Analytical Report for

Northwest Pipe

ASL Report #: R1893
Project ID: 682722.GW.05

Attn: Gretchen Gee

cc:

Beckett, Jamie/RDD

Authorized and Released By:

Kathy McKinley

Laboratory Project Manager
Kathy McKinley
(541) 758-0235 ext.23144
May 17, 2017

All analyses performed by CH2M HILL are clearly indicated. Any subcontracted analyses are included as appended reports as received from the subcontracted laboratory. The results included in this report only relate to the samples listed on the following Sample Cross-Reference page. This report shall not be reproduced except in full, without the written approval of the laboratory.

Any unusual difficulties encountered during the analysis of your samples are discussed in the attached case narratives.

Accredited in accordance with NELAP:
Oregon (100022)
Louisiana (05031)

CH2M – Applied Sciences Laboratory
1100 NE Circle Boulevard, Suite 300
Corvallis, Oregon 97330 Email: asl@ch2m.com
www.ch2m.com

Sample Receipt Comments

We certify that the test results meet all NELAP requirements.

Sample Cross-Reference

ASL Sample ID	Client Sample ID	Date/Time Collected	Date Received
R189301	TRIPBLANK-050117-03	05/01/17 08:00	05/02/17
R189302	MW-01-050117-0	05/01/17 10:20	05/02/17
R189303	MW-100-050117-0	05/01/17 12:00	05/02/17
R189304	MW-06-050117-0	05/01/17 11:50	05/02/17
R189305	MW-03-050117-0	05/01/17 13:50	05/02/17
R189306	MW-05-050117-0	05/01/17 15:20	05/02/17

1100 NE Circle Blvd., Suite 300
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Tel 541-768-3120 Fax 541-752-0276

CASE NARRATIVE
GC/MS VOLATILES ANALYSIS

Lab Name: CH2M ASL **ASL SDG#:** R1893

Project: Northwest Pipe **Project #:** 682722.GW.05

With the exceptions noted as flags, footnotes, or detailed in the section below; standard operating procedures were followed in the analysis of the samples and no problems were encountered or anomalies observed.

All laboratory quality control samples were within established control limits, with any exceptions noted below, or in the associated QC summary forms.

Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

Calculations are performed before rounding to minimize errors in calculated values.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the section below, or in the sample receipt documentation.

Method(s):
SW8260B: SW5030

Analytical Exception(s):
Due to instrumental contamination concerns, some samples in this SDG could not be analyzed at a 1x-concentration.

CH2M ASL

Client Information

Client Sample ID: **MW-01-050117-0**

Project Name: Northwest Pipe
Sample Date: 05/01/17
Sample Time: 10:20
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: **R189302**

Date Received: 05/02/17
Dilution Factor: 1
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
Vinyl Chloride	75-01-4	0.15	0.50	51.6		ug/L	SW8260B	05/03/17
cis-1,2-Dichloroethene	156-59-2	0.15	0.50	220	E	ug/L	SW8260B	05/03/17
Trichloroethene (TCE)	79-01-6	0.15	0.50	13.0		ug/L	SW8260B	05/03/17
Tetrachloroethene (PCE)	127-18-4	0.15	0.50	61.7		ug/L	SW8260B	05/03/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	119	70-130	
1,2-Dichloroethane-d4	119	70-130	
Toluene-d8	108	70-130	
4-Bromofluorobenzene	109	70-130	

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative
B=Analyte detected in blank

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Client Information

Client Sample ID: **MW-01-050117-0DL**

Project Name: Northwest Pipe
Sample Date: 05/01/17
Sample Time: 10:20
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: **R189302DL**

Date Received: 05/02/17
Dilution Factor: 10
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
Vinyl Chloride	75-01-4	1.50	5.00	49.3		ug/L	SW8260B	05/04/17
cis-1,2-Dichloroethene	156-59-2	1.50	5.00	220		ug/L	SW8260B	05/04/17
Trichloroethene (TCE)	79-01-6	1.50	5.00	11.3		ug/L	SW8260B	05/04/17
Tetrachloroethene (PCE)	127-18-4	1.50	5.00	54.6		ug/L	SW8260B	05/04/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	110	70-130	
1,2-Dichloroethane-d4	105	70-130	
Toluene-d8	103	70-130	
4-Bromofluorobenzene	103	70-130	

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Client Information

Client Sample ID: **MW-100-050117-0**

Project Name: Northwest Pipe
Sample Date: 05/01/17
Sample Time: 12:00
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: **R189303**

Date Received: 05/02/17
Dilution Factor: 10
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
Vinyl Chloride	75-01-4	1.50	5.00	20.7		ug/L	SW8260B	05/03/17
cis-1,2-Dichloroethene	156-59-2	1.50	5.00	1590	E	ug/L	SW8260B	05/03/17
Trichloroethene (TCE)	79-01-6	1.50	5.00	228		ug/L	SW8260B	05/03/17
Tetrachloroethene (PCE)	127-18-4	1.50	5.00	1250	E	ug/L	SW8260B	05/03/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	115	70-130	
1,2-Dichloroethane-d4	114	70-130	
Toluene-d8	106	70-130	
4-Bromofluorobenzene	106	70-130	

