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NWIRP BETHPAGE
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2013-2014 OPERABLE UNIT 2 (OU 2) GROUNDWATER INVESTIGATION VPB 144 NWIRP BETHPAGE NY

09/01/2014

RESOLUTION CONSULTANTS

2013 - 2014 OU2 GROUNDWATER INVESTIGATION

VPB 144
BETHPAGE, NY

Prepared for:

Department of the Navy
Naval Facilities Engineering Command, Mid-Atlantic
9742 Maryland Ave.
Norfolk, VA 23511-3095

Comprehensive Long-Term Environmental Action Navy
Contract Number N62470-11-D-8013

CTO WE15

Prepared by:

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List of Acronyms and Abbreviations

AOC	Area of Concern
bgs	below ground surface
DoD	Department of Defense
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency, United States
ft	feet
GOCO	Government-Owned Contractor-Operated
IDW	Investigation Derived Waste
IR	Installation Restoration
Katahdin	Katahdin Analytical Services, Inc
NAD	North American Datum
NAVD	North American Vertical Datum
NAVFAC	Naval Facilities Engineering Command
NG	Northrop Grumman
NWIRP	Naval Weapons Industrial Reserve Plant
NYSDEC	New York State Department of Environmental Conservation
ONCT	On-site Containment Treatment System
OU	Operable Unit
PCBs	Polychlorinated Biphenyls
PCE	Tetrachloroethene
PID	Photoionization Detector
POTW	Publicly Owned Treatment Works
PPE	Personal Protective Equipment
PVC	Polyvinylchloride
RTN	Real Time Networks
SAP	Sampling and analysis plan
SVOC	Semivolatile Organic Compounds
TCE	Trichloroethene
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TOC	Total Organic Carbon
UFP	United Federal Programs
VOC	Volatile Organic Compounds
VPB	Vertical Profile Boring

1. PROJECT BACKGROUND

Resolution Consultants has prepared this Data Summary Report for the Naval Facilities Engineering Command, Mid-Atlantic under contract task order WE15 Contract N62470-11-D-8013. This report describes vertical profile boring (VPB) installation activities (specifically at the VPB 144 location) in 2013 and 2014 for the Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage Operable Unit (OU) 2 Site 1 offsite plume. NWIRP Bethpage is located in east-central Nassau County, Long Island, New York, approximately 30 miles east of New York City (Figure 1).

1.1 Scope and Objectives

This data summary report provides information on the installation of VPB 144. The purpose of the VPB 144 investigation was to ascertain contaminant levels and depths immediately upgradient of the On-site Containment Treatment (ONCT) system. VPB and monitoring well locations within the general vicinity of VPB 144 are shown in Figure 2. VPB 144 was completed to 890 feet (ft) below ground surface (bgs). The data from VPB 144 provides information on the extent and magnitude of Volatile Organic Compounds (VOCs) in the vicinity of the ONCT and to a certain extent helps ascertain the effectiveness of the ONCT.

Field tasks were conducted between 2013 and 2014 in accordance with the *United Federal Programs Sampling and Analysis Plan (UFP SAP)*, Bethpage, New York and the UFP SAP Addendum Installation of Vertical Profile Borings and Monitoring Wells (Resolution Consultants, 2013). The field investigation included completing one vertical profile boring, groundwater grab samples, geophysical logging and surveying.

Documentation of these activities is included in Appendix A of this report.

1.2 Site History

NWIRP Bethpage is in the Hamlet of Bethpage, Town of Oyster Bay, New York. Since its inception in 1941, the plant's primary mission was the research prototyping, testing, design, engineering, fabrication, and primary assembly of military aircraft. The facilities at NWIRP included four plants used for assembly and prototype testing, a group of quality control laboratories, two warehouse complexes (north and south), a salvage storage area, water recharge basins, the Industrial Wastewater Treatment Plant, and several smaller support buildings.

The Navy's property originally totaled 109.5 acres and was formerly a Government-Owned Contractor-Operated (GOCO) facility that was operated by Northrop Grumman (NG) until

September 1998. Prior to 2002, the NWIRP property was bordered on the north, west, and south by current or former NG facilities, and on the east by a residential neighborhood. By March 2008, approximately 100 acres of NWIRP property were transferred to Nassau County in three separate actions. The remaining 9 acres and access easements were retained by the Navy to continue remedial efforts at Installation Restoration (IR) Site 1 – Former Drum Marshalling Area and Site 4 – Former Underground Storage Tanks (Area of Concern [AOC] 22). A parcel of land connecting the two sites was also retained. Currently, the 9-acre parcel of NWIRP is bordered on the east by the residential neighborhood and on the north, south, and west by Nassau County property. Access to the NWIRP is from South Oyster Bay Road.

1.3 Geology and Hydrogeology

Overburden at the site consists of approximately 1,000 ft of Cretaceous deposits overlying crystalline bedrock of the Hartland Formation. Overburden is divided into four geologic units: the upper Pleistocene deposits, the Magothy Formation, the clay member of the Raritan Formation ("Raritan Clay") and the Lloyd Sand member of the Raritan Formation ("Lloyd Sand") (Geraghty and Miller, 1994).

The upper Pleistocene ranges in thickness from approximately 50 to 100 ft and consists of till and outwash deposits of medium to coarse sand and gravel with lenses of fine sand, silt and clay (Smolensky and Feldman, 1990); these deposits form the Upper Glacial Aquifer. Directly underlying this unit is the Magothy Formation with a thickness of 650 to 850 ft bgs observed onsite. The Magothy is characterized by fine to medium sands and silts interbedded with zones of clays, silty sands and sandy clays. Sand and gravel lenses are found in some areas between depths of 600 and 875 ft bgs; these deposits form the Magothy Aquifer.

The Raritan Clay is encountered at NWIRP at a depth of approximately 700 to 900 ft bgs. Raritan Clay deepens to the south southeast, as evidenced by clay depths of 1000 ft bgs (or more) in borings installed in the offsite plume to date. The Raritan Clay Unit is of continental origin and consists of clay, silty clay, clayey silt, and fine silty sand. This member acts as a confining layer over the Lloyd Sand Unit. The Lloyd Sand Unit is also of continental origin, having been deposited in a large fresh water lacustrine environment. The material consists of fine to coarse-grained sands, gravel, inter-bedded clay, and silty sand. These deposits form the Lloyd Aquifer.

The Upper Glacial Aquifer and the Magothy Aquifer comprise the aquifers of interest at the NWIRP. Regionally, these formations are generally considered to form a common, interconnected aquifer as

the coarse nature of each unit near their contact and the lack of any regionally confining clay unit allows for the unrestricted flow of groundwater between the formations.

The Magothy Aquifer is the major source of public water in Nassau County. The most productive water bearing zones are the discontinuous lenses of sand and gravel that occur within the siltier matrix. The major water-bearing zone is basal gravel located at or near the contact with the Raritan. The Magothy Aquifer is commonly regarded to function overall as an unconfined aquifer at shallow depths and a confined aquifer at deeper depths. The drilling program at the NWIRP has revealed that clay zones beneath the facility are common but laterally discontinuous. No confining clay units of facility-wide extent have been encountered.

Groundwater is encountered at a depth of approximately 50 ft bgs at the facility. Historically, because of pumping and recharge at the facility, groundwater depths have been measured to range from 40 to 60 ft bgs. The regional groundwater flow in the area is to the south-southeast.

2. FIELD PROGRAM

Field investigation activities at VPB 144 consisted of drilling, sampling, soil/groundwater analysis, geophysical logging, and surveying. Drilling during this investigation was performed by Delta Well and Pump Company of Ronkonkoma, New York. A description of these tasks is provided below.

2.1 Vertical Profile Borings

One vertical profile boring (VPB 144) was completed during this field effort between November 11, 2013 and January 23, 2014. The total depth of VPB 144 was 890 ft. The location is shown in Figure 2 and details are summarized in Table 1.

2.1.1 Drilling

VPB 144 was installed by drilling an 8-inch diameter hole via mud rotary drilling techniques. Drilling mud consisted of potable water and polymer-free sodium bentonite or equivalent. Drilling mud was contained and re-circulated in baffled, high capacity mud tubs. A sand separator was used intermittently to remove fines from circulation.

2.1.2 Sampling

When a change in geology was observed, seven split spoon samples were collected from ground surface to a depth of approximately 850 ft. In addition, seven split spoon samples were collected from 858 ft to 890 ft to confirm the Raritan occurrence. Samples were logged by the field geologist and screened for VOCs utilizing a photoionization detector (PID). A detailed boring log for VPB 144 is included in Appendix A.

Groundwater grab samples were collected every 50 ft for the first 200 ft of borehole depth. After the first 200 ft, groundwater grab samples were collected approximately every 20 ft until the boring terminated in the Raritan. Groundwater grab samples were collected with a hydropunch sampler and analyzed for VOCs using Environmental Protection Agency (EPA) Method 8260B. The groundwater grab samples were analyzed by Katahdin Analytical Services (Katahdin), a Department of Defense (DoD), Environmental Laboratory Accreditation Program (ELAP), and New York State Department of Environmental Conservation (NYSDEC)-certified laboratory. During the collection of groundwater grab samples, field parameters were measured (pH, temperature, specific conductivity, oxidation reduction potential, dissolved oxygen, and turbidity). Data validation was performed by Resolution Consultants. Groundwater grab sample logs, data validation packages, and analytical data tables are included in Appendix A.

One soil sample was collected for laboratory analysis for total organic carbon (TOC) by EPA series SW-846 method 9060A. During drilling, air sampling was conducted under a Community Air Monitoring Plan. One air sample was collected per VPB using Summa canisters and submitted for laboratory analysis by EPA Method TO-15. All analyses were performed or sub-contracted by Katahdin. Data validation of both TOC and air data was performed by Resolution Consultants. Data validation packages and analytical data tables are included in Appendix A.

2.1.3 Geophysics

Borehole geophysical logs (gamma) were recorded after the borehole was drilled but prior to the removal of drill rods. A Mount Sopris Instrument model 2PGA-100 poly gamma was used. Starting at the top of the hole, the probe was advanced at a maximum rate of 12 ft per minute. A copy of the log was printed in the field for review once the probe reached the bottom of the borehole. The instrument was then raised to the top of the boring and a second log was generated and printed in the field. The down hole gamma log sheets and plots comparing the gamma log with trichloroethene (TCE) and tetrachloroethene (PCE) concentrations from hydropunch samples are included in Appendix A.

2.2 Decontamination and Investigation Derived Waste (IDW)

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

The investigation waste (consisting of soil cuttings, drilling muds, IDW fluids, and personal protective equipment (PPE)) generated during the borings and well installations were containerized and staged at NWIRP Bethpage. All IDW was characterized and disposed of properly. Representative samples from each roll off were submitted to Katahdin for analysis of:

- Target Compound List (TCL) VOCs
- TCL Semi-volatile Organic Compounds (SVOCs)
- Toxicity Characteristic Leaching Procedure (TCLP) Metals
- Polychlorinated Biphenyls (PCBs)

- Total petroleum hydrocarbons
- Corrosivity
- Ignitability
- Reactive Cyanide
- Reactive Sulfide
- Paint Filter

Purge water was containerized in frac tanks and stored at NWIRP Bethpage for characterization and ultimate disposal to the Publicly Owned Treatment Works (POTW), in accordance with the facilities existing discharge permit. A representative water sample was collected from each frac tank and submitted to Katahdin for analysis of VOCs via method SW 624 and pH via method SW 9040B (all waters). To the extent feasible, soil and water were not mixed. All analytical criteria were met for disposal of soil and water.

2.3 Surveying

A survey of the boring locations was conducted at the end of fieldwork by GEOD Corporation of Newfoundland, New Jersey, under the direct supervision of Resolution Consultants. The locations were tied into the existing base map developed for this investigation. Survey elevations are referenced to the North American Vertical Datum (NAVD) 1988 and have a vertical accuracy of 0.01 foot. Local vertical control was based on the National Geodetic Survey Station 11E 12N. The horizontal locations are referenced to the North American Datum (NAD) 1983 (2011) NYL13104 and have an accuracy of 0.1 foot. Local horizontal control was based on Leica Smartnet\NYSNet Real Time Networks (RTN) station data.

A table of survey data (ground, latitude/longitude and northing/easting) and a survey map is included in Appendix A.

3. REFERENCES

Geraghty and Miller, Inc., 1994. *Remedial Investigation Report, Grumman Aerospace Corporation, Bethpage, New York*. Revised September 1994.

Naval Facilities Engineering Command (NAVFAC), 2003. *Record of Decision Naval Weapons Industrial Reserve Plant Bethpage, New York, Operable Unit 2 – Groundwater*, NYS Registry: 1-30-003B. April.

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

Resolution Consultants, 2013. UFP SAP Addendum*, Installation of Vertical Profile Borings and Monitoring Wells.* December.

Smolensky, D., and Feldman, S., 1990. *Geohydrology of the Bethpage-Hicksville-Levittown Area, Long Island, New York, U.S*. Geological Survey Water-Resourced Investigations Report 88-4135, 25 pp.

Tables

TABLE 1
VERTICAL PROFILE BORING SUMMARY
2013 TO 2014 OU2 GROUNDWATER INVESTIGATION
NWIRP BETHPAGE, NY

BORING	BORING START DATE	BORING COMPLETION DATE	GROUND ELEVATION (MSL)	TOTAL DEPTH (ft bgs)	SURFACE CASING SET AT (ft bgs)	NO. OF SPOON SAMPLES	GAMMA LOG (ft bgs)	NO. GW SAMPLES COLLECTED / ATTEMPTED	TOC SAMPLES	DATE OF AIR SAMPLE	MONITORING WELLS INSTALLED AT LOCATION
VP 144	11/26/2013	1/23/2014	100.37	890	55	14	888	33/8	1 (682 - 685 ft bgs)	12/30/2013	None

Figures

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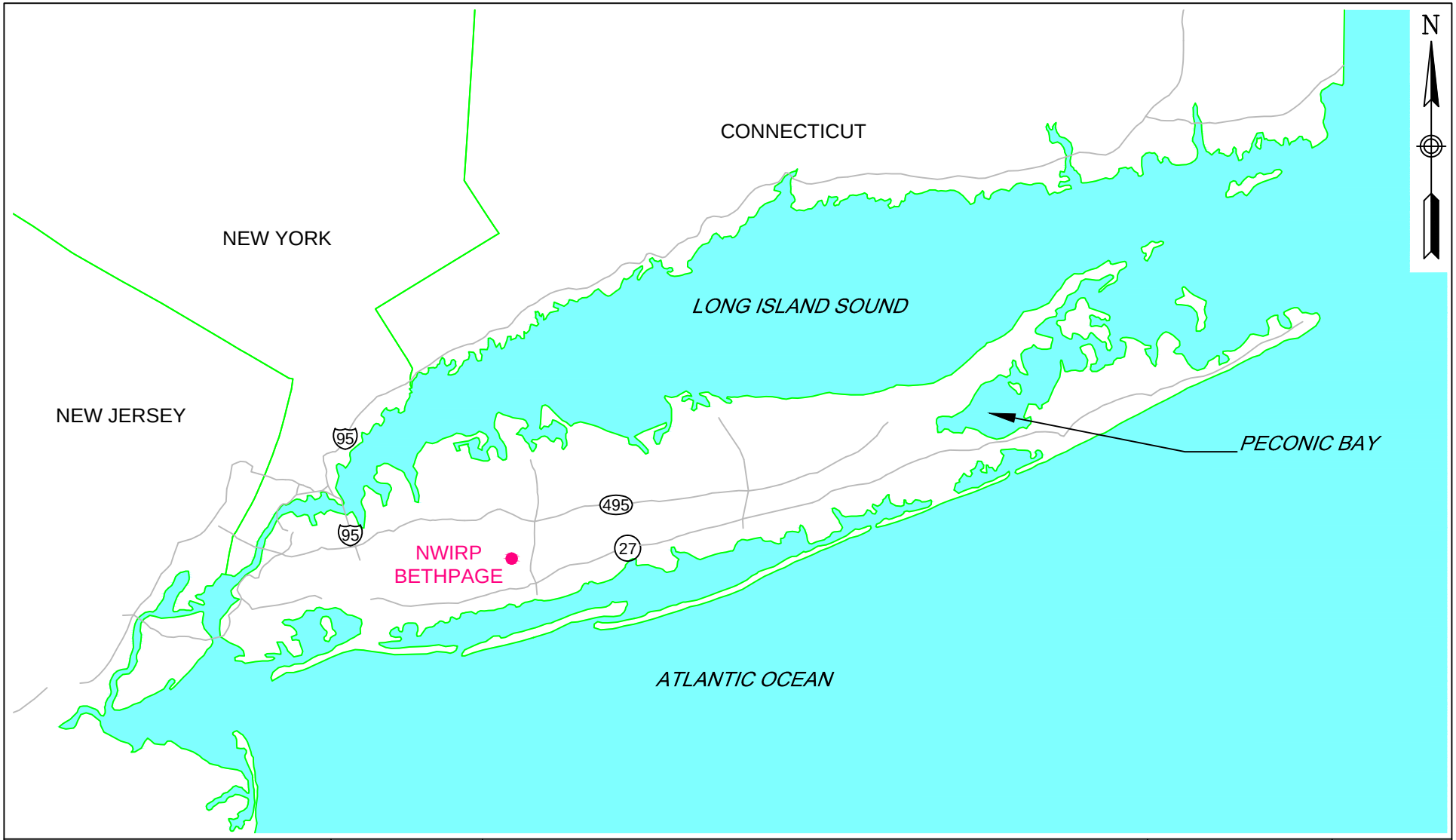


0 15 30

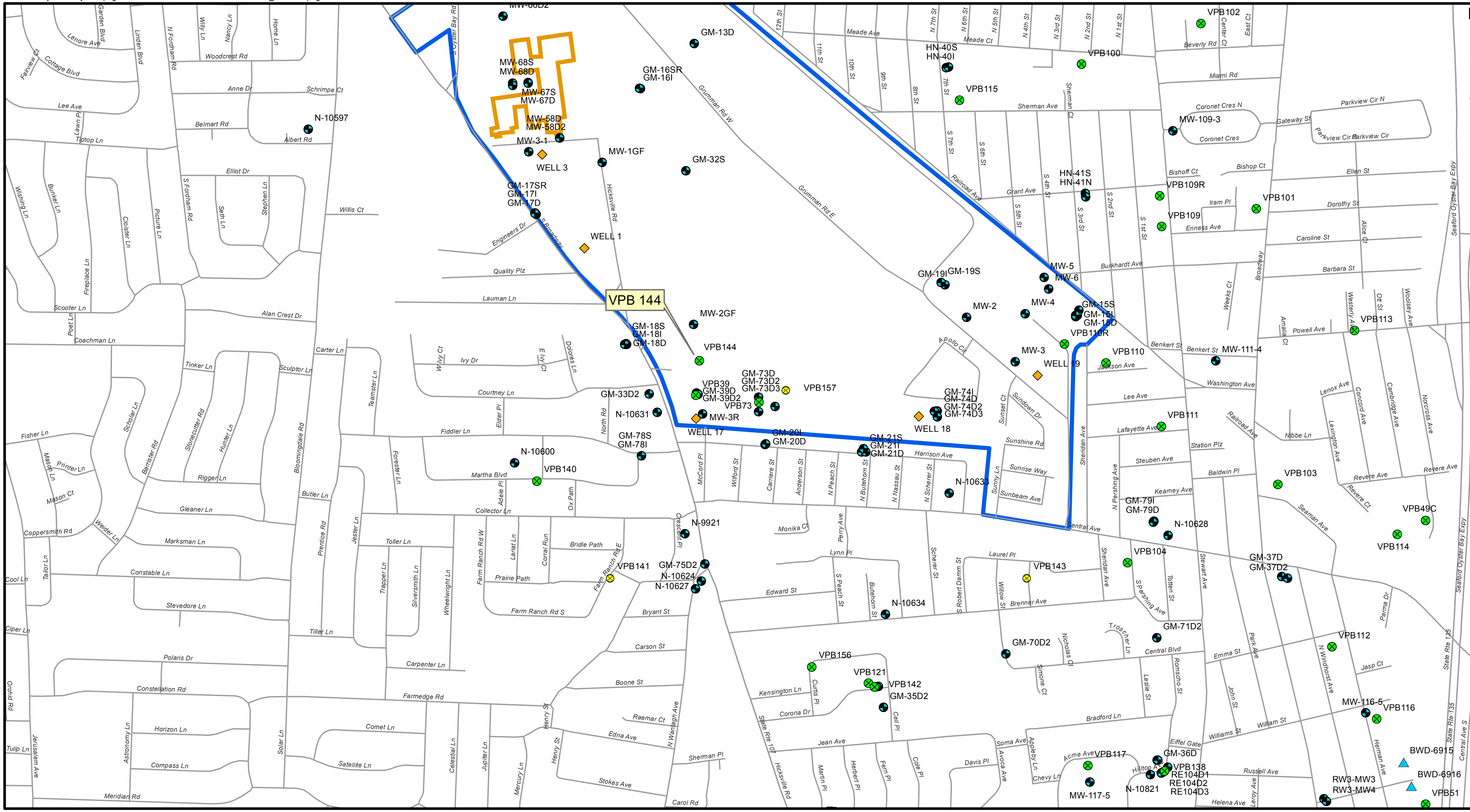
SCALE IN MILES

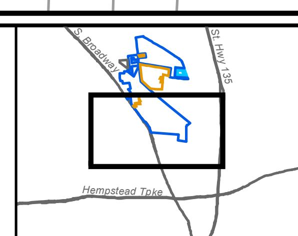
NAVFAC

GENERAL LOCATION MAP
NWIRP BETHPAGE
BETHPAGE, NEW YORK

CONTRACT NUMBER	CTO NUMBER
N62470-11-D-8013	WE15
APPROVED BY --	DATE --
APPROVED BY --	DATE --
FIGURE NO. 1	REV 0

Path: F:\Projects\Navy\Bethpage WXE08\7.0 Deliverables\7.2 CADD\GIS_files\Bethpage\MAP DOCS\MXD\Cross-Sections\VPB142\F2 VPB 144 2014 07 31 R1.mxd





- Vertical Profile Boring
- Monitoring Well
- Vertical Profile Boring - Proposed
- Water Supply Well
- Extraction Well

0 220 440 880 Feet

NAVFAC

VPB 144 LOCATION MAP

OPERABLE UNIT 2 (SITE 1)

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT

BETHPAGE, NEW YORK

CONTRACT NUMBER	CTO NUMBER
N62470-11-D-8013	WE15
APPROVED BY EV	DATE 8/18/2014
APPROVED BY __	DATE __
FIGURE NO. 2	REV 1

Appendix A

VPB 144

Section 1

VPB 144 Boring and Gamma Logs

Resolution Consultants

Boring Log

BORING #: VPB144

Client: Department of the Navy, Naval Facilities Engineering Command, Mid-Atlantic		**Logged By:** M. Zobel
Location: Sunbeam Ave.	**Northing:** 210194.3 **Easting:** 1124109.96	**Drilling Company:** Delta Well & Pump
Project #: 60266526	**Ground Elevation (ft amsl):** 100.37	**Well Screen Interval (ft):**
Start Date: 11/26/2013	**Drilling Method:** Mud Rotary	**Water Level (ft):**
Finish Date: 1/23/2014		**Total Depth (ft):** 890.0

Note: Unless denoted by a splitspoon sample (indicated by the presence of a PID reading), boundaries between strata are approximate only and may be transitional because they are based on screened wash samples collected during mud rotary drilling at 5 ft. intervals.

DEPTH (ft)	Gamma Ray (30 60 90)	PID (ppm)	TCE (ug/L)	PCE (ug/L)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION
0					Upper Glacial	SM		Pavement. Fill
2						SM		Dark brown (7.5 YR 3/2) Silty SAND, fine to coarse Sand, few fine to coarse subrounded gravel
4								
6						SM		Brown (7.5 YR 5/2) Silty SAND, fine to coarse Sand, 30% coarse sand, little fine to coarse subrounded gravel
8								
10								
12						SM		Brown (7.5 YR 5/2) Silty SAND, fine to coarse Sand, 30% coarse sand, little fine to coarse subrounded gravel
14						SW-SM		Strong brown (7.5 YR 5/6) Well graded SAND with Silt, fine to coarse Sand, little fine to coarse subrounded gravel
16								
18								
20								
22								
24						SM		Dark yellowish brown (10 YR 4/4) Silty SAND, fine to coarse Sand, few fine to coarse subrounded gravel
26								
28								
30								
32						SM		Reddish yellow (7.5 YR 6/6) Silty SAND, fine to coarse subangular Sand, trace gravel
34								
36						SM		Reddish yellow (7.5 YR 6/6) Silty SAND, medium to coarse Sand
38								
40						SM		Reddish yellow (7.5 YR 7/6) Silty SAND, medium Sand, trace coarse subangular sand
42								
44								
46						SM		Reddish yellow (7.5 YR 6/6) Silty SAND, medium Sand, trace coarse subangular sand
48								
50								
52						SM		Reddish yellow (7.5 YR 6/6) Silty SAND, medium to coarse angular Sand
54								

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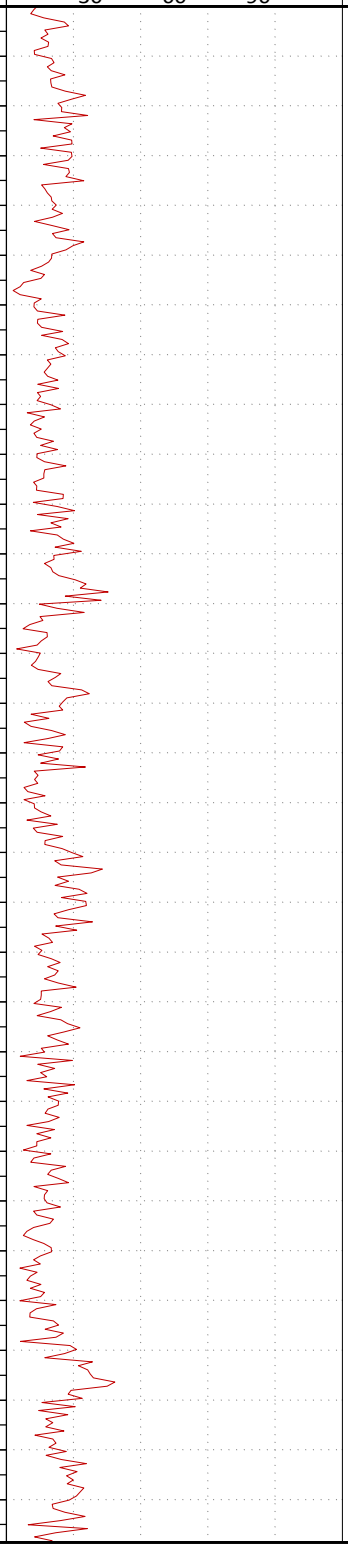
Resolution Consultants

Boring Log

BORING #: VPB144



DEPTH (ft)	PID (ppm)	TCE (ug/L)	PCE (ug/L)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION
54				Upper Glacial	SW		Brownish yellow (10YR 6/6) well graded fine to coarse SAND, trace Silt *(continued)*
56					SW		
58							
60		0.33	< 0.50		SW		Yellowish brown (10YR 5/6) well graded medium to coarse subangular SAND, few fine Sand, trace silt
62							
64					SP		Brownish yellow (10 YR 6/6) poorly graded coarse subangular SAND, few medium Sand, trace fine subangular gravel
66							
68							
70					SW		Yellowish brown (10 YR 6/6) well graded medium to coarse subangular SAND, few fine Sand, trace silt
72							
74					SW		Light yellowish brown (2.5 Y 6/4) well graded fine to medium SAND, few subangular coarse Sand, few iron deposits
76							
78							
80					SW		Light yellowish brown (2.5 Y 6/4) well graded fine to coarse subangular SAND, few Iron deposits, trace silt
82							
84					SP		Light yellowish brown (2.5 Y 6/4) poorly graded fine to medium SAND, trace coarse subangular Sand
86							
88							
90					SP		Brownish yellow (10 YR 6/6) poorly graded fine to medium SAND, trace coarse subangular Sand
92							
94							
96					SW-SM		Brownish yellow (10YR 6/6) well graded coarse subangular SAND with Silt and fine subangular Gravel, trace iron deposits
98							
100					SP		Light yellowish brown (10 YR 6/4) poorly graded fine to medium SAND, trace fine subangular Gravel, trace silt, trace iron deposits
102				Magothy			
104		< 0.50	< 0.50		SW		Brownish yellow (10 YR 6/6) well graded fine to coarse subangular SAND
106							
108							
110					SP		Brownish yellow (10 YR 6/6) poorly graded fine to medium SAND, trace coarse subangular Sand
112							
114					SW		Yellow (10 YR 7/6) well graded fine to coarse subangular SAND, few Silt, trace fine subangular gravel

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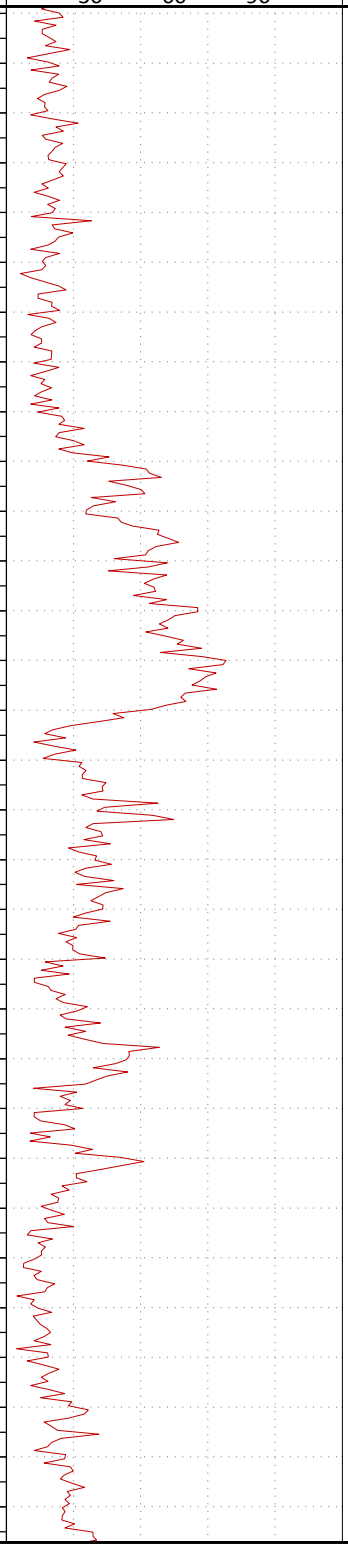
Resolution Consultants

Boring Log

BORING #: VPB144



DEPTH (ft)	PID (ppm)	TCE (ug/L)	PCE (ug/L)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION
116				Magothy	SW		Yellow (10 YR 7/6) well graded fine to coarse subangular SAND, few Silt, trace fine subangular gravel *(continued)*
118							
120					SW		Light yellowish brown (10 YR 6/4) well graded fine to coarse subangular SAND, few Silt, few iron deposits, trace fine subangular gravel
122							
124					SP		Pale brown (10 YR 6/3) poorly graded fine to medium SAND
126							
128					SP		Pale brown (10 YR 6/3) poorly graded fine to medium SAND
130							
132					CL		Dark gray (2.5 Y 4/1) lean CLAY with fine to medium Sand
134							
136					CL		Dark gray (2.5 Y 4/1) lean CLAY, trace fine to medium Sand
138							
140					SP		Gray (10 YR 5/1) poorly graded fine to medium SAND, trace Clay
142							
144					CL		Dark gray (2.5 Y 4/1) lean CLAY with fine Sand
146							
148		28	0.49		SP		Light yellowish brown (2.5 Y 6/3) poorly graded fine to medium SAND, trace Clay
150							
152					SP		Light yellowish brown (2.5 Y 6/3) poorly graded fine to medium SAND, trace Clay
154							
156					SP		Grayish brown (2.5 Y 5/2) poorly graded fine to medium SAND
158							
160					SP		Grayish brown (2.5 Y 5/2) poorly graded fine to medium SAND
162							
164					SP		Brown (10 YR 5/3) poorly graded fine to medium SAND, trace Clay contains lignite
166							
168							
170							
172							
174							
176							

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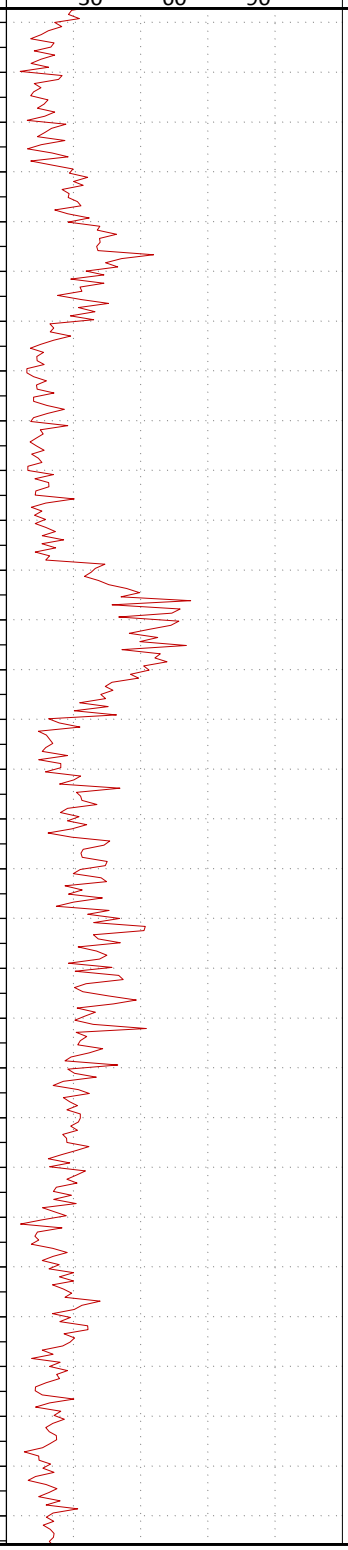
Resolution Consultants

Boring Log

BORING #: VPB144



DEPTH (ft)	PID (ppm)	TCE (ug/L)	PCE (ug/L)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION
178				Magothy			
180					SP		Grayish brown (2.5 Y 5/2) poorly graded fine to medium SAND
182							
184					SC		Light yellowish brown (10 YR 6/4) Clayey fine SAND, trace medium sand contains lignite
186							
188					SP		Light olive brown (2.5 Y 5/3) poorly graded fine SAND, few medium Sand, trace clay contains lignite
190							
192							
194					SP		Light olive brown (2.5 Y 5/3) poorly graded fine to medium SAND, trace Clay contains lignite
196							
198							
200		5.8	< 0.50		CL		Pale brown (10 YR 6/3) lean CLAY with fine to medium Sand
202							
204					CL		Pale brown (10 YR 6/3) lean CLAY with fine Sand, trace medium sand
206							
208					CL		Light brownish gray (2.5 Y 6/2) lean CLAY with fine Sand, trace medium sand
210							
212							
214					CL		Pale brown (10 YR 6/3) lean CLAY with fine Sand
216							
218							
220					CL		Pale brown (10 YR 6/3) lean CLAY with fine Sand
222							
224		0.57	< 0.50		CL		Pale brown (10 YR 6/3) lean CLAY with fine Sand
226							
228							
230					CL		Light yellowish brown (2.5 Y 6/3) lean CLAY, few fine Sand
232							
234							Pale brown (10 YR 6/3) lean CLAY with fine Sand
236					CL		
238							
		0.85	< 0.50		CL		

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Resolution Consultants

Boring Log

BORING #: VPB144

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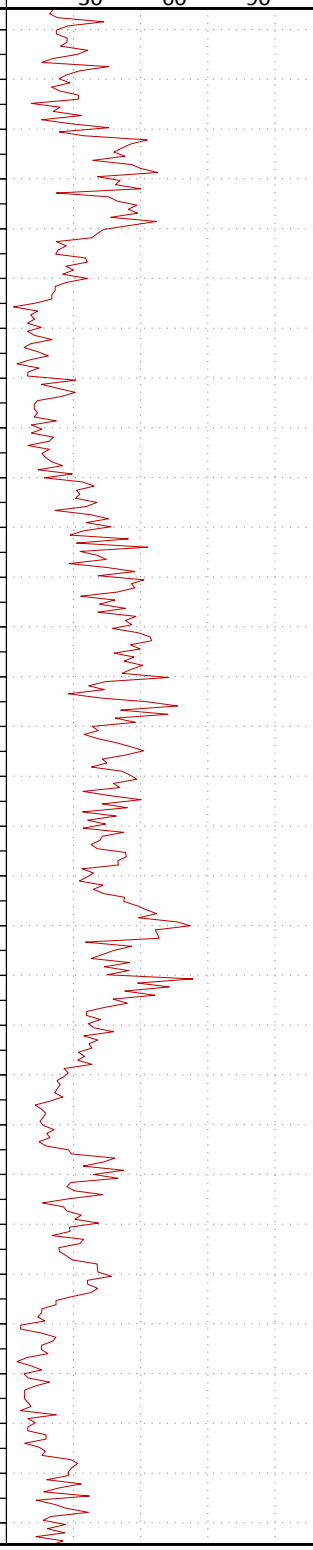


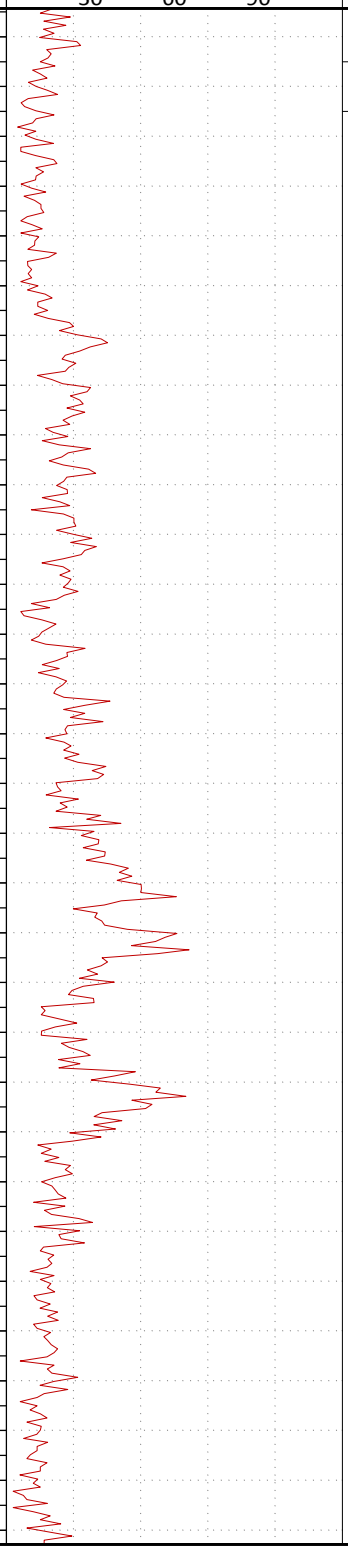
DEPTH (ft)	PID (ppm)	TCE (ug/L)	PCE (ug/L)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION
240		0.85	< 0.50	Magothy	CL		Light yellowish brown (2.5 YR 6/3) lean CLAY with fine Sand, trace coarse sand *(continued)*
242							
244					CL		Brownish yellow (10 YR 6/6) lean CLAY with fine Sand, trace coarse sand
246							
248					CL		Light yellowish brown (10 YR 6/4) lean CLAY with fine Sand
250							
252					SP		Grayish brown (2.5 Y 5/2) poorly graded fine SAND, trace medium Sand, trace clay
254							
256					CL		Black (2.5 Y 2.5/1) lean CLAY with fine Sand
258		< 0.50	< 0.50				
260					CL		Black (2.5 Y 2.5/1) lean CLAY, few fine Sand
262							
264					CL		Dark gray (2.5 Y 4/1) lean CLAY, few fine Sand
266							
268					CL		Very dark gray (2.5 Y 3/1) lean CLAY with fine Sand
270							
272					CL		Light olive brown (2.5 Y 5/4) Sandy lean CLAY
274							
276					SP		Grayish brown (2.5 Y 5/2) poorly graded fine SAND, few medium Sand, trace clay
278							
280		50	0.53		SP		Light brownish gray (2.5 Y 6/2) poorly graded medium SAND, few fine Sand
282							
284					SP		Grayish brown (2.5 Y 5/2) poorly graded fine to medium SAND
286							
288					SP		Light yellowish brown (2.5Y 6/3) poorly graded fine to medium SAND
290							
292							
294							
296							
298							
300							

(Continued Next Page)

Resolution Consultants

Boring Log

BORING #: VPB144



DEPTH (ft)	PID (ppm)	TCE (ug/L)	PCE (ug/L)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION
302				Magothy	SP		Light yellowish brown (2.5Y 6/3) poorly graded fine to medium SAND *(continued)*
304	0				SP		Light yellowish brown (2.5 Y 6/3) poorly graded fine to medium SAND trace Clay, banded structure (0.25" - 2" bands)
306							
308							
310		9.9	< 0.50		SP		Grayish brown (2.5 Y 5/2) poorly graded fine SAND, few medium Sand
312							
314					SP		Grayish brown (2.5 Y 5/2) poorly graded fine SAND, few medium Sand
316							
318							
320		5.2	< 0.50		SP		Light yellowish brown (2.5 Y 6/3) poorly graded fine SAND, few Silt, trace medium sand contains lignite
322							
324					SP		Grayish brown (2.5 Y 5/2) poorly graded fine SAND, trace Silt, trace clay, trace fine subrounded gravel contains lignite
326							
328							
330					ML		Light brownish gray (2.5 Y 6/2) fine Sandy SILT, trace clay, trace coarse subrounded sand
332							
334					ML		Light brownish gray (2.5 Y 6/2) fine Sandy SILT, trace clay, trace coarse subrounded sand
336							
338							
340		6.7	< 0.50		SP-SM		Grayish brown (2.5 Y 5/2) poorly graded fine SAND with Silt, trace medium sand
342							
344					SP-SM		Grayish brown (2.5 Y 5/2) poorly graded fine SAND with Silt, trace medium sand
346							
348							
350					SP		Grayish brown (2.5 Y 5/2) poorly graded fine SAND, trace Silt, trace medium sand
352							
354					SP		Dark grayish brown (2.5 Y 4/2) poorly graded fine SAND, trace Silt, trace medium sand
356							
358							
360					SM		Light yellowish brown (2.5 Y 6/3) Silty fine SAND
362							

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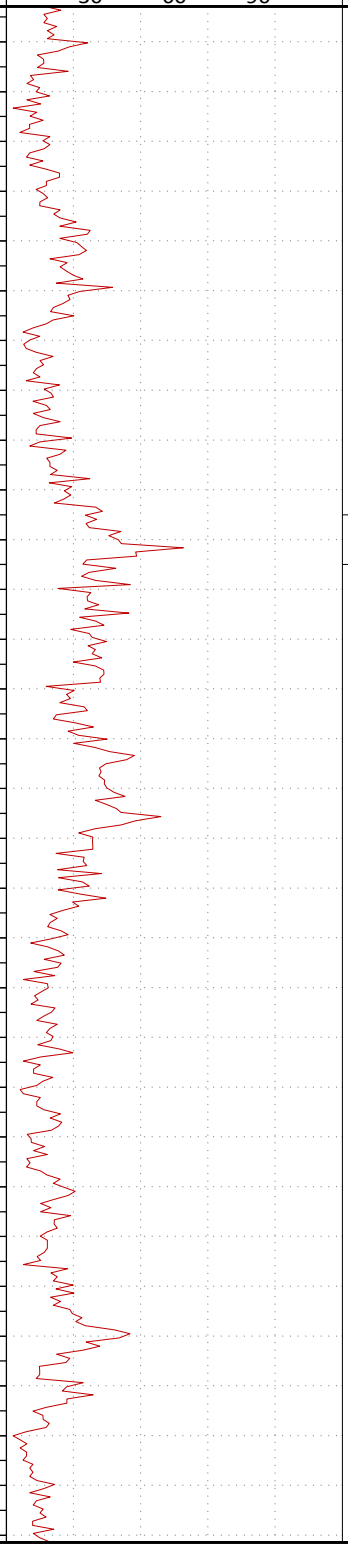
Resolution Consultants

Boring Log

BORING #: VPB144



DEPTH (ft)	PID (ppm)	TCE (ug/L)	PCE (ug/L)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION
364				Magothy			
366		11	< 0.50		SM		Brown (10 YR 5/3) Silty fine SAND, trace Clay, trace coarse subrounded sand
368							
370					SM		Brown (10 YR 5/3) Silty fine SAND, trace Clay, trace coarse subrounded sand
372							
374					SM		Grayish brown (2.5 Y 5/2) Silty fine SAND, trace Clay, trace coarse subrounded sand
376							
378							
380		20	< 0.50		SP		Light yellowish brown (10 YR 6/3) poorly graded fine SAND, trace medium Sand, trace silt
382							
384	0				SP		Gray (2.5 Y 6/1) poorly graded fine SAND, trace Silt
386							
388							
390					SM		Gray (2.5 Y 5/1) Silty fine Sand
392							
394					SP		Grayish brown (2.5 Y 5/2) poorly graded fine SAND, trace medium Sand, trace clay
396							
398							
400					SP		Grayish brown (2.5 Y 5/2) poorly graded fine SAND, trace medium Sand, trace clay
402							
404					SP		Grayish brown (2.5 Y 5/2) poorly graded fine SAND, few medium Sand
406							
408							
410					SP		Grayish brown (2.5 Y 5/2) poorly graded fine SAND, few medium Sand, trace clay
412							
414					SP		Grayish brown (10 YR 5/2) poorly graded fine SAND, trace medium Sand
416							
418							
420					SP		Grayish brown (10 YR 5/2) poorly graded fine SAND, trace medium Sand
422							
424		7.8	< 0.50		SP		

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Resolution Consultants

Boring Log

BORING #: VPB144

DEPTH (ft)	Gamma Ray (30 60 90)	PID (ppm)	TCE (ug/L)	PCE (ug/L)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION
426					Magothy	SP		Grayish brown (2.5 Y 5/2) poorly graded fine SAND, few medium Sand *(continued)*
428								
430						SW		Grayish brown (2.5 Y 5/2) well graded fine to medium SAND, trace coarse Sand
432								
434						SW		Grayish brown (2.5 Y 5/2) well graded fine to coarse subrounded SAND
436								
438								
440			1.9	< 0.50		SW		Grayish brown (2.5 Y 5/2) well graded fine to medium SAND, trace subrounded coarse Sand
442								
444						SW		Grayish brown (2.5 Y 5/2) well graded fine to coarse subrounded SAND, few Clay
446								
448								
450						CL		Dark gray (5 Y 4/1) lean CLAY, few fine Sand
452								
454						CL		Gray (2.5 Y 5/1) lean CLAY with fine to medium Sand, trace coarse subangular sand
456								
458								
460			150	0.80		SW		Grayish brown (2.5 Y 5/2) well graded fine to coarse subangular SAND, trace Clay, trace iron deposits
462								
464						SW		Grayish brown (2.5 Y 5/2) well graded medium to coarse subangular SAND, few fine Sand, trace clay, trace iron deposits
466								
468								
470						SW		Grayish brown (2.5 Y 5/2) well graded coarse subangular SAND, few fine Sand, few medium sand
472								
474						SW		Grayish brown (2.5 Y 5/2) well graded coarse subangular SAND, few fine Sand, trace medium sand, trace fine subrounded gravel
476								
478								
480			1200	5.7		SW		Grayish brown (2.5 Y 5/2) well graded coarse subangular SAND, few fine Sand, trace medium sand, trace fine subrounded gravel, trace iron deposits
482								
484						SW		Grayish brown (2.5 Y 5/2) well graded coarse subangular SAND, few fine Sand, trace medium sand, trace fine subrounded gravel, trace iron deposits
486								

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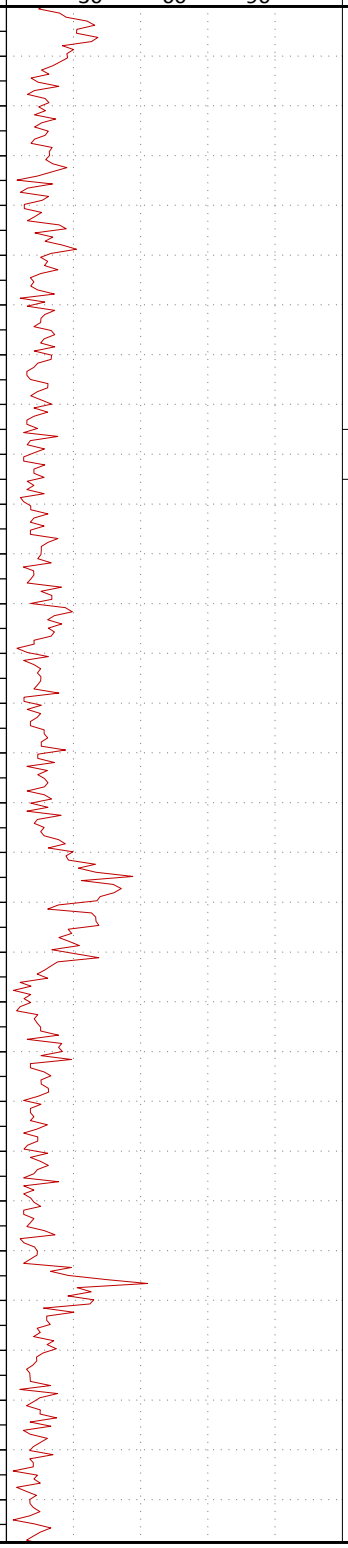
Boring Log

BORING #: VPB144



DEPTH (ft)	PID (ppm)	TCE (ug/L)	PCE (ug/L)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION
486				Magothy	SW		
488							
490					SW		Grayish brown (2.5 Y 5/2) well graded fine to coarse subangular SAND, trace fine subangular Gravel, trace iron deposits
492							
494					SW		Light brownish gray (2.5 Y 6/2) well graded coarse subangular SAND, few fine Sand, trace coarse sand, trace fine subangular gravel, trace iron deposits
496							
498							
500		7600	52		SW		Light brownish gray (2.5 Y 6/2) well graded fine to coarse subangular SAND, trace fine subangular Gravel
502							
504	7.1				SP		Light brownish gray (2.5 Y 6/2) poorly graded fine SAND, trace medium Sand
506							
508							
510					SW		Grayish brown (2.5 Y 5/2) well graded fine to coarse subangular SAND
512							
514					SW		Grayish brown (2.5 Y 5/2) well graded coarse subangular SAND, few medium Sand, few fine sand, trace fine subangular gravel
516							
518							
520		200	420		SW		Grayish brown (2.5 Y 5/2) well graded fine to coarse subangular SAND, trace fine subangular Gravel, trace clay, trace iron deposits
522							
524					SW		Grayish brown (10 YR 5/2) well graded fine to medium SAND, few coarse subangular Sand, trace clay, trace iron deposits
526							
528							
530					SW-SC		Grayish brown (2.5 Y 5/2) well graded fine to medium SAND with Clay, trace coarse subangular Sand
532							
534					CL		Light gray (5 Y 7/1) lean CLAY, few fine to medium Sand
536							
538							
540		22	28		SW-SC		Grayish brown (2.5 Y 5/2) well graded fine to medium SAND with Clay, few coarse subangular Sand
542							
544					SW		Grayish brown (2.5 Y 5/2) well graded fine to medium SAND, few coarse subrounded Sand, trace clay
546							

(Continued Next Page)

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Boring Log

BORING #: VPB144

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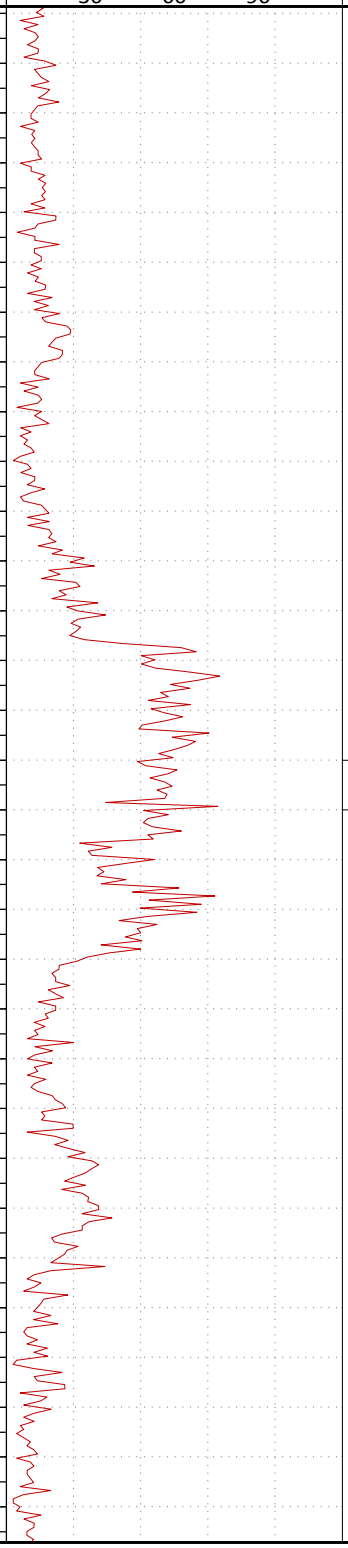

DEPTH (ft)	PID (ppm)	TCE (ug/L)	PCE (ug/L)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION
548				Magothy			
550					SW		Grayish brown (2.5 Y 5/2) well graded fine to medium SAND, few coarse subrounded Sand
552							
554					SW		Grayish brown (2.5 Y 5/2) well graded fine to medium SAND, few coarse subrounded Sand
556							
558					SW		Grayish brown (2.5 Y 5/2) well graded fine to coarse subangular SAND, trace subangular Gravel
560							
562					SW		Grayish brown (2.5 Y 5/2) well graded fine to coarse subangular SAND, trace Clay
564							
566					CH		Gray (2.5 Y 5/1) fat CLAY with fine to medium Sand
568							
570		1.1	0.69		CH		Gray (2.5 Y 5/1) fat CLAY, trace fine to medium Sand
572							
574					CH		Gray (Gley 1 5/N) fat CLAY, trace fine Sand. Laminated Varve
576							
578	0				CH		Gray (2.5 Y 5/1) Sandy fat CLAY
580							
582					SC		Gray (2.5 Y 5/1) Clayey fine to coarse subangular SAND
584							
586					SW		White (2.5 Y 8/1) well graded fine to coarse subangular SAND with fine subangular Gravel, trace clay
588							
590					SW		White (2.5 Y 8/1) well graded fine to coarse subangular SAND with fine subangular Gravel, trace clay
592							
594					SW		White (10 YR 8/1) well graded fine to coarse subangular SAND with fine subangular Gravel
596							
598					SW		
600		0.90	1.2				
602							
604							
606							
608							

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Boring Log

BORING #: VPB144

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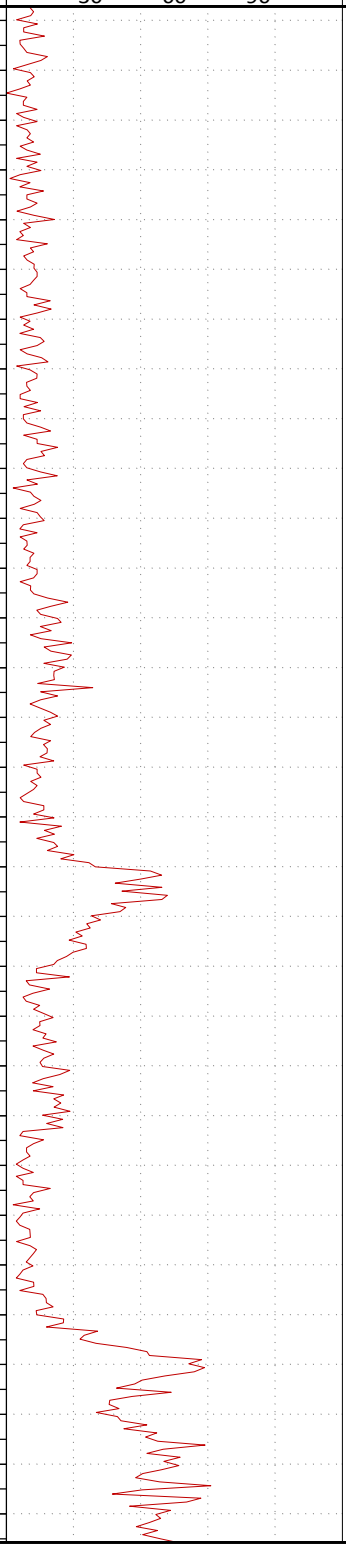

DEPTH (ft)	PID (ppm)	TCE (ug/L)	PCE (ug/L)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION
610				Magothy			
612					SW		Very pale brown (10 YR 8/2) well graded medium to coarse subangular SAND with fine subangular Gravel, trace fine sand *(continued)*
614					SW		Very pale brown (10 YR 8/2) well graded medium to coarse subangular SAND with fine subangular Gravel, trace fine sand, trace clay
616							
618							
620		< 0.50	< 0.50		GW		Very pale brown (10 YR 8/4) well graded fine subangular GRAVEL with medium to coarse subangular Sand, trace fine sand
622							
624					GW		Very pale brown (10 YR 8/4) well graded fine subangular GRAVEL with medium to coarse subangular Sand, trace fine sand, contains lignite
626							
628							
630					GW		Very pale brown (10 YR 8/3) well graded fine subangular GRAVEL with medium to coarse subangular Sand, trace fine sand, trace clay contains lignite
632							
634					SW		Very pale brown (10 YR 8/2) well graded medium to coarse subangular SAND with fine subangular Gravel, trace fine sand, contains lignite
636							
638							
640					GW		White (7.5 YR 8/1) well graded fine subangular GRAVEL with medium to coarse subangular Sand, trace fine sand, trace clay
642							
644		< 5.0	< 5.0		CH		Light gray (10 YR 7/1) fat CLAY with fine subrounded Gravel, few coarse subrounded sand, trace medium sand
646							
648							
650					CH		White (7.5 YR 8/1) Gravelly fat CLAY with coarse subrounded Sand, few medium sand
652							
654					SC		Light gray (10 YR 7/1) Clayey coarse subrounded SAND with fine subrounded Gravel, few medium sand
656							
658							
660		< 3.0	< 3.0		GW		Pale orange yellow (10 YR 9.5/2) well graded fine subrounded GRAVEL with coarse subrounded Sand, few medium sand, trace fine sand, trace clay
662							
664					CL		White (2.5 Y 8/1) lean CLAY with fine Sand, trace medium sand, trace coarse subangular sand
666							
668							
670					CH		Red (2.5 YR 5/8) fat CLAY, few fine Sand

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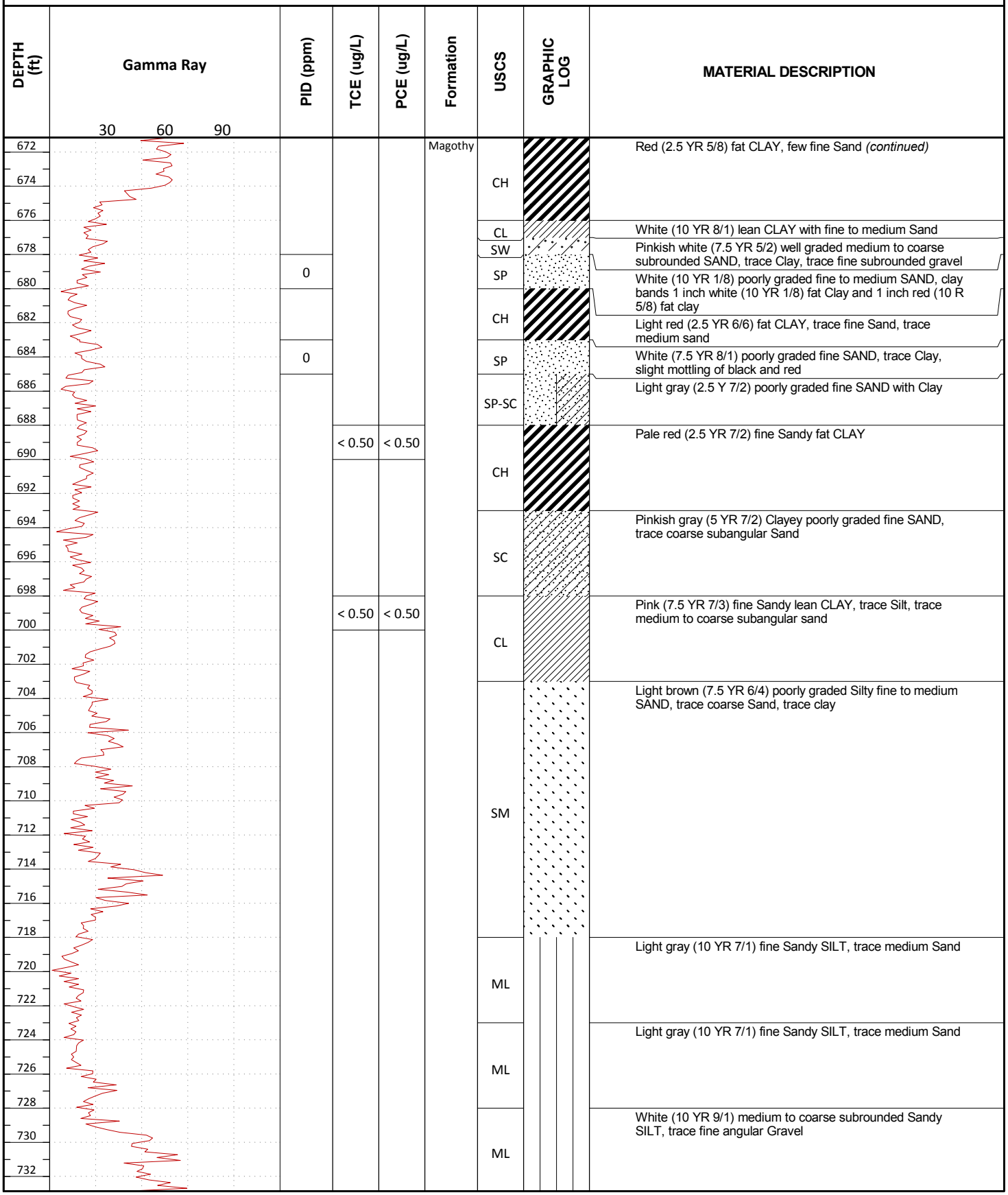
Boring Log

BORING #: VPB144

Sheet 12 of 15



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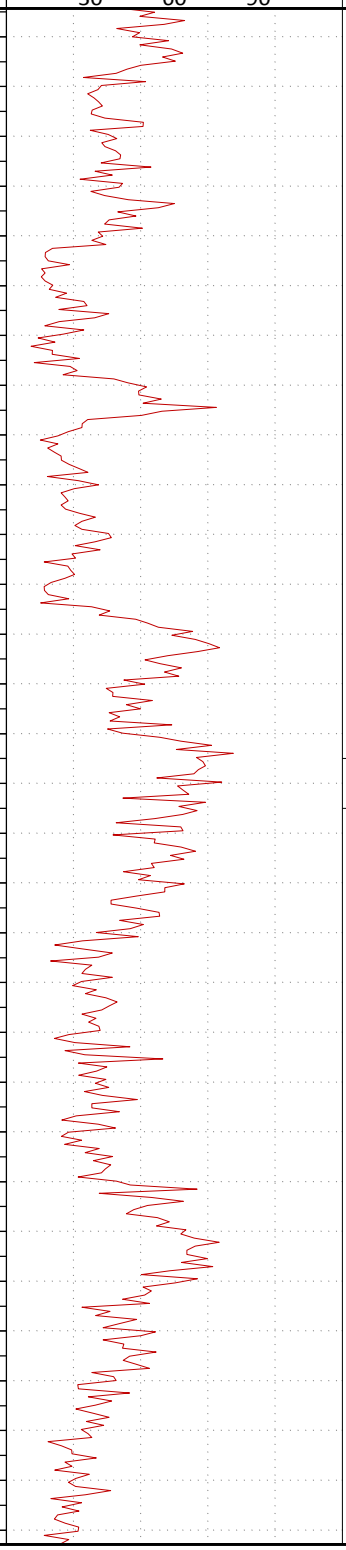
Boring Log

BORING #: VPB144



DEPTH (ft)	PID (ppm)	TCE (ug/L)	PCE (ug/L)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION
734				Magothy	ML		White (10 YR 9/1) SILT with fine to medium Sand, trace subrounded coarse sand
736							
738							
740		< 0.50	< 0.50		ML		White (10 YR 9/1) fine to medium Sandy SILT, trace Clay
742							
744					ML		Light gray (7.5 YR 7/1) SILT with fine to medium Sand, few clay
746							
748							
750					ML		Light gray (5 YR 7/1) fine to medium Sandy SILT, few Clay
752							
754					ML		Gray (GLEY 1 6/N) SILT, few Clay, few fine sand
756							
758							
760		< 0.50	< 0.50		ML		Gray (GLEY 1 5/N) SILT, few fine Sand, trace clay
762							
764	0				ML		Dark gray (GLEY 1 4/N) SILT, few fine Sand
766					ML		Dark gray (GLEY 1 4/N) SILT, few fine Sand
768							
770					ML		Gray (GLEY 1 5/N) SILT, few fine Sand, trace clay
772							
774					ML		Gray (GLEY 1 6/N) SILT, trace fine Sand, trace clay
776							
778							
780					ML		Gray (GLEY 1 6/N) SILT, trace fine Sand, trace clay
782							
784					ML		Gray (GLEY 1 5/N) SILT, few fine Sand, trace clay
786							
788							
790					ML		Dark gray (GLEY 1 4/N) SILT with fine Sand, trace clay
792							
794					ML		Gray (2.5 Y 5/1) fine to medium Sandy SILT, trace Clay

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Boring Log

BORING #: VPB144

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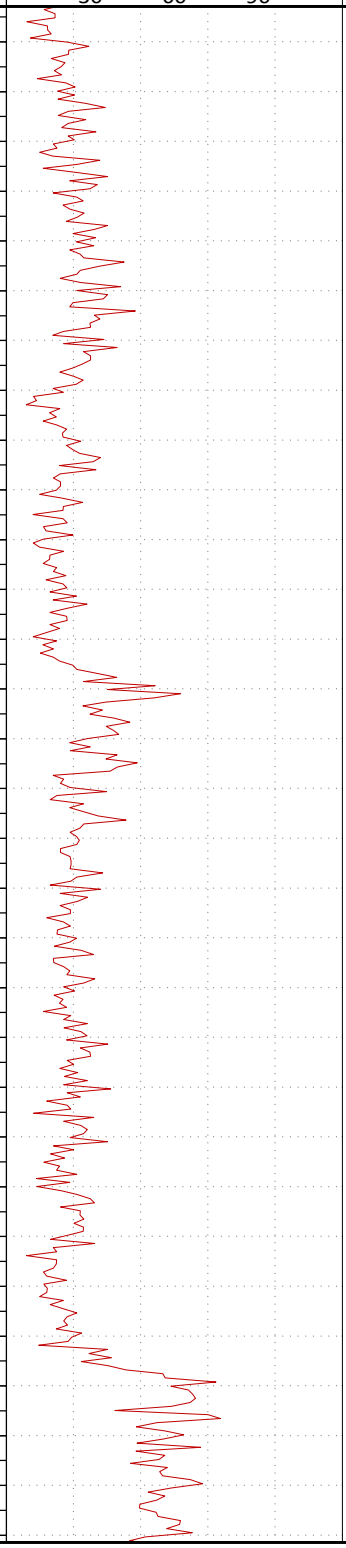

DEPTH (ft)	PID (ppm)	TCE (ug/L)	PCE (ug/L)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION
796				Magothy	ML		Gray (2.5 Y 5/1) fine to medium Sandy SILT, trace Clay *(continued)*
798							
800		< 0.50	< 0.50		CL		Gray (2.5 Y 5/1) lean CLAY with fine to medium Sand
802							
804					CL		Gray (2.5 Y 5/1) fine to medium Sandy lean CLAY
806							
808							
810					SC		Gray (2.5 Y 6/1) Clayey fine to coarse subrounded SAND
812							
814							Gray (2.5 Y 6/1) well graded fine to coarse subrounded SAND with Clay, trace subrounded fine Gravel, contains lignite
816					SW-SC		
818							
820		< 0.50	< 0.50				Gray (2.5 Y 5/1) well graded fine to coarse subrounded SAND with Silt, trace fine subrounded gravel, contains lignite
822					SW-SM		
824							Gray (GLEY 1 5/N) Silty well graded fine to coarse subrounded SAND, trace fine subrounded Gravel, contains lignite
826					SM		
828							
830							Gray (2.5 Y 5/1) well graded medium to coarse subrounded SAND with Silt, trace fine sand, trace fine subrounded gravel, contains lignite
832					SW-SM		
834							Gray (2.5 Y 5/1) well graded medium to coarse subrounded SAND with Silt, trace fine sand, trace fine subrounded gravel, contains lignite
836					SW-SM		
838							
840		< 0.50	< 0.50		ML		Dark gray (GLEY 1 4/N) medium Sandy SILT, few fine sand, trace clay, trace coarse sand, contains lignite
842							
844					ML		Dark gray (GLEY 1 4/N) medium Sandy SILT, few fine sand, trace clay, trace coarse sand, contains lignite
846							
848							
850					ML		Dark gray (GLEY 1 4/N) fine to coarse subrounded Sandy SILT, few clay, contains lignite
852				Raritan Clay			
854					ML		Dark gray (GLEY 1 4/N) fine to medium Sandy SILT, few clay, trace coarse subrounded sand, contains lignite.
856							

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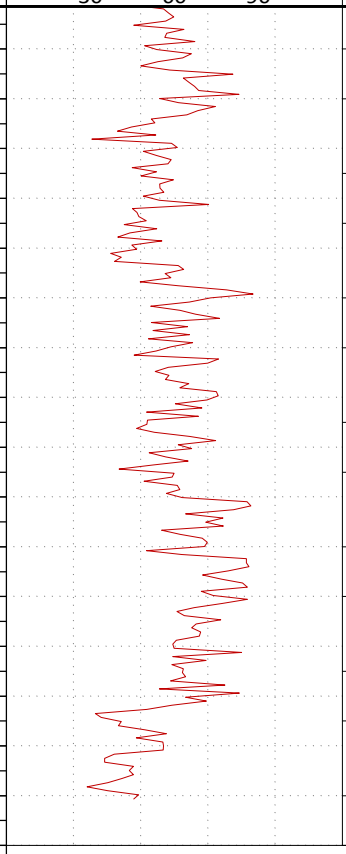
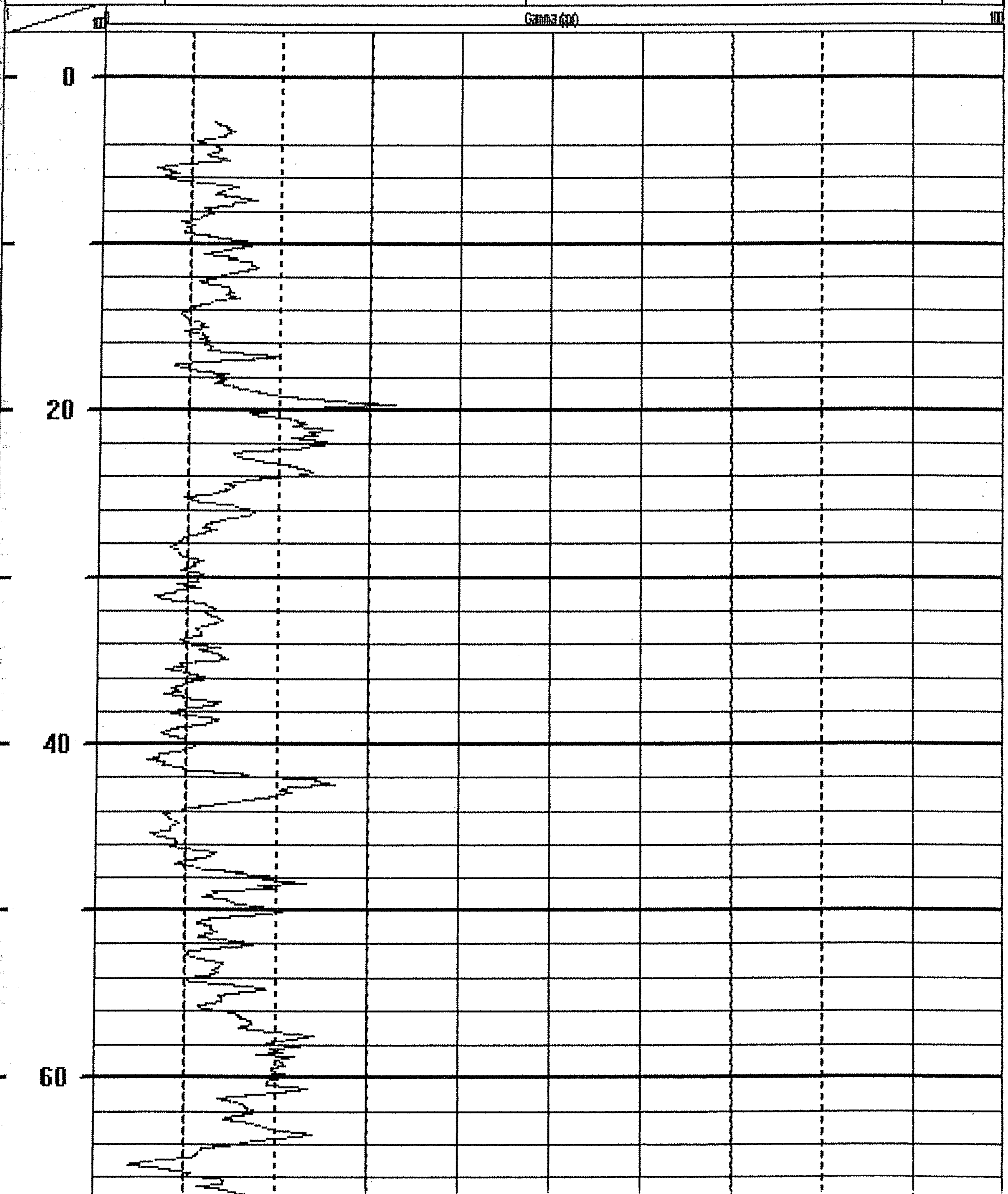
Boring Log

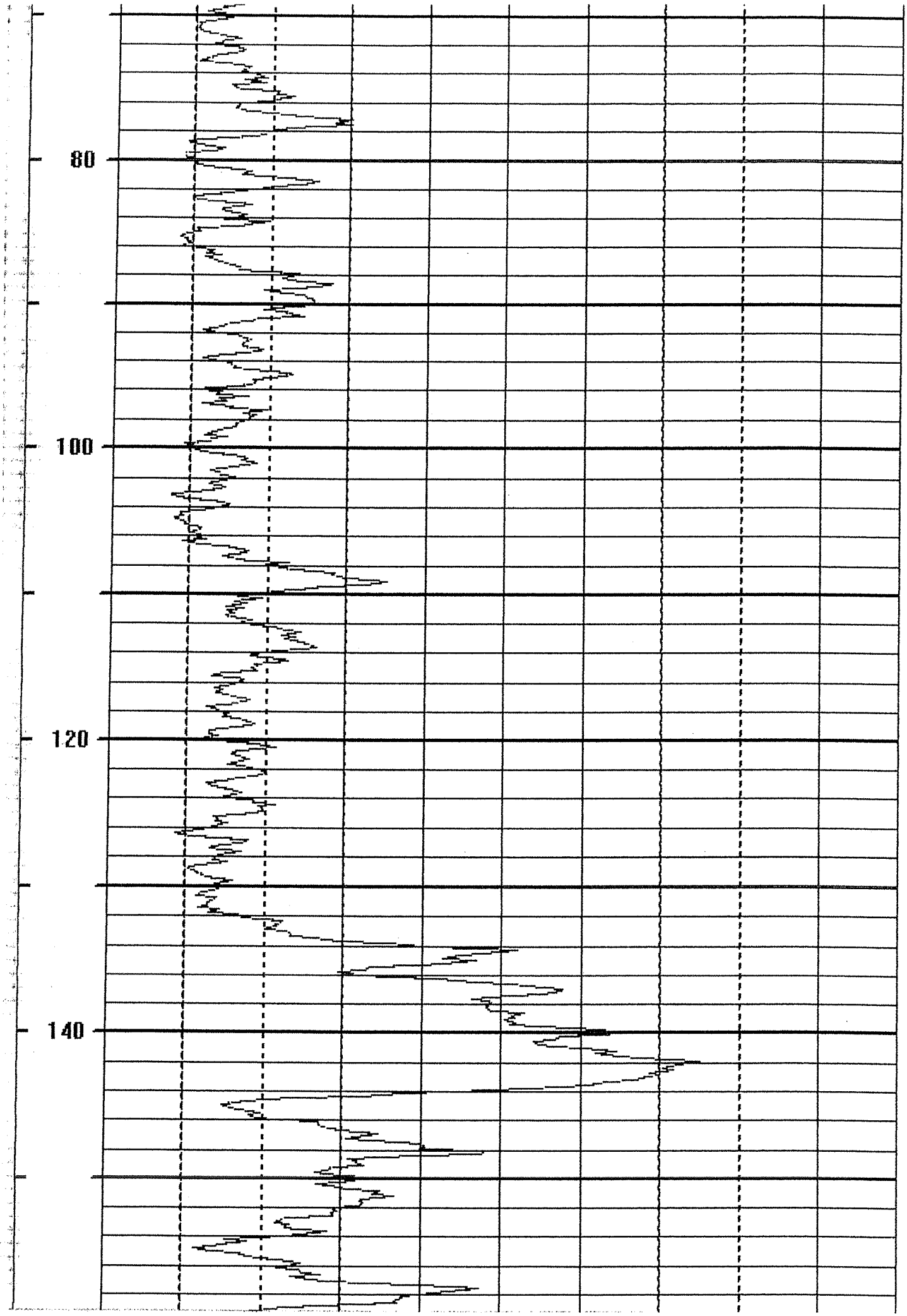
BORING #: VPB144



DEPTH (ft)	PID (ppm)	TCE (ug/L)	PCE (ug/L)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION
858				Raritan Clay	ML		
860	0.2				CL		Very dark gray (GLEY 1 3/N) lean CLAY with fine Sand, trace medium sand, interbedded clay and sand layers, trace lignite
862					CL		Dark gray (GLEY 1 4/N) fine to medium Sandy lean CLAY, contains lignite
864	0.1				CH		Dark gray (GLEY 1 4/N) fat CLAY, trace lignite
866					CH		Dark gray (GLEY 1 4/N) fat CLAY, trace lignite
868							
870	0.1				CH		Red (7.5 R 4/6) fat CLAY. Red and white (10 YR 8/1) mottling
872					CH		Red (7.5 R 4/6) fat CLAY. Red and white (10 YR 8/1) mottling
874	0				SC		White (White N/8) Clayey fine SAND
876					CH		Red (7.5 R 5/8) fat CLAY with fine Sand
878							
880	0				CL		Gray (GLEY 1 5/N) lean CLAY
882					CL		Gray (GLEY 1 5/N) and red (7.5 R 5/8) lean CLAY
884	0.1				CL		Gray (GLEY 1 5/N) and olive (5 Y 5/3) lean CLAY, mottled
886					CH		Red (7.5 R 5/8) and gray (GLEY 1 5/N) fat CLAY
888							
890	0				CH		Red (7.5 R 5/6) white (white N/8.5) and olive (5 Y 5/4) fat CLAY, mottled
							End of boring at 890.0 ft. bgs.

	COMPANY: DELTA WELL & PUMP CO., INC.				Casing
	Location: NWIRP BETHPAGE				
Well	VBP-144		Depth Driller		
			Depth Logger		
Date	01/15/14	BH Fluid	Logged by: CMC		
File Name	729		Witness: MIKE		

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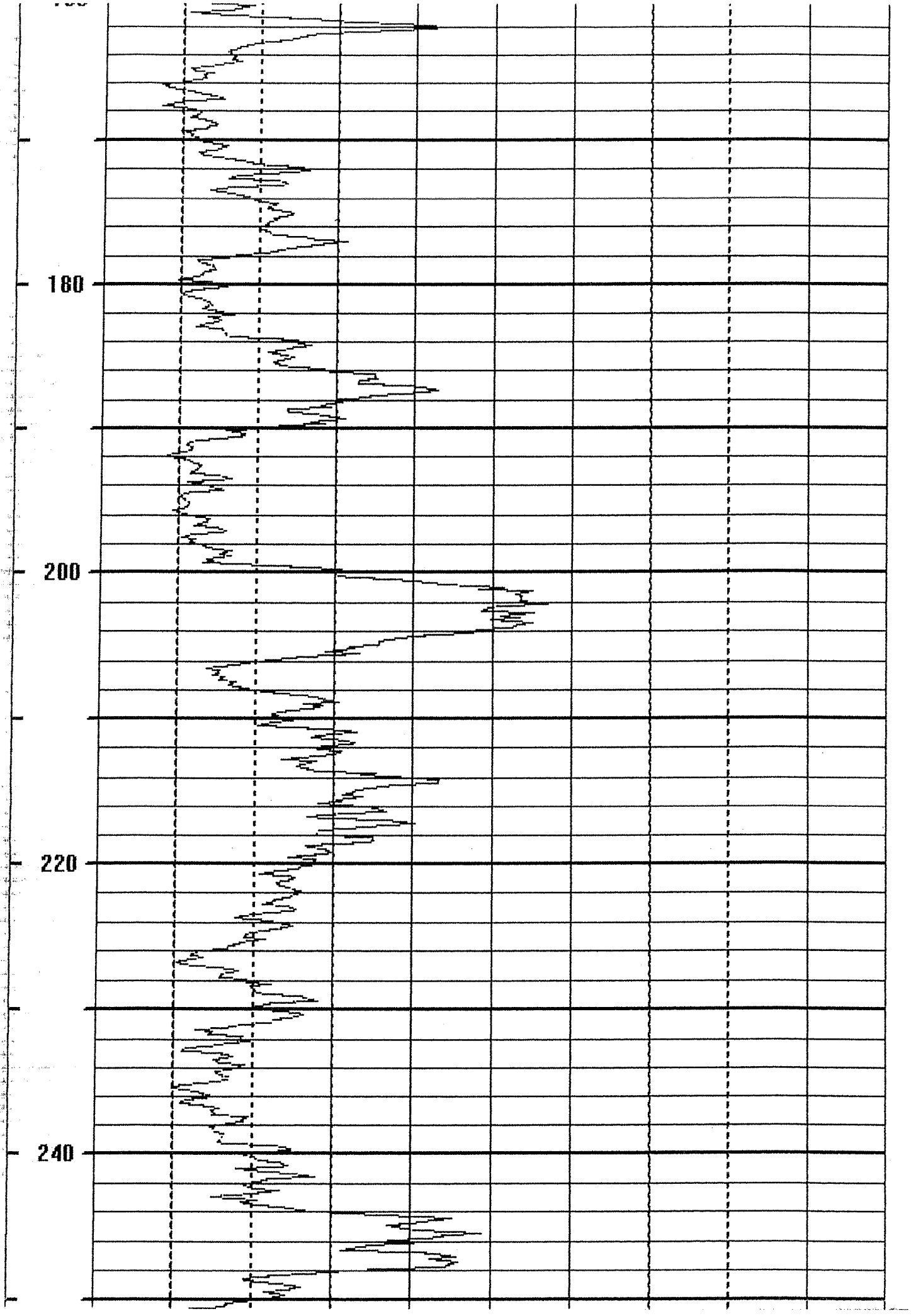
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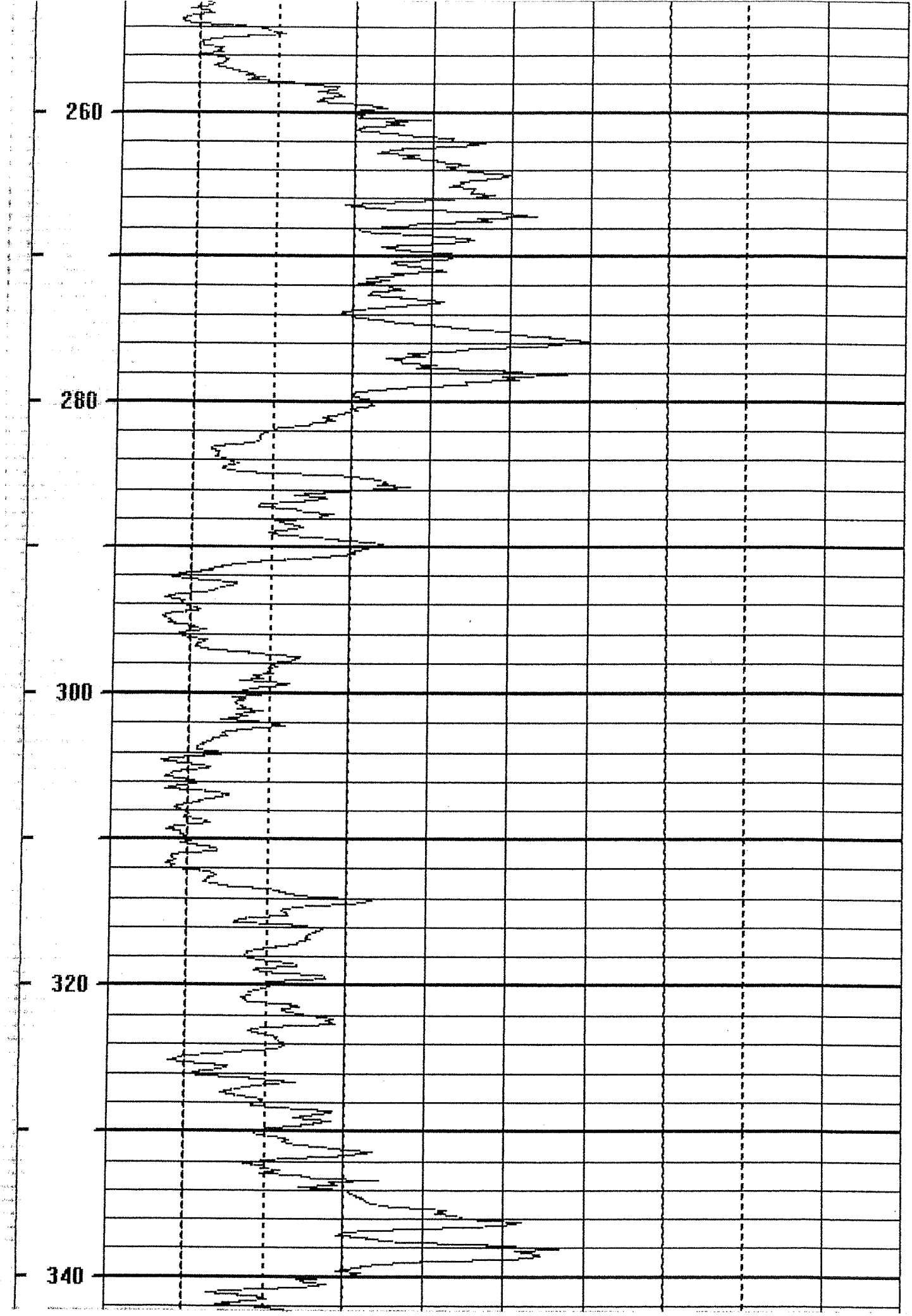
240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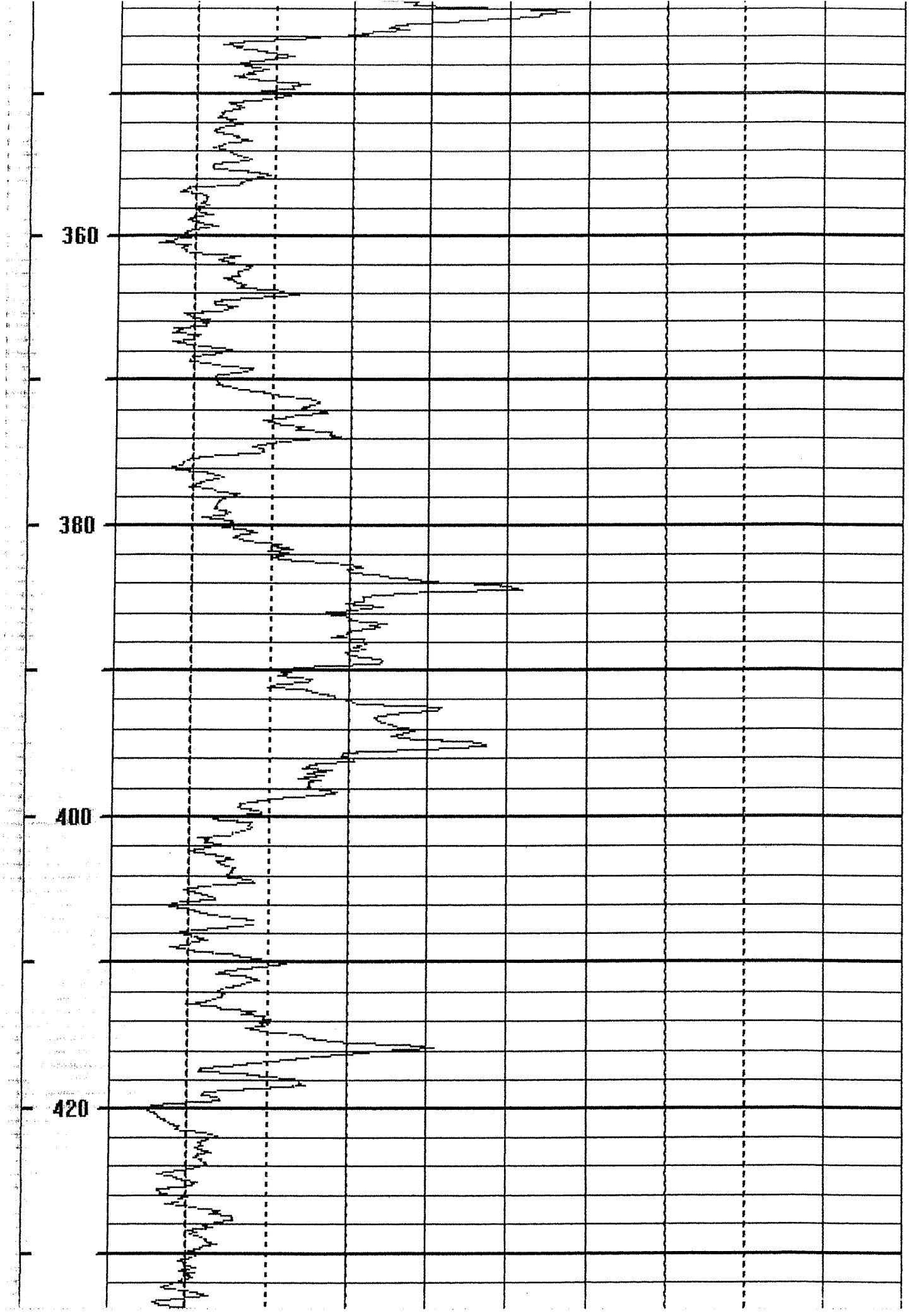
320
340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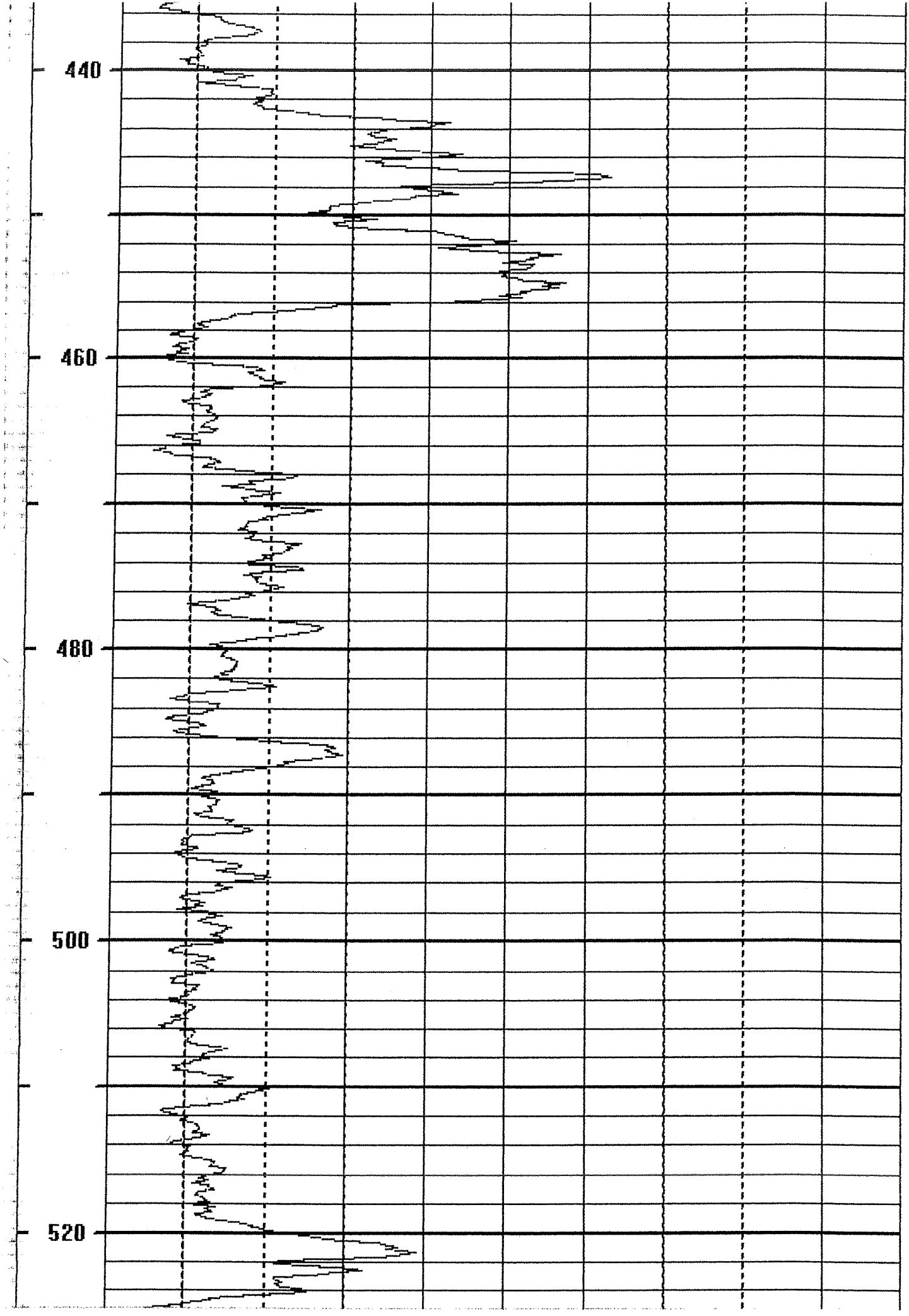
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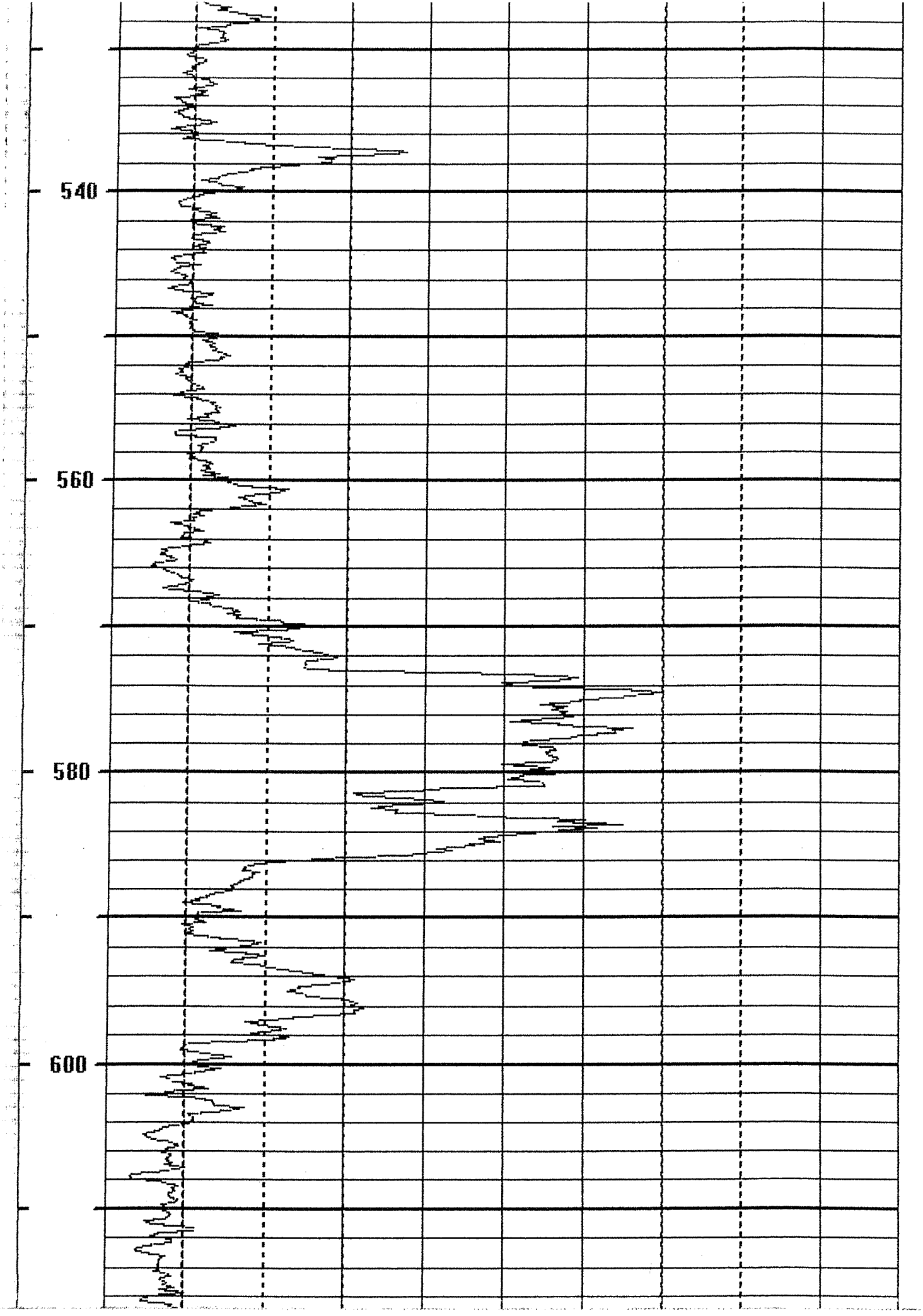
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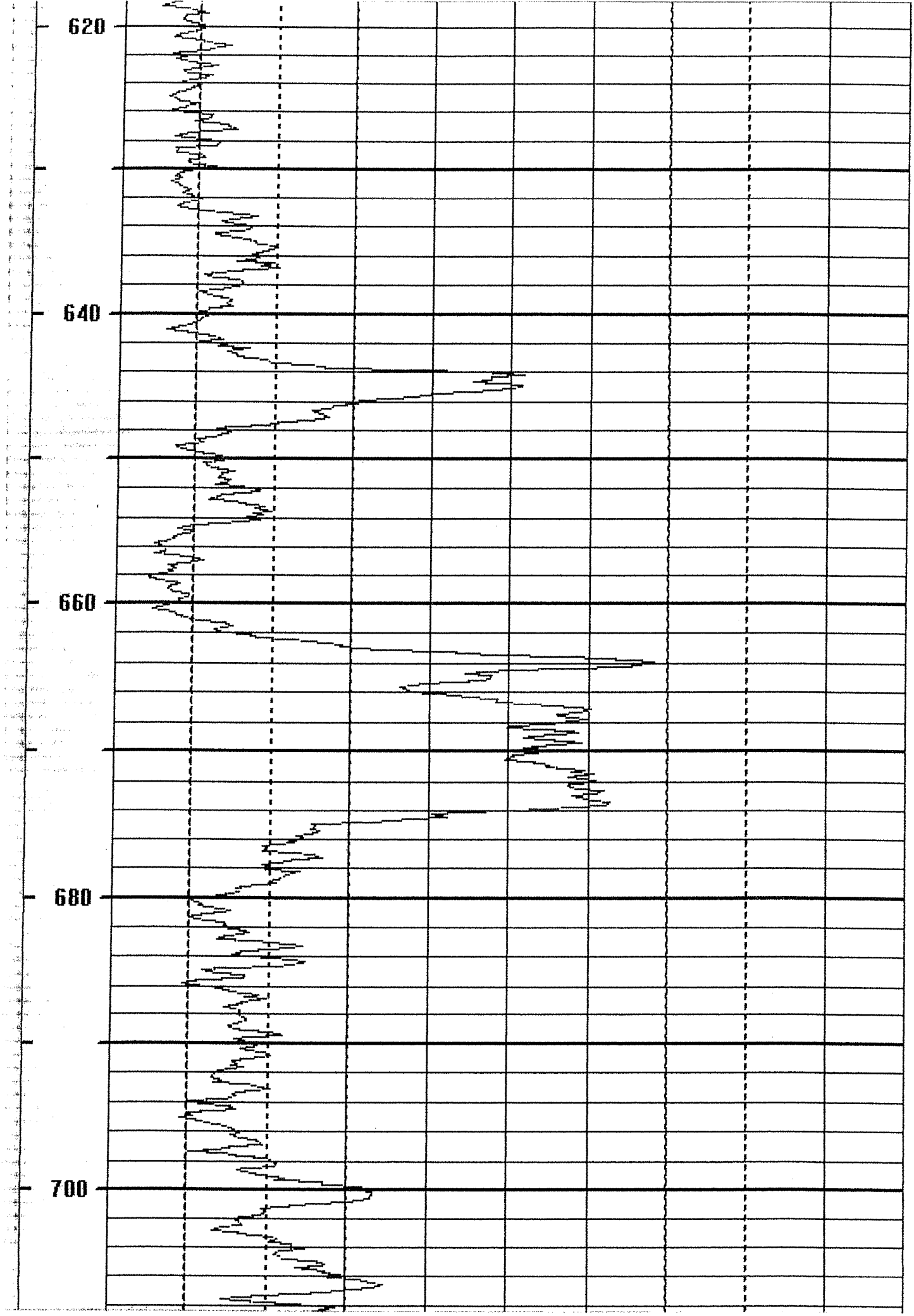
580
600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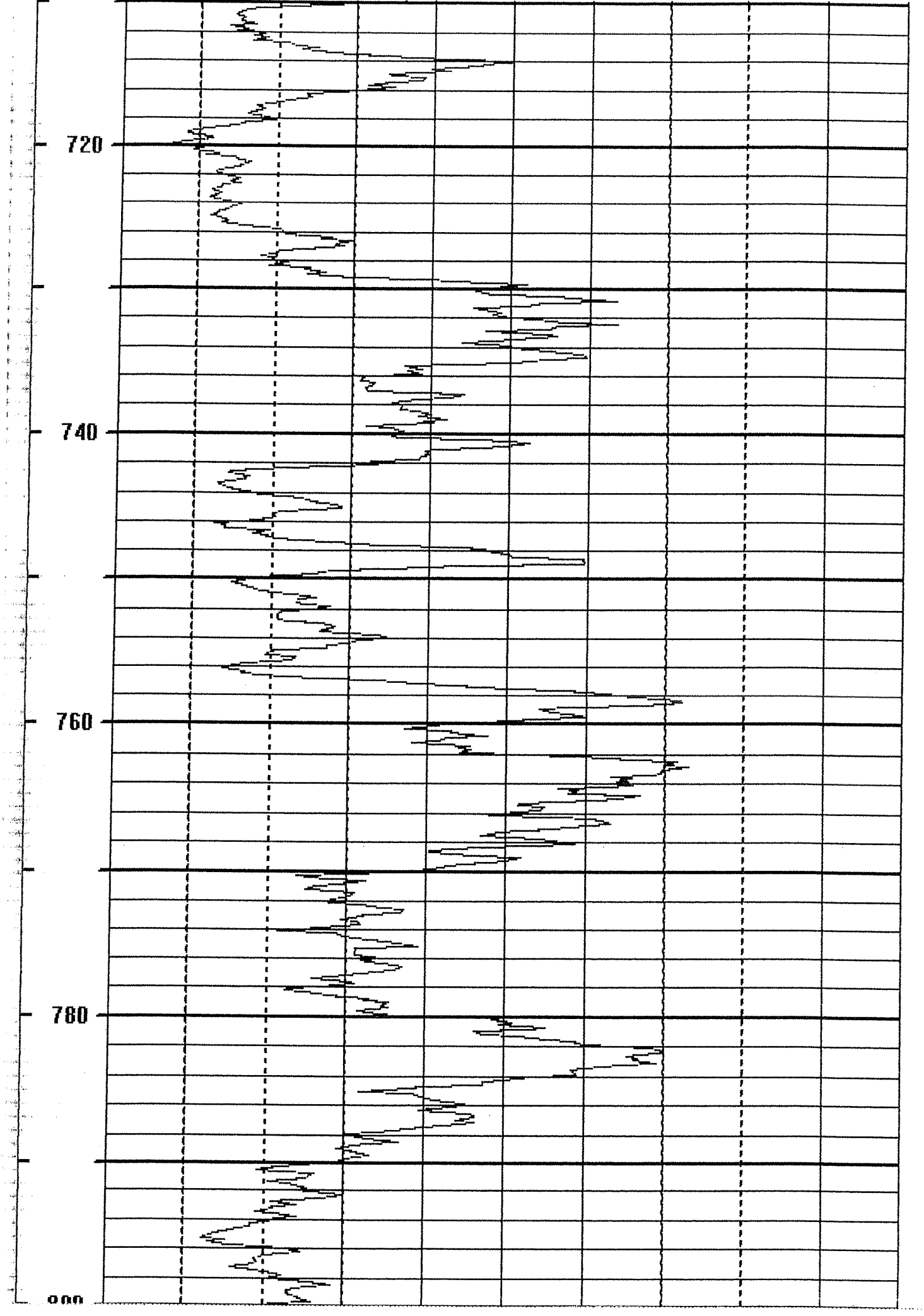
640
660
680
700


720
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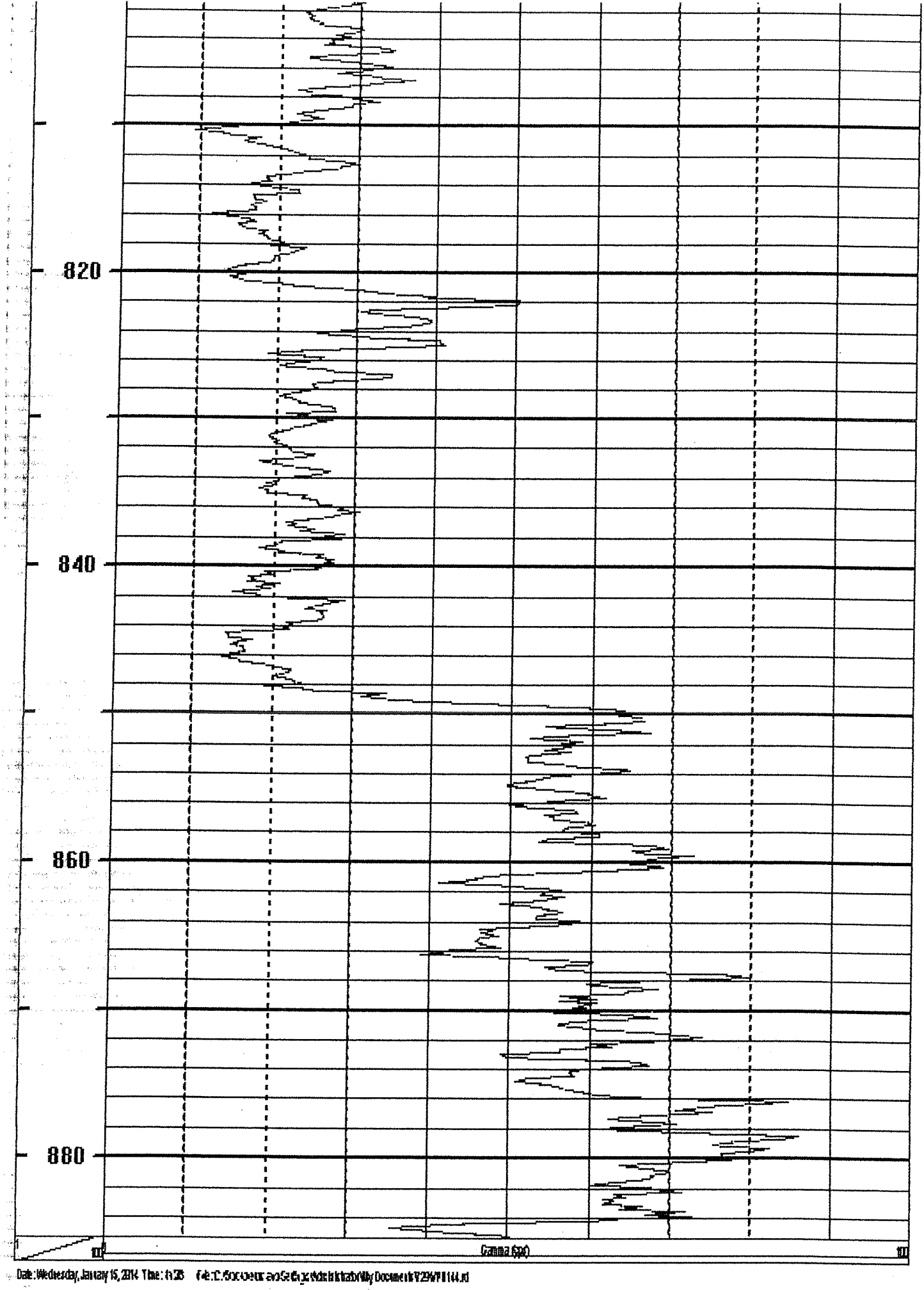
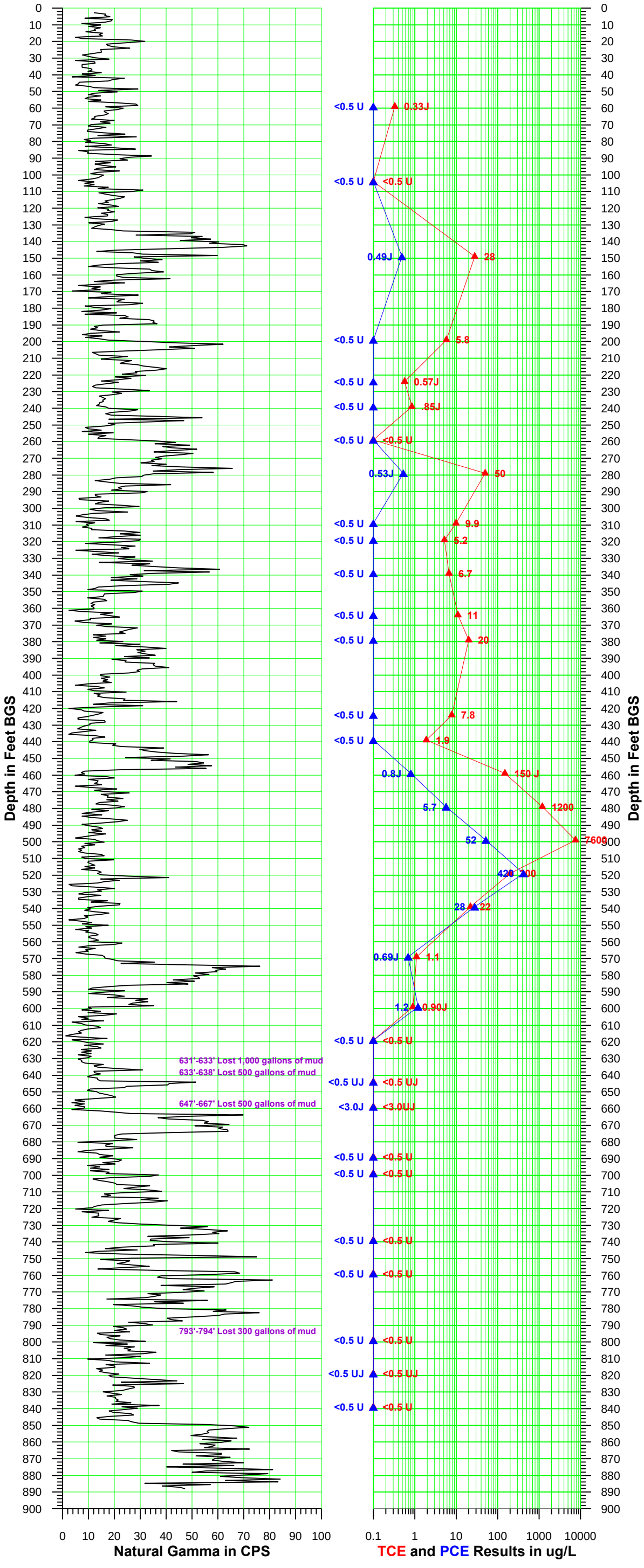
760
780


820
840
860
880
Gamma (cps)

Section 2

VPB 144 Gamma and PCE/TCE Plot

Vertical Profile Boring VPB-144
Downward Run - January 14, 2014
Validated Analytical Data



Section 3

VPB 144 Groundwater Sample Log Sheets

Hydropunch Sample

Client: Navy
Project No: 60265526
Site Location: NWIRP Bethpage
Weather Conds:

Date : 12-5-13
VPB: VPB-144
Collector(s): MZ

Sample Date	Time	Temp	pH	Spec. Cond. (µS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Starting depth(ft)	Ending depth(ft)	Color
12-5-13	1130	14.11	7.45	219	6.37	28.4	1060	58	60	yellow-brown
12-5-13	1430	14.17	7.23	208	6.49	6.0	746.2	103	105	yellow-brown
12-6-13	1030	12.48	7.08	145	9.19	25.2	677.0	148	150	yellow-brown
12-6-13 (DUP/MS/MSD*)	1315	9.58	6.55	126	7.31	43.0	>1,100	198	200	yellow-brown
12-9-13	1040	8.64	6.92	308	10.86	75.0	396.4	223	225	light brown
12-9-13	1235	9.35	6.39	211	10.27	56.7	318.7	238	240	light brown
12-9-13	1430	9.16	6.77	221	14.70	106.2	>1,100	258	260	light gray
12-10-13	1100	8.11	7.05	201	11.17	32.7	>1,100	278	280	brown
12-10-13	1305	* No	sample - hydropunch			did not	open *	298	300	—
12-11-13	1020	7.65	6.91	230	11.16	48.8	297.2	303	310	cloudy
12-11-13	1230	9.00	6.75	231	12.51	57.3	877.6	318	320	brown
12-11-13	1445	8.91	6.56	352	7.96	-1.9	248.7	338	340	cloudy
12-12-13	1110	* No	sample - hydropunch		malfunction		*	358	360	—
12-12-13	1310	8.36	6.91	434	7.44	29.5	233.6	363	365	cloudy
12-12-13	1535	8.44	6.45	326	8.72	40.1	160.1	378	380	cloudy
12-13-13	1125	8.72	6.53	301	11.66	53.1	398.6	398	400	cloudy
12-16-13	1120	8.96	6.54	373	7.98	-38.1	434.1	423	425	cloudy
12-16-13	1325	8.82	6.69	363	5.62	-54.3	>1,100	438	440	brown
12-17-13	1050	11.26	6.75	237	12.64	58.3	>1,100	458	460	~~clear~~ brown
12-17-13	1255	8.76	6.96	191	12.61	-19.2	596.1	478	480	cloudy
12-18-13	1045	9.40	6.95	383	11.07	39.7	>1,100	498	500	brown
12-18-13	1430	8.69	6.44	362	10.56	24.3	293.1	528	600	cloudy

Hydropunch Sample

Client: Navy
Project No: 60265526
Site Location: ~~VPB144~~ NWIRP Bethpage
Weather Conds:

Date : 12-19-13
VPB: VPB144
Collector(s): Mike Zobel

Sample Date	Time	Temp (°C)	pH	Spec. Cond. (µS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Starting depth(ft)	Ending depth(ft)	Color
12-19-13	1025	10.49	7.13	189	15.49	56.2	278.2	538	540	cloudy
12-20-13	1125	12.28	6.18	104	11.36	-60.7	>1,100	568	570	orange/brown
12-23-13	1210	14.16	7.28	149	12.08	10.6	365.2	598	600	Cloudy
12-26-13	1130	8.22	7.59	114	9.38	103.9	>1,100	618	620	brown
12-27-13	0940	8.63	7.41	135	10.12	87.3	>1,100	643	645	brown
12-27-13	1210	8.91	7.39	128	10.53	64.1	>1,100	658	660	brown
12-30-13	1430	7.98	7.14	107	N/A	98.6	>1,100	688	690	brown *DO sensor not working
12-31-13	1030	2.26	7.99	282	10.41	73.3	848.6	698	700	brown
1-8-14	1525	8.43	7.84	214	10.13	81.2	>1,100	738	740	brown
1-9-14	1120	8.92	7.76	189	10.47	78.4	>1,100	758	760	Brown
1-10-14 ~~1-9-14~~	1020	9.54	7.01	161	10.10	42.3	>1,100	778	780	Brown *did not send to lab.
1-10-14	1300	9.96	6.77	166	8.93	22.4	>1,100	798	800	Brown Bubbles formed over the weekend
10-13-14	1025	13.31	7.81	487	3.76	-63.9	>1,100	818	820	Brown
10-13-14	1305	13.44	6.81	56	10.66	27.2	572.0	838	840	brown

Section 4

VPB 144 Analytical Data Validation

- Analytical Data Sheets
- Chain of Custody Records
- Validation Letter and Table

AECOM
250 Apollo Drive
Chelmsford, MA 01886-3140

978.905.2100 tel
978.905.2101 fax

Data Validation Report

Project:	Regional Groundwater Investigation - NWIRP Bethpage
Laboratory:	Katahdin Analytical
Service Request:	G0006
Analyses/Method:	EPA SW-846 Method 8260B for VOCs (GC/MS) and Standard Method 5310 for Total Organic Carbon by High-Temperature Combustion
Validation Level:	Limited
AECOM Project Number:	60266526.SA.DV
Prepared by:	Sheena Blair/AECOM — Completed on: 01/23/2014
Reviewed by:	Lori Herberich/AECOM — File Name: G0006_5310B and 8260B

SUMMARY

The samples listed below were collected by Resolution Consultants from the Regional Groundwater Investigation - NWIRP Bethpage site on December 17, 18, and 19, 2013.

Sample ID	Matrix/Sample Type	Analysis
VPB144-WATER-EB-121913	Equipment blank	SW-846 Method 8260B SM5310B
VPB144-GWD-121713	Groundwater (FD of VPB144-GW-121713-458-460)	SW-846 Method 8260B
VPB144-GW-121713-458-460	Ground water	SW-846 Method 8260B
VPB144-GW-121713-478-480	Ground water	SW-846 Method 8260B
VPB144-GW-121813-498-500	Ground water	SW-846 Method 8260B
VPB144-GW-121813-518-520	Ground water	SW-846 Method 8260B
VPB144-GW-121913-538-540	Ground water	SW-846 Method 8260B
VPB144-TRIP BLANK-121913	Trip Blank	SW-846 Method 8260B

The samples were analyzed in accordance with:

- *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW846,* Method 8260B, *Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry* (USEPA, 1996).
- Standard Methods for the Examination of Water and Wastewater, Method SM310B, *Total Organic Carbon by High-Temperature Combustion*

Data validation activities were conducted with reference to these methods, *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (June 2008), *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (January 2010), and Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.2 (DoD, October 2010) where applicable. In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

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

✓	Data completeness (chain-of-custody (COC))/sample integrity
✓	Holding times and sample preservation
✓	GC/MS performance checks
✗	Initial calibration/continuing calibration verification
✗	Laboratory blanks/trip blanks/equipment blanks
✓	Surrogate spike recoveries
✗	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
✓	Field duplicates
✓	Internal standards
✓	Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. Selected data points were estimated or negated, due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

Data Completeness

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Due to limitations in the reporting system, the laboratory omitted the "VPB-144-" prefix from the sample ID in the report. The submitted EDD file reflects the full sample ID.

Holding Times/Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria.

The QC acceptance criteria were met.

GC/MS Performance Checks

The data were reviewed to ensure that the 4-bromofluorobenzene (BFB) tuning was performed at the correct frequency and that the method acceptance criteria were met. All samples were analyzed within 12 hours of the BFB tunes.

The QC acceptance criteria were met.

Initial Calibration/Continuing Calibration Verification

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

- the initial calibration (ICAL) percent relative standard deviation (%RSD), correlation coefficient (r)/coefficient of determination (r^2), and/or response factor method acceptance criteria were met;
- the continuing calibration verification standard (CCV) method percent difference or percent drift (%Ds) and RF acceptance criteria were met; and
- the retention time method acceptance criteria were met.

The QC acceptance criteria were met.

Data qualification to the analytes associated with the specific ICAL and/or CCV was as follows:

CCV Linearity Nonconformances:

Nonconformance	Actions	
	Detected Results	Nondetected Results
%D > 20%	J	UJ
%Drift	J*	UJ*
* No guidance in NFG, thus professional judgment was used		

Qualified sample results are shown in Table 1. Nonconformances are summarized in Attachment A in Table A-1.

Laboratory Blanks/Equipment Blanks/Trip Blanks

Laboratory method blanks, equipment rinsate and trip blanks were evaluated as to whether there were contaminants detected above the detection limit (DL).

Data validation qualifications for individual samples are based on the maximum contaminant concentration detected in all associated blanks.

Method, equipment rinsate and trip blank results were reviewed for conformance with the QC acceptance criteria. Detected results in blanks are not discussed in this data validation report if the associated results were nondetect or if qualification of sample results was not required.

Sample results were qualified as follows:

For common lab contaminants (methylene chloride, acetone, 2-butanone):

Blank type	Blank result	Sample result	Action for samples
Method, Storage, Field, Trip, or Instrument*	Detects	Not detected	No qualification
	≤ 2x LOQ	< 2x LOQ	Report sample LOQ value with a U
		≥ 2x LOQ and ≤ 4x LOQ	Report the sample result with a U**
		≥ 4x LOQ	No qualifications
	> 2x LOQ	< 2x LOQ	Report sample LOQ value with a U
		≥ 2x LOQ and < blank contamination	Report the sample result with a U
		≥ 2x LOQ and ≥ blank contamination	If the result is ≤2x blank result, report the sample result U.** If the result is > 2x blank result, no qualification is required.**
* Qualifications based on instrument blank results affect only the sample analyzed immediately after the sample that has target compounds that exceed the calibration range or non-target compounds that exceed 100 g/L.			
**Based on AECOM professional judgment			

For all other compounds:

Blank type	Blank result	Sample result	Action for samples
Method, Storage, Field, Trip, or Instrument*	Detects	Not detected	No qualification
	≤ LOQ	< LOQ	Report sample LOQ value with a U
		≥ LOQ and ≤ 2x LOQ	Report the sample result with a U**
		≥ 2x the LOQ	No qualifications
	> LOQ	< LOQ	Report sample LOQ value with a U
		≥ LOQ and < blank contamination	Report the sample result with a U or reject the sample result as unusable R
		≥ LOQ and ≥ blank contamination	If the result is ≤2x blank result, report the sample result U.** If the result is > 2x blank result, no qualification is required.**
* Qualifications based on instrument blank results affect only the sample analyzed immediately after the sample that has target compounds that exceed the calibration range or non-target compounds that exceed 100 g/L.			
**Based on AECOM professional judgment.			

LOQ - Limit of Quantitation

Nonconformances are summarized in Attachment A in Table A-2. Qualified sample results are shown in Table 1.

Surrogate Spike Recoveries

The surrogate recoveries (%Rs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

MS/MSD Results

The MS/MSD %Rs and relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria.

Associated sample results for MS/MSD that exceeded criteria were non-detected; therefore, no data was qualified on the basis of MS/MSD nonconformance.

LCS/LCSD Results

The LCS/LCSD %Rs and/or relative percent recoveries (RPDs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Field Duplicate Results

Field duplicate RPDs were reviewed for conformance with the QC criterion of ≤ 30% for aqueous matrices. This criterion applies if both results were greater than five times the Limit of Quantitation (LOQ).

All QC acceptance criteria were met.

Internal Standard Results

The internal standard (IS) recoveries were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Sample Results/Reporting Issues

Compounds that were not detected in the sample are reported as undetected (U) at the Limit of Detection (LOD).

Compounds detected at concentrations less than the LOQ but greater than the detection limit (DL) were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation.

Any sample that was analyzed at a dilution due to high concentrations of target or non-target compounds or matrix interferences was checked to ensure that the results and/or sample specific LODs and LOQs were adjusted accordingly by the laboratory.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Nonconformance Summary Tables

Attachment B: Qualifier Codes and Explanations

Attachment C: Reason Codes and Explanations

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Matrix	Compound	Result	LOQ	Units	Validation Qualifiers	Validation Reason
VPB144-GW-121713-458-460	WG	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c
VPB144-GW-121713-458-460	WG	TRICHLOROETHENE	150	0.50	UG/L	J	m
VPB144-GW-121713-478-480	WG	CARBON TETRACHLORIDE	0.89	0.50	UG/L	J	c
VPB144-GW-121813-498-500	WG	CARBON TETRACHLORIDE	2.8	0.50	UG/L	J	c
VPB144-GW-121813-518-520	WG	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c
VPB144-GW-121913-538-540	WG	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c
VPB144-GWD-121713	WG	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c
VPB144-TRIP BLANK-121913	WQ	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c
VPB144-WATER-EB-121913	WQ	TOTAL ORGANIC CARBON	0.64	0.64	MG/L	U	bl
VPB144-WATER-EB-121913	WQ	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c

Attachment A

Non Conformance Summary Tables

Table A-1 -Continuing Calibration Verification Standard

CCV ID	Compound	% D or % Drift	Limit (%)	Associated Samples
WG136655-4	Carbon Tetrachloride	25.7	<20	Sample in batch WG136655-4
WG136697-4	Carbon Tetrachloride	30.2	<20	Sample in batch WG136697-4

Table A-2 –Method Blanks

Blank ID	Compound	Result	LOQ	Units	Associated Samples
WG136890-1	TOTAL ORGANIC CARBON	0.23	0.50	MG/L	VPB144-WATER-EB-12191

Attachment B

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Attachment C

Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
c	Calibration issue
co	Analyte carryover
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate RPDs
h	Holding times
i	Internal standard areas
k	Estimated Maximum Possible Concentration (EMPC)
l	LCS or OPR recoveries
lc	Labeled compound recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
md	Matrix spike/matrix spike duplicate RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
r	Dual column RPD
q	Quantitation issue
s	Surrogate recovery
su	Ion suppression
t	Temperature preservation issue
x	Percent solids
y	Serial dilution results
z	ICS results

Katahdin ANALYTICAL SERVICES
600 Technology Way
Scarborough, ME 04074
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE BEAR DOWN AND PRINT LEGIBLY IN PEN

Client	Contact	Phone #	Fax #
Resolution Consultants	Eleanor Vivaudou	(845) 425-4980	( )

Address	City	State	Zip Code
100 Red Schoolhouse Rd	Chestnut Ridge	NY	10977

Purchase Order #	Proj. Name / No.	Katahdin Quote #
	NWIRP Bethpage / 60265526	

Bill (if different than above) Address

Sampler (Print / Sign) Michael Zobel / Michael Zobel

Copies To:

LAB USE ONLY WORK ORDER #: G600006

KATAHDIN PROJECT NUMBER

REMARKS:

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO:

TEMP°C ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	ANALYSIS AND CONTAINER TYPE PRESERVATIVES: VOC	TOC	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N
	VPB144-GW-121713-458-460	12-17-13 / 1015	GW	2	2										
	VPB144-GWMS/MSD-121713-458-460	12-17-13 / 1015	GW	6	6										
	VPB144-GW-121713-478-480	12-17-13 / 1255	GW	3	3										
	VPB144-GWD-121713	12-17-13 / —	GW	2	2										
	VPB144-GW-121813-498-500	12-18-13 / 1145	GW	3	3										
	VPB144-GW-121813-518-520	12-20-13 / 1430	GW	3	3										
	VPB144-TripBlank-121913	11-25-13 / 1100	W	3	3										
	VPB144-WATER-EB-121913	12-19-13 / 1210	W	6	3	3									
	VPB144-GW-121913-538-540	12-19-13 / 1025	GW	3											
		/													
		/													
		/													
		/													
		/													
		/													
		/													

COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
Michael Zobel	12-19-13 / 1730	FedEx	FedEx	12/21/13 12:35	A. Blanchard
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

ORIGINAL

COC1

Katahdin
ANALYTICAL SERVICES

ACCREDITED IN ACCORDANCE WITH melac
Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: G0006-1
Client ID: GW-121713-458-460
Project: Navy Clean WE15 NWIRP B
SDG: G0006
Lab File ID: C4922.D

Sample Date: 17-DEC-13
Received Date: 21-DEC-13
Extract Date: 23-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136655

Analysis Date: 23-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 03-JAN-14

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	UM	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	J	0.38	ug/L	1	1	1.0	0.21	0.50
Chloroform	J	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~UMM~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	~~M~~ J	150	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	J	0.80	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		97.8	%					
Toluene-d8		98.8	%					
1,2-Dichloroethane-d4		118.	%					
Dibromofluoromethane		105.	%					

2/14/14

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http://www.katahdinlab.com

Katahdin
ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: G0006-2
Client ID: GW-121713-478-480
Project: Navy Clean WE15 NWIRP B
SDG: G0006
Lab File ID: C4923.D

Sample Date: 17-DEC-13
Received Date: 21-DEC-13
Extract Date: 23-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136655

Analysis Date: 23-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 31-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	J	0.99	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	J	0.43	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene		1.8	ug/L	1	1	1.0	0.21	0.50
Chloroform		1.6	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~J~~ J	0.89	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	~~E~~ 1200	1100	ug/L	~~1~~ 20	1	~~1.0~~ 20	~~0.28~~ 5.6	~~0.50~~ 10
Tetrachloroethene		5.7	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		93.7	%					
Toluene-d8		94.2	%					
1,2-Dichloroethane-d4		117.	%					
Dibromofluoromethane		102.	%					

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Report of Analytical Results

Client: AECOM Environment
Lab ID: G0006-3
Client ID: VPB144-GWD-121713
Project: Navy Clean WE15 NWIRP B
SDG: G0006
Lab File ID: C4924.D

Sample Date: 17-DEC-13
Received Date: 21-DEC-13
Extract Date: 23-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136655

Analysis Date: 23-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 31-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	J	0.49	ug/L	1	1	1.0	0.21	0.50
Chloroform	J	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene		160	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	J	0.92	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		94.9	%					
Toluene-d8		96.5	%					
1,2-Dichloroethane-d4		112.	%					
Dibromofluoromethane		104.	%					

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Report of Analytical Results

Client: AECOM Environment
Lab ID: G0006-4
Client ID: GW-121813-498-500
Project: Navy Clean WE15 NWIRP B
SDG: G0006
Lab File ID: C4925.D

Sample Date: 18-DEC-13
Received Date: 21-DEC-13
Extract Date: 23-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136655

Analysis Date: 23-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 31-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene		12	ug/L	1	1	1.0	0.35	0.50
Freon-113		4.5	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene		1.3	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane		6.3	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene		24	ug/L	1	1	1.0	0.21	0.50
Chloroform		2.7	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride		2.8 J	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane		3.2	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	~~E~~ 7600	~~2600~~	ug/L	50	1	~~1.0~~ 50	~~0.28~~ 14	~~0.50~~ 25
Tetrachloroethene		52	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		90.2	%					
Toluene-d8		89.5	%					
1,2-Dichloroethane-d4		112.	%					
Dibromofluoromethane		97.9	%					

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Report of Analytical Results

Client: AECOM Environment
Lab ID: G0006-5
Client ID: GW-121813-518-520
Project: Navy Clean WE15 NWIRP B
SDG: G0006
Lab File ID: C4926.D

Sample Date: 18-DEC-13
Received Date: 21-DEC-13
Extract Date: 23-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136655

Analysis Date: 23-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 31-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene		34	ug/L	1	1	1.0	0.35	0.50
Freon-113		11	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	J	0.57	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane		16	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene		62	ug/L	1	1	1.0	0.21	0.50
Chloroform	J	0.98	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane		8.5	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	~~E~~ 200	~~230~~	ug/L	~~1~~ 10	1	~~1.0~~ 10	~~0.28~~ 2.8	~~0.50~~ 5.0
Tetrachloroethene	~~E~~ 420	~~510~~	ug/L	~~1~~ 10	1	~~1.0~~ 10	~~0.40~~ 4.0	~~0.50~~ 5.0
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		95.1	%					
Toluene-d8		97.2	%					
1,2-Dichloroethane-d4		115.	%					
Dibromofluoromethane		105.	%					

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Report of Analytical Results

Client: AECOM Environment
Lab ID: G0006-6
Client ID: TRIP BLANK-121913
Project: Navy Clean WE15 NWIRP B
SDG: G0006
Lab File ID: C4920.D

Sample Date: 19-DEC-13
Received Date: 21-DEC-13
Extract Date: 23-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136655

Analysis Date: 23-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 31-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		93.4	%					
Toluene-d8		95.0	%					
1,2-Dichloroethane-d4		106.	%					
Dibromofluoromethane		103.	%					

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Report of Analytical Results

Client: AECOM Environment
Lab ID: G0006-7
Client ID: WATER-EB-121913
Project: Navy Clean WE15 NWIRP B
SDG: G0006
Lab File ID: C4921.D

Sample Date: 19-DEC-13
Received Date: 21-DEC-13
Extract Date: 23-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136655

Analysis Date: 23-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 31-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		97.2	%					
Toluene-d8		97.5	%					
1,2-Dichloroethane-d4		107.	%					
Dibromofluoromethane		101.	%					

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Report of Analytical Results

Client: Rick Purdy
AECOM
701 Edgewater Drive
Wakefield,MA 01880

Lab Sample ID: G0006-7
Report Date: 07-JAN-14
Client PO: 60266526 ATS-3(WE15)
Project: Navy Clean WE15 NWIR
SDG: G0006

Sample Description	Matrix	Date Sampled	Date Received
WATER-EB-121913	AQ	19-DEC-13	21-DEC-13

Parameter	Result	Adj LOQ	Adj MDL	Adj LOD	Anal. Method	QC.Batch	Anal. Date	Prep. Method	Prep. Date	Footnotes
Total Organic Carbon	~~J0.64~~ mg/L	1.0	.1023	.5	SM5310B	WG136890	26-DEC-13 19:43:09	N/A	N/A	

0.64 U

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Report of Analytical Results

Client: AECOM Environment
Lab ID: G0006-8
Client ID: GW-121913-538-540
Project: Navy Clean WE15 NWIRP B
SDG: G0006
Lab File ID: C4927.D

Sample Date: 19-DEC-13
Received Date: 21-DEC-13
Extract Date: 23-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136655

Analysis Date: 23-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 31-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene		1.4	ug/L	1	1	1.0	0.35	0.50
Freon-113	J	0.65	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	J	0.76	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene		1.2	ug/L	1	1	1.0	0.21	0.50
Chloroform	J	0.36	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~J~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	J	0.22	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene		22	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene		28	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		98.1	%					
Toluene-d8		99.2	%					
1,2-Dichloroethane-d4		114.	%					
Dibromofluoromethane		106.	%					

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Data Validation Report

Project:	Regional Groundwater Investigation - NWIRP Bethpage	
Laboratory:	Katahdin Analytical	
Service Request:	G0042	
Analyses/Method:	EPA SW-846 Method 8260B for VOCs (GC/MS)	
Validation Level:	Limited	
AECOM Project Number:	60266526.SA.DV	
Prepared by:	Sheena Blair/AECOM	Completed on: 01/23/2014
Reviewed by:	Lori Herberich/AECOM	File Name: G0042_8260B

SUMMARY

The samples listed below were collected by Resolution Consultants from the Regional Groundwater Investigation - NWIRP Bethpage site on December 20 and 23, 2013.

Sample ID	Matrix/Sample Type
VPB144-GW-122013-568-570	Ground water
VPB144-GW-122313-598-600	Ground water
VPB144-TRIP BLANK-122313	Trip Blank

Data validation activities were conducted with reference to *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW846, specifically SW-846 Method 8260B, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry* (USEPA, 1996), *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (June 2008), and Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.2 (DoD, October 2010). In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

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

✓	Data completeness (chain-of-custody (COC))/sample integrity
✓	Holding times and sample preservation
✓	GC/MS performance checks
✗	Initial calibration/continuing calibration verification
✓	Laboratory blanks/trip blanks/equipment blanks
✓	Surrogate spike recoveries
NA	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Laboratory control sample (LCS)
NA	Field duplicates
✓	Internal standards

✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. No data were rejected. Selected data points were estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

Data Completeness/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Due to limitations in the reporting system, the laboratory omitted the "VPB-144-" prefix from the sample ID in the report. The submitted EDD file reflects the full sample ID.

Holding Times/Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria.

The QC acceptance criteria were met.

GC/MS Performance Checks

The data were reviewed to ensure that the 4-bromofluorobenzene (BFB) tuning was performed at the correct frequency and that the method acceptance criteria were met. The QC acceptance criteria were met.

Initial Calibration/Continuing Calibration Verification

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

- the initial calibration (ICAL) percent relative standard deviation (%RSD), correlation coefficient (r)/coefficient of determination (r^2), and/or response factor method acceptance criteria were met;
- the continuing calibration verification standard (CCV) method percent difference or percent drift (%Ds) and RF acceptance criteria were met; and

- the retention time method acceptance criteria were met.

Data qualification to the analytes associated with the specific ICAL and/or CCV was as follows:

CCV Linearity Nonconformances:

Nonconformance	Actions	
	Detected Results	Nondetected Results
%D > 20%	J	UJ
%Drift	J*	UJ*
* No guidance in NFG, thus professional judgment was used		

Qualified sample results are shown in Table 1. Nonconformances are summarized in Attachment A in Table A-1.

Laboratory Blanks/Equipment Blanks/Trip Blanks

Laboratory method blanks and trip blanks were evaluated as to whether there were contaminants detected above the detection limit (DL).

Data validation qualifications for individual samples are based on the maximum contaminant concentration detected in all associated blanks.

Method and trip blank results were reviewed for conformance with the QC acceptance criteria. Detected results in blanks are not discussed in this data validation report if the associated results were nondetect or if qualification of sample results was not required.

The QC acceptance criteria were met.

Surrogate Spike Recoveries

The surrogate percent recoveries (%Rs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

MS/MSD Results

MS/MSD analyses were not performed on samples reported in this SDG. There were no validation actions taken on this basis.

LCS Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Field Duplicate Results

There were no field duplicate samples submitted with this data set. No validation actions were taken on this basis.

Internal Standard Results

The internal standard (IS) recoveries were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Sample Results/Reporting Issues

Compounds that were not detected in the sample are reported as undetected (U) at the Limit of Detection (LOD).

Compounds detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the detection limit (DL) were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation.

Any sample that was analyzed at a dilution due to high concentrations of target or non-target compounds or matrix interferences was checked to ensure that the results and/or sample specific QLs were adjusted accordingly by the laboratory.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Nonconformance Summary Tables

Attachment B: Qualifier Codes and Explanations

Attachment C: Reason Codes and Explanations

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Matrix	Compound	Result	LOD	Units	Validation Qualifiers	Validation Reason
VPB144-GW-122013-568-570	WG	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c
VPB144-GW-122313-598-600	WG	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c
VPB144-TRIP BLANK-122313	WQ	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c

Attachment A

Nonconformance Summary Tables

Table A-1 -Continuing Calibration Verification Standard

CCV ID	Compound	% D or % Drift	Limit (%)	Associated Samples
WG136799-4	Carbon Tetrachloride	21.1	< 20	VPB144-GW-122013-568-570 VPB144-GW-122313-598-600 VPB144-TRIP BLANK-122313

Attachment B

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Attachment C

Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
c	Calibration issue
co	Analyte carryover
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate RPDs
h	Holding times
i	Internal standard areas
k	Estimated Maximum Possible Concentration (EMPC)
l	LCS or OPR recoveries
lc	Labeled compound recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
md	Matrix spike/matrix spike duplicate RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
r	Dual column RPD
q	Quantitation issue
s	Surrogate recovery
su	Ion suppression
t	Temperature preservation issue
x	Percent solids
y	Serial dilution results
z	ICS results

Katahdin ANALYTICAL SERVICES
600 Technology Way
Scarborough, ME 04074
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

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Client	Contact	Phone #	Fax #
Resolution Consultants	Eleanor Vivaudou	(845) 425-4980	( )

Address	City	State	Zip Code
100 Red Schoolhouse Rd	Chestnut Ridge	NY	10977

Purchase Order #	Proj. Name / No.	Katahdin Quote #
	NWIRP Bethpage / 60265526	

Bill (if different than above) Address

Sampler (Print / Sign) Michael Zobel / Michael Zobel

Copies To:

LAB USE ONLY WORK ORDER #: G0642

KATAHDIN PROJECT NUMBER

REMARKS:

SHIPPING INFO: ❒ FED EX ❒ UPS ❒ CLIENT

AIRBILL NO:

TEMP°C ❒ TEMP BLANK ❒ INTACT ❒ NOT INTACT

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	ANALYSIS AND CONTAINER TYPE PRESERVATIVES: Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N
					VOC	Metals								
	VPB144-GW-122013-528-570	12-20-13 / 1125	GW	3	3									
	VPB144-GW-122313-598-600	12-23-13 / 1210	GW	3	3									
	VPB144-Trip Blank-122313	12-23-13 / 1400	W	3	3									
	IDW-GW-122313	12-23-13 / 1115	GW	1		1								
		/												
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COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
Michael Zobel	12-23-13 / 1645				
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

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ORIGINAL

KAS-COC1

Katahdin
ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: G0042-1
Client ID: GW-122013-568-570
Project: Navy Clean WE15 NWIRP B
SDG: G0042
Lab File ID: C5010.D

Sample Date: 20-DEC-13
Received Date: 26-DEC-13
Extract Date: 27-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136799

Analysis Date: 27-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 30-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene		1.1	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	J	0.69	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		92.5	%					
Toluene-d8		97.6	%					
1,2-Dichloroethane-d4		102.	%					
Dibromofluoromethane		96.1	%					

2/14/14

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P.O. Box 540, Scarborough, ME 04070
Tel:(207) 874-2400 Fax:(207) 775-4029

http://www.katahdinlab.com

Katahdin
ANALYTICAL SERVICES

ACCREDITED IN ACCORDANCE WITH nelac Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: G0042-2
Client ID: GW-122313-598-600
Project: Navy Clean WE15 NWIRP B
SDG: G0042
Lab File ID: C5011.D

Sample Date: 23-DEC-13
Received Date: 26-DEC-13
Extract Date: 27-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136799

Analysis Date: 27-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 30-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	J	0.90	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene		1.2	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		89.5	%					
Toluene-d8		93.9	%					
1,2-Dichloroethane-d4		93.6	%					
Dibromofluoromethane		94.7	%					

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ANALYTICAL SERVICES

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Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: G0042-3
Client ID: TRIP BLANK-122313
Project: Navy Clean WE15 NWIRP B
SDG: G0042
Lab File ID: C5009.D

Sample Date: 23-DEC-13
Received Date: 26-DEC-13
Extract Date: 27-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136799

Analysis Date: 27-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 30-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		86.8	%					
Toluene-d8		94.3	%					
1,2-Dichloroethane-d4		93.9	%					
Dibromofluoromethane		90.1	%					

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http://www.katahdinlab.com

AECOM
250 Apollo Drive
Chelmsford, MA 01886-3140

978.905.2100 tel
978.905.2101 fax

Data Validation Report

Project:	Regional Groundwater Investigation - NWIRP Bethpage	
Laboratory:	Katahdin Analytical	
Service Request:	G0081	
Analyses/Method:	EPA SW-846 Method 8260B for VOCs (GC/MS)	
Validation Level:	Limited	
AECOM Project Number:	60266526.SA.DV	
Prepared by:	Sheena Blair/AECOM	Completed on: 01/23/2014
Reviewed by:	Lori Herberich/AECOM	File Name: G0081_8260B

SUMMARY

The samples listed below were collected by Resolution Consultants from the Regional Groundwater Investigation - NWIRP Bethpage site on November 26 and December 26, 2013.

Sample ID	Matrix/Sample Type
VPB144-GW-122613-618-620	Groundwater
VPB144-TRIP BLANK-122613	Trip Blank

Data validation activities were conducted with reference to *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW846, specifically SW-846 Method 8260B, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry* (USEPA, 1996), *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (June 2008), and Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.2 (DoD, October 2010). In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

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

✓	Data completeness (chain-of-custody (COC))/sample integrity
✓	Holding times and sample preservation
✓	GC/MS performance checks
✗	Initial calibration/continuing calibration verification
✓	Laboratory blanks/trip blanks/equipment blanks
✓	Surrogate spike recoveries
NA	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
NA	Field duplicates
✓	Internal standards
✓	Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. No data were rejected. Selected data points were estimated, due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

Data Completeness/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Due to limitations in the reporting system, the laboratory omitted the "VPB-144-" prefix from the sample ID in the report. The submitted EDD file reflects the full sample ID.

Holding Times/Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria.

The QC acceptance criteria were met.

GC/MS Performance Checks

The data were reviewed to ensure that the 4-bromofluorobenzene (BFB) tuning was performed at the correct frequency and that the method acceptance criteria were met.

The QC acceptance criteria were met.

Initial Calibration/Continuing Calibration Verification

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

- the initial calibration (ICAL) percent relative standard deviation (%RSD), correlation coefficient (r)/coefficient of determination (r^2), and/or response factor method acceptance criteria were met;
- the continuing calibration verification standard (CCV) method percent difference or percent drift (%Ds) and RF acceptance criteria were met; and
- the retention time method acceptance criteria were met.

Data qualification to the analytes associated with the specific ICAL and/or CCV was as follows:

CCV Linearity Nonconformances:

Nonconformance	Actions	
	Detected Results	Nondetected Results
%D > 20%	J	UJ
%Drift	J*	UJ*
* No guidance in NFG, thus professional judgment was used		

Qualified sample results are shown in Table 1. Nonconformances are summarized in Attachment A in Table A-1.

Laboratory Blanks/Equipment Blanks/Trip Blanks

Laboratory method blanks and trip blanks were evaluated as to whether there were contaminants detected above the detection limit (DL).

Data validation qualifications for individual samples are based on the maximum contaminant concentration detected in all associated blanks.

Method and trip blank results were reviewed for conformance with the QC acceptance criteria. Detected results in blanks are not discussed in this data validation report if the associated results were nondetect or if qualification of sample results was not required.

The QC acceptance criteria were met.

Surrogate Spike Recoveries

The surrogate percent recoveries (%Rs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

MS/MSD Results

MS/MSD analyses were not performed on samples reported in this SDG. There were no validation actions taken on this basis.

LCS Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Field Duplicate Results

There were no field duplicate samples submitted with this data set. No validation actions were taken on this basis.

Internal Standard Results

The internal standard (IS) recoveries were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Sample Results/Reporting Issues

Compounds that were not detected in the sample are reported as undetected (U) at the Limit of Detection (LOD).

Compounds detected at concentrations less than the LOQ but greater than the detection limit (DL) were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation.

Any sample that was analyzed at a dilution due to high concentrations of target or non-target compounds or matrix interferences was checked to ensure that the results and/or sample specific LODs and LOQs were adjusted accordingly by the laboratory.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Nonconformance Summary Tables

Attachment B: Qualifier Codes and Explanations

Attachment C: Reason Codes and Explanations

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Matrix	Compound	Result	LOD	Units	Validation Qualifiers	Validation Reason
VPB144-GW-122613-618-620	WG	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c
VPB144-TRIP BLANK-122613	WQ	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c

Attachment A

Nonconformance Summary Tables

Table A-1 -Continuing Calibration Verification Standard

CCV ID	Compound	% D or % Drift	Limit (%)	Associated Samples
WG136799-4	Carbon Tetrachloride	21.1	< 20	VPB144-GW-122613-618-620 VPB144-TRIP BLANK-122613

Attachment B

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Attachment C

Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
c	Calibration issue
co	Analyte carryover
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate RPDs
h	Holding times
i	Internal standard areas
k	Estimated Maximum Possible Concentration (EMPC)
l	LCS or OPR recoveries
lc	Labeled compound recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
md	Matrix spike/matrix spike duplicate RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
r	Dual column RPD
q	Quantitation issue
s	Surrogate recovery
su	Ion suppression
t	Temperature preservation issue
x	Percent solids
y	Serial dilution results
z	ICS results

Katahdin ANALYTICAL SERVICES
600 Technology Way
Scarborough, ME 04074
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

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Client	Contact	Phone #	Fax #
Resolution Consultants	Eleanor Vivarelou	(845) 425-4980	( )

Address	City	State	Zip Code
100 Red Schoolhouse Rd	Chestnut Ridge	NY	10977

Purchase Order #	Proj. Name / No.	Katahdin Quote #
	NWIRP Bethpage / 60265526	

Bill (if different than above) Address

Sampler (Print / Sign) Michael Zobel / Michael Zobel

Copies To:

LAB USE ONLY

WORK ORDER #: G0081

KATAHDIN PROJECT NUMBER

REMARKS:

SHIPPING INFO: ❒ FED EX ❒ UPS ❒ CLIENT

AIRBILL NO:

TEMP°C ____ ❒ TEMP BLANK ❒ INTACT ❒ NOT INTACT

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	ANALYSIS AND CONTAINER TYPE PRESERVATIVES: VOC	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N
	VPB144-GW-122613-618-620	12-26-13 / 1130	GW	3	3										
	VPB144-Trip Blank-122613	12-26-13 / 1400	W	3	3										
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COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
Michael Zobel	12-26-13 / 1615				
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

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ORIGINAL

Katahdin
ANALYTICAL SERVICES

ACCREDITED IN ACCORDANCE WITH nelac
Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: G0081-1
Client ID: GW-122613-618-620
Project: Navy Clean WE15 NWIRP B
SDG: G0081
Lab File ID: C5017.D

Sample Date: 26-DEC-13
Received Date: 27-DEC-13
Extract Date: 27-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136799

Analysis Date: 27-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 30-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		90.1	%					
Toluene-d8		98.3	%					
1,2-Dichloroethane-d4		107.	%					
Dibromofluoromethane		97.8	%					

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Tel:(207) 874-2400 Fax:(207) 775-4029

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Katahdin
ANALYTICAL SERVICES

ACCREDITED IN ACCORDANCE WITH melac
Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: G0081-2
Client ID: TRIP BLANK-122613
Project: Navy Clean WE15 NWIRP B
SDG: G0081
Lab File ID: C5016.D

Sample Date: 26-NOV-13
Received Date: 27-DEC-13
Extract Date: 27-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136799

Analysis Date: 27-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 30-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		86.7	%					
Toluene-d8		94.3	%					
1,2-Dichloroethane-d4		103.	%					
Dibromofluoromethane		94.7	%					

2/14/14

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Data Validation Report

Project:	Regional Groundwater Investigation - NWIRP Bethpage	
Laboratory:	Katahdin Analytical	
Service Request:	SG9545	
Analyses/Method:	EPA SW-846 Method 8260B for VOCs (GC/MS)	
Validation Level:	Limited	
AECOM Project Number:	60266526.SA.DV	
Prepared by:	Sheena Blair/AECOM	Completed on: 01/21/2014
Reviewed by:	Lori Herberich/AECOM	File Name: SG9545_8260B

SUMMARY

The samples listed below were collected by Resolution Consultants from the Regional Groundwater Investigation - NWIRP Bethpage site on December 5, 2013.

Sample ID	Matrix/Sample Type
VPB144-GW-120513-103-105	Ground water
VPB144-GW-120513-58-60	Ground water
VPB144-TRIP BLANK-120513	Trip Blank

Data validation activities were conducted with reference to *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW846, specifically SW-846 Method 8260B, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry* (USEPA, 1996), *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (June 2008), and Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.2 (DoD, October 2010). In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

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

✓	Data completeness (chain-of-custody (COC)/sample integrity
✓	Holding times and sample preservation
✓	GC/MS performance checks
✓	Initial calibration/continuing calibration verification
✓	Laboratory blanks/trip blanks/equipment blanks
✓	Surrogate spike recoveries
NA	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Laboratory control sample (LCS) results
NA	Field duplicates
✓	Internal standards

✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. There were no data points qualified or rejected on the basis of this data review.

RESULTS

Data Completeness/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Due to limitations in the reporting system, the laboratory omitted the "VPB-144-" prefix from the sample ID in the report. The submitted EDD file reflects the full sample ID.

Holding Times/Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria.

The QC acceptance criteria were met.

GC/MS Performance Checks

The data were reviewed to ensure that the 4-bromofluorobenzene (BFB) tuning was performed at the correct frequency and that the method acceptance criteria were met.

Initial Calibration/Continuing Calibration Verification

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

- the initial calibration (ICAL) percent relative standard deviation (%RSD), correlation coefficient (r)/coefficient of determination (r^2), and/or response factor method acceptance criteria were met;
- the initial calibration verification (ICV) percent recovery (%R) criteria were met; and
- the continuing calibration verification standard (CCV) method percent difference or percent drift (%Ds), %Rs, and/or RF acceptance criteria were met; and/or
- the retention time method acceptance criteria were met.

The QC acceptance criteria were met.

Laboratory Blanks/Equipment Blanks/Trip Blanks

Laboratory method blanks and trip blanks were evaluated as to whether there were contaminants detected above the detection limit (DL).

Data validation qualifications for individual samples are based on the maximum contaminant concentration detected in all associated blanks.

Method and trip blank results were reviewed for conformance with the QC acceptance criteria. Detected results in blanks are not discussed in this data validation report if the associated results were nondetect or if qualification of sample results was not required.

The QC acceptance criteria were met and/or qualification of the sample results was not required.

Surrogate Spike Recoveries

The surrogate percent recoveries (%Rs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

MS/MSD Results

MS/MSD analyses,were not performed on samples reported in this SDG. There were no validation actions taken on this basis.

LCS Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Field Duplicate Results

There were no field duplicate samples submitted with this data set. No validation actions were taken on this basis.

Internal Standard Results

The internal standard (IS) recoveries were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Sample Results/Reporting Issues

Compounds/analytes that were not detected in the sample are reported as undetected (U) at the Limit of Detection (LOD).

Compounds/analytes detected at concentrations less than the LOQ but greater than the detection limit (DL) were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation.

Any sample that was analyzed at a dilution due to high concentrations of target or non-target compounds or matrix interferences was checked to ensure that the results and/or sample specific LODs and LOQs were adjusted accordingly by the laboratory.

QUALIFICATION ACTIONS

No sample results were qualified as a result of this data review.

ATTACHMENTS

Attachment A: Nonconformance Summary Tables

Attachment B: Qualifier Codes and Explanations

Attachment A

Non Conformance Summary Tables

No nonconformances were identified in this data set.

Attachment B

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

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Client	Contact	Phone #	Fax #
Resolution Consultants	Eleanor Vivaudou	(845) 425-4980	( )

Address	City	State	Zip Code
100 Red Schoolhouse Rd.	Chestnut Ridge	NY	10977

Purchase Order # | Proj. Name / No. NWIRP Bethpage / 60265526 | Katahdin Quote #

Bill (if different than above) | Address

Sampler (Print / Sign) Michael Zobel / Michael Zobel | Copies To:

LAB USE ONLY WORK ORDER #: SG9545
KATAHDIN PROJECT NUMBER

REMARKS:

SHIPPING INFO: ❒ FED EX ❒ UPS ❒ CLIENT

AIRBILL NO:

TEMP°C ____ ❒ TEMP BLANK ❒ INTACT ❒ NOT INTACT

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	ANALYSIS AND CONTAINER TYPE PRESERVATIVES: VOC (Filt. ❒Y ❒N)	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N
	VPB144-GW-120513-58-60	12-5-13 / 1130	GW	3	3									
	VPB144-GW-120513-103-105	12-5-13 / 1430	GW	3	3									
	VPB144-Trip Blank-120513	9-24-13 / 1200	W	3	3									
		/												
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COMMENTS

12-6-13/0920

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
Michael Zobel	12-5-13 1700				
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

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ORIGINAL

KAS-COC1

Katahdin
ANALYTICAL SERVICES

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Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9545-3
Client ID: TRIP BLANK-120513
Project: Navy Clean WE15 NWIRP B
SDG: SG9545
Lab File ID: D7111.D

Sample Date: 05-DEC-13
Received Date: 06-DEC-13
Extract Date: 10-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG135894

Analysis Date: 10-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		82.4	%					
Toluene-d8		88.5	%					
1,2-Dichloroethane-d4		104.	%					
Dibromofluoromethane		95.7	%					

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Katahdin
ANALYTICAL SERVICES

ACCREDITED IN ACCORDANCE WITH nelac
Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9545-2
Client ID: GW-120513-103-105
Project: Navy Clean WE15 NWIRP B
SDG: SG9545
Lab File ID: D7109.D

Sample Date: 05-DEC-13
Received Date: 06-DEC-13
Extract Date: 10-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG135894

Analysis Date: 10-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		90.1	%					
Toluene-d8		95.6	%					
1,2-Dichloroethane-d4		101.	%					
Dibromofluoromethane		94.4	%					

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ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9545-1
Client ID: GW-120513-58-60
Project: Navy Clean WE15 NWIRP B
SDG: SG9545
Lab File ID: D7108.D

Sample Date: 05-DEC-13
Received Date: 06-DEC-13
Extract Date: 10-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG135894

Analysis Date: 10-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	J	0.24	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	J	0.33	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		85.5	%					
Toluene-d8		90.3	%					
1,2-Dichloroethane-d4		95.1	%					
Dibromofluoromethane		88.4	%					

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Data Validation Report

Project:	Regional Groundwater Investigation - NWIRP Bethpage	
Laboratory:	Katahdin Analytical	
Service Request:	SG9628	
Analyses/Method:	EPA SW-846 Method 8260B for VOCs (GC/MS)	
Validation Level:	Limited	
AECOM Project Number:	60266526.SA.DV	
Prepared by:	Sheena Blair/AECOM	Completed on: 01/21/2014
Reviewed by:	Lori Herberich/AECOM	File Name: SG9628_8260B

SUMMARY

The samples listed below were collected by Resolution Consultants from the Regional Groundwater Investigation - NWIRP Bethpage site on December and December 9, 2013.

Sample ID	Matrix/Sample Type
VPB144-GW-120613-148-150	Groundwater
VPB144-GW-120613-198-200	Groundwater
VPB144-GWD-120613	Groundwater (Field Duplicate of VPB144-GW-120613-198-200)
VPB144-GW-120913-223-225	Groundwater
VPB144-GW-120913-238-240	Groundwater
VPB144-TRIP BLANK-120913	Trip Blank

Data validation activities were conducted with reference to *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW846, specifically SW-846 Method 8260B, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry* (USEPA, 1996), *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (June 2008), and Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.2 (DoD, October 2010). In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

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

- ✓ Data completeness (chain-of-custody (COC)/sample integrity
- ✓ Holding times and sample preservation
- ✓ GC/MS performance checks
- ✓ Initial calibration/continuing calibration verification
- ✓ Laboratory blanks/trip blanks/equipment blanks
- ✗ Surrogate spike recoveries

✓ Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
✓ Field duplicates
✓ Internal standards
✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. No data were rejected. Selected data points were qualified as estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

Data Completeness/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Due to limitations in the reporting system, the laboratory omitted the "VPB-144-" prefix from the sample ID in the report. The submitted EDD file reflects the full sample ID.

Holding Times/Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria.

The QC acceptance criteria were met.

GC/MS Performance Checks

The data were reviewed to ensure that the 4-bromofluorobenzene (BFB) tuning was performed at the correct frequency and that the method acceptance criteria were met.

Initial Calibration/Continuing Calibration Verification

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

- the initial calibration (ICAL) percent relative standard deviation (%RSD), correlation coefficient (r)/coefficient of determination (r^2), and/or response factor method acceptance criteria were met;
- the continuing calibration verification standard (CCV) method percent difference or percent drift (%Ds) and RF acceptance criteria were met; and
- the retention time method acceptance criteria were met.

The QC acceptance criteria were met.

Laboratory Blanks/Equipment Blanks/Trip Blanks

Laboratory method blanks and trip blanks were evaluated as to whether there were contaminants detected above the detection limit (DL).

Data validation qualifications for individual samples are based on the maximum contaminant concentration detected in all associated blanks.

Method and trip blank results were reviewed for conformance with the QC acceptance criteria. Detected results in blanks are not discussed in this data validation report if the associated results were nondetect or if qualification of sample results was not required.

The QC acceptance criteria were met.

Surrogate Spike Recoveries

The surrogate recoveries (%Rs) were reviewed for conformance with the QC acceptance criteria.

Nonconformances are summarized in Attachment A in Table A-1. Data qualification on the basis of surrogate recovery nonconformances was as follows:

Nonconformance	Action	
	Detected Compounds	Nondetected Compounds
%R > Upper Limit (UL)	J	No qualification
20% ≤%R < Lower Limit (LL)	J	UJ
%R < 20%	J	R

Qualified sample results are shown in Table 1.

MS/MSD Results

The MS/MSD %Rs and relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

LCS/LCSD Results

The LCS/LCSD %Rs and/or relative percent recoveries (RPDs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Field Duplicate Results

Field duplicate RPDs were reviewed for conformance with the AECOM QC criterion of ≤30% for aqueous matrices. This criterion applies if both results were greater than five times the Limit of Quantitation (LOQ).

All QC acceptance criteria were met.

Internal Standard Results

The internal standard (IS) recoveries were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Sample Results/Reporting Issues

All compounds detected at concentrations less than the LOQ but greater than the DL were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation.

Any sample that was analyzed at a dilution due to high concentrations of target or non-targets was checked to ensure that the results and/or sample specific LODs and LOQs were adjusted accordingly by the laboratory.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Nonconformance Summary Tables

Attachment B: Qualifier Codes and Explanations

Attachment C: Reason Codes and Explanations

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Matrix	Compound	Result	LOD	Units	Validation Qualifiers	Validation Reason
VPB144-GW-120913-223-225	WG	TRICHLOROETHENE	0.57	0.50	UG/L	J	s

Attachment A

Nonconformance Summary Tables

Table A-1- Surrogates

Sample ID	Surrogate	% Recovery	Lower Limit	Upper Limit
VPB144-GW-120913-223-225	1,2-DICHLOROETHANE-D4	123	70	120

Attachment B

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Attachment C

Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
c	Calibration issue
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate RPDs
h	Holding times
i	Internal standard areas
k	Estimated Maximum Possible Concentration (EMPC)
l	LCS or OPR recoveries
lc	Labeled compound recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
md	Matrix spike/matrix spike duplicate RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
r	Dual column RPD
q	Quantitation issue
s	Surrogate recovery
su	Ion suppression
t	Temperature preservation issue
x	Percent solids
y	Serial dilution results
z	ICS results

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Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE BEAR DOWN AND PRINT LEGIBLY IN PEN

Client	Contact	Phone #	Fax #
Resolution Consultants	Eleanor Vivaudou	(845) 425-4960	( )

Address	City	State	Zip Code
100 Red Schoolhouse Rd	Chestnut Ridge	NY	10977

Purchase Order #	Proj. Name / No.	Katahdin Quote #
	NWIRP Bethpage / 60265526	

Bill (if different than above) — Address

Sampler (Print / Sign): Michael Zobel / Michael Zobel — Copies To:

LAB USE ONLY

WORK ORDER #: 56 9628

KATAHDIN PROJECT NUMBER

REMARKS:

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO:

TEMP°C ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	ANALYSIS AND CONTAINER TYPE PRESERVATIVES: VOC	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N
	VPB144-GW-120613-148-150	12-6-13 / 1030	GW	3	3									
	VPB144-GW-120613-198-200	12-6-13 / 1315	GW	3	3									
	VPB144-GWMS/MSD-120613-198-200	12-6-13 / 1315	GW	6	6									
	VPB144-GWD-120613	12-6-13 / N/A	GW	3	3									
	VPB144-GW-120913-238-240	12-9-13 / 1235	GW	3	3									
	VPB144-GW-120913-223-225	120913 / 1040	GW	3	3									
	VPB144-TripBlank-120913	12-24-13 / 1200	W	3	3									
		/												
		/												
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COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
Michael Zobel	12-9-13 1430	12-10-13 0930			
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

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ORIGINAL

Katahdin
ANALYTICAL SERVICES

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Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9628-1
Client ID: GW-120613-148-150
Project: Navy Clean WE15 NWIRP B
SDG: SG9628
Lab File ID: C4744.D

Sample Date: 06-DEC-13
Received Date: 10-DEC-13
Extract Date: 11-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG135959

Analysis Date: 11-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 11-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113		1.1	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene		28	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	J	0.49	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		101.	%					
Toluene-d8		101.	%					
1,2-Dichloroethane-d4		115.	%					
Dibromofluoromethane		101.	%					

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Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9628-2
Client ID: GW-120613-198-200
Project: Navy Clean WE15 NWIRP B
SDG: SG9628
Lab File ID: C4745.D

Sample Date: 06-DEC-13
Received Date: 10-DEC-13
Extract Date: 11-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG135959

Analysis Date: 11-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 11-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene		5.8	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		103.	%					
Toluene-d8		103.	%					
1,2-Dichloroethane-d4		119.	%					
Dibromofluoromethane		107.	%					

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Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9628-3
Client ID: VPB144-GWD-120613
Project: Navy Clean WE15 NWIRP B
SDG: SG9628
Lab File ID: C4746.D

Sample Date: 06-DEC-13
Received Date: 10-DEC-13
Extract Date: 11-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG135959

Analysis Date: 11-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 11-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	J	0.21	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene		5.8	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		104.	%					
Toluene-d8		104.	%					
1,2-Dichloroethane-d4		117.	%					
Dibromofluoromethane		107.	%					

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ANALYTICAL SERVICES

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Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9628-4
Client ID: GW-120913-238-240
Project: Navy Clean WE15 NWIRP B
SDG: SG9628
Lab File ID: C4747.D

Sample Date: 09-DEC-13
Received Date: 10-DEC-13
Extract Date: 11-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG135959

Analysis Date: 11-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 11-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	J	0.85	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		105.	%					
Toluene-d8		106.	%					
1,2-Dichloroethane-d4		120.	%					
Dibromofluoromethane		111.	%					

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ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9628-5
Client ID: GW-120913-223-225
Project: Navy Clean WE15 NWIRP B
SDG: SG9628
Lab File ID: C4748.D

Sample Date: 09-DEC-13
Received Date: 10-DEC-13
Extract Date: 11-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG135959

Analysis Date: 11-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 11-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	J	0.57	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		105.	%					
Toluene-d8		105.	%					
1,2-Dichloroethane-d4	*	123.	%					
Dibromofluoromethane		112.	%					

2/14/14

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ANALYTICAL SERVICES

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Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9628-6
Client ID: TRIP BLANK-120913
Project: Navy Clean WE15 NWIRP B
SDG: SG9628
Lab File ID: C4743.D

Sample Date: 09-DEC-13
Received Date: 10-DEC-13
Extract Date: 11-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG135959

Analysis Date: 11-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 11-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		102.	%					
Toluene-d8		101.	%					
1,2-Dichloroethane-d4		115.	%					
Dibromofluoromethane		107.	%					

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Data Validation Report

Project:	Regional Groundwater Investigation - NWIRP Bethpage	
Laboratory:	Katahdin Analytical	
Service Request:	SG9712	
Analyses/Method:	EPA SW-846 Method 8260B for VOCs (GC/MS) and Standard Method 5310 for Total Organic Carbon by High-Temperature Combustion	
Validation Level:	Limited	
AECOM Project Number:	60266526.SA.DV	
Prepared by:	Sheena Blair/AECOM	Completed on: 01/21/2014
Reviewed by:	Lori Herberich/AECOM	File Name: SG9712_5310B and 8260B

SUMMARY

The samples listed below were collected by Resolution Consultants from the Regional Groundwater Investigation - NWIRP Bethpage site on December 10 and 11, 2013.

Sample ID	Matrix/Sample Type	Analysis
VPB144-GW-121013-278-280	Ground water	SW-846 Method 8260B
VPB144-GW-121113-308-310	Ground water	SW-846 Method 8260B
VPB144-GW-121113-318-320	Ground water	SW-846 Method 8260B
VPB144-GW-121113-338-340	Ground water	SW-846 Method 8260B
VPB144-TRIP BLANK-121113	Trip Blank	SW-846 Method 8260B
VPB144-WATER-EB-121113	Equipment blank	SW-846 Method 8260B SM5310B
VPB144-WATER-FB-121113	Field blank	SW-846 Method 8260B SM5310B

The samples were analyzed in accordance with:

- *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW846,* Method 8260B, *Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry* (USEPA, 1996).

- *Standard Methods for the Examination of Water and Wastewater, Method SM310B, Total Organic Carbon by High-Temperature Combustion*

Data validation activities were conducted with reference to these methods, *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (June 2008), *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (January 2010), and Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.2 (DoD, October 2010) where applicable. In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

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

✓	Data completeness (chain-of-custody (COC))/sample integrity
✓	Holding times and sample preservation
✓	GC/MS performance checks
✗	Initial calibration/continuing calibration verification
✗	Laboratory blanks/trip blanks/equipment blanks
✓	Surrogate spike recoveries
✓	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
NA	Field duplicates
✓	Internal standards
✓	Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. No data were rejected. Selected data points were negated or qualified due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

Data Completeness/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Due to limitations in the reporting system, the laboratory omitted the "VPB-144-" prefix from the sample ID in the report. The submitted EDD file reflects the full sample ID.

Holding Times/Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria.

GC/MS Performance Checks

The data were reviewed to ensure that the 4-bromofluorobenzene (BFB) tuning was performed at the correct frequency and that the method acceptance criteria were met.

The QC acceptance criteria were met.

Initial Calibration/Continuing Calibration Verification

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

- the initial calibration (ICAL) percent relative standard deviation (%RSD), correlation coefficient (r)/coefficient of determination (r^2), and/or response factor method acceptance criteria were met;
- the initial calibration verification (ICV) percent recovery (%R) criteria were met; and
- the continuing calibration verification standard (CCV) method percent difference or percent drift (%Ds), %Rs, and/or RF acceptance criteria were met; and/or
- the retention time method acceptance criteria were met.

Data qualification to the analytes associated with the specific ICAL and/or CCV was as follows:

ICV Recovery Nonconformances:

Nonconformance	Actions	
	Detected Compounds	Nondetected Compounds
%R > 120%	J	No qualification
20% < %R < 80%	J	UJ
%R <20% (see note)	J	R*

Notes: Based on NFG 2008 VOC guidance, professional judgment is used to reject (R) non-detects in all associated samples for any analyte with < 20% recovery. Also, professional judgment is used to estimate (UJ) rather the reject (R) sample results previously negated (U) on the basis of blank contamination.

Qualified sample results are shown in Table 1. Nonconformances are summarized in Attachment A in Table A-1.

Laboratory Blanks/Equipment Blanks/Trip Blanks

Laboratory method blanks, equipment rinsate and trip blanks were evaluated as to whether there were contaminants detected above the detection limit (DL).

Data validation qualifications for individual samples are based on the maximum contaminant concentration detected in all associated blanks.

Method, equipment rinsate and trip blank results were reviewed for conformance with the QC acceptance criteria. Detected results in blanks are not discussed in this data validation report if the associated results were nondetect or if qualification of sample results was not required.

Sample results were qualified as follows:

Blank type	Blank result	Sample result	Action for samples
Method, Storage, Field, Trip, or Instrument*	Detects	Not detected	No qualification
	≤ LOQ	< LOQ	Report sample LOQ value with a U
		≥ LOQ and ≤ 2x LOQ	Report the sample result with a U**
		≥ 2x the LOQ	No qualifications
	> LOQ	< LOQ	Report sample LOQ value with a U
		≥ LOQ and < blank contamination	Report the sample result with a U or reject the sample result as unusable R
		≥ LOQ and ≥ blank contamination	If the result is ≤ 2x blank result, report the sample result U.** If the result is > 2x blank result, no qualification is required.**
* Qualifications based on instrument blank results affect only the sample analyzed immediately after the sample that has target compounds that exceed the calibration range or non-target compounds that exceed 100 g/L.			
**Based on AECOM professional judgment.			

LOQ - Limit of Quantitation

Nonconformances are summarized in Attachment A in Tables A-2. Qualified sample results are shown in Table 1.

Surrogate Spike Recoveries

The surrogate recoveries (%Rs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

MS/MSD Results

MS/MSD analyses were not performed on samples reported in this SDG. There were no validation actions taken on this basis.

LCS Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Field Duplicate Results

There were no field duplicate samples submitted with this data set. No validation actions were taken on this basis.

Internal Standard Results

The internal standard (IS) recoveries were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Sample Results/Reporting Issues

Compounds that were not detected in the sample are reported as undetected (U) at the Limit of Detection (LOD).

Compounds detected at concentrations less than the LOQ but greater than the detection limit (DL) were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation.

Any sample that was analyzed at a dilution due to high concentrations of target or non-target compounds or matrix interferences was checked to ensure that the results and/or sample specific LODs and LOQs were adjusted accordingly by the laboratory.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Nonconformance Summary Tables

Attachment B: Qualifier Codes and Explanations

Attachment C: Reason Codes and Explanations

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Matrix	Compound	Result	LOQ	Units	Validation Qualifiers	Validation Reason
VPB144-GW-121013-278-280	WG	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c
VPB144-GW-121113-308-310	WG	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c
VPB144-GW-121113-318-320	WG	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c
VPB144-GW-121113-338-340	WG	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c
VPB144-TRIP BLANK-121113	WQ	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c
VPB144-WATER-EB-121113	WQ	TOTAL ORGANIC CARBON		0.5	MG/L	U	bl
VPB144-WATER-EB-121113	WQ	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c
VPB144-WATER-FB-121113	WQ	TOTAL ORGANIC CARBON		0.5	MG/L	U	bl
VPB144-WATER-FB-121113	WQ	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c

Attachment A

Nonconformance Summary Tables

Table A-1 – Initial Calibration Verification

ICV ID	Compound	% R	Limit	Associated Samples
WG135904-7	Carbon Tetrachloride	139.6	80% - 120%	VPB144-GW-121013-278-280 VPB144-GW-121113-308-310 VPB144-GW-121113-318-320 VPB144-GW-121113-338-340 VPB144-TRIP BLANK-121113 VPB144-WATER-EB-121113 VPB144-WATER-FB-121113

Table A-2 - Laboratory Blanks

Blank ID	Compound	Result	LOQ	Units	Associated Samples
WG136317-1	TOTAL ORGANIC CARBON	0.16	1.0	MG/L	VPB144-WATER-EB-121113 VPB144-WATER-FB-121113

Attachment B

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Attachment C

Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
c	Calibration issue
co	Analyte carryover
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate RPDs
h	Holding times
i	Internal standard areas
k	Estimated Maximum Possible Concentration (EMPC)
l	LCS or OPR recoveries
lc	Labeled compound recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
md	Matrix spike/matrix spike duplicate RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
r	Dual column RPD
q	Quantitation issue
s	Surrogate recovery
su	Ion suppression
t	Temperature preservation issue
x	Percent solids
y	Serial dilution results
z	ICS results

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Fax: (207) 775-4029

CHAIN of CUSTODY

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Client	Contact	Phone #	Fax #
Resolution Consultants	Eleanor Vivarelli	(845) 425-4980	( )

Address	City	State	Zip Code
100 Red Schoolhouse Rd	Chestnut Ridge	NY	10977

Purchase Order #	Proj. Name / No.	Katahdin Quote #
	NWIRP Bethpage / 60265526	

Bill (if different than above) | Address

Sampler (Print / Sign): Michael Zobel / Michael Zobel | Copies To:

LAB USE ONLY

WORK ORDER #: SG9712

KATAHDIN PROJECT NUMBER _____

REMARKS: _____

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO: _____

TEMP°C _____ ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	ANALYSIS AND CONTAINER TYPE PRESERVATIVES: VOC (Filt. ☐Y ☐N)	TOC (Filt. ☐Y ☐N)	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐I
	VPB144-GW-121013-278-280	12-10-13 / 1100	GW	3	3									
	VPB144-GW-121113-308-310	12-11-13 / 1020	GW	3	3									
	VPB144-GW-121113-318-320	12-11-13 / 1230	GW	3	3									
	VPB144-WATER-FB-121113	12-11-13 / 1130	W	6	3	3								
	VPB144-WATER-EB-121113	12-11-13 / 1355	W	6	3	3								
	VPB144-GW-121113-338-340	12-11-13 / 1445	GW	3	3									
	VPB144-Trip Blank-121113	11-25-13 / 1400	W	3	3									
		/												
		/												
		/												
		/												
		/												
		/												
		/												
		/												
		/												

COMMENTS

12-12-13/0920

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
Michael Zobel	12-11-13 1630				
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

ORIGINAL

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Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9712-1
Client ID: GW-121013-278-280
Project: Navy Clean WE15 NWIRP B
SDG: SG9712
Lab File ID: S9664.D

Sample Date: 10-DEC-13
Received Date: 12-DEC-13
Extract Date: 13-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136136

Analysis Date: 13-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 15-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	J	0.22	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene		50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	J	0.53	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		88.0	%					
Toluene-d8		97.4	%					
1,2-Dichloroethane-d4		95.6	%					
Dibromofluoromethane		92.3	%					

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Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9712-2
Client ID: GW-121113-308-310
Project: Navy Clean WE15 NWIRP B
SDG: SG9712
Lab File ID: S9665.D

Sample Date: 11-DEC-13
Received Date: 12-DEC-13
Extract Date: 13-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136136

Analysis Date: 13-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 15-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene		9.9	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		94.7	%					
Toluene-d8		105.	%					
1,2-Dichloroethane-d4		102.	%					
Dibromofluoromethane		99.8	%					

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Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9712-3
Client ID: GW-121113-318-320
Project: Navy Clean WE15 NWIRP B
SDG: SG9712
Lab File ID: S9666.D

Sample Date: 11-DEC-13
Received Date: 12-DEC-13
Extract Date: 13-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136136

Analysis Date: 13-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 15-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene		5.2	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		89.2	%					
Toluene-d8		98.4	%					
1,2-Dichloroethane-d4		99.4	%					
Dibromofluoromethane		98.4	%					

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Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9712-4
Client ID: WATER-FB-121113
Project: Navy Clean WE15 NWIRP B
SDG: SG9712
Lab File ID: S9662.D

Sample Date: 11-DEC-13
Received Date: 12-DEC-13
Extract Date: 13-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136136

Analysis Date: 13-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 15-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		93.8	%					
Toluene-d8		104.	%					
1,2-Dichloroethane-d4		102.	%					
Dibromofluoromethane		103.	%					

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Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9712-5
Client ID: WATER-EB-121113
Project: Navy Clean WE15 NWIRP B
SDG: SG9712
Lab File ID: S9663.D

Sample Date: 11-DEC-13
Received Date: 12-DEC-13
Extract Date: 13-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136136

Analysis Date: 13-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 15-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		87.8	%					
Toluene-d8		98.8	%					
1,2-Dichloroethane-d4		96.6	%					
Dibromofluoromethane		95.7	%					

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Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9712-6
Client ID: GW-121113-338-340
Project: Navy Clean WE15 NWIRP B
SDG: SG9712
Lab File ID: S9667.D

Sample Date: 11-DEC-13
Received Date: 12-DEC-13
Extract Date: 13-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136136

Analysis Date: 13-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 15-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene		6.7	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		88.1	%					
Toluene-d8		97.5	%					
1,2-Dichloroethane-d4		98.8	%					
Dibromofluoromethane		94.6	%					

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Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9712-7
Client ID: TRIP BLANK-121113
Project: Navy Clean WE15 NWIRP B
SDG: SG9712
Lab File ID: S9661.D

Sample Date: 11-DEC-13
Received Date: 12-DEC-13
Extract Date: 13-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136136

Analysis Date: 13-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 15-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		87.7	%					
Toluene-d8		97.7	%					
1,2-Dichloroethane-d4		95.2	%					
Dibromofluoromethane		94.9	%					

2/17/14

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ANALYTICAL SERVICES

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Report of Analytical Results

Client: Rick Purdy
AECOM
701 Edgewater Drive
Wakefield,MA 01880

Lab Sample ID: SG9712-4
Report Date: 30-DEC-13
Client PO: 60266526 ATS-3(WE15)
Project: Navy Clean WE15 NWIR
SDG: SG9712

Sample Description	Matrix	Date Sampled	Date Received
WATER-FB-121113	AQ	11-DEC-13	12-DEC-13

Parameter	Result	Adj LOQ	Adj MDL	Adj LOD	Anal. Method	QC.Batch	Anal. Date	Prep. Method	Prep. Date	Footnotes
Total Organic Carbon	~~J0.26~~ mg/L	1.0	.1023	.5	SM5310B	WG136317	17-DEC-13 03:10:38	N/A	N/A	

0.5 U

2/17/14

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Katahdin
ANALYTICAL SERVICES

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Cert No E87604

Report of Analytical Results

Client: Rick Purdy
AECOM
701 Edgewater Drive
Wakefield,MA 01880

Lab Sample ID: SG9712-5
Report Date: 30-DEC-13
Client PO: 60266526 ATS-3(WE15)
Project: Navy Clean WE15 NWIR
SDG: SG9712

Sample Description	Matrix	Date Sampled	Date Received
WATER-EB-121113	AQ	11-DEC-13	12-DEC-13

Parameter	Result	Adj LOQ	Adj MDL	Adj LOD	Anal. Method	QC.Batch	Anal. Date	Prep. Method	Prep. Date	Footnotes
Total Organic Carbon	~~J0.18~~ 0.5 J mg/L	1.0	.1023	.5	SM5310B	WG136317	17-DEC-13 04:09:41	N/A	N/A	

R 2/12/14

Katahdin Analytical Services 0000222

AECOM
250 Apollo Drive
Chelmsford, MA 01886-3140

978.905.2100 tel
978.905.2101 fax

Data Validation Report

Project:	Regional Groundwater Investigation - NWIRP Bethpage	
Laboratory:	Katahdin Analytical	
Service Request:	SG9670	
Analyses/Method:	EPA SW-846 Method 8260B for VOCs (GC/MS)	
Validation Level:	Limited	
AECOM Project Number:	60266526.SA.DV	
Prepared by:	Sheena Blair/AECOM	Completed on: 01/23/2014
Reviewed by:	Lori Herberich/AECOM	File Name: SG9670_8260B

SUMMARY

The samples listed below were collected by Resolution Consultants from the Regional Groundwater Investigation - NWIRP Bethpage site on December 9 and 10, 2013.

Sample ID	Matrix/Sample Type
VPB144-GW-120913-258-260	Ground water
VPB144-TRIP BLANKS-121013	Trip Blank

Data validation activities were conducted with reference to *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW846, specifically SW-846 Method 8260B, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry* (USEPA, 1996), *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (June 2008), and Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.2 (DoD, October 2010). In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

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

✓	Data completeness (chain-of-custody (COC))/sample integrity
✓	Holding times and sample preservation
✓	GC/MS performance checks
✓	Initial calibration/continuing calibration verification
✓	Laboratory blanks/trip blanks/equipment blanks
✓	Surrogate spike recoveries
NA	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Laboratory control sample (LCS) results
NA	Field duplicates
✓	Internal standards
✓	Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. There were no data points qualified or rejected on the basis of this data review.

RESULTS

Data Completeness/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Due to limitations in the reporting system, the laboratory omitted the "VPB-144-" prefix from the sample ID in the report. The submitted EDD file reflects the full sample ID.

Holding Times/Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria.

The QC acceptance criteria were met.

GC/MS Performance Checks

The data were reviewed to ensure that the 4-bromofluorobenzene (BFB) tuning was performed at the correct frequency and that the method acceptance criteria were met.

The QC acceptance criteria were met.

Initial Calibration/Continuing Calibration Verification

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

- the initial calibration (ICAL) percent relative standard deviation (%RSD), correlation coefficient (r)/coefficient of determination (r^2), and/or response factor method acceptance criteria were met;
- the continuing calibration verification standard (CCV) method percent difference or percent drift (%Ds) and RF acceptance criteria were met; and
- the retention time method acceptance criteria were met.

The QC acceptance criteria were met.

Laboratory Blanks/Equipment Blanks/Trip Blanks

Laboratory method blanks and trip blanks were evaluated as to whether there were contaminants detected above the detection limit (DL).

Data validation qualifications for individual samples are based on the maximum contaminant concentration detected in all associated blanks.

Method and trip blank results were reviewed for conformance with the QC acceptance criteria. Detected results in blanks are not discussed in this data validation report if the associated results were nondetect or if qualification of sample results was not required.

The QC acceptance criteria were met and/or qualification of the sample results was not required.

Surrogate Spike Recoveries

The surrogate percent recoveries (%Rs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

MS/MSD Results

The MS/MSD %Rs and relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria.

MS/MSD analyses were not performed on samples reported in this SDG. There were no validation actions taken on this basis.

LCS/LCSD Results

The LCS/LCSD %Rs and/or relative percent recoveries (RPDs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Field Duplicate Results

Field duplicate RPDs were reviewed for conformance with the QC criterion of $\leq$30% for aqueous matrices. This criterion applies if both results were greater than five times the Limit of Quantitation (LOQ).

There were no field duplicate samples submitted with this data set. No validation actions were taken on this basis.

Internal Standard Results

The internal standard (IS) recoveries were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Sample Results/Reporting Issues

Compounds that were not detected in the sample are reported as undetected (U) at the Limit of Detection (LOD).

Compounds detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the detection limit (DL) were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation.

Any sample that was analyzed at a dilution due to high concentrations of target or non-target compounds or matrix interferences was checked to ensure that the results and/or sample specific QLs were adjusted accordingly by the laboratory.

QUALIFICATION ACTIONS

No sample results were qualified as a result of this data review.

Katahdin ANALYTICAL SERVICES
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Scarborough, ME 04074
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE BEAR DOWN AND PRINT LEGIBLY IN PEN

Client: Resolution Consultants	Contact: Eleanor Vivaudou	Phone #: (845) 425-4980	Fax #: ( )
Address: 100 Red Schoolhouse Rd	City: Chestnut Ridge	State: NY	Zip Code: 10977
Purchase Order #:	Proj. Name / No.: Bethpage 60266526 FI.WI		Katahdin Quote #:
Bill (if different than above):	Address:		
Sampler (Print / Sign): Valerie Thayer V Thayer		Copies To: Valerie Thayer	

LAB USE ONLY WORK ORDER #: SG 9670
KATAHDIN PROJECT NUMBER ____
REMARKS: ____
SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT
AIRBILL NO: ____
TEMP°C ____ ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES (Filt. ☐Y ☐N for each column)

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	PCBs	VOCs 624/HCL	pH	Total Metals HNO3	VOCs 8260/HCL					
	1DWGW-121013-FRAC TANK 1 (Green)	12/10/13 / 9:30	W	2	X									
	1DWGW-121013-FRAC TANK 1 (Green)	12/10/13 / 9:30	W	3		X								
	1DWGW-121013 FRAC TANK 1 (Green)	12/10/13 / 9:30	W	1			X							
	1DWGW-121013-Frac Tank 1 (Green)	12/10/13 / 9:30	W	1				X						
	VPB144-GW-120913-258-260	12/09/13 / 14:30	GW	3					X					
	VPB144-Trip blanks-121013	/	W	3.										
	Temperature Blank	/	W	1										
		/												
		/												
		/												

COMMENTS: → NOTE: Trip blanks have lab date 9-24-13 NOON placed in cooler for VPB 144 - hydropunch samples ~~12/10/13~~ VT 12-11-13 0925

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
Valerie Thayer	12/10/13 6:00	[signature]			
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

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Katahdin
ANALYTICAL SERVICES

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Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9670-2
Client ID: TRIP BLANKS-121013
Project: Navy Clean WE15 NWIRP B
SDG: SG9670
Lab File ID: C4768.D

Sample Date: 10-DEC-13
Received Date: 11-DEC-13
Extract Date: 12-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136049

Analysis Date: 12-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 12-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		84.5	%					
Toluene-d8		88.5	%					
1,2-Dichloroethane-d4		101.	%					
Dibromofluoromethane		89.0	%					

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Katahdin
ANALYTICAL SERVICES

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Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9670-3
Client ID: GW-120913-258-260
Project: Navy Clean WE15 NWIRP B
SDG: SG9670
Lab File ID: C4769.D

Sample Date: 09-DEC-13
Received Date: 11-DEC-13
Extract Date: 12-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136049

Analysis Date: 12-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 12-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		88.4	%					
Toluene-d8		90.8	%					
1,2-Dichloroethane-d4		106.	%					
Dibromofluoromethane		93.3	%					

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AECOM
250 Apollo Drive
Chelmsford, MA 01886-3140

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978.905.2101 fax

Data Validation Report

Project:	Regional Groundwater Investigation - NWIRP Bethpage	
Laboratory:	Katahdin Analytical	
Service Request:	SG9768	
Analyses/Method:	EPA SW-846 Method 8260B for VOCs (GC/MS)	
Validation Level:	Limited	
AECOM Project Number:	60266526.SA.DV	
Prepared by:	Sheena Blair/AECOM	Completed on: 01/22/2014
Reviewed by:	Lori Herberich/AECOM	File Name: SG9768_8260B

SUMMARY

The samples listed below were collected by AECOM from the Regional Groundwater Investigation - NWIRP Bethpage site on December 12, 2013.

Sample ID	Matrix/Sample Type
VPB144-GW-121213-363-365	Groundwater
VPB144-GW-121213-378-380	Groundwater
VPB144-TRIP BLANK-121213	Trip Blank

Data validation activities were conducted with reference to *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW846, specifically SW-846 Method 8260B, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry* (USEPA, 1996), *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (June 2008), and Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.2 (DoD, October 2010). In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

The Investigation Derived Waste samples submitted with this sample set were not validated.

REVIEW ELEMENTS

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

✓	Data completeness (chain-of-custody (COC)/sample integrity
✓	Holding times and sample preservation
✓	GC/MS performance checks
✓	Initial calibration/continuing calibration verification
✓	Laboratory blanks/trip blanks/equipment blanks
✓	Surrogate spike recoveries
NA	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Laboratory control sample (LCS) results

NA	Field duplicates
✓	Internal standards
✓	Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. There were no data points qualified or rejected on the basis of this data review.

RESULTS

Data Completeness

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Due to limitations in the reporting system, the laboratory omitted the "VPB144-" prefix from the sample ID in the report. The submitted EDD file reflects the full sample ID.

Holding Times/Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria.

The QC acceptance criteria were met.

GC/MS Performance Checks

The data were reviewed to ensure that the 4-bromofluorobenzene (BFB) tuning was performed at the correct frequency and that the method acceptance criteria were met. All samples were analyzed within 12 hours of the BFB tunes.

Initial Calibration/Continuing Calibration Verification

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

- the initial calibration (ICAL) percent relative standard deviation (%RSD), correlation coefficient (r)/coefficient of determination (r^2), and/or response factor method acceptance criteria were met;

- the continuing calibration verification standard (CCV) method percent difference or percent drift (%Ds) and RF acceptance criteria were met; and
- the retention time method acceptance criteria were met.

The QC acceptance criteria were met.

Laboratory Blanks/Equipment Blanks/Trip Blanks

Laboratory method blanks and trip blanks were evaluated as to whether there were contaminants detected above the detection limit (DL).

Data validation qualifications for individual samples are based on the maximum contaminant concentration detected in all associated blanks.

Method and trip blank results were reviewed for conformance with the QC acceptance criteria. Detected results in blanks are not discussed in this data validation report if the associated results were nondetect or if qualification of sample results was not required.

The QC acceptance criteria were met and/or qualification of the sample results was not required.

Surrogate Spike Recoveries

The surrogate recoveries (%Rs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

MS/MSD Results

MS/MSD analyses were not performed on samples reported in this SDG. There were no validation actions taken on this basis.

LCS/LCSD Results

The LCS/LCSD %Rs and/or relative percent recoveries (RPDs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Field Duplicate Results

There were no field duplicate samples submitted with this data set. No validation actions were taken on this basis.

Internal Standard Results

The internal standard (IS) recoveries were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Sample Results/Reporting Issues

Compounds that were not detected in the sample are reported as undetected (U) at the Limit of Detection (LOD).

Compounds detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the detection limit (DL) were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation.

Any sample that was analyzed at a dilution due to high concentrations of target or non-target compounds or matrix interferences was checked to ensure that the results and/or sample specific QLs were adjusted accordingly by the laboratory.

QUALIFICATION ACTIONS

No sample results were qualified as a result of this data review.

ATTACHMENTS

Attachment A: Nonconformance Summary Tables

Attachment B: Qualifier Codes and Explanations

Attachment A

Non Conformance Summary Tables

No nonconformances were identified in this data set.

Attachment B

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Katahdin ANALYTICAL SERVICES
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Scarborough, ME 04074
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE BEAR DOWN AND PRINT LEGIBLY IN PEN

Client: Resolution Consultants
Contact: Eleanor Vivaudou
Phone #: (845) 425-4980
Fax #: ( )

Address: 100 Red Schoolhouse Rd
City: Chestnut Ridge
State: NY
Zip Code: 10977

Purchase Order #:
Proj. Name / No.: NWIRP Bethpage / 60265526
Katahdin Quote #:

Bill (if different than above):
Address:

Sampler (Print / Sign): Michael Zobel / [signature]
Copies To:

LAB USE ONLY
WORK ORDER #: SG 9768
KATAHDIN PROJECT NUMBER:
REMARKS:

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT
AIRBILL NO.:
TEMP°C ______ ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES (each column: Filt. ☐Y ☐N)

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	VOC	Paint Filter / metal Reactivity	TSS / IG-N	SVOA / PCB TCLP Metals	TPH	Trip Blank w/ MeOH 3 NaHSO4	Temp Blank DI H2O in 4oz jar			
	VPB144-GW-121213-~~358-360~~ 363-365	12-12-13 / 1310	GW	3	3									
	VPB144-GW-121213-~~378~~-380	12-12-13 / 1535	GW	3	3									
	VPB144-Trip Blank-121213	12-12-13 / 15:30	W	4										
	Bethpage 121213 Temp Blank 12/32	12/12/13 / 15:30	W	1							1			
	Rollott 12/12	12/12/13 / 15:30	S	4		2	1	1	1					
	Rollott 12/12 Soil Trip Blank	12/12/13 / 15:30	W	4						4				
	Rollott 12/12	12/12/13 / 15:30	S	4	4									
		/												
		/												
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		/												

COMMENTS: Rollott 12/12 samples in (4) 8oz JARS. Samples: Paint Filter/metal Reactivity; TSS/IGN/SVOA/TCLP Metals; AND TPH. VOC samples, 4 VOA (1w) methanol + 3 (w) DI H2O

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
[signature]	12-12-13 1700	[signature] 12-13-13 10:20			
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

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ANALYTICAL SERVICES

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Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9768-1
Client ID: GW-121213-363-365
Project: Navy Clean WE15 NWIRP B
SDG: SG9768
Lab File ID: S9695.D

Sample Date: 12-DEC-13
Received Date: 13-DEC-13
Extract Date: 16-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136270

Analysis Date: 16-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 16-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene		11	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		83.2	%					
Toluene-d8		90.7	%					
1,2-Dichloroethane-d4		92.7	%					
Dibromofluoromethane		89.8	%					

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Katahdin
ANALYTICAL SERVICES

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Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9768-2
Client ID: GW-121213-378-380
Project: Navy Clean WE15 NWIRP B
SDG: SG9768
Lab File ID: S9696.D

Sample Date: 12-DEC-13
Received Date: 13-DEC-13
Extract Date: 16-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136270

Analysis Date: 16-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 16-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	J	0.57	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene		20	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		84.1	%					
Toluene-d8		90.6	%					
1,2-Dichloroethane-d4		92.3	%					
Dibromofluoromethane		88.9	%					

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ANALYTICAL SERVICES

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Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9768-3
Client ID: TRIP BLANK-121213
Project: Navy Clean WE15 NWIRP B
SDG: SG9768
Lab File ID: S9694.D

Sample Date: 12-DEC-13
Received Date: 13-DEC-13
Extract Date: 16-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136270

Analysis Date: 16-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 16-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		83.3	%					
Toluene-d8		91.0	%					
1,2-Dichloroethane-d4		91.0	%					
Dibromofluoromethane		90.2	%					

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978.905.2101 fax

Data Validation Report

Project:	Regional Groundwater Investigation - NWIRP Bethpage	
Laboratory:	Katahdin Analytical	
Service Request:	SG9836	
Analyses/Method:	EPA SW-846 Method 8260B for VOCs (GC/MS)	
Validation Level:	Limited	
AECOM Project Number:	60266526.SA.DV	
Prepared by:	Sheena Blair/AECOM	Completed on: 01/28/2014
Reviewed by:	Lori Herberich/AECOM	File Name: SG9836_8260B

SUMMARY

The samples listed below were collected by Resolution Consultants from the Regional Groundwater Investigation - NWIRP Bethpage site on December 16, 2013.

Sample ID	Matrix/Sample Type
VPB144-GW-121613-423-425	Ground water
VPB144-GW-121613-438-440	Ground water
VPB144-TRIP BLANK-121613	Trip Blank

Data validation activities were conducted with reference to *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW846, specifically SW-846 Method 8260B, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry* (USEPA, 1996), *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (June 2008), and Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.2 (DoD, October 2010). In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

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

✓	Data completeness (chain-of-custody (COC))/sample integrity
✓	Holding times and sample preservation
✓	GC/MS performance checks
✓	Initial calibration/continuing calibration verification
✓	Laboratory blanks/trip blanks/equipment blanks
✓	Surrogate spike recoveries
NA	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Laboratory control sample (LCS) results
NA	Field duplicates
✓	Internal standards

✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. There were no data points qualified or rejected on the basis of this data review.

RESULTS

Data Completeness/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Due to limitations in the reporting system, the laboratory omitted the "VPB-144-" prefix from the sample ID in the report. The submitted EDD file reflects the full sample ID.

Sample VPB-144-GW-121313-398-400 was listed on the COC; however, the vials for this sample were broken in transit. No validation actions were required other than this notation.

Holding Times/Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria.

The QC acceptance criteria were met.

GC/MS Performance Checks

The data were reviewed to ensure that the 4-bromofluorobenzene (BFB) tuning was performed at the correct frequency and that the method acceptance criteria were met. The QC acceptance criteria were met.

Initial Calibration/Continuing Calibration Verification

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

- the initial calibration (ICAL) percent relative standard deviation (%RSD), correlation coefficient (r)/coefficient of determination (r^2), and/or response factor method acceptance criteria were met;

- the continuing calibration verification standard (CCV) method percent difference or percent drift (%Ds) and RF acceptance criteria were met; and
- the retention time method acceptance criteria were met.

The QC acceptance criteria were met.

Laboratory Blanks/Equipment Blanks/Trip Blanks

Laboratory method blank and trip blanks were evaluated as to whether there were contaminants detected above the detection limit (DL).

Data validation qualifications for individual samples are based on the maximum contaminant concentration detected in all associated blanks.

Method and trip blank results were reviewed for conformance with the QC acceptance criteria. Detected results in blanks are not discussed in this data validation report if the associated results were nondetect or if qualification of sample results was not required.

The QC acceptance criteria were met.

Surrogate Spike Recoveries

The surrogate percent recoveries (%Rs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

MS/MSD Results

MS/MSD analyses were not performed on samples reported in this SDG. There were no validation actions taken on this basis.

LCS Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Field Duplicate Results

Field duplicate RPDs were reviewed for conformance with the QC criterion of ≤30% for aqueous matrices. This criterion applies if both results were greater than five times the Limit of Quantitation (LOQ).

All QC acceptance criteria were met.

Internal Standard Results

The internal standard (IS) recoveries were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Sample Results/Reporting Issues

Compounds that were not detected in the sample are reported as undetected (U) at the Limit of Detection (LOD).

Compounds detected at concentrations less than the LOQ but greater than the detection limit (DL) were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation.

Any sample that was analyzed at a dilution due to high concentrations of target or non-target compounds or matrix interferences was checked to ensure that the results and/or sample specific LODs and LOQs were adjusted accordingly by the laboratory.

QUALIFICATION ACTIONS

No sample results were qualified as a result of this data review.

ATTACHMENTS

Attachment A: Nonconformance Summary Tables

Attachment B: Qualifier Codes and Explanations

Attachment A

Nonconformance Summary Tables

No nonconformances were identified in this data set.

Attachment B

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

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Scarborough, ME 04074
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Fax: (207) 775-4029

CHAIN of CUSTODY

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Client	Contact	Phone #	Fax #
Resolution Consultants	Eleanor Vivenzio	(845) 425-4980	( )

Address 100 Red Schoolhouse Rd City Chestnut Ridge State NY Zip Code 10977

Purchase Order # Proj. Name / No. NWIRP Bethpage / 6026526 Katahdin Quote #

Bill (if different than above) Address

Sampler (Print / Sign) Michael Zobel / Michael Zobel Copies To:

LAB USE ONLY WORK ORDER #: 5160 9836

KATAHDIN PROJECT NUMBER

REMARKS:

SHIPPING INFO: ❒ FED EX ❒ UPS ❒ CLIENT

AIRBILL NO:

TEMP°C ❒ TEMP BLANK ❒ INTACT ❒ NOT INTACT

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	ANALYSIS AND CONTAINER TYPE PRESERVATIVES: VOC	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒N	Filt. ❒Y ❒I
	VPB144-GW-121313-398-400	12-13-13 / 1125	GW	3	3									
	VPB144-GW-121613-423-425	12-16-13 / 1120	GW	3	3									
	VPB144-GW-121613-434-440	12-16-13 / 1325	GW	3	3									
	VPB144-TRIP BLANK-121613	11-25-13 / 1400	W	3	3									
		/												
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COMMENTS

12-17-13 / 0700

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
Michael Zobel	12-16-13 1700				
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

00000029

ORIGINAL

Katahdin
ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9836-4
Client ID: TRIP BLANK-121613
Project: Navy Clean WE15 NWIRP B
SDG: SG9836
Lab File ID: C4867.D

Sample Date: 16-DEC-13
Received Date: 17-DEC-13
Extract Date: 18-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136381

Analysis Date: 18-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 18-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		86.9	%					
Toluene-d8		91.2	%					
1,2-Dichloroethane-d4		99.6	%					
Dibromofluoromethane		91.0	%					

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Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9836-2
Client ID: GW-121613-423-425
Project: Navy Clean WE15 NWIRP B
SDG: SG9836
Lab File ID: C4868.D

Sample Date: 16-DEC-13
Received Date: 17-DEC-13
Extract Date: 18-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136381

Analysis Date: 18-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 18-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	J	0.40	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene		7.8	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		89.4	%					
Toluene-d8		90.7	%					
1,2-Dichloroethane-d4		106.	%					
Dibromofluoromethane		94.3	%					

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ANALYTICAL SERVICES

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Report of Analytical Results

Client: AECOM Environment
Lab ID: SG9836-3
Client ID: GW-121613-438-440
Project: Navy Clean WE15 NWIRP B
SDG: SG9836
Lab File ID: C4869.D

Sample Date: 16-DEC-13
Received Date: 17-DEC-13
Extract Date: 18-DEC-13
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG136381

Analysis Date: 18-DEC-13
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 18-DEC-13

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene		1.9	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		90.9	%					
Toluene-d8		92.3	%					
1,2-Dichloroethane-d4		107.	%					
Dibromofluoromethane		96.7	%					

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Data Validation Report

Project:	Regional Groundwater Investigation - NWIRP Bethpage	
Laboratory:	Katahdin Analytical	
Service Request:	SH0003	
Analyses/Method:	EPA SW-846 Method 8260B for VOCs (GC/MS)	
Validation Level:	Limited	
AECOM Project Number:	60266526.SA.DV	
Prepared by:	Sheena Blair/AECOM	Completed on: 3/13/2014
Reviewed by:	Lori Herberich/AECOM	File Name: SH0003_8260B

SUMMARY

The samples listed below were collected by Resolution Consultants from the Regional Groundwater Investigation - NWIRP Bethpage site on December 27 and 30, 2013.

Sample ID	Matrix/Sample Type
VPB144-GW-122713-643-645	Ground water
VPB144-GW-122713-658-660	Ground water
VPB144-GW-123013-688-690	Ground water
VPB144-TRIP BLANK-123013	Trip Blank

Data validation activities were conducted with reference to *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW846, specifically SW-846 Method 8260B, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry* (USEPA, 1996), *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (June 2008), and Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.2 (DoD, October 2010). In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

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

✗	Data completeness (chain-of-custody (COC))/sample integrity
✓	Holding times and sample preservation
✓	GC/MS performance checks
✗	Initial calibration/continuing calibration verification
✓	Laboratory blanks/trip blanks/equipment blanks
✓	Surrogate spike recoveries
NA	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Laboratory control sample (LCS) results
NA	Field duplicates

✓ Internal standards
✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. No data were rejected. Selected data points were estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

Data Completeness/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Due to limitations in the reporting system, the laboratory omitted the "VPB-144-" prefix from the sample ID in the report. The submitted EDD file reflects the full sample ID.

Samples VPB144-GW-122713-658-660 and VPB144-GW-122713-643-645 were extremely silty and had very little standing water. The laboratory decanted the water from the individual vials and made a composite for each of the samples; the composite was then made up to a final 40mLs volume with deionized water. As a result samples VPB144-GW-122713-658-660 and VPB144-GW-122713-643-645 were analyzed at 6- and 10-fold dilutions, respectively. Positive and nondetect results for these samples were qualified as estimated, J and UJ, respectively, due to possible loss of VOCs and compromised sample integrity during the compositing procedure.

Qualified sample results are shown in Table 1.

Holding Times/Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria.

The QC acceptance criteria were met.

GC/MS Performance Checks

The data were reviewed to ensure that the 4-bromofluorobenzene (BFB) tuning was performed at the correct frequency and that the method acceptance criteria were met.

The QC acceptance criteria were met.

Initial Calibration/Continuing Calibration Verification

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

- the initial calibration (ICAL) percent relative standard deviation (%RSD), correlation coefficient (r)/coefficient of determination (r^2), and/or response factor method acceptance criteria were met;
- the continuing calibration verification standard (CCV) method percent difference or percent drift (%Ds) and RF acceptance criteria were met; and
- the retention time method acceptance criteria were met.

Data qualification to the analytes associated with the specific ICAL and/or CCV was as follows:

CCV Linearity Nonconformances:

Nonconformance	Actions	
	Detected Results	Nondetected Results
%D > 20%	J	UJ
%Drift	J*	UJ*
* No guidance in NFG, thus professional judgment was used		

Qualified sample results are shown in Table 1. Nonconformances are summarized in Attachment A in Table A-1.

Laboratory Blanks/Equipment Blanks/Trip Blanks

Laboratory method blanks, equipment rinsate and trip blanks were evaluated as to whether there were contaminants detected above the detection limit (DL).

Data validation qualifications for individual samples are based on the maximum contaminant concentration detected in all associated blanks.

Method and trip blank results were reviewed for conformance with the QC acceptance criteria. Detected results in blanks are not discussed in this data validation report if the associated results were nondetect or if qualification of sample results was not required.

The QC acceptance criteria were met and/or qualification of the sample results was not required.

Surrogate Spike Recoveries

The surrogate percent recoveries (%Rs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

MS/MSD Results

MS/MSD analyses were not performed on samples reported in this SDG. There were no validation actions taken on this basis.

LCS/LCSD Results

The LCS/LCSD %Rs and/or relative percent recoveries (RPDs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Field Duplicate Results

There were no field duplicate samples submitted with this data set. No validation actions were taken on this basis.

Internal Standard Results

The internal standard (IS) recoveries were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Sample Results/Reporting Issues

Compounds that were not detected in the sample are reported as undetected (U) at the Limit of Detection (LOD).

Compounds detected at concentrations less than the LOQ but greater than the detection limit (DL) were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation.

Any sample that was analyzed at a dilution due to high concentrations of target or non-target compounds or matrix interferences was checked to ensure that the results and/or sample specific LODs and LOQs were adjusted accordingly by the laboratory.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Nonconformance Summary Tables

Attachment B: Qualifier Codes and Explanations

Attachment C: Reason Codes and Explanations

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Matrix	Compound	Result	LOD	Units	Validation Qualifiers	Validation Reason
VPB144-GW-122713-643-645	WG	1,1,1-TRICHLOROETHANE		5.0	UG/L	UJ	mc
VPB144-GW-122713-643-645	WG	1,1,2,2-TETRACHLOROETHANE		5.0	UG/L	UJ	mc
VPB144-GW-122713-643-645	WG	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		5.0	UG/L	UJ	c,mc
VPB144-GW-122713-643-645	WG	1,1,2-TRICHLOROETHANE		5.0	UG/L	UJ	mc
VPB144-GW-122713-643-645	WG	1,1-DICHLOROETHANE		5.0	UG/L	UJ	mc
VPB144-GW-122713-643-645	WG	1,1-DICHLOROETHENE		5.0	UG/L	UJ	mc
VPB144-GW-122713-643-645	WG	1,2-DICHLOROETHANE		5.0	UG/L	UJ	mc
VPB144-GW-122713-643-645	WG	CARBON TETRACHLORIDE		5.0	UG/L	UJ	c,mc
VPB144-GW-122713-643-645	WG	CHLOROBENZENE		5.0	UG/L	UJ	mc
VPB144-GW-122713-643-645	WG	CHLOROFORM		5.0	UG/L	UJ	mc
VPB144-GW-122713-643-645	WG	CIS-1,2-DICHLOROETHENE		5.0	UG/L	UJ	mc
VPB144-GW-122713-643-645	WG	TETRACHLOROETHENE		5.0	UG/L	UJ	mc
VPB144-GW-122713-643-645	WG	TRANS-1,2-DICHLOROETHENE		5.0	UG/L	UJ	mc
VPB144-GW-122713-643-645	WG	TRICHLOROETHENE		5.0	UG/L	UJ	mc
VPB144-GW-122713-658-660	WG	1,1,1-TRICHLOROETHANE		3.0	UG/L	UJ	mc
VPB144-GW-122713-658-660	WG	1,1,2,2-TETRACHLOROETHANE		3.0	UG/L	UJ	mc
VPB144-GW-122713-658-660	WG	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		3.0	UG/L	UJ	c,mc
VPB144-GW-122713-658-660	WG	1,1,2-TRICHLOROETHANE		3.0	UG/L	UJ	mc
VPB144-GW-122713-658-660	WG	1,1-DICHLOROETHANE		3.0	UG/L	UJ	mc
VPB144-GW-122713-658-660	WG	1,1-DICHLOROETHENE		3.0	UG/L	UJ	mc
VPB144-GW-122713-658-660	WG	1,2-DICHLOROETHANE		3.0	UG/L	UJ	mc
VPB144-GW-122713-658-660	WG	CARBON TETRACHLORIDE		3.0	UG/L	UJ	c,mc
VPB144-GW-122713-658-660	WG	CHLOROBENZENE		3.0	UG/L	UJ	mc
VPB144-GW-122713-658-660	WG	CHLOROFORM		3.0	UG/L	UJ	mc
VPB144-GW-122713-658-660	WG	CIS-1,2-DICHLOROETHENE		3.0	UG/L	UJ	mc

Sample ID	Matrix	Compound	Result	LOD	Units	Validation Qualifiers	Validation Reason
VPB144-GW-122713-658-660	WG	TETRACHLOROETHENE		3.0	UG/L	UJ	mc
VPB144-GW-122713-658-660	WG	TRANS-1,2-DICHLOROETHENE		3.0	UG/L	UJ	mc
VPB144-GW-122713-658-660	WG	TRICHLOROETHENE		3.0	UG/L	UJ	mc
VPB144-GW-123013-688-690	WG	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		0.50	UG/L	UJ	c
VPB144-GW-123013-688-690	WG	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c
VPB144-TRIP BLANK-123013	WQ	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		0.50	UG/L	UJ	c
VPB144-TRIP BLANK-123013	WQ	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c

Attachment A

Nonconformance Summary Tables

Table A-1 -Continuing Calibration Verification Standard

Calibration	Compound	%D or %Drift
WG137014	Carbon tetrachloride	34.5
	Freon-113	34.9
Associated samples: Samples reported from batch WG137014		

Attachment B

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Attachment C

Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
c	Calibration issue
co	Analyte carryover
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate RPDs
h	Holding times
i	Internal standard areas
k	Estimated Maximum Possible Concentration (EMPC)
l	LCS or OPR recoveries
lc	Labeled compound recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
md	Matrix spike/matrix spike duplicate RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
r	Dual column RPD
q	Quantitation issue
s	Surrogate recovery
su	Ion suppression
t	Temperature preservation issue
x	Percent solids
y	Serial dilution results
z	ICS results
mc	Deviation from the method.

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Scarborough, ME 04074
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CHAIN of CUSTODY

PLEASE BEAR DOWN AND PRINT LEGIBLY IN PEN

Client: Resolution Consultants	Contact: Eleanor Vivaldo	Phone #: (845) 425-4980	Fax #: ( )
Address: 100 Red Schoolhouse Rd	City: Chestnut Ridge	State: NY	Zip Code: 10977
Purchase Order #	Proj. Name / No.: NWIRP Bethpage / 60265526	Katahdin Quote #	
Bill (if different than above)	Address		
Sampler (Print / Sign): Michael Zobel / Michael Zobel		Copies To:	

LAB USE ONLY WORK ORDER #: SH0003

KATAHDIN PROJECT NUMBER

REMARKS:

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO:

TEMP°C ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	ANALYSIS AND CONTAINER TYPE / PRESERVATIVES: VOC	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N
	VPB144-GW-122713-643-645	12-27-13 / 0940	GW	3	3									
	VPB144-GW-122713-658-660	12-27-13 / 1210	GW	3	3									
	VPB144-TripBlank-123013	11-25-13 / 1400	W	3	3									
	VPB144-GW-123013-688-690	12-30-13 / 1430	GW	3	3									
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COMMENTS

1-2-14 12:30

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
Michael Zobel	12-30-13 1700	Dana Medler			
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

ORIGINAL

Katahdin
ANALYTICAL SERVICES

ACCREDITED IN ACCORDANCE WITH nelac
Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SH0003-1DL
Client ID: GW-122713-643-645
Project: Navy Clean WE15 NWIRP B
SDG: SH0003
Lab File ID: C5086.D

Sample Date: 27-DEC-13
Received Date: 02-JAN-14
Extract Date: 03-JAN-14
Extracted By: DJP
Extraction Method: SW846 5030
Lab Prep Batch: WG137014

Analysis Date: 03-JAN-14
Analyst: DJP
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 06-JAN-14

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U UJ	5.0	ug/L	10	1	10.	3.5	5.0
Freon-113	U	5.0	ug/L	10	1	10.	3.1	5.0
trans-1,2-Dichloroethene	U	5.0	ug/L	10	1	10.	2.5	5.0
1,1-Dichloroethane	U	5.0	ug/L	10	1	10.	2.1	5.0
cis-1,2-Dichloroethene	U	5.0	ug/L	10	1	10.	2.1	5.0
Chloroform	U	5.0	ug/L	10	1	10.	3.2	5.0
Carbon Tetrachloride	U	5.0	ug/L	10	1	10.	2.2	5.0
1,1,1-Trichloroethane	U	5.0	ug/L	10	1	10.	2.0	5.0
1,2-Dichloroethane	U	5.0	ug/L	10	1	10.	2.0	5.0
Trichloroethene	U	5.0	ug/L	10	1	10.	2.8	5.0
Tetrachloroethene	U	5.0	ug/L	10	1	10.	4.0	5.0
1,1,2-Trichloroethane	U	5.0	ug/L	10	1	10.	3.3	5.0
Chlorobenzene	U	5.0	ug/L	10	1	10.	2.2	5.0
1,1,2,2-Tetrachloroethane	U	5.0	ug/L	10	1	10.	3.8	5.0
P-Bromofluorobenzene		93.7	%					
Toluene-d8		98.7	%					
1,2-Dichloroethane-d4		109.	%					
Dibromofluoromethane		100.	%					

3/17/14

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ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SH0003-2DL
Client ID: GW-122713-658-660
Project: Navy Clean WE15 NWIRP B
SDG: SH0003
Lab File ID: C5087.D

Sample Date: 27-DEC-13
Received Date: 02-JAN-14
Extract Date: 03-JAN-14
Extracted By: DJP
Extraction Method: SW846 5030
Lab Prep Batch: WG137014

Analysis Date: 03-JAN-14
Analyst: DJP
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 06-JAN-14

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U UJ	3.0	ug/L	6	1	6.0	2.1	3.0
Freon-113	U	3.0	ug/L	6	1	6.0	1.9	3.0
trans-1,2-Dichloroethene	U	3.0	ug/L	6	1	6.0	1.5	3.0
1,1-Dichloroethane	U	3.0	ug/L	6	1	6.0	1.3	3.0
cis-1,2-Dichloroethene	U	3.0	ug/L	6	1	6.0	1.3	3.0
Chloroform	U	3.0	ug/L	6	1	6.0	1.9	3.0
Carbon Tetrachloride	U	3.0	ug/L	6	1	6.0	1.3	3.0
1,1,1-Trichloroethane	U	3.0	ug/L	6	1	6.0	1.2	3.0
1,2-Dichloroethane	U	3.0	ug/L	6	1	6.0	1.2	3.0
Trichloroethene	U	3.0	ug/L	6	1	6.0	1.7	3.0
Tetrachloroethene	U	3.0	ug/L	6	1	6.0	2.4	3.0
1,1,2-Trichloroethane	U	3.0	ug/L	6	1	6.0	2.0	3.0
Chlorobenzene	U	3.0	ug/L	6	1	6.0	1.3	3.0
1,1,2,2-Tetrachloroethane	U	3.0	ug/L	6	1	6.0	2.3	3.0
P-Bromofluorobenzene		94.0	%					
Toluene-d8		97.0	%					
1,2-Dichloroethane-d4		111.	%					
Dibromofluoromethane		98.4	%					

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Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SH0003-4
Client ID: GW-123013-688-690
Project: Navy Clean WE15 NWIRP B
SDG: SH0003
Lab File ID: C5084.D

Sample Date: 30-DEC-13
Received Date: 02-JAN-14
Extract Date: 03-JAN-14
Extracted By: DJP
Extraction Method: SW846 5030
Lab Prep Batch: WG137014

Analysis Date: 03-JAN-14
Analyst: DJP
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 06-JAN-14

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		91.5	%					
Toluene-d8		95.8	%					
1,2-Dichloroethane-d4		112.	%					
Dibromofluoromethane		104.	%					

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ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SH0003-3
Client ID: TRIP BLANK-123013
Project: Navy Clean WE15 NWIRP B
SDG: SH0003
Lab File ID: C5080.D

Sample Date: 30-DEC-13
Received Date: 02-JAN-14
Extract Date: 03-JAN-14
Extracted By: DJP
Extraction Method: SW846 5030
Lab Prep Batch: WG137014

Analysis Date: 03-JAN-14
Analyst: DJP
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 06-JAN-14

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		93.3	%					
Toluene-d8		97.6	%					
1,2-Dichloroethane-d4		104.	%					
Dibromofluoromethane		98.8	%					

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250 Apollo Drive
Chelmsford, MA 01886-3140

978.905.2100 tel
978.905.2101 fax

Data Validation Report

Project:	Regional Groundwater Investigation - NWIRP Bethpage	
Laboratory:	Katahdin Analytical	
Service Request:	SH0067	
Analyses/Method:	EPA SW-846 Method 8260B for VOCs (GC/MS) and EPA SW-846 Method 9060 for TOC (Carbonaceous analyzer, IR or FID)	
Validation Level:	Limited	
AECOM Project Number:	60266526.SA.DV	
Prepared by:	Sheena Blair/AECOM	Completed on: 01/29/2014
Reviewed by:	Lori Herberich/AECOM	File Name: SH0067_8260B and 9060

SUMMARY

The samples listed below were collected by Resolution Consultants from the Regional Groundwater Investigation - NWIRP Bethpage site on December 30 and 31, 2013 and January 6, 2014.

Sample ID	Matrix/Sample Type	Analysis
VPB144-GW-123113-698-700	Groundwater	SW-846 Method 8260B
VPB144-SOIL-123013-682-685	Soil	SW-846 Method 9060
VPB144-SOIL-D-123013	Soil	SW-846 Method 9060
VPB144-TRIP BLANK-010614	Trip Blank	SW-846 Method 8260B

The samples were analyzed in accordance with *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW846* (USEPA, 1996), specifically:

- Method 8260B, *Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry*
- Method 9060A, *Total Organic Carbon*

Data validation activities were conducted with reference to these methods, *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (June 2008), *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (January 2010), and Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.2 (DoD, October 2010) where applicable. In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

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

- ✓ Data completeness (chain-of-custody (COC))/sample integrity
- ✓ Holding times and sample preservation
- ✓ GC/MS performance checks

✗ Initial calibration/continuing calibration verification
✓ Laboratory blanks/trip blanks/equipment blanks
✓ Surrogate spike recoveries
✗ Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
✓ Field duplicates
✓ Internal standards
✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. No data were rejected. Selected data points were estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

Data Completeness/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Due to limitations in the reporting system, the laboratory omitted the "VPB-144-" prefix from the sample ID in the report. The submitted EDD file reflects the full sample ID.

Holding Times/Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria.

The QC acceptance criteria were met.

GC/MS Performance Checks

The data were reviewed to ensure that the 4-bromofluorobenzene (BFB) tuning was performed at the correct frequency and that the method acceptance criteria were met.

Initial Calibration/Continuing Calibration Verification

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

- the initial calibration (ICAL) percent relative standard deviation (%RSD), correlation coefficient (r)/coefficient of determination (r^2), and/or response factor method acceptance criteria were met;
- the initial calibration verification (ICV) percent recovery (%R) criteria were met; and
- the continuing calibration verification standard (CCV) method percent difference or percent drift (%Ds), %Rs, and/or RF acceptance criteria were met; and/or
- the retention time method acceptance criteria were met.

Data qualification to the analytes associated with the CCV is as follows:

CCV Linearity Nonconformances

Nonconformance	Actions	
	Detected Results	Nondetected Results
%D > 20%	J	UJ
%Drift >20%	J*	UJ*
* No guidance in NFG, thus professional judgment was used		

Qualified sample results are shown in Table 1. Nonconformances are summarized in Attachment A in Table A-1.

Laboratory Blanks/Equipment Blanks/Trip Blanks

Laboratory method blanks and trip blanks were evaluated as to whether there were contaminants detected above the detection limit (DL).

Data validation qualifications for individual samples are based on the maximum contaminant concentration detected in all associated blanks.

Method and trip blank results were reviewed for conformance with the QC acceptance criteria. Detected results in blanks are not discussed in this data validation report if the associated results were nondetect or if qualification of sample results was not required.

The QC acceptance criteria were met and/or qualification of the sample results was not required.

Surrogate Spike Recoveries

The surrogate recoveries (%Rs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

MS/MSD Results

The MS/MSD %Rs and relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria.

Data qualification to the analytes associated with the specific MS/MSD nonconformances was as follows:

Criteria	Action	
	Detected Compounds	Nondetected Compounds
%R > UL	J	No qualification
20% ≤ %R < LL	J	UJ
%R <20% (see note 1)	J	R*
%RPD > UL (see note 2)	J	No qualification
Note: Actions are applied to the native unspiked sample only (see note 3) *When the native sample concentration is >4X the concentration of the spike added (based on Region I criteria), evaluate the MS, MSD, and native sample with regards to %RSD rather than %R (professional judgment)		

Notes:

1. Based on NFG 2008 VOC guidance, professional judgment is used to reject (R) non-detects in all associated samples for any analyte with < 20% recovery. Also, professional judgment is used to estimate (UJ) rather the reject (R) sample results previously negated (U) on the basis of blank contamination.
2. In the absence of Region 2 guidance, RPD actions are based on professional judgment.
3. If a field duplicate sample was also collected for the native sample chosen for MS/MSD analysis, professional judgment is used to apply MS/MSD actions to the corresponding field duplicate sample as well as the native sample.

Nonconformances are summarized in Attachment A in Table A-2. Qualified sample results are shown in Table 1.

LCS/LCSD Results

The LCS/LCSD %Rs and/or relative percent recoveries (RPDs) were reviewed for conformance with the QC acceptance criteria.

The LCS for batch WG137156 had a high recovery for Freon-113. However, the associated samples were nondetect and these results were accepted without qualification.

Field Duplicate Results

Field duplicate RPDs were reviewed for conformance with the QC criterion of ≤50% for the solid field duplicatepair VPB144-SOIL-123013-682-685 and VPB144-SOIL-D-123013 . This criterion applies if both results were greater than five times the Limit of Quantitation (LOQ).

All QC acceptance criteria were met.

Internal Standard Results

The internal standard (IS) recoveries were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Sample Results/Reporting Issues

Compounds that were not detected in the sample are reported as undetected (U) at the Limit of Detection (LOD).

Compounds detected at concentrations less than the LOQ but greater than the detection limit (DL) were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation.

Any sample that was analyzed at a dilution due to high concentrations of target or non-target compounds or matrix interferences was checked to ensure that the results and/or sample specific LODs and LOQs were adjusted accordingly by the laboratory.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Nonconformance Summary Tables

Attachment B: Qualifier Codes and Explanations

Attachment C: Reason Codes and Explanations

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Matrix	Compound	Result	LOQ	Units	Validation Qualifiers	Validation Reason
VPB144-GW-123113-698-700	WG	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		0.50	UG/L	UJ	c
VPB144-SOIL-123013-682-685	SO	TOTAL ORGANIC CARBON	110	360	UG/G	J	m
VPB144-TRIP BLANK-010614	WQ	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		0.50	UG/L	UJ	c

Attachment A

Non Conformance Summary Tables

Table A-1 -Continuing Calibration Verification Standard

CCV ID	Compound	% D or % Drift	Limits
WG137156	1,1,2,2-TETRACHLOROETHANE	23.6	<20%

Table A-2 - Matrix Spikes

Sample ID	Compound	MS % Recovery	MSD % Recovery	Lower Limit	Upper Limit	RPD	RPD Limit
VPB144-SOIL-123013-682-685	TOTAL ORGANIC CARBON	131		75	125		

Attachment B

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Attachment C

Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
c	Calibration issue
co	Analyte carryover
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate RPDs
h	Holding times
i	Internal standard areas
k	Estimated Maximum Possible Concentration (EMPC)
l	LCS or OPR recoveries
lc	Labeled compound recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
md	Matrix spike/matrix spike duplicate RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
r	Dual column RPD
q	Quantitation issue
s	Surrogate recovery
su	Ion suppression
t	Temperature preservation issue
x	Percent solids
y	Serial dilution results
z	ICS results

Katahdin ANALYTICAL SERVICES
600 Technology Way
Scarborough, ME 04074
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE BEAR DOWN AND PRINT LEGIBLY IN PEN

Client	Contact	Phone #	Fax #
Resolution Consultants	Eleanor Vivavolou	(845) 425-4950	( )

Address	City	State	Zip Code
100 Red Schoolhouse Rd	Chestnut Ridge	NY	10977

Purchase Order #	Proj. Name / No.	Katahdin Quote #
	NWIRP Bethpage / 60265526	

Bill (if different than above) — Address

Sampler (Print / Sign): Michael Zobel / Michael Zobel — Copies To:

LAB USE ONLY — WORK ORDER #: 5H0068T

KATAHDIN PROJECT NUMBER

REMARKS:

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO:

TEMP°C ____ ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	ANALYSIS AND CONTAINER TYPE PRESERVATIVES: Filt. ☐Y ☐N — VOC	TOC								
	VPB144-GW-123113-698-700	12-31-13 / 1030	GW	3	3									
	VPB144-SOIL-123013-682-685	12-30-13 / 1215	Soil	1		1								
	VPB144-SOIL-D-123013	12-30-13 / —	Soil	1		1								
	VPB144-TRIPBLANK-020614	11-25-13 → 12-26-13 / 1400	W	3	3									
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COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
Michael Zobel	1-6-14 / 1700	1-7-14 0945			
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

THE TERMS AND CONDITIONS ON THE REVERSE SIDE HEREOF SHALL GOVERN SERVICES, EXCEPT WHEN A SIGNED CONTRACTUAL AGREEMENT EXISTS.

ORIGINAL

KAS-COC1

Katahdin
ANALYTICAL SERVICES

ACCREDITED IN ACCORDANCE WITH nelac
Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SH0067-1
Client ID: -GW-123113-698-700
Project: Navy Clean WE15 NWIRP B
SDG: SH0067
Lab File ID: C5118.D

Sample Date: 31-DEC-13
Received Date: 07-JAN-14
Extract Date: 08-JAN-14
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG137156

Analysis Date: 08-JAN-14
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 09-JAN-14

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	~~UL~~ UJ	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		94.2	%					
Toluene-d8		96.8	%					
1,2-Dichloroethane-d4		106.	%					
Dibromofluoromethane		99.5	%					

2/17/14

600 Technology Way
P.O. Box 540, Scarborough, ME 04070
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http://www.katahdinlab.com

Katahdin
ANALYTICAL SERVICES

ACCREDITED IN ACCORDANCE WITH melac
Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SH0067-4
Client ID: TRIP BLANK-010614
Project: Navy Clean WE15 NWIRP B
SDG: SH0067
Lab File ID: C5117.D

Sample Date: 06-JAN-14
Received Date: 07-JAN-14
Extract Date: 08-JAN-14
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG137156

Analysis Date: 08-JAN-14
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 09-JAN-14

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	~~UL~~ UJ	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		93.3	%					
Toluene-d8		96.4	%					
1,2-Dichloroethane-d4		105.	%					
Dibromofluoromethane		98.8	%					

R 2/17/14

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http://www.katahdinlab.com

Katahdin
ANALYTICAL SERVICES

Accredited in accordance with nelac
Cert No E87604

Report of Analytical Results

Client: Rick Purdy
AECOM
701 Edgewater Drive
Wakefield,MA 01880

Lab Sample ID: SH0067-2
Report Date: 14-JAN-14
Client PO: 60266526 ATS-3(WE15)
Project: Navy Clean WE15 NWIR
SDG: SH0067

Sample Description	Matrix	Date Sampled	Date Received
SOIL-123013-682-685	SL	30-DEC-13	07-JAN-14

Parameter	Result	Adj LOQ	Adj MDL	Adj LOD	Anal. Method	QC.Batch	Anal. Date	Prep. Method	Prep. Date	Footnotes
TOC In Soil	110 J ~~1140~~ ug/gdrywt	480	100	360	SW846 M9060	WG137383	13-JAN-14 14:06:00	N/A	N/A	
Total Solids	83. %	1		N/A	SM2540G	WG137164	09-JAN-14 12:03:31	SM2540G	09-JAN-14	

2/17/14

Katahdin Analytical Services 0000097

Katahdin
ANALYTICAL SERVICES

ACCREDITED IN ACCORDANCE WITH nelac
Cert No E87604

Report of Analytical Results

Client: Rick Purdy
AECOM
701 Edgewater Drive
Wakefield,MA 01880

Lab Sample ID: SH0067-3
Report Date: 14-JAN-14
Client PO: 60266526 ATS-3(WE15)
Project: Navy Clean WE15 NWIR
SDG: SH0067

Sample Description	Matrix	Date Sampled	Date Received
SOIL-D-123013	SL	30-DEC-13	07-JAN-14

Parameter	Result	Adj LOQ	Adj MDL	Adj LOD	Anal. Method	QC.Batch	Anal. Date	Prep. Method	Prep. Date	Footnotes
TOC In Soil	U350 ug/gdrywt	470	100	350	SW846 M9060	WG137383	13-JAN-14 14:25:59	N/A	N/A	
Total Solids	84. %	1		N/A	SM2540G	WG137164	09-JAN-14 12:03:44	SM2540G	09-JAN-14	

AECOM
250 Apollo Drive
Chelmsford, MA 01886-3140

978.905.2100 tel
978.905.2101 fax

Data Validation Report

Project:	Regional Groundwater Investigation - NWIRP Bethpage	
Laboratory:	Katahdin Analytical	
Service Request:	SH0166	
Analyses/Method:	EPA SW-846 Method 8260B for VOCs (GC/MS)	
Validation Level:	Limited	
AECOM Project Number:	60266526.SA.DV	
Prepared by:	Sheena Blair/AECOM	Completed on: 02/06/2014
Reviewed by:	Lori Herberich/AECOM	File Name: SH0166_8260B

SUMMARY

The samples listed below were collected by Resolution Consultants from the Regional Groundwater Investigation - NWIRP Bethpage site on January 8 and 9, 2014.

Sample ID	Matrix/Sample Type
VPB144-GW-010814-738-740	Ground water
VPB144-GW-010914-758-760	Ground water
VPB144-TRIP BLANK-010914	Trip Blank

Data validation activities were conducted with reference to *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW846, specifically SW-846 Method 8260B, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry* (USEPA, 1996), *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (June 2008), and Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.2 (DoD, October 2010). In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

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

- ✓ Data completeness (chain-of-custody (COC))/sample integrity
- ✓ Holding times and sample preservation
- ✓ GC/MS performance checks
- ✓ Initial calibration/continuing calibration verification
- ✓ Laboratory blanks/trip blanks/equipment blanks
- ✓ Surrogate spike recoveries
- NA Matrix spike (MS) and/or matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS) results
- NA Field duplicates
- ✓ Internal standards

✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. . There were no data points qualified or rejected on the basis of this data review.

RESULTS

Data Completeness/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Due to limitations in the reporting system, the laboratory omitted the "VPB-144-" prefix from the sample ID in the report. The submitted EDD file reflects the full sample ID.

Holding Times/Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria.

The QC acceptance criteria were met.

GC/MS Performance Checks

The data were reviewed to ensure that the 4-bromofluorobenzene (BFB) tuning was performed at the correct frequency and that the method acceptance criteria were met.

The QC acceptance criteria were met.

Initial Calibration/Continuing Calibration Verification

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

- the initial calibration (ICAL) percent relative standard deviation (%RSD), correlation coefficient (r)/coefficient of determination (r^2), and/or response factor method acceptance criteria were met;
- the continuing calibration verification standard (CCV) method percent difference or percent drift (%Ds) and RF acceptance criteria were met; and

- the retention time method acceptance criteria were met.

The ICV associated with the samples in this data set had a high %R for 1, 1-dichloroethene; however, all samples were non-detect and accepted without qualification.

Laboratory Blanks/Equipment Blanks/Trip Blanks

Laboratory method blanks, equipment rinsate and trip blanks were evaluated as to whether there were contaminants detected above the detection limit (DL).

Data validation qualifications for individual samples are based on the maximum contaminant concentration detected in all associated blanks.

Method, equipment rinsate and trip blank results were reviewed for conformance with the QC acceptance criteria. Detected results in blanks are not discussed in this data validation report if the associated results were nondetect or if qualification of sample results was not required.

The QC acceptance criteria were met and/or qualification of the sample results was not required.

Surrogate Spike Recoveries

The surrogate percent recoveries (%Rs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

MS/MSD Results

MS/MSD analyses were not performed on samples reported in this SDG. There were no validation actions taken on this basis.

LCS Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Field Duplicate Results

There were no field duplicate samples submitted with this data set. No validation actions were taken on this basis.

Internal Standard Results

The internal standard (IS) recoveries were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

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250 Apollo Drive
Chelmsford, MA 01886-3140

978.905.2100 tel
978.905.2101 fax

Sample Results/Reporting Issues

Compounds that were not detected in the sample are reported as undetected (U) at the Limit of Detection (LOD).

Compounds detected at concentrations less than the LOQ but greater than the detection limit (DL) were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation.

Any sample that was analyzed at a dilution due to high concentrations of target or non-target compounds or matrix interferences was checked to ensure that the results and/or sample specific LODs and LOQs were adjusted accordingly by the laboratory.

QUALIFICATION ACTIONS

No sample results were qualified as a result of this data review.

ATTACHMENTS

Attachment A: Nonconformance Summary Tables

Attachment B: Qualifier Codes and Explanations

Attachment A

Non Conformance Summary Tables

No nonconformances were identified in this data set.

Attachment B

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

SAP Worksheet #21: Project Sampling SOP References Table

Reference Number	Title, Revision Date and/or Number	Originating Organization	Equipment Identification	Modified for Project Work Y or N	Comments
SOP-022	*SOP-022, Surface and Subsurface Soil Sample Procedure,* Revision 1, December 2006	AECOM	Stainless steel bowls, Stainless steel trowels, stakes and flagging, electronic pan scale and weights for calibration, Syringes or other discrete soil core samplers	N	
SOP-009	*SOP-009: Procedures for Equipment Decontamination,* Revision Original. July 20, 2004.	AECOM	All non-dedicated equipment (*i.e.*, Water Level Indicator)	N	
SOP-027	*SOP-027: Monitoring Well Installation and Development,* Revision 0, December 1, 2006.	AECOM	Peristaltic Pump, Bailer, YSI Water Quality Meter, Turbidimeter, Water Level Indicator	N	
SOP-012	*SOP-012: Water Level Measurements,* Revision 1, December 8, 2006.	AECOM	Water level indicator	N	
SOP-005	*SOP-005: Low Stress Groundwater Sampling Procedures,* Revision 04. March 2010.	AECOM	Peristaltic Pump, Bailer, YSI Water Quality Meter, Turbidimeter, Water Level Indicator	N	
SOP-013	*SOP-013: Procedures for Field Sample Collection, Custody and Shipping,* Revision 00, October 30, 2007.	AECOM	coolers, stickers, tape, paint cans, labels, chain of custodies, placards, vermiculite, bubble wrap, ice, hazardous goods shipping paperwork, airbills, custody seals	N	
604.010	*Technical Guidance for Handling, Packaging, and Shipping of Environmental Samples and Small Quantities of Hazardous Materials*, 604.010, Revision 4, November 2001	AECOM	coolers, stickers, tape, paint cans, labels, chain of custodies, placards, vermiculite, bubble wrap, ice, hazardous goods shipping paperwork, airbills, custody seals	N	

SOPs are included in Appendix A

Katahdin ANALYTICAL SERVICES
600 Technology Way
Scarborough, ME 04074
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE BEAR DOWN AND PRINT LEGIBLY IN PEN

Client	Contact	Phone #	Fax #
Resolution Consultants	Eleanor Vivaudou	(845) 425-4990	( )

Address	City	State	Zip Code
100 Red Schoolhouse Rd	Chestnut Ridge	NY	10977

Purchase Order #	Proj. Name / No.	Katahdin Quote #
	NWIRP Bethpage c/60265526	

Bill (if different than above)	Address

Sampler (Print / Sign)	Copies To:
Michael Zobel / Michael Zobel	

LAB USE ONLY WORK ORDER #: 5H0166

KATAHDIN PROJECT NUMBER _____

REMARKS: _____

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO: _____

TEMP°C _____ ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	ANALYSIS AND CONTAINER TYPE PRESERVATIVES: VOC	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N
	VPB144-GW-010914-738-740	1-8-14 / 1525	GW	3	3										
	VPB144-TripBlank-010914	11-25-13 / 1400	W	3	3										
	VPB144-GW-010914-758-760	1-9-14 / 1120	GW	3	3										
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COMMENTS

1-10-14 / 0900

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
Michael Zobel	1-9-14 1640				
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

ORIGINAL

Katahdin
ANALYTICAL SERVICES

ACCREDITED IN ACCORDANCE WITH nelac
Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SH0166-1
Client ID: GW-010814-738-740
Project: Navy Clean WE15 NWIRP B
SDG: SH0166
Lab File ID: C5161.D

Sample Date: 08-JAN-14
Received Date: 10-JAN-14
Extract Date: 13-JAN-14
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG137376

Analysis Date: 13-JAN-14
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 14-JAN-14

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		95.3	%					
Toluene-d8		100.	%					
1,2-Dichloroethane-d4		109.	%					
Dibromofluoromethane		104.	%					

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http://www.katahdinlab.com

Katahdin
ANALYTICAL SERVICES

ACCREDITED IN ACCORDANCE WITH
nelac
Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SH0166-2
Client ID: TRIP BLANK-010914
Project: Navy Clean WE15 NWIRP B
SDG: SH0166
Lab File ID: C5160.D

Sample Date: 09-JAN-14
Received Date: 10-JAN-14
Extract Date: 13-JAN-14
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG137376

Analysis Date: 13-JAN-14
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 14-JAN-14

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		95.1	%					
Toluene-d8		97.9	%					
1,2-Dichloroethane-d4		101.	%					
Dibromofluoromethane		97.0	%					

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Katahdin
ANALYTICAL SERVICES

ACCREDITED IN ACCORDANCE WITH
nelac
Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SH0166-3
Client ID: GW-010914-758-760
Project: Navy Clean WE15 NWIRP B
SDG: SH0166
Lab File ID: C5162.D

Sample Date: 09-JAN-14
Received Date: 10-JAN-14
Extract Date: 13-JAN-14
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG137376

Analysis Date: 13-JAN-14
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 14-JAN-14

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
P-Bromofluorobenzene		92.5	%					
Toluene-d8		97.6	%					
1,2-Dichloroethane-d4		104.	%					
Dibromofluoromethane		98.7	%					

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AECOM
250 Apollo Drive
Chelmsford, MA 01886-3140

978.905.2100 tel
978.905.2101 fax

Data Validation Report

Project:	Regional Groundwater Investigation - NWIRP Bethpage	
Laboratory:	Katahdin Analytical	
Service Request:	SH0268	
Analyses/Method:	EPA SW-846 Method 8260B for VOCs (GC/MS)	
Validation Level:	Limited	
AECOM Project Number:	60266526.SA.DV	
Prepared by:	Sheena Blair/AECOM	Completed on: 03/05/2014
Reviewed by:	Lori Herberich/AECOM	File Name: SH0268_8260B

SUMMARY

The samples listed below were collected by Resolution Consultants from the Regional Groundwater Investigation - NWIRP Bethpage site on January 10 and 13, 2014.

Sample ID	Matrix/Sample Type
VPB144-GW-011014-798-800	Ground water
VPB144-GW-011314-818-820	Ground water
VPB144-GW-011314-838-840	Ground water
VPB144-TRIP BLANK-011314	Trip Blank

Data validation activities were conducted with reference to *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW846, specifically SW-846 Method 8260B, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry* (USEPA, 1996), *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (June 2008), and Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.2 (DoD, October 2010). In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

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

✗	Data completeness (chain-of-custody (COC))/sample integrity
✓	Holding times and sample preservation
✓	GC/MS performance checks
✗	Initial calibration/continuing calibration verification
✓	Laboratory blanks/trip blanks/equipment blanks
✓	Surrogate spike recoveries
NA	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Laboratory control sample (LCS) results
NA	Field duplicates

✓ Internal standards
✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. No data were rejected. Selected data points were estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

Data Completeness

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Due to limitations in the reporting system, the laboratory omitted the "VPB-144-" prefix from the sample ID in the report. The submitted EDD file reflects the full sample ID.

Sample VPB144-GW-011314-818-820 was extremely silty and had very little standing water. The laboratory decanted the water from the individual vials and made a composite for the sample. Positive and nondetect results for this sample were qualified as estimated, J and UJ, respectively, due to possible loss of VOCs and compromised sample integrity during the compositing procedure.

Holding Times/Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria.

The QC acceptance criteria were met.

GC/MS Performance Checks

The data were reviewed to ensure that the 4-bromofluorobenzene (BFB) tuning was performed at the correct frequency and that the method acceptance criteria were met.

The QC acceptance criteria were met.

Initial Calibration/Continuing Calibration Verification

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

- the initial calibration (ICAL) percent relative standard deviation (%RSD), correlation coefficient (r)/coefficient of determination (r^2), and/or response factor method acceptance criteria were met;
- the continuing calibration verification standard (CCV) method percent difference or percent drift (%Ds) and RF acceptance criteria were met; and
- the retention time method acceptance criteria were met.

The ICV associated with the samples in this data set had high %Rs for selected compounds; however, all these compounds were non-detect and were accepted without qualification

Laboratory Blanks/Equipment Blanks/Trip Blanks

Laboratory method blanks, equipment rinsate and trip blanks were evaluated as to whether there were contaminants detected above the detection limit (DL).

Data validation qualifications for individual samples are based on the maximum contaminant concentration detected in all associated blanks.

Method, equipment rinsate and trip blank results were reviewed for conformance with the QC acceptance criteria. Detected results in blanks are not discussed in this data validation report if the associated results were nondetect or if qualification of sample results was not required.

The QC acceptance criteria were met and/or qualification of the sample results was not required.

Surrogate Spike Recoveries

The surrogate percent recoveries (%Rs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

MS/MSD Results

MS/MSD analyses were not performed on samples reported in this SDG. There were no validation actions taken on this basis.

LCS Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria.

Acetone and 2-butanone had high %Rs for batch WG137496; however, all associated samples were nondetect for these compounds and the results were accepted without qualification.

Field Duplicate Results

There were no field duplicate samples submitted with this data set. No validation actions were taken on this basis.

Internal Standard Results

The internal standard (IS) recoveries were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Sample Results/Reporting Issues

Compounds that were not detected in the sample are reported as undetected (U) at the Limit of Detection (LOD).

Compounds detected at concentrations less than the LOQ but greater than the detection limit (DL) were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation.

Any sample that was analyzed at a dilution due to high concentrations of target or non-target compounds or matrix interferences was checked to ensure that the results and/or sample specific LODs and LOQs were adjusted accordingly by the laboratory.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Nonconformance Summary Tables

Attachment B: Qualifier Codes and Explanations

Attachment C: Reason Codes and Explanations

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Matrix	Compound	Result	LOD	Units	Validation Qualifiers	Validation Reason
VPB144 GW 011014-798-800	WG	2-BUTANONE		2.5	UG/L	UJ	c
VPB144-GW-011014-798-800	WG	2-HEXANONE		2.5	UG/L	UJ	c
VPB144-GW-011014-798-800	WG	ACETONE		2.5	UG/L	UJ	c
VPB144-GW-011014-798-800	WG	CARBON TETRACHLORIDE		0.50	UG/L	UJ	c
VPB144-GW-011014-798-800	WG	DICHLORODIFLUOROMETHANE		1.0	UG/L	UJ	c
VPB144-GW-011314-818-820	WG	1,1,1-TRICHLOROETHANE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	1,1,2,2-TETRACHLOROETHANE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	1,1,2-TRICHLOROETHANE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	1,1-DICHLOROETHANE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	1,1-DICHLOROETHENE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	1,2,4-TRICHLOROBENZENE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	1,2-DIBROMO-3-CHLOROPROPANE		0.75	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	1,2-DIBROMOETHANE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	1,2-DICHLOROBENZENE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	1,2-DICHLOROETHANE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	1,2-DICHLOROETHENE, TOTAL		1.0	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	1,2-DICHLOROPROPANE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	1,3-DICHLOROBENZENE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	1,4-DICHLOROBENZENE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	2-BUTANONE		2.5	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	2-HEXANONE		2.5	UG/L	UJ	mc

Sample ID	Matrix	Compound	Result	LOD	Units	Validation Qualifiers	Validation Reason
VPB144-GW-011314-818-820	WG	4-METHYL-2-PENTANONE		2.5	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	ACETONE		2.5	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	BENZENE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	BROMODICHLOROMETHANE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	BROMOFORM		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	BROMOMETHANE		1.0	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	CARBON DISULFIDE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	CARBON TETRACHLORIDE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	CHLOROBENZENE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	CHLOROETHANE		1.0	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	CHLOROFORM		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	CHLOROMETHANE		1.0	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	CIS-1,2-DICHLOROETHENE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	CIS-1,3-DICHLOROPROPENE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	CYCLOHEXANE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	DIBROMOCHLOROMETHANE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	DICHLORODIFLUOROMETHANE		1.0	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	ETHYLBENZENE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	ISOPROPYLBENZENE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	M- AND P-XYLENE		1.0	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	METHYL ACETATE		0.75	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	METHYL CYCLOHEXANE		0.50	UG/L	UJ	mc
VPB144-GW-	WG	METHYL TERT-BUTYL ETHER		0.50	UG/L	UJ	mc

Sample ID	Matrix	Compound	Result	LOD	Units	Validation Qualifiers	Validation Reason
011314-818-820							
VPB144-GW-011314-818-820	WG	METHYLENE CHLORIDE		2.5	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	O-XYLENE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	STYRENE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	TETRACHLOROETHENE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	TOLUENE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	TRANS-1,2-DICHLOROETHENE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	TRANS-1,3-DICHLOROPROPENE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	TRICHLOROETHENE		0.50	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	TRICHLOROFLUOROMETHANE		1.0	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	VINYL CHLORIDE		1.0	UG/L	UJ	mc
VPB144-GW-011314-818-820	WG	XYLENES, TOTAL		1.5	UG/L	UJ	mc

Attachment A

Nonconformance Summary Tables

No nonconformances tables were required.

Attachment B

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Attachment C

Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
c	Calibration issue
co	Analyte carryover
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate RPDs
h	Holding times
i	Internal standard areas
k	Estimated Maximum Possible Concentration (EMPC)
l	LCS or OPR recoveries
lc	Labeled compound recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
md	Matrix spike/matrix spike duplicate RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
r	Dual column RPD
q	Quantitation issue
s	Surrogate recovery
su	Ion suppression
t	Temperature preservation issue
x	Percent solids
y	Serial dilution results
z	ICS results
mc	Deviation from the method.

Katahdin ANALYTICAL SERVICES

600 Technology Way
Scarborough, ME 04074
Tel: (207) 874-2400
Fax: (207) 775-4029

CHAIN of CUSTODY

PLEASE BEAR DOWN AND PRINT LEGIBLY IN PEN

Client	Contact	Phone #	Fax #
Resolution Consultants	Eleanor Vivaudou	(845)425-4980	( )

Address: 100 Red Schoolhouse Rd City: Chestnut Ridge State: NY Zip Code: 10977

Purchase Order # | Proj. Name / No.: NWIRP Bethpage / 60265526 | Katahdin Quote #

Bill (if different than above) | Address

Sampler (Print / Sign): Michael Zabel / Michael Zabel | Copies To:

LAB USE ONLY WORK ORDER #: SH0268

KATAHDIN PROJECT NUMBER

REMARKS:

SHIPPING INFO: ☐ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO:

TEMP°C ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	NOC	ANALYSIS AND CONTAINER TYPE PRESERVATIVES: Filt. ☐Y ☐N
	~~VPB144-GW-011014-798-798~~	~~1-10-14 / 1020~~	GW	~~3~~	~~3~~	(N2)
	VPB144-GW-011014-798-800	1-10-14 / 1300	GW	3	3	
	VPB144-GW-011314-818-820	1-13-14 / 1025	GW	3	3	
	VPB144-GW-011314-838-840	1-13-14 / 1305	GW	3	3	
	VPB144-TripBlank-011314	11-25-13 / 1400	W	3	3	
		/				
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		/				
		/				
		/				

COMMENTS

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
Michael Zabel	1-13-14 1645	1-15-14 0915			
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)

THE TERMS AND CONDITIONS ON THE REVERSE SIDE HEREOF SHALL GOVERN SERVICES, EXCEPT WHEN A SIGNED CONTRACTUAL AGREEMENT EXISTS.

ORIGINAL 00000009

KAS-COC1

Katahdin
ANALYTICAL SERVICES

ACCREDITED IN ACCORDANCE WITH nelac
Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SH0268-1
Client ID: GW-011014-798-800
Project: Navy Clean WE15 NWIRP B
SDG: SH0268
Lab File ID: S9817.D

Sample Date: 10-JAN-14
Received Date: 15-JAN-14
Extract Date: 15-JAN-14
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG137496

Analysis Date: 15-JAN-14
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 19-FEB-14

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
Dichlorodifluoromethane	~~U~~ UJ	1.0	ug/L	1	2	2.0	0.24	1.0
Chloromethane	U	1.0	ug/L	1	2	2.0	0.36	1.0
Vinyl Chloride	U	1.0	ug/L	1	2	2.0	0.25	1.0
Bromomethane	U	1.0	ug/L	1	2	2.0	0.49	1.0
Chloroethane	U	1.0	ug/L	1	2	2.0	0.55	1.0
Trichlorofluoromethane	U	1.0	ug/L	1	2	2.0	0.24	1.0
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Carbon Disulfide	U	0.50	ug/L	1	1	1.0	0.25	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
Methylene Chloride	U	2.5	ug/L	1	5	5.0	1.1	2.5
Acetone	~~UL~~ UJ	2.5	ug/L	1	5	5.0	2.2	2.5
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
Methyl tert-butyl Ether	U	0.50	ug/L	1	1	1.0	0.36	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
2-Butanone	~~UL~~ UJ	2.5	ug/L	1	5	5.0	1.3	2.5
Cyclohexane	U	0.50	ug/L	1	1	1.0	0.31	0.50
Carbon Tetrachloride	~~U~~ UJ	0.50	ug/L	1	1	1.0	0.22	0.50
Benzene	U	0.50	ug/L	1	1	1.0	0.26	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
1,2-Dichloropropane	U	0.50	ug/L	1	1	1.0	0.25	0.50
Bromodichloromethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
cis-1,3-Dichloropropene	U	0.50	ug/L	1	1	1.0	0.19	0.50
Toluene	U	0.50	ug/L	1	1	1.0	0.27	0.50
4-Methyl-2-Pentanone	U	2.5	ug/L	1	5	5.0	1.3	2.5
trans-1,3-Dichloropropene	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
Dibromochloromethane	U	0.50	ug/L	1	1	1.0	0.30	0.50
2-Hexanone	~~U~~ UJ	2.5	ug/L	1	5	5.0	1.7	2.5
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
Ethylbenzene	U	0.50	ug/L	1	1	1.0	0.21	0.50

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REISSUE

Katahdin
ANALYTICAL SERVICES

Accredited in accordance with the NELAC
Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SH0268-1
Client ID: GW-011014-798-800
Project: Navy Clean WE15 NWIRP B
SDG: SH0268
Lab File ID: S9817.D

Sample Date: 10-JAN-14
Received Date: 15-JAN-14
Extract Date: 15-JAN-14
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG137496

Analysis Date: 15-JAN-14
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 19-FEB-14

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
Xylenes (total)	U	1.5	ug/L	1	3	3.0	0.25	1.5
Styrene	U	0.50	ug/L	1	1	1.0	0.23	0.50
Bromoform	U	0.50	ug/L	1	1	1.0	0.23	0.50
Isopropylbenzene	U	0.50	ug/L	1	1	1.0	0.23	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
1,3-Dichlorobenzene	U	0.50	ug/L	1	1	1.0	0.26	0.50
1,4-Dichlorobenzene	U	0.50	ug/L	1	1	1.0	0.24	0.50
1,2-Dichlorobenzene	U	0.50	ug/L	1	1	1.0	0.15	0.50
1,2,4-Trichlorobenzene	U	0.50	ug/L	1	1	1.0	0.37	0.50
Methyl Acetate	U	0.75	ug/L	1	1	1.0	0.53	0.75
Methylcyclohexane	U	0.50	ug/L	1	1	1.0	0.30	0.50
o-Xylene	U	0.50	ug/L	1	1	1.0	0.25	0.50
M+P-Xylenes	U	1.0	ug/L	1	2	2.0	0.59	1.0
1,2-Dichloroethylene (Total)	U	1.0	ug/L	1	2	2.0	0.21	1.0
1,2-Dibromoethane	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,2-Dibromo-3-Chloropropane	U	0.75	ug/L	1	1	1.0	0.50	0.75
P-Bromofluorobenzene		91.6	%					
Toluene-d8		99.1	%					
1,2-Dichloroethane-d4		100.	%					
Dibromofluoromethane		95.7	%					

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REISSUE

Katahdin
ANALYTICAL SERVICES

ACCREDITED IN ACCORDANCE WITH nelac
Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SH0268-2
Client ID: GW-011314-818-820
Project: Navy Clean WE15 NWIRP B
SDG: SH0268
Lab File ID: S9818.D

Sample Date: 13-JAN-14
Received Date: 15-JAN-14
Extract Date: 15-JAN-14
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG137496

Analysis Date: 15-JAN-14
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 19-FEB-14

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
Dichlorodifluoromethane	U UJ	1.0	ug/L	1	2	2.0	0.24	1.0
Chloromethane	U	1.0	ug/L	1	2	2.0	0.36	1.0
Vinyl Chloride	U	1.0	ug/L	1	2	2.0	0.25	1.0
Bromomethane	U	1.0	ug/L	1	2	2.0	0.49	1.0
Chloroethane	U	1.0	ug/L	1	2	2.0	0.55	1.0
Trichlorofluoromethane	U	1.0	ug/L	1	2	2.0	0.24	1.0
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Carbon Disulfide	U	0.50	ug/L	1	1	1.0	0.25	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
Methylene Chloride	U	2.5	ug/L	1	5	5.0	1.1	2.5
Acetone	UL	2.5	ug/L	1	5	5.0	2.2	2.5
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
Methyl tert-butyl Ether	U	0.50	ug/L	1	1	1.0	0.36	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
2-Butanone	UL	2.5	ug/L	1	5	5.0	1.3	2.5
Cyclohexane	U	0.50	ug/L	1	1	1.0	0.31	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
Benzene	U	0.50	ug/L	1	1	1.0	0.26	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
1,2-Dichloropropane	U	0.50	ug/L	1	1	1.0	0.25	0.50
Bromodichloromethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
cis-1,3-Dichloropropene	U	0.50	ug/L	1	1	1.0	0.19	0.50
Toluene	U	0.50	ug/L	1	1	1.0	0.27	0.50
4-Methyl-2-Pentanone	U	2.5	ug/L	1	5	5.0	1.3	2.5
trans-1,3-Dichloropropene	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
Dibromochloromethane	U	0.50	ug/L	1	1	1.0	0.30	0.50
2-Hexanone	U	2.5	ug/L	1	5	5.0	1.7	2.5
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
Ethylbenzene	U	0.50	ug/L	1	1	1.0	0.21	0.50

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REISSUE

Katahdin
ANALYTICAL SERVICES

ACCREDITED IN ACCORDANCE WITH nelac
Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SH0268-2
Client ID: GW-011314-818-820
Project: Navy Clean WE15 NWIRP B
SDG: SH0268
Lab File ID: S9818.D

Sample Date: 13-JAN-14
Received Date: 15-JAN-14
Extract Date: 15-JAN-14
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG137496

Analysis Date: 15-JAN-14
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 19-FEB-14

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
Xylenes (total)	U UJ	1.5	ug/L	1	3	3.0	0.25	1.5
Styrene	U	0.50	ug/L	1	1	1.0	0.23	0.50
Bromoform	U	0.50	ug/L	1	1	1.0	0.23	0.50
Isopropylbenzene	U	0.50	ug/L	1	1	1.0	0.23	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
1,3-Dichlorobenzene	U	0.50	ug/L	1	1	1.0	0.26	0.50
1,4-Dichlorobenzene	U	0.50	ug/L	1	1	1.0	0.24	0.50
1,2-Dichlorobenzene	U	0.50	ug/L	1	1	1.0	0.15	0.50
1,2,4-Trichlorobenzene	U	0.50	ug/L	1	1	1.0	0.37	0.50
Methyl Acetate	U	0.75	ug/L	1	1	1.0	0.53	0.75
Methylcyclohexane	U	0.50	ug/L	1	1	1.0	0.30	0.50
o-Xylene	U	0.50	ug/L	1	1	1.0	0.25	0.50
M+P-Xylenes	U	1.0	ug/L	1	2	2.0	0.59	1.0
1,2-Dichloroethylene (Total)	U	1.0	ug/L	1	2	2.0	0.21	1.0
1,2-Dibromoethane	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,2-Dibromo-3-Chloropropane	U	0.75	ug/L	1	1	1.0	0.50	0.75
P-Bromofluorobenzene		91.4	%					
Toluene-d8		98.3	%					
1,2-Dichloroethane-d4		99.7	%					
Dibromofluoromethane		94.6	%					

3/16/14

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REISSUE

Katahdin Analytical Services 0000028

Katahdin
ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SH0268-3
Client ID: GW-011314-838-840
Project: Navy Clean WE15 NWIRP B
SDG: SH0268
Lab File ID: S9819.D

Sample Date: 13-JAN-14
Received Date: 15-JAN-14
Extract Date: 15-JAN-14
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG137496

Analysis Date: 15-JAN-14
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 19-FEB-14

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
Dichlorodifluoromethane	U	1.0	ug/L	1	2	2.0	0.24	1.0
Chloromethane	U	1.0	ug/L	1	2	2.0	0.36	1.0
Vinyl Chloride	U	1.0	ug/L	1	2	2.0	0.25	1.0
Bromomethane	U	1.0	ug/L	1	2	2.0	0.49	1.0
Chloroethane	U	1.0	ug/L	1	2	2.0	0.55	1.0
Trichlorofluoromethane	U	1.0	ug/L	1	2	2.0	0.24	1.0
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Carbon Disulfide	U	0.50	ug/L	1	1	1.0	0.25	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
Methylene Chloride	U	2.5	ug/L	1	5	5.0	1.1	2.5
Acetone	UL	2.5	ug/L	1	5	5.0	2.2	2.5
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
Methyl tert-butyl Ether	U	0.50	ug/L	1	1	1.0	0.36	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
2-Butanone	UL	2.5	ug/L	1	5	5.0	1.3	2.5
Cyclohexane	U	0.50	ug/L	1	1	1.0	0.31	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
Benzene	U	0.50	ug/L	1	1	1.0	0.26	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
1,2-Dichloropropane	U	0.50	ug/L	1	1	1.0	0.25	0.50
Bromodichloromethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
cis-1,3-Dichloropropene	U	0.50	ug/L	1	1	1.0	0.19	0.50
Toluene	U	0.50	ug/L	1	1	1.0	0.27	0.50
4-Methyl-2-Pentanone	U	2.5	ug/L	1	5	5.0	1.3	2.5
trans-1,3-Dichloropropene	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
Dibromochloromethane	U	0.50	ug/L	1	1	1.0	0.30	0.50
2-Hexanone	U	2.5	ug/L	1	5	5.0	1.7	2.5
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
Ethylbenzene	U	0.50	ug/L	1	1	1.0	0.21	0.50

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REISSUE

Report of Analytical Results

Client: AECOM Environment
Lab ID: SH0268-3
Client ID: GW-011314-838-840
Project: Navy Clean WE15 NWIRP B
SDG: SH0268
Lab File ID: S9819.D

Sample Date: 13-JAN-14
Received Date: 15-JAN-14
Extract Date: 15-JAN-14
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG137496

Analysis Date: 15-JAN-14
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 19-FEB-14

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
Xylenes (total)	U	1.5	ug/L	1	3	3.0	0.25	1.5
Styrene	U	0.50	ug/L	1	1	1.0	0.23	0.50
Bromoform	U	0.50	ug/L	1	1	1.0	0.23	0.50
Isopropylbenzene	U	0.50	ug/L	1	1	1.0	0.23	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
1,3-Dichlorobenzene	U	0.50	ug/L	1	1	1.0	0.26	0.50
1,4-Dichlorobenzene	U	0.50	ug/L	1	1	1.0	0.24	0.50
1,2-Dichlorobenzene	U	0.50	ug/L	1	1	1.0	0.15	0.50
1,2,4-Trichlorobenzene	U	0.50	ug/L	1	1	1.0	0.37	0.50
Methyl Acetate	U	0.75	ug/L	1	1	1.0	0.53	0.75
Methylcyclohexane	U	0.50	ug/L	1	1	1.0	0.30	0.50
o-Xylene	U	0.50	ug/L	1	1	1.0	0.25	0.50
M+P-Xylenes	U	1.0	ug/L	1	2	2.0	0.59	1.0
1,2-Dichloroethylene (Total)	U	1.0	ug/L	1	2	2.0	0.21	1.0
1,2-Dibromoethane	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,2-Dibromo-3-Chloropropane	U	0.75	ug/L	1	1	1.0	0.50	0.75
P-Bromofluorobenzene		92.9	%					
Toluene-d8		99.4	%					
1,2-Dichloroethane-d4		101.	%					
Dibromofluoromethane		94.0	%					

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ANALYTICAL SERVICES

ACCREDITED IN ACCORDANCE WITH nelac
Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SH0268-4
Client ID: TRIP BLANK-011314
Project: Navy Clean WE15 NWIRP B
SDG: SH0268
Lab File ID: S9816.D

Sample Date: 13-JAN-14
Received Date: 15-JAN-14
Extract Date: 15-JAN-14
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG137496

Analysis Date: 15-JAN-14
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 19-FEB-14

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
Dichlorodifluoromethane	U	1.0	ug/L	1	2	2.0	0.24	1.0
Chloromethane	U	1.0	ug/L	1	2	2.0	0.36	1.0
Vinyl Chloride	U	1.0	ug/L	1	2	2.0	0.25	1.0
Bromomethane	U	1.0	ug/L	1	2	2.0	0.49	1.0
Chloroethane	U	1.0	ug/L	1	2	2.0	0.55	1.0
Trichlorofluoromethane	U	1.0	ug/L	1	2	2.0	0.24	1.0
1,1-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.35	0.50
Carbon Disulfide	U	0.50	ug/L	1	1	1.0	0.25	0.50
Freon-113	U	0.50	ug/L	1	1	1.0	0.31	0.50
Methylene Chloride	J	2.2	ug/L	1	5	5.0	1.1	2.5
Acetone	UL	2.5	ug/L	1	5	5.0	2.2	2.5
trans-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.25	0.50
Methyl tert-butyl Ether	U	0.50	ug/L	1	1	1.0	0.36	0.50
1,1-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.21	0.50
cis-1,2-Dichloroethene	U	0.50	ug/L	1	1	1.0	0.21	0.50
Chloroform	U	0.50	ug/L	1	1	1.0	0.32	0.50
1,1,1-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
2-Butanone	UL	2.5	ug/L	1	5	5.0	1.3	2.5
Cyclohexane	U	0.50	ug/L	1	1	1.0	0.31	0.50
Carbon Tetrachloride	U	0.50	ug/L	1	1	1.0	0.22	0.50
Benzene	U	0.50	ug/L	1	1	1.0	0.26	0.50
1,2-Dichloroethane	U	0.50	ug/L	1	1	1.0	0.20	0.50
Trichloroethene	U	0.50	ug/L	1	1	1.0	0.28	0.50
1,2-Dichloropropane	U	0.50	ug/L	1	1	1.0	0.25	0.50
Bromodichloromethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
cis-1,3-Dichloropropene	U	0.50	ug/L	1	1	1.0	0.19	0.50
Toluene	U	0.50	ug/L	1	1	1.0	0.27	0.50
4-Methyl-2-Pentanone	U	2.5	ug/L	1	5	5.0	1.3	2.5
trans-1,3-Dichloropropene	U	0.50	ug/L	1	1	1.0	0.20	0.50
1,1,2-Trichloroethane	U	0.50	ug/L	1	1	1.0	0.33	0.50
Tetrachloroethene	U	0.50	ug/L	1	1	1.0	0.40	0.50
Dibromochloromethane	U	0.50	ug/L	1	1	1.0	0.30	0.50
2-Hexanone	U	2.5	ug/L	1	5	5.0	1.7	2.5
Chlorobenzene	U	0.50	ug/L	1	1	1.0	0.22	0.50
Ethylbenzene	U	0.50	ug/L	1	1	1.0	0.21	0.50

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ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: AECOM Environment
Lab ID: SH0268-4
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Extraction Method: SW846 5030
Lab Prep Batch: WG137496

Analysis Date: 15-JAN-14
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 19-FEB-14

Compound	Qualifier	Result	Units	Dilution	LOQ	ADJ LOQ	ADJ MDL	ADJ LOD
Xylenes (total)	U	1.5	ug/L	1	3	3.0	0.25	1.5
Styrene	U	0.50	ug/L	1	1	1.0	0.23	0.50
Bromoform	U	0.50	ug/L	1	1	1.0	0.23	0.50
Isopropylbenzene	U	0.50	ug/L	1	1	1.0	0.23	0.50
1,1,2,2-Tetrachloroethane	U	0.50	ug/L	1	1	1.0	0.38	0.50
1,3-Dichlorobenzene	U	0.50	ug/L	1	1	1.0	0.26	0.50
1,4-Dichlorobenzene	U	0.50	ug/L	1	1	1.0	0.24	0.50
1,2-Dichlorobenzene	U	0.50	ug/L	1	1	1.0	0.15	0.50
1,2,4-Trichlorobenzene	U	0.50	ug/L	1	1	1.0	0.37	0.50
Methyl Acetate	U	0.75	ug/L	1	1	1.0	0.53	0.75
Methylcyclohexane	U	0.50	ug/L	1	1	1.0	0.30	0.50
o-Xylene	U	0.50	ug/L	1	1	1.0	0.25	0.50
M+P-Xylenes	U	1.0	ug/L	1	2	2.0	0.59	1.0
1,2-Dichloroethylene (Total)	U	1.0	ug/L	1	2	2.0	0.21	1.0
1,2-Dibromoethane	U	0.50	ug/L	1	1	1.0	0.22	0.50
1,2-Dibromo-3-Chloropropane	U	0.75	ug/L	1	1	1.0	0.50	0.75
P-Bromofluorobenzene		91.3	%					
Toluene-d8		98.4	%					
1,2-Dichloroethane-d4		100.	%					
Dibromofluoromethane		95.1	%					

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Section 5

VPB 144 Analytical Data Table

Location		VPB144	VPB144	VPB144	VPB144	VPB144	VPB144	VPB144	VPB144
Sample Date	NYSDEC Groundwater Guidance or Standard Value (Note 1)	12/5/2013	12/5/2013	12/6/2013	12/6/2013	12/9/2013	12/9/2013	12/9/2013	12/10/2013
Sample ID		VPB144-GW-120513-58-60	VPB144-GW-120513-103-105	VPB144-GW-120613-148-150	VPB144-GW-120613-198-200	VPB144-GW-120913-223-225	VPB144-GW-120913-238-240	VPB144-GW-120913-258-260	VPB144-GW-121013-278-280
Sample Interval		58 - 60 ft	103 - 105 ft	148 - 150 ft	198 - 200 ft	223 - 225 ft	238 - 240 ft	258 - 260 ft	278 - 280 ft
Sample type code		N	N	N	N	N	N	N	N
VOC (ug/L)									
1,1,1-TRICHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,1,2,2-TETRACHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5	< 0.50 U	< 0.50 U	1.1	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,1,2-TRICHLOROETHANE	1	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,1-DICHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,1-DICHLOROETHENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DICHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
CARBON TETRACHLORIDE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 UJ
CHLOROBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
CHLOROFORM	7	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
CIS-1,2-DICHLOROETHENE	5	0.24 J	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	0.22 J
TETRACHLOROETHENE	5	< 0.50 U	< 0.50 U	0.49 J	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	0.53 J
TRANS-1,2-DICHLOROETHENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
TRICHLOROETHENE	5	0.33 J	< 0.50 U	28	5.8	0.57 J	0.85 J	< 0.50 U	50

Notes:

ug/L = micrograms per Liter

1 Ambient water quality standards and groundwater effluent limitations, class GA (6 NYCRR 700-706, esp. Part 703.5 summarized in the New York State Department of Environmental Conservation Division of Water Technical and Operation Guidance series [TOGS 1.1.1]).

Bold = Detected; ***Bold and Italics*** =Not detect exceeds NYS Groundwater Standards or guidance value

Yellow highlighted values exceed Groundwater Standards or guidance value

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

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

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

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

Location		VPB144	VPB144	VPB144	VPB144	VPB144	VPB144	VPB144	VPB144
Sample Date	NYSDEC Groundwater Guidance or Standard Value (Note 1)	12/11/2013	12/11/2013	12/11/2013	12/12/2013	12/12/2013	12/16/2013	12/16/2013	12/17/2013
Sample ID		VPB144-GW-121113-308-310	VPB144-GW-121113-318-320	VPB144-GW-121113-338-340	VPB144-GW-121213-363-365	VPB144-GW-121213-378-380	VPB144-GW-121613-423-425	VPB144-GW-121613-438-440	VPB144-GW-121713-458-460
Sample Interval		308 - 310 ft	318 - 320 ft	338 - 340 ft	363 - 365 ft	378 - 380 ft	423 - 425 ft	438 - 440 ft	458 - 460 ft
Sample type code		N	N	N	N	N	N	N	N
VOC (ug/L)									
1,1,1-TRICHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,1,2,2-TETRACHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,1,2-TRICHLOROETHANE	1	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,1-DICHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,1-DICHLOROETHENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
1,2-DICHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
CARBON TETRACHLORIDE	5	< 0.50 UJ	< 0.50 UJ	< 0.50 UJ	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 UJ
CHLOROBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
CHLOROFORM	7	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	0.57 J	0.40 J	< 0.50 U	0.50 J
CIS-1,2-DICHLOROETHENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	0.38 J
TETRACHLOROETHENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	0.80 J
TRANS-1,2-DICHLOROETHENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
TRICHLOROETHENE	5	9.9	5.2	6.7	11	20	7.8	1.9	150 J

Notes:

ug/L = micrograms per Liter

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Bold = Detected; ***Bold and Italics*** =Not detect exceeds NYS Groundwater Standards or guidance value

Yellow highlighted values exceed Groundwater Standards or guidance value

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

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

Location		VPB144	VPB144	VPB144	VPB144	VPB144	VPB144	VPB144	VPB144
Sample Date	NYSDEC Groundwater Guidance or Standard Value (Note 1)	12/17/2013	12/18/2013	12/18/2013	12/19/2013	12/20/2013	12/23/2013	12/26/2013	12/27/2013
Sample ID		VPB144-GW-121713-478-480	VPB144-GW-121813-498-500	VPB144-GW-121813-518-520	VPB144-GW-121913-538-540	VPB144-GW-122013-568-570	VPB144-GW-122313-598-600	VPB144-GW-122613-618-620	VPB144-GW-122713-643-645
Sample Interval		478 - 480 ft	498 - 500 ft	518 - 520 ft	538 - 540 ft	568 - 570 ft	598 - 600 ft	618 - 620 ft	643 - 645 ft
Sample type code		N	N	N	N	N	N	N	N
VOC (ug/L)									
1,1,1-TRICHLOROETHANE	5	< 0.50 U	3.2	8.5	0.22 J	< 0.50 U	< 0.50 U	< 0.50 U	< 5.0 UJ
1,1,2,2-TETRACHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 5.0 UJ
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5	< 0.50 U	4.5	11	0.65 J	< 0.50 U	< 0.50 U	< 0.50 U	< 5.0 UJ
1,1,2-TRICHLOROETHANE	1	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 5.0 UJ
1,1-DICHLOROETHANE	5	0.43 J	6.3	16	0.76 J	< 0.50 U	< 0.50 U	< 0.50 U	< 5.0 UJ
1,1-DICHLOROETHENE	5	0.99 J	12	34	1.4	< 0.50 U	< 0.50 U	< 0.50 U	< 5.0 UJ
1,2-DICHLOROETHANE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 5.0 UJ
CARBON TETRACHLORIDE	5	0.89 J	2.8 J	< 0.50 UJ	< 0.50 UJ	< 0.50 UJ	< 0.50 UJ	< 0.50 UJ	< 5.0 UJ
CHLOROBENZENE	5	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 5.0 UJ
CHLOROFORM	7	1.6	2.7	0.98 J	0.36 J	< 0.50 U	< 0.50 U	< 0.50 U	< 5.0 UJ
CIS-1,2-DICHLOROETHENE	5	1.8	24	62	1.2	< 0.50 U	< 0.50 U	< 0.50 U	< 5.0 UJ
TETRACHLOROETHENE	5	5.7	52	420	28	0.69 J	1.2	< 0.50 U	< 5.0 UJ
TRANS-1,2-DICHLOROETHENE	5	< 0.50 U	1.3	0.57 J	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 5.0 UJ
TRICHLOROETHENE	5	1200	7600	200	22	1.1	0.90 J	< 0.50 U	< 5.0 UJ

Notes:

ug/L = micrograms per Liter

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Bold = Detected; ***Bold and Italics*** =Not detect exceeds NYS Groundwater Standards or guidance value

Yellow highlighted values exceed Groundwater Standards or guidance value

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

Location		VPB144	VPB144	VPB144	VPB144	VPB144	VPB144	VPB144	VPB144
Sample Date	NYSDEC Groundwater Guidance or Standard Value (Note 1)	12/27/2013	12/30/2013	12/31/2013	1/8/2014	1/9/2014	1/10/2014	1/13/2014	1/13/2014
Sample ID		VPB144-GW-122713-658-660	VPB144-GW-123013-688-690	VPB144-GW-123113-698-700	VPB144-GW-010814-738-740	VPB144-GW-010914-758-760	VPB144-GW-011014-798-800	VPB144-GW-011314-818-820	VPB144-GW-011314-838-840
Sample Interval		658 - 660 ft	688 -690 ft	698 - 700 ft	738 - 740 ft	758 - 760 ft	798 - 800 ft	818 - 820 ft	838 - 840 ft
Sample type code		N	N	N	N	N	N	N	N
VOC (ug/L)									
1,1,1-TRICHLOROETHANE	5	< 3.0 UJ	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 UJ	< 0.50 U
1,1,2,2-TETRACHLOROETHANE	5	< 3.0 UJ	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 UJ	< 0.50 U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5	< 3.0 UJ	< 0.50 UJ	< 0.50 UJ	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 UJ	< 0.50 U
1,1,2-TRICHLOROETHANE	1	*< 3.0 UJ*	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 UJ	< 0.50 U
1,1-DICHLOROETHANE	5	< 3.0 UJ	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 UJ	< 0.50 U
1,1-DICHLOROETHENE	5	< 3.0 UJ	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 UJ	< 0.50 U
1,2-DICHLOROETHANE	5	< 3.0 UJ	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 UJ	< 0.50 U
CARBON TETRACHLORIDE	5	< 3.0 UJ	< 0.50 UJ	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 UJ	< 0.50 U
CHLOROBENZENE	5	< 3.0 UJ	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 UJ	< 0.50 U
CHLOROFORM	7	< 3.0 UJ	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 UJ	< 0.50 U
CIS-1,2-DICHLOROETHENE	5	< 3.0 UJ	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 UJ	< 0.50 U
TETRACHLOROETHENE	5	< 3.0 UJ	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 UJ	< 0.50 U
TRANS-1,2-DICHLOROETHENE	5	< 3.0 UJ	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 UJ	< 0.50 U
TRICHLOROETHENE	5	< 3.0 UJ	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 UJ	< 0.50 U

Notes:

ug/L = micrograms per Liter

1 Ambient water quality standards and groundwater effluent limitations, class GA (6 NYCRR 700-706, esp. Part 703.5
summarized in the New York State Department of Environmental Conservation Division of Water Technical and Operation Guidance series [TOGS 1.1.1]).

Bold = Detected; ***Bold and Italics*** =Not detect exceeds NYS Groundwater Standards or guidance value

Yellow highlighted values exceed Groundwater Standards or guidance value

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

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

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

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

Location		VPB144	VPB144
Sample Date	NYSDEC Groundwater Guidance or Standard Value (Note 1)	12/6/2013	12/17/2013
Sample ID		VPB144-GWD-120613	VPB144-GWD-121713
Sample Interval		198 - 200 ft	458 - 460 ft
Sample type code		FD	FD
VOC (ug/L)			
1,1,1-TRICHLOROETHANE	5	< 0.50 U	< 0.50 U
1,1,2,2-TETRACHLOROETHANE	5	< 0.50 U	< 0.50 U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5	< 0.50 U	< 0.50 U
1,1,2-TRICHLOROETHANE	1	< 0.50 U	< 0.50 U
1,1-DICHLOROETHANE	5	< 0.50 U	< 0.50 U
1,1-DICHLOROETHENE	5	< 0.50 U	< 0.50 U
1,2-DICHLOROETHANE	5	< 0.50 U	< 0.50 U
CARBON TETRACHLORIDE	5	< 0.50 U	< 0.50 UJ
CHLOROBENZENE	5	< 0.50 U	< 0.50 U
CHLOROFORM	7	< 0.50 U	0.50 J
CIS-1,2-DICHLOROETHENE	5	0.21 J	0.49 J
TETRACHLOROETHENE	5	< 0.50 U	0.92 J
TRANS-1,2-DICHLOROETHENE	5	< 0.50 U	< 0.50 U
TRICHLOROETHENE	5	5.8	160

Notes:

ug/L = micrograms per Liter

1 Ambient water quality standards and groundwater effluent limitations, class GA (6 NYCRR 700-706, esp. Part 703.5 summarized in the New York State Department of Environmental Conservation Division of Water Technical and Operation Guidance series [TOGS 1.1.1]).

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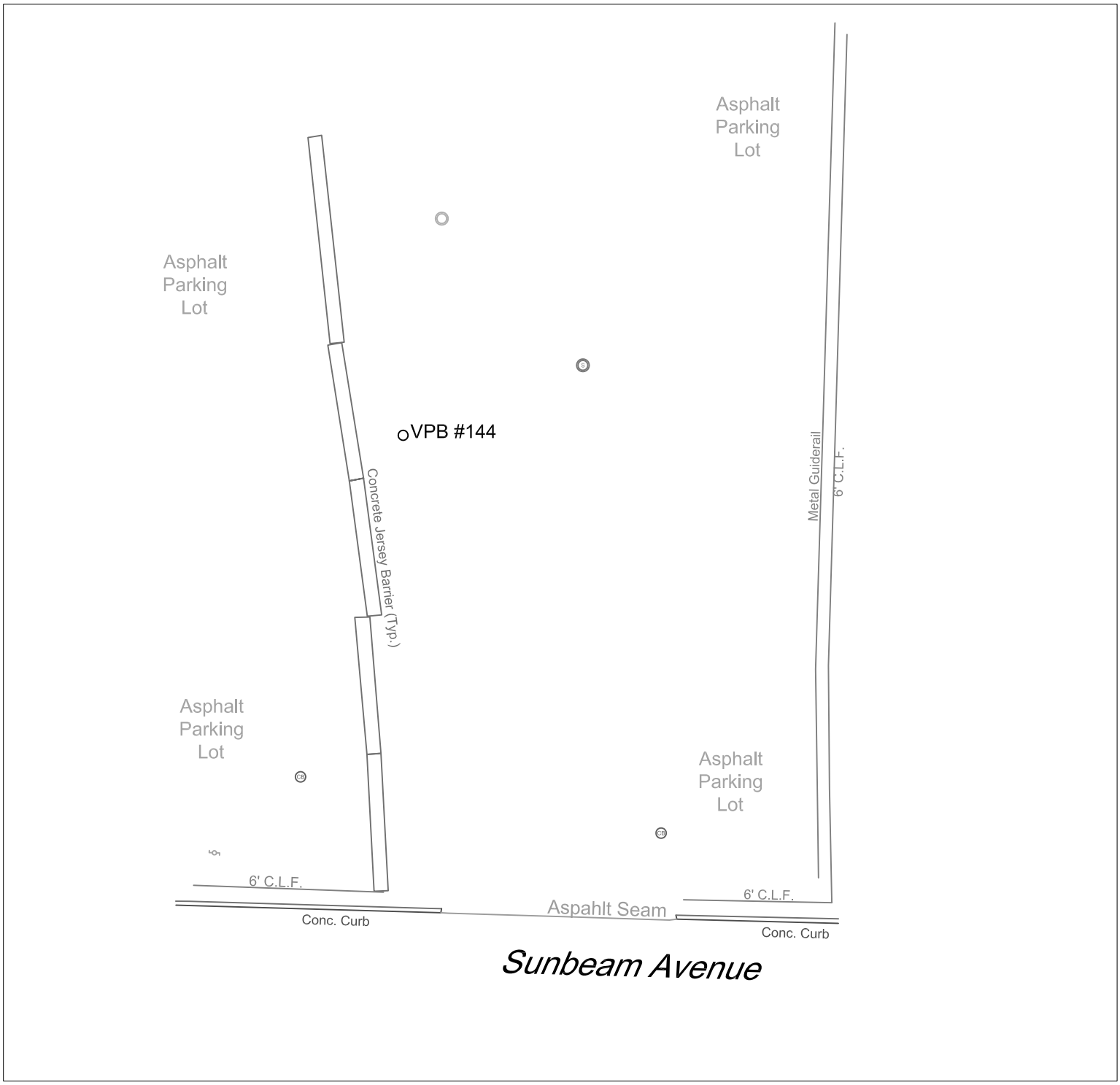
Section 6

Survey



Vertical Profile Boring 144 Survey Locations

Adapted from mapping provided by GeodCorp, 5/9/2014

SURVEY RESULTS, BETHPAGE, LONG ISLAND, NY
Project No: 3276
Client: AECOM

Horizontal Datum: NAD 83(2011) NYLI3104
Vertical Datum: NAVD 88
Units: U.S. Survey Feet
Survey date: 5/9/2014

Description	Point	Northing	Easting	Latitude	Longitude	Ground	Rim	PVC
VPB 142	6003	207661.53	1125468.82	40-44-07.92	73-29-25.53	94.97	N/A	N/A
RE108D1	6001	207665.03	1125499.54	40-44-07.95	73-29-25.14	95.68	95.70	95.38
RE108D2	6002	207663.29	1125484.08	40-44-07.93	73-29-25.34	95.72	95.75	95.43
VPB 144	4001	210194.30	1124109.96	40-44-33.02	73-29-42.99	100.37	N/A	N/A
VPB 148	5001	201701.50	1124253.93	40-43-09.09	73-29-41.76	73.73	N/A	N/A