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NAS WILLOW GROVE
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Interim Groundwater Monitoring Report
Round 1
Site 3 - Ninth Street Landfill

Naval Air Station
Joint Reserve Base
Willow Grove, Pennsylvania

Naval Facilities Engineering Command
Mid-Atlantic

Contract No. N62467-04-D-0055
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TETRA TECH

SITE 3 - NINTH STREET LANDFILL
INTERIM GROUNDWATER MONITORING REPORT
ROUND 1

INTRODUCTION

Tetra Tech NUS, Inc. (Tetra Tech) has performed Round 1 of Interim Groundwater Monitoring (IGWM) at Site 3 –Ninth Street Landfill at the Naval Air Station Joint Reserve Base (NAS JRB) Willow Grove, Pennsylvania. The intent of the IGWM is to provide interim groundwater data to evaluate the status of groundwater in the vicinity of Site 3 while the Remedial Investigation/Feasibility Study (RI/FS) process continues with the Navy and regulatory agencies studying the extent of landfill cells discovered at Site 3 in 2007. IGWM Round 1 field work, consisting of groundwater level measurements, groundwater sampling and surface water sampling at Site 3 was performed from March 10 to March 20, 2008 in accordance with the approved Uniform Federal Procurement (UFP) Sampling and Analysis Plan (SAP) for Interim Groundwater Monitoring; Site 3- Ninth Street Landfill (Tetra Tech, March 2008).

This report presents a summary of IGWM Round 1 field operations and results to provide Navy and regulatory agency decision makers with current groundwater quality information to use while the Navy continues with the RI/FS process at Site 3.

SITE DESCRIPTION AND PHYSICAL SETTING

NAS JRB Willow Grove, Pennsylvania is located in Horsham Township, Montgomery County in southeastern Pennsylvania, approximately 20 miles north of the city of Philadelphia. The Ninth Street Landfill occupies about 9 acres immediately north of Ninth Street along the western boundary of NAS JRB Willow Grove (Figure 1).

The Ninth Street Landfill was active from 1960 to 1967. Wastes reportedly disposed in the landfill include trichloroethene (TCE), paint wastes, asbestos, polychlorinated biphenyls (PCB) fluids, general refuse, metal scrap, sewage sludge, and industrial pretreatment plant sludge. Wastes were dumped in trenches, burned, and buried. Subsequent to the landfill's closure, a salvage yard was established over a large portion of the landfill for the handling of empty drums, discarded equipment, and transformers containing PCBs.

The Ninth Street Landfill is located in an undeveloped area between Ninth Street and Dawes Road. The ground surface is well vegetated with a mixture of grass and woody vegetation. The ground surface slopes at a grade of approximately five percent in a generally north-northwest direction toward a wetland area, intermittent stream, and storm water retention basin located approximately 200 feet from the northern limit of

the site. Surface recreational facilities including a pavilion, playground and baseball diamond are located within or immediately adjacent to the site.

NAS JRB Willow Grove is located within the Triassic Basin of southeastern Pennsylvania. The bedrock underlying Air Station consists of the middle arkose member of the Late Triassic age Stockton Formation. Soil borings and monitoring well boreholes drilled in the vicinity of the Site 3 typically encountered the top of bedrock at a depth of 10 feet to 15 feet below the ground surface. The overburden consists of silty to sandy clay that grade downward to weathered siltstone or shale. The overburden is generally thinnest (3 feet to 5 feet) in the northwest portion of the site.

The maximum depth of the monitoring well boreholes at Site 3 is 225 feet. The bedrock to this depth typically consists of alternating sequences of sandstone, siltstone, and shale. In general, the lithologic units at this site are rather thick and fairly continuous, although it is not unusual to encounter local, finer-grained lenses within a generally coarser matrix within any particular unit.

The major source of groundwater in the vicinity of NAS JRB Willow Grove is the fractured bedrock of the Stockton Formation. These rocks form a multi-aquifer system of relatively discrete water-bearing zones separated by less permeable zones. Transmissivity and groundwater movement within water-bearing zones are greater parallel to bedding than across bedding. Groundwater is generally first encountered between 5 feet and 25 feet bgs.

Groundwater within the Stockton Formation locally occurs under both unconfined and confined conditions. The unconfined conditions generally extend to a subsurface depth of about 75 to 100 feet, depending on the local lithologies. Confined conditions are generally encountered below a depth of about 150 feet. A semi-confined or transitional aquifer lies between the unconfined and confined aquifers. Although significant amounts of groundwater may be held in storage within the primary porosity of the fine- to medium-grained sandstones, groundwater migration is chiefly through the secondary porosity created by fractures and joints and along bedding-plane partings. The finer grained shale and siltstone beds typically have very low permeability. In addition, fractures and joints are typically not as well developed in these finer grained beds. Consequently, the shale and siltstone units may act as confining layers to groundwater flow.

PREVIOUS GROUNDWATER INVESTIGATIONS

A Site Inspection (SI) was completed in 1990 (EA Engineering, May 1990). Seven monitoring wells were installed and sampled for full target compound list/target analyte list (TCL/TAL) parameters, total organic carbon, and total petroleum hydrocarbons. Four of the wells, 03MW01S, 03MW02S, 03MW03S, and

03MW04S, were shallow, 4-inch wells designed to intercept the water table, and three of the wells, 03MW01SI, 03MW03SI, and 03MW04SI, were deeper, 2-inch diameter wells.

During the Phase I Remedial Investigation (Halliburton NUS Corporation, 1993), four new bedrock monitoring wells were installed: 03MW01I, 03MW03I, 03MW04I, and 03MW05S. Monitoring well 03MW05S was installed upgradient of the 03MW01 well cluster to investigate the tetrachloroethene (PCE) contamination that was detected upgradient of the landfill. Monitoring wells 03MW01I, 03MW03I, and 03MW04I were installed to investigate groundwater quality in the deeper portion of the aquifer at these well cluster locations. The four new and seven existing monitoring wells were sampled for TAL metals and full TCL organic compounds in September 1991. PCE was detected in eight wells at concentrations ranging from 5 ug/l to 61 ug/l. There were no semivolatiles detected at levels exceeding reference criteria during Phase I.

During the Phase II Remedial Investigation (Brown & Root Environmental, 1996), a total of seven new monitoring wells were installed: 03MW02SI, 03MW02I, 03MW05I, 03MW06S, 03MW06SI, 03MW06I, and 03MW07S. The 03MW06 cluster was installed upgradient of the 03MW05 cluster to further investigate the PCE contamination detected upgradient of the landfill. Samples were collected from all of the new and existing wells in June 1997 and analyzed for TAL metals and full TCL organic compounds. PCE was detected in eleven wells at concentrations ranging from 5 ug/l to 39 ug/l. Only one semivolatile organic compound (SVOC), bis(2-ethylhexyl) phthalate, was detected during the Phase II sampling round, in 03MW05I (6J ug/l) and 03MW06SI (11 ug/l).

During the Phase II follow-on activities (Tetra Tech, September 2006), two new wells, 03MW08S and 03MW08D, were installed upgradient of the 03MW06 cluster in a further attempt to identify the Site 3 groundwater source, since PCE had been detected at the upgradient monitoring well 03MW06. Construction details for all wells are listed in Table 1. Groundwater samples were obtained from all existing and newly installed permanent monitoring wells at Site 3 in February 2006. There was no sample collected from 03MW03I because the well was obstructed. The samples from the two new wells, 03MW08S and 03MW08D, were analyzed for TCL VOCs and SVOCs. The samples from the remaining wells were analyzed for TCL volatile organic compounds (VOCs) only. PCE was detected in sixteen wells at concentrations ranging from 0.23 ug/l to 14 ug/l. There were no semivolatiles detected in the two new wells.

SCOPE OF THE GROUNDWATER INVESTIGATION

All of the existing Site 3 monitoring wells were sampled. In addition, one off-Base downgradient well (Matrix Development Lot 1 Irrigation well) was sampled. Two surface water samples, one upgradient

(03SW10) and one downgradient (03SW11) of the off-Base flowing artesian well, were collected because the off-Base well discharges to surface water. Sampling locations are illustrated on Figure 2.

Groundwater elevation measurements were obtained to refine the interpreted directions of groundwater flow (see Figures 3 and 4).

Groundwater samples were collected at each of 20 monitoring well locations, one off-Base well, and two surface water locations for TCL VOCs, 1,4-Dioxane and TAL total metals analysis. TAL dissolved metals was performed on samples collected at the 20 monitoring wells and the off-Base well. Hexavalent chromium was analyzed on samples collected at eight well locations: 03MW01S, 03MW01I, 03MW03I, 03MW05S, 03MW05I, 03MW06S, 03MW06SI, and 03MW06I.

FIELD INVESTIGATION

Sampling Methods

All Site 3 monitoring wells are constructed from PVC well screens and casing. Each of the monitoring wells was purged prior to sampling. Monitoring wells with a screen length of 10 feet or less were purged and sampled following the low-flow sampling techniques prescribed by the EPA Region 3 Recommended Procedure (Bulletin QAD023 - June 16, 1999). The monitoring wells were purged and sampled using a submersible pump with an adjustable flow rate. In each well, the Redi-Flo2 pump was positioned within the well screen interval at the depth of the water-producing fracture, which was identified using the available boring logs and geophysical logs. The pumping rate was set at between 0.1 to 0.4 liter/minute, and water levels were monitored to assure that the static water level was not drawn down into the well screen. Purged water was monitored for pH, specific conductivity, temperature, turbidity, redox potential, and dissolved oxygen every five minutes. When the levels of these parameters stabilized, and a minimum of two saturated screen volumes had been removed from the well, the purging was considered complete and the groundwater samples were obtained. Parameter stabilization was defined as three successive readings (taken at least 5 minutes apart) within 0.1 unit for pH, 3% for conductivity, 10% for turbidity and dissolved oxygen, and 10 mV for redox potential. The vertical location of the pump, the required minimum purge volume, and the calculations for parameter stabilization were recorded on the groundwater sample log sheet. Sample collection log sheets are included in Appendix B.

Monitoring wells having a screen length greater than 10 feet were sampled by purging three to five well volumes prior to sample collection. Water quality indicator parameters such as pH, specific conductivity, temperature, turbidity, redox potential, and dissolved oxygen were recorded for every half well volume. When three consecutive readings had reached stabilization, and at least three well volumes had been purged, the samples were collected. The Redi-Flo2 pump was used to purge wells and collect samples.

Well 03MW01SI has damage that prevents the use of a submersible pump in the well. This well was sampled using a small diameter bailer after purging three well volumes with a peristaltic pump.

The off-Base, Lot 1 irrigation well (designated 03IW01 for this investigation), which is an open-bedrock borehole flowing artesian well, was sampled by directly filling the sample bottles from the flow of water from the well. Surface water samples were collected by directly filling the bottles from the stream. The sampling methods for each well are summarized in Table 2.

Groundwater Elevation Measurements

Water-level elevation measurements were performed on March 18, 2008. Elevation measurements were obtained during a day of no precipitation, and at least 48 hours after the conclusion of any precipitation event. Static water levels were measured in all available wells using an electronic water-level indicator and were recorded to the nearest 0.01 foot. The static water levels in the flowing artesian wells were obtained by extending the casing stick-up of the wells and measuring the height of the water above the reference point elevation. Groundwater elevation data are included in Appendix C.

RESULTS OF INVESTIGATION

Hydrogeology

The hydraulic head data indicate that two hydrogeologic units, an upper unconfined zone and a deeper semi-confined to confined zone, exist beneath Site 3. The confining conditions at any monitoring well cluster location are not created by the presence of any single confining layer or geologic unit and cannot be predicted solely by well depth, but are related to the surface elevation of that cluster location, the elevation of the recharge area for the hydrogeologic unit being monitored, and the subsurface depth (or elevation) of the well screen.

Monitoring wells at the site are completed in both of these groundwater zones, based on the vertical distribution of hydraulic head. Semi-confined to confined conditions are present in monitoring wells 03MW01I, 03MW02I, 03MW03SI, 03MW03I, 03MW04SI and 03MW04I. Monitoring wells 03MW03I, 03MW03SI, 03MW04SI, and 03MW04I are typically flowing.

Groundwater Flow Directions

The groundwater flow directions for the unconfined groundwater zone and the confined groundwater zone are illustrated in Figure 3 (unconfined zone) and Figure 4 (confined zone). The maps were constructed

using the groundwater elevations measured 18 March 2008. These results are similar to the site-specific groundwater flow directions interpreted for previous reports.

Groundwater at the water table and within the unconfined groundwater zone beneath Site 3 flows in an overall northwestward direction. The configuration of the water table appears to be a subdued reflection of the surface topography, as is typical for this area. Groundwater in the confined zone flows in a generally northward direction.

Data Usability Evaluation

The data collected during the groundwater investigation were determined to be of sufficient quality to be used to evaluate interim groundwater conditions. Quality assurance/quality control (QA/QC) samples collected during the March 2008 sampling event included four duplicate samples, one matrix spike (MS), one matrix spike duplicate (MSD), one rinseate blank, one field blank, and seven trip blanks. SW-846 methods were used for VOCs, 1,4-dioxane, and metals. Data validation was performed on all data in accordance with the final Sampling and Analysis Plan (SAP) (Tetra Tech, March, 1998) following Tetra Tech SOPs DV-02 and DV-04 and EPA Functional Guidelines for Organic and Inorganic Data Review, as amended for use within EPA Region 3 (9/94), in conjunction with method specific criteria presented in the SAP. Data validation summary narrative reports are included in Appendix D.

No sampling issues or field conditions affected data usability. Field duplicate precision was met (within 30%) for all analytes. No problems were associated with data representativeness with the exception of the field quality control (QC) blanks. The field QC blanks were non-detect for organic compounds with the exception of a low level of the commonly reported laboratory contaminant methylene chloride. Several inorganic analytes were detected in the field QC blanks. If an analyte was within the action level it was qualified "B" for blank contamination and should be considered unusable.

For all detected chemicals in groundwater, the quantitation limits (QLs) were sufficiently sensitive (below project action limits [PALs]) with the exception of trichloroethene, bromodichlormoethane, and arsenic. Trichloroethene had a QL above the PAL; however, the method detection limit (MDL) was below the PAL. Bromodichloromethane and arsenic had QLs and MDLs above the PAL. There were several detections of arsenic above the PALand bromodichloromethane was detected in one sample at a level above the PAL.

For non-detected chemicals in groundwater, the QLs exceeded the RBC values for some compounds. For these compounds, the MDLs were sufficiently sensitive with the exception of 1,2-dibromo-3-chloropropane, 1,2-dibromoethane, 1,2-dichloroethane, cis-1,3-dichloropropene, and vinyl chloride.

Some usable results were flagged with the qualifiers J, K, L, U, UL, and UJ because the data were outside quality control criteria. Results were flagged estimated (J) by the laboratory if the positive concentration was below the QL.

Unusable results were flagged with B (blank contamination) and R (rejected). Non-detected VOC results for 2-butanone and acetone were qualified as unusable because the initial calibration did not meet criteria. The non-detected silver results were qualified as unusable because the matrix spike recovery did not meet QC criteria.

Data validation qualifications and discussion can be found in Appendix D.

Surface Water Analytical Results

Two surface water samples (03SW10 and 03SW11) were collected from the off-Base surface water stream. Samples were analyzed for TCL VOCs, 1,4-Dioxane and TAL total metals analysis. Figure 2 presents sample locations. Table 3 presents a comparison of detected compounds to the EPA Region 3 freshwater benchmark screening criteria. Figure 5 shows sample locations and concentrations of compounds that exceed the Region 3 freshwater benchmark criteria. Appendix A presents a summary of groundwater and surface water analytical results.

The Region 3 freshwater benchmark criteria were exceeded for aluminum (174 ug/l at 03SW11), barium (84.1ug/l at 03SW10 and 113 ug/l at 03SW11), iron (430 ug/l at 03SW10 and 1,060 ug/l at 03SW11), and manganese (197 ug/l at 03SW11). Toluene was detected at 03SW10 at a trace level (0.21J ug/l) below screening criteria. No other VOCs were detected in surface water samples.

Groundwater Analytical Results

The samples from all 20 monitoring wells and the off-Base well were analyzed for TCL VOCs, 1,4-dioxane, TAL total metals and TAL dissolved metals. Hexavalent chromium analysis was performed on samples from eight well locations: 03MW01S, 03MW01I, 03MW03I, 03MW05S, 03MW05I, 03MW06S, 03MW06SI, and 03MW06I.

Figure 2 presents sample locations. Table 4 presents a comparison of detected compounds to EPA Region 3 RBCs Tap Water. Table 5 presents a historical comparison of the PCE concentrations detected in Site 3 monitoring wells. Figure 5 shows sample locations and concentrations of compounds that exceed EPA Region 3 RBCs Tap Water screening levels. Arsenic, bromodichloromethane,

dibromochloromethane and tetrachloroethene (PCE) were identified at concentrations above the screening levels. Appendix A presents a summary of groundwater and surface water analytical results.

There was no 1, 4-dioxane or hexavalent chromium detected.

Arsenic was detected at concentrations exceeding reference criteria at unfiltered and filtered groundwater samples. In the filtered groundwater samples, arsenic was detected in 03MW01I (6.4 ug/l), 03MW02I (1.1J ug/l), 03MW03I (1.5J ug/l), 03MW03SI (0.5J ug/l) , 03MW06I (10.1 ug/l) and 03IW01 (0.5J ug/l). In the unfiltered groundwater samples, arsenic was detected in 03MW01I (6.0 ug/l), 03MW02I (1J ug/l), 03MW03I (1.4J ug/l), 03MW03SI (0.5J ug/l), 03MW04I (0.6J ug/l), 03MW04SI (0.6J ug/l), 03MW05I (0.5J ug/l), 03MW06I (9.1 ug/l) and 03MW08D (0.5J ug/l).

PCE was detected in 03MW01S (1.9 ug/l), 03MW01SI (8.8J ug/l), 03MW02I (7.8 ug/l), 03MW02SI (3.3 ug/l), 03MW03I (6.9 ug/l), 03MW03SI (12 ug/l), 03MW03S (2.5 ug/l), 03MW04S (4.5 ug/l), 03MW04SI (4.6 ug/l), 03MW07S (1.1 ug/l), 03MW08D (1 ug/l) and 03IW01 (6.3 ug/l) exceeding screening criteria.

Bromodichloromethane (1.1 ug/l) and dibromochloromethane (1.5 ug/l) were detected in 03MW04S exceeding the RBC. Several other VOCs were detected at concentrations below reference criteria. Most of these were detected in 03MW08D.

CONCLUSIONS

The March 2008 IGWM Round 1 groundwater sampling results resemble the February 2006 sampling results, so it would be difficult to point to a verifiable trend based on those two sampling events. However, when the entire data set from 1991 through 2008 (see Table 5) is examined, a trend does seem to present itself.

In 1991, 100% (eight of eight) Site 3 groundwater sample results equaled or exceeded the PCE MCL of 5 ug/L. In 1997, 91% (ten of eleven) sample results equaled or exceeded the PCE MCL of 5 ug/L. In 2006, 21% (four of nineteen) sample results equaled or exceeded the PCE MCL of 5 ug/L. And finally, in 2008, 20% (four of twenty) sample results equaled or exceeded the PCE MCL of 5 ug/L, indicating a decreasing trend over time. Also, the maximum concentration of PCE encountered in Site 3 groundwater in 1997 (56 ug/L) compared to the maximum in 2008 (12 ug/L), appears to indicate a decreasing trend over time.

Analytical results indicate that the PCE contamination has migrated off-Base to the adjacent golf course property. PCE was detected in the off-Base Lot 1 irrigation well at 6.3 ug/l. However, surface water samples upstream and downstream of where this artesian flow enters surface flow did not show PCE.

TABLES

TABLE 1

Monitoring Well Construction Summary
Site 3 - Ninth Street Landfill
NASJRB, Willow Grove, Pennsylvania

Monitoring Well	Well Diameter (inches)	Screen Interval (ft bgs)	Sand-Pack Interval (ft bgs)	Elevation TOC (ft amsl)
Site Inspection				
03MW01S	4	12 – 32	10 - 33	347.49
03MS01SI	2	60 – 80	57 - 81	346.98
03MW02S	4	4.5 – 22.5	4 - 23	326.15
03MW03S	4	5 – 20	4 - 22	312.96
03MW03SI	2	60 – 80	58 - 81	313.75
03MW04S	4	5 - 35	4 - 37	324.49
03MW04SI	2	60 – 80	53 - 81	323.87
Phase I RI				
03MW01I	4	159 - 179	156 – 179.5	347.50
03MW03I	4	148.5 – 168.5	145 - 171	315.00
03MW04I	4	148 - 168	145 - 169	324.85
03MW05S	4	17 - 37	15 – 37.5	362.90
Initial Phase II RI				
03MW02SI	2	55 - 65	52 - 70	326.33
03MW02I	2	134 - 144	130 - 144	326.38
03MW05I	2	82 - 92	78 - 96	362.93
03MW06S	2	26 - 36	25 - 38	367.00
03MW06SI	2	75 - 85	72 - 85	366.86
03MW06I	2	140 - 150	136 - 150	366.82
03MW07S	2	34 - 44	30.5 - 50	324.90
Phase II RI Follow-on Activities				
03MW08S	2	38 - 68	33 – 73	365.59
03MW08D	2	163 - 173	158 - 178	365.63

TABLE 2

Groundwater Sampling Methods
Site 3 - Ninth Street Landfill

Sampling Location	Well Diameter (inches)	Screen Interval (ft bgs)	Elevation TOC (ft amsl)	Sampling Method	Note
03MW01S	4	12 - 32	347.49	Purging and Sampling	Redi-Flo2 Pump
03MS01SI	2	60 - 80	346.98	Purging and Sampling	Peristaltic Pump
03MW02S	4	4.5 - 22.5	326.15	Purging and Sampling	Redi-Flo2 Pump
03MW03S	4	5 - 20	312.96	Purging and Sampling	Redi-Flo2 Pump
03MW03SI	2	60 - 80	313.75	Purging and Sampling	Redi-Flo2 Pump
03MW04S	4	5 - 35	324.49	Purging and Sampling	Redi-Flo2 Pump
03MW04SI	2	60 - 80	323.87	Purging and Sampling	Redi-Flo2 Pump
03MW01I	4	159 - 179	347.50	Purging and Sampling	Redi-Flo2 Pump
03MW03I	4	148.5 - 168.5	315.00	Purging and Sampling	Redi-Flo2 Pump
03MW04I	4	148 - 168	324.85	Purging and Sampling	Redi-Flo2 Pump
03MW05S	4	17 - 37	362.90	Purging and Sampling	Redi-Flo2 Pump
03MW02SI	2	55 - 65	326.33	Low-Flow Purging and Sampling	Redi-Flo2 Pump
03MW02I	2	134 - 144	326.38	Low-Flow Purging and Sampling	Redi-Flo2 Pump
03MW05I	2	82 - 92	362.93	Low-Flow Purging and Sampling	Redi-Flo2 Pump
03MW06S	2	26 - 36	367.00	Low-Flow Purging and Sampling	Redi-Flo2 Pump
03MW06SI	2	75 - 85	366.86	Low-Flow Purging and Sampling	Redi-Flo2 Pump
03MW06I	2	140 - 150	366.82	Low-Flow Purging and Sampling	Redi-Flo2 Pump
03MW07S	2	34 - 44	324.90	Low-Flow Purging and Sampling	Redi-Flo2 Pump
03MW08S	2	38 - 68	365.59	Low-Flow Purging and Sampling	Redi-Flo2 Pump
03MW08D	2	163 - 173	365.63	Low-Flow Purging and Sampling	Redi-Flo2 Pump
03IW 01				Bottle Ware	
03SW10				Bottle Ware	
03SW11				Bottle Ware	

TABLE 3
DATA SUMMARY OF POSITIVE ANALYTICAL RESULTS
SITE 3 IGWM - SURFACE WATER SAMPLES
NAS JRB WILLOW GROVE, WILLOW GROVE, PENNSYLVANIA

Sample ID:	Region 3	03SW10-20080319		03SW11-20080319	
Sample Date:	Freshwater	03/19/08		03/19/08	
Dup Of:	Benchmarks				
INORGANICS	**ug/L**	**ug/L**		**ug/L**	
Aluminum	87	80	U	174	
Barium	4	84.1		113	
Calcium	116,000	16400		22300	
Chromium	85	1.5	B	1.7	B
Cobalt	23	6	U	0.2	J
Copper	9	0.8	B	3	B
Iron	300	430		1060	
Lead	2.5	0.07	J	0.9	J
Magnesium	82,000	5800		7470	
Manganese	120	95.6		197	
Nickel	52	1.2	J	2	J
Potassium	53,000	1730		1880	
Silver	3.2	0.6	B	0.6	B
Sodium	680,000	7670		18800	
Vanadium	20	0.8	B	1.4	
Zinc	120	3.6	J	16	
VOLATILES	**ug/L**	**ug/L**		**ug/L**	
Toluene	2	0.21	J	1	U

DATA SUMMARY OF POSITIVE ANALYTICAL RESULTS
SITE 3 IGWM - SURFACE WATER SAMPLES
NAS JRB WILLOW GROVE, WILLOW GROVE, PENNSYLVANIA

Data Qualifiers:
B -- Positive result is considered to be an artifact of blank contamination, and should not be considered present.
J -- Value is considered estimated due to exceedance of technical quality control criteria or because result is less than the Contract Required Quantitation Limit (CRQL).
U -- Value is a non-detected result as reported by the laboratory.
UR -- Non-detected result is considered unusable due to exceedance of technical quality control criteria.

Shaded cells indicate that the value exceeds the Region 3 Freshwater Screening Benchmark.
http://www.epa.gov/reg3hwmd/risk/eco/btag/sbv/fw/screenbench.htm

Database source file: H:\WILLOWGROVE\SITE 3 GW\DATA SUMMARIES\MAY1908N412.DBF data retrieved on: 06/05/08

TABLE 4
DATA SUMMARY OF POSITIVE ANALYTICAL RESULTS
SITE 3 IGWM - GROUNDWATER SAMPLES
NAS JRB WILLOW GROVE, WILLOW GROVE, PENNSYLVANIA

Sample ID:	Project Action Limit	03IW01-20080319		03IW01-20080319-D		03MW01I-20080311		03MW01S-20080311		03MW01S-20080311-D		03MW01SI-20080320		03MW02I-20080318	
Sample Date:	Region 3 RBC	03/19/08		03/19/08		03/11/08		03/11/08		03/11/08		03/20/08		03/18/08	
Duplicate of:	Tap Water			03IW01-20080319						03MW01S-20080311					
TOTAL INORGANICS	ug/L	ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
Aluminum	3.70E+04	80	U	80	U	1160		80	U	80	U	80	U	80	U
Antimony	1.50E+01	2	U	2	U	1.2	J	1.2	J	0.7	J	2	U	2	U
Arsenic	4.5E-01*	6	U	6	U	6		6	U	6	U	6	U	1	J
Barium	7.30E+03	590		589		215		111		111		107		268	
Beryllium	7.30E+01	1	U	1	U	1	U	0.1	J	0.09	J	1	U	1	U
Cadmium	1.80E+01	1	U	1	U	0.1	J	1	U	1	U	1.1		1	U
Calcium		48600		47700		25000		7220		7250		17000		21400	
Chromium	1.10E+02	1.3	B	1.4	B	4.3		5		4.7		1.5	J	2	B
Cobalt		6	U	6	U	0.8	J	0.2	J	0.2	J	6	U	6	U
Copper	1.50E+03	6	U	0.6	B	0.6	J	0.3	J	0.3	J	0.4	J	0.7	B
Iron	2.60E+04	70	U	70	U	1200	K	110	K	140	K	70	U	70	U
Lead	1.50E+01	2	U	2	U	0.4	J	0.06	J	0.04	J	2	U	2	U
Magnesium		18500		18100		10600		1880		1880		2670		9550	
Manganese	7.30E+02	6	U	6	U	16.3		3	J	2.8	J	0.4	J	1.8	J
Mercury	3.70E+00	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Nickel	7.30E+02	1.9	J	1.9	J	3.9	J	3.8	J	3.9	J	1.7	J	1.4	J
Potassium		1050		1020		1480		670		600		560	U	660	
Selenium	1.80E+02	2	J	2	J	2	J	3	J	3	J	2	J	6	U
Silver	1.80E+02	0.6	B	0.6	B	1	U	1	U	1	U	0.6	B	0.6	B
Sodium		15000		14800		12700		12300		12300		9570		7020	
Vanadium	3.70E+01	1.4		1.5		0.5	J	1	U	1	U	0.4	B	1.8	
Zinc	1.10E+04	6	U	6	U	3	J	2.8	J	2.8	J	6	U	6	U
MISCELLANEOUS	mg/L					mg/L		mg/L		mg/L					
Hexavalent Chromium	1.10E-01	NA		NA		0.01	U	0.01	U	0.01	U	NA		NA	
DISSOLVED INORGANICS		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
Aluminum	3.70E+04	80	U	80	U	36	J	7	J	5	J	80	U	80	U
Antimony	1.50E+01	0.4	B	0.4	B	2	U	1.4	J	2	U	2	U	0.4	B
Arsenic	4.5E-01*	0.5	J	0.2	J	6.4		3	U	3	U	3	U	1.1	J
Barium	7.30E+03	520		473		199		104		102		106		245	
Beryllium	7.30E+01	1	U	1	U	1	U	0.2	J	1	U	1	U	1	U
Cadmium	1.80E+01	1	U	1	U	1	U	1	U	1	U	1.2		1	U
Calcium		53700		50100		24900		7690		7840		19000		24100	
Chromium	1.10E+02	3.1		2.7		3.5		6.1		6.3		1.3	J	2.3	
Cobalt		5	U	0.2	J	5	U	0.2	J	0.2	J	5	U	5	U
Copper	1.50E+03	5	U	5	U	5	U	5	U	5	U	5	U	0.3	J
Iron	2.60E+04	60	U	60	U	20	J	60	U	9	J	60	U	60	U
Magnesium		19200		17800		10400	L	1900	L	1930	L	2960		9740	
Manganese	7.30E+02	4	U	0.7	J	3.6	J	1.8	J	2	J	1.2	J	0.08	B
Mercury	3.70E+00	0.5	U	0.5	U	0.09	J	0.09	J	0.09	J	0.5	U	0.5	U
Nickel	7.30E+02	0.8	J	0.9	J	1.8	J	4.8	J	5.4		1.3	J	0.8	J
Potassium		1070		960		1560		790		780		580		840	
Selenium	1.80E+02	2	J	1	J	5	U	3	J	3	J	3	J	1	J
Sodium		16800		15600		13200		12700		12800		11400		8170	
Vanadium	3.70E+01	1.5		1.3		1		1	U	1	U	0.8	B	1.7	
Zinc	1.10E+04	5	U	5	U	0.4	J	1.8	J	1.5	J	0.6	J	6.5	
SEMIVOLATILES		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
1,4-Dioxane	6.10E+00	3	U	2.9	U	2.8	U	2.8	U	2.8	U	2.9	U	2.9	U
VOLATILES		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
1,1,1-Trichloroethane	1.70E+03	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	9.00E+02	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	3.50E+02	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethene (cis)	6.10E+01	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	1.70E-01	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromoform	8.5E+01*	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Tetrachloride	1.6E-00*	1	U	1	U	1	U	1	U	1	U	1	U	0.38	J
Chloroform	1.5E00*	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dibromochloromethane	1.3E00*	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methyl Tert-butyl Ether	2.60E+00	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	1.0E00*	6		6.3		1	U	1.9		1.9		8.8	J	7.8	
Toluene	2.30E+03	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	2.6E-01*	1	U	1	U	1	U	1	U	1	U	1	U	1	U

