12.8	NS	NS
HMF-MW8I	1.3	NS	NS	5.1	NS	NS	6	NS	NS
HMF-MW9I	3.1	NS	NS	5.2	NS	NS	0.05 U	NS	NS
NLP-IW2I	35.6	NS	NS	73.7	NS	NS	10	NS	NS
NLP-IW1I	**3,950**	**6,590**	312	25.1	1.5	68.4	2.5	1.6 I	88.6
NLP-IW1S	197	146	178	127	1,770	289	**2,280**	178	594
NLP-IW4I	**5,220**	**9,330**	953	437	183	90.5	**4,470**	**5,610**	352
NLP-IW3I	0.43 U	NS	NS	0.50 U	NS	NS	3.2	NS	NS
Source wells are: NLP-IW1I, NLP-IW4I, HMF-MW5I									
Source well average concentration (µg/L)	3,213	5,480	445	166	171	112	1,588	2,960	174
Source area remaining soluble mass (lbs)	2.26	3.86	0.31	0.12	0.12	0.08	1.12	2.08	0.12
Source area removal from baseline (%)	98.86	98.06	99.84	99.94	99.94	99.96	99.44	98.95	99.94

Table 3-1. Groundwater TCFM Data Summary by Sampling Event (continued)

Monitoring Well	Forty-Sixth Month (July-09)	Forty-Eighth Month (Sept-09)	Forty-Ninth Month (Oct-09)	Fiftieth Month (Nov-09)	Fifty-First Month (Dec-09)	Fifty-Second Month (Jan-10)	Fifty-Third Month (Feb-10)	Fifty-Fourth Month (Mar-10)	Fifty-Sixth Month (May-10)
HMF-MW5I	194	315	155	142	46.2	71.6	101	51.1	61.4
HMF-MW6I	NS	1.0 I	NS	NS	NS	NS	NS	0.4 U	NS
HMF-MW7I	NS	10.5	NS	NS	NS	NS	NS	1.1 I	NS
HMF-MW8I	NS	0.50 U	NS	NS	NS	NS	NS	0.4 U	NS
HMF-MW9I	NS	0.55	NS	NS	NS	NS	NS	0.4 U	NS
NLP-IW2I	NS	32.2	NS	NS	NS	NS	NS	0.4 U	NS
NLP-IW1I	464	2.7	59	**17,000**	755	38.3	65	5.8	2.0 U
NLP-IW1S	1,750	**4,020**	**8,280**	511	695	122	90.2	41.1	54.1
NLP-IW4I	918	**22,800**	**21,900**	**7,240**	**6,840**	90.7	529	107	507
NLP-IW3I	NS	15.9	NS	NS	NS	NS	NS	0.4 U	NS
Source wells are: NLP-IW1I, NLP-IW4I, HMF-MW5I									
Source well average concentration (µg/L)	525	7,706	7,371	8,127	2,547	67	232	55	284
Source area remaining soluble mass (lbs)	0.37	5.43	5.19	5.72	1.79	0.05	0.16	0.04	0.20
Source area removal from baseline (%)	99.81	97.26	97.38	97.12	99.10	99.98	99.92	99.98	99.90

Table 3-1. Groundwater TCFM Data Summary by Sampling Event (continued)

Monitoring Well	Fifty-Eighth Month (July-10)	Fifty-Ninth Month (Aug-10)	Sixtieth Month (Sept-10)	Sixty-Third Month (Dec-10)	Sixty-Sixth Month (Mar-11)	Sixty-Ninth Month (Jun-11)	Seventy-Second Month (Sept-11)	Seventy-Fifth Month (Dec-11)	Seventy-Eighth Month (Mar-12)
HMF-MW5I	3.8	334	89.4	104	197	125	118	4.9	4.5
HMF-MW6I	NS	NS	2.6	NS	NS	NS	0.50 U	NS	NS
HMF-MW7I	NS	NS	7.1	NS	NS	NS	6.5	NS	NS
HMF-MW8I	NS	NS	0.40 U	NS	NS	NS	0.50 U	NS	NS
HMF-MW9I	NS	NS	7.2	NS	NS	NS	0.50 U	NS	NS
NLP-IW2I	NS	NS	67.3	NS	NS	NS	NS	NS	NS
NLP-IW1I	0.44 I	1.9 I	36.5	0.8 I	0.50 U	5.7	0.85 I	0.50 U	0.50 U
NLP-IW1S	43.6	57.4	94.3	296	1,010 E	1,480	753	502	1,200
NLP-IW4I	**3,350**	**3,100**	**3,670**	**2,750**	1,190	**2,940**	**7,210**	**9,660**	723
NLP-IW3I	NS	NS	35.7	NS	NS	NS	NS	NS	NS
Source wells are: NLP-IW1I, NLP-IW4I, HMF-MW5I									
Source well average concentration (µg/L)	1,677	1,717	1,265	952	462	1,024	2,443	3,222	243
Source area remaining soluble mass (lbs)	1.18	1.21	0.89	0.67	0.33	0.72	1.72	2.27	0.17
Source area removal from baseline (%)	99.40	99.39	99.55	99.66	99.84	99.64	99.13	98.86	99.91

Table 3-1. Groundwater TCFM Data Summary by Sampling Event (continued)

Monitoring Well	Eighty-First Month (June-12)	Eighty-Sixth Month (Nov-12)	Eighty-Seventh Month (Dec-12)	Ninetieth Month (Mar-13)	Ninety-Third Month (Jun-13)	Ninety-Sixth Month (Sept-13)	Ninety-Ninth Month (Dec-13)	101st Month (Pre-Startup Baseline) (Feb-14)	102nd Month (Mar-14)
HMF-MW5I	0.5 U	NS	3.4	16.5	58.6	49.7	30.3	NS	286
HMF-MW6I	NS	NS	NS	NS	NS	0.50 U	NS	NS	NS
HMF-MW7I	NS	NS	NS	NS	NS	0.50 U	NS	NS	NS
HMF-MW8I	NS	NS	NS	NS	NS	0.50 U	NS	NS	NS
HMF-MW9I	NS	NS	NS	NS	NS	0.50 U	NS	NS	NS
NLP-IW2I	NS	NS	NS	NS	NS	NS	NS	NS	NS
NLP-IW1I	0.50 U	NS	50	4.5	3.2	0.50 U	0.50 U	NS	0.79 I
NLP-IW1S	10.7	NS	12.1	95.2	123	51.4	83.9	NS	192
NLP-IW4I	**9,250**	166	76.4	272	1,480	**6,730**	**10,300**	**14,600**	26
NLP-IW3I	NS	NS	NS	NS	NS	NS	NS	NS	NS
Source wells are: NLP-IW1I, NLP-IW4I, HMF-MW5I									
Source well average concentration (µg/L)	3,084	NA	43	98	514	2,260	3,444	NA	104
Source area remaining soluble mass (lbs)	2.17	NA	0.03	0.07	0.36	1.59	2.43	NA	0.07
Source area removal from baseline (%)	98.91	NA	99.98	99.97	99.82	99.20	98.78	NA	99.96

Table 3-1. Groundwater TCFM Data Summary by Sampling Event (continued)

Monitoring Well	106th Month (Jul-14)	108th Month (Sept-2014)
HMF-MW5I	**2,650**	**2,130**
HMF-MW6I	NS	14.1
HMF-MW7I	NS	0.5 U
HMF-MW8I	NS	0.93 I
HMF-MW9I	NS	45.4
NLP-IW2I	NS	NS
NLP-IW1I	51.2	1.1 I
NLP-IW1S	117	132
NLP-IW4I	123	**3,370**
NLP-IW3I	NS	NS

Source wells are: NLP-IW1I, NLP-IW4I, HMF-MW5I		
Source well average concentration (µg/L)	941	1,834
Source area remaining soluble mass (lbs)	0.66	1.29
Source area removal from baseline (%)	99.67	99.35

Bolded results indicate TCFM greater than GCTL of 2,100 µg/L.
Shaded area indicates TCFM greater than the MNA-DV of 21,000 µg/L.
NS - Well not sampled or not installed at time of sampling effort.

1 Additional sampling results from January 2006:

Free Product TCFM Results:
- Water above product: HMF-GW-PROD-IW1I = 814,000 230 µg/L
- Product: HMF-PRODUCT-IW1I = 813,000,000 µg/L

Supplemental sampling based on free product identification.
- M7-1411-IW1D: TCFM = 1.7 I µg/L
- NLP-IW1D: TCFM = 0.5 U µg/L

Deep well NLP-IW1D TCFM Results:
- Sept-06 Annual: 9.2 µg/L
- Mar-07 Semi-annual: 82.5 µg/L
- Sept-07 Annual: 6.8 µg/L
- Mar-08 Semi-annual: 29.8 µg/L
- Sept-08 Annual: 167 µg/L
- Mar-09 Semi-annual: 0.50 U µg/L
- Sept-09 Annual: 0.50 U µg/L
- Mar-10 Semi-annual: 0.40 U µg/L
- Sept-10 Annual: 0.40 U µg/L
- Sept-11 Annual: 0.50 U µg/L
- Sept-13 Annual: 0.50 U µg/L
- Sept-14 Annual: 10.3 µg/L

February 2014 Sparging Well Results:
- HMF-ASW-34: 79.8 µg/L
- HMF-ASW-38: 20.8 µg/L
- HMF-ASW39: 4,160 µg/L

Table 3-2. Groundwater Data Summary by Monitoring Well

MONITORING WELL	SAMPLE ID	SAMPLE DATE	TCFM RESULT (µg/L)
NLP-IW1S	HMF-NLP-IW0001S-013.5-20050908	09-08-2005	0.5 U
	HMF-NLP-IW0001S-013.0-20051026	10-26-2005	721
	HMF-NLP-IW0001S-013.0-20051201	12-01-2005	57
	HMF-NLP-IW0001-013.5-122805	12-28-2005	9.3
	HMF-NLP-MW0001-013-20060125	01-25-2006	15.8
	HMF-NLP-MW0001-013.0-20060227	02-27-2006	37
	HMF-NLP-MW0001-013.0-20060328	03-28-2006	36.2
	HMF-NLP-MW0001-013.0-20060424	04-25-2006	25.2
	HMF-NLP-MW0001-013.0-20060525	05-25-2006	8.8
	HMF-NLP-MW0001-013.0-20060621	06-21-2006	3.4
	HMF-NLP-MW0001-013.0-20060726	07-26-2006	14
	HMF-NLP-MW0001-013.0-20060901	09-01-2006	384
	HMF-NLP-MW0001-013.0-20060928	09-28-2006	701
	HMF-NLP-MW0001-013.0-20061025	10-25-2006	**2,280**
	HMF-NLP-MW0001-013.0-20061129	11-29-2006	**4,000**
	HMF-NLP-MW0001-013.0-20061228	12-28-2006	2,010
	HMF-NLP-MW0001-013.0-20070131	01-31-2007	**8,780**
	HMF-NLP-MW0001-013.0-20070227	02-27-2007	**15,300**
	HMF-NLP-MW0001-013.0-20070329	03-29-2007	**7,430**
	HMF-NLP-MW0001-013.0-20070430	04-30-2007	**7,540**
	HMF-NLP-MW0001-013.0-20070531	05-31-2007	**3,890**
	HMF-NLP-MW0001-013.0-20070628	06-28-2007	**3,830**
	HMF-NLP-MW0001-013.0-20070731	07-31-2007	**9,640**
	HMF-NLP-MW0001-013.0-20070828	08-28-2007	**4,320**
	HMF-NLP-MW0001-013.0-20070926	09-26-2007	**2,870**
	HMF-NLP-MW0001-013.0-20071128	11-28-2007	463
	HMF-NLP-MW0001-013.0-20080131	01-31-2008	217
	HMF-NLP-MW0001-013.0-20080327	03-27-2008	197
	HMF-NLP-MW0001-013.0-20080528	05-28-2008	146
	HMF-NLP-MW0001-013.0-20080729	07-29-2008	178
	HMF-NLP-MW0001-013.0-20080925	09-25-2008	127
	HMF-NLP-MW0001-013.0-20081124	11-24-2008	1,770
	HMF-NLP-MW0001-013.0-20090130	01-30-2009	289
	HMF-NLP-MW0001-013.0-20090401	04-01-2009	**2,280**
	HMF-NLP-MW0001-013.0-20090526	05-26-2009	150
	HMF-NLP-MW0001-013.0-20090701	07-01-2009	594
	HMF-NLP-MW0001-013.0-20090729	07-29-2009	1,750
	HMF-NLP-MW0001-013.0-20090925	09-25-2009	**4,020**
	HMF-NLP-MW0001-013.0-20091027	10-27-2009	**8,280**
	HMF-NLP-MW0001-008.5-20091124	11-24-2009	511
	HMF-NLP-MW0001-008.5-20091229	12-29-2009	695
	HMF-NLP-MW0001-008.5-20100128	01-28-2010	122
	HMF-NLP-MW0001-008.5-20100224	02-24-2010	90.2
	HMF-NLP-MW0001-008.5-20100331	03-31-2010	41.1
	HMF-NLP-MW0001-008.5-20100527	05-27-2010	54.1
	HMF-NLP-MW0001-008.5-20100727	07-27-2010	43.6
	HMF-NLP-MW0001-008.5-20100831	08-31-2010	57.4
	HMF-NLP-MW0001-008.5-20100922	09-23-2010	94.3
	HMF-NLP-MW0001-008.5-20101229	12-29-2010	296

Table 3-2. Groundwater Data Summary by Monitoring Well (continued)

MONITORING WELL	SAMPLE ID	SAMPLE DATE	TCFM RESULT (µg/L)
NLP-IW1S (continued)	HMF-NLP-MW0001-008.5-20110324	03-24-2011	1,010 E
	HMF-NLP-MW0001-008.5-20110622	06-22-2011	1,480
	HMF-NLP-MW0001-008.5-20110915	09-15-2011	753
	HMF-NLP-MW0001-008.5-20111216	12-16-2011	502
	HMF-NLP-MW0001-008.5-20120329	03-29-2012	1,200
	HMF-NLP-MW0001-008.5-20120621	06-21-2012	10.7
	HMF-NLP-MW0001-008.5-2012	12-27-2012	12.1
	HMF-NLP-MW0001-008.5-20130327	03-27-2013	95.2
	HMF-NLP-MW0001-008.5-20130627	06-27-2013	123
	HMF-NLP-MW0001-008.5-20130926	09-26-2013	51.4
	HMF-NLP-MW0001-008.5-20131219	12-19-2013	83.9
	HMF-NLP-MW0001-008.5-20140327	03-27-2014	192
	HMF-NLP-MW0001-008.5-20140710	07-10-2014	117
	HMF-NLP-MW0001-008.5-20140923	09-23-2014	132
NLP-IW1I	HMF-NLP-IW0001I-040.0-20050908	09-08-2005	**400,000**
	HMF-NLP-IW0001I-042.0-20051026	10-26-2005	**48,400**
	HMF-NLP-IW0001I-040.0-20051201	12-01-2005	**3,660**
	HMF-NLP-IW0001-040.0-122805	12-28-2005	**9,190**
	HMF-NLP-MW0001-040-20060126	01-26-2006	**184,000**
	HMF-NLP-MW0001-042.0-20060227	02-27-2006	**34,600**
	HMF-NLP-MW0001-042.0-20060328	03-28-2006	1520
	HMF-NLP-MW0001-042.0-20060424	04-24-2006	**3,950**
	HMF-NLP-MW0001-042.0-20060525	05-25-2006	**2,320**
	HMF-NLP-MW0001-042.0-20060621	06-21-2006	**4,180**
	HMF-NLP-MW0001-042.0-20060726	07-26-2006	**15,700**
	HMF-NLP-MW0001-042.0-20060901	09-01-2006	**9,380**
	HMF-NLP-MW0001-042.0-20060928	09-28-2006	**8,790**
	HMF-NLP-MW0001-042.0-20061025	10-25-2006	**3,930**
	HMF-NLP-MW0001-042.0-20061129	11-29-2006	**14,900**
	HMF-NLP-MW0001-042.0-20061228	12-28-2006	**4,260**
	HMF-NLP-MW0001-042.0-20070131	01-31-2007	**14,800**
	HMF-NLP-MW0001-042.0-20070227	02-27-2007	**12,400**
	HMF-NLP-MW0001-042.0-20070329	03-29-2007	**11,200 L**
	HMF-NLP-MW0001-042.0-20070430	04-30-2007	**7,590**
	HMF-NLP-MW0001-042.0-20070531	05-31-2007	447
	HMF-NLP-MW0001-042.0-20070628	06-28-2007	**8,090**
	HMF-NLP-MW0001-042.0-20070731	07-31-2007	7
	HMF-NLP-MW0001-042.0-20070828	08-28-2007	**5,330**
	HMF-NLP-MW0001-042.0-20070926	09-26-2007	**2,970**
	HMF-NLP-MW0001-042.0-20071128	11-28-2007	**4,550**
	HMF-NLP-MW0001-042.0-20080131	01-31-2008	1,140
	HMF-NLP-MW0001-042.0-20080327	03-27-2008	**3,950**
	HMF-NLP-MW0001-042.0-20080528	05-28-2008	**6,590**
	HMF-NLP-MW0001-042.0-20080729	07-29-2008	312
	HMF-NLP-MW0001-042.0-20080925	09-25-2008	25.1
	HMF-NLP-MW0001-042.0-20081124	11-24-2008	1.5
	HMF-NLP-MW0001-042.0-20090130	01-30-2009	68.4
	HMF-NLP-MW0001-042.0-20090401	04-01-2009	2.5

Table 3-2. Groundwater Data Summary by Monitoring Well (continued)

MONITORING WELL	SAMPLE ID	SAMPLE DATE	TCFM RESULT (µg/L)
NLP-IW1I (continued)	HMF-NLP-MW0001-042.0-20090526	05-26-2009	1.6 I
	HMF-NLP-MW0001-042.0-20090701	07-01-2009	88.6
	HMF-NLP-MW0001-042.0-20090729	07-29-2009	464
	HMF-NLP-MW0001-042.0-20090925	09-25-2009	2.7
	HMF-NLP-MW0001-042.0-20091027	10-27-2009	59
	HMF-NLP-MW0001-037.5-20091124	11-24-2009	**17,000**
	HMF-NLP-MW0001-037.5-20091229	12-29-2009	755
	HMF-NLP-MW0001-037.5-20100128	01-28-2010	38.3
	HMF-NLP-MW0001-037.5-20100224	02-24-2010	65
	HMF-NLP-MW0001-037.5-20100331	03-31-2010	5.8
	HMF-NLP-MW0001-037.5-20100527	05-27-2010	2.0 U
	HMF-NLP-MW0001-037.5-20100727	07-27-2010	0.44 I
	HMF-NLP-MW0001-037.5-20100831	08-31-2010	1.9 I
	HMF-NLP-MW0001-037.5-20100922	09-23-2010	36.5
	HMF-NLP-MW0001-037.5-20101229	12-29-2010	0.8 I
	HMF-NLP-MW0001-037.5-20110324	03-24-2011	0.5 U
	HMF-NLP-MW0001-037.5-20110622	06-22-2011	5.7
	HMF-NLP-MW0001-037.5-20110915	09-15-2011	0.85 I
	HMF-NLP-MW0001-037.5-20111216	12-16-2011	0.5 U
	HMF-NLP-MW0001-037.5-20120329	03-29-2012	0.5 U
	HMF-NLP-MW0001-037.5-20120621	06-21-2012	0.5 U
	HMF-NLP-MW0001-037.5-2012	12-27-2012	50
	HMF-NLP-MW0001-037.5-20130327	03-27-2013	4.5
	HMF-NLP-MW0001-037.5-20130627	06-27-2013	3.2
	HMF-NLP-MW0001-037.5-20130926	09-26-2013	0.5 U
	HMF-NLP-MW0001-037.5-20131219	12-19-2013	0.5 U
	HMF-NLP-MW0001-037.5-20140327	03-27-2014	0.79 I
	HMF-NLP-MW0001-037.5-20140710	07-10-2014	51.2
	HMF-NLP-MW0001-037.5-20140923	09-23-2014	1.1 I
NLP-IW1D	HMF-NLP-MW0001-053-20050908	09-08-2005	12.8
	HMF-NLP-MW0001-053-20060328	03-28-2006	0.5 U
	HMF-NLP-MW0001-053-20060928	09-28-2006	9.2
	HMF-NLP-MW0001-053-20070329	03-29-2007	82.5
	HMF-NLP-MW0001-053-20070926	09-26-2007	6.8
	HMF-NLP-MW0001-053-20080327	03-27-2008	29.8
	HMF-NLP-MW0001-053-20080925	09-25-2008	167
	HMF-NLP-MW0001-053-20090401	04-01-2009	0.5 U
	HMF-NLP-MW0001-053-20090925	09-25-2009	0.5 U
	HMF-NLP-MW0001-053-20100331	03-31-2010	0.4 U
	HMF-NLP-MW0001-053-20100922	09-23-2010	0.4 U
	HMF-NLP-MW0001-050.5-20110915	09-15-2011	0.5 U
	HMF-NLP-MW0001-050.5-20130926	09-26-2013	0.5 U
	HMF-NLP-MW0001-050.5-20140922	09-22-2014	10.3

Table 3-2. Groundwater Data Summary by Monitoring Well (continued)

