# JUNE 2015 GROUNDWATER SAMPLING DATA SUMMARY REPORT BETHPAGE, NY

Prepared for:



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CTO WE15

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### **List of Acronyms and Abbreviations**

DOT Department of Transportation
IDW Investigation Derived Waste
Katahdin Katahdin Analytical Services, Inc.

NWIRP Naval Weapons Industrial Reserve Plant

ONCT Onsite Containment System

OU Operable Unit

POTW Publicly Owned Treatment Works

QA Quality Assurance QC Quality Control

SAP Sampling and Analysis Plan UFP Uniform Federal Policy

VOC Volatile Organic Compounds

### 1.0 PROJECT BACKGROUND

Resolution Consultants has prepared this Groundwater Sampling Data Summary Report for the Naval Facilities Engineering Command, Mid-Atlantic under contract task order WE15 Contract N62470-11-D-8013. The report describes quarterly sampling activities in June 2015, part of the Navy's ongoing Environmental Restoration Program for the Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage Operable Unit (OU) 2 Site 1 offsite plume. NWIRP Bethpage is located in east-central Nassau County, Long Island, New York, approximately 30 miles east of New York City (Figure 1).

This data summary report provides information on quarterly sampling of 25 monitoring wells by Resolution Consultants (for the Navy) and ARCADIS (for Northrop Grumman). The purpose of this sampling is to provide information on the extent and magnitude of volatile organic compounds (VOCs) located in a narrow area immediately south of the Onsite Containment System (ONCT) in the western offsite plume, which could represent contamination that has bypassed the ONCT. The locations of monitoring wells sampled as part of this effort are shown in Figure 2 and listed in Table 1.

Per an agreement between the Navy and Northrop Grumman (letter May 6, 2015), Northrop Grumman takes over the quarterly sampling of selected monitoring wells after the initial sampling (post well installation) by Resolution Consultants. The June 2015 quarterly sampling round is the first round in which seven monitoring wells were scheduled for transition to Northrop Grumman for sampling.

Documentation of these activities is included in the appendices of this report. Groundwater sampling forms, and analytical data validation for wells sampled by Resolution Consultants are included in Appendix A and B, respectively. Appendix C contains analytical data validation for wells sampled by ARCADIS. Additional documentation of sampling activities by ARCADIS is provided in their report, Results of Second Quarter 2015 Groundwater Monitoring.

### 2.0 FIELD PROGRAM

Field tasks were conducted in June of 2015 in accordance with the Uniform Federal Policy (UFP) Sampling and Analysis Plan (SAP) Addendum: Groundwater Sampling Using Low Stress (Low Flow) Purging and Sampling Protocol (Resolution Consultants, 2013). The field investigation included purging and sampling of monitoring wells in the quarterly groundwater sampling network.

The June 2015 quarterly sampling round consisted of a total of 25 wells (Table 1). Of these, 18 groundwater wells were sampled by Resolution Consultants and seven were sampled by ARCADIS, Northrop Grumman's consultant. Northrop Grumman sampled the following wells after the initial sampling by Resolution Consultants in March 2015: BPOW5-1, BPOW5-2, BPOW5-3, BPOW6-1, BPOW6-2, BPOW6-3, and BPOW6-4. Results and data validation for ARCADIS-sampled wells is provided in Table 4 and Appendix C of this report.

### 2.1 Sampling

Resolution Consultants purged monitoring wells using a bladder pump with the intake placed at the approximate midpoint of the screened interval. The following field water quality parameters were continuously measured during purging: water temperature, pH, conductivity, oxidation-reduction potential, dissolved oxygen and turbidity. Groundwater analytical samples were collected when field water quality parameters stabilized. Samples were analyzed for VOCs via Method 8260C and 1,4-dioxane via Method 8270C by Katahdin Analytical Services (Katahdin). All purge water was managed as investigation derived waste (IDW). Samples were placed in a cooler containing ice and held for sample pick up by the laboratory courier. All samples were submitted to the laboratory for analyses of VOCs for the analytes listed in, and in accordance with, GC method SW846-8260C. Quality assurance (QA) and quality control (QC) samples were collected during the sampling effort.

Resolution Consultants utilized dedicated and disposable sampling equipment when possible to avoid the potential for cross-contamination of samples. The sampling equipment included dedicated disposable polyethylene tubing, disposable gloves, and laboratory supplied sample bottles. Hand held equipment was decontaminated using a liquinox and water wash, a potable water rinse followed by a distilled water rinse. Purge water was collected in 5-gallon pails or 55-gallon drums.

Sampling methods employed by ARCADIS can be found in their report, Results of Second Quarter 2015 Groundwater Monitoring.

### 2.2 Investigation Derived Waste

Resolution Consultants transported purge water from point of generation to the designated staging area at NWIRP in Department of Transportation (DOT) approved 5-gallon pails. Purge water was then containerized in a frac tank and stored at NWIRP Bethpage for characterization and ultimate disposal to the Nassau County Publicly Owned Treatment Works (POTW) in accordance with the facility's existing discharge permit. A representative water sample will be collected from each of the frac tanks and submitted to Katahdin for analysis. No solid waste was generated during sampling.

### 3.0 SUMMARY

Well construction information for all wells sampled by Resolution Consultants and ARCADIS is summarized in Table 1.

Analytical results and stabilized field water quality parameters for wells sampled by Resolution Consultants are summarized in Tables 2 and 3, respectively. Groundwater sample forms and data validation packages for wells sampled by Resolution Consultants are included in Appendix A and B, respectively.

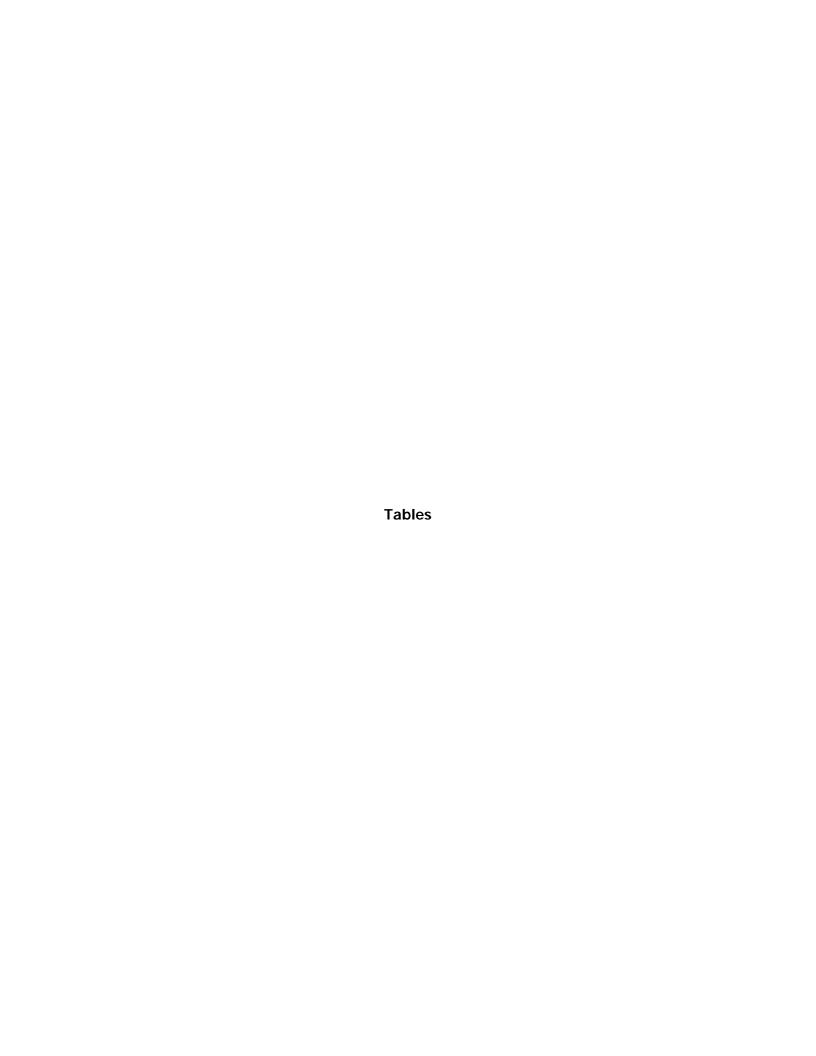
Analytical results for wells sampled by ARCADIS are summarized in Tables 4 and 5. Data validation packages for wells sampled by ARCADIS are included in Appendix C. Additional documentation of ARCADIS' sampling activities can be found in their report, Results of Second Quarter 2015 Groundwater Monitoring.

### 4.0 REFERENCES

ARCADIS, 2015. Results of Second Quarter 2015 Groundwater Monitoring. August.

Resolution Consultants, 2013. UFP SAP Addendum, *Groundwater Sampling Using Low Stress (Low Flow) Purging and Sampling* Protocol. November.

Resolution Consultants, 2015. *March 2015 Groundwater Sampling Data Summary Report, Bethpage, NY.* June.



June 2015 Groundwater Sampling Report Naval Weapons Industrial Reserve Plant, Bethpage, NY

# Table 1. Monitoring Well Construction Summary

Well	Total Depth (ft bgs)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Mid-screen (ft bgs)	Sump Length (ft)	VPB affiliation	Sampled by
RE103D1	645	625	640	630	5	VPB137	Resolution
RE103D2	673	653	673	663	0	VPB137	Resolution
RE103D3	735	715	730	720	5	VPB137	Resolution
RE104D1	375	350	370	360	5	VPB138	Resolution
RE104D2	735	710	730	720	5	VPB138	Resolution
RE104D3	785	760	780	770	5	VPB138	Resolution
RE105D1	555	530	550	540	5	VPB139	Resolution
RE105D2	755	730	750	740	5	VPB139	Resolution
RE108D1	555	530	550	540	5	VPB142	Resolution
RE108D2	655	630	650	640	5	VPB142	Resolution
RE118D1	795	765	790	777.5	5	VPB152	Resolution
TT101D	350	325	345	335	5	VPB129	Resolution
TT101D1	595	570	590	580	5	VPB129	Resolution
TT101D2	765	740	760	750	5	VPB129	Resolution
BPOW5-1	515	480	510	495	5	VPB132	ARCADIS
BPOW5-2	585	540	580	560	5	VPB132	ARCADIS
BPOW5-3	665	620	660	640	5	VPB132	ARCADIS
BPOW5-5	545	515	540	527.5	5	VPB152	Resolution
BPOW5-6	615	585	610	597.5	5	VPB152	Resolution
BPOW6-1	580	550	575	562.5	5	VPB145	ARCADIS
BPOW6-2	785	755	780	767.5	5	VPB145	ARCADIS
BPOW6-3	780	750	775	762.5	5	VPB146	ARCADIS
BPOW6-4	575	545	570	557.5	5	VPB146	ARCADIS
BPOW6-5	555	525	550	537.5	5	VPB147	Resolution
BPOW6-6	800	770	795	782.5	5	VPB147	Resolution

Location Sample Date	NYSDEC Groundwater	TT101D 6/22/2015	TT101D1 6/22/2015	TT101D2 6/22/2015	TT101D2 6/22/2015
Sample ID	Guidance or Standard Value	TT101D-GW- 062215	TT101D1-GW- 062215	TT101D2-GW- 062215	DUPLICATE-GW- 062215
Sample type code	(Note 1)	N	N	N	FD
VOC 8260C (ug/L)					
1,1,1-TRICHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	0.44 J
1,1,2,2-TETRACHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5	16	16	24	22
1,1,2-TRICHLOROETHANE	1	< 0.50 U	0.54 J	0.57 J	0.60 J
1,1-DICHLOROETHANE	5	0.77 J	0.86 J	0.79 J	0.85 J
1,1-DICHLOROETHENE	5	3.2	4.8	4.8	4.6
1,2,4-TRICHLOROBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DIBROMO-3-CHLOROPROPANE	0.04	< 0.75 U	< 0.75 U	< 0.75 U	< 0.75 U
1,2-DIBROMOETHANE	NL	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DICHLOROBENZENE	3	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DICHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DICHLOROETHENE, TOTAL	5	2.8	1.8 J	2.0	2.2
1,2-DICHLOROPROPANE	1	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,3-DICHLOROBENZENE	3	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,4-DICHLOROBENZENE	3	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,4-DIOXANE (Method 8270D_SIM)	NL	8.6	8.7	2.3	2.4
2-BUTANONE	50	< 2.5 U	< 2.5 U	< 2.5 U	< 2.5 U
2-HEXANONE	50	< 2.5 UJ	< 2.5 UJ	< 2.5 UJ	< 2.5 UJ
4-METHYL-2-PENTANONE	NL	< 2.5 UJ	< 2.5 UJ	< 2.5 UJ	< 2.5 UJ
ACETONE	50	3.1 J	< 2.5 UJ	2.3 J	< 2.5 UJ
BENZENE	1	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
BROMODICHLOROMETHANE	50	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
BROMOFORM	50	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
BROMOMETHANE	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
CARBON DISULFIDE	60	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
CARBON TETRACHLORIDE	5	< 0.50 U	2.2	1.4	1.3
CHLOROBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
CHLOROETHANE	5	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ
CHLOROFORM	7	0.45 J	0.95 J	0.85 J	0.82 J
CHLOROMETHANE	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
CIS-1,2-DICHLOROETHENE	5	2.8	1.8	2.0	2.2
CIS-1,3-DICHLOROPROPENE	0.4	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
CYCLOHEXANE	NL	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
DIBROMOCHLOROMETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
DICHLORODIFLUOROMETHANE	5	2.1	1.8 J	< 1.0 U	< 1.0 U
ETHYLBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
ISOPROPYLBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
M- AND P-XYLENE	NL	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
METHYL ACETATE	NL	< 0.75 U	< 0.75 U	< 0.75 U	< 0.75 U
METHYL CYCLOHEXANE	NL	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
METHYL TERT-BUTYL ETHER	10	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
METHYLENE CHLORIDE	5	< 2.5 U	< 2.5 U	< 2.5 U	< 2.5 U
O-XYLENE	NL	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
STYRENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
TETRACHLOROETHENE	5	< 0.50 U	< 0.50 U	0.82 J	0.86 J
TOLUENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
TRANS-1,2-DICHLOROETHENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
TRANS-1,3-DICHLOROPROPENE	0.4	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
TRICHLOROETHENE	5	66	180	620	620
TRICHLOROFLUOROMETHANE	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
VINYL CHLORIDE	2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
XYLENES, TOTAL	5	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U

Location Sample Date Sample ID	NYSDEC Groundwater Guidance or	RE103D1 6/22/2015 RE103D1-GW-	RE103D2 6/22/2015 RE103D2-GW-	RE103D3 6/22/2015 RE103D3-GW-	RE104D1 6/23/2015 RE104D1-GW-
·	Standard Value (Note 1)	062215	062215	062215	062315
Sample type code		N	N	N	N
VOC 8260C (ug/L)	_				
1,1,1-TRICHLOROETHANE	5	0.38 J	< 0.50 U	< 0.50 U	0.22 J
1,1,2,2-TETRACHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5	11 J	4.3	2.0	3.7
1,1,2-TRICHLOROETHANE	1	0.51 J	0.57 J	< 0.50 U	< 0.50 U
1,1-DICHLOROETHANE	5	0.64 J	< 0.50 U	< 0.50 U	< 0.50 U
1,1-DICHLOROETHENE	5	4.2	0.81 J	0.47 J	0.66 J
1,2,4-TRICHLOROBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DIBROMO-3-CHLOROPROPANE	0.04	< 0.75 U	< 0.75 U	< 0.75 U	< 0.75 U
1,2-DIBROMOETHANE	NL	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DICHLOROBENZENE	3	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DICHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DICHLOROETHENE, TOTAL	5	3.0	1.4 J	0.89 J	1.0 J
1,2-DICHLOROPROPANE	1	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,3-DICHLOROBENZENE	3	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,4-DICHLOROBENZENE	3	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,4-DIOXANE (Method 8270D_SIM)	NL	16	1.9	0.86	8.7
2-BUTANONE	50	< 2.5 U	< 2.5 U	< 2.5 U	< 2.5 U
2-HEXANONE	50	< 2.5 UJ	< 2.5 UJ	< 2.5 UJ	< 2.5 U
4-METHYL-2-PENTANONE	NL	< 2.5 UJ	< 2.5 UJ	< 2.5 UJ	< 2.5 U
ACETONE	50	3.3 J	7.3 J	< 2.5 UJ	< 2.5 U
BENZENE	1	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
BROMODICHLOROMETHANE	50	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
BROMOFORM	50	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
BROMOMETHANE	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
CARBON DISULFIDE	60	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
CARBON TETRACHLORIDE	5	< 0.50 U	0.25 J	< 0.50 U	< 0.50 U
CHLOROBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
CHLOROETHANE	5	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ
CHLOROFORM	7	0.49 J	0.94 J	0.69 J	< 0.50 U
CHLOROMETHANE	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
CIS-1,2-DICHLOROETHENE	5	3.0	1.4	0.89 J	1.0
CIS-1,3-DICHLOROPROPENE	0.4	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
CYCLOHEXANE	NL	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
DIBROMOCHLOROMETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
DICHLORODIFLUOROMETHANE	5	0.26 J	< 1.0 U	< 1.0 U	0.38 J
ETHYLBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
ISOPROPYLBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
M- AND P-XYLENE	NL	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
METHYL ACETATE	NL	< 0.75 U	< 0.75 U	< 0.75 U	< 0.75 U
METHYL CYCLOHEXANE	NL	< 0.50 UJ	< 0.50 U	< 0.50 U	< 0.50 U
METHYL TERT-BUTYL ETHER	10	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
METHYLENE CHLORIDE	5	< 2.5 U	< 2.5 U	< 2.5 U	< 2.5 U
O-XYLENE	NL	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
STYRENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
TETRACHLOROETHENE	5	4.0	0.88 J	< 0.50 U	2.1
TOLUENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
TRANS-1,2-DICHLOROETHENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
TRANS-1,3-DICHLOROPROPENE	0.4	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
TRICHLOROETHENE	5	810	770	420	100
TRICHLOROFLUOROMETHANE	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
VINYL CHLORIDE	2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
XYLENES, TOTAL	5	< 1.5 UJ	< 1.5 U	< 1.5 U	< 1.5 U
		1.0 00	` 1.00	` 1.0 0	` 1.0 0

Location Sample Date Sample ID	NYSDEC Groundwater Guidance or Standard Value (Note 1)	RE104D2 6/23/2015 RE104D2-GW- 062315	RE104D3 6/23/2015 RE104D3-GW- 062315	RE105D1 6/23/2015 RE105D1-GW- 062315	RE105D2 6/23/2015 RE105D2-GW- 062315
Sample type code	· · ·	N	N	N	N
VOC 8260C (ug/L)					
1,1,1-TRICHLOROETHANE	5	< 0.50 U	< 0.50 U	0.35 J	0.53 J
1,1,2,2-TETRACHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5	< 0.50 U	< 0.50 U	8.4	25
1,1,2-TRICHLOROETHANE	1	< 0.50 U	< 0.50 U	< 0.50 U	1.1
1,1-DICHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	1.3
1,1-DICHLOROETHENE	5	< 0.50 U	< 0.50 U	1.1	6.0
1,2,4-TRICHLOROBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DIBROMO-3-CHLOROPROPANE	0.04	< 0.75 U	< 0.75 U	< 0.75 U	< 0.75 U
1,2-DIBROMOETHANE	NL	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DICHLOROBENZENE	3	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DICHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DICHLOROETHENE, TOTAL	5	1.4 J	< 1.0 U	1.7 J	3.4
1,2-DICHLOROPROPANE	1	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,3-DICHLOROBENZENE	3	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,4-DICHLOROBENZENE	3	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,4-DIOXANE (Method 8270D_SIM)	NL	0.15 J	< 0.17 U	11	6.1
2-BUTANONE	50	< 2.5 U	< 2.5 U	< 2.5 U	< 2.5 U
2-HEXANONE	50	< 2.5 U	< 2.5 U	< 2.5 U	< 2.5 UJ
4-METHYL-2-PENTANONE	NL	< 2.5 U	< 2.5 U	< 2.5 U	< 2.5 UJ
ACETONE	50	< 2.5 U	< 2.5 U	3.2 J	4.2 J
BENZENE	1	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
BROMODICHLOROMETHANE	50	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
BROMOFORM	50	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
BROMOMETHANE	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
CARBON DISULFIDE	60	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
CARBON TETRACHLORIDE	5	< 0.50 U	< 0.50 U	< 0.50 U	2.7
CHLOROBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
CHLOROETHANE	5	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ
CHLOROFORM	7	< 0.50 U	< 0.50 U	< 0.50 U	2.1
CHLOROMETHANE	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
CIS-1,2-DICHLOROETHENE	5	1.4	< 0.50 U	1.7	3.4
CIS-1,3-DICHLOROPROPENE	0.4	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
CYCLOHEXANE	NL	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
DIBROMOCHLOROMETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
DICHLORODIFLUOROMETHANE	5	< 1.0 U	< 1.0 U	0.63 J	0.40 J
ETHYLBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
ISOPROPYLBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
M- AND P-XYLENE	NL	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
METHYL ACETATE	NL NL	< 0.75 U	< 0.75 U	< 0.75 U	< 0.75 U
METHYL CYCLOHEXANE	NL	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
METHYL TERT-BUTYL ETHER	10	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
METHYLENE CHLORIDE	5	< 2.5 U	< 2.5 U	< 2.5 U	< 2.5 U
O-XYLENE	NL NL	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
STYRENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
TETRACHLOROETHENE	5	< 0.50 U	< 0.50 U	< 0.50 U	1.6
TOLUENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
TRANS-1,2-DICHLOROETHENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
TRANS-1,3-DICHLOROPROPENE	0.4	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
TRANS-1,3-DICHLOROPROPENE TRICHLOROETHENE	5	4.3	< 0.50 U	120	1400
	5				
TRICHLOROFLUOROMETHANE	-	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
VINYL CHLORIDE	2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
XYLENES, TOTAL	5	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U

Location	NYSDEC	RE108D1	RE108D2	RE118D1	BPOW5-5
Sample Date	Groundwater	6/24/2015	6/24/2015	6/24/2015	6/24/2015
Sample ID	Guidance or Standard Value (Note 1)	RE108D1-GW- 062415	RE108D2-GW- 062415	RE118D1-GW- 062415	BPOW5-5-GW- 062415
Sample type code	,	N	N	N	N
VOC 8260C (ug/L)					
1,1,1-TRICHLOROETHANE	5	< 0.50 U	0.98 J	< 0.50 U	< 0.50 U
1,1,2,2-TETRACHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5	1.0	6.8	< 0.50 U	< 0.50 U
1,1,2-TRICHLOROETHANE	1	< 0.50 U	1.8	< 0.50 U	< 0.50 U
1,1-DICHLOROETHANE	5	< 0.50 U	4.6	< 0.50 U	< 0.50 U
1,1-DICHLOROETHENE	5	< 0.50 U	6.6	< 0.50 U	< 0.50 U
1,2,4-TRICHLOROBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DIBROMO-3-CHLOROPROPANE	0.04	< 0.75 U	< 0.75 U	< 0.75 U	< 0.75 U
1,2-DIBROMOETHANE	NL	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DICHLOROBENZENE	3	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DICHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DICHLOROETHENE, TOTAL	5	0.34 J	8.1	< 1.0 U	< 1.0 U
1,2-DICHLOROPROPANE	1	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,3-DICHLOROBENZENE	3	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,4-DICHLOROBENZENE	3	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,4-DIOXANE (Method 8270D_SIM)	NL	5.2	6.1	< 0.18 U	< 0.18 U
2-BUTANONE	50	< 2.5 U	< 2.5 U	< 2.5 U	< 2.5 U
2-HEXANONE	50	< 2.5 U	< 2.5 U	< 2.5 U	< 2.5 U
4-METHYL-2-PENTANONE	NL	< 2.5 U	< 2.5 U	< 2.5 U	< 2.5 U
ACETONE	50	< 2.5 U	< 2.5 U	2.7 J	8.0
BENZENE	1	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
BROMODICHLOROMETHANE	50	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
BROMOFORM	50	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
BROMOMETHANE	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
CARBON DISULFIDE	60	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
CARBON TETRACHLORIDE	5	< 0.50 U	1.5	< 0.50 U	< 0.50 U
CHLOROBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
CHLOROETHANE	5	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ
CHLOROFORM	7	< 0.50 U	3.5	< 0.50 U	< 0.50 U
CHLOROMETHANE	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
CIS-1,2-DICHLOROETHENE	5	0.34 J	8.1	< 0.50 U	< 0.50 U
CIS-1.3-DICHLOROPROPENE	0.4	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
CYCLOHEXANE	NL	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
DIBROMOCHLOROMETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
DICHLORODIFLUOROMETHANE	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
ETHYLBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
ISOPROPYLBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
M- AND P-XYLENE	NL NL	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
METHYL ACETATE	NL NL	< 0.75 U	< 0.75 U	< 0.75 U	< 0.75 U
METHYL CYCLOHEXANE	NL NL	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
METHYL TERT-BUTYL ETHER	10	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
METHYLENE CHLORIDE	5	< 2.5 U	< 2.5 U	< 2.5 U	< 2.5 U
O-XYLENE	NL	< 2.5 U	< 2.5 U	< 2.5 U	< 2.5 U
STYRENE	NL 5	< 0.50 U	< 0.50 U		
TETRACHLOROETHENE	5			< 0.50 U < 0.50 U	< 0.50 U < 0.50 U
	+	1.4	2.2		
TOLUENE TRANS 1.2 DICHI ODOETHENE	5	< 0.50 U	< 0.50 U	0.38 J	< 0.50 U
TRANS-1,2-DICHLOROETHENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
TRANS-1,3-DICHLOROPROPENE	0.4	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
TRICHLOROETHENE	5	110	3900	< 0.50 U	< 0.50 U
TRICHLOROFLUOROMETHANE	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
VINYL CHLORIDE	2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
XYLENES, TOTAL	5	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U

Location Sample Date	NYSDEC Groundwater	BPOW5-6 6/24/2015	BPOW6-5 6/25/2015	BPOW6-6 6/25/2015
Sample ID	Guidance or Standard Value (Note 1)	BPOW5-6-GW- 062415	BPOW6-5-GW- 062515	BPOW6-6-GW- 062515
Sample type code	,	N	N	N
VOC 8260C (ug/L)				
1,1,1-TRICHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U
1,1,2,2-TETRACHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U
1,1,2-TRICHLOROETHANE	1	< 0.50 U	< 0.50 U	< 0.50 U
1,1-DICHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U
1,1-DICHLOROETHENE	5	< 0.50 U	< 0.50 U	< 0.50 U
1,2,4-TRICHLOROBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DIBROMO-3-CHLOROPROPANE	0.04	< 0.75 U	< 0.75 U	< 0.75 U
1,2-DIBROMOETHANE	NL	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DICHLOROBENZENE	3	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DICHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DICHLOROETHENE, TOTAL	5	< 1.0 U	< 1.0 U	< 1.0 U
1,2-DICHLOROPROPANE	1	< 0.50 U	< 0.50 U	< 0.50 U
1,3-DICHLOROBENZENE	3	< 0.50 U	< 0.50 U	< 0.50 U
1,4-DICHLOROBENZENE	3	< 0.50 U	< 0.50 U	< 0.50 U
1,4-DIOXANE (Method 8270D_SIM)	NL	< 0.17 U	< 0.17 U	< 0.17 U
2-BUTANONE	50	12	< 2.5 U	< 2.5 U
2-HEXANONE	50	< 2.5 U	< 2.5 U	< 2.5 U
4-METHYL-2-PENTANONE	NL	< 2.5 U	< 2.5 U	< 2.5 U
ACETONE	50	< 2.5 U	< 2.5 U	< 2.5 U
BENZENE	1	< 0.50 U	< 0.50 U	< 0.50 U
BROMODICHLOROMETHANE	50	< 0.50 U	< 0.50 U	< 0.50 U
BROMOFORM	50	< 0.50 U	< 0.50 U	< 0.50 U
BROMOMETHANE	5	< 1.0 U	< 1.0 U	< 1.0 U
CARBON DISULFIDE	60	< 0.50 U	< 0.50 U	< 0.50 U
CARBON TETRACHLORIDE	5	< 0.50 U	< 0.50 U	< 0.50 U
CHLOROBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U
CHLOROETHANE	5	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ
CHLOROFORM	7	< 0.50 U	< 0.50 U	< 0.50 U
CHLOROMETHANE	5	< 1.0 U	< 1.0 U	< 1.0 U
CIS-1,2-DICHLOROETHENE	5	< 0.50 U	< 0.50 U	< 0.50 U
CIS-1.3-DICHLOROPROPENE	0.4	< 0.50 U	< 0.50 U	< 0.50 U
CYCLOHEXANE	NL	< 0.50 U	< 0.50 U	< 0.50 U
DIBROMOCHLOROMETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U
DICHLORODIFLUOROMETHANE	5	< 1.0 U	< 1.0 U	< 1.0 U
ETHYLBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U
ISOPROPYLBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U
M- AND P-XYLENE	NL NL	< 1.0 U	< 1.0 U	< 1.0 U
METHYL ACETATE	NL NL	< 0.75 U	< 0.75 U	< 0.75 U
METHYL CYCLOHEXANE	NL NL	< 0.75 U	< 0.75 U	< 0.75 U
METHYL TERT-BUTYL ETHER	10	< 0.50 U	< 0.50 U	< 0.50 U
METHYLENE CHLORIDE	5	< 2.5 U	< 0.50 U	< 2.5 U
O-XYLENE	NL	< 2.5 U	< 2.5 U	< 2.5 U
	NL 5	<b>†</b>		
STYRENE TETRACHI OPOETHENE	5	< 0.50 U	< 0.50 U	< 0.50 U
TOLLIENE		< 0.50 U	< 0.50 U	< 0.50 U
TOLUENE TRANS 1.2 DICHI ODOETHENE	5	0.74 J	0.76 J	1.0
TRANS-1,2-DICHLOROETHENE	5	< 0.50 U	< 0.50 U	< 0.50 U
TRANS-1,3-DICHLOROPROPENE	0.4	< 0.50 U	< 0.50 U	< 0.50 U
TRICHLOROETHENE	5	0.45 J	< 0.50 U	< 0.50 U
TRICHLOROFLUOROMETHANE	5	< 1.0 U	< 1.0 U	< 1.0 U
VINYL CHLORIDE	2	< 1.0 U	< 1.0 U	< 1.0 U
XYLENES, TOTAL	5	< 1.5 U	< 1.5 U	< 1.5 U

### Notes:

1 New York State Department of Environmental Conservation Division of Water Technical and Operation Guidance series (6 NYCRR 700-706, Part 703.5 summarized in TOGS 1.1.1)

Ambient water quality standards and groundwater effluent limitations, class GA; NL = Not Listed

**Bold =** Detected; **Bold and Italics**=Not detected exceeds NYS Groundwater Standards or guidance value Yellow highlighted values exceed Groundwater Standards or guidance value

Sample type codes: N - normal environmental sample, FD - field duplicate

U = Nondetected result. The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

M = the matrix spike or matrix spike duplicate did not meet recovery or precision requirements.

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# Table 3. Stabilized Field Parameters for wells sampled by Resolution Consultants

Well	Date	Temperature (°C)	рН	Specific Conductance (μS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to water (ft bgs)	Flow rate (ml/min)
TT101D	6/22/2015	15.43	4.22	0.098	0.14	351	1.01	32.18	850
TT101D1	6/22/2015	15.29	4.52	108	0.85	382.4	0.69	34.05	1000
TT101D2	6/22/2015	15.41	4.24	0.051	7.04	442.8	1.39	34.61	1000
RE103D1	6/22/2015	17.05	5.07	0.122	3.16	350.1	0.20	38.73	450
RE103D2	6/22/2015	18.47	NA**	0.037	6.11	1173.8	0.28	38.52	400
RE103D3	6/22/2015	16.32	3.82	0.038	5.41	456.9	0.77	38.82	350
RE104D1	6/23/2015	16.70	4.05	0.095	5.55	445.7	0.36	35.15	600
RE104D2	6/23/2015	15.25	NA**	0.026	6.95	506.8	6.10	40.60	700
RE104D3	6/23/2015	16.47	4.46	0.028	4.62	380.9	16.2	40.98	500
RE105D1	6/23/2015	16.08	4.84	0.139	2.17	328.3	3.61	37.02	575
RE105D2	6/23/2015	16.95	4.56	0.080	6.52	411.8	0.78	38.20	500
RE108D1	6/24/2015	16.39	7.71	0.109	6.86	403	3.99	39.20	700
RE108D2	6/24/2015	16.25	4.70	0.089	3.80	380.2	0.94	39.80	700
BPOW5-5	6/24/2015	16.00	4.14	0.319	2.49	218.6	3.94	27.30	775
BPOW5-6	6/24/2015	20.92	5.09	0.115	1.39	220.2	37.6	28.00	200
RE118D1	6/24/2015	15.61	7.90	0.036	1.63	378.7	10.1	27.53	600
BPOW6-5	6/25/2015	20.80	4.81	0.054	0.58	221.1	1.57	18.00	200
BPOW6-6	6/25/2015	16.46	4.10	0.028	0.61	330.7	31.6	18.51	700

<sup>\*</sup> Initial water level not equilibrated due to pump installation; drawdown during sampling not determined.

NA\*\* pH sensor not functioning



Concentrations of Volatile Organic Compounds in Monitoring Wells BPOW 5-1, BPOW 5-2 and BPOW 5-3, Table 4. Second Quarter 2015, Operable Unit 2 (Groundwater), Bethpage, New York.

CONSTITUENT (Units in µg/L)	Well: Sample ID: Date:	BPOW 5-1 BPOW 5-1 6/18/2015	BPOW 5-2 BPOW 5-2 6/19/2015	BPOW 5-3 BPOW 5-3 6/25/2015	
1,1,1-Trichloroethane		< 0.50	< 0.50	< 0.50	
1,1,2,2-Tetrachloroethane		< 0.50	< 0.50	< 0.50	
1,1,2-trichloro-1,2,2-trifluroethane		< 1.0	< 1.0	< 1.0	
1,1,2-Trichloroethane		< 0.50	< 0.50	< 0.50	
1,1-Dichloroethane		< 0.50	< 0.50	< 0.50	
1,1-Dichloroethene		< 0.50	< 0.50	< 0.50	
1,2-Dichloroethane		< 0.50	< 0.50	< 0.50	
1,2-Dichloropropane		< 0.50	< 0.50	< 0.50	
2-Butanone (MEK)		< 5.0	1.1 J	< 5.0	
2-Hexanone		< 2.0	< 2.0	< 2.0	
4-methyl-2-pentanone (MIK)		< 2.0	< 2.0	< 2.0	
Acetone		< 5.0 B	< 5.0 B	< 5.0	
Benzene		< 0.50	< 0.50	< 0.50	
Bromodichloromethane		< 0.50	< 0.50	< 0.50	
Bromoform		< 0.50	< 0.50	< 0.50	
Bromomethane		< 0.50	< 0.50	< 0.50	
Carbon Disulfide		< 0.50	< 0.50	< 0.50	
Carbon tetrachloride		< 0.50	< 0.50	< 0.50	
Chlorobenzene		< 0.50	< 0.50	< 0.50	
Chloroethane		< 0.50	< 0.50	< 0.50	
Chloroform		< 0.50	< 0.50	< 0.50	
Chloromethane		< 0.50	0.25 J	< 0.50	
cis-1,2-dichloroethene		< 0.50	< 0.50	< 0.50	
cis-1,3-dichloropropene		< 0.50	< 0.50	< 0.50	
Dibromochloromethane		< 0.50	< 0.50	< 0.50	
Ethylbenzene		< 0.50	< 0.50	< 0.50	
Methylene Chloride		< 0.50	< 0.50	< 0.50	
Styrene		< 0.50	< 0.50	< 0.50	
Tetrachloroethene		< 0.50	< 0.50	< 0.50	
Toluene		< 0.50	< 0.50	< 0.50	
trans-1,2-dichloroethene		< 0.50	< 0.50	< 0.50	
trans-1,3-dichloropropene		< 0.50	< 0.50	< 0.50	
Trichloroethylene		< 0.50	< 0.50	< 0.50	
Vinyl Chloride		< 0.50	< 0.50	< 0.50	
Xylene-o		< 0.50	< 0.50	< 0.50	
Xylenes - m,p		< 0.50	< 0.50	< 0.50	
Total VOCs		0	1.4	0	

### **Notes and Abbreviations:**

Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2014). Samples analyzed for the TCL VOCs using USEPA Method 524.2. Total VOCs are rounded to two significant figures.

Bold value indicates a detection TCL Target Compound List VOC Volatile Organic Compound

United States Environmental Protection Agency **USEPA** 

μg/L Micrograms per liter

Constituent value is estimated

В Compound detected in associated blank sample



Table 5. Concentrations of Volatile Organic Compounds in Monitoring Wells BPOW 6-1, BPOW 6-2, BPOW 6-3 and BPOW 6-4, Second Quarter 2015, Operable Unit 2 (Groundwater), Bethpage, New York.

CONSTITUENT (Units in µg/L)	Well: Sample ID: Date:	BPOW 6-1 BPOW 6-1 6/22/2015	BPOW 6-2 BPOW 6-2 6/23/2015	BPOW 6-2 BPOW 6-R <sup>(1)</sup> 6/23/2015	BPOW 6-3 BPOW 6-3 6/24/2015	BPOW 6-4 BPOW 6-4 6/24/2015
1,1,1-Trichloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1,2,2-Tetrachloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1,2-trichloro-1,2,2-trifluroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1-Dichloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1-Dichloroethene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichloropropane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Butanone (MEK)		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2-Hexanone		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
4-methyl-2-pentanone (MIK)		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Acetone		< 9.3 B	< 5.0 B	< 5.0 B	< 5.0 B	< 5.0
Benzene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromoform		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromomethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbon Disulfide		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbon tetrachloride		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chlorobenzene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chloroform		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chloromethane		0.51	< 0.50	< 0.50	< 0.50	< 0.50
cis-1,2-dichloroethene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
cis-1,3-dichloropropene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibromochloromethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Ethylbenzene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Methylene Chloride		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Styrene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Tetrachloroethene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Toluene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
trans-1,2-dichloroethene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
trans-1,3-dichloropropene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Trichloroethylene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Vinyl Chloride		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Xylene-o		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Xylenes - m,p		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total VOCs		0.51	0	0	0	0

# Notes and Abbreviations:

(1) BPOW 6-R is a blind duplicate sample.

Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2014)

Samples analyzed for the TCL VOCs using USEPA Method 524.2.

Total VOCs are rounded to two significant figures.

