VERTICAL PROFILE BORING (VPB) – 133
OU 2 OFF-SITE GROUNDWATER INVESTIGATION
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP)
BETHPAGE, NEW YORK

GROUNDWATER ANALYTICAL DATA GROUPS

- SDG D1061
- SDG D1108
- SDG D1148
- SDG D1208
- SDG D1280
- SDG D1320
- SDG D1365
- SDG D1436

D1061

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER Nº 1152 | PAGE ___ OF ___

PROJECT NO: 112600622	FACILITY: BP/AMOCO 002	PROJECT MANAGER David Benyak	PHONE NUMBER 757-461-3768	LABORATORY NAME AND CONTACT: CHEMTECH
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER J. Ferguson	PHONE NUMBER 412-496-9283	ADDRESS 284 Sheffield Street
		CARRIER/WAYBILL NUMBER 8735 5966 0358		CITY, STATE Mountainside NJ 07092

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

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: Volatile Organic Compounds 1&L	COMMENTS
									6			
01/04	11:30	BP-VPB133-GW-058	VPB 133	57'	58'	GW	G	1			X	
01/04	08:30	BP-VPB-TB-010412	—	NA	NA	GW	G	2			X	
01/04	16:00	BP-VPB133-GW-114	VPB 133	113'	114'	GW	G	2			X	H2M SPLIT
01/05	11:55	BP-VPB133-GW-146	VPB 133	147'	148'	GW	G	1			X	
01/05	13:35	BP-VPB133-GW-150	VPB 133	149'	150'	GW	G	2			X	H2M SPLIT
01/06	12:25	BP-VPB133-GW-194	VPB 133	193'	194'	GW	G	1			X	H2M Split

1. RELINQUISHED BY		DATE 01/06/2012	TIME 14:20	1. RECEIVED BY FEDERAL EXPRESS AB # 8735 5966 0358	DATE 01/06/2012	TIME 14:30
2. RELINQUISHED BY		DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	Fedex	DATE 1/7/12	TIME 9:45	3. RECEIVED BY PS	DATE 1/7/12	TIME 9:45
COMMENTS	Tonio 4°C					

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

4/02R
FORM NO. TtNUS-001

D1108

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER Nº 1166 | PAGE 1 OF 1

PROJECT NO: 112600622	FACILITY: BETHPAGE OU-2	PROJECT MANAGER: DAVID BRANK	PHONE NUMBER: 757-461-3768
SAMPLERS (SIGNATURE): [signature]		FIELD OPERATIONS LEADER: J. Ferguson/S. Conti	PHONE NUMBER: 412-496-9283
		CARRIER/WAYBILL NUMBER: 8993 8010 8761	

LABORATORY NAME AND CONTACT: CHEMTECH
ADDRESS: 284 Sheffield Street
CITY, STATE: Mountainside NJ 07092

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

DATE (YEAR 2012)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G): G	PRESERVATIVE USED: HCL	TYPE OF ANALYSIS: Volatile Organics	COMMENTS
01-09	11:00	BP-VPB-TB-010912	VPB 133	—	—	GW	G	2	X			
01-09	13:10	BP-VPB-133-GW-234	VPB 133	233	234	GW	G	2	X			Split sample
01-09	15:05	BP-VPB133-GW-254	VPB 133	253	254	GW	G	2	X			Split sample
01-10	10:10	BP-VPB133-GW-274	VPB 133	273	274	GW	G	2	X			Split Sample
1-10	12:10	BP-VPB133-GW-294	VPB 133	293	294	GW	G	2	X			Split Sample
1-10	15:15	BP-VPB133-GW-314	VPB 133	313	314	GW	G	2	X			Split Sample
1-11	10:00	BP-VPB133-GW-334	VPB 133	333	334	GW	G	2	X			" "
1-11	13:00	BP-VPB133-GW-354	VPB 133	353	354	GW	G	2	X			" "
1-11	16:30	BP-VPB133-GW-374	VPB 133	373	374	GW	G	2	X			" "

1. RELINQUISHED BY [signature]	DATE 1/11/12	TIME 18:00	1. RECEIVED BY FedEx AB# 8993 8010 8761	DATE 1/11/12	TIME 18:00
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY FedEx	DATE 1/12/12	TIME 9:10	3. RECEIVED BY TDS	DATE 1/12/12	TIME 9:10

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TCAD: 40C

D1148

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER Nº 1165 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G00622	Bethpage 002 VPB133	David Branack	757 461 3768	Chemtech (K. Hummel)
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		Jim Ferguson	412-496-9283	284 Sheffield Street
		CARRIER/WAYBILL NUMBER		CITY, STATE
		8993 8010 8772		Mountainside NJ 07092

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

DATE YEAR 2012	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: Volatile Organic Compounds	COMMENTS
1/12	08:00	BP-VPB-TB-01212	—	—	—	GW	G	2			X	
1/13	10:55	BP-VPB133-GW-394	VPB 133	393	394	GW	G	2			X	insufficient volume for split with MS/MSD
1/13	13:25	BP-VPB133-GW-414	VPB 133	413	414	GW	G	1			X	" " "
1/13	15:40	BP-VPB133-GW-434	VPB 133	433	434	GW	G	2			X	Split Sample W/ MS/MSD
1/13	10:15	BP-VPB133-GW-454	VPB 133	434	454	GW	G	2			X	" " "
1/13	12:15	BP-VPB133-GW-474	VPB 133	473	474	GW	G	2			X	" " "
1/13	14:10	BP-VPB133-GW-494	VPB 133	493	494	GW	G	2			X	" " "

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	1/13/2012	16:30	1. RECEIVED BY Federal Express AB# 8993 8010 8772	1/13/2012	16:30
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY Fed Ex	DATE 1/14/12	TIME 10:45	3. RECEIVED BY Ken Hummel	DATE 1/14/12	TIME 10:45

COMMENTS

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

4/02R
FORM NO. TtNUS-001

D1208

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER Nº 1151 | PAGE ___ OF ___

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G00622	Bemiface OU2 VPB133	David Braymick	757-461-3768	Chemtech (K. Hummel)
SAMPLERS (SIGNATURE)		**FIELD OPERATIONS LEADER**	**PHONE NUMBER**	**ADDRESS**
RT		J. Ferguson / S. Conti	412-496-9783	284 Sheffield Street
		CARRIER/WAYBILL NUMBER		**CITY, STATE**
		8987 4256 0978		Mountainside NJ 07092

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

DATE YEAR 2012	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: Volatile Organic Comp. VOC	COMMENTS
									G			
1/16	12:00	BP-VPB133-GW-514'	VPB 133	513'	514'	GW	G	2			X	Split Sample with HAM
1/16	10:00	BP-VPB-TB-011612	—	—	—	GW	G	2			X	TRIP BLANK
1/16	16:30	BP-VPB133-GW-534'	VPB 133	533'	534'	GW	G	2			X	HAM Split Sample
1/17	10:30	BP-VPB133-GW-554'	VPB 133	553'	554'	GW	G	2			X	HAM Split Sample
1/17	13:25	BP-VPB133-GW-574'	VPB 133	573'	574'	GW	G	2			X	SEDIMENT IN Sample Due to highly perm. Zone.
1/17	16:00	BP-VPB133-GW-594'	VPB 133	593'	594'	GW	G	2			X	
1/18	10:15	BP-VPB133-GW-614'	VPB 133	613'	614'	GW	G	2			X	Sediment in sample highly permeable Zone
1/18	13:15	BP-VPB133-GW-634'	VPB 133	633'	634'	GW	G	2			X	Method reaction in water while filling VOC jar.
1/18	16:00	BP-VPB133-GW-654'	VPB 133	653'	654'	GW	G	2			X	Minor sediment content

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: RT	1/18/2012	17:30	1. RECEIVED BY: Federal Express AB# 8987 4526 0978	1/18/2012	17:30
2. RELINQUISHED BY:	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY: Fed Ex	DATE 1/19/12	TIME 9:10	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TINUS-001

D1280

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER № 1154 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G00622	Bethune 002 VPB133	David Baynack	757-461-3768	Chemtech (K. Kunnel
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		J. Ferguson / S. Cook	412-496-9283	284 Sheffield Street
		CARRIER/WAYBILL NUMBER		CITY, STATE
		8987 4526 0989		Mountainside NJ 07092

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

DATE / YEAR	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS VOC's	COMMENTS
1/20	12:30	BP-VPB133-GW-694	VPB 133	693	694	GW	G	2			X	
1/19	08:00	BP-VPB-TB-011912	—	—	—	GW	G	2			X	
1/23	15:30	BP-VPB133-GW-734	VPB 133	733	734	GW	G	2			X	
1/20	15:30	BP-VPB133-GW-703	VPB 133	703	704	GW	G	2			X	Sediment on Samples
1/23	11:40	BP-VPB133-GW-714	VPB 133	713	714	GW	G	2			X	
1/24	11:00	BP-VPB133-GW-744	VPB 133	743	744	GW	G	2			X	
1/24	15:50	BP-VPB133-GW-764	VPB 133	763	764	GW	G	2			X	
1/24	13:00	BP-VPB133-GW-754	VPB 133	753	754	GW	G	2			X	

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	1/24/2012	18:00	1. RECEIVED BY Fed Ex 8987 4526 0989	1/24/2012	18:00
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY Fedex	DATE 1/25/12	TIME 9:10	3. RECEIVED BY PS	DATE 1/25/12	TIME 9:10

COMMENTS

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

Temp: 4°C

4/02R
FORM NO. TtNUS-001

D 1320

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER Nº 1155 | PAGE 1 OF 1

PROJECT NO: 112600622	FACILITY: BERHAGE 002 VPBB3	PROJECT MANAGER David Brayack	PHONE NUMBER 757-461-3768
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER Jim Ferguson	PHONE NUMBER 412-496-9383
		CARRIER/WAYBILL NUMBER 8735 5966 0369	

LABORATORY NAME AND CONTACT: Chemtech 908-789 8900
ADDRESS 284 Sheffield Street
CITY, STATE Mountainside NJ 07092

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

DATE (YEAR 2012)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: VOC	COMMENTS
1/25	08:00	BP-VPB-TB-012512	VPB 133	—	—	GW	G	2	G	HCl	X	
1/25	13:50	BP-VPB133-GW-784	VPB 133	783	784	GW	G	2			X	Sediment in Sample
1/25	16:25	BP-VPB133-GW-794	VPB 133	793	794	GW	G	4			X	TAN Sediment in Sample
1/26	11:50	BP-VPB133-GW-808	VPB 133	807	808	GW	G	3			X	
1/26	15:00	BP-VPB133-GW-814	VPB 133	813	814	GW	G	2			X	CLEAR, Sediment bubbles in Sample Have fuel
1/27	10:55	BP-VPB133-GW-824	VPB 133	823	824	GW	G	1			(X) UNPreserved	
1/27	14:00	BP-VPB133-DW	VPB 133	—	—	W	G	2			X	Fire hydrant water
1/27	14:30	BP-VPB133-DM	VPB 133	—	—	Drill MUD	G	2			(X) - UNPRESERVED	Drilling mud
1/27	15:00	BP-VPB133-834	VPB 133	833	834	GW	G	2			(X) - UNPRESERVED	Sediment in Sample

1. RELINQUISHED BY	DATE 1/27/2012	TIME 17:30	1. RECEIVED BY FEDERAL EXPRESS AB" 8735 5966 0369	DATE 1/27/2012	TIME 17:30
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY FedEx	DATE 1/28/12	TIME 10:10	3. RECEIVED BY Jen Rivera	DATE 1/28/12	TIME 10:10

COMMENTS Temp: 4°C

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

4/02R
FORM NO. TtNUS-001

D1365

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER № 1156 | PAGE 1 OF 1

PROJECT NO: 112600622	FACILITY: BP/AMOCO OU7 VPB133	PROJECT MANAGER David Bennack	PHONE NUMBER 757 461 3768	LABORATORY NAME AND CONTACT: Chemtech K. Kumar
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER Jim Ferguson / B. Lunn	PHONE NUMBER 412-496-9283	ADDRESS 284 Sheffield Street
		CARRIER/WAYBILL NUMBER 8000 4356 0791		CITY, STATE Mountainside NJ 07092

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

DATE YEAR 2012	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS VOC	TYPE OF ANALYSIS VOC	TYPE OF ANALYSIS UNPRES.	TYPE OF ANALYSIS PRES.	TYPE OF ANALYSIS	TYPE OF ANALYSIS	TYPE OF ANALYSIS	TYPE OF ANALYSIS	COMMENTS
1/30	11:30	BP-VPB133-GW-844	VPB 133	843	844	GW	G	2	G		X	—							Grey, turbid, UNPRES.
1/30	14:30	BP-VPB133-GW-854	VPB 133	853	854	GW	G	2	G		X	X							Grey / turb. 1 pres / 1 unpres
1/30	08:00	BP-VPB133-TB-013012-JF	—	—	—	GW	G	2	G		—	X							
1/31	10:10	BP-VPB133-GW-864	VPB 133	863	864	GW	G	2	G		X	—							Grey, Turbid
1/31	13:10	BP-VPB133-GW-874	VPB 133	873	874	GW	G	2	G		X	—							" "
1/31	16:10	BP-VPB133-GW-884	VPB 133	883	884	GW	G	2	G		X	—							" "
2/1	12:20	BP-VPB133-GW-904	VPB 133	903	904	GW	G	2	G		X	—							" "

1. RELINQUISHED BY	DATE 2/1/2012	TIME 17:45	1. RECEIVED BY Fedex Express AB# 8000 4356 0791	DATE 2/1/2012 TIME 17:45
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE TIME
3. RELINQUISHED BY Fedex	DATE 2/2/12	TIME 9:15	3. RECEIVED BY Palab Shah	DATE 2/2/12 TIME 9:15

COMMENTS Temp 4°C

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

4/02R
FORM NO. TtNUS-001

D1436

TETRA TECH NUS, INC. | **CHAIN OF CUSTODY** | **NUMBER** Nº 1190 | **PAGE** 1 **OF** 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112600622	BETHPAGE OU1 VPB133	David Brayack	757461 3768	Chemtech (K. Hummel)
SAMPLERS (SIGNATURE)		**FIELD OPERATIONS LEADER**	**PHONE NUMBER**	**ADDRESS**
		J. Lentz / J. Ferguson	412-496-9283	284 Sheffield Street
		CARRIER/WAYBILL NUMBER		**CITY, STATE**
		8000 4355 8265		Mountainside NJ

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

DATE YEAR 2012	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)									
									G	G								
									PRESERVATIVE USED		HCL	4°C						
									TYPE OF ANALYSIS									COMMENTS
									VOC	VOC								
2/2	09:00	BP-VPB133-TB-030212-JRF	TB	—	—	GW	G	2	X	—								
2/2	10:50	BP-VPB133-GW-934	VPB 133	938	939	GW	G	2	—	2								
2/2	16:15	BP-VPB133-GW-954	VPB 133	950	954	GW	G	2	—	2								
2/2	17:10	BP-VPB133-GW-974	VPB 133	973	974	GW	G	1	—	1								

1. RELINQUISHED BY	DATE 03/07/12	TIME 16:15	1. RECEIVED BY FEDERAL Express AB# 8000 4355 8265	DATE 03/07/12	TIME 16:15
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY FedEx	DATE 2/8/12	TIME 9:15	3. RECEIVED BY PS	DATE 2/8/12	TIME 9:15

COMMENTS: Temp 4°C

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

4/02R
FORM NO. TtNUS-001

Tetra Tech INC **INTERNAL CORRESPONDENCE**

TO:	**D. BRAYACK**	**DATE:**	**FEBRUARY 20, 2012**
FROM:	**JOSEPH KALINYAK**	**COPIES:**	**DV FILE**
SUBJECT:	**ORGANIC DATA VALIDATION – VOC NWIRP BETHPAGE, CTO 066 SDG D1061**		
SAMPLES:	6 / Aqueous / VOC		

BP-VPB-TB-010412	BP-VPB133-GW-058	BP-VPB133-GW-114
BP-VPB133-GW-148	BP-VPB133-GW-150	BP-VPB133-GW-194

Overview

The sample set for NWIRP Calverton, CTO 066, SDG D1061 consisted of six (6) aqueous samples including one (1) aqueous trip blank sample. All aqueous samples were analyzed for a select list of volatile organic compounds (VOC). No field duplicate sample pairs were included in this Sample Delivery Group (SDG).

The samples were collected by Tetra Tech on January 4, 5, and 6, 2012 and analyzed by ChemTech laboratory. All analyses were conducted in accordance with EPA Method SW-846 8260B analytical and reporting protocols.

The data contained in this SDG were validated with regard to the following parameters:

*	• Data completeness
*	• Hold times
*	• GC/MS System Tuning and Performance
	• Initial/continuing calibrations
*	• Laboratory Blank Results
	• Laboratory Control Sample
	• Matrix Spike/Matrix Spike Duplicate Recoveries
	• Surrogate Spike Recoveries
*	• Internal Standard Recoveries
*	• Compound Identification
	• Compound Quantitation
*	• Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Qualified analytical results are presented in Appendix A, results as reported by the laboratory are presented in Appendix B, Region II data validation forms are presented in Appendix C, and documentation supporting these findings is presented in Appendix D.

VOC

An email from the laboratory indicated that four (4) of the samples had air bubbles in some of the sample vials. The email indicated that sample BP-VPB-TB-010412 had one vial with a medium air bubble. Since

two vials were sent for this sample no validation action was taken as the alternate vial was available for sample analysis. According to the laboratory, sample BP-VPB133-GW-114 had two (2) of two (2) sample vials with big air bubbles in both vials, sample BP-VPB133-GW-150 had two (2) of two (2) sample vials with medium air bubbles, and sample BP-VPB133-GW-148 had one (1) of one (1) sample vial with small multiple air bubbles. Samples BP-VPB133-GW-114 and BP-VPB133-GW-150 VOC sample positive results were qualified estimated, (J), and the non-detected sample results were qualified rejected, (UR), per the Region 2 data validation guidelines. Sample BP-VPB133-GW-148 VOC results were not qualified for the sample vial small air bubble content identified in the email.