TABLE 4
DATA SUMMARY OF POSITIVE ANALYTICAL RESULTS
SITE 3 IGWM - GROUNDWATER SAMPLES
NAS JRB WILLOW GROVE, WILLOW GROVE, PENNSYLVANIA

Sample ID:	Project Action Limit	03MW02S-20080318		03MW02SI-20080318		03MW03I-20080317		03MW03S-20080317		03MW03SI-20080317		03MW03SI-20080317-D		03MW04I-20080314	
Sample Date:	Region 3 RBC	03/18/08		03/18/08		03/17/08		03/17/08		03/17/08		03/17/08		03/14/08	
Duplicate of:	Tap Water											03MW03SI-20080317			
TOTAL INORGANICS	ug/L	ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
Aluminum	3.70E+04	80	U	80	U	80	U	80	U	80	U	80	U	80	U
Antimony	1.50E+01	2	U	2	U	2	U	2	U	2	U	0.08	J	0.7	J
Arsenic	4.5E-01*	6	U	0.4	J	1.4	J	6	U	6	U	0.5	J	0.6	J
Barium	7.30E+03	123		347		209		157		353		362		455	
Beryllium	7.30E+01	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Cadmium	1.80E+01	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Calcium		9590		23700		23700		13800		25900		25600		31900	
Chromium	1.10E+02	1.9	B	2.1	B	1.2	B	2.4	B	1.8	B	1.4	B	1	J
Cobalt		6	U	0.2	J	6	U	6	U	6	U	6	U	6	U
Copper	1.50E+03	0.3	B	0.3	B	6	U	1	B	6	U	6	U	0.08	J
Iron	2.60E+04	70	U	30	J	70	U	40	J	70	U	70	U	40	J
Lead	1.50E+01	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Magnesium		4060		9150		11400		5580		9960		9860		8260	
Manganese	7.30E+02	2.5	J	1.6	J	6	U	3.3	J	6	U	6	U	6	U
Mercury	3.70E+00	0.5	U	0.5	U	0.5	U	0.5	U	0.03	J	0.5	U	0.5	U
Nickel	7.30E+02	1.6	J	1.3	J	0.7	J	2.7	J	0.9	J	0.8	J	1.8	J
Potassium		930		640		1200		1180		670		670		680	
Selenium	1.80E+02	6	U	6	U	1	J	2	J	2	J	2	J	3	J
Silver	1.80E+02	0.6	B	0.6	B	0.6	B	0.6	B	0.6	B	0.7	B	1	U
Sodium		7580		7600		8180		11300		9300		9470		13300	
Vanadium	3.70E+01	0.3	B	2.6		1.8		0.3	B	1.5		1.5		1	U
Zinc	1.10E+04	2.7	J	2	J	6	U	4.3	J	6	U	6	U	6.2	
MISCELLANEOUS	mg/L					mg/L									
Hexavalent Chromium	1.10E-01	NA		NA		0.01	U	NA		NA		NA		NA	
DISSOLVED INORGANICS		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
Aluminum	3.70E+04	80	U	80	U	80	U	80	U	80	U	80	U	80	UL
Antimony	1.50E+01	0.5	B	0.4	B	0.6	B	0.6	B	1.6	B	0.8	B	2	U
Arsenic	4.5E-01*	5	U	0.4	J	1.5	J	5	U	0.5	J	0.4	J	3	U
Barium	7.30E+03	113		313		197		141		344		351		461	
Beryllium	7.30E+01	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Cadmium	1.80E+01	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Calcium		10800		26700		26600		15500		28300		29000		35700	
Chromium	1.10E+02	2.8		2.4		2.2		3.7		2.7		2.6		1.5	J
Cobalt		0.8	J	5	U	5	U	5	U	5	U	5	U	0.1	J
Copper	1.50E+03	0.4	J	5	U	5	U	1.1	J	5	U	5	U	5	U
Iron	2.60E+04	60	U	60	U	60	U	60	U	60	U	60	U	60	U
Magnesium		4450		9360		11600		5870		10200		10100		8570	L
Manganese	7.30E+02	4.5		4	U	4	U	3.3	J	4	U	4	U	4	U
Mercury	3.70E+00	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.09	J
Nickel	7.30E+02	1.3	J	0.7	J	0.3	J	2.2	J	0.7	J	0.5	J	5	U
Potassium		1070		660		1360		1390		770		760		870	
Selenium	1.80E+02	0.6	J	1	J	2	J	3	J	2	J	2	J	2	J
Sodium		8740		9130		8080		11600		9770		9900		13600	
Vanadium	3.70E+01	0.3	J	2.3		1.9		0.5	J	1.7		1.7		1.2	
Zinc	1.10E+04	5	U	5	U	5	U	1.1	J	5	U	5	U	5	U
SEMIVOLATILES		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
1,4-Dioxane	6.10E+00	2.9	U	2.9	U	2.8	U	2.8	U	2.9	U	2.9	UJ	2.9	U
VOLATILES		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
1,1,1-Trichloroethane	1.70E+03	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	9.00E+02	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	3.50E+02	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethene (cis)	6.10E+01	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	1.70E-01	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromoform	8.5E+01*	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Tetrachloride	1.6E-00*	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	1.5E00*	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dibromochloromethane	1.3E00*	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methyl Tert-butyl Ether	2.60E+00	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	1.0E00*	1	U	3.3		6.9		2.5		12		11.7		0.45	J
Toluene	2.30E+03	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	2.6E-01*	1	U	1	U	1	U	1	U	1	U	1	U	1	U

TABLE 4
DATA SUMMARY OF POSITIVE ANALYTICAL RESULTS
SITE 3 IGWM - GROUNDWATER SAMPLES
NAS JRB WILLOW GROVE, WILLOW GROVE, PENNSYLVANIA

Sample ID:	Project Action Limit	03MW04S-20080314		03MW04SI-20080314		03MW05I-20080311		03MW05S-20080312		03MW06I-20080314		03MW06S-20080313		03MW06SI-20080313	
Sample Date:	Region 3 RBC	03/14/08		03/14/08		03/11/08		03/12/08		03/14/08		03/13/08		03/13/08	
Duplicate of:	Tap Water														
TOTAL INORGANICS	**ug/L**	**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**	
Aluminum	3.70E+04	80	U	80	U	80	U	80	U	2030		89		144	
Antimony	1.50E+01	0.2	J	0.6	J	0.8	J	0.7	J	0.7	J	0.7	J	0.7	J
Arsenic	4.5E-01*	6	U	0.6	J	0.5	J	6	U	9.1		0.4	J	6	U
Barium	7.30E+03	434		487		209		55		413		37		111	
Beryllium	7.30E+01	1	U	1	U	1	U	1	U	1	U	0.1	J	1	U
Cadmium	1.80E+01	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Calcium		36500		37200		12000		9690		25900		12000		7310	
Chromium	1.10E+02	5.4	B	0.9	J	7.6		2.7		12		4.9		5.1	
Cobalt		6	U	6	U	4	J	6	U	3	J	6	U	6	U
Copper	1.50E+03	1.3	B	0.1	J	1	J	6	U	2.4	J	1.7	J	1.7	J
Iron	2.60E+04	70	U	20	J	130	K	40	J	2400	K	90	K	230	K
Lead	1.50E+01	2	U	2	U	2	U	2	U	1.4	J	2	U	2	U
Magnesium		13200		9650		3160		3240		11100		6420		2260	
Manganese	7.30E+02	1	J	6	U	2.8	J	1.7	J	103		8.2		10.2	
Mercury	3.70E+00	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Nickel	7.30E+02	4.2	J	2.6	J	5.7	J	1.8	J	9.6		5	J	4.3	J
Potassium		840		880		790		800		3080		1370		980	
Selenium	1.80E+02	1	J	3	J	2	J	3	J	2	J	5	J	1	J
Silver	1.80E+02	0.7	B	1	U	0.06	J	1	U	1	U	1	U	1	U
Sodium		12100		17600		9320		11500		9550		13500		8680	
Vanadium	3.70E+01	0.8	B	1	U	1	U	1	U	6.4		1	U	1	U
Zinc	1.10E+04	6	U	1.9	J	6	U	2.8	J	10.6		8.4		5.2	J
MISCELLANEOUS	**mg/L**					**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**	
Hexavalent Chromium	1.10E-01	NA		NA		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
DISSOLVED INORGANICS		**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**	
Aluminum	3.70E+04	80	U	80	UL	80	U	5	J	4	J	10	J	3	J
Antimony	1.50E+01	0.4	B	2	U	2	U	2	U	2	U	2	U	2	U
Arsenic	4.5E-01*	0.3	J	3	U	3	U	3	U	10.1		3	U	3	U
Barium	7.30E+03	411		496		201		54.8		299		34.8		104	
Beryllium	7.30E+01	1	U	1	U	1	U	1	U	1	U	0.4	J	1	U
Cadmium	1.80E+01	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Calcium		39900		42400		12800		11100		24900		14000		8310	
Chromium	1.10E+02	3.6		2.5		3.9		4.9		1.4	J	4.7		3.6	
Cobalt		5	U	0.2	J	2.5	J	0.5	J	0.1	J	5	U	5	U
Copper	1.50E+03	5	U	5	U	5	U	5	U	5	U	1.4	J	5	U
Iron	2.60E+04	60	U	60	U	60	U	9	J	60	U	10	J	10	J
Magnesium		13600		10100		3240	L	3720	L	10200	L	6760	L	2490	L
Manganese	7.30E+02	4	U	0.06	J	4	U	2.4	J	0.4	J	5.8		0.6	J
Mercury	3.70E+00	0.5	U	0.09	J	0.1	J	0.09	J	0.09	J	0.09	J	0.08	J
Nickel	7.30E+02	1.2	J	0.9	J	3.6	J	2.2	J	0.5	J	4.4	J	2.6	J
Potassium		960		1020		860		1140		2090		1670		1100	
Selenium	1.80E+02	2	J	2	J	5	U	3	J	2	J	5	J	5	U
Sodium		13000		18500		9470		12600		9310		14400		9110	
Vanadium	3.70E+01	1.1		1.3		1	U	1	U	4.9		1	U	1	U
Zinc	1.10E+04	5	U	5	U	0.3	J	1.4	J	5	U	6		0.7	J
SEMIVOLATILES		**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**	
1,4-Dioxane	6.10E+00	2.9	U	2.8	U	2.8	U	2.8	U	2.8	U	2.9	U	2.8	U
VOLATILES		**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**		**ug/L**	
1,1,1-Trichloroethane	1.70E+03	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	9.00E+02	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	3.50E+02	1	U	1	U	1	U	1	U	0.2	J	1	U	1	U
1,2-Dichloroethene (cis)	6.10E+01	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	1.70E-01	1.1		1	U	1	U	1	U	1	U	1	U	1	U
Bromoform	8.5E+01*	0.87	J	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Tetrachloride	1.6E-00*	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	1.5E00*	0.4	J	0.22	J	1	U	1	U	1	U	1	U	1	U
Dibromochloromethane	1.3E00*	1.5		1	U	1	U	1	U	1	U	1	U	1	U
Methyl Tert-butyl Ether	2.60E+00	1	U	0.26	J	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	1.0E00*	4.5		4.6		0.46	J	1	U	1	U	0.76	J	1	U
Toluene	2.30E+03	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	2.6E-01*	1	U	1	U	1	U	1	U	1	U	1	U	1	U

TABLE 4
DATA SUMMARY OF POSITIVE ANALYTICAL RESULTS
SITE 3 IGWM - GROUNDWATER SAMPLES
NAS JRB WILLOW GROVE, WILLOW GROVE, PENNSYLVANIA

Sample ID:	Project Action Limit	03MW07S-20080319		03MW08D-20080312		03MW08S-20080312	
Sample Date:	Region 3 RBC	03/19/08		03/12/08		03/12/08	
Duplicate of:	Tap Water						
TOTAL INORGANICS	**ug/L**	**ug/L**		**ug/L**		**ug/L**	
Aluminum	3.70E+04	96		80	U	80	U
Antimony	1.50E+01	2	U	0.7	J	0.8	J
Arsenic	4.5E-01*	6	U	0.5	J	6	U
Barium	7.30E+03	625		340		50.1	
Beryllium	7.30E+01	1	U	1	U	0.6	J
Cadmium	1.80E+01	1	U	1	U	1	U
Calcium		62900		31900		11500	
Chromium	1.10E+02	2.2	B	2.5		2.8	
Cobalt		0.2	J	2.4	J	0.2	J
Copper	1.50E+03	0.1	B	6	U	2	J
Iron	2.60E+04	90		170	K	70	K
Lead	1.50E+01	2	U	2	U	2	U
Magnesium		16200		13800		3470	
Manganese	7.30E+02	12.9		1.9	J	35.3	
Mercury	3.70E+00	0.5	U	0.5	U	0.5	U
Nickel	7.30E+02	4.8	J	2.8	J	4	J
Potassium		1060		770		1140	
Selenium	1.80E+02	6	U	1	J	1	J
Silver	1.80E+02	0.6	B	1	U	1	U
Sodium		22400		10800		14600	
Vanadium	3.70E+01	0.6	B	0.09	J	1	U
Zinc	1.10E+04	2.4	J	6	U	3.1	J
MISCELLANEOUS	**mg/L**						
Hexavalent Chromium	1.10E-01	NA		NA		NA	
DISSOLVED INORGANICS		**ug/L**		**ug/L**		**ug/L**	
Aluminum	3.70E+04	80	U	17	J	5	J
Antimony	1.50E+01	0.4	B	2	U	2	U
Arsenic	4.5E-01*	5	U	3	U	3	U
Barium	7.30E+03	544		324		46.9	
Beryllium	7.30E+01	1	U	1	U	0.6	J
Cadmium	1.80E+01	1	U	1	U	1	U
Calcium		71100		35500		12600	
Chromium	1.10E+02	3.4		3.7		3.9	
Cobalt		5	U	1.9	J	5	U
Copper	1.50E+03	5	U	5	U	1.6	J
Iron	2.60E+04	60	U	60	U	60	U
Magnesium		17100		15300	L	3780	L
Manganese	7.30E+02	0.1	B	0.05	J	34.6	
Mercury	3.70E+00	0.5	U	0.1	J	0.09	J
Nickel	7.30E+02	2.9	J	1.7	J	3.8	J
Potassium		1180		970		1430	
Selenium	1.80E+02	1	J	9		5	U
Sodium		26000		11300		15300	
Vanadium	3.70E+01	0.7	J	1	J	1	U
Zinc	1.10E+04	5	U	0.7	J	3.4	J
SEMIVOLATILES		**ug/L**		**ug/L**		**ug/L**	
1,4-Dioxane	6.10E+00	2.9	U	2.8	U	2.8	U
VOLATILES		**ug/L**		**ug/L**		**ug/L**	
1,1,1-Trichloroethane	1.70E+03	1	U	2.6		1	U
1,1-Dichloroethane	9.00E+02	1	U	6.3		1	U
1,1-Dichloroethene	3.50E+02	1	U	3.1		1	U
1,2-Dichloroethene (cis)	6.10E+01	1	U	1.2		1	U
Bromodichloromethane	1.70E-01	1	U	1	U	1	U
Bromoform	8.5E+01*	1	U	1	U	1	U
Carbon Tetrachloride	1.6E-00*	1	U	0.28	J	1	U
Chloroform	1.5E00*	1	U	1	U	1	U
Dibromochloromethane	1.3E00*	1	U	1	U	1	U
Methyl Tert-butyl Ether	2.60E+00	1	U	1	U	1	U
Tetrachloroethene	1.0E00*	1.1		1		1	U
Toluene	2.30E+03	1	U	1	U	1	U
Trichloroethene	2.6E-01*	1	U	1.9		1	U

DATA SUMMARY OF POSITIVE ANALYTICAL RESULTS
SITE 3 IGWM - MARCH 2008
NAS JRB WILLOW GROVE, WILLOW GROVE, PENNSYLVANIA

Data Qualifiers:
B -- Positive result is considered to be an artifact of blank contamination, and should not be considered present.
J -- Value is considered estimated due to exceedance of technical quality control criteria or because result is less than the Contract Required Quantitation Limit (CRQL).
K -- Positive result is considered biased high due to exceedance of technical quality control criteria.
L -- Positive result is considered biased low due to exceedance of technical quality control criteria.
U -- Value is a non-detected result as reported by the laboratory.
UJ -- Non-detected result is considered estimated due to exceedance of technical quality control criteria.
UL -- Non-detected result is considered biased low due to exceedance of technical quality control criteria.
UR -- Non-detected result is considered unusable due to exceedance of technical quality control criteria.
NA -- No result is available/applicable for this parameter in this sample.

Database source file: H:\WILLOWGROVE\SITE 4\DATA SUMMARIES\MAY1908N412.DBF data retrieved on: 05/19/08

* The RBC has been increased by a factor of ten for carcinogens to correspond to a single-chemical risk of 1E-5.
It is recognized that method detection limits are greater than certain 'project action limits'.
However, it is anticipated that this will not be a problem for planned data use.

TABLE 5
HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER
NINTH STREET LANDFILL
NAS JRB WILLOW GROVE, PENNSYLVANIA

WELL	SAMPLING DATE			
	SEPTEMBER 1991	JUNE 1997	FEBRUARY 2006	March 2008
SHALLOW WELLS				
03MW01S	15	6J	0.9	1.9
03MW02S	ND	ND	ND	ND
03MW03S	8	5J	14	2.5
03MW04S	61	21	9.1	4.5
03MW05S	7	2J	0.67J	ND
03MW06S	NA	29	1.3	0.76J
03MW07S	NA	ND	1.4	1.1
SHALLOW-INTERMEDIATE DEPTH WELLS				
03MW01SI	29	---	4.9	8.8
03MW02SI	NA	6J	1.9	3.3
03MW03SI	35	18	12	12
03MW04SI	56	20	10	4.6
03MW05I	NA	ND	0.70J	0.46J
03MW06SI	NA	ND	ND	ND
03MW08S	NA	NA	ND	ND
INTERMEDIATE DEPTH WELLS				
03MW01I	ND	ND	0.23J	ND
03MW03I	5	6J	---	6.9
03MW04I	ND	ND	0.52J	0.45J
03MW02I	NA	8J	2.4	7.8
03MW06I	NA	39	0.79J	ND
03MW08D	NA	NA	0.78J	1
Off-Base Lot 1 Irrigation Well				
03IW01	25	15 *	---	6.3

Notes:

The unit of concentrations is ug/L.

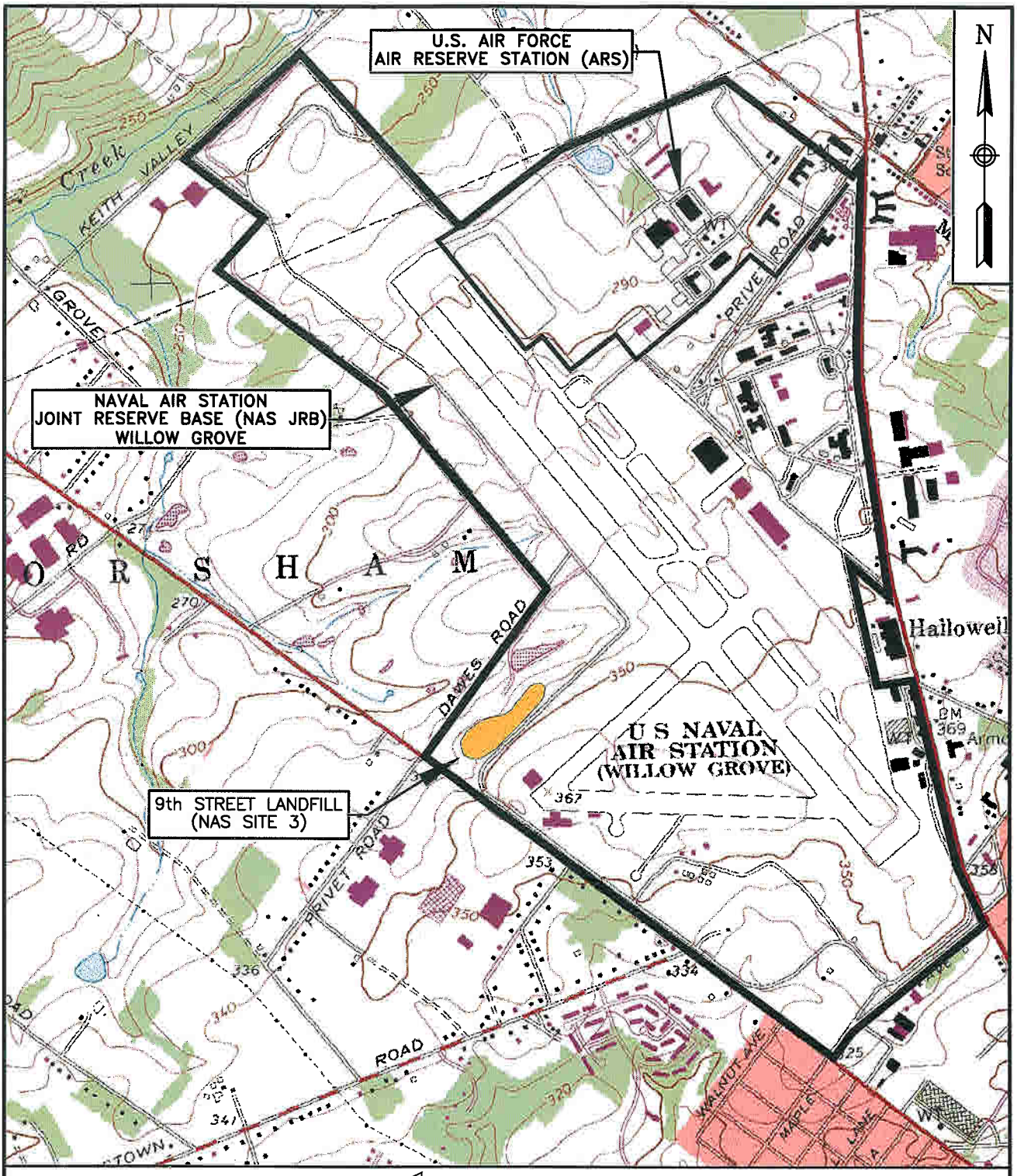
NA = Not Available. Well had not been installed at time of sampling round.

ND = Non-Detected.

* = Sampled March 1998

FIGURES

112G00845\0321\112G00845BM01.DWG 08/10/08 MKB



BASE MAP IS A PORTION OF THE AMBLER, PA U.S.G.S. 7.5 MINUTE QUADRANGLE MAP, DATED 1963, PHOTOREVISED IN 1983.

QUADRANGLE LOCATION

0 1500 3000

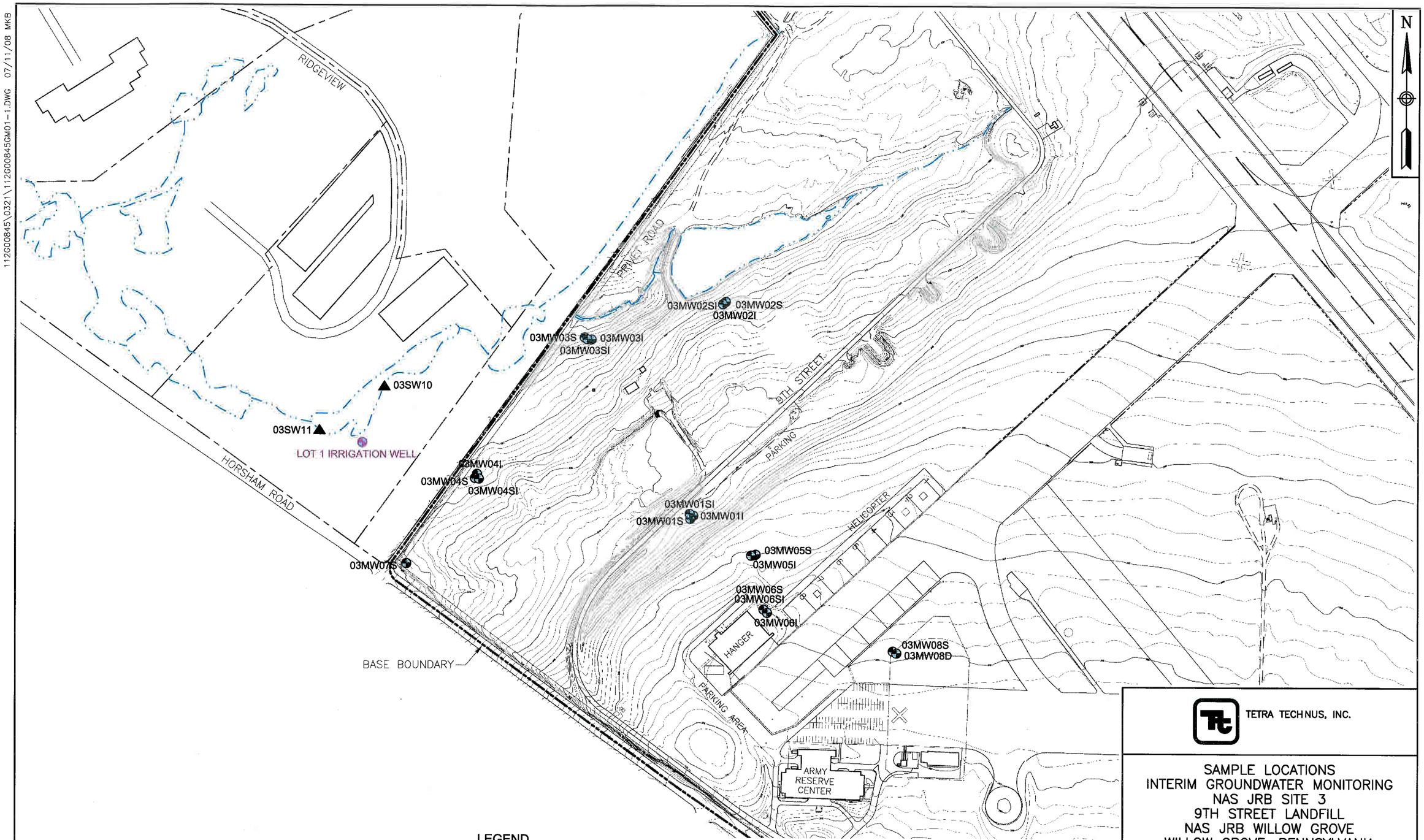
SCALE IN FEET

TETRA TECHNUS, INC.

FACILITY LOCATION MAP
NAS JRB WILLOW GROVE
WILLOW GROVE, PENNSYLVANIA

SCALE	AS NOTED
FILE	112G00845BM01
REV	0
DATE	08/10/08
FIGURE NUMBER	FIGURE 1

112G00845\0321\112G00845GM01-1.DWG 07/11/08 MKB

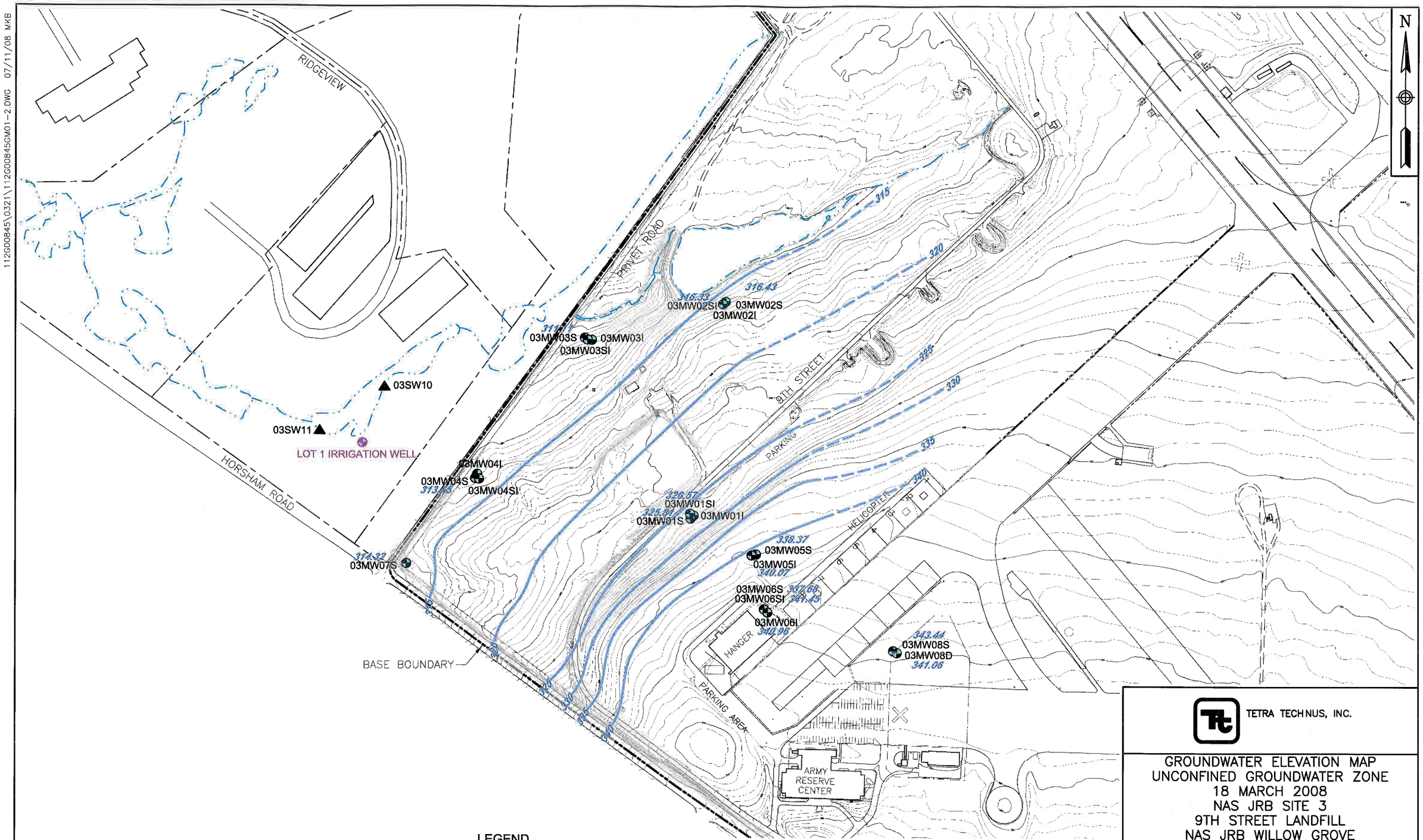


TETRA TECHNUS, INC.

SAMPLE LOCATIONS
INTERIM GROUNDWATER MONITORING
NAS JRB SITE 3
9TH STREET LANDFILL
NAS JRB WILLOW GROVE
WILLOW GROVE, PENNSYLVANIA

FILE	SCALE
112G00845GM01-1	AS NOTED
FIGURE NUMBER	REV / DATE
FIGURE 2	0 / 07/11/08

112G00845\0321\112G00845GM01-2.DWG 07/11/08 MKB



0 300 600

SCALE IN FEET

LEGEND

- ON-SITE MONITORING WELL LOCATION
- OFF BASE WELL LOCATION
- SURFACE WATER SAMPLE LOCATION
- 338.37 GROUNDWATER ELEVATION (FEET, AMSL)
- 325 GROUNDWATER CONTOUR

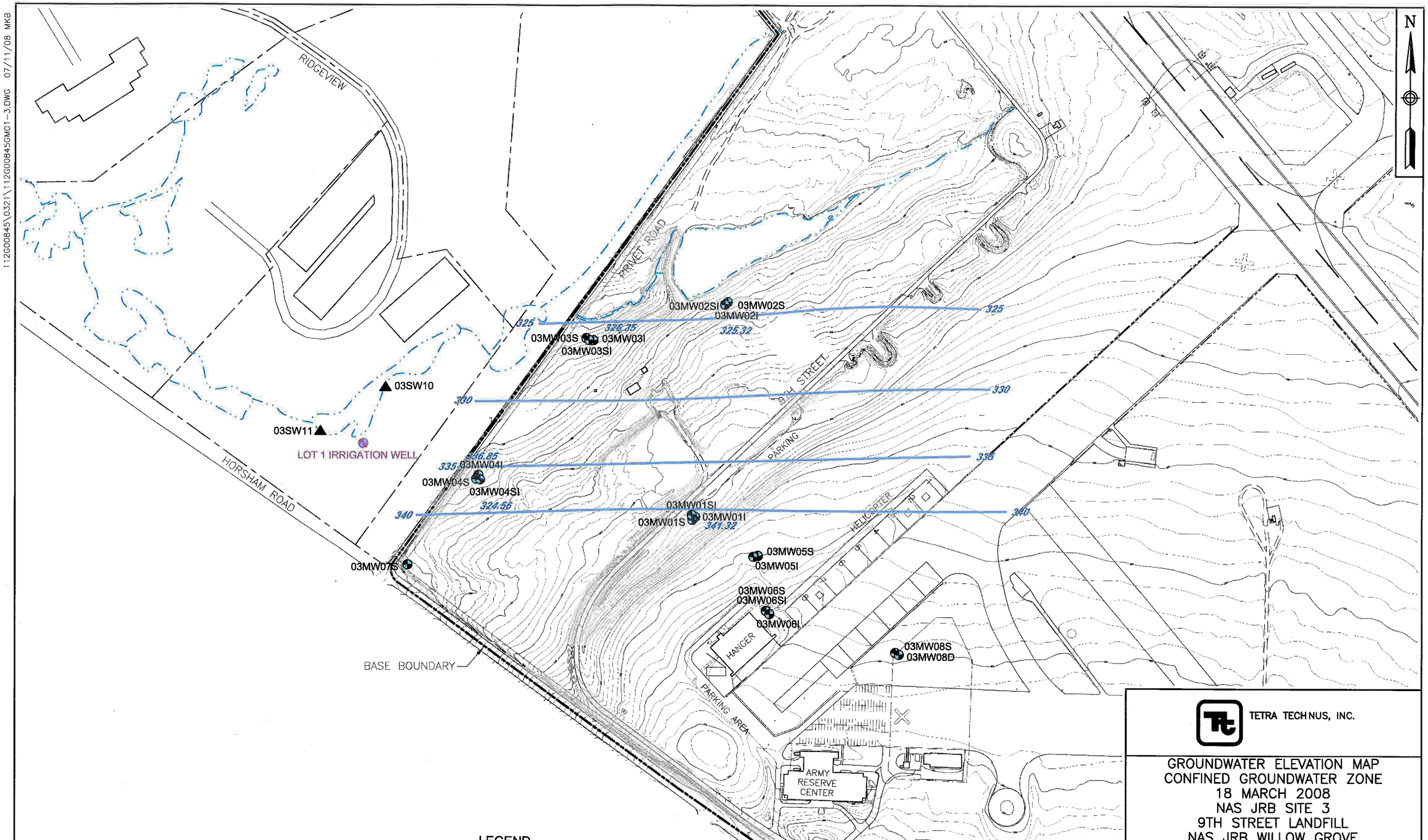
TETRA TECH NUS, INC.

GROUNDWATER ELEVATION MAP
UNCONFINED GROUNDWATER ZONE
18 MARCH 2008
NAS JRB SITE 3
9TH STREET LANDFILL
NAS JRB WILLOW GROVE
WILLOW GROVE, PENNSYLVANIA

FILE	SCALE
112G00845GM01-2	AS NOTED

FIGURE NUMBER	REV	DATE
FIGURE 3	0	07/11/08

112G00845\0321\112G00845GM01-3.DWG 07/11/08 MKB

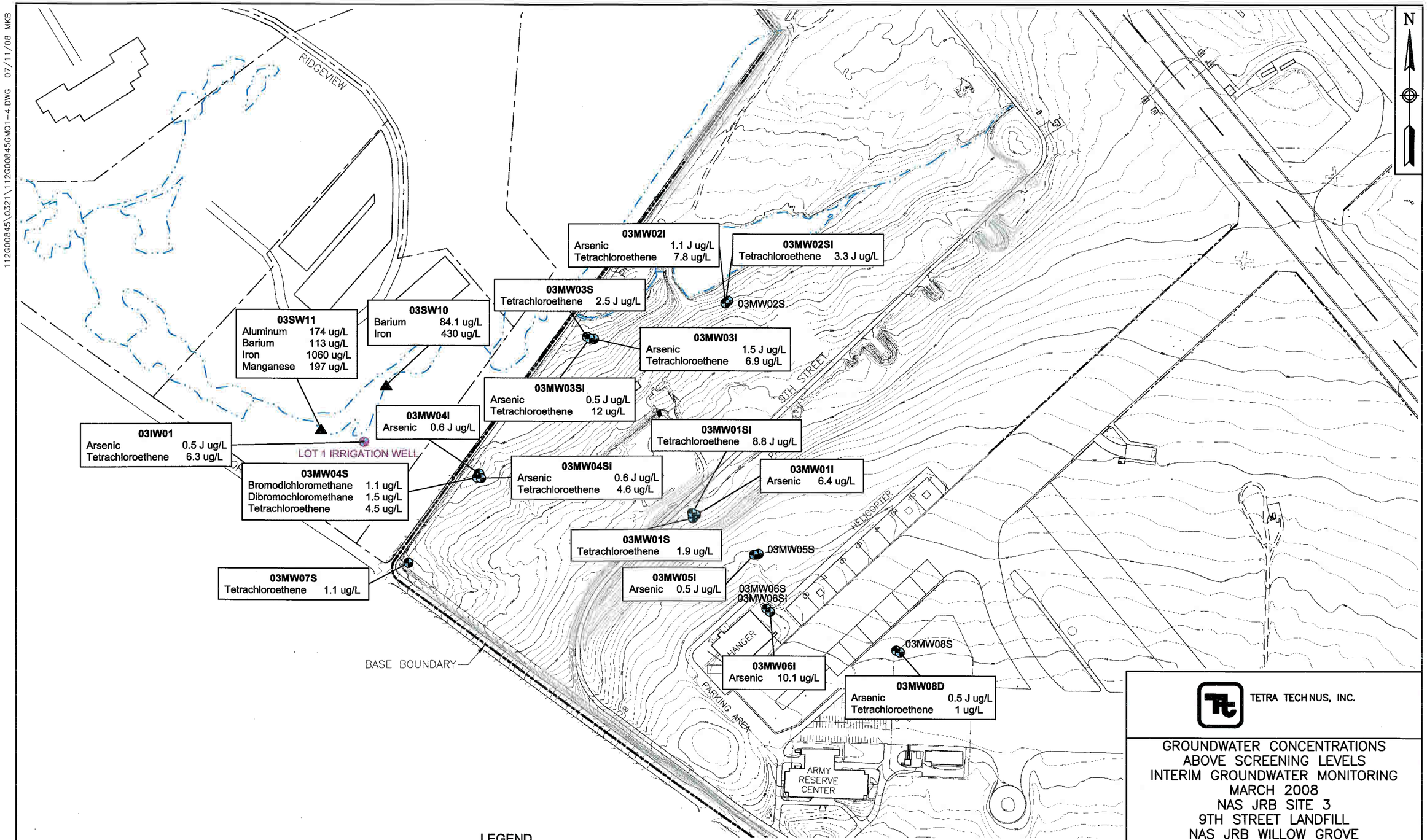


TETRA TECH NUS, INC.

GROUNDWATER ELEVATION MAP
CONFINED GROUNDWATER ZONE
18 MARCH 2008
NAS JRB SITE 3
9TH STREET LANDFILL
NAS JRB WILLOW GROVE
WILLOW GROVE, PENNSYLVANIA

FILE	SCALE
112G00845GM01-3	AS NOTED
FIGURE NUMBER	REV / DATE
FIGURE 4	0 / 07/11/08

112G00845\0321\112G00845GM01-4.DWG 07/11/08 MKB



TETRA TECH NUS, INC.

GROUNDWATER CONCENTRATIONS
ABOVE SCREENING LEVELS
INTERIM GROUNDWATER MONITORING
MARCH 2008
NAS JRB SITE 3
9TH STREET LANDFILL
NAS JRB WILLOW GROVE
WILLOW GROVE, PENNSYLVANIA

FILE	SCALE
112G00845GM01-4	AS NOTED

FIGURE NUMBER	REV	DATE
FIGURE 5	0	07/11/08

APPENDIX A

ANALYTICAL RESULTS

DATA SUMMARY OF ANALYTICAL RESULTS
SITE 3 IGWM - GROUNDWATER SAMPLES
NAS JRB WILLOW GROVE, WILLOW GROVE, PENNSYLVANIA

Sample ID:	03IW01		03IW01-D		03MW01I		03MW01S		03MW01S-D		03MW01SI		03MW02I		03MW02S		03MW02SI		03MW03I		03MW03S		03MW03SI	
Sample Date:	03/19/08		03/19/08		03/11/08		03/11/08		03/11/08		03/20/08		03/18/08		03/18/08		03/18/08		03/17/08		03/17/08		03/17/08	
Dup Of:			03IW01						03MW01S															
MISCELLANEOUS					mg/L		mg/L		mg/L										mg/L					
Hexavalent Chromium	NA		NA		0.01	U	0.01	U	0.01	U	NA		NA		NA		NA		0.01	U	NA		NA	
TOTAL INORGANICS	ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
Aluminum	80	U	80	U	1160		80	U	80	U	80	U	80	U	80	U	80	U	80	U	80	U	80	U
Antimony	2	U	2	U	1.2	J	1.2	J	0.7	J	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Arsenic	6	U	6	U	6		6	U	6	U	6	U	1	J	6	U	0.4	J	1.4	J	6	U	6	U
Barium	590		589		215		111		111		107		268		123		347		209		157		353	
Beryllium	1	U	1	U	1	U	0.1	J	0.09	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Cadmium	1	U	1	U	0.1	J	1	U	1	U	1.1		1	U	1	U	1	U	1	U	1	U	1	U
Calcium	48600		47700		25000		7220		7250		17000		21400		9590		23700		23700		13800		25900	
Chromium	1.3	B	1.4	B	4.3		5		4.7		1.5	J	2	B	1.9	B	2.1	B	1.2	B	2.4	B	1.8	B
Cobalt	6	U	6	U	0.8	J	0.2	J	0.2	J	6	U	6	U	6	U	0.2	J	6	U	6	U	6	U
Copper	6	U	0.6	B	0.6	J	0.3	J	0.3	J	0.4	J	0.7	B	0.3	B	0.3	B	6	U	1	B	6	U
Iron	70	U	70	U	1200	K	110	K	140	K	70	U	70	U	70	U	30	J	70	U	40	J	70	U
Lead	2	U	2	U	0.4	J	0.06	J	0.04	J	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Magnesium	18500		18100		10600		1880		1880		2670		9550		4060		9150		11400		5580		9960	
Manganese	6	U	6	U	16.3		3	J	2.8	J	0.4	J	1.8	J	2.5	J	1.6	J	6	U	3.3	J	6	U
Mercury	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.03	J
Nickel	1.9	J	1.9	J	3.9	J	3.8	J	3.9	J	1.7	J	1.4	J	1.6	J	1.3	J	0.7	J	2.7	J	0.9	J
Potassium	1050		1020		1480		670		600		560	U	660		930		640		1200		1180		670	
Selenium	2	J	2	J	2	J	3	J	3	J	2	J	6	U	6	U	6	U	1	J	2	J	2	J
Silver	0.6	B	0.6	B	1	U	1	U	1	U	0.6	B	0.6	B	0.6	B	0.6	B	0.6	B	0.6	B	0.6	B
Sodium	15000		14800		12700		12300		12300		9570		7020		7580		7600		8180		11300		9300	
Thallium	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Vanadium	1.4		1.5		0.5	J	1	U	1	U	0.4	B	1.8		0.3	B	2.6		1.8		0.3	B	1.5	
Zinc	6	U	6	U	3	J	2.8	J	2.8	J	6	U	6	U	2.7	J	2	J	6	U	4.3	J	6	U
DISSOLVED INORGANICS	ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
Aluminum	80	U	80	U	36	J	7	J	5	J	80	U	80	U	80	U	80	U	80	U	80	U	80	U
Antimony	0.4	B	0.4	B	2	U	1.4	J	2	U	2	U	0.4	B	0.5	B	0.4	B	0.6	B	0.6	B	1.6	B
Arsenic	0.5	J	0.2	J	6.4		3	U	3	U	3	U	1.1	J	5	U	0.4	J	1.5	J	5	U	0.5	J
Barium	520		473		199		104		102		106		245		113		313		197		141		344	
Beryllium	1	U	1	U	1	U	0.2	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Cadmium	1	U	1	U	1	U	1	U	1	U	1.2		1	U	1	U	1	U	1	U	1	U	1	U
Calcium	53700		50100		24900		7690		7840		19000		24100		10800		26700		26600		15500		28300	
Chromium	3.1		2.7		3.5		6.1		6.3		1.3	J	2.3		2.8		2.4		2.2		3.7		2.7	
Cobalt	5	U	0.2	J	5	U	0.2	J	0.2	J	5	U	5	U	0.8	J	5	U	5	U	5	U	5	U
Copper	5	U	5	U	5	U	5	U	5	U	5	U	0.3	J	0.4	J	5	U	5	U	1.1	J	5	U
Iron	60	U	60	U	20	J	60	U	9	J	60	U	60	U	60	U	60	U	60	U	60	U	60	U
Lead	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Magnesium	19200		17800		10400	L	1900	L	1930	L	2960		9740		4450		9360		11600		5870		10200	
Manganese	4	U	0.7	J	3.6	J	1.8	J	2	J	1.2	J	0.08	B	4.5		4	U	4	U	3.3	J	4	U
Mercury	0.5	U	0.5	U	0.09	J	0.09	J	0.09	J	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Nickel	0.8	J	0.9	J	1.8	J	4.8	J	5.4		1.3	J	0.8	J	1.3	J	0.7	J	0.3	J	2.2	J	0.7	J
Potassium	1070		960		1560		790		780		580		840		1070		660		1360		1390		770	
Selenium	2	J	1	J	5	U	3	J	3	J	3	J	1	J	0.6	J	1	J	2	J	3	J	2	J
Silver	1	UR	1	UR	1	U	1	U	1	U	1	U	1	UR	1	UR	1	UR	1	UR	1	UR	1	UR
Sodium	16800		15600		13200		12700		12800		11400		8170		8740		9130		8080		11600		9770	
Thallium	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Vanadium	1.5		1.3		1		1	U	1	U	0.8	B	1.7		0.3	J	2.3		1.9		0.5	J	1.7	
Zinc	5	U	5	U	0.4	J	1.8	J	1.5	J	0.6	J	6.5		5	U	5	U	5	U	1.1	J	5	U
SEMIVOLATILES	ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
1,4-Dioxane	3	U	2.9	U	2.8	U	2.8	U	2.8	U	2.9	U	2.9	U	2.9	U	2.9	U	2.8	U	2.8	U	2.9	U
VOLATILES	ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	

DATA SUMMARY OF ANALYTICAL RESULTS
SITE 3 IGWM - GROUNDWATER SAMPLES
NAS JRB WILLOW GROVE, WILLOW GROVE, PENNSYLVANIA

Sample ID:	03IW01		03IW01-D		03MW01I		03MW01S		03MW01S-D		03MW01SI		03MW02I		03MW02S		03MW02SI		03MW03I		03MW03S		03MW03SI	
Sample Date:	03/19/08		03/19/08		03/11/08		03/11/08		03/11/08		03/20/08		03/18/08		03/18/08		03/18/08		03/17/08		03/17/08		03/17/08	
Dup Of:			03IW01						03MW01S															
1,1,1-Trichloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichlorotrifluoroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-Trichlorobenzene	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2,4-Trichlorobenzene	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dibromo-3-chloropropane	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U
1,2-Dibromoethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichlorobenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethene (cis)	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethene (trans)	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3-Dichlorobenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dichlorobenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-Butanone	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR
2-Hexanone	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Acetone	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR
Benzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromochloromethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromoform	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromomethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Disulfide	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Tetrachloride	1	U	1	U	1	U	1	U	1	U	1	U	0.38	J	1	U	1	U	1	U	1	U	1	U
Chlorobenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloromethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,3-Dichloropropene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Cyclohexane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dibromochloromethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dichlorodifluoromethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Isopropylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
M+p-xylenes	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Methyl Acetate	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Methyl Cyclohexane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methyl Tert-butyl Ether	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methylene Chloride	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
O-xylene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Styrene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	6		6.3		1	U	1.9		1.9		8.8	J	7.8		1	U	3.3		6.9		2.5		12	
Toluene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,3-Dichloropropene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichlorofluoromethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Vinyl Chloride	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

DATA SUMMARY OF ANALYTICAL RESULTS
SITE 3 IGWM - GROUNDWATER SAMPLES
NAS JRB WILLOW GROVE, WILLOW GROVE, PENNSYLVANIA

Sample ID:	03MW03SI-D	03MW04I	03MW04S	03MW04SI	03MW05I	03MW05S	03MW06I	03MW06S	03MW06SI	03MW07S	03MW08D	03MW08S
Sample Date:	03/17/08	03/14/08	03/14/08	03/14/08	03/11/08	03/12/08	03/14/08	03/13/08	03/13/08	03/19/08	03/12/08	03/12/08
Dup Of:	03MW03SI											
MISCELLANEOUS					mg/L	mg/L	mg/L	mg/L	mg/L			
Hexavalent Chromium	NA	NA	NA	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NA	NA	NA
TOTAL INORGANICS	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Aluminum	80 U	80 U	80 U	80 U	80 U	80 U	2030	89	144	96	80 U	80 U
Antimony	0.08 J	0.7 J	0.2 J	0.6 J	0.8 J	0.7 J	0.7 J	0.7 J	0.7 J	2 U	0.7 J	0.8 J
Arsenic	0.5 J	0.6 J	6 U	0.6 J	0.5 J	6 U	9.1	0.4 J	6 U	6 U	0.5 J	6 U
Barium	362	455	434	487	209	55	413	37	111	625	340	50.1
Beryllium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.1 J	1 U	1 U	1 U	0.6 J
Cadmium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Calcium	25600	31900	36500	37200	12000	9690	25900	12000	7310	62900	31900	11500
Chromium	1.4 B	1 J	5.4 B	0.9 J	7.6	2.7	12	4.9	5.1	2.2 B	2.5	2.8
Cobalt	6 U	6 U	6 U	6 U	4 J	6 U	3 J	6 U	6 U	0.2 J	2.4 J	0.2 J
Copper	6 U	0.08 J	1.3 B	0.1 J	1 J	6 U	2.4 J	1.7 J	1.7 J	0.1 B	6 U	2 J
Iron	70 U	40 J	70 U	20 J	130 K	40 J	2400 K	90 K	230 K	90	170 K	70 K
Lead	2 U	2 U	2 U	2 U	2 U	2 U	1.4 J	2 U	2 U	2 U	2 U	2 U
Magnesium	9860	8260	13200	9650	3160	3240	11100	6420	2260	16200	13800	3470
Manganese	6 U	6 U	1 J	6 U	2.8 J	1.7 J	103	8.2	10.2	12.9	1.9 J	35.3
Mercury	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Nickel	0.8 J	1.8 J	4.2 J	2.6 J	5.7 J	1.8 J	9.6	5 J	4.3 J	4.8 J	2.8 J	4 J
Potassium	670	680	840	880	790	800	3080	1370	980	1060	770	1140
Selenium	2 J	3 J	1 J	3 J	2 J	3 J	2 J	5 J	1 J	6 U	1 J	1 J
Silver	0.7 B	1 U	0.7 B	1 U	0.06 J	1 U	1 U	1 U	1 U	0.6 B	1 U	1 U
Sodium	9470	13300	12100	17600	9320	11500	9550	13500	8680	22400	10800	14600
Thallium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Vanadium	1.5	1 U	0.8 B	1 U	1 U	1 U	6.4	1 U	1 U	0.6 B	0.09 J	1 U
Zinc	6 U	6.2	6 U	1.9 J	6 U	2.8 J	10.6	8.4	5.2 J	2.4 J	6 U	3.1 J
DISSOLVED INORGANICS	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Aluminum	80 U	80 UL	80 U	80 UL	80 U	5 J	4 J	10 J	3 J	80 U	17 J	5 J
Antimony	0.8 B	2 U	0.4 B	2 U	2 U	2 U	2 U	2 U	2 U	0.4 B	2 U	2 U
Arsenic	0.4 J	3 U	0.3 J	3 U	3 U	3 U	10.1	3 U	3 U	5 U	3 U	3 U
Barium	351	461	411	496	201	54.8	299	34.8	104	544	324	46.9
Beryllium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.4 J	1 U	1 U	1 U	0.6 J
Cadmium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Calcium	29000	35700	39900	42400	12800	11100	24900	14000	8310	71100	35500	12600
Chromium	2.6	1.5 J	3.6	2.5	3.9	4.9	1.4 J	4.7	3.6	3.4	3.7	3.9
Cobalt	5 U	0.1 J	5 U	0.2 J	2.5 J	0.5 J	0.1 J	5 U	5 U	5 U	1.9 J	5 U
Copper	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1.4 J	5 U	5 U	5 U	1.6 J
Iron	60 U	60 U	60 U	60 U	60 U	9 J	60 U	10 J	10 J	60 U	60 U	60 U
Lead	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Magnesium	10100	8570 L	13600	10100	3240 L	3720 L	10200 L	6760 L	2490 L	17100	15300 L	3780 L
Manganese	4 U	4 U	4 U	0.06 J	4 U	2.4 J	0.4 J	5.8	0.6 J	0.1 B	0.05 J	34.6
Mercury	0.5 U	0.09 J	0.5 U	0.09 J	0.1 J	0.09 J	0.09 J	0.09 J	0.08 J	0.5 U	0.1 J	0.09 J
Nickel	0.5 J	5 U	1.2 J	0.9 J	3.6 J	2.2 J	0.5 J	4.4 J	2.6 J	2.9 J	1.7 J	3.8 J
Potassium	760	870	960	1020	860	1140	2090	1670	1100	1180	970	1430
Selenium	2 J	2 J	2 J	2 J	5 U	3 J	2 J	5 J	5 U	1 J	9	5 U
Silver	1 UR	1 U	1 UR	1 U	1 U	1 U	1 U	1 U	1 U	1 UR	1 U	1 U
Sodium	9900	13600	13000	18500	9470	12600	9310	14400	9110	26000	11300	15300
Thallium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Vanadium	1.7	1.2	1.1	1.3	1 U	1 U	4.9	1 U	1 U	0.7 J	1 J	1 U
Zinc	5 U	5 U	5 U	5 U	0.3 J	1.4 J	5 U	6	0.7 J	5 U	0.7 J	3.4 J
SEMIVOLATILES	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
1,4-Dioxane	2.9 UJ	2.9 U	2.9 U	2.8 U	2.8 U	2.8 U	2.8 U	2.9 U	2.8 U	2.9 U	2.8 U	2.8 U
VOLATILES	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L

DATA SUMMARY OF ANALYTICAL RESULTS
SITE 3 IGWM - GROUNDWATER SAMPLES
NAS JRB WILLOW GROVE, WILLOW GROVE, PENNSYLVANIA

Sample ID:	03MW03SI-D		03MW04I		03MW04S		03MW04SI		03MW05I		03MW05S		03MW06I		03MW06S		03MW06SI		03MW07S		03MW08D		03MW08S	
Sample Date:	03/17/08		03/14/08		03/14/08		03/14/08		03/11/08		03/12/08		03/14/08		03/13/08		03/13/08		03/19/08		03/12/08		03/12/08	
Dup Of:	03MW03SI																							
1,1,1-Trichloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	2.6		1	U
1,1,2,2-Tetrachloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichlorotrifluoroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	6.3		1	U
1,1-Dichloroethene	1	U	1	U	1	U	1	U	1	U	1	U	0.2	J	1	U	1	U	1	U	3.1		1	U
1,2,3-Trichlorobenzene	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2,4-Trichlorobenzene	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dibromo-3-chloropropane	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U
1,2-Dibromoethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichlorobenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethene (cis)	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.2		1	U
1,2-Dichloroethene (trans)	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3-Dichlorobenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dichlorobenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-Butanone	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR
2-Hexanone	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Acetone	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR	10	UR
Benzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromochloromethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	1	U	1	U	1.1		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromoform	1	U	1	U	0.87	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromomethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Disulfide	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Tetrachloride	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.28	J	1	U
Chlorobenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	1	U	1	U	0.4	J	0.22	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloromethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,3-Dichloropropene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Cyclohexane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dibromochloromethane	1	U	1	U	1.5		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dichlorodifluoromethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Isopropylbenzene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
M+p-xylenes	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Methyl Acetate	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Methyl Cyclohexane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methyl Tert-butyl Ether	1	U	1	U	1	U	0.26	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methylene Chloride	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
O-xylene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Styrene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	11.7		0.45	J	4.5		4.6		0.46	J	1	U	1	U	0.76	J	1	U	1.1		1		1	U
Toluene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,3-Dichloropropene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.9		1	U
Trichlorofluoromethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Vinyl Chloride	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

DATA SUMMARY OF ANALYTICAL RESULTS
SITE 3 IGWM - GROUNDWATER SAMPLES
NAS JRB WILLOW GROVE, WILLOW GROVE, PENNSYLVANIA

Data Qualifiers:
B -- Positive result is considered to be an artifact of blank contamination, and should not be considered present.
J -- Value is considered estimated due to exceedance of technical quality control criteria or because result is less than the Contract Required Quantitation Limit (CRQL).
K -- Positive result is considered biased high due to exceedance of technical quality control criteria.
L -- Positive result is considered biased low due to exceedance of technical quality control criteria.
U -- Value is a non-detected result as reported by the laboratory.
UJ -- Non-detected result is considered estimated due to exceedance of technical quality control criteria.
UL -- Non-detected result is considered biased low due to exceedance of technical quality control criteria.
UR -- Non-detected result is considered unusable due to exceedance of technical quality control criteria.
NA -- No result is available/applicable for this parameter in this sample.

Database source file: H:\WILLOWGROVE\SITE 3 GW\DATA SUMMARIES\MAY1908N412.DBF data retrieved on: 06/05/08

DATA SUMMARY OF ANALYTICAL RESULTS
SITE 3 IGWM - SURFACE WATER SAMPLES
NAS JRB WILLOW GROVE, WILLOW GROVE, PENNSYLVANIA

Sample ID:	**03SW10-20080319**		**03SW11-20080319**	
Sample Date:	**03/19/08**		**03/19/08**	
Dup Of:				
INORGANICS	**ug/L**		**ug/L**	
Aluminum	80	U	174	
Antimony	2	U	2	U
Arsenic	6	U	6	U
Barium	84.1		113	
Beryllium	1	U	1	U
Cadmium	1	U	1	U
Calcium	16400		22300	
Chromium	1.5	B	1.7	B
Cobalt	6	U	0.2	J
Copper	0.8	B	3	B
Iron	430		1060	
Mercury	0.5	U	0.5	U
Lead	0.07	J	0.9	J
Magnesium	5800		7470	
Manganese	95.6		197	
Nickel	1.2	J	2	J
Potassium	1730		1880	
Selenium	6	U	6	U
Silver	0.6	B	0.6	B
Sodium	7670		18800	
Thallium	1	U	1	U
Vanadium	0.8	B	1.4	
Zinc	3.6	J	16	
SEMIVOLATILES	**ug/L**		**ug/L**	
1,4-Dioxane	2.9	U	3	U
VOLATILES	**ug/L**		**ug/L**	
1,1,1-Trichloroethane	1	U	1	U
1,1,2,2-Tetrachloroethane	1	U	1	U
1,1,2-Trichloroethane	1	U	1	U
1,1,2-Trichlorotrifluoroethane	1	U	1	U
1,1-Dichloroethane	1	U	1	U
1,1-Dichloroethene	1	U	1	U
1,2,3-Trichlorobenzene	2	U	2	U
1,2,4-Trichlorobenzene	2	U	2	U
1,2-Dibromo-3-chloropropane	7	U	7	U
1,2-Dibromoethane	1	U	1	U
1,2-Dichlorobenzene	1	U	1	U
1,2-Dichloroethane	1	U	1	U
1,2-Dichloroethene (cis)	1	U	1	U
1,2-Dichloroethene (trans)	1	U	1	U
1,2-Dichloropropane	1	U	1	U
1,3-Dichlorobenzene	1	U	1	U
1,4-Dichlorobenzene	1	U	1	U
2-Butanone	10	UR	10	UR
2-Hexanone	5	U	5	U
4-Methyl-2-pentanone	5	U	5	U

DATA SUMMARY OF ANALYTICAL RESULTS
SITE 3 IGWM - SURFACE WATER SAMPLES
NAS JRB WILLOW GROVE, WILLOW GROVE, PENNSYLVANIA

Sample ID:	**03SW10-20080319**		**03SW11-20080319**	
Sample Date:	**03/19/08**		**03/19/08**	
Dup Of:				
Acetone	10	UR	10	UR
Benzene	1	U	1	U
Bromochloromethane	1	U	1	U
Bromodichloromethane	1	U	1	U
Bromoform	1	U	1	U
Bromomethane	1	U	1	U
Carbon Disulfide	1	U	1	U
Carbon Tetrachloride	1	U	1	U
Chlorobenzene	1	U	1	U
Chloroethane	1	U	1	U
Chloroform	1	U	1	U
Chloromethane	1	U	1	U
cis-1,3-Dichloropropene	1	U	1	U
Cyclohexane	1	U	1	U
Dibromochloromethane	1	U	1	U
Dichlorodifluoromethane	1	U	1	U
Ethylbenzene	1	U	1	U
Isopropylbenzene	1	U	1	U
M+p-xylenes	2	U	2	U
Methyl Acetate	2	U	2	U
Methyl Cyclohexane	1	U	1	U
Methyl Tert-butyl Ether	1	U	1	U
Methylene Chloride	1	U	1	U
O-xylene	1	U	1	U
Styrene	1	U	1	U
Tetrachloroethene	1	U	1	U
Toluene	0.21	J	1	U
trans-1,3-Dichloropropene	1	U	1	U
Trichloroethene	1	U	1	U
Trichlorofluoromethane	1	U	1	U
Vinyl Chloride	1	U	1	U

DATA SUMMARY OF ANALYTICAL RESULTS
SITE 3 IGWM - SURFACE WATER SAMPLES
NAS JRB WILLOW GROVE, WILLOW GROVE, PENNSYLVANIA

Data Qualifiers:
B -- Positive result is considered to be an artifact of blank contamination, and should not be considered present.
J -- Value is considered estimated due to exceedance of technical quality control criteria or because result is less than the Contract Required Quantitation Limit (CRQL).
U -- Value is a non-detected result as reported by the laboratory.
UR -- Non-detected result is considered unusable due to exceedance of technical quality control criteria.

Database source file: H:\WILLOWGROVE\SITE 3 GW\DATA SUMMARIES\MAY1908N412.DBF data retrieved on: 06/05/08

APPENDIX B

SAMPLE COLLECTION LOGS

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW01I
Sample Location: 03MW01I
Sampled By: CM/JC
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 3/11/08	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	TBD
Time: 0923 am	Visual	Standard	mS/cm	°C	NTU	mg/l	mV	
Method: Redi-Flo 2 Pump	clear/white	6.29	0.248	9.65	21	5.97	217	48.80

PURGE DATA:

Date: 3/10/08	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Method: Redi-Flo2 Pump	Initial	7.07	0.300	11.21	7.4	10.05	223	4.84
Monitor Reading (ppm): 0.0	0.5 Vol	8.36	0.239	11.87	2.3	10.05	173	68.00
Well Casing Diameter & Material	1.0 Vol	8.76	0.227	12.20	5.1	10.39	157	102.90
Type: 4" PVC	1.5 Vol	8.47	0.207	12.98	5.1	8.40	140	126.10
Total Well Depth (TD): 180.61	2.0 Vol	8.49	0.216	13.00	6.4	10.75	91	156.37
Static Water Level (WL): 4.84								
One Casing Volume (gal/L): 114.78	16:24	Purge	to	Dry		3/10	/2008	
Start Purge (hrs): 1346								
End Purge (hrs): 1624								
Total Purge Time (min): 158								
Total Vol. Purged (gal/L): 217.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	6
TAL Metals	HNO3	500 ml Poly	3
Dissolved Metals	HNO3	500 ml Poly	3
Hexavalent Chromium	4 C	1 Liter Poly	3
1-4 Dioxane	4°C	1 Liter Amber	6

OBSERVATIONS / NOTES:

180.61
- 4.84
175.77
x 0.653
52731
87885
105462
114.77781

1346 Purge Rate 1.5 gpm
1500 Purge rate dropped to 1 gpm due to draw down
1624 Purging completed after drawing down to the top of the screen.
1635 Recovery rate of 6.75 Feet over 10 minutes
3/11/08 WL = 4.90 9:00 am. Flow Rate 0.45 gpm.

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): James Ann

TBD: To Be Determined

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW01S-2008
Sample Location: 03MW01S
Sampled By: CM/JC
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	TBD
Date: 3/11/08								
Time: 12:45								
Method: Redi-Flo2 Pump	~~5.30~~ Clear	5.37	0.112	12.45	10.00	9.83	210	28.35

PURGE DATA:

Date: 3/11/08	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Method: Redi-Flo2 Pump	Initial	6.50	0.115	12.03	4.95	9.40	168	19.71
Monitor Reading (ppm): 0.0	0.5 vol	5.45	0.119	12.01	16.70	8.78	189	24.81
Well Casing Diameter & Material	1.0 vol	5.39	0.116	12.34	26.00	8.88	194	26.18
Type: 4" PVC	1.5 vol	5.36	0.114	12.77	8.14	9.90	196	26.52
Total Well Depth (TD): 33.93	2.0 vol	5.28	0.113	12.23	6.20	9.27	205	26.72
Static Water Level (WL): 19.71	2.5 vol	5.30	0.113	12.17	5.58	9.05	210	27.41
One Casing Volume (gal/L): 4.3	3.0 vol	5.30	0.112	11.94	11.80	9.56	215	27.85
Start Purge (hrs): 1109								
End Purge (hrs): 12:45								
Total Purge Time (min): 96								
Total Vol. Purged (gal/L): 30								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	4
TAL Metals	HNO3	500 ml Poly	2
Dissolved Metals	HNO3	500 ml Poly	2
Hexavalent Chromium	4 C	1 Liter Poly	2
1-4 - Dioxane	4°C	1 Liter Amber Glass	4

OBSERVATIONS / NOTES:

Pump set at 23 feet would not hold 0.25 gallon purge rate set pump to the bottom of the well 1135 began pump 1/2 gal/min water level 23 feet

Circle if Applicable:

MS/MSD	Duplicate ID No.:	Signature(s):
—	DUP01 17:45	James Chen

TBD: To Be Determined

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW01SE
Sample Location: 03MW01SE
Sampled By: CM
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	TBD
Date: 5/20/08								
Time: 1425								
Method: Peristaltic Pump	Clear	6.28	0.146	10.58	0.00	8.08	232	20.92

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Date: 3/20/08								
Method: Redi-Flo2 Pump	Initial	6.12	0.321	10.86	4.55	9.15	245	20.65
Monitor Reading (ppm): 0.0	0.5 Vol	7.05	0.271	8.97	4.14	10.02	297	21.08
Well Casing Diameter & Material	1.0 Vol	6.73	0.207	10.48	1.46	8.17	266	20.92
Type: 2" PVC	1.5 Vol	6.49	0.170	10.26	0.24	8.05	208	20.92
Total Well Depth (TD): 30.85	2.0 Vol	6.39	0.154	10.82	0.00	8.38	216	20.92
Static Water Level (WL): 20.65	2.5 Vol	6.30	0.149	10.61	0.00	8.43	221	20.92
One Casing Volume (gal/L): 4.89	3.0 Vol	6.28	0.146	10.58	0.00	8.08	232	20.92
Start Purge (hrs): 0915								
End Purge (hrs): 1423								
Total Purge Time (min): 227								
Total Vol. Purged (gal/L): 30								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	2
TAL Metals	HNO3	500 ml Poly	1
Dissolved Metals	HNO3	500 ml Poly	1
Hexavalent Chromium	4 C	1 Liter Poly	0
1,4-Dioxane	4°C	1 Liter Amber Glass	2

OBSERVATIONS / NOTES:

0945 Went to gate to escort person to pick up truck
car
1105 Arrived back onsite to continue the purge

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

TBD: To Be Determined

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW02S
Sample Location: 03MW02S
Sampled By: CM/JC
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	TBD
Date: 3/18/2008								
Time: 17:46								
Method: Redi-Flo2 pump	Clear	5.69	0.122	10.41	0.0	6.27	257	9.90

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Date: 3/18/08	Initial	7.43	0.126	10.68	34.10	7.45	368	9.73
Method: Redi-Flo2 Pump	0.5 Vol	5.77	0.122	10.82	2.10	6.82	302	9.95
Monitor Reading (ppm):	1.0 Vol	5.70	0.122	10.89	0.00	6.18	281	9.91
Well Casing Diameter & Material	1.5 Vol	5.69	0.122	10.84	0.00	6.20	270	9.90
Type: 4" PVC	2.0 Vol	5.68	0.122	10.68	0.48	6.40	262	9.90
Total Well Depth (TD): 24.26	2.5 Vol	5.70	0.122	10.46	0.00	6.30	258	9.90
Static Water Level (WL): 9.73	3.0 Vol	5.69	0.122	10.54	0.00	6.25	257	9.90
One Casing Volume (gal/L): 9.5	3.5 Vol	5.69	0.122	10.50	0.00	6.30	256	9.90
Start Purge (hrs): 16:27								
End Purge (hrs): 17:34								
Total Purge Time (min): 67								
Total Vol. Purged (gal/L): 33.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	2
TAL Metals	HNO3	500 ml Poly	1
Dissolved Metals	HNO3	500 ml Poly	1
Hexavalent Chromium	4 C	1 Liter Poly	0
1,4 - Dioxane	4°C	1 Liter Amber Glass	2

OBSERVATIONS / NOTES:

Pump was set at 14 ft depth.

Pumping Rate: 0.5 gal/min

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): James Chen

TBD: To Be Determined

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW02SI
Sample Location: 03MW02SI
Sampled By: CM/JC
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	TBD
Date: 3/18/2008								
Time: 15:46								
Method: Redi-Flo2 Pump	Clear	7.02	0.205	11.60	0.0	6.33	149	10.07

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Date: 3/18/08								
Method: Redi-Flo2 Pump	See Low Flow Purge Data Sheet							
Monitor Reading (ppm): 0.								
Well Casing Diameter & Material Type: 2" PVC								
Total Well Depth (TD): 66.95								
Static Water Level (WL): 10.02								
Two Screen Vol's (gal/L): 3.26								
Start Purge (hrs): 14:32								
End Purge (hrs): 15:42								
Total Purge Time (min): 70								
Total Vol. Purged (gal/L): 3.70								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	2
TAL Metals	HNO3	500 ml Poly	1
Dissolved Metals	HNO3	500 ml Poly	1
Hexavalent Chromium	4 C	1 Liter Poly	0
1,4 Dioxane	4C	1 Liter Amber	2

OBSERVATIONS / NOTES:

Vertical Pump Placement = 62 ft

Circle if Applicable:

MS/MSD	Duplicate ID No.:	Signature(s):
—	—	James Chen

TBD: To Be Determined

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove JRB Site 3
PROJECT NUMBER: 845

WELL ID.: 03MW02~~I~~ 2SI 20080318 CM 3/18/08
DATE: 3/18/08

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Vertical Pump Placement Other Comments
14:32	10.00	200	7.35	0.195	4.79	12.09	11.51	271	Pump was set
14:37	10.07	200	7.14	0.201	1.99	7.30	11.39	236	at 62 ft depth.
14:42	10.07	200	7.08	0.202	0.81	6.86	11.43	220	
14:47	10.07	200	7.05	0.203	0.00	6.64	11.44	207	
14:52	10.07	200	7.03	0.203	0.00	6.55	11.55	186	
14:57	10.07	200	7.02	0.205	0.00	6.52	11.45	173	
15:02	10.07	200	7.03	0.205	0.00	6.50	11.43	171	
15:07	10.07	200	7.02	0.205	0.00	6.46	11.42	164	
15:12	10.07	200	7.02	0.205	0.00	6.40	11.45	157	
15:17	10.07	200	7.02	0.205	0.00	6.38	11.53	154	
15:22	10.07	200	7.02	0.205	0.00	6.37	11.56	151	
15:27	10.07	200	7.02	0.205	0.00	6.35	11.59	150	
15:32	10.07	200	7.02	0.205	0.00	6.34	11.51	149	
15:37	10.07	200	7.02	0.205	0.00	6.33	11.63	149	
15:42	10.07	200	7.02	0.205	0.00	6.34	11.60	149	

CALCULATIONS

SIGNATURE(S): James Chen **PAGE** ___ **OF**

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW02I
Sample Location: 03MW02I
Sampled By: CM/JC
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	TBD
Date: 3/18/2008								
Time: 13:46								
Method: Redi-Flo2 pump	Clear	7.32	1.99	10.96	0.0	10.12	233	1.16

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Date: 3/18/08								
Method: Redi-Flo2 Pump	See	Low	Flow	Purge	Data	Sheet		
Monitor Reading (ppm): 0.0								
Well Casing Diameter & Material								
Type: 2" PVC								
Total Well Depth (TD): 146.05								
Static Water Level (WL): 1.12								
Two Screen Vol's (gal/L): 3.26								
Start Purge (hrs): 12:33								
End Purge (hrs): 13:43								
Total Purge Time (min): 70								
Total Vol. Purged (gal/L): 3.8								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	2
TAL Metals	HNO3	500 ml Poly	1
Dissolved Metals	HNO3	500 ml Poly	1
Hexavalent Chromium	4 C	1 Liter Poly	0
1,4-Dioxane	4°C	1 Liter Amber	2

OBSERVATIONS / NOTES:

Vertical Pump Placement = 140 ft

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): James Chen

TBD: To Be Determined

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove JRB Site 3
PROJECT NUMBER: 845

WELL ID.: 03MW02I
DATE: 3/18/2008

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Vertical Pump Placement Other Comments
12:33	1.16	200	6.29	0.207	0.43	15.42	10.15	260	pump was set
12:38	1.16	200	6.68	0.207	6.50	12.41	10.17	262	at 140 ft depth.
12:43	1.16	200	6.75	0.206	6.25	12.24	10.17	262	
12:48	1.16	200	6.91	0.204	4.91	11.74	10.30	257	
12:53	1.16	200	6.99	0.202	3.17	11.49	10.38	254	
12:58	1.16	200	7.07	0.202	2.39	11.26	10.45	250	
13:03	1.16	200	7.13	0.202	1.32	11.09	10.46	245	
13:08	1.16	200	7.16	0.200	0.67	10.88	10.61	241	
13:13	1.16	200	7.20	0.200	0.40	10.70	10.72	240	
13:18	1.16	200	7.22	0.199	0.07	10.62	10.64	238	
13:23	1.16	200	7.24	0.199	0.20	10.50	10.80	236	
13:28	1.16	200	7.27	0.199	0.00	10.39	10.85	234	
13:33	1.16	200	7.29	0.198	0.00	10.30	10.89	232	
13:38	1.16	200	7.31	0.199	0.00	10.20	10.92	232	
13:43	1.16	200	7.32	0.199	0.00	10.12	10.95	232	

CALCULATIONS

SIGNATURE(S):_____ **PAGE**___ **OF**

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW03SI
Sample Location: 03MW03SI
Sampled By: DW / JC
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	TBD
Date: 3/17/08								
Time: 10:10								
Method: Redi-Flo2 Pump	Clear	6.55	0.223	10.98	0.0	8.58	247	0

PURGE DATA:

Date: 3/17/2008	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Method: Redi-Flo2 Pump	Initial	5.48	0.243	10.35	0.0	9.55	249	0
Monitor Reading (ppm): 0	0.5 Vol	6.20	0.222	10.93	0.0	8.70	245	0
Well Casing Diameter & Material	1.5 Vol	6.32	0.220	11.05	0.0	8.24	245	0
Type: 2" PVC	2.0 Vol	6.39	0.221	11.14	0.0	8.15	243	0
Total Well Depth (TD): 80'	2.5 Vol	6.42	0.223	11.03	0.0	8.90	243	0
Static Water Level (WL): 0	3.0 Vol	6.49	0.222	11.05	0.0	8.63	244	0
One Casing Volume (gal/L): 13	3.5 Vol	6.53	0.221	10.95	0.0	8.59	245	0
Start Purge (hrs): 09:41	4.0 Vol	6.55	0.223	10.98	0.0	8.58	247	0
End Purge (hrs): 10:08								
Total Purge Time (min): 27								
Total Vol. Purged (gal/L): 54								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	4
TAL Metals	HNO3	500 ml Poly	2
Dissolved Metals	HNO3	500 ml Poly	2
Hexavalent Chromium	4 C	1 Liter Poly	0
1,4-Dioxane	4C	1 Liter Amber	4

OBSERVATIONS / NOTES:

Start Purge: 09:41. Pumping Rate: 2 gal/min

Circle if Applicable:

MS/MSD — Duplicate ID No.: DUP-02

Signature(s): James Chen

TBD: To Be Determined

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

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Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW03S
Sample Location: 03MW03S
Sampled By: DW/JC
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	TBD
Date: 3/17/2008								
Time: 13:27								
Method: Redi-Flo2 pump	Clear	5.56	0.161	9.65	0.0	6.54	233	1.95

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Date: 3/17/2008								
Method: Redi-Flo2 Pump	Initial	5.94	0.161	8.55	1.6	7.24	272	1.76
Monitor Reading (ppm): 0.0	0.5 Vol	5.66	0.161	9.71	0.0	6.65	265	1.95
Well Casing Diameter & Material	1.0 Vol	5.58	0.161	9.82	0.0	6.63	256	1.95
Type: 4" PVC	1.5 Vol	5.56	0.161	9.68	0.0	6.68	245	1.95
Total Well Depth (TD): 9.15'	2.0 Vol	5.56	0.161	9.78	0.0	6.50	228	1.95
Static Water Level (WL): 1.76'	2.5 Vol	5.55	0.161	9.71	0.0	6.67	233	1.95
One Casing Volume (gal/L): 13	3.0 Vol	5.56	0.161	9.65	0.0	6.54	233	1.95
Start Purge (hrs): 12:01								
End Purge (hrs): 13:19								
Total Purge Time (min): 78								
Total Vol. Purged (gal/L): 39								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	2
TAL Metals	HNO3	500 ml Poly	1
Dissolved Metals	HNO3	500 ml Poly	1
Hexavalent Chromium	4 C	1 Liter Poly	0
1,4-Dioxane	4C	1 Liter Amber	2

OBSERVATIONS / NOTES:

Pump was set at 6.6 ft depth.
Pumping Rate: 0.5 gal/min.

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): James Chen

TBD: To Be Determined

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

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Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW03I
Sample Location: 03MW03I
Sampled By: DW/JC
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	TBD
Date: 3/17/2008								
Time: 16:37								
Method: Redi-Flo2 pump	Clear	7.81	0.216	11.30	0.0	7.60	211	39.40

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Date: 3/17/2008								
Method: Redi-Flo2 Pump	Initial	6.90	0.209	11.02	0.0	7.24	229	0
Monitor Reading (ppm): 0.0	0.5 Vol	7.57	0.219	11.50	0.0	7.52	208	26.30
Well Casing Diameter & Material	1 Vol	7.71	0.215	11.46	0.0	7.62	204	34.80
Type: 4" PVC	1.5 Vol	7.76	0.216	11.40	0.0	8.33	214	37.71
Total Well Depth (TD): 168.5	2.0 Vol	7.80	0.216	11.45	0.0	7.53	212	38.80
Static Water Level (WL): Flowing	2.5 Vol	7.78	0.216	11.25	0.0	7.63	211	39.32
One Casing Volume(gal/L): 110	3.0 Vol	7.80	0.216	11.35	0.0	7.64	212	39.55
Start Purge (hrs): 14:42								
End Purge (hrs): 16:36								
Total Purge Time (min): 114								
Total Vol. Purged (gal/L): 342								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	2
TAL Metals	HNO3	500 ml Poly	1
Dissolved Metals	HNO3	500 ml Poly	1
Hexavalent Chromium	4 C	1 Liter Poly	1
1,4 Dioxane	4C	1 Liter Amber	2

OBSERVATIONS / NOTES:

Water level was 10.6 ft above ground surface.
initial flow rate = 3 gpm

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): James Chen

TBD: To Be Determined

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

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Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW04I
Sample Location: 03MW04I
Sampled By: CM/JC
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	TBD
Date: 3/14/08								
Time: 12:08								
Method: Redi-Flo2 pump	Clear	6.96	0.254	11.30	0.0	9.82	178	0

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Date: 3/14/08								
Method: Redi-Flo2 Pump	Initial	6.67	0.239	10.78	50	9.27	293	0
Monitor Reading (ppm): 0.0	0.5 Vol	6.71	0.247	11.08	9.4	10.39	257	0
Well Casing Diameter & Material	1.0 Vol	6.90	0.247	11.22	1.6	10.21	247	0
Type: 4" PVC	1.5 Vol	6.90	0.253	11.06	0.0	10.00	225	0
Total Well Depth (TD): 168	2.0 Vol	6.91	0.250	11.08	0.0	10.16	210	0
Static Water Level (WL): 0.0	2.5 Vol	6.94	0.250	11.28	0.0	10.37	203	0
One Casing Volume(gal/L): 110	3.0 Vol	6.95	0.253	11.25	0.0	9.80	194	0
Start Purge (hrs): 10:36	3.5 Vol	6.95	0.255	11.23	0.0	9.84	187	0
End Purge (hrs): 12:12	4.0 Vol	6.96	0.254	11.30	0.0	9.82	178	0
Total Purge Time (min): 96								
Total Vol. Purged (gal/L): 350								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	2
TAL Metals	HNO3	500 ml Poly	1
Dissolved Metals	HNO3	500 ml Poly	1
Hexavalent Chromium	4 C	1 Liter Poly	0
1,4-Dioxane	4°C	1 Liter Amber Glass	2

OBSERVATIONS / NOTES:

Start to pump 10:36, pump rate: 2 gal/min
1055 speeded up pump rate to 5 gal/min
water level was 12.04 feet above ground surface

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): James Chen

TBD: To Be Determined

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

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Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW04SI
Sample Location: 03MW04SI
Sampled By: CM/JC
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	TBD
Date: 3/14/2008	Visual	Standard	mS/cm	°C	NTU	mg/l	mV	
Time: 14:03								
Method: Redi-Flo2 Pump	Clear	6.26	0.327	10.85	0.0	9.37	178	N/A

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Date: 3/14/2008								
Method: Redi-Flo2 Pump	Initial	6.82	0.329	11.94	0.0	11.32	179	0
Monitor Reading (ppm): 0.0	0.5 Vol	6.31	0.319	11.25	0.0	10.20	175	0
Well Casing Diameter & Material	1.0 Vol	6.29	0.327	11.04	0.0	9.66	173	0
Type: 2" PVC	1.5 Vol	6.26	0.322	10.93	0.0	9.56	173	0
Total Well Depth (TD): 80	2.0 Vol	6.29	0.323	11.03	0.0	9.53	172	0
Static Water Level (WL): 0.0	2.5 Vol	6.26	0.327	10.84	0.0	9.34	173	0
One Casing Volume(gal/L): 13.0	3.0 Vol	6.29	0.328	10.76	0.0	9.35	177	0
Start Purge (hrs): 13:07	3.5 Vol	6.28	0.328	11.01	0.0	9.25	176	0
End Purge (hrs): 14:01	4.0 Vol	6.26	0.327	10.85	0.0	9.37	178	
Total Purge Time (min): 54								
Total Vol. Purged (gal/L): 60								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	2
TAL Metals	HNO3	500 ml Poly	1
Dissolved Metals	HNO3	500 ml Poly	1
Hexavalent Chromium	4 C	1 Liter Poly	0
1,4-Dioxane	4°C	1 Liter Amber Glass	2

OBSERVATIONS / NOTES:

13:07: Pump Rate: 3 Gal/min.
13:11: Pump Rate: 1 Gal/min
Water level was 3.0 feet above ground surface.

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): James Chen

TBD: To Be Determined

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

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Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW04S
Sample Location: 03MW04S
Sampled By: CM/JC
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	TBD
Date: 3/14/2008								
Time: 17:25								
Method: Redi-Flo2 Pump	Clear	6.39	0.304	10.28	0.0	8.86	211	12.22

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Date: 3/14/08								
Method: Redi-Flo2 Pump	Initial	6.62	0.327	12.32	50	10.41	238.0	10.34
Monitor Reading (ppm): 384	0.5 Vol	6.45	0.327	10.59	12.2	9.28	226	12.20
Well Casing Diameter & Material	1.0 Vol	6.42	0.324	10.59	6.0	9.16	218	12.23
Type: 4" PVC	1.5 Vol	6.52	0.315	10.37	3.0	9.43	216	12.21
Total Well Depth (TD): 36.47	2.0 Vol	6.44	0.301	10.21	1.4	9.40	215	12.21
Static Water Level (WL): 10.34	2.5 Vol	6.37	0.306	10.36	0.7	8.91	211	12.22
One Casing Volume(gal/L): 16.87	3.0 Vol	6.39	0.301	10.30	0.25	8.91	211	12.22
Start Purge (hrs): 16:09	3.5 Vol	6.39	0.304	10.28	0.0	8.86	211	12.22
End Purge (hrs): 17:22								
Total Purge Time (min): 73								
Total Vol. Purged (gal/L): 55								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	2
TAL Metals	HNO3	500 ml Poly	1
Dissolved Metals	HNO3	500 ml Poly	1
Hexavalent Chromium	4 C	1 Liter Poly	0
1,4-Dioxane	4°C	1 Liter Amber Glass	2

OBSERVATIONS / NOTES:

36.47
10.34
2613
1653
7834
12065
15678
1586289

16:09: Pump Rate: 1 Gal/min
16:26: Pump Rate 0.75 gal/min

Pump was set at 14 ft depth.

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): James Chen

TBD: To Be Determined

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

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Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW05S
Sample Location: 03MW05S
Sampled By: CM/JC
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	TBD
Date: 3/12/08								
Time: 10:46								
Method: Redi-Flo2 Pump	Clear	5.13	0.135	12.02	0.00	8.57	268	23.57

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Date: 3/12/08								
Method: Redi-Flo2 Pump	Initial	4.84	0.172	11.28	0.40	8.62	262	23.44
Monitor Reading (ppm): 0.5	0.5 Vol	5.02	0.138	11.90	0.00	8.64	268	23.55
Well Casing Diameter & Material	1 Vol.	5.14	0.133	12.40	0.00	13.90	266	23.58
Type: 4" PVC	1.5 Vol	5.11	0.136	12.63	0.00	12.46	266	23.57
Total Well Depth (TD): 40.44	2 Vol	5.13	0.135	12.37	0.00	8.18	267	23.57
Static Water Level (WL): 23.43	2.5 Vol	5.13	0.136	12.38	0.00	8.21	268	23.58
One Casing Volume (gal/L): 11.19	3 Vol	5.13	0.135	12.02	0.00	8.57	268	23.57
Start Purge (hrs): 09:32								
End Purge (hrs): 10:43								
Total Purge Time (min): 71								
Total Vol. Purged (gal/L): 35								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	2
TAL Metals	HNO3	500 ml Poly	1
Dissolved Metals	HNO3	500 ml Poly	1
Hexavalent Chromium	4 C	1 Liter Poly	1
1,4 Dioxane	4C	1 Liter Glass	2

OBSERVATIONS / NOTES:

Start to Purge 9:32 Am
pump set to 25 ft. Flow Rate: 2 L/min

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): James Chen

TBD: To Be Determined

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

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Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW05I
Sample Location: 03MW05I
Sampled By: CM/JC
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	TBD
Date: 3/11/08								
Time: 1559								
Method: RediFlow 2 Pump	Clear	6.08	0.124	12.38	2.62	11.75	153	21.93

PURGE DATA:

Date: 3/11/08	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Method: Redi-Flo2 Pump	See	Low	Flow	Purge	Data	Sheet		
Monitor Reading (ppm): 0.0								
Well Casing Diameter & Material								
Type: 2" PVC								
Total Well Depth (TD): 93.98								
Static Water Level (WL): 21.61								
Two Screen Vol's (gal/L): 3.26								
Start Purge (hrs): 14:39								
End Purge (hrs): 15:54								
Total Purge Time (min): 75								
Total Vol. Purged (gal/L): 5.06								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	2
TAL Metals	HNO3	500 ml Poly	1
Dissolved Metals	HNO3	500 ml Poly	1
Hexavalent Chromium	4 C	1 Liter Poly	1
1,4-Dioxane	4°C	1 Liter Amber Glass	2

OBSERVATIONS / NOTES:

Vertical Pump Placement = 86 ft

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): James Chen

TBD: To Be Determined

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove JRB Site 3
PROJECT NUMBER: 845

WELL ID.: 03MW05I
DATE: 3/11/08

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Vertical Pump Placement Other Comments
14:39	21.68	150 mL/min	6.34	0.130	23.2	13.12	11.48	195	
14:44	21.85	200	6.25	0.126	22.6	9.05	11.42	174	
14:49	21.91	200	6.12	0.127	192	11.20	11.60	119	
14:54	21.95	250	6.07	0.126	55.1	12.13	11.94	119	
14:59	21.97	250	6.05	0.125	17.8	12.60	12.03	125	
15:04	21.98	250	6.05	0.126	9.19	12.65	12.03	131	
15:09	21.99	250	6.05	0.125	6.14	12.82	11.95	136	
15:14	21.99	250	6.05	0.125	4.05	12.88	12.01	139	
15:19	21.99	250	6.06	0.125	3.12	12.75	12.21	143	
15:24	21.99	250	6.06	0.125	1.88	12.74	12.15	146	
15:29	21.98	250	6.06	0.124	1.85	12.54	12.43	148	
15:34	21.96	250	6.07	0.124	1.99	12.30	12.25	150	
15:39	21.96	250	6.07	0.124	1.14	12.09	12.26	151	
15:44	21.94	250	6.08	0.124	0.98	12.02	12.05	153	
15:49	21.92	250	6.08	0.124	1.03	11.80	12.40	154	
15:54	21.93	250	6.08	0.124	0.90	11.75	12.38	153	

CALCULATIONS

SIGNATURE(S): James Chen **PAGE** ___ **OF**

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

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Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW06I
Sample Location: 03MW06I
Sampled By: CM/JC
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	TBD
Date: 3/14/08								
Time: 0910								
Method: Redi-Flo2 Pump	Brown	6.16	0.246	11.92	330	7.75	237	

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Date: 3/13/08								
Method: Redi-Flo2 Pump	See	low	Flow	Purge	Data	Sheets		
Monitor Reading (ppm): 3.2								
Well Casing Diameter & Material								
Type: 2" PVC								
Total Well Depth (TD): 148.82								
Static Water Level (WL): 25.03								
Two Screen Vol's (gal/L): 3.26								
Start Purge (hrs): 09:24								
End Purge (hrs): 12:27								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	2
TAL Metals	HNO3	500 ml Poly	1
Dissolved Metals	HNO3	500 ml Poly	1
Hexavalent Chromium	4 C	1 Liter Poly	1
1.4 – Dioxane	4°C	1 Liter Amber Glass	2

OBSERVATIONS / NOTES:

Vertical Pump Placement = 144.3 ft.
3/13/2008
11:46 Purging Dry was begun.
12:27 Purging Dry was completed
Water Level = 25.52 3/14/08 0909

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): James Chen

TBD: To Be Determined

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove JRB Site 3
PROJECT NUMBER: 845

WELL ID.: 03 MW 06I
DATE: 3/13/08

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Vertical Pump Placement Other Comments
09:24	24.52	100	7.79	0.226	25.1	12.00	10.31	219	Pump was set
09:29	25.92	100	8.78	0.223	33.4	9.46	10.13	213	at 144.3 ft depth
09:34	25.95	100	9.31	0.224	41.9	7.71	10.15	209	
09:39	25.98	90	9.42	0.224	43.1	7.13	10.00	208	
09:44	26.01	100	9.24	0.217	120.0	6.24	10.47	210	
09:49	26.18	100	8.86	0.213	527.0	4.40	11.16	212	
09:54	26.19	100	8.72	0.211	524.0	3.78	11.10	200	
09:59	26.19	90	8.70	0.210	447.0	3.66	10.62	184	
10:04	26.19	90	8.70	0.209	401.0	3.54	10.76	168	
10:09	26.22	90	8.68	0.207	335.0	3.30	11.16	151	
10:14	26.23	90	8.68	0.207	300.0	3.24	11.02	133	
10:19	26.23	90	8.68	0.207	270.0	3.06	11.06	111	
10:24	26.23	90	8.68	0.206	250.0	2.96	11.18	97	
10:29	26.23	90	8.69	0.206	220.0	2.86	11.04	81	
10:34	26.21	90	8.68	0.206	210.0	2.77	11.18	69	
10:39	26.22	90	8.70	0.207	190.0	2.77	10.91	57	
10:44	26.21	90	8.70	0.206	180.0	2.65	11.30	46	
10:49	26.21	90	8.70	0.206	170.0	2.63	11.32	39	
10:54	26.22	90	8.70	0.206	160.0	2.63	11.39	32	
10:59	26.22	90	8.71	0.205	140.0	2.58	11.49	26	
11:04	26.23	90	8.71	0.205	130.0	2.57	11.44	22	
11:09	26.22	90	8.72	0.206	120.0	2.59	11.28	20	
11:14	26.25	90	8.72	0.205	120.0	2.57	11.58	17	
11:19	26.25	90	8.71	0.205	110.0	2.56	11.55	15	

CALCULATIONS

SIGNATURE(S): James Chen

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove JRB Site 3
PROJECT NUMBER: 845

WELL ID.: 03MW061
DATE: 3/13/08

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Vertical Pump Placement Other Comments
11:24	26.30	90	8.72	0.207	100	2.61	11.40	14	
11:29	26.33	90	8.71	0.204	100	2.57	11.94	13	
11:34	26.39	90	8.70	0.204	95	2.58	11.98	13	
11:39	26.38	90	8.71	0.204	95	2.58	12.13	12	
11:44									
11:49	will not sustain pump rate talked with office								
	will purge dry and come back tomorrow for								
	sample								
1146	Purging Dry was begun								
1227	Purging Dry was completed								

CALCULATIONS

SIGNATURE(S): James Chen

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03-MW06SE
Sample Location: MW06SE
Sampled By: CW/JC
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	TBD
Date: 3/13/2008								
Time: 14:40								
Method: Redi-Flo2 Pump	Clear	5.54	0.102	13.35	5.7	11.95	192	24.39

PURGE DATA:

Date: 3/13/08	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Method: Redi-Flo2 Pump	See	low	Flow	Purge	Data	Sheet		
Monitor Reading (ppm): 3800								
Well Casing Diameter & Material								
Type: 2" PVC								
Total Well Depth (TD): 86.35								
Static Water Level (WL): 24.36								
Two Screen Vol's (gal/L): 3.26								
Start Purge (hrs): 13:24								
End Purge (hrs): 14:34								
Total Purge Time (min): 70								
Total Vol. Purged (gal/L): 3.36								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	2
TAL Metals	HNO3	500 ml Poly	1
Dissolved Metals	HNO3	500 ml Poly	1
Hexavalent Chromium	4 C	1 Liter Poly	1
1,4-Dioxane	4°C	1 Liter Amber Glass	2

OBSERVATIONS / NOTES:

Vertical Pump Placement = 81 ft

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): James Chen

TBD: To Be Determined

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove JRB Site 3
PROJECT NUMBER: 845

WELL ID.: 03MW06SI
DATE: 3/13/2008

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Vertical Pump Placement Other Comments
13:24	24.37	180	8.01	0.103	23	12.05	12.88	154	Pump was set at
13:29	24.39	180	6.65	0.103	30	10.51	12.30	163	81 ft
13:34	24.39	180	6.11	0.103	26	11.03	12.30	163	
13:39	24.39	180	5.86	0.103	20	11.41	12.41	166	
13:44	24.39	180	5.71	0.103	19	11.66	12.64	170	
13:49	24.39	180	5.62	0.103	17	11.84	12.75	174	
13:54	24.39	180	5.57	0.104	14	12.00	12.84	177	
13:59	24.39	180	5.54	0.103	14	12.06	12.90	180	
14:04	24.39	180	5.52	0.103	12	12.03	13.19	184	
14:09	24.39	180	5.50	0.102	9.7	12.10	13.29	186	
14:14	24.39	180	5.51	0.102	8.2	12.03	13.35	187	
14:19	24.39	180	5.51	0.102	7.6	12.04	13.33	189	
14:24	24.39	180	5.51	0.102	6.4	12.06	13.33	191	
14:29	24.39	180	5.53	0.102	6.2	12.05	13.31	192	
14:34	24.39	180	5.54	0.102	5.7	11.95	13.35	192	

CALCULATIONS

SIGNATURE(S): James Chen **PAGE** ___ **OF**

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW06S
Sample Location: MW06S
Sampled By: CM/JC
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	TBD
Date: 3/13/08								
Time: 1714								
Method: Redi-Flo 2 Pump	Clear	5.11	0.188	17.04	1.00	9.21	268	28.43

PURGE DATA:

Date: 3/13/08	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Method: Redi-Flo2 Pump								
Monitor Reading (ppm): 25.7								
Well Casing Diameter & Material								
Type: 2" PVC	(See Low Flow Purge Data Sheets)							
Total Well Depth (TD): 38.27								
Static Water Level (WL): 28.35								
Two Screen Vol's (gal/L): 3.26								
Start Purge (hrs): 1516								
End Purge (hrs): 1711								
Total Purge Time (min): 115								
Total Vol. Purged (gal/L): 5.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	3
TAL Metals	HNO3	500 ml Poly	1
Dissolved Metals	HNO3	500 ml Poly	1
Hexavalent Chromium	4 C	1 Liter Poly	1
1,4-Dioxane	4°C	1 Liter Amber Glass	2

OBSERVATIONS / NOTES:

Vertical Pump Placement = 31 ft

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): James Chen

TBD: To Be Determined

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove JRB Site 3
PROJECT NUMBER: 845

WELL ID.: 03MW06S 20080313
DATE: 3/13/08

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Vertical Pump Placement Other Comments
15:16	28.38	125	5.26	0.187	95	12.95	12.48	230	pump was set
15:21	28.40	150	5.16	0.183	95	13.47	14.08	233	at 31 ft depth
15:26	28.39	150	5.13	0.185	50	12.98	14.77	232	
15:31	28.39	125	5.14	0.187	39.2	13.00	14.18	233	
15:36	28.41	150	5.15	0.181	36.0	11.47	15.65	225	
15:41	28.41	140	5.12	0.182	20.1	10.50	17.50	235	
15:46	28.37	120	5.15	0.192	18.0	11.18	15.67	238	
15:51	28.38	100	5.15	0.189	18.0	9.67	15.29	235	
15:56	28.42	150	5.13	0.187	15.0	9.62	16.90	249	
16:01	28.41	250	5.11	0.186	11.14	9.61	17.04	252	
16:06	28.43	250	5.12	0.183	6.43	9.51	16.34	259	
16:11	28.43	250	5.12	0.187	5.69	9.24	16.29	261	
16:16	28.43	250	5.11	0.187	5.07	9.02	15.96	259	
16:21	28.41	250	5.13	0.188	3.87	8.87	15.47	255	
16:26	28.40	240	5.13	0.190	3.45	9.20	14.52	255	
16:31	28.40	230	5.14	0.192	3.32	9.25	12.80	249	
16:36	28.39	200	5.13	0.190	4.96	9.00	13.10	242	
16:41	28.40	200	5.13	0.188	4.00	9.04	13.80	238	
16:46	28.39	200	5.12	0.184	5.72	9.10	14.10	238	
16:51	28.39	150	5.12	0.186	4.50	9.15	14.28	239	
16:56	28.43	200	5.12	0.179	5.40	9.48	17.80	245	
17:01	28.43	200	5.11	0.187	2.34	9.50	17.60	259	
17:06	28.43	200	5.11	0.188	2.90	9.39	17.20	260	
17:11	28.43	200	5.11	0.188	1.00	9.21	17.04	268	

CALCULATIONS

SIGNATURE(S): James Chen **PAGE** ___ **OF**

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

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Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW075
Sample Location: 03MW075
Sampled By: CM/JC
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	TBD
Date: 3/19/2008								
Time: 13:23								
Method: Redi-Flo2 Pump	Clear	6.16	0.559	11.72	0.00	7.44	179	10.55

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Date: 3/19/08								
Method: Redi-Flo2 Pump	See	low	Flow	Purge	Data	Sheet		
Monitor Reading (ppm): 6.2								
Well Casing Diameter & Material								
Type: 2" PVC								
Total Well Depth (TD): 10.51								
Static Water Level (WL): 46.33								
Two Screen Vol's (gal/L): 3.26								
Start Purge (hrs): 12:06								
End Purge (hrs): 13:21								
Total Purge Time (min): 75								
Total Vol. Purged (gal/L): 4.6								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	2
TAL Metals	HNO3	500 ml Poly	1
Dissolved Metals	HNO3	500 ml Poly	1
Hexavalent Chromium	4 C	1 Liter Poly	0
1,4-Dioxane	4°C	1 Liter Amber Glass	2

OBSERVATIONS / NOTES:

Vertical Pump Placement = 40 ft depth

Circle if Applicable:

MS/MSD	Duplicate ID No.:	Signature(s):
—	—	James Chen

TBD: To Be Determined

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove JRB Site 3
PROJECT NUMBER: 845

WELL ID.: 03MW07S
DATE: 3/19/2008

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Vertical Pump Placement Other Comments
12:06	10.51	200	6.50	0.503	38	10.34	9.68	312	~~10.51~~ JC 3.19.08
12:11	10.55	200	6.20	0.487	31	9.10	10.38	290	Pump Was Set
12:16	10.55	200	6.15	0.487	25	8.50	11.00	248	at 40 ft depth
12:21	10.55	210	6.15	0.494	22	8.40	11.13	235	
12:26	10.55	210	6.15	0.535	17	8.25	11.36	220	
12:31	10.55	210	6.15	0.545	13	8.10	11.43	210	
12:36	10.55	240	6.16	0.552	9.4	7.94	11.55	199	
12:41	10.55	240	6.16	0.556	6.9	7.83	11.53	193	
12:46	10.55	240	6.16	0.555	5.14	7.82	11.62	188	
12:51	10.55	240	6.16	0.555	3.33	7.71	11.76	185	
12:56	10.55	240	6.16	0.556	1.89	7.63	11.86	182	
13:01	10.55	240	6.17	0.557	1.17	7.61	11.86	180	
13:06	10.55	240	6.17	0.558	0.43	7.56	11.78	179	
13:11	10.55	240	6.16	0.559	0.14	7.51	11.75	179	
13:16	10.55	240	6.16	0.559	0.10	7.46	11.74	179	
13:21	10.55	240	6.16	0.559	0.00	7.44	11.72	179	

CALCULATIONS

SIGNATURE(S): James Chen **PAGE** ___ **OF**

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW085
Sample Location: 03MW085
Sampled By: CM / JC
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	TBD
Date: 3/12/08								
Time: 1458								
Method: Redi Flo-2 Pump	Clear	5.44	0.151	12.01	0.0	10.57	234	21.21

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Date: 3/12/08	See	low	Flow	Purge	Data	Sheets		
Method: Redi-Flo2 Pump								
Monitor Reading (ppm): 0.2								
Well Casing Diameter & Material								
Type: 2" PVC								
Total Well Depth (TD): 69.47								
Static Water Level (WL): 20.69								
Two Screen Vol's (gal/L): 9.78								
Start Purge (hrs): 1217								
End Purge (hrs): 1452								
Total Purge Time (min): 155								
Total Vol. Purged (gal/L): 6.75								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	2
TAL Metals	HNO3	500 ml Poly	1
Dissolved Metals	HNO3	500 ml Poly	1
Hexavalent Chromium	4 C	1 Liter Poly	0
1,4-Dioxane	4°C	1 Liter Amber Glass	2

OBSERVATIONS / NOTES:

Vertical Pump Placement = 50 feet

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): James Chen

TBD: To Be Determined

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove JRB Site 3
PROJECT NUMBER: 845

WELL ID.: 03MW08S
DATE: 3/12/2008

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Vertical Pump Placement Other Comments
12:17	20.64	200	6.10	0.154	16.00	11.23	10.83	289	55 ft depth
12:22	21.21	200	5.54	0.156	21.00	11.30	11.04	221	(pump was see)
12:27	21.21	200	5.44	0.157	21.30	11.62	11.30	203	
12:32	21.20	180	5.44	0.158	20.50	11.72	11.35	201	
12:37	21.24	180	5.45	0.156	15.40	11.69	11.40	203	
12:42	21.21	150	5.44	0.156	17.60	11.70	11.22	238	Generator cut off 12:43
12:52	21.16	150	5.43	0.156	13.10	11.62	11.26	203	Generator set again 12:47
12:57	21.17	150	5.42	0.156	6.80	11.51	11.68	208	
13:02	21.16	150	5.42	0.156	3.15	11.46	11.90	212	
13:07	21.16	150	5.43	0.155	2.56	11.21	12.37	215	
13:12	21.16	150	5.45	0.156	1.82	11.18	11.96	216	
13:17	21.16	150	5.44	0.156	0.98	11.21	11.67	218	
13:22	21.16	150	5.45	0.156	0.83	10.98	11.97	220	
13:27	21.16	150	5.45	0.154	1.35	10.83	12.57	220	
13:32	21.16	150	5.46	0.155	0.2	11.07	11.85	222	
13:37	21.16	150	5.46	0.154	0.0	10.71	12.64	223	
13:42	21.16	150	5.46	0.153	0.0	10.55	12.78	224	
13:47	21.16	150	5.46	0.154	0.0	10.69	11.96	225	
13:52	21.16	150	5.45	0.153	0.0	10.45	12.60	224	
13:57	21.20	150	5.44	0.152	0.0	10.54	11.85	227	
14:02	21.21	150	5.44	0.152	0.0	10.45	12.06	228	
14:07	21.21	200	5.44	0.152	0.0	10.36	12.33	230	
14:12	21.21	200	5.44	0.152	0.0	10.42	12.09	231	
14:17	21.21	200	5.44	0.153	0.0	10.42	12.16	231	

CALCULATIONS

SIGNATURE(S): James Chen

PAGE 1 **OF** 2

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove JRB Site 3
PROJECT NUMBER: 845

WELL ID.: 03MW085
DATE: 3/12/08

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Vertical Pump Placement Other Comments
14:22	21.21	200	5.44	0.153	0.0	10.47	12.16	233	pump was set at
14:27	21.21	180	5.44	0.152	0.0	10.49	11.79	232	
14:32	21.21	150	5.45	0.153	0.0	10.56	11.94	233	55 ft depth.
14:37	21.21	150	5.45	0.152	0.0	10.54	12.59	233	
14:42	21.21	150	5.45	0.152	0.0	10.56	11.98	235	
14:47	21.21	150	5.44	0.152	0.0	10.60	11.98	236	
14:52	21.21	150	5.44	0.151	0.0	10.57	12.01	234	

CALCULATIONS

SIGNATURE(S): James Chen

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW08D
Sample Location: 03MW08D
Sampled By: CM/JC
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	TBD
Date: 3/12/08								
Time: 1700								
Method: Rediflo 2 Pump	Clear	7.17	0.269	12.67	1.70	6.43	86	23.78

PURGE DATA:

Date: 3/12/08	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Method: Redi-Flo2 Pump	Initial	6.58	0.265	12.05	4.6	12.86	208	23.75
Monitor Reading (ppm): 21.2								
Well Casing Diameter & Material	See	Low	Flow	Purge	Data	Sheet		
Type: 2" PVC								
Total Well Depth (TD): 175.05								
Static Water Level (WL): 23.75								
Two Screen Vol's (gal/L): 3.26								
Start Purge (hrs): 15:48								
End Purge (hrs): 16:58								
Total Purge Time (min): 70								
Total Vol. Purged (gal/L): 5.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	2
TAL Metals	HNO3	500 ml Poly	1
Dissolved Metals	HNO3	500 ml Poly	1
Hexavalent Chromium	4 C	1 Liter Poly	0
1,4-Dioxane	4°C	1 Liter Amber	2

OBSERVATIONS / NOTES:

Vertical Pump Placement = 160 ft

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): James Chen

TBD: To Be Determined

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove JRB Site 3
PROJECT NUMBER: 845

WELL ID.: 03MW08D
DATE: 3/12/2008

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Vertical Pump Placement Other Comments
15:48	23.75	250	6.58	0.265	4.6	12.80	12.05	208	Pump Set at
15:53	23.78	250	6.90	0.266	3.0	10.91	12.06	198	160 ft bmpt
15:58	23.76	250	6.98	0.267	8.51	10.54	11.94	172	
16:03	23.76	300	7.02	0.267	8.71	10.00	12.17	139	
16:08	23.77	300	7.06	0.268	10.75	9.57	12.09	105	
16:13	23.79	300	7.09	0.270	9.64	9.13	12.12	95	
16:18	23.77	300	7.12	0.270	6.66	8.60	12.44	88	
16:23	23.78	300	7.14	0.270	5.30	8.17	12.45	84	
16:28	23.78	300	7.15	0.270	4.08	7.95	12.47	83	
16:33	23.78	300	7.15	0.270	3.76	7.62	12.53	83	
16:38	23.78	300	7.16	0.270	3.17	7.34	12.53	82	
16:43	23.78	300	7.16	0.270	2.89	7.17	12.33	83	
16:48	23.78	300	7.16	0.270	2.00	6.83	12.45	84	
16:53	23.78	300	7.16	0.270	1.80	6.57	12.60	86	
16:58	23.78	300	7.17	0.269	1.70	6.43	12.67	86	

CALCULATIONS

SIGNATURE(S): James Chen **PAGE** ___ **OF**

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Willow Grove JRB Site 3
Project No.: 845

[] Domestic Well Data
[X] Monitoring Well Data
[X] Other Well Type: Irrigation Well Golf Course
[] QA Sample Type:

Sample ID No.: 03 IW 01 - 20080319
Sample Location: 03IW01
Sampled By: CM
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA: JC

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	TBD
Date: 03/19/08								
Time: 0923								
Method: Bottleware	clear	6.55	0.455	10.52	2.32	8.22	238	

PURGE DATA:

Date: 03/19/08	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Method: Redi-Flo2 Pump								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCL	40 ml VOA Vials	4
TAL Metals	HNO3	500 ml Poly	2
Dissolved Metals	HNO3	500 ml Poly	2
Hexavalent Chromium	4 C	1 Liter Poly	0
1,4-Dioxane	4°C	1 Liter Amber Glass	4

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD

Duplicate ID No.: Dup-03
Assigned time 1523

Signature(s):

TBD: To Be Determined

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: Willow Grove JRB
Project No.: 845

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 035W10-20080319
Sample Location: 03 SW 10
Sampled By: CM
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

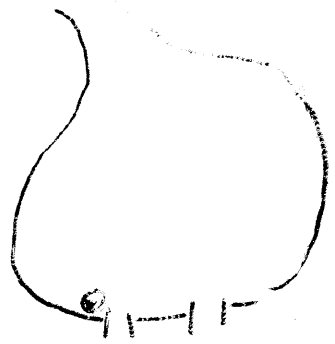
	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	ORP Mv	Other NA
Date: 3/19/08								
Time: 1013								
Depth: 0-4"	clear	6.64	0.165	6.70	18.9	13.39	239	
Method: Bailer								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOC	HCl	40 ml VOA Vial	2
1, 4-Dioxane	4 C	1 Liter Amber Glass	2
Dissolved Metals	HNO3	500 ml Poly	1
TAL Metals	HNO3	500 ml Poly	1

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: Willow Grove JRB
Project No.: 845

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 035W11-200803K
Sample Location: 035W11
Sampled By: CM
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

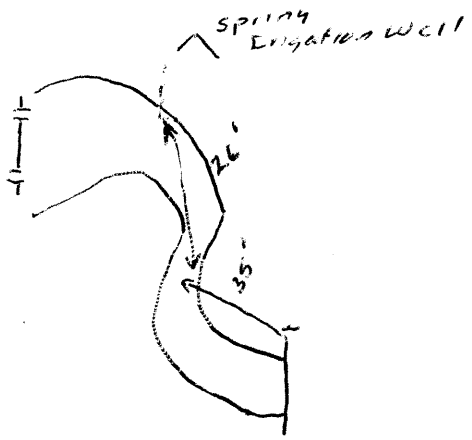
	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	ORP Mv	Other NA
Date: 3/19/08								
Time: 0944								
Depth: 0-4"	light green	6.81	0.273	7.20	41.4	11.69	243	
Method: Bottle wave								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOC	HCl	40 ml VOA Vial	2
1, 4-Dioxane	4 C	1 Liter Amber Glass	2
Dissolved Metals	HNO3	500 ml Poly	1
TAL Metals	HNO3	500 ml Poly	1

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

APPENDIX C

GROUNDWATER LEVEL DATA

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: NAS JRB Willow Grove Site3
Project No.: G00845
Location: Willow Grove JRB
Personnel: C.Meyer James Chen
Weather Conditions: Cloudy, Cool
Measuring Device: Herron Dipper T
Tidally Influenc Yes ___ No ___
Remarks:

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
03MW01S	3/18/2008	9:45	347.49	33.93	21.68		325.81	PID: 0.5
03MS01SI	3/18/2008	9:47	346.98	80.85	20.41		326.57	PID: 1.8
03MW02S	3/18/2008	9:58	326.15	24.26	9.72		316.43	PID: 0.0
03MW03S	3/18/2008	10:09	312.96	9.15	1.85		311.11	PID: 6.4
03MW03SI	3/18/2008	17:05	313.75	80.00	0.91 ATOC		314.66	PID: 0.0
03MW04S	3/18/2008	10:35	324.49	36.47	10.94		313.55	PID: 0.0
03MW04SI	3/18/2008	17:23	323.87	80.00	0.69 ATOC		324.56	PID: 0.0
03MW01I	3/18/2008	9:43	347.50	180.61	6.18		341.32	PID: 0.0
03MW03I	3/18/2008	10:22	315.00	168.50	11.35 ATOC		326.35	PID: 0.0
03MW04I	3/18/2008	10:48	324.85	168.00	12.00 ATOC		336.85	PID: 0.0
03MW05S	3/18/2008	9:35	362.90	40.44	24.53		338.37	PID: 0.0
03MW02SI	3/18/2008	9:55	326.33	66.95	10.00		316.33	PID: 0.0
03MW02I	3/18/2008	9:54	326.38	146.05	1.06		325.32	PID: 0.0
03MW05I	3/18/2008	9:31	362.93	93.98	22.86		340.07	PID: 0.0
03MW06S	3/18/2008	9:25	367.00	38.27	29.32		337.68	PID: 0.0
03MW06SI	3/18/2008	9:23	366.86	86.35	25.41		341.45	PID: 0.0
03MW06I	3/18/2008	9:16	366.82	148.82	25.86		340.96	PID: 0.0
03MW07S	3/18/2008	11:04	324.90	46.33	10.58		314.32	PID: 0.0
03MW08S	3/18/2008	9:07	365.59	69.47	22.15		343.44	PID: 0.0
03MW08D	3/18/2008	9:11	365.63	175.05	24.57		341.06	PID: 0.0

* All measurements to the nearest 0.01 foot

APPENDIX D

DATA VALIDATION REPORT SUMMARIES

TETRA TECH NUS

PHIL- 22096

TO:	**RUSS TURNER**	**DATE:**	**MAY 2, 2008**
FROM:	**MEGAN RITCHIE**	**COPIES:**	**FILE**

SUBJECT: **ORGANIC DATA VALIDATION – VOC AND 1,4-DIOXANE**
NAS JRB WILLOW GROVE SITE 3, WILLOW GROVE, PENNSYLVANIA
SDG NO. TWK-003

SAMPLES: **3/Aqueous/**

03MW01SI TB-20080320 FB-20080320

*The sample date was truncated for clarity for the environmental sample.

OVERVIEW

The sample set for the NAS JRB Willow Grove Site 3 Interim Groundwater Monitoring (IGWM) – Willow Grove, PA, SDG TWK-003 consists of 1 aqueous environmental samples (designated 03MW-) and two field quality control (QC) blanks (designated FB- and TB-). No samples were designated as the matrix spike and matrix spike duplicate (MS/MSD) for this sample set. No field duplicate pairs were included in this sample set. All samples were analyzed for Volatile Organic Compounds (VOCs) and 1,4-Dioxane except for the trip blank. The trip blank was analyzed for VOCs only.

The samples were collected by Tetra Tech NUS on March 20, 2008 and analyzed by Analytical Laboratory Services, Inc. (ALSI) of Middletown, Pennsylvania.

All analyses were conducted using EPA SW-846 Methods. VOCs were analyzed by 8260B and 1,4-Dioxane by 8270D.

SUMMARY

Most analytes were successfully analyzed in all samples. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until analysis, GC/MS tuning and calibration data, laboratory and field quality control blank results, system monitoring compound recoveries, matrix spike/matrix spike duplicate (MS/MSD) results, laboratory control spike (LCS) results, internal standards performance, compound identification, compound quantitation, and field duplicate results.

MAJOR PROBLEMS

- The initial calibration relative response factors (RRFs) for 2-butanone and acetone were below the QC criterion of 0.05. The non-detected results for 2-butanone and acetone were qualified as unusable (UR).

MINOR PROBLEMS

- The continuing calibration percent difference (%D) exceeded the QC criteria of 25% for tetrachloroethene. The associated positive tetrachloroethene result in sample 03MW01SI was qualified as estimated (J).

Notes

The continuing calibration %Ds exceeded the QC criteria of 25% for several VOC compounds. No action was taken because there were no detections of these compounds in the associated samples.

The LCS recoveries exceeded the QC criteria for chloromethane, Freon 113, and methyl acetate. No action was taken because there were no positive detections of these compounds in the associated samples.

There were no contaminants present in the laboratory and field QC blanks.

The 1,4-dioxane data were acceptable as reported by the laboratory.

EXECUTIVE SUMMARY

Laboratory Performance: Two VOC compounds had initial calibration RRFs below QC criteria. Several VOC compounds exceeded the continuing calibration %D criteria. Three VOC compound recoveries exceeded LCS QC limits.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the Tetra Tech NUS Standard Operating Procedure DV-02 (8/01) "Data Validation for Non-CLP Organics for Solid Matrices" and EPA "Functional Guidelines for Organic Data Review", as amended for use within EPA Region 3 (9/94).

The text of this report has been formatted to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the Functional Guidelines and the Quality Assurance Project Plan (QAPjP)."

Megan Ritchie

Megan N. Ritchie
Chemist

Tetra Tech NUS, Inc.
Russell Sloboda
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Laboratory Analytical Results
3. Appendix C – Support Documentation

APPENDIX A

Qualified Analytical Results

PROJ_NO: 00845

SDG: TWK003 MEDIA: WATER DATA FRACTION: OV

nsample	03MW01SI-20080320
samp_date	3/20/2008
lab_id	9728539003
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

nsample	03MW01SI-20080320
samp_date	3/20/2008
lab_id	9728539003
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	8.8	J	C
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

nsample	FB-20080320
samp_date	3/20/2008
lab_id	9728539002
qc_type	FB
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

PROJ_NO: 00845

SDG: TWK003 MEDIA: WATER DATA FRACTION: OV

nsample	FB-20080320
samp_date	3/20/2008
lab_id	9728539002
qc_type	FB
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

nsample	TB-20080320
samp_date	3/20/2008
lab_id	9728539001
qc_type	TB
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

nsample	TB-20080320
samp_date	3/20/2008
lab_id	9728539001
qc_type	TB
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

PROJ_NO: 00845

SDG: TWK003 MEDIA: WATER DATA FRACTION: OS

nsample	03MW01SI-20080320	nsample	FB-20080320
samp_date	3/20/2008	samp_date	3/20/2008
lab_id	9728539003	lab_id	9728539002
qc_type	NM	qc_type	FB
units	UG/L	units	UG/L
Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.9	U	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.9	U	

Qualifier Codes:

a	=	Lab Blank Contamination
b	=	Field Blank Contamination
c	=	Calibration (i.e., %RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
d	=	MS/MSD Noncompliance
e	=	LSC/LSCD Noncompliance
f	=	Laboratory Duplicate Imprecision
g	=	Field Duplicate Imprecision
h	=	Holding Time Exceedance
i	=	ICP Serial Dilution Noncompliance
j	=	GFAA PDS – GFAA MSA's r<0.995 (correlation coefficient)
k	=	ICP Interference – include ICSAB %Rs
l	=	Instrument Calibration Range Exceedance
m	=	Sample Preservation
n	=	Internal Standard Noncompliance
n01	=	Internal Standard Recovery Noncompliance Dioxins
n02	=	Recovery Standard Noncompliance Dioxins
n03	=	Clean-up Standard Noncompliance Dioxins
o	=	Poor Instrument Performance (i.e. baseline drifting)
p	=	Uncertainty Near Detection Limit (<2 x IDL for inorganics and < CRQL for organics)
q	=	Other Problems (can encompass of number of issues)
r	=	Surrogates Recovery Noncompliance
s	=	Pesticide/PCB Resolution
t	=	% Breakdown Noncompliance for DDT and Endrin
u	=	Pesticide/PCB % Difference Between Columns for Positive Results
v	=	Non-linear Calibrations, Tuning r <0.995 (correlation coefficient)
w	=	Ratios of primary monitored ions outside of theoretical +/-15 %, within +/- 25 %
x	=	Signal to noise response drop
y	=	Percent solids <30%
z	=	Uncertainty at 2 sigma deviation is greater than sample activity

Data Qualifier Key:

B	- Positive result is considered to be an artifact of blank contamination and should not be considered present.
J	- Value is considered estimated due to exceedance of technical quality control or because result is less than the Contract Required Quantitation Limit (CRQL).
K	- Positive result is considered biased high due to exceedance of technical quality control criteria.
L	- Positive result is considered biased low due to exceedance of technical quality control criteria.
U	- Value is a non-detected result as reported by the laboratory.
UL	- Non-detected result is considered biased low due to exceedance of technical quality control criteria.
UR	- Non-detected result is considered unusable due to exceedance of technical quality control criteria.

TETRA TECH NUS

PHIL-22097

TO: RUSS TURNER **DATE:** MAY 15, 2008

FROM: MEGAN N. RITCHIE **COPIES:** FILE

SUBJECT: INORGANIC DATA VALIDATION – TOTAL/DISSOLVED METALS AND HEXAVALENT CHROMIUM
NAS JRB WILLOW GROVE SITE 3, WILLOW GROVE, PENNSYLVANIA
SDG NO. TWK-003

SAMPLES: 2/Aqueous/

03MW01SI FB-20080320

*The sample date was truncated for clarity.

OVERVIEW

The sample set for the NAS JRB Willow Grove Site 3 Interim Groundwater Monitoring (IGWM) – Willow Grove, PA, SDG TWK-003 consists of one aqueous environmental sample (designated 03MW-) and one field quality control (QC) blank (designated FB-). No samples were designated as the matrix spike and matrix spike duplicate (MS/MSD) for this sample set. No field duplicate pairs were included in this sample set. All samples were analyzed for target analyte list (TAL) total and dissolved metals. The field blank analyzed for hexavalent chromium.

The samples were collected by Tetra Tech NUS on March 20, 2008 and analyzed by Analytical Laboratory Services, Inc. (ALSI) of Middletown, Pennsylvania.

EPA SW-846 Methods were conducted using 6010C for ICP-AES metals, 6020 for ICP-MS metals, 7470D for mercury, and 7196A for hexavalent chromium.

SUMMARY

All analytes were successfully analyzed in all samples. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until analysis, calibration data, laboratory blank results, ICP interference check samples, matrix spike (MS) and matrix spike duplicate (MSD) results, laboratory control spike (LCS) results, field duplicate results, ICP serial dilution results, detection limits, and analyte quantitation.

Areas of concern with respect to data quality are listed below as follows:

MINOR PROBLEMS

- The following table summarizes the analytes detected as contaminants in the field blank at the maximum concentration indicated:

Analyte	Total Maximum Concentration	Total Action Level	Dissolved Maximum Concentration	Dissolved Action Level
Barium	0.0004 mg/L	0.002 mg/L	---	---
Cadmium	0.0001 mg/L	0.0005 mg/L	---	---
Calcium	0.07 mg/L	0.35 mg/L	---	---
Copper	---	---	0.0009 mg/L	0.0045 mg/L
Lead	0.00007 mg/L	0.00035 mg/L	---	---
Nickel	0.00008 mg/L	0.0004 mg/L	---	---
Silver	0.0006 mg/L	0.003 mg/L	---	---
Vanadium	0.0003 mg/L	0.0015 mg/L	0.0006 mg/L	0.003 mg/L

Samples affected: The action levels apply to all aqueous environmental samples. The total action levels apply to the total metals fraction only. The dissolved metals apply to the dissolved metals fraction only.

Dilution factors and sample preparation volumes were taken into account during application of action levels. Results reported at concentrations within the action level are qualified (B) and are considered to be false positives (artifacts of blank contamination). No action was taken for barium, cadmium, calcium, copper, lead, and nickel because the results exceeded the action level or there were no positive results for these analytes.

- Positive results at concentrations less than the reporting limits (RLs) were qualified as estimated (J).

NOTES

The ICP-MS interference check recoveries for aluminum in solutions A and AB were below the lower QC limit of 80%. The ICP-MS interference check recoveries exceeded QC criteria of 120% for chromium, manganese, and zinc for the total metals fraction. The ICP-MS interference check recovery for cadmium exceeded the 120% criteria in the dissolved metals fraction. No action was taken for these exceedances because there were no analyte concentrations in the samples that caused interference.

No analytes were detected in the laboratory blanks.

The mercury and hexavalent chromium data are acceptable as reported by the laboratory.

EXECUTIVE SUMMARY

Laboratory Performance: The ICP-MS interference check recoveries for aluminum, cadmium, chromium, manganese, and zinc were outside QC limits.

Other Factors Affecting Data Quality: Several analytes were present in the field blank.

The data for these analyses were reviewed with reference to the EPA "Functional Guidelines for Inorganic Data Review", as amended for use within EPA Region 3 (4/93).

The text of this report has been formatted to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the Functional Guidelines and the Quality Assurance Project Plan (QAPjP)."

R Sloboda for M. Ritchie

Megan N. Ritchie
Chemist

Russ Sloboda

Tetra Tech NUS, Inc.
Russ Sloboda
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A

Qualified Analytical Results

PROJ_NO: 00845

SDG: TWK003 MEDIA: WATER DATA FRACTION: M

nsample	03MW01SI-20080320	nsample	FB-20080320
samp_date	3/20/2008	samp_date	3/20/2008
lab_id	9728539003	lab_id	9728539002
qc_type	NM	qc_type	FB
units	MG/L	units	MG/L
Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.002	U	
ARSENIC	0.006	U	
BARIUM	0.107		
BERYLLIUM	0.001	U	
CADMIUM	0.0011		
CALCIUM	17		
CHROMIUM	0.0015	J	P
COBALT	0.006	U	
COPPER	0.0004	J	P
IRON	0.07	U	
LEAD	0.002	U	
MAGNESIUM	2.67		
MANGANESE	0.0004	J	P
MERCURY	0.0005	U	
NICKEL	0.0017	J	P
POTASSIUM	0.56	U	
SELENIUM	0.002	J	P
SILVER	0.0006	B	B
SODIUM	9.57		
THALLIUM	0.001	U	
VANADIUM	0.0004	B	B
ZINC	0.006	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.002	U	
ARSENIC	0.006	U	
BARIUM	0.0004	J	P
BERYLLIUM	0.001	U	
CADMIUM	0.0001	J	P
CALCIUM	0.07	J	P
CHROMIUM	0.002	U	
COBALT	0.006	U	
COPPER	0.006	U	
IRON	0.07	U	
LEAD	0.00007	J	P
MAGNESIUM	0.11	U	
MANGANESE	0.006	U	
MERCURY	0.0005	U	
NICKEL	0.00008	J	P
POTASSIUM	0.56	U	
SELENIUM	0.006	U	
SILVER	0.0006	J	P
SODIUM	0.56	U	
THALLIUM	0.001	U	
VANADIUM	0.0003	J	P
ZINC	0.006	U	

PROJ_NO: 00845

SDG: TWK-003 MEDIA: WATER DATA FRACTION: MF

nsample	03MW01SI-20080320	nsample	FB-20080320
samp_date	3/20/2008	samp_date	3/20/2008
lab_id	9728539003	lab_id	9728539002
qc_type	NM	qc_type	FB
units	MG/L	units	MG/L
Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.002	U	
ARSENIC	0.003	U	
BARIUM	0.106		
BERYLLIUM	0.001	U	
CADMIUM	0.0012		
CALCIUM	19		
CHROMIUM	0.0013	J	P
COBALT	0.005	U	
COPPER	0.005	U	
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	2.96		
MANGANESE	0.0012	J	P
MERCURY	0.0005	U	
NICKEL	0.0013	J	P
POTASSIUM	0.58		
SELENIUM	0.003	J	P
SILVER	0.001	U	
SODIUM	11.4		
THALLIUM	0.001	U	
VANADIUM	0.0008	B	B
ZINC	0.0006	J	P

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.002	U	
ARSENIC	0.003	U	
BARIUM	0.005	U	
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	0.1	U	
CHROMIUM	0.002	U	
COBALT	0.005	U	
COPPER	0.0009	J	P
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	0.1	U	
MANGANESE	0.004	U	
MERCURY	0.0005	U	
NICKEL	0.005	U	
POTASSIUM	0.5	U	
SELENIUM	0.005	U	
SILVER	0.001	U	
SODIUM	0.5	U	
THALLIUM	0.001	U	
VANADIUM	0.0006	J	P
ZINC	0.005	U	

PROJ_NO: 00845

SDG: TWK003 MEDIA: WATER DATA FRACTION: MISC

nsample	FB-20080320
samp_date	3/20/2008
lab_id	9728539002
qc_type	FB
Pct_Solids	
DUP_OF:	

Parameter	units	Result	Val Qual	Qual Code
HEXAVALENT CHROMIUM	MG/L	0.01	U	

Qualifier Codes:

a	=	Lab Blank Contamination
b	=	Field Blank Contamination
c	=	Calibration (i.e., %RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
d	=	MS/MSD Noncompliance
e	=	LSC/LSCD Noncompliance
f	=	Laboratory Duplicate Imprecision
g	=	Field Duplicate Imprecision
h	=	Holding Time Exceedance
i	=	ICP Serial Dilution Noncompliance
j	=	GFAA PDS – GFAA MSA's r<0.995 (correlation coefficient)
k	=	ICP Interference – include ICSAB %Rs
l	=	Instrument Calibration Range Exceedance
m	=	Sample Preservation
n	=	Internal Standard Noncompliance
o	=	Poor Instrument Performance (i.e. baseline drifting)
p	=	Uncertainty Near Detection Limit (<2 x IDL for inorganics and < CRQL for organics)
q	=	Other Problems (can encompass of number of issues)
r	=	Surrogates Recovery Noncompliance
s	=	Pesticide/PCB Resolution
t	=	% Breakdown Noncompliance for DDT and Endrin
u	=	Pesticide/PCB % Difference Between Columns for Positive Results
v	=	Non-linear Calibrations, Tuning r <0.995 (correlation coefficient)

Data Qualifier Key:

B	-	Positive result is considered to be an artifact of blank contamination and should not be considered present.
J	-	Value is considered estimated due to exceedance of technical quality control or because result is less than the Contract Required Quantitation Limit (CRQL).
L	-	Positive result is considered biased low due to exceedance of technical quality control criteria.
U	-	Value is a non-detected result as reported by the laboratory.
UL	-	Non-detected result is considered biased low due to exceedance of technical quality control criteria.

TETRA TECH NUS

PHIL-22095

TO: RUSS TURNER **DATE:** MAY 15, 2008

FROM: MEGAN N. RITCHIE **COPIES:** FILE

SUBJECT: INORGANIC DATA VALIDATION – TOTAL/DISSOLVED METALS AND HEXAVALENT CHROMIUM
NAS JRB WILLOW GROVE SITE 3, WILLOW GROVE, PENNSYLVANIA
SDG NO. TWK-002

SAMPLES: 14/Aqueous/

03MW02I	03MW03SI	03IW01	DUP-02
03MW02SI	03MW03S	03SW10	DUP-03
03MW02S	03MW04S	03SW11	
03MW03I	03MW07S	RB	

*The sample dates were truncated for clarity.

OVERVIEW

The sample set for the NAS JRB Willow Grove Site 3 Interim Groundwater Monitoring (IGWM) – Willow Grove, PA, SDG TWK-002 consists of 13 aqueous environmental samples (designated 03MW-, 03IW-, and 03SW-) and one field quality control (QC) blank (designated RB-). Two field duplicate pairs (DUP-02/03MW03SI and DUP-03/03IW01) were included in this sample set. All samples were analyzed for target analyte list (TAL) total and dissolved metals, except for two surface water sample (03SW10 and 03SW11) which were analyzed for total metals only. Two samples were analyzed for hexavalent chromium.

The samples were collected by Tetra Tech NUS on March 14-19, 2008 and analyzed by Analytical Laboratory Services, Inc. (ALSI) of Middletown, Pennsylvania.

EPA SW-846 Methods were conducted using 6010C for ICP-AES metals, 6020 for ICP-MS metals, 7470D for mercury, and 7196A for hexavalent chromium.

SUMMARY

Most analytes were successfully analyzed in all samples. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until analysis, calibration data, laboratory blank results, ICP interference check samples, matrix spike (MS) and matrix spike duplicate (MSD) results, laboratory control spike (LCS) results, field duplicate results, ICP serial dilution results, detection limits, and analyte quantitation.

Areas of concern with respect to data quality are listed below as follows:

MAJOR PROBLEMS

- The matrix spike recovery for dissolved silver was below the lower QC limit of 75 percent (%). The matrix spike duplicate recovery for dissolved silver was 0%. The non-detected silver results in the dissolved metals portion of the analysis were qualified as unusable (UR).

MINOR PROBLEMS

- The following table summarizes the analytes detected as contaminants in the rinsate blank at the maximum concentration indicated:

Analyte	Total Maximum Concentration	Total Action Level	Dissolved Maximum Concentration	Dissolved Action Level
Antimony	---	---	0.0005 mg/L	0.0025 mg/L
Barium	0.0001 mg/L	0.0005 mg/L	0.0002 mg/L	0.001 mg/L
Cadmium	0.0001 mg/L	0.0005 mg/L	---	---
Calcium	0.06 mg/L	0.3 mg/L	---	---
Chromium	0.0013 mg/L	0.0065 mg/L	0.0004 mg/L	0.002 mg/L
Copper	0.0006 mg/L	0.003 mg/L	---	---
Manganese	---	---	0.00004 mg/L	0.0002 mg/L
Silver	0.0006 mg/L	0.003 mg/L	---	---
Vanadium	0.0002 mg/L	0.001 mg/L	---	---

Samples affected: The action levels apply to all aqueous environmental samples. The total action levels apply to the total metals fraction only. The dissolved metals apply to the dissolved metals fraction only.

Dilution factors and sample preparation volumes were taken into account during application of action levels. Results reported at concentrations within the action level are qualified (B) and are considered to be false positives (artifacts of blank contamination). No action was taken for barium, cadmium, and calcium because the results exceeded the action level or there were no positive results for these analytes.

- Positive results at concentrations less than the reporting limits (RLs) were qualified as estimated (J).

NOTES

The ICP-MS interference check recoveries exceeded QC criteria of 120% for chromium, manganese, and zinc for the total and dissolved fractions. The ICP-MS interference check recovery for nickel exceeded the 120% criteria in the dissolved metals fraction. No action was taken for these exceedances because there were no analyte concentrations in the samples that caused interference.

Field duplicate precision was within QC criteria.

No analytes were detected in the laboratory blanks.

The mercury and hexavalent chromium data are acceptable as reported by the laboratory.

EXECUTIVE SUMMARY

Laboratory Performance: None.

Other Factors Affecting Data Quality: Several analytes were present in the rinsate blank. The MS/MSD recoveries were below QC criteria for dissolved silver.

The data for these analyses were reviewed with reference to the EPA "Functional Guidelines for Inorganic Data Review", as amended for use within EPA Region 3 (4/93).

The text of this report has been formatted to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the Functional Guidelines and the Quality Assurance Project Plan (QAPjP)."

R. Sloboda for M. Ritchie

Megan N. Ritchie
Chemist

Russ Sloboda

Tetra Tech NUS, Inc.
Russ Sloboda
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
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APPENDIX A

Qualified Analytical Results

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: M

nsample	03IW01-20080319	nsample	03MW02I-20080318	nsample	03MW02S-20080318
samp_date	3/19/2008	samp_date	3/18/2008	samp_date	3/18/2008
lab_id	9728271005	lab_id	9728271002	lab_id	9728271004
qc_type	NM	qc_type	NM	qc_type	NM
units	MG/L	units	MG/L	units	MG/L
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.002	U	
ARSENIC	0.006	U	
BARIUM	0.59		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	48.6		
CHROMIUM	0.0013	B	B
COBALT	0.006	U	
COPPER	0.006	U	
IRON	0.07	U	
LEAD	0.002	U	
MAGNESIUM	18.5		
MANGANESE	0.006	U	
MERCURY	0.0005	U	
NICKEL	0.0019	J	P
POTASSIUM	1.05		
SELENIUM	0.002	J	P
SILVER	0.0006	B	B
SODIUM	15		
THALLIUM	0.001	U	
VANADIUM	0.0014		
ZINC	0.006	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.002	U	
ARSENIC	0.001	J	P
BARIUM	0.268		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	21.4		
CHROMIUM	0.002	B	B
COBALT	0.006	U	
COPPER	0.0007	B	B
IRON	0.07	U	
LEAD	0.002	U	
MAGNESIUM	9.55		
MANGANESE	0.0018	J	P
MERCURY	0.0005	U	
NICKEL	0.0014	J	P
POTASSIUM	0.66		
SELENIUM	0.006	U	
SILVER	0.0006	B	B
SODIUM	7.02		
THALLIUM	0.001	U	
VANADIUM	0.0018		
ZINC	0.006	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.002	U	
ARSENIC	0.006	U	
BARIUM	0.123		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	9.59		
CHROMIUM	0.0019	B	B
COBALT	0.006	U	
COPPER	0.0003	B	B
IRON	0.07	U	
LEAD	0.002	U	
MAGNESIUM	4.06		
MANGANESE	0.0025	J	P
MERCURY	0.0005	U	
NICKEL	0.0016	J	P
POTASSIUM	0.93		
SELENIUM	0.006	U	
SILVER	0.0006	B	B
SODIUM	7.58		
THALLIUM	0.001	U	
VANADIUM	0.0003	B	B
ZINC	0.0027	J	P

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: M

nsample	03MW02SI-20080318	nsample	03MW03I-20080317	nsample	03MW03S-20080317
samp_date	3/18/2008	samp_date	3/17/2008	samp_date	3/17/2008
lab_id	9728271003	lab_id	9727814006	lab_id	9727814005
qc_type	NM	qc_type	NM	qc_type	NM
units	MG/L	units	MG/L	units	MG/L
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.002	U	
ARSENIC	0.0004	J	P
BARIUM	0.347		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	23.7		
CHROMIUM	0.0021	B	B
COBALT	0.0002	J	P
COPPER	0.0003	B	B
IRON	0.03	J	P
LEAD	0.002	U	
MAGNESIUM	9.15		
MANGANESE	0.0016	J	P
MERCURY	0.0005	U	
NICKEL	0.0013	J	P
POTASSIUM	0.64		
SELENIUM	0.006	U	
SILVER	0.0006	B	B
SODIUM	7.6		
THALLIUM	0.001	U	
VANADIUM	0.0026		
ZINC	0.002	J	P

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.002	U	
ARSENIC	0.0014	J	P
BARIUM	0.209		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	23.7		
CHROMIUM	0.0012	B	B
COBALT	0.006	U	
COPPER	0.006	U	
IRON	0.07	U	
LEAD	0.002	U	
MAGNESIUM	11.4		
MANGANESE	0.006	U	
MERCURY	0.0005	U	
NICKEL	0.0007	J	P
POTASSIUM	1.2		
SELENIUM	0.001	J	P
SILVER	0.0006	B	B
SODIUM	8.18		
THALLIUM	0.001	U	
VANADIUM	0.0018		
ZINC	0.006	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.002	U	
ARSENIC	0.006	U	
BARIUM	0.157		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	13.8		
CHROMIUM	0.0024	B	B
COBALT	0.006	U	
COPPER	0.001	B	B
IRON	0.04	J	P
LEAD	0.002	U	
MAGNESIUM	5.58		
MANGANESE	0.0033	J	P
MERCURY	0.0005	U	
NICKEL	0.0027	J	P
POTASSIUM	1.18		
SELENIUM	0.002	J	P
SILVER	0.0006	B	B
SODIUM	11.3		
THALLIUM	0.001	U	
VANADIUM	0.0003	B	B
ZINC	0.0043	J	P

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: M

nsample	03MW03SI-20080317	nsample	03MW04S-20080314	nsample	03MW07S-20080319
samp_date	3/17/2008	samp_date	3/14/2008	samp_date	3/19/2008
lab_id	9727814003	lab_id	9727814002	lab_id	9728271008
qc_type	NM	qc_type	NM	qc_type	NM
units	MG/L	units	MG/L	units	MG/L
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.002	U	
ARSENIC	0.006	U	
BARIUM	0.353		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	25.9		
CHROMIUM	0.0018	B	B
COBALT	0.006	U	
COPPER	0.006	U	
IRON	0.07	U	
LEAD	0.002	U	
MAGNESIUM	9.96		
MANGANESE	0.006	U	
MERCURY	0.00003	J	P
NICKEL	0.0009	J	P
POTASSIUM	0.67		
SELENIUM	0.002	J	P
SILVER	0.0006	B	B
SODIUM	9.3		
THALLIUM	0.001	U	
VANADIUM	0.0015		
ZINC	0.006	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0002	J	P
ARSENIC	0.006	U	
BARIUM	0.434		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	36.5		
CHROMIUM	0.0054	B	B
COBALT	0.006	U	
COPPER	0.0013	B	B
IRON	0.07	U	
LEAD	0.002	U	
MAGNESIUM	13.2		
MANGANESE	0.001	J	P
MERCURY	0.0005	U	
NICKEL	0.0042	J	P
POTASSIUM	0.84		
SELENIUM	0.001	J	P
SILVER	0.0007	B	B
SODIUM	12.1		
THALLIUM	0.001	U	
VANADIUM	0.0008	B	B
ZINC	0.006	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.096		
ANTIMONY	0.002	U	
ARSENIC	0.006	U	
BARIUM	0.625		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	62.9		
CHROMIUM	0.0022	B	B
COBALT	0.0002	J	P
COPPER	0.0001	B	B
IRON	0.09		
LEAD	0.002	U	
MAGNESIUM	16.2		
MANGANESE	0.0129		
MERCURY	0.0005	U	
NICKEL	0.0048	J	P
POTASSIUM	1.06		
SELENIUM	0.006	U	
SILVER	0.0006	B	B
SODIUM	22.4		
THALLIUM	0.001	U	
VANADIUM	0.0006	B	B
ZINC	0.0024	J	P

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: M

nsample	03SW10-20080319	nsample	03SW11-20080319	nsample	DUP-02
samp_date	3/19/2008	samp_date	3/19/2008	samp_date	3/17/2008
lab_id	9728271007	lab_id	9728271006	lab_id	9727814004
qc_type	NM	qc_type	NM	qc_type	FD
units	MG/L	units	MG/L	units	MG/L
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:		DUP_OF:	03MW03SI-20080317

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.002	U	
ARSENIC	0.006	U	
BARIUM	0.0841		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	16.4		
CHROMIUM	0.0015	B	B
COBALT	0.006	U	
COPPER	0.0008	B	B
IRON	0.43		
LEAD	0.00007	J	P
MAGNESIUM	5.8		
MANGANESE	0.0956		
MERCURY	0.0005	U	
NICKEL	0.0012	J	P
POTASSIUM	1.73		
SELENIUM	0.006	U	
SILVER	0.0006	B	B
SODIUM	7.67		
THALLIUM	0.001	U	
VANADIUM	0.0008	B	B
ZINC	0.0036	J	P

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.174		
ANTIMONY	0.002	U	
ARSENIC	0.006	U	
BARIUM	0.113		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	22.3		
CHROMIUM	0.0017	B	B
COBALT	0.0002	J	P
COPPER	0.003	B	B
IRON	1.06		
LEAD	0.0009	J	P
MAGNESIUM	7.47		
MANGANESE	0.197		
MERCURY	0.0005	U	
NICKEL	0.002	J	P
POTASSIUM	1.88		
SELENIUM	0.006	U	
SILVER	0.0006	B	B
SODIUM	18.8		
THALLIUM	0.001	U	
VANADIUM	0.0014		
ZINC	0.016		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.00008	J	P
ARSENIC	0.0005	J	P
BARIUM	0.362		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	25.6		
CHROMIUM	0.0014	B	B
COBALT	0.006	U	
COPPER	0.006	U	
IRON	0.07	U	
LEAD	0.002	U	
MAGNESIUM	9.86		
MANGANESE	0.006	U	
MERCURY	0.0005	U	
NICKEL	0.0008	J	P
POTASSIUM	0.67		
SELENIUM	0.002	J	P
SILVER	0.0007	B	B
SODIUM	9.47		
THALLIUM	0.001	U	
VANADIUM	0.0015		
ZINC	0.006	U	

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: M

nsample	DUP-03	nsample	RB-20080318
samp_date	3/19/2008	samp_date	3/19/2008
lab_id	9728271010	lab_id	9728271009
qc_type	FD	qc_type	RB
units	MG/L	units	MG/L
Pct_Solids		Pct_Solids	
DUP_OF:	03IW01-20080319	DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.002	U	
ARSENIC	0.006	U	
BARIUM	0.589		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	47.7		
CHROMIUM	0.0014	B	B
COBALT	0.006	U	
COPPER	0.0006	B	B
IRON	0.07	U	
LEAD	0.002	U	
MAGNESIUM	18.1		
MANGANESE	0.006	U	
MERCURY	0.0005	U	
NICKEL	0.0019	J	P
POTASSIUM	1.02		
SELENIUM	0.002	J	P
SILVER	0.0006	B	B
SODIUM	14.8		
THALLIUM	0.001	U	
VANADIUM	0.0015		
ZINC	0.006	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.002	U	
ARSENIC	0.006	U	
BARIUM	0.0001	J	P
BERYLLIUM	0.001	U	
CADMIUM	0.0001	J	P
CALCIUM	0.06	J	
CHROMIUM	0.0013	J	P
COBALT	0.006	U	
COPPER	0.0006	J	P
IRON	0.07	U	
LEAD	0.002	U	
MAGNESIUM	0.11	U	
MANGANESE	0.006	U	
MERCURY	0.0005	U	
NICKEL	0.006	U	
POTASSIUM	0.56	U	
SELENIUM	0.006	U	
SILVER	0.0006	J	P
SODIUM	0.56	U	
THALLIUM	0.001	U	
VANADIUM	0.0002	J	P
ZINC	0.006	U	

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: MF

nsample	03IW01-20080319	nsample	03MW02I-20080318	nsample	03MW02S-20080318
samp_date	3/19/2008	samp_date	3/18/2008	samp_date	3/18/2008
lab_id	9728271005	lab_id	9728271002	lab_id	9728271004
qc_type	NM	qc_type	NM	qc_type	NM
units	MG/L	units	MG/L	units	MG/L
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0004	B	B
ARSENIC	0.0005	J	P
BARIUM	0.52		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	53.7		
CHROMIUM	0.0031		
COBALT	0.005	U	
COPPER	0.005	U	
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	19.2		
MANGANESE	0.004	U	
MERCURY	0.0005	U	
NICKEL	0.0008	J	P
POTASSIUM	1.07		
SELENIUM	0.002	J	P
SILVER	0.001	UR	D
SODIUM	16.8		
THALLIUM	0.001	U	
VANADIUM	0.0015		
ZINC	0.005	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0004	B	B
ARSENIC	0.0011	J	P
BARIUM	0.245		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	24.1		
CHROMIUM	0.0023		
COBALT	0.005	U	
COPPER	0.0003	J	P
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	9.74		
MANGANESE	0.00008	B	B
MERCURY	0.0005	U	
NICKEL	0.0008	J	P
POTASSIUM	0.84		
SELENIUM	0.001	J	P
SILVER	0.001	UR	D
SODIUM	8.17		
THALLIUM	0.001	U	
VANADIUM	0.0017		
ZINC	0.0065		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0005	B	B
ARSENIC	0.005	U	
BARIUM	0.113		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	10.8		
CHROMIUM	0.0028		
COBALT	0.0008	J	P
COPPER	0.0004	J	P
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	4.45		
MANGANESE	0.0045		
MERCURY	0.0005	U	
NICKEL	0.0013	J	P
POTASSIUM	1.07		
SELENIUM	0.0006	J	P
SILVER	0.001	UR	D
SODIUM	8.74		
THALLIUM	0.001	U	
VANADIUM	0.0003	J	P
ZINC	0.005	U	

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: MF

nsample	03MW02SI-20080318	nsample	03MW03I-20080317	nsample	03MW03S-20080317
samp_date	3/18/2008	samp_date	3/17/2008	samp_date	3/17/2008
lab_id	9728271003	lab_id	9727814006	lab_id	9727814005
qc_type	NM	qc_type	NM	qc_type	NM
units	MG/L	units	MG/L	units	MG/L
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0004	B	B
ARSENIC	0.0004	J	P
BARIUM	0.313		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	26.7		
CHROMIUM	0.0024		
COBALT	0.005	U	
COPPER	0.005	U	
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	9.36		
MANGANESE	0.004	U	
MERCURY	0.0005	U	
NICKEL	0.0007	J	P
POTASSIUM	0.66		
SELENIUM	0.001	J	P
SILVER	0.001	UR	D
SODIUM	9.13		
THALLIUM	0.001	U	
VANADIUM	0.0023		
ZINC	0.005	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0006	B	B
ARSENIC	0.0015	J	P
BARIUM	0.197		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	26.6		
CHROMIUM	0.0022		
COBALT	0.005	U	
COPPER	0.005	U	
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	11.6		
MANGANESE	0.004	U	
MERCURY	0.0005	U	
NICKEL	0.0003	J	P
POTASSIUM	1.36		
SELENIUM	0.002	J	P
SILVER	0.001	UR	D
SODIUM	8.08		
THALLIUM	0.001	U	
VANADIUM	0.0019		
ZINC	0.005	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0006	B	B
ARSENIC	0.005	U	
BARIUM	0.141		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	15.5		
CHROMIUM	0.0037		
COBALT	0.005	U	
COPPER	0.0011	J	P
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	5.87		
MANGANESE	0.0033	J	P
MERCURY	0.0005	U	
NICKEL	0.0022	J	P
POTASSIUM	1.39		
SELENIUM	0.003	J	P
SILVER	0.001	UR	D
SODIUM	11.6		
THALLIUM	0.001	U	
VANADIUM	0.0005	J	P
ZINC	0.0011	J	P

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: MF

nsample	03MW03SI-20080317	nsample	03MW04S-20080314	nsample	03MW07S-20080319
samp_date	3/17/2008	samp_date	3/14/2008	samp_date	3/19/2008
lab_id	9727814003	lab_id	9727814002	lab_id	9728271008
qc_type	NM	qc_type	NM	qc_type	NM
units	MG/L	units	MG/L	units	MG/L
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0016	B	B
ARSENIC	0.0005	J	P
BARIUM	0.344		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	28.3		
CHROMIUM	0.0027		
COBALT	0.005	U	
COPPER	0.005	U	
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	10.2		
MANGANESE	0.004	U	
MERCURY	0.0005	U	
NICKEL	0.0007	J	P
POTASSIUM	0.77		
SELENIUM	0.002	J	P
SILVER	0.001	UR	D
SODIUM	9.77		
THALLIUM	0.001	U	
VANADIUM	0.0017		
ZINC	0.005	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0004	B	B
ARSENIC	0.0003	J	P
BARIUM	0.411		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	39.9		
CHROMIUM	0.0036		
COBALT	0.005	U	
COPPER	0.005	U	
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	13.6		
MANGANESE	0.004	U	
MERCURY	0.0005	U	
NICKEL	0.0012	J	P
POTASSIUM	0.96		
SELENIUM	0.002	J	P
SILVER	0.001	UR	D
SODIUM	13		
THALLIUM	0.001	U	
VANADIUM	0.0011		
ZINC	0.005	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0004	B	B
ARSENIC	0.005	U	
BARIUM	0.544		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	71.1		
CHROMIUM	0.0034		
COBALT	0.005	U	
COPPER	0.005	U	
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	17.1		
MANGANESE	0.0001	B	B
MERCURY	0.0005	U	
NICKEL	0.0029	J	P
POTASSIUM	1.18		
SELENIUM	0.001	J	P
SILVER	0.001	UR	D
SODIUM	26		
THALLIUM	0.001	U	
VANADIUM	0.0007	J	P
ZINC	0.005	U	

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: MF

nsample	DUP-02	nsample	DUP-03	nsample	RB-20080318
samp_date	3/17/2008	samp_date	3/19/2008	samp_date	3/19/2008
lab_id	9727814004	lab_id	9728271010	lab_id	9728271009
qc_type	FD	qc_type	FD	qc_type	RB
units	MG/L	units	MG/L	units	MG/L
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:	03MW03SI-20080317	DUP_OF:	03IW01-20080319	DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0008	B	B
ARSENIC	0.0004	J	P
BARIUM	0.351		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	29		
CHROMIUM	0.0026		
COBALT	0.005	U	
COPPER	0.005	U	
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	10.1		
MANGANESE	0.004	U	
MERCURY	0.0005	U	
NICKEL	0.0005	J	P
POTASSIUM	0.76		
SELENIUM	0.002	J	P
SILVER	0.001	UR	D
SODIUM	9.9		
THALLIUM	0.001	U	
VANADIUM	0.0017		
ZINC	0.005	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0004	B	B
ARSENIC	0.0002	J	P
BARIUM	0.473		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	50.1		
CHROMIUM	0.0027		
COBALT	0.0002	J	P
COPPER	0.005	U	
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	17.8		
MANGANESE	0.0007	J	P
MERCURY	0.0005	U	
NICKEL	0.0009	J	P
POTASSIUM	0.96		
SELENIUM	0.001	J	P
SILVER	0.001	UR	D
SODIUM	15.6		
THALLIUM	0.001	U	
VANADIUM	0.0013		
ZINC	0.005	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0005	J	P
ARSENIC	0.005	U	
BARIUM	0.0002	J	P
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	0.1	U	
CHROMIUM	0.0004	J	P
COBALT	0.005	U	
COPPER	0.005	U	
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	0.1	U	
MANGANESE	0.00004	J	P
MERCURY	0.0005	U	
NICKEL	0.005	U	
POTASSIUM	0.5	U	
SELENIUM	0.005	U	
SILVER	0.001	UR	D
SODIUM	0.5	U	
THALLIUM	0.001	U	
VANADIUM	0.001	U	
ZINC	0.005	U	

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: MISC

nsample	03MW03I-20080317	nsample	RB-20080318
samp_date	3/17/2008	samp_date	3/19/2008
lab_id	9727814006	lab_id	9728271009
qc_type	NM	qc_type	RB
Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:	

Parameter	units	Result	Val Qual	Qual Code
HEXAVALENT CHROMIUM	MG/L	0.01	U	

Parameter	units	Result	Val Qual	Qual Code
HEXAVALENT CHROMIUM	MG/L	0.01	U	

Qualifier Codes:

a	=	Lab Blank Contamination
b	=	Field Blank Contamination
c	=	Calibration (i.e., %RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
d	=	MS/MSD Noncompliance
e	=	LSC/LSCD Noncompliance
f	=	Laboratory Duplicate Imprecision
g	=	Field Duplicate Imprecision
h	=	Holding Time Exceedance
i	=	ICP Serial Dilution Noncompliance
j	=	GFAA PDS – GFAA MSA's r<0.995 (correlation coefficient)
k	=	ICP Interference – include ICSAB %Rs
l	=	Instrument Calibration Range Exceedance
m	=	Sample Preservation
n	=	Internal Standard Noncompliance
o	=	Poor Instrument Performance (i.e. baseline drifting)
p	=	Uncertainty Near Detection Limit (<2 x IDL for inorganics and < CRQL for organics)
q	=	Other Problems (can encompass of number of issues)
r	=	Surrogates Recovery Noncompliance
s	=	Pesticide/PCB Resolution
t	=	% Breakdown Noncompliance for DDT and Endrin
u	=	Pesticide/PCB % Difference Between Columns for Positive Results
v	=	Non-linear Calibrations, Tuning r <0.995 (correlation coefficient)

Data Qualifier Key:

B	- Positive result is considered to be an artifact of blank contamination and should not be considered present.
J	- Value is considered estimated due to exceedance of technical quality control or because result is less than the Contract Required Quantitation Limit (CRQL).
L	- Positive result is considered biased low due to exceedance of technical quality control criteria.
U	- Value is a non-detected result as reported by the laboratory.
UL	- Non-detected result is considered biased low due to exceedance of technical quality control criteria.

TETRA TECH NUS

PHIL- 22092

TO:	**RUSS TURNER**	**DATE:**	**APRIL 25, 2008**
FROM:	**MEGAN RITCHIE**	**COPIES:**	**FILE**

SUBJECT: **ORGANIC DATA VALIDATION – VOC AND 1,4-DIOXANE**
NAS JRB WILLOW GROVE SITE 3, WILLOW GROVE, PENNSYLVANIA
SDG NO. TWK-001

SAMPLES: **16/Aqueous/**

03MW01I	03MW05I	03MW06SI	TB-20080311
03MW01S	03MW05S	03MW08D	TB-20080312
03MW04I	03MW06I	03MW08S	TB-20080313
03MW04SI	03MW06S	DUP-01	TB-20080314

*The sample dates were truncated for clarity except for the trip blanks.

OVERVIEW

The sample set for the NAS JRB Willow Grove Site 3 Interim Groundwater Monitoring (IGWM) – Willow Grove, PA, SDG TWK-001 consists of 12 aqueous environmental samples (designated 03MW) and four field quality control (QC) blanks (designated TB-). Sample 03MW01I was designated as the matrix spike and matrix spike duplicate (MS/MSD) for this sample set. One field duplicate pair (DUP-01/03MW01S) was included in this sample set. All samples were analyzed for Volatile Organic Compounds (VOCs) and 1,4-Dioxane except for the trip blanks. The trip blanks were analyzed for VOCs only.

The samples were collected by Tetra Tech NUS on March 11-14, 2008 and analyzed by Analytical Laboratory Services, Inc. (ALSI) of Middletown, Pennsylvania.

All analyses were conducted using EPA SW-846 Methods. VOCs were analyzed by 8260B and 1,4-Dioxane by 8270D.

SUMMARY

Most analytes were successfully analyzed in all samples. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until analysis, GC/MS tuning and calibration data, laboratory and field quality control blank results, system monitoring compound recoveries, matrix spike/matrix spike duplicate (MS/MSD) results, laboratory control spike (LCS) results, internal standards performance, compound identification, compound quantitation, and field duplicate results.

MAJOR PROBLEMS

- The initial calibration relative response factors (RRFs) for 2-butanone and acetone were below the QC criterion of 0.05. The non-detected results for 2-butanone and acetone were qualified as unusable (UR).

MINOR PROBLEMS

- Positive results at concentrations less than the reporting limits (RLs) were qualified as estimated (J).

Notes

Methylene chloride was detected in a trip blank. No action was taken because there were no detections of methylene chloride in the associated samples.

The continuing calibration percent difference (%D) exceeded QC criteria of 25% for chloromethane. No action was taken because there were no detections of chloromethane in the associated samples.

The LCS recoveries exceeded the QC criteria for chloromethane and Freon 113. No action was taken because there were no positive detections of these compounds in the associated samples.

EXECUTIVE SUMMARY

Laboratory Performance: Two VOC compounds had initial calibration RRFs below QC criteria. One VOC compound exceeded the continuing calibration %D criteria. Two VOC compound recoveries exceeded LCS QC limits.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the Tetra Tech NUS Standard Operating Procedure DV-02 (8/01) "Data Validation for Non-CLP Organics for Solid Matrices" and EPA "Functional Guidelines for Organic Data Review", as amended for use within EPA Region 3 (9/94).

The text of this report has been formatted to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the Functional Guidelines and the Quality Assurance Project Plan (QAPjP)."

Megan Ritchie

Megan N. Ritchie
Chemist

Tetra Tech NUS, Inc.
Russell Sloboda
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Laboratory Analytical Results
3. Appendix C – Support Documentation

APPENDIX A

Qualified Analytical Results

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: OV

nsample	03MW01I-20080311
samp_date	3/11/2008
lab_id	9726965002
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

nsample	03MW01I-20080311
samp_date	3/11/2008
lab_id	9726965002
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

nsample	03MW01S-20080311
samp_date	3/11/2008
lab_id	9726965003
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: OV

nsample	03MW01S-20080311
samp_date	3/11/2008
lab_id	9726965003
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1.9		
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

nsample	03MW04I-20080314
samp_date	3/14/2008
lab_id	9727555003
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

nsample	03MW04I-20080314
samp_date	3/14/2008
lab_id	9727555003
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	0.45	J	P
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: OV

nsample	03MW04SI-20080314
samp_date	3/14/2008
lab_id	9727555004
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	0.22	J	P
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

nsample	03MW04SI-20080314
samp_date	3/14/2008
lab_id	9727555004
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	0.26	J	P
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	4.6		
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

nsample	03MW05I-20080311
samp_date	3/11/2008
lab_id	9726965004
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: OV

nsample	03MW05I-20080311
samp_date	3/11/2008
lab_id	9726965004
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	0.46	J	P
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

nsample	03MW05S-20080312
samp_date	3/12/2008
lab_id	9727192002
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

nsample	03MW05S-20080312
samp_date	3/12/2008
lab_id	9727192002
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: OV

nsample	03MW06I-20080314
samp_date	3/14/2008
lab_id	9727555002
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	0.2	J	P
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

nsample	03MW06I-20080314
samp_date	3/14/2008
lab_id	9727555002
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

nsample	03MW06S-20080313
samp_date	3/13/2008
lab_id	9727450003
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: OV

nsample	03MW06S-20080313
samp_date	3/13/2008
lab_id	9727450003
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	0.76	J	P
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

nsample	03MW06SI-20080313
samp_date	3/13/2008
lab_id	9727450002
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

nsample	03MW06SI-20080313
samp_date	3/13/2008
lab_id	9727450002
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: OV

nsample	03MW08D-20080312
samp_date	3/12/2008
lab_id	9727192004
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	2.6		
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	6.3		
1,1-DICHLOROETHENE	3.1		
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	0.28	J	P
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1.2		

nsample	03MW08D-20080312
samp_date	3/12/2008
lab_id	9727192004
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1		
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1.9		
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

nsample	03MW08S-20080312
samp_date	3/12/2008
lab_id	9727192003
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: OV

nsample	03MW08S-20080312
samp_date	3/12/2008
lab_id	9727192003
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

nsample	DUP-01
samp_date	3/11/2008
lab_id	9726965005
qc_type	FD
units	UG/L
Pct_Solids	
DUP_OF:	03MW01S-20080311

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

nsample	DUP-01
samp_date	3/11/2008
lab_id	9726965005
qc_type	FD
units	UG/L
Pct_Solids	
DUP_OF:	03MW01S-20080311

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1.9		
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: OV

nsample	TB-20080311
samp_date	3/11/2008
lab_id	9726965001
qc_type	TB
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

nsample	TB-20080311
samp_date	3/11/2008
lab_id	9726965001
qc_type	TB
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

nsample	TB-20080312
samp_date	3/12/2008
lab_id	9727192001
qc_type	TB
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: OV

nsample	TB-20080312
samp_date	3/12/2008
lab_id	9727192001
qc_type	TB
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

nsample	TB-20080313
samp_date	3/13/2008
lab_id	9727450001
qc_type	TB
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

nsample	TB-20080313
samp_date	3/13/2008
lab_id	9727450001
qc_type	TB
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	0.3	J	P
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: OV

nsample	TB-20080314
samp_date	3/14/2008
lab_id	9727555001
qc_type	TB
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

nsample	TB-20080314
samp_date	3/14/2008
lab_id	9727555001
qc_type	TB
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: OS

nsample	03MW01I-20080311	nsample	03MW01S-20080311	nsample	03MW04I-20080314
samp_date	3/11/2008	samp_date	3/11/2008	samp_date	3/14/2008
lab_id	9726965002	lab_id	9726965003	lab_id	9727555003
qc_type	NM	qc_type	NM	qc_type	NM
units	UG/L	units	UG/L	units	UG/L
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.8	U	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.8	U	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.9	U	

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: OS

nsample	03MW04SI-20080314
samp_date	3/14/2008
lab_id	9727555004
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.8	U	

nsample	03MW05I-20080311
samp_date	3/11/2008
lab_id	9726965004
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.8	U	

nsample	03MW05S-20080312
samp_date	3/12/2008
lab_id	9727192002
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.8	U	

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: OS

nsample	03MW06I-20080314
samp_date	3/14/2008
lab_id	9727555002
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.8	U	

nsample	03MW06S-20080313
samp_date	3/13/2008
lab_id	9727450003
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.9	U	

nsample	03MW06SI-20080313
samp_date	3/13/2008
lab_id	9727450002
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.8	U	

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: OS

nsample	03MW08D-20080312	nsample	03MW08S-20080312	nsample	DUP-01
samp_date	3/12/2008	samp_date	3/12/2008	samp_date	3/11/2008
lab_id	9727192004	lab_id	9727192003	lab_id	9726965005
qc_type	NM	qc_type	NM	qc_type	FD
units	UG/L	units	UG/L	units	UG/L
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:		DUP_OF:	03MW01S-20080311

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.8	U	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.8	U	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.8	U	

Qualifier Codes:

a	=	Lab Blank Contamination
b	=	Field Blank Contamination
c	=	Calibration (i.e., %RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
d	=	MS/MSD Noncompliance
e	=	LSC/LSCD Noncompliance
f	=	Laboratory Duplicate Imprecision
g	=	Field Duplicate Imprecision
h	=	Holding Time Exceedance
i	=	ICP Serial Dilution Noncompliance
j	=	GFAA PDS – GFAA MSA's r<0.995 (correlation coefficient)
k	=	ICP Interference – include ICSAB %Rs
l	=	Instrument Calibration Range Exceedance
m	=	Sample Preservation
n	=	Internal Standard Noncompliance
n01	=	Internal Standard Recovery Noncompliance Dioxins
n02	=	Recovery Standard Noncompliance Dioxins
n03	=	Clean-up Standard Noncompliance Dioxins
o	=	Poor Instrument Performance (i.e. baseline drifting)
p	=	Uncertainty Near Detection Limit (<2 x IDL for inorganics and < CRQL for organics)
q	=	Other Problems (can encompass of number of issues)
r	=	Surrogates Recovery Noncompliance
s	=	Pesticide/PCB Resolution
t	=	% Breakdown Noncompliance for DDT and Endrin
u	=	Pesticide/PCB % Difference Between Columns for Positive Results
v	=	Non-linear Calibrations, Tuning r <0.995 (correlation coefficient)
w	=	Ratios of primary monitored ions outside of theoretical +/-15 %, within +/- 25 %
x	=	Signal to noise response drop
y	=	Percent solids <30%
z	=	Uncertainty at 2 sigma deviation is greater than sample activity

Data Qualifier Key:

B	- Positive result is considered to be an artifact of blank contamination and should not be considered present.
J	- Value is considered estimated due to exceedance of technical quality control or because result is less than the Contract Required Quantitation Limit (CRQL).
K	- Positive result is considered biased high due to exceedance of technical quality control criteria.
L	- Positive result is considered biased low due to exceedance of technical quality control criteria.
U	- Value is a non-detected result as reported by the laboratory.
UL	- Non-detected result is considered biased low due to exceedance of technical quality control criteria.
UR	- Non-detected result is considered unusable due to exceedance of technical quality control criteria.

TETRA TECH NUS

PHIL-22093

TO: RUSS TURNER **DATE:** MAY 14, 2008

FROM: MEGAN N. RITCHIE **COPIES:** FILE

SUBJECT: INORGANIC DATA VALIDATION – TOTAL/DISSOLVED METALS AND HEXAVALENT CHROMIUM
NAS JRB WILLOW GROVE SITE 3, WILLOW GROVE, PENNSYLVANIA
SDG NO. TWK-001

SAMPLES: 12/Aqueous/

03MW01I	03MW05I	03MW06SI
03MW01S	03MW05S	03MW08D
03MW04I	03MW06I	03MW08S
03MW04SI	03MW06S	DUP-01

*The sample dates were truncated for clarity.

OVERVIEW

The sample set for the NAS JRB Willow Grove Site 3 Interim Groundwater Monitoring (IGWM) – Willow Grove, PA, SDG TWK-001 consists of 12 aqueous environmental samples (designated 03MW-, 03IW-, and 03SW-). Sample 03MW01I was designated as the matrix spike and matrix spike duplicate (MS/MSD) for this sample set. One field duplicate pair (DUP-01/03MW01S) was included in this sample set. All samples were analyzed for target analyte list (TAL) total and dissolved metals. Eight samples were analyzed for hexavalent chromium.

The samples were collected by Tetra Tech NUS on March 11-14, 2008 and analyzed by Analytical Laboratory Services, Inc. (ALSI) of Middletown, Pennsylvania.

EPA SW-846 Methods were conducted using 6010C for ICP-AES metals, 6020 for ICP-MS metals, 7470D for mercury, and 7196A for hexavalent chromium.

SUMMARY

All analytes were successfully analyzed in all samples. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until analysis, calibration data, laboratory blank results, ICP interference check samples, matrix spike (MS) and matrix spike duplicate (MSD) results, laboratory control spike (LCS) results, field duplicate results, ICP serial dilution results, detection limits, and analyte quantitation.

Areas of concern with respect to data quality are listed below as follows:

MINOR PROBLEMS

- The matrix spike recovery for total iron exceeded the upper QC limit of 125%. The total iron results were qualified as biased high (K) in all the associated samples.

- The matrix spike recovery for dissolved aluminum exceeded the upper QC limit of 125%. The dissolved aluminum positive results were qualified as estimated (J) due this problem in conjunction with other QC problems..
- The matrix spike duplicate recovery for dissolved magnesium was below the lower QC limit of 75%. The dissolved magnesium results were qualified as biased low (L) in all the associated samples.
- The ICP-MS interference check recoveries were below the QC criteria of 80% for dissolved aluminum. The associated non-detected dissolved aluminum result was qualified as biased low (UL). The associated positive dissolved aluminum results were superseded by the estimated qualifier (J) due to other QC problems.
- Positive results at concentrations less than the reporting limits (RLs) were qualified as estimated (J).

NOTES

An ICP-MS interference check recovery exceeded QC criteria of 120% for chromium in the dissolved fraction. No action was taken for these exceedances because there were no analyte concentrations in the samples that caused interference.

Field duplicate precision was within QC criteria.

No analytes were detected in the laboratory blanks.

The mercury and hexavalent chromium data are acceptable as reported by the laboratory.

EXECUTIVE SUMMARY

Laboratory Performance: None.

Other Factors Affecting Data Quality: Several analytes were present in the associated rinsate blank from SDG TWK-002. The MS/MSD recoveries exceeded QC criteria for two analytes.

The data for these analyses were reviewed with reference to the EPA "Functional Guidelines for Inorganic Data Review", as amended for use within EPA Region 3 (4/93).

The text of this report has been formatted to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the Functional Guidelines and the Quality Assurance Project Plan (QAPP)."

R. Sloboda for M. Ritchie

Megan N. Ritchie
Chemist

Russ Sloboda

Tetra Tech NUS, Inc.
Russ Sloboda
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A

Qualified Analytical Results

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: M

nsample	03MW01I-20080311	nsample	03MW01S-20080311	nsample	03MW04I-20080314
samp_date	3/11/2008	samp_date	3/11/2008	samp_date	3/14/2008
lab_id	9726965002	lab_id	9726965003	lab_id	9727555003
qc_type	NM	qc_type	NM	qc_type	NM
units	MG/L	units	MG/L	units	MG/L
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	1.16		
ANTIMONY	0.0012	J	P
ARSENIC	0.006		
BARIUM	0.215		
BERYLLIUM	0.001	U	
CADMIUM	0.0001	J	P
CALCIUM	25		
CHROMIUM	0.0043		
COBALT	0.0008	J	P
COPPER	0.0006	J	P
IRON	1.2	K	D
LEAD	0.0004	J	P
MAGNESIUM	10.6		
MANGANESE	0.0163		
MERCURY	0.0005	U	
NICKEL	0.0039	J	P
POTASSIUM	1.48		
SELENIUM	0.002	J	P
SILVER	0.001	U	
SODIUM	12.7		
THALLIUM	0.001	U	
VANADIUM	0.0005	J	P
ZINC	0.003	J	P

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0012	J	P
ARSENIC	0.006	U	
BARIUM	0.111		
BERYLLIUM	0.0001	J	P
CADMIUM	0.001	U	
CALCIUM	7.22		
CHROMIUM	0.005		
COBALT	0.0002	J	P
COPPER	0.0003	J	P
IRON	0.11	K	D
LEAD	0.00006	J	P
MAGNESIUM	1.88		
MANGANESE	0.003	J	P
MERCURY	0.0005	U	
NICKEL	0.0038	J	P
POTASSIUM	0.67		
SELENIUM	0.003	J	P
SILVER	0.001	U	
SODIUM	12.3		
THALLIUM	0.001	U	
VANADIUM	0.001	U	
ZINC	0.0028	J	P

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0007	J	P
ARSENIC	0.0006	J	P
BARIUM	0.455		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	31.9		
CHROMIUM	0.001	J	P
COBALT	0.006	U	
COPPER	0.00008	J	P
IRON	0.04	J	DP
LEAD	0.002	U	
MAGNESIUM	8.26		
MANGANESE	0.006	U	
MERCURY	0.0005	U	
NICKEL	0.0018	J	P
POTASSIUM	0.68		
SELENIUM	0.003	J	P
SILVER	0.001	U	
SODIUM	13.3		
THALLIUM	0.001	U	
VANADIUM	0.001	U	
ZINC	0.0062		

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: M

nsample	03MW04SI-20080314	nsample	03MW05I-20080311	nsample	03MW05S-20080312
samp_date	3/14/2008	samp_date	3/11/2008	samp_date	3/12/2008
lab_id	9727555004	lab_id	9726965004	lab_id	9727192002
qc_type	NM	qc_type	NM	qc_type	NM
units	MG/L	units	MG/L	units	MG/L
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0006	J	P
ARSENIC	0.0006	J	P
BARIUM	0.487		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	37.2		
CHROMIUM	0.0009	J	P
COBALT	0.006	U	
COPPER	0.0001	J	P
IRON	0.02	J	DP
LEAD	0.002	U	
MAGNESIUM	9.65		
MANGANESE	0.006	U	
MERCURY	0.0005	U	
NICKEL	0.0026	J	P
POTASSIUM	0.88		
SELENIUM	0.003	J	P
SILVER	0.001	U	
SODIUM	17.6		
THALLIUM	0.001	U	
VANADIUM	0.001	U	
ZINC	0.0019	J	P

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0008	J	P
ARSENIC	0.0005	J	P
BARIUM	0.209		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	12		
CHROMIUM	0.0076		
COBALT	0.004	J	P
COPPER	0.001	J	P
IRON	0.13	K	D
LEAD	0.002	U	
MAGNESIUM	3.16		
MANGANESE	0.0028	J	P
MERCURY	0.0005	U	
NICKEL	0.0057	J	P
POTASSIUM	0.79		
SELENIUM	0.002	J	P
SILVER	0.00006	J	P
SODIUM	9.32		
THALLIUM	0.001	U	
VANADIUM	0.001	U	
ZINC	0.006	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0007	J	P
ARSENIC	0.006	U	
BARIUM	0.055		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	9.69		
CHROMIUM	0.0027		
COBALT	0.006	U	
COPPER	0.006	U	
IRON	0.04	J	DP
LEAD	0.002	U	
MAGNESIUM	3.24		
MANGANESE	0.0017	J	P
MERCURY	0.0005	U	
NICKEL	0.0018	J	P
POTASSIUM	0.8		
SELENIUM	0.003	J	P
SILVER	0.001	U	
SODIUM	11.5		
THALLIUM	0.001	U	
VANADIUM	0.001	U	
ZINC	0.0028	J	P

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: M

nsample	03MW06I-20080314
samp_date	3/14/2008
lab_id	9727555002
qc_type	NM
units	MG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	2.03		
ANTIMONY	0.0007	J	P
ARSENIC	0.0091		
BARIUM	0.413		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	25.9		
CHROMIUM	0.012		
COBALT	0.003	J	P
COPPER	0.0024	J	P
IRON	2.4	K	D
LEAD	0.0014	J	P
MAGNESIUM	11.1		
MANGANESE	0.103		
MERCURY	0.0005	U	
NICKEL	0.0096		
POTASSIUM	3.08		
SELENIUM	0.002	J	P
SILVER	0.001	U	
SODIUM	9.55		
THALLIUM	0.001	U	
VANADIUM	0.0064		
ZINC	0.0106		

nsample	03MW06S-20080313
samp_date	3/13/2008
lab_id	9727450003
qc_type	NM
units	MG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.089		
ANTIMONY	0.0007	J	P
ARSENIC	0.0004	J	P
BARIUM	0.037		
BERYLLIUM	0.0001	J	P
CADMIUM	0.001	U	
CALCIUM	12		
CHROMIUM	0.0049		
COBALT	0.006	U	
COPPER	0.0017	J	P
IRON	0.09	K	D
LEAD	0.002	U	
MAGNESIUM	6.42		
MANGANESE	0.0082		
MERCURY	0.0005	U	
NICKEL	0.005	J	P
POTASSIUM	1.37		
SELENIUM	0.005	J	P
SILVER	0.001	U	
SODIUM	13.5		
THALLIUM	0.001	U	
VANADIUM	0.001	U	
ZINC	0.0084		

nsample	03MW06SI-20080313
samp_date	3/13/2008
lab_id	9727450002
qc_type	NM
units	MG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.144		
ANTIMONY	0.0007	J	P
ARSENIC	0.006	U	
BARIUM	0.111		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	7.31		
CHROMIUM	0.0051		
COBALT	0.006	U	
COPPER	0.0017	J	P
IRON	0.23	K	D
LEAD	0.002	U	
MAGNESIUM	2.26		
MANGANESE	0.0102		
MERCURY	0.0005	U	
NICKEL	0.0043	J	P
POTASSIUM	0.98		
SELENIUM	0.001	J	P
SILVER	0.001	U	
SODIUM	8.68		
THALLIUM	0.001	U	
VANADIUM	0.001	U	
ZINC	0.0052	J	P

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: M

nsample	03MW08D-20080312
samp_date	3/12/2008
lab_id	9727192004
qc_type	NM
units	MG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0007	J	P
ARSENIC	0.0005	J	P
BARIUM	0.34		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	31.9		
CHROMIUM	0.0025		
COBALT	0.0024	J	P
COPPER	0.006	U	
IRON	0.17	K	D
LEAD	0.002	U	
MAGNESIUM	13.8		
MANGANESE	0.0019	J	P
MERCURY	0.0005	U	
NICKEL	0.0028	J	P
POTASSIUM	0.77		
SELENIUM	0.001	J	P
SILVER	0.001	U	
SODIUM	10.8		
THALLIUM	0.001	U	
VANADIUM	0.00009	J	P
ZINC	0.006	U	

nsample	03MW08S-20080312
samp_date	3/12/2008
lab_id	9727192003
qc_type	NM
units	MG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0008	J	P
ARSENIC	0.006	U	
BARIUM	0.0501		
BERYLLIUM	0.0006	J	P
CADMIUM	0.001	U	
CALCIUM	11.5		
CHROMIUM	0.0028		
COBALT	0.0002	J	P
COPPER	0.002	J	P
IRON	0.07	K	D
LEAD	0.002	U	
MAGNESIUM	3.47		
MANGANESE	0.0353		
MERCURY	0.0005	U	
NICKEL	0.004	J	P
POTASSIUM	1.14		
SELENIUM	0.001	J	P
SILVER	0.001	U	
SODIUM	14.6		
THALLIUM	0.001	U	
VANADIUM	0.001	U	
ZINC	0.0031	J	P

nsample	DUP-01
samp_date	3/11/2008
lab_id	9726965005
qc_type	FD
units	MG/L
Pct_Solids	
DUP_OF:	03MW01S-20080311

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.0007	J	P
ARSENIC	0.006	U	
BARIUM	0.111		
BERYLLIUM	0.00009	J	P
CADMIUM	0.001	U	
CALCIUM	7.25		
CHROMIUM	0.0047		
COBALT	0.0002	J	P
COPPER	0.0003	J	P
IRON	0.14	K	D
LEAD	0.00004	J	P
MAGNESIUM	1.88		
MANGANESE	0.0028	J	P
MERCURY	0.0005	U	
NICKEL	0.0039	J	P
POTASSIUM	0.6		
SELENIUM	0.003	J	P
SILVER	0.001	U	
SODIUM	12.3		
THALLIUM	0.001	U	
VANADIUM	0.001	U	
ZINC	0.0028	J	P

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: MF

nsample	03MW01I-20080311
samp_date	3/11/2008
lab_id	9726965002
qc_type	NM
units	MG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.036	J	DP
ANTIMONY	0.002	U	
ARSENIC	0.0064		
BARIUM	0.199		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	24.9		
CHROMIUM	0.0035		
COBALT	0.005	U	
COPPER	0.005	U	
IRON	0.02	J	P
LEAD	0.002	U	
MAGNESIUM	10.4	L	D
MANGANESE	0.0036	J	P
MERCURY	0.00009	J	P
NICKEL	0.0018	J	P
POTASSIUM	1.56		
SELENIUM	0.005	U	
SILVER	0.001	U	
SODIUM	13.2		
THALLIUM	0.001	U	
VANADIUM	0.001		
ZINC	0.0004	J	P

nsample	03MW01S-20080311
samp_date	3/11/2008
lab_id	9726965003
qc_type	NM
units	MG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.007	J	DP
ANTIMONY	0.0014	J	P
ARSENIC	0.003	U	
BARIUM	0.104		
BERYLLIUM	0.0002	J	P
CADMIUM	0.001	U	
CALCIUM	7.69		
CHROMIUM	0.0061		
COBALT	0.0002	J	P
COPPER	0.005	U	
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	1.9	L	D
MANGANESE	0.0018	J	P
MERCURY	0.00009	J	P
NICKEL	0.0048	J	P
POTASSIUM	0.79		
SELENIUM	0.003	J	P
SILVER	0.001	U	
SODIUM	12.7		
THALLIUM	0.001	U	
VANADIUM	0.001	U	
ZINC	0.0018	J	P

nsample	03MW04I-20080314
samp_date	3/14/2008
lab_id	9727555003
qc_type	NM
units	MG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	UL	K
ANTIMONY	0.002	U	
ARSENIC	0.003	U	
BARIUM	0.461		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	35.7		
CHROMIUM	0.0015	J	P
COBALT	0.0001	J	P
COPPER	0.005	U	
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	8.57	L	D
MANGANESE	0.004	U	
MERCURY	0.00009	J	P
NICKEL	0.005	U	
POTASSIUM	0.87		
SELENIUM	0.002	J	P
SILVER	0.001	U	
SODIUM	13.6		
THALLIUM	0.001	U	
VANADIUM	0.0012		
ZINC	0.005	U	

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: MF

nsample	03MW04SI-20080314	nsample	03MW05I-20080311	nsample	03MW05S-20080312
samp_date	3/14/2008	samp_date	3/11/2008	samp_date	3/12/2008
lab_id	9727555004	lab_id	9726965004	lab_id	9727192002
qc_type	NM	qc_type	NM	qc_type	NM
units	MG/L	units	MG/L	units	MG/L
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	UL	K
ANTIMONY	0.002	U	
ARSENIC	0.003	U	
BARIUM	0.496		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	42.4		
CHROMIUM	0.0025		
COBALT	0.0002	J	P
COPPER	0.005	U	
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	10.1		
MANGANESE	0.00006	J	DP
MERCURY	0.00009	J	P
NICKEL	0.0009	J	P
POTASSIUM	1.02		
SELENIUM	0.002	J	P
SILVER	0.001	U	
SODIUM	18.5		
THALLIUM	0.001	U	
VANADIUM	0.0013		
ZINC	0.005	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.08	U	
ANTIMONY	0.002	U	
ARSENIC	0.003	U	
BARIUM	0.201		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	12.8		
CHROMIUM	0.0039		
COBALT	0.0025	J	P
COPPER	0.005	U	
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	3.24	L	D
MANGANESE	0.004	U	
MERCURY	0.0001	J	P
NICKEL	0.0036	J	P
POTASSIUM	0.86		
SELENIUM	0.005	U	
SILVER	0.001	U	
SODIUM	9.47		
THALLIUM	0.001	U	
VANADIUM	0.001	U	
ZINC	0.0003	J	P

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.005	J	DP
ANTIMONY	0.002	U	
ARSENIC	0.003	U	
BARIUM	0.0548		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	11.1		
CHROMIUM	0.0049		
COBALT	0.0005	J	P
COPPER	0.005	U	
IRON	0.009	J	
LEAD	0.002	U	
MAGNESIUM	3.72	L	D
MANGANESE	0.0024	J	P
MERCURY	0.00009	J	P
NICKEL	0.0022	J	P
POTASSIUM	1.14		
SELENIUM	0.003	J	P
SILVER	0.001	U	
SODIUM	12.6		
THALLIUM	0.001	U	
VANADIUM	0.001	U	
ZINC	0.0014	J	P

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: MF

nsample	03MW06I-20080314	nsample	03MW06S-20080313	nsample	03MW06SI-20080313
samp_date	3/14/2008	samp_date	3/13/2008	samp_date	3/13/2008
lab_id	9727555002	lab_id	9727450003	lab_id	9727450002
qc_type	NM	qc_type	NM	qc_type	NM
units	MG/L	units	MG/L	units	MG/L
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.004	J	DPK
ANTIMONY	0.002	U	
ARSENIC	0.0101		
BARIUM	0.299		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	24.9		
CHROMIUM	0.0014	J	P
COBALT	0.0001	J	P
COPPER	0.005	U	
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	10.2	L	D
MANGANESE	0.0004	J	P
MERCURY	0.00009	J	P
NICKEL	0.0005	J	P
POTASSIUM	2.09		
SELENIUM	0.002	J	P
SILVER	0.001	U	
SODIUM	9.31		
THALLIUM	0.001	U	
VANADIUM	0.0049		
ZINC	0.005	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.01	J	DP
ANTIMONY	0.002	U	
ARSENIC	0.003	U	
BARIUM	0.0348		
BERYLLIUM	0.0004	J	P
CADMIUM	0.001	U	
CALCIUM	14		
CHROMIUM	0.0047		
COBALT	0.005	U	
COPPER	0.0014	J	P
IRON	0.01	J	P
LEAD	0.002	U	
MAGNESIUM	6.76	L	D
MANGANESE	0.0058		
MERCURY	0.00009	J	P
NICKEL	0.0044	J	P
POTASSIUM	1.67		
SELENIUM	0.005	J	P
SILVER	0.001	U	
SODIUM	14.4		
THALLIUM	0.001	U	
VANADIUM	0.001	U	
ZINC	0.006		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.003	J	DP
ANTIMONY	0.002	U	
ARSENIC	0.003	U	
BARIUM	0.104		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	8.31		
CHROMIUM	0.0036		
COBALT	0.005	U	
COPPER	0.005	U	
IRON	0.01	J	P
LEAD	0.002	U	
MAGNESIUM	2.49	L	D
MANGANESE	0.0006	J	P
MERCURY	0.00008	J	P
NICKEL	0.0026	J	P
POTASSIUM	1.1		
SELENIUM	0.005	U	
SILVER	0.001	U	
SODIUM	9.11		
THALLIUM	0.001	U	
VANADIUM	0.001	U	
ZINC	0.0007	J	P

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: MF

nsample	03MW08D-20080312	nsample	03MW08S-20080312	nsample	DUP-01
samp_date	3/12/2008	samp_date	3/12/2008	samp_date	3/11/2008
lab_id	9727192004	lab_id	9727192003	lab_id	9726965005
qc_type	NM	qc_type	NM	qc_type	FD
units	MG/L	units	MG/L	units	MG/L
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:		DUP_OF:	03MW01S-20080311

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.017	J	DP
ANTIMONY	0.002	U	
ARSENIC	0.003	U	
BARIUM	0.324		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	35.5		
CHROMIUM	0.0037		
COBALT	0.0019	J	P
COPPER	0.005	U	
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	15.3	L	D
MANGANESE	0.00005	J	P
MERCURY	0.0001	J	P
NICKEL	0.0017	J	P
POTASSIUM	0.97		
SELENIUM	0.009		
SILVER	0.001	U	
SODIUM	11.3		
THALLIUM	0.001	U	
VANADIUM	0.001	J	P
ZINC	0.0007	J	P

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.005	J	DP
ANTIMONY	0.002	U	
ARSENIC	0.003	U	
BARIUM	0.0469		
BERYLLIUM	0.0006	J	P
CADMIUM	0.001	U	
CALCIUM	12.6		
CHROMIUM	0.0039		
COBALT	0.005	U	
COPPER	0.0016	J	P
IRON	0.06	U	
LEAD	0.002	U	
MAGNESIUM	3.78	L	D
MANGANESE	0.0346		
MERCURY	0.00009	J	P
NICKEL	0.0038	J	P
POTASSIUM	1.43		
SELENIUM	0.005	U	
SILVER	0.001	U	
SODIUM	15.3		
THALLIUM	0.001	U	
VANADIUM	0.001	U	
ZINC	0.0034	J	P

Parameter	Result	Val Qual	Qual Code
ALUMINUM	0.005	J	DP
ANTIMONY	0.002	U	
ARSENIC	0.003	U	
BARIUM	0.102		
BERYLLIUM	0.001	U	
CADMIUM	0.001	U	
CALCIUM	7.84		
CHROMIUM	0.0063		
COBALT	0.0002	J	P
COPPER	0.005	U	
IRON	0.009	J	P
LEAD	0.002	U	
MAGNESIUM	1.93	L	D
MANGANESE	0.002	J	P
MERCURY	0.00009	J	P
NICKEL	0.0054		
POTASSIUM	0.78		
SELENIUM	0.003	J	P
SILVER	0.001	U	
SODIUM	12.8		
THALLIUM	0.001	U	
VANADIUM	0.001	U	
ZINC	0.0015	J	P

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: MISC

nsample	03MW01I-20080311	nsample	03MW01S-20080311	nsample	03MW05I-20080311
samp_date	3/11/2008	samp_date	3/11/2008	samp_date	3/11/2008
lab_id	9726965002	lab_id	9726965003	lab_id	9726965004
qc_type	NM	qc_type	NM	qc_type	NM
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	units	Result	Val Qual	Qual Code
HEXAVALENT CHROMIUM	MG/L	0.01	U	

Parameter	units	Result	Val Qual	Qual Code
HEXAVALENT CHROMIUM	MG/L	0.01	U	

Parameter	units	Result	Val Qual	Qual Code
HEXAVALENT CHROMIUM	MG/L	0.01	U	

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: MISC

nsample	03MW05S-20080312	nsample	03MW06I-20080314	nsample	03MW06S-20080313
samp_date	3/12/2008	samp_date	3/14/2008	samp_date	3/13/2008
lab_id	9727192002	lab_id	9727555002	lab_id	9727450003
qc_type	NM	qc_type	NM	qc_type	NM
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	units	Result	Val Qual	Qual Code
HEXAVALENT CHROMIUM	MG/L	0.01	U	

Parameter	units	Result	Val Qual	Qual Code
HEXAVALENT CHROMIUM	MG/L	0.01	U	

Parameter	units	Result	Val Qual	Qual Code
HEXAVALENT CHROMIUM	MG/L	0.01	U	

PROJ_NO: 00845

SDG: TWK-001 MEDIA: WATER DATA FRACTION: MISC

nsample	03MW06SI-20080313	nsample	DUP-01
samp_date	3/13/2008	samp_date	3/11/2008
lab_id	9727450002	lab_id	9726965005
qc_type	NM	qc_type	FD
Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:	03MW01S-20080311

Parameter	units	Result	Val Qual	Qual Code
HEXAVALENT CHROMIUM	MG/L	0.01	U	

Parameter	units	Result	Val Qual	Qual Code
HEXAVALENT CHROMIUM	MG/L	0.01	U	

Qualifier Codes:

a	=	Lab Blank Contamination
b	=	Field Blank Contamination
c	=	Calibration (i.e., %RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
d	=	MS/MSD Noncompliance
e	=	LSC/LSCD Noncompliance
f	=	Laboratory Duplicate Imprecision
g	=	Field Duplicate Imprecision
h	=	Holding Time Exceedance
i	=	ICP Serial Dilution Noncompliance
j	=	GFAA PDS – GFAA MSA's r<0.995 (correlation coefficient)
k	=	ICP Interference – include ICSAB %Rs
l	=	Instrument Calibration Range Exceedance
m	=	Sample Preservation
n	=	Internal Standard Noncompliance
o	=	Poor Instrument Performance (i.e. baseline drifting)
p	=	Uncertainty Near Detection Limit (<2 x IDL for inorganics and < CRQL for organics)
q	=	Other Problems (can encompass of number of issues)
r	=	Surrogates Recovery Noncompliance
s	=	Pesticide/PCB Resolution
t	=	% Breakdown Noncompliance for DDT and Endrin
u	=	Pesticide/PCB % Difference Between Columns for Positive Results
v	=	Non-linear Calibrations, Tuning r <0.995 (correlation coefficient)

Data Qualifier Key:

B	- Positive result is considered to be an artifact of blank contamination and should not be considered present.
J	- Value is considered estimated due to exceedance of technical quality control or because result is less than the Contract Required Quantitation Limit (CRQL).
L	- Positive result is considered biased low due to exceedance of technical quality control criteria.
U	- Value is a non-detected result as reported by the laboratory.
UL	- Non-detected result is considered biased low due to exceedance of technical quality control criteria.

TETRA TECH NUS

PHIL- 22094

TO:	**RUSS TURNER**	**DATE:**	**APRIL 24, 2008**
FROM:	**MEGAN RITCHIE**	**COPIES:**	**FILE**

SUBJECT: **ORGANIC DATA VALIDATION – VOC AND 1,4-DIOXANE**
NAS JRB WILLOW GROVE SITE 3, WILLOW GROVE, PENNSYLVANIA
SDG NO. TWK-002

SAMPLES: **16/Aqueous/**

03MW02I	03MW03SI	03IW01	DUP-02
03MW02SI	03MW03S	03SW10	DUP-03
03MW02S	03MW04S	03SW11	TB-20080314
03MW03I	03MW07S	RB	TB-20080318

*The sample dates were truncated for clarity except for the trip blanks.

OVERVIEW

The sample set for the NAS JRB Willow Grove Site 3 Interim Groundwater Monitoring (IGWM) – Willow Grove, PA, SDG TWK-002 consists of 13 aqueous environmental samples (designated 03MW-, 03IW-, and 03SW-) and three field quality control (QC) blanks (designated RB- and TB-). No samples were designated as the matrix spike and matrix spike duplicate (MS/MSD) for this sample set. Two field duplicate pairs (DUP-02/03MW03SI and DUP-03/03IW01) were included in this sample set. All samples were analyzed for Volatile Organic Compounds (VOCs) and 1,4-Dioxane except for the trip blanks. The trip blanks were analyzed for VOCs only.

The samples were collected by Tetra Tech NUS on March 13-19, 2008 and analyzed by Analytical Laboratory Services, Inc. (ALSI) of Middletown, Pennsylvania.

All analyses were conducted using EPA SW-846 Methods. VOCs were analyzed by 8260B and 1,4-Dioxane by 8270D.

SUMMARY

Most analytes were successfully analyzed in all samples. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until analysis, GC/MS tuning and calibration data, laboratory and field quality control blank results, system monitoring compound recoveries, matrix spike/matrix spike duplicate (MS/MSD) results, laboratory control spike (LCS) results, internal standards performance, compound identification, compound quantitation, and field duplicate results.

MAJOR PROBLEMS

- The initial calibration relative response factors (RRFs) for 2-butanone and acetone were below the QC criterion of 0.05. The non-detected results for 2-butanone and acetone were qualified as unusable (UR).

MINOR PROBLEMS

- The continuing calibration percent difference (%D) exceeded the QC criteria of 25% for carbon tetrachloride. The associated positive carbon tetrachloride result in sample 03MW02I was qualified as estimated (J).
- All surrogate recoveries were very low for sample DUP-02. The laboratory noted in the narrative that there was an error during the extraction process. The sample was re-extracted outside hold time and reanalyzed with surrogate recoveries within control limits. The non-detected result for 1,4-Dioxane in DUP-02 was qualified as estimated (UJ) because it was outside holding time.
- Positive results at concentrations less than the reporting limits (RLs) were qualified as estimated (J).

Notes

The continuing calibration %Ds exceeded the QC criteria of 25% for several VOC compounds. No action was taken because there were no detections of these compounds in the associated samples.

The MS and LCS recoveries exceeded the QC criteria for chloromethane, Freon 113, and m,p-xylene. No action was taken because there were no positive detections of these compounds in the associated samples.

The 1,4-Dioxane analysis surrogate recoveries for sample 03MW03SI exceeded QC criteria. No action was taken because there was not a positive detection for this sample.

EXECUTIVE SUMMARY

Laboratory Performance: Two VOC compounds had initial calibration RRFs below QC criteria. Several VOC compounds exceeded the continuing calibration %D criteria. Surrogate recoveries were below QC limits for two samples. Three VOC compound recoveries exceeded LCS QC limits.

Other Factors Affecting Data Quality: One VOC compound recovery exceeded MS/MSD QC limits.

The data for these analyses were reviewed with reference to the Tetra Tech NUS Standard Operating Procedure DV-02 (8/01) "Data Validation for Non-CLP Organics for Solid Matrices" and EPA "Functional Guidelines for Organic Data Review", as amended for use within EPA Region 3 (9/94).

The text of this report has been formatted to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the Functional Guidelines and the Quality Assurance Project Plan (QAPjP)."

Megan Ritchie

Megan N. Ritchie
Chemist

Tetra Tech NUS, Inc.
Russell Sloboda
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Laboratory Analytical Results
3. Appendix C – Support Documentation

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: OV

nsample	03IW01-20080319
samp_date	3/19/2008
lab_id	9728271005
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

nsample	03IW01-20080319
samp_date	3/19/2008
lab_id	9728271005
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	6		
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

nsample	03MW02I-20080318
samp_date	3/18/2008
lab_id	9728271002
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	0.38	J	CP
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: OV

nsample	03MW02I-20080318
samp_date	3/18/2008
lab_id	9728271002
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	7.8		
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

nsample	03MW02S-20080318
samp_date	3/18/2008
lab_id	9728271004
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

nsample	03MW02S-20080318
samp_date	3/18/2008
lab_id	9728271004
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: OV

nsample	03MW02SI-20080318
samp_date	3/18/2008
lab_id	9728271003
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

nsample	03MW02SI-20080318
samp_date	3/18/2008
lab_id	9728271003
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	3.3		
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

nsample	03MW03I-20080317
samp_date	3/17/2008
lab_id	9727814006
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: OV

nsample	03MW03I-20080317
samp_date	3/17/2008
lab_id	9727814006
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	6.9		
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

nsample	03MW03S-20080317
samp_date	3/17/2008
lab_id	9727814005
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

nsample	03MW03S-20080317
samp_date	3/17/2008
lab_id	9727814005
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	2.5		
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: OV

nsample	03MW03SI-20080317
samp_date	3/17/2008
lab_id	9727814003
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

nsample	03MW03SI-20080317
samp_date	3/17/2008
lab_id	9727814003
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	12		
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

nsample	03MW04S-20080314
samp_date	3/14/2008
lab_id	9727814002
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1.1		
BROMOFORM	0.87	J	P
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1.5		
CHLOROETHANE	1	U	
CHLOROFORM	0.4	J	P
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

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SDG: TWK-002 MEDIA: WATER DATA FRACTION: OV

nsample	03MW04S-20080314
samp_date	3/14/2008
lab_id	9727814002
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	4.5		
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

nsample	03MW07S-20080319
samp_date	3/19/2008
lab_id	9728271008
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

nsample	03MW07S-20080319
samp_date	3/19/2008
lab_id	9728271008
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1.1		
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: OV

nsample	03SW10-20080319	nsample	03SW10-20080319	nsample	03SW11-20080319
samp_date	3/19/2008	samp_date	3/19/2008	samp_date	3/19/2008
lab_id	9728271007	lab_id	9728271007	lab_id	9728271006
qc_type	NM	qc_type	NM	qc_type	NM
units	UG/L	units	UG/L	units	UG/L
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	0.21	J	P
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: OV

nsample	03SW11-20080319	nsample	DUP-02	nsample	DUP-02
samp_date	3/19/2008	samp_date	3/17/2008	samp_date	3/17/2008
lab_id	9728271006	lab_id	9727814004	lab_id	9727814004
qc_type	NM	qc_type	FD	qc_type	FD
units	UG/L	units	UG/L	units	UG/L
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:	03MW03SI-20080317	DUP_OF:	03MW03SI-20080317

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	11.7		
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

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SDG: TWK-002 MEDIA: WATER DATA FRACTION: OV

nsample	DUP-03
samp_date	3/19/2008
lab_id	9728271010
qc_type	FD
units	UG/L
Pct_Solids	
DUP_OF:	03IW01-20080319

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

nsample	DUP-03
samp_date	3/19/2008
lab_id	9728271010
qc_type	FD
units	UG/L
Pct_Solids	
DUP_OF:	03IW01-20080319

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	6.3		
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

nsample	RB-20080318
samp_date	3/19/2008
lab_id	9728271009
qc_type	RB
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: OV

nsample	RB-20080318
samp_date	3/19/2008
lab_id	9728271009
qc_type	RB
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

nsample	TB-20080314-TWK002
samp_date	3/14/2008
lab_id	9727814001
qc_type	TB
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

nsample	TB-20080314-TWK002
samp_date	3/14/2008
lab_id	9727814001
qc_type	TB
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: OV

nsample	TB-20080318-TWK002	nsample	TB-20080318-TWK002
samp_date	3/18/2008	samp_date	3/18/2008
lab_id	9728271001	lab_id	9728271001
qc_type	TB	qc_type	TB
units	UG/L	units	UG/L
Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2,3-TRICHLOROBENZENE	2	U	
1,2,4-TRICHLOROBENZENE	2	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	1	U	
1,2-DICHLOROBENZENE	1	U	
1,2-DICHLOROETHANE	1	U	
1,2-DICHLOROPROPANE	1	U	
1,3-DICHLOROBENZENE	1	U	
1,4-DICHLOROBENZENE	1	U	
2-BUTANONE	10	UR	C
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	10	UR	C
BENZENE	1	U	
BROMOCHLOROMETHANE	1	U	
BROMODICHLOROMETHANE	1	U	
BROMOFORM	1	U	
BROMOMETHANE	1	U	
CARBON DISULFIDE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	1	U	
CHLORODIBROMOMETHANE	1	U	
CHLOROETHANE	1	U	
CHLOROFORM	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	

Parameter	Result	Val Qual	Qual Code
CIS-1,3-DICHLOROPROPENE	1	U	
CYCLOHEXANE	1	U	
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	1	U	
ISOPROPYLBENZENE	1	U	
M+P-XYLENES	2	U	
METHYL ACETATE	2	U	
METHYL CYCLOHEXANE	1	U	
METHYL TERT-BUTYL ETHER	1	U	
METHYLENE CHLORIDE	1	U	
O-XYLENE	1	U	
STYRENE	1	U	
TETRACHLOROETHENE	1	U	
TOLUENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	1	U	
TRICHLOROETHENE	1	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1	U	

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: OS

nsample	03IW01-20080319	nsample	03MW02I-20080318	nsample	03MW02S-20080318
samp_date	3/19/2008	samp_date	3/18/2008	samp_date	3/18/2008
lab_id	9728271005	lab_id	9728271002	lab_id	9728271004
qc_type	NM	qc_type	NM	qc_type	NM
units	UG/L	units	UG/L	units	UG/L
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	3	U	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.9	U	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.9	U	

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: OS

nsample	03MW02SI-20080318	nsample	03MW03I-20080317	nsample	03MW03S-20080317
samp_date	3/18/2008	samp_date	3/17/2008	samp_date	3/17/2008
lab_id	9728271003	lab_id	9727814006	lab_id	9727814005
qc_type	NM	qc_type	NM	qc_type	NM
units	UG/L	units	UG/L	units	UG/L
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.9	U	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.8	U	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.8	U	

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: OS

nsample	03MW03SI-20080317
samp_date	3/17/2008
lab_id	9727814003
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.9	U	

nsample	03MW04S-20080314
samp_date	3/14/2008
lab_id	9727814002
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.9	U	

nsample	03MW07S-20080319
samp_date	3/19/2008
lab_id	9728271008
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.9	U	

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: OS

nsample	03SW10-20080319	nsample	03SW11-20080319	nsample	DUP-02
samp_date	3/19/2008	samp_date	3/19/2008	samp_date	3/17/2008
lab_id	9728271007	lab_id	9728271006	lab_id	9727814004
qc_type	NM	qc_type	NM	qc_type	FD
units	UG/L	units	UG/L	units	UG/L
Pct_Solids		Pct_Solids		Pct_Solids	
DUP_OF:		DUP_OF:		DUP_OF:	03MW03SI-20080317

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.9	U	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	3	U	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.9	UJ	H

PROJ_NO: 00845

SDG: TWK-002 MEDIA: WATER DATA FRACTION: OS

nsample	DUP-03	nsample	RB-20080318
samp_date	3/19/2008	samp_date	3/19/2008
lab_id	9728271010	lab_id	9728271009
qc_type	FD	qc_type	RB
units	UG/L	units	UG/L
Pct_Solids		Pct_Solids	
DUP_OF:	03IW01-20080319	DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.9	U	

Parameter	Result	Val Qual	Qual Code
1,4-DIOXANE	2.9	U	

Qualifier Codes:

a	=	Lab Blank Contamination
b	=	Field Blank Contamination
c	=	Calibration (i.e., %RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
d	=	MS/MSD Noncompliance
e	=	LSC/LSCD Noncompliance
f	=	Laboratory Duplicate Imprecision
g	=	Field Duplicate Imprecision
h	=	Holding Time Exceedance
i	=	ICP Serial Dilution Noncompliance
j	=	GFAA PDS – GFAA MSA's r<0.995 (correlation coefficient)
k	=	ICP Interference – include ICSAB %Rs
l	=	Instrument Calibration Range Exceedance
m	=	Sample Preservation
n	=	Internal Standard Noncompliance
n01	=	Internal Standard Recovery Noncompliance Dioxins
n02	=	Recovery Standard Noncompliance Dioxins
n03	=	Clean-up Standard Noncompliance Dioxins
o	=	Poor Instrument Performance (i.e. baseline drifting)
p	=	Uncertainty Near Detection Limit (<2 x IDL for inorganics and < CRQL for organics)
q	=	Other Problems (can encompass of number of issues)
r	=	Surrogates Recovery Noncompliance
s	=	Pesticide/PCB Resolution
t	=	% Breakdown Noncompliance for DDT and Endrin
u	=	Pesticide/PCB % Difference Between Columns for Positive Results
v	=	Non-linear Calibrations, Tuning r <0.995 (correlation coefficient)
w	=	Ratios of primary monitored ions outside of theoretical +/-15 %, within +/- 25 %
x	=	Signal to noise response drop
y	=	Percent solids <30%
z	=	Uncertainty at 2 sigma deviation is greater than sample activity

Data Qualifier Key:

B	- Positive result is considered to be an artifact of blank contamination and should not be considered present.
J	- Value is considered estimated due to exceedance of technical quality control or because result is less than the Contract Required Quantitation Limit (CRQL).
K	- Positive result is considered biased high due to exceedance of technical quality control criteria.
L	- Positive result is considered biased low due to exceedance of technical quality control criteria.
U	- Value is a non-detected result as reported by the laboratory.
UL	- Non-detected result is considered biased low due to exceedance of technical quality control criteria.
UR	- Non-detected result is considered unusable due to exceedance of technical quality control criteria.