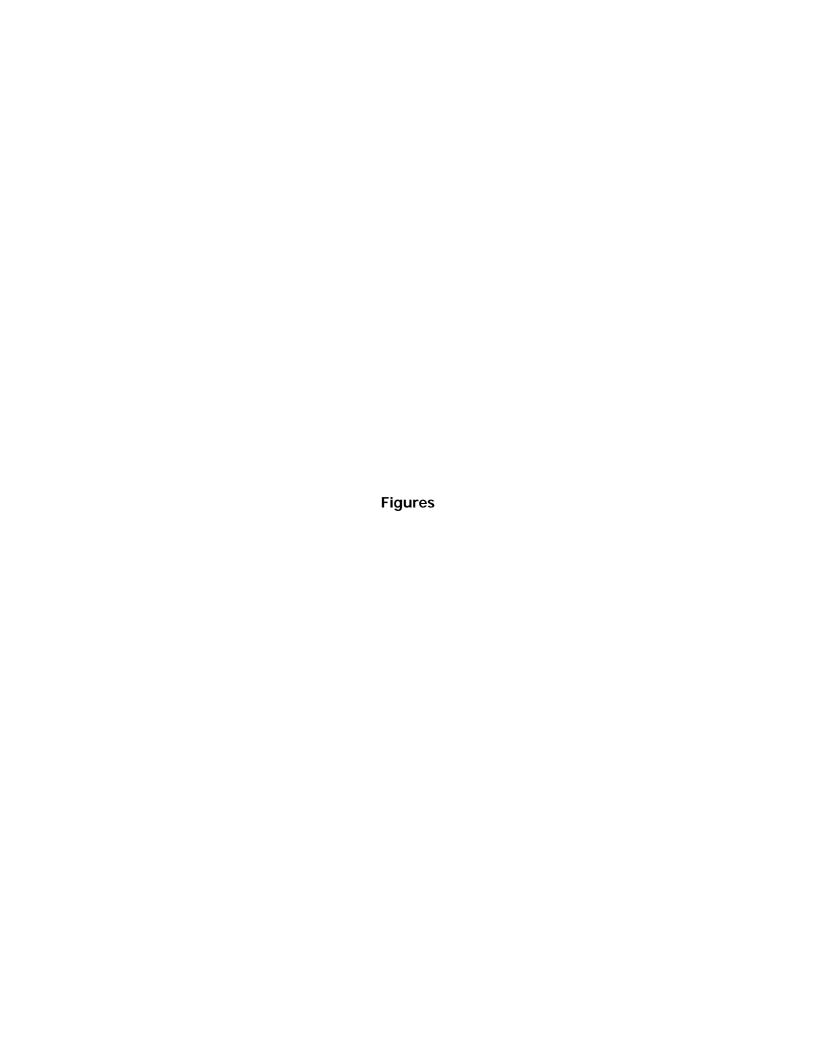
### **Bold value indicates a detection**

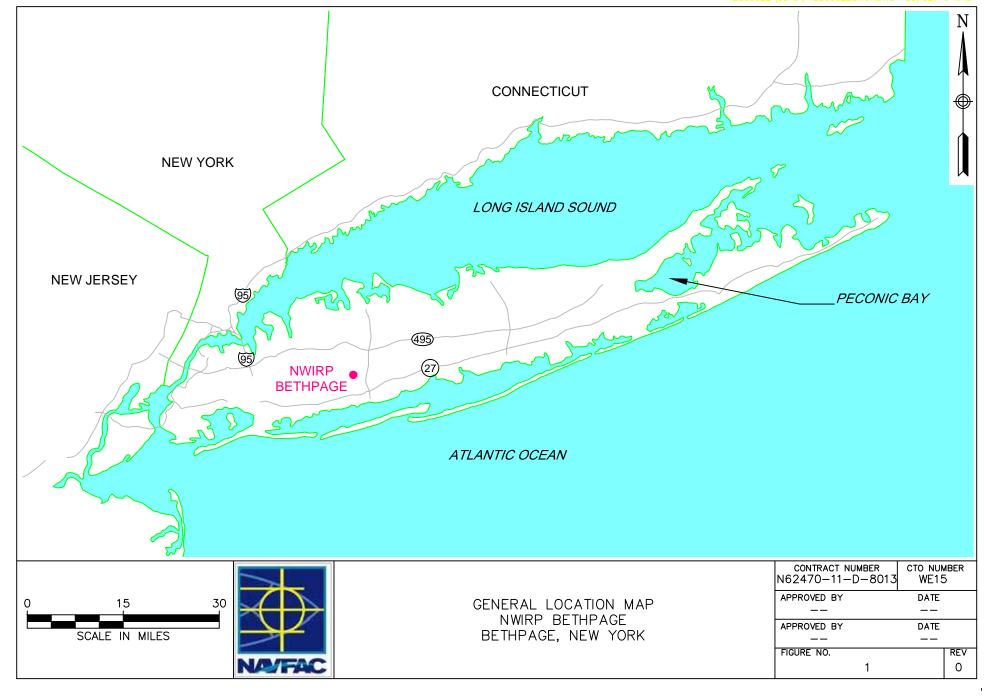
TCL Target Compound List VOC Volatile Organic Compound

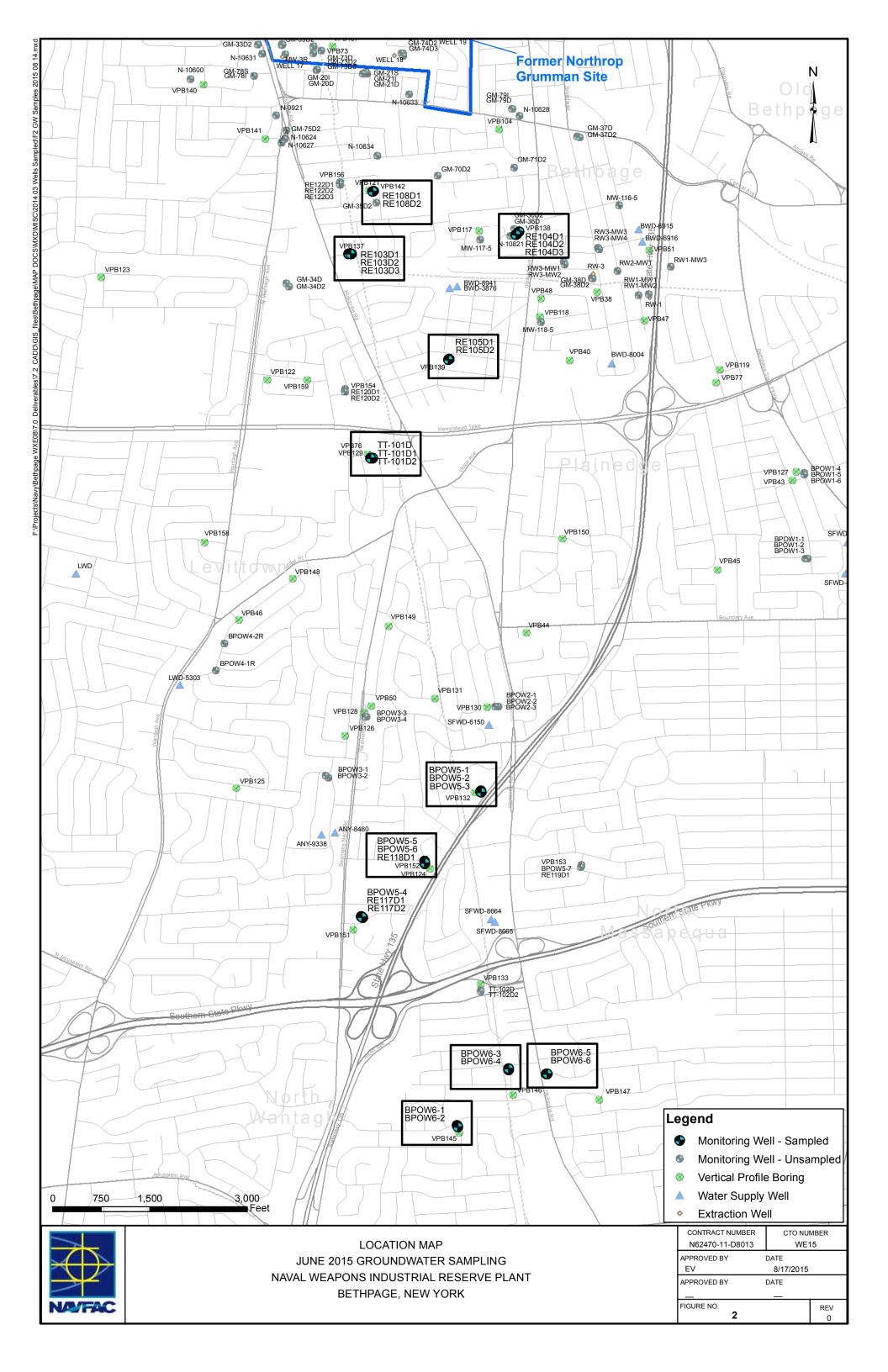
USEPA United States Environmental Protection Agency

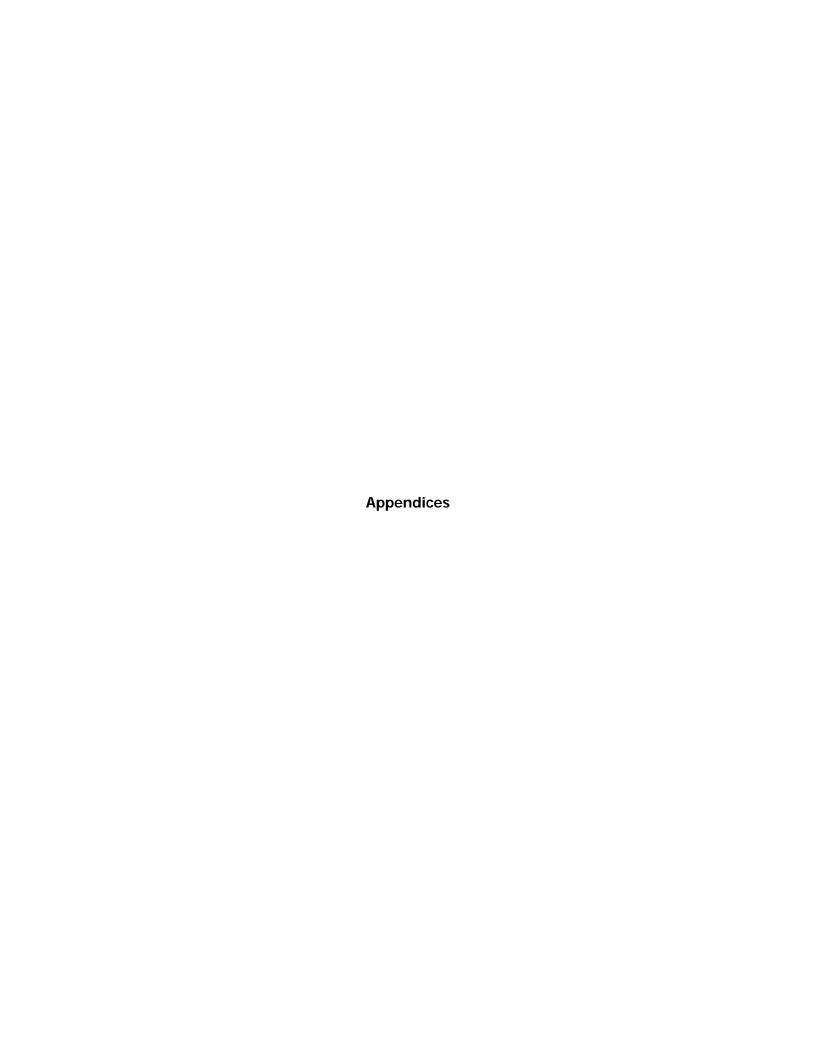
μg/L Micrograms per liter

Compound detected in associated blank sample









# Appendix A

**Groundwater Sampling Forms – Resolution Consultants** 

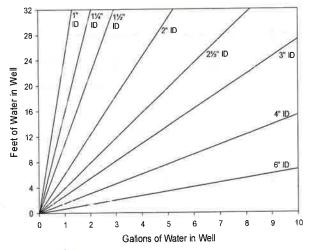


Vell ID:	17	101	D	
. עו ווסיי				

# **Low Flow Ground Water Sample Collection Record**

Client:		/IRP Beth				Date:	6/2	<sup>7</sup> /15	Time:		_am/pm
Project N		6026652								Finish_I060	@m/pm
Site Loca			ls north			-		460			
Weather	Conds:	800	- 04	ear - 6n	ervi	_ C	ollector(s)	50			
1. WATE	ER LEVEL	DATA: (	measure	d from Top	of Casing	g)					
	a. Total V	Vell Lengt	th: <u>350</u>	ft ft	c. Length	of Water C	olumn: 🗾	17.88 ft	Ca	asing Diameter	
	b. Water	Table De	pth: 37.1	<mark>ℓ_</mark> ft	d. Calcula	ated Syster	n Volume (	(see back)	13.1	gul pirg	
2. WELL	_ PURGE	DATA						ji.		30	
	a. Purge	Method:	Geotech	bladder pu	mp with dro	op tube ass	embly				
b. Acceptance Criteria defined (see workplan) - Temperature ± 3% - D.O. ± 10% (value - pH ± 0.1 unit - ORP ± 10mV - Sp. Cond. ± 3% - Drawdown < 0.3'						s >0.5 mg/	L)		y ± 10% e a minimu	ım 1 screen vo	lume
	c. Field T	esting Eq	uipment ι	ısed:	Make	6 mps	Model			Serial Numbe	r
			*		Hauny					67982	
	Volume	<b>T</b>									
Time (24hr)	Removed (liters)	Temp (°C)	pН	Sp. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate	Depth to	Calar / O	4
835	(inters)	15.40	4.67	0.101	5.84	407.9	(N10)	(ml/min)	water (ft)	Color / Oc	
840		15.66	4.15	0.097	0.26	383.7	0.50	650	32.17	11	non
850		15,50	4.19	0.017	0.15	367.4	-	650	32.20	c <sub>1</sub>	
900	5901	15.48	4.19	0.097	0.11	357.8	1.59	800	37.19	ny.	
910		15.48	4.20	0.097	0.15	8.0%	1.14	250	32.18	16	
977	10901	15.48	15.4	0.096	0-14	348.5	1.07	850+	32.19	ч	
930		15.43	4.20	0.098	0.14	352.7		850+	77.14	4	
d1	Has re Have <sub>l</sub>	equired vo	lume bee bidity bee s stabilize	fail n removed en reached ed		Yes	No	N/A	ts.	(continued on back)	
3. SAMP	LE COLL	ECTION:		Method:	Geotech b	ladder pum	p with dro	p tube asse	embly		
Sample II	D - GW_	062270	<b>115</b>		tainer type 0-mL vials	No. of 0	containers	<u>Preserv</u> HCI	<u>/ation</u> A	nalysis Req. VOCs	Time 940
Trioi	D-9W-	067220	115		1-L amber	2		none		1,4-Dioxane	990
Comment	ts		*							IX.	
			$\overline{}$								
Signature	5 <del>.</del>	(	/	2							

## Purge Volume Calculation



Volume /	Linear Ft	. of Pipe
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

1 screen volume

15 ft = 37.1 L / 9.8 G 20 ft = 49.6 L / 13.1 G 25 ft = 61.7 L / 16.3 G

	-	f -	
Well ID:		101	

Time (24 hr)	from front)  Volume  Removed  (Liters)	Temp (°C)	рН	Spec. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color/Odor
935	14991	15.43	4.22	0.048	0.14	351.0	1.01	8501	32.18	1,
940										Sumple
							-			
										4
										10
		8				-				

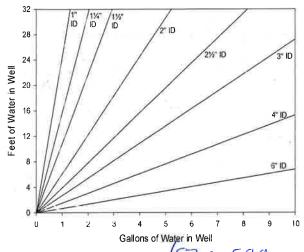


Well ID: TT 101 DI	
--------------------	--

# **Low Flow Ground Water Sample Collection Record**

Client: Project N Site Loca	No:	/IRP Beth	6			Date:	6/	z <del>2</del> /15		Start <u>(1840</u> Finish <u>1999</u>	am/pm am/pm
Weather		Wads		cleyr. U	1484	- Ce	ollector(s):	G. Hicks			
1 WAT	FR I FVFI	DATA: (i	-		of Casing						
		-		ft		of Water Co	olumn: 🏄	61.06 m	Ca	asing Diameter/N _4-inch PV	
	b. Water	Table Der	oth: <u>57</u>	<u>74</u> ft	d. Calcula	ated Systen	n Volume (	see back)	13.1		
2. WELI	L <b>PURGE</b> a. Purge		Geotech	bladder pu	mp with dro	op tube ass	embly				
	- Tempe - pH ± 0	rature ± 3	3%	ed (see wor - D.O. ± - ORP ± - Drawdov	10% (value 10mV	s >0.5 mg/l	_)	- Turbidit - Remove	•	um 1 screen volu	ıme
c. Field Testing Equipment used: Make						53	Model			Serial Number	_
	Volume			1 3	HANNA		H 98703			U54034X	
Time	Removed	Temp		Sp. Cond.	DO	ORP	Turbidity	Flow Rate	Depth to		
(24hr)	(liters)	(°C)	pН	(mS/em)	(mg/L)	(mV)	(NTU)	(ml/min)	water (ft)	Color / Odd	
0845	2	15.41	4.20	108	1.05	377.4	1.19	1000	33.99	clear u	one
PASO	11	15.35	4.20	108	0.79	349.4	3.45	800	34.02	181	
0855	14	15.34	4.23	108	0.75	352.0	2.46	800	34.03	~	
0000	18	15.35	4.27	(69	0.77	361.4	2.58	800	34.03	41	
1005	23	15:35	4.31	109	O. 88	372.4	7.02	800	34.04	u	
(CHC) SK	54	15.34	4.41	1 08	0.87	380.7	0.98	1000	34.05	11	
Jet 5095		[5.35	4,44	108	0.86	385.0	1.14	1000	34.00	d	
	d. Accep	tance crite				Yes	No	N/A		(continued on back)	
	Has re Have	-	bidity bee		111				a	5	
3. SAMI	PLE COLL	ECTION:		Method:	Geotech b	ladder pum	p with dro	p tube ass	embly	-	
Sample I			100		tainer type	<u>No. of c</u>	containers	<u>Preser</u>	vation A	nalysis Req.	<u>Time</u>
TT101D1 - Gw · 062215 40-mL via						3		HCI			0940
TTYOL	ol-GW.	(Cotal)			1-L amber	2		none		1,4-Dioxane	0946
Commer	nts								-		
Signature	9										

## Purge Volume Calculation



Volume /	Linear Ft	. of Pipe
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1,5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

1 screen volume

15 ft = 37.1 L / 9.8 G 20 ft = 49.6 L / 13.1 G 25 ft = 61.7 L / 16.3 G

SG= 18.9L

Well ID: TT 10101 (570-590 screen)

(continued f	rom front) Volume				25	2				
Time (24 hr)	Removed (Liters)	Temp (°C)	pН	Spec. Cond.	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color/Odor
1070	36		4.46	108	0.88	383.6	0-83	1000	34.04	Clear/none
1025	39	15.32	4.49	109	0.87	382,3	0:77	1000	34.05	V) = =
1030	41	15.32	952	108	0 86	383.0	0.66	1000	34.05	li –
Qd'35	46	15.39	4.52	108	<b>0.</b> 85	382.4	0.72	1600	34.05	<u>~1</u>
0940	51	15.29	4.52	108	0-	3 D.9	0.69	1000	34.05	L
									12	
										14
	-					-				
										4
	-									38
		- i								2
			6							
				-			74			
				ž.						

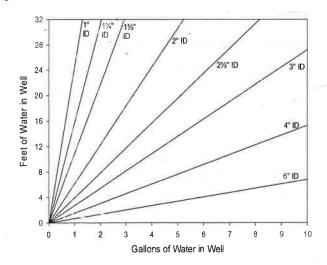


Well ID: 71-101-02

# **Low Flow Ground Water Sample Collection Record**

CONSUL	IANIS										
Client:		/IRP Beth				Date:	6/2	Z /15		Start 8/5	_am/pm
Project N		6026652				4			1	Finish 445	_am/pm
Site Loca Weather			ts unirth			- 0	ollector(s):	P	1 100	4	
vveatner	Conas	sun	ny 75°				ollector(s):	- 1 au	/ /(Mrcz	71	
1. WATE	ER LEVEL	DATA: (	measure	d from Top	of Casing	<b>a</b> )		C -			
	a. Total \	Well Lengt	th:_ <b>76</b> 0	ft	c. Length	of Water C	olumn: 72	2-22 ft	t Ca	sing Diameter/ 4-inch P	
	b. Water	Table De	pth: <i>34.43</i>	<u>5</u> ft	d. Calcula	ated Syster	n Volume (	see back)	13.19		
2. WELL	. PURGE	DATA									
	a. Purge	Method:	Geotech	bladder pu	mp with dro	op tube ass	sembly				
	b. Accep	tance Crit	eria defin	ed (see wo	rkplan)						
	•	rature ± 3	3%		10% (value	s >0.5 mg/	L)	- Turbidit			
	- pH ± 0	).1 unit nd. ± 3%		- ORP ± - Drawdo				- Remove	e a minimu	ım 1 screen vol	ume
	- Sp. Co	IIU. ± 370		- Drawdo	WII ~U.3						
	c. Field T	esting Eq	uipment ι	ısed:	Make		Model			Serial Number	٢
					157		98703			63982	
	Volume				Hanna		78103			6510	
Time	Removed	Temp		Sp. Cond.	DO	ORP	Turbidity	Flow Rate	Depth to		
(24hr)	(liters)	(°C)	pH	(mS/cm)	(mg/L)	(mV)	(NTU)	(ml/min)	water (ft)	Color / Oc	lor
820									34.45		
830								1,000		011	
£38		15.68	4.22	0.055	1.86	418.1	555		34.49		
840		15.51	4.25	0.053	2.87	415.7					
845		15.44	4.26	0.052	3.4/	409.1					
850		15.43	4.26	1.052	3,95	417.5	0.60	1000	34.58		
855	MAL	15.42	4.26	0.052	6.58	426.0					
		tance crit	eria pass/	fail		Yes	No	N/A		(continued on back)	
		-		n removed							
		equired tu paramete	•	en reached ed			$\vdash$	님			
		no or N/A						Ш			
			·						)9		- 1
3. SAMF	LE COLI	ECTION:	:	Method:	Geotech b	ladder pun	np with dro	p tube ass	embly		
Sample I	D			Cor	tainer type	No. of	containers	Preser	vation A	nalysis Req.	Time
TT10102-6W-062215 40-mL						3		HCI		VOCs	925
TT 101	02-9W.	06221	15		1-L amber	2		none		1,4-Dioxane	979
Commen	ts	Dupl	icata	6W.06	122/5	2 1030					
Signature	 e		land	Harat	H						

# Purge Volume Calculation



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1 screen volume

15 ft = 37.1 L / 9.8 G 20 ft = 49.6 L / 13.1 G 25 ft = 61.7 L / 16.3 G

Well ID: 77/0/ (continued from front)

TT10102 2 8130

(continued	Volume					1.5				
Time (24 hr)	Removed (Liters)	Temp (°C)	pН	Spec. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color/Odor
900	2426	15.41	4.25	0.052	6.86	430.7	3.54	1,000	34.58	
905	10201	15.42	4.2.2	1.052	6.96	438.2				
910		15.42	4.24	0.052	6.99	439.8	1.39	1,000	34.59	
915		15.41	4.22	0.052	7.01	442.1		*		
920		15:41	4.24	0.051	7.04	442.8			34.61	
725									5	sample
		Dus	liende	. et co	30					~
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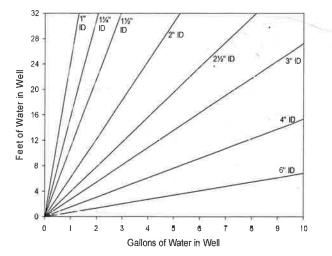


	0-1-0	(V)
Well ID:	KF 103 N	

# **Low Flow Ground Water Sample Collection Record**

			1								
Client: Project N	lo:	/IRP Beth 6026652	6	1.7		Date:	6/2	<b>~</b> /15		Start_1100 -inish_133C	_am/pm ⊇am/pm
Site Loca Weather		AVOC	unu 75	artin		Co	ollector(s);	Paul	Kareti	4	
1. WATE	R LEVEL	_ DATA: (	measure	d from Top	o of Casing	 g)				5:	
	a. Total \	Well Leng	th: <u>645</u>	ft	c. Length	of Water Co	olumn: _6	06.23 ft	Cas	sing Diameter/ 4-inch P\	
	b. Water	Table De	pth: <i>3<b>9</b>]</i>	<u>77</u> ft	d. Calcula	ated System	n Volume (	see back)	9.89	7 7	screer
2. WELL	<b>PURGE</b> a. Purge		Geotech	bladder pu	ımp with dre	op tube ass	embly	-			
	- Tempe - pH ± 0	rature ±	3%	ed (see wo - D.O. ± - ORP ± - Drawdo	10% (value 10mV	es >0.5 mg/l	-)	- Turbidit		m 1 screen vol	ume
	c. Field T	esting Eq	juipment i	used:	Make YST		Model ぶらそ			Serial Number	•
	Volume				Hanna		H1987	03		63982	6
Time (24hr)	Removed (liters)	Temp (°C)	pH	Sp. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color / Od	lor
11.60									38.77		
1/25								2	_	/x0	
1135	-		5.45	0.112	Z.54	310,7		450	38.75		
1140		17.01	5.40	0.113	1.36	304.4			_		
1145		17.05	5.38	0.112	1.13	30Z.4	0.30	4	38.77		
1150		16.91	531	1.115	1.78	307.4	- 1	456			
1155		17.04	5.14	0.118	2.65	3 23,5	0.26	NI/A	38.75		
,	Has re Has re Have		olume bee rbidity be rs stabiliz	en removed en reached ed		Yes	No	N/A		(continued on back)	
3. SAMF	PLE COLI	ECTION	:	Method:	Geotech b	oladder pum	p with dro	p tube ass	embly		
Sample I			· 2		ntainer type 40-mL vials		<u>containers</u>	Preser	vation A	nalysis Req.	<u>Time</u>
	7, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,									VOCs	1245
RE1	0301.6	10.065	2/3		1-L amber	r 2		none		1,4-Dioxane	1295
Commen	ts		s MSD								
Signature	<u> </u>		P	O Kree	45						

## Purge Volume Calculation



Linear F	t, of Pipe
Gallon	Liter
0.0025	0.0097
0.0057	0.0217
0.0102	0.0386
0.0229	0.0869
0.0408	0.1544
0.0637	0.2413
0.0918	0.3475
0.1632	0.6178
0.2550	0.9653
0.3672	1.3900
0.6528	2.4711
1.4688	5.5600
	Gallon 0.0025 0.0057 0.0102 0.0229 0.0408 0.0637 0.0918 0.1632 0.2550 0.3672 0.6528

1 screen volume

15 ft = 37.1 L / 9.8 G 20 ft = 49.6 L / 13.1 G 25 ft = 61.7 L / 16.3 G

Well ID: RE103DI @ 11125

(continued t	from front)									
	Volume									
Time	Removed	Temp	ρН	Spec. Cond.	DO	ORP	Turbidity		Depth to	Color/Odor
(24 hr)	(Liters)	(°C)	-	(mS/cm)	(mg/L)	(mV)	(NTU)	(ml/min)	water (ft)	
1200		17.09	5.08	0.120	2.77	333,1			-	
1205	5701	17,06	5.13	0120	2.89	33%/				
1210		17,00	5.06	0.120	2.95	344.0	0.16	450		
1215		16.98	5.05	0.120	2.97	346.2			38.77	
1220		16.94	5.07	0.121	3,01	347.5				
1225		1697	5.12	0.121	3.06	346.3	0.15			UF.
1230		17.04	5.08	0.121	3,13	349.2				2
1235		17.03	5.08	0.122	3.16	348.8			38.73	
1240	10 gal	17.05	5.07	0.122	3.16	350.1	0.20	450		
	T								4: *	
245										Sample
			Yes							.,,
			3							Sumple MS/MSD
										/
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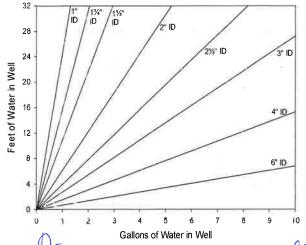


Well ID:	PE	(1/3/1/2)	
Well ID.	1	6)10	260

# **Low Flow Ground Water Sample Collection Record**

Client: Project N	lo:	/IRP Beth 60266526	3			Date:	6/	/15		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	m/pm m/pm
Site Loca Weather		Show.				Co	ollector(s):	6	thicks		
1. WATE	ER LEVEL	DATA: (ı	measure	d from Top	of Casing			New 1971 (C			
	a. Total V	Vell Lengt	h: 673	ft	c. Length	of Water Co	olumn: 🢪	34.48 ft	Cas	ing Diameter/M	
	b. Water	Table Dep	oth: <u>38.5</u>	2 <sub>ft</sub>	d. Calcula	ited System	n Volume (	see back)	13.1	4-inch PV0	<u>,                                    </u>
2. WELL	- PURGE										
	a. Purge	Method:	Geotech	bladder pu	mp with dro	op tube ass	embly				
b. Acceptance Criteria defined (see workplan)  - Temperature ± 3%  - D.O. ± 10% (values >0.5 mg/L)  - pH ± 0.1 unit  - ORP ± 10mV  - Remove a minimum 1 screen volun  - Sp. Cond. ± 3%  - Drawdown <0.3'									me		
	c. Field T	esting Eq	uipment u	ised:	Make		Model 556 m	PS	Serial Number		
					HANNA		H198-	703		NT 15326	22
Time	Volume Removed	Temp		Sp. Cond.	DO	ORP	Turbidity	Flow Rate	Depth to		
(24hr)	(liters)	(°C)	pН	_(mS/cm)	(mg/L)	(mV)	(NTU)	(ml/min)	water (ft)	Color / Odor	
1155		20.51		0.039	4.19	11382	71.3	259	24.25	Clear / May	( n
200	7	90.35	/	0.038	3-67	1135.6	210	100	38.57	in	-
1205	4	20,07		0.046	3.47	1/386	20.9	200	38.52	Ч	
1216	7	20.25	/	0-045	3.65	1142.6	1.38	200	38.51	e,	
1312	8	18.96	_	0.044	3.82	1145.4	1.12	400	38.52	75	
1225	()	19.04	1	0.043	4,49	1128.5	1.69	350	38.52	la.	
1235	13	19.09	1	0,035	5.73	11690	1.25	350	38.51	n	
	Has re Has re Have	•	lume bee bidity bee s stabiliz	n removed en reached ed			No	N/A	(	continued on back)	
3. SAMF	LE COLL	ECTION:		Method:	Geotech b	ladder pum	p with dro	p tube ass	embly		
	13-GW-				ntainer type I0-mL vials	3	containers	Preser HCl		nalysis Req. VOCs	Time /9/S
LEI0	3D) - 60-	062712			1-L amber	2		none		1,4-Dioxane	lyis
Commen	ts	1122	A GATOR	not Fur	ctioning						
Signature	•	1		10							

# Purge Volume Calculation



0		
Volume /	Linear F	t, of Pipe
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

1 screen volume

15 ft = 37.1 L / 9.8 G 20 ft = 49.6 L / 13.1 G 25 ft = 61.7 L / 16.3 G

Well ID: ( L ( W ) ) )	Well ID:	RE10302	Screen	653-673	F395
------------------------	----------	---------	--------	---------	------

(continued f	rom front)	riva		15/63						<del></del>
Time (24 hr)	Volume Removed (Liters)	Temp (°C)	рН	Spec. Cond. (mS/em)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color/Odor
1245	16	19.00	/	0.036		1175.6	7.06	350	38-51	Clear (none
1255	21	@ 18.86	/	0 037	6.45	1178.0	0.90	350	38.50	3 1
1305	27725	1971	/_	0.937	648	1174.1	1.38	350	38.51	V.
1315	28	8.67		0.037	6.47	1177.0	0.77	350	38,S1	τ,
1325	32	18.64	_	Q 037	647	1174.6	0.26	350	38 Sø	I <sub>X</sub>
1335	34	18.62		0.037	649	1173.9	027	350	38.51	V <sub>1</sub>
(345	38	19.68	1	0,036	6-47	1172.9	0.25	400	78.52	4
1755	43	18.48	1	0.038	6.22	11748	Q.87	400	38.52	()
1405	46	18.47	/	0.038	6.12	1174.4	0.36	400	38.12	L <sub>g</sub>
1915	50	18.47	1	0.037	6.11	1/73.8	0.28	400	38.52	₩ ®
										*
			П					,		
150							#:	-		
20										
			21							

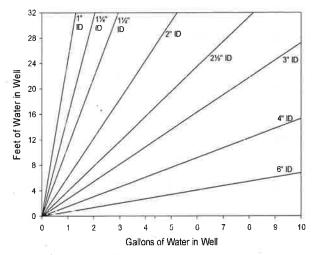


Vell ID:	REIOZ	D3
		0-

# **Low Flow Ground Water Sample Collection Record**

Client: Project N		/IRP Beth 6026652				Date:	6/ 7	<sup>7</sup> /15	Time: \$	Start //30 Finish 1430	_am/pm _am/pm
Site Loca		725	a + May	T.					n '	1111311_1	_am/pm
Weather		90	ACCORD	car		- Co	ollector(s):	JC			
	V.1.		10.00								
1. WATE		•		-	o of Casing		,	01			
		_	th: 735		c. Length	of Water Co	olumn: 🧘	96.25 ft		sing Diameter 4-inch F	
			pth: 38-7	🤦 ft	d. Calcula	ated Systen	n Volume (	see back)	9-8	941.	
2. WELL	<b>PURGE</b> a. Purge		Geotech	bladder pu	ımp with dr	op tube ass	embly	n .			
	- Tempe - pH ± 0	rature ± 3	3%	ed (see wo - D.O. ± - ORP ± - Drawdo	10% (value 10mV	s >0.5 mg/l	L)	- Turbidit	•	ım 1 screen vo	olume
	c. Field T	esting Eq	uipment u	ısed:	Make Y51		Model 556 mf			Serial Number	÷r
					Hanna		H198703			63982	
	Volume	-									
Time (24hr)	Removed (liters)	Temp (°C)	pН	Sp. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color / O	ldor
1145	(11013)	18-30	8.07	0.038	3.94	785. 4	(1410)	750	38.82	cle4- /1	
1155		17.93	4.88	0.037	3.56	392.4	9.55	750	38.82	~	- Car
-		17.98	4.92				6.36	250	38.85	×	
1710		17.94	4.10	0.037	7.76	387.6	3-68	750	38.82	· · · · · · · · · · · · · · · · · · ·	
1250		17-86	4.75	0-037	3.71	392.5	4.69	750	38.83	lγ	
1270		17.70	4.50	0.036	3:39	394.8	3.75	750	38.84	9	
1240		17:77	4.48	0-037	3.80	411.2		250	78-84	4	
	Has re Has re Have	tance critequired vo equired tu equired tu paramete	eria pass/ olume bee	fail In removed In reached In reached		Yes	No	N/A	70-84	(continued on back)	)
3. SAMP	LE COLL	ECTION:		Method:	Geotech b	ladder pum	np with dro	p tube ass	embly		
	-4W-06Z				ntainer type I0-mL vials		containers	<u>Preser</u> HCl	vation <u>A</u>	nalysis Req. VOCs	Time
REIOZ D'S	-GW - 067	122015			1-L amber	2		none		1,4-Dioxane	1420
Commen	ts				ğ			-/-		2.00	
						9	/				
Signature	•										
					/		5				

## Purge Volume Calculation



Volume /	Linear Ft	. of Pipe
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

1 screen volume

15 ft = 37.1 L / 9.8 G 20 ft = 49.6 L / 13.1 G 25 ft = 61.7 L / 16.3 G

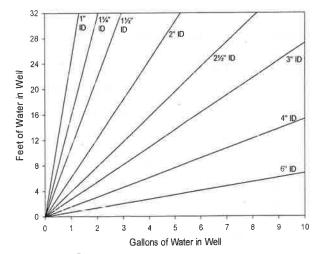
Well ID: RE103 D3

(continued f	from front) Volume									
Time (24 hr)	Removed (Liters)	Temp (°C)	pН	Spec. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color/Odor
1520		17.75	4.46	0.036	7.98	417.7	[-33	250	38.85	J.
1300		17.84	4.39	0.036	400	418.9	1	_	78.83	<b>4</b> 8
1310		17.47	4.43	0.036	4.04	45.5	1.25	200	78.87	LT.
1770		17-91	4.42	0.037	4,02	416.1	1-27	760	38.85	Le
1330		17.89	4.41	0-037	4.00	412.1	)	250	78.82	ll
1346		17.76	4-36	0.036	4.00	414.8	1.15	250	78.52	Ŋ
1750		18.56	4.54	0.037	ろいって	404.0	)	200	28.85	ы
1400	_	18,40	7.83	0-037	4-43	960-7	1.21	250	38-85	4
1410		16.29	3.66	0.057	5.59	465.1		סמד	28.82	ř
1415		16.35	3.82	0.078	5-41	486.9	0.77	750	78.82	4
1470										Sanples
									4 -	
										0
	L.		ita							



Well ID:	RElOUD 1
11011 10.	11/1

Client:		VIRP Beth				Date:	6/	23/15	Time:	Start_ 875	an/pm
Project N		6026652				2				Finish 1055	em/pm
Site Loca		_ Eiffel	Crake	+ Hillse	P	_			,	•	
Weather	Conds:	90's	Hazy			C	ollector(s)	1	<u>c</u>		
1. WATE	ER LEVEI	L DATA: (	measure	d from Top	of Casing	g)					
	a. Total \	Well Leng	th: 375	ft	c. Length	of Water Co	olumn: 🔼	39.89 f	t Ca	sing Diameter/	Material
	b. Water	Table De	<sub>pth:</sub> کُکُ۔رر	ft	d. Calcula	ated Systen	n Volume	(see back)		4-inch P	
2. WELL	- PURGE	DATA						·	***************************************		
	a. Purge	Method:	Geotech	bladder pu	mp with dr	op tube ass	embly				
	b. Accep	tance Crit	eria defin	ed (see wo	rkplan)						
		rature ± 3			•	s >0.5 mg/l	L)	- Turbidit			
	- pH ± 0			- ORP ±				- Remove	e a minimu	m 1 screen vol	ume
	- Sp. Co	nd. ± 3%		- Drawdo	wn <0.3'						
	c. Field T	esting Eq	uipment ι	ısed:	Make		Model			Serial Number	
					4>1		5561	1000			
	Volume				Hanna		4198	705			
Time	Removed	Temp		Sp. Cond.	DO	ORP	Turbidity	Flow Rate	Depth to		
(24hr)	(liters)	(°C)	pН	(mS/cm)	(mg/L)	(mV)	(NTU)	(ml/min)	water (ft)	Color / Od	or
840		17.98	4.67	0.097	13.28	384.0	1.97	550	35.15	Cherr /	rom
850		17.14	4.31	0.096	8-11	401.5	1	550	75.15	t <sub>i</sub>	
0900		17.08	4.18	0.098	6.60	410.8	7.88	500	35.17	= 10	
410		16.91	4,30	0.016	6.15	421.7	1	500	35.17	C <sub>Y</sub>	
420	541	16.89	4.24	0.098	2-80	423.4	1.67	525	35.18	- ч	
430		16-87	4.07	0.096	5-61	429.2	(	600	35.18	4	
940		16.83	4.26	0.096	5.21	475.2	0.79	625	75.17	и	
	•	tance crit	•			Yes	No	N/A		(continued on back)	
		-		n removed			닏				
		equired tui parametei		en reached		H	님	님			
		no or N/A						Ш			
							**				
		E071011									
3. SAIVIP	LE COLL	ECTION:		Method:	Geotech b	ladder pum	p with dro	p tube ass	embly		
Sample II	)			Con	tainer type	No. of o	containers	Preser	vation A	nalysis Req.	Time
RE104D1-GW-0623 2018 40-mL v						3		HCI		VOCs	1027
ZE104D1 - GW - 06232015 1-L an						2		none		1,4-Dioxane	1007
Comment	'S										
							M				
Signature											



Volume /	Linear Ft	of Pipe
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

1 screen volume

15 ft = 37.1 L / 9.8 G 20 ft = 49.6 L / 13.1 G 25 ft = 61.7 L / 16.3 G

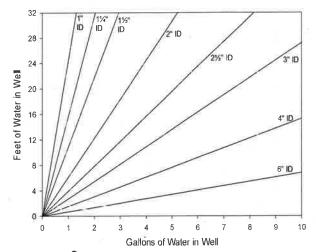
Well ID:

RE 104 DI

Volume   Removed   Temp   pH   Spec. Cond.   DO   ORP   Turbletty   Flow Rate   Depth to   Color/Odor	(continued f	rom front)									
(24 hr) (Liters) (°C) (mS/cm) (mg/L) (mV) (NTU) (ml/min) water (ft)  950   16.70   3.45   0.096   6.23   940.8   - 600   75.15   1  1000   (09-11   6.94   4.00   0.094   5.44   94.1   0.38   600   35.16   1  1010   16.84   4.02   0.096   5.55   446.1   0.38   600   35.16   1  1020   126   16.70   4.05   0.095   5.55   445.7   0.26   600   35.15   1  1077   1070											
950   10-0 3.46   0.096   6.23   440.8   - 600   75.15   1000   (09-1   6.94   4.02   0.096   5.55   446.1   0.38   600   35.16   1000   126   16.70   4.05   0.095   5.55   446.7   0.36   600   35.15   1000   126   16.70   4.05   0.095   5.55   446.7   0.36   600   35.15   1000   126   16.70   4.05   0.095   5.55   446.7   0.36   600   35.15   1000   126   16.70   4.05   0.095   126   12				pН				-			Color/Odor
1000 (091) [6.94 M.DI 0.094 S.48 MU69 0.41 660 75.17 W 1010 16.84 4.02 0.096 5.55 446.1 0.38 600 35.16 " 1020 126 16.70 4.05 0.095 5.35 445.7 0.86 600 35.15 " 1077 5.47 5.48 6.48 6.48 6.48 6.48 6.48 6.48 6.48 6		(Liters)									
1010 16.84 4.02 0.096 5.55 446.1 0.38 600 35.16 " 1020 126 16.70 4.05 0.095 5.55 445.7 0.86 600 35.15 " 1027 1020 126 16.70 4.05 0.095 6.55 445.7 0.86 600 35.15 " 1027 1020 126 16.70 4.05 6.55 445.7 0.86 600 35.15 " 1027 1020 126 16.70 4.05 6.55 445.7 0.86 600 35.15 " 1027 1020 126 16.70 4.05 6.55 445.7 0.86 600 35.15 " 1027 1020 126 16.70 4.05 6.55 445.7 0.86 600 35.15 " 1027 1020 126 16.70 4.05 600 35.15 " 1027 1020 126 16.70 4.05 600 35.15 " 1027 1020 126 16.70 4.05 600 35.15 " 1027 1020 126 16.70 4.05 600 35.15 " 1027 1020 126 16.70 4.05 600 35.15 " 1027 1020 126 16.70 4.05 600 35.15 " 1027 1020 126 16.70 4.05 600 35.15 " 1027 1020 126 16.70 4.05 600 35.15 " 1027 1020 126 16.70 4.05 600 35.15 " 1027 1020 126 16.70 4.05 600 35.15 " 1027 1020 126 16.70 4.05 600 35.15 " 1027 126 16.70 4.05 600 3	950		16.70	3.95	0.096	6.23	440.8	_	600	53.15	<i>y</i>
1010 16.84 4.02 0.096 \$.55 446.1 0.38 600 35.16  1020 126 16.70 4.05 0.095 5.55 445.7 0.86 600 35.15  1027 Sunfin	woo	(091	16.94	1/20(	0.098	6.42	4469	0.41	600	75.17	
102° 126 16.70 4.05 0.045 5.35 445.7 0.36 600 35.15 5.445.7 0.36 600 35.15 5.445.7 0.36 600 35.15 5.445.7 6.36 600	1010		16.84	4.02	0.096	5.55	446.1	0.38	600	35.16	
	-	126								35,15	ή
											Summ
	1001										
	H									a a	
	-										
	*										
					Je.						



