



December 30, 2014

Mr. Mark Grey  
Stephen C. Grey & Associates, LLC  
2501 North Northlake Way, Suite 201  
Seattle, Washington 98103

**Subject: 4th Quarter Groundwater Monitoring Report  
Sehome Village Mall  
Bellingham, Washington 98225  
RGI Project No. 2004-015A  
Ecology VCP No. 1601**

Dear Mr. Grey:

This report documents The Riley Group Inc.'s (RGI) analytical results from sampling of groundwater monitoring well (MW-10) located at the Sehome Village Mall, Bellingham, Washington (hereafter referred to as the Site, Figure 1). This work was authorized by Stephen C. Grey & Associates, LLC (hereafter referred to as the Client) on April 1, 2014.

#### **SITE LOCATION AND DESCRIPTION**

Sehome Village Mall is located west of Interstate 5, between MacDonald Parkway and Fielding Street, and east of 36th Street, in Bellingham, Washington (Figure 1). The Site is at the base of Sehome Hill. The surficial geology consists of glacial drift overlying sedimentary rocks of the Chuckanut formation. The Site is at an elevation of approximately 190 feet above mean sea level. The topography of the Site is flat and the land surface has a gentle downward slope towards the south. The vicinity of the Site is zoned for commercial use. Adjacent and nearby properties contain commercial and retail businesses. The west-adjointing property is developed with Western Washington University administrative offices.

#### **GROUNDWATER TREATMENT**

On August 5, 2014, RGI treated the groundwater in MW-10 by injecting an approximately 8 percent sugar solution to stimulate bacterial activity by increasing the amount of organic carbon in the groundwater. RGI injected approximately 70 gallons of water containing approximately 50 pounds of powdered sugar. The injection was conducted under low pressure in order to disperse the solution into the formation beyond the well and its filter pack. The location of MW-10 is shown on the attached Figure 2 (relative to the existing retail building and other monitoring wells).

Prior to the injection, RGI collected a sample for analysis for total organic carbon (TOC) in order to measure the background levels. The resulting concentration measured at 11 mg/L.

#### **GROUNDWATER SAMPLING**

On December 2, 2014, RGI collected a groundwater sample from MW-10 for analytical testing for halogenated volatile organic compounds (HVOCs) and TOC. Groundwater monitoring well MW-10 was purged and sampled using dedicated tubing and a positive displacement submersible pump

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*Kennewick, Washington*  
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to withdraw the groundwater under low-flow conditions. Purging the well removed approximately 20 gallons of water from the well casing, surrounding sand filter pack and formation. The well was allowed to recharge for approximately 1 hour prior to collecting the groundwater sample. The recharge rate was characteristic for the well, recharging to approximately 22 feet below ground surface (bgs). The sampling data were recorded on a field data sheet, which are retained in the RGI office.

The groundwater sample was collected in a laboratory-supplied, 40-milliliter (ml) jar with a Teflon cap (no headspace). In addition, 500 ml of water was collected for TOC.

The filled sample containers were immediately placed in a chilled cooler and transported to the analytical laboratory under proper chain-of-custody documentation.

#### **LABORATORY ANALYSIS**

On December 2, 2014, the groundwater sample from monitoring well MW-10 was submitted to ALS Laboratory Group of Everett, Washington and analyzed for the following:

- HVOCs using EPA Method 8260
- TOC using EPA Method 415.1

#### **MTCA CLEANUP REGULATIONS**

Groundwater analytical results were compared to the following regulation:

- Washington State Department of Ecology Model Toxics Control Act (MTCA) MTCA Method A Cleanup Levels for Ground Water (WAC 173-340-900, Table 720-1).

#### **FINDINGS**

Analytical laboratory results yielded vinyl chloride at a concentration of less than 0.2 µg/L, which is below the MTCA Method A Cleanup Levels for Ground Water of 0.20 µg/L and, therefore, non-detect. No other HVOCs were detected above the method detection limits. The TOC was measured at 4,600 mg/L.

Concentration of cis-dichloroethene and vinyl chloride verses time are illustrated on the attached data summary charts located in Appendix A.

Sampling is scheduled to continue in February or March 2015.