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*=See case narrative
B=Analyte detected in blank

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Client Information

Client Sample ID: **MW-100-050117-0DL**

Project Name: Northwest Pipe
Sample Date: 05/01/17
Sample Time: 12:00
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: **R189303DL**

Date Received: 05/02/17
Dilution Factor: 100
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
Vinyl Chloride	75-01-4	15.0	50.0	24.4	J	ug/L	SW8260B	05/03/17
cis-1,2-Dichloroethene	156-59-2	15.0	50.0	1550		ug/L	SW8260B	05/03/17
Trichloroethene (TCE)	79-01-6	15.0	50.0	224		ug/L	SW8260B	05/03/17
Tetrachloroethene (PCE)	127-18-4	15.0	50.0	1280		ug/L	SW8260B	05/03/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	115	70-130	
1,2-Dichloroethane-d4	116	70-130	
Toluene-d8	106	70-130	
4-Bromofluorobenzene	107	70-130	

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Client Information

Client Sample ID: **MW-06-050117-0**

Project Name: Northwest Pipe
Sample Date: 05/01/17
Sample Time: 11:50
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: **R189304**

Date Received: 05/02/17
Dilution Factor: 10
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
Vinyl Chloride	75-01-4	1.50	5.00	21.9		ug/L	SW8260B	05/03/17
cis-1,2-Dichloroethene	156-59-2	1.50	5.00	1600	E	ug/L	SW8260B	05/03/17
Trichloroethene (TCE)	79-01-6	1.50	5.00	225		ug/L	SW8260B	05/03/17
Tetrachloroethene (PCE)	127-18-4	1.50	5.00	1280	E	ug/L	SW8260B	05/03/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	115	70-130	
1,2-Dichloroethane-d4	113	70-130	
Toluene-d8	103	70-130	
4-Bromofluorobenzene	103	70-130	

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative
B=Analyte detected in blank

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Client Information

Client Sample ID: **MW-06-050117-0DL**

Project Name: Northwest Pipe
Sample Date: 05/01/17
Sample Time: 11:50
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: **R189304DL**

Date Received: 05/02/17
Dilution Factor: 50
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
Vinyl Chloride	75-01-4	7.50	25.0	20.9	J	ug/L	SW8260B	05/03/17
cis-1,2-Dichloroethene	156-59-2	7.50	25.0	1530		ug/L	SW8260B	05/03/17
Trichloroethene (TCE)	79-01-6	7.50	25.0	220		ug/L	SW8260B	05/03/17
Tetrachloroethene (PCE)	127-18-4	7.50	25.0	1280		ug/L	SW8260B	05/03/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	111	70-130	
1,2-Dichloroethane-d4	112	70-130	
Toluene-d8	105	70-130	
4-Bromofluorobenzene	102	70-130	

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
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B=Analyte detected in blank

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Client Information

Client Sample ID: **MW-03-050117-0**

Project Name: Northwest Pipe
Sample Date: 05/01/17
Sample Time: 13:50
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: **R189305**

Date Received: 05/02/17
Dilution Factor: 10
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
Vinyl Chloride	75-01-4	1.50	5.00	26.1		ug/L	SW8260B	05/03/17
cis-1,2-Dichloroethene	156-59-2	1.50	5.00	847		ug/L	SW8260B	05/03/17
Trichloroethene (TCE)	79-01-6	1.50	5.00	283		ug/L	SW8260B	05/03/17
Tetrachloroethene (PCE)	127-18-4	1.50	5.00	657		ug/L	SW8260B	05/03/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	111	70-130	
1,2-Dichloroethane-d4	109	70-130	
Toluene-d8	102	70-130	
4-Bromofluorobenzene	101	70-130	

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J=Estimated value below reporting limit
E=Estimated value above calibration range
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B=Analyte detected in blank

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Client Information

Client Sample ID: **MW-05-050117-0**

Project Name: Northwest Pipe
Sample Date: 05/01/17
Sample Time: 15:20
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: **R189306**

Date Received: 05/02/17
Dilution Factor: 1
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
Vinyl Chloride	75-01-4	0.15	0.50	70.7		ug/L	SW8260B	05/03/17
cis-1,2-Dichloroethene	156-59-2	0.15	0.50	608	E	ug/L	SW8260B	05/03/17
Trichloroethene (TCE)	79-01-6	0.15	0.50	92.0		ug/L	SW8260B	05/03/17
Tetrachloroethene (PCE)	127-18-4	0.15	0.50	770	E	ug/L	SW8260B	05/03/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	109	70-130	
1,2-Dichloroethane-d4	106	70-130	
Toluene-d8	102	70-130	
4-Bromofluorobenzene	103	70-130	

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
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B=Analyte detected in blank