MONITORING WELL	SAMPLE ID	SAMPLE DATE	TCFM RESULT (µg/L)
NLP-IW2I	HMF-NLP-IW0002I-042.0-20050909	09-09-2005	**3,080**
	HMF-NLP-IW0002I-042.0-20051026	10-26-2005	**3,710**
	HMF-NLP-IW0002I-042.5-20070227	02-27-2007	0.5 U
	HMF-NLP-IW0002I-042.5-20070329	03-29-2007	16 U
	HMF-NLP-IW0002I-042.5-20070430	04-30-2007	4.2
	HMF-NLP-IW0002I-042.5-20070531	05-31-2007	14.1
	HMF-NLP-IW0002I-042.5-20070628	06-28-2007	0.8 I
	HMF-NLP-IW0002I-042.5-20070731	07-31-2007	0.43 U
	HMF-NLP-IW0002I-042.5-20070828	08-28-2007	21.5
	HMF-NLP-IW0002I-042.5-20070926	09-26-2007	22.4
	HMF-NLP-IW0002I-042.5-20071128	11-28-2007	0.43 U
	HMF-NLP-IW0002I-042.5-20080131	01-31-2008	23.6
	HMF-NLP-IW0002I-042.5-20080327	03-27-2008	35.6
	HMF-NLP-IW0002I-042.5-20080925	09-25-2008	73.7
	HMF-NLP-IW0002I-042.5-20090401	04-01-2009	10
	HMF-NLP-IW0002I-042.5-20090925	09-25-2009	32.2
	HMF-NLP-IW0002I-042.5-20100331	03-31-2010	0.4 U
	HMF-NLP-IW0002I-042.5-20100922	09-23-2010	67.3
NLP-IW3I	HMF-NLP-IW0003I-040.5-20050909	09-09-2005	200 U
	HMF-NLP-IW0003I-040.0-20051027	10-27-2005	0.5 U
	HMF-NLP-IW0003I-040.0-20051201	12-01-2005	24.5
	HMF-NLP-IW0003-040.0-122805	12-28-2008	10.6
	HMF-NLP-MW0003-045-20060126	01-26-2006	0.54 I
	HMF-NLP-MW0003-030.0-20060228	02-28-2006	0.5 U
	HMF-NLP-MW0003-040.0-20060328	03-28-2006	2 U
	HMF-NLP-MW0003-040.0-20060424	04-24-2006	1.8
	HMF-NLP-MW0003-040.0-20060525	05-25-2006	1
	HMF-NLP-MW0003-040.0-20060424	04-24-2006	1.8
	HMF-NLP-MW0003-040.0-20060621	06-21-2006	0.5
	HMF-NLP-MW0003-040.0-20060726	07-26-2006	14.9
	HMF-NLP-MW0003-040.0-20060901	09-01-2006	0.5
	HMF-NLP-MW0003-040.0-20060928	09-28-2006	0.87 I
	HMF-NLP-MW0003-040.0-20061025	10-25-2006	11.2
	HMF-NLP-MW0003-040.0-20061129	11-29-2006	19.8
	HMF-NLP-MW0003-040.0-20061228	12-28-2006	0.5 U
	HMF-NLP-MW0003-040.0-20070131	01-31-2007	0.5 U
	HMF-NLP-MW0003-040.0-20070227	02-27-2007	0.5 U
	HMF-NLP-MW0003-040.0-20070329	03-29-2007	0.5 U
	HMF-NLP-MW0003-040.0-20070430	04-30-2007	14.7
	HMF-NLP-MW0003-040.0-20070531	05-31-2007	0.5 U
	HMF-NLP-MW0003-040.0-20070628	06-28-2007	0.5 U
	HMF-NLP-MW0003-040.0-20070731	07-31-2007	**13,600**
	HMF-NLP-MW0003-040.0-20070828	08-28-2007	0.43 U
	HMF-NLP-MW0003-040.0-20070926	09-26-2007	57.1
	HMF-NLP-MW0003-040.0-20071128	11-28-2007	0.43 U
	HMF-NLP-MW0003-040.0-20080131	01-31-2008	0.43 U

Table 3-2. Groundwater Data Summary by Monitoring Well (continued)

MONITORING WELL	SAMPLE ID	SAMPLE DATE	TCFM RESULT (µg/L)
NLP-IW3I (continued)	HMF-NLP-MW0003-040.0-20080327	03-27-2008	0.43 U
	HMF-NLP-MW0003-040.0-20080925	09-25-2008	0.5 U
	HMF-NLP-MW0003-040.0-20090401	04-01-2009	3.2
	HMF-NLP-MW0003-040.0-20090925	09-25-2009	15.9
	HMF-NLP-MW0003-040.0-20100331	03-31-2010	0.4 U
	HMF-NLP-MW0003-040.0-20100922	09-23-2010	35.7
NLP-IW4I	HMF-NLP-IW0004I-040.0-20050908	09-08-2005	**396,000**
	HMF-NLP-IW0004I-040.0-20051026	10-26-2005	**23,500**
	HMF-NLP-IW0004I-040.0-20051201	12-01-2005	**21,200**
	HMF-NLP-IW0004-040.0-122805	12-28-2005	**54,700**
	HMF-NLP-MW0004-040-20060126	01-26-2006	**49,700**
	HMF-NLP-MW0004-040.0-20060228	02-28-2006	**9,230**
	HMF-NLP-MW0004-040.0-20060328	03-28-2006	**27,200**
	HMF-NLP-MW0004-040.0-20060424	04-24-2006	**34,800**
	HMF-NLP-MW0004-040.0-20060525	05-25-2006	**2,380**
	HMF-NLP-MW0004-040.0-20060621	06-21-2006	**17,000**
	HMF-NLP-MW0004-040.0-20060726	07-26-2006	**40,600**
	HMF-NLP-MW0004-040.0-20060901	09-01-2006	**6,370**
	HMF-NLP-MW0004-040.0-20060928	09-28-2006	**48,900**
	HMF-NLP-MW0004-040.0-20061025	10-25-2006	**25,700**
	HMF-NLP-MW0004-040.0-20061129	11-29-2006	**21,400**
	HMF-NLP-MW0004-040.0-20061228	12-28-2006	**12,500**
	HMF-NLP-MW0004-040.0-20070131	01-31-2007	**45,800**
	HMF-NLP-MW0004-040.0-20070227	02-27-2007	**65,300**
	HMF-NLP-MW0004-040.0-20070329	03-29-2007	**36,200**
	HMF-NLP-MW0004-040.0-20070430	04-30-2007	**8,180**
	HMF-NLP-MW0004-040.0-20070531	05-31-2007	583
	HMF-NLP-MW0004-040.0-20070628	06-28-2007	**19,500**
	HMF-NLP-MW0004-040.0-20070731	07-31-2007	**67,000**
	HMF-NLP-MW0004-040.0-20070828	08-28-2007	**13,000**
	HMF-NLP-MW0004-040.0-20070926	09-26-2007	**24,000**
	HMF-NLP-MW0004-040.0-20071128	11-28-2007	**4,590**
	HMF-NLP-MW0004-040.0-20080131	01-31-2008	**2,580**
	HMF-NLP-MW0004-040.0-20080327	03-27-2008	**5,220**
	HMF-NLP-MW0004-040.0-20080528	05-28-2008	**9,330**
	HMF-NLP-MW0004-040.0-20080729	07-29-2008	953
	HMF-NLP-MW0004-040.0-20080925	09-25-2008	437
	HMF-NLP-MW0004-040.2-20081124	11-24-2008	183
	HMF-NLP-MW0004-040.0-20080130	01-30-2009	90.5
	HMF-NLP-MW0004-040.0-20090401	04-01-2009	**4,470**
	HMF-NLP-MW0004-040.0-20090526	05-26-2009	**5,610**
	HMF-NLP-MW0004-040.0-20090701	07-01-2009	352
	HMF-NLP-MW0004-040.0-20090729	07-29-2009	918
	HMF-NLP-MW0004-040.0-20090924	09-25-2009	**22,800**
	HMF-NLP-MW0004-040.0-20091027	10-27-2009	**21,900**
	HMF-NLP-MW0004-037.5-20091124	11-24-2009	**7,240**
	HMF-NLP-MW0004-037.5-20091229	12-29-2009	**6,840**
	HMF-NLP-MW0004-037.5-20100128	01-28-2010	90.7

Table 3-2. Groundwater Data Summary by Monitoring Well (continued)

MONITORING WELL	SAMPLE ID	SAMPLE DATE	TCFM RESULT (µg/L)
NLP-IW4I (continued)	HMF-NLP-MW0004-037.5-20100224	02-24-2010	529
	HMF-NLP-MW0004-037.5-20100331	03-31-2010	107
	HMF-NLP-MW0004-037.5-20100527	05-27-2010	507
	HMF-NLP-MW0004-037.5-20100727	07-27-2010	**3,350**
	HMF-NLP-MW0004-037.5-20100831	08-31-2010	**3,100**
	HMF-NLP-MW0004-037.5-20100922	09-23-2010	**3,670**
	HMF-NLP-MW0004-037.5-20101229	12-29-2010	**2,750**
	HMF-NLP-MW0004-037.5-20110324	03-24-2011	1,190
	HMF-NLP-MW0004-037.5-20110622	06-22-2011	**2,940**
	HMF-NLP-MW0004-037.5-20110915	09-15-2011	**7,210**
	HMF-NLP-MW0004-037.5-20111216	12-16-2011	**9,660**
	HMF-NLP-MW0004-037.5-20120329	03-29-2012	723
	HMF-NLP-MW0004-037.5-20120621	06-21-2012	**9,250**
	HMF-NLP-MW0004-037.5-20121120	11-20-2012	166
	HMF-NLP-MW0004-037.5-2012	12-27-2012	76.4
	HMF-NLP-MW0004-037.5-20130327	03-27-2013	272
	HMF-NLP-MW0004-037.5-20130627	06-27-2013	1,480
	HMF-NLP-MW0004-037.5-20130926	09-26-2013	**6,730**
	HMF-NLP-MW0004-037.5-20131219	12-19-2013	**10,300**
	HMF-NLP-MW0004-037.5-20131219	02-13-2014	**14,600**
	HMF-NLP-MW0004-037.5-20140327	03-27-2014	26
	HMF-NLP-MW0004-037.5-20140710	07-10-2014	123
	HMF-NLP-MW0004-037.5-20140923	09-23-2014	**3,370**
HMF-MW5I	HMF-MW0005I-040.0-20050908	09-08-2005	**49,200**
	HMF-MW0005I-040.0-20051026	10-26-2005	**36,200**
	HMF-MW0005I-040.0-20051201	12-01-2005	**2,660**
	HMF-MW0005-040.0-122805	12-28-2005	**60,600**
	HMF-MW0005-040-20060125	01-25-2006	**71,700**
	HMF-MW0005-040.0-20060227	02-27-2006	**51,000**
	HMF-MW0005-040.0-20060328	03-28-2006	**51,900**
	HMF-MW0005-040.0-20060424	04-25-2006	**8,240**
	HMF-MW0005-040.0-20060525	05-25-2006	**25,800**
	HMF-MW0005-040.0-20060621	06-21-2006	**87,900**
	HMF-MW0005-040.0-20060726	07-26-2006	**75,700**
	HMF-MW0005-040.0-20060901	09-01-2006	**42,800**
	HMF-MW0005-040.0-20060928	09-28-2006	**34,800**
	HMF-MW0005-040.0-20061025	10-25-2006	**18,600**
	HMF-MW0005-040.0-20061129	11-29-2006	**89,500**
	HMF-MW0005-040.0-20061228	12-28-2006	**51,500**
	HMF-MW0005-040.0-20070131	01-31-2007	**81,200**
	HMF-MW0005-040.0-20070227	02-27-2007	**78,100**
	HMF-MW0005-040.0-20070329	03-29-2007	**40,900**
	HMF-MW0005-040.0-20070430	04-30-2007	**15,000**
	HMF-MW0005-040.0-20070531	05-31-2007	**6,310**
	HMF-MW0005-040.0-20070628	06-28-2007	**4,290**
	HMF-MW0005-040.0-20070731	07-31-2007	**2,420**
	HMF-MW0005-040.0-20070828	08-28-2007	826
	HMF-MW0005-040.0-20070926	09-26-2007	**2,900**

Table 3-2. Groundwater Data Summary by Monitoring Well (continued)

MONITORING WELL	SAMPLE ID	SAMPLE DATE	TCFM RESULT (µg/L)
HMF-MW5I (continued)	HMF-MW0005-040.0-20071128	11-28-2007	698
	HMF-MW0005-040.0-20080131	01-31-2008	547
	HMF-MW0005-040.0-20080327	03-27-2008	469
	HMF-MW0005-040.0-20080528	05-28-2008	519
	HMF-MW0005-040.0-20080729	07-29-2008	69.6
	HMF-MW0005-040.0-20080925	09-25-2008	35.1
	HMF-MW0005-040.0-20081124	11-24-2008	328
	HMF-MW0005-040.0-20080130	01-30-2009	178
	HMF-MW0005-040.0-20090401	04-01-2009	290
	HMF-MW0005-040.0-20090526	05-26-2009	309
	HMF-MW0005-040.0-20090701	07-01-2009	82.2
	HMF-MW0005-040.0-20090729	07-29-2009	194
	HMF-MW0005-040.0-20090924	09-25-2009	315
	HMF-MW0005-040.0-20091027	10-27-2009	155
	HMF-MW0005-037.5-20091124	11-24-2009	142
	HMF-MW0005-037.5-20091229	12-29-2009	46.2
	HMF-MW0005-037.5-20100128	01-28-2010	71.6
	HMF-MW0005-037.5-20100224	02-24-2010	101
	HMF-MW0005-037.5-20100331	03-31-2010	51.1
	HMF-MW0005-037.5-20100527	05-27-2010	61.4
	HMF-MW0005-037.5-20100727	07-27-2010	3.8
	HMF-MW0005-037.5-20100831	08-31-2010	334
	HMF-MW0005-037.5-20100922	09-23-2010	89.4
	HMF-MW0005-037.5-20101229	12-29-2010	104
	HMF-MW0005-037.5-20110324	03-24-2011	197
	HMF-MW0005-037.5-20110622	06-22-2011	125
	HMF-MW0005-037.5-20110915	09-15-2011	118
	HMF-MW0005-037.5-20111216	12-16-2011	4.9
	HMF-MW0005-037.5-20120329	03-29-2012	4.5
	HMF-MW0005-037.5-20120621	06-21-2012	0.5 U
	HMF-MW0005-037.5-20121227	12-27-2012	3.4
	HMF-MW0005-037.5-20130327	03-27-2013	16.5
	HMF-MW0005-037.5-20130627	06-27-2013	58.6
	HMF-MW0005-037.5-20130926	09-26-2013	49.7
	HMF-MW0005-037.5-20131219	12-19-2013	30.3
	HMF-MW0005-037.5-20140327	03-27-2014	286
	HMF-MW0005-037.5-20140710	07-10-2014	**2,650**
	HMF-MW0005-037.5-20140923	09-23-2014	**2,130**
HMF-MW6I	HMF-MW0006I-040.0-20050907	09-07-2005	2 U
	HMF-MW0006I-040.0-20051026	10-26-2005	41.7
	HMF-MW0006I-040.0-20051201	12-01-2005	3.4
	HMF-MW0006-040.0-122805	12-28-2005	15.1
	HMF-MW0006-040-20060125	01-25-2006	17.5
	HMF-MW0006-040.0-20060227	02-27-2006	9.8
	HMF-MW0006-040.0-20060328	03-28-2006	5
	HMF-MW0006-040.0-20060424	04-24-2006	2.3
	HMF-MW0006-040.0-20060525	05-25-2006	0.7
	HMF-MW0006-040.0-20060621	06-21-2006	0.5 U

Table 3-2. Groundwater Data Summary by Monitoring Well (continued)

MONITORING WELL	SAMPLE ID	SAMPLE DATE	TCFM RESULT (µg/L)
HMF-MW6I (continued)	HMF-MW0006-040.0-20060726	07-26-2006	0.5 U
	HMF-MW0006-040.0-20060901	09-01-2006	0.5 U
	HMF-MW0006-040.0-20060928	09-28-2006	2.7
	HMF-MW0006-040.0-20061025	10-25-2006	2.7 U
	HMF-MW0006-040.0-20061129	11-29-2006	2.7 U
	HMF-MW0006-040.0-20061228	12-28-2006	1.6 I
	HMF-MW0006-040.0-20070131	01-31-2007	0.5 U
	HMF-MW0006-040.0-20070226	02-27-2007	0.5 U
	HMF-MW0006-040.0-20070329	03-29-2007	0.5 U
	HMF-MW0006-040.0-20070430	04-30-2007	4
	HMF-MW0006-040.0-20070531	05-31-2007	5.8
	HMF-MW0006-040.0-20070628	06-28-2007	0.5 U
	HMF-MW0006-040.0-20070731	07-31-2007	69.7
	HMF-MW0006-040.0-20070828	08-28-2007	2.1
	HMF-MW0006-040.0-20070926	09-26-2007	2.6
	HMF-MW0006-040.0-20071128	11-28-2007	2.2
	HMF-MW0006-040.0-20080131	01-31-2008	2.1
	HMF-MW0006-040.0-20080327	03-27-2008	5.2
	HMF-MW0006-040.0-20080925	09-25-2008	4.5
	HMF-MW0006-040.0-20090401	04-01-2009	1.4 I
	HMF-MW0006-040.0-20090924	09-25-2009	1.0 I
	HMF-MW0006-040.0-20100331	03-31-2010	0.4 U
	HMF-MW0006-040.0-20100922	09-23-2010	2.6
	HMF-MW0006-037.5-20110915	09-15-2011	0.5 U
	HMF-MW0006-037.5-20130926	09-26-2013	0.5 U
	HMF-MW0006-037.5-20140923	09-23-2014	14.1
HMF-MW7I	HMF-MW00071-040.0-20050909	09-09-2005	0.5 U
	HMF-MW00071-040.0-20051026	10-26-2005	6.3
	HMF-MW00071-040.0-20051201	12-01-2005	37.1
	HMF-MW0007-040.0-122805	12-28-2005	10.7
	HMF-MW0007-040-20060125	01-25-2006	11.4
	HMF-MW0007-040.0-20060227	02-27-2006	20.5
	HMF-MW0007-040.0-20060328	03-28-2006	17.3
	HMF-MW0007-040.0-20060424	04-24-2006	28
	HMF-MW0007-040.0-20060525	05-25-2006	2.3
	HMF-MW0007-040.0-20060621	06-21-2006	2
	HMF-MW0007-040.0-20060726	07-26-2006	51.2
	HMF-MW0007-040.0-20060901	09-01-2006	0.5
	HMF-MW0007-040.0-20060928	09-28-2006	2.3
	HMF-MW0007-040.0-20061025	10-25-2006	2.3 U
	HMF-MW0007-040.0-20061129	11-29-2006	2.3 U
	HMF-MW0007-040.0-20061228	12-28-2006	0.5 U
	HMF-MW0007-040.0-20070131	01-31-2007	0.5 U
	HMF-MW0007-040.0-20070226	02-27-2007	0.5 U
	HMF-MW0007-040.0-20070329	03-29-2007	40.3
	HMF-MW0007-040.0-20070430	04-30-2007	2.6
	HMF-MW0007-040.0-20070531	05-31-2007	2.9
	HMF-MW0007-040.0-20070628	06-28-2007	0.5 U

Table 3-2. Groundwater Data Summary by Monitoring Well (continued)

MONITORING WELL	SAMPLE ID	SAMPLE DATE	TCFM RESULT (µg/L)
HMF-MW7I (continued)	HMF-MW0007-040.0-20070731	07-31-2007	**13,100**
	HMF-MW0007-040.0-20070828	08-28-2007	4.2
	HMF-MW0007-040.0-20070926	09-26-2007	6.1
	HMF-MW0007-040.0-20071128	11-28-2007	4.8
	HMF-MW0007-040.0-20080131	01-31-2008	4.3
	HMF-MW0007-040.0-20080327	03-27-2008	7.5
	HMF-MW0007-040.0-20080327	03-27-2008	7.5
	HMF-MW0007-040.0-20080925	09-25-2008	11.4
	HMF-MW0007-040.0-20090401	04-01-2009	12.8
	HMF-MW0007-040.0-20090924	09-25-2009	10.5
	HMF-MW0007-040.0-20100331	03-31-2010	1.1 I
	HMF-MW0007-040.0-20100922	09-23-2010	7.1
	HMF-MW0007-037.5-20110915	09-15-2011	6.5
	HMF-MW0007-037.5-20130926	09-26-2013	0.5 U
	HMF-MW0007-037.5-20140923	09-23-2014	0.5 U
HMF-MW8I	HMF-MW0008-039-20060126	01-26-2006	0.56 I
	HMF-MW0008-040.0-20060227	02-27-2006	9.2
	HMF-MW0008-040.0-20060326	03-26-2006	5 U
	HMF-MW0008-040.0-20060424	04-24-2006	4.7
	HMF-MW0008-040.0-20060525	05-25-2006	4.7
	HMF-MW0008-040.0-20060621	06-21-2006	0.5 U
	HMF-MW0008-040.0-20060726	07-26-2006	0.5 U
	HMF-MW0008-040.0-20060901	09-01-2006	0.5 U
	HMF-MW0008-040.0-20060928	09-28-2006	0.5 U
	HMF-MW0008-040.0-20061025	10-25-2006	0.5 U
	HMF-MW0008-040.0-20061129	11-29-2006	0.73 I
	HMF-MW0008-040.0-20061228	12-28-2006	0.84 I
	HMF-MW0008-040.0-20070131	01-31-2007	4.4
	HMF-MW0008-040.0-20070226	02-27-2007	0.5 U
	HMF-MW0008-040.0-20070329	03-29-2007	5.3
	HMF-MW0008-040.0-20070430	04-30-2007	2.5
	HMF-MW0008-040.0-20070531	05-31-2007	5.5
	HMF-MW0008-040.0-20070628	06-28-2007	0.68
	HMF-MW0008-040.0-20070731	07-31-2007	68.5
	HMF-MW0008-040.0-20070828	08-28-2007	0.51 U
	HMF-MW0008-040.0-20070926	09-26-2007	0.43 U
	HMF-MW0008-040.0-20071128	11-28-2007	0.43 U
	HMF-MW0008-040.0-20080131	01-31-2008	0.81 I
	HMF-MW0008-040.0-20080327	03-27-2008	1.3 I
	HMF-MW0008-040.0-20080925	09-25-2008	5.1
	HMF-MW0008-040.0-20090401	04-01-2009	6
	HMF-MW0008-040.0-20090924	09-25-2009	0.5 U
	HMF-MW0008-040.0-20100331	03-31-2010	0.4 U
	HMF-MW0008-040.0-20100922	09-23-2010	0.4 U
	HMF-MW0008-037.5-20110915	09-15-2011	0.5 U
	HMF-MW0008-037.5-20130926	09-26-2013	0.5 U
	HMF-MW0008-037.5-20140923	09-23-2014	0.93 I

Table 3-2. Groundwater Data Summary by Monitoring Well (continued)

MONITORING WELL	SAMPLE ID	SAMPLE DATE	TCFM RESULT (µg/L)
HMF-MW9I	HMF-MW0009-040-20060126	01-26-2006	4.7
	HMF-MW0009-040.0-20060227	02-27-2006	0.69 I
	HMF-MW0009-040.0-20060328	03-28-2006	3.2
	HMF-MW0009-040.0-20060424	04-24-2006	5.3
	HMF-MW0009-040.0-20060525	05-25-2006	10.5
	HMF-MW0009-040.0-20060621	06-21-2006	31.5
	HMF-MW0009-040.0-20060726	07-26-2006	40.6
	HMF-MW0009-040.0-20060901	09-01-2006	1.6 I
	HMF-MW0009-040.0-20060928	09-28-2006	0.5 U
	HMF-MW0009-040.0-20061025	10-25-2006	94.3
	HMF-MW0009-040.0-20061129	11-29-2006	0.78
	HMF-MW0009-040.0-20061228	12-28-2006	3.8
	HMF-MW0009-040.0-20070131	01-31-2007	0.51 I
	HMF-MW0009-040.0-20070227	02-27-2007	0.5 U
	HMF-MW0009-040.0-20070329	03-29-2007	3.8
	HMF-MW0009-040.0-20070430	04-30-2007	2
	HMF-MW0009-040.0-20070531	05-31-2007	5
	HMF-MW0009-040.0-20070628	06-28-2007	0.92
	HMF-MW0009-040.0-20070731	07-31-2007	117
	HMF-MW0009-040.0-20070828	08-28-2007	1.7 I
	HMF-MW0009-040.0-20070926	09-26-2007	1.9 I
	HMF-MW0009-040.0-20070927	11-28-2007	3.2
	HMF-MW0009-040.0-20070928	01-31-2008	1.2 I
	HMF-MW0009-040.0-20080327	03-27-2008	3.1
	HMF-MW0009-040.0-20080925	09-25-2008	5.2
	HMF-MW0009-040.0-20090401	04-01-2009	0.5 U
	HMF-MW0009-040.0-20090924	09-25-2009	0.55 I
	HMF-MW0009-040.0-20100331	03-31-2010	0.4 U
	HMF-MW0009-040.0-20100922	09-23-2010	7.2
	HMF-MW0009-037.5-20110915	09-15-2011	0.5 U
	HMF-MW0009-037.5-20130926	09-26-2013	0.5 U
	HMF-MW0009-037.5-20140923	09-23-2014	45.4

Bolded values indicate TCFM results greater than the GCTL (2,100 µg/L).
Shaded cells indicate TCFM results greater than the MNA-DV (21,000 µg/L).
NA = Not analyzed.
U = Not detected.
E = Above calibration range.
I = Result is less than or equal to method detection limit but less than reporting limit.
L = Exceeds calibration limit.