CONSOL	AL							2		0.6	$\overline{}$
		/IRP Beth 6026652				Date:	6/2	3 /15		Start 0820 (am	
Project N Site Loca		00200320	0		v	B			1	Finish <u>8950</u> (affi	pm
Weather		805	SUN	HOTHU	MID	Co	ollector(s):	S. U	URIGHT		
4 MAT	5D L EV/51					710		> SCRR			-
1. WAII		-	_	-	of Casing	)	-				
				ft	c. Length	of Water Co	olumn: 💆	<u>' ' ' ' ' '                          </u>	Ca	sing Diameter/Mate 4-inch PVC	erial
	b. Water	Table De	oth: <u>40,9</u>	<u>O</u> ft	d. Calcula	ted System	n Volume (	see back)	13.1	GALLONS'	_
2. WELI	<b>PURGE</b> a. Purge		Geotech	bladder pu	mp with dro	p tube ass	embly				
	- Tempe - pH ± 0	rature ± 3	3%	ed (see wor - D.O. ± ′ - ORP ± - Drawdov	10% (value: 10mV	s >0.5 mg/L	-)	- Turbidit	•	m 1 screen volume	)
	c. Field T	esting Eq	uipment u	sed:	Make Y5 (		Model 556 M			Serial Number 2472)	
					Hanna		41 987			1232626	
	Volume	-					10000				
Time (24hr)	Removed (liters)	Temp (°C)	Нq	Sp. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color / Odor	
0830		16.45		0.031	8,13	554.1	5.38	700	40,90	CLEAR/NOWE	
0840	7	15,28	7,	0,030	5,93	606.3	7.26	700	40.95	1/ 1/2	_
0850	14	15.76		0.028	6.22	552.4	6.94	700	41.00	10 ([	
6900	21	15.25		0.026	6.61	520.9	11.13	700	40,95	11 11	
0910	28	15.28		0.026	6.85	507.5	6.09	700	40,75	3/ 1/	
0920	35	15.26		0.026	6.88	50H.7	6.11	750	40.70	38 0	
0930	43	15.30		0.026	6.90	495.2	6.34	150		6 10	
	Has re Has re Have		lume bee bidity bee s stabilize	n removed en reached ed		/	No	N/A		(continued on back)	
3. SAMF	PLE COLL	ECTION:		Method:	Geotech b	adder pum	p with dro	p tube ass	embly		_
Sample I		0623116	115		tainer type 0-mL vials	No. of o	containers	Preser HCI	vation A		ime So
		ж.			1-L amber	2		none		1,4-Dioxane 🔊 9	50
Commen	ts	pH c	ALIBRAI	K) ANK	207 N	EADING	INCORI	40714 (	WELL.	4.	_
Signature	-	8	5)								_



Volume /	Volume / Linear Ft. of Pipe									
ID (in)	Gallon	Liter								
0.25	0.0025	0.0097								
0.375	0.0057	0.0217								
0.5	0.0102	0.0386								
0.75	0.0229	0.0869								
1	0.0408	0.1544								
1.25	0.0637	0.2413								
1.5	0.0918	0.3475								
2	0.1632	0.6178								
2.5	0.2550	0.9653								
3	0.3672	1.3900								
4	0.6528	2.4711								
6	1.4688	5.5600								

1 screen volume

15 ft = 37.1 L / 9.8 G 20 ft = 49.6 L / 13.1 G 25 ft = 61.7 L / 16.3 G

Well ID:

RE 10402

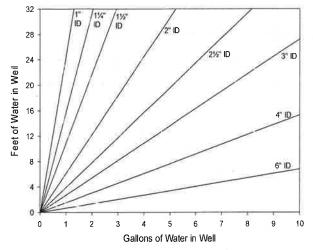
(continued f										
	Volume					000	<b>-</b>	El. D-4-	- - -	0-1/0-1
Time	Removed	Temp	рН	Spec. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color/Odor
(24 hr)	(Liters)	(°C)	,							
0340	50	15.25	_ t:	0,026	6.95	506.8	6,0	700	40,60	CLAR / NONE
0950	54					P		_	-	
			= 1							
					-				-	
				1						
									*2	
										(A
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			-							
			- 4	1						
										*



F104 D3

# RESOLUTION Low Flow Ground Water Sample Collection Record

CONSU	TANTS					,	p.0 00			or a
Client:	Navy NV	VIRP Beth				Date:	6/ 2	/15	Time:	Start 0 (25 am/p
Project N		6026652				11 ≃:			)	Finish <u>  Ø/</u> @_am/p
Site Loca		RE10					ollector(s):	6	theke	THE COLUMN
Weather	Conds:	800	- Sunn			C	ollector(s):	<u> </u>	(11 616)	
1. WAT				d from Top	of Casing	<b>3</b> )	71	12.55		
		Well Lengt			c. Length	of Water C	olumn:	fi		sing Diameter/Materi 4-inch PVC
		Table De	oth: 4	5ft	d. Calcula	ated Syster	n Volume (	see back)	<u>  [7.1</u>	901
2. WEL	<b>L PURGE</b> a. Purge		Geotech	bladder pu	mp with dro	op tube ass	embly			
	- Tempe - pH ± 0	erature ± 3	3%	ed (see wor - D.O. ± - ORP ± - Drawdov	10% (value 10mV	es >0.5 mg/	L)	- Turbidit - Remov	-	ım 1 screen volume
	c. Field T	esting Eq	uipment u	ised:	Make YS (		Model		Ñ	Serial Number
					HANN	A	HI	1870)		CATT 1532622
	Volume					-/2				
Time (24hr)	Removed	Temp (°C)	nЦ	Sp. Cond. (mS/cm)	DO (ma/L)	ORP	Turbidity	Flow Rate	Depth to	0-1/04
0830	(liters)	17.09	pH 3.96	0.033	(mg/L)	(mV)	(NTU) 4.93	(ml/min)	water (ft)	Color / Odor Clear / none
Osuo	7	17.27	4.01	-	7.46	396.9		10		Cher y hora
0850	13	16.60	3-85	0.031	7.00	412.4	5.68	500	91.65 91.70	· ·
0960	20	16.39	3,95	0.028	6.44	412.4	1.28	504	41.70	u
0910	25	16.70	4.60	0.629	6.43	380.5	12.6	500	41.70	t/
Q926	27	16.58	4.15	0.028	6.28	402.8	15.9	Soo	41.50	f <sub>q</sub>
0930	36	16.41	4.14	6. 128	5.19	353./	15.9	500	41.15	(c
		tance crit				Yes	No	N/A		(continued on back)
				n removed		<u>k</u>				
		equired tui parametei	•	en reached			H	님		
		no or N/A				<b>E</b>	_			
3. SAMF	PLE COLL	ECTION:		Method:	Geotech b	ladder pun	np with dro	p tube ass	embly	
Sample I				Con	tainer type	No. of	containers	Preser	vation A	nalysis Req. / Tim
		m. 060		4	0-mL vials			HCI		VOCs /0/
KE I	0400 (	aw - 06	3315		1-L amber	2		none		1,4-Dioxane /0/0
Commen	nts				>					
Signature	e	11	1	11						-



Volume /	Linear Ft	. of Pipe
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

1 screen volume

15 ft = 37.1 L / 9.8 G 20 ft = 49.6 L / 13.1 G 25 ft = 61.7 L / 16.3 G

Well ID:

RELOYDS .

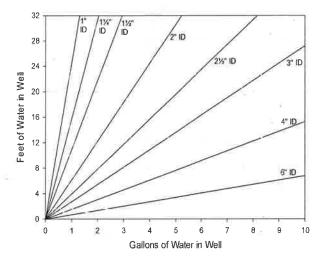
Screen 760-780 Pagi

(continued from front) Volume Time Removed Temp рΗ Spec. Cond. DO ORP Turbidity Flow Rate Depth to Color/Odor (mS/cm) (NTU) (ml/min) water (ft) (mV) (24 hr) (Liters) (mg/L) (°C) Clear/ nony 384.5 500 41.02 16.40 4.36 0.028 4.92 0940 500 386.9 L50 4.34 41.00 6 1 950 41 0.021 4.85 4.45 500 40.98  $\varepsilon_{\mathbf{t}}$ 4.64 160.0 381.3 16.47 000 51 380.9 4.46 4.62 40.98 16.47 0.028 500 16.2 610



Well ID:	REIDEDI
well iD.	KILIUJUI

Client: Project N Site Loca	lo:	IRP Beth 60266526	3			Date:	6/ a	73/15			am/pm am/pm
Weather		10200				- Co	ollector(s):				
1 WATE	ED I EVEL	DATA: /	maneura	d from Ton	of Casing						
I. WAIL		Vell Lengt		-	-	of Water Co	olumn: <u>5</u>	17.83 ft	Cas	sing Diameter/N	
		Table Dep	oth: <u>\$7,1</u>	7_ft	d. Calcula	ated System	n Volume (	see back)	13.1	4-inch PV	
2. WELL	<b>PURGE</b> a. Purge		Geotech	bladder pu	mp with dro	op tube ass	embly				
	- Tempe - pH ± 0	rature ± 3		ed (see wor - D.O. ± ' - ORP ± - Drawdov	10% (value 10mV	s >0.5 mg/l	-)	- Turbidit - Remove	-	m 1 screen volu	ume
	c. Field T	esting Equ	uipment u	Model	107-0	Rf	Serial Number				
	Volume				HANN	H	HI	18703	9	CIO 1 123	1620
Time	Removed	Temp		Sp. Cond.	DO	ORP	Turbidity	Flow Rate	Depth to		
(24hr)	(liters)	(°C)	pH	(mS/cm)	(mg/L)	(mV)	(NTU)	(ml/min)	water (ft)	Color / Odd	
1562	/	17.50	527	0.145	1180	298.0	(, 94	400	37.08	Clear/1	ore
1245		16.30	4.81	0-142	4-24	725.0		COO	37.00	L1"	
1255	4.50	[6.23	4.82	0.(43		7255	7.2(	650	77.05	0	
1305	5 341	16.05	4-74	0.141	2.73	3310		600	37.05	•	
1312		16,04	4.71	0.140	2.55	337.2	244	600	37.05	h	
1325		15.97		0.140	2.44	343.9		600	37.02	и	
1332	(0901	15.49	4.79	0.139	7-78	330.6	1-88	600	37.02	4	
	Has re Has re Have l		lume bee bidity bee s stabilize	n removed en reached ed		Yes D D	No  C	N/A		(continued on back)	
3. SAMP	LE COLL	ECTION:		Method:	Geotech b	ladder pum	p with dro	p tube ass	embly		
Sample I		067315			tainer type 0-mL vials	No. of 6	containers	<u>Preser</u> HCl		nalysis Req. VOCs	Time 1410
		- 062315			1-L amber			none		1,4-Dioxane	1416
Commen	ts										
			. /								
Signature	)										



Volume /	Linear Ft	. of Pipe
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

1 screen volume

15 ft = 37.1 L / 9.8 G 20 ft = 49.6 L / 13.1 G 25 ft = 61.7 L / 16.3 G

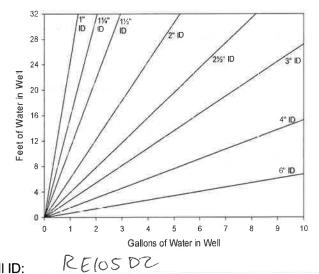
### Well ID:

(continued										7
Time (24 hr)	Removed (Liters)	Temp (°C)	рΗ	Spec. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color/Odor
1345		16.12	4.76	0.139	7.27	334.0		575	3702	И
1355		13.93	4-69	0.140	2.19	740.3	7.61	575	77.67	l.c
1405		16.08	4.84	0.139	2.17	258.2		575	77.07	
1410										Sumpled!
					5					
								-		
										Al .
				11						
									<u>6</u>	- (
				18						*



Well ID: REIOS DZ

Client: Navy NWIRP Bethpage Project No: 60266526					Date:	6/2	3 /15		Start 1230 Finish 1420		
Site Loca		0020032	<u> </u>			<b>*</b> 0			Г	Inish_[[20	_am(om)
Weather		80s	HAZY	, HOT , H	dimor	- Co	ollector(s):	_ S. u	RIGHT	-	
4 10/475	D I EVE						Eu 73				
I. WAIE		•		d from Top ft		of Water Co			Cas	sing Diameter	
	h Water	Table De	oth: 30 7	77#	d Calcula	tod Systom	. Volumo (	aaa baak)	121	4-inch F SALLONS	<u>'VC</u>
			۱۱۱. <u>کۍ ده</u>	<u>- 1</u> 11	u. Calcula	ileu System	i volume (	see back)	10.16	ALLONS	
2. WELL			Geotech	bladder pui	mp with dro	op tube ass	embly				
	- Tempe - pH ± 0	rature ± 3	3%	ed (see wor - D.O. ± 1 - ORP ± ′ - Drawdov	0% (value: 10mV	s >0.5 mg/l	-)	- Turbidit - Remove	•	m 1 screen vo	olume
	c. Field T	esting Eq	uipment u	sed:	Make Y 5 (		Model SSG IV	ies		Serial Numbe	er
	Volume				Hanna		H1 98	707			
Time	Removed	Temp		Sp. Cond.	DO	ORP	Turbidity	Flow Rate	Depth to		
(24hr)	(liters)	(°C)	рН	(mS/cm)	(mg/L)	(mV)	(NTU)	(ml/min)	water (ft)	Color / O	dor
1240		22.21	5.4B	0,080	11.86	338.8	1.65	500	38.27	CLEAR/N	ONE
1250		17.34	4.50	0.075	5.60	391.2	2.14	500	38.20	9	
1300	46AL	16.90	4.42	0.078	5.33	4020	1.78	500	38,20	1, 11	
1310		16.82	4.29	0.079	6.24	423.3	1.56	500	38.20	(1)	
1320	BONL	16.72	4.50	0.078	6.61	421.7	1.42	500	38.20	w .v.	
1330		16.80	4.37	0.079	6.67	421.9	1.51	500	38.20	3.5	
1340	864	16.90	4.41	0.080	6.71	422.8		500	38.20	<1 S	ß.
	Has re Has re Have		lume beerbidity beers stabilize	n removed en reached ed		Yesy	No 	N/A		(continued on back	22
3. SAMP	LE COLL	ECTION:		Method:	Geotech b	ladder pum	p with dro	p tube asse	embly		
Sample II RE 105D		062370	15	4	tainer type 0-mL vials 1-L amber	3	containers	Presen HCI none		nalysis Req. VOCs 1,4-Dioxane	Time 1420 1420
										.,. Dioxano	
Comment	ts										
				7							
Signature		$\leq$		T			, K				*1



Volume /	Linear Fl	. of Pipe
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

1 screen volume

15 ft = 37.1 L / 9.8 G 20 ft = 49.6 L / 13.1 G 25 ft = 61.7 L / 16.3 G

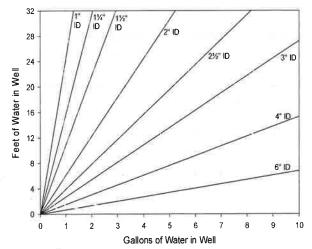
Well ID:

(continued t	from front) Volume										
Time (24 hr)	Removed (Liters)	Temp (°C)	рН	Spec. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Co	olor/Odor
1350		16.92	4.62	0.080	7.47	413.7	1.48	500	38.20	CLEAR	NOISE
1400		16.86			6.71		0.86	500	38.20	11	L
1410			4.56		6.55	412.0	0.88	500	38.20	18	1 \
1420		16.95							38.20	1.8	r)
						<u> </u>					
				0						R	
										ė	1



Well ID: BPow 5-5	
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							•				
Client: Project N		VIRP Beth 6026652				Date:	6/2	<sup>'4</sup> /15	Time:		am/pm
Site Loca				Peters		-				Finish <u>lo45</u>	_am/pm
Weather			SF	clear		- с	ollector(s):		JC		
4 WAT	ED I EVEI	DATA	· · · · · · · · · · · · · · · · · · ·		of Coolin			17-95			
I. WAII				d from Top		g) of Water C				. 5.	
	a. rotar t	veli Leng	tn <u>: 3 10</u>	π	c. Length	or water C	olumn: 🍱	<del>и и и</del>	t Ca	sing Diameter/ 4-inch P	
			pth: <u>27.0</u>	≥≤ ft	d. Calcula	ated Syster	n Volume (	(see back)	16	.J 9a1	
WELL PURGE DATA     a. Purge Method: Geotech bladder pump with drop tube assembly											
		rature ±	3%	ed (see wo - D.O. ± - ORP ±	10% (value	es >0.5 mg/	L)	- Turbidit	•	4	L
	•	nd. ± 3%		- Drawdo		18		- Remov	e a minimu	ım 1 screen vo	lume
	c. Field T	esting Ed	uipment u	ısed:	Make		Model			Serial Number	r
Time	Volume Removed	Temp		Sp. Cond.	DO	ORP	Turbidity	Flow Rate	Depth to		
(24hr)	(liters)	(°C)	pН	(mS/cm)	(mg/L)	(mV)	(NTU)	(ml/min)	water (ft)	Color / Oc	dor
905		16.10	4.20	0.132	9.52	759.6	-	800	27.12		nom
915		15.85	4.16	0.148	7-17	237.7	736	775	27-14	cloudy ) v	rond
925		15.69	4.18	0.326	5.96	768.0	49.3	775	27.18	14	
930	5941	15.68	409	0.774	5.06	785.6	70.1	785	27.22	L(	
940		15.81	4.09	0.318	4.10	288.3	8.71	775	27.76	cléaren	1 /non
950	10941	15.43	4.10	0-318	47.19	1.82S	3.14	775	27.27	T <sub>e</sub>	
1000		15.95	4.15	0.319	3.71	215.7	3.01	775	27.79	ve	
	-		eria pass/		•	Yes	No	N/A		(continued on back)	
		•		n removed en reached							
- 2			rs stabilize				H	H			
			- Explain				_		9		
	N = 001 1	EOTION	12								
3. SAMI	PLE COLL	ECTION:		Method:	Geotech b	ladder pun	ip with dro	p tube ass	embly		
Sample I Brows-	D 5- GW- 06	5242015			tainer type -0-mL vials		<u>containers</u>	<u>Preser</u> HCl		<u>nalysis Req.</u> VOCs	Time
Brows-s	5-6W-06	242015			1-L amber	2		none		1,4-Dioxane	1028
Commen	Comments Tagged bottom with tobing										
Signature	•										



Volume /	Linear F1	. of Pipe
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

1 screen volume

15 ft = 37.1 L / 9.8 G 20 ft = 49.6 L / 13.1 G 25 ft = 61.7 L / 16.3 G

Well ID:

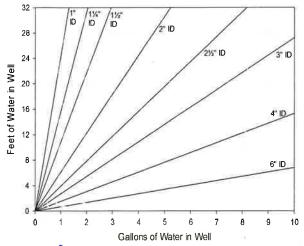
BPOW 5-5

(continued f	rom front) Volume									
Time (24 hr)	Removed (Liters)	Temp (°C)	рН	Spec. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color/Odor
1010	15 741	15.95	4.16	0-714	7.57	715.4	_	7775	27.36	i/
1015		16,02	4.15	0.319	7.56	214.8	3.94	775	27.70	11
1070	17901	6.00	4.14	0.319	2.49	218.6	1	775	77.30	Sumple
1075						-				Sample
				¥1						
							IV. g			
						_				
- 8										
			5.							



Well ID:	BPOW56

Client:						Date:	6/2	/15		Start <u>6830</u>	<u> </u>
Project N		6026652		Brows	~ (	- 1			F	Finish HOO	_am/pm
Site Loca Weather		DCIN	page !	1510000	3	- Co	ollector(s):				
	- 1		<i>y</i> , ,	1					> SCREE	'A.I	
1. WAT		•		d from Top	-					,~	
		Vell Lengt		_	c. Length	of Water Co	olumn: 5	<u>87.                                    </u>	Ca	sing Diameter 4-inch F	
	b. Water	Table De	pth: <u>27,6</u>	<u>g</u> ft	d. Calcula	ated Systen	n Volume (	see back)	16.	3 GALLON	5
2. WELI	L PURGE										
	a. Purge	Method:	Geotech	bladder pu	mp with dro	op tube ass	embly				
	- Tempe - pH ± 0	rature ± 3	3%	ed (see wo - D.O. ± - ORP ± - Drawdov	10% (value 10mV	s >0.5 mg/l	-)	- Turbidit - Remove		m 1 screen vo	olume
	c. Field T	esting Eq	uipment u	sed:	Make		Model SS6 m			Serial Number	
					HAD	INA	(+)	98703		63982	
Time.	Volume	Tomp		C-	- 50	ODD	T	Flor Pote	D. 11.1		
Time (24hr)	Removed (liters)	Temp (°C)	pН	Sp. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color / C	)dor
0045	1	18.06	7	0.136	13,27	200.2	2.31	300	27.69	CLEAR/A	
0855	2		5.19		5.25	246.4		300	27.69	4	, co, c.c.
0900		15.71	4.63	0.175	2.19	769.9	3.15	400	77.82	i,	
1910		14.81	481	661.0	3.84	254.6	2.68	450	27.89	/1	
1920		15.18	5.41	0.164	1.69	221.4	916	300	27 93	tursidas	n.
8940		22.22	6.85	0.447	2.37	121.8	>1,100		JF. 94	(10429)	
(950		21.69	6.92	0.477	0.13	106.0	>1,100		27.96	a	
		tance crit	•	fail		Yes	No	N/A		(continued on back	2)
		•		n removed en reached							
				_			H	K			
	lf i	paramete no or N/A	- Explain	below.	purge ti	ne of ¿	) hours	Par	The SF	P) reac	hod
3. SAMF	PLE COLL	ECTION:		Method:	Geotech b	ladder pum	p with dro	p tube ass	embly		-
Sample I	D 15-6-6	w - 4690	1)5		tainer type 0-mL vials		containers	<u>Preser</u> HCI		nalysis Req. VOCs	Time
RASUS	-6-6w	- 0639	15		1-L amber			none		1,4-Dioxane	1100
						•					
Commen	nts										
					->						
			201	1							
Signature	Э	1/2	14								



Volume /	Linear Ft	. of Pipe
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

1 screen volume

15 ft = 37.1 L / 9.8 G 20 ft = 49.6 L / 13.1 G 25 ft = 61.7 L / 16.3 G

Well ID: BPOW 5-6

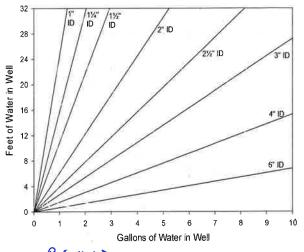
(continued	from front) Volume									-
Time (24 hr)	Removed (Liters)	Temp (°C)	pН	Spec. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color/Odor
1000		18.50	6.60	1.213	2.61	(570	>1,160		27.97	Cloudy Inout
A CONTRACTOR OF THE PARTY OF TH	AGH AD	1/24	5.34	0.155	1.02	161.5	960	600	28.00	1(
1020 (010	- N 32	20.88	8.14	0.116	325	223.3	685	900	28,00	
1030		51.05		0.114	2172	221.5	51.6	400	94.00	4
1040		2191	5.08	0.114	318.2	219.1	49.1	200	28.00	(1
(650		91.64	5.07	Q.115	217.0	318.8	46.9	200.	28.01	· ·
100	33	20.92	5.04	0.115	1.39	220.2	37.6	200	28.00	Clear I non
	13									
			Ñ							r .
									5%	
								7.1		
				,						
				1						
	e									>3
										'
						=				



Well ID: RE/18D/

Client: Project N		/IRP Beth 6026652				Date:	6/2	4 /15		Start <u>0870</u> Finish_1030	
Site Loca		PINEN				-				111311_1030	ampin
Weather	Conds:		SONNY			C	ollector(s):	<u> </u>	WRIGH	7	
1 WATI	ER LEVEL	DATA: (	measure	d from Top	of Casino		5-796				
		Vell Lengt		-	_	of Water Co			•	sing Diamete	r/Matorial
										4-inch	
		Table De	otn: <u>67,5</u>	<u>υ</u> π	d. Calcula	ated Systen	n volume (	see back)		BGALL	
2. WELI	<b>PURGE</b> a. Purge		Geotech	bladder pu	mp with dro	op tube ass	embly				
b. Acceptance Criteria defined (see workplan)  - Temperature ± 3% - D.O. ± 10% (values >0.5 mg/L) - Turbidity ± 10%  - pH ± 0.1 unit - ORP ± 10mV - Remove a minimum 1 screen volume  - Sp. Cond. ± 3% - Drawdown <0.3'											
	c. Field T	esting Eq	uipment u	ised:	Make		Model			Serial Number	er
								7			
	Volume					× .					
Time (24hr)	Removed (liters)	Temp (°C)	рН	Sp. Cond. (mS/cm)	DO (mg/L)	ORP (m)()	Turbidity	Flow Rate	Depth to	Color / C	) de a
0820	(iiters)	19.37	6.72	0.055	(mg/L) 5,92	(mV)	(NTU)	(ml/min) 400	water (ft)	Color / C	7
0830		16,88	7.01	0,045	3,66	307.1	106 105	400	27.30	CLO DY	/ NONE
0840			8,10		2,40	3866	97.7		27.30	31	,,
0850		16.21		0.039	2.03	434.8	85,4	400	27.30	65	(1)
0900		16,80	8.00	0,036	7.02	401.0	66.4	400	27.30		
0910	5 (MI	15,49		0.036		425.6	50.0	500	27.30	10	~
0920	JOHU	15.57	8.04		3,15		27.0		27.30	cicial	
0120	d. Accen	tance crite		0,036 fail	3,13	407.3 Yes	No No	600 N/A	27.40	(continued on back	
	Has re Has re Have	equired vo	lume bee bidity bee s stabilize	n removed en reached ed						in the second se	,
3. SAMP	LE COLL	ECTION:		Method:	Geotech b	ladder pum	p with dro	p tube ass	embly		-
Sample II		062420	15		tainer type 0-mL vials	No. of 0	containers	Preser HCI		nalysis Req. VOCs	Time jo30
.3	18	6.0			1-L amber	2		none		1,4-Dioxane	1030
Commen	ts						×			-	
		1	13								
Signature	<	1									

RE118D1 2 of 2



Volume /	Linear Ft	. of Pipe
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
- 0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

1 screen volume

15 ft = 37.1 L / 9.8 G 20 ft = 49.6 L / 13.1 G 25 ft = 61.7 L / 16.3 G

Well ID:

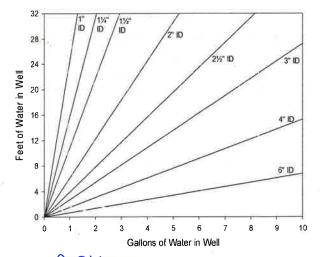
RE118 DI

(continued f	rom front) Volume									
Time (24 hr)	Removed (Liters)	Temp (°C)	рН	Spec. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color/Odor
0930			7.96	0.036	5.06	381.5	24.5	600	27.50	CLEAR/NONE
0940	9 GALL			0.036	2.29	387.2	20.2	600	27.50	
0950		15.66	7.93		1,99	381.4	16.5	600	27.50	(' ''
1000		15.70	7.40	0.036	1-76	375-1	16.2	600	27.52	a H
1010		15.69	7.91	0.036	1.64	376.7	14.8	600	27.52	a h
1070		15.67	7.90	0.036	[.63	376.9	10.1	600	27.52	in the
1025		15.61	7.90	0.0%	1.63	378-7	1	600	77.53	le ve
1070		3								Sangh 1!
									1	
		-						ă.		
							-	= 5:		
										*
	12									1
L	L			L						



Well ID:	REIGEDI	

Client:	Navy NW	/IRP Beth	page			Date:	6/7	/15	Time: \$	Start_1365	am/pm
Project N		6026652	6			<del>.</del>				inish /440	-
Site Loca						-	- U t( - ) -				
Weather	Conas:						ollector(s):				
1. WATE		-	- 17	d from Top							
		_	th:		c. Length	of Water Co	olumn:	75.43 ft	Ca	sing Diameter 4-inch F	
	b. Water	Table De	pth: 37.0	<u>√</u> ft	d. Calcula	ated Systen	n Volume (	see back)	-3	201	· · ·
2. WELL	<b>PURGE</b> a. Purge		Geotech	bladder pu	mp with dr	op tube ass	embly				
	b. Accep - Tempe - pH ± 0	tance Crit	eria define 3%	ed (see wo	rkplan) 10% (value 10mV	s >0.5 mg/l		- Turbidit - Remove	•	m 1 screen vc	olume
	c. Field T	esting Eq	uipment u	ised:	Make		Model			Serial Numbe	:r
	Volume			100			,				
Time (24hr)	Removed (liters)	Temp (°C)	pН	Sp. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color / O	dor
1315		16:72	7.69	0.109	6.40	37.4.1	(	750	39.70	Cher /NO	m
1325	-	16.65	7.75	0.168	6.95	388.8	_	750	39.20	6 2	•
1335		16.63	7.72	0.110	6.95	393,8	21.7	750	39.20	ll .c.	
1345		16.50	7.73	D.109	7.16	405.1	J	750	39.20	u M	
1355		16.45	7.73	0.108	7-14	407.9	l	750	39-20	a re	
1405	10441	16.51	7.70	0.109	7.03	401.0	3.99	750	39.00	uu	
1415		10.30	7.70	6.110	7.35	383,2		725	39.20	u u	
	Has re Has re Have	equired vo equired tu paramete		n removed en reached ed		Yes A A A	No  □  □	N/A 		(continued on back)	
3. SAMP	LE COLL	ECTION		Method:	Geotech b	ladder pum	p with dro	p tube ass	embly	::	
Sample II	D GW-062	w70K			tainer type 0-mL vials	<u>No. of a</u>	<u>containers</u>	<u>Preser</u> HCl	vation A	nalysis Req. VOCs	Time M30
	-GN-06				1-L amber			none		1,4-Dioxane	1430
Commen	ts										
Signature	)										



Volume /	Linear F	t. of Pipe
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

1 screen volume

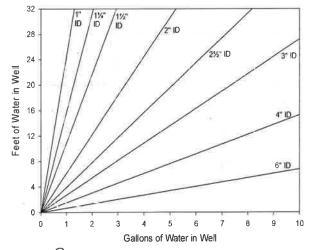
15 ft = 37.1 L / 9.8 G 20 ft = 49.6 L / 13.1 G 25 ft = 61.7 L / 16.3 G

Well ID: RE168D1

(continued								21		
	Volume	_								0
Time	Removed	Temp	pН	Spec. Cond.	DO	ORP		Flow Rate	Depth to	Color/Odor
(24 hr)	(Liters)	(°C)	7.71	(mS/cm)	(mg/L)	(mV)	(NTU)	(ml/min)	water (ft)	
1428	13. Ged	16.34	1570	0.19	6.86	407.0		700	37.20	
1430										Sumper!
										· · · · · · · · · · · · · · · · · · ·
									1.1	
						-8				
							-			
				9						
								22		
	18									
										C 8
								9		
				_ 0						
								2		
-										
					.r					
		-								



Client:	Navy NV	/IRP Beth	page			Date:	6/2	4 /15	Time:		mam/m
Project N		6026652	6			50 <b>4</b> 8				Finish 14SC	2_am/em
Site Loca			5040								
Weather	Conds:	_ 805	SUN			. Co	ollector(s):				
1. WATE	ER LEVEL	DATA: (	measure	d from Top							
	a. Total V	Vell Lengt	th: 655	ft	c. Length	of Water Co	olumn: 🧘	15.70 ft	Ca	asing Diamete 4-inch	
	b. Water	Table De	pth: <u>39.8</u>	<u>80</u> ft	d. Calcula	ated Systen	n Volume (	see back)	13.1	GALL	
2. WELL	PURGE		•					iii			
	a. Purge	Method:	Geotech	bladder pu	mp with dro	op tube ass	embly				
	- Tempe - pH ± 0	rature ± 3	3%	ed (see wor - D.O. ± 1 - ORP ± - Drawdov	I0% (value 10mV	s >0.5 mg/l	<b>L)</b>	- Turbidit - Remove	-	um 1 screen v	volume
	c. Field T	esting Eq	uipment ι	ısed:	Make		Model			Serial Numb	per
		~									
	Volume										
Time (24hr)	Removed (liters)	Temp (°C)	рН	Sp. Cond. (mS/cm)	DO (ma/l.)	ORP (mV)	Turbidity	Flow Rate	Depth to	Color /	Odor
1316	(iiters)	23.68	4.58		(mg/L) 5.46		(NTU)	(ml/min)	water (ft)		50-1
-		21.07		0.099		345.7	4.68		39.80	CLEAR/L	one_
1320		16.63	4.46	0.094	4.57	317.0			39.80	1,	
1335			4.42	<u> </u>		391.3	1.41	700			
1345	C (011	16-34	4.33	0.089	3.72	397-6 396.3	1-31	700	39.80	13	7,
	5 6ML							700		123	~).
1405		16.36	4,45		3.61	396.6	1.25		39.80	Ä.	
1415	d Accer	16.31 stance crit	4.58	0.088	3.70	Yes	1.15 No	700 N/A	39.80		-1.\
	Has re Has re Have	equired vo	olume bee rbidity bee rs stabilize	n removed en reached ed		中区区区			19	(continued on bad	:K)
3. SAMP	LE COLL	ECTION:		Method:	Geotech b	ladder pum	ıp with dro	p tube ass	embly		
Sample II	D '-6W-06	5242015			tainer type 0-mL vials	No. of 0	containers	<u>Preser</u> HCI	vation A	nalysis Req. VOCs	Time
	r.	(1			1-L amber			none		1,4-Dioxane	1450
Commen	ts	Pump	155UE - 1	LECTIFIE	0				1		
Signature	•			3							



Volume /	Linear Ft	of Pipe
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

1 screen volume

15 ft = 37.1 L / 9.8 G 20 ft = 49.6 L / 13.1 G 25 ft = 61.7 L / 16.3 G

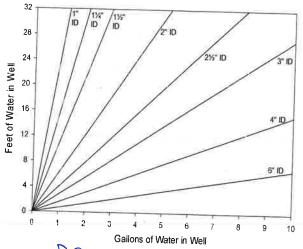
Well ID: RE 108 DZ

(continued f										
	Volume	_					_ Y. L.	5965		0.1.701
Time (24 hr)	Removed (Liters)	Temp (°C)	рН	Spec. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color/Odor
	B8		450	0.088	3.76	396.6	1.700	700		Clear I none
1475 1435		16.24	4.65	0.089	3.79		0.92	700	3 <b>1.80</b> 3980	( (
1445		110.25	4.70	0.089	3.80		0,94		39.80	18,
						-				
2										
										9.
		-								
									а	
							1:			
										N.