#### **PROJECT LIMITATIONS**

Work for this project was performed, and this report prepared, in accordance with generally accepted professional practices for the nature and conditions of work completed in same or similar locations at the present time. RGI's results and findings from the select area do not necessarily reflect soil or groundwater conditions underlying other areas of the Site not investigated. RGI reserves the right to modify conclusions and/or recommendations as new data and information is made available. No legal or other warranty, expressed or implied, is made.

Please call us if you have any questions or need additional information.

Sincerely,

THE RILEY GROUP, INC.



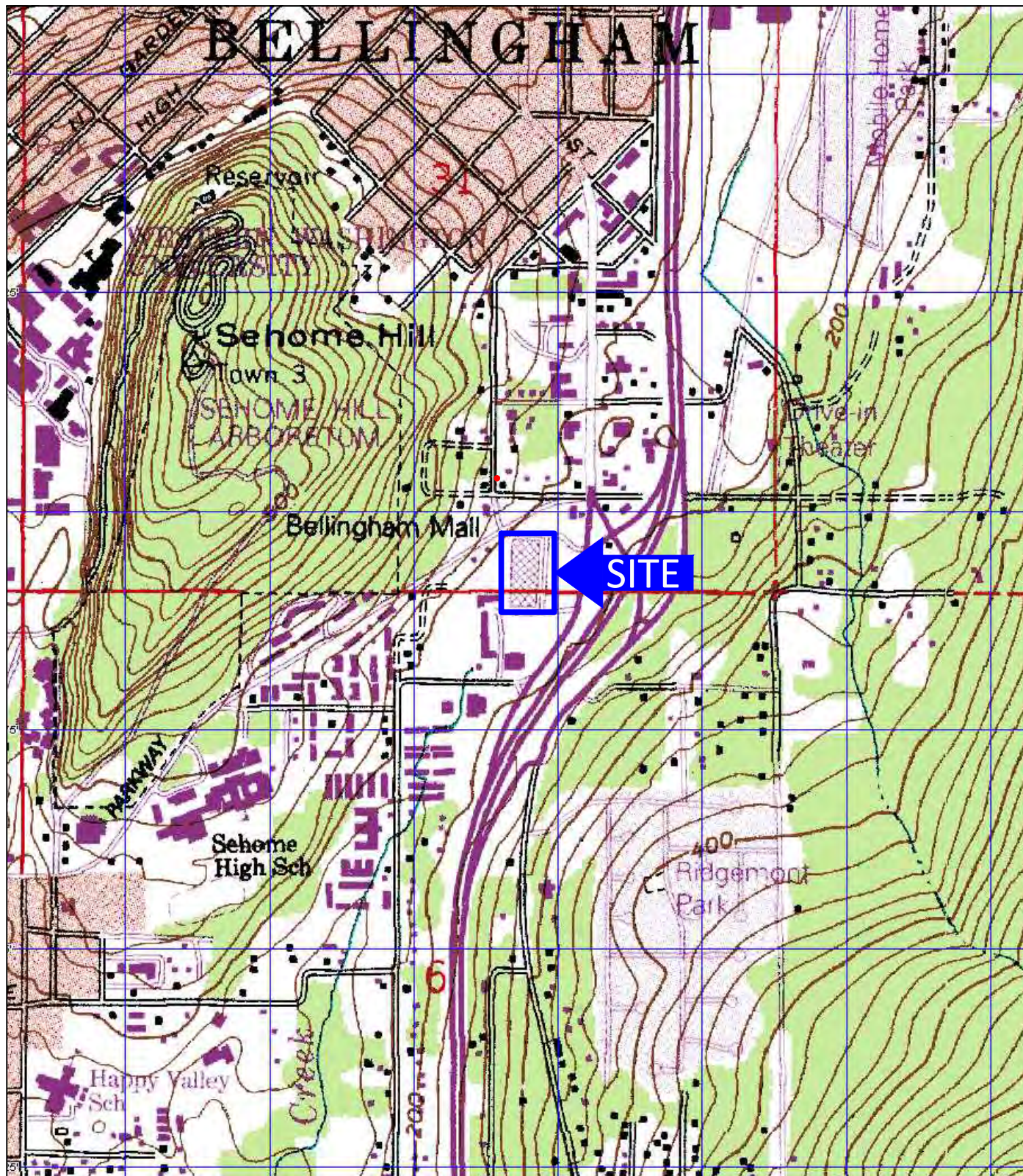
FREDERICK H. BECKER

*F. H. Becker*  
Frederick H. Becker, LG, LHG, LEG  
Senior Geologist

Paul D. Riley, LG, LHG  
Principal

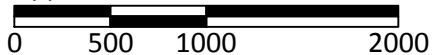
Attachments: *Figure 1, Site Vicinity Map*  
*Figure 2, Historical Site Plan and Monitoring Well Locations*  
*Appendix A, Data Summary Charts*  
*Appendix B, Analytical Laboratory Certificates*

Distribution: *Mr. Mark Grey, Stephen C. Grey & Associates, LLC (one bound copy and PDF)*  
*Ms. Kristine Phillips, Stephen C Grey & Associates LLC (PDF)*  
*Ms. Heather Vick, Ecology NWRO (one bound copy and PDF)*



USGS, 1995, Bellingham, Washington  
7.5-Minute Quadrangle

Approximate Scale: 1"=1000'



Corporate Office  
17522 Bothell Way Northeast  
Bothell, Washington 98011  
Phone: 425.415.0551  
Fax: 425.415.0311

RGI Project Number  
2004-015A

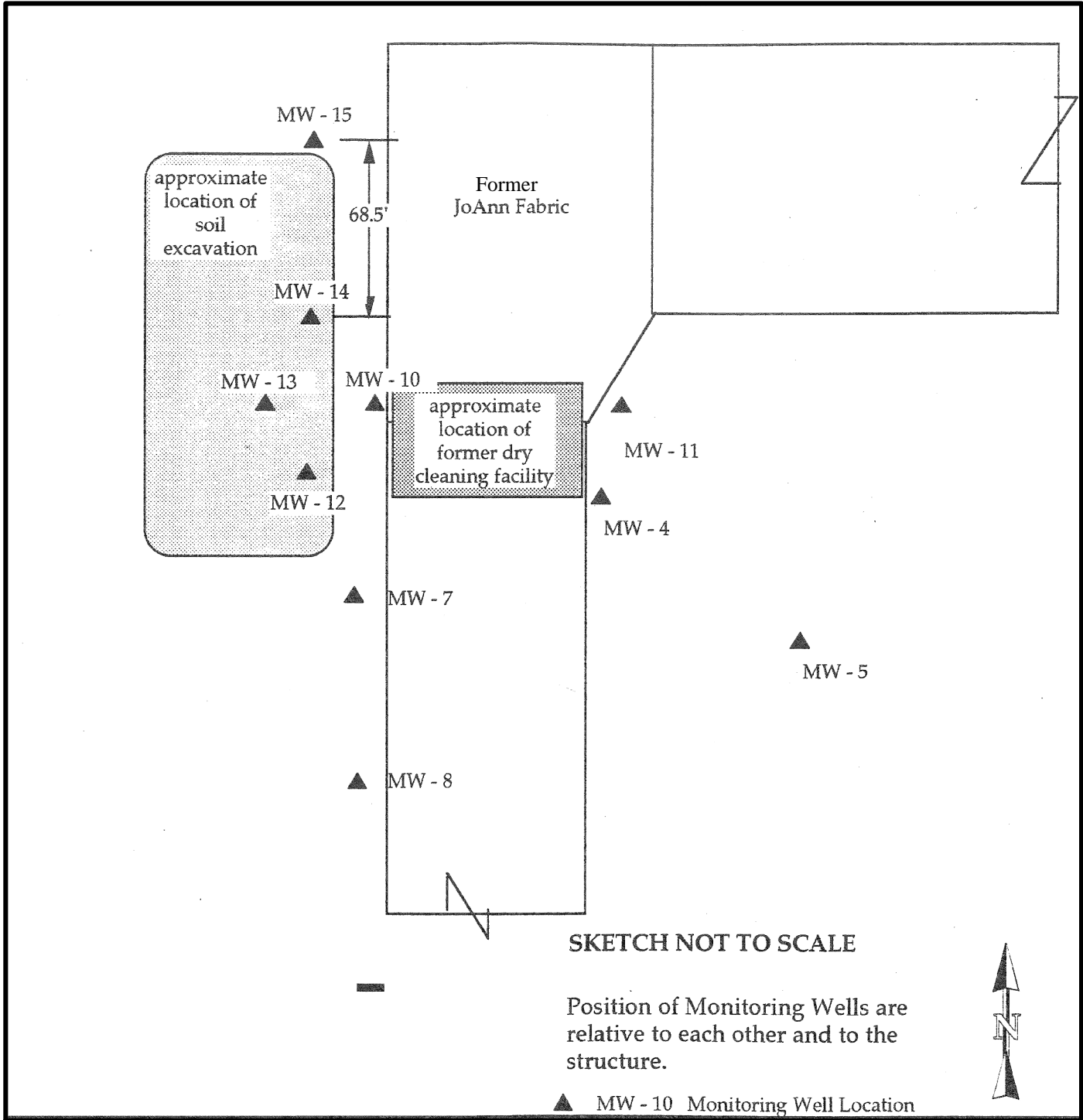
Sehome Village Mall

Site Vicinity Map

Figure 1

Date Drawn:  
12/2014

Address: 36th Street, Bellingham, Washington 98225




SKETCH NOT TO SCALE

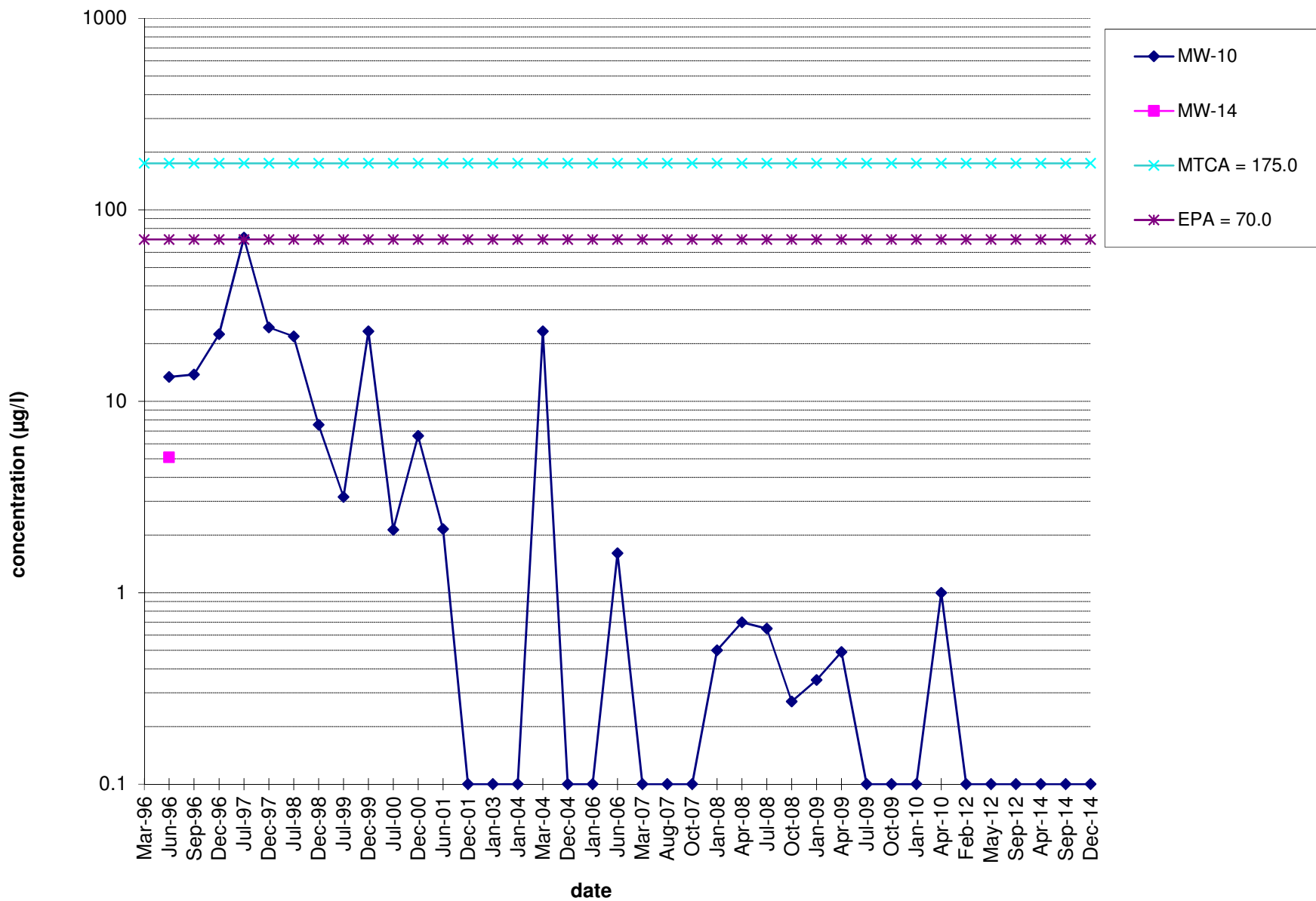
Position of Monitoring Wells are relative to each other and to the structure.

▲ MW - 10 Monitoring Well Location

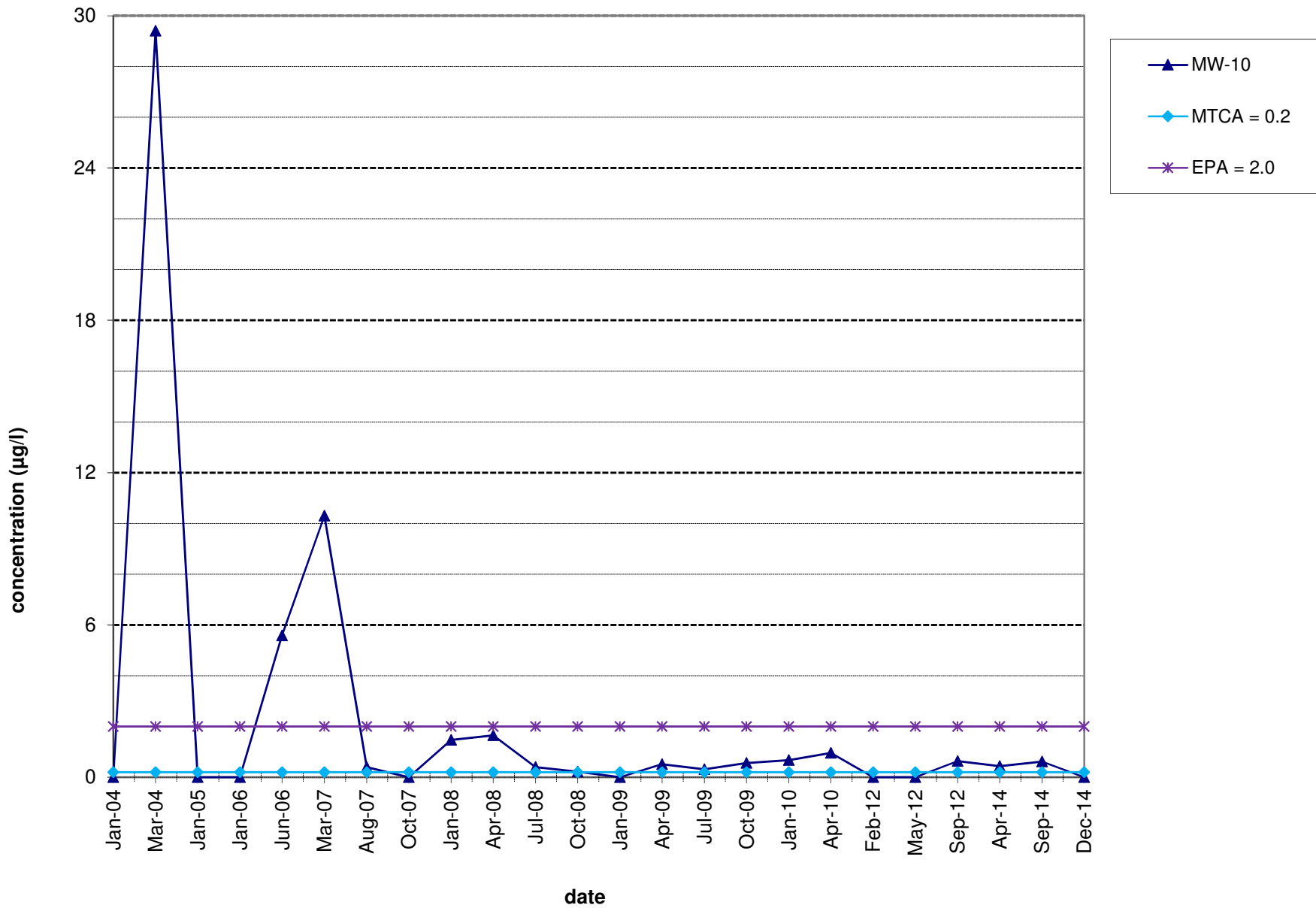
(after Index Environmental Services, Inc., 1996)

 Corporate Office 17522 Bothell Way Northeast Bothell, Washington 98011 Phone: 425.415.0551 Fax: 425.415.0311	Sehome Village Mall		Figure 2
	RGI Project Number 2004-015A	Historical Site Plan and Monitoring Well Locations	Date Drawn: 12/2014
	Address: 36th Street, Bellingham, Washington 98225		

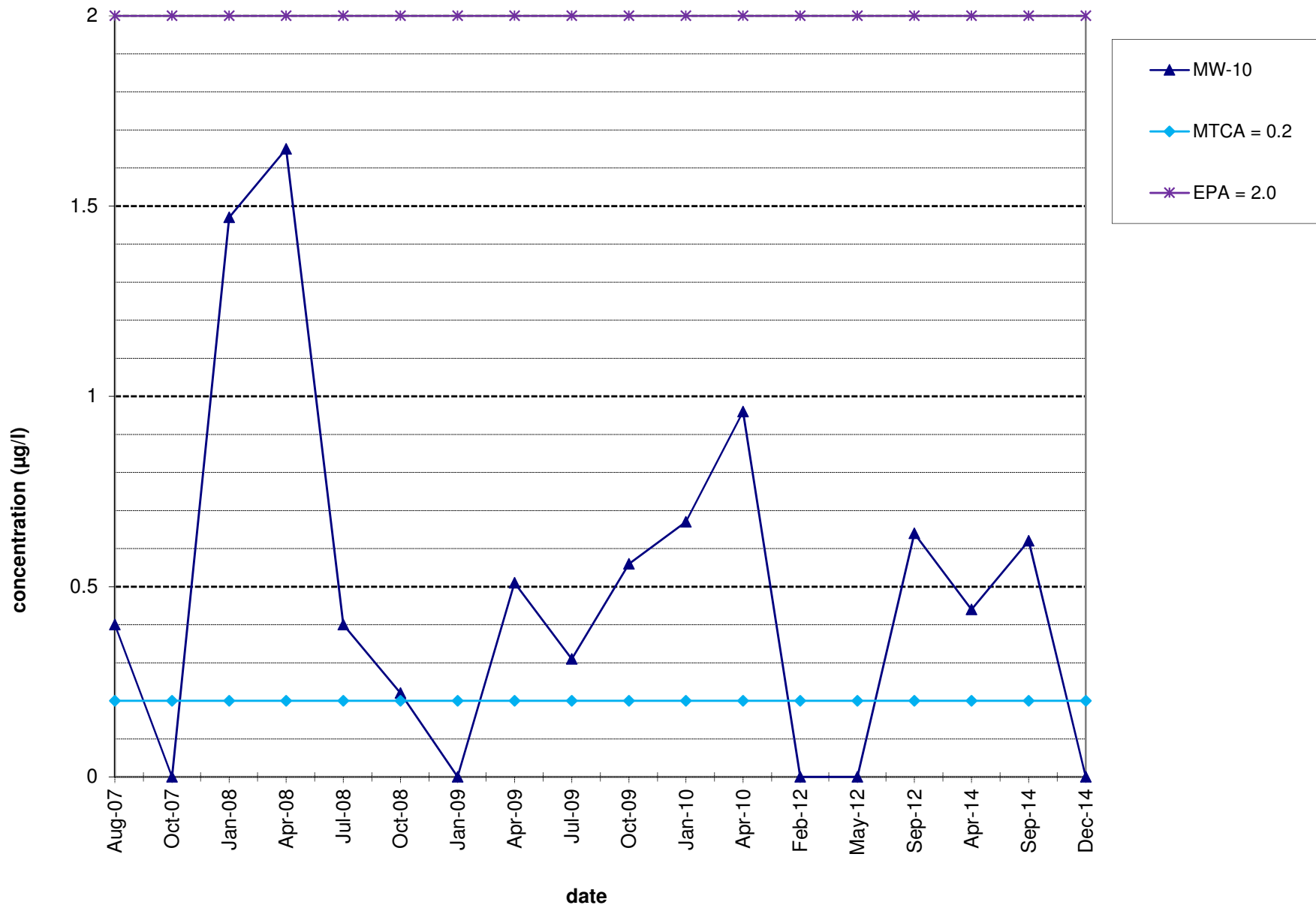
# Concentration of cis-Dichloroethene



# Concentration of vinyl chloride



# Concentration of vinyl chloride





December 15, 2014

Mr. Fred Becker  
The Riley Group, Inc.  
17522 Bothell Way NE, Suite A  
Bothell, WA 98011

Dear Mr. Becker,

On December 2nd, 1 sample was received by our laboratory and assigned our laboratory project number EV14120007. The project was identified as your 2004-015A. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group

Rick Bagan  
Laboratory Director



**CERTIFICATE OF ANALYSIS**

CLIENT: The Riley Group, Inc.  
 17522 Bothell Way NE, Suite A  
 Bothell, WA 98011

CLIENT CONTACT: Fred Becker  
 CLIENT PROJECT: 2004-015A  
 CLIENT SAMPLE ID: MW-10

DATE: 12/15/2014  
 ALS JOB#: EV14120007  
 ALS SAMPLE#: EV14120007-01  
 DATE RECEIVED: 12/02/2014  
 COLLECTION DATE: 12/2/2014 10:45:00 AM  
 WDOE ACCREDITATION: C601

**SAMPLE DATA RESULTS**

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS	ANALYSIS
						DATE	BY
Dichlorodifluoromethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Chloromethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Vinyl Chloride	EPA-8260	U	0.20	1	ug/L	12/04/2014	DLC
Bromomethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Chloroethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Carbon Tetrachloride	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Trichlorofluoromethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,1-Dichloroethene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Methylene Chloride	EPA-8260	U	5.0	1	ug/L	12/04/2014	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,1-Dichloroethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
2,2-Dichloropropane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Bromochloromethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Chloroform	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,1,1-Trichloroethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,1-Dichloropropene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,2-Dichloroethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Trichloroethene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,2-Dichloropropane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Dibromomethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Bromodichloromethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,1,1,2-Trichloroethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,3-Dichloropropane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Tetrachloroethylene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Dibromochloromethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,2-Dibromoethane	EPA-8260	U	0.01	1	ug/L	12/04/2014	DLC
Chlorobenzene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Bromoform	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,1,1,2,2-Tetrachloroethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,2,3-Trichloropropane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Bromobenzene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
2-Chlorotoluene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
4-Chlorotoluene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,3 Dichlorobenzene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC



**CERTIFICATE OF ANALYSIS**

CLIENT:	The Riley Group, Inc. 17522 Bothell Way NE, Suite A Bothell, WA 98011	DATE:	12/15/2014
CLIENT CONTACT:	Fred Becker	ALS JOB#:	EV14120007
CLIENT PROJECT:	2004-015A	ALS SAMPLE#:	EV14120007-01
CLIENT SAMPLE ID	MW-10	DATE RECEIVED:	12/02/2014
		COLLECTION DATE:	12/2/2014 10:45:00 AM
		WDOE ACCREDITATION:	C601

**SAMPLE DATA RESULTS**

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
1,4-Dichlorobenzene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,2-Dichlorobenzene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	10	1	ug/L	12/04/2014	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Hexachlorobutadiene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Total Organic Carbon (TOC)	EPA-415.1	<b>4600</b>	5.0	1	MG/L	12/11/2014	ARI

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
1,2-Dichloroethane-d4	EPA-8260	<b>115</b>	12/04/2014	DLC
4-Bromofluorobenzene	EPA-8260	<b>108</b>	12/04/2014	DLC

U - Analyte analyzed for but not detected at level above reporting limit.



**CERTIFICATE OF ANALYSIS**

CLIENT: The Riley Group, Inc.  
 17522 Bothell Way NE, Suite A  
 Bothell, WA 98011

CLIENT CONTACT: Fred Becker  
 CLIENT PROJECT: 2004-015A

DATE: 12/15/2014  
 ALS SDG#: EV14120007  
 WDOE ACCREDITATION: C601

**LABORATORY BLANK RESULTS**

**MB-120314W - Batch 88640 - Water by EPA-8260**

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS	ANALYSIS
						DATE	BY
Dichlorodifluoromethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Chloromethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Vinyl Chloride	EPA-8260	U	0.20	1	ug/L	12/04/2014	DLC
Bromomethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Chloroethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Carbon Tetrachloride	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Trichlorofluoromethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,1-Dichloroethene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Methylene Chloride	EPA-8260	U	5.0	1	ug/L	12/04/2014	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,1-Dichloroethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
2,2-Dichloropropane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Bromochloromethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Chloroform	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,1,1-Trichloroethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,1-Dichloropropene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,2-Dichloroethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Trichloroethene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,2-Dichloropropane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Dibromomethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Bromodichloromethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Toluene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,1,2-Trichloroethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,3-Dichloropropane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Tetrachloroethylene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Dibromochloromethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,2-Dibromoethane	EPA-8260	U	0.01	1	ug/L	12/04/2014	DLC
Chlorobenzene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Bromoform	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,2,3-Trichloropropane	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Bromobenzene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
2-Chlorotoluene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
4-Chlorotoluene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC



**CERTIFICATE OF ANALYSIS**

CLIENT:	The Riley Group, Inc. 17522 Bothell Way NE, Suite A Bothell, WA 98011	DATE:	12/15/2014
CLIENT CONTACT:	Fred Becker	ALS SDG#:	EV14120007
CLIENT PROJECT:	2004-015A	WDOE ACCREDITATION:	C601

**LABORATORY BLANK RESULTS**

**MB-120314W - Batch 88640 - Water by EPA-8260**

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
1,3-Dichlorobenzene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,4-Dichlorobenzene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,2-Dichlorobenzene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,2-Dibromo-3-Chloropropane	EPA-8260	U	10	1	ug/L	12/04/2014	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
Hexachlorobutadiene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	2.0	1	ug/L	12/04/2014	DLC

U - Analyte analyzed for but not detected at level above reporting limit.

**MBLK-12112014 - Batch R246688 - Water by EPA-415.1**

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Total Organic Carbon (TOC)	EPA-415.1	U	5.0	1	MG/L	12/11/2014	ARI

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT: The Riley Group, Inc.  
17522 Bothell Way NE, Suite A  
Bothell, WA 98011

CLIENT CONTACT: Fred Becker  
CLIENT PROJECT: 2004-015A

DATE: 12/15/2014  
ALS SDG#: EV14120007  
WDOE ACCREDITATION: C601

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: 88640 - Water by EPA-8260

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
1,1-Dichloroethene - BS	EPA-8260	116			12/04/2014	DLC
1,1-Dichloroethene - BSD	EPA-8260	108	7		12/04/2014	DLC
Trichloroethene - BS	EPA-8260	123			12/04/2014	DLC
Trichloroethene - BSD	EPA-8260	116	6		12/04/2014	DLC
Toluene - BS	EPA-8260	117			12/04/2014	DLC
Toluene - BSD	EPA-8260	111	6		12/04/2014	DLC
Chlorobenzene - BS	EPA-8260	114			12/04/2014	DLC
Chlorobenzene - BSD	EPA-8260	109	4		12/04/2014	DLC

ALS Test Batch ID: R246688 - Water by EPA-415.1

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Total Organic Carbon (TOC) - BS	EPA-415.1	105			12/11/2014	ARI

APPROVED BY

Laboratory Director