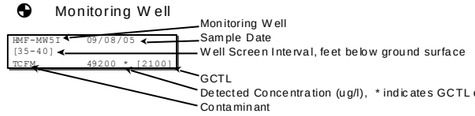
FIGURE 3-1 GROUNDWATER TCFM RESULTS SUMMARY

SWMU 70, KENNEDY SPACE CENTER, FLORIDA

NLP-IW1S [3.5-13.5]	09/07/05	09/28/06	09/26/07	09/25/08	04/01/09	09/25/09	03/31/10	09/23/10	09/15/11	12/16/11	03/29/12	06/21/12	11/20/12	12/27/12	03/27/13	06/27/13	09/26/13	12/19/13	03/27/14	07/10/14	09/23/14	12/23/14	
TCFM	0.5 U	701	2,870*	127	2,280*	4,020*	41.1	94.3	753	502	1200	10.7	NS	12.1	95.2	123	51.4	83.9	192	117	132	54.9	[2100]
NLP-IW1I [35-40]	09/07/05	09/28/06	09/26/07	09/25/08	04/01/09	09/25/09	03/31/10	09/23/10	09/15/11	12/16/11	03/29/12	06/21/12	11/20/12	12/27/12	03/27/13	06/27/13	09/26/13	12/19/13	03/27/14	07/10/14	09/23/14	12/23/14	
TCFM	400,000*	8,790*	2,970*	25.1	2.5	2.7	5.8	36.5	0.85 I	0.5 U	0.5 U	0.5 U	NS	50	4.5	3.2	0.5 U	0.5 U	0.79 I	51.2	1.1 I	0.5 U	[2100]
NLP-IW1D [49.8-54.8]	09/07/05	09/28/06	09/26/07	09/25/08	04/01/09	09/25/09	03/31/10	09/23/10	09/15/11	12/16/11	03/29/12	06/21/12	11/20/12	12/27/12	03/27/13	06/27/13	09/26/13	12/19/13	03/27/14	07/10/14	09/22/14	12/23/14	
TCFM	12.8	9.2	6.8	167	0.5 U	0.5 U	0.4 U	0.4 U	0.5 U	NS	NS	NS	NS	NS	NS	NS	0.5 U	NS	NS	NS	10.3	NS	[2100]
NLP-IW2I [37-42]	09/07/05	09/28/06	09/26/07	09/25/08	04/01/09	09/25/09	03/31/10	09/23/10	09/15/11	12/16/11	03/29/12	06/21/12	11/20/12	12/27/12	03/27/13	06/27/13	09/26/13	12/19/13	03/27/14	07/10/14	09/23/14	12/23/14	
TCFM	3,080*	NS	22.4	73.7	10	32.2	0.4 U	67.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	[2100]
HMF-MW8I [35-40]	09/07/05	09/28/06	09/26/07	09/25/08	04/01/09	09/25/09	03/31/10	09/23/10	09/15/11	12/16/11	03/29/12	06/21/12	11/20/12	12/27/12	03/27/13	06/27/13	09/26/13	12/19/13	03/27/14	07/10/14	09/23/14	12/23/14	
TCFM	NS	0.5 U	0.43 U	5.1	6	0.5 U	0.4 U	0.4 U	0.5 U	NS	NS	NS	NS	NS	NS	NS	0.5 U	NS	NS	NS	0.93 I	NS	[2100]
HMF-MW9I [35-40]	09/07/05	09/28/06	09/26/07	09/25/08	04/01/09	09/25/09	03/31/10	09/23/10	09/15/11	12/16/11	03/29/12	06/21/12	11/20/12	12/27/12	03/27/13	06/27/13	09/26/13	12/19/13	03/27/14	07/10/14	09/23/14	12/23/14	
TCFM	NS	0.5 U	1.9 I	5.2	0.5 U	0.55 I	0.4 U	7.2	0.5 U	NS	NS	NS	NS	NS	NS	NS	0.5 U	NS	NS	NS	45.4	NS	[2100]
NLP-IW3I [35.5-40.	09/07/05	09/28/06	09/26/07	09/25/08	04/01/09	09/25/09	03/31/10	09/23/10	09/15/11	12/16/11	03/29/12	06/21/12	11/20/12	12/27/12	03/27/13	06/27/13	09/26/13	12/19/13	03/27/14	07/10/14	09/23/14	12/23/14	
TCFM	200 U	0.87 I	57.1	0.5 U	3.2	15.9	0.4 U	35.7	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	[2100]
HMF-MW5I [35-40]	09/07/05	09/28/06	09/26/07	09/25/08	04/01/09	09/25/09	03/31/10	09/23/10	09/15/11	12/16/11	03/29/12	06/21/12	11/20/12	12/27/12	03/27/13	06/27/13	09/26/13	12/19/13	03/27/14	07/10/14	09/23/14	12/23/14	
TCFM	49,200*	34,800*	2,900*	35.1	290	315	51.1	89.4	118	4.9	4.5	0.5 U	NS	3.4	16.5	58.6	49.7	30.3	286	2,650*	2,130*	506	[2100]
NLP-IW4I [35-40]	09/07/05	09/28/06	09/26/07	09/25/08	04/01/09	09/25/09	03/31/10	09/23/10	09/15/11	12/16/11	03/29/12	06/21/12	11/20/12	12/27/12	03/27/13	06/27/13	09/26/13	12/19/13	02/13/14	03/27/14	07/10/14	09/23/14	12/23/14
TCFM	396,000*	48,900*	24,000*	437	4,470*	22,800*	107	3,670*	7,210*	9,660*	723	9,250*	166	76.4	272	1,480	6,730*	10,300*	14,600*	26	123	3,370*	75.1	[2100]
HMF-MW6I [35-40]	09/07/05	09/28/06	09/26/07	09/25/08	04/01/09	09/25/09	03/31/10	09/23/10	09/15/11	12/16/11	03/29/12	06/21/12	11/20/12	12/27/12	03/27/13	06/27/13	09/26/13	12/19/13	03/27/14	07/10/14	09/23/14	12/23/14	
TCFM	2 U	2.7	2.6	4.5	1.4 I	1 I	0.4 U	2.6	0.5 U	NS	NS	NS	NS	NS	NS	NS	0.5 U	NS	NS	NS	14.1	NS	[2100]
HMF-MW7I [35-40]	09/07/05	09/28/06	09/26/07	09/25/08	04/01/09	09/25/09	03/31/10	09/23/10	09/15/11	12/16/11	03/29/12	06/21/12	11/20/12	12/27/12	03/27/13	06/27/13	09/26/13	12/19/13	03/27/14	07/10/14	09/23/14	12/23/14	
TCFM	0.5 U	2.3	6.1	11.4	12.8	10.5	1.1 I	7.1	6.5	NS	NS	NS	NS	NS	NS	NS	0.5 U	NS	NS	NS	0.5 U	NS	[2100]

Legend

- Air Sparging Well
- Monitoring Well



Note: TCFM - Trichlorofluoromethane
I - Reported value between MDL and PQL
L - Exceeds calibration limit
U - Not detected at or above MDL
NS - Not Sampled

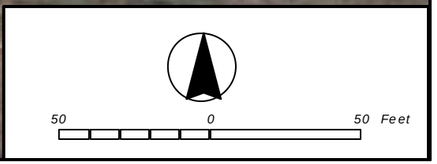


Figure 3-2
TCFM Concentrations Versus Time

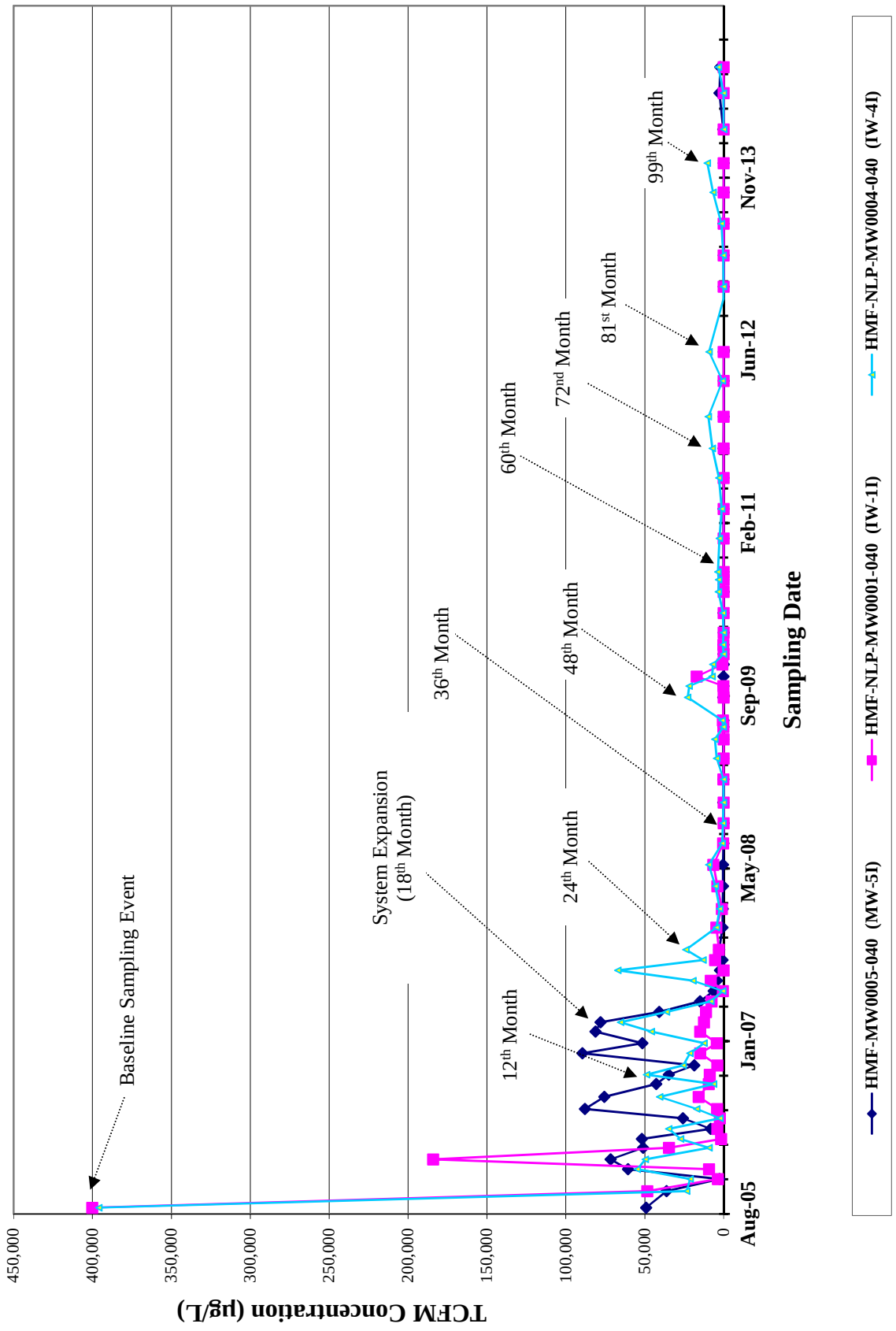
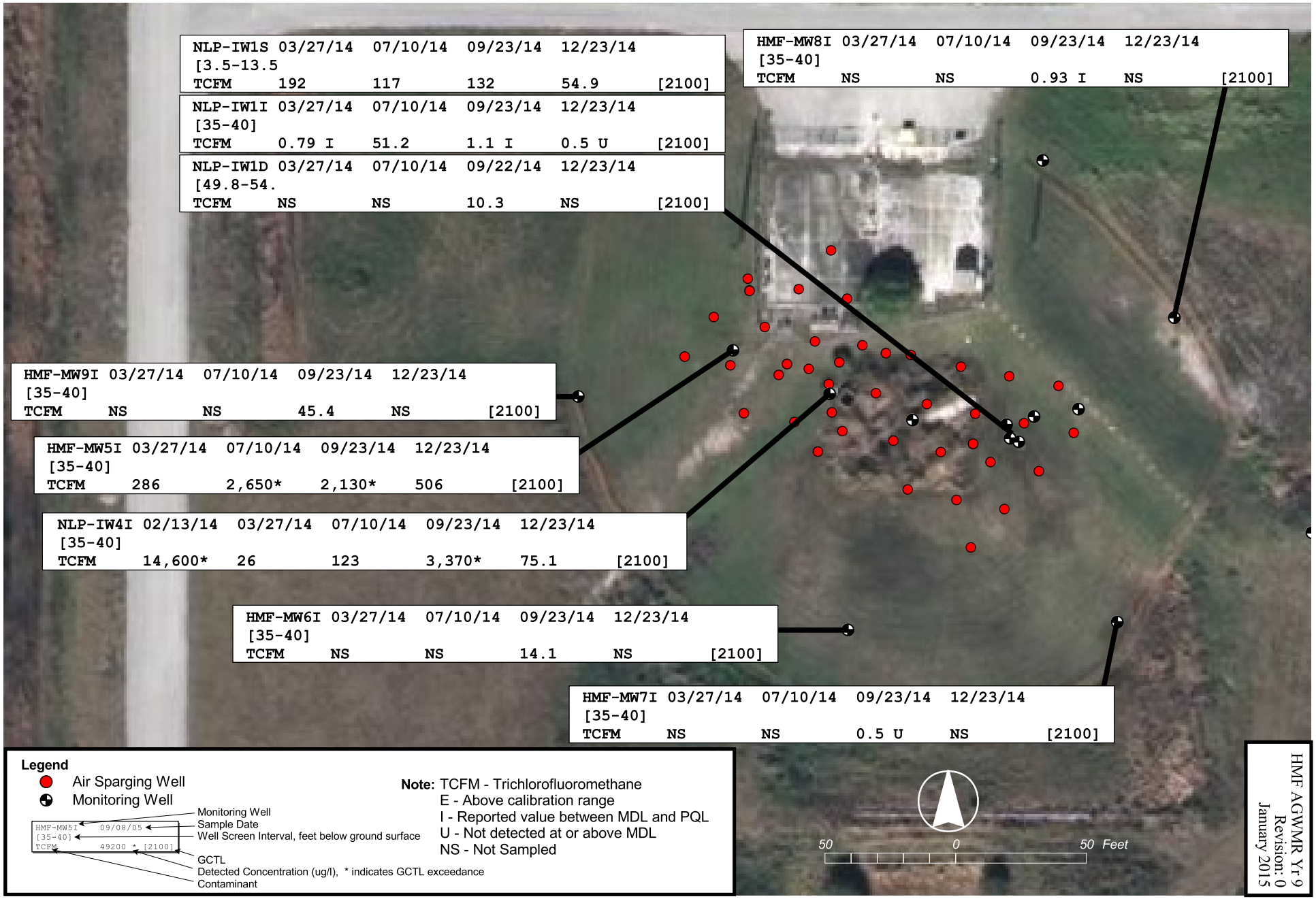
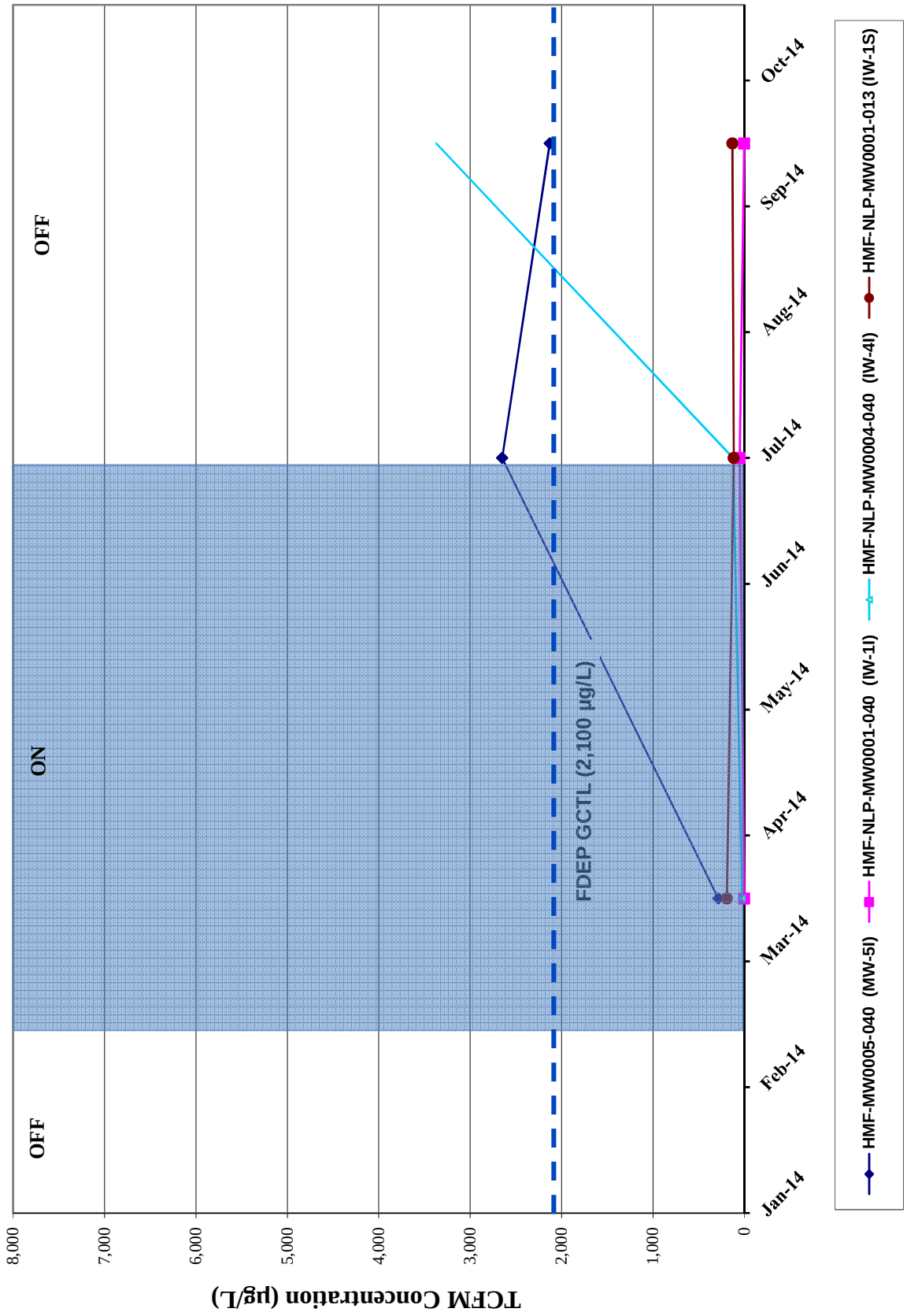


FIGURE 3-3 YEAR 9 ANNUAL GROUNDWATER TCFM RESULTS SUMMARY
SWMU 70, KENNEDY SPACE CENTER, FLORIDA



:\GIS\KSC_NASA\MAPDOCS\HMF_20120104 03-03

Figure 3-4
Year 9 TCFM Concentrations Versus Time



SECTION 4

OBSERVATIONS AND RECOMMENDATIONS

This section provides observations about the results from the ninth year of CMI and recommendations based on these observations.

During the project's ninth year, a pre-startup sampling event was conducted in February 2104 prior to restarting the air sparging system, and three quarterly groundwater monitoring events were conducted in March, July, and September 2014. NLP-IW4I and three air sparging wells (ASW-34, ASW-38, and ASW-39) were sampled in February 2014. Groundwater sampling was conducted at the three source area wells (NLP-IW1I, NLP-IW4I, and HMF-MW5I) and the shallow well (NLP-IW1S) during the March, July, and September events. During the September 2014 event, nine wells were sampled, including the three source areas wells and shallow well, deep well NLP-IW1D, and perimeter wells HMF-MW6I, HMF-MW7I, HMF-MW8I, and HMF-MW9I.

Periodic operation of the air sparging system at HMF between 2005 and 2010 removed a significant amount of TCFM, as evidenced by groundwater sampling results. While the system was operational during the fourth and fifth years of implementation (2008 and 2009), TCFM concentrations in the source area decreased to less than the GCTL; however, during periods when the system was off line, TCFM concentrations greater than the GCTL were detected in the source area. At the KSCRT meeting in October 2011, the team reached consensus to install additional sparging wells and to conduct additional air sparging to address rebounding TCFM concentrations in the NLP-IW4I area, with the objective of site closure. The modified system included three additional sparging wells and with flow concentrated in the NLP-IW4I area and operated from October 2012 to March 2013, when operations were discontinued based on two rounds with TCFM concentrations less than the GCTL in all wells. However, concentrations at NLP-IW4I increased to greater than the GCTL in September 2013 and increased further in December 2013.

As stated in Section 2, KSCRT consensus in February 2014 included operation of the system for 5 months, with sparging concentrated in the NLP-IW4I area and a likely transition to long-term monitoring only if rebounding occurred after the 5 months of operation. Based on rebounding at NLP-IW4I and HMF-MW5I, consensus was reached at the November 2014 KSCRT meeting to conduct an additional year of quarterly monitoring, in December 2014 and March, June, and September 2015, and if TCFM concentrations continue to exceed the GCTL, a long-term monitoring plan will be developed for continued monitoring. If concentrations decrease to and remain less than the GCTL in all wells, no further action will be considered.