The continuing calibration verification (CCV) percent differences (%D) were greater than the 20% quality control limit for dichlorodifluoromethane, chloromethane, vinyl chloride, 1,1,2-trichlorotrifluoroethane, acetone, and methylene acetate for instrument MSVOAG on 01/10/12 @ 13:13.

Affected samples:
BP-VPB-TB-010412 BP-VPB133-GW-058 BP-VPB133-GW-148
BP-VPB133-GW-194

Action: The aforementioned sample positive and non-detected results for dichlorodifluoromethane, chloromethane, vinyl chloride, 1,1,2-trichlorotrifluoroethane, acetone, and methylene acetate were qualified estimated, (J) and (UJ), respectively.

The laboratory control sample (LCS) percent recoveries (%R) were greater than the quality control limit for chloromethane and 1,2-dibromo-3-chloropropane for batch VBG0110W2.

Affected samples:
BP-VPB-TB-010412 BP-VPB133-GW-058 BP-VPB133-GW-148
BP-VPB133-GW-194

Action: The positive results for chloromethane for samples BP-VPB133-GW-058 and BP-VPB133-GW-148 were qualified estimated, (J). The non-detected chloromethane and 1,2-dibromo-3-chloropropane sample results were not qualified.

The surrogate %R for toluene-d8 was less than the quality control limits for sample BP-VPB133-GW-058.

Action: Sample BP-VPB133-GW-058 positive and non-detected results were qualified estimated, (J) and (UJ), respectively.

Positive results below the limit of quantitation (LOQ) and above the method detection limit (MDL) were qualified as estimated, (J), due to uncertainty near the detection limit.

Additional Comments

The Matrix Spike (MS) and MS duplicate (MSD) %Rs were greater than the quality control limit for chloromethane, methyl tert-butyl ether, and 2-hexanone for a spiked sample from another SDG.

Affected samples: None

Action: No validation action was taken as the sample was not from this SDG.

Forty-nine (49) analytes were reported for VOCs.

Non-detected sample results were reported to the LOD.

Sample BP-VPB133-GW-148 had the analytes octanal and 1,2,3-trichloropropane identified as present in the tentatively identified compound page of the laboratory sample results. This was identified for report completeness and no validation action was necessary.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Sample VOC results were qualified for CCV %D, LCS %R, and surrogate %R quality control limit non-compliances.

Other Factors Affecting Data Quality: Sample BP-VPB133-GW-114 and BP-VPB133-GW-150 VOC positive results were qualified and non-detected VOC results rejected for significant air bubble content in the sample vials. Positive results below the LOQ and above the MDL were qualified as estimated, (J), due to uncertainty near the detection limit.

The data for these analyses were reviewed with reference to the USEPA SW-846 Method 8260B, USEPA Region II Hazardous Waste Support Branch Validating Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry SW-846 Method 8260B SOP HW-24 Revision #2 August 2008 and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (April 2009).

TetraTech
Joseph Kalinyak
Chemist/Data Validator

TetraTech
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:
Appendix A - Qualified Analytical Results
Appendix B - Results as Reported by the Laboratory
Appendix C – Region II Data Validation Forms
Appendix D - Support Documentation

Appendix A

Qualified Analytical Results

Value Qualifier Key (Val Qual)

J – The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

UJ – The result is an estimated non-detected quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

U - Value is a non-detect as reported by the laboratory.

UR – Non-detected result is considered rejected, (UR), as a result of technical non-compliances.

DATA QUALIFICATION CODE (QUAL CODE)

Qualifier Codes:

A	=	Lab Blank Contamination
B	=	Field Blank Contamination
C	=	Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01	=	GC/MS Tuning Noncompliance
D	=	MS/MSD Recovery Noncompliance
E	=	LCS/LCSD Recovery Noncompliance
F	=	Lab Duplicate Imprecision
G	=	Field Duplicate Imprecision
H	=	Holding Time Exceedance
I	=	ICP Serial Dilution Noncompliance
J	=	ICP PDS Recovery Noncompliance; MSA's r < 0.995
K	=	ICP Interference - includes ICS % R Noncompliance
L	=	Instrument Calibration Range Exceedance
M	=	Sample Preservation Noncompliance
N	=	Internal Standard Noncompliance
N01	=	Internal Standard Recovery Noncompliance Dioxins
N02	=	Recovery Standard Noncompliance Dioxins
N03	=	Clean-up Standard Noncompliance Dioxins
O	=	Poor Instrument Performance (i.e., base-time drifting)
P	=	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q	=	Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R	=	Surrogates Recovery Noncompliance
S	=	Pesticide/PCB Resolution
T	=	% Breakdown Noncompliance for DDT and Endrin
U	=	RPD between columns/detectors >40% for positive results determined via GC/HPLC
V	=	Non-linear calibrations; correlation coefficient r < 0.995
W	=	EMPC result
X	=	Signal to noise response drop
Y	=	Percent solids <30%
Z	=	Uncertainty at 2 sigma deviation is less than sample activity
Z1	=	Tentatively Identified Compound considered presumptively present
Z2	=	Tentatively Identified Compound column bleed

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-058			BP-VPB133-GW-114			BP-VPB133-GW-148			BP-VPB133-GW-150		
SDG: D1061	LAB_ID	D1061-01			D1061-03			D1061-04			D1061-05		
FRACTION: OV	SAMP_DATE	1/4/2012			1/4/2012			1/5/2012			1/5/2012		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
1,1,2,2-TETRACHLOROETHANE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
1,1,2-TRICHLOROETHANE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
1,1,2-TRICHLOROTRIFLUOROETHANE		0.5	UJ	CR	0.5	UR	Q	0.5	UJ	C	0.5	UR	Q
1,1-DICHLOROETHANE		0.5	UJ	R	0.5	UR	Q	1.3			1.1	J	Q
1,1-DICHLOROETHENE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.63	J	PQ
1,2,4-TRICHLOROBENZENE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
1,2-DIBROMO-3-CHLOROPROPANE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
1,2-DIBROMOETHANE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
1,2-DICHLOROBENZENE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
1,2-DICHLOROETHANE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
1,2-DICHLOROPROPANE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
1,3-DICHLOROBENZENE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
1,4-DICHLOROBENZENE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
2-BUTANONE		2.5	UJ	R	2.5	UR	Q	4.9	J	P	2.5	UR	Q
2-HEXANONE		2.5	UJ	R	2.5	UR	Q	2.5	U		2.5	UR	Q
4-METHYL-2-PENTANONE		2.5	UJ	R	2.5	UR	Q	2.5	U		2.5	UR	Q
ACETONE		42	J	CR	5.5	J	Q	27	J	C	3.8	J	PQ
BENZENE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
BROMODICHLOROMETHANE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
BROMOFORM		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
BROMOMETHANE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
CARBON DISULFIDE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
CARBON TETRACHLORIDE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
CHLOROBENZENE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
CHLORODIBROMOMETHANE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
CHLOROETHANE		1.7	J	R	0.5	UR	Q	0.5	U		0.5	UR	Q
CHLOROFORM		0.5	J	PR	0.5	UR	Q	0.5	U		0.42	J	PQ
CHLOROMETHANE		2.1	J	CER	0.5	UR	Q	4	J	CE	0.5	UR	Q
CIS-1,2-DICHLOROETHENE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
CIS-1,3-DICHLOROPROPENE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
CYCLOHEXANE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
DICHLORODIFLUOROMETHANE		0.5	UJ	CR	0.5	UR	Q	0.5	UJ	C	0.5	UR	Q
ETHYLBENZENE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
ISOPROPYLBENZENE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-194			BP-VPB-TB-010412		
SDG: D1061	LAB_ID	D1061-06			D1061-02		
FRACTION: OV	SAMP_DATE	1/6/2012			1/4/2012		
MEDIA: WATER	QC_TYPE	NM			NM		
	UNITS	UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		0.5	U		0.5	U	
1,1,2,2-TETRACHLOROETHANE		0.5	U		0.5	U	
1,1,2-TRICHLOROETHANE		0.5	U		0.5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE		0.5	UJ	C	0.5	UJ	C
1,1-DICHLOROETHANE		0.5	U		0.5	U	
1,1-DICHLOROETHENE		0.5	U		0.5	U	
1,2,4-TRICHLOROBENZENE		0.5	U		0.5	U	
1,2-DIBROMO-3-CHLOROPROPANE		0.5	U		0.5	U	
1,2-DIBROMOETHANE		0.5	U		0.5	U	
1,2-DICHLOROBENZENE		0.5	U		0.5	U	
1,2-DICHLOROETHANE		0.5	U		0.5	U	
1,2-DICHLOROPROPANE		0.5	U		0.5	U	
1,3-DICHLOROBENZENE		0.5	U		0.5	U	
1,4-DICHLOROBENZENE		0.5	U		0.5	U	
2-BUTANONE		2.5	U		2.5	U	
2-HEXANONE		2.5	U		2.5	U	
4-METHYL-2-PENTANONE		2.5	U		2.5	U	
ACETONE		2.5	UJ	C	2.5	UJ	C
BENZENE		0.5	U		0.5	U	
BROMODICHLOROMETHANE		0.5	U		0.5	U	
BROMOFORM		0.5	U		0.5	U	
BROMOMETHANE		0.5	U		0.5	U	
CARBON DISULFIDE		0.5	U		0.5	U	
CARBON TETRACHLORIDE		0.5	U		0.5	U	
CHLOROBENZENE		0.5	U		0.5	U	
CHLORODIBROMOMETHANE		0.5	U		0.5	U	
CHLOROETHANE		0.5	U		0.5	U	
CHLOROFORM		0.5	U		0.5	U	
CHLOROMETHANE		0.5	UJ	C	0.5	UJ	C
CIS-1,2-DICHLOROETHENE		0.5	U		0.5	U	
CIS-1,3-DICHLOROPROPENE		0.5	U		0.5	U	
CYCLOHEXANE		0.5	U		0.5	U	
DICHLORODIFLUOROMETHANE		0.5	UJ	C	0.5	UJ	C
ETHYLBENZENE		0.5	U		0.5	U	
ISOPROPYLBENZENE		0.5	U		0.5	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-058			BP-VPB133-GW-114			BP-VPB133-GW-148			BP-VPB133-GW-150		
SDG: D1061	LAB_ID	D1061-01			D1061-03			D1061-04			D1061-05		
FRACTION: OV	SAMP_DATE	1/4/2012			1/4/2012			1/5/2012			1/5/2012		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
M+P-XYLENES		1	UJ	R	1	UR	Q	1	U		1	UR	Q
METHYL ACETATE		0.5	UJ	CR	0.5	UR	Q	0.5	UJ	C	0.5	UR	Q
METHYL CYCLOHEXANE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
METHYL TERT-BUTYL ETHER		2.6	J	R	0.5	UR	Q	2.2			2.3	J	Q
METHYLENE CHLORIDE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
O-XYLENE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
STYRENE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
TETRACHLOROETHENE		0.5	UJ	R	0.5	UR	Q	0.5	U		1.4	J	Q
TOLUENE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
TRANS-1,2-DICHLOROETHENE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
TRANS-1,3-DICHLOROPROPENE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
TRICHLOROETHENE		0.5	UJ	R	0.5	UR	Q	0.79	J	P	1.4	J	Q
TRICHLOROFLUOROMETHANE		0.5	UJ	R	0.5	UR	Q	0.5	U		0.5	UR	Q
VINYL CHLORIDE		0.5	UJ	CR	0.5	UR	Q	0.5	UJ	C	0.5	UR	Q

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-194			BP-VPB-TB-010412		
SDG: D1061	LAB_ID	D1061-06			D1061-02		
FRACTION: OV	SAMP_DATE	1/6/2012			1/4/2012		
MEDIA: WATER	QC_TYPE	NM			NM		
	UNITS	UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
M+P-XYLENES		1	U		1	U	
METHYL ACETATE		0.5	UJ	C	0.5	UJ	C
METHYL CYCLOHEXANE		0.5	U		0.5	U	
METHYL TERT-BUTYL ETHER		0.5	U		0.5	U	
METHYLENE CHLORIDE		0.5	U		0.5	U	
O-XYLENE		0.5	U		0.5	U	
STYRENE		0.5	U		0.5	U	
TETRACHLOROETHENE		0.5	U		0.5	U	
TOLUENE		0.5	U		0.5	U	
TRANS-1,2-DICHLOROETHENE		0.5	U		0.5	U	
TRANS-1,3-DICHLOROPROPENE		0.5	U		0.5	U	
TRICHLOROETHENE		0.5	U		0.5	U	
TRICHLOROFLUOROMETHANE		0.5	U		0.5	U	
VINYL CHLORIDE		0.5	UJ	C	0.5	UJ	C

Tetra Tech **INTERNAL CORRESPONDENCE**

TO: **D. BRAYACK** **DATE:** **FEBRUARY 21, 2012**

FROM: **A. COGNETTI** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – VOC**
NWIRP BETHPAGE CTO WE 066
SAMPLE DELIVERY GROUP (SDG) – D1108

SAMPLES: 9/Aqueous/VOC

BP-VPB-TB-010912	BP-VPB133-GW-234	BP-VPB133-GW-254
BP-VPB133-GW-274	BP-VPB133-GW-294	BP-VPB133-GW-314
BP-VPB133-GW-334	BP-VPB133-GW-354	BP-VPB133-GW-374

Overview

The sample set for NWIRP Bethpage, CTO WE 066, SDG D1108 consists of eight (8) environmental aqueous samples and a trip blank analyzed for volatile organic compounds (VOCs). There was no field duplicate contained in this SDG.

The samples were collected on January 9, 10 and 11, 2012 by Tetra Tech and analyzed by Chemtech. VOC analyses were conducted in accordance with EPA Method SW-846 8260B analytical and reporting protocol. The data contained in this SDG were validated with regard to the following parameters:

* • Data completeness
* • Holding times
* • GC/MS Tuning
• Initial/continuing calibrations
* • Laboratory Method Blank Results
* • Surrogate Recoveries
• Laboratory Control Sample Recoveries
* • Internal Standard Recoveries
* • Compound Quantitation
* • Compound Identification
* • Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Qualified analytical results are presented in Appendix A, results as reported by the laboratory are presented in Appendix B, Region II data validation forms are presented in Appendix C, and documentation supporting these findings is presented in Appendix D.

VOC

The initial calibration relative standard deviations (%RSDs) were greater than the 15% quality control limit for several target analytes on January 3, 2012 on instrument MSVOA R. The analytes were dichlorodifluoromethane, carbon disulfide, methylene chloride, cyclohexane, carbon tetrachloride, chloroform, 1,1,1-trichloroethane, bromodichloromethane, trans-1,3-dichloropropene, cis-1,3-dichloropropene, 2-hexanone, dibromochloromethane, styrene, bromoform, isopropyl benzene and 1,2-dibromo-3-chloropropane. The positive and nondetected results of the aforementioned analytes were qualified as estimated (J) and (UJ), respectively in the affected samples BP-VPB133-GW-234, BP-VPB133-GW-254, BP-VPB133-GW-274, BP-VPB133-GW-294, BP-VPB133-GW-314, BP-VPB133-GW-334, BP-VPB133-GW-354 and BP-VPB133-GW-374.

The continuing calibration percent differences (%Ds) for several target analytes were greater than the 20% quality control limit On January 13, 2012 @ 16:35 on instrument MSVOA R. The analytes were carbon tetrachloride, chloroform, trans- 1,3-dichloropropene, dibromochloromethane and bromoform. The nondetected bromoform results were qualified as estimated (UJ) in the affected samples BP-VPB133-GW-234, BP-VPB133-GW-254, BP-VPB133-GW-274, BP-VPB133-GW-294, BP-VPB133-GW-314, BP-VPB133-GW-334, BP-VPB133-GW-354 and BP-VPB133-GW-374.

The initial calibration %RSDs for several target analytes were greater than the 15% quality control limit on January 17, 2012 on instrument MSVOA G. The analytes were bromomethane, chloroethane, acetone, methyl acetate, methylene chloride, 2-butanone, 4-methyl-2-pentanone, 2-hexanone and tetrachloroethene. The nondetected bromomethane, chloroethane, acetone, methyl acetate, methylene chloride, 2-butanone, 4-methyl-2-pentanone, 2-hexanone and tetrachloroethene results were qualified as estimated (UJ) in the affected sample BP-VPB-TB-010912.

The laboratory control sample (LCS) percent recoveries (%Rs) of 2-butanone and cis-1,2-dichloroethene were greater than the upper quality control limit in batch BSR0113W1. The positive 2-butanone and cis-1,2-dichloroethene results were qualified as estimated (J) in the affected samples BP-VPB133-GW-234, BP-VPB133-GW-254, BP-VPB133-GW-274, BP-VPB133-GW-294, BP-VPB133-GW-314, BP-VPB133-GW-334, BP-VPB133-GW-354 and BP-VPB133-GW-374.

Additional Comments

The matrix spike/matrix spike duplicate (MS/MSD) %Rs for cis-1,2-dichloroethene, methyl cyclohexane, trichloroethene, chlorobenzene and o-xylene were outside quality control limits in a sample not included in this SDG. No action was taken on the for cis-1,2-dichloroethene, methyl cyclohexane, trichloroethene, chlorobenzene and o-xylene results. In addition, the %R of ethyl benzene was greater than the upper quality control limit. No action was taken.

Nondetected results are reported to the limit of detection (LOD).

Positive results below the Reporting Limit (RL) and above the detection limit were qualified as estimated, (J), due to uncertainty near the detection limit.

EXECUTIVE SUMMARY

Laboratory Performance Issues: The continuing calibration %Ds and % drifts for several analytes exceeded quality control limits. The %RSDs exceeded the quality control limit for several analytes resulting in the qualification of data. The LCS %Rs of 2-butanone and cis-1,2-dichloroethene were greater than the upper quality control limit.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to SOP # HW-24 Revision #2, August 2008, USEPA Region II Hazardous Waste Support Branch Validating Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry SW-846/8260B, and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories", April 2009. The text of this report has been formulated to address only those problem areas affecting data quality.