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Client Information

Client Sample ID: **MW-05-050117-0DL**

Project Name: Northwest Pipe
Sample Date: 05/01/17
Sample Time: 15:20
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: **R189306DL**

Date Received: 05/02/17
Dilution Factor: 100
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
Vinyl Chloride	75-01-4	15.0	50.0	79.9		ug/L	SW8260B	05/03/17
cis-1,2-Dichloroethene	156-59-2	15.0	50.0	634		ug/L	SW8260B	05/03/17
Trichloroethene (TCE)	79-01-6	15.0	50.0	98.1		ug/L	SW8260B	05/03/17
Tetrachloroethene (PCE)	127-18-4	15.0	50.0	949		ug/L	SW8260B	05/03/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	105	70-130	
1,2-Dichloroethane-d4	104	70-130	
Toluene-d8	96	70-130	
4-Bromofluorobenzene	94	70-130	

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E=Estimated value above calibration range
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Client Information

Client Sample ID: **WB1-0503**

Project Name: Northwest Pipe
Sample Date: N/A
Sample Time: N/A
Type: QC
Matrix: Water

Lab Information

Lab Sample ID: **WB1-0503**

Date Received: N/A
Dilution Factor: 1
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
Vinyl Chloride	75-01-4	0.15	0.50	0.15	U	ug/L	SW8260B	05/03/17
cis-1,2-Dichloroethene	156-59-2	0.15	0.50	0.15	U	ug/L	SW8260B	05/03/17
Trichloroethene (TCE)	79-01-6	0.15	0.50	0.15	U	ug/L	SW8260B	05/03/17
Tetrachloroethene (PCE)	127-18-4	0.15	0.50	0.15	U	ug/L	SW8260B	05/03/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	110	70-130	
1,2-Dichloroethane-d4	107	70-130	
Toluene-d8	103	70-130	
4-Bromofluorobenzene	102	70-130	

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B=Analyte detected in blank

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Client Information

Client Sample ID: **WB1-0504**

Project Name: Northwest Pipe
Sample Date: N/A
Sample Time: N/A
Type: QC
Matrix: Water

Lab Information

Lab Sample ID: **WB1-0504**

Date Received: N/A
Dilution Factor: 1
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
Vinyl Chloride	75-01-4	0.15	0.50	0.15	U	ug/L	SW8260B	05/04/17
cis-1,2-Dichloroethene	156-59-2	0.15	0.50	0.15	U	ug/L	SW8260B	05/04/17
Trichloroethene (TCE)	79-01-6	0.15	0.50	0.15	U	ug/L	SW8260B	05/04/17
Tetrachloroethene (PCE)	127-18-4	0.15	0.50	0.15	U	ug/L	SW8260B	05/04/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	99	70-130	
1,2-Dichloroethane-d4	93	70-130	
Toluene-d8	97	70-130	
4-Bromofluorobenzene	98	70-130	

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*=See case narrative
B=Analyte detected in blank

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CH2M ASL

Client Information

Project Name: Northwest Pipe
Type: QC
Matrix: Water

Lab Information

LCS ID: BS1W0503

Report Revision No.: 0
Dilution Factor: 1

Analyte	CAS#	Spike Amount	Sample Result	Units	%Recovery	Analysis Method	Date Analyzed
GC/MS Volatiles							
Vinyl Chloride	75-01-4	20.0	20.1	ug/L	101	SW8260B	05/03/17
cis-1,2-Dichloroethene	156-59-2	20.0	17.4	ug/L	87	SW8260B	05/03/17
Trichloroethene (TCE)	79-01-6	20.0	18.5	ug/L	93	SW8260B	05/03/17
Tetrachloroethene (PCE)	127-18-4	20.0	18.3	ug/L	92	SW8260B	05/03/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	106	70-130	
1,2-Dichloroethane-d4	102	70-130	
Toluene-d8	102	70-130	
4-Bromofluorobenzene	104	70-130	

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Client Information

Project Name: Northwest Pipe
Type: QC
Matrix: Water

Lab Information

LCS ID: BS1W0504

Report Revision No.: 0
Dilution Factor: 1

Analyte	CAS#	Spike Amount	Sample Result	Units	%Recovery	Analysis Method	Date Analyzed
GC/MS Volatiles							
Vinyl Chloride	75-01-4	20.0	21.3	ug/L	106	SW8260B	05/04/17
cis-1,2-Dichloroethene	156-59-2	20.0	18.6	ug/L	93	SW8260B	05/04/17
Trichloroethene (TCE)	79-01-6	20.0	20.4	ug/L	102	SW8260B	05/04/17
Tetrachloroethene (PCE)	127-18-4	20.0	20.9	ug/L	104	SW8260B	05/04/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	94	70-130	
1,2-Dichloroethane-d4	88	70-130	
Toluene-d8	96	70-130	
4-Bromofluorobenzene	100	70-130	

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CASE NARRATIVE
GC/MS VOLATILES ANALYSIS

Lab Name: CH2M ASL **ASL SDG#:** R1893

Project: Northwest Pipe **Project #:** 682722.GW.05

With the exceptions noted as flags, footnotes, or detailed in the section below; standard operating procedures were followed in the analysis of the samples and no problems were encountered or anomalies observed.