DOWE S					
Well ID: Row 6 5	Well ID:	Rpow	6-	5	

	avy NWIF	RP Bethpa				Date:	61 25	/15	Time: Sta	O-X	m/pm m/pm
roject No:		0266526							Liii	ISII_IVZ	im biii
Site Location:  Collector(s):											
/eather C	onds:					Coll	ector(s)				
. WATER	R LEVEL I	DATA: (m ell Length:	easured 1	from Top	of Casing) c. Length of	f Water Colu	umn: 53	7. 60 ft	Casir	ng Diameter/M 4-inch PV	aterial
b. Water Table Depth: 10 d. Calculated System Volume (see back)											
WELL PURGE DATA     a. Purge Method: Geotech bladder pump with drop tube assembly											
b. Acceptance Criteria defined (see workplan)  - Temperature ± 3%  - D.O. ± 10% (values >0.5 mg/L)  - pH ± 0.1 unit  - ORP ± 10mV  - Sp. Cond. ± 3%  - Drawdown <0.3'  - Turbidity ± 10%  - Remove a minimum 1 screen volume											
c. Field Testing Equipment used:  Make  Model  Serial Number											
	22			0.	HANN	/A		98703		1240 24X	
	Volume						Turbidity	Flow Rate	Depth to		
Time	Removed	Temp		Sp. Cond.	DO (ma/l )	ORP (mV)	(NTU)	(ml/min)	water (ft)	Color / Od	or
(24hr)	(liters)	(°C)	pH	(mS/cm) (0.67)	(mg/L)	134.6	(4.6	700	18.04	Claruli	non(
1835		6.29	10.99		3.84		11.0	800	(8.05	i,	
1745		15.83	6.31	0-085		150.6				53	
1855 19 15.76 4.25 0.052 2.18 275.3 19.6 700 18.00											
1905		15.90	4.26	0-053	1.73	279.6	11.5			46	+
1915		15.95	4,25	6-053	1.55	279.>	10.2	700	18.06	377	
0925	38	16.15	4.43	0.053	1-08	975.3	3.49	700	18.02	73.	
	70	100	4.23	0.053	1.48	265.7	2,69	100	18.00		
d. Acceptance criteria pass/fail  Has required volume been removed  Has required turbidity been reached  Have parameters stabilized  If no or N/A - Explain below.											
3. SAM	IPLE COL	LECTION	:	Method	Geotech	bladder pur	mp with dro	op tube as	sembly		
Sample ID Container type No. of containers Preservation Analysis Req. Time											
40-mL vials 3 none 1,4-Dioxane io 26											
Comme	eņts										
		1//	1								



	Linear F	t. of Pipe
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

1 screen volume

15 ft = 37.1 L / 9.8 G 20 ft = 49.6 L / 13.1 G 25 ft = 61.7 L / 16.3 G

Well ID:

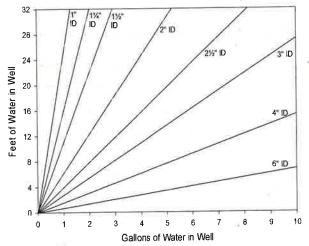
Brow 6-5

continuea t	from front)									
	Volume									
Time	Removed	Temp	pН	Spec. Cond.	DO	ORP	Turbidity	Flow Rate	D" ·	
(24 hr)	(Liters)	(°C)		(mS/cm)	(mg/L)	(mV)	(NTU)	(ml/min)	Depth to water (ft)	Color/Odor
0945	(A)	16.00	4.49	0.053	03.0	251.9	2.30	750	18,00	1,
1955	62	16.03	4.46	6.053	0.75		2.14	700		a a
1005		16.25	4.40	0-653	0.69	233.1	2.24	750	18.00	
1010		(6.98		6-053	0.65	239.6	1.65	200		
1015		20-19	4.78	0.054	0.57	220.7	1.80		18.00	
620		2080		0.05-1	0-58	221.1	1.57	260	18.00	G.
				0.03 -1		(0)	1.21	dou	18,00	Clearloone Simpled
										ř.
		-								9
	-	-								
_										
					-					
_										
-					Δ.					
										*



Well ID: BPOW 6-6

						. <b>.</b>	Pio oc	, nootic	III IXEC	, OI G	
Client:		WIRP Bet				Date:	6/ 7	? <b>5</b> /15	Time:	Start 810	_ám/pm
Project										Finish 1075	
	Site Location: N. Hickory							=			
vveame	r Conas:	40	3 F	dias		C	collector(s)	:			
1. WAT	ER LEVE	L DATA:	(measure	ed from To	p of Casin	g)					
	1. WATER LEVEL DATA: (measured from Top of Casing)  a. Total Well Length: 800 ft c. Length of Water Column: 781-47 ft Casing Diameter/Material										
b. Water Table Depth: 18.53 ft d. Calculated System Volume (see back) 4-inch PVC											
WELL PURGE DATA     a. Purge Method: Geotech bladder pump with drop tube assembly											
	a. Purge	Method:	Geotech	bladder pu	ımp with dr	op tube ass	sembly				
	b. Acceptance Criteria defined (see workplan)  - Temperature ± 3% - D.O. ± 10% (values >0.5 mg/L) - Turbidity ± 10%  - pH ± 0.1 unit - ORP ± 10mV - Remove a minimum 1 screen volume  - Sp. Cond. ± 3% - Drawdown <0.3'									ume	
	c. Field 1	resting Ed	quipment ι	used:	Make		Model			Serial Number	r
	Volume										
Time	Removed	Temp		Sp. Cond.	DO	ORP	Turbidity	Flow Rate	Depth to		
(24hr)	(liters)	(°C)	pН	(mS/cm)	(mg/L)	(mV)	(NTU)	(ml/min)	water (ft)	Color / Ode	or
225		16.04	5.05	0.048	1.59	265.6	627	700	18.55	stable ilid,	Inem
838	Saullon		4.63	0.035	1.45	283.6	-	700	18.56	7.	14
845		15,99	4.14	0.079	1.16	315.3	104	700	18.56	Cleanny	- 5
855		16.08	4.27	0.028	0.89	311.9	75.7	700	18.56	5/194Hs do	sede Ino
905	(Ogellons	16.04	4.34	0.028	0.85	311, 9	69.0	700	18.56	Clearlhony	-
915		16,13	4.18	0 028	0.76	320.2	60.7	700	(8.56	U	
925		16.29	4.21	0-628		312	46.3	700	18.56	tc .	
			eria pass/f			Yes	No	N/A	10 0	(continued on back)	
				n removed		<u>*</u>					
	Have	parameter	s stabilize	n reached		[ <del>]</del>	片				
			- Explain b			3	ш	Ш			
			_								
SAMPLE COLLECTION: Method: Geotech bladder pump with drop tube assembly											
Sample ID	)			Cont	ainer type	No of c	ontainers	Preserv	vation A	nalysis Bos	
	GW-662				0-mL vials	3	<u>Ortaniers</u>	HCI	<u>valion A</u>	nalysis Req. VOCs	Time 1015
POW 6-6	-GW-06.	25 2015			1-L amber	2		none		1,4-Dioxane	1015
omments											
	-										
						·					
ignature	p.:						_				
				(							



Volume /	Linear Ft	. of Pipe
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

1 screen volume

15 ft = 37.1 L / 9.8 G 20 ft = 49.6 L / 13.1 G 25 ft = 61.7 L / 16.3 G

Well ID:

BPOW 6-6

(continued f	from front)	000								
Time (24 hr)	Volume Removed (Liters)	Temp (°C)	рН	Spec. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color/Odor
135	15 galle	16-13	4.21	0-005	0-66	324-6	36.0	700	18.56	If
940	16.59	16.78	4.45	0.078	0.56	3/3.9	39-1	700	18.56	fe -
945	100	16.43	4.57	0.078	0.58	313.1	32.9	700	18.56	K
950		16.39	4.52	0.078	0.58	316.0	31.5	700	18.56	4
9.55		16.40	4.26	0.028	6.59	330.5	31.5	700	18.52	/ (
1000		16.46	4.10	4.029	0.61	3307	31.6	700	18-51	Ny
1015		10 10								Sant
1010										
-						Κ.				
			-							
										-

### Appendix B

**Analytical Data Validation – Resolution Consultants** 



#### **DATA VALIDATION REPORT**

Project:	Regional Groundwater Investigation — NWIRP Bethpage				
Laboratory:	Katahdin Analytical				
Sample Delivery Group:	S14462				
Analyses/Method:	Volatile Organic Compounds by U.S. EPA SW-846 Method 8260C 1,4-Dioxane by U.S. EPA SW-846 Method 8270D via Selective Ion Monitoring (SIM)				
Validation Level:	3				
Project Number:	0888812477.SA.DV				
Prepared by:	Dana Miller/Resolution Consultants Completed on: 07/30/2015				
Reviewed by:	Tina Cantwell/Resolution File Name: S14462_8260C_8270D Consultants				

#### **SUMMARY**

This report summarizes data review findings for samples listed below, collected by Resolution Consultants from the Regional Groundwater Investigation — NWIRP Bethpage Site on 22 and 23 June 2015 in accordance with the following Sampling and Analysis Plans:

- Sampling and Analysis Plan, Bethpage, New York. (Resolution Consultants, April 2013).
- UFP SAP Addendum, Installation of Vertical Profile Borings and Monitoring Wells, Operable Unit 2, NWIRP Bethpage, New York. (Resolution Consultants, November 2013).
- UFP SAP Addendum, Inclusion of Additional Target Analytes for Volatile Organics Analyses, NWIRP Bethpage OU2, Bethpage, New York. (Resolution Consultants, August 2014).

Sample ID	Matrix/Sample Type	Analysis	
RE104D3-GW-062315	Groundwater	8260C/8270D_SIM	
RE104D2-GW-062315	Groundwater	8260C/8270D_SIM	
RE104D1-GW-062315	Groundwater	8260C/8270D_SIM	
RE103D1-GW-062215	Groundwater	8260C/8270D_SIM	
RE103D2-GW-062215	Groundwater	8260C/8270D_SIM	
RE103D3-GW-062215	Groundwater	8260C/8270D_SIM	
DUPLICATE-GW-062215	Field Duplicate	8260C/8270D_SIM	
RE105D1-GW-062315	Groundwater	8260C/8270D_SIM	
RE105D2-GW-062315	Groundwater	8260C/8270D_SIM	
TB-062315	Trip Blank	8260C	



Data validation activities were conducted using the following guidance documents: *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846, specifically Method 8260C, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry* (United States Environmental Protection Agency [U.S. EPA] 2006), *SW-846 Method 8270D, Semivolatile Organic Compounds by Gas Chromatograph/Mass Spectrometry* (U.S. EPA 2007), *U.S. Environmental Protection Agency Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (U.S. EPA, June 2008), and *Department of Defense Quality Systems Manual for Environmental Laboratories*, Version 4.2 (October 2010). In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements, and/or professional judgment were used as appropriate.

#### **REVIEW ELEMENTS**

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody)/sample integrity
- ✓ Holding times and sample preservation
- ✓ Gas chromatography/Mass spectrometer performance checks
- X Initial calibration verification (ICV)/continuing calibration verification (CCV)
- ✓ Laboratory blanks/trip blanks
- ✓ Surrogate spike recoveries
- X Matrix spike (MS) and/or matrix spike duplicate (MSD) results
- ✓ Laboratory control sample/laboratory control sample duplicate results
- ✓ Field duplicates
- ✓ Internal standards
- ✓ Sample results/reporting issues

The symbol ( $\checkmark$ ) indicates that no validation qualifiers were applied based on this parameter. Acceptable data parameters for which all criteria were met and no qualification was performed and non-conformance or other issues that were noted during validation, but did not result in qualification of data are not discussed further. The symbol (x) indicates that a QC non-conformance resulted in the qualification of data. Any QC non-conformance that resulted in the qualification of data is discussed below.



#### **RESULTS**

### **Initial Calibration/Continuing Calibration Verification**

Calibration data were reviewed for conformance with the QC acceptance criteria to ensure that:

- The initial calibration percent relative standard deviation, correlation coefficient/coefficient of determination, and/or response factor method acceptance criteria were met
- The ICV standard percent recovery acceptance criteria were met
- The CCV method percent difference or percent drift and response factor acceptance criteria were met
- The retention time method acceptance criteria were met

Data qualification to the analytes associated with the specific calibration verification was as follows:

### **ICV Recovery Non-conformance:**

Cuitania	Ac	tions
Criteria	Detected Results	Non-detected Results
Recovery >120%	J	UJ
Recovery < 80%	J	UJ

#### Notes:

J = Estimated

UJ = Undetected and estimated

### **CCV Linearity Non-conformance:**

Crittania	Ac	tions
Criteria	Detected Results	Non-detected Results
%Difference or %Drift > 20%	J	UJ

#### Notes:

J = Estimated

UJ = Undetected and estimated

ICV and CCV non-conformances are summarized in Attachment A in Tables A-1 and A-2.



### **Matrix Spike/Matrix Spike Duplicate Results**

MS/MSDs are generated to provide information about the effect of each sample matrix on the sample preparation and the measurement methodology. MS/MSD percent recoveries (%Rs) assess the effect of the sample matrix on the accuracy of the analytical results and %Rs above the recovery control limits could indicate a potential high result bias while %Rs below the recovery QC limits could indicate a potential low result bias. The relative percent differences between the MS and MSD results are evaluated to assess sample precision. The MS/MSD %Rs and relative percent differences were reviewed for conformance with the QC acceptance criteria. Non-conformances are summarized in Attachment A in Table A-3. Data qualification to the analytes associated with the specific MS/MSD non-conformances were as follows:

#### **MS/MSD Non-conformances Chart:**

Cuitouio	Action				
Criteria	Detected Compounds	Non-detected Compounds			
%R > Upper Limit	J	No qualification			
20% < %R < Lower Limit	J	UJ			
%R <20%	J	Rejected			
RPD >Upper Limit	J	No qualification			

The MS/MSD recovery control limits do not apply for the MS/MSD performed on sample locations where the analyte concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

#### Notes:

%R = Percent recovery

RPD = Relative percent difference

J = Estimated

UJ = Undetected and estimated

#### **Oualifications Actions**

The data was reviewed independently from the laboratory to assess data quality. All compounds detected at concentrations less than the limit of quantitation but greater than the method detection limit were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation. Any sample that was analyzed at a dilution because of high concentrations of target or non-target analytes was checked to confirm that the results and/or sample-specific limit of quantitation and limit of detections were adjusted accordingly by the laboratory.

No results were rejected; therefore, analytical completeness was calculated to be 100 percent. Data not qualified during data review are considered usable by the project. The remaining results qualified as estimated may be high or low, but the data are usable for their intended purpose, according to U.S. EPA and Department of Defense guidelines. Final data review qualifiers used to describe results and how they should be interpreted by the end data user are provided in Attachment B and Attachment C. Attachment D provides final results after data review.



### **ATTACHMENTS**

Attachment A: Non-Conformance Summary Tables
Attachment B: Qualifier Codes and Explanations
Attachment C: Reason Codes and Explanations
Attachment D: Final Results after Data Review

Attachment A
Non-Conformance Summary Tables

	Table A-1 Initial Calibration Verification Non-Conformance						
Method	Analyte	ICV ID	%R	Limit	Associated Samples	Qualifier	
8260C	Chloroethane	P1539A	127.5	80-120	DUPLICATE-GW-062215	UJ	
8260C	Chloroethane	P1539A	127.5	80-120	RE103D1-GW-062215	UJ	
8260C	Chloroethane	P1539A	127.5	80-120	RE103D2-GW-062215	UJ	
8260C	Chloroethane	P1539A	127.5	80-120	RE103D3-GW-062215	UJ	
8260C	Chloroethane	P1539A	127.5	80-120	RE104D1-GW-062315	UJ	
8260C	Chloroethane	P1539A	127.5	80-120	RE104D2-GW-062315	UJ	
8260C	Chloroethane	P1539A	127.5	80-120	RE104D3-GW-062315	UJ	
8260C	Chloroethane	P1539A	127.5	80-120	RE105D1-GW-062315	UJ	
8260C	Chloroethane	P1539A	127.5	80-120	RE105D2-GW-062315	UJ	
8260C	Chloroethane	P1539A	127.5	80-120	TB-062315	UJ	

#### Notes:

ICV ID = Initial calibration verification identification

%R = Percent recovery

UJ = Non-detected analyte in associated sample qualified estimated "UJ" due to potential bias

Table A-2 Continuing Calibration Verification Non-Conformance							
Method	Analyte	CCV ID	%D	Limit	Associated Samples	Qualifier	
8260C	Acetone	P1636.D	23.74313	20	DUPLICATE-GW-062215	UJ	
8260C	Acetone	P1636.D	23.74313	20	RE103D1-GW-062215	J	
8260C	Acetone	P1636.D	23.74313	20	RE103D2-GW-062215	J	
8260C	Acetone	P1636.D	23.74313	20	RE103D3-GW-062215	UJ	
8260C	Acetone	P1636.D	23.74313	20	RE105D2-GW-062315	J	
8260C	4-Methyl-2-pentanone	P1636.D	22.32254	20	DUPLICATE-GW-062215	UJ	
8260C	4-Methyl-2-pentanone	P1636.D	22.32254	20	RE103D1-GW-062215	UJ	
8260C	4-Methyl-2-pentanone	P1636.D	22.32254	20	RE103D2-GW-062215	UJ	
8260C	4-Methyl-2-pentanone	P1636.D	22.32254	20	RE103D3-GW-062215	UJ	
8260C	4-Methyl-2-pentanone	P1636.D	22.32254	20	RE105D2-GW-062315	UJ	
8260C	2-Hexanone	P1636.D	22.14855	20	DUPLICATE-GW-062215	UJ	
8260C	2-Hexanone	P1636.D	22.14855	20	RE103D1-GW-062215	UJ	
8260C	2-Hexanone	P1636.D	22.14855	20	RE103D2-GW-062215	UJ	
8260C	2-Hexanone	P1636.D	22.14855	20	RE103D3-GW-062215	UJ	
8260C	2-Hexanone	P1636.D	22.14855	20	RE105D2-GW-062315	UJ	

#### Notes:

CCV ID = Continuing calibration verification identification

%D = Percent difference

UJ = Non-detected analyte in associated sample qualified estimated "UJ" due to potential bias

J = Detected analyte qualified estimated "J" due to potential bias

Table (A-3) Matrix Spike/Matrix Spike Duplicate									
Spiked Sample	Analyte	Sample Result (µg/L)	Spike Added	MS %R	MSD %R	%R Limits	RPD	RPD Limit	Qualifier
RE103D1-GW-062215	Methyl cyclohexane	ND	500	111	65.2*	73-125	52**	30	UJ
RE103D1-GW-062215	Xylenes, total	ND	1500	115	84.7*	89-116	30	30	UJ
RE103D1-GW-062215	Freon-113	11	500	116	66.7*	73-126	53**	30	J

#### Notes:

µg/L = Micrograms per liter
MS = Matrix spike
MSD = Matrix spike duplicate
%R = Percent recovery

RPD = Relative percent difference

**Bold\*** = Percent recovery less than lower control limit **Bold\*\*** = Relative percent difference outside control limit

ND = Non-detect

UJ = Non-detected analyte in associated sample qualified estimated "UJ" because %R is below the lower limit J Detected analyte qualified estimated "J" because %R is below the lower limit in associated sample

Attachment B Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
ΠΊ	The analyte was not detected above the reported sample quantitation limit.  However, the reported quantitation limit is approximate and may or may not represent the actual quantitation limit necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

Attachment C
Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
bt	Trip blank contamination
С	Calibration issue
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate relative percent difference
h	Holding times
i	Internal standard areas
k	Estimated Maximum Possible Concentration
I	Laboratory control sample
Ic	Labeled compound recovery
ld	Laboratory duplicate relative percent difference
lp	Laboratory control sample/laboratory control sample duplicate relative percent difference
m	Matrix spike recovery
mc	Method compliance non-conformance
md	Matrix spike/matrix spike duplicate relative percent difference
nb	Negative laboratory blank contamination
р	Chemical preservation issue
r	Dual column relative percent difference
q	Quantitation issue
S	Surrogate recovery
su	Ion suppression
t	Temperature preservation issue
х	Percent solids
у	Serial dilution results
Z	Interference check sample results (metals)

Attachment D
Final Results after Data Review

Sample Delivery Group Lab ID Sample ID Sample Date Sample Type

SI4462 SI4462-1 RE104D3-GW-062315 6/23/2015 Groundwater

		Sam <sub>i</sub> Sam <sub>i</sub>				
Method	Analyte	CAS No	Units	Result	undwater Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG L	0.5	U	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG L	0.5	U	1
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG L	0.5	Ü	1
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG L	0.5	Ü	+
8260C	1,1-DICHLOROETHANE	75-34-3	UG L	0.5	Ü	+
8260C	1,1-DICHLOROETHENE	75-35-4	UG L	0.5	U	+
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG L	0.5	Ü	+
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG L	0.75	Ü	+
8260C	1,2-DIBROMOETHANE	106-93-4	UG L	0.5	Ü	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG L	0.5	Ü	+
8260C	1,2-DICHLOROETHANE	107-06-2	UG L	0.5	U	+
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG L	1	Ü	
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	Ü	+
8260C	1,3-DICHLOROBENZENE	541-73-1	UG L	0.5	U	+
8260C	1,4-DICHLOROBENZENE	106-46-7	UG L	0.5	Ü	+
8260C	2-BUTANONE	78-93-3	UG L	2.5	U	+
8260C	2-HEXANONE	591-78-6	UG L	2.5	U	+
8260C	4-METHYL-2-PENTANONE	108-10-1	UG L	2.5	U	+
8260C	ACETONE	67-64-1	UG L	2.5	U	+
8260C	BENZENE	71-43-2	UG L	0.5	U	+
8260C	BROMODICHLOROMETHANE	75-27-4	UG L	0.5	U	+
8260C	BROMOFORM	75-25-2	UG L	0.5	U	+
8260C	BROMOMETHANE	74-83-9	UG L	1	U	+
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	U	+
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	0.5	U	+
8260C	CHLOROBENZENE	108-90-7	UG L	0.5	U	+
8260C	CHLOROETHANE	75-00-3	UG_L	1	UJ	С
8260C	CHLOROFORM	67-66-3	UG_L	0.5	U	+ -
8260C	CHLOROMETHANE	74-87-3	UG_L	1	U	+
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	0.5	U	+
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U	+
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U	+
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	U	+
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	U	+
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U	+
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	+
8260C	M- AND P-XYLENE	108-38-3/106-42		1	U	+
8260C	METHYL ACETATE	79-20-9	UG L	0.75	U	+
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.75	U	+
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	+
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	+
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	+
8260C	STYRENE	100-42-5	UG_L	0.5	U	+-
8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.5	U	+
8260C	TOLUENE	108-88-3		0.5	U	+
8260C 8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L UG L	0.5	U	+
	·					+-
8260C 8260C	TRANS-1,3-DICHLOROPROPENE TRICHLOROETHENE	10061-02-6 79-01-6	UG_L UG_L	0.5 0.5	U	+-
	TRICHLOROFLUOROMETHANE				U	+
8260C		75-69-4	UG_L	1		+
8260C	VINYL CHLORIDE	75-01-4	UG_L	1 -	U	+
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	1

Sample Delivery Group Lab ID Sample ID Sample Date SI4462 SI4462-2 RE104D2-GW-062315 6/23/2015 Groundwater

			Sample Date Sample Type	-	23/2015 undwater	
Method	Analyte	CAS No	Units	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG L	0.5	Ū	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG L	0.5	U	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG L	0.5	U	
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG L	0.5	U	
8260C	1,1-DICHLOROETHANE	75-34-3	UG L	0.5	U	
8260C	1,1-DICHLOROETHENE	75-35-4	UG L	0.5	U	
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG L	1.4	J	
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG L	0.5	U	
8260C	2-BUTANONE	78-93-3	UG L	2.5	U	1
8260C	2-HEXANONE	591-78-6	UG L	2.5	U	1
8260C	4-METHYL-2-PENTANONE	108-10-1	UG L	2.5	U	
8260C	ACETONE	67-64-1	UG L	2.5	Ü	
8260C	BENZENE	71-43-2	UG L	0.5	U	
8260C	BROMODICHLOROMETHANE	75-27-4	UG L	0.5	Ü	
8260C	BROMOFORM	75-25-2	UG L	0.5	Ü	
8260C	BROMOMETHANE	74-83-9	UG L	1	U	
8260C	CARBON DISULFIDE	75-15-0	UG L	0.5	U	
8260C	CARBON TETRACHLORIDE	56-23-5	UG L	0.5	Ü	
8260C	CHLOROBENZENE	108-90-7	UG L	0.5	Ü	
8260C	CHLOROETHANE	75-00-3	UG_L	1	UJ	С
8260C	CHLOROFORM	67-66-3	UG L	0.5	U	
8260C	CHLOROMETHANE	74-87-3	UG L	1	Ü	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG L	1.4		
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG L	0.5	Ü	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG L	0.5	Ü	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG L	1	U	
8260C	ETHYLBENZENE	100-41-4	UG L	0.5	Ü	
8260C	ISOPROPYLBENZENE	98-82-8	UG L	0.5	Ü	
8260C	M- AND P-XYLENE	108-38-3/106-42		1	Ü	
8260C	METHYL ACETATE	79-20-9	UG L	0.75	Ü	
8260C	METHYL CYCLOHEXANE	108-87-2	UG L	0.5	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	
8260C	O-XYLENE	95-47-6	UG L	0.5	U	1
8260C	STYRENE	100-42-5	UG_L	0.5	U	
8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.5	U	
8260C	TOLUENE	108-88-3	UG L	0.5	U	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U	
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	
8260C	TRICHLOROETHENE	79-01-6	UG L	4.3		1
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG L	1	U	
8260C	VINYL CHLORIDE	75-01-4	UG L	1	U	
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	
3270D_SIM	1,4-DIOXANE	123-91-1	UG_L	0.15	J	1

Sample Delivery Group Lab ID Sample ID Sample Date SI4462 SI4462-3 RE104D1-GW-062315 6/23/2015 Groundwater

		Sample Date Sample Type	6/23/2015 Groundwater			
Method	Analyte	CAS No	Units	Result	Qual	RC
8260C	1.1.1-TRICHLOROETHANE	71-55-6	UG_L	0.22	J	1
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG L	0.5	U	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG L	3.7		
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG L	0.5	U	-
8260C	1,1-DICHLOROETHANE	75-34-3	UG L	0.5	U	
8260C	1,1-DICHLOROETHENE	75-35-4	UG L	0.66	J	-
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG L	0.5	U	1
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG L	0.75	U	1
8260C	1,2-DIBROMOETHANE	106-93-4	UG L	0.5	Ü	1
8260C	1,2-DICHLOROBENZENE	95-50-1	UG L	0.5	Ü	1
8260C	1,2-DICHLOROETHANE	107-06-2	UG L	0.5	U	+
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	1	J	+
8260C	1,2-DICHLOROPROPANE	78-87-5	UG L	0.5	Ü	+
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	Ü	+
8260C	1,4-DICHLOROBENZENE	106-46-7	UG L	0.5	U	+
8260C	2-BUTANONE	78-93-3	UG L	2.5	U	+
8260C	2-HEXANONE	591-78-6	UG L	2.5	U	+
8260C	4-METHYL-2-PENTANONE	108-10-1	UG L	2.5	U	+
8260C	ACETONE	67-64-1	UG L	2.5	U	+
8260C	BENZENE	71-43-2	UG L	0.5	U	+
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	U	+
8260C		75-27-4		0.5	U	+-
8260C 8260C	BROMOFORM BROMOMETHANE	75-25-2	UG_L UG L	1	U	+
8260C 8260C	CARBON DISULFIDE	74-83-9	UG_L	0.5	U	+
					· ·	+
8260C 8260C	CARBON TETRACHLORIDE CHLOROBENZENE	56-23-5 108-90-7	UG_L UG L	0.5	U	+
8260C 8260C	CHLOROBENZENE CHLOROETHANE	75-00-3	UG_L	0.5 1	UJ	+
				-	U	С
8260C	CHLOROFORM	67-66-3	UG_L	0.5		+
8260C	CHLOROMETHANE	74-87-3	UG_L	1	U	+
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	1		+
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U	-
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U	-
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	U	+
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	0.38	J	-
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U	-
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	+
8260C	M- AND P-XYLENE	108-38-3/106-42		11	U	-
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	-
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	U	-
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	_
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	4
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	4
8260C	STYRENE	100-42-5	UG_L	0.5	U	4
8260C	TETRACHLOROETHENE	127-18-4	UG_L	2.1		4
8260C	TOLUENE	108-88-3	UG_L	0.5	U	4
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U	1
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	1
8260C	TRICHLOROETHENE	79-01-6	UG_L	100		1
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	1
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U	
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	
8270D_SIM	1,4-DIOXANE	123-91-1	UG_L	8.7		1

		•	livery Group Lab ID Sample ID Sample Date Sample Type	S: RE103D 6/	SI4462 I4462-4 1-GW-062 22/2015 undwater	
Method	Analyte	CAS No	Units	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.38	J	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	U	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG L	11	J	m,ld
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.51	J	
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.64	J	
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	4.2		
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	3		
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	U	
8260C	2-BUTANONE	78-93-3	UG_L	2.5	U	
8260C	2-HEXANONE	591-78-6	UG L	2.5	UJ	С
8260C	4-METHYL-2-PENTANONE	108-10-1	UG L	2.5	UJ	С
8260C	ACETONE	67-64-1	UG L	3.3	J	С
8260C	BENZENE	71-43-2	UG_L	0.5	U	
8260C	BROMODICHLOROMETHANE	75-27-4	UG L	0.5	Ü	
8260C	BROMOFORM	75-25-2	UG L	0.5	Ü	
8260C	BROMOMETHANE	74-83-9	UG_L	1	Ü	
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	Ü	
8260C	CARBON TETRACHLORIDE	56-23-5	UG L	0.5	U	
8260C	CHLOROBENZENE	108-90-7	UG L	0.5	Ü	
8260C	CHLOROETHANE	75-00-3	UG_L	1	UJ	С
8260C	CHLOROFORM	67-66-3	UG L	0.49	J	
8260C	CHLOROMETHANE	74-87-3	UG L	1	U	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG L	3		
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG L	0.5	U	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG L	0.26	J	
8260C	ETHYLBENZENE	100-41-4	UG L	0.5	Ü	
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	
8260C	METHYL CYCLOHEXANE	108-87-2	UG L	0.5	UJ	m
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	
8260C	O-XYLENE	95-47-6	UG L	0.5	U	
8260C	STYRENE	100-42-5	UG_L	0.5	U	Ì
8260C	TETRACHLOROETHENE	127-18-4	UG_L	4		Ì
8260C	TOLUENE	108-88-3	UG_L	0.5	U	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U	
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG L	0.5	Ü	
8260C	TRICHLOROETHENE	79-01-6	UG_L	810		
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG L	1	U	
8260C	VINYL CHLORIDE	75-01-4	UG L	1	U	
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	UJ	m
3270D_SIM	1,4-DIOXANE	123-91-1	UG_L	16		<del>                                     </del>

			ivery Group Lab ID Sample ID Sample Date Sample Type	S RE103D 6/	SI4462 I4462-5 92-GW-062 22/2015 oundwater	215
Method	Analyte	CAS No	Units	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG L	0.5	U	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG L	0.5	U	-
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG L	4.3	J	+
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG L	0.57	J	+
8260C	1,1-DICHLOROETHANE	75-34-3	UG L	0.5	Ü	+
8260C	1,1-DICHLOROETHENE	75-35-4	UG L	0.81	J	+
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG L	0.5	U	1
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG L	0.75	Ü	+
8260C	1,2-DIBROMOETHANE	106-93-4	UG L	0.5	Ü	+
8260C	1,2-DICHLOROBENZENE	95-50-1	UG L	0.5	U	+
8260C	1,2-DICHLOROETHANE	107-06-2	UG L	0.5	U	+
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG L	1.4	J	+
8260C	1,2-DICHLOROPROPANE	78-87-5	UG L	0.5	U	+
8260C	1,3-DICHLOROBENZENE	541-73-1	UG L	0.5	U	+
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	U	+
8260C	2-BUTANONE	78-93-3	UG_L	2.5	U	+
8260C	2-HEXANONE	591-78-6	UG L	2.5	UJ	С
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	UJ	С
8260C	ACETONE  ACETONE	67-64-1	UG_L	7.3	J	
8260C 8260C	BENZENE	71-43-2	UG_L	0.5	U	С
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	U	+
					U	-
8260C	BROMOFORM	75-25-2	UG_L	0.5		+
8260C	BROMOMETHANE CARRON DISTRICTOR	74-83-9	UG_L	1	U	-
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5		+
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	0.25	J	+
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	U	+
8260C	CHLOROETHANE	75-00-3	UG_L	1	UJ	С
8260C	CHLOROFORM	67-66-3	UG_L	0.94	J	
8260C	CHLOROMETHANE	74-87-3	UG_L	1	U	1
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	1.4		
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U	+
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	U	<b>↓</b>
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	U	
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U	<u> </u>
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	<u> </u>
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	<b>↓</b>
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	<b>↓</b>
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	U	<b>↓</b>
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	
8260C	STYRENE	100-42-5	UG_L	0.5	U	<u> </u>
8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.88	J	
8260C	TOLUENE	108-88-3	UG_L	0.5	U	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U	
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	
8260C	TRICHLOROETHENE	79-01-6	UG_L	770		
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U	
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	
8270D_SIM	1,4-DIOXANE	123-91-1	UG_L	1.9		

		Sample Delivery Group Lab ID SI4462-6 Sample ID Sample Date Sample Type Sample Type Si462 Si462-6 Si46			4462-6 3-GW-062 22/2015	215
Method	Analyte	CAS No	Units	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG L	0.5	U	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG L	0.5	Ü	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG L	2		
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG L	0.5	U	
8260C	1,1-DICHLOROETHANE	75-34-3	UG L	0.5	U	
8260C	1,1-DICHLOROETHENE	75-35-4	UG L	0.47	J	
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	Ü	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG L	0.89	J	
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.69	U	+
8260C 8260C	1,3-DICHLOROPROPAINE  1.3-DICHLOROBENZENE	541-73-1	UG_L UG L	0.5	U	+
				0.5	U	1
8260C 8260C	1,4-DICHLOROBENZENE 2-BUTANONE	106-46-7 78-93-3	UG_L UG_L	2.5	U	+
8260C	2-HEXANONE	591-78-6	UG_L	2.5	UJ	С
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	UJ	С
8260C	ACETONE	67-64-1	UG_L	2.5	UJ	С
8260C	BENZENE	71-43-2	UG_L	0.5	U	
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	U	
8260C	BROMOFORM	75-25-2	UG_L	0.5	U	
8260C	BROMOMETHANE	74-83-9	UG_L	1	U	
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	U	
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	0.5	U	
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	U	
8260C	CHLOROETHANE	75-00-3	UG_L	1	UJ	С
8260C	CHLOROFORM	67-66-3	UG_L	0.69	J	
8260C	CHLOROMETHANE	74-87-3	UG_L	1	U	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	0.89	J	
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	U	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	U	
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U	
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	
8260C	O-XYLENE	95-47-6	UG L	0.5	U	
8260C	STYRENE	100-42-5	UG_L	0.5	U	
8260C	TETRACHLOROETHENE	127-18-4	UG L	0.5	U	
8260C	TOLUENE	108-88-3	UG L	0.5	Ü	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG L	0.5	Ü	1
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG L	0.5	U	1
8260C	TRICHLOROETHENE	79-01-6	UG_L	420	1 -	1
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG L	1	U	1
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U	1
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	1
<u>8260C</u>	1,4-DIOXANE	123-91-1	UG_L UG_L	0.86	U	<u> </u>

		Sample Delivery Group Lab ID SI4462-7 Sample ID DUPLICATE-GW-06 Sample Date Sample Type Field Duplicate			4462-7 E-GW-062 2/2015	462-7 E-GW-062215 2/2015 Duplicate		
Method	Analyte	CAS No	Units	Result	Qual	RC		
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG L	0.44	J	1		
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG L	0.5	U	+		
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG L	22	0	+		
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.6	J	+		
8260C	1,1-DICHLOROETHANE	75-34-3	UG L	0.85	J	+		
8260C	1,1-DICHLOROETHENE	75-34-3	UG_L	4.6	J	+		
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U	+		
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U	+		
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.75	U	+		
		95-50-1				-		
8260C	1,2-DICHLOROBENZENE		UG_L	0.5	U	+		
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	U	+		
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	2.2		<del>                                     </del>		
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U	<del>                                     </del>		
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U	<del>                                     </del>		
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	U	<u> </u>		
8260C	2-BUTANONE	78-93-3	UG_L	2.5	U	<u> </u>		
8260C	2-HEXANONE	591-78-6	UG_L	2.5	UJ	С		
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	UJ	С		
8260C	ACETONE	67-64-1	UG_L	2.5	UJ	С		
8260C	BENZENE	71-43-2	UG_L	0.5	U			
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	U			
8260C	BROMOFORM	75-25-2	UG_L	0.5	U			
8260C	BROMOMETHANE	74-83-9	UG_L	1	U			
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	U			
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	1.3				
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	U			
8260C	CHLOROETHANE	75-00-3	UG_L	1	UJ	С		
8260C	CHLOROFORM	67-66-3	UG_L	0.82	J			
8260C	CHLOROMETHANE	74-87-3	UG_L	1	U			
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	2.2				
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U			
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U			
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	U			
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	U			
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U			
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U			
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U			
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U			
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	U			
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	1		
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	1		
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	1		
8260C	STYRENE	100-42-5	UG_L	0.5	Ü	1		
8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.86	J			
8260C	TOLUENE	108-88-3	UG_L	0.5	Ü	1		
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG L	0.5	U			
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG L	0.5	Ü	<b>†</b>		
8260C	TRICHLOROETHENE	79-01-6	UG L	620		<b>†</b>		
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	†		
8260C	VINYL CHLORIDE	75-01-4	UG L	1	U	†		
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	†		
8270D SIM	1,4-DIOXANE	123-91-1	UG_L	2.4		+-		