Tetra Tech
Ann Cognetti
Chemist/Data Validator

Tetra Tech
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C – Region II Data Validation Forms
4. Appendix D - Support Documentation

Appendix A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-234			BP-VPB133-GW-254			BP-VPB133-GW-274			BP-VPB133-GW-294		
SDG: D1108	LAB_ID	D1108-02			D1108-03			D1108-04			D1108-05		
FRACTION: OV	SAMP_DATE	1/9/2012			1/9/2012			1/10/2012			1/10/2012		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
1,1,2,2-TETRACHLOROETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
1,1,2-TRICHLOROETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
1,1-DICHLOROETHANE		3			0.5	U		0.5	U		0.5	U	
1,1-DICHLOROETHENE		0.68	J	P	0.5	U		0.5	U		0.5	U	
1,2,4-TRICHLOROBENZENE		0.46	J	P	0.5	U		0.5	U		0.5	U	
1,2-DIBROMO-3-CHLOROPROPANE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
1,2-DIBROMOETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
1,2-DICHLOROBENZENE		0.5	U		0.5	U		0.5	U		0.5	U	
1,2-DICHLOROETHANE		0.51	J	P	0.5	U		0.5	U		0.5	U	
1,2-DICHLOROPROPANE		2.2			0.5	U		0.5	U		0.5	U	
1,3-DICHLOROBENZENE		0.5	U		0.5	U		0.5	U		0.5	U	
1,4-DICHLOROBENZENE		0.5	U		0.5	U		0.5	U		0.5	U	
2-BUTANONE		2.7	J	EP	13	J	E	2.5	U		2.5	U	
2-HEXANONE		2.5	UJ	C	2.5	UJ	C	2.5	UJ	C	2.5	UJ	C
4-METHYL-2-PENTANONE		2.5	U		2.5	U		2.5	U		2.5	U	
ACETONE		5	J	P	9.1			4.7	J	P	6.8		
BENZENE		0.5	U		0.5	U		0.5	U		0.5	U	
BROMODICHLOROMETHANE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
BROMOFORM		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
BROMOMETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
CARBON DISULFIDE		0.5	UJ	C	1.8	J	C	0.5	UJ	C	2	J	C
CARBON TETRACHLORIDE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
CHLOROBENZENE		0.5	U		0.5	U		0.5	U		0.5	U	
CHLORODIBROMOMETHANE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
CHLOROETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
CHLOROFORM		3.1	J	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
CHLOROMETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
CIS-1,2-DICHLOROETHENE		1.8	J	E	0.5	U		0.5	U		0.5	U	
CIS-1,3-DICHLOROPROPENE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
CYCLOHEXANE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
DICHLORODIFLUOROMETHANE		2.1	J	C	2	J	C	0.5	UJ	C	0.5	UJ	C
ETHYLBENZENE		0.5	U		0.5	U		0.5	U		0.5	U	
ISOPROPYLBENZENE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-314			BP-VPB133-GW-334			BP-VPB133-GW-354			BP-VPB133-GW-374		
SDG: D1108	LAB_ID	D1108-06			D1108-07			D1108-08			D1108-09		
FRACTION: OV	SAMP_DATE	1/10/2012			1/11/2012			1/11/2012			1/11/2012		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
1,1,2,2-TETRACHLOROETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
1,1,2-TRICHLOROETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
1,1-DICHLOROETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
1,1-DICHLOROETHENE		0.5	U		0.5	U		0.5	U		0.5	U	
1,2,4-TRICHLOROBENZENE		0.5	U		0.5	U		0.5	U		0.5	U	
1,2-DIBROMO-3-CHLOROPROPANE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
1,2-DIBROMOETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
1,2-DICHLOROBENZENE		0.5	U		0.5	U		0.5	U		0.5	U	
1,2-DICHLOROETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
1,2-DICHLOROPROPANE		0.5	U		0.5	U		0.5	U		0.5	U	
1,3-DICHLOROBENZENE		0.5	U		0.5	U		0.5	U		0.5	U	
1,4-DICHLOROBENZENE		0.5	U		0.5	U		0.5	U		0.5	U	
2-BUTANONE		2.5	U		5.5	J	E	5.5	J	E	2.5	U	
2-HEXANONE		2.5	UJ	C	2.5	UJ	C	2.5	UJ	C	2.5	UJ	C
4-METHYL-2-PENTANONE		2.5	U		2.5	U		2.5	U		2.5	U	
ACETONE		6.2			7.3			10			8.6		
BENZENE		0.5	U		0.5	U		0.5	U		0.5	U	
BROMODICHLOROMETHANE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
BROMOFORM		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
BROMOMETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
CARBON DISULFIDE		0.5	UJ	C	2.4	J	C	1.6	J	C	0.5	UJ	C
CARBON TETRACHLORIDE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
CHLOROBENZENE		0.5	U		0.5	U		0.5	U		0.5	U	
CHLORODIBROMOMETHANE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
CHLOROETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
CHLOROFORM		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
CHLOROMETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
CIS-1,2-DICHLOROETHENE		0.5	U		0.5	U		0.5	U		0.5	U	
CIS-1,3-DICHLOROPROPENE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
CYCLOHEXANE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
DICHLORODIFLUOROMETHANE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
ETHYLBENZENE		0.5	U		0.5	U		0.5	U		0.5	U	
ISOPROPYLBENZENE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C

PROJ_NO: 00622	NSAMPLE	BP-VPB-TB-010912
SDG: D1108	LAB_ID	D1108-01
FRACTION: OV	SAMP_DATE	1/9/2012
MEDIA: WATER	QC_TYPE	NM
	UNITS	UG/L
	PCT_SOLIDS	0.0
	DUP_OF	

PARAMETER	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE	0.5	U	
1,1,2,2-TETRACHLOROETHANE	0.5	U	
1,1,2-TRICHLOROETHANE	0.5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	0.5	U	
1,1-DICHLOROETHANE	0.5	U	
1,1-DICHLOROETHENE	0.5	U	
1,2,4-TRICHLOROBENZENE	0.5	U	
1,2-DIBROMO-3-CHLOROPROPANE	0.5	U	
1,2-DIBROMOETHANE	0.5	U	
1,2-DICHLOROBENZENE	0.5	U	
1,2-DICHLOROETHANE	0.5	U	
1,2-DICHLOROPROPANE	0.5	U	
1,3-DICHLOROBENZENE	0.5	U	
1,4-DICHLOROBENZENE	0.5	U	
2-BUTANONE	2.5	UJ	C
2-HEXANONE	2.5	UJ	C
4-METHYL-2-PENTANONE	2.5	UJ	C
ACETONE	2.5	UJ	C
BENZENE	0.5	U	
BROMODICHLOROMETHANE	0.5	U	
BROMOFORM	0.5	U	
BROMOMETHANE	0.5	UJ	C
CARBON DISULFIDE	0.5	U	
CARBON TETRACHLORIDE	0.5	U	
CHLOROBENZENE	0.5	U	
CHLORODIBROMOMETHANE	0.5	U	
CHLOROETHANE	0.5	UJ	C
CHLOROFORM	0.5	U	
CHLOROMETHANE	0.5	U	
CIS-1,2-DICHLOROETHENE	0.5	U	
CIS-1,3-DICHLOROPROPENE	0.5	U	
CYCLOHEXANE	0.5	u	
DICHLORODIFLUOROMETHANE	0.5	U	
ETHYLBENZENE	0.5	U	
ISOPROPYLBENZENE	0.5	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-234			BP-VPB133-GW-254			BP-VPB133-GW-274			BP-VPB133-GW-294		
SDG: D1108	LAB_ID	D1108-02			D1108-03			D1108-04			D1108-05		
FRACTION: OV	SAMP_DATE	1/9/2012			1/9/2012			1/10/2012			1/10/2012		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
M+P-XYLENES		1	U		1	U		1	U		1	U	
METHYL ACETATE		0.5	U		0.5	U		0.5	U		0.5	U	
METHYL CYCLOHEXANE		0.5	U		0.5	U		0.5	U		0.5	U	
METHYL TERT-BUTYL ETHER		8.8			5.4			0.5	U		0.5	U	
METHYLENE CHLORIDE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
O-XYLENE		0.5	U		0.5	U		0.5	U		0.5	U	
STYRENE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
TETRACHLOROETHENE		0.5	U		0.5	U		0.5	U		0.5	U	
TOLUENE		0.5	U		0.5	U		0.5	U		0.5	U	
TRANS-1,2-DICHLOROETHENE		0.5	U		0.5	U		0.5	U		0.5	U	
TRANS-1,3-DICHLOROPROPENE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
TRICHLOROETHENE		0.5	U		0.5	U		0.5	U		0.5	U	
TRICHLOROFLUOROMETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
VINYL CHLORIDE		0.5	U		0.5	U		0.5	U		0.5	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-314			BP-VPB133-GW-334			BP-VPB133-GW-354			BP-VPB133-GW-374		
SDG: D1108	LAB_ID	D1108-06			D1108-07			D1108-08			D1108-09		
FRACTION: OV	SAMP_DATE	1/10/2012			1/11/2012			1/11/2012			1/11/2012		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
M+P-XYLENES		1	U		1	U		1	U		1	U	
METHYL ACETATE		0.5	U		0.5	U		0.5	U		0.5	U	
METHYL CYCLOHEXANE		0.5	U		0.5	U		0.5	U		0.5	U	
METHYL TERT-BUTYL ETHER		0.5	U		0.5	U		0.5	U		0.5	U	
METHYLENE CHLORIDE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
O-XYLENE		0.5	U		0.5	U		0.5	U		0.5	U	
STYRENE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
TETRACHLOROETHENE		0.5	U		0.5	U		0.5	U		0.5	U	
TOLUENE		0.5	U		0.5	U		0.5	U		0.5	U	
TRANS-1,2-DICHLOROETHENE		0.5	U		0.5	U		0.5	U		0.5	U	
TRANS-1,3-DICHLOROPROPENE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
TRICHLOROETHENE		0.5	U		0.5	U		0.5	U		0.5	U	
TRICHLOROFLUOROMETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
VINYL CHLORIDE		0.5	U		0.5	U		0.5	U		0.5	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB-TB-010912		
SDG: D1108	LAB_ID	D1108-01		
FRACTION: OV	SAMP_DATE	1/9/2012		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	UG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
M+P-XYLENES		1	U	
METHYL ACETATE		0.5	UJ	C
METHYL CYCLOHEXANE		0.5	U	
METHYL TERT-BUTYL ETHER		0.5	U	
METHYLENE CHLORIDE		0.5	UJ	C
O-XYLENE		0.5	U	
STYRENE		0.5	U	
TETRACHLOROETHENE		0.5	UJ	C
TOLUENE		0.5	U	
TRANS-1,2-DICHLOROETHENE		0.5	U	
TRANS-1,3-DICHLOROPROPENE		0.5	U	
TRICHLOROETHENE		0.5	U	
TRICHLOROFLUOROMETHANE		0.5	U	
VINYL CHLORIDE		0.5	U	

Tetra Tech **INTERNAL CORRESPONDENCE**

TO: **D. BRAYACK** **DATE:** **FEBRUARY 21, 2012**

FROM: **A. COGNETTI** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – VOC**
NWIRP BETHPAGE CTO WE 066
SAMPLE DELIVERY GROUP (SDG) – D1148

SAMPLES: 7/Aqueous/VOC

BP-VPB-TB-011212	BP-VPB133-GW-394	BP-VPB133-GW-414
BP-VPB133-GW-434	BP-VPB133-GW-454	BP-VPB133-GW-474
BP-VPB133-GW-494		

Overview

The sample set for NWIRP Bethpage, CTO WE 066, SDG D1148 consists of six (6) environmental aqueous samples and a trip blank analyzed for volatile organic compounds (VOCs). There was no field duplicate contained in this SDG.

The samples were collected on January 12 and 13, 2012 by Tetra Tech and analyzed by Chemtech. VOC analyses were conducted in accordance with EPA Method SW-846 8260B analytical and reporting protocol. The data contained in this SDG were validated with regard to the following parameters:

* • Data completeness
* • Holding times
* • GC/MS Tuning
• Initial/continuing calibrations
* • Laboratory Method Blank Results
* • Surrogate Recoveries
* • Laboratory Control Sample Recoveries
* • Internal Standard Recoveries
* • Compound Quantitation
* • Compound Identification
• Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Qualified analytical results are presented in Appendix A, results as reported by the laboratory are presented in Appendix B, Region II data validation forms are presented in Appendix C, and documentation supporting these findings is presented in Appendix D.

VOC

The initial calibration relative standard deviations (%RSDs) for chloroethane and 1,2-dibromo-3-chloropropane were greater than the 15% quality control limit on January 19, 2012 on instrument MSVOA F. The nondetected chloroethane and 1,2-dibromo-3-chloropropane results were qualified as estimated (UJ) in the affected samples BP-VPB133-GW394 and BP-VPB133-GW-414.

The initial calibration %RSDs for several target analytes were greater than the 15% quality control limit on January 17, 2012 on instrument MSVOA G. The analytes were chloroethane, acetone, methyl acetate, methylene chloride, 2-butanone, 4-methyl-2-pentanone, 2-hexanone and tetrachloroethene. The nondetected chloroethane, acetone, methyl acetate, methylene chloride, 2-butanone, 4-methyl-2-

pentanone, 2-hexanone and tetrachloroethene results were qualified as estimated (UJ) in the affected samples BP-VPB-TB-0112122, BP-VPB133-GW-434, BP-VPB133-GW-454, BP-VPB133-GW-474 and BP-VPB133-GW-494.

The continuing calibration percent differences and/or percent drifts were greater than the 20% quality control limit for several target analytes on January 18, 2012 @ 5:41 on instrument MSVOAG. The analytes were acetone, methyl acetate and tetrachloroethane. The nondetected acetone, methyl acetate and tetrachloroethane results were qualified as estimated (UJ) in the affected samples BP-VPB-TB-0112122, BP-VPB133-GW-434, BP-VPB133-GW-454, BP-VPB133-GW-474 and BP-VPB133-GW-494.

Due to sediment in samples BP-VPB133-GW-394 and BP-VPB133-GW-414, the laboratory had to analyze them as soil after decanting the top portion of liquid. No validation action was taken.

Additional Comments

The percent recovery (%R) of surrogate 1,2-dichloroethane-d4 was greater than the upper quality control limit in samples BP-VPB-TB-011212, BP-VPB133-GW-434, BP-VPB133-GW-454, BP-VPB133-GW-474 and BP-VPB133-GW-494. No action was taken on the nondetected results in the affected samples.

The matrix spike/matrix spike duplicate (MS/MSD) %Rs for cis-1,2-dichloroethene, methyl cyclohexane, trichloroethene, chlorobenzene and o-xylene were outside quality control limits in a sample not included in this SDG. No action was taken on the for cis-1,2-dichloroethene, methyl cyclohexane, trichloroethene, chlorobenzene and o-xylene results. In addition, the %R of ethyl benzene was greater than the upper quality control limit. No action was taken.

The MS/MSD %Rs of 1,1,2,2-tetrachloroethane was greater than the upper quality control limit in a sample not included in this SDG. No action was taken on the 1,1,2,2-tetrachloroethane results. In addition, the MSD %Rs of isopropylbenzene and 1,2,4-trichlorobenzene were outside quality control limits. No action was taken.

The laboratory control sample %R of methyl tert-butyl ether was greater than the upper quality control limit in batch BSG0117W3. No action was taken on the nondetected methyl tert-butyl ether results in the affected samples.

Nondetected results are reported to the limit of detection (LOD).

Positive results below the Reporting Limit (RL) and above the detection limit were qualified as estimated, (J), due to uncertainty near the detection limit.

EXECUTIVE SUMMARY

Laboratory Performance Issues: The continuing calibration %Ds and % drifts for several analytes exceeded quality control limits. The %RSDs exceeded the quality control limit for several analytes resulting in the qualification of data.

Other Factors Affecting Data Quality: Due to sediment in samples BP-VPB133-GW-394 and BP-VPB133-GW-414, the laboratory had to analyzed them as soil after decanting the top portion of liquid.

TO: D. Brayack
FROM: A. Cognetti
SDG: D1148
DATE: February 21, 2012
PAGE: 3

The data for these analyses were reviewed with reference to SOP # HW-24 Revision #2, August 2008, USEPA Region II Hazardous Waste Support Branch Validating Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry SW-846/8260B, and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories", April 2009. The text of this report has been formulated to address only those problem areas affecting data quality.