All laboratory quality control samples were within established control limits, with any exceptions noted below, or in the associated QC summary forms.

Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

Calculations are performed before rounding to minimize errors in calculated values.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the section below, or in the sample receipt documentation.

Method(s):
SW8260B: SW5030

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Client Information

Client Sample ID: **TRIPBLANK-050117-03**

Project Name: Northwest Pipe
Sample Date: 05/01/17
Sample Time: 08:00
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: **R189301**

Date Received: 05/02/17
Dilution Factor: 1
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
cis-1,2-Dichloroethene	156-59-2	0.15	0.50	0.15	U	ug/L	SW8260B	05/03/17
Trichloroethene (TCE)	79-01-6	0.15	0.50	0.15	U	ug/L	SW8260B	05/03/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	111	70-130	
1,2-Dichloroethane-d4	107	70-130	
Toluene-d8	100	70-130	
4-Bromofluorobenzene	97	70-130	

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*=See case narrative
B=Analyte detected in blank

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CH2M ASL

Client Information

Client Sample ID: **WB1-0503**

Project Name: Northwest Pipe
Sample Date: N/A
Sample Time: N/A
Type: QC
Matrix: Water

Lab Information

Lab Sample ID: **WB1-0503**

Date Received: N/A
Dilution Factor: 1
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
cis-1,2-Dichloroethene	156-59-2	0.15	0.50	0.15	U	ug/L	SW8260B	05/03/17
Trichloroethene (TCE)	79-01-6	0.15	0.50	0.15	U	ug/L	SW8260B	05/03/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	110	70-130	
1,2-Dichloroethane-d4	107	70-130	
Toluene-d8	103	70-130	
4-Bromofluorobenzene	102	70-130	

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B=Analyte detected in blank

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CH2M ASL

Client Information

Project Name: Northwest Pipe
Type: QC
Matrix: Water

Lab Information

LCS ID: BS1W0503

Report Revision No.: 0
Dilution Factor: 1

Analyte	CAS#	Spike Amount	Sample Result	Units	%Recovery	Analysis Method	Date Analyzed
GC/MS Volatiles							
cis-1,2-Dichloroethene	156-59-2	20.0	17.4	ug/L	87	SW8260B	05/03/17
Trichloroethene (TCE)	79-01-6	20.0	18.5	ug/L	93	SW8260B	05/03/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	106	70-130	
1,2-Dichloroethane-d4	102	70-130	
Toluene-d8	102	70-130	
4-Bromofluorobenzene	104	70-130	

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative

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CASE NARRATIVE
GC/MS VOLATILES ANALYSIS

Lab Name: CH2M ASL **ASL SDG#:** R1893

Project: Northwest Pipe **Project #:** 682722.GW.05

With the exceptions noted as flags, footnotes, or detailed in the section below; standard operating procedures were followed in the analysis of the samples and no problems were encountered or anomalies observed.

All laboratory quality control samples were within established control limits, with any exceptions noted below, or in the associated QC summary forms.

Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

Calculations are performed before rounding to minimize errors in calculated values.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the section below, or in the sample receipt documentation.

Method(s):
SW8260C-SIM: SW5030

CH2M ASL

Client Information

Client Sample ID: **TRIPBLANK-050117-03**

Project Name: Northwest Pipe
Sample Date: 05/01/17
Sample Time: 08:00
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: **R189301**

Date Received: 05/02/17
Dilution Factor: 1
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
Vinyl Chloride	75-01-4	8.00	20.0	8.00	U	ng/L	SW8260C-SI	05/09/17
Tetrachloroethene (PCE)	127-18-4	5.00	20.0	5.00	U	ng/L	SW8260C-SI	05/09/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	109	70-130	
1,2-Dichloroethane-d4	106	70-130	
Toluene-d8	96	70-130	
4-Bromofluorobenzene	108	70-130	

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative
B=Analyte detected in blank

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CH2M ASL

Client Information

Client Sample ID: **WB1-0509**

Project Name: Northwest Pipe
Sample Date: N/A
Sample Time: N/A
Type: QC
Matrix: Water

Lab Information

Lab Sample ID: **WB1-0509**

Date Received: N/A
Dilution Factor: 1
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
Vinyl Chloride	75-01-4	8.00	20.0	8.00	U	ng/L	SW8260C-SI	05/09/17
Tetrachloroethene (PCE)	127-18-4	5.00	20.0	5.00	U	ng/L	SW8260C-SI	05/09/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	103	70-130	
1,2-Dichloroethane-d4	102	70-130	
Toluene-d8	95	70-130	
4-Bromofluorobenzene	109	70-130	

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative
B=Analyte detected in blank

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CH2M ASL

Client Information

Project Name: Northwest Pipe
Type: QC
Matrix: Water

Lab Information

LCS ID: BS1W0509

Report Revision No.: 0
Dilution Factor: 1

Analyte	CAS#	Spike Amount	Sample Result	Units	%Recovery	Analysis Method	Date Analyzed
GC/MS Volatiles							
Vinyl Chloride	75-01-4	500	503	ng/L	101	SW8260C-SIM	05/09/17
Tetrachloroethene (PCE)	127-18-4	500	485	ng/L	97	SW8260C-SIM	05/09/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	101	70-130	
1,2-Dichloroethane-d4	101	70-130	
Toluene-d8	98	70-130	
4-Bromofluorobenzene	111	70-130	

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E=Estimated value above calibration range
*=See case narrative

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CASE NARRATIVE
HEADSPACE ANALYSIS

Lab Name: CH2M ASL **ASL SDG#:** R1893

Project: Northwest Pipe **Project #:** 682722.GW.05

With the exceptions noted as flags, footnotes, or detailed in the section below; standard operating procedures were followed in the analysis of the samples and no problems were encountered or anomalies observed.

All laboratory quality control samples were within established control limits, with any exceptions noted below, or in the associated QC summary forms.

Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

Calculations are performed before rounding to minimize errors in calculated values.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the section below, or in the sample receipt documentation.

Method(s):
RSK-175

CH2M ASL

Client Information

Client Sample ID: MW-01-050117-0

Project Name: Northwest Pipe
Sample Date: 05/01/17
Sample Time: 10:20
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: R189302

Date Received: 05/02/17
Report Revision No: 0

Analyte	CAS#	Dilution Factor	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC Volatiles									
Methane	74-82-8	1	5.23	41.9	3120		ug/L	RSK-175	05/03/17
Carbon dioxide	124-38-9	1	37.0	224	82600		ug/L	RSK-175	05/03/17

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative
B=Analyte detected in blank

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CH2M ASL

Client Information

Client Sample ID: MW-100-050117-0

Project Name: Northwest Pipe
Sample Date: 05/01/17
Sample Time: 12:00
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: R189303

Date Received: 05/02/17
Report Revision No: 0

Analyte	CAS#	Dilution Factor	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC Volatiles									
Methane	74-82-8	1	6.26	50.2	265		ug/L	RSK-175	05/03/17
Carbon dioxide	124-38-9	1	39.3	237	82300		ug/L	RSK-175	05/03/17

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative
B=Analyte detected in blank

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CH2M ASL

Client Information

Client Sample ID: MW-06-050117-0

Project Name: Northwest Pipe
Sample Date: 05/01/17
Sample Time: 11:50
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: R189304

Date Received: 05/02/17
Report Revision No: 0

Analyte	CAS#	Dilution Factor	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC Volatiles									
Methane	74-82-8	1	5.25	42.1	206		ug/L	RSK-175	05/03/17
Carbon dioxide	124-38-9	1	37.1	224	81800		ug/L	RSK-175	05/03/17

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative
B=Analyte detected in blank

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CH2M ASL

Client Information

Client Sample ID: MW-03-050117-0

Project Name: Northwest Pipe
Sample Date: 05/01/17
Sample Time: 13:50
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: R189305

Date Received: 05/02/17
Report Revision No: 0

Analyte	CAS#	Dilution Factor	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC Volatiles									
Methane	74-82-8	1	4.99	40.0	748		ug/L	RSK-175	05/03/17
Carbon dioxide	124-38-9	1	36.5	221	53900		ug/L	RSK-175	05/03/17

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative
B=Analyte detected in blank

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CH2M ASL

Client Information

Client Sample ID: MW-05-050117-0

Project Name: Northwest Pipe
Sample Date: 05/01/17
Sample Time: 15:20
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: R189306

Date Received: 05/02/17
Report Revision No: 0

Analyte	CAS#	Dilution Factor	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC Volatiles									
Methane	74-82-8	1	4.97	39.9	2310		ug/L	RSK-175	05/03/17
Carbon dioxide	124-38-9	1	36.5	221	50500		ug/L	RSK-175	05/03/17

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J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative
B=Analyte detected in blank

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CH2M ASL

Client Information

Lab Information

Method Blank ID: XB1-0503

Project Name: Northwest Pipe
Sample Date: N/A
Sample Time: N/A
Type: QC
Matrix: Water

Date Received: N/A
Report Revision No: 0

Analyte	CAS#	Dilution Factor	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC Volatiles									
Methane	74-82-8	1	14.3	114	14.3	U	ug/L	RSK-175	05/03/17
Carbon dioxide	124-38-9	1	56.6	342	56.6	U	ug/L	RSK-175	05/03/17

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*=See case narrative
B=Analyte detected in blank

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CH2M ASL

Client Information

Project Name: Northwest Pipe
Type: QC
Matrix: Water

Lab Information

LCS ID: BS1X0503

Report Revision No.: 0
Dilution Factor: 1

Analyte	CAS#	Spike Amount	Sample Result	Units	%Recovery	Analysis Method	Date Analyzed
GC Volatiles							
Methane	74-82-8	593	594	ug/L	100	RSK-175	05/03/17
Carbon dioxide	124-38-9	3180	3140	ug/L	99	RSK-175	05/03/17

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E=Estimated value above calibration range
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CASE NARRATIVE
METALS ANALYSIS

Lab Name: CH2M ASL **ASL SDG#:** R1893

Project: Northwest Pipe **Project #:** 682722.GW.05

With the exceptions noted as flags, footnotes, or detailed in the section below; standard operating procedures were followed in the analysis of the samples and no problems were encountered or anomalies observed.

All laboratory quality control samples were within established control limits, with any exceptions noted below, or in the associated QC summary forms.

Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

Calculations are performed before rounding to minimize errors in calculated values.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the section below, or in the sample receipt documentation.

Method(s):
E200.7: FLDFLT

CH2M ASL

Client Information

Project Name: Northwest Pipe

Date Received: 05/02/17
Type: See C.O.C.
Matrix: Water

Lab Information

Lab Batch ID: R1893

Report Revision No.: 0

Client Sample ID	Lab Sample ID	Dilution Factor	DL	RL	Result	Qual	Units	Date Analyzed
Iron: E200.7								
Dissolved Metals								
MW-01-050117-0	R189302F	1	10.0	100	1530		ug/L	05/05/17
MW-100-050117-0	R189303F	1	10.0	100	3600		ug/L	05/05/17
MW-06-050117-0	R189304F	1	10.0	100	3530		ug/L	05/05/17
MW-03-050117-0	R189305F	1	10.0	100	3320		ug/L	05/05/17
MW-05-050117-0	R189306F	1	10.0	100	4170		ug/L	05/05/17
Total Metals								
WB10-0505	WB10-0505	1	10.0	100	10.0	U	ug/L	05/05/17

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B=Analyte detected in blank

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CH2M ASL

Client Information

Project Name: Northwest Pipe
Type: QC
Matrix: Water

Lab Information

Blank Spike ID: BS10W0505

Report Revision No: 0
Dilution Factor: 1

Analyte	Spike Amount	Result	Units	%Recovery	Analysis Method	Prep Method	Date Analyzed
Metals							
Iron	50000	52700	ug/L	105	E200.7	E200.2	05/05/17

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E=Estimated value above calibration range
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CASE NARRATIVE
GENERAL CHEMISTRY ANALYSIS

Lab Name: CH2M ASL **ASL SDG#:** R1893

Project: Northwest Pipe **Project #:** 682722.GW.05

With the exceptions noted as flags, footnotes, or detailed in the section below; standard operating procedures were followed in the analysis of the samples and no problems were encountered or anomalies observed.

All laboratory quality control samples were within established control limits, with any exceptions noted below, or in the associated QC summary forms.

Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

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Method(s):
E300.0A

CH2M ASL

Client Information

Project Name: **Northwest Pipe**

Date Received: 05/02/2017
Type: See C.O.C.
Matrix: Water

Lab Information

Lab Batch ID: **R1893**

Analysis Method: E300.0A
Units: mg/L
Report Revision No.: 0

Client Sample ID	Lab Sample ID	Dilution Factor	DL	RL	Chloride Result	Qualifier	Date Analyzed
General Chemistry							
MW-01-050117-0	R189302	1	0.020	0.20	4.00		05/05/2017
MW-100-050117-0	R189303	1	0.020	0.20	6.21		05/05/2017
MW-06-050117-0	R189304	1	0.020	0.20	6.20		05/05/2017
MW-03-050117-0	R189305	1	0.020	0.20	5.47		05/05/2017
MW-05-050117-0	R189306	1	0.020	0.20	4.87		05/05/2017
WB1-0504	WB1-0504	1	0.020	0.20	0.020	U	05/04/2017

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J=Estimated value below reporting limit
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*=See case narrative
B=Analyte detected in blank

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CH2M ASL

Client Information

Project Name: Northwest Pipe

Date Received: 05/02/2017
Type: See C.O.C.
Matrix: Water

Lab Information

Lab Batch ID: R1893

Analysis Method: E300.0A
Units: mg/L
Report Revision No.: 0

Client Sample ID	Lab Sample ID	Dilution Factor	DL	RL	Sulfate Result	Qualifier	Date Analyzed
General Chemistry							
MW-01-050117-0	R189302	1	0.020	0.20	3.57		05/05/2017
MW-100-050117-0	R189303	1	0.020	0.20	14.0		05/05/2017
MW-06-050117-0	R189304	1	0.020	0.20	13.9		05/05/2017
MW-03-050117-0	R189305	1	0.020	0.20	12.1		05/05/2017
MW-05-050117-0	R189306	1	0.020	0.20	11.9		05/05/2017
WB1-0504	WB1-0504	1	0.020	0.20	0.020	U	05/04/2017