		Sample Delivery Group Lab ID SI4462-1: Sample ID RE105D1-GW-0 Sample Date 6/23/201: Sample Type Groundwat				62-11 GW-062315 /2015	
Method	Analyte	CAS No	Units	Result	Qual	RC	
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.35	<b>Q</b>		
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG L	0.5	U		
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG L	8.4	0		
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG L	0.5	U		
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	Ü		
8260C	1,1-DICHLOROETHENE	75-35-4	UG L	1.1			
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG L	0.5	U		
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U		
8260C	1,2-DIBROMOETHANE	106-93-4	UG L	0.5	U		
8260C	1,2-DICHLOROBENZENE	95-50-1	UG L	0.5	Ü		
8260C	1,2-DICHLOROETHANE	107-06-2	UG L	0.5	Ü		
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	1.7	J		
8260C	1,2-DICHLOROPROPANE	78-87-5	UG L	0.5	U	<b>†</b>	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U		
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	Ü		
8260C	2-BUTANONE	78-93-3	UG_L	2.5	U		
8260C	2-HEXANONE	591-78-6	UG L	2.5	U		
8260C	4-METHYL-2-PENTANONE	108-10-1	UG L	2.5	Ü		
8260C	ACETONE	67-64-1	UG L	3.2	j		
8260C	BENZENE	71-43-2	UG L	0.5	U		
8260C	BROMODICHLOROMETHANE	75-27-4	UG L	0.5	U		
8260C	BROMOFORM	75-25-2	UG_L	0.5	Ü		
8260C	BROMOMETHANE	74-83-9	UG_L	1	U		
8260C	CARBON DISULFIDE	75-15-0	UG L	0.5	U		
8260C	CARBON TETRACHLORIDE	56-23-5	UG L	0.5	Ü		
8260C	CHLOROBENZENE	108-90-7	UG L	0.5	Ü		
8260C	CHLOROETHANE	75-00-3	UG L	1	UJ	С	
8260C	CHLOROFORM	67-66-3	UG L	0.5	U		
8260C	CHLOROMETHANE	74-87-3	UG_L	1	U		
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	1.7			
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG L	0.5	U		
8260C	CYCLOHEXANE	110-82-7	UG L	0.5	Ü		
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG L	0.5	Ü		
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG L	0.63	J		
8260C	ETHYLBENZENE	100-41-4	UG L	0.5	Ü		
8260C	ISOPROPYLBENZENE	98-82-8	UG L	0.5	Ü		
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U		
8260C	METHYL ACETATE	79-20-9	UG L	0.75	Ü	1	
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	Ü		
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U		
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U		
8260C	O-XYLENE	95-47-6	UG_L	0.5	U		
8260C	STYRENE	100-42-5	UG_L	0.5	Ü		
8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.5	U		
8260C	TOLUENE	108-88-3	UG_L	0.5	U		
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U		
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	Ì	
8260C	TRICHLOROETHENE	79-01-6	UG_L	120			
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG L	1	U		
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U		
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U		
8270D_SIM	1,4-DIOXANE	123-91-1	UG_L	11			

		Sample Delivery Group Lab ID SI4462-12 Sample ID Sample Date Sample Type SI4462 SI4462-12 RE105D2-GW-06 G/23/2015 Groundwater			1462-12 2-GW-062 23/2015	315
Method	Analyte	CAS No	Units	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.53	J	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	Ü	1
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG L	25		1
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG L	1.1		1
8260C	1,1-DICHLOROETHANE	75-34-3	UG L	1.3		+
8260C	1,1-DICHLOROETHENE	75-35-4	UG L	6		+
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG L	0.5	U	+
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG L	0.75	U	+
8260C	1,2-DIBROMOETHANE	106-93-4	UG L	0.5	U	+
8260C	1,2-DICHLOROBENZENE	95-50-1	UG L	0.5	U	1
8260C	1,2-DICHLOROETHANE	107-06-2	UG L	0.5	U	1
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG L	3.4	- 0	+
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U	+
8260C 8260C	1,2-DICHLOROPROPAINE  1.3-DICHLOROBENZENE	541-73-1	UG_L UG L	0.5	U	+
	, -				U	+
8260C 8260C	1,4-DICHLOROBENZENE 2-BUTANONE	106-46-7 78-93-3	UG_L UG L	0.5 2.5	U	+
						<del></del>
8260C	2-HEXANONE	591-78-6	UG_L	2.5	UJ	С
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	UJ	С
8260C	ACETONE	67-64-1	UG_L	4.2	J	С
8260C	BENZENE	71-43-2	UG_L	0.5	U	
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	U	<u> </u>
8260C	BROMOFORM	75-25-2	UG_L	0.5	U	<u> </u>
8260C	BROMOMETHANE	74-83-9	UG_L	1	U	
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	U	
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	2.7		<del> </del>
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	U	
8260C	CHLOROETHANE	75-00-3	UG_L	1	UJ	С
8260C	CHLOROFORM	67-66-3	UG_L	2.1		
8260C	CHLOROMETHANE	74-87-3	UG_L	1	U	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	3.4		
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	U	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	0.4	J	
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U	
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	<u> </u>
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	<u> </u>
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	
8260C	STYRENE	100-42-5	UG_L	0.5	U	
8260C	TETRACHLOROETHENE	127-18-4	UG_L	1.6		
8260C	TOLUENE	108-88-3	UG_L	0.5	U	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U	
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	
8260C	TRICHLOROETHENE	79-01-6	UG_L	1400		
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U	
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	
8270D_SIM	1,4-DIOXANE	123-91-1	UG_L	6.1		1

Method   Analyte   CAS No	Sample Delivery Group Lab ID Sample ID Sample Date Sample Type					SI4462 SI4462-13 TB-062315 6/23/2015 Trip Blank		
B260C	Method	Analyte	CAS No	Units	Result	Qual	RC	
8260C   1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE   76-13-1   U.G. L   0.5   U	8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	U		
B250C	8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	U		
8260C	8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG_L	0.5	U		
R260C	8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.5	U		
B260C	8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	U		
8260C   1,2-DIBROMO3-CHLIOROPROPANE   96-12-8   U.G. L	8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.5	U		
B260C   1,2-DIGROMOETHANE   106-93-4   UG_L   0.5   U	8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG L	0.5	U		
B260C   1,2-DICHLOROBENZENE   95-50-1   UG_L   0.5   U	8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG L	0.75	U		
B260C   1,2-DICHLOROBENZENE   95-50-1   UG_L   0.5   U	8260C	1,2-DIBROMOETHANE	106-93-4	UG L	0.5	U		
B260C   1,2-DICHLOROETHANE   107-06-2   UG_L   0.5   U		'						
R260C						Ü		
R260C								
B260C								
8260C								
R260C   2-BUTANONE   78-93-3   UG_L   2.5   U								
8260C								
R260C								
8260C   ACETONE   67-64-1   UG_L   2.5   U								
8260C   BENZENE							+	
8260C         BROMODICHLOROMETHANE         75-27-4         UG_L         0.5         U           8260C         BROMOFORM         75-25-2         UG_L         0.5         U           8260C         BROMOMETHANE         74-83-9         UG_L         1         U           8260C         CARBON DISULFIDE         75-15-0         UG_L         0.5         U           8260C         CARBON TETRACHLORIDE         56-23-5         UG_L         0.5         U           8260C         CHLOROBENZENE         108-90-7         UG_L         0.5         U           8260C         CHLOROBENZENE         108-90-7         UG_L         0.5         U           8260C         CHLOROFORM         67-66-3         UG_L         1         UJ           8260C         CHLOROFORM         67-66-3         UG_L         0.5         U           8260C         CHLOROMETHANE         74-87-3         UG_L         0.5         U           8260C         CIS-1,2-DICHLOROFORPENE         156-59-2         UG_L         0.5         U           8260C         CIS-1,3-DICHLOROPROPENE         10061-01-5         UG_L         0.5         U           8260C         CYCLOHEXANE         110-82-7								
8260C         BROMOFORM         75-25-2         UG_L         0.5         U           8260C         BROMOMETHANE         74-83-9         UG_L         1         U           8260C         CARBON DISULFIDE         75-15-0         UG_L         0.5         U           8260C         CARBON TETRACHLORIDE         56-23-5         UG_L         0.5         U           8260C         CHLOROBENZENE         108-90-7         UG_L         0.5         U           8260C         CHLOROFANAN         67-66-3         UG_L         1         UJ           8260C         CHLOROFORM         67-66-3         UG_L         0.5         U           8260C         CHLOROMETHANE         74-87-3         UG_L         1         U           8260C         CHLOROMETHANE         156-59-2         UG_L         0.5         U           8260C         CIS-1,2-DICHLOROPENE         10061-01-5         UG_L         0.5         U           8260C         CIS-1,3-DICHLOROPENE         110-82-7         UG_L         0.5         U           8260C         CYCLOHEXANE         110-82-7         UG_L         0.5         U           8260C         DIBROMOCHLOROMETHANE         12-48-1         UG_								
8260C         BROMOMETHANE         74-83-9         UG_L         1         U           8260C         CARBON DISULFIDE         75-15-0         UG_L         0.5         U           8260C         CARBON TETRACHLORIDE         56-23-5         UG_L         0.5         U           8260C         CHLOROBENZENE         108-90-7         UG_L         0.5         U           8260C         CHLOROETHANE         75-00-3         UG_L         1         UJ           8260C         CHLOROMETHANE         74-87-3         UG_L         0.5         U           8260C         CHLOROMETHANE         74-87-3         UG_L         1         U           8260C         CHLOROMETHANE         156-59-2         UG_L         0.5         U           8260C         CHLOROMETHANE         156-59-2         UG_L         0.5         U           8260C         CIS-1,2-DICHLOROPROPENE         10061-01-5         UG_L         0.5         U           8260C         CIS-1,3-DICHLOROPROPENE         110-82-7         UG_L         0.5         U           8260C         DIBROMOCHLOROMETHANE         110-82-7         UG_L         0.5         U           8260C         DICHLOROMETHANE         75-71-8 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
8260C         CARBON DISULFIDE         75-15-0         UG_L         0.5         U           8260C         CARBON TETRACHLORIDE         56-23-5         UG_L         0.5         U           8260C         CHLOROBENZENE         108-90-7         UG_L         0.5         U           8260C         CHLOROFTHANE         75-00-3         UG_L         1         UJ           8260C         CHLOROFORM         67-66-3         UG_L         0.5         U           8260C         CHLOROMETHANE         74-87-3         UG_L         1         U           8260C         CIS-1,2-DICHLOROFTHENE         156-59-2         UG_L         0.5         U           8260C         CIS-1,3-DICHLOROPROPENE         100-10-15         UG_L         0.5         U           8260C         CYCLOHEXANE         110-82-7         UG_L         0.5         U           8260C         DIBROMOCHLOROMETHANE         124-48-1         UG_L         0.5         U           8260C         DICHLORODIFLUOROMETHANE         75-71-8         UG_L         1         U           8260C         DICHLORODIFLUOROMETHANE         100-41-4         UG_L         0.5         U           8260C         ISOPROPYLEBNZENE								
8260C         CARBON TETRACHLORIDE         56-23-5         UG_L         0.5         U           8260C         CHLOROBENZENE         108-90-7         UG_L         0.5         U           8260C         CHLOROETHANE         75-00-3         UG_L         1         UJ           8260C         CHLOROMETHANE         74-87-3         UG_L         1         U           8260C         CHLOROMETHANE         74-87-3         UG_L         1         U           8260C         CIS-1,2-DICHLOROETHENE         156-59-2         UG_L         0.5         U           8260C         CIS-1,3-DICHLOROPROPENE         10061-01-5         UG_L         0.5         U           8260C         CYCLOHEXANE         110-82-7         UG_L         0.5         U           8260C         DIBROMOCHLOROMETHANE         124-48-1         UG_L         0.5         U           8260C         DICHLORODIFLUOROMETHANE         75-71-8         UG_L         0.5         U           8260C         ETHYLBENZENE         100-41-4         UG_L         0.5         U           8260C         ISOPROPYLBENZENE         98-82-8         UG_L         0.5         U           8260C         ISOPROPYLBENZENE         9								
8260C   CHLOROBENZENE   108-90-7   UG_L   0.5   U								
8260C         CHLOROETHANE         75-00-3         UG_L         1         UJ           8260C         CHLOROFORM         67-66-3         UG_L         0.5         U           8260C         CHLOROMETHANE         74-87-3         UG_L         1         U           8260C         CIS-1,2-DICHLOROPENE         156-59-2         UG_L         0.5         U           8260C         CIS-1,3-DICHLOROPROPENE         10061-01-5         UG_L         0.5         U           8260C         CYCLOHEXANE         110-82-7         UG_L         0.5         U           8260C         DIBROMOCHLOROMETHANE         124-48-1         UG_L         0.5         U           8260C         DICHLORODIFLUOROMETHANE         75-71-8         UG_L         0.5         U           8260C         DICHLORODIFLUOROMETHANE         75-71-8         UG_L         0.5         U           8260C         ETHYLBENZENE         100-41-4         UG_L         0.5         U           8260C         ISOPROPYLBENZENE         98-82-8         UG_L         0.5         U           8260C         METHYLBENZENE         108-38-3/106-42         UG_L         1         U           8260C         METHYL ACETATE <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>								
8260C         CHLOROFORM         67-66-3         UG_L         0.5         U           8260C         CHLOROMETHANE         74-87-3         UG_L         1         U           8260C         CIS-1,2-DICHLOROFHENE         156-59-2         UG_L         0.5         U           8260C         CIS-1,3-DICHLOROPROPENE         10061-01-5         UG_L         0.5         U           8260C         CYCLOHEXANE         110-82-7         UG_L         0.5         U           8260C         DIBROMOCHLOROMETHANE         124-48-1         UG_L         0.5         U           8260C         DICHLORODIFLUOROMETHANE         75-71-8         UG_L         1         U           8260C         ETHYLBENZENE         100-41-4         UG_L         0.5         U           8260C         ETHYLBENZENE         98-82-8         UG_L         0.5         U           8260C         METHYLBENZENE         108-38-3/106-42         UG_L         0.5         U           8260C         METHYLACETATE         79-20-9         UG_L         0.5         U           8260C         METHYL ACETATE         108-87-2         UG_L         0.5         U           8260C         METHYL CYCLOHEXANE         108								
8260C         CHLOROMETHANE         74-87-3         UG_L         1         U           8260C         CIS-1,2-DICHLOROETHENE         156-59-2         UG_L         0.5         U           8260C         CIS-1,3-DICHLOROPROPENE         10061-01-5         UG_L         0.5         U           8260C         CYCLOHEXANE         110-82-7         UG_L         0.5         U           8260C         DIBROMOCHLOROMETHANE         124-48-1         UG_L         0.5         U           8260C         DICHLORODIFLUOROMETHANE         75-71-8         UG_L         1         U           8260C         ETHYLBENZENE         100-41-4         UG_L         0.5         U           8260C         ISOPROPYLBENZENE         98-82-8         UG_L         0.5         U           8260C         ISOPROPYLBENZENE         108-38-3/106-42         UG_L         0.5         U           8260C         METHYL ACYLARE         108-38-3/106-42         UG_L         1         U           8260C         METHYL ACYLARE         108-38-3/106-42         UG_L         0.5         U           8260C         METHYL CYCLOHEXANE         108-87-2         UG_L         0.5         U           8260C         METHYL T							С	
8260C         CIS-1,2-DICHLOROETHENE         156-59-2         UG_L         0.5         U           8260C         CIS-1,3-DICHLOROPROPENE         10061-01-5         UG_L         0.5         U           8260C         CYCLOHEXANE         110-82-7         UG_L         0.5         U           8260C         DIBROMOCHLOROMETHANE         124-48-1         UG_L         0.5         U           8260C         DICHLORODIFLUOROMETHANE         75-71-8         UG_L         1         U           8260C         ETHYLBENZENE         100-41-4         UG_L         0.5         U           8260C         ISOPROPYLBENZENE         98-82-8         UG_L         0.5         U           8260C         ISOPROPYLBENZENE         108-38-3/106-42         UG_L         0.5         U           8260C         M-AND P-XYLENE         108-38-3/106-42         UG_L         1         U           8260C         METHYL ACETATE         79-20-9         UG_L         0.75         U           8260C         METHYL CYCLOHEXANE         108-87-2         UG_L         0.5         U           8260C         METHYL TERT-BUTYL ETHER         1634-04-4         UG_L         0.5         U           8260C         M							-	
8260C         CIS-1,3-DICHLOROPROPENE         10061-01-5         UG_L         0.5         U           8260C         CYCLOHEXANE         110-82-7         UG_L         0.5         U           8260C         DIBROMOCHLOROMETHANE         124-48-1         UG_L         0.5         U           8260C         DICHLORODIFLUOROMETHANE         75-71-8         UG_L         1         U           8260C         ETHYLBENZENE         100-41-4         UG_L         0.5         U           8260C         ISOPROPYLBENZENE         98-82-8         UG_L         0.5         U           8260C         M- AND P-XYLENE         108-38-3/106-42         UG_L         1         U           8260C         METHYL ACETATE         79-20-9         UG_L         0.75         U           8260C         METHYL CYCLOHEXANE         108-87-2         UG_L         0.5         U           8260C         METHYL TERT-BUTYL ETHER         1634-04-4         UG_L         0.5         U           8260C         METHYLENE CHLORIDE         75-09-2         UG_L         0.5         U           8260C         STYRENE         100-42-5         UG_L         0.5         U           8260C         TETRACHLOROETHENE <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td>							-	
8260C         CYCLOHEXANE         110-82-7         UG_L         0.5         U           8260C         DIBROMOCHLOROMETHANE         124-48-1         UG_L         0.5         U           8260C         DICHLORODIFLUOROMETHANE         75-71-8         UG_L         1         U           8260C         ETHYLBENZENE         100-41-4         UG_L         0.5         U           8260C         ISOPROPYLBENZENE         98-82-8         UG_L         0.5         U           8260C         M- AND P-XYLENE         108-38-3/106-42         UG_L         1         U           8260C         METHYL ACETATE         79-20-9         UG_L         0.75         U           8260C         METHYL CYCLOHEXANE         108-87-2         UG_L         0.5         U           8260C         METHYL TERT-BUTYL ETHER         1634-04-4         UG_L         0.5         U           8260C         METHYL TERT-BUTYL ETHER         1634-04-4         UG_L         0.5         U           8260C         METHYLENE CHLORIDE         75-09-2         UG_L         0.5         U           8260C         STYRENE         100-42-5         UG_L         0.5         U           8260C         TETRACHLOROETHENE								
8260C         DIBROMOCHLOROMETHANE         124-48-1         UG_L         0.5         U           8260C         DICHLORODIFLUOROMETHANE         75-71-8         UG_L         1         U           8260C         ETHYLBENZENE         100-41-4         UG_L         0.5         U           8260C         ISOPROPYLBENZENE         98-82-8         UG_L         0.5         U           8260C         M- AND P-XYLENE         108-38-3/106-42         UG_L         1         U           8260C         METHYL ACETATE         79-20-9         UG_L         0.75         U           8260C         METHYL CYCLOHEXANE         108-87-2         UG_L         0.5         U           8260C         METHYL TERT-BUTYL ETHER         1634-04-4         UG_L         0.5         U           8260C         METHYLENE CHLORIDE         75-09-2         UG_L         2.5         U           8260C         O-XYLENE         95-47-6         UG_L         0.5         U           8260C         STYRENE         100-42-5         UG_L         0.5         U           8260C         TETRACHLOROETHENE         127-18-4         UG_L         0.5         U           8260C         TRANS-1,2-DICHLOROETHENE								
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8260C         TOLUENE         108-88-3         UG_L         0.5         U           8260C         TRANS-1,2-DICHLOROETHENE         156-60-5         UG_L         0.5         U           8260C         TRANS-1,3-DICHLOROPROPENE         10061-02-6         UG_L         0.5         U           8260C         TRICHLOROETHENE         79-01-6         UG_L         0.5         U           8260C         TRICHLOROFLUOROMETHANE         75-69-4         UG_L         1         U	8260C	STYRENE	100-42-5	UG_L	0.5	U		
8260C         TRANS-1,2-DICHLOROETHENE         156-60-5         UG_L         0.5         U           8260C         TRANS-1,3-DICHLOROPROPENE         10061-02-6         UG_L         0.5         U           8260C         TRICHLOROETHENE         79-01-6         UG_L         0.5         U           8260C         TRICHLOROFLUOROMETHANE         75-69-4         UG_L         1         U	8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.5	U		
8260C         TRANS-1,3-DICHLOROPROPENE         10061-02-6         UG_L         0.5         U           8260C         TRICHLOROETHENE         79-01-6         UG_L         0.5         U           8260C         TRICHLOROFLUOROMETHANE         75-69-4         UG_L         1         U	8260C	TOLUENE	108-88-3	UG_L	0.5	U		
8260C         TRANS-1,3-DICHLOROPROPENE         10061-02-6         UG_L         0.5         U           8260C         TRICHLOROETHENE         79-01-6         UG_L         0.5         U           8260C         TRICHLOROFLUOROMETHANE         75-69-4         UG_L         1         U		TRANS-1,2-DICHLOROETHENE		UG_L	0.5	U		
8260C         TRICHLOROETHENE         79-01-6         UG_L         0.5         U           8260C         TRICHLOROFLUOROMETHANE         75-69-4         UG_L         1         U	8260C					U		
8260C TRICHLOROFLUOROMETHANE 75-69-4 UG_L 1 U								
							1	
							1	
8260C XYLENES, TOTAL 1330-20-7 UG_L 1.5 U								
8270D_SIM							1	

Notes: UG\_L = NA = Qual = RC = Micrograms per liter Not analyzed Final qualifier (Refer to Attachment B) Reason code (Refer to Attachment C)



### DATA VALIDATION REPORT

Project:	Regional Groundwater Investigation —	NWIRP Bethpage
Laboratory:	Katahdin Analytical	
Sample Delivery Group:	S14496	
Analyses/Method:	Volatile Organic Compounds by U.S. EP 1,4-Dioxane by U.S. EPA SW-846 Metho (SIM)	
Validation Level:	3	
Project Number:	0888812477.SA.DV	
Prepared by:	Dana Miller/Resolution Consultants	Completed on: 07/30/2015
Reviewed by:	Tina Cantwell/Resolution Consultants	File Name: S14496_8260C_8270D

### **SUMMARY**

This report summarizes data review findings for samples listed below, collected by Resolution Consultants from the Regional Groundwater Investigation — NWIRP Bethpage Site on 22 June 2015 in accordance with the following Sampling and Analysis Plans:

- Sampling and Analysis Plan, Bethpage, New York. (Resolution Consultants, April 2013).
- UFP SAP Addendum, Installation of Vertical Profile Borings and Monitoring Wells, Operable Unit 2, NWIRP Bethpage, New York. (Resolution Consultants, November 2013).
- UFP SAP Addendum, Inclusion of Additional Target Analytes for Volatile Organics Analyses, NWIRP Bethpage OU2, Bethpage, New York. (Resolution Consultants, August 2014).

Sample ID	Matrix/Sample Type	Analysis
TT101D1-GW-062215	Groundwater	8260C/8270D_SIM
TT101D2-GW-062215	Groundwater	8260C/8270D_SIM
TT101D-GW-062215	Groundwater	8260C/8270D_SIM

Data validation activities were conducted using the following guidance documents: *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846, specifically Method 8260C, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry* (United States Environmental Protection Agency [U.S. EPA] 2006), *SW-846 Method 8270D, Semivolatile Organic Compounds by Gas Chromatograph/Mass Spectrometry* (U.S. EPA 2007), *U.S. Environmental* 



Protection Agency Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (U.S. EPA, June 2008), and Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.2 (October 2010). In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements, and/or professional judgment were used as appropriate.

#### **REVIEW ELEMENTS**

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody)/sample integrity
- ✓ Holding times and sample preservation
- ✓ Gas chromatography/Mass spectrometer performance checks
- X Initial calibration verification (ICV)/continuing calibration verification (CCV)
- ✓ Laboratory blanks/trip blanks
- ✓ Surrogate spike recoveries
- NA Matrix spike and/or matrix spike duplicate results
- ✓ Laboratory control sample/laboratory control sample duplicate results
- NA Field duplicates
- ✓ Internal standards
- ✓ Sample results/reporting issues

The symbol ( $\checkmark$ ) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Acceptable data parameters for which all criteria were met and no qualification was performed and non-conformance or other issues that were noted during validation, but did not result in qualification of data are not discussed further. The symbol ( $\checkmark$ ) indicates that a QC non-conformance resulted in the qualification of data. Any QC non-conformance that resulted in the qualification of data is discussed below.

#### RESULTS

# **Initial Calibration/Continuing Calibration Verification**

Calibration data were reviewed for conformance with the QC acceptance criteria to ensure that:



- The initial calibration percent relative standard deviation, correlation coefficient/coefficient of determination, and/or response factor method acceptance criteria were met
- The ICV standard percent recovery acceptance criteria were met
- The CCV method percent difference or percent drift and response factor acceptance criteria were met
- The retention time method acceptance criteria were met

Data qualification to the analytes associated with the specific calibration verification was as follows:

## **ICV Recovery Non-conformance:**

Omitania	Actions		
Criteria	Detected Results	Non-detected Results	
Recovery >120%	J	UJ	
Recovery < 80%	J	UJ	

#### Notes:

J = Estimated

UJ = Undetected and estimated

## **CCV Linearity Non-conformance:**

Cuitouio	Actions		
Criteria	Detected Results	Non-detected Results	
%Difference or %Drift > 20%	J	ΩΊ	

#### Notes:

J = Estimated

UJ = Undetected and estimated

ICV and CCV non-conformances are summarized in Attachment A in Tables A-1 and A-2.

## **Qualifications Actions**

The data was reviewed independently from the laboratory to assess data quality. All compounds detected at concentrations less than the limit of quantitation but greater than the method detection limit were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation. Any sample that was analyzed at a dilution because of high concentrations of target or non-target analytes was checked to confirm that the results and/or sample-specific limit of quantitation and limit of detections were adjusted accordingly by the laboratory.



No results were rejected; therefore, analytical completeness was calculated to be 100 percent. Data not qualified during data review are considered usable by the project. The remaining results qualified as estimated may be high or low, but the data are usable for their intended purpose, according to U.S. EPA and Department of Defense guidelines. Final data review qualifiers used to describe results and how they should be interpreted by the end data user are provided in Attachment B and Attachment C. Attachment D provides final results after data review.

### **ATTACHMENTS**

Attachment A: Non-Conformance Summary Tables
Attachment B: Qualifier Codes and Explanations
Attachment C: Reason Codes and Explanations
Attachment D: Final Results after Data Review

Attachment A Non-Conformance Summary Tables

Table A-1 Initial Calibration Verification Non-Conformance							
Method	Method Analyte ICV ID %R Limit Associated Samples Qualifier						
8260C	Chloroethane	P1539A	127.5	80-120	TT101D1-GW-062215	UJ	
8260C	Chloroethane	P1539A	127.5	80-120	TT101D2-GW-062215	UJ	
8260C	Chloroethane	P1539A	127.5	80-120	TT101D-GW-062215	UJ	

## Notes:

ICV ID Initial calibration verification identification

%R Percent recovery

UJ Non-detected analyte in associated sample qualified estimated "UJ" due to potential bias

	Table A-2 Continuing Calibration Verification Non-Conformance							
Method	Analyte CCV ID %D Limit Associated Samples Qualifier							
8260C	Acetone	P1636.D	23.74313	20	TT101D1-GW-062215	UJ		
8260C	Acetone	P1636.D	23.74313	20	TT101D2-GW-062215	J		
8260C	Acetone	P1636.D	23.74313	20	TT101D-GW-062215	J		
8260C	4-Methyl-2-pentanone	P1636.D	22.32254	20	TT101D1-GW-062215	UJ		
8260C	4-Methyl-2-pentanone	P1636.D	22.32254	20	TT101D2-GW-062215	UJ		
8260C	4-Methyl-2-pentanone	P1636.D	22.32254	20	TT101D-GW-062215	UJ		
8260C	2-Hexanone	P1636.D	22.14855	20	TT101D1-GW-062215	UJ		
8260C	2-Hexanone	P1636.D	22.14855	20	TT101D2-GW-062215	UJ		
8260C	2-Hexanone	P1636.D	22.14855	20	TT101D-GW-062215	UJ		

### Notes:

CCV ID Continuing calibration verification identification

Percent difference %D

Non-detected analyte in associated sample qualified estimated "UJ" due to potential bias Detected analyte qualified estimated "J" due to potential bias UJ

J

Attachment B

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit.  However, the reported quantitation limit is approximate and may or may not represent the actual quantitation limit necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

Attachment C Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
bt	Trip blank contamination
С	Calibration issue
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate relative percent difference
h	Holding times
i	Internal standard areas
k	Estimated Maximum Possible Concentration
I	Laboratory control sample
Ic	Labeled compound recovery
ld	Laboratory duplicate relative percent difference
lp	Laboratory control sample/laboratory control sample duplicate relative percent difference
m	Matrix spike recovery
mc	Method compliance non-conformance
md	Matrix spike/matrix spike duplicate relative percent difference
nb	Negative laboratory blank contamination
р	Chemical preservation issue
r	Dual column relative percent difference
q	Quantitation issue
S	Surrogate recovery
su	Ion suppression
t	Temperature preservation issue
х	Percent solids
у	Serial dilution results
Z	Interference check sample results (metals)

Attachment D
Final Results after Data Review

Sample Delivery Group Lab ID Sample ID Sample Date

S14496 S14496-1 TT101D-GW-062215 6/22/2015 Groundwater

			Sample Date		undwater	
Method	Analyte	CAS No	Units	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	U	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	U	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG L	16		
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG L	0.5	U	
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.77	J	
8260C	1,1-DICHLOROETHENE	75-35-4	UG L	3.2		1
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG L	0.5	U	1
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG L	0.75	U	1
8260C	1,2-DIBROMOETHANE	106-93-4	UG L	0.5	U	1
8260C	1,2-DICHLOROBENZENE	95-50-1	UG L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG L	0.5	U	1
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG L	2.8		1
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U	1
8260C	1,3-DICHLOROBENZENE	541-73-1	UG L	0.5	U	1
8260C	1,4-DICHLOROBENZENE	106-46-7	UG L	0.5	Ü	1
8260C	2-BUTANONE	78-93-3	UG L	2.5	Ü	1
8260C	2-HEXANONE	591-78-6	UG L	2.5	UJ	С
8260C	4-METHYL-2-PENTANONE	108-10-1	UG L	2.5	UJ	С
8260C	ACETONE	67-64-1	UG L	3.1	J	С
8260C	BENZENE	71-43-2	UG L	0.5	U	+ -
8260C	BROMODICHLOROMETHANE	75-27-4	UG L	0.5	U	+
8260C	BROMOFORM	75-27-4	UG L	0.5	U	+
8260C	BROMOMETHANE	74-83-9	UG L	1	U	+
8260C	CARBON DISULFIDE	75-15-0	UG L	0.5	U	+
8260C	CARBON TETRACHLORIDE	56-23-5	UG L	0.5	IJ	+
8260C	CHLOROBENZENE	108-90-7	UG L	0.5	U	+
8260C	CHLOROETHANE	75-00-3	UG L	1	UJ	С
8260C	CHLOROFORM	67-66-3	UG L	0.45	J	+-
8260C	CHLOROMETHANE	74-87-3	UG L	1	IJ	+
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG L	2.8	0	+
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG L	0.5	U	+
8260C	CYCLOHEXANE	110-82-7	UG L	0.5	U	+
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	U	+
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	2.1	U	+
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U	+
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	+
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	+
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	+
8260C	METHYL ACETATE  METHYL CYCLOHEXANE	108-87-2	UG_L	0.75	U	+
8260C		1634-04-4	UG_L	0.5	U	+
8260C 8260C	METHYL TERT-BUTYL ETHER METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	+
		95-47-6			U	-
8260C	O-XYLENE STYDENE		UG_L	0.5	ļ	+
8260C	STYRENE	100-42-5	UG_L	0.5	U	+
8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.5		-
8260C	TOLUENE TRANS 1.2 DICHI ODOFTHENE	108-88-3	UG_L	0.5	U	+
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U	+
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	+
8260C	TRICHLOROETHENE	79-01-6	UG_L	66		+
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	+-
8260C	VINYL CHLORIDE	75-01-4	UG_L	1 - 1 -	U	+
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	+-
3270D_SIM	1,4-DIOXANE	123-91-1	UG_L	8.6		

Sample Delivery Group Lab ID Sample ID Sample Date \$14496 \$14496-2 TT101D1-GW-062215 6/22/2015 Groundwater

			Sample Date Sample Type	6/22/2015 Groundwater		
Method	Analyte	CAS No	Units	Result	Qual	R
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	U	† · · ·
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG L	0.5	Ü	
8260C	1.1.2-TRICHLORO-1.2.2-TRIFLUOROETHANE	76-13-1	UG L	16	<u> </u>	
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG L	0.54	J	
8260C	1,1-DICHLOROETHANE	75-34-3	UG L	0.86	J	
8260C	1,1-DICHLOROETHENE	75-35-4	UG L	4.8	,	
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG L	1.8	J	
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG L	0.5	U	-
8260C	2-BUTANONE	78-93-3	UG L	2.5	U	
8260C	2-HEXANONE	591-78-6	UG_L	2.5	UJ	
	4-METHYL-2-PENTANONE	108-10-1	UG_L		UJ	(
8260C 8260C	ACETONE  ACETONE	67-64-1	UG_L	2.5 2.5	UJ	
8260C	BENZENE	71-43-2	UG_L	0.5	U	(
8260C 8260C	BROMODICHLOROMETHANE	71-43-2	UG_L UG L	0.5	U	
8260C	BROMOFORM BROMOMETHANE	75-25-2 74-83-9	UG_L	0.5 1	U	
8260C			UG_L	· ·	U	
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	U	
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	2.2		
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	U	
8260C	CHLOROETHANE	75-00-3	UG_L	1 0.05	UJ	-
8260C	CHLOROFORM	67-66-3	UG_L	0.95	J	-
8260C	CHLOROMETHANE	74-87-3	UG_L	1	U	-
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	1.8		-
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	U	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1.8	J	-
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U	
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	-
8260C	M- AND P-XYLENE	108-38-3/106-42		1	U	
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	
8260C	O-XYLENE .	95-47-6	UG_L	0.5	U	
8260C	STYRENE	100-42-5	UG_L	0.5	U	
8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.5	U	
8260C	TOLUENE	108-88-3	UG_L	0.5	U	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U	
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	
8260C	TRICHLOROETHENE	79-01-6	UG_L	180		
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U	
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	
3270D_SIM	1,4-DIOXANE	123-91-1	UG_L	8.7		

		Sa	Lab ID Sample ID Imple Date Imple Type	TT101D2 6/2	4496-3 2-GW-0622 22/2015 Indwater	15
Method	Analyte	CAS No	Units	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	U	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG L	0.5	U	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG L	24		
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG L	0.57	J	
8260C	1,1-DICHLOROETHANE	75-34-3	UG L	0.79	J	
8260C	1,1-DICHLOROETHENE	75-35-4	UG L	4.8		
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG L	2		
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	Ü	
8260C	2-BUTANONE	78-93-3	UG L	2.5	U	
8260C	2-HEXANONE	591-78-6	UG L	2.5	UJ	С
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	UJ	С
8260C	ACETONE	67-64-1	UG L	2.3	J	С
8260C	BENZENE	71-43-2	UG L	0.5	U	
8260C	BROMODICHLOROMETHANE	75-27-4	UG L	0.5	U	
8260C	BROMOFORM	75-25-2	UG L	0.5	U	
8260C	BROMOMETHANE	74-83-9	UG L	1	U	
8260C	CARBON DISULFIDE	75-15-0	UG L	0.5	U	
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	1.4		
8260C	CHLOROBENZENE	108-90-7	UG L	0.5	U	
8260C	CHLOROETHANE	75-00-3	UG_L	1	UJ	С
8260C	CHLOROFORM	67-66-3	UG L	0.85	J	
8260C	CHLOROMETHANE	74-87-3	UG L	1	U	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG L	2		
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	Ü	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	Ü	
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	Ü	
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	
8260C	STYRENE	100-42-5	UG_L	0.5	U	
8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.82	J	
8260C	TOLUENE	108-88-3	UG_L	0.5	U	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U	
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	
8260C	TRICHLOROETHENE	79-01-6	UG_L	620		
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U	
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	
8270D_SIM	1,4-DIOXANE	123-91-1	UG_L	2.3		

Notes: UG\_L = Qual = RC = Micrograms per liter Final qualifier (Refer to Attachment B) Reason code (Refer to Attachment C)



## **DATA VALIDATION REPORT**

Project:	Regional Groundwater Investigation — NWIRP Bethpage		
Laboratory:	Katahdin Analytical		
Sample Delivery Group:	S14556		
Analyses/Method:	Volatile Organic Compounds by U.S. EP 1,4-Dioxane by U.S. EPA SW-846 Metho (SIM)		
Validation Level:	3		
Project Number:	0888812477.SA.DV		
Prepared by:	Dana Miller/Resolution Consultants	Completed on: 07/30/2015	
Reviewed by:	Tina Cantwell/Resolution Consultants	File Name: S14556_8260C_8270D	

## **SUMMARY**

This report summarizes data review findings for samples listed below, collected by Resolution Consultants from the Regional Groundwater Investigation — NWIRP Bethpage Site on 24 and 25 June 2015 in accordance with the following Sampling and Analysis Plans:

- Sampling and Analysis Plan, Bethpage, New York. (Resolution Consultants, April 2013).
- UFP SAP Addendum, Installation of Vertical Profile Borings and Monitoring Wells, Operable Unit 2, NWIRP Bethpage, New York. (Resolution Consultants, November 2013).
- UFP SAP Addendum, Inclusion of Additional Target Analytes for Volatile Organics Analyses, NWIRP Bethpage OU2, Bethpage, New York. (Resolution Consultants, August 2014).

Sample ID	Matrix/Sample Type	Analysis
BPOW5-6-GW-062415	Groundwater	8260C/8270D_SIM
BPOW5-5-GW-062415	Groundwater	8260C/8270D_SIM
RE118D1-GW-062415	Groundwater	8260C/8270D_SIM
RE108D1-GW-062415	Groundwater	8260C/8270D_SIM
RE108D2-GW-062415	Groundwater	8260C/8270D_SIM
BPOW6-5-GW-062515	Groundwater	8260C/8270D_SIM
BPOW6-6-GW-062515	Field Duplicate	8260C/8270D_SIM
RE117D1-GW-062515	Groundwater	8260C/8270D_SIM
TRIPBLANK-062515	Trip Blank	8260C



Data validation activities were conducted using the following guidance documents: *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846, specifically Method 8260C, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry* (United States Environmental Protection Agency [U.S. EPA] 2006), *SW-846 Method 8270D, Semivolatile Organic Compounds by Gas Chromatograph/Mass Spectrometry* (U.S. EPA 2007), *U.S. Environmental Protection Agency Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (U.S. EPA, June 2008), and *Department of Defense Quality Systems Manual for Environmental Laboratories*, Version 4.2 (October 2010). In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements, and/or professional judgment were used as appropriate.

#### **REVIEW ELEMENTS**

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody)/sample integrity
- ✓ Holding times and sample preservation
- ✓ Gas chromatography/Mass spectrometer performance checks
- X Initial calibration verification (ICV)/continuing calibration verification (CCV)
- ✓ Laboratory blanks/trip blanks
- ✓ Surrogate spike recoveries
- NA Matrix spike and/or matrix spike duplicate results
- ✓ Laboratory control sample/laboratory control sample duplicate results
- NA Field duplicates
- ✓ Internal standards
- ✓ Sample results/reporting issues

The symbol ( $\checkmark$ ) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Acceptable data parameters for which all criteria were met and no qualification was performed and non-conformance or other issues that were noted during validation, but did not result in qualification of data are not discussed further. The symbol (X) indicates that a QC non-conformance resulted in the qualification of data. Any QC non-conformance that resulted in the qualification of data is discussed below.



### **RESULTS**

# **Initial Calibration/Continuing Calibration Verification**

Calibration data were reviewed for conformance with the QC acceptance criteria to ensure that:

- The initial calibration percent relative standard deviation, correlation coefficient/coefficient of determination, and/or response factor method acceptance criteria were met
- The ICV standard percent recovery acceptance criteria were met
- The CCV method percent difference or percent drift and response factor acceptance criteria were met
- The retention time method acceptance criteria were met

Data qualification to the analytes associated with the specific calibration verification was as follows:

# **ICV Recovery Non-conformance:**

Criteria	Actions			
Criteria	Detected Results	Non-detected Results		
Recovery >120%	J	UJ		
Recovery < 80%	J	UJ		

#### Notes:

J = Estimated

UJ = Undetected and estimated

ICV non-conformances are summarized in Attachment A in Table A-1.

### **Qualifications Actions**

The data was reviewed independently from the laboratory to assess data quality. All compounds detected at concentrations less than the limit of quantitation but greater than the method detection limit were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation. Any sample that was analyzed at a dilution because of high concentrations of target or non-target analytes was checked to confirm that the results and/or sample-specific limit of quantitation and limit of detections were adjusted accordingly by the laboratory.



No results were rejected; therefore, analytical completeness was calculated to be 100 percent. Data not qualified during data review are considered usable by the project. The remaining results qualified as estimated may be high or low, but the data are usable for their intended purpose, according to U.S. EPA and Department of Defense guidelines. Final data review qualifiers used to describe results and how they should be interpreted by the end data user are provided in Attachment B and Attachment C. Attachment D provides final results after data review.

### **ATTACHMENTS**

Attachment A: Non-Conformance Summary Tables
Attachment B: Qualifier Codes and Explanations
Attachment C: Reason Codes and Explanations
Attachment D: Final Results after Data Review

Attachment A Non-Conformance Summary Table

Table A-1 Initial Calibration Verification Non-Conformance							
Method	Analyte	ICV ID	%R	Limit	Associated Samples	Qualifier	
8260C	Chloroethane	P1539A	127.5	80-120	BPOW5-6-GW-062415	UJ	
8260C	Chloroethane	P1539A	127.5	80-120	BPOW5-5-GW-062415	UJ	
8260C	Chloroethane	P1539A	127.5	80-120	RE118D1-GW-062415	UJ	
8260C	Chloroethane	P1539A	127.5	80-120	RE108D1-GW-062415	UJ	
8260C	Chloroethane	P1539A	127.5	80-120	RE108D2-GW-062415	UJ	
8260C	Chloroethane	P1539A	127.5	80-120	BPOW6-5-GW-062515	UJ	
8260C	Chloroethane	P1539A	127.5	80-120	BPOW6-6-GW-062515	UJ	
8260C	Chloroethane	P1539A	127.5	80-120	RE117D1-GW-062515	UJ	
8260C	Chloroethane	P1539A	127.5	80-120	TRIPBLANK-062515	UJ	

# Notes:

Initial calibration verification identification Percent recovery ICV ID =

%R

UJ Non-detected analyte in associated sample qualified estimated "UJ" due to potential bias Attachment B

Qualifier Codes and Explanations

Qualifier	Explanation		
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.		
UJ	The analyte was not detected above the reported sample quantitation limit.  However, the reported quantitation limit is approximate and may or may not represent the actual quantitation limit necessary to accurately and precisely measure the analyte in the sample.		
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.		

Attachment C Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
bt	Trip blank contamination
С	Calibration issue
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate relative percent difference
h	Holding times
i	Internal standard areas
k	Estimated Maximum Possible Concentration
I	Laboratory control sample
Ic	Labeled compound recovery
ld	Laboratory duplicate relative percent difference
lp	Laboratory control sample/laboratory control sample duplicate relative percent difference
m	Matrix spike recovery
mc	Method compliance non-conformance
md	Matrix spike/matrix spike duplicate relative percent difference
nb	Negative laboratory blank contamination
р	Chemical preservation issue
r	Dual column relative percent difference
q	Quantitation issue
S	Surrogate recovery
su	Ion suppression
t	Temperature preservation issue
Х	Percent solids
У	Serial dilution results
Z	Interference check sample results (metals)

Attachment D
Final Results after Data Review

Sample Delivery Group Lab ID Sample ID Sample Date

\$14556 \$14556-1 BPOW5-6-GW-062415 6/24/2015 Groundwater

	Sample Type					
Method	Analyte	CAS No	Units	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG L	0.5	U	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG L	0.5	Ü	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG L	0.5	U	
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG L	0.5	U	
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	Ü	
8260C	1,1-DICHLOROETHENE	75-35-4	UG L	0.5	U	
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG L	0.75	Ü	
8260C	1,2-DIBROMOETHANE	106-93-4	UG L	0.5	Ü	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG L	1	Ü	
8260C	1,2-DICHLOROPROPANE	78-87-5	UG L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG L	0.5	U	
8260C	2-BUTANONE	78-93-3	UG L	12	0	1
8260C	2-HEXANONE	591-78-6	UG_L	2.5	U	1
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	U	1
8260C	ACETONE	67-64-1	UG_L	2.5	U	1
	BENZENE				U	
8260C 8260C		71-43-2 75-27-4	UG_L UG L	0.5 0.5	U	
8260C 8260C	BROMODICHLOROMETHANE				U	
	BROMOFORM	75-25-2	UG_L	0.5	_	
8260C	BROMOMETHANE	74-83-9	UG_L	1	U	-
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	U	1
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	0.5	U	
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	U	1
8260C	CHLOROETHANE	75-00-3	UG_L	1	UJ	С
8260C	CHLOROFORM	67-66-3	UG_L	0.5	U	
8260C	CHLOROMETHANE	74-87-3	UG_L	11	U	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	0.5	U	
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	U	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	U	
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U	
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	
8260C	STYRENE	100-42-5	UG_L	0.5	U	
8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.5	U	
8260C	TOLUENE	108-88-3	UG_L	0.74	J	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U	
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	
8260C	TRICHLOROETHENE	79-01-6	UG_L	0.45	J	
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U	
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	
8270D_SIM	1,4-DIOXANE	123-91-1	UG_L	0.17	U	

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8260C 8260C 8260C 8260C 8260C 8260C 8260C 8260C	Analyte  1,1,1-TRICHLOROETHANE  1,1,2,2-TETRACHLOROETHANE  1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	71-55-6 79-34-5	Units UG_L	Result 0.5	<b>Qual</b> U	RC
8260C 8260C 8260C 8260C 8260C	1,1,2,2-TETRACHLOROETHANE			0.5	- 11	
8260C 8260C 8260C 8260C		79-34-5			U	
8260C 8260C 8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		UG_L	0.5	U	
8260C 8260C		76-13-1	UG_L	0.5	U	
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.5	U	
	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	U	
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.5	U	
	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG L	1	U	T
8260C	1,2-DICHLOROPROPANE	78-87-5	UG L	0.5	U	1
8260C	1,3-DICHLOROBENZENE	541-73-1	UG L	0.5	U	1
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	U	1
8260C	2-BUTANONE	78-93-3	UG L	2.5	U	1
8260C	2-HEXANONE	591-78-6	UG L	2.5	Ü	1
8260C	4-METHYL-2-PENTANONE	108-10-1	UG L	2.5	U	+
8260C	ACETONE	67-64-1	UG_L	8		+
8260C	BENZENE	71-43-2	UG L	0.5	U	+
8260C	BROMODICHLOROMETHANE	75-27-4	UG L	0.5	U	
8260C	BROMOFORM	75-25-2	UG L	0.5	U	
8260C	BROMOMETHANE	74-83-9	UG_L	1	U	
8260C	CARBON DISULFIDE	75-15-0	UG L	0.5	U	+
8260C	CARBON TETRACHLORIDE	56-23-5	UG L	0.5	U	+
8260C	CHLOROBENZENE	108-90-7	UG L	0.5	U	+
8260C	CHLOROETHANE	75-00-3	UG L	1	UJ	(
8260C	CHLOROFORM	67-66-3	UG L	0.5	U	+
8260C	CHLOROMETHANE	74-87-3	UG_L	1	U	+
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	0.5	U	+
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG L	0.5	U	+
8260C	CYCLOHEXANE	110-82-7	UG L	0.5	U	-
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG L	0.5	U	+
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG L	1	U	+
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U	+
8260C	ISOPROPYLBENZENE	98-82-8	UG L	0.5	U	+
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	+
	METHYL ACETATE		UG_L		U	+
8260C 8260C	METHYL ACETATE  METHYL CYCLOHEXANE	79-20-9 108-87-2	UG_L UG L	0.75 0.5	IJ	+
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG L	0.5	U	+
		1			U	+
8260C 8260C	METHYLENE CHLORIDE O-XYLENE	75-09-2 95-47-6	UG_L UG_L	2.5 0.5	U	+-
8260C	STYRENE	100-42-5		0.5	U	+
8260C		127-18-4	UG_L UG L		U	+
	TETRACHLOROETHENE			0.5		+
8260C	TOLUENE TRANS 1.2 DICHLODOFTHENE	108-88-3	UG_L	0.5	U	+
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U	+
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5		+-
8260C	TRICHLOROETHENE	79-01-6	UG_L	0.5	U	+
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	₩
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U	1
8260C 3270D_SIM	XYLENES, TOTAL 1,4-DIOXANE	1330-20-7 123-91-1	UG_L UG_L	1.5 0.18	U	4

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	Sample Type		Groundwater			
Method	Analyte	CAS No	Units	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	U	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	U	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG_L	0.5	U	
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.5	U	
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	U	
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.5	U	
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	1	U	
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG L	0.5	U	
8260C	2-BUTANONE	78-93-3	UG L	2.5	U	
8260C	2-HEXANONE	591-78-6	UG L	2.5	U	
8260C	4-METHYL-2-PENTANONE	108-10-1	UG L	2.5	U	
8260C	ACETONE	67-64-1	UG L	2.7	J	
8260C	BENZENE	71-43-2	UG L	0.5	U	
8260C	BROMODICHLOROMETHANE	75-27-4	UG L	0.5	Ü	
8260C	BROMOFORM	75-25-2	UG_L	0.5	Ü	
8260C	BROMOMETHANE	74-83-9	UG L	1	U	
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	Ü	
8260C	CARBON TETRACHLORIDE	56-23-5	UG L	0.5	Ü	
8260C	CHLOROBENZENE	108-90-7	UG L	0.5	Ü	
8260C	CHLOROETHANE	75-00-3	UG L	1	UJ	(
8260C	CHLOROFORM	67-66-3	UG_L	0.5	U	-
8260C	CHLOROMETHANE	74-87-3	UG_L	1	U	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	0.5	U	
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	U	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG L	0.5 1	U	
8260C	ETHYLBENZENE ETHYLBENZENE	100-41-4	UG L	0.5	U	
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.75	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	
8260C	STYRENE	100-42-5	UG_L	0.5	U	
8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.5	U	
8260C 8260C	TOLUENE	108-88-3	UG_L UG L	0.38	J	-
8260C 8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L UG L	0.38	U	
8260C 8260C	TRANS-1,2-DICHLOROETHENE TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L UG L	0.5	U	-
	·					-
8260C	TRICHLOROETHENE	79-01-6	UG_L	0.5	U	-
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	-
8260C	VINYL CHLORIDE  XYLENES, TOTAL	75-01-4 1330-20-7	UG_L UG_L	1 1.5	U	-
8260C			110-1	ı h		

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		Sample Type		Groundwater		
Method	Analyte	CAS No	Units	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	U	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	U	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG_L	1		
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.5	U	
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	U	
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.5	U	
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	0.34	J	
8260C	1,2-DICHLOROPROPANE	78-87-5	UG L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG L	0.5	U	
8260C	2-BUTANONE	78-93-3	UG L	2.5	U	
8260C	2-HEXANONE	591-78-6	UG L	2.5	U	
8260C	4-METHYL-2-PENTANONE	108-10-1	UG L	2.5	U	
8260C	ACETONE	67-64-1	UG L	2.5	Ü	
8260C	BENZENE	71-43-2	UG L	0.5	Ü	
8260C	BROMODICHLOROMETHANE	75-27-4	UG L	0.5	Ü	
8260C	BROMOFORM	75-25-2	UG_L	0.5	Ü	
8260C	BROMOMETHANE	74-83-9	UG L	1	Ü	
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	U	
8260C	CARBON TETRACHLORIDE	56-23-5	UG L	0.5	Ü	
8260C	CHLOROBENZENE	108-90-7	UG L	0.5	Ü	
8260C	CHLOROETHANE	75-00-3	UG L	1	UJ	С
8260C	CHLOROFORM	67-66-3	UG L	0.5	U	
8260C	CHLOROMETHANE	74-87-3	UG L	1	Ü	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG L	0.34	J	
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG L	0.5	Ü	
8260C	CYCLOHEXANE	110-82-7	UG L	0.5	Ü	1
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG L	0.5	U	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG L	1	U	
8260C	ETHYLBENZENE ETHYLBENZENE	100-41-4	UG L	0.5	U	
8260C	ISOPROPYLBENZENE	98-82-8	UG L	0.5	Ü	
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	Ü	
8260C	METHYL ACETATE	79-20-9	UG L	0.75	U	
8260C	METHYL CYCLOHEXANE	108-87-2	UG L	0.5	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG L	0.5	Ü	
8260C	METHYLENE CHLORIDE	75-09-2	UG L	2.5	U	
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	
8260C	STYRENE	100-42-5	UG L	0.5	U	
8260C	TETRACHLOROETHENE	127-18-4	UG_L	1.4		
8260C	TOLUENE	108-88-3	UG L	0.5	U	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG L	0.5	U	<del>                                     </del>
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG L	0.5	U	<del>                                     </del>
8260C	TRICHLOROETHENE	79-01-6	UG_L	110		<del>                                     </del>
8260C 8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG L	1	U	
8260C	VINYL CHLORIDE	75-01-4	UG L	1	U	<del>                                     </del>
8260C 8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	<del>                                     </del>
			_		U	<del>                                     </del>
8270D_SIM	1,4-DIOXANE	123-91-1	UG_L	5.2		

		Sa	very Group Lab ID Sample ID mple Date mple Type	S RE108D 6/	SI4556 I4556-5 2-GW-062 24/2015 oundwater	415
Method	Analyte	CAS No	Units	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.98	J	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	U	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG_L	6.8		
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	1.8		
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	4.6		
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	6.6		
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	8.1		
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	U	
8260C	2-BUTANONE	78-93-3	UG_L	2.5	U	
8260C	2-HEXANONE	591-78-6	UG L	2.5	U	
8260C	4-METHYL-2-PENTANONE	108-10-1	UG L	2.5	U	
8260C	ACETONE	67-64-1	UG L	2.5	U	
8260C	BENZENE	71-43-2	UG_L	0.5	U	
8260C	BROMODICHLOROMETHANE	75-27-4	UG L	0.5	U	
8260C	BROMOFORM	75-25-2	UG L	0.5	U	
8260C	BROMOMETHANE	74-83-9	UG L	1	Ü	
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	U	
8260C	CARBON TETRACHLORIDE	56-23-5	UG L	1.5	, j	
8260C	CHLOROBENZENE	108-90-7	UG L	0.5	U	
8260C	CHLOROETHANE	75-00-3	UG L	1	UJ	С
8260C	CHLOROFORM	67-66-3	UG L	3.5	- 03	
8260C	CHLOROMETHANE	74-87-3	UG L	1	U	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	8.1	- ŭ	
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG L	0.5	U	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	U	
8260C	ETHYLBENZENE  ETHYLBENZENE	100-41-4	UG L	0.5	U	
8260C	ISOPROPYLBENZENE	98-82-8	UG L	0.5	U	
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.73	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG L	2.5	U	
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	
8260C	STYRENE	100-42-5	UG L		U	
8260C 8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.5 2.2	U	
8260C	TOLUENE	108-88-3	UG_L	0.5	U	
		156-60-5	_			1
8260C	TRANS-1,2-DICHLOROETHENE		UG_L	0.5	U	1
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	
8260C	TRICHLOROETHENE	79-01-6	UG_L	3900		
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	<del>                                     </del>
8260C 8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U	
	XYLENES, TOTAL	1330-20-7	UG L	1.5	U	1

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Method	Analyte	CAS No	Units	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG L	0.5	U	<del>                                     </del>
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	U	+
8260C		76-13-1	UG_L	0.5	U	+
	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE					+
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.5	U	+
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	U	+
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.5	U	<del></del>
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	U	_
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	U	_
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	U	4
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	1	U	
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	U	
8260C	2-BUTANONE	78-93-3	UG_L	2.5	U	
8260C	2-HEXANONE	591-78-6	UG_L	2.5	U	
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	U	
8260C	ACETONE	67-64-1	UG_L	2.5	U	
8260C	BENZENE	71-43-2	UG_L	0.5	U	
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	U	
8260C	BROMOFORM	75-25-2	UG_L	0.5	U	Ī
8260C	BROMOMETHANE	74-83-9	UG_L	1	U	
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	U	1
8260C	CARBON TETRACHLORIDE	56-23-5	UG L	0.5	U	1
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	U	
8260C	CHLOROETHANE	75-00-3	UG_L	1	UJ	С
8260C	CHLOROFORM	67-66-3	UG L	0.5	U	1
8260C	CHLOROMETHANE	74-87-3	UG L	1	U	1
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG L	0.5	U	
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG L	0.5	U	1
8260C	CYCLOHEXANE	110-82-7	UG L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG L	0.5	Ü	†
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG L	1	Ü	T
8260C	ETHYLBENZENE	100-41-4	UG L	0.5	U	1
8260C	ISOPROPYLBENZENE	98-82-8	UG L	0.5	U	1
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	T
8260C	METHYL ACETATE	79-20-9	UG L	0.75	U	†
8260C	METHYL CYCLOHEXANE	108-87-2	UG L	0.75	U	t
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	t
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	+
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	+-
8260C	STYRENE	100-42-5	UG_L	0.5	U	+-
8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.5	U	+-
8260C 8260C	TOLUENE	127-18-4	UG_L UG L	0.76	J	+-
8260C 8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L UG L	0.76	U	+-
						+
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	+
8260C	TRICHLOROETHENE	79-01-6	UG_L	0.5	U	+
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	+
8260C	VINYL CHLORIDE	75-01-4	UG_L	11	U	₩
8260C	XYLENES, TOTAL	1330-20-7	UG_L UG_L	1.5	U	

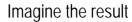
		Sample D	elivery Group Lab ID Sample ID Sample Date Sample Type	SI4556 SI4556-7RA BPOW6-6-GW-062515 6/25/2015 Groundwater			
Method	Analyte	CAS No	Units	Result	Qual	RC	
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	U		
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	U		
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG_L	0.5	U		
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.5	U		
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	U		
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.5	U		
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U		
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U		
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	U		
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	U		
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	U		
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	1	U		
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U		
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U		
8260C	1,4-DICHLOROBENZENE	106-46-7	UG L	0.5	U		
8260C	2-BUTANONE	78-93-3	UG L	2.5	U		
8260C	2-HEXANONE	591-78-6	UG L	2.5	U		
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	U		
8260C	ACETONE	67-64-1	UG_L	2.5	U		
8260C	BENZENE	71-43-2	UG L	0.5	Ü		
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	U		
8260C	BROMOFORM	75-25-2	UG_L	0.5	U		
8260C	BROMOMETHANE	74-83-9	UG_L	1	Ü		
8260C	CARBON DISULFIDE	75-15-0	UG L	0.5	U		
8260C	CARBON TETRACHLORIDE	56-23-5	UG L	0.5	U		
8260C	CHLOROBENZENE	108-90-7	UG L	0.5	U		
8260C	CHLOROETHANE	75-00-3	UG L	1	UJ	С	
8260C	CHLOROFORM	67-66-3	UG_L	0.5	U	Ŭ	
8260C	CHLOROMETHANE	74-87-3	UG L	1	U		
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG L	0.5	U		
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG L	0.5	U		
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U		
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG L	0.5	U		
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG L	1	U		
8260C	ETHYLBENZENE	100-41-4	UG L	0.5	U		
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U		
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U		
8260C	METHYL ACETATE	79-20-9	UG L	0.75	U		
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.75	U		
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U		
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U		
8260C 8260C	O-XYLENE	95-47-6	UG_L	0.5	U		
8260C 8260C	STYRENE	100-42-5	UG_L	0.5	U		
8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.5	U		
8260C	TOLUENE	108-88-3	UG L	1	-		
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG L	0.5	U		
8260C 8260C	TRANS-1,2-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U		
8260C 8260C	TRICHLOROETHENE	79-01-6	UG_L	0.5	U		
8260C 8260C		75-69-4	UG_L UG L	1	U	-	
	TRICHLOROFLUOROMETHANE		UG_L UG L		U		
8260C	VINYL CHLORIDE	75-01-4		1 1 5			
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U		
8270D_SIM	1,4-DIOXANE	123-91-1	UG_L	0.17	U		

		Sample D	Lab ID Sample ID Sample Date Sample Type	SI4556 SI4556-8 RE117D1-GW-062515 6/25/2015 Groundwater			
Method	Analyte	CAS No	Units	Result	Qual	RC	
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	U		
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	U		
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG_L	0.5	U		
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.5	U		
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	U		
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.5	U		
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U		
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U		
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	U		
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	U		
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	U		
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	1	U		
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U		
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U		
8260C	1,4-DICHLOROBENZENE	106-46-7	UG L	0.5	U		
8260C	2-BUTANONE	78-93-3	UG L	2.1	J		
8260C	2-HEXANONE	591-78-6	UG L	2.5	U		
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	U		
8260C	ACETONE	67-64-1	UG_L	2.5	Ü		
8260C	BENZENE	71-43-2	UG L	0.5	Ü		
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	U		
8260C	BROMOFORM	75-25-2	UG_L	0.5	U		
8260C	BROMOMETHANE	74-83-9	UG_L	1	Ü		
8260C	CARBON DISULFIDE	75-15-0	UG L	0.5	U		
8260C	CARBON TETRACHLORIDE	56-23-5	UG L	0.5	U		
8260C	CHLOROBENZENE	108-90-7	UG L	0.5	U		
8260C	CHLOROETHANE	75-00-3	UG L	1	UJ	С	
8260C	CHLOROFORM	67-66-3	UG_L	0.5	U		
8260C	CHLOROMETHANE	74-87-3	UG L	1	U		
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	0.5	U		
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG L	0.5	U		
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U		
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG L	0.5	U		
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	U		
8260C	ETHYLBENZENE	100-41-4	UG L	0.5	U		
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U		
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U		
8260C	METHYL ACETATE	79-20-9	UG L	0.75	U		
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.75	U		
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U		
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U		
8260C 8260C	O-XYLENE	95-47-6	UG_L	0.5	U		
8260C	STYRENE	100-42-5	UG_L	0.5	U		
8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.5	U		
8260C 8260C	TOLUENE	108-88-3	UG_L	0.5	U		
8260C 8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U		
8260C 8260C	TRANS-1,2-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U		
8260C 8260C	TRICHLOROETHENE	79-01-6	UG_L UG L	7.8	U		
8260C 8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L UG L		U		
			UG_L UG L	1	U		
8260C	VINYL CHLORIDE	75-01-4		1 5			
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U		
8270D_SIM	1,4-DIOXANE	123-91-1	UG_L	0.17	U	1	

		Sample D	elivery Group Lab ID Sample ID Sample Date Sample Type	SI4556 SI4556-9 TRIPBLANK-062515 6/24/2015 Trip Blank			
Method	Analyte	CAS No	Units	Result	Qual	RC	
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	U		
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	U		
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG_L	0.5	U		
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.5	U		
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	U		
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.5	U		
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U		
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U		
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	U		
8260C	1,2-DICHLOROBENZENE	95-50-1	UG L	0.5	U		
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	U		
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	1	U		
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U		
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U		
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	U		
8260C	2-BUTANONE	78-93-3	UG L	2.5	Ü		
8260C	2-HEXANONE	591-78-6	UG_L	2.5	U		
8260C	4-METHYL-2-PENTANONE	108-10-1	UG L	2.5	Ü		
8260C	ACETONE	67-64-1	UG_L	2.5	Ü		
8260C	BENZENE	71-43-2	UG_L	0.5	Ü		
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	U		
8260C	BROMOFORM	75-25-2	UG_L	0.5	U		
8260C	BROMOMETHANE	74-83-9	UG L	1	U		
8260C	CARBON DISULFIDE	75-15-0	UG L	0.5	U		
8260C	CARBON DISCETIBE  CARBON TETRACHLORIDE	56-23-5	UG L	0.5	U	+	
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	U		
8260C	CHLOROETHANE	75-00-3	UG L	1	UJ	С	
8260C	CHLOROFORM	67-66-3	UG L	0.5	U	L L	
8260C	CHLOROMETHANE	74-87-3	UG L	1	U		
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	0.5	U		
8260C	CIS-1,3-DICHLOROPROPENE				U		
8260C 8260C	CYCLOHEXANE	10061-01-5 110-82-7	UG_L UG L	0.5 0.5	U		
		124-48-1			U	-	
8260C	DIBROMOCHLOROMETHANE		UG_L	0.5			
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	U		
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U		
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U		
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U		
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U		
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	U		
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	1	
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	-	
8260C	O-XYLENE	95-47-6	UG_L	0.5	U		
8260C	STYRENE	100-42-5	UG_L	0.5	U	1	
8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.5	U	1	
8260C	TOLUENE	108-88-3	UG_L	0.5	U	1	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U		
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U		
8260C	TRICHLOROETHENE	79-01-6	UG_L	0.5	U		
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U		
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U		
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U		
8270D_SIM	1,4-DIOXANE	123-91-1	UG_L	NA			

Notes: UG\_L = NA = Qual = RC = Micrograms per liter Not analyzed Final qualifier (Refer to Attachment B) Reason code (Refer to Attachment C)

# Appendix C Analytical Data Validation – Arcadis





## Northrop Grumman Corporation-Operable Unit 2

## **Data Review**

BETHPAGE, NEW YORK

Volatile Analysis

SDG #JB97939

Analyses Performed By: Accutest Laboratories Dayton, New Jersey

Report #23878R July 17, 2015 Review Level: Tier II Project #NY001496.1514.NAVI4

## **SUMMARY**

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #JB97939 for samples collected in association with the Northrop Grumman-Bethpage Site. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

			Sample			,	Analysis	6	
Sample ID	Lab ID	Matrix	Collection Date	Parent Sample	voc	svoc	РСВ	MET	MISC
BPOW 5-3	JB97939-1	Water	06/25/2015		Χ				
FB062515AM1	JB97939-2	Water	06/25/2015		Х				
TB062515KAM1	JB97939-3	Water	06/25/2015		Х				

## **ANALYTICAL DATA PACKAGE DOCUMENTATION**

## **GENERAL INFORMATION**

Items Reviewed		Reported		mance ptable	Not	
	No	Yes	No	Yes	Required	
1. Sample receipt condition		Х		Х		
2. Requested analyses and sample results		Х		Х		
3. Collection Technique (grab, composite, etc.)		Х		Х		
4. Methods of analysis		Х		Х		
5. Reporting limits		Х		Х		
6. Sample collection date		Х		Х		
7. Laboratory sample received date		Х	Х			
8. Sample preservation verification (as applicable)		Х		X		
9. Sample preparation/extraction/analysis dates		Х		Х		
10. Fully executed Chain-of-Custody (COC) form completed		Х		Х		
11. Narrative summary of QA or sample problems provided		Х		Х		
12. Data Package Completeness and Compliance		Х		Х		

QA - Quality Assurance

## **VOLATILE ANALYSIS INTRODUCTION**

Analyses were performed according to United States Environmental Protection Agency (USEPA), Method 524.2. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
  - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
  - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
  - UB Compound considered non-detect at the listed value due to associated blank contamination.
  - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
  - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## **VOLATILE ORGANIC COMPOUND (VOC) ANALYSES**

## 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
EPA 524.2	Water	14 days from collection to analysis	Cool to < 6°C; preserved to a pH of less than 2 s.u

s.u. Standard units

All samples were analyzed within the specified holding time and temperature criteria.

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

All compounds associated with the QA blanks exhibited a concentration less than the MDL, with the exception of the compounds listed in the following table. Sample results associated with QA blank contamination that were greater than the BAL resulted in the removal of the laboratory qualifier (B) of data. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Locations	Analytes	Sample Result	Qualification
BPOW 5-2	TICs: Isopropyl alcohol (RT: 7.48)	Detected sample results less than 5 times blank result	R

## 3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

## 4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established

acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

A MS analysis was not performed on a sample location associated with this SDG.

#### 5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

## 6. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate was not collected with a sample location associated with this SDG.

## 7. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A laboratory duplicate was not performed on a sample location associated with this SDG.

#### 8. System Performance and Overall Assessment

Tentatively identified compounds (TICs) were identified in sample locations BPOW 5-3, FB062515AM1 and TB062515AM1. The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. TICs are qualified as estimated (JN).

Overall system performance was noted by the laboratory in the case narrative as acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## **DATA VALIDATION CHECKLIST FOR VOCs**

VOCs: 524.2	Rep	orted		mance otable	Not Required
	No	Yes	No	Yes	Required
GAS CHROMATOGRAPHY/MASS SPECTROME	TRY (GC/	MS)			
Tier II Validation					
Holding times & Temperature		Х		X	
Reporting limits (units)		Х		Х	
Blanks					
A. Method blanks		Х		Х	
B. Equipment blanks		Х	Х		
C. Trip blanks		Х	Х		
Surrogate (%R)		Х		Х	
Laboratory Control Sample (%R)		Х		Х	
Laboratory Control Sample Duplicate(LCSD)					Х
LCS/LCSD Precision (RPD)					Х
Matrix Spike (MS)					Х
Matrix Spike Duplicate(MSD)					Х
MS/MSD Precision (RPD)					Х
Field/Lab Duplicate (RPD)		Х		Х	
Dilution Factor		Х		Х	
Moisture Content					Х

<sup>%</sup>R Percent Recovery RPD Relative Percent Difference

VALIDATION PERFORMED BY: Lisa Horton

SIGNATURE:

DATE: July 17, 2015

PEER REVIEW BY: Todd Church

DATE: July 20, 2015

## CHAIN OF CUSTODY/ CORRECTED SAMPLE ANALYSIS DATA SHEETS

GW. JFB

## CHAIN OF CUSTODY

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JB97939: Chain of Custody

Page 1 of 2



## **Report of Analysis**

By

MD

n/a

Client Sample ID: BPOW 5-3 Lab Sample ID: JB97939-1

File ID

Matrix: AQ - Water
Method: EPA 524.2 REV 4.1

Analyzed

06/30/15

Project: Northrop Grumman, OU2 Hydro, Bethpage, NY

DF

1

Prep Date Prep Batch Analytical Batch

n/a

06/26/15

V1B4648

**Date Sampled:** 06/25/15

**Date Received:** 

**Percent Solids:** 

n/a

Run #1 Run #2

**Purge Volume** 

1B97998.D

Run #1 5.0 ml

Run #2

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	0.91	ug/l	
78-93-3	2-Butanone	ND	5.0	0.57	ug/l	
71-43-2	Benzene	ND	0.50	0.057	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.082	ug/l	
75-25-2	Bromoform	ND	0.50	0.046	ug/l	
74-83-9	Bromomethane	ND	0.50	0.077	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.028	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.027	ug/l	
75-00-3	Chloroethane	ND	0.50	0.037	ug/l	
67-66-3	Chloroform	ND	0.50	0.031	ug/l	
74-87-3	Chloromethane	ND	0.50	0.044	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.074	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.039	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.054	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.034	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.082	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.042	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.039	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.081	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.033	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.063	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.033	ug/l	
76-13-1	Freon 113	ND	1.0	0.10	ug/l	
591-78-6	2-Hexanone	ND	2.0	0.084	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.047	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	0.27	ug/l	
100-42-5	Styrene	ND	0.50	0.028	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.050	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.035	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.052	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.091	ug/l	
108-88-3	Toluene	ND	0.50	0.044	ug/l	

 $ND = Not detected \qquad MDL = N$ 

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



## **Report of Analysis**

Client Sample ID: BPOW 5-3
Lab Sample ID: JB97939-1
Matrix: AQ - Water

**Method:** EPA 524.2 REV 4.1

Northrop Grumman, OU2 Hydro, Bethpage, NY

Date Sampled: 06/25/15
Date Received: 06/26/15
Percent Solids: n/a

## **Special VOA List**

**Project:** 

CAS No.	Compound	Result	RL	MDL	Units	Q		
79-01-6 75-01-4	Trichloroethylene Vinyl chloride	ND ND	0.50 0.50	0.024 0.032	ug/l ug/l			
95-47-6	m,p-Xylene o-Xylene	ND ND	0.50 0.50	0.13 0.029	ug/l ug/l			
CAS No.	Surrogate Recoveries	Recoveries Run# 1 R		Lim	its			
2199-69-1 460-00-4	1,2-Dichlorobenzene-d4 4-Bromofluorobenzene	93% 86%		78-1 77-1				
CAS No.	Tentatively Identified Compo	vely Identified Compounds			Conc.	Units	Q	
67-63-0	Isopropyl Alcohol Total TIC, Volatile		7.48	.68 .68		ug/l ug/l	JN J	R

ND = Not detected MDL = Method Detection Limit J = I

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



## 4

## **Report of Analysis**

Client Sample ID: FB062515AM1

Lab Sample ID:JB97939-2Date Sampled:06/25/15Matrix:AQ - Field Blank WaterDate Received:06/26/15Method:EPA 524.2 REV 4.1Percent Solids:n/a

Project: Northrop Grumman, OU2 Hydro, Bethpage, NY

	File ID	DF	Analyzed	By	<b>Prep Date</b>	<b>Prep Batch</b>	Analytical Batch
Run #1	1B98024.D	1	07/02/15	MD	n/a	n/a	V1B4650
Run #2							

Purge Volume Run #1 5.0 ml

Run #2

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	6.6	5.0	0.91	ug/l	
78-93-3	2-Butanone	ND	5.0	0.57	ug/l	
71-43-2	Benzene	ND	0.50	0.057	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.082	ug/l	
75-25-2	Bromoform	ND	0.50	0.046	ug/l	
74-83-9	Bromomethane	ND	0.50	0.077	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.028	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.027	ug/l	
75-00-3	Chloroethane	ND	0.50	0.037	ug/l	
67-66-3	Chloroform	0.14	0.50	0.031	ug/l	J
74-87-3	Chloromethane	0.38	0.50	0.044	ug/l	J
56-23-5	Carbon tetrachloride	ND	0.50	0.074	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.039	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.054	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.034	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.082	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.042	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.039	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.081	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.033	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.063	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.033	ug/l	
76-13-1	Freon 113	ND	1.0	0.10	ug/l	
591-78-6	2-Hexanone	ND	2.0	0.084	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.047	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	0.27	ug/l	
100-42-5	Styrene	ND	0.50	0.028	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.050	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.035	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.052	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.091	ug/l	
108-88-3	Toluene	ND	0.50	0.044	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



Page 2 of 2

## **Report of Analysis**

Client Sample ID: FB062515AM1

Lab Sample ID: JB97939-2 **Date Sampled:** 06/25/15 Matrix: AQ - Field Blank Water Date Received: 06/26/15 Method: **Percent Solids:** EPA 524.2 REV 4.1 n/a

**Project:** Northrop Grumman, OU2 Hydro, Bethpage, NY

## Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q	
79-01-6 75-01-4 95-47-6	Trichloroethylene Vinyl chloride m,p-Xylene o-Xylene	ND ND ND ND	0.50 0.50 0.50 0.50	0.024 0.032 0.13 0.029	ug/l ug/l ug/l ug/l		
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi	ts		
2199-69-1 460-00-4	1,2-Dichlorobenzene-d4 4-Bromofluorobenzene		78-11 77-11				
CAS No.	Tentatively Identified Compo	unds	R.T.	Est.	Conc.	Units	Q
67-63-0 78-84-2	Isopropyl Alcohol Propanal, 2-methyl- unknown alcohols		7.46 8.71 9.66 10.12	80 1.4 1.4 .62		ug/l ug/l ug/l ug/l	JN JN J N J N
78-83-1 15045-43-9 104-76-7	1-Propanol, 2-methyl- Furan, tetrahydro-2,2,5,5-tetra 1-Hexanol, 2-ethyl- Total TIC, Volatile	10.83 12.87 17.36	2.6 2.3 .89 89.21	I	ug/l ug/l ug/l ug/l	JN JN JN JN	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



## **Report of Analysis**

Client Sample ID: TB062515AM1

 Lab Sample ID:
 JB97939-3
 Date Sampled:
 06/25/15

 Matrix:
 AQ - Trip Blank Water
 Date Received:
 06/26/15

 Method:
 EPA 524.2 REV 4.1
 Percent Solids:
 n/a

Project: Northrop Grumman, OU2 Hydro, Bethpage, NY

File ID DF **Prep Date Analytical Batch** Analyzed By **Prep Batch** Run #1 1B98000.D 1 06/30/15 MD n/aV1B4648 n/aRun #2

Purge Volume

Run #1 5.0 ml

Run #2

#### **Special VOA List**

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	2.2	5.0	0.91	ug/l	J
78-93-3	2-Butanone	ND	5.0	0.57	ug/l	
71-43-2	Benzene	ND	0.50	0.057	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.082	ug/l	
75-25-2	Bromoform	ND	0.50	0.046	ug/l	
74-83-9	Bromomethane	ND	0.50	0.077	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.028	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.027	ug/l	
75-00-3	Chloroethane	ND	0.50	0.037	ug/l	
67-66-3	Chloroform	0.14	0.50	0.031	ug/l	J
74-87-3	Chloromethane	ND	0.50	0.044	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.074	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.039	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.054	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.034	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.082	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.042	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.039	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.081	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.033	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.063	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.033	ug/l	
76-13-1	Freon 113	ND	1.0	0.10	ug/l	
591-78-6	2-Hexanone	ND	2.0	0.084	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.047	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	0.27	ug/l	
100-42-5	Styrene	ND	0.50	0.028	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.050	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.035	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.052	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.091	ug/l	
108-88-3	Toluene	ND	0.50	0.044	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 

 $N = \ \ Indicates \ presumptive \ evidence \ of \ a \ compound$ 



Page 2 of 2

## **Report of Analysis**

Client Sample ID: TB062515AM1

Lab Sample ID:JB97939-3Date Sampled:06/25/15Matrix:AQ - Trip Blank WaterDate Received:06/26/15Method:EPA 524.2 REV 4.1Percent Solids:n/a

**Project:** Northrop Grumman, OU2 Hydro, Bethpage, NY

## Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q	
79-01-6	Trichloroethylene	ND	0.50	0.024	ug/l		
75-01-4	Vinyl chloride	ND	0.50	0.032	ug/l		
	m,p-Xylene	ND	0.50	0.13	ug/l		
95-47-6	o-Xylene	ND	0.50	0.029	ug/l		
CAS No.	Surrogate Recoveries	Run# 1	un# 1 Run# 2 Limits				
2199-69-1	1,2-Dichlorobenzene-d4	93%		78-1	14%		
460-00-4	4-Bromofluorobenzene	88%		77-1			
100 00 1	Bromonuorosenzene	0070		,, 1	1570		
CAS No.	Tentatively Identified Compo	ounds	R.T.	Est.	Conc.	Units	Q
67-63-0	Isopropyl Alcohol		7.47	2.6		ug/l	JN
	Total TIC, Volatile			2.6		ug/l	$J_{\hbox{\scriptsize N}}$

ND = Not detected MDL = Method Detection Limit J = Indicates an expression of the property of the proper

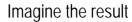
RL = Reporting Limit

E = Indicates value exceeds calibration range

 $J = \ Indicates \ an \ estimated \ value$ 

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound







## Northrop Grumman Corporation-Operable Unit 2

## **Data Review**

BETHPAGE, NEW YORK

Volatile Analysis

SDG #JB97537

Analyses Performed By: Accutest Laboratories Dayton, New Jersey

Report #23905R July 9, 2015 Review Level: Tier II Project #NY001496.1514.NAVI4

#### **SUMMARY**

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #JB97537 for samples collected in association with the Northrop Grumman-Bethpage Site. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

			Sample		Analysis				
Sample ID	Lab ID Matrix Collection Date	Collection Date	Parent Sample	voc	svoc	РСВ	MET	MISC	
BPOW 5-1	JB97537-1	Water	06/18/2015		Х				
TB061815KV1	JB97537-2	Water	06/18/2015		Х				
FB061815KV1	JB97537-3	Water	06/18/2015		Х				
FB061915KV1	JB97537-4	Water	06/19/2015		Х				
TB061915KV1	JB97537-5	Water	06/19/2015		Х				
BPOW 5-2	JB97537-6	Water	06/19/2015		Х				

#### Note:

<sup>1.</sup> Sample TB061815KV1 was inadvertently logged in at the laboratory as collected on June 19, 2015.

## **ANALYTICAL DATA PACKAGE DOCUMENTATION**

## **GENERAL INFORMATION**

Items Reviewed		Reported		mance ptable	Not	
	No	Yes	No	Yes	Required	
1. Sample receipt condition		Х		Х		
2. Requested analyses and sample results		Х		Х		
3. Collection Technique (grab, composite, etc.)		Х		Х		
4. Methods of analysis		Х		Х		
5. Reporting limits		Х		Х		
6. Sample collection date		Х		Х		
7. Laboratory sample received date		Х	Х			
8. Sample preservation verification (as applicable)		Х		X		
9. Sample preparation/extraction/analysis dates		Х		Х		
10. Fully executed Chain-of-Custody (COC) form completed		Х		Х		
11. Narrative summary of QA or sample problems provided		Х		Х		
12. Data Package Completeness and Compliance		Х		Х		

QA - Quality Assurance

## **VOLATILE ANALYSIS INTRODUCTION**

Analyses were performed according to United States Environmental Protection Agency (USEPA), Method 524.2. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
  - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
  - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
  - UB Compound considered non-detect at the listed value due to associated blank contamination.
  - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
  - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## **VOLATILE ORGANIC COMPOUND (VOC) ANALYSES**

## 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
EPA 524.2	Water	14 days from collection to analysis	Cool to < 6°C; preserved to a pH of less than 2 s.u

s.u. Standard units

All samples were analyzed within the specified holding time and temperature criteria.

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

All compounds associated with the QA blanks exhibited a concentration less than the MDL, with the exception of the compounds listed in the following table. Sample results associated with QA blank contamination that were greater than the BAL resulted in the removal of the laboratory qualifier (B) of data. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Locations	Analytes	Sample Result	Qualification	
	Acetone	Detected sample results <rl <bal<="" and="" td=""><td>"UB" at the RL</td></rl>	"UB" at the RL	
BPOW 5-1	TICs: Isopropyl alcohol (RT: 7.46) Propanal, 2-methyl (RT: 8.71)	Detected sample results less than 5 times blank result	R	
BPOW 5-2	Acetone	Detected sample results <rl <bal<="" and="" td=""><td>"UB" at the RL</td></rl>	"UB" at the RL	
	TICs: Isopropyl alcohol (RT: 7.46)	Detected sample results less than 5 times blank result	R	

RL Reporting limit

## 3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

## 4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

A MS analysis was not performed on a sample location associated with this SDG.

#### 5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

#### 6. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate was not collected on a sample location associated with this SDG.

#### 7. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A laboratory duplicate was not performed on a sample location associated with this SDG.

#### 8. System Performance and Overall Assessment

Tentatively identified compounds (TICs) were identified in sample locations BPOW 5-1, TB061815KV1, FB061815KV1 and BPOW 5-2. The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. TICs are qualified as estimated (JN).

Overall system performance was noted by the laboratory in the case narrative as acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## **DATA VALIDATION CHECKLIST FOR VOCs**

VOCs: 524.2	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
GAS CHROMATOGRAPHY/MASS SPECTROME	TRY (GC/	MS)			
Tier II Validation					
Holding times & Temperature		Х		Х	
Reporting limits (units)		Х		Х	
Blanks					
A. Method blanks		Х		Х	
B. Equipment blanks		Х	Х		
C. Trip blanks		Х	Х		
Surrogate (%R)		Х		Х	
Laboratory Control Sample (%R)		Х		Х	
Laboratory Control Sample Duplicate(LCSD)					Х
LCS/LCSD Precision (RPD)					Х
Matrix Spike (MS)					Х
Matrix Spike Duplicate(MSD)					Х
MS/MSD Precision (RPD)					Х
Field/Lab Duplicate (RPD)					Х
Dilution Factor		Х		Х	
Moisture Content					Х

<sup>%</sup>R Percent Recovery RPD Relative Percent Difference

VALIDATION PERFORMED BY: Lisa Horton

SIGNATURE: XISA HORLAN

DATE: July 9, 2015

PEER REVIEW BY: Todd Church

DATE: \_ July 20, 2015

# CHAIN OF CUSTODY/ CORRECTED SAMPLE ANALYSIS DATA SHEETS

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$\sim$ $^{\prime}$	2235 Route 130, Dayton, NJ 08810

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JB97537: Chain of Custody

Page 1 of 3



**Date Sampled:** 06/18/15

06/19/15

# **Report of Analysis**

Client Sample ID: BPOW 5-1 Lab Sample ID: JB97537-1

Matrix:AQ - WaterDate Received:06/Method:EPA 524.2 REV 4.1Percent Solids:n/a

**Project:** Northrop Grumman, OU2 Hydro, Bethpage, NY

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch
Run #1 1B97890.D 1 06/26/15 MD n/a n/a V1B4644

Run #2

**Purge Volume** 

Run #1 5.0 ml

Run #2

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q	
67-64-1	Acetone 5.0	1.0	5.0	0.91	ug/l	<del></del>	UB
78-93-3	2-Butanone	ND	5.0	0.57	ug/l		
71-43-2	Benzene	ND	0.50	0.057	ug/l		
75-27-4	Bromodichloromethane	ND	0.50	0.082	ug/l		
75-25-2	Bromoform	ND	0.50	0.046	ug/l		
74-83-9	Bromomethane	ND	0.50	0.077	ug/l		
75-15-0	Carbon disulfide	ND	0.50	0.028	ug/l		
108-90-7	Chlorobenzene	ND	0.50	0.027	ug/l		
75-00-3	Chloroethane	ND	0.50	0.037	ug/l		
67-66-3	Chloroform	ND	0.50	0.031	ug/l		
74-87-3	Chloromethane	ND	0.50	0.044	ug/l		
56-23-5	Carbon tetrachloride	ND	0.50	0.074	ug/l		
75-34-3	1,1-Dichloroethane	ND	0.50	0.039	ug/l		
75-35-4	1,1-Dichloroethylene	ND	0.50	0.054	ug/l		
107-06-2	1,2-Dichloroethane	ND	0.50	0.034	ug/l		
78-87-5	1,2-Dichloropropane	ND	0.50	0.082	ug/l		
124-48-1	Dibromochloromethane	ND	0.50	0.042	ug/l		
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.039	ug/l		
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.081	ug/l		
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.033	ug/l		
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.063	ug/l		
100-41-4	Ethylbenzene	ND	0.50	0.033	ug/l		
76-13-1	Freon 113	ND	1.0	0.10	ug/l		
591-78-6	2-Hexanone	ND	2.0	0.084	ug/l		
75-09-2	Methylene chloride	ND	0.50	0.047	ug/l		
108-10-1	4-Methyl-2-pentanone	ND	2.0	0.27	ug/l		
100-42-5	Styrene	ND	0.50	0.028	ug/l		
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.050	ug/l		
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.035	ug/l		
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.052	ug/l		
127-18-4	Tetrachloroethylene	ND	0.50	0.091	ug/l		
108-88-3	Toluene	ND	0.50	0.044	ug/l		

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 

N = Indicates presumptive evidence of a compound



**Date Sampled:** 06/18/15

06/19/15

n/a

**Date Received:** 

**Percent Solids:** 

## +

# **Report of Analysis**

Client Sample ID: BPOW 5-1 Lab Sample ID: JB97537-1

Matrix: AQ - Water
Method: EPA 524.2 REV 4.1

Project: Northrop Grumman, OU2 Hydro, Bethpage, NY

# Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q		
79-01-6 75-01-4	Trichloroethylene Vinyl chloride	ND ND	0.50 0.50	0.024 0.032	ug/l ug/l			
95-47-6	m, p-Xylene o-Xylene	ND ND	0.50 0.50	0.13 0.029	ug/l ug/l			
CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Limi	its			
2199-69-1 460-00-4	1,2-Dichlorobenzene-d4 4-Bromofluorobenzene	88% 85%		78-1 77-1				
CAS No.	<b>Tentatively Identified Compo</b>	ounds	R.T.	Est.	Conc.	Units	Q	
108-11-2 78-84-2	Isopropyl alcohol Propanal, 2-methyl- Total TIC, Volatile	_	7.46 -8.71	1.1 .92 2.02		ug/l ug/l ug/l	JN JN J	R R

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value



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## 4

# **Report of Analysis**

 Client Sample ID:
 TB061815KV1
 06/18/15

 Lab Sample ID:
 JB97537-2
 Date Sampled:
 06/19/15

 Matrix:
 AQ - Trip Blank Water
 Date Received:
 06/19/15

 Method:
 EPA 524.2 REV 4.1
 Percent Solids:
 n/a

Project: Northrop Grumman, OU2 Hydro, Bethpage, NY

File ID DF **Prep Date Analytical Batch** Analyzed By **Prep Batch** Run #1 1B97891.D 1 06/26/15 MD V1B4644 n/an/aRun #2

Purge Volume
Run #1 5.0 ml
Run #2

#### **Special VOA List**

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	1.1	5.0	0.91	ug/l	J
78-93-3	2-Butanone	ND	5.0	0.57	ug/l	
71-43-2	Benzene	ND	0.50	0.057	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.082	ug/l	
75-25-2	Bromoform	ND	0.50	0.046	ug/l	
74-83-9	Bromomethane	ND	0.50	0.077	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.028	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.027	ug/l	
75-00-3	Chloroethane	ND	0.50	0.037	ug/l	
67-66-3	Chloroform	0.17	0.50	0.031	ug/l	J
74-87-3	Chloromethane	ND	0.50	0.044	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.074	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.039	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.054	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.034	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.082	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.042	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.039	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.081	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.033	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.063	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.033	ug/l	
76-13-1	Freon 113	ND	1.0	0.10	ug/l	
591-78-6	2-Hexanone	ND	2.0	0.084	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.047	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	0.27	ug/l	
100-42-5	Styrene	ND	0.50	0.028	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.050	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.035	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.052	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.091	ug/l	
108-88-3	Toluene	ND	0.50	0.044	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value



Page 2 of 2

# **Report of Analysis**

 Client Sample ID:
 TB061815KV1
 06/18/15

 Lab Sample ID:
 JB97537-2
 Date Sampled:
 -06/19/15

 Matrix:
 AQ - Trip Blank Water
 Date Received:
 06/19/15

 Method:
 EPA 524.2 REV 4.1
 Percent Solids:
 n/a

**Project:** Northrop Grumman, OU2 Hydro, Bethpage, NY

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q	
79-01-6 75-01-4 95-47-6	Trichloroethylene Vinyl chloride m,p-Xylene o-Xylene	ND ND ND ND	0.50 0.50 0.50 0.50	0.024 0.032 0.13 0.029	ug/l ug/l ug/l ug/l		
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its		
2199-69-1 460-00-4	1,2-Dichlorobenzene-d4 4-Bromofluorobenzene	88% 89%		78-1 77-1	/ -		
CAS No.	Tentatively Identified Compo	ounds	R.T.	Est.	Conc.	Units	Q
67-63-0	Isopropyl Alcohol unknown Total TIC, Volatile		7.47 9.68	2.4 .51 2.91		ug/l ug/l ug/l	JN J N J <sub>N</sub>

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value



Client Sample ID: FB061815KV1

Lab Sample ID:JB97537-3Date Sampled:06/18/15Matrix:AQ - Field Blank WaterDate Received:06/19/15Method:EPA 524.2 REV 4.1Percent Solids:n/a

Project: Northrop Grumman, OU2 Hydro, Bethpage, NY

	File ID	DF	Analyzed	$\mathbf{B}\mathbf{y}$	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	1B97892.D	1	06/26/15	MD	n/a	n/a	V1B4644
Dun #2							

Purge Volume
Run #1 5.0 ml
Run #2

#### **Special VOA List**

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	1.5	5.0	0.91	ug/l	J
78-93-3	2-Butanone	ND	5.0	0.57	ug/l	
71-43-2	Benzene	ND	0.50	0.057	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.082	ug/l	
75-25-2	Bromoform	ND	0.50	0.046	ug/l	
74-83-9	Bromomethane	ND	0.50	0.077	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.028	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.027	ug/l	
75-00-3	Chloroethane	ND	0.50	0.037	ug/l	
67-66-3	Chloroform	ND	0.50	0.031	ug/l	
74-87-3	Chloromethane	ND	0.50	0.044	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.074	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.039	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.054	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.034	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.082	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.042	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.039	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.081	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.033	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.063	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.033	ug/l	
76-13-1	Freon 113	ND	1.0	0.10	ug/l	
591-78-6	2-Hexanone	ND	2.0	0.084	ug/l	
75-09-2	Methylene chloride	0.21	0.50	0.047	ug/l	J
108-10-1	4-Methyl-2-pentanone	ND	2.0	0.27	ug/l	
100-42-5	Styrene	ND	0.50	0.028	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.050	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.035	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.052	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.091	ug/l	
108-88-3	Toluene	ND	0.50	0.044	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value



Page 2 of 2

# **Report of Analysis**

Client Sample ID: FB061815KV1

Lab Sample ID:JB97537-3Date Sampled:06/18/15Matrix:AQ - Field Blank WaterDate Received:06/19/15Method:EPA 524.2 REV 4.1Percent Solids:n/a

Project: Northrop Grumman, OU2 Hydro, Bethpage, NY

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q	
79-01-6 75-01-4	Trichloroethylene Vinyl chloride m,p-Xylene o-Xylene	ND ND ND ND	0.50 0.50 0.50 0.50	0.024 0.032 0.13 0.029	ug/l ug/l ug/l ug/l		
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi	ts		
2199-69-1 460-00-4	1,2-Dichlorobenzene-d4 4-Bromofluorobenzene	86% 91%		78-1 77-1			
CAS No.	Tentatively Identified Compo	ounds	R.T.	Est.	Conc.	Units	Q
67-63-0 78-84-2	Isopropyl Alcohol Propanal, 2-methyl- Total TIC, Volatile		7.46 8.71	4.5 .93 5.43		ug/l ug/l ug/l	JN JN J N

ND = Not detected MDL = Method Detection Limit J = Indicates

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value



Client Sample ID: FB061915KV1

Lab Sample ID:JB97537-4Date Sampled:06/19/15Matrix:AQ - Field Blank WaterDate Received:06/19/15Method:EPA 524.2 REV 4.1Percent Solids:n/a

**Project:** Northrop Grumman, OU2 Hydro, Bethpage, NY

**Analytical Batch** File ID DF Analyzed By **Prep Date Prep Batch** Run #1 1B97893.D 1 06/26/15 MD V1B4644 n/an/aRun #2

Purge Volume Run #1 5.0 ml

Run #2

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	1.3	5.0	0.91	ug/l	J
78-93-3	2-Butanone	ND	5.0	0.57	ug/l	
71-43-2	Benzene	ND	0.50	0.057	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.082	ug/l	
75-25-2	Bromoform	ND	0.50	0.046	ug/l	
74-83-9	Bromomethane	ND	0.50	0.077	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.028	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.027	ug/l	
75-00-3	Chloroethane	ND	0.50	0.037	ug/l	
67-66-3	Chloroform	0.11	0.50	0.031	ug/l	J
74-87-3	Chloromethane	ND	0.50	0.044	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.074	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.039	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.054	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.034	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.082	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.042	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.039	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.081	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.033	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.063	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.033	ug/l	
76-13-1	Freon 113	ND	1.0	0.10	ug/l	
591-78-6	2-Hexanone	ND	2.0	0.084	ug/l	
75-09-2	Methylene chloride	0.31	0.50	0.047	ug/l	J
108-10-1	4-Methyl-2-pentanone	ND	2.0	0.27	ug/l	
100-42-5	Styrene	ND	0.50	0.028	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.050	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.035	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.052	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.091	ug/l	
108-88-3	Toluene	ND	0.50	0.044	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value



Client Sample ID: FB061915KV1

Lab Sample ID: JB97537-4 **Date Sampled:** 06/19/15 Matrix: AQ - Field Blank Water Date Received: 06/19/15 Method: **Percent Solids:** EPA 524.2 REV 4.1 n/a

Northrop Grumman, OU2 Hydro, Bethpage, NY **Project:** 

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q	
79-01-6 75-01-4	Trichloroethylene	ND ND	0.50	0.024	ug/l		
	Vinyl chloride m,p-Xylene	ND ND	0.50 0.50	0.032 0.13	ug/l ug/l		
95-47-6	o-Xylene	ND	0.50	0.029	ug/l		
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi	ts		
2199-69-1 460-00-4	1,2-Dichlorobenzene-d4 4-Bromofluorobenzene	86% 87%		78-1 77-1			
CAS No.	Tentatively Identified Compo	ounds	R.T.	Est.	Conc.	Units	Q
67-63-0	Isopropyl Alcohol Total TIC, Volatile		7.46	5.1 5.1		ug/l ug/l	JN J N

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value



Client Sample ID: TB061915KV1

Lab Sample ID: JB97537-5 **Date Sampled:** 06/19/15 Matrix: AQ - Trip Blank Water **Date Received:** 06/19/15 Method: **Percent Solids:** EPA 524.2 REV 4.1 n/a

**Project:** Northrop Grumman, OU2 Hydro, Bethpage, NY

File ID **Analytical Batch** DF Analyzed By **Prep Date Prep Batch** Run #1 1B97894.D 1 06/26/15 MD V1B4644 n/an/aRun #2

**Purge Volume** Run #1 5.0 ml

Run #2

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	0.91	ug/l	
78-93-3	2-Butanone	ND	5.0	0.57	ug/l	
71-43-2	Benzene	ND	0.50	0.057	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.082	ug/l	
75-25-2	Bromoform	ND	0.50	0.046	ug/l	
74-83-9	Bromomethane	ND	0.50	0.077	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.028	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.027	ug/l	
75-00-3	Chloroethane	ND	0.50	0.037	ug/l	
67-66-3	Chloroform	0.18	0.50	0.031	ug/l	J
74-87-3	Chloromethane	ND	0.50	0.044	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.074	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.039	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.054	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.034	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.082	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.042	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.039	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.081	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.033	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.063	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.033	ug/l	
76-13-1	Freon 113	ND	1.0	0.10	ug/l	
591-78-6	2-Hexanone	ND	2.0	0.084	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.047	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	0.27	ug/l	
100-42-5	Styrene	ND	0.50	0.028	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.050	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.035	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.052	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.091	ug/l	
108-88-3	Toluene	ND	0.50	0.044	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound



Page 2 of 2

# **Report of Analysis**

Client Sample ID: TB061915KV1

Lab Sample ID: JB97537-5 **Date Sampled:** 06/19/15 Matrix: AQ - Trip Blank Water Date Received: 06/19/15 Method: EPA 524.2 REV 4.1 **Percent Solids:** n/a

**Project:** Northrop Grumman, OU2 Hydro, Bethpage, NY

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q	
79-01-6	Trichloroethylene	ND	0.50	0.024	ug/l		
75-01-4	Vinyl chloride	ND	0.50	0.032	ug/l		
	m,p-Xylene	ND	0.50	0.13	ug/l		
95-47-6	o-Xylene	ND	0.50	0.029	ug/l		
CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Limi	ts		
2199-69-1	1,2-Dichlorobenzene-d4	86%		78-11	14%		
460-00-4	4-Bromofluorobenzene	87%		77-11	15%		
CAS No.	Tentatively Identified Compo	ounds	R.T.	Est.	Conc.	Units	Q
	Total TIC, Volatile			0		ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value

RL = Reporting Limit

E = Indicates value exceeds calibration range



Client Sample ID: BPOW 5-2
Lab Sample ID: JB97537-6
Matrix: AQ - Water

Method: EPA 524.2 REV 4.1

Project: Northrop Grumman, OU2 Hydro, Bethpage, NY

Date Sampled: 06/19/15
Date Received: 06/19/15
Percent Solids: n/a

File ID DF **Prep Date Analytical Batch** Analyzed By **Prep Batch** Run #1 1B97895.D 1 06/26/15 MD V1B4644 n/an/aRun #2

Purge Volume Run #1 5.0 ml

Run #2

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q	
67-64-1	Acetone 5.0	2.6	5.0	0.91	ug/l	_ <u>J</u>	UB
78-93-3	2-Butanone	1.1	5.0	0.57	ug/l	J	00
71-43-2	Benzene	ND	0.50	0.057	ug/l	3	
75-27-4	Bromodichloromethane	ND	0.50	0.037	ug/l		
75-25-2	Bromoform	ND	0.50	0.046	ug/l		
74-83-9	Bromomethane	ND	0.50	0.077	ug/l		
75-15-0	Carbon disulfide	ND	0.50	0.028	ug/l		
108-90-7	Chlorobenzene	ND	0.50	0.027	ug/l		
75-00-3	Chloroethane	ND	0.50	0.037	ug/l		
67-66-3	Chloroform	ND	0.50	0.031	ug/l		
74-87-3	Chloromethane	0.25	0.50	0.044	ug/l	J	
56-23-5	Carbon tetrachloride	ND	0.50	0.074	ug/l	-	
75-34-3	1,1-Dichloroethane	ND	0.50	0.039	ug/l		
75-35-4	1,1-Dichloroethylene	ND	0.50	0.054	ug/l		
107-06-2	1,2-Dichloroethane	ND	0.50	0.034	ug/l		
78-87-5	1,2-Dichloropropane	ND	0.50	0.082	ug/l		
124-48-1	Dibromochloromethane	ND	0.50	0.042	ug/l		
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.039	ug/l		
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.081	ug/l		
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.033	ug/l		
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.063	ug/l		
100-41-4	Ethylbenzene	ND	0.50	0.033	ug/l		
76-13-1	Freon 113	ND	1.0	0.10	ug/l		
591-78-6	2-Hexanone	ND	2.0	0.084	ug/l		
75-09-2	Methylene chloride	ND	0.50	0.047	ug/l		
108-10-1	4-Methyl-2-pentanone	ND	2.0	0.27	ug/l		
100-42-5	Styrene	ND	0.50	0.028	ug/l		
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.050	ug/l		
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.035	ug/l		
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.052	ug/l		
127-18-4	Tetrachloroethylene	ND	0.50	0.091	ug/l		
108-88-3	Toluene	ND	0.50	0.044	ug/l		

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound



 Client Sample ID:
 BPOW 5-2

 Lab Sample ID:
 JB97537-6
 Date Sampled:
 06/19/15

 Matrix:
 AQ - Water
 Date Received:
 06/19/15

 Method:
 EPA 524.2 REV 4.1
 Percent Solids:
 n/a

Project: Northrop Grumman, OU2 Hydro, Bethpage, NY

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q	
79-01-6	Trichloroethylene	ND	0.50	0.024	ug/l		
75-01-4	Vinyl chloride m,p-Xylene	ND ND	0.50 0.50	0.032 0.13	ug/l ug/l		
95-47-6	o-Xylene	ND	0.50	0.029	ug/l		
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi	its		
2199-69-1	1,2-Dichlorobenzene-d4	89%		78-1			
460-00-4	4-Bromofluorobenzene	89%		77-1	15%		
CAS No.	Tentatively Identified Compo	ounds	R.T.	Est.	Conc.	Units	Q
	alkene		4.57	.52		ug/l	J N
67-63-0	Isopropyl Alcohol		7.46	7.6		ug/l	<del>JN</del> R
78-84-2	Propanal, 2-methyl-		8.71	2.8		ug/l	JN
	unknown		12.87	.89		ug/l	JΝ
	Total TIC, Volatile		4.2	11.8	1	ug/l	JN

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value





Table 1. Concentrations of Volatile Organic Compounds in Monitoring Wells BPOW 5-1, BPOW 5-2 and BPOW 5-3, Second Quarter 2015, Operable Unit 2 (Groundwater), Bethpage, New York.

CONSTITUENT (Units in µg/L)	Well: Sample ID: Date:	BPOW 5-1 BPOW 5-1 6/18/2015	BPOW 5-2 BPOW 5-2 6/19/2015	BPOW 5-3 BPOW 5-3 6/25/2015	
1,1,1-Trichloroethane		< 0.50	< 0.50	< 0.50	
1,1,2,2-Tetrachloroethane		< 0.50	< 0.50	< 0.50	
1,1,2-trichloro-1,2,2-trifluroethane		< 1.0	< 1.0	< 1.0	
1,1,2-Trichloroethane		< 0.50	< 0.50	< 0.50	
1,1-Dichloroethane		< 0.50	< 0.50	< 0.50	
1,1-Dichloroethene		< 0.50	< 0.50	< 0.50	
1,2-Dichloroethane		< 0.50	< 0.50	< 0.50	
1,2-Dichloropropane		< 0.50	< 0.50	< 0.50	
2-Butanone (MEK)		< 5.0	1.1 J	< 5.0	
2-Hexanone		< 2.0	< 2.0	< 2.0	
4-methyl-2-pentanone (MIK)		< 2.0	< 2.0	< 2.0	
Acetone		< 5.0 B	< 5.0 B	< 5.0	
Benzene		< 0.50	< 0.50	< 0.50	
Bromodichloromethane		< 0.50	< 0.50	< 0.50	
Bromoform		< 0.50	< 0.50	< 0.50	
Bromomethane		< 0.50	< 0.50	< 0.50	
Carbon Disulfide		< 0.50	< 0.50	< 0.50	
Carbon tetrachloride		< 0.50	< 0.50	< 0.50	
Chlorobenzene		< 0.50	< 0.50	< 0.50	
Chloroethane		< 0.50	< 0.50	< 0.50	
Chloroform		< 0.50	< 0.50	< 0.50	
Chloromethane		< 0.50	0.25 J	< 0.50	
cis-1,2-dichloroethene		< 0.50	< 0.50	< 0.50	
cis-1,3-dichloropropene		< 0.50	< 0.50	< 0.50	
Dibromochloromethane		< 0.50	< 0.50	< 0.50	
Ethylbenzene		< 0.50	< 0.50	< 0.50	
Methylene Chloride		< 0.50	< 0.50	< 0.50	
Styrene		< 0.50	< 0.50	< 0.50	
Tetrachloroethene		< 0.50	< 0.50	< 0.50	
Toluene		< 0.50	< 0.50	< 0.50	
trans-1,2-dichloroethene		< 0.50	< 0.50	< 0.50	
trans-1,3-dichloropropene		< 0.50	< 0.50	< 0.50	
Trichloroethylene		< 0.50	< 0.50	< 0.50	
Vinyl Chloride		< 0.50	< 0.50	< 0.50	
Xylene-o		< 0.50	< 0.50	< 0.50	
Xylenes - m,p		< 0.50	< 0.50	< 0.50	
Total VOCs		0	1.4	0	

#### Notes and Abbreviations:

Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2014). Samples analyzed for the TCL VOCs using USEPA Method 524.2. Total VOCs are rounded to two significant figures.

#### **Bold value indicates a detection**

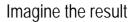
TCL Target Compound List VOC Volatile Organic Compound

USEPA United States Environmental Protection Agency

μg/L Micrograms per liter

J Constituent value is estimated

B Compound detected in associated blank sample





# **Northrop Grumman Corporation- Operable Unit 2**

# **Data Review**

BETHPAGE, NEW YORK

Volatile Analysis

SDG #JB97683

Analyses Performed By: Accutest Laboratories Dayton, New Jersey

Report #23906R July 17, 2015 Review Level: Tier II Project #NY001496.1514.NAVI4

#### **SUMMARY**

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #JB97683 for samples collected in association with the Northrop Grumman-Bethpage Site. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

			Sample			,	Analysis		
Sample ID	Lab ID	Matrix	Collection Date	Parent Sample	voc	svoc	РСВ	MET	MISC
BPOW 6-1	JB97683-1	Water	06/22/2015		Χ				
TB062215KV1	JB97683-2	Water	06/22/2015		Х				
FB062215KV1	JB97683-3	Water	06/22/2015		Х				

# **ANALYTICAL DATA PACKAGE DOCUMENTATION**

### **GENERAL INFORMATION**

Items Reviewed	Rep	orted		mance	Not
	No	Yes	No	Yes	Required
1. Sample receipt condition		Х		Х	
2. Requested analyses and sample results		Х		Х	
3. Collection Technique (grab, composite, etc.)		Х		Х	
4. Methods of analysis		Х		Х	
5. Reporting limits		Х		Х	
6. Sample collection date		Х		Х	
7. Laboratory sample received date		Х	Х		
8. Sample preservation verification (as applicable)		Х		Х	
9. Sample preparation/extraction/analysis dates		Х		Х	
10. Fully executed Chain-of-Custody (COC) form completed		Х		Х	
11. Narrative summary of QA or sample problems provided		Х		Х	
12. Data Package Completeness and Compliance		Х		Х	

QA - Quality Assurance

#### **VOLATILE ANALYSIS INTRODUCTION**

Analyses were performed according to United States Environmental Protection Agency (USEPA), Method 524.2. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
  - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
  - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
  - UB Compound considered non-detect at the listed value due to associated blank contamination.
  - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
  - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

### **VOLATILE ORGANIC COMPOUND (VOC) ANALYSES**

### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
EPA 524.2	Water	14 days from collection to analysis	Cool to < 6°C; preserved to a pH of less than 2 s.u

s.u. Standard units

All samples were analyzed within the specified holding time and temperature criteria.

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

All compounds associated with the QA blanks exhibited a concentration less than the MDL, with the exception of the compounds listed in the following table. Sample results associated with QA blank contamination that were greater than the BAL resulted in the removal of the laboratory qualifier (B) of data. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Locations	Analytes	Sample Result	Qualification
BPOW 6-1	Acetone	Detected sample results >RL and <bal< td=""><td>"UB" at detected sample concentration</td></bal<>	"UB" at detected sample concentration
BPOW 6-1	TICs: Isopropyl alcohol (RT: 7.46) Propanal, 2-methyl (RT: 8.71)	Detected sample results less than 5 times blank result	R

RL Reporting limit

#### 3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

#### 4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

A MS analysis was not performed on a sample location associated with this SDG.

#### 5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

#### 6. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate was not collected on a sample location associated with this SDG.

#### 7. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A laboratory duplicate was not performed on a sample location associated with this SDG.

#### 8. System Performance and Overall Assessment

Tentatively identified compounds (TICs) were identified in sample locations BPOW 6-1 and FB062215KV1. The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. TICs are qualified as estimated (JN).

Overall system performance was noted by the laboratory in the case narrative as acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

# **DATA VALIDATION CHECKLIST FOR VOCs**

VOCs: 524.2	Rep	orted		mance ptable	Not Required
	No	Yes	No	Yes	Required
GAS CHROMATOGRAPHY/MASS SPECTROM	ETRY (GC/	MS)			
Tier II Validation					
Holding times & Temperature		Х		Х	
Reporting limits (units)		Х		Х	
Blanks					
A. Method blanks		Х		Х	
B. Equipment blanks		Х	Х		
C. Trip blanks		Х	Х		
Surrogate (%R)		Х		Х	
Laboratory Control Sample (%R)		Х		Х	
Laboratory Control Sample Duplicate(LCSD)					Х
LCS/LCSD Precision (RPD)					Х
Matrix Spike (MS)					Х
Matrix Spike Duplicate(MSD)					Х
MS/MSD Precision (RPD)					Х
Field/Lab Duplicate (RPD)					Х
Dilution Factor		Х		Х	
Moisture Content					Х

<sup>%</sup>R Percent Recovery RPD Relative Percent Difference

VALIDATION PERFORMED BY: Lisa Horton

SIGNATURE: XISA T

DATE: July 17, 2015

PEER REVIEW BY: Todd Church

DATE: July 20, 2015

# CHAIN OF CUSTODY/ CORRECTED SAMPLE ANALYSIS DATA SHEETS

GWBB

# CHAIN OF CUSTODY Accutest New Jersey/SPL Environmental 2235 Route 130 Dayton NI 08810

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JB97683: Chain of Custody Page 1 of 3



Page 1 of 2

**Date Sampled:** 06/22/15

# **Report of Analysis**

Client Sample ID: BPOW 6-1 Lab Sample ID: JB97683-1

 Matrix:
 AQ - Water
 Date Received:
 06/23/15

 Method:
 EPA 524.2 REV 4.1
 Percent Solids:
 n/a

**Project:** Northrop Grumman, OU2 Hydro, Bethpage, NY

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch
Run #1 1B97958.D 1 06/29/15 MD n/a n/a V1B4647

Run #2

**Purge Volume** 

Run #1 5.0 ml

Run #2

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	9.3	5.0	0.91	ug/l	UB
78-93-3	2-Butanone	ND	5.0	0.57	ug/l	
71-43-2	Benzene	ND	0.50	0.057	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.082	ug/l	
75-25-2	Bromoform	ND	0.50	0.046	ug/l	
74-83-9	Bromomethane	ND	0.50	0.077	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.028	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.027	ug/l	
75-00-3	Chloroethane	ND	0.50	0.037	ug/l	
67-66-3	Chloroform	ND	0.50	0.031	ug/l	
74-87-3	Chloromethane	0.51	0.50	0.044	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.074	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.039	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.054	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.034	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.082	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.042	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.039	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.081	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.033	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.063	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.033	ug/l	
76-13-1	Freon 113	ND	1.0	0.10	ug/l	
591-78-6	2-Hexanone	ND	2.0	0.084	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.047	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	0.27	ug/l	
100-42-5	Styrene	ND	0.50	0.028	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.050	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.035	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.052	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.091	ug/l	
108-88-3	Toluene	ND	0.50	0.044	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 

N = Indicates presumptive evidence of a compound



**Date Sampled:** 06/22/15

**Date Received:** 06/23/15

n/a

**Percent Solids:** 

# **Report of Analysis**

Client Sample ID: BPOW 6-1 Lab Sample ID: JB97683-1

Matrix: AQ - Water Method: EPA 524.2 REV 4.1

**Project:** Northrop Grumman, OU2 Hydro, Bethpage, NY

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q		
79-01-6 75-01-4	Trichloroethylene Vinyl chloride m,p-Xylene	ND ND ND	0.50 0.50 0.50	0.024 0.032 0.13	ug/l ug/l ug/l			
95-47-6 CAS No.	o-Xylene Surrogate Recoveries	ND Run# 1	0.50 Run# 2	0.029 <b>Limi</b>	ug/l ts			
2199-69-1 460-00-4	1,2-Dichlorobenzene-d4 4-Bromofluorobenzene	93% 86%		78-1 77-1				
CAS No.	<b>Tentatively Identified Compo</b>	ounds	R.T.	Est.	Conc.	Units	Q	
67-63-0	Isopropyl Alcohol Propanal, methyl- Propanol, methyl- Furan, tetrahydro-tetramethyl- Hexanol, ethyl- Total TIC, Volatile		7.46 8.71 10.84 12.87 17.36 5.12	.98 2.1 2.2 .82 66.1		ug/l ug/l ug/l ug/l ug/l ug/l	JN J N J N J N J N	R R

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value



Client Sample ID: FB062215KV1

Lab Sample ID:JB97683-2Date Sampled:06/22/15Matrix:AQ - Field Blank WaterDate Received:06/23/15Method:EPA 524.2 REV 4.1Percent Solids:n/a

Project: Northrop Grumman, OU2 Hydro, Bethpage, NY

File ID DF **Prep Date Analytical Batch** Analyzed By **Prep Batch** Run #1 1B97959.D 1 06/29/15 MD V1B4647 n/an/aRun #2

Purge Volume Run #1 5.0 ml

Run #2

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	1.1	5.0	0.91	ug/l	J
78-93-3	2-Butanone	ND	5.0	0.57	ug/l	
71-43-2	Benzene	ND	0.50	0.057	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.082	ug/l	
75-25-2	Bromoform	ND	0.50	0.046	ug/l	
74-83-9	Bromomethane	ND	0.50	0.077	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.028	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.027	ug/l	
75-00-3	Chloroethane	ND	0.50	0.037	ug/l	
67-66-3	Chloroform	0.15	0.50	0.031	ug/l	J
74-87-3	Chloromethane	ND	0.50	0.044	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.074	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.039	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.054	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.034	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.082	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.042	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.039	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.081	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.033	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.063	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.033	ug/l	
76-13-1	Freon 113	ND	1.0	0.10	ug/l	
591-78-6	2-Hexanone	ND	2.0	0.084	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.047	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	0.27	ug/l	
100-42-5	Styrene	ND	0.50	0.028	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.050	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.035	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.052	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.091	ug/l	
108-88-3	Toluene	ND	0.50	0.044	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 

N = Indicates presumptive evidence of a compound



Page 2 of 2

## 4

# **Report of Analysis**

Client Sample ID: FB062215KV1

Lab Sample ID:JB97683-2Date Sampled:06/22/15Matrix:AQ - Field Blank WaterDate Received:06/23/15Method:EPA 524.2 REV 4.1Percent Solids:n/a

**Project:** Northrop Grumman, OU2 Hydro, Bethpage, NY

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q	
79-01-6 75-01-4 95-47-6	Trichloroethylene Vinyl chloride m,p-Xylene o-Xylene	ND ND ND ND	0.50 0.50 0.50 0.50	0.024 0.032 0.13 0.029	ug/l ug/l ug/l ug/l		
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi	ts		
2199-69-1 460-00-4	1,2-Dichlorobenzene-d4 4-Bromofluorobenzene	91% 86%		78-11 77-11			
CAS No.	<b>Tentatively Identified Compo</b>	ounds	R.T.	Est.	Conc.	Units	Q
67-63-0	Isopropyl Alcohol Propanal, methyl- Total TIC, Volatile		7.47 8.72	4.6 1.3 5.9		ug/l ug/l ug/l	JN J <sub>N</sub> J <sub>N</sub>

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value



Client Sample ID: TB062215KV1

Lab Sample ID:JB97683-3Date Sampled:06/22/15Matrix:AQ - Trip Blank WaterDate Received:06/23/15Method:EPA 524.2 REV 4.1Percent Solids:n/a

Project: Northrop Grumman, OU2 Hydro, Bethpage, NY

	File ID	DF	Analyzed	$\mathbf{B}\mathbf{y}$	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	1B97907.D	1	06/27/15	MD	n/a	n/a	V1B4644
Dun #2							

	Purge Volume	
Run #1	5.0 ml	
Run #2		

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	0.91	ug/l	
78-93-3	2-Butanone	ND	5.0	0.57	ug/l	
71-43-2	Benzene	ND	0.50	0.057	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.082	ug/l	
75-25-2	Bromoform	ND	0.50	0.046	ug/l	
74-83-9	Bromomethane	ND	0.50	0.077	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.028	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.027	ug/l	
75-00-3	Chloroethane	ND	0.50	0.037	ug/l	
67-66-3	Chloroform	0.17	0.50	0.031	ug/l	J
74-87-3	Chloromethane	ND	0.50	0.044	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.074	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.039	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.054	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.034	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.082	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.042	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.039	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.081	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.033	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.063	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.033	ug/l	
76-13-1	Freon 113	ND	1.0	0.10	ug/l	
591-78-6	2-Hexanone	ND	2.0	0.084	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.047	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	0.27	ug/l	
100-42-5	Styrene	ND	0.50	0.028	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.050	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.035	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.052	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.091	ug/l	
108-88-3	Toluene	ND	0.50	0.044	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value



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# **Report of Analysis**

Client Sample ID: TB062215KV1

Lab Sample ID: JB97683-3 **Date Sampled:** 06/22/15 Matrix: AQ - Trip Blank Water **Date Received:** 06/23/15 Method: EPA 524.2 REV 4.1 **Percent Solids:** n/a

**Project:** Northrop Grumman, OU2 Hydro, Bethpage, NY

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q	
79-01-6	Trichloroethylene	ND	0.50	0.024	ug/l		
75-01-4	Vinyl chloride	ND	0.50	0.032	ug/l		
	m,p-Xylene	ND	0.50	0.13	ug/l		
95-47-6	o-Xylene	ND	0.50	0.029	ug/l		
CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Limi	ts		
		2221		=0.4			
2199-69-1	1,2-Dichlorobenzene-d4	88%		78-1	/ -		
460-00-4	4-Bromofluorobenzene	88%		77-1	15%		
		_		_			_
CAS No.	Tentatively Identified Compo	ounds	R.T.	Est.	Conc.	Units	Q
	m . 1 m/G . 1/1 . 11			0		(1	
	Total TIC, Volatile			0		ug/l	

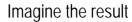
ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value







# **Northrop Grumman Corporation- Operable Unit 2**

# **Data Review**

BETHPAGE, NEW YORK

Volatile Analysis

SDG #JB97745

Analyses Performed By: Accutest Laboratories Dayton, New Jersey

Report #23913R July 10, 2015 Review Level: Tier II Project #NY001496.1514.NAVI4

#### **SUMMARY**

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #JB97745 for samples collected in association with the Northrop Grumman-Bethpage Site. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

			Sample			,	Analysis	<b>S</b>	
Sample ID	Lab ID	Matrix	Collection Date	Parent Sample	voc	svoc	РСВ	MET	MISC
BPOW 6-2	JB97745-1	Water	06/23/2015		Χ				
FB062315KV1	JB97745-2	Water	06/23/2015		Х				
TB062315KV1	JB97745-3	Water	06/23/2015		Х				
BPOW 6-R	JB97745-4	Water	06/23/2015	BPOW 6-2	Х				

# **ANALYTICAL DATA PACKAGE DOCUMENTATION**

### **GENERAL INFORMATION**

Items Reviewed	Reported		Performance Acceptable		Not	
	No	Yes	No	Yes	Required	
1. Sample receipt condition		Х		Х		
2. Requested analyses and sample results		Х		Х		
3. Collection Technique (grab, composite, etc.)		Х		Х		
4. Methods of analysis		Х		Х		
5. Reporting limits		Х		Х		
6. Sample collection date		Х		Х		
7. Laboratory sample received date		Х	Х			
8. Sample preservation verification (as applicable)		Х		Х		
9. Sample preparation/extraction/analysis dates		Х		Х		
10. Fully executed Chain-of-Custody (COC) form completed		Х		Х		
11. Narrative summary of QA or sample problems provided		Х		Х		
12. Data Package Completeness and Compliance		Х		Х		

QA - Quality Assurance

#### **VOLATILE ANALYSIS INTRODUCTION**

Analyses were performed according to United States Environmental Protection Agency (USEPA), Method 524.2. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
  - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
  - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
  - UB Compound considered non-detect at the listed value due to associated blank contamination.
  - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
  - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

#### **VOLATILE ORGANIC COMPOUND (VOC) ANALYSES**

### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
EPA 524.2	Water	14 days from collection to analysis	Cool to < 6°C; preserved to a pH of less than 2 s.u

s.u. Standard units

All samples were analyzed within the specified holding time and temperature criteria.

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

All compounds associated with the QA blanks exhibited a concentration less than the MDL, with the exception of the compounds listed in the following table. Sample results associated with QA blank contamination that were greater than the BAL resulted in the removal of the laboratory qualifier (B) of data. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Locations	Analytes	Sample Result	Qualification
BPOW 6-2 BPOW 6-R	Acetone	Detected sample results >RL and <bal< td=""><td>"UB" at detected sample concentration</td></bal<>	"UB" at detected sample concentration
BPOW 6-R	TICs: Isopropyl alcohol (RT: 7.46/7.47)	Detected sample results less than 5 times blank result	R

RL Reporting limit

#### 3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

#### 4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

A MS analysis was not performed on a sample location associated with this SDG.

#### 5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

#### 6. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
BPOW 6-2/ BPOW 6-R	Acetone	2.0 J	2.9 J	AC

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

#### 7. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A laboratory duplicate was not performed on a sample location associated with this SDG.

#### 8. System Performance and Overall Assessment

Tentatively identified compounds (TICs) were identified in sample locations BPOW 6-2, FB062315KV1 and BPOW 6-R. The analysis indicates the presence of a compound for which there is presumptive evidence to

make a tentative identification. TICs are qualified as estimated (JN).

Overall system performance was noted by the laboratory in the case narrative as acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## **DATA VALIDATION CHECKLIST FOR VOCs**

VOCs: 524.2	Rep	orted		mance ptable	Not Required	
	No	Yes	No	Yes	Required	
GAS CHROMATOGRAPHY/MASS SPECTROME	TRY (GC/	MS)				
Tier II Validation						
Holding times & Temperature		X		X		
Reporting limits (units)		Х		Х		
Blanks						
A. Method blanks		Х		Х		
B. Equipment blanks		Х	Х			
C. Trip blanks		Х	Х			
Surrogate (%R)		Х		Х		
Laboratory Control Sample (%R)		Х		Х		
Laboratory Control Sample Duplicate(LCSD)					Х	
LCS/LCSD Precision (RPD)					Х	
Matrix Spike (MS)					Х	
Matrix Spike Duplicate(MSD)					Х	
MS/MSD Precision (RPD)					Х	
Field/Lab Duplicate (RPD)		Х		Х		
Dilution Factor		Х		Х		
Moisture Content					Х	

<sup>%</sup>R Percent Recovery RPD Relative Percent Difference

VALIDATION PERFORMED BY: Lisa Horton

SIGNATURE: XISA HORLING

DATE: \_ July 10, 2015

PEER REVIEW BY: Todd Church

DATE: July 16, 2015

# CHAIN OF CUSTODY/ CORRECTED SAMPLE ANALYSIS DATA SHEETS

ACC	UTEST.
	LABORATORIES

av
WTB
WFB

## CHAIN OF CUSTODY

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3 TB062315 KV2 4 BPOW 6-R		6/23/5	1100	+-	TB	2	-	++-	₩	⊢⊢	++-	+		1							
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JB97745: Chain of Custody Page 1 of 2



Client Sample ID: BPOW 6-2 Lab Sample ID: JB97745-1

 Lab Sample ID:
 JB97745-1
 Date Sampled:
 06/23/15

 Matrix:
 AQ - Ground Water
 Date Received:
 06/24/15

 Method:
 EPA 524.2 REV 4.1
 Percent Solids:
 n/a

Project: Northrop Grumman, OU2 Hydro, Bethpage, NY

File IDDFAnalyzedByPrep DatePrep BatchAnalytical BatchRun #11B97914.D106/27/15MDn/an/aV1B4645

Run #2

**Purge Volume** 

Run #1 5.0 ml

Run #2

#### **Special VOA List**

CAS No.	Compound	Result	RL	MDL	Units Q
67-64-1	Acetone 5.0	2.0	5.0	0.91	ug/l <del>J</del> UB
78-93-3	2-Butanone	ND	5.0	0.57	ug/l
71-43-2	Benzene	ND	0.50	0.057	ug/l
75-27-4	Bromodichloromethane	ND	0.50	0.082	ug/l
75-25-2	Bromoform	ND	0.50	0.046	ug/l
74-83-9	Bromomethane	ND	0.50	0.077	ug/l
75-15-0	Carbon disulfide	ND	0.50	0.028	ug/l
108-90-7	Chlorobenzene	ND	0.50	0.027	ug/l
75-00-3	Chloroethane	ND	0.50	0.037	ug/l
67-66-3	Chloroform	ND	0.50	0.031	ug/l
74-87-3	Chloromethane	ND	0.50	0.044	ug/l
56-23-5	Carbon tetrachloride	ND	0.50	0.074	ug/l
75-34-3	1,1-Dichloroethane	ND	0.50	0.039	ug/l
75-35-4	1,1-Dichloroethylene	ND	0.50	0.054	ug/l
107-06-2	1,2-Dichloroethane	ND	0.50	0.034	ug/l
78-87-5	1,2-Dichloropropane	ND	0.50	0.082	ug/l
124-48-1	Dibromochloromethane	ND	0.50	0.042	ug/l
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.039	ug/l
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.081	ug/l
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.033	ug/l
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.063	ug/l
100-41-4	Ethylbenzene	ND	0.50	0.033	ug/l
76-13-1	Freon 113	ND	1.0	0.10	ug/l
591-78-6	2-Hexanone	ND	2.0	0.084	ug/l
75-09-2	Methylene chloride	ND	0.50	0.047	ug/l
108-10-1	4-Methyl-2-pentanone	ND	2.0	0.27	ug/l
100-42-5	Styrene	ND	0.50	0.028	ug/l
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.050	ug/l
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.035	ug/l
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.052	ug/l
127-18-4	Tetrachloroethylene	ND	0.50	0.091	ug/l
108-88-3	Toluene	ND	0.50	0.044	ug/l

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 

N = Indicates presumptive evidence of a compound



**Date Sampled:** 06/23/15

06/24/15

n/a

**Date Received:** 

**Percent Solids:** 

## **Report of Analysis**

Client Sample ID: BPOW 6-2 Lab Sample ID: JB97745-1

Matrix: AQ - Ground Water
Method: EPA 524.2 REV 4.1

Project: Northrop Grumman, OU2 Hydro, Bethpage, NY

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q		
79-01-6	Trichloroethylene	ND ND	0.50	0.024	ug/l			
75-01-4	Vinyl chloride m,p-Xylene	ND ND	0.50 0.50	0.032 0.13	ug/l ug/l			
95-47-6	o-Xylene	ND	0.50	0.029	ug/l			
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi	ts			
2199-69-1	1,2-Dichlorobenzene-d4	90%		78-1	14%			
460-00-4	4-Bromofluorobenzene	87%		77-1	15%			
CAS No.	<b>Tentatively Identified Compo</b>	ounds	R.T.	Est.	Conc.	Units	Q	
67-63-0	Isopropyl Alcohol		7.46	1.9		ug/l	JN_	R
78-84-2	Propanal, 2-methyl-		8.71	.79		ug/l	JN	
	Total TIC, Volatile		0.79	2.69	-	ug/l	JN	

 $ND = Not detected \qquad MDL = 1$ 

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

 $N = \ \ Indicates \ presumptive \ evidence \ of \ a \ compound$ 



Client Sample ID: FB062315KV1

Lab Sample ID:JB97745-2Date Sampled:06/23/15Matrix:AQ - Field Blank WaterDate Received:06/24/15Method:EPA 524.2 REV 4.1Percent Solids:n/a

Project: Northrop Grumman, OU2 Hydro, Bethpage, NY

File ID DF **Prep Date Analytical Batch** Analyzed By **Prep Batch** Run #1 1B97955.D 1 06/29/15 MD n/aV1B4647 n/aRun #2

Purge Volume

Run #1 5.0 ml

Run #2

#### **Special VOA List**

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	1.1	5.0	0.91	ug/l	J
78-93-3	2-Butanone	ND	5.0	0.57	ug/l	
71-43-2	Benzene	ND	0.50	0.057	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.082	ug/l	
75-25-2	Bromoform	ND	0.50	0.046	ug/l	
74-83-9	Bromomethane	ND	0.50	0.077	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.028	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.027	ug/l	
75-00-3	Chloroethane	ND	0.50	0.037	ug/l	
67-66-3	Chloroform	0.13	0.50	0.031	ug/l	J
74-87-3	Chloromethane	ND	0.50	0.044	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.074	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.039	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.054	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.034	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.082	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.042	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.039	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.081	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.033	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.063	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.033	ug/l	
76-13-1	Freon 113	ND	1.0	0.10	ug/l	
591-78-6	2-Hexanone	ND	2.0	0.084	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.047	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	0.27	ug/l	
100-42-5	Styrene	ND	0.50	0.028	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.050	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.035	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.052	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.091	ug/l	
108-88-3	Toluene	ND	0.50	0.044	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 

N = Indicates presumptive evidence of a compound



Page 2 of 2

## **Report of Analysis**

Client Sample ID: FB062315KV1

Lab Sample ID: JB97745-2 **Date Sampled:** 06/23/15 Matrix: AQ - Field Blank Water **Date Received:** 06/24/15 Method: **Percent Solids:** EPA 524.2 REV 4.1 n/a

**Project:** Northrop Grumman, OU2 Hydro, Bethpage, NY

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q		
79-01-6	Trichloroethylene	ND	0.50	0.024	ug/l			
75-01-4	Vinyl chloride	ND	0.50	0.032	ug/l			
	m,p-Xylene	ND	0.50	0.13	ug/l			
95-47-6	o-Xylene	ND	0.50	0.029	ug/l			
CACNo	Cuma acta Decembra	Run# 2	Limi	4				
CAS No.	Surrogate Recoveries	Run# 1	Kun# Z	LIIII	ıs			
2199-69-1	1,2-Dichlorobenzene-d4	98%	78-114%					
460-00-4	4-Bromofluorobenzene	87%		77-1	15%			
CAS No.	Tentatively Identified Compo	ounds	R.T.	Est.	Conc.	Units	Q	
<b>55.52.</b> 0			4.5			T. T		
67-63-0	Isopropyl Alcohol		7.47	1.7		ug/l	JN	
	Total TIC, Volatile		1.7		ug/l	JΝ		

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value

RL = Reporting Limit

E = Indicates value exceeds calibration range

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



Client Sample ID: TB062315KV1

Lab Sample ID:JB97745-3Date Sampled:06/23/15Matrix:AQ - Trip Blank WaterDate Received:06/24/15Method:EPA 524.2 REV 4.1Percent Solids:n/a

Project: Northrop Grumman, OU2 Hydro, Bethpage, NY

	File ID	DF	Analyzed	By	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	1B97956.D	1	06/29/15	MD	n/a	n/a	V1B4647
Run #2							

Purge Volume
Run #1 5.0 ml
Run #2

#### **Special VOA List**

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	0.91	ug/l	
78-93-3	2-Butanone	ND	5.0	0.57	ug/l	
71-43-2	Benzene	ND	0.50	0.057	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.082	ug/l	
75-25-2	Bromoform	ND	0.50	0.046	ug/l	
74-83-9	Bromomethane	ND	0.50	0.077	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.028	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.027	ug/l	
75-00-3	Chloroethane	ND	0.50	0.037	ug/l	
67-66-3	Chloroform	0.17	0.50	0.031	ug/l	J
74-87-3	Chloromethane	ND	0.50	0.044	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.074	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.039	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.054	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.034	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.082	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.042	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.039	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.081	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.033	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.063	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.033	ug/l	
76-13-1	Freon 113	ND	1.0	0.10	ug/l	
591-78-6	2-Hexanone	ND	2.0	0.084	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.047	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	0.27	ug/l	
100-42-5	Styrene	ND	0.50	0.028	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.050	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.035	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.052	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.091	ug/l	
108-88-3	Toluene	ND	0.50	0.044	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 

N = Indicates presumptive evidence of a compound



Client Sample ID: TB062315KV1

Lab Sample ID: JB97745-3 **Date Sampled:** 06/23/15 Matrix: AQ - Trip Blank Water Date Received: 06/24/15 Method: EPA 524.2 REV 4.1 **Percent Solids:** n/a

**Project:** Northrop Grumman, OU2 Hydro, Bethpage, NY

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q	
79-01-6	Trichloroethylene	ND	0.50	0.024	ug/l		
75-01-4	Vinyl chloride	ND	0.50	0.032	ug/l		
	m,p-Xylene	ND	0.50	0.13	ug/l		
95-47-6	o-Xylene	ND	0.50	0.029	ug/l		
CAS No.	Surrogate Recoveries Run# 1 F		Run# 2	Limi			
2199-69-1	1,2-Dichlorobenzene-d4	95%		78-1	14%		
460-00-4	4-Bromofluorobenzene	91%		77-1	15%		
CAS No.	<b>Tentatively Identified Compe</b>	R.T.	Est.	Conc.	Units	Q	
	Total TIC, Volatile		0		ug/l		

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value

RL = Reporting Limit

E = Indicates value exceeds calibration range

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



Client Sample ID: BPOW 6-R Lab Sample ID: JB97745-4

 Lab Sample ID:
 JB97745-4
 Date Sampled:
 06/23/15

 Matrix:
 AQ - Ground Water
 Date Received:
 06/24/15

 Method:
 EPA 524.2 REV 4.1
 Percent Solids:
 n/a

Project: Northrop Grumman, OU2 Hydro, Bethpage, NY

File IDDFAnalyzedByPrep DatePrep BatchAnalytical BatchRun #11B97957.D106/29/15MDn/an/aV1B4647

Run #2

**Purge Volume** 

Run #1 5.0 ml

Run #2

#### **Special VOA List**

CAS No.	Compound	Compound Result R				
	5.0					
67-64-1	Acetone 5.0	2.9	5.0	0.91	ug/l	→ UB
78-93-3	2-Butanone	ND	5.0	0.57	ug/l	
71-43-2	Benzene	ND	0.50	0.057	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.082	ug/l	
75-25-2	Bromoform	ND	0.50	0.046	ug/l	
74-83-9	Bromomethane	ND	0.50	0.077	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.028	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.027	ug/l	
75-00-3	Chloroethane	ND	0.50	0.037	ug/l	
67-66-3	Chloroform	ND	0.50	0.031	ug/l	
74-87-3	Chloromethane	ND	0.50	0.044	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.074	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.039	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.054	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.034	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.082	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.042	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.039	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.081	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.033	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.063	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.033	ug/l	
76-13-1	Freon 113	ND	1.0	0.10	ug/l	
591-78-6	2-Hexanone	ND	2.0	0.084	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.047	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	0.27	ug/l	
100-42-5	Styrene	ND	0.50	0.028	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.050	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.035	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.052	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.091	ug/l	
108-88-3	Toluene	ND	0.50	0.044	ug/l	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound



06/24/15

n/a

## **Report of Analysis**

**Client Sample ID:** BPOW 6-R Lab Sample ID: JB97745-4

**Date Sampled:** 06/23/15 Matrix: AQ - Ground Water **Date Received:** Method: **Percent Solids:** EPA 524.2 REV 4.1

**Project:** Northrop Grumman, OU2 Hydro, Bethpage, NY

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q		
79-01-6 75-01-4 95-47-6	Trichloroethylene Vinyl chloride m,p-Xylene o-Xylene	ND ND ND ND	0.50 0.50 0.50 0.50	0.024 0.032 0.13 0.029	ug/l ug/l ug/l ug/l			
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi	ts			
2199-69-1 460-00-4	1,2-Dichlorobenzene-d4 99% 4-Bromofluorobenzene 91%			78-11 77-11				
CAS No.	<b>Tentatively Identified Compo</b>	ounds	R.T.	Est.	Conc.	Units	Q	
67-63-0 78-84-2 15045-43-9	Isopropyl Alcohol Propanal, 2-methyl- Furan, tetrahydro-2,2,5,5-tetra Total TIC, Volatile		7.47 8.72 12.88 3.39	3.5 2.7 .69 6.89	-	ug/l ug/l ug/l ug/l	JN JN JN J N	R

ND = Not detected MDL = Method Detection Limit

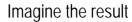
RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound







## Northrop Grumman Corporation-Operable Unit 2

## **Data Review**

BETHPAGE, NEW YORK

Volatile Analysis

SDG #JB97890

Analyses Performed By: Accutest Laboratories Dayton, New Jersey

Report #23914R July 10, 2015 Review Level: Tier II Project #NY001496.1514.NAVI4

#### **SUMMARY**

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #JB97890 for samples collected in association with the Northrop Grumman-Bethpage Site. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

			Sample			,	Analysis	6	
Sample ID	Lab ID	Matrix	Collection Date	Parent Sample	voc	svoc	РСВ	MET	MISC
BPOW 6-3	JB97890-1	Water	06/24/2015		Х				
TB062415KV1	JB97890-2	Water	06/24/2015		Х				
FB062415KV1	JB97890-3	Water	06/24/2015		Х				
BPOW 6-4	JB97890-4	Water	06/24/2015		Х				

#### Note:

1. The matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample location BPOW 6-3.

## **ANALYTICAL DATA PACKAGE DOCUMENTATION**

#### **GENERAL INFORMATION**

Items Reviewed	Rep	orted		mance	Not
	No	Yes	No	Yes	Required
1. Sample receipt condition		Х		Х	
2. Requested analyses and sample results		Х		Х	
3. Collection Technique (grab, composite, etc.)		Х		Х	
4. Methods of analysis		Х		Х	
5. Reporting limits		Х		Х	
6. Sample collection date		Х		Х	
7. Laboratory sample received date		Х	Х		
8. Sample preservation verification (as applicable)		Х		X	
9. Sample preparation/extraction/analysis dates		Х		Х	
10. Fully executed Chain-of-Custody (COC) form completed		Х		Х	
11. Narrative summary of QA or sample problems provided		Х		Х	
12. Data Package Completeness and Compliance		Х		Х	

QA - Quality Assurance

#### **VOLATILE ANALYSIS INTRODUCTION**

Analyses were performed according to United States Environmental Protection Agency (USEPA), Method 524.2. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
  - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
  - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
  - UB Compound considered non-detect at the listed value due to associated blank contamination.
  - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
  - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

### **VOLATILE ORGANIC COMPOUND (VOC) ANALYSES**

### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
EPA 524.2	Water	14 days from collection to analysis	Cool to < 6°C; preserved to a pH of less than 2 s.u

s.u. Standard units

All samples were analyzed within the specified holding time and temperature criteria.

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

All compounds associated with the QA blanks exhibited a concentration less than the MDL, with the exception of the compounds listed in the following table. Sample results associated with QA blank contamination that were greater than the BAL resulted in the removal of the laboratory qualifier (B) of data. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Locations	Analytes	Sample Result	Qualification
BPOW 6-3	Acetone	Detected sample results >RL and <bal< td=""><td>"UB" at detected sample concentration</td></bal<>	"UB" at detected sample concentration
	TICs: Isopropyl alcohol (RT: 7.46)	Detected sample results less than 5 times blank result	R

RL Reporting limit

#### 3. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

#### 4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD exhibited acceptable recoveries and RPD between the MS/MSD recoveries.

#### 5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

#### 6. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate was not collected on a sample location associated with this SDG.

#### 7. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A laboratory duplicate was not performed on a sample location associated with this SDG.

#### 8. System Performance and Overall Assessment

Tentatively identified compounds (TICs) were identified in sample locations BPOW 6-3, TB062415KV1 and FB062415KV1. The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. TICs are qualified as estimated (JN).

Overall system performance was noted by the laboratory in the case narrative as acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## **DATA VALIDATION CHECKLIST FOR VOCs**

VOCs: 524.2	Rep	orted		mance ptable	Not Required
	No	Yes	No	Yes	Required
GAS CHROMATOGRAPHY/MASS SPECTROME	TRY (GC/	MS)			
Tier II Validation					
Holding times & Temperature		Х		Х	
Reporting limits (units)		Х		Х	
Blanks					
A. Method blanks		Х		Х	
B. Equipment blanks		Х	Х		
C. Trip blanks		Х	Х		
Surrogate (%R)		Х		Х	
Laboratory Control Sample (%R)		Х		Х	
Laboratory Control Sample Duplicate(LCSD)					Х
LCS/LCSD Precision (RPD)					Х
Matrix Spike (MS)		Х		Х	
Matrix Spike Duplicate(MSD)		Х		Х	
MS/MSD Precision (RPD)		Х		Х	
Field/Lab Duplicate (RPD)					Х
Dilution Factor		Х		Х	
Moisture Content					Х

<sup>%</sup>R Percent Recovery RPD Relative Percent Difference

VALIDATION PERFORMED BY: Lisa Horton

SIGNATURE: XISA 77

DATE: \_ July 10, 2015

PEER REVIEW BY: Todd Church

DATE: July 16, 2015

# CHAIN OF CUSTODY/ CORRECTED SAMPLE ANALYSIS DATA SHEETS

ACCUTEST.
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CHAIN OF CUSTODY
Accutest New Jersey/SPL Environmental
2235 Route 130, Dayton, NJ 08810

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JB97890: Chain of Custody

Page 1 of 2



**Date Sampled:** 06/24/15

## **Report of Analysis**

Client Sample ID: BPOW 6-3 Lab Sample ID: JB97890-1

 Matrix:
 AQ - Water
 Date Received:
 06/25/15

 Method:
 EPA 524.2 REV 4.1
 Percent Solids:
 n/a

**Project:** Northrop Grumman, OU2 Hydro, Bethpage, NY

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch
Run #1 1B97954.D 1 06/29/15 MD n/a n/a V1B4647

Run #2

**Purge Volume** 

Run #1 5.0 ml

Run #2

#### **Special VOA List**

CAS No.	Compound	Result	RL	MDL	Units	Q	
67-64-1	Acetone 5.0	1.0	5.0	0.91	ug/l	J	UB
78-93-3	2-Butanone	ND	5.0	0.57	ug/l		OD
71-43-2	Benzene	ND	0.50	0.057	ug/l		
75-27-4	Bromodichloromethane	ND	0.50	0.082	ug/l		
75-25-2	Bromoform	ND	0.50	0.046	ug/l		
74-83-9	Bromomethane	ND	0.50	0.077	ug/l		
75-15-0	Carbon disulfide	ND	0.50	0.028	ug/l		
108-90-7	Chlorobenzene	ND	0.50	0.027	ug/l		
75-00-3	Chloroethane	ND	0.50	0.037	ug/l		
67-66-3	Chloroform	ND	0.50	0.031	ug/l		
74-87-3	Chloromethane	ND	0.50	0.044	ug/l		
56-23-5	Carbon tetrachloride	ND	0.50	0.074	ug/l		
75-34-3	1,1-Dichloroethane	ND	0.50	0.039	ug/l		
75-35-4	1,1-Dichloroethylene	ND	0.50	0.054	ug/l		
107-06-2	1,2-Dichloroethane	ND	0.50	0.034	ug/l		
78-87-5	1,2-Dichloropropane	ND	0.50	0.082	ug/l		
124-48-1	Dibromochloromethane	ND	0.50	0.042	ug/l		
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.039	ug/l		
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.081	ug/l		
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.033	ug/l		
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.063	ug/l		
100-41-4	Ethylbenzene	ND	0.50	0.033	ug/l		
76-13-1	Freon 113	ND	1.0	0.10	ug/l		
591-78-6	2-Hexanone	ND	2.0	0.084	ug/l		
75-09-2	Methylene chloride	ND	0.50	0.047	ug/l		
108-10-1	4-Methyl-2-pentanone	ND	2.0	0.27	ug/l		
100-42-5	Styrene	ND	0.50	0.028	ug/l		
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.050	ug/l		
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.035	ug/l		
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.052	ug/l		
127-18-4	Tetrachloroethylene	ND	0.50	0.091	ug/l		
108-88-3	Toluene	ND	0.50	0.044	ug/l		

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

 $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$ 

N = Indicates presumptive evidence of a compound



**Date Sampled:** 06/24/15

## **Report of Analysis**

**Client Sample ID:** BPOW 6-3 Lab Sample ID: JB97890-1 Matrix:

Method: EPA 524.2 REV 4.1

AQ - Water Date Received: 06/25/15 **Percent Solids:** n/a

**Project:** Northrop Grumman, OU2 Hydro, Bethpage, NY

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q		
79-01-6 75-01-4	Trichloroethylene Vinyl chloride m,p-Xylene	ND ND ND	0.50 0.50 0.50	0.024 0.032 0.13	ug/l ug/l ug/l			
95-47-6	o-Xylene	ND	0.50	0.029	ug/l			
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its			
2199-69-1 460-00-4	1,2-Dichlorobenzene-d4 4-Bromofluorobenzene	96% 91%		78-1 77-1				
CAS No.	Tentatively Identified Compo	ounds	R.T.	Est.	Conc.	Units	Q	
67-63-0	Isopropyl Alcohol Total TIC, Volatile		7.46	3.5 3.5		ug/l ug/l	JN J	R

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



Client Sample ID: TB062415AM1

Lab Sample ID:JB97890-2Date Sampled:06/24/15Matrix:AQ - Trip Blank WaterDate Received:06/25/15Method:EPA 524.2 REV 4.1Percent Solids:n/a

Project: Northrop Grumman, OU2 Hydro, Bethpage, NY

File ID DF Analyzed By Prep Date Prep Batch Analytical Batch
Run #1 1B97963.D 1 06/29/15 MD n/a n/a V1B4647

Run #2

**Purge Volume** 

Run #1 5.0 ml

Run #2

#### **Special VOA List**

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	1.5	5.0	0.91	ug/l	J
78-93-3	2-Butanone	ND	5.0	0.57	ug/l	
71-43-2	Benzene	ND	0.50	0.057	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.082	ug/l	
75-25-2	Bromoform	ND	0.50	0.046	ug/l	
74-83-9	Bromomethane	ND	0.50	0.077	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.028	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.027	ug/l	
75-00-3	Chloroethane	ND	0.50	0.037	ug/l	
67-66-3	Chloroform	0.17	0.50	0.031	ug/l	J
74-87-3	Chloromethane	ND	0.50	0.044	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.074	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.039	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.054	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.034	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.082	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.042	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.039	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.081	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.033	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.063	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.033	ug/l	
76-13-1	Freon 113	ND	1.0	0.10	ug/l	
591-78-6	2-Hexanone	ND	2.0	0.084	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.047	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	0.27	ug/l	
100-42-5	Styrene	ND	0.50	0.028	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.050	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.035	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.052	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.091	ug/l	
108-88-3	Toluene	ND	0.50	0.044	ug/l	

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound



Page 2 of 2

## 4

## **Report of Analysis**

Client Sample ID: TB062415AM1

 Lab Sample ID:
 JB97890-2
 Date Sampled:
 06/24/15

 Matrix:
 AQ - Trip Blank Water
 Date Received:
 06/25/15

 Method:
 EPA 524.2 REV 4.1
 Percent Solids:
 n/a

**Project:** Northrop Grumman, OU2 Hydro, Bethpage, NY

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q	
79-01-6 75-01-4 95-47-6	Trichloroethylene Vinyl chloride m,p-Xylene o-Xylene	ND ND ND ND	0.50 0.50 0.50 0.50	0.024 0.032 0.13 0.029	ug/l ug/l ug/l ug/l		
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi	ts		
2199-69-1 460-00-4	1,2-Dichlorobenzene-d4 4-Bromofluorobenzene	94% 86%		78-11 77-11			
CAS No.	<b>Tentatively Identified Compo</b>	ounds	R.T.	Est.	Conc.	Units	Q
67-63-0	Isopropyl Alcohol unknown Total TIC, Volatile		7.47 9.67	3.4 .7 4.1		ug/l ug/l ug/l	JN J <sub>N</sub> J <sub>N</sub>

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



Client Sample ID: FB062415AM1

Lab Sample ID:JB97890-3Date Sampled:06/24/15Matrix:AQ - Field Blank WaterDate Received:06/25/15Method:EPA 524.2 REV 4.1Percent Solids:n/a

Project: Northrop Grumman, OU2 Hydro, Bethpage, NY

File ID DF **Prep Date Analytical Batch** Analyzed By **Prep Batch** Run #1 1B97961.D 1 06/29/15 MD V1B4647 n/an/aRun #2

Purge Volume Run #1 5.0 ml

Run #2

#### **Special VOA List**

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	1.3	5.0	0.91	ug/l	J
78-93-3	2-Butanone	ND	5.0	0.57	ug/l	
71-43-2	Benzene	ND	0.50	0.057	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.082	ug/l	
75-25-2	Bromoform	ND	0.50	0.046	ug/l	
74-83-9	Bromomethane	ND	0.50	0.077	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.028	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.027	ug/l	
75-00-3	Chloroethane	ND	0.50	0.037	ug/l	
67-66-3	Chloroform	0.099	0.50	0.031	ug/l	J
74-87-3	Chloromethane	ND	0.50	0.044	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.074	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.039	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.054	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.034	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.082	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.042	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.039	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.081	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.033	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.063	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.033	ug/l	
76-13-1	Freon 113	ND	1.0	0.10	ug/l	
591-78-6	2-Hexanone	ND	2.0	0.084	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.047	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	0.27	ug/l	
100-42-5	Styrene	ND	0.50	0.028	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.050	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.035	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.052	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.091	ug/l	
108-88-3	Toluene	ND	0.50	0.044	ug/l	

ND = Not detected MDL = Method Detection Limit

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E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound

N = Indicates presumptive evidence of a compound



Page 2 of 2

## **Report of Analysis**

Client Sample ID: FB062415AM1

Lab Sample ID:JB97890-3Date Sampled:06/24/15Matrix:AQ - Field Blank WaterDate Received:06/25/15Method:EPA 524.2 REV 4.1Percent Solids:n/a

Project: Northrop Grumman, OU2 Hydro, Bethpage, NY

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q	
79-01-6 75-01-4	Trichloroethylene Vinyl chloride	ND ND	0.50 0.50	0.024 0.032	ug/l ug/l		
95-47-6	m,p-Xylene o-Xylene	ND ND	0.50 0.50	0.13 0.029	ug/l ug/l		
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its		
2199-69-1 460-00-4	1,2-Dichlorobenzene-d4 4-Bromofluorobenzene	99% 91%		78-1 77-1			
CAS No.	Tentatively Identified Compo	ounds	R.T.	Est.	Conc.	Units	Q
67-63-0	Isopropyl Alcohol Total TIC, Volatile		7.48	1.5 1.5		ug/l ug/l	JN J <mark>N</mark>

ND = Not detected MDL = Method Detection Limit J = Indicates and J = Indicates

RL = Reporting Limit

E = Indicates value exceeds calibration range

 $J = \ Indicates \ an \ estimated \ value$ 

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



 Client Sample ID:
 BPOW 6-4

 Lab Sample ID:
 JB97890-4
 Date Sampled:
 06/24/15

 Matrix:
 AQ - Water
 Date Received:
 06/25/15

 Method:
 EPA 524.2 REV 4.1
 Percent Solids:
 n/a

**Project:** Northrop Grumman, OU2 Hydro, Bethpage, NY

	File ID	DF	Analyzed	By	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	1B97962.D	1	06/29/15	MD	n/a	n/a	V1B4647
Run #2							

	Purge Volume		
Run #1	5.0 ml		
Run #2			

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	0.91	ug/l	
78-93-3	2-Butanone	ND	5.0	0.57	ug/l	
71-43-2	Benzene	ND	0.50	0.057	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.082	ug/l	
75-25-2	Bromoform	ND	0.50	0.046	ug/l	
74-83-9	Bromomethane	ND	0.50	0.077	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.028	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.027	ug/l	
75-00-3	Chloroethane	ND	0.50	0.037	ug/l	
67-66-3	Chloroform	ND	0.50	0.031	ug/l	
74-87-3	Chloromethane	ND	0.50	0.044	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.074	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.039	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.054	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.034	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.082	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.042	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.039	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.081	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.033	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.063	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.033	ug/l	
76-13-1	Freon 113	ND	1.0	0.10	ug/l	
591-78-6	2-Hexanone	ND	2.0	0.084	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.047	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	0.27	ug/l	
100-42-5	Styrene	ND	0.50	0.028	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.050	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.035	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.052	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.091	ug/l	
108-88-3	Toluene	ND	0.50	0.044	ug/l	

ND = Not detected MDL = Method Detection Limit

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E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



Page 2 of 2

**Date Sampled:** 06/24/15

06/25/15

n/a

**Date Received:** 

**Percent Solids:** 

## **Report of Analysis**

Client Sample ID: BPOW 6-4 Lab Sample ID: JB97890-4 Matrix: AQ - Water

Method: EPA 524.2 REV 4.1

Northrop Grumman, OU2 Hydro, Bethpage, NY

## **Project:**

#### Special VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q	
79-01-6 75-01-4	Trichloroethylene Vinyl chloride m,p-Xylene	ND ND ND	0.50 0.50 0.50	0.024 0.032 0.13	ug/l ug/l ug/l		
95-47-6 CAS No.	o-Xylene Surrogate Recoveries	ND Run# 1	0.50 Run# 2	0.029	ug/l		
2199-69-1 460-00-4	1,2-Dichlorobenzene-d4 4-Bromofluorobenzene	96% 91%	111111111111111111111111111111111111111	78-1 77-1	14%		
CAS No.	Tentatively Identified Compo		R.T.		Conc.	Units	Q
	Total TIC, Volatile			0		ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value

RL = Reporting Limit

E = Indicates value exceeds calibration range

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound





Table 1. Concentrations of Volatile Organic Compounds in Monitoring Wells BPOW 6-1, BPOW 6-2, BPOW 6-3 and BPOW 6-4, Second Quarter 2015, Operable Unit 2 (Groundwater), Bethpage, New York.

CONSTITUENT (Units in µg/L)	Well: Sample ID: Date:	BPOW 6-1 BPOW 6-1 6/22/2015	BPOW 6-2 BPOW 6-2 6/23/2015	BPOW 6-2 BPOW 6-R <sup>(1)</sup> 6/23/2015	BPOW 6-3 BPOW 6-3 6/24/2015	BPOW 6-4 BPOW 6-4 6/24/2015
1,1,1-Trichloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1,2,2-Tetrachloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1,2-trichloro-1,2,2-trifluroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1-Dichloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1-Dichloroethene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichloropropane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Butanone (MEK)		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2-Hexanone		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
4-methyl-2-pentanone (MIK)		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Acetone		< 9.3 B	< 5.0 B	< 5.0 B	< 5.0 B	< 5.0
Benzene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromoform		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromomethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbon Disulfide		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbon tetrachloride		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chlorobenzene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chloroform		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chloromethane		0.51	< 0.50	< 0.50	< 0.50	< 0.50
cis-1,2-dichloroethene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
cis-1,3-dichloropropene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibromochloromethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Ethylbenzene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Methylene Chloride		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Styrene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Tetrachloroethene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Toluene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
trans-1,2-dichloroethene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
trans-1,3-dichloropropene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Trichloroethylene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Vinyl Chloride		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Xylene-o		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Xylenes - m,p		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total VOCs		0.51	0	0	0	0

# Notes and Abbreviations:

(1) BPOW 6-R is a blind duplicate sample.

Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2014)

Samples analyzed for the TCL VOCs using USEPA Method 524.2.

Total VOCs are rounded to two significant figures.

#### **Bold value indicates a detection**

TCL Target Compound List VOC Volatile Organic Compound

USEPA United States Environmental Protection Agency

μg/L Micrograms per liter

B Compound detected in associated blank sample