Tetra Tech
Ann Cognetti
Chemist/Data Validator

Tetra Tech
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C – Region II Data Validation Forms
4. Appendix D - Support Documentation

Appendix A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-434			BP-VPB133-GW-454			BP-VPB133-GW-474			BP-VPB133-GW-494		
SDG: D1148	LAB_ID	D1148-04			D1148-05			D1148-06			D1148-07		
FRACTION: OV	SAMP_DATE	1/12/2012			1/13/2012			1/13/2012			1/13/2012		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
1,1,2,2-TETRACHLOROETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
1,1,2-TRICHLOROETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
1,1-DICHLOROETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
1,1-DICHLOROETHENE		0.5	U		0.5	U		0.5	U		0.5	U	
1,2,4-TRICHLOROBENZENE		0.5	U		0.5	U		0.5	U		0.5	U	
1,2-DIBROMO-3-CHLOROPROPANE		0.5	U		0.5	U		0.5	U		0.5	U	
1,2-DIBROMOETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
1,2-DICHLOROBENZENE		0.5	U		0.5	U		0.5	U		0.5	U	
1,2-DICHLOROETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
1,2-DICHLOROPROPANE		0.5	U		0.5	U		0.5	U		0.5	U	
1,3-DICHLOROBENZENE		0.5	U		0.5	U		0.5	U		0.5	U	
1,4-DICHLOROBENZENE		0.5	U		0.5	U		0.5	U		0.5	U	
2-BUTANONE		2.5	UJ	C	2.5	UJ	C	2.5	UJ	C	2.5	UJ	C
2-HEXANONE		2.5	UJ	C	2.5	UJ	C	2.5	UJ	C	2.5	UJ	C
4-METHYL-2-PENTANONE		2.5	UJ	C	2.5	UJ	C	2.5	UJ	C	2.5	UJ	C
ACETONE		2.5	UJ	C	2.5	UJ	C	2.5	UJ	C	2.5	UJ	C
BENZENE		0.5	U		0.5	U		0.5	U		0.5	U	
BROMODICHLOROMETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
BROMOFORM		0.5	U		0.5	U		0.5	U		0.5	U	
BROMOMETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
CARBON DISULFIDE		0.5	U		0.5	U		0.5	U		0.5	U	
CARBON TETRACHLORIDE		0.5	U		0.5	U		0.5	U		0.5	U	
CHLOROBENZENE		0.5	U		0.5	U		0.5	U		0.5	U	
CHLORODIBROMOMETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
CHLOROETHANE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
CHLOROFORM		0.5	U		0.5	U		0.5	U		0.5	U	
CHLOROMETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
CIS-1,2-DICHLOROETHENE		0.5	U		0.5	U		0.5	U		0.5	U	
CIS-1,3-DICHLOROPROPENE		0.5	U		0.5	U		0.5	U		0.5	U	
CYCLOHEXANE		0.5	U		0.5	U		0.5	U		0.5	U	
DICHLORODIFLUOROMETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
ETHYLBENZENE		0.5	U		0.5	U		0.5	U		0.5	U	
ISOPROPYLBENZENE		0.5	U		0.5	U		0.5	U		0.5	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB-TB-011212
SDG: D1148	LAB_ID	D1148-01
FRACTION: OV	SAMP_DATE	1/12/2012
MEDIA: WATER	QC_TYPE	NM
	UNITS	UG/L
	PCT_SOLIDS	0.0
	DUP_OF	

PARAMETER	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE	0.5	U	
1,1,2,2-TETRACHLOROETHANE	0.5	U	
1,1,2-TRICHLOROETHANE	0.5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	0.5	U	
1,1-DICHLOROETHANE	0.5	U	
1,1-DICHLOROETHENE	0.5	U	
1,2,4-TRICHLOROBENZENE	0.5	U	
1,2-DIBROMO-3-CHLOROPROPANE	0.5	U	
1,2-DIBROMOETHANE	0.5	U	
1,2-DICHLOROBENZENE	0.5	U	
1,2-DICHLOROETHANE	0.5	U	
1,2-DICHLOROPROPANE	0.5	U	
1,3-DICHLOROBENZENE	0.5	U	
1,4-DICHLOROBENZENE	0.5	U	
2-BUTANONE	2.5	UJ	C
2-HEXANONE	2.5	UJ	C
4-METHYL-2-PENTANONE	2.5	UJ	C
ACETONE	2.5	UJ	C
BENZENE	0.5	U	
BROMODICHLOROMETHANE	0.5	U	
BROMOFORM	0.5	U	
BROMOMETHANE	0.5	U	
CARBON DISULFIDE	0.5	U	
CARBON TETRACHLORIDE	0.5	U	
CHLOROBENZENE	0.5	U	
CHLORODIBROMOMETHANE	0.5	U	
CHLOROETHANE	0.5	UJ	C
CHLOROFORM	0.5	U	
CHLOROMETHANE	0.5	U	
CIS-1,2-DICHLOROETHENE	0.5	U	
CIS-1,3-DICHLOROPROPENE	0.5	U	
CYCLOHEXANE	0.5	U	
DICHLORODIFLUOROMETHANE	0.5	U	
ETHYLBENZENE	0.5	U	
ISOPROPYLBENZENE	0.5	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-434			BP-VPB133-GW-454			BP-VPB133-GW-474			BP-VPB133-GW-494		
SDG: D1148	LAB_ID	D1148-04			D1148-05			D1148-06			D1148-07		
FRACTION: OV	SAMP_DATE	1/12/2012			1/13/2012			1/13/2012			1/13/2012		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
M+P-XYLENES		1	U		1	U		1	U		1	U	
METHYL ACETATE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
METHYL CYCLOHEXANE		0.5	U		0.5	U		0.5	U		0.5	U	
METHYL TERT-BUTYL ETHER		0.5	U		0.5	U		0.5	U		0.5	U	
METHYLENE CHLORIDE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
O-XYLENE		0.5	U		0.5	U		0.5	U		0.5	U	
STYRENE		0.5	U		0.5	U		0.5	U		0.5	U	
TETRACHLOROETHENE		0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
TOLUENE		0.5	U		0.5	U		0.5	U		0.5	U	
TRANS-1,2-DICHLOROETHENE		0.5	U		0.5	U		0.5	U		0.5	U	
TRANS-1,3-DICHLOROPROPENE		0.5	U		0.5	U		0.5	U		0.5	U	
TRICHLOROETHENE		0.5	U		0.5	U		0.5	U		0.5	U	
TRICHLOROFLUOROMETHANE		0.5	U		0.5	U		0.5	U		0.5	U	
VINYL CHLORIDE		0.5	U		0.5	U		0.5	U		0.5	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB-TB-011212		
SDG: D1148	LAB_ID	D1148-01		
FRACTION: OV	SAMP_DATE	1/12/2012		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	UG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
M+P-XYLENES		1	U	
METHYL ACETATE		0.5	UJ	C
METHYL CYCLOHEXANE		0.5	U	
METHYL TERT-BUTYL ETHER		0.5	U	
METHYLENE CHLORIDE		0.5	UJ	C
O-XYLENE		0.5	U	
STYRENE		0.5	U	
TETRACHLOROETHENE		0.5	UJ	C
TOLUENE		0.5	U	
TRANS-1,2-DICHLOROETHENE		0.5	U	
TRANS-1,3-DICHLOROPROPENE		0.5	U	
TRICHLOROETHENE		0.5	U	
TRICHLOROFLUOROMETHANE		0.5	U	
VINYL CHLORIDE		0.5	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-394			BP-VPB133-GW-414		
SDG: D1148	LAB_ID	D1148-08			D1148-09		
FRACTION: OV	SAMP_DATE	1/12/2012			1/12/2012		
MEDIA: SOIL	QC_TYPE	NM			NM		
	UNITS	UG/KG			UG/KG		
	PCT_SOLIDS	100.0			100.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		2.5	U		2.5	U	
1,1,2,2-TETRACHLOROETHANE		2.5	U		2.5	U	
1,1,2-TRICHLOROETHANE		2.5	U		2.5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE		2.5	U		2.5	U	
1,1-DICHLOROETHANE		2.5	U		2.5	U	
1,1-DICHLOROETHENE		2.5	U		2.5	U	
1,2,4-TRICHLOROBENZENE		2.5	U		2.5	U	
1,2-DIBROMO-3-CHLOROPROPANE		2.5	UJ	C	2.5	UJ	C
1,2-DIBROMOETHANE		2.5	U		2.5	U	
1,2-DICHLOROBENZENE		2.5	U		2.5	U	
1,2-DICHLOROETHANE		2.5	U		2.5	U	
1,2-DICHLOROPROPANE		2.5	U		2.5	U	
1,3-DICHLOROBENZENE		2.5	U		2.5	U	
1,4-DICHLOROBENZENE		2.5	U		2.5	U	
2-BUTANONE		23	J	P	5.4	J	P
2-HEXANONE		12.5	U		12.5	U	
4-METHYL-2-PENTANONE		12.5	U		12.5	U	
ACETONE		72			22	J	P
BENZENE		2.5	U		2.5	U	
BROMODICHLOROMETHANE		2.5	U		2.5	U	
BROMOFORM		2.5	U		2.5	U	
BROMOMETHANE		2.5	U		2.5	U	
CARBON DISULFIDE		2.5	U		18		
CARBON TETRACHLORIDE		2.5	U		2.5	U	
CHLOROBENZENE		2.5	U		2.5	U	
CHLORODIBROMOMETHANE		2.5	U		2.5	U	
CHLOROETHANE		2.5	UJ	C	2.5	UJ	C
CHLOROFORM		2.5	U		2.5	U	
CHLOROMETHANE		2.5	U		2.5	U	
CIS-1,2-DICHLOROETHENE		2.5	U		2.5	U	
CIS-1,3-DICHLOROPROPENE		2.5	U		2.5	U	
CYCLOHEXANE		2.5	U		2.5	U	
DICHLORODIFLUOROMETHANE		2.5	U		2.5	U	
ETHYLBENZENE		2.5	U		2.5	U	
ISOPROPYLBENZENE		2.5	U		2.5	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-394			BP-VPB133-GW-414		
SDG: D1148	LAB_ID	D1148-08			D1148-09		
FRACTION: OV	SAMP_DATE	1/12/2012			1/12/2012		
MEDIA: SOIL	QC_TYPE	NM			NM		
	UNITS	UG/KG			UG/KG		
	PCT_SOLIDS	100.0			100.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
M+P-XYLENES		5	U		5	U	
METHYL ACETATE		2.5	U		2.5	U	
METHYL CYCLOHEXANE		2.5	U		2.5	U	
METHYL TERT-BUTYL ETHER		2.5	U		2.5	U	
METHYLENE CHLORIDE		2.5	U		2.5	U	
O-XYLENE		2.5	U		2.5	U	
STYRENE		2.5	U		2.5	U	
TETRACHLOROETHENE		2.5	U		2.5	U	
TOLUENE		2.5	U		2.5	U	
TRANS-1,2-DICHLOROETHENE		2.5	U		2.5	U	
TRANS-1,3-DICHLOROPROPENE		2.5	U		2.5	U	
TRICHLOROETHENE		2.5	U		2.5	U	
TRICHLOROFLUOROMETHANE		2.5	U		2.5	U	
VINYL CHLORIDE		2.5	U		2.5	U	

Tetra Tech **INTERNAL CORRESPONDENCE**

TO:	**D. BRAYACK**	**DATE:**	**FEBRUARY 21, 2012**
FROM:	**A. COGNETTI**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – VOC**
NWIRP BETHPAGE CTO WE 066
SAMPLE DELIVERY GROUP (SDG) – D1208

SAMPLES: 9/Aqueous/VOC

BP-VPB-TB-011612	BP-VPB133-GW-514	BP-VPB133-GW-534
BP-VPB133-GW-554	BP-VPB133-GW-574	BP-VPB133-GW-594
BP-VPB133-GW-614	BP-VPB133-GW-634	BP-VPB133-GW-654

Overview

The sample set for NWIRP Bethpage, CTO WE 066, SDG D1208 consists of eight (8) environmental aqueous samples and a trip blank analyzed for volatile organic compounds (VOCs). There was no field duplicate contained in this SDG.

The samples were collected on January 16, 17 and 18, 2012 by Tetra Tech and analyzed by Chemtech. VOC analyses were conducted in accordance with EPA Method SW-846 8260B analytical and reporting protocol. The data contained in this SDG were validated with regard to the following parameters:

* • Data completeness
* • Holding times
* • GC/MS Tuning
* • Initial/continuing calibrations
* • Laboratory Method Blank Results
* • Surrogate Recoveries
* • Laboratory Control Sample Recoveries
* • Internal Standard Recoveries
* • Compound Quantitation
* • Compound Identification
* • Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Qualified analytical results are presented in Appendix A, results as reported by the laboratory are presented in Appendix B, Region II data validation forms are presented in Appendix C, and documentation supporting these findings is presented in Appendix D.

VOC

The initial calibration relative standard deviations (%RSDs) for chloroethane and 1,2-dibromo-3-chloropropane were greater than the 15% quality control limit on January 19, 2012 on instrument MSVOA F. The nondetected chloroethane and 1,2-dibromo-3-chloropropane results were qualified as estimated (UJ) in the affected samples BP-VPB133-GW-614, BP-VPB133-GW-654, BP-VPB133-GW-574 and BP-VPB133-GW-594.

The initial calibration %RSDs were greater than the 15% quality control limit for several target analytes on January 17, 2012 on instrument MSVOA R. The analytes were methylene chloride, cis-1,3-dichloropropene, dibromochloromethane, tetrachloroethane, ethyl benzene, bromoform and isopropylbenzene, The

nondetected results of the aforementioned analytes were qualified as estimated (UJ) in the affected samples BP-VPB-TB-011612, BP-VPB133-GW-514, BP-VPB133-GW-534, BP-VPB133-GW-554 and BP-VPB133-GW-634.

The continuing calibration %Ds for trans-1,2-dichloroethene carbon tetrachloride and bromoform were greater than the 20% quality control limit on January 19, 2012 @ 13:24 on instrument MSVOA R. The nondetected trans-1,2-dichloroethene carbon tetrachloride and bromoform results were qualified as estimated (UJ) in the affected samples BP-VPB-TB-011612, BP-VPB133-GW-514, BP-VPB133-GW-534, BP-VPB133-GW-554 and BP-VPB133-GW-634.

Due to sediment in samples BP-VPB133-GW-574, BP-VPB133-GW-594, BP-VPB133-GW-614 and BP-VPB133-GW-654, the laboratory had to analyze them as soil after decanting the top portion of liquid. No action was taken.

It was noted by the laboratory that samples BP-VPB133-GW-534, BP-VPB133-GW-554 and BP-VPB133-GW-634 contained air bubbles. The positive results in these samples were qualified as estimated (J) and the nondetected results were rejected (UR).

Additional Comments

The matrix spike (MS) percent recovery (%R) for 1,2,4-trichlorobenzene was less than the lower quality control limit in a sample not included in this SDG. No action was taken on the for 1,2,4-trichlorobenzene results. In addition, the MSD %R of 1,1,2,2-tetrachloroethane was greater than the upper quality control limit. No action was taken.

The relative percent difference (RPD) for trans-1,2-dichloroethene was outside quality control limits in the MS/MSD of sample D1165-03 which is not included in this SDG. No action was taken.

Nondetected results are reported to the limit of detection (LOD).

Positive results below the Reporting Limit (RL) and above the detection limit were qualified as estimated, (J), due to uncertainty near the detection limit.

EXECUTIVE SUMMARY

Laboratory Performance Issues: The continuing calibration %Ds and % drifts for several analytes exceeded quality control limits. The %RSDs exceeded the quality control limit for several analytes resulting in the qualification of data.

Other Factors Affecting Data Quality: Due to sediment in samples BP-VPB133-GW-574, BP-VPB133-GW-594, BP-VPB133-GW-614 and BP-VPB133-GW-654, the laboratory had to analyzed them as soil after decanting the top portion of liquid. Samples BP-VPB133-GW-534, BP-VPB133-GW-554 and BP-VPB133-GW-634 contained air bubbles

TO: D. Brayack
FROM: A. Cognetti
SDG: D1208
DATE: February 21, 2012
PAGE: 3

The data for these analyses were reviewed with reference to SOP # HW-24 Revision #2, August 2008, USEPA Region II Hazardous Waste Support Branch Validating Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry SW-846/8260B, and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories", April 2009. The text of this report has been formulated to address only those problem areas affecting data quality.

Tetra Tech
Ann Cognetti
Chemist/Data Validator

Tetra Tech
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C – Region II Data Validation Forms
4. Appendix D - Support Documentation

Appendix A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-574			BP-VPB133-GW-594			BP-VPB133-GW-614			BP-VPB133-GW-654		
SDG: D1208	LAB_ID	D1208-05			D1208-06			D1208-07			D1208-09		
FRACTION: OV	SAMP_DATE	1/17/2012			1/17/2012			1/18/2012			1/18/2012		
MEDIA: SEDIMENT	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		2.5	U		2.55	U		2.45	U		2.5	U	
1,1,2,2-TETRACHLOROETHANE		2.5	U		2.55	U		2.45	U		2.5	U	
1,1,2-TRICHLOROETHANE		2.5	U		2.55	U		2.45	U		2.5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE		2.5	U		2.55	U		2.45	U		2.5	U	
1,1-DICHLOROETHANE		2.5	U		2.55	U		2.45	U		2.5	U	
1,1-DICHLOROETHENE		2.5	U		2.55	U		2.45	U		2.5	U	
1,2,4-TRICHLOROBENZENE		2.5	U		2.55	U		2.45	U		2.5	U	
1,2-DIBROMO-3-CHLOROPROPANE		2.5	UJ	C	2.55	UJ	C	2.45	UJ	C	2.5	UJ	C
1,2-DIBROMOETHANE		2.5	U		2.55	U		2.45	U		2.5	U	
1,2-DICHLOROBENZENE		2.5	U		2.55	U		2.45	U		2.5	U	
1,2-DICHLOROETHANE		2.5	U		2.55	U		2.45	U		2.5	U	
1,2-DICHLOROPROPANE		2.5	U		2.55	U		2.45	U		2.5	U	
1,3-DICHLOROBENZENE		2.5	U		2.55	U		2.45	U		2.5	U	
1,4-DICHLOROBENZENE		2.5	U		2.55	U		2.45	U		2.5	U	
2-BUTANONE		12.5	U		12.5	U		12.5	U		12.5	U	
2-HEXANONE		12.5	U		12.5	U		12.5	U		12.5	U	
4-METHYL-2-PENTANONE		12.5	U		12.5	U		12.5	U		12.5	U	
ACETONE		32			38			34			31		
BENZENE		2.5	U		2.55	U		2.45	U		2.5	U	
BROMODICHLOROMETHANE		2.5	U		2.55	U		2.45	U		2.5	U	
BROMOFORM		2.5	U		2.55	U		2.45	U		2.5	U	
BROMOMETHANE		2.5	U		2.55	U		2.45	U		2.5	U	
CARBON DISULFIDE		2.5	U		2.55	U		2.45	U		2.5	U	
CARBON TETRACHLORIDE		2.5	U		2.55	U		2.45	U		2.5	U	
CHLOROBENZENE		2.5	U		2.55	U		2.45	U		2.5	U	
CHLORODIBROMOMETHANE		2.5	U		2.55	U		2.45	U		2.5	U	
CHLOROETHANE		2.5	UJ	C	2.55	UJ	C	2.45	UJ	C	2.5	UJ	C
CHLOROFORM		2.5	U		2.55	U		2.45	U		2.5	U	
CHLOROMETHANE		2.5	U		2.55	U		2.45	U		2.5	U	
CIS-1,2-DICHLOROETHENE		2.5	U		2.55	U		2.45	U		2.5	U	
CIS-1,3-DICHLOROPROPENE		2.5	U		2.55	U		2.45	U		2.5	U	
CYCLOHEXANE		2.5	U		2.55	U		2.45	U		2.5	U	
DICHLORODIFLUOROMETHANE		2.5	U		2.55	U		2.45	U		2.5	U	
ETHYLBENZENE		2.5	U		2.55	U		2.45	U		2.5	U	
ISOPROPYLBENZENE		2.5	U		2.55	U		2.45	U		2.5	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-574			BP-VPB133-GW-594			BP-VPB133-GW-614			BP-VPB133-GW-654		
SDG: D1208	LAB_ID	D1208-05			D1208-06			D1208-07			D1208-09		
FRACTION: OV	SAMP_DATE	1/17/2012			1/17/2012			1/18/2012			1/18/2012		
MEDIA: SEDIMENT	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
M+P-XYLENES		4.95	U		5	U		4.9	U		5	U	
METHYL ACETATE		2.5	U		2.55	U		2.45	U		2.5	U	
METHYL CYCLOHEXANE		2.5	U		2.55	U		2.45	U		2.5	U	
METHYL TERT-BUTYL ETHER		2.5	U		2.55	U		2.45	U		2.5	U	
METHYLENE CHLORIDE		2.5	U		2.55	U		6.1			6		
O-XYLENE		2.5	U		2.55	U		2.45	U		2.5	U	
STYRENE		2.5	U		2.55	U		2.45	U		2.5	U	
TETRACHLOROETHENE		2.5	U		2.55	U		2.45	U		2.5	U	
TOLUENE		2.5	U		2.55	U		2.45	U		2.5	U	
TRANS-1,2-DICHLOROETHENE		2.5	U		2.55	U		2.45	U		2.5	U	
TRANS-1,3-DICHLOROPROPENE		2.5	U		2.55	U		2.45	U		2.5	U	
TRICHLOROETHENE		2.5	U		2.55	U		2.45	U		2.5	U	
TRICHLOROFLUOROMETHANE		2.5	U		2.55	U		2.45	U		2.5	U	
VINYL CHLORIDE		2.5	U		2.55	U		2.45	U		2.5	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-514			BP-VPB133-GW-534			BP-VPB133-GW-554			BP-VPB133-GW-634		
SDG: D1208	LAB_ID	D1208-01			D1208-03			D1208-04			D1208-08		
FRACTION: OV	SAMP_DATE	1/16/2012			1/16/2012			1/17/2012			1/18/2012		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
1,1,2,2-TETRACHLOROETHANE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
1,1,2-TRICHLOROETHANE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
1,1,2-TRICHLOROTRIFLUOROETHANE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
1,1-DICHLOROETHANE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
1,1-DICHLOROETHENE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
1,2,4-TRICHLOROBENZENE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
1,2-DIBROMO-3-CHLOROPROPANE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
1,2-DIBROMOETHANE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
1,2-DICHLOROBENZENE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
1,2-DICHLOROETHANE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
1,2-DICHLOROPROPANE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
1,3-DICHLOROBENZENE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
1,4-DICHLOROBENZENE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
2-BUTANONE		2.5	U		2.5	UR	Q	2.5	UR	Q	2.5	UR	Q
2-HEXANONE		2.5	U		2.5	UR	Q	2.5	UR	Q	2.5	UR	Q
4-METHYL-2-PENTANONE		2.5	U		2.5	UR	Q	2.5	UR	Q	2.5	UR	Q
ACETONE		7.6			4.2	J	PQ	4.8	J	PQ	8.2	J	Q
BENZENE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
BROMODICHLOROMETHANE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
BROMOFORM		0.5	UJ	C	0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
BROMOMETHANE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
CARBON DISULFIDE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
CARBON TETRACHLORIDE		0.5	UJ	C	0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
CHLOROBENZENE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
CHLORODIBROMOMETHANE		0.5	UJ	C	0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
CHLOROETHANE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
CHLOROFORM		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
CHLOROMETHANE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
CIS-1,2-DICHLOROETHENE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
CIS-1,3-DICHLOROPROPENE		0.5	UJ	C	0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
CYCLOHEXANE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
DICHLORODIFLUOROMETHANE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
ETHYLBENZENE		0.5	UJ	C	0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
ISOPROPYLBENZENE		0.5	UJ	C	0.5	UR	Q	0.5	UR	Q	0.5	UR	Q

PROJ_NO: 00622	NSAMPLE	BP-VPB-TB-011612
SDG: D1208	LAB_ID	D1208-02
FRACTION: OV	SAMP_DATE	1/16/2012
MEDIA: WATER	QC_TYPE	NM
	UNITS	UG/L
	PCT_SOLIDS	0.0
	DUP_OF	

PARAMETER	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE	0.5	U	
1,1,2,2-TETRACHLOROETHANE	0.5	U	
1,1,2-TRICHLOROETHANE	0.5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	0.5	U	
1,1-DICHLOROETHANE	0.5	U	
1,1-DICHLOROETHENE	0.5	U	
1,2,4-TRICHLOROBENZENE	0.5	U	
1,2-DIBROMO-3-CHLOROPROPANE	0.5	U	
1,2-DIBROMOETHANE	0.5	U	
1,2-DICHLOROBENZENE	0.5	U	
1,2-DICHLOROETHANE	0.5	U	
1,2-DICHLOROPROPANE	0.5	U	
1,3-DICHLOROBENZENE	0.5	U	
1,4-DICHLOROBENZENE	0.5	U	
2-BUTANONE	2.5	U	
2-HEXANONE	2.5	U	
4-METHYL-2-PENTANONE	2.5	U	
ACETONE	2.5	U	
BENZENE	0.5	U	
BROMODICHLOROMETHANE	0.5	U	
BROMOFORM	0.5	UJ	C
BROMOMETHANE	0.5	U	
CARBON DISULFIDE	0.5	U	
CARBON TETRACHLORIDE	0.5	UJ	C
CHLOROBENZENE	0.5	U	
CHLORODIBROMOMETHANE	0.5	UJ	C
CHLOROETHANE	0.5	U	
CHLOROFORM	0.5	U	
CHLOROMETHANE	0.5	U	
CIS-1,2-DICHLOROETHENE	0.5	U	
CIS-1,3-DICHLOROPROPENE	0.5	UJ	C
CYCLOHEXANE	0.5	U	
DICHLORODIFLUOROMETHANE	0.5	U	
ETHYLBENZENE	0.5	UJ	C
ISOPROPYLBENZENE	0.5	UJ	C

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-514			BP-VPB133-GW-534			BP-VPB133-GW-554			BP-VPB133-GW-634		
SDG: D1208	LAB_ID	D1208-01			D1208-03			D1208-04			D1208-08		
FRACTION: OV	SAMP_DATE	1/16/2012			1/16/2012			1/17/2012			1/18/2012		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
M+P-XYLENES		1	U		1	UR	Q	1	UR	Q	1	UR	Q
METHYL ACETATE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
METHYL CYCLOHEXANE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
METHYL TERT-BUTYL ETHER		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
METHYLENE CHLORIDE		0.5	UJ	C	0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
O-XYLENE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
STYRENE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
TETRACHLOROETHENE		0.5	UJ	C	0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
TOLUENE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
TRANS-1,2-DICHLOROETHENE		0.5	UJ	C	0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
TRANS-1,3-DICHLOROPROPENE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
TRICHLOROETHENE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
TRICHLOROFLUOROMETHANE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q
VINYL CHLORIDE		0.5	U		0.5	UR	Q	0.5	UR	Q	0.5	UR	Q

PROJ_NO: 00622	NSAMPLE	BP-VPB-TB-011612
SDG: D1208	LAB_ID	D1208-02
FRACTION: OV	SAMP_DATE	1/16/2012
MEDIA: WATER	QC_TYPE	NM
	UNITS	UG/L
	PCT_SOLIDS	0.0
	DUP_OF	

PARAMETER	RESULT	VQL	QLCD
M+P-XYLENES	1	U	
METHYL ACETATE	0.5	U	
METHYL CYCLOHEXANE	0.5	U	
METHYL TERT-BUTYL ETHER	0.5	U	
METHYLENE CHLORIDE	0.5	UJ	C
O-XYLENE	0.5	U	
STYRENE	0.5	U	
TETRACHLOROETHENE	0.5	UJ	C
TOLUENE	0.5	U	
TRANS-1,2-DICHLOROETHENE	0.5	UJ	C
TRANS-1,3-DICHLOROPROPENE	0.5	U	
TRICHLOROETHENE	0.5	U	
TRICHLOROFLUOROMETHANE	0.5	U	
VINYL CHLORIDE	0.5	U	

TO: D. BRAYACK **DATE:** MARCH 20, 2012

FROM: TERRI L. SOLOMON **COPIES:** DV FILE

SUBJECT: **ORGANIC DATA VALIDATION – VOC**
NWIRP BETHPAGE CTO WE 066
SAMPLE DELIVERY GROUP (SDG) – D1280

SAMPLES: 8/Aqueous/VOC

BP-VPB133-GW-754	BP-VPB-TB-011912
BP-VPB133-GW-694	BP-VPB133-GW-703
BP-VPB133-GW-714	BP-VPB133-GW-734
BP-VPB133-GW-744	BP-VPB133-GW-764

Overview

The sample set for NWIRP Bethpage, CTO WE 066, SDG D1280 consists of seven (7) environmental aqueous samples and a trip blank analyzed for volatile organic compounds (VOCs). There was no field duplicate contained in this SDG.

The samples were collected on January 19, 20, 23 and 24, 2012 by Tetra Tech and analyzed by Chemtech. VOC analyses were conducted in accordance with EPA Method SW-846 8260B analytical and reporting protocol. The data contained in this SDG were validated with regard to the following parameters:

* • Data completeness
* • Holding times
* • GC/MS Tuning
• Initial/continuing calibrations
* • Laboratory Method Blank Results
• Surrogate Recoveries
• Laboratory Control Sample Recoveries
• Internal Standard Recoveries
* • Compound Quantitation
* • Compound Identification
* • Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Qualified analytical results are presented in Appendix A, results as reported by the laboratory are presented in Appendix B, Region II data validation forms are presented in Appendix C, and documentation supporting these findings is presented in Appendix D.

VOC

The initial calibration relative standard deviations (%RSDs) for bromomethane, methyl acetate, methylene chloride, cyclohexane, trans-1,3-dichloropropene and cis-1,3-dichloropropene were greater than the 15% quality control limit on 01/26/2012 on instrument MSVOA R. The nondetected results for bromomethane, methyl acetate, methylene chloride, cyclohexane, trans-1,3-dichloropropene and cis-1,3-dichloropropene were qualified as estimated "UJ" in the affected samples BP-VPB133-GW-754 and BP-VPB-TB-011912.

The continuing calibration percent differences and/or percent drifts were greater than the 20% quality control limit for chloromethane and bromomethane on 01/26/2012 at 18:20 on instrument MSVOA R. The nondetected results for chloromethane and bromomethane were qualified as estimated "UJ" in the affected samples BP-VPB133-GW-754 and BP-VPB-TB-011912.

The initial calibration %RSDs for bromomethane, styrene and bromoform were greater than the 15% quality control limit on 01/24/2012 on instrument MSVOA T. The nondetected results for bromomethane, styrene and bromoform were qualified as estimated "UJ" in the affected samples BP-VPB133-GW-694, BP-VPB133-GW-703, BP-VPB133-GW-714, BP-VPB133-GW-734, BP-VPB133-GW-744 and BP-VPB133-GW-764.

The continuing calibration percent differences and/or percent drifts were greater than the 20% quality control limit for bromomethane, chloroethane and carbon disulfide on 01/26/2012 at 11:48 on instrument MSVOA T. The nondetected results for bromomethane, chloroethane and carbon disulfide were qualified as estimated "UJ" in the affected samples BP-VPB133-GW-694, BP-VPB133-GW-703, BP-VPB133-GW-714, BP-VPB133-GW-734, BP-VPB133-GW-744 and BP-VPB133-GW-764.

Sample BP-VPB133-GW-694 had a surrogate recovery less than the quality control limit for 4-bromofluorobenzene and internal standards recoveries below the quality control limits for pentafluorobenzene, chlorobenzene-d5 and 1,4-dichlorobenzene-d4. The sample was reanalyzed and had surrogate recoveries for 4-bromofluorobenzene and toluene-d8 less than the quality control limits and an internal standard recovery for 1,4-dichlorobenzene-d4 below the quality control limit. The reanalyses was chosen for validation purposes. The positive and nondetected results reported for sample BP-VPB133-GW-694 were qualified as estimated, "J" and "UJ", respectively, as a result of surrogate noncompliances. The nondetected results reported for sample BP-VPB133-GW-694 for the affected compounds were qualified as estimated, "UJ", as a result of internal standard noncompliances..

Samples BP-VPB133-GW-703, BP-VPB133-GW-714, BP-VPB133-GW-734, BP-VPB133-GW-744 and BP-VPB133-GW-764 had surrogate recoveries less than the quality control limits for 4-bromofluorobenzene. The samples were reanalyzed and had surrogate recoveries for 4-bromofluorobenzene and/or toluene-d8 less than the quality control limits. The original analyses were chosen for validation purposes. The positive and nondetected results reported for samples BP-VPB133-GW-703, BP-VPB133-GW-714, BP-VPB133-GW-734, BP-VPB133-GW-744 and BP-VPB133-GW-764 were qualified as estimated, "J" and "UJ", respectively.

Samples BP-VPB133-GW-703, BP-VPB133-GW-714, BP-VPB133-GW-734, BP-VPB133-GW-744, BP-VPB133-GW-764 had internal standard recoveries less than the quality control limits for 1,4-dichlorobenzene-d4. The samples were reanalyzed and had internal standard recoveries for 1,4-dichlorobenzene-d4 less than the quality control limits. The original analyses were chosen for validation purposes. The nondetected results reported for samples BP-VPB133-GW-703, BP-VPB133-GW-714, BP-VPB133-GW-734, BP-VPB133-GW-744 and BP-VPB133-GW-764 for the affected compounds were qualified as estimated, "UJ".

Positive results below the Reporting Limit (RL) and above the detection limit were qualified as estimated, (J), due to uncertainty near the detection limit.

Additional Comments

Groundwater samples BP-VPB133-GW-694, BP-VPB133-GW-703, BP-VPB133-GW-714, BP-VPB133-GW-734, BP-VPB133-GW-744 and BP-VPB133-GW-764 were analyzed as soil samples due to the amount of sediment in the samples. The sample results were reported as ug/kg on a wet weight basis.

The laboratory control sample duplicate (LCSD) percent recovery for chloromethane was greater than the upper quality control limit affecting samples BP-VPB133-GW-754 and BP-VPB-TB-011912. No validation actions were required as all sample results for chloromethane were nondetects.

The laboratory control sample (LCS) / laboratory control sample duplicate (LCSD) relative percent difference was outside the quality control limits for methyl acetate affecting samples BP-VPB133-GW-754 and BP-VPB-TB-011912. No validation actions were required as the LCS and LCSD percent recoveries for methyl acetate were within the quality control limits.

Nondetected results are reported to the limit of detection (LOD).

EXECUTIVE SUMMARY

Laboratory Performance Issues: Several initial %RSDs and continuing calibration %Ds / % drifts for several compounds exceeded the quality control limits.

Other Factors Affecting Data Quality: Several surrogate and internal standards were below the quality control limits. Positive results below the RL and above the detection limit were qualified as estimated.

The data for these analyses were reviewed with reference to SOP # HW-24 Revision #2, August 2008, USEPA Region II Hazardous Waste Support Branch Validating Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry SW-846/8260B, and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories", April 2009. The text of this report has been formulated to address only those problem areas affecting data quality.

Tetra Tech
Terri L. Solomon
Chemist/Data Validator

Tetra Tech
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C – Region II Data Validation Forms
4. Appendix D - Support Documentation

Appendix A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-754			BP-VPB-TB-011912		
SDG: D1280	LAB_ID	D1280-08			D1280-02		
FRACTION: OV	SAMP_DATE	1/24/2012			1/19/2012		
MEDIA: WATER	QC_TYPE	NM			NM		
	UNITS	UG/L			UG/L		
	PCT_SOLIDS	100.0			100.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		0.5	U		0.5	U	
1,1,2,2-TETRACHLOROETHANE		0.5	U		0.5	U	
1,1,2-TRICHLOROETHANE		0.5	U		0.5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE		0.5	U		0.5	U	
1,1-DICHLOROETHANE		0.5	U		0.5	U	
1,1-DICHLOROETHENE		0.5	U		0.5	U	
1,2,4-TRICHLOROBENZENE		0.5	U		0.5	U	
1,2-DIBROMO-3-CHLOROPROPANE		0.5	U		0.5	U	
1,2-DIBROMOETHANE		0.5	U		0.5	U	
1,2-DICHLOROBENZENE		0.5	U		0.5	U	
1,2-DICHLOROETHANE		0.5	U		0.5	U	
1,2-DICHLOROPROPANE		0.5	U		0.5	U	
1,3-DICHLOROBENZENE		0.5	U		0.5	U	
1,4-DICHLOROBENZENE		0.5	U		0.5	U	
2-BUTANONE		2.5	U		2.5	U	
2-HEXANONE		2.5	U		2.5	U	
4-METHYL-2-PENTANONE		2.5	U		2.5	U	
ACETONE		6.8			2.5	U	
BENZENE		0.5	U		0.5	U	
BROMODICHLOROMETHANE		0.5	U		0.5	U	
BROMOFORM		0.5	U		0.5	U	
BROMOMETHANE		0.5	UJ	C	0.5	UJ	C
CARBON DISULFIDE		0.5	U		0.5	U	
CARBON TETRACHLORIDE		0.5	U		0.5	U	
CHLOROBENZENE		0.5	U		0.5	U	
CHLORODIBROMOMETHANE		0.5	U		0.5	U	
CHLOROETHANE		0.5	U		0.5	U	
CHLOROFORM		0.5	U		0.5	U	
CHLOROMETHANE		0.5	UJ	C	0.5	UJ	C
CIS-1,2-DICHLOROETHENE		0.5	U		0.5	U	
CIS-1,3-DICHLOROPROPENE		0.5	UJ	C	0.5	UJ	C
CYCLOHEXANE		0.5	UJ	C	0.5	UJ	C
DICHLORODIFLUOROMETHANE		0.5	U		0.5	U	
ETHYLBENZENE		0.5	U		0.5	U	
ISOPROPYLBENZENE		0.5	U		0.5	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-754			BP-VPB-TB-011912		
SDG: D1280	LAB_ID	D1280-08			D1280-02		
FRACTION: OV	SAMP_DATE	1/24/2012			1/19/2012		
MEDIA: WATER	QC_TYPE	NM			NM		
	UNITS	UG/L			UG/L		
	PCT_SOLIDS	100.0			100.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
M+P-XYLENES		1	U		1	U	
METHYL ACETATE		0.5	UJ	C	0.5	UJ	C
METHYL CYCLOHEXANE		0.5	U		0.5	U	
METHYL TERT-BUTYL ETHER		0.5	U		0.5	U	
METHYLENE CHLORIDE		0.5	UJ	C	0.5	UJ	C
O-XYLENE		0.5	U		0.5	U	
STYRENE		0.5	U		0.5	U	
TETRACHLOROETHENE		0.5	U		0.5	U	
TOLUENE		0.5	U		0.5	U	
TRANS-1,2-DICHLOROETHENE		0.5	U		0.5	U	
TRANS-1,3-DICHLOROPROPENE		0.5	UJ	C	0.5	UJ	C
TRICHLOROETHENE		0.5	U		0.5	U	
TRICHLOROFLUOROMETHANE		0.5	U		0.5	U	
VINYL CHLORIDE		0.5	U		0.5	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-694RE			BP-VPB133-GW-703			BP-VPB133-GW-714			BP-VPB133-GW-734		
SDG: D1280	LAB_ID	D1280-01RE			D1280-04			D1280-05			D1280-03		
FRACTION: OV	SAMP_DATE	1/20/2012			1/20/2012			1/23/2012			1/23/2012		
MEDIA: SEDIMENT	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
1,1,2,2-TETRACHLOROETHANE		2.5	UJ	NR	2.5	UJ	NR	2.45	UJ	NR	2.45	UJ	NR
1,1,2-TRICHLOROETHANE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
1,1,2-TRICHLOROTRIFLUOROETHANE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
1,1-DICHLOROETHANE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
1,1-DICHLOROETHENE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
1,2,4-TRICHLOROBENZENE		2.5	UJ	NR	2.5	UJ	NR	2.45	UJ	NR	2.45	UJ	NR
1,2-DIBROMO-3-CHLOROPROPANE		2.5	UJ	NR	2.5	UJ	NR	2.45	UJ	NR	2.45	UJ	NR
1,2-DIBROMOETHANE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
1,2-DICHLOROBENZENE		2.5	UJ	NR	2.5	UJ	NR	2.45	UJ	NR	2.45	UJ	NR
1,2-DICHLOROETHANE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
1,2-DICHLOROPROPANE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
1,3-DICHLOROBENZENE		2.5	UJ	NR	2.5	UJ	NR	2.45	UJ	NR	2.45	UJ	NR
1,4-DICHLOROBENZENE		2.5	UJ	NR	2.5	UJ	NR	2.45	UJ	NR	2.45	UJ	NR
2-BUTANONE		12.5	UJ	R	12.5	UJ	R	12.5	UJ	R	12.5	UJ	R
2-HEXANONE		12.5	UJ	R	12.5	UJ	R	12.5	UJ	R	12.5	UJ	R
4-METHYL-2-PENTANONE		12.5	UJ	R	12.5	UJ	R	12.5	UJ	R	12.5	UJ	R
ACETONE		29	J	R	35	J	R	19	J	PR	16	J	PR
BENZENE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
BROMODICHLOROMETHANE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
BROMOFORM		2.5	UJ	CR	2.5	UJ	CR	2.45	UJ	CR	2.45	UJ	CR
BROMOMETHANE		2.5	UJ	CR	2.5	UJ	CR	2.45	UJ	CR	2.45	UJ	CR
CARBON DISULFIDE		2.5	UJ	CR	2.5	UJ	CR	2.45	UJ	CR	2.45	UJ	CR
CARBON TETRACHLORIDE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
CHLOROBENZENE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
CHLORODIBROMOMETHANE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
CHLOROETHANE		2.5	UJ	CR	2.5	UJ	CR	2.45	UJ	CR	2.45	UJ	CR
CHLOROFORM		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
CHLOROMETHANE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
CIS-1,2-DICHLOROETHENE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
CIS-1,3-DICHLOROPROPENE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
CYCLOHEXANE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
DICHLORODIFLUOROMETHANE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
ETHYLBENZENE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
ISOPROPYLBENZENE		2.5	UJ	NR	2.5	UJ	NR	2.45	UJ	NR	2.45	UJ	NR

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-694RE			BP-VPB133-GW-703			BP-VPB133-GW-714			BP-VPB133-GW-734		
SDG: D1280	LAB_ID	D1280-01RE			D1280-04			D1280-05			D1280-03		
FRACTION: OV	SAMP_DATE	1/20/2012			1/20/2012			1/23/2012			1/23/2012		
MEDIA: SEDIMENT	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
M+P-XYLENES		5	UJ	R	5	UJ	R	4.95	UJ	R	4.9	UJ	R
METHYL ACETATE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
METHYL CYCLOHEXANE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
METHYL TERT-BUTYL ETHER		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
METHYLENE CHLORIDE		2.7	J	PR	2.7	J	PR	2.7	J	PR	2.45	UJ	R
O-XYLENE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
STYRENE		2.5	UJ	CR	2.5	UJ	CR	2.45	UJ	CR	2.45	UJ	CR
TETRACHLOROETHENE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
TOLUENE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
TRANS-1,2-DICHLOROETHENE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
TRANS-1,3-DICHLOROPROPENE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
TRICHLOROETHENE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
TRICHLOROFLUOROMETHANE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R
VINYL CHLORIDE		2.5	UJ	R	2.5	UJ	R	2.45	UJ	R	2.45	UJ	R

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-744			BP-VPB133-GW-764		
SDG: D1280	LAB_ID	D1280-06			D1280-07		
FRACTION: OV	SAMP_DATE	1/24/2012			1/24/2012		
MEDIA: SEDIMENT	QC_TYPE	NM			NM		
	UNITS	UG/KG			UG/KG		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		2.5	UJ	R	2.5	UJ	R
1,1,2,2-TETRACHLOROETHANE		2.5	UJ	NR	2.5	UJ	NR
1,1,2-TRICHLOROETHANE		2.5	UJ	R	2.5	UJ	R
1,1,2-TRICHLOROTRIFLUOROETHANE		2.5	UJ	R	2.5	UJ	R
1,1-DICHLOROETHANE		2.5	UJ	R	2.5	UJ	R
1,1-DICHLOROETHENE		2.5	UJ	R	2.5	UJ	R
1,2,4-TRICHLOROBENZENE		2.5	UJ	NR	2.5	UJ	NR
1,2-DIBROMO-3-CHLOROPROPANE		2.5	UJ	NR	2.5	UJ	NR
1,2-DIBROMOETHANE		2.5	UJ	R	2.5	UJ	R
1,2-DICHLOROBENZENE		2.5	UJ	NR	2.5	UJ	NR
1,2-DICHLOROETHANE		2.5	UJ	R	2.5	UJ	R
1,2-DICHLOROPROPANE		2.5	UJ	R	2.5	UJ	R
1,3-DICHLOROBENZENE		2.5	UJ	NR	2.5	UJ	NR
1,4-DICHLOROBENZENE		2.5	UJ	NR	2.5	UJ	NR
2-BUTANONE		12.5	UJ	R	12.5	UJ	R
2-HEXANONE		12.5	UJ	R	12.5	UJ	R
4-METHYL-2-PENTANONE		12.5	UJ	R	12.5	UJ	R
ACETONE		24	J	PR	35	J	R
BENZENE		2.5	UJ	R	2.5	UJ	R
BROMODICHLOROMETHANE		2.5	UJ	R	2.5	UJ	R
BROMOFORM		2.5	UJ	CR	2.5	UJ	CR
BROMOMETHANE		2.5	UJ	CR	2.5	UJ	CR
CARBON DISULFIDE		2.5	UJ	CR	2.5	UJ	CR
CARBON TETRACHLORIDE		2.5	UJ	R	2.5	UJ	R
CHLOROBENZENE		2.5	UJ	R	2.5	UJ	R
CHLORODIBROMOMETHANE		2.5	UJ	R	2.5	UJ	R
CHLOROETHANE		2.5	UJ	CR	2.5	UJ	CR
CHLOROFORM		2.5	UJ	R	2.5	UJ	R
CHLOROMETHANE		2.5	UJ	R	2.5	UJ	R
CIS-1,2-DICHLOROETHENE		2.5	UJ	R	2.5	UJ	R
CIS-1,3-DICHLOROPROPENE		2.5	UJ	R	2.5	UJ	R
CYCLOHEXANE		2.5	UJ	R	2.5	UJ	R
DICHLORODIFLUOROMETHANE		2.5	UJ	R	2.5	UJ	R
ETHYLBENZENE		2.5	UJ	R	2.5	UJ	R
ISOPROPYLBENZENE		2.5	UJ	NR	2.5	UJ	NR

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-744			BP-VPB133-GW-764		
SDG: D1280	LAB_ID	D1280-06			D1280-07		
FRACTION: OV	SAMP_DATE	1/24/2012			1/24/2012		
MEDIA: SEDIMENT	QC_TYPE	NM			NM		
	UNITS	UG/KG			UG/KG		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
M+P-XYLENES		4.95	UJ	R	5	UJ	R
METHYL ACETATE		2.5	UJ	R	2.5	UJ	R
METHYL CYCLOHEXANE		2.5	UJ	R	2.5	UJ	R
METHYL TERT-BUTYL ETHER		2.5	UJ	R	2.5	UJ	R
METHYLENE CHLORIDE		2.5	UJ	R	3.1	J	PR
O-XYLENE		2.5	UJ	R	2.5	UJ	R
STYRENE		2.5	UJ	CR	2.5	UJ	CR
TETRACHLOROETHENE		2.5	UJ	R	2.5	UJ	R
TOLUENE		2.5	UJ	R	2.5	UJ	R
TRANS-1,2-DICHLOROETHENE		2.5	UJ	R	2.5	UJ	R
TRANS-1,3-DICHLOROPROPENE		2.5	UJ	R	2.5	UJ	R
TRICHLOROETHENE		2.5	UJ	R	2.5	UJ	R
TRICHLOROFLUOROMETHANE		2.5	UJ	R	2.5	UJ	R
VINYL CHLORIDE		2.5	UJ	R	2.5	UJ	R

Tetra Tech, Inc. **INTERNAL CORRESPONDENCE**

TO: D. BRAYACK **DATE:** MARCH 21, 2011

FROM: MICHELLE L. ALLEN **COPIES:** DV FILE

SUBJECT: ORGANIC & INORGANIC DATA VALIDATION – VOC
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP), BETHPAGE
CTO 066
SAMPLE DELIVERY GROUP (SDG) D1320

SAMPLES: 1/Solid/VOC

BP-VPB133-DM

8/Aqueous/VOC

BP-VPB-TB-012512	BP-VPB133-834	BP-VPB133-DW
BP-VPB133-GW-784	BP-VPB133-GW-794	BP-VPB133-GW-808
BP-VPB133-GW-814	BP-VPB133-GW-824	

Overview

The sample set for NWIRP Bethpage SDG D1320 consisted of one (1) drill mud sample, seven (7) aqueous environmental samples, and one (1) trip blank. All nine (9) samples were analyzed for Target Compound List (TCL) volatile organic compounds (VOC). No field duplicate sample pair was associated with this sample data group (SDG).

The samples were collected by Tetra Tech, Inc. on January 25-27, 2012 and analyzed by Chemtech. All analyses were conducted in accordance with EPA Method SW-846 8260C analytical and reporting protocols. The data contained in this SDG was validated with regard to the following parameters:

*	• Data completeness
*	• Hold times
*	• GC/MS System Tuning and Performance
*	• Initial/continuing calibrations
*	• Laboratory Method and Field Blank Results
*	• Surrogate Spike Recoveries
*	• Internal Standard Results
	• Laboratory Control Sample/Laboratory Control Sample Duplicate Results
	• Matrix Spike/Matrix Spike Duplicate Sample Results
*	• Compound Identification
*	• Compound Quantitation
*	• Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Qualified analytical results are presented in Appendix A, results as reported by the laboratory are presented in Appendix B, Region II data validation forms are presented in Appendix C, and documentation supporting these findings is presented in Appendix D.

Volatiles (VOC)

Due to the nature of the matrices, the environmental groundwater samples, BP-VPB133-834, BP-VPB133-GW-784, BP-VPB133-GW-808, BP-VPB133-GW-814, and BP-VPB133-GW-824, were analyzed as soils. The sample results were reported in µg/Kg based on the dry weight of the sample.

Positive results reported below the LOQ but above the Method Detection Limit (MDL) were qualified as estimated, (J).

Additional Comments

The aqueous Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD), BSR0103W1 and BSR0103W2G0216W1, had a Percent Recoveries (%Rs) for dichlorodifluoromethane chloride above the upper quality control limit. No action necessary because no positive results were reported for this compound in the affected samples.

The soil Matrix Spike Duplicate (MS/MSD) analysis yielded a %R for 1,2,4-trichlorobenzene below the lower quality control limit. No action was taken because the Matrix Spike (MS) %R was acceptable and the MS/MSD parent sample was not a sample from this SDG.

Non-detected results are reported to the Limit of Detection (LOD).

EXECUTIVE SUMMARY

Laboratory Performance Issues: The aqueous LCS/LCSD had high %Rs for a target compound.

Other Factors Affecting Data Quality: A MSD %R was low. Positive results reported below the LOQ but above the MDL were qualified as estimated.

The data for these analyses were reviewed with reference to the SOP #HW-24 Revision #2, USEPA Region II Hazardous Waste Support Branch Validating Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry SW-846 Method 8260B (August 2008), EPA Method SW-846 8260C analytical and reporting protocols, and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (April 2009).

Tetra Tech, Inc.
Michelle L. Allen
Chemist/Data Validator

Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C – Region II Data Validation Forms
4. Appendix D - Support Documentation

Appendix A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed

PROJ_NO: 00622	NSAMPLE	BP-VPB133-834			BP-VPB133-DM			BP-VPB133-GW-784			BP-VPB133-GW-808		
SDG: D1320	LAB_ID	D1320-09			D1320-08			D1320-02			D1320-04		
FRACTION: OV	SAMP_DATE	1/27/2012			1/27/2012			1/25/2012			1/26/2012		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		2.5	U		2.5	U		2.5	U		2.5	U	
1,1,2,2-TETRACHLOROETHANE		2.5	U		2.5	U		2.5	U		2.5	U	
1,1,2-TRICHLOROETHANE		2.5	U		2.5	U		2.5	U		2.5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE		2.5	U		2.5	U		2.5	U		2.5	U	
1,1-DICHLOROETHANE		2.5	U		2.5	U		2.5	U		2.5	U	
1,1-DICHLOROETHENE		2.5	U		2.5	U		2.5	U		2.5	U	
1,2,4-TRICHLOROBENZENE		2.5	U		2.5	U		2.5	U		2.5	U	
1,2-DIBROMO-3-CHLOROPROPANE		2.5	U		2.5	U		2.5	U		2.5	U	
1,2-DIBROMOETHANE		2.5	U		2.5	U		2.5	U		2.5	U	
1,2-DICHLOROBENZENE		2.5	U		2.5	U		2.5	U		2.5	U	
1,2-DICHLOROETHANE		2.5	U		2.5	U		2.5	U		2.5	U	
1,2-DICHLOROPROPANE		2.5	U		2.5	U		2.5	U		2.5	U	
1,3-DICHLOROBENZENE		2.5	U		2.5	U		2.5	U		2.5	U	
1,4-DICHLOROBENZENE		2.5	U		2.5	U		2.5	U		2.5	U	
2-BUTANONE		12.5	U		12.5	U		12.5	U		12.5	U	
2-HEXANONE		12.5	U		12.5	U		12.5	U		12.5	U	
4-METHYL-2-PENTANONE		12.5	U		12.5	U		12.5	U		12.5	U	
ACETONE		73			51			53			24	J	P
BENZENE		2.5	U		2.5	U		2.5	U		2.5	U	
BROMODICHLOROMETHANE		2.5	U		2.5	U		2.5	U		2.5	U	
BROMOFORM		2.5	U		2.5	U		2.5	U		2.5	U	
BROMOMETHANE		2.5	U		2.5	U		2.5	U		2.5	U	
CARBON DISULFIDE		2.5	U		2.5	U		2.5	U		2.5	U	
CARBON TETRACHLORIDE		2.5	U		2.5	U		2.5	U		2.5	U	
CHLOROBENZENE		2.5	U		2.5	U		2.5	U		2.5	U	
CHLORODIBROMOMETHANE		2.5	U		2.5	U		2.5	U		2.5	U	
CHLOROETHANE		2.5	U		2.5	U		2.5	U		2.5	U	
CHLOROFORM		2.5	U		2.5	U		2.5	U		2.5	U	
CHLOROMETHANE		2.5	U		2.5	U		2.5	U		2.5	U	
CIS-1,2-DICHLOROETHENE		2.5	U		2.5	U		2.5	U		2.5	U	
CIS-1,3-DICHLOROPROPENE		2.5	U		2.5	U		2.5	U		2.5	U	
CYCLOHEXANE		2.5	U		2.5	U		2.5	U		2.5	U	
DICHLORODIFLUOROMETHANE		2.5	U		2.5	U		2.5	U		2.5	U	
ETHYLBENZENE		2.5	U		2.5	U		2.5	U		2.5	U	
ISOPROPYLBENZENE		2.5	U		2.5	U		2.5	U		2.5	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-814			BP-VPB133-GW-824		
SDG: D1320	LAB_ID	D1320-05			D1320-06		
FRACTION: OV	SAMP_DATE	1/26/2012			1/27/2012		
MEDIA: SOIL	QC_TYPE	NM			NM		
	UNITS	UG/KG			UG/KG		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		2.5	U		2.55	U	
1,1,2,2-TETRACHLOROETHANE		2.5	U		2.55	U	
1,1,2-TRICHLOROETHANE		2.5	U		2.55	U	
1,1,2-TRICHLOROTRIFLUOROETHANE		2.5	U		2.55	U	
1,1-DICHLOROETHANE		2.5	U		2.55	U	
1,1-DICHLOROETHENE		2.5	U		2.55	U	
1,2,4-TRICHLOROBENZENE		2.5	U		2.55	U	
1,2-DIBROMO-3-CHLOROPROPANE		2.5	U		2.55	U	
1,2-DIBROMOETHANE		2.5	U		2.55	U	
1,2-DICHLOROBENZENE		2.5	U		2.55	U	
1,2-DICHLOROETHANE		2.5	U		2.55	U	
1,2-DICHLOROPROPANE		2.5	U		2.55	U	
1,3-DICHLOROBENZENE		2.5	U		2.55	U	
1,4-DICHLOROBENZENE		2.5	U		2.55	U	
2-BUTANONE		12.5	U		12.5	U	
2-HEXANONE		12.5	U		12.5	U	
4-METHYL-2-PENTANONE		12.5	U		12.5	U	
ACETONE		27			28		
BENZENE		2.5	U		2.55	U	
BROMODICHLOROMETHANE		2.5	U		2.55	U	
BROMOFORM		2.5	U		2.55	U	
BROMOMETHANE		2.5	U		2.55	U	
CARBON DISULFIDE		2.5	U		2.55	U	
CARBON TETRACHLORIDE		2.5	U		2.55	U	
CHLOROBENZENE		2.5	U		2.55	U	
CHLORODIBROMOMETHANE		2.5	U		2.55	U	
CHLOROETHANE		2.5	U		2.55	U	
CHLOROFORM		2.5	U		2.55	U	
CHLOROMETHANE		2.5	U		2.55	U	
CIS-1,2-DICHLOROETHENE		2.5	U		2.55	U	
CIS-1,3-DICHLOROPROPENE		2.5	U		2.55	U	
CYCLOHEXANE		2.5	U		2.55	U	
DICHLORODIFLUOROMETHANE		2.5	U		2.55	U	
ETHYLBENZENE		2.5	U		2.55	U	
ISOPROPYLBENZENE		2.5	U		2.55	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB133-834			BP-VPB133-DM			BP-VPB133-GW-784			BP-VPB133-GW-808		
SDG: D1320	LAB_ID	D1320-09			D1320-08			D1320-02			D1320-04		
FRACTION: OV	SAMP_DATE	1/27/2012			1/27/2012			1/25/2012			1/26/2012		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
M+P-XYLENES		5	U		5	U		5	U		4.95	U	
METHYL ACETATE		2.5	U		2.5	U		2.5	U		2.5	U	
METHYL CYCLOHEXANE		2.5	U		2.5	U		2.5	U		2.5	U	
METHYL TERT-BUTYL ETHER		2.5	U		2.5	U		2.5	U		2.5	U	
METHYLENE CHLORIDE		2.5	U		2.5	U		2.5	U		2.5	U	
O-XYLENE		2.5	U		2.5	U		2.5	U		2.5	U	
STYRENE		2.5	U		2.5	U		2.5	U		2.5	U	
TETRACHLOROETHENE		2.5	U		2.5	U		2.5	U		2.5	U	
TOLUENE		2.5	U		2.5	U		2.5	U		2.5	U	
TRANS-1,2-DICHLOROETHENE		2.5	U		2.5	U		2.5	U		2.5	U	
TRANS-1,3-DICHLOROPROPENE		2.5	U		2.5	U		2.5	U		2.5	U	
TRICHLOROETHENE		2.5	U		2.5	U		2.5	U		2.5	U	
TRICHLOROFLUOROMETHANE		2.5	U		2.5	U		2.5	U		2.5	U	
VINYL CHLORIDE		2.5	U		2.5	U		2.5	U		2.5	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-814			BP-VPB133-GW-824		
SDG: D1320	LAB_ID	D1320-05			D1320-06		
FRACTION: OV	SAMP_DATE	1/26/2012			1/27/2012		
MEDIA: SOIL	QC_TYPE	NM			NM		
	UNITS	UG/KG			UG/KG		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
M+P-XYLENES		5	U		5	U	
METHYL ACETATE		2.5	U		2.55	U	
METHYL CYCLOHEXANE		2.5	U		2.55	U	
METHYL TERT-BUTYL ETHER		2.5	U		2.55	U	
METHYLENE CHLORIDE		2.5	U		2.55	U	
O-XYLENE		2.5	U		2.55	U	
STYRENE		2.5	U		2.55	U	
TETRACHLOROETHENE		2.5	U		2.55	U	
TOLUENE		2.5	U		2.55	U	
TRANS-1,2-DICHLOROETHENE		2.5	U		2.55	U	
TRANS-1,3-DICHLOROPROPENE		2.5	U		2.55	U	
TRICHLOROETHENE		2.5	U		2.55	U	
TRICHLOROFLUOROMETHANE		2.5	U		2.55	U	
VINYL CHLORIDE		2.5	U		2.55	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB133-DW			BP-VPB133-GW-794			BP-VPB-TB-012512		
SDG: D1320	LAB_ID	D1320-07			D1320-03			D1320-01		
FRACTION: OV	SAMP_DATE	1/27/2012			1/25/2012			1/25/2012		
MEDIA: WATER	QC_TYPE	NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0		
	DUP_OF									
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		0.5	U		0.5	U		0.5	U	
1,1,2,2-TETRACHLOROETHANE		0.5	U		0.5	U		0.5	U	
1,1,2-TRICHLOROETHANE		0.5	U		0.5	U		0.5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE		0.5	U		0.5	U		0.5	U	
1,1-DICHLOROETHANE		0.5	U		0.5	U		0.5	U	
1,1-DICHLOROETHENE		0.5	U		0.5	U		0.5	U	
1,2,4-TRICHLOROBENZENE		0.5	U		0.5	U		0.5	U	
1,2-DIBROMO-3-CHLOROPROPANE		0.5	U		0.5	U		0.5	U	
1,2-DIBROMOETHANE		0.5	U		0.5	U		0.5	U	
1,2-DICHLOROBENZENE		0.5	U		0.5	U		0.5	U	
1,2-DICHLOROETHANE		0.5	U		0.5	U		0.5	U	
1,2-DICHLOROPROPANE		0.5	U		0.5	U		0.5	U	
1,3-DICHLOROBENZENE		0.5	U		0.5	U		0.5	U	
1,4-DICHLOROBENZENE		0.5	U		0.5	U		0.5	U	
2-BUTANONE		2.5	U		3.9	J	P	2.5	U	
2-HEXANONE		2.5	U		2.5	U		2.5	U	
4-METHYL-2-PENTANONE		2.5	U		2.5	U		2.5	U	
ACETONE		1.6	J	P	15			2.5	U	
BENZENE		0.5	U		0.5	U		0.5	U	
BROMODICHLOROMETHANE		1.1			0.5	U		0.5	U	
BROMOFORM		0.5	U		0.5	U		0.5	U	
BROMOMETHANE		0.5	U		0.5	U		0.5	U	
CARBON DISULFIDE		0.5	U		0.5	U		0.5	U	
CARBON TETRACHLORIDE		0.5	U		0.5	U		0.5	U	
CHLOROBENZENE		0.5	U		0.5	U		0.5	U	
CHLORODIBROMOMETHANE		1.7			0.5	U		0.5	U	
CHLOROETHANE		0.5	U		0.5	U		0.5	U	
CHLOROFORM		0.63	J	P	0.5	U		0.5	U	
CHLOROMETHANE		0.5	U		0.5	U		0.5	U	
CIS-1,2-DICHLOROETHENE		0.5	U		0.5	U		0.5	U	
CIS-1,3-DICHLOROPROPENE		0.5	U		0.5	U		0.5	U	
CYCLOHEXANE		0.5	U		0.5	U		0.5	U	
DICHLORODIFLUOROMETHANE		0.5	U		0.5	U		0.5	U	
ETHYLBENZENE		0.5	U		0.5	U		0.5	U	
ISOPROPYLBENZENE		0.5	U		0.5	U		0.5	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB133-DW			BP-VPB133-GW-794			BP-VPB-TB-012512		
SDG: D1320	LAB_ID	D1320-07			D1320-03			D1320-01		
FRACTION: OV	SAMP_DATE	1/27/2012			1/25/2012			1/25/2012		
MEDIA: WATER	QC_TYPE	NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0		
	DUP_OF									
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
M+P-XYLENES		1	U		1	U		1	U	
METHYL ACETATE		0.5	U		0.5	U		0.5	U	
METHYL CYCLOHEXANE		0.5	U		0.5	U		0.5	U	
METHYL TERT-BUTYL ETHER		0.5	U		0.5	U		0.5	U	
METHYLENE CHLORIDE		0.5	U		0.5	U		0.5	U	
O-XYLENE		0.5	U		0.5	U		0.5	U	
STYRENE		0.5	U		0.5	U		0.5	U	
TETRACHLOROETHENE		0.5	U		0.5	U		0.5	U	
TOLUENE		0.5	U		0.5	U		0.5	U	
TRANS-1,2-DICHLOROETHENE		0.5	U		0.5	U		0.5	U	
TRANS-1,3-DICHLOROPROPENE		0.5	U		0.5	U		0.5	U	
TRICHLOROETHENE		0.5	U		0.5	U		0.5	U	
TRICHLOROFLUOROMETHANE		0.5	U		0.5	U		0.5	U	
VINYL CHLORIDE		0.5	U		0.5	U		0.5	U	

TO: D. BRAYACK **DATE:** MARCH 21, 2012

FROM: TERRI L. SOLOMON **COPIES:** DV FILE

SUBJECT: ORGANIC DATA VALIDATION – VOC
NWIRP BETHPAGE CTO WE 066
SAMPLE DELIVERY GROUP (SDG) – D1365

SAMPLES: 8/Aqueous/VOC

BP-VPB133-GW-844	BP-VPB133-GW-854
BP-VPB133-GW-864	BP-VPB133-GW-874
BP-VPB133-GW-884	BP-VPB133-GW-904
BP-VPB133-TB-013012-JF	

Overview

The sample set for NWIRP Bethpage, CTO WE 066, SDG D1365 consists of six (6) environmental aqueous samples and a trip blank analyzed for volatile organic compounds (VOCs). There was no field duplicate contained in this SDG.

The samples were collected on January 30 and 31 and February 1, 2012 by Tetra Tech and analyzed by Chemtech. VOC analyses were conducted in accordance with EPA Method SW-846 8260B analytical and reporting protocol. The data contained in this SDG were validated with regard to the following parameters:

* • Data completeness
* • Holding times
* • GC/MS Tuning
• Initial/continuing calibrations
* • Laboratory Method Blank Results
* • Surrogate Recoveries
* • Laboratory Control Sample Recoveries
* • Internal Standard Recoveries
* • Compound Quantitation
* • Compound Identification
* • Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Qualified analytical results are presented in Appendix A, results as reported by the laboratory are presented in Appendix B, Region II data validation forms are presented in Appendix C, and documentation supporting these findings is presented in Appendix D.

VOC

The initial calibration relative standard deviations (%RSDs) for bromomethane, methyl acetate, methylene chloride, cyclohexane, trans-1,3-dichloropropene and cis-1,3-dichloropropene were greater than the 15% quality control limit on 01/26/2012 on instrument MSVOA R. The nondetected results for bromomethane, methyl acetate, methylene chloride, cyclohexane, trans-1,3-dichloropropene and cis-1,3-dichloropropene were qualified as estimated "UJ" in the affected sample BP-VPB133-TB-013012-JF.

The continuing calibration percent differences and/or percent drifts were greater than the 20% quality control limit for methyl acetate on 02/02/2012 at 18:11 on instrument MSVOA R. The nondetected result for methyl acetate was qualified as estimated "UJ" in the affected sample BP-VPB133-TB-013012-JF

The continuing calibration percent differences and/or percent drifts were greater than the 20% quality control limit for chloroethane and trichlorofluoromethane on 02/02/2012 at 12:12 on instrument MSVOA F. The nondetected results for chloroethane and trichlorofluoromethane were qualified as estimated "UJ" in the affected samples BP-VPB133-GW-844, BP-VPB133-GW-854, BP-VPB133-GW-864, BP-VPB133-GW-874, BP-VPB133-GW-884 and BP-VPB133-GW-904.

Positive results below the Reporting Limit (RL) and above the detection limit were qualified as estimated, (J), due to uncertainty near the detection limit.

Additional Comments

Groundwater samples BP-VPB133-GW-844, BP-VPB133-GW-854, BP-VPB133-GW-864, BP-VPB133-GW-874, BP-VPB133-GW-884 and BP-VPB133-GW-904 were analyzed as soil samples due to the amount of sediment in the samples. The sample results were reported as ug/kg on a wet weight basis.

Nondetected results are reported to the limit of detection (LOD).

EXECUTIVE SUMMARY

Laboratory Performance Issues: Several initial %RSDs and continuing calibration %Ds / % drifts for several compounds exceeded the quality control limits.

Other Factors Affecting Data Quality: Positive results below the RL and above the detection limit were qualified as estimated.

The data for these analyses were reviewed with reference to SOP # HW-24 Revision #2, August 2008, USEPA Region II Hazardous Waste Support Branch Validating Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry SW-846/8260B, and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories", April 2009. The text of this report has been formulated to address only those problem areas affecting data quality.

Tetra Tech
Terri L. Solomon
Chemist/Data Validator

Tetra Tech
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C – Region II Data Validation Forms
4. Appendix D - Support Documentation

Appendix A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed

PROJ_NO: 00622 SDG: D1365 FRACTION: OV MEDIA: WATER	NSAMPLE	BP-VPB133-TB-013012-JF		
	LAB_ID	D1365-03		
	SAMP_DATE	1/30/2012		
	QC_TYPE	NM		
	UNITS	UG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		0.5	U	
1,1,2,2-TETRACHLOROETHANE		0.5	U	
1,1,2-TRICHLOROETHANE		0.5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE		0.5	U	
1,1-DICHLOROETHANE		0.5	U	
1,1-DICHLOROETHENE		0.5	U	
1,2,4-TRICHLOROBENZENE		0.5	U	
1,2-DIBROMO-3-CHLOROPROPANE		0.5	U	
1,2-DIBROMOETHANE		0.5	U	
1,2-DICHLOROBENZENE		0.5	U	
1,2-DICHLOROETHANE		0.5	U	
1,2-DICHLOROPROPANE		0.5	U	
1,3-DICHLOROBENZENE		0.5	U	
1,4-DICHLOROBENZENE		0.5	U	
2-BUTANONE		2.5	U	
2-HEXANONE		2.5	U	
4-METHYL-2-PENTANONE		2.5	U	
ACETONE		2.5	U	
BENZENE		0.5	U	
BROMODICHLOROMETHANE		0.5	U	
BROMOFORM		0.5	U	
BROMOMETHANE		0.5	UJ	C
CARBON DISULFIDE		0.5	U	
CARBON TETRACHLORIDE		0.5	U	
CHLOROBENZENE		0.5	U	
CHLORODIBROMOMETHANE		0.5	U	
CHLOROETHANE		0.5	U	
CHLOROFORM		0.5	U	
CHLOROMETHANE		0.5	U	
CIS-1,2-DICHLOROETHENE		0.5	U	
CIS-1,3-DICHLOROPROPENE		0.5	UJ	C
CYCLOHEXANE		0.5	UJ	C
DICHLORODIFLUOROMETHANE		0.5	U	
ETHYLBENZENE		0.5	U	
ISOPROPYLBENZENE		0.5	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB133-TB-013012-JF
SDG: D1365	LAB_ID	D1365-03
FRACTION: OV	SAMP_DATE	1/30/2012
MEDIA: WATER	QC_TYPE	NM
	UNITS	UG/L
	PCT_SOLIDS	0.0
	DUP_OF	

PARAMETER	RESULT	VQL	QLCD
M+P-XYLENES	1	U	
METHYL ACETATE	0.5	UJ	C
METHYL CYCLOHEXANE	0.5	U	
METHYL TERT-BUTYL ETHER	0.5	U	
METHYLENE CHLORIDE	0.5	UJ	C
O-XYLENE	0.5	U	
STYRENE	0.5	U	
TETRACHLOROETHENE	0.5	U	
TOLUENE	0.5	U	
TRANS-1,2-DICHLOROETHENE	0.5	U	
TRANS-1,3-DICHLOROPROPENE	0.5	UJ	C
TRICHLOROETHENE	0.5	U	
TRICHLOROFLUOROMETHANE	0.5	U	
VINYL CHLORIDE	0.5	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-844			BP-VPB133-GW-854			BP-VPB133-GW-864			BP-VPB133-GW-874		
SDG: D1365	LAB_ID	D1365-01			D1365-02			D1365-04			D1365-05		
FRACTION: OV	SAMP_DATE	1/30/2012			1/30/2012			1/31/2012			1/31/2012		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		2.5	U		2.5	U		2.55	U		2.45	U	
1,1,2,2-TETRACHLOROETHANE		2.5	U		2.5	U		2.55	U		2.45	U	
1,1,2-TRICHLOROETHANE		2.5	U		2.5	U		2.55	U		2.45	U	
1,1,2-TRICHLOROTRIFLUOROETHANE		2.5	U		2.5	U		2.55	U		2.45	U	
1,1-DICHLOROETHANE		2.5	U		2.5	U		2.55	U		2.45	U	
1,1-DICHLOROETHENE		2.5	U		2.5	U		2.55	U		2.45	U	
1,2,4-TRICHLOROBENZENE		2.5	U		2.5	U		2.55	U		2.45	U	
1,2-DIBROMO-3-CHLOROPROPANE		2.5	U		2.5	U		2.55	U		2.45	U	
1,2-DIBROMOETHANE		2.5	U		2.5	U		2.55	U		2.45	U	
1,2-DICHLOROBENZENE		2.5	U		2.5	U		2.55	U		2.45	U	
1,2-DICHLOROETHANE		2.5	U		2.5	U		2.55	U		2.45	U	
1,2-DICHLOROPROPANE		2.5	U		2.5	U		2.55	U		2.45	U	
1,3-DICHLOROBENZENE		2.5	U		2.5	U		2.55	U		2.45	U	
1,4-DICHLOROBENZENE		2.5	U		2.5	U		2.55	U		2.45	U	
2-BUTANONE		12.5	U		12.5	U		13	U		12.5	U	
2-HEXANONE		12.5	U		12.5	U		13	U		12.5	U	
4-METHYL-2-PENTANONE		12.5	U		12.5	U		13	U		12.5	U	
ACETONE		12.5	U		18	J	P	13	U		20	J	P
BENZENE		2.5	U		2.5	U		2.55	U		2.45	U	
BROMODICHLOROMETHANE		2.5	U		2.5	U		2.55	U		2.45	U	
BROMOFORM		2.5	U		2.5	U		2.55	U		2.45	U	
BROMOMETHANE		2.5	U		2.5	U		2.55	U		2.45	U	
CARBON DISULFIDE		2.5	U		2.5	U		2.55	U		2.45	U	
CARBON TETRACHLORIDE		2.5	U		2.5	U		2.55	U		2.45	U	
CHLOROBENZENE		2.5	U		2.5	U		2.55	U		2.45	U	
CHLORODIBROMOMETHANE		2.5	U		2.5	U		2.55	U		2.45	U	
CHLOROETHANE		2.5	UJ	C	2.5	UJ	C	2.55	UJ	C	2.45	UJ	C
CHLOROFORM		2.5	U		2.5	U		2.55	U		2.45	U	
CHLOROMETHANE		2.5	U		2.5	U		2.55	U		2.45	U	
CIS-1,2-DICHLOROETHENE		2.5	U		2.5	U		2.55	U		2.45	U	
CIS-1,3-DICHLOROPROPENE		2.5	U		2.5	U		2.55	U		2.45	U	
CYCLOHEXANE		2.5	U		2.5	U		2.55	U		2.45	U	
DICHLORODIFLUOROMETHANE		2.5	U		2.5	U		2.55	U		2.45	U	
ETHYLBENZENE		2.5	U		2.5	U		2.55	U		2.45	U	
ISOPROPYLBENZENE		2.5	U		2.5	U		2.55	U		2.45	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-844			BP-VPB133-GW-854			BP-VPB133-GW-864			BP-VPB133-GW-874		
SDG: D1365	LAB_ID	D1365-01			D1365-02			D1365-04			D1365-05		
FRACTION: OV	SAMP_DATE	1/30/2012			1/30/2012			1/31/2012			1/31/2012		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
M+P-XYLENES		5	U		4.95	U		5	U		4.9	U	
METHYL ACETATE		2.5	U		2.5	U		2.55	U		2.45	U	
METHYL CYCLOHEXANE		2.5	U		2.5	U		2.55	U		2.45	U	
METHYL TERT-BUTYL ETHER		2.5	U		2.5	U		2.55	U		2.45	U	
METHYLENE CHLORIDE		2.5	U		2.5	U		2.55	U		2.45	U	
O-XYLENE		2.5	U		2.5	U		2.55	U		2.45	U	
STYRENE		2.5	U		2.5	U		2.55	U		2.45	U	
TETRACHLOROETHENE		2.5	U		2.5	U		2.55	U		2.45	U	
TOLUENE		2.5	U		2.5	U		2.55	U		2.45	U	
TRANS-1,2-DICHLOROETHENE		2.5	U		2.5	U		2.55	U		2.45	U	
TRANS-1,3-DICHLOROPROPENE		2.5	U		2.5	U		2.55	U		2.45	U	
TRICHLOROETHENE		2.5	U		2.5	U		2.55	U		2.45	U	
TRICHLOROFLUOROMETHANE		2.5	UJ	C	2.5	UJ	C	2.55	UJ	C	2.45	UJ	C
VINYL CHLORIDE		2.5	U		2.5	U		2.55	U		2.45	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-884			BP-VPB133-GW-904		
SDG: D1365	LAB_ID	D1365-06			D1365-07		
FRACTION: OV	SAMP_DATE	1/31/2012			2/1/2012		
MEDIA: SOIL	QC_TYPE	NM			NM		
	UNITS	UG/KG			UG/KG		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		2.5	U		2.5	U	
1,1,2,2-TETRACHLOROETHANE		2.5	U		2.5	U	
1,1,2-TRICHLOROETHANE		2.5	U		2.5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE		2.5	U		2.5	U	
1,1-DICHLOROETHANE		2.5	U		2.5	U	
1,1-DICHLOROETHENE		2.5	U		2.5	U	
1,2,4-TRICHLOROBENZENE		2.5	U		2.5	U	
1,2-DIBROMO-3-CHLOROPROPANE		2.5	U		2.5	U	
1,2-DIBROMOETHANE		2.5	U		2.5	U	
1,2-DICHLOROBENZENE		2.5	U		2.5	U	
1,2-DICHLOROETHANE		2.5	U		2.5	U	
1,2-DICHLOROPROPANE		2.5	U		2.5	U	
1,3-DICHLOROBENZENE		2.5	U		2.5	U	
1,4-DICHLOROBENZENE		2.5	U		2.5	U	
2-BUTANONE		12.5	U		12.5	U	
2-HEXANONE		12.5	U		12.5	U	
4-METHYL-2-PENTANONE		12.5	U		12.5	U	
ACETONE		20	J	P	33		
BENZENE		2.5	U		2.5	U	
BROMODICHLOROMETHANE		2.5	U		2.5	U	
BROMOFORM		2.5	U		2.5	U	
BROMOMETHANE		2.5	U		2.5	U	
CARBON DISULFIDE		2.5	U		2.5	U	
CARBON TETRACHLORIDE		2.5	U		2.5	U	
CHLOROBENZENE		2.5	U		2.5	U	
CHLORODIBROMOMETHANE		2.5	U		2.5	U	
CHLOROETHANE		2.5	UJ	C	2.5	UJ	C
CHLOROFORM		2.5	U		2.5	U	
CHLOROMETHANE		2.5	U		2.5	U	
CIS-1,2-DICHLOROETHENE		2.5	U		2.5	U	
CIS-1,3-DICHLOROPROPENE		2.5	U		2.5	U	
CYCLOHEXANE		2.5	U		2.5	U	
DICHLORODIFLUOROMETHANE		2.5	U		2.5	U	
ETHYLBENZENE		2.5	U		2.5	U	
ISOPROPYLBENZENE		2.5	U		2.5	U	

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-884			BP-VPB133-GW-904		
SDG: D1365	LAB_ID	D1365-06			D1365-07		
FRACTION: OV	SAMP_DATE	1/31/2012			2/1/2012		
MEDIA: SOIL	QC_TYPE	NM			NM		
	UNITS	UG/KG			UG/KG		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
M+P-XYLENES		5	U		5	U	
METHYL ACETATE		2.5	U		2.5	U	
METHYL CYCLOHEXANE		2.5	U		2.5	U	
METHYL TERT-BUTYL ETHER		2.5	U		2.5	U	
METHYLENE CHLORIDE		2.5	U		2.6	J	P
O-XYLENE		2.5	U		2.5	U	
STYRENE		2.5	U		2.5	U	
TETRACHLOROETHENE		2.5	U		2.5	U	
TOLUENE		2.5	U		2.5	U	
TRANS-1,2-DICHLOROETHENE		2.5	U		2.5	U	
TRANS-1,3-DICHLOROPROPENE		2.5	U		2.5	U	
TRICHLOROETHENE		2.5	U		2.5	U	
TRICHLOROFLUOROMETHANE		2.5	UJ	C	2.5	UJ	C
VINYL CHLORIDE		2.5	U		2.5	U	

Tetra Tech, Inc. **INTERNAL CORRESPONDENCE**

TO: **D. BRAYACK** **DATE:** **MARCH 22, 2011**

FROM: **MICHELLE L. ALLEN** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – VOC**
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP), BETHPAGE
CTO 066
SAMPLE DELIVERY GROUP (SDG) D1436

SAMPLES: 4Aqueous/VOC

BP-VPB133-GW-939 BP-VPB133-GW-959 BP-VPB133-GW-974
BP-VPB133-TB-020212-JRF

Overview

The sample set for NWIRP Bethpage SDG D1436 consisted of three (3) aqueous environmental samples and one (1) trip blank. All four (4) samples were analyzed for Target Compound List (TCL) volatile organic compounds (VOC). No field duplicate sample pair was associated with this sample data group (SDG).

The samples were collected by Tetra Tech, Inc. on February 2-3, 2012 and analyzed by Chemtech. All analyses were conducted in accordance with EPA Method SW-846 8260C analytical and reporting protocols. The data contained in this SDG was validated with regard to the following parameters:

*	• Data completeness
*	• Hold times
*	• GC/MS System Tuning and Performance
	• Initial/continuing calibrations
*	• Laboratory Method and Field Blank Results
	• Surrogate Spike Recoveries
*	• Internal Standard Results
*	• Laboratory Control Sample/Laboratory Control Sample Duplicate Results
*	• Matrix Spike/Matrix Spike Duplicate Sample Results
*	• Compound Identification
*	• Compound Quantitation
*	• Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Qualified analytical results are presented in Appendix A, results as reported by the laboratory are presented in Appendix B, Region II data validation forms are presented in Appendix C, and documentation supporting these findings is presented in Appendix D.

Volatiles (VOC)

Due to the nature of the matrices, the environmental groundwater samples, BP-VPB133-GW-939 and BP-VPB133-GW-959, were analyzed as soils. The sample results were reported in µg/Kg based on the dry weight of the sample.

The continuing calibration performed on instrument MSVOAG on 02/08/12 @ 11:29 had Percent Differences (%Ds) for 2-butanone, bromoform, and bromomethane, and Percent Drifts (%Drifts) for chloroethane and methyl acetate above the 20% quality control criterion. Only non-detected results were reported for these compounds in the affected samples, BP-VPB133-GW-974 and BP-VPB133-TB-020212-JRF, and these non-detects were qualified as estimated, (UJ).

The Percent Recovery (%R) for the surrogate spike compound, 4-bromofluorobenzene, was below the lower quality control limit in sample BP-VPB133-GW-959. The sample was reanalyzed with similar results. The results from the initial analysis were used in the data validation. The non-detected results reported for the target compounds in this sample were qualified as estimated, (UJ).

Additional Comments

Non-detected results are reported to the Limit of Detection (LOD).

EXECUTIVE SUMMARY

Laboratory Performance Issues: Some continuing calibration %Ds and %Drifts exceeded 20%. One sample had a low surrogate %R.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the SOP #HW-24 Revision #2, USEPA Region II Hazardous Waste Support Branch Validating Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry SW-846 Method 8260B (August 2008), EPA Method SW-846 8260C analytical and reporting protocols, and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (April 2009).

Tetra Tech, Inc.
Michelle L. Allen
Chemist/Data Validator

Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C – Region II Data Validation Forms
4. Appendix D - Support Documentation

Appendix A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-939			BP-VPB133-GW-959		
SDG: D1436	LAB_ID	D1436-02			D1436-03		
FRACTION: OV	SAMP_DATE	2/2/2012			2/2/2012		
MEDIA: SOIL	QC_TYPE	NM			NM		
	UNITS	UG/KG			UG/KG		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		2.5	U		2.5	UJ	R
1,1,2,2-TETRACHLOROETHANE		2.5	U		2.5	UJ	R
1,1,2-TRICHLOROETHANE		2.5	U		2.5	UJ	R
1,1,2-TRICHLOROTRIFLUOROETHANE		2.5	U		2.5	UJ	R
1,1-DICHLOROETHANE		2.5	U		2.5	UJ	R
1,1-DICHLOROETHENE		2.5	U		2.5	UJ	R
1,2,4-TRICHLOROBENZENE		2.5	U		2.5	UJ	R
1,2-DIBROMO-3-CHLOROPROPANE		2.5	U		2.5	UJ	R
1,2-DIBROMOETHANE		2.5	U		2.5	UJ	R
1,2-DICHLOROBENZENE		2.5	U		2.5	UJ	R
1,2-DICHLOROETHANE		2.5	U		2.5	UJ	R
1,2-DICHLOROPROPANE		2.5	U		2.5	UJ	R
1,3-DICHLOROBENZENE		2.5	U		2.5	UJ	R
1,4-DICHLOROBENZENE		2.5	U		2.5	UJ	R
2-BUTANONE		12.5	U		12.5	UJ	R
2-HEXANONE		12.5	U		12.5	UJ	R
4-METHYL-2-PENTANONE		12.5	U		12.5	UJ	R
ACETONE		12.5	U		12.5	UJ	R
BENZENE		2.5	U		2.5	UJ	R
BROMODICHLOROMETHANE		2.5	U		2.5	UJ	R
BROMOFORM		2.5	U		2.5	UJ	R
BROMOMETHANE		2.5	U		2.5	UJ	R
CARBON DISULFIDE		2.5	U		2.5	UJ	R
CARBON TETRACHLORIDE		2.5	U		2.5	UJ	R
CHLOROBENZENE		2.5	U		2.5	UJ	R
CHLORODIBROMOMETHANE		2.5	U		2.5	UJ	R
CHLOROETHANE		2.5	U		2.5	UJ	R
CHLOROFORM		2.5	U		2.5	UJ	R
CHLOROMETHANE		2.5	U		2.5	UJ	R
CIS-1,2-DICHLOROETHENE		2.5	U		2.5	UJ	R
CIS-1,3-DICHLOROPROPENE		2.5	U		2.5	UJ	R
CYCLOHEXANE		2.5	U		2.5	UJ	R
DICHLORODIFLUOROMETHANE		2.5	U		2.5	UJ	R
ETHYLBENZENE		2.5	U		2.5	UJ	R
ISOPROPYLBENZENE		2.5	U		2.5	UJ	R

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-939			BP-VPB133-GW-959		
SDG: D1436	LAB_ID	D1436-02			D1436-03		
FRACTION: OV	SAMP_DATE	2/2/2012			2/2/2012		
MEDIA: SOIL	QC_TYPE	NM			NM		
	UNITS	UG/KG			UG/KG		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
M+P-XYLENES		5	U		5	UJ	R
METHYL ACETATE		2.5	U		2.5	UJ	R
METHYL CYCLOHEXANE		2.5	U		2.5	UJ	R
METHYL TERT-BUTYL ETHER		2.5	U		2.5	UJ	R
METHYLENE CHLORIDE		2.5	U		2.5	UJ	R
O-XYLENE		2.5	U		2.5	UJ	R
STYRENE		2.5	U		2.5	UJ	R
TETRACHLOROETHENE		2.5	U		2.5	UJ	R
TOLUENE		2.5	U		2.5	UJ	R
TRANS-1,2-DICHLOROETHENE		2.5	U		2.5	UJ	R
TRANS-1,3-DICHLOROPROPENE		2.5	U		2.5	UJ	R
TRICHLOROETHENE		2.5	U		2.5	UJ	R
TRICHLOROFLUOROMETHANE		2.5	U		2.5	UJ	R
VINYL CHLORIDE		2.5	U		2.5	UJ	R

PROJ_NO: 00622	NSAMPLE	BP-VPB133-GW-974			BP-VPB133-TB-020212-JRF		
SDG: D1436	LAB_ID	D1436-04			D1436-01		
FRACTION: OV	SAMP_DATE	2/3/2012			2/2/2012		
MEDIA: WATER	QC_TYPE	NM			NM		
	UNITS	UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		0.5	U		0.5	U	
1,1,2,2-TETRACHLOROETHANE		0.5	U		0.5	U	
1,1,2-TRICHLOROETHANE		0.5	U		0.5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE		0.5	U		0.5	U	
1,1-DICHLOROETHANE		0.5	U		0.5	U	
1,1-DICHLOROETHENE		0.5	U		0.5	U	
1,2,4-TRICHLOROBENZENE		0.5	U		0.5	U	
1,2-DIBROMO-3-CHLOROPROPANE		0.5	U		0.5	U	
1,2-DIBROMOETHANE		0.5	U		0.5	U	
1,2-DICHLOROBENZENE		0.5	U		0.5	U	
1,2-DICHLOROETHANE		0.5	U		0.5	U	
1,2-DICHLOROPROPANE		0.5	U		0.5	U	
1,3-DICHLOROBENZENE		0.5	U		0.5	U	
1,4-DICHLOROBENZENE		0.5	U		0.5	U	
2-BUTANONE		2.5	UJ	C	2.5	UJ	C
2-HEXANONE		2.5	U		2.5	U	
4-METHYL-2-PENTANONE		2.5	U		2.5	U	
ACETONE		2.5	U		2.5	U	
BENZENE		0.5	U		0.5	U	
BROMODICHLOROMETHANE		0.5	U		0.5	U	
BROMOFORM		0.5	UJ	C	0.5	UJ	C
BROMOMETHANE		0.5	UJ	C	0.5	UJ	C
CARBON DISULFIDE		0.5	U		0.5	U	
CARBON TETRACHLORIDE		0.5	U		0.5	U	
CHLOROBENZENE		0.5	U		0.5	U	
CHLORODIBROMOMETHANE		0.5	U		0.5	U	
CHLOROETHANE		0.5	UJ	C	0.5	UJ	C
CHLOROFORM		0.5	U		0.5	U	
CHLOROMETHANE		0.5	U		0.5	U	
CIS-1,2-DICHLOROETHENE		0.5	U		0.5	U	
CIS-1,3-DICHLOROPROPENE		0.5	U		0.5	U	
CYCLOHEXANE		0.5	U		0.5	U	
DICHLORODIFLUOROMETHANE		0.5	U		0.5	U	
ETHYLBENZENE		0.5	U		0.5	U	
ISOPROPYLBENZENE		0.5	U		0.5	U	

PROJ_NO: 00622 SDG: D1436 FRACTION: OV MEDIA: WATER	NSAMPLE	BP-VPB133-GW-974			BP-VPB133-TB-020212-JRF		
	LAB_ID	D1436-04			D1436-01		
	SAMP_DATE	2/3/2012			2/2/2012		
	QC_TYPE	NM			NM		
	UNITS	UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
M+P-XYLENES		1	U		1	U	
METHYL ACETATE		0.5	UJ	C	0.5	UJ	C
METHYL CYCLOHEXANE		0.5	U		0.5	U	
METHYL TERT-BUTYL ETHER		0.5	U		0.5	U	
METHYLENE CHLORIDE		0.5	U		0.5	U	
O-XYLENE		0.5	U		0.5	U	
STYRENE		0.5	U		0.5	U	
TETRACHLOROETHENE		0.5	U		0.5	U	
TOLUENE		0.5	U		0.5	U	
TRANS-1,2-DICHLOROETHENE		0.5	U		0.5	U	
TRANS-1,3-DICHLOROPROPENE		0.5	U		0.5	U	
TRICHLOROETHENE		0.5	U		0.5	U	
TRICHLOROFLUOROMETHANE		0.5	U		0.5	U	
VINYL CHLORIDE		0.5	U		0.5	U	