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative

B=Analyte detected in blank

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CH2M ASL

Client Information

Project Name: Northwest Pipe
Type: QC
Matrix: Water

Lab Information

Lab Batch ID: R1893

Report Revision No.: 0

LCS ID	Analyte	Spike Amount	Sample Result	Units	% Recovery	Analysis Method	Date Analyzed
General Chemistry							
BS1W0504	Chloride	5.00	4.99	mg/L	100	E300.0A	05/04/2017
BS1W0504	Sulfate	5.00	4.85	mg/L	97	E300.0A	05/04/2017

U=Not detected and reported as less than detection limit
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E=Estimated value above calibration range
*=See case narrative

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CASE NARRATIVE
GENERAL CHEMISTRY ANALYSIS

Lab Name: CH2M ASL **ASL SDG#:** R1893

Project: Northwest Pipe **Project #:** 682722.GW.05

With the exceptions noted as flags, footnotes, or detailed in the section below; standard operating procedures were followed in the analysis of the samples and no problems were encountered or anomalies observed.

All laboratory quality control samples were within established control limits, with any exceptions noted below, or in the associated QC summary forms.

Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

Calculations are performed before rounding to minimize errors in calculated values.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the section below, or in the sample receipt documentation.

Method(s):
E353.2

CH2M ASL

Client Information

Project Name: Northwest Pipe

Date Received: 05/02/17
Type: See C.O.C.
Matrix: Water

Lab Information

Lab Batch ID: R1893

Analysis Method: E353.2
Units: mg/L
Report Revision No.: 0

Client Sample ID	Lab Sample ID	Dilution Factor	DL	RL	Nitrate-N Result	Qualifier	Date Analyzed
General Chemistry							
MW-01-050117-0	R189302	1	0.0028	0.010	0.029		05/02/17 14:52
MW-100-050117-0	R189303	1	0.0028	0.010	0.0028	U	05/02/17 14:53
MW-06-050117-0	R189304	1	0.0028	0.010	0.0028	U	05/02/17 14:54
MW-03-050117-0	R189305	1	0.0028	0.010	0.0028	U	05/02/17 14:56
MW-05-050117-0	R189306	1	0.0028	0.010	0.0028	U	05/02/17 14:57
WB1-050217	WB1-050217	1	0.0028	0.010	0.0028	U	05/02/17

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative
B=Analyte detected in blank

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CASE NARRATIVE
GENERAL CHEMISTRY ANALYSIS

Lab Name: CH2M ASL **ASL SDG#:** R1893

Project: Northwest Pipe **Project #:** 682722.GW.05

With the exceptions noted as flags, footnotes, or detailed in the section below; standard operating procedures were followed in the analysis of the samples and no problems were encountered or anomalies observed.

All laboratory quality control samples were within established control limits, with any exceptions noted below, or in the associated QC summary forms.

Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

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All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the section below, or in the sample receipt documentation.

Method(s):
SM5310B

CH2M ASL

Client Information

Project Name: Northwest Pipe

Date Received: 05/02/2017
Type: See C.O.C.
Matrix: Water

Lab Information

Lab Batch ID: R1893

Analysis Method: SM5310B
Units: mg/L
Report Revision No.: 0

Client Sample ID	Lab Sample ID	Dilution Factor	DL	RL	Total Organic Carbon Result	Qualifier	Date Analyzed
General Chemistry							
MW-01-050117-0	R189302	1	0.20	0.50	1.34		05/08/2017
MW-100-050117-0	R189303	1	0.20	0.50	1.40		05/08/2017
MW-06-050117-0	R189304	1	0.20	0.50	1.27		05/08/2017
MW-03-050117-0	R189305	1	0.20	0.50	1.27		05/08/2017
MW-05-050117-0	R189306	1	0.20	0.50	1.33		05/08/2017
WB1-0508	WB1-0508	1	0.20	0.50	0.20	U	05/08/2017

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative
B=Analyte detected in blank

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CH2M ASL

Client Information

Lab Information

Lab Batch ID: R1893

Project Name: Northwest Pipe
Type: QC
Matrix: Water

Report Revision No.: 0

LCS ID	Analyte	Spike Amount	Sample Result	Units	% Recovery	Analysis Method	Date Analyzed
General Chemistry							
BS1W0508	Total Organic Carbon	5.00	4.87	mg/L	97	SM5310B	05/08/2017

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative

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CH2MHILL Applied Sciences Laboratory
CHAIN OF CUSTODY RECORD
AND AGREEMENT TO PERFORM SERVICES

Chain of Custody Record

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Client Contact	Analysis Turnaround Time	Preservation Used	For Lab Use Only:
Project Name: NNP	TAT is Calander days	HU HU 1 4 1 3	SDG: R1893
Project # or PO #: 682722	TAT if different from below ____	Analysis Requested	Custody Seals intact? ☒ Yes ☐ No
Company Name: CH2M	☑ 21 days (STD)	SW8260C; SW8260SIM; RSK-175; E200.7F; E300.0, E353.2; SM5310	Hand delivered? ☐ Yes ☒ No
Address: 2020 SW 4th Ave Ste 300	☐ 14 days * ☐ 3 day *		Cooler Temp 2.9 °C
City/State/Zip: Portland OR 97201	☐ 7 days * ☐ 2 days *		Therm ID No. 73 Therm Exp. 7/17/17
Project Manager: Gretchen Gee	☐ 5 days * ☐ 1 day *		Packing Material: Circle Below
Phone #: 503-736-4349	* (Surcharges will apply)		Ice Blue Ice Box Bubble Wrap
Report to email: Gretchen.Gee@ch2m.com			Radiological Screen? ☐ Yes ☒ No

Sample Identification (Limit of 20 characters)	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix (Water, Soil, Air)	Total # of Cont.	SW8260C	SW8260SIM	RSK-175	E200.7F	E300.0, E353.2	SM5310	Sample Specific Notes:	Lab ID:
TRIPBLANK-050117-03	5/1/17	0900	G	W	4	2	2						1
MW-01-050117-0	5/1/17	1020	G	W	12	3	3	3	1	1	1		2
MW-100-050117-0	5/1/17	1200	G	W	12	3	3	3	1	1	1		3
MW-06-050117-0	5/1/17	1150	G	W	12	3	3	3	1	1	1		4
MW-03-050117-0	5/1/17	1350	G	W	12	3	3	3	1	1	1		5
MW-05-050117-0	5/1/17	1520	G	W	12	3	3	3	1	1	1		6

5/12/17

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ____

Possible Hazard Identification:
Are samples hazardous? ☐ Yes ☒ No
If yes, select hazard(s): ☐ Listed ☐ Ignitable ☐ Corrosive ☐ Reactive ☐ Toxic
If YES or NO is not checked above, samples will be assumed hazardous and hazardous disposal fees will be applied.

Sample Disposal (A fee may be added if samples are retained longer than 30 day per client request, samples are returned to client, or classified as hazardous.)
☐ Return to Client ☒ Disposal by Lab ☐ Archive for ____ months

Sampled By:	Date/Time: 5/1/17 1720	Relinquished by:	Date/Time:
Received by:	Date/Time:	Relinquished by:	Date/Time:
Received in Laboratory by:	Date/Time: 5/2/17 0945	Shipped Via: ☐ UPS ☒ Fed-Ex ☐ USPS ☐ Other	Tracking #:

Special Instructions/QC Requirements

CH2M Applied Sciences Laboratory

Sample Receipt Record

SDG ID: R1893 Date Received: 5/2/2017

Client/Project: Northwest Pipe Received by: TW

Were custody seals intact and on the outside of the cooler?	☑ Yes	☐ No	☐ N/A	
Shipping Record:	☐ Hand Delivered	☑ On File	☐ COC	
Radiological Screening for DoD	☐ Yes	☐ No	☑ N/A	
Packing Material:	☐ Hand Delivered	☑ Ice	☐ Blue Ice	☐ Box
Temp OK? (<6C) Therm ID: TH173 Exp. 7/17/17	2.9 °C	☑ Yes	☐ No	☐ N/A
Was a Chain of Custody (CoC) Provided?	☑ Yes	☐ No	☐ N/A	
Was the CoC correctly filled out (If No, document below)	☑ Yes	☐ No	☐ N/A	
Did sample labels agree with COC? (If No, document below)	☑ Yes	☐ No	☐ N/A	
Did the CoC list a correct bottle count and the preservative types (No=Correct on CoC)	☑ Yes	☐ No	☐ N/A	
Were the sample containers in good condition (not broken or leaking)?	☑ Yes	☐ No	☐ N/A	
Was enough sample volume provided for analysis? (If No, document below)	☑ Yes	☐ No	☐ N/A	
Containers supplied by ASL?	☑ Yes	☐ No	☐ N/A	
Any sample with < 1/2 holding time remaining? If so contact LPM and document below.	☐ Yes	☑ No	☐ N/A	
Samples have multi-phase? If yes, document on SRER	☐ Yes	☑ No	☐ N/A	
All water VOCs free of air bubbles? No, document on SRER	☐ Yes	☐ No	☑ N/A	
pH of all samples met criteria on receipt? If "No", preserve and document below.	☑ Yes	☐ No	☐ N/A	
Dissolved/Soluble metals filtered in the field?	☑ Yes	☐ No	☐ N/A	
Dissolved/Soluble metals have sediment in bottom of container? If so document below.	☐ Yes	☑ No	☐ N/A	

Preservation Adjustment

Sample ID	Reagent	Reagent Lot Number	Volume Added	Initials/Date-Time	24 hour pH check Initials/Time

Did pH of all metals samples preserved upon receipt meet criteria 24 hours after preservation? ☐ Yes ☐ No

Sample Exception Report (The following exceptions were noted)

Client was notified on: Client contact:

Resolution to Exception: