

MEMORANDUM

To: Mr. Robert Williams, R.G.
Department of Environmental Quality
2020 SW Fourth Ave., Suite 400
Portland, OR 97201-4987

Sarah Prowell, R.G.
Prowell Environmental, Inc.
Phone: 503/452-0972
E-mail: sprowell@ix.netcom.com

Date: May 15, 2012

RE: BOP-69(usg) Well Decommissioning Work Plan
TSA East Multnomah County Remedy

Introduction

This work plan summarizes methods to be used during the decommissioning of groundwater monitoring well BOP-69(usg), as part of the Troutdale Sandstone Aquifer (TSA) remedy being implemented under Department of Environmental Quality (DEQ) *Consent Order No. No. WMCSR-NWR-96-08* (DEQ, 1997). The well is located north of Sandy Boulevard, as shown in [Figure 1](#). The well site is 19000 block NE Sandy Boulevard, Gresham, (Tax Lot No. 3) and is owned by Weston Investment Co., LLC, (Portland Maps, 2012).

BOP-69(usg) was installed in 1997 and is screened as a Confining Unit 2 (CU2) equivalent well in an area where CU2 is absent. (See [Attachment A](#) for well records.) The well was proposed for decommissioning on April 27 (Prowell, 2012) following its removal from the remedy well network in 2009 (DEQ, 2009) and final confirmation sampling in 2011. The August 2011 confirmation sample results showed trichloroethene (TCE) concentrations (1.3 micrograms per liter [$\mu\text{g/L}$]) remained below the 5 $\mu\text{g/L}$ remedy cleanup level, with all other VOC concentrations remaining non-detectable.

DEQ approved BOP-69(usg) for decommissioning on May 8 (DEQ, 2012), based on consistently compliant TCE concentrations in this well since 2007, and the presence of other nearby wells better suited for long term remedy monitoring.

Methods

The well will be decommissioned in accordance with applicable Oregon Administrative Rules (OARs) as outlined in Chapter 690, Division 240 (OAR 690-240). Boart Longyear, Tualatin, Oregon, a state-licensed well driller, will be performing the decommissioning. Work will be conducted under the oversight of Prowell Environmental, Inc, on behalf of Cascade Corporation. The property owner has provided verbal approval to proceed with the decommissioning work (S. Prowell phone communication with J. Weston, May 11, 2012). The following tasks will be completed before work begins:

- Perform below-grade utility survey in the well vicinity to confirm clearance before drilling
- Obtain an OWRD start card for well decommissioning, per OAR-690-240-0385

- Measure the well for total depth and depth to groundwater.

Well Decommissioning. BOP-69(usg) will be decommissioned using over-drill methods, per OAR-690-240-0510(1). As shown in the OWRD well report ([Attachment A](#)), it was constructed as follows:

- 10-inch diameter borehole extending from ground surface to 185 feet
- 2-inch PVC screen from 175 to 185 feet with sand filter pack from 172 to 185 feet
- Bentonite chip plug from 169 to 172 feet and high solids bentonite grout seal from 5 to 169 feet.

The wellbore intercepts TSA sandstone and underlying conglomerate materials; the characteristically fine-grained CU2 lithology was not encountered at this location. Based on the reported conglomerate material encountered within the well screen interval and the subsequent hydraulic responses observed in this well, BOP-69(usg) has been interpreted to monitor a lateral facies of the CU2. Given the absence of characteristic fine-grained CU2 material at this location, an inter-aquifer borehole diameter step-down seal was not constructed.

The above described well construction will be decommissioned by over-drilling the well and wellbore using a truck-mounted rotosonic drill rig to excavate and remove all well construction materials. Before decommissioning commences, all downhole equipment will be decontaminated. The decommissioning methods will include:

- Removing the above-grade well-head casing, stanchions, and concrete pad
- Advancing a minimum 10-inch diameter over-drill borehole from ground surface to the total well depth of 185 feet
- Bailing and cleaning out the borehole to remove cuttings and residual debris
- Measuring the borehole depth and estimating the downhole seal volume
- Injecting a grout slurry (per OAR-690-240-0475) through a tremie pipe, filling the bottom of the well upward to within 1 foot of ground surface
- Containing all well construction debris in labeled, sealed, DOT-approved 55-gallon drums

Site Cleanup and Waste Management. Upon completion, the drill site will be cleared and restored to pre-decommissioning condition. All drummed waste cuttings and deconstruction debris will be transported to Cascade's remediation yard for interim staging, waste characterization, permitting, and transport to an appropriately licensed disposal facility. Above-grade well completion debris will be managed as construction debris and will be transported from the site for appropriate disposal.

Well Decommission Reporting. Upon completion of the well decommissioning, Boart Longyear will prepare and submit an abandonment report to the OWRD, per OAR-690-240-0510(6). Prowell Environmental will prepare and submit a memorandum of completion to the DEQ and Weston Investment Co., LLC, documenting the work performed.

Schedule

The well decommissioning is currently scheduled to begin May 21, 2012 and is anticipated to require two to three days to complete. The memorandum of completion is anticipated to be submitted approximately 30 days thereafter.

References

Department of Environmental Quality, 1997. *Order on Consent to The Boeing Company and Cascade Corporation*. Troutdale Sandstone Aquifer. Oregon Department of Environmental Quality No. WMCSR-NWR-96-08, with amendments. February 5.

Department of Environmental Quality, 2009. Email to S. Prowell, Prowell Environmental. *Re: Proposed Lower TSA Monitoring Reductions*. March 11.

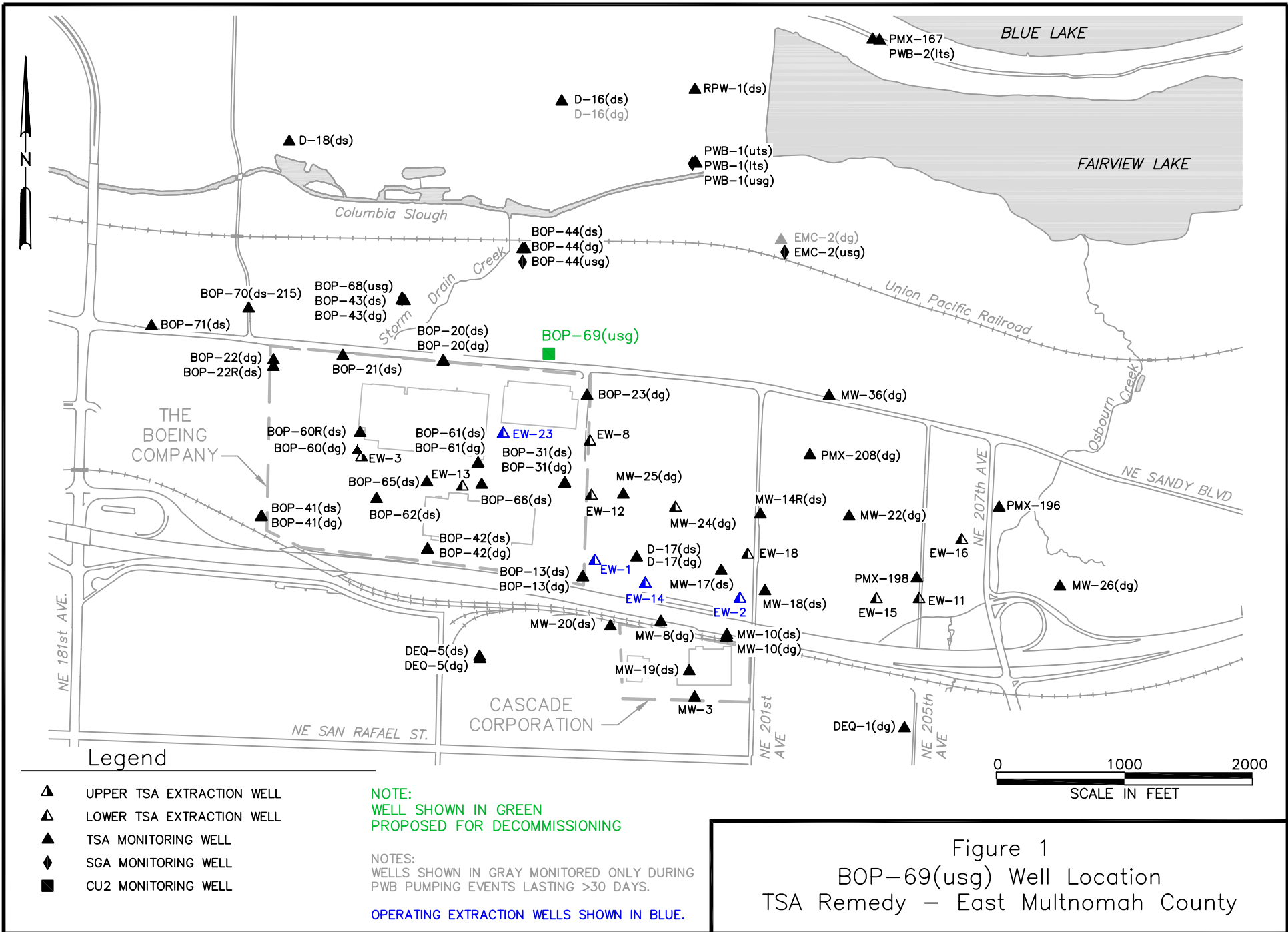
Department of Environmental Quality, 2012. Email to S. Prowell, Prowell Environmental. *Re: BOP-69usg Decommissioning Email*. May 8.

Portland Maps, 2012. www.portlandmaps.com.

Prowell Environmental, Inc., 2012. Email to R. Williams, DEQ. *Re: BOP-69usg Decommissioning Email*. April 27.

Figure 1. BOP-69(usg) Well Location

Attachment A. BOP-69(usg) Well Information

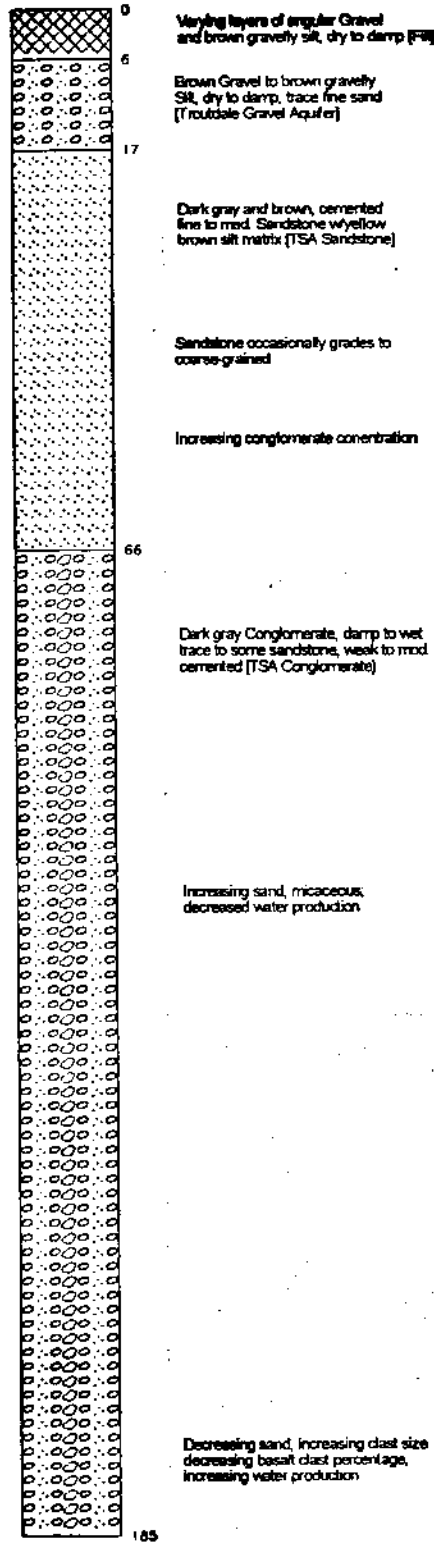


ATTACHMENT A. BOP-69(usg) Well Information

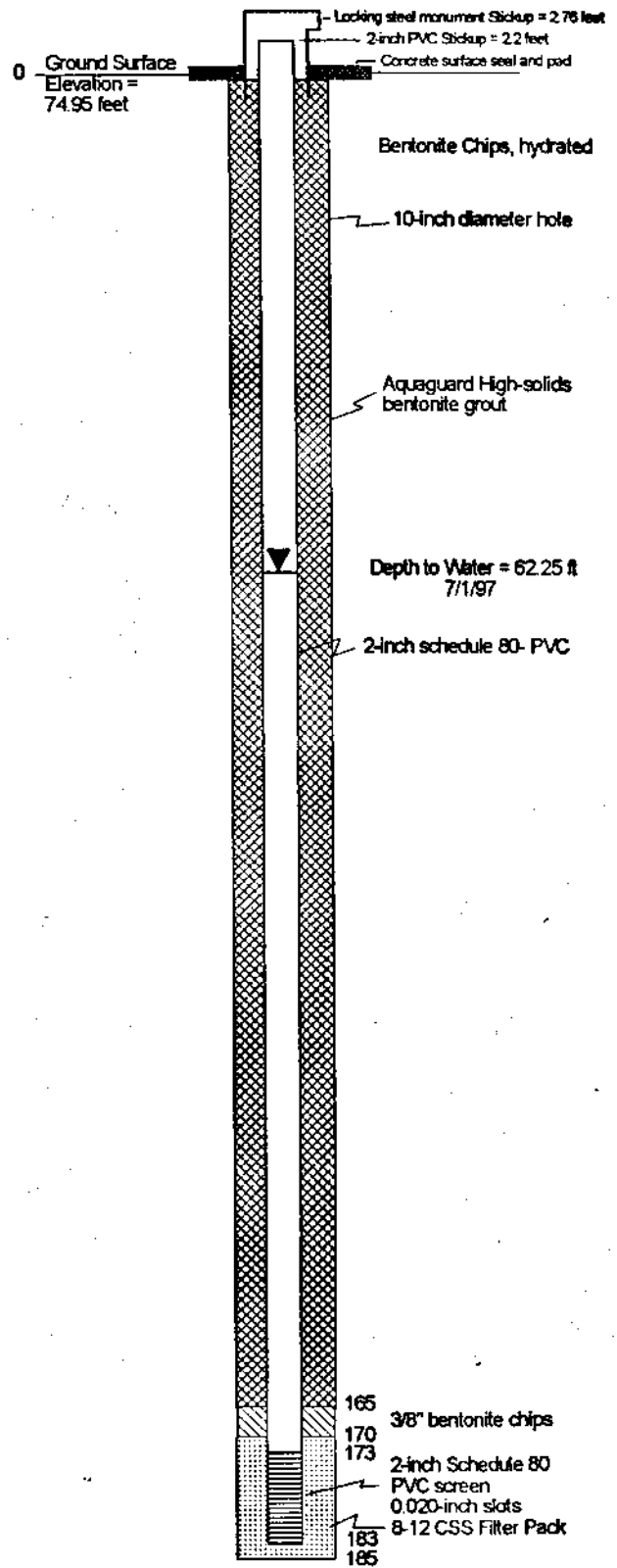
Well Construction Logs

Analytical Results for August 2011 Well Confirmation Sampling

Lithologic



Construction



Completion Date: 7/1/97

MONITORING WELL REPORT WATER RESOURCES DEPT. SALEM, OREGON

Start Card # 95677

Instructions for completing this report are on the last page of this form.

(1) OWNER/PROJECT: WELL NO. BOP-69mag

Name The Boeing Co. Address PO Box 3707 M/S 7A-XA City Seattle State WA

(2) TYPE OF WORK:

- New construction [X] Conversion [] Alteration [] Deepening [] Abandonment []

(3) DRILLING METHOD SALEM, OREGON

- Rotary Air [X] Rotary Mud [] Cable [] Hollow Stem Auger [] Other []

(6) LOCATION OF WELL By legal description

Well Location: County Multnomah Township IN (N or S) Range 3E (E or W) Section 2E 1. NW 1/4 of NE 1/4 of above section. 2. Either Street address of well location Sandy Blvd

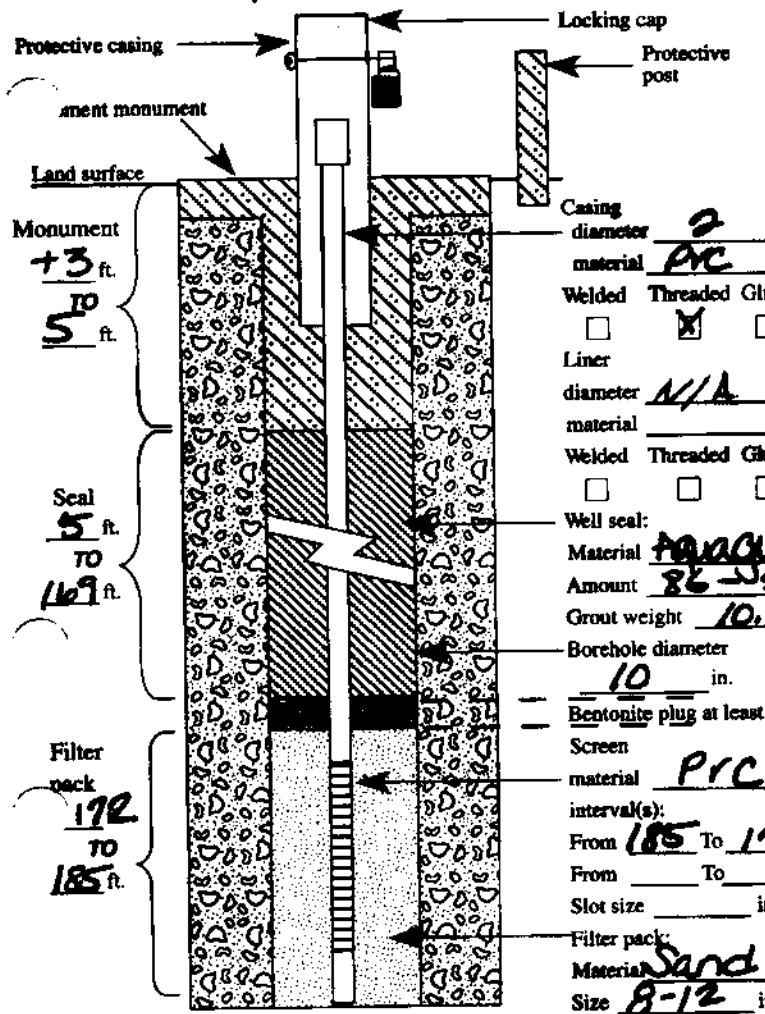
3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(7) STATIC WATER LEVEL:

55 Ft. below land surface. Date 7/1/97 Artesian Pressure N/A lb/sq. in. Date

BORE HOLE CONSTRUCTION

Special Standards Yes [] No [X] Depth of completed well 185 ft.



(8) WATER BEARING ZONES:

Table with columns: From, To, Est. Flow Rate, SWL. Data rows: 95-105 (3), 130-145 (10-20), 170-185 (150). SWL values: 75, 76, 55.

(9) WELL LOG: Ground elevation

Well log table with columns: Material, From, To, SWL. Materials include Brn Gravelly silt, Brn gravel, Gray s, brn cemented sandstone, Gray sandstone, Gray Cong. w/ sand, Brn clay, moderately cemented.

(5) WELL TEST:

Pump [] Bailer [] Air [] Flowing Artesian [] Permeability Yield GPM Conductivity PH Temperature of water 56 °F/C Depth artesian flow found 95 ft. Was water analysis done? [] Yes [] No By whom? Depth of strata to be analyzed. From ft. to ft. Remarks:

(unbonded) Monitor Well Constructor Certification: I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best of my knowledge and belief. MWC Number 10 Signed Tony L. Reynolds Date 7-23

(bonded) Monitor Well Constructor Certification: I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief. MWC Number 11

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Prowell Environmental, Incorporated
Project: Cascade TSA
Sample Matrix: Water

Service Request: K1107323
Date Collected: 08/08/2011
Date Received: 08/09/2011

Volatile Organic Compounds

Sample Name: BoP69usg-080811
Lab Code: K1107323-001
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
Chloromethane	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
Vinyl Chloride	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
Bromomethane	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
Chloroethane	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
Trichlorofluoromethane	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
Trichlorotrifluoroethane	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
1,1-Dichloroethene	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
Methylene Chloride	ND	U	2.0	1	08/09/11	08/09/11	KWG1107613	
trans-1,2-Dichloroethene	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
1,1-Dichloroethane	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
cis-1,2-Dichloroethene	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
Chloroform	1.1		0.50	1	08/09/11	08/09/11	KWG1107613	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
Carbon Tetrachloride	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
Trichloroethene (TCE)	1.3		0.50	1	08/09/11	08/09/11	KWG1107613	
1,2-Dichloropropane	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
Bromodichloromethane	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
cis-1,3-Dichloropropene	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
trans-1,3-Dichloropropene	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
1,1,2-Trichloroethane	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
Tetrachloroethene (PCE)	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
Dibromochloromethane	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
Chlorobenzene	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
Bromoform	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
1,1,2,2-Tetrachloroethane	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
1,3-Dichlorobenzene	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
1,4-Dichlorobenzene	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	
1,2-Dichlorobenzene	ND	U	0.50	1	08/09/11	08/09/11	KWG1107613	

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Prowell Environmental, Incorporated
Project: Cascade TSA
Sample Matrix: Water

Service Request: K1107323
Date Collected: 08/08/2011
Date Received: 08/09/2011

Volatile Organic Compounds

Sample Name: BoP69usg-080811
Lab Code: K1107323-001

Units: ug/L
Basis: NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	94	73-122	08/09/11	Acceptable
Toluene-d8	85	65-144	08/09/11	Acceptable
4-Bromofluorobenzene	75	68-117	08/09/11	Acceptable

Comments