Based on KSCRT consensus at the February 2014 meeting, NLP-IW4I can continue to be used as a monitoring well and can again be used as a compliance well 1 year after the end of active remediation (July 2015). Quarterly monitoring will include sampling of three source area wells (NLP-IW1I, NLP-IW4I, and HMF-MW5I) and the shallow well (NLP-IW1S) during each quarterly event, with the addition of the four perimeter wells (HMF-MW6I through HMF-MW9I) and the deep well (NLP-IW1D) during the comprehensive sampling event (third quarter) in September 2014. A quarterly sampling event was conducted in December 2014, and the next event is scheduled for March 2015.

SECTION 5

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APPENDIX A

SYSTEM OPERATION CALENDAR

September 2005						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
25	26	27	28 system installed and startup conducted	29 ON @ 1600	30 ON	

October 2005						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
						1 ON System Evaluation
2 ON	3 ON	4 OFF~1/2-hr for Maintenance	5 ON System Evaluation	6 ON System Evaluation	7 ON	8 ON
9 ON	10 ON	11 OFF~1/2-hr for Maintenance	12 Ran Out of Fuel ~ 1700	13 Restarted @ 1110	14 ON Weekly Evaluation	15 ON
16 ON	17 ON	18 OFF~1/2-hr for Maintenance	19 ON Weekly Evaluation	20 ON	21 ON	22 ON
23 ON	24 Ran Out of Fuel ~ 1500 Hurricane	25 Left OFF for Monthly GW Sampling	26 OFF Monthly GW Sampling	27 ON @ 1815	28 ON Weekly Evaluation	29 ON
30 ON	31 ON					

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

November 2005						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		1 OFF~1/2-hr for Maintenance	2 ON	3 ON Weekly Evaluation	4 ON	5 ON
6 Ran Out of Fuel ~ 1230	7 OFF	8 Maintenance& Restarted @ 0930	9 ON 1/2 Weekly Evaluation	10 ON 1/2 Weekly Evaluation	11 ON	12 ON
13 ON	14 ON	15 OFF ~ 2-hr for Maintenance	16 ON Weekly Evaluation	17 ON	18 ON	19 ON
20 ON	21 ON	22 OFF~1/2-hr Maintenance Weekly Evaluation	23 ON	24 ON	25 ON	26 ON
27 ON	28 OFF @1405 for Monthly GW Sampling	29 Left OFF for Monthly GW Sampling	30 Left OFF for Monthly GW Sampling			

December 2005						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1 OFF Monthly GW Sampling ON @ 1745	2 ON Weekly Evaluation	3 ON
4 Ran Out of Fuel ~ 1400	5 OFF	6 Maintenance& Restarted @ 1130	7 ON	8 ON Weekly Evaluation	9 ON	10 ON
11 ON	12 ON	13 ON	14 ON Weekly Evaluation	15 ON	16 ON	17 ON
18 ON	19 ON	20 ON Weekly Evaluation	21 ON	22 OFF @0930 for Holiday & Monthly GW Sampling	23 Left OFF for Monthly GW Sampling	24 Left OFF for Monthly GW Sampling
25 Christmas Left OFF for Monthly GW Sampling	26 Left OFF for Monthly GW Sampling	27 Left OFF for Monthly GW Sampling	28 OFF Monthly GW Sampling ON ~ 1630	29 ON Weekly Evaluation	30 ON	31 ON

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

January 2006						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1 ON	2 ON	3 ON	4 ON	5 ON Weekly Evaluation	6 ON	7 ON
8 ON	9 ON	10 ON	11 ON	12 ON	13 ON Weekly Evaluation	14 ON
15 ON	16 ON	17 ON	18 ON Weekly Evaluation	19 ON	20 ON	21 ON
22 ON	23 OFF @1540 Hose Burst	24 Left OFF for Monthly GW Sampling	25 OFF Monthly GW sampling	26 OFF Monthly GW sampling	27 OFF Install New Hose @ 1205	28 OFF
29 OFF	30 Maintenance& Restarted @ 1045	31 ON				

February 2006						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1 ON	2 ON Weekly Evaluation	3 OFF well cap failure	4 OFF
5 OFF	6 ON @ 1000	7 ON	8 ON Weekly Evaluation	9 ON	10 ON	11 ON Until 1200 hrs, generator failure
12 OFF	13 OFF	14 OFF	15 OFF	16 OFF	17 OFF Generator Repaired Back on 1700	18 ON
19 ON	20 ON	21 Weekly Ev. OFF @1545 Generator Failure	22 ON @ 1500	23 OFF @1400 for Monthly GW Sampling	24 Left OFF for Monthly GW Sampling	25 Left OFF for Monthly GW Sampling
26 Left OFF for Monthly GW Sampling	27 OFF Monthly GW Sampling	28 ON @ 1300 Monthly GW Sampling/ Weekly Eval.				

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

March 2006						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1 ON	2 ON	3 ON	4 ON
5 ON	6 ON	7 ON System Eval. Conducted	8 ON	9 ON	10 ON	11 ON
12 ON	13 ON	14 ON	15 ON	16 ON	17 ON	18 ON
19 ON	20 ON System Eval. Conducted	21 ON	22 Generator outtage reported (1900 hrs)	23 OFF	24 OFF	25 OFF
26 OFF	27 OFF	28 OFF Monthly GW sampling conducted	29 OFF	30 Generator Removed for Repair	31 OFF	

April 2006						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
						1 OFF
2 OFF	3 OFF	4 OFF	5 OFF	6 OFF	7 OFF	8 OFF
9 OFF	10 OFF	11 Generator Returned & Restarted (1600 hrs)	12 ON	13 ON System Evaluation Conducted	14 ON	15 ON
16 ON	17 ON	18 ON	19 ON	20 ON	21 OFF for GW sampling (1600 hrs)	22 OFF
23 OFF	24 OFF 7th GW sampling conducted	25 ON (1000 hrs)	26 ON System Evaluation Conducted	27 ON	28 ON	29 ON
30 ON						

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

May 2006						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1 ON	2 ON	3 ON	4 ON	5 ON	6 ON
7 ON	8 ON	9 ON	10 ON System Evaluation Conducted	11 ON	12 ON	13 ON
14 ON	15 ON	16 ON	17 ON	18 ON	19 ON	20 ON
21 ON	22 ON System Evaluation Conducted	23 System Monitoring. Air sample collected.	24 Turned OFF for GW sampling.	25 OFF GW sampling conducted	26 ON	27 ON
28 ON	29 ON	30 ON	31 ON			

June 2006						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1 ON	2 ON	3 ON
4 ON	5 ON	6 ON	7 ON	8 ON	9 ON System Evaluation Conducted	10 ON
11 ON	12 ON	13 ON	14 ON	15 ON	16 ON	17 ON
18 System Shut down for GW sampling 1800 hrs	19 OFF	20 OFF	21 GW Sampling Conducted	22 ON	23 ON System Evaluation Conducted	24 ON
25 ON	26 ON	27 ON	28 ON	29 ON	30 ON	

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

July 2006						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
						1 ON
2 ON	3 ON	4 ON	5 ON System Evaluation Conducted	6 ON	7 ON	8 ON
9 ON	10 ON	11 ON	12 ON	13 ON	14 ON	15 ON
16 ON	17 ON	18 ON	19 ON	20 ON	21 ON	22 ON
23 System shut down for GW sampling.	24 OFF	25 OFF	26 OFF GW sampling conducted	27 OFF Problem restarting system	28 OFF	29 OFF
30 OFF	31 OFF Solinoid repair required.					

August 2006						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		1 ON Legs 2 & 4 Only	2 ON parts ordered for repair	3 ON Legs 2 & 4 Only	4 ON Legs 2 & 4 Only	5 ON Legs 2 & 4 Only
6 OFF approx. 1/2 day operation. Fuel Issue	7 OFF	8 ON Repairs Made. System Eval.	9 ON	10 ON	11 ON	12 ON
13 ON	14 ON	15 System Eval conducted.	16 ON	17 ON	18 ON	19 ON
20 ON	21 ON	22 ON	23 ON	24 ON	25 ON	26 ON
27	28	29	30	31 System Evaluation Conducted. Off After		

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

September 2006						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1 GW sampling conducted	2 down for rebound evaluation and electrical
3 OFF	4 OFF	5 OFF	6 OFF	7 OFF	8 OFF	9 OFF
10 OFF	11 OFF	12 OFF	13 OFF	14 OFF	15 OFF	16 OFF
17 OFF	18 OFF	19 OFF	20 OFF	21 OFF	22 OFF	23 OFF
24 OFF	25 OFF	26 OFF	27 Annual GW Sampling conducted	28 OFF	29 OFF	30 OFF

October 2006						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1 OFF	2 OFF	3 OFF	4 OFF	5 OFF	6 OFF	7 OFF
8 OFF	9 Off Electrical line install	10 OFF	11 OFF	12 OFF	13 OFF	14 OFF
15 OFF	16 OFF	17 OFF	18 OFF	19 OFF	20 OFF	21 OFF
22 OFF	23 Off Electrical connection	24 Off system check	25 Off Monthly GW Sampling Conducted	26 Off DPT Investigation	27 Off DPT Investigation	28 Off DPT Investigation
29 OFF	30 OFF	31 ON				

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

November 2006						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1 ON Presentation & System Evaluation	2 ON	3 ON	4 ON
5 ON	6 ON	7 ON System Evaluation Conducted	8 ON	9 ON	10 ON	11 ON
12 ON	13 ON	14 ON	15 ON	16 ON	17 ON	18 ON
19 ON	20 ON	21 ON	22 ON	23 ON	24 ON	25 ON
26 ON	27 ON	28 ON	29 OFF Turned off for GW sampling	30 Monthly GW Sampling conducted		

December 2006						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1 ON	2 ON
3 ON	4 ON	5 ON	6 ON System Evaluation Conducted	7 ON	8 ON	9 ON
10 ON	11 ON	12 ON	13 ON	14 ON	15 ON	16 ON
17 ON	18 ON	19 ON	20 ON	21 ON	22 ON	23 ON
24 ON	25 ON	26 ON	27 ON	28 OFF Turned off for GW sampling	29 Monthly GW Sampling conducted	30 ON
31 ON						

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

January 2007						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1 ON	2 ON	3 ON	4 ON	5 ON	6 ON
7 ON	8 ON	9 ON	10 ON	11 ON	12 ON	13 ON
14 ON	15 ON	16 ON	17 ON System Evaluation Conducted	18 ON	19 ON	20 ON
21 ON	22 ON	23 ON	24 ON	25 ON	26 ON	27 ON
28 ON	29 System Off, motor and compressor problem	30 OFF due to unit problems	31 Monthly GW Sampling conducted			

February 2007						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1 Off replacement unit ordered	2 OFF	3 OFF
4 OFF	5 OFF	6 OFF	7 OFF	8 OFF	9 OFF	10 OFF
11 OFF	12 OFF	13 OFF	14 OFF	15 OFF	16 OFF	17 OFF
18 OFF	19 Off - System Expansion	20 Off - System Expansion	21 Off - System Expansion	22 Off - System Expansion	23 Off - System Expansion Completed	24 OFF
25 OFF	26 OFF	27 Monthly GW Sampling conducted	28 OFF			

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

March 2007						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1 OFF	2 OFF	3 OFF
4 OFF	5 OFF	6 OFF	7 OFF	8 ON System Evaluation Conducted	9 ON	10 ON
11 ON	12 ON	13 ON	14 ON	15 ON	16 ON	17 ON
18 ON	19 ON	20 ON	21 ON	22 ON	23 ON	24 ON
25 ON	26 System Evaluation Conducted OFF at 1300	27 OFF Turned off for GW sampling	28 OFF Turned off for GW sampling	29 Monthly GW Sampling conducted	30 ON	31 ON

April 2007						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1 ON	2 ON	3 ON	4 ON	5 ON	6 ON	7 ON
8 ON	9 ON	10 ON	11 ON	12 ON	13 ON System Evaluation Conducted	14 ON
15 ON	16 ON	17 ON	18 ON	19 ON	20 ON	21 ON
22 ON	23 ON	24 ON	25 ON	26 ON	27 ON	28 ON
29 System Evaluation Conducted OFF at 1645	30 OFF Turned off for GW sampling					

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

May 2007						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		1 Monthly GW Sampling conducted	2 ON	3 ON	4 ON	5 ON
6 ON	7 ON	8 ON	9 ON	10 ON	11 ON System Evaluation Conducted	12 ON
13 ON	14 ON	15 ON	16 ON	17 ON	18 ON	19 ON
20 ON	21 ON	22 ON	23 ON	24 ON	25 ON	26 ON
27 ON	28 ON	29 ON	30 OFF Turned off for GW sampling at 1600	31 Monthly GW Sampling conducted		

June 2007						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1 1	2 ON
3 ON	4 ON	5 ON	6 ON	7 ON	8 ON	9 ON
10 ON	11 ON	12 ON	13 ON System Evaluation Conducted	14 ON	15 ON	16 ON
17 ON	18 ON	19 ON	20 ON	21 ON	22 ON	23 ON
24 ON	25 OFF Turned off for GW sampling at 1430	26 OFF Turned off for GW sampling	27 OFF Turned off for GW sampling	28 Monthly GW Sampling conducted	29 ON	30 ON

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

July 2007						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1 ON	2 ON	3 ON	4 ON	5 ON	6 ON	7 OFF 1640 hrs Compressor Failure
8 OFF	9 OFF	10 OFF	11 OFF System identified as off	12 OFF	13 OFF	14 OFF
15 OFF	16 OFF	17 OFF	18 OFF	19 OFF	20 OFF	21 OFF
22 OFF	23 OFF New Unit delivered	24 OFF	25 OFF	26 OFF	27 OFF Motor Failure	28 OFF
29 OFF	30 OFF	31 OFF GW Sampling Effort				

August 2007						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1 OFF GW Sampling Effort	2 OFF	3 OFF Motor Fixed	4 OFF
5 OFF	6 OFF Motor Installed	7 ON System Restart and Evaluation	8 ON NASA Presentation	9 ON	10 ON	11 ON
12 ON	13 ON	14 ON	15 ON	16 ON	17 ON	18 ON
19 ON	20 ON	21 ON	22 ON	23 ON	24 ON	25 ON
26 ON	27 Turned off for GW sampling	28 GW Sampling	29 ON	30 ON	31 ON	

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

September 2007						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
						1 ON
2 ON	3 ON	4 ON	5 ON	6 ON	7 ON	8 ON
9 ON	10 ON	11 ON Installed bleed, five operating.	12 ON System Evaluation Conducted	13 ON	14 ON	15 ON
16 ON	17 ON	18 ON	19 ON	20 ON	21 ON	22 ON
23 ON	24 Turned off for GW sampling (1000 hrs off)	25 OFF to stabilize	26 GW Sampling (1250 hrs turned on)	27 ON	28 ON	29 ON
30 ON						

October 2007						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1 ON	2 ON	3 ON	4 ON	5 ON System Evaluation Conducted	6 ON
7 ON	8 ON	9 ON	10 ON	11 ON System Evaluation Conducted	12 ON	13 ON
14 ON	15 ON	16 ON	17 ON	18 ON	19 ON	20 ON
21 ON	22 ON	23 ON	24 ON	25 ON	26 ON System Evaluation and Elec Reading	27 ON
28 ON	29 ON	30 ON	31 ON			

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

November 2007						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1 OFF @ 0900 (pressure failure)	2 OFF	3 OFF
4 OFF	5 OFF	6 OFF	7 OFF	8 OFF	9 OFF	10 OFF
11 OFF	12 ON System Evaluation Conducted	13 ON System Evaluation Continued	14 ON	15 ON	16 ON	17 ON
18 ON	19 ON	20 ON	21 ON	22 ON	23 ON	24 ON
25 ON	26 OFF for GW sampling	27 OFF	28 GW / Air Sampling Conducted	29 ON System Evaluation Continued	30 ON	

December 2007						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
						1 ON
2 ON	3 ON	4 ON	5 ON	6 ON	7 ON	8 ON
9 ON	10 ON	11 ON	12 ON	13 ON System Evaluation Conducted	14 ON	15 ON
16 ON	17 ON	18 ON	19 ON	20 ON	21 ON	22 ON
23 ON	24 ON	25 ON	26 ON	27 ON	28 ON	29 ON
30 ON	31 ON System Evaluation Conducted					

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

January 2008						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		1 ON	2 ON	3 ON	4 ON	5 ON
6 ON	7 ON	8 ON	9 ON	10 ON	11 ON	12 ON
13 ON	14 ON	15 ON	16 ON	17 ON System Evaluation Conducted	18 ON	19 ON
20 ON	21 ON	22 ON	23 ON	24 ON	25 ON	26 ON
27 ON	28 System eval then OFF for GW sampling	29 OFF	30 OFF	31 GW / Air Sampling Conducted		

February 2008						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1 ON	1 ON	2 ON
3 ON	4 ON	5 ON	6 ON	7 ON	8 ON	9 ON
10 ON	11 OFF Power Outtage	12 OFF	13 ON (approx. 4 PM)	14 ON	15 ON System Evaluation Conducted	16 ON
17 ON	18 ON	19 ON	20 ON	21 ON	22 ON	23 ON
24 ON	25 ON	26 ON	27 ON	28 ON System Evaluation Conducted	29 ON	

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

March 2008						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
						1 ON
2 ON	3 ON	4 ON	5 ON	6 ON	7 ON	8 ON
9 ON	10 ON	11 ON	12 ON	13 ON	14 ON System Evaluation Conducted	15 ON
16 ON	17 ON	18 ON	19 ON	20 ON	21 ON	22 ON
23 ON	24 ON Air Sampling Conducted	25 System eval then OFF for GW sampling	26 OFF for GW sampling	27 GW Sampling Conducted	28 ON	29
30 ON	31 ON					

April 2008						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		1 ON	2 ON	3 ON	4 ON	5 ON
6 ON	7 ON	8 ON	9 ON	10 ON	11 ON	12 ON
13 ON	14 ON	15 ON	16 ON	17 ON System Evaluation Conducted	18 ON	19 ON
20 ON	21 ON	22 ON	23 ON	24 ON	25 ON	26 ON
27 ON	28 ON	29 ON System Evaluation Conducted	30 ON			

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

May 2008						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1 ON	2 ON	3 ON
4 ON	5 ON	6 ON	7 ON	8 ON	9 ON	10 ON
11 ON	12 ON System Evaluation Conducted	13 OFF System Timer Programs Altered	14 ON System Evaluation Conducted	15 ON	16 ON	17 ON
18 ON	19 ON	20 ON	21 ON	22 ON	23 ON	24 ON
25 ON	26 ON	27 System eval / Air Sampling then OFF for GW sampling	28 GW Sampling Conducted	30 ON	30 ON	31 ON

June 2008						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1 ON	2 ON	3 ON	4 ON	5 ON	6 ON	7 ON
8 ON	9 ON	10 ON System Evaluation Conducted	11 ON	12 ON	13 ON	14 ON
15 ON	16 ON	17 ON	18 ON	19 ON	20 ON	21 ON
22 ON	23 ON	24 ON	25 ON	26 ON	27 ON	28 ON
29 ON	30 ON					

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

July 2008						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		1 ON System Evaluation Conducted	2 ON	3 ON	4 ON	5 ON
6 ON	7 ON	8 ON	9 ON	10 ON	11 ON	12 ON
13 ON	14 ON System Evaluation Conducted	15 ON	16 ON	17 ON	18 ON	19 ON
20 ON	21 ON	22 ON	23 ON	24 ON	25 OFF for GW Sampling	26 OFF for GW Sampling
27 OFF for GW Sampling	28 OFF for GW Sampling	29 OFF GW and Air Sampling Conducted	30 ON System Evaluation Conducted / OFF Hose Failure Late in day	31 OFF		

August 2008						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1 OFF	2 OFF
3 OFF	4 ON Hose Failure Repaired	5 ON	6 ON	7 ON	8 ON	9 ON
10 ON	11 ON	12 ON	13 ON	14 ON	15 ON	16 ON
17 ON	18 ON	19 System Evaluation Conducted, then OFF for Storm	20 OFF for Storm	21 OFF for Storm	22 System Turned Back ON	23 ON
24 ON	25 ON	26 ON	27 ON	28 ON System Evaluation Conducted	29 ON	30 ON
31 ON						

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

September 2008						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1 ON	2 ON	3 ON	4 OFF Restarted after 1 hour	5 ON	6 ON
7 ON	8 OFF System overheated	9 OFF	10 ON System Evaluation Conducted / Overheating issue fixed	11 ON	12 ON	13 ON
14 ON	15 ON	16 ON	17 ON	18 ON	19 ON	20 ON
21 ON	22 ON System Evaluation / Air Sampling Conducted	23 OFF for GW Sampling	24 OFF for GW Sampling	25 GW Sampling Conducted	26 ON	27 ON
28 ON	29 ON	30 ON				

October 2008						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1	2 ON	3 ON	4 ON
5 ON	6 ON	7 ON System Evaluation Conducted	8 ON	9 ON	10 ON	11 ON
12 ON	13 ON	14 ON	15 ON	16 ON	17 ON	18 ON
19 ON	20 ON	21 ON System Evaluation Conducted/ System Taken Off-line	22 OFF	23 OFF	24 OFF	25 OFF
26 OFF	27 OFF	28 OFF	29 OFF	30	31	

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

November 2008						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
						1 OFF
2 OFF	3 OFF	4 OFF	5 OFF	6 OFF	7 OFF	8 OFF
9 OFF	10 OFF	11 OFF	12 OFF	13 OFF	14 OFF	15 OFF
16 OFF	17 OFF	18 OFF	19 OFF	20 OFF	21 OFF	22 OFF
23 OFF	24 OFF GW Sampling Conducted	25 OFF System Evaluation Conducted	26 OFF	27 OFF	28 OFF	29 OFF
30 OFF						

December 2008						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1 OFF	2 OFF	3 OFF	4 OFF	5 OFF	6 OFF
7 OFF	8 OFF	9 OFF	10 OFF	11 OFF	12 OFF	13 OFF
14 OFF	15 OFF	16 OFF	17 OFF	18 OFF	19 OFF	20 OFF
21 OFF	22 OFF	23 OFF	24 OFF	25 OFF	26 OFF	27 OFF
28 OFF	29 OFF System Evaluation Conducted	30 OFF	31 OFF			

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

January 2009						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1 OFF	2 OFF	3 OFF
4 OFF	5 OFF	6 OFF	7 OFF	8 OFF	9 OFF	10 OFF
11 OFF	12 OFF	13 OFF	14 OFF	15 OFF	16 OFF	17 OFF
18 OFF	19 OFF	20 OFF	21 OFF	22 OFF	23 OFF	24 OFF
25 OFF	26 OFF	27 OFF	28 OFF	29 OFF	30 OFF GW Sampling Conducted	31 OFF

February 2009						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1 OFF	2 OFF	3 OFF	4 OFF	5 OFF System Evaluation Conducted	6 OFF	7 OFF
8 OFF	9 OFF	10 OFF	11 OFF	12 OFF	13 OFF	14 OFF
15 OFF	16 OFF	17 OFF	18 OFF	19 OFF	20 OFF	21 OFF
22 OFF	23 OFF	24 OFF	25 OFF	26 OFF	27 OFF System Evaluation Conducted	28 OFF

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

March 2009						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1 OFF	2 OFF	3 OFF	4 OFF	5 OFF	6 OFF	7 OFF
8 OFF	9 OFF	10 OFF	11 OFF	12 OFF	13 OFF	14 OFF
15 OFF	16 OFF	17 OFF	18 OFF	19 OFF	20 OFF	21 OFF
22 OFF	23 OFF	24 OFF	25 OFF	26 OFF	27 OFF	28 OFF
29 OFF	30 OFF	31 OFF System Evaluation Conducted				

April 2009						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1 OFF GW Sampling Conducted	2 OFF	3 OFF	4 OFF
5 OFF	6 OFF	7 OFF	8 OFF	9 OFF	10 OFF	11 OFF
12 OFF	13 OFF	14 OFF	15 OFF	16 OFF	17 OFF	18 OFF
19 OFF	20 OFF	21 OFF	22 OFF	23 OFF	24 OFF	25 OFF
26 OFF	27 OFF	28 OFF System Evaluation Conducted	29 OFF	30 OFF		

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

May 2009						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1 OFF	2 OFF
3 OFF	4 OFF	5 OFF	6 OFF	7 OFF	8 OFF	9 OFF
10 OFF	11 OFF	12 OFF	13 OFF	14 OFF	15 OFF	16 OFF
17 OFF	18 OFF	19 OFF	20 OFF	21 OFF	22 OFF	23 OFF
24 OFF	25 OFF	26 OFF GW Sampling Conducted	27 OFF	28 OFF	29 OFF	30 OFF
31 OFF						

June 2009						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1 OFF	2 OFF	3 OFF	4 OFF	5 OFF	6 OFF
7 OFF	8 OFF	9 OFF	10 System turned ON	11 ON System Evaluation Conducted	12 ON	13 ON
14 ON	15 ON	16 ON	17 ON	18 ON	19 ON	20 ON
21 ON	22 ON	23 ON	24 ON	25 ON	26 ON	27 ON
28 ON	29 System eval then OFF for GW sampling	30 OFF for GW sampling				

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

July 2009						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1 Air / GW Sampling Conducted	2 ON	3 ON	4 ON
5 ON	6 ON	7 ON	8 ON	9 ON	10 ON	11 ON
12 ON	13 ON System Evaluation Conducted	14 OFF Compressor Failure	15 OFF for Repairs	16 OFF for Repairs	17 OFF for Repairs	18 OFF for Repairs
19 OFF for Repairs	20 OFF for Repairs	21 OFF for Repairs	22 OFF for Repairs	23 OFF for Repairs	24 OFF for Repairs	25 OFF for Repairs
26 OFF for Repairs	27 OFF for Repairs	28 OFF for Repairs	29 OFF GW Sampling Conducted	30 OFF	31 OFF	

August 2009						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
						1 OFF
2 OFF	3 OFF	4 OFF	5 OFF	6 OFF	7 OFF	8 OFF
9 OFF	10 OFF	11 OFF	12 OFF	13 OFF	14 OFF	15 OFF
16 OFF	17 OFF	18 OFF	19 OFF	20 OFF	21 OFF	22 OFF
23 OFF	24 OFF	25 OFF	26 OFF	27 OFF	28 OFF	29 OFF
30 OFF						

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

September 2009						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		1 OFF	2 OFF	3 OFF	4 OFF	5 OFF
6 OFF	7 OFF	8 OFF	9 OFF	10 OFF	11 OFF	12 OFF
13 OFF	14 OFF	15 OFF	16 OFF	17 OFF	18 OFF	19 OFF
20 OFF	21 OFF	22 OFF	23 OFF	24 OFF GW Sampling Conducted	25 OFF GW Sampling Conducted	26 OFF
27 OFF	28 OFF	29 OFF	30 OFF	31 OFF		

October 2009						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1 OFF	2 OFF	3 OFF
4 OFF	5 OFF	6 OFF	7 OFF	8 OFF	9 OFF	10 OFF
11 OFF	12 OFF	13 OFF	14 OFF	15 OFF	16 OFF	17 OFF
18 OFF	19 OFF	20 OFF	21 OFF	22 OFF	23 OFF	24 OFF
25 OFF	26 OFF	27 OFF GW Sampling Conducted	28 OFF	29 System Turned ON / Air Sampling and System Evaluation Conducted	30 ON	31 ON

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

November 2009						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1 ON	2 ON	3 ON	4 ON	5 ON	6 ON	7 ON
8 ON	9 ON	10 ON	11 ON	12 ON	13 ON System Evaluation Conducted	14 ON
15 ON	16 ON	17 ON	18 ON	19 ON	20 ON	21 ON
22 ON	23 System eval then OFF for GW sampling	24 OFF Air / GW Sampling Conducted	25 ON	26 ON	27 ON	28 ON
29 ON	30 ON					

December 2009						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		1 ON	2 ON	3 ON	4 ON	5 ON
6 ON	7 ON	8 ON	9 ON	10 ON	11 ON	12 ON
13 ON	14 ON	15 ON	16 ON	17 ON System Evaluation Conducted	18 ON	19 ON
20 ON	21 ON	22 ON	23 ON	24 ON	25 ON	26 ON
27 ON	28 System eval then OFF for GW sampling	29 OFF Air / GW Sampling Conducted	30 ON Solenoid Failure Legs 1 and 3 Operational	31 ON Legs 1 and 3 Operation		

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

January 2010						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1 ON Legs 1 and 3 Operation	2 ON Legs 1 and 3 Operation
3 ON Legs 1 and 3 Operation	4 ON Legs 1 and 3 Operation	5 ON Legs 1 and 3 Operation	6 ON Legs 1 and 3 Operation	7 ON Legs 1 and 3 Operation	8 ON Legs 1 and 3 Operation	9 ON Legs 1 and 3 Operation
10 ON Legs 1 and 3 Operation	11 ON Legs 1 and 3 Operation	12 ON Legs 1 and 3 Operation	13 ON Legs 1 and 3 Repaired / All Legs Operational	14 ON	15 ON	16 ON
17 ON	18 ON	19 ON System Evaluation Conducted	20 ON	21 ON	22 ON	23 ON
24 ON	25 ON	26 ON	27 System eval then OFF for GW sampling	28 OFF GW Sampling Conducted	29 ON	30 ON
31 ON						

February 2010						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1 ON	2 ON	3 ON	4 ON	5 ON	6 ON
7 ON	8 ON	9 ON	10 ON Air Sampling Conducted	11 ON	12 ON	13 ON
14 ON	15 ON	16 ON	17 ON	18 ON System Evaluation Conducted	19 ON	20 ON
21 ON	22 ON	23 System eval then OFF for GW sampling	24 OFF GW Sampling Conducted	25 ON Air Sampling Conducted	26 ON	27 ON
28 ON						

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

March 2010						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1 ON	2 ON	3 ON	4 ON	5 ON	6 ON
7 ON	8 ON	9 ON	10 ON	11 ON	12 ON	13 ON
14 ON	15 ON	16 ON	17 ON System Evaluation Conducted/ System Taken Off-line	18 OFF	19 OFF	20 OFF
21 OFF	22 OFF	23 OFF	24 OFF	25 OFF	26 OFF	27 OFF
28 OFF	29 OFF	30 OFF	31 OFF GW Sampling Conducted			

April 2010						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1 OFF	2 OFF	3 OFF
4 OFF	5 OFF	6 OFF	7 OFF	8 OFF	9 OFF	10 OFF
11 OFF	12 OFF	13 OFF	14 OFF	15 OFF	16 OFF	17 OFF
18 OFF	19 OFF	20 OFF	21 OFF	22 OFF	23 OFF	24 OFF
25 OFF	26 OFF	27 OFF	28 OFF	29 OFF	30 OFF	

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

May 2010						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
						1 OFF
2 OFF	3 OFF	4 OFF	5 OFF	6 OFF	7 OFF	8 OFF
9 OFF	10 OFF	11 OFF	12 OFF	13 OFF	14 OFF	15 OFF
16 OFF	17 OFF	18 OFF	19 OFF	20 OFF	21 OFF	22 OFF
23 OFF	24 OFF	25 OFF	26 OFF	27 OFF GW Sampling Conducted	28 OFF	29 OFF
30 OFF	31 OFF					

June 2010						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		1 OFF	2 OFF	3 OFF	4 OFF	5 OFF
6 OFF	7 OFF	8 OFF	9 OFF	10 OFF	11 OFF	12 OFF
13 OFF	14 OFF	15 OFF	16 OFF	17 OFF	18 OFF	19 OFF
20 OFF	21 OFF	22 OFF	23 OFF	24 OFF	25 OFF	26 OFF
27 OFF	28 OFF	29 OFF	30 OFF			

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

July 2010						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1 OFF	2 OFF	3 OFF
4 OFF	5 OFF	6 OFF	7 OFF	8 OFF	9 OFF	10 OFF
11 OFF	12 OFF	13 OFF	14 OFF	15 OFF	16 OFF	17 OFF
18 OFF	19 OFF	20 OFF	21 OFF	22 OFF	23 OFF	24 OFF
25 OFF	26 OFF	27 OFF GW Sampling Conducted	28 OFF	29 OFF	30 OFF	31 OFF

August 2010						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1 OFF	2 OFF	3 OFF	4 OFF	5 OFF	6 OFF	7 OFF
8 OFF	9 OFF	10 OFF	11 OFF	12 OFF	13 OFF	14 OFF
15 OFF	16 System Turned ON	17 ON	18 ON	19 ON	20 ON	21 ON
22 ON	23 ON	24 ON	25 ON	26 ON	27 OFF Air Sampling Conducted/ Compressor Failure	28 OFF for Repairs
29 OFF for Repairs	30 OFF for Repairs	31 OFF GW Sampling Conducted				

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

September 2010						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1 OFF for Repairs	2 OFF for Repairs	3 OFF for Repairs	4 OFF for Repairs
5 OFF for Repairs	6 OFF for Repairs	7 OFF for Repairs	8 OFF for Repairs	9 OFF for Repairs	10 OFF for Repairs	11 OFF for Repairs
12 OFF for Repairs	13 OFF for Repairs	14 OFF for Repairs	15 OFF for Repairs	16 OFF for Repairs	17 OFF for Repairs	18 OFF for Repairs
19 OFF for Repairs	20 OFF for Repairs	21 OFF for Repairs	22 OFF for Repairs	23 OFF GW Sampling Conducted	24 OFF for Repairs	25 OFF for Repairs
26 OFF for Repairs	27 OFF for Repairs	28 OFF for Repairs	29 OFF for Repairs	30 OFF for Repairs		

October 2010						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1 OFF	2 OFF
3 OFF	4 OFF	5 OFF	6 OFF	7 OFF	8 OFF	9 OFF
10 OFF	11 OFF	12 OFF	13 OFF	14 OFF	15 OFF	16 OFF
17 OFF	18 OFF	19 OFF	20 OFF	21 OFF	22 OFF	23 OFF
24 OFF	25 OFF	26 OFF	27 OFF	28 OFF	29 OFF	30 OFF
31 OFF						

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

November 2010						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1 OFF	2 OFF	3 OFF	4 OFF	5 OFF	6 OFF
7 OFF	8 OFF	9 OFF	10 OFF	11 OFF	12 OFF	13 OFF
14 OFF	15 OFF	16 OFF	17 OFF	18 OFF	19 OFF	20 OFF
21 OFF	22 OFF	23 OFF	24 OFF	25 OFF	26 OFF	27 OFF
28 OFF	29 OFF	30 OFF				

December 2010						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1 OFF	2 OFF	3 OFF	4 OFF
5 OFF	6 OFF	7 OFF	8 OFF	9 OFF	10 OFF	11 OFF
12 OFF	13 OFF	14 OFF	15 OFF	16 OFF	17 OFF	18 OFF
19 OFF	20 OFF	21 OFF	22 OFF	23 OFF	24 OFF	25 OFF
26 OFF	27 OFF	28 OFF	29 OFF GW Sampling Conducted	30 OFF	31 OFF	

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

January 2011						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
						1 OFF
2 OFF	3 OFF	4 OFF	5 OFF	6 OFF	7 OFF	8 OFF
9 OFF	10 OFF	11 OFF	12 OFF	13 OFF	14 OFF	15 OFF
16 OFF	17 OFF	18 OFF	19 OFF	20 OFF	21 OFF	22 OFF
23 OFF	24 OFF	25 OFF	26 OFF	27 OFF	28 OFF	29 OFF
30 OFF	31 OFF					

February 2011						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		1 OFF	2 OFF	3 OFF	4 OFF	5 OFF
6 OFF	7 OFF	8 OFF	9 OFF	10 OFF	11 OFF	12 OFF
13 OFF	14 OFF	15 OFF	16 OFF	17 OFF	18 OFF	19 OFF
20 OFF	21 OFF	22 OFF	23 OFF	24 OFF	25 OFF	26 OFF
27 OFF	28 OFF					

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

March 2011						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		1 OFF	2 OFF	3 OFF	4 OFF	5 OFF
6 OFF	7 OFF	8 OFF	9 OFF	10 OFF	11 OFF	12 OFF
13 OFF	14 OFF	15 OFF	16 OFF	17 OFF	18 OFF	19 OFF
20 OFF	21 OFF	22 OFF	23 OFF	24 OFF	25 OFF GW Sampling Conducted	26 OFF
27 OFF	28 OFF	29 OFF	30 OFF	31 OFF		

April 2011						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1 OFF	2 OFF
3 OFF	4 OFF	5 OFF	6 OFF	7 OFF	8 OFF	9 OFF
10 OFF	11 OFF	12 OFF	13 OFF	14 OFF	15 OFF	16 OFF
17 OFF	18 OFF	19 OFF	20 OFF	21 OFF	22 OFF	23 OFF
24 OFF	25 OFF	26 OFF	27 OFF	28 OFF	29 OFF	30 OFF

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

May 2011						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1 OFF	2 OFF	3 OFF	4 OFF	5 OFF	6 OFF	7 OFF
8 OFF	9 OFF	10 OFF	11 OFF	12 OFF	13 OFF	14 OFF
15 OFF	16 OFF	17 OFF	18 OFF	19 OFF	20 OFF	21 OFF
22 OFF	23 OFF	24 OFF	25 OFF	26 OFF	27 OFF	28 OFF
29 OFF	30 OFF	31 OFF				

June 2011						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1 OFF	2 OFF	3 OFF	4 OFF
5 OFF	6 OFF	7 OFF	8 OFF	9 OFF	10 OFF	11 OFF
12 OFF	13 OFF	14 OFF	15 OFF	16 OFF	17 OFF	18 OFF
19 OFF	20 OFF	21 OFF Mowing and Site Maintenance	22 OFF GW Sampling Conducted	23 OFF	24 OFF	25 OFF
26 OFF	27 OFF	28 OFF	29 OFF	30 OFF		

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

July 2011						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1 OFF	1 OFF	2 OFF
3 OFF	4 OFF	5 OFF	6 OFF	7 OFF	8 OFF	9 OFF
10 OFF	11 OFF	12 OFF	13 OFF	14 OFF	15 OFF	16 OFF
17 OFF	18 OFF	19 OFF	20 OFF	21 OFF	22 OFF	23 OFF
24 OFF	25 OFF	26 OFF	27 OFF	28 OFF	29 OFF	30 OFF
31 OFF						

August 2011						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1 OFF	2 OFF	3 OFF	4 OFF	5 OFF	6 OFF
7 OFF	8 OFF	9 OFF	10 OFF	11 OFF	12 OFF	13 OFF
14 OFF	15 OFF	16 OFF	17 OFF	18 OFF	19 OFF	20 OFF
21 OFF	22 OFF	23 OFF	24 OFF	25 OFF	26 OFF	27 OFF
28 OFF	29 OFF	30 OFF	31 OFF			

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

September 2011						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1 OFF	2 OFF	3 OFF
4 OFF	5 OFF	6 OFF	7 OFF	8 OFF	9 OFF	10 OFF
11 OFF	12 OFF	13 OFF	14 OFF	15 OFF GW Sampling Conducted	16 OFF	17 OFF
18 OFF	19 OFF	20 OFF	21 OFF	22 OFF	23 OFF	24 OFF
25 OFF	26 OFF	27 OFF	28 OFF	29 OFF	30 OFF	

October 2011						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
						1 OFF
2 OFF	3 OFF	4 OFF	5 OFF	6 OFF	7 OFF	8 OFF
9 OFF	10 OFF	11 OFF	12 OFF	13 OFF	14 OFF	15 OFF
16 OFF	17 OFF	18 OFF	19 OFF	20 OFF	21 OFF	22 OFF
23 OFF	24 OFF	25 OFF	26 OFF	27	28	29
30 OFF	31 OFF					

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

November 2011						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		1 OFF	2 OFF	3 OFF	4 OFF	5 OFF
6 OFF	7 OFF	8 OFF	9 OFF	10 OFF	11 OFF	12 OFF
13 OFF	14 OFF	15 OFF	16 OFF	17 OFF	18 OFF	19 OFF
20 OFF	21 OFF	22 OFF	23 OFF	24 OFF	25 OFF	26 OFF
27 OFF	28 OFF	29 OFF	30 OFF			

December 2011						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1 OFF	2 OFF	3 OFF
4 OFF	5 OFF	6 OFF	7 OFF	8 OFF	9 OFF	10 OFF
11 OFF	12 OFF	13 OFF	14 OFF	15 OFF	16 OFF	17 OFF
18 OFF	19 OFF	20 OFF	21 OFF	22 OFF	23 OFF	24 OFF
25 OFF	26 OFF	27 OFF	28 OFF	29 OFF	30 OFF	31 OFF

Green shading identifies that the system is operational.
Peach shading identifies that the system is not operational.

~ January 2012 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 See Notes for 2011 activities.	**2**	**3**	**4**	**5**	**6**	**7**
8	**9**	**10**	**11**	**12**	**13**	**14**
15	**16**	**17**	**18**	**19**	**20**	**21**
22	**23**	**24**	**25**	**26**	**27**	**28**
29	**30** POP Extension - Mod 3. Received RFP for TD-02 for system expansion.	**31**	Notes: 2011 Milestones: October 2011 HMF Presentation - proposed system expansion to address residual contamination. November 2011 - Team agreement on what the system expansion should look like. December 16, 2011 - quarterly sampling verified contamination still exists in MW-04I. Waiting for 2012 funding to become available to move forward.			

~ February 2012 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23 Submitted TD-02 Proposal to NASA	24	25
26	27	28	29	Notes:		

~ March 2012 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15 TD-02 Funding obtained for trailer modification and system expansion and operation. Modification #4.	16	17
18	19	20	21	22	23 Submitted Site Plan Request files for HMF system expansion.	24
25	26 Began preparation of HASP addendum for system expansion.	27	28	29 Source well sampling (Initially planned as baseline sampling event) All wells below GCTL.	30 Three previous quarters above GCTL. Moving forward with trailer relocation while discussing path forward.	31

~ April 2012 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
8	9	10	11	12 Status update e-mail: Procure electric sub. Resample after rain event. Procure driller but keep on hold. Submit HASP.	13	14
15	16	17	18	19	20	21
22	23	24	25 Power outage for trailer disconnection at FDTL. Electric disconnected from trailer.	26 Some rain; discussed resampling of MW-04I and relocation of trailer.	27	28
29	30	Notes:				

~ May 2012 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3 Relocation of trailer from FDTL to HMF. Site and trailer cleaning and maintenance.	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29 HASP Rev 2 for HMF expansion and ongoing efforts. Final SSSP approved by KSC.	30	31	Notes:	

~ June 2012 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 Site Plan approved for HMF system expansion. HASP posted to RIS	**2**
3	**4** Still very dry; decision to sample toward end of month with hope of rain.	**5**	**6**	**7**	**8**	**9**
10	**11**	**12**	**13**	**14**	**15**	**16**
17	**18**	**19**	**20**	**21** Quarterly source area well sampling (new baseline). MW-04I rebound above GCTL.	**22**	**23**
24	**25**	**26**	**27**	**28**	**29**	**30**

~ July 2012 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
8	9	10	11 June results obtained. Direction to proceed with system expansion and connections.	12	13	14
15	16	17	18	19	20 Procured driller for new AS system well installation.	21
22	23	24	25	26	27	28
29	30	31 Set up well installation for 8/22/12. Utility clearance and well screen procurement. Dig permit. Test bores oversight.	Notes:			

~ August 2012 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22 Soil borings and well installation activities.	23 Well installation completed.	24	25
26	27	28	29	30 New electric contract for system connection. Began new well system connections.	31	Notes:

~ September 2012 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19 System connection completed. Resolving transformer delivery issue.	20	21	22
23	24	25	26	27	28	29
30	Notes: No quarterly sampling conducted in September. Next sampling effort after system startup. Using June 21, 2012, effort as baseline.					

~ October 2012 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	**2**	**3** Leaky IDW drum identified.	**4**	**5**	**6**
7	**8**	**9**	**10**	**11** Transformer installation and electrical connection completed.	**12**	**13**
14	**15** System startup attempted. Issue with control panel turning off system. Talking with vendor to resolve issues.	**16** Testing	**17** Testing	**18** Testing	**19** Testing	**20** OFF
21 OFF	**22** Testing Testing indicating problem with using existing trailer compressor for deep wells.	**23** Testing	**24** Testing	**25** Testing	**26** Testing System still not fully operational - only periodical operation.	**27** OFF
28 OFF	**29** Testing Trailer control panel bypassed and ordered new key pad. System turned on. Intermediate wells and two new wells operational.	**30** ON **System Operational** Deep wells off line. Initial system evaluation.	**31** ON	Notes:		

~ November 2012 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1 ON Ordered compressor for deep well operation.	2 ON	3 ON
4 ON	5 ON	6 ON	7 ON	8 ON MW-01I blew cap and resulted in water spurting in air. Cap replaced. System evaluation	9 ON	10 ON
11 ON	12 ON	13 ON Install secondary compressor (portable compressor) inside trailer to operate deep wells.	14 ON Three legs operational. See notes box. **Full operation**	15 ON	16 ON	17 ON
18 ON	19 ON	20 ON Sampled NLP-IW4I; result less than GCTL System evaluation	21 ON	22 ON	23 ON	24 ON
25 ON	26 ON	27 ON	28 ON	29 ON System evaluation Wells adjusted to maximize flow to each well. Water level in pond elevated; water bubbling.	30 ON	Notes:

~ December 2012 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 ON
2 ON	3 ON	4 ON System evaluation	5 ON	6 ON	7 ON System evaluation	8 ON
9 ON	10 ON	11 ON System evaluation	12 ON Installed replacement key pad touch screen.	13 ON System evaluation	14 ON	15 ON
16 ON	17 ON	18 ON System evaluation	19 ON Bubbling in MW01I so turned off ASW-37 near this MW.	20 ON System evaluation	21 ON	22 ON
23 ON	24 ON	25 ON CHRISTMAS	26 OFF System turned off prior to sampling of four source area wells.	27 OFF System turned back on after sampling effort completed.	28 ON	29 ON
30 ON System evaluation	31 ON	Notes:				

~ January 2013 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 ON	2 ON System evaluation	3 ON	4 ON	5 ON
6 ON	7 ON	8 ON System evaluation	9 ON	10 ON	11 ON System evaluation	12 ON
13 ON	14 ON	15 ON System evaluation Shallow and Intermediate wells revised to cycle on 2 hrs ON and 4 hours OFF.	16 ON	17 ON	18 ON System evaluation	19 ON
20 ON	21 ON System evaluation	22 ON	23 ON	24 ON	25 ON	26 ON
27 ON	28 ON	29 ON	30 ON Electric meter reading	31 ON System evaluation Presentation on HMF system to KSC remediation team.	Notes: Running ASW-11 only to maximize CFM to deep well for couple days and then switching to running just ASW -40 for couple days and then both (ASW-11 and ASW-40) for few days and keep rotating.	

~ February 2013 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 ON	2 ON
3 ON	4 ON	5 ON	6 ON	7 ON System evaluation	8 ON	9 ON
10 ON	11 ON	12 ON	13 ON	14 ON	15 ON System evaluation	16
17 ON	18 ON	19 ON	20 ON System evaluation	21 ON	22 ON Installed valve for ASW11/ASW40. Turned off ASW40. Turned on ASW37 to address increase at IW1S.	23 ON
24 ON	25 ON	26 ON System evaluation	27 ON	28 ON Electric meter reading	Notes: Starting 2/22/13, running ASW-11 only to maximize CFM to deep well for couple days and then switching to running just ASW -40 for couple days and then both (ASW-11 and ASW-40) for few days and keep rotating.	

~ March 2013 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 ON	2 ON
3 ON	4 ON	5 ON System evaluation ASW11 off/ASW40 on.	6 ON	7 ON	8 ON	9 ON
10 ON	11 ON	12 ON System evaluation AWS40 off/ASW11 on.	13 ON	14 ON	15 ON	16 ON
17 ON	18 ON	19 ON	20 ON System evaluation	21 ON	22 ON	23 ON
24 ON	25 OFF System turned off and to remain off unless otherwise directed.	26 OFF	27 OFF Source area monitoring well sampling effort. Result obtained 4/15/13.	28 OFF Electric meter reading	29 OFF	30 OFF
31 OFF	Notes: Analytical results from March sampling event all below the GCTL. System to remain off and quarterly source area groundwater monitoring conducted.					

~ April 2013 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 OFF	2 OFF	3 OFF	4 OFF	5 OFF	6 OFF
7 OFF	8 OFF	9 OFF	10 OFF	11 OFF	12 OFF	13 OFF
14 OFF	15 OFF March results obtained. All results below GCTL. System to remain OFF	16 OFF	17 OFF	18 OFF	19 OFF	20 OFF
21 OFF	22 OFF	23 OFF	24 OFF	25 OFF	26 OFF	27 OFF
28 OFF	29 OFF	30 OFF	Notes:			

~ May 2013 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1 OFF	2 OFF	3 OFF	4 OFF
5 OFF	6 OFF	7 OFF	8 OFF	9 OFF	10 OFF	11 OFF
12 OFF	13 OFF	14 OFF	15 OFF	16 OFF	17 OFF	18 OFF
19 OFF	20 OFF	21 OFF	22 OFF	23 OFF	24 OFF	25 OFF
26 OFF	27 OFF	28 OFF	29 OFF	30 OFF	31 OFF	Notes:

~ June 2013 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 OFF
2 OFF	3 OFF	4 OFF	5 OFF	6 OFF	7 OFF	8 OFF
9 OFF	10 OFF	11 OFF	12 OFF	13 OFF	14 OFF	15 OFF
16 OFF	17 OFF	18 OFF	19 OFF	20 OFF	21 OFF	22 OFF
23 OFF	24 OFF	25 OFF	26 OFF	27 OFF Source Area monitoring well sampling effort. Result obtained 7/15/13. All below GCTL	28 OFF	29 OFF
30 OFF	Notes:					

~ July 2013 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 OFF	2 OFF	3 OFF	4 OFF	5 OFF	6 OFF
7 OFF	8 OFF	9 OFF	10 OFF	11 OFF	12 OFF	13 OFF
14 OFF	15 OFF GW results obtained. All below GCTL. System to remain OFF.	16 OFF	17 OFF	18 OFF	19 OFF	20 OFF
21 OFF	22 OFF	23 OFF	24 OFF	25 OFF	26 OFF	27 OFF
28 OFF	29 OFF	30 OFF	31 OFF	Notes:		

~ August 2013 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1 OFF	2 OFF	3 OFF
4 OFF	5 OFF	6 OFF	7 OFF	8 OFF	9 OFF	10 OFF
11 OFF	12 OFF	13 OFF	14 OFF	15 OFF	16 OFF	17 OFF
18 OFF	19 OFF	20 OFF	21 OFF	22 OFF	23 OFF	24 OFF
25 OFF	26 OFF	27 OFF	28 OFF	29 OFF	30 OFF	31 OFF

~ September 2013 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 OFF	2 OFF	3 OFF	4 OFF	5 OFF	6 OFF	7 OFF
8 OFF	9 OFF	10 OFF	11 OFF	12 OFF	13 OFF	14 OFF
15 OFF	16 OFF	17 OFF	18 OFF	19 OFF	20 OFF	21 OFF
22 OFF	23 OFF	24 OFF	25 OFF	26 OFF Groundwater sampling conducted. Source and perimeter wells sampled.	27 OFF	28 OFF
29 OFF	30 OFF	Notes:				

~ October 2013 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 OFF	2 OFF	3 OFF	4 OFF	5 OFF
6 OFF	7 OFF	8 OFF	9 OFF	10 OFF	11 OFF	12 OFF
13 OFF	14 OFF September GW results obtained. IW4I had rebound above GCTL. All other wells below GCTL.	15 OFF	16 OFF	17 OFF	18 OFF Decision made to keep system off to see what concentration in HMF-4I does.	19 OFF
20 OFF	21 OFF	22 OFF	23 OFF	24 OFF	25 OFF Submitted the Year 7 and System Modification Report to DEP.	26 OFF
27 OFF	28 OFF	29 OFF	30 OFF	31 OFF	Notes:	

~ November 2013 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 OFF	2 OFF
3 OFF	4 OFF	5 OFF	6 OFF	7 OFF	8 OFF	9 OFF
10 OFF	11 OFF	12 OFF	13 OFF	14 OFF	15 OFF	16 OFF
17 OFF	18 OFF	19 OFF	20 OFF	21 OFF	22 OFF	23 OFF
24 OFF	25 OFF	26 OFF	27 OFF	28 OFF	29 OFF	30 OFF

~ December 2013 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 OFF	2 OFF	3 OFF	4 OFF	5 OFF	6 OFF	7 OFF
8 OFF	9 OFF	10 OFF	11 OFF	12 OFF	13 OFF	14 OFF
15 OFF	16 OFF	17 OFF	18 OFF	19 OFF Source area sampling event.	20 OFF	21 OFF
22 OFF	23 OFF	24 OFF	25 OFF	26 OFF	27 OFF	28 OFF
29 OFF	30 OFF	31 OFF	Notes:			

~ January 2014 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1 OFF	2 OFF	3 OFF	4 OFF
5 OFF	6 OFF	7 OFF	8 OFF	9 OFF	10 OFF	11 OFF
12 OFF	13 OFF	14 OFF	15 OFF	16 OFF	17 OFF	18 OFF
19 OFF	20 OFF	21 OFF	22 OFF	23 OFF	24 OFF	25 OFF
26 OFF	27 OFF	28 OFF	29 OFF	30 OFF	31 OFF	

~ February 2014~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Note: KSCRT consensus at February 2014 meeting to restart system for 5 months of operation concentrating sparging on NLP-IW4I area. NLP-IW4I used as sparging well. NLP-IW4I and ASW-11 combined continuous 4-day operation once per month (6 days in June) and then rotating 2-day continuous operation of deep sparge wells ASW-7, -11, -15, and -38, shallow sparge wells ASW-34, -35, -39, and NLP-IW4I.						1 OFF
2 OFF	3 OFF	4 OFF	5 OFF	6 OFF Presentation on HMF results to KSC Remediation Team.	7 OFF	8 OFF
9 OFF	10 OFF	11 OFF	12 OFF	13 OFF Pre-Startup Baseline Sampling - NLPIW4I and ASW-34, 38, and 39	14 OFF	15 OFF
16 OFF	17 OFF	18 OFF	19 ON System startup Electric meter reading	20 ON	21 ON	22 ON
			Sparging of NLP-IW4I and ASW-11			
23 ON	24 ON	25 ON	26 ON	27 ON Electric meter reading	28 ON	
Sparging of NLP-IW4I and ASW-11	Sparging of NLP-IW4I		Sparging of ASW-11		Sparging of ASW-15	

~ March 2013 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 ON Sparging of ASW-15
2 ON Sparging of ASW-38	3 ON	4 ON Sparging of ASW-7	5 ON	6 ON Sparging of NLP-IW4I	7 ON	8 ON Sparging of ASW-34
9 ON Sparging of ASW-34	10 ON Sparging of ASW-35	11 ON	12 ON Sparging of ASW-11	13 ON	14 ON Sparging of ASW-39	15 ON
16 ON Sparging of ASW-7	17 ON	18 ON Sparging of NLP-IW4I and ASW-11	19 ON	20 ON	21 ON	22 ON Sparging of ASW-15
23 ON Sparging of ASW-15	24 ON Sparging of NLP-IW4I	25 ON	26 ON Sparging of ASW-11	27 OFF Source area monitoring well sampling event System off for sampling	28 ON Electric meter reading Sparging of ASW-38	29 ON
30 ON Sparging of ASW-7	23 ON					

~ April 2014 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 ON	2 ON	3 ON	4 ON	5 ON
		Sparging of NLP-IW4I		Sparging of ASW-34		Sparging of ASW-35
6 ON	7 ON	8 ON	9 ON	10 ON	11 ON	12 ON
Sparging of ASW-35	Sparging of ASW-11		Sparging of ASW-39		Sparging of ASW-7	
13 ON	14 ON	15 ON	16 ON	17 ON	18 ON	19 ON
Sparging of NLP-IW4I and ASW-11				Sparging of ASW-15		Sparging of NLP-IW4I
20 ON	21 ON	22 ON	23 ON	23 ON	25 ON	26 ON
Sparging of NLP-IW4I	Sparging of ASW-11		Sparging of ASW-38		Sparging of ASW-7	
27 ON	28 ON	29 ON	30 ON			
		Electric meter reading				
Sparging of NLP-IW4I		Sparging of ASW-34				

~ May 2014 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1 ON	2 ON	3 ON
				Sparging of ASW-35		Sparging of ASW-11
4 ON	5 ON	6 ON	7 ON	8 ON	9 ON	10 ON
Sparging of ASW-11	Sparging of ASW-39		Sparging of ASW-7		Sparging of NLP-IW4I and ASW-11	
11 ON	12 ON	13 ON	14 ON	15 ON	16 ON	17 ON
Sparging of NLP-IW4I and ASW-11		Sparging of ASW-15		Sparging of NLP-IW4I		Sparging of ASW-11
18 ON	19 ON	20 ON	21 ON	22 ON	23 ON	24 ON
Sparging of ASW-11	Sparging of ASW-38		Sparging of ASW-7		Sparging of NLP-IW4I	
25 ON	26 ON	27 ON	28 ON	29 ON	30 ON	31 ON
				Electric meter reading		
Sparging of ASW-34		Sparging of ASW-35		Sparging of ASW-11		Sparging of ASW-39

~ June 2014 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 ON	2 ON	3 ON	4 ON	5 ON	6 ON	7 ON
Sparging of ASW-39	Sparging of ASW-7		Sparging of NLP-IW4I and ASW-11			
8 ON	9 ON	10 ON System down - compressor problem	11 ON System down - compressor problem	12 ON System down - compressor problem	13 ON System down - compressor problem	14 ON System down - compressor problem
Sparging of ASW-15		Sparging of NLP-IW4I		Sparging of ASW-11		
15 ON System down - compressor problem	16 ON System down - compressor problem	17 ON System down - compressor problem	18 ON	19 ON	20 ON	21 ON
			Sparging of NLP-IW4I		Sparging of ASW-34	
22 ON	23 ON	24 ON	25 ON	26 ON	27 ON Electric meter reading	28 ON
Sparging of ASW-35		Sparging of NLP-IW4I and ASW-11				
29 ON	30 ON					
Sparging of NLP-IW4I and ASW-11						

~ July 2014 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 OFF System turned off in preparation for groundwater sampling event	2 OFF	3 OFF	4 OFF	5 OFF
6 OFF	7 OFF	8 OFF	9 OFF	10 OFF Source area monitoring well sampling event	11 OFF	12 OFF
13 OFF	14 OFF	15 OFF	16 OFF	17 OFF	18 OFF	19 OFF
20 OFF	21 OFF	22 OFF	23 OFF	24 OFF	12 OFF	26 OFF
27 OFF	28 OFF	29 OFF	30 OFF Electric meter reading	31 OFF		

~ August 2014 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 OFF	2 OFF
3 OFF	4 OFF	5 OFF	6 OFF	7 OFF	8 OFF	9 OFF
10 OFF	11 OFF	12 OFF	13 OFF	14 OFF	15 OFF	16 OFF
17 OFF	18 OFF	19 OFF	20 OFF	21 OFF	22 OFF	23 OFF
24 OFF	25 OFF	26 OFF	27 OFF	28 OFF Electric meter reading	29 OFF	30 OFF

~ September 2014 ~

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 OFF	2 OFF	3 OFF	4 OFF	5 OFF	6 OFF
7 OFF	8 OFF	9 OFF	10 OFF	11 OFF	12 OFF	13 OFF
14 OFF	15 OFF	16 OFF	17 OFF	18 OFF	19 OFF	20 OFF
21 OFF	22 OFF Annual groundwater sampling event - source area and perimeter wells	24 OFF	25 OFF	25 OFF	26 OFF	27 OFF
28 OFF	29 OFF Electric meter reading	30 OFF				

APPENDIX B

FIELD LOGBOOK

Work continued from Page

2-13-14 Sampling

4I @ 34, 35, 39

0800 Arrive on Site Calibrate Equip

4I purge 0900 - 0920 Sample time 0925
IDW 2.0L

ASW 34 purge 0950 - 1010 Sample time 1015
IDW 2.0 L

ASW 38 purge 1040 - 1100 Sample time 1105
IDW 2.0

ASW 39 purge 1130 - 1150 Sample time 1155
IDW 2.0

total IDW 8L
Drum # 1-4120
Pallet # 18205

Samples Packed on Ice
Picked up By Accutest
Courier 2-14-14

Work continued to Page

SIGNATURE DATE

DISCLOSED TO AND UNDERSTOOD BY DATE WITNESS DATE

HMF well Sampling

Work continued from Page

3-27 14

0900 Arrive on site Calibrate Equip

MW 1S purge 0535 - 0555 Sample time 1000
IDW 60

MW 1I purge 1050 - 1110 Sample time 1115
IDW 2.0

MW 4I purge 1145 - 1205 Sample time 1210
IDW 2.0

MW 5I purge 1235 - 1255 Sample 1300
IDW 2.0

Samples packed on Ice
Picked up By Acutest
Courier 3-28-14

IDW 12L
Drum 174123
Poly 185285

Restart System on ASW 39

3-31 ASW 7

Sept 2014 GW Sampling HMF KSC

Weather 85°F Rainy, Clouds, Wet

YSI cali. SN# 12A100316

Cond 1.413 mS/cm Pre 1.668 post 1.413

DO% 762.3 Pre 108.2 post 100.3

Orp. 240.0 mV Pre 253.2 post 240.0

PH 7.0 Pre 7.06 post 7.0
4.0 Pre 4.60 post 4.0
10.0 Pre 9.90 post 9.98

Lamotte 2020 SN# 2286-0721

1 NTU Pre .28 Post 1.00
10 NTU Pre 6.4 Post 10.00

8:15 Set up on well # HMF-MW000537.0-20140923
8:30 Initiated purge
8:50 End purge IDW 2.5
8:55 Collect sample

9:00 Set up on well # HMF-NLP-MW0004-037.5-20140923
9:05 Initiated purge
9:25 End purge IDW 2.5
9:30 Collect sample

9:35 Set up on Well # HMF-NLP-MW0001-037.5 20140923
9:40 Initiated purge.
10:00 End purge IDW 2.5
10:05 Collect sample

07-10-2014 GWS HMF KSC
weather humid 74°

07:00 Calabcate equipment

YSI

orp.		Pre 190	Post 200	
Cond		Pre 1540	Post 1489	
Do		Pre 1419.0 %	Post 99.8 %	
PH	7.0	Pre 7.00	Post 7.00	Exp 10/2/15 Lot# C274-11
	4.0	Pre 3.9	Post 4.00	Exp. 10/2/15 Lot# C279-10
	10.0	Pce 9.76	Post 9.96	Exp. 10-15-14 Lot# C287-15

Lamotle 2020

1 NTU	Pre 3.78	Post 1.	
10 NTU	Pre 7.9	Post 10.00	

8:50 Set up on well HMF-NLP-mw0004-037.5-20140710
9:00 Initiated purge
9:20 End purge 8.L
9:25 Collect sample

Doug Pellett 174120

07-10-2014 GWS HMF KSC

9:40 Set up on well HMF-MW0005-037.5-20140710
9:45 Initiate purge
10:10 ~~9:50~~ End purge 2.5 L
10:12 Collect sample

10:30 Set up on well HMF-NLP-MW001-037.5-20140710
10:40 Initiate purge
11:05 End purge
11:10 collect sample

11:15 Set up on well HMF-NLP-MW0001-0108.5-20140710
11:20 Initiated purge
11:45 End purge 2.L
11:50 collect sample

Sept 23 - 2014 GW Sampling HMF KSC

10:10 Set up on well # HMF-NLP-MW0001-008.5-2014092
10:15 Initiated purge
10:35 End purge IDW 2.5
10:40 collect Sample

10:50 Set up on well # HMF-NLP-MW0001-050.5-2014092
10:55 Initiated purge
11:10 End purge IDW 2
11:20 Collect Sample

11:25 Set up on well # HMF-MW0009-037.5-20140923
11:30 Initiated purge
11:45 End purge IDW 2
11:50 Collect Sample

12:00 Set up on Well # HMF-MW0007-037.5-2014092
12:05 Initiated purge
12:25 End purge IDW 2.5
12:30 Collect Sample

12:50 Set up on Well #
13:00 Initiated purge
13:20 End purge IDW 2.5
13:30 Collect sample

13:40 Set up on Well # HMF-MW0006-037.5-2014092
13:45 Initiated purge
14:05 End purge IDW 2.5
14:10 Collect Sample

Total IDW for 20140923 21.5 L

APPENDIX C

GROUNDWATER CHAIN-OF-CUSTODY FORMS AND SAMPLE LOG SHEETS

GROUNDWATER CHAIN-OF-CUSTODY FORMS

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 1

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112602387	KSC - HMF	Rob Simkit	Accutest Lab
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER	ADDRESS
		Skip V SCI 443 1999	Kirkland Rd
		CARRIER/WAYBILL NUMBER	CITY, STATE
		Courier Pick up	Orlando FL

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2014	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: 8260 TCFM only								COMMENTS
								HCL								
3/27	1021	HMF-MLP MW0001-0025-20140327		G	3	G		X								
3/27	1115	HMF-MLP MW0001-0325-20140327		G	3	G		X								
3/27	1210	HMF-MLP-MW0004-0325-20140327		G	3	G		X								
3/27	1300	HMF-MW0005-0325-20140327		G	3	G		X								

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	3/28	1230	1. RECEIVED BY Michael C. Glover	03-28-14	12:30
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 1

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112602.392	KSC - HMF	Rob Smyk	Accutest Lab
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER	ADDRESS
		Skip Orr 44C	Kirkland Rd
		CARRIER/WAYBILL NUMBER	CITY, STATE
		Courier Pick-up	Orlando, FL

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2014	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS 8260 *	COMMENTS
2/13	0525	HMF-MW2004-0325-20140213	GW	G	3	P	HCl	X	*TCLP only
2/13	1015	HMF-ASW 24-40-20140213		G	3			X	
2/13	1105	HMF-ASW 38-31-20140213		G	3			X	
2/13	1155	HMF-ASW 39-35-20140213		G	3			X	

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	2/14/14		1. RECEIVED BY	02.14.14	10:45
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 1

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER	ADDRESS
		CARRIER/WAYBILL NUMBER	CITY, STATE

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE / YEAR	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS	COMMENTS

1. RELINQUISHED BY	DATE	TIME	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

Accutest Laboratories Southeast
Chain of Custody

ACCUTEST LABORATORIES

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL. 407-425-6700 • FAX: 407-425-0707
www.accutest.com

Accutest JOB # FA16590 PAGE 1 OF 1

Accutest Quote # SKIFF#

Client / Reporting Information

Company Name: Tetra Tech
Address: 661 Andersen Drive
City: Pittsburgh State: PA Zip:
Project Contact: Rob Sinnett E-mail:
Phone#: 407 921 7058
Sampler(s) Name(s) (Printed): Ron Lotspeich

Project Information

Project Name: KSC - HMF
Street:
City: Kennedy Space Center
Project #: 112C0232
Fax #:
Client Purchase Order #:

Analytical Information

8260
TCLP 8260

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL - Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid
WP - Wipe

Accutest Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	Matrix Code	MATRIX	TOTAL # OF BOTTLES	CONTAINER INFORMATION: OTHER	NONE	HCl	HNO3	H2SO4	NaOH	ZnAc/NaOH	DI WATER	MEOH
1	HMF-DLP-MW004-0225-20140210		1025	GW	GW	3			X						
2	HMF-DLP-MW005-0225-20140210		1018	GW	GW	3			X						
3	HMF-DLP-MW001-0225-20140210		1119	GW	GW	3			X						
4	HMF-DLP-MW001-0908-20140210		1150	GW	GW	3			X						

TURNAROUND TIME (Business Days)

Approved By: / Rush Code

- [x] 10 Days Standard
- [ ] 7 Day RUSH
- [ ] 5 Day RUSH
- [ ] 3 Day EMERGENCY
- [ ] 2 Day EMERGENCY
- [ ] 1 Day EMERGENCY
- [ ] OTHER

Emergency or Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULT1 (EPA LEVEL 4)
- [ ] EDD'S

Comments / Remarks

Cool to 4°C

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished by:	Date Time:	Received By:
1	7-11 9:40	2 10:20 07-11-14	3	07-11-14 17:40	4 7-12-14
Relinquished by:	Date Time:	Received By:	Relinquished by:	Date Time:	Received By:
5		6	7		8

Lab Use Only: Custody Seal in Place: Y N Temp Blank Provided: Y N Preserved where Applicable: Y N Total # of Coolers: Cooler Temperature (s) Celsius: 3.0

Accutest Laboratories Southeast

ACCUTEST LABORATORIES

Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL. 407-425-6700 • FAX: 407-425-0707
www.accutest.com

Accutest JOB # FA18590 PAGE 1 OF 1

Accutest Quote # | SKIFF#

Client / Reporting Information

Company Name: Tetra Tech
Address: 661 Anderson Drive
City: Pittsburgh State: PA Zip:
Project Contact: Rob Simcik E-mail:
Phone#: 561 445 6[illegible]
Sampler(s) Name(s) (Printed): Seth Bond

Project Information

Project Name: KSC - HMF
Street:
City: Kennedy Space State: FL
Project #: 112
Fax #:
Client Purchase Order #:

Analytical Information

8260 + ETHANOL

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL - Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid
WP - Wipe

Accutest Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	CONTAINER INFORMATION: OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NAOH+ZNAC	DI WATER	MEOH	LAB USE ONLY
1	HMF-MW0005-0325-2014	0325	855	RL	GW	3			X						3	
2	HMF-NLP-MW0004-0325-2014	0325	930	RL	GW	3			X						3	
3	HMF-NLP-MW0001-0325-2014	0325	1005	RL	GW	3			X						X	
4	HMF-NLP-MW0001-0325-2014	0325	1040	RL	GW	3			X						X	
5	HMF-NLP-MW0001-0325-2014	0325	1120	RL	GW	3			X						X	
6	HMF-MW0009-0325-2014	0325	1150	RL	GW	3			X						X	
7	HMF-MW0007-0325-2014	0325	1230	RL	GW	3			X						X	
8	HMF-MW0008-0325-2014	0325	1330	RL	GW	3			X						X	
9	HMF-MW0006-0325-2014	0325	1410	RL	GW	3			X						X	

TURNAROUND TIME (Business Days)

Approved By: / Rush Code

- [x] 10 Days Standard
- [ ] 7 Day RUSH
- [ ] 5 Day RUSH
- [ ] 3 Day EMERGENCY
- [ ] 2 Day EMERGENCY
- [ ] 1 Day EMERGENCY
- [ ] OTHER

Emergency or Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULT1 (EPA LEVEL 4)
- [ ] EDD'S

Comments / Remarks

Cool to 4°C

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished by:	Date Time:	Received By:
1 Bonnie S. Linton	9-24 11:35	2 Michael Llera 11:35 09-24-14	3 Michael Llera	09-24-13 16:45	4 [signature] 09-25-14 8:0
Relinquished by:	Date Time:	Received By:	Relinquished by:	Date Time:	Received By:
5		6	7		8

Lab Use Only: Custody Seal in Place: Y N Temp Blank Provided: Y N Preserved where Applicable: Y N Total # of Coolers: Cooler Temperature (s) Celsius: 3.4

SAMPLE LOG SHEETS

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: Hypergol Maintenance Facility (HMF)	SITE LOCATION: John F. Kennedy Space Center (KSC)	
WELL NO: IW-4I	SAMPLE ID: HMF-NLP-MW0004-037.5-20140213	DATE: 2-13-14

PURGING DATA

WELL DIAMETER (in): 1	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 35.00 ft. to 40.00 ft.	STATIC DEPTH TO WATER (ft): 4.86	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)

Liters

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

Liters

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 37.5	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 37.5	PURGE INITIATED AT: 0500	PURGE ENDED AT: 0520	TOTAL VOLUME PURGED (Liters): 2.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
0500	—	—	100	4.88	—	—	—	—	—	—	Clear
0505	.5	.5	1.1	4.92	4.68	2543	4052	3.60	8.2	22.7	11
0510	1.0	.5	1.1	4.94	4.67	2487	4073	2.66	8.1	21.0	11
0515	1.5	.5	1.1	4.93	4.65	2581	4078	2.56	7.9	21.3	11
0520	2.0	.5	1.1	4.94	4.66	2573	4061	2.45	8.0	21.0	11
				Sample Time 0525							

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 0520	SAMPLING ENDED AT: 0525
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N) FILTER SIZE: ____ µm Filtration Equipment Type:	MS/MSD: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
PP	3	CG	40 mL	HCL	NONE	<2	Select VOCs (TCFM) /8260B	RFPP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **Hypergol Maintenance Facility (HMF)**	SITE LOCATION: **John F. Kennedy Space Center (KSC)**	
WELL NO: ASW39	SAMPLE ID: **HMF-ASW39-35-20140213**	DATE: 2-13-2014

PURGING DATA

total Depth 35

WELL DIAMETER (in): 1	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 35.00	STATIC DEPTH TO WATER (ft): 2.54	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)

_____ Liters

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

_____ Liters

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 34	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 34	PURGE INITIATED AT: 1130	PURGE ENDED AT:	TOTAL VOLUME PURGED (Liters): 2.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
1130	–	–	10	2.54	–	–	–	–	–	–	Clear
1135	.5	.5	11	6.55	6.66	22.50	6664	2.7	7.9	-1.7	"
1140	.5	1.0	11	7.02	6.65	22.69	6248	2.3	7.7	-1.3	"
1145	.5	1.5	11	7.03	6.65	22.70	6275	2.1	7.6	-1.2	"
1150	.5	2.0	"	7.03	6.65	2271	6279	2.0	7.6	-1.6	"
					Sample time			1155			

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ SG	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1150	SAMPLING ENDED AT: 1155
PUMP OR TUBING DEPTH IN WELL (feet): 34	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ____ µm Filtration Equipment Type:	MS/MSD: Y ND	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
PP	3	CG	40 mL	HCL	NONE	<2	Select VOCs (TCFM) /8260B	RFPP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **Hypergol Maintenance Facility (HMF)**	SITE LOCATION: **John F. Kennedy Space Center (KSC)**	
WELL NO: ASW38	SAMPLE ID: **HMF-ASW38-31-20140213**	DATE: 2-13-2014

PURGING DATA

Total Depth 32.5

WELL DIAMETER (in): 1	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 31.00	STATIC DEPTH TO WATER (ft): 4.33	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)

_____ Liters

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

_____ Liters

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 32.5	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 32.5	PURGE INITIATED AT: 1040	PURGE ENDED AT: 1100	TOTAL VOLUME PURGED (Liters): 2.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
1040	—	—	101	4.33	—	—	—	—	—	—	Clear
1045	.5	.5	11	7.52	6.85	22.26	5523	1.2	8.3	22.6	"
1050	.5	1.0	11	6.63	6.84	22.24	5531	1.0	8.0	22.7	"
1055	.5	1.5	11	5.66	6.84	22.23	5533	1.1	8.1	22.5	"
1100	.5	2.0	11	5.66	6.84	22.22	5534	1.0	8.0	22.8	"
				Sample Time 1105							

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1100	SAMPLING ENDED AT: 1105
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	

FIELD DECONTAMINATION: (Y) N — FIELD-FILTERED: Y (N) — FILTER SIZE: ____ µm — Filtration Equipment Type: _____ — MS/MSD: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
PP	3	CG	40 mL	HCL	NONE	<2	Select VOCs (TCFM) /8260B	RFPP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **Hypergol Maintenance Facility (HMF)**	SITE LOCATION: **John F. Kennedy Space Center (KSC)**	
WELL NO: ASW34	SAMPLE ID: **HMF-ASW34-40-20140213**	DATE: 2-13-2014

PURGING DATA

total Depth 40

WELL DIAMETER (in): 1	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH:40.00	STATIC DEPTH TO WATER (ft): 5.16	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)
_____ Liters

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
_____ Liters

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 35	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 35	PURGE INITIATED AT: 0950	PURGE ENDED AT: 1010	TOTAL VOLUME PURGED (Liters): 2.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
0950	—	—	100	5.10	—	—	—	—	—	—	Clear
0955	.5	.5	1.1	13.35	6.81	22.57	4032	2.6	5.1	12.0	"
1000	1.0	.5	1.1	13.42	6.82	22.59	4034	2.7	5.3	16.3	"
1005	1.5	.5	1.1	13.51	6.82	22.64	4041	2.1	5.0	16.1	"
1010	2.0	.5	1.1	13.59	6.82	22.63	4042	2.0	5.2	15.5	"
					Sample	Time	1015				

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ SV	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1015	SAMPLING ENDED AT: 1020
PUMP OR TUBING DEPTH IN WELL (feet): 35	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ____ µm Filtration Equipment Type:	MS/MSD: Y N	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
PP	3	CG	40 mL	HCL	NONE	<2	Select VOCs (TCFM) /8260B	RFPP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **Hypergol Maintenance Facility (HMF)**	SITE LOCATION: **John F. Kennedy Space Center (KSC)**	
WELL NO: **MW-5I**	SAMPLE ID: **HMF-MW0005-037.5-20140327**	DATE: 3-27-14

PURGING DATA

WELL DIAMETER (in): 1	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 35.00 ft. to 40.00 ft.	STATIC DEPTH TO WATER (ft): 3.55	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)
Liters

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
Liters

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 37.5	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 37.5	PURGE INITIATED AT: 1235	PURGE ENDED AT: 1255	TOTAL VOLUME PURGED (Liters): 2.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
1235	–	–	10	3.55	–	–	–	–	–	–	Clear
1240	.5	.5	11	3.60	7.16	20.96	2153	6.50	6.5	10.3	"
1245	.5	1.0	11	3.65	7.17	21.10	2155	6.44	7.1	10.7	"
1250	.5	1.5	11	3.66	7.18	21.15	2162	6.41	8.2	10.5	"
1255	.5	2.0	11	3.66	7.17	21.16	2168	6.40	8.0	11.7	"
				Sample	Time	1300					

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1255	SAMPLING ENDED AT: 1300
PUMP OR TUBING DEPTH IN WELL (feet): 37.5	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ____ µm Filtration Equipment Type:	MS/MSD: Y N	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
PP	3	CG	40 mL	HCL	NONE	<2	Select VOCs (TCFM) /8260B	RFPP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **Hypergol Maintenance Facility (HMF)**	SITE LOCATION: **John F. Kennedy Space Center (KSC)**	
WELL NO: **IW-1S**	SAMPLE ID: **HMF-NLP-MW0001-008.5-20140327**	DATE: 3-27-14

PURGING DATA

WELL DIAMETER (in): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 3.00 ft. to 13.00 ft.	STATIC DEPTH TO WATER (ft): 2.37	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)

Liters

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

Liters

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 37.5	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 37.5	PURGE INITIATED AT: 0735	PURGE ENDED AT: 0955	TOTAL VOLUME PURGED (Liters): 6.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
0935	—	—	300	2.37	—	—	—	—	—	—	Clear
0740	1.5	1.5	11	2.61	5.91	2296	3257	3.54	8.3	-43.9	11
0945	1.5	3.0	11	2.60	5.91	2106	3309	2.17	8.1	-44.9	11
0950	1.5	4.5	11	2.60	5.91	2108	3312	2.02	8.1	-41.0	11
0955	1.5	6.0	11	2.60	5.91	2109	3318	1.99	8.2	-41.1	11
					SAMPLE TIME		1000				

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ SAJ	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 0955	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet): 37.5	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N) FILTER SIZE: ____ µm Filtration Equipment Type:	MS/MSD: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
PP	3	CG	40 mL	HCL	NONE	<2	Select VOCs (TCFM) /8260B	RFPP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **Hypergol Maintenance Facility (HMF)**	SITE LOCATION: **John F. Kennedy Space Center (KSC)**	
WELL NO: **IW-1I**	SAMPLE ID: **HMF-NLP-MW0001-037.5-20140327**	DATE: 3-27-14

PURGING DATA

WELL DIAMETER (in): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 37.00 ft. to 42.00 ft.	STATIC DEPTH TO WATER (ft): 2.07	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)

Liters

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

Liters

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 37.5	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 37.5	PURGE INITIATED AT: 1050	PURGE ENDED AT: 1110	TOTAL VOLUME PURGED (Liters): 2

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
1050	—	—	100	2.07	—	—	—	—	—	—	Clear
1055	.5	.5	11	2.11	6.76	21.32	1468	2.13	11.5	-53.9	"
1100	.5	1.0	"	2.12	6.77	21.42	1458	2.02	10.2	-45.6	"
1105	.5	1.5	"	2.12	6.80	21.44	1449	1.88	9.7	-44.4	"
1110	.5	2.0	"	2.12	6.80	21.45	1447	1.79	9.6	-43.9	"
			Sample	time	1115						

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1110	SAMPLING ENDED AT: 1115
PUMP OR TUBING DEPTH IN WELL (feet): 37.5	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N) FILTER SIZE: ____ µm Filtration Equipment Type:	MS/MSD: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
PP	3	CG	40 mL	HCL	NONE	<2	Select VOCs (TCFM) /8260B	RFPP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **Hypergol Maintenance Facility (HMF)**	SITE LOCATION: **John F. Kennedy Space Center (KSC)**	
WELL NO: **IW-4I**	SAMPLE ID: **HMF-NLP-MW0004-037.5-20140327**	DATE: 3-27-14

PURGING DATA

WELL DIAMETER (in): 1	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 35.00 ft. to 40.00 ft.	STATIC DEPTH TO WATER (ft): 32	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)

Liters

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

Liters

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 37.5	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 37.5	PURGE INITIATED AT: 1145	PURGE ENDED AT: 1205	TOTAL VOLUME PURGED (Liters): 2.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
1145	–	–	400	32	–	–	–	–	–	–	CLR
1150	.5	.5	11	4.11	692	2175	3377	8.78	8.3	26	11
1155	.5	1.0	11	4.12	693	2174	3402	8.77	8.1	4.2	11
1200	.5	1.5	11	4.12	694	2170	3412	8.72	8.3	4.1	11
1205	.5	2.0	11	4.2	693	2169	3418	8.70	8.0	4.3	11
			Sample	time	1210						

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1205	SAMPLING ENDED AT: 1210
PUMP OR TUBING DEPTH IN WELL (feet): 37.5	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N) FILTER SIZE: ____ µm Filtration Equipment Type:	MS/MSD: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
PP	3	CG	40 mL	HCL	NONE	<2	Select VOCs (TCFM) /8260B	RFPP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **Hypergol Maintenance Facility (HMF)**	SITE LOCATION: **John F. Kennedy Space Center (KSC)**	
WELL NO: **MW-5I**	SAMPLE ID: **HMF-MW0005-037.5-20140710**	DATE: 7-10-2014

PURGING DATA

WELL DIAMETER (in): 1	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 35.00 ft. to 40.00 ft.	STATIC DEPTH TO WATER (ft): 4.05	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)

Liters

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

Liters 0.005 x 45 + 0.5 = 0.725

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGE INITIATED AT: 9.45	PURGE ENDED AT: 10:10	TOTAL VOLUME PURGED (Liters): 2.5

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
9:45	0.5	0.5	.100	4.05		Initiate purge					
9:50	~~.500~~	~~.500~~	.100	4.05	6.66	28.31	9573	12.9	7.7	-169.6	clear
9:55	~~.500~~	~~1.00~~	.100	4.72	6.46	27.08	9500	11.9	4.8	-177.4	clear
10:00	.5	1.5	.100	4.73	6.37	27.02	10125	12.6	7.7	-180.9	clear
10:05	.5	2	.100	4.73	6.33	27.00	10552	14.6	6.8	-183.2	clear
10:10	.5	2.5	.100	4.75	6.32	27.09	11043	23.3	8.2	-184.3	clear

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ Rinclinton Ttnus	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 10:12	SAMPLING ENDED AT: 10:15
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ____ µm Filtration Equipment Type: ____	MS/MSD: Y N	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
PP	3	CG	40 mL	HCL	NONE	<2	Select VOCs (TCFM) /8260B	RFPP

REMARKS:
Turbidity on the rise grab sample

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **Hypergol Maintenance Facility (HMF)**	SITE LOCATION: **John F. Kennedy Space Center (KSC)**	
WELL NO: **IW-1I**	SAMPLE ID: **HMF-NLP-MW0001-037.5-20140710**	DATE: 10-7-2014

PURGING DATA

WELL DIAMETER (in): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 37.00 ft. to 40.00 ft.	STATIC DEPTH TO WATER (ft): ,5	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)
Liters

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
Liters 0.005 x 42 + .5 = 0.71 L

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGE INITIATED AT: 10:40	PURGE ENDED AT: 11:05	TOTAL VOLUME PURGED (Liters): 2.5

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
10:40	0	0	.100	.5		Initiated purge					
10:45	.5	.5	.100	.87	7.27	25.57	1505	8.8	9.8	-238.4	Yellow
10:55	.1	1.5	.100	.85	6.91	25.78	1401	7.1	10	-231.8	Yellow
11:00	.5	2	.100	.85	6.86	25.82	1437	6.8	9.4	-230.1	Yellow
1105	.5	2.5	.100	.85	6.80	25.93	1505	6.6	8.9	-215	Yellow
			Collect Sample								

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ Ron Linton TtNUS	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 11:10	SAMPLING ENDED AT: 11:15
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ____ µm Filtration Equipment Type:	MS/MSD: Y N	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
PP	3	CG	40 mL	HCL	NONE	<2	Select VOCs (TCFM) /8260B	RFPP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **Hypergol Maintenance Facility (HMF)**	SITE LOCATION: **John F. Kennedy Space Center (KSC)**	
WELL NO: **IW-1S**	SAMPLE ID: **HMF-NLP-MW0001-0108.5-20140710**	DATE: 10-7-2014

PURGING DATA

WELL DIAMETER (in): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 3.00 ft. to 13.00 ft.	STATIC DEPTH TO WATER (ft): .55	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)
Liters

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
Liters 0.005 x 15 + .5 = 0.575

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGE INITIATED AT: 11:20	PURGE ENDED AT: 11:45	TOTAL VOLUME PURGED (Liters): 2

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
11:20	0	0	.100	.55		Initiate purge					
11:25	.5	.5	.100	.82	5.41	26.07	7971	30.2	8.3	-192.1	Yellow
11:30	.5	1	.100	.83	5.48	25.88	7968	23.0	5.5	-182.	clear
11:35	.5	1.5	.100	.83	5.55	25.89	7961	14.4	5.4	-190	clear
11:40	.5	2	.100	.83	5.57	25.95	7911	11.5	5.4	-192.0	clear

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ Ron Lanton TtNUS	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 11:50	SAMPLING ENDED AT: 11:55
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ____ µm Filtration Equipment Type:	MS/MSD: Y N	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
PP	3	CG	40 mL	HCL	NONE	<2	Select VOCs (TCFM) /8260B	RFPP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **Hypergol Maintenance Facility (HMF)**	SITE LOCATION: **John F. Kennedy Space Center (KSC)**	
WELL NO: **IW-4I**	SAMPLE ID: **HMF-NLP-MW0004-037.5-20140710**	DATE: 10-7-2014

PURGING DATA

WELL DIAMETER (in): 1	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 35.00 ft. to 40.00 ft.	STATIC DEPTH TO WATER (ft): 3.42	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)

Liters

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) 0.725 Liters (0.005 x 45) + 0.5 = 0.725 L

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGE INITIATED AT: 09:00	PURGE ENDED AT: 9:20	TOTAL VOLUME PURGED (Liters): 4.

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
09:00	0	0	.200	3.42	Purge	Initiated					
9:05	1.0	1.0	.200	4.80	7.36	26.67	8002	62.5	5.5	-107.9	clear
9.10	1.0	2.0	.200	4.80	7.34	26.72	7895	61.6	3.4	-107.4	clear
9:15	1.0	3.0	.200	4.78	7.34	26.60	7800	62.0	3.7	-106.5	clear
9.20	1.0	4.0	.200	4.78	7.34	26.68	7667	61.3	1.3	-105.2	clear
		Parameters			stabilized			collect sample			

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ Ron Linton TTNUS	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 09:25	SAMPLING ENDED AT: 09:30
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ____ µm Filtration Equipment Type: _____	MS/MSD: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
PP	3	CG	40 mL	HCL	NONE	<2	Select VOCs (TCFM) /8260B	RFPP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **Hypergol Maintenance Facility (HMF)**	SITE LOCATION: **John F. Kennedy Space Center (KSC)**	
WELL NO: **MW-5I**	SAMPLE ID: **HMF-MW000537.0-20140923**	DATE: 9-23

PURGING DATA

WELL DIAMETER (in): 1	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 35.00 ft. to 40.00 ft.	STATIC DEPTH TO WATER (ft): 2.69	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)

Liters

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

Liters .005 x 45 + 0.5 = 0.725

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGE INITIATED AT: 8:30	PURGE ENDED AT: 9:50	TOTAL VOLUME PURGED (Liters): 2.5

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
8:30	0	0	.200	2.69	Initiated purge						
8:35	1	1	.100	2.65	6.86	26.23	11966	.40	23	-62.4	clear
8:40	.5	1.5	.100	2.65	6.85	26.31	12088	.52	15	-52.3	clear
8:45	.5	2	.100	2.65	6.87	26.31	11955	.52	12	-53.7	clear
8:50	.5	2.5	.100	2.65	6.87	26.33	11860	.51	10	-52.	clear
		9:55		Sample time							

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ Jon Linton Ttnus	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 08:55	SAMPLING ENDED AT: 09:00
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ____ µm Filtration Equipment Type: ____	MS/MSD: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
PP	3	CG	40 mL	HCL	NONE	<2	Select VOCs (TCFM) /8260B	RFPP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **Hypergol Maintenance Facility (HMF)**	SITE LOCATION: **John F. Kennedy Space Center (KSC)**	
WELL NO: **IW-4I**	SAMPLE ID: **HMF-NLP-MW0004-037.5-20140923**	DATE: 9-23

PURGING DATA

WELL DIAMETER (in): 1	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 35.00 ft. to 40.00 ft.	STATIC DEPTH TO WATER (ft): 2.52	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)
_____ Liters

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
_____ Liters .005 x 45 + 0.5 = 0.725

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGE INITIATED AT: 9:05	PURGE ENDED AT: 9:25	TOTAL VOLUME PURGED (Liters): 2.5

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
9:05	0	0	.200	2.52		Initiated purge					
9:10	1	1	.100	2.45	7.13	26.11	8812	4.40	12	14.7	clear
9:15	.5	1.5	.100	2.44	7.04	25.98	9040	3.48	12	15.3	clear
9:20	.5	2	.100	2.44	6.94	25.96	11027	2.46	10	9.0	clear
9:25	.5	2.5	.100	2.44	6.94	25.97	11030	2.50	10	9.0	clear
			9:30	Sample		time					

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ Ron Linton Ttnus	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 9:30	SAMPLING ENDED AT: 9:35
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ____ µm Filtration Equipment Type: _____	MS/MSD: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
PP	3	CG	40 mL	HCL	NONE	<2	Select VOCs (TCFM) /8260B	RFPP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **Hypergol Maintenance Facility (HMF)**	SITE LOCATION: **John F. Kennedy Space Center (KSC)**	
WELL NO: **IW-1I**	SAMPLE ID: **HMF-NLP-MW0001-037.5.20140923**	DATE: 9-23

PURGING DATA

WELL DIAMETER (in): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 35.00 ft. to 40.00 ft.	STATIC DEPTH TO WATER (ft): 4.03	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)
Liters

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
Liters .005 X 45 + 0.5 = 0.725

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGE INITIATED AT: 9:40	PURGE ENDED AT: 10:00	TOTAL VOLUME PURGED (Liters): 2.5

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
9:40	0	0	.200	4.03	Initiated purge						
9:45	1	1	.100	4.00	7.60	26.23	2185	2.33	28	-84.1	turbid
9:50	.5	1.5	.100	3.98	7.59	26.25	1512	.81	21	-96.9	turbid
9:55	.5	2	.100	3.98	7.56	26.41	1194	.51	16	-93.4	clear
10:00	.5	2.5	.100	3.98	7.55	26.53	1092	.71	10	-99.5	clear
				Sample	Time	1005					

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ Ron Linton Ttnus	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 10:05	SAMPLING ENDED AT: 10:10
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ____ µm Filtration Equipment Type:	MS/MSD: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
PP	3	CG	40 mL	HCL	NONE	<2	Select VOCs (TCFM) /8260B	RFPP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **Hypergol Maintenance Facility (HMF)**	SITE LOCATION: **John F. Kennedy Space Center (KSC)**	
WELL NO: **IW-1S**	SAMPLE ID: **HMF-NLP-MW0001-008.5-20140923**	DATE: 9-23

PURGING DATA

WELL DIAMETER (in): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 3.00 ft. to 13.00 ft.	STATIC DEPTH TO WATER (ft): 8.5	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)
Liters

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
Liters .005 x 18 + 0.5 = .59

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGE INITIATED AT: 10:15	PURGE ENDED AT: 10:35	TOTAL VOLUME PURGED (Liters): 2.5

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
10:15	0	0	.200	.85		29.80	Initiated purge				
10:20	1	1	.100	.84	7.88	~~32.11~~	7555	6.56	33	-108.7	clear
10:25	.5	1.5	.100	.84	5.74	28.11	7782	.67	20	-116.7	clear
10:30	.5	2	.100	.84	5.73	27.85	7693	.41	16	-121.2	clear
10:35	.5	2.5	.100	.84	5.73	27.66	7609	.32	10	-111	clear
				10:40		sample	time				

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS Ron Linton Ttnus	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 10:40	SAMPLING ENDED AT: 10:45
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ____ µm Filtration Equipment Type:	MS/MSD: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
PP	3	CG	40 mL	HCL	NONE	<2	Select VOCs (TCFM) /8260B	RFPP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **Hypergol Maintenance Facility (HMF)**	SITE LOCATION: **John F. Kennedy Space Center (KSC)**	
WELL NO: **IW-1D**	SAMPLE ID: **HMF-NLP-MW0001-050.5-20140923**	DATE: 9-23

PURGING DATA

WELL DIAMETER (in): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 48.00 ft. to 53.00 ft.	STATIC DEPTH TO WATER (ft):	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)
_____ Liters

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
_____ Liters .005 x 55 + 0.5 = 0.775

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGE INITIATED AT: 10:55	PURGE ENDED AT: 11:10	TOTAL VOLUME PURGED (Liters): 2

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
10:55	0	0	.200	.83	6.06	28.61	2660	1.56	30	-76.1	clear
11:00	1	1	.100	.83	6.30	28.28	1382	1.78	14	-62.9	clear
11:05	.5	1.5	.100	.83	6.53	28.08	903	1.89	10	-59.8	clear
11:10	.5	2	.100	.83	6.57	28.01	915	1.89	9	-57.8	clear
					11:20	Sample	time				

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ Ron Linton Ttnus	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 11:20	SAMPLING ENDED AT: 11:25
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ____ µm Filtration Equipment Type: _____	MS/MSD: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
PP	3	CG	40 mL	HCL	NONE	<2	Select VOCs (TCFM) /8260B	RFPP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **Hypergol Maintenance Facility (HMF)**	SITE LOCATION: **John F. Kennedy Space Center (KSC)**	
WELL NO: **MW-9I**	SAMPLE ID: **HMF-MW0009-037.5-2014-0923**	DATE: 9-23

PURGING DATA

WELL DIAMETER (in): 1	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 35.00 ft. to 40.00 ft.	STATIC DEPTH TO WATER (ft): 0	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)
_____ Liters

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
_____ Liters .005 x 45 + 0.5 = 0.725

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGE INITIATED AT: 11:30	PURGE ENDED AT: 11:45	TOTAL VOLUME PURGED (Liters): 2

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
11:30	0	0	.200	0							
11:35	1	1	.100	.05	7.95	29.37	1601	.15	40	-191	turbid
11:40	.5	1.5	.100	1.2	8.02	28.48	839	.19	20	-181	clear
11:45	.5	2	.100	1.21	8.03	28.37	820	.15	10	-180	clear

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ Ron Linton TtNUS	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 11:50	SAMPLING ENDED AT: 11:55
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ____ µm Filtration Equipment Type: _____	MS/MSD: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
PP	3	CG	40 mL	HCL	NONE	<2	Select VOCs (TCFM) /8260B	RFPP

REMARKS:
Well under water. level at 0

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **Hypergol Maintenance Facility (HMF)**	SITE LOCATION: **John F. Kennedy Space Center (KSC)**	
WELL NO: **MW-7I**	SAMPLE ID: **HMF-MW0007-037.5-20140923**	DATE: 9-23

PURGING DATA

WELL DIAMETER (in): 1	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 35 ft. to 40 ft.	STATIC DEPTH TO WATER (ft): .05	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)
_____ Liters

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
_____ Liters .005 x 45 + 0.5 = 0.725

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGE INITIATED AT: 12:05	PURGE ENDED AT: 12:25	TOTAL VOLUME PURGED (Liters): 2.5

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
12:05	0	0	.200	.05		Initiated		purge			
12:10	1	1	.100	.85	7.10	29.22	4032	3.88	410	-150.1	clear
12:15	.5	1.5	.100	.85	7.07	29.05	17160	.67	30	-152.	Clear
12:20	.5	2	.100	.87	7.10	28.31	17681	.59	20.1	-151.1	clear
12:25	.5	2.5	.100	.87	7.11	28.32	17690	.58	10	-151.	clear
				12:30		Sample time					

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ Ron Linton TtNUS	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 12:30	SAMPLING ENDED AT: 12:35
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ____ µm Filtration Equipment Type: _____	MS/MSD: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
PP	3	CG	40 mL	HCL	NONE	<2	Select VOCs (TCFM) /8260B	RFPP

REMARKS:
Well under water. level at bottom of cap.

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

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8 I

SITE NAME: [redacted]	SITE LOCATION: Kennedy Space Center	
LOCATION ID: [redacted] 8 I	SAMPLE ID: [redacted] Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: 09-23-2014

PURGING DATA

STATIC DEPTH TO WATER (feet btoc):	CASING HEIGHT (feet als): 3.19	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): .95	WELL SCREEN INTERVAL DEPTH (feet bls): [redacted]

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 3/16	PURGE PUMP TYPE OR BAILER: Peristaltic Pump	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): [redacted]	BOTTOM DEPTH (feet bls): [redacted]

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
_____Liters

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
_____Liters .005 X 40 + 0.5 = 0.7

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 15.0	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 15.0	PURGING INITIATED AT: 13:00	PURGING ENDED AT: 13:30	TOTAL VOLUME PURGED (Liters): 2.5

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
13:00	0	0	.200	.95		Initiated purge					
13:05	1	1	.100	.97	7.55	30.12	1406	1.45	26	-101	clear
13:10	.5	1.5	.100	1.00	7.52	30.11	1339	.61	20	-93	clear
13:15	.5	2	.100	1.02	7.47	30.49	1390	.41	15	-92	clear
13:20	.5	2.5	.100	1.02	7.19	30.96	1399	.40	10	-90	clear
						13:30 sample time					

WELL CAPACITY (Liters Per Foot): 0.75" = 0.076; 1" = 0.15; 1.25" = 0.23; 2" = 0.61; 3" = 1.40; 4" = 2.46; 5" = 3.86; 6" = 5.57; 12" = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): 1/8" = 0.002; 3/16" = 0.005; 1/4" = 0.0098; 5/16" = 0.015; 3/8" = 0.023; 1/2" = 0.038; 5/8" = 0.06

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 13:30	SAMPLING ENDED AT: 13:35
Ron Linton Ttnus			

PUMP OR TUBING DEPTH IN WELL (feet): 15.0	SAMPLE PUMP: SM FLOW RATE (mL per minute): 100	TUBING MATERIAL CODE: Poly
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N) FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
	3	CG	40ml	HCL				

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **Hypergol Maintenance Facility (HMF)**	SITE LOCATION: **John F. Kennedy Space Center (KSC)**	
WELL NO: **MW-6I**	SAMPLE ID: **HMF-MW0006-037.5-20140923**	DATE: 9-23

PURGING DATA

WELL DIAMETER (in): 1	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 35.00 ft. to 40.00 ft.	STATIC DEPTH TO WATER (ft): .05	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)

Liters

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) .005 X 45 + 0.5 = 0.725

Liters

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGE INITIATED AT: 13:45	PURGE ENDED AT: 14:05	TOTAL VOLUME PURGED (Liters): 2.5

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
13:45	0	0	.200	.05		Initiated purge					
13:50	1	1	.100	.75	7.29	28.38	4790	3.10	23	-155	clear
13:55	.5	1.5	.100	.75	7.24	28.39	4678	.62	20	-150	clear
14:00	.5	2	.100	.77	7.23	28.19	4777	.60	15	-151	clear
14:05	.5	2.5	.100	.77	7.19	28.21	4763	.57	10	-147	clear
					14:10	Sample time					

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ Ron Linton Ttnus	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 14:10	SAMPLING ENDED AT: 14:15
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ____ µm Filtration Equipment Type:	MS/MSD: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
PP	3	CG	40 mL	HCL	NONE	<2	Select VOCs (TCFM) /8260B	RFPP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

APPENDIX D

ANALYTICAL RESULTS

GROUNDWATER MONITORING EVENTS

- **PRE-STARTUP BASELINE – SDG FA12519**
- **102nd MONTH: MARCH 2014 – SDG FA13725**
- **106th MONTH: JULY 2014 – SDG FA16590**
- **108th MONTH: SEPTEMBER 2014 – SDG FA18590**

Full analytical reports (SDG packages) provided on project CD

PRE-STARTUP BASELINE – SDG FA12519

Report of Analysis

Client Sample ID:	HMF-NLP-MW0004-037.5-20140213		
Lab Sample ID:	FA12519-1	**Date Sampled:**	02/13/14
Matrix:	AQ - Ground Water	**Date Received:**	02/15/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	HMF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B096469.D	250	02/26/14	WV	n/a	n/a	VB3932
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	14600	500	130	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	96%		83-118%
17060-07-0	1,2-Dichloroethane-D4	95%		79-125%
2037-26-5	Toluene-D8	102%		85-112%
460-00-4	4-Bromofluorobenzene	100%		83-118%

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	HMF-ASW 34-40-20140213		
Lab Sample ID:	FA12519-2	**Date Sampled:**	02/13/14
Matrix:	AQ - Ground Water	**Date Received:**	02/15/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	HMF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	B096467.D	1	02/26/14	WV	n/a	n/a	VB3932
Run #2 [b]	B096471.D	2	02/26/14	WV	n/a	n/a	VB3932

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	79.8 [c]	4.0	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	97%	99%	83-118%
17060-07-0	1,2-Dichloroethane-D4	96%	98%	79-125%
2037-26-5	Toluene-D8	104%	103%	85-112%
460-00-4	4-Bromofluorobenzene	101%	103%	83-118%

(a) Confirmation run.
(b) Sample vial(s) contained significant headspace; reported results are considered minimum values.
(c) Result is from Run# 2

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	HMF-ASW 38-31-20140213		
Lab Sample ID:	FA12519-3	**Date Sampled:**	02/13/14
Matrix:	AQ - Ground Water	**Date Received:**	02/15/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	HMF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B096468.D	1	02/26/14	WV	n/a	n/a	VB3932
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	20.8	2.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	97%		83-118%
17060-07-0	1,2-Dichloroethane-D4	95%		79-125%
2037-26-5	Toluene-D8	100%		85-112%
460-00-4	4-Bromofluorobenzene	98%		83-118%

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	HMF-ASW 39-35-20140213		
Lab Sample ID:	FA12519-4	**Date Sampled:**	02/13/14
Matrix:	AQ - Ground Water	**Date Received:**	02/15/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	HMF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B096470.D	100	02/26/14	WV	n/a	n/a	VB3932
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	4160	200	50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		83-118%
17060-07-0	1,2-Dichloroethane-D4	96%		79-125%
2037-26-5	Toluene-D8	97%		85-112%
460-00-4	4-Bromofluorobenzene	100%		83-118%

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

102nd MONTH: MARCH 2014 – SDG FA13725

Report of Analysis

Client Sample ID:	HMF-NLP-MW0001-008.5-20140327		
Lab Sample ID:	FA13725-1	**Date Sampled:**	03/27/14
Matrix:	AQ - Ground Water	**Date Received:**	03/29/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	HMF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J093350.D	5	04/10/14	MM	n/a	n/a	VJ4642
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	192	10	2.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		83-118%
17060-07-0	1,2-Dichloroethane-D4	96%		79-125%
2037-26-5	Toluene-D8	99%		85-112%
460-00-4	4-Bromofluorobenzene	96%		83-118%

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	HMF-NLP-MW0001-037.5-20140327		
Lab Sample ID:	FA13725-2	**Date Sampled:**	03/27/14
Matrix:	AQ - Ground Water	**Date Received:**	03/29/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	HMF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J093298.D	1	04/09/14	MM	n/a	n/a	VJ4640
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	0.79	2.0	0.50	ug/l	I

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		83-118%
17060-07-0	1,2-Dichloroethane-D4	90%		79-125%
2037-26-5	Toluene-D8	100%		85-112%
460-00-4	4-Bromofluorobenzene	99%		83-118%

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	HMF-NLP-MW0004-037.5-20140327		
Lab Sample ID:	FA13725-3	**Date Sampled:**	03/27/14
Matrix:	AQ - Ground Water	**Date Received:**	03/29/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	HMF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J093295.D	1	04/09/14	MM	n/a	n/a	VJ4640
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	26.0	2.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		83-118%
17060-07-0	1,2-Dichloroethane-D4	92%		79-125%
2037-26-5	Toluene-D8	100%		85-112%
460-00-4	4-Bromofluorobenzene	96%		83-118%

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	HMF-MW0005-037.5-20140327		
Lab Sample ID:	FA13725-4	**Date Sampled:**	03/27/14
Matrix:	AQ - Ground Water	**Date Received:**	03/29/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	HMF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J093351.D	5	04/10/14	MM	n/a	n/a	VJ4642
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	286	10	2.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		83-118%
17060-07-0	1,2-Dichloroethane-D4	94%		79-125%
2037-26-5	Toluene-D8	102%		85-112%
460-00-4	4-Bromofluorobenzene	95%		83-118%

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

106th MONTH: JULY 2014 – SDG FA16590

Report of Analysis

Client Sample ID:	HMF-DLP-MW0004-037.5-20140710		
Lab Sample ID:	FA16590-1	**Date Sampled:**	07/10/14
Matrix:	AQ - Ground Water	**Date Received:**	07/12/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	HMF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B099963.D	2.5	07/24/14	DP	n/a	n/a	VB4061
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	123	5.0	1.3	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		83-118%
17060-07-0	1,2-Dichloroethane-D4	101%		79-125%
2037-26-5	Toluene-D8	103%		85-112%
460-00-4	4-Bromofluorobenzene	104%		83-118%

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	HMF-DLP-MW0005-037.5-20140710		
Lab Sample ID:	FA16590-2	**Date Sampled:**	07/10/14
Matrix:	AQ - Ground Water	**Date Received:**	07/12/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	HMF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B099964.D	50	07/24/14	DP	n/a	n/a	VB4061
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	2650	100	25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		83-118%
17060-07-0	1,2-Dichloroethane-D4	98%		79-125%
2037-26-5	Toluene-D8	101%		85-112%
460-00-4	4-Bromofluorobenzene	105%		83-118%

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	HMF-DLP-MW0001-037.5-20140710		
Lab Sample ID:	FA16590-3	**Date Sampled:**	07/10/14
Matrix:	AQ - Ground Water	**Date Received:**	07/12/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	HMF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	B099965.D	1	07/24/14	DP	n/a	n/a	VB4061
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	51.2	2.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		83-118%
17060-07-0	1,2-Dichloroethane-D4	102%		79-125%
2037-26-5	Toluene-D8	98%		85-112%
460-00-4	4-Bromofluorobenzene	103%		83-118%

(a) Sample was treated with an anti-foaming agent.

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	HMF-DLP-MW0001-008.5-20140710		
Lab Sample ID:	FA16590-4	**Date Sampled:**	07/10/14
Matrix:	AQ - Ground Water	**Date Received:**	07/12/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	HMF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B099966.D	5	07/24/14	DP	n/a	n/a	VB4061
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	117	10	2.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		83-118%
17060-07-0	1,2-Dichloroethane-D4	101%		79-125%
2037-26-5	Toluene-D8	96%		85-112%
460-00-4	4-Bromofluorobenzene	99%		83-118%

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

108th MONTH: SEPTEMBER 2014 – SDG FA18590

Report of Analysis

Client Sample ID: HMF-MW0005-037.5-20140923
Lab Sample ID: FA18590-1
Matrix: AQ - Ground Water
Method: SW846 8260B
Project: HMF

Date Sampled: 09/23/14
Date Received: 09/25/14
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	O25403.D	100	10/06/14	MM	n/a	n/a	VO983
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	2130	200	50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	85%		83-118%
17060-07-0	1,2-Dichloroethane-D4	87%		79-125%
2037-26-5	Toluene-D8	91%		85-112%
460-00-4	4-Bromofluorobenzene	90%		83-118%

U = Not detected MDL = Method Detection Limit
PQL = Practical Quantitation Limit
L = Indicates value exceeds calibration range
I = Result > = MDL but < PQL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	HMF-NLP-MW0004-037.5-20140923		
Lab Sample ID:	FA18590-2	**Date Sampled:**	09/23/14
Matrix:	AQ - Ground Water	**Date Received:**	09/25/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	HMF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	O25404.D	100	10/06/14	MM	n/a	n/a	VO983
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	3370	200	50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	87%		83-118%
17060-07-0	1,2-Dichloroethane-D4	88%		79-125%
2037-26-5	Toluene-D8	90%		85-112%
460-00-4	4-Bromofluorobenzene	90%		83-118%

U = Not detected MDL = Method Detection Limit
PQL = Practical Quantitation Limit
L = Indicates value exceeds calibration range
I = Result > = MDL but < PQL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	HMF-NLP-MW0001-037.5-20140923		
Lab Sample ID:	FA18590-3	**Date Sampled:**	09/23/14
Matrix:	AQ - Ground Water	**Date Received:**	09/25/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	HMF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	O25448.D	1	10/07/14	TD	n/a	n/a	VO984
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	1.1	2.0	0.50	ug/l	I

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	87%		83-118%
17060-07-0	1,2-Dichloroethane-D4	87%		79-125%
2037-26-5	Toluene-D8	88%		85-112%
460-00-4	4-Bromofluorobenzene	88%		83-118%

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	HMF-NLP-MW0001-008.5-20140923		
Lab Sample ID:	FA18590-4	**Date Sampled:**	09/23/14
Matrix:	AQ - Ground Water	**Date Received:**	09/25/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	HMF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	O25405.D	10	10/06/14	MM	n/a	n/a	VO983
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	132	20	5.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	86%		83-118%
17060-07-0	1,2-Dichloroethane-D4	86%		79-125%
2037-26-5	Toluene-D8	90%		85-112%
460-00-4	4-Bromofluorobenzene	90%		83-118%

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	HMF-NLP-MW0001-050.5-20140922		
Lab Sample ID:	FA18590-5	**Date Sampled:**	09/22/14
Matrix:	AQ - Ground Water	**Date Received:**	09/25/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	HMF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	M77814.D	1	10/03/14	RB	n/a	n/a	VM3292
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	10.3	2.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	95%		83-118%
17060-07-0	1,2-Dichloroethane-D4	89%		79-125%
2037-26-5	Toluene-D8	93%		85-112%
460-00-4	4-Bromofluorobenzene	96%		83-118%

(a) Sample was treated with an anti-foaming agent.

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	HMF-MW0009-037.5-20140923		
Lab Sample ID:	FA18590-6	**Date Sampled:**	09/23/14
Matrix:	AQ - Ground Water	**Date Received:**	09/25/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	HMF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J0960644.D	1	10/04/14	DP	n/a	n/a	VJ4791
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	45.4	2.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		83-118%
17060-07-0	1,2-Dichloroethane-D4	107%		79-125%
2037-26-5	Toluene-D8	94%		85-112%
460-00-4	4-Bromofluorobenzene	91%		83-118%

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	HMF-MW0007-037.5-20140923		
Lab Sample ID:	FA18590-7	**Date Sampled:**	09/23/14
Matrix:	AQ - Ground Water	**Date Received:**	09/25/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	HMF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J0960645.D	1	10/04/14	DP	n/a	n/a	VJ4791
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	0.50 U	2.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		83-118%
17060-07-0	1,2-Dichloroethane-D4	106%		79-125%
2037-26-5	Toluene-D8	93%		85-112%
460-00-4	4-Bromofluorobenzene	93%		83-118%

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	HMF-MW0008-037.5-20140923		
Lab Sample ID:	FA18590-8	**Date Sampled:**	09/23/14
Matrix:	AQ - Ground Water	**Date Received:**	09/25/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	HMF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J0960646.D	1	10/04/14	DP	n/a	n/a	VJ4791
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	0.93	2.0	0.50	ug/l	I

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		83-118%
17060-07-0	1,2-Dichloroethane-D4	108%		79-125%
2037-26-5	Toluene-D8	94%		85-112%
460-00-4	4-Bromofluorobenzene	91%		83-118%

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	HMF-MW0006-037.5-20140923		
Lab Sample ID:	FA18590-9	**Date Sampled:**	09/23/14
Matrix:	AQ - Ground Water	**Date Received:**	09/25/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	HMF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J0960647.D	1	10/04/14	DP	n/a	n/a	VJ4791
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	14.1	2.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		83-118%
17060-07-0	1,2-Dichloroethane-D4	104%		79-125%
2037-26-5	Toluene-D8	95%		85-112%
460-00-4	4-Bromofluorobenzene	94%		83-118%

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound