

APPENDIX H

VAPOR INTRUSION RESULTS BY PROPERTY

**3 7TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
3 7th St W_2nd Floor	03/01/18	20180301-37STW-03	1.9	<0.09	<0.066	<0.066	<0.043	<0.037	<1.6	2.3	0.35	0.63
3 7th St W_Main	03/01/18	20180301-37STW-02	3	<0.088	0.076	<0.065	<0.042	<0.036	<1.6	2.1	0.49	0.47
3 7th St W_Boiler Room	03/01/18	20180301-37STW-01	1.9	<0.086	<0.064	<0.064	<0.041	<0.036	<1.6	2.2	0.48	0.41
3 7th St W_Subslab	03/02/18	20180302-37STW-01	40.1	0.31	0.11	<0.08	<0.051	<0.045	<2	0.15	0.2	161

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

MT DEQ - Montana Department of Environmental Quality

APH - Air-phase petroleum hydrocarbons

**3 7TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
3 7th St W_2nd Floor	03/01/18	20180301-37STW-03	<0.067	0.18	<1.4	<4.3	0.21	<3.4	<1.3	<0.13	<2	<0.077
3 7th St W_Main	03/01/18	20180301-37STW-02	<0.066	0.13	<1.4	<4.2	0.15	<3.4	<1.3	<0.13	<2	<0.076
3 7th St W_Boiler Room	03/01/18	20180301-37STW-01	<0.065	0.12	<1.4	<4.2	0.13	<3.3	<1.2	<0.12	<1.9	<0.074
3 7th St W_Subslab	03/02/18	20180302-37STW-01	<0.081	<0.081	<1.7	<5.2	23.6	<4.2	<1.6	0.29	<2.4	<0.093

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

MT DEQ - Montana Department of Environmental Quality

APH - Air-phase petroleum hydrocarbons

**3 7TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
3 7th St W_2nd Floor	03/01/18	20180301-37STW-03	<3.6	<6.8	<4.4	<0.11	<6.2	<0.091	34.3	<4.9	<1.5	2.2
3 7th St W_Main	03/01/18	20180301-37STW-02	<3.5	<6.7	<4.3	<0.11	<6.1	<0.089	39	<4.8	<1.5	<0.68
3 7th St W_Boiler Room	03/01/18	20180301-37STW-01	<3.4	<6.6	<4.2	<0.11	<6	<0.088	28.7	<4.7	<1.5	<0.66
3 7th St W_Subslab	03/02/18	20180302-37STW-01	<4.3	<8.2	<5.3	<0.14	10.3	<0.11	23.4	<5.9	<1.9	<0.83

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit
 DUP - Field duplicate sample
 NA - Not applicable
 J+ - Estimated concentration, possibly biased high
 UJ - Estimated reporting limit
 R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues
 MT DEQ - Montana Department of Environmental Quality
 APH - Air-phase petroleum hydrocarbons

**3 7TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
3 7th St W_2nd Floor	03/01/18	20180301-37STW-03	277	<1.6	2.2	35	3.2	<1.9	<1.6	2.2	3.4	<1.4
3 7th St W_Main	03/01/18	20180301-37STW-02	215	<1.6	2	28.7	4.5	<1.8	<1.6	1.7	3.3	<1.4
3 7th St W_Boiler Room	03/01/18	20180301-37STW-01	218	<1.6	2.1	35.1	1.9	<1.8	<1.6	1.2	<2.8	<1.4
3 7th St W_Subslab	03/02/18	20180302-37STW-01	5.2	<2	<1.4	<5	<1.2	4.5	<2	3.7	<3.5	<1.7

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues
- MT DEQ - Montana Department of Environmental Quality
- APH - Air-phase petroleum hydrocarbons

**3 7TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
3 7th St W_2nd Floor	03/01/18	20180301-37STW-03	2.6	<0.066	<5.8	<6	5.4	<0.091	1.9	<1.4	<1	<0.88
3 7th St W_Main	03/01/18	20180301-37STW-02	2.4	<0.065	<5.7	<5.9	5.5	<0.089	2.1	<1.3	<1	<0.86
3 7th St W_Boiler Room	03/01/18	20180301-37STW-01	2.6	<0.064	<5.6	<5.8	5.1	<0.088	1.9	<1.3	<1	<0.85
3 7th St W_Subslab	03/02/18	20180302-37STW-01	2.5	<0.08	<7	<7.2	<1.5	<0.11	<1.4	<1.6	<1.3	<1.1

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit
DUP - Field duplicate sample
NA - Not applicable
J+ - Estimated concentration, possibly biased high
UJ - Estimated reporting limit
R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues
MT DEQ - Montana Department of Environmental Quality
APH - Air-phase petroleum hydrocarbons

**3 7TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
3 7th St W_2nd Floor	03/01/18	20180301-37STW-03	<2.8	<2.3	<2	<2	<0.076	<0.076	2.9	<6.8	<0.57	<1.4
3 7th St W_Main	03/01/18	20180301-37STW-02	<2.8	<2.3	<2	<2	<0.074	<0.074	2.7	<6.7	<0.56	<1.4
3 7th St W_Boiler Room	03/01/18	20180301-37STW-01	<2.7	<2.2	<1.9	<1.9	<0.073	<0.073	2.8	<6.6	<0.55	<1.4
3 7th St W_Subslab	03/02/18	20180302-37STW-01	<3.4	<2.8	<2.4	<2.4	<0.091	0.12	<1.5	<8.2	<0.69	<1.7

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit
 DUP - Field duplicate sample
 NA - Not applicable
 J+ - Estimated concentration, possibly biased high
 UJ - Estimated reporting limit
 R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues
 MT DEQ - Montana Department of Environmental Quality
 APH - Air-phase petroleum hydrocarbons

**3 7TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Sample ID	1,1,2-Trichloroethane (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
3 7th St W_2nd Floor	03/01/18	20180301-37STW-03	<2.6	--	--	--	--	--
3 7th St W_Main	03/01/18	20180301-37STW-02	<2.5	--	--	--	--	--
3 7th St W_Boiler Room	03/01/18	20180301-37STW-01	<2.5	--	--	--	--	--
3 7th St W_Subslab	03/02/18	20180302-37STW-01	<3.1	<16.8	79.3	19.5	<2	<3.6

Applicable Residential Screening Levels

520

NA

NA

NA

NA

NA

Applicable Industrial Screening Levels

2,200

NA

NA

NA

NA

NA

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

MT DEQ - Montana Department of Environmental Quality

APH - Air-phase petroleum hydrocarbons

**3 7TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloroethane (ug/m3)	1,2-Dichloroethane (ug/m3)
BPS-IA-6_3 7TH ST W_Apt 102	03/26/01	0.28	<0.18	<0.26	--	<0.28	0.68	0.71	0.45	--	--
BPIA46_3 7TH ST W APARTMENT 104	02/02/07	1.4	0.066	<0.059	<0.059	<0.059	--	1.1	2.8	0.059	0.19
BPIA32_3 7TH ST W APARTMENT 105	11/30/06	8.6	0.16	0.12	0.59	0.038	--	6.8	6.6	0.12	0.2
	02/02/07	6.2	0.092	<0.043	<0.043	0.0086	--	2.5	1.8	0.043	0.2
BPS-IA-5_3 7TH ST W_Behind door basement level	03/26/01	<0.18	<0.18	<0.26	--	<0.28	0.55	0.69	<0.24	--	--
BPS-IA-4_3 7TH ST W_Boiler room	03/26/01	0.24	<0.18	<0.26	--	<0.28	0.47	0.63	<0.24	--	--
BPSS46_3 7TH ST W APARTMENT 104	02/02/07	5100	29	<17	<17	<17	--	<66	<66	<17	<17
BPSS33_3 7TH ST W BOILER ROOM	11/29/06	420	0.59	<0.35	<1.7	<0.11	--	<0.7	70	<0.35	<0.35

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	6.3	1.3	0.12	1.8	0.23
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	26	1.6	0.53	7.7	0.47

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

MT DEQ - Montana Department of Environmental Quality

APH - Air-phase petroleum hydrocarbons

**3 7TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Ethyl- benzene (ug/m3)	1,4-Di- chloro- benzene (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chloromethane (ug/m3)	4-Ethyltoluene (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)
BPS-IA-6_3 7TH ST W_Apt 102	03/26/01	0.37	<0.29	<0.26	--	12	0.77	0.85	<0.27	0.46	<0.32
BPIA46_3 7TH ST W APARTMENT 104	02/02/07	0.56	--	--	<0.059	--	--	--	--	--	--
BPIA32_3 7TH ST W APARTMENT 105	11/30/06	2.2	--	--	0.16	--	--	--	--	--	--
	02/02/07	0.94	--	--	<0.043	--	--	--	--	--	--
BPS-IA-5_3 7TH ST W_Behind door basement level	03/26/01	0.29	<0.29	<0.26	--	<8.8	0.68	0.83	<0.27	0.32	<0.32
BPS-IA-4_3 7TH ST W_Boiler room	03/26/01	0.35	<0.29	<0.26	--	<8.8	0.42	0.7	<0.27	0.52	<0.32
BPSS46_3 7TH ST W APARTMENT 104	02/02/07	1.7	--	--	<17	--	--	--	--	--	--
BPSS33_3 7TH ST W BOILER ROOM	11/29/06	1	--	--	<0.48	--	--	--	--	--	--

Applicable Residential Screening Levels	1.1	0.26	0.21	0.021	3,200	520	9.4	NA	1.3	6.3
Applicable Industrial Screening Levels	4.9	1.1	0.88	0.088	14,000	2,200	39	NA	1.3	26

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

MT DEQ - Montana Department of Environmental Quality

APH - Air-phase petroleum hydrocarbons

**3 7TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	Dichloro- difluoro- methane (ug/m3)	1,1-Dichloro- ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1- Trichloro- ethane (ug/m3)	Carbon Disulfide (ug/m3)	1,2-Di- chloro- benzene (ug/m3)
BPS-IA-6_3 7TH ST W_Apt 102	03/26/01	1.3	0.46	0.57	--	1.2	--	3.7	<0.22	<0.25	<0.24
BPIA46_3 7TH ST W APARTMENT 104	02/02/07	1.9	0.73	--	0.017	0.26	0.016	14	0.052	--	--
BPIA32_3 7TH ST W APARTMENT 105	11/30/06	7.1	2.4	--	0.059	1	0.54	15	0.16	--	--
	02/02/07	3.5	1.1	--	0.039	0.64	0.012	8.3	0.054	--	--
BPS-IA-5_3 7TH ST W_Behind door basement level	03/26/01	1.1	0.37	0.52	--	<0.23	--	1.8	<0.22	<0.25	<0.24
BPS-IA-4_3 7TH ST W_Boiler room	03/26/01	1.2	0.37	0.47	--	1.1	--	1.8	0.42	0.81	<0.24
BPSS46_3 7TH ST W APARTMENT 104	02/02/07	4.8	<66	--	<17	<66	<17	<66	<17	--	--
BPSS33_3 7TH ST W BOILER ROOM	11/29/06	2.5	0.85	--	<0.17	<3	<1.6	3.7	<0.48	--	--

Applicable Residential Screening Levels	10	10	10	21	63	11	520	520	73	21
Applicable Industrial Screening Levels	44	44	44	88	260	47	2,200	2,200	310	88

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit
DUP - Field duplicate sample
NA - Not applicable
J+ - Estimated concentration, possibly biased high
UJ - Estimated reporting limit
R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues
MT DEQ - Montana Department of Environmental Quality
APH - Air-phase petroleum hydrocarbons

**3 7TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Styrene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)
BPS-IA-6_3 7TH ST W_Apt 102	03/26/01	0.43	<0.27
BPIA46_3 7TH ST W APARTMENT 104	02/02/07	--	--
BPIA32_3 7TH ST W APARTMENT 105	11/30/06	--	--
	02/02/07	--	--
BPS-IA-5_3 7TH ST W_Behind door basement level	03/26/01	<0.22	<0.27
BPS-IA-4_3 7TH ST W_Boiler room	03/26/01	<0.22	<0.27
BPSS46_3 7TH ST W APARTMENT 104	02/02/07	--	--
BPSS33_3 7TH ST W BOILER ROOM	11/29/06	--	--

Applicable Residential Screening Levels	100	520
Applicable Industrial Screening Levels	440	2,200

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues
- MT DEQ - Montana Department of Environmental Quality
- APH - Air-phase petroleum hydrocarbons

**3 BROADWATER AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
3 Broadwater Ave_Main Hall	02/22/18	20180222-3BROADWATER-02	0.57	<0.11	<0.081	<0.081	<0.053	<0.045	<1.5	1.7	<0.13	0.24
3 Broadwater Ave_Gym Hall	02/22/18	20180222-3BROADWATER-01	0.25	0.11	<0.079	<0.079	<0.051	<0.044	<1.4	2.5	0.8	0.26
3 Broadwater Ave_Board Room	02/22/18	20180222-3BROADWATER-03	0.36	0.16	0.17	<0.088	<0.057	0.24	<1.6	1.4	0.37	0.2
3 Broadwater Ave_Boiler Room	02/22/18	20180222-3BROADWATER-04	0.24	<0.086	<0.064	<0.064	<0.041	0.34	5	2.1	0.43	0.17
3 Broadwater Ave_Main Crawlspace	02/22/18	20180222-3BROADWATER-05	3.3	0.28	<0.14	<0.14	<0.088	<0.076	<2.5 R	1.6	<0.22	0.29
3 Broadwater Ave_Subslab	02/23/18	20180223-3BROADWATER-01	50.6	0.67	<0.12	<0.12	<0.08	<0.069	<1.7	1.6	0.37	2.3

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**3 BROADWATER AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
3 Broadwater Ave_Main Hall	02/22/18	20180222-3BROADWATER-02	<0.083	0.1	<1.4	<1.6 UJ	<0.14	<3.3	<1.2	<0.16	<1.9	<0.095
3 Broadwater Ave_Gym Hall	02/22/18	20180222-3BROADWATER-01	<0.081	0.12	<1.3	<1.5 UJ	<0.13	<3	<1.1	<0.15	<1.8	<0.092
3 Broadwater Ave_Board Room	02/22/18	20180222-3BROADWATER-03	<0.09	0.12	<1.4	<1.7 UJ	<0.15	<3.4	<1.3	<0.17	<2	<0.1
3 Broadwater Ave_Boiler Room	02/22/18	20180222-3BROADWATER-04	<0.065	0.084	<1.4	<1.7 UJ	<0.11	<3.3	<1.2	<0.12	<1.9	<0.074
3 Broadwater Ave_Main Crawlspace	02/22/18	20180222-3BROADWATER-05	<0.14	0.16	<2.2 R	<2.6 R	<0.23	<5.3 R	<2	<0.26	<3.1 R	<0.16
3 Broadwater Ave_Subslab	02/23/18	20180223-3BROADWATER-01	<0.13	<0.13	<1.5	<1.8	0.22	<3.6	<1.3	0.26	<2.1	<0.14

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**3 BROADWATER AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
3 Broadwater Ave_Main Hall	02/22/18	20180222-3BROADWATER-02	<3.4	<6.4	<4.1	<0.14	<5.8	<0.11	156	<4.6	<1.5	1.4
3 Broadwater Ave_Gym Hall	02/22/18	20180222-3BROADWATER-01	<3.1	<6	<3.8	<0.14	<5.4	<0.11	20.5	<4.3	<1.3	1.5
3 Broadwater Ave_Board Room	02/22/18	20180222-3BROADWATER-03	<3.5	<6.7	<4.3	<0.15	<6.1	<0.12	41.4	<4.8	<1.5	1.5
3 Broadwater Ave_Boiler Room	02/22/18	20180222-3BROADWATER-04	<3.4	<6.6	<4.2	<0.11	<6	<0.088	16.3	<4.7	<1.5	1.3
3 Broadwater Ave_Main Crawlspace	02/22/18	20180222-3BROADWATER-05	<5.5 R	<10.5 R	<6.7	<0.24	<9.5 R	<0.19	54.7	<7.6	<2.4 R	1.3
3 Broadwater Ave_Subslab	02/23/18	20180223-3BROADWATER-01	<3.7	<7.1	<4.5	0.36	<6.4	<0.17	275	13.9	<1.6	<0.72

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**3 BROADWATER AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
3 Broadwater Ave_Main Hall	02/22/18	20180222-3BROADWATER-02	67.8	<1.5	2.9	52.9	<0.93	2.1	<1.5	<1.1	<2.7	<1.4
3 Broadwater Ave_Gym Hall	02/22/18	20180222-3BROADWATER-01	66.1	<1.4	4	4.4	<0.86	2.1	<1.4	<1	3.4	1.4
3 Broadwater Ave_Board Room	02/22/18	20180222-3BROADWATER-03	26	<1.6	3.4	<4	<0.97	1.9	<1.6	2.3	<2.8	<1.4
3 Broadwater Ave_Boiler Room	02/22/18	20180222-3BROADWATER-04	18.7	<1.6	3.4	32.9	<0.95	2	<1.6	<1.1	6	1.9
3 Broadwater Ave_Main Crawlspace	02/22/18	20180222-3BROADWATER-05	55.7	<2.5 R	3.4	<6.3	<1.5	<2.9	<2.5 R	5	<4.5 R	<2.2 R
3 Broadwater Ave_Subslab	02/23/18	20180223-3BROADWATER-01	4	<1.7	<1.2	6.2	<1	<1.9	<1.7	<1.2	<3	<1.5

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**3 BROADWATER AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
3 Broadwater Ave_Main Hall	02/22/18	20180222-3BROADWATER-02	3.2	<0.081	6.8	<5.7	3.7	<0.11	2.1	<1.3	<0.98	<0.83
3 Broadwater Ave_Gym Hall	02/22/18	20180222-3BROADWATER-01	3.5	<0.079	21.5	<5.3	5.6	<0.11	3.6	1.9	<0.91	<0.77
3 Broadwater Ave_Board Room	02/22/18	20180222-3BROADWATER-03	3.2	<0.088	9.5	<5.9	3.8	<0.12	2.2	<1.3	<1	<0.86
3 Broadwater Ave_Boiler Room	02/22/18	20180222-3BROADWATER-04	3.5	<0.064	8.9	<5.8	5.9	<0.088	3.2	1.4	<1	<0.85
3 Broadwater Ave_Main Crawlspace	02/22/18	20180222-3BROADWATER-05	3.4	<0.14	10.6	<9.2	4.6	<0.19	<1.8	<2.1	<1.6	<1.4
3 Broadwater Ave_Subslab	02/23/18	20180223-3BROADWATER-01	2.3	<0.12	<6	<6.3	1.5	0.2	<1.2	<1.4	<1.1	<0.92

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**3 BROADWATER AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo-chloromethane (ug/m3)	1,2-Dichloro-1,1,2,2-tetrafluoroethane (ug/m3)	1,2-Dichlorobenzene (ug/m3)	1,3-Dichlorobenzene (ug/m3)	Cis-1,3-dichloropropene (ug/m3)	trans-1,3-Dichloropropene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl-2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
3 Broadwater Ave_Main Hall	02/22/18	20180222-3BROADWATER-02	<2.7	<2.2	<1.9	<1.9	<0.093	<0.093	<1.1	<6.4	<0.54	<1.3
3 Broadwater Ave_Gym Hall	02/22/18	20180222-3BROADWATER-01	<2.5	<2	<1.8	<1.8	<0.09	<0.09	<1.1	<6	<0.5	<1.2
3 Broadwater Ave_Board Room	02/22/18	20180222-3BROADWATER-03	<2.8	<2.3	<2	<2	<0.1	<0.1	<1.2	<6.7	<0.56	<1.4
3 Broadwater Ave_Boiler Room	02/22/18	20180222-3BROADWATER-04	<2.7	<2.2	<1.9	<1.9	<0.073	<0.073	<1.2	<6.6	<0.55	<1.4
3 Broadwater Ave_Main Crawlspace	02/22/18	20180222-3BROADWATER-05	<4.4 R	<3.6	<3.1 R	<3.1 R	<0.16	<0.16	<1.8	<10.5	<0.88	<2.2 R
3 Broadwater Ave_Subslab	02/23/18	20180223-3BROADWATER-01	<3	<2.4	<2.1	<2.1	<0.14	0.16	<1.3	<7.1	2.7	<1.5

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**3 BROADWATER AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
3 Broadwater Ave_Main Hall	02/22/18	20180222-3BROADWATER-02	<2.4	<18.6	<18.6	25.2	--	--	--	--	--
3 Broadwater Ave_Gym Hall	02/22/18	20180222-3BROADWATER-01	<2.2	<17.3	<17.3	78.3	--	--	--	--	--
3 Broadwater Ave_Board Room	02/22/18	20180222-3BROADWATER-03	<2.5	30.6	<19.3	40.6	--	--	--	--	--
3 Broadwater Ave_Boiler Room	02/22/18	20180222-3BROADWATER-04	<2.5	<19	<19	<22.1	--	--	--	--	--
3 Broadwater Ave_Main Crawlspace	02/22/18	20180222-3BROADWATER-05	<3.9	<30.2	<30.2	63.9	--	--	--	--	--
3 Broadwater Ave_Subslab	02/23/18	20180223-3BROADWATER-01	<2.7	<20.5	<20.5	<23.9	<17.1	80.8	19.5	<2	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA	NA

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**3 BROADWATER AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)
BPIA40_3 BROADWATER AVE HS ART SUPPLY ROOM	02/02/07	1.7	0.076	<0.042	<0.042	0.0048	1.3	0.14	0.042	0.057	0.37
BPCS40_3 BROADWATER AVE CRAWLSPACE	02/02/07	22	0.96	0.037	<0.041	0.0059	1.3	0.32	0.041	0.078	0.47

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**3 BROADWATER AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloro-ethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)
BPIA40_3 BROADWATER AVE HS ART SUPPLY ROOM	02/02/07	<0.042	1.4	0.47	0.04	0.41	<0.042	2.9	0.12
BPCS40_3 BROADWATER AVE CRAWLSPACE	02/02/07	<0.041	1.8	0.58	0.064	0.59	<0.041	6.6	0.12

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit
DUP - Field duplicate sample
NA - Not applicable
J+ - Estimated concentration, possibly biased high
UJ - Estimated reporting limit
R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**11 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
11 Custer Ave_2nd Floor	02/27/18	20180227-11CUSTER-03	1.5	0.14	<0.087	<0.087	<0.056	<0.049	<1.6 R	2 J+	0.62	0.2
11 Custer Ave_Basement	02/27/18	20180227-11CUSTER-01	2.6	0.26	<0.082	<0.082	<0.053	<0.046	<1.6	1.9	0.62	0.21
11 Custer Ave_Main	02/27/18	20180227-11CUSTER-02	1.4	0.13	<0.085	<0.085	<0.055	0.3	<1.6	2.2	0.34	0.21
11 Custer Ave_Subslab	02/28/18	20180228-11CUSTER-01	108000	8640	120	12.5	<0.43	<0.74	<1.6	<0.53	<1	48

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**11 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
11 Custer Ave_2nd Floor	02/27/18	20180227-11CUSTER-03	<0.089	0.14	<1.4 R	<1.7 R	<0.15	<3.4 R	<1.3 R	<0.17	<2 R	<0.1
11 Custer Ave_Basement	02/27/18	20180227-11CUSTER-01	<0.083	0.092	<1.4	<1.7 UJ	<0.14	<3.4	<1.3	<0.16	<2	<0.095
11 Custer Ave_Main	02/27/18	20180227-11CUSTER-02	<0.087	0.14	<1.4	<1.7 UJ	<0.14	<3.3	<1.2	<0.17	<1.9	<0.1
11 Custer Ave Subslab	02/28/18	20180228-11CUSTER-01	19.8	<0.67	<1.4	<1.7	<2.2	<3.4	<1.3	<2.6	<2	<1.5

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**11 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
11 Custer Ave_2nd Floor	02/27/18	20180227-11CUSTER-03	<3.5 R	<6.7 R	<4.3 R	<0.15	<6.1 R	<0.12	17.4 J+	<4.8 R	<1.5 R	1.7 J+
11 Custer Ave_Basement	02/27/18	20180227-11CUSTER-01	<3.5	<6.7	<4.3	<0.14	<6.1	<0.11	14.9	<4.8	<1.5	1.4
11 Custer Ave_Main	02/27/18	20180227-11CUSTER-02	<3.4	<6.6	<4.2	<0.15	<6	<0.12	19.2	<4.7	<1.5	1.7
11 Custer Ave_Subslab	02/28/18	20180228-11CUSTER-01	<3.6	<6.8	<4.4	<1.1	<6.2	<0.91	28	5.4	<1.5	2.7

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**11 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
11 Custer Ave_2nd Floor	02/27/18	20180227-11CUSTER-03	63.5 J+	<1.6 R	2.3 J+	<4 R	<0.97 R	2.3 J+	<1.6 R	<1.2 R	<2.8 R	<1.4 R
11 Custer Ave_Basement	02/27/18	20180227-11CUSTER-01	57.6	<1.6	2.3	<4	<0.97	2	<1.6	<1.2	<2.8	<1.4
11 Custer Ave_Main	02/27/18	20180227-11CUSTER-02	63.8	<1.6	2.3	<4	<0.95	2.2	<1.6	<1.1	<2.8	<1.4
11 Custer Ave_Subslab	02/28/18	20180228-11CUSTER-01	<1.6	<1.6	<1.2	<4.1	<0.98	<1.9	<1.6	<1.2	<2.9	<1.4

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**11 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro- difluoro- methane (ug/m3)	1,1-Dichloro- ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1- Trichloro- ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
11 Custer Ave_2nd Floor	02/27/18	20180227-11CUSTER-03	4 J+	<0.087	<5.7 R	<5.9 R	4.8 J+	<0.12	3.3 J+	1.5 J+	<1 R	<0.86 R
11 Custer Ave_Basement	02/27/18	20180227-11CUSTER-01	4	<0.082	<5.7	<5.9	4.9	<0.11	3.2	<1.3	<1	<0.86
11 Custer Ave_Main	02/27/18	20180227-11CUSTER-02	4.1	<0.085	<5.6	<5.8	5	<0.12	3.4	2	<1	<0.85
11 Custer Ave_Subslab	02/28/18	20180228-11CUSTER-01	<1.7	<1.3	<5.8	<6	1.5	114	<1.1	<1.4	<1 UJ	<0.88

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**11 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
11 Custer Ave_2nd Floor	02/27/18	20180227-11CUSTER-03	<2.8 R	<2.3 R	<2 R	<2 R	<0.1	<0.1	<1.2 R	<6.7 R	<0.56 R	<1.4 R
11 Custer Ave_Basement	02/27/18	20180227-11CUSTER-01	<2.8	<2.3	<2	<2	<0.094	<0.094	<1.2	<6.7	<0.56	<1.4
11 Custer Ave_Main	02/27/18	20180227-11CUSTER-02	<2.7	<2.2	<1.9	<1.9	<0.098	<0.098	<1.2	<6.6	<0.55	<1.4
11 Custer Ave Subslab	02/28/18	20180228-11CUSTER-01	<2.8	<2.3	<2	<2	<1.5	<1.5	<1.2	<6.8	<0.57	<1.4

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**11 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloroethane (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
11 Custer Ave_2nd Floor	02/27/18	20180227-11CUSTER-03	<2.5 R	--	--	--	--	--
11 Custer Ave_Basement	02/27/18	20180227-11CUSTER-01	<2.5	--	--	--	--	--
11 Custer Ave_Main	02/27/18	20180227-11CUSTER-02	<2.5	--	--	--	--	--
11 Custer Ave_Subslab	02/28/18	20180228-11CUSTER-01	<2.6	<16.1	77.3	18	4.7	<3.6

Applicable Residential Screening Levels	520	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	NA	NA	NA	NA	NA	NA

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**11 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	1,1,2-Trichloro-ethane (ug/m3)	1,1-Dichloro-ethene (ug/m3)
BPIA171_11 CUSTER AVE	04/12/10	5.6	0.54	<0.14	<0.68	<0.044	0.27	<0.14	<0.14	<0.19	0.068
BPSS171 11 CUSTER AVE	04/13/10	61630.2	--	--	--	--	<488	--	<4050	--	--

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.12	1.8	0.23	0.021	21
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.53	7.7	0.47	0.088	88

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**11 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Methylene Chloride (ug/m3)	MTBE (ug/m3)	1,1,1-Trichloroethane (ug/m3)
BPIA171_11 CUSTER AVE	04/12/10	1.2	<0.62	<0.19
BPSS171_11 CUSTER AVE	04/13/10	--	--	--

Applicable Residential Screening Levels	63	11	520
Applicable Industrial Screening Levels	260	47	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**19 S BROADWAY VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
19 S Broadway_Main	03/02/18	20180302-19SBROADWAY-01	223	<0.92	<1.4	<1.4	<0.44	<0.76	<1.7	1.5	<1.1	<0.83
19 S Broadway_Subslab	03/02/18	20180302-19SBROADWAY-02	583000	8680	189	3.7	<0.41	<0.71	<1.6 R	4.7	<1	56.7

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**19 S BROADWAY VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
19 S Broadway_Main	03/02/18	20180302-19SBROADWAY-01	<1.4	<0.69	<1.5	<1.8	<2.3	<3.5	<1.3	<2.6	<2	<1.6
19 S Broadway_Subslab	03/02/18	20180302-19SBROADWAY-02	4.1	<0.65	<1.4 R	<1.7 R	<2.1	<3.3 R	<1.2	<2.5 R	<1.9 R	<1.5

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**19 S BROADWAY VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
19 S Broadway_Main	03/02/18	20180302-19SBROADWAY-01	<3.6	<7	<4.5	<1.2	<6.3	<0.93	<4	<5	<1.6	0.83
19 S Broadway_Subslab	03/02/18	20180302-19SBROADWAY-02	<3.4 R	<6.6 R	<4.2	<1.1 R	<6 R	<0.88	<3.8	<4.7	<1.5 R	<0.66

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**19 S BROADWAY VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
19 S Broadway_Main	03/02/18	20180302-19SBROADWAY-01	21.1	<1.7	1.6	<4.2	<1	<1.9	<1.7	<1.2	<3	<1.5
19 S Broadway_Subslab	03/02/18	20180302-19SBROADWAY-02	<1.5	<1.6 R	<1.1	<4	<0.95	<1.8	<1.6 R	<1.1	<2.8 R	<1.4 R

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**19 S BROADWAY VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro- difluoro- methane (ug/m3)	1,1-Dichloro- ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1- Trichloro- ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
19 S Broadway_Main	03/02/18	20180302-19SBROADWAY-01	2.3	<1.4	<5.9	<6.1	3.9	<1.9	<1.2	<1.4	<1.1	<0.9
19 S Broadway_Subslab	03/02/18	20180302-19SBROADWAY-02	2.2	<1.3	<5.6	<5.8	<1.2	9.8	<1.1	<1.3	<1	<0.85

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**19 S BROADWAY VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
19 S Broadway_Main	03/02/18	20180302-19SBROADWAY-01	<2.9	<2.4	<2	<2	<1.6	<1.6	<1.2	<7	<0.59	<1.5
19 S Broadway_Subslab	03/02/18	20180302-19SBROADWAY-02	<2.7 R	<2.2	<1.9 R	<1.9 R	<1.5	<1.5	<1.2	<6.6	<0.55	<1.4 R

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**19 S BROADWAY VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
19 S Broadway_Main	03/02/18	20180302-19SBROADWAY-01	<2.6	<20.2	<20.2	<23.5	--	--	--	--	--
19 S Broadway_Subslab	03/02/18	20180302-19SBROADWAY-02	<2.5	5090 J+	<19 R	<22.1 R	253	78.7	20	<2	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**26 S 24TH STREET VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
26 S 24th St_Shop	02/28/18	20180228-26S24ST-01	0.28	0.3	<0.066	<0.066	<0.043	<0.037	3.7	4.6	0.35	0.22
26 S 24th St_Shop	02/28/18	20180228-A	0.31	0.29	<0.065	<0.065	<0.042	<0.036	3.7	4.7	0.44	0.27
26 S 24th St Subslab	02/28/18	20180228-26S24ST-02	832	21.9	<1.3	<1.3	<0.43	<0.74	<1.6	<0.53	<1	<0.81

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**26 S 24TH STREET VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
26 S 24th St_Shop	02/28/18	20180228-26S24ST-01	<0.067	0.069	3.6	<4.3	<0.11	<3.4	<1.3	<0.13	<2	<0.077
26 S 24th St_Shop	02/28/18	20180228-A	<0.066	0.093	3.5	<4.2	<0.11	<3.4	<1.3	<0.13	<2	<0.076
26 S 24th St Subslab	02/28/18	20180228-26S24ST-02	<1.3	<0.67	<1.4	<1.7	<2.2	<3.4	<1.3	<2.6	<2	<1.5

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**26 S 24TH STREET VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
26 S 24th St_Shop	02/28/18	20180228-26S24ST-01	<3.6	<6.8	<4.4	0.12	<6.2	<0.091	211	64.4	<1.5	1.7
26 S 24th St_Shop	02/28/18	20180228-A	<3.5	<6.7	4.3	0.22	<6.1	<0.089	202	64.2	<1.5	1.5
26 S 24th St Subslab	02/28/18	20180228-26S24ST-02	<3.6	<6.8	<4.4	<1.1	<6.2	<0.91	9	<4.9	<1.5	<0.69

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**26 S 24TH STREET VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
26 S 24th St_Shop	02/28/18	20180228-26S24ST-01	123	1.7	7.3	2020 J	117	<1.9	<1.6	3.2 J	13.2	4.3
26 S 24th St_Shop	02/28/18	20180228-A	135	<1.6	7.1	1950 J	116	<1.8	<1.6	1.9 J	13.8	4.2
26 S 24th St Subslab	02/28/18	20180228-26S24ST-02	<1.6	<1.6	<1.2	9.5	<0.98	<1.9	<1.6	<1.2	<2.9	<1.4

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**26 S 24TH STREET VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
26 S 24th St_Shop	02/28/18	20180228-26S24ST-01	2.1	<0.066	<5.8	<6	20	<0.091	8	2.4	<1	<0.88
26 S 24th St_Shop	02/28/18	20180228-A	2.3	0.069	<5.7	<5.9	20.8	<0.089	8.2	2.7	<1	<0.86
26 S 24th St Subslab	02/28/18	20180228-26S24ST-02	2.6	<1.3	<5.8	<6	<1.3	<1.8	<1.1	<1.4	<1	<0.88

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**26 S 24TH STREET VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo-chloromethane (ug/m3)	1,2-Dichloro-1,1,2,2-tetrafluoroethane (ug/m3)	1,2-Di-chloro-benzene (ug/m3)	1,3-Di-chloro-benzene (ug/m3)	Cis-1,3-dichloro-propene (ug/m3)	trans-1,3-Dichloro-propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl-2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
26 S 24th St_Shop	02/28/18	20180228-26S24ST-01	<2.8	<2.3	<2	<2	<0.076	<0.076	<1.2	<6.8	84.1	<1.4
26 S 24th St_Shop	02/28/18	20180228-A	<2.8	<2.3	<2	<2	<0.074	<0.074	<1.2	<6.7	83.8	<1.4
26 S 24th St Subslab	02/28/18	20180228-26S24ST-02	<2.8	<2.3	<2	<2	<1.5	<1.5	<1.2	<6.8	<0.57	<1.4

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**26 S 24TH STREET VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloroethane (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
26 S 24th St_Shop	02/28/18	20180228-26S24ST-01	<2.6	--	--	--	--	--
26 S 24th St_Shop	02/28/18	20180228-A	<2.5	--	--	--	--	--
26 S 24th St Subslab	02/28/18	20180228-26S24ST-02	<2.6	<16.1	80.2	19.8	<2	<3.6

Applicable Residential Screening Levels	520	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	NA	NA	NA	NA	NA	NA

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**28 7TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
28 7th Street W_Main	02/07/18	20180207-287THSTW-01	0.35 J	<0.11	<0.081	<0.081	<0.052	<0.045	2.7	1.1	0.56 J	5.8
28 7th Street W_Main	02/07/18	20180207-B	0.24 J	<0.11	<0.083	<0.083	<0.053	<0.046	<1.6	0.99	0.37 J	6.1
28 7th Street W_Basement	02/07/18	20180207-287THSTW-02	0.22	<0.073	<0.054	<0.054	<0.035	0.29	<1.3	0.96	0.55	2.1
28 7th Street W_Subslab	02/08/18	20180208-287THSTW-01	13200	9.9	<1.3	<1.3	<0.42	<0.72	4 J+	<0.52	<1 UJ	<0.8

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**28 7TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
28 7th Street W_Main	02/07/18	20180207-287THSTW-01	<0.082	0.85	<1.3	<1.6	1.8	<3.1	<1.2	<0.16	<1.8	<0.094
28 7th Street W_Main	02/07/18	20180207-B	<0.084	0.85	<1.4	<1.7	1.8	<3.3	<1.2	<0.16	<1.9	<0.096
28 7th Street W_Basement	02/07/18	20180207-287THSTW-02	<0.055	0.63	<1.2	<1.4	0.66	<2.8	<1.1	<0.1	<1.6	<0.063
28 7th Street W_Subslab	02/08/18	20180208-287THSTW-01	<1.3	<0.66	<1.4 R	<1.7 R	<2.2	<3.4 R	<1.3	<2.5 R	<2 R	<1.5

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**28 7TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
28 7th Street W_Main	02/07/18	20180207-287THSTW-01	<3.2 UJ	<6.2	<4 UJ	<0.14	<5.6 UJ	<0.11	42.7	<4.5	<1.4	1.5
28 7th Street W_Main	02/07/18	20180207-B	<3.4 UJ	<6.6	<4.2 UJ	<0.14	<6 UJ	<0.11	50.2	4.7	<1.5	1.6
28 7th Street W_Basement	02/07/18	20180207-287THSTW-02	<2.9 UJ	<5.6	<3.6 UJ	<0.094	<5.1 UJ	<0.074	25.9	<4	<1.3	1.1
28 7th Street W_Subslab	02/08/18	20180208-287THSTW-01	<3.5 R	<6.7 R	<4.3 UJ	<1.1 R	<6.1 R	<0.89	28.8	10.1	<1.5 R	2.1

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**28 7TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
28 7th Street W_Main	02/07/18	20180207-287THSTW-01	1570 J	<1.5	2.1	29.8	<0.89	<1.7	<1.5	3.8 J	<2.6	<1.3
28 7th Street W_Main	02/07/18	20180207-B	1670 J	<1.6	2.1	32.6	<0.95	<1.8	<1.6	6.1 J	<2.8	<1.4
28 7th Street W_Basement	02/07/18	20180207-287THSTW-02	1060 J	<1.3	4.5	20.1	<0.8	1.5	<1.3	1.3	<2.4	<1.2
28 7th Street W_Subslab	02/08/18	20180208-287THSTW-01	11.2 J	<1.6 R	<1.2	4.2	<0.97	<1.8	<1.6 R	2.7	<2.8 R	<1.4 R

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**28 7TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
28 7th Street W_Main	02/07/18	20180207-287THSTW-01	1.9	<0.081 UJ	<5.3	<5.5	5.5	<0.11	5	2	<0.94	<0.8
28 7th Street W_Main	02/07/18	20180207-B	2.4	0.23 J	<5.6	<5.8	5.2	<0.11	5.2	2.2	<1	<0.85
28 7th Street W_Basement	02/07/18	20180207-287THSTW-02	2.1	<0.054	30.3	<4.9	5.8	<0.074	2.9	1.6	<0.85	<0.72
28 7th Street W_Subslab	02/08/18	20180208-287THSTW-01	1.9	<1.3	<5.7	<5.9	2.4	<1.8	2.7	<1.3	<1	<0.86

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**28 7TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
28 7th Street W_Main	02/07/18	20180207-287THSTW-01	<2.6	<2.1	<1.8	<1.8	<0.092	<0.092	7.5	<6.2	<0.52	<1.3
28 7th Street W_Main	02/07/18	20180207-B	<2.7	<2.2	<1.9	<1.9	<0.095	<0.095	7.6	<6.6	<0.55	<1.4
28 7th Street W_Basement	02/07/18	20180207-287THSTW-02	<2.3	<1.9	<1.6	<1.6	<0.062	<0.062	6	<5.6	<0.47	<1.2
28 7th Street W_Subslab	02/08/18	20180208-287THSTW-01	<2.8 R	<2.3	<2 R	<2 R	<1.5	<1.5	<1.2	<6.7	1.1	<1.4 R

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**28 7TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
28 7th Street W_Main	02/07/18	20180207-287THSTW-01	<2.3	<17.9	<17.9	<20.9	--	--	--	--	--
28 7th Street W_Main	02/07/18	20180207-B	<2.5	<19	<19	<22.1	--	--	--	--	--
28 7th Street W_Basement	02/07/18	20180207-287THSTW-02	<2.1	<16.1	<16.1	<18.8	--	--	--	--	--
28 7th Street W_Subslab	02/08/18	20180208-287THSTW-01	<2.5	2290 J	<19.3	82.2	<16.1 UJ	79.3	16.6	4.1	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**28 7TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)
BPIA19_28 7TH ST W	02/03/07	0.21	0.044	<0.038	0.0039	0.005	1.6	0.99	0.038	0.27	0.71
BPSS19_28 7TH ST W	09/22/06	8400	52	11	<42	<2.7	<17	<10	<8.5	<8.5	<9.1

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit
DUP - Field duplicate sample
NA - Not applicable
J+ - Estimated concentration, possibly biased high
UJ - Estimated reporting limit
R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**28 7TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloro-ethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)
BPIA19_28 7TH ST W	02/03/07	<0.038	2.2	0.77	0.12	0.26	<0.038	4.9	0.057
BPSS19_28 7TH ST W	09/22/06	<11	23	<9.1	<4.2	<73	<38	17	<11

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**44 6TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
44 6th Street W_Main	02/05/18	20180205-446THSTW-02	2.1	<0.086 UJ	<0.064	<0.064	<0.041	<0.036	<1.6	0.97	0.64	1.9
44 6th Street W_Basement	02/05/18	20180205-446THSTW-01	5.7	0.2 J	<0.073	<0.073	<0.047	<0.041	<1.5	1.2	0.54	2.7
44 6th Street W_Subslab	02/06/18	20180206-446THSTW-01	58500	141	<1.3	<1.3	<0.42	<0.72	17.8	<0.52	<1	49

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**44 6TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
44 6th Street W_Main	02/05/18	20180205-446THSTW-02	<0.065	0.3	<1.4	<1.7	0.31	<3.3	<1.2	<0.12	<1.9	<0.074
44 6th Street W_Basement	02/05/18	20180205-446THSTW-01	<0.075	0.29	<1.3	<1.6	0.9	<3.1	<1.2	<0.14	<1.8	<0.086
44 6th Street W_Subslab	02/06/18	20180206-446THSTW-01	<1.3	<0.66	1.7	<1.7	<2.2	<3.4	<1.3	<2.5	<2	<1.5

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**44 6TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
44 6th Street W_Main	02/05/18	20180205-446THSTW-02	<3.4	<6.6	<4.2	<0.11	<6	<0.088	29.1	<4.7	<1.5	<0.66
44 6th Street W_Basement	02/05/18	20180205-446THSTW-01	<3.2	<6.2	<4	<0.13	<5.6	<0.1	27.3	<4.5	<1.4	1
44 6th Street W_Subslab	02/06/18	20180206-446THSTW-01	<3.5	<6.7	113	<1.1	<6.1	<0.89	4.8	<4.8	<1.5	<0.68

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**44 6TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
44 6th Street W_Main	02/05/18	20180205-446THSTW-02	415	<1.6	2.8	38.5	<0.95	<1.8	<1.6	<1.1	<2.8	<1.4
44 6th Street W_Basement	02/05/18	20180205-446THSTW-01	1020 J	<1.5	2.7	5.6	<0.89	<1.7	<1.5	<1.1	3.2	<1.3
44 6th Street W_Subslab	02/06/18	20180206-446THSTW-01	2.6	4.1	3.4	<4	<0.97	<1.8	6.4	<1.2	6.4	3.2

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**44 6TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
44 6th Street W_Main	02/05/18	20180205-446THSTW-02	2.2	0.14	20.2	<5.8	4.9	0.13	<1.1	<1.3	<1	<0.85
44 6th Street W_Basement	02/05/18	20180205-446THSTW-01	2.2	<0.073	<5.3	<5.5	7.3	0.49	<1	1.3	<0.94	<0.8
44 6th Street W_Subslab	02/06/18	20180206-446THSTW-01	1.7	<1.3	<5.7	<5.9	18.1	<1.8	13.7	28.6	<1	<0.86

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**44 6TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
44 6th Street W_Main	02/05/18	20180205-446THSTW-02	<2.7	<2.2	<1.9	<1.9	<0.073	<0.073	6.5	<6.6	<0.55	<1.4
44 6th Street W_Basement	02/05/18	20180205-446THSTW-01	<2.6	<2.1	<1.8	<1.8	<0.084	<0.084	3.4	<6.2	<0.52	<1.3
44 6th Street W_Subslab	02/06/18	20180206-446THSTW-01	<2.8	<2.3	<2	<2	<1.5	<1.5	<1.2	<6.7	<0.56	<1.4

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**44 6TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
44 6th Street W_Main	02/05/18	20180205-446THSTW-02	<2.5	--	--	--	--	--	--	--	--
44 6th Street W_Basement	02/05/18	20180205-446THSTW-01	<2.3	--	--	--	--	--	--	--	--
44 6th Street W_Subslab	02/06/18	20180206-446THSTW-01	<2.5	<37100	<37100	<43300	64700	80.5	17.1	2.4	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**44 6TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)
BPIA07_44 6TH ST W	07/13/06	1.5	0.082	<0.085	<0.085	<0.085	1.2	2.2	0.085	0.17	0.82
BPIA07_44 6TH ST W	02/03/07	16	0.13	<0.046	0.0096	0.009	2.8	0.78	0.046	0.085	0.95
BPSS07_44 6TH ST W WATER HEATER ROOM	07/13/06	58000	510	<100	<100	<100	<400	<400	<100	<100	<400
BPSS07_44 6TH ST W WATER HEATER ROOM	02/02/07	38000	340	<110	<110	<110	<440	<440	<110	<110	<440

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit
DUP - Field duplicate sample
NA - Not applicable
J+ - Estimated concentration, possibly biased high
UJ - Estimated reporting limit
R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**44 6TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloro-ethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)
BPIA07_44 6TH ST W	07/13/06	<0.085	2.7	1	0.085	0.43	<0.085	9.8	4.2
BPIA07_44 6TH ST W	02/03/07	<0.046	3.6	1.2	0.083	0.52	0.32	6.7	0.23
BPSS07_44 6TH ST W WATER HEATER ROOM	07/13/06	<100	<400	<400	<100	<400	<100	<400	<100
BPSS07_44 6TH ST W WATER HEATER ROOM	02/02/07	<110	<440	<440	<110	<440	<110	<440	<110

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit
DUP - Field duplicate sample
NA - Not applicable
J+ - Estimated concentration, possibly biased high
UJ - Estimated reporting limit
R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**104 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
104 Custer Ave_Main	02/08/18	20180208-104CUSTER-02	2.3	<1.1	<1.6	<1.6	<0.52	<0.9	2.5	1.6	<1.3 UJ	<1
104 Custer Ave_Basement	02/08/18	20180208-104CUSTER-01	2.3	0.24	<0.062	<0.062	<0.04	0.21	2.1	1.2	0.24	0.33
104 Custer Ave_Subslab	02/09/18	20180209-104CUSTER-01	3520	214	<1.3	<1.3	<0.42	<0.72	<1.6	<0.52	<1 UJ	29.9

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**104 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
104 Custer Ave_Main	02/08/18	20180208-104CUSTER-02	<1.7	<0.83	<1.8	<2.1	<2.7	<4.2	<1.6	<3.1	<2.5	<1.9
104 Custer Ave_Basement	02/08/18	20180208-104CUSTER-01	<0.064	0.11	<1.4	<1.6	<0.11	<3.3	<1.2	<0.12	<1.9	<0.073
104 Custer Ave_Subslab	02/09/18	20180209-104CUSTER-01	<1.3	<0.66	<1.4	<1.7	2.2	<3.4	<1.3	<2.5	<2	<1.5

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**104 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
104 Custer Ave_Main	02/08/18	20180208-104CUSTER-02	<4.4	<8.4 UJ	<5.3	<1.4	<7.6	<1.1	132	<6	<1.9	4.9
104 Custer Ave_Basement	02/08/18	20180208-104CUSTER-01	<3.4	<6.4 UJ	<4.1	<0.11	<5.8	<0.086	32.1	<4.6	<1.5	<0.65
104 Custer Ave_Subslab	02/09/18	20180209-104CUSTER-01	<3.5	<6.7 UJ	<4.3	<1.1	<6.1	<0.89	40.3	10.6	<1.5	2.4

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**104 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
104 Custer Ave_Main	02/08/18	20180208-104CUSTER-02	773 J	<2	3	26.3	<1.2	<2.3	<2	<1.4	<3.6	<1.8
104 Custer Ave_Basement	02/08/18	20180208-104CUSTER-01	132	<1.5	1.7	6.4	<0.93	<1.8	<1.5	<1.1	<2.7	<1.4
104 Custer Ave_Subslab	02/09/18	20180209-104CUSTER-01	23.4	<1.6	8.6	5.3	<0.97	<1.8	<1.6	<1.2	<2.8	<1.4

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**104 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro- difluoro- methane (ug/m3)	1,1-Dichloro- ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1- Trichloro- ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
104 Custer Ave_Main	02/08/18	20180208-104CUSTER-02	2.9	<1.6	11.7	<7.4	7.4	<2.2	<1.4	<1.7	<1.3	<1.1
104 Custer Ave_Basement	02/08/18	20180208-104CUSTER-01	2.4	<0.062	<5.5	<5.7	4.5	<0.086	<1.1	<1.3	<0.98	<0.83
104 Custer Ave_Subslab	02/09/18	20180209-104CUSTER-01	2.1	<1.3	<5.7	<5.9	35.5	9.7	5.4	<1.3	<1	<0.86

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**104 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo-chloromethane (ug/m3)	1,2-Dichloro-1,1,2,2-tetrafluoroethane (ug/m3)	1,2-Di-chloro-benzene (ug/m3)	1,3-Di-chloro-benzene (ug/m3)	Cis-1,3-dichloro-propene (ug/m3)	trans-1,3-Dichloro-propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl-2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
104 Custer Ave_Main	02/08/18	20180208-104CUSTER-02	<3.5	<2.9	<2.5	<2.5	<1.9	<1.9	<1.5	<8.4	<0.7	<1.7
104 Custer Ave_Basement	02/08/18	20180208-104CUSTER-01	<2.7	<2.2	<1.9	<1.9	<0.071	<0.071	<1.1	<6.4	<0.54	<1.3
104 Custer Ave_Subslab	02/09/18	20180209-104CUSTER-01	<2.8	<2.3	<2	<2	<1.5	<1.5	<1.2	<6.7	1.6	<1.4

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**104 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	Methane (ppmv)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
104 Custer Ave_Main	02/08/18	20180208-104CUSTER-02	<3.1	--	--	--	--
104 Custer Ave_Basement	02/08/18	20180208-104CUSTER-01	<2.4	--	--	--	--
104 Custer Ave_Subslab	02/09/18	20180209-104CUSTER-01	<2.5	<24.9	17.5	<3.2	<5.8

Applicable Residential Screening Levels	520	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	NA	NA	NA	NA

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**104 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)
BPIA91_104 CUSTER AVE	12/12/07	5.8	0.29	<1.8	<1.8	<1.8	14	0.4	<1.8	<1.8	11
BPCS91_104 CUSTER AVE	12/12/07	6.5	0.35	<1.8	<1.8	<1.8	6	0.2	<1.8	<1.8	5.02

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit
 DUP - Field duplicate sample
 NA - Not applicable
 J+ - Estimated concentration, possibly biased high
 UJ - Estimated reporting limit
 R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**104 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloro-ethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)
BPIA91_104 CUSTER AVE	12/12/07	<1.8	50	17	<1.8	1.1	<1.8	59	<1.8
BPCS91_104 CUSTER AVE	12/12/07	<1.8	22.8	7.62	<1.8	0.87	<1.8	26.4	<1.8

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**109 S 38TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
109 S 38th St_Main	03/02/18	20180302-109S38THST-01	0.25	<0.086	<0.064	<0.064	<0.041	<0.036	<1.6	3.5	0.31	1
109 S 38th St_Main	03/02/18	20180302-A	0.26	<0.18	<0.13	<0.13	<0.084	<0.073	<3.2	3.5	0.29	1.1
109 S 38th St_Basement	03/02/18	20180302-109S38THST-02	0.25	<0.085	<0.062	<0.062	<0.04	<0.035	<1.5	1.8	0.36	0.73
109 S 38th St_Subslab	03/03/18	20180303-109S38THST-01	2710 J+	17.6	0.26	0.12	<0.04	0.056	9	0.35	0.11	0.52

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**109 S 38TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
109 S 38th St_Main	03/02/18	20180302-109S38THST-01	<0.065	0.47	<1.4	<4.2	0.26	<3.3	<1.2	<0.12	<1.9	<0.074
109 S 38th St_Main	03/02/18	20180302-A	<0.13	0.45	<2.9	<8.5	0.29	<6.8	<2.5	<0.25	<3.9	<0.15
109 S 38th St_Basement	03/02/18	20180302-109S38THST-02	<0.064	<0.064	<1.4	<4.1	0.21	<3.3	<1.2	<0.12	<1.9	<0.073
109 S 38th St_Subslab	03/03/18	20180303-109S38THST-01	<0.064	0.065	<1.4	<4.1	<0.11	<3.3	<1.2	0.27	<1.9	0.12

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**109 S 38TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
109 S 38th St_Main	03/02/18	20180302-109S38THST-01	<3.4	<6.6	<4.2	<0.11	<6	<0.088	32.6 J	7.7	<1.5	4.6
109 S 38th St_Main	03/02/18	20180302-A	<7	<13.4	<8.6	<0.23	<12.2	<0.18	88.5 J	<9.7	<3	4.6
109 S 38th St_Basement	03/02/18	20180302-109S38THST-02	<3.4	<6.4	<4.1	<0.11	<5.8	<0.086	17.8	<4.6	<1.5	2.2
109 S 38th St_Subslab	03/03/18	20180303-109S38THST-01	<3.4	<6.4	7.2	0.35	<5.8	0.12	58.7	10.3	<1.5	<0.65

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**109 S 38TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
109 S 38th St_Main	03/02/18	20180302-109S38THST-01	44 J	<1.6	2.1	4	<0.95	<1.8	<1.6	6.7 J	3.1	<1.4
109 S 38th St_Main	03/02/18	20180302-A	73.1 J	<3.2	3.1	15	<1.9	<3.7	<3.2	3.9 J	<5.7	<2.9
109 S 38th St_Basement	03/02/18	20180302-109S38THST-02	26.1	<1.5	1.4	<3.9	<0.93	<1.8	<1.5	3.4	<2.7	<1.4
109 S 38th St_Subslab	03/03/18	20180303-109S38THST-01	17.2	<1.5	1.8	9.2	1	<1.8	<1.5	<1.1	<2.7	<1.4

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**109 S 38TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
109 S 38th St_Main	03/02/18	20180302-109S38THST-01	3.7	<0.064	<5.6	<5.8	7.8	<0.088	1.1	<1.3	<1	<0.85
109 S 38th St_Main	03/02/18	20180302-A	3.6	<0.13	12.6	<11.8	8.2	<0.18	<2.3	<2.7	<2	<1.7
109 S 38th St_Basement	03/02/18	20180302-109S38THST-02	3.4	<0.062	<5.5	<5.7	4.4	<0.086	<1.1	<1.3	<0.98	<0.83
109 S 38th St_Subslab	03/03/18	20180303-109S38THST-01	3.9	<0.062	<5.5	<5.7	<1.2	0.35	<1.1	<1.3	<0.98	<0.83

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**109 S 38TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
109 S 38th St_Main	03/02/18	20180302-109S38THST-01	<2.7	<2.2	<1.9	<1.9	<0.073	<0.073	2.3	<6.6	<0.55	<1.4 UJ
109 S 38th St_Main	03/02/18	20180302-A	<5.6	<4.6	<3.9	<3.9	<0.15	<0.15	3.5	<13.4	<1.1	17.1 J
109 S 38th St_Basement	03/02/18	20180302-109S38THST-02	<2.7	<2.2	<1.9	<1.9	<0.071	<0.071	<1.1	<6.4	<0.54	<1.3
109 S 38th St_Subslab	03/03/18	20180303-109S38THST-01	<2.7	<2.2	<1.9	<1.9	<0.071	0.096	<1.1	<6.4	<0.54	<1.3

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**109 S 38TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloroethane (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
109 S 38th St_Main	03/02/18	20180302-109S38THST-01	<2.5	--	--	--	--	--
109 S 38th St_Main	03/02/18	20180302-A	<5	--	--	--	--	--
109 S 38th St_Basement	03/02/18	20180302-109S38THST-02	<2.4	--	--	--	--	--
109 S 38th St_Subslab	03/03/18	20180303-109S38THST-01	<2.4	62.5	80.2	19.9	<2	<3.6

Applicable Residential Screening Levels	520	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	NA	NA	NA	NA	NA	NA

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**112 S 33RD STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
112 S 33rd St_Main	02/12/18	20180212-112S33RDST-01	<1.2 UJ	<0.92	<1.4	<1.4	<0.44	<0.76 UJ	<1.7	1.5	<1.1 UJ	<0.83 UJ
112 S 33rd St_Main	02/12/18	20180212-C	1.3 J	<0.12	<0.085	<0.085	<0.055	0.57 J	<1.6	1.5	0.66 J	0.5 J
112 S 33rd St_Basement	02/12/18	20180212-112S33RDST-02	0.59	<0.086	<0.064	<0.064	<0.041	0.61	<1.6	1.2	<0.1	0.49
112 S 33rd St_Subslab	02/13/18	20180213-112S33RDST-01	25500 J	7.3	<1.3	<1.3	<0.42	<0.72	<1.6	<0.52	<1	<0.8

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**112 S 33RD STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
112 S 33rd St_Main	02/12/18	20180212-112S33RDST-01	<1.4	<0.69 UJ	<1.5	<1.8	<2.3	<3.5	<1.3	<2.6	<2	<1.6
112 S 33rd St_Main	02/12/18	20180212-C	<0.087	0.2 J	<1.4	<1.7	<0.14	<3.3	<1.2	<0.17	<1.9	<0.1
112 S 33rd St_Basement	02/12/18	20180212-112S33RDST-02	<0.065	0.2	<1.4	<1.7	<0.11	<3.3	<1.2	<0.12	<1.9	<0.074
112 S 33rd St_Subslab	02/13/18	20180213-112S33RDST-01	<1.3	<0.66	<1.4	<1.7	<2.2	<3.4	<1.3	<2.5	<2	<1.5

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**112 S 33RD STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
112 S 33rd St_Main	02/12/18	20180212-112S33RDST-01	<3.6	<7	<4.5	<1.2	<6.3	<0.93	21	6.9	<1.6	1.3
112 S 33rd St_Main	02/12/18	20180212-C	<3.4	<6.6 UJ	<4.2	<0.15	<6	<0.12	20.9	8.6	<1.5	1.4
112 S 33rd St_Basement	02/12/18	20180212-112S33RDST-02	<3.4	<6.6	<4.2	<0.11	<6	<0.088	16.8	6.3	<1.5	1
112 S 33rd St_Subslab	02/13/18	20180213-112S33RDST-01	<3.5	<6.7	<4.3	<1.1	<6.1	<0.89	19.7	6.1	<1.5	<0.68

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**112 S 33RD STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
112 S 33rd St_Main	02/12/18	20180212-112S33RDST-01	525 J	<1.7	1.4	12.3 J	<1	<1.9	<1.7	<1.2	<3	<1.5
112 S 33rd St_Main	02/12/18	20180212-C	482	<1.6	1.9	9.5 J	<0.95	<1.8	<1.6	<1.1	2.9	<1.4
112 S 33rd St_Basement	02/12/18	20180212-112S33RDST-02	415	<1.6	1.4	7.6	<0.95	<1.8	<1.6	<1.1	<2.8	<1.4
112 S 33rd St_Subslab	02/13/18	20180213-112S33RDST-01	25.2	<1.6	<1.2	<4	<0.97	<1.8	<1.6	<1.2	<2.8	<1.4

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**112 S 33RD STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
112 S 33rd St_Main	02/12/18	20180212-112S33RDST-01	1.9	<1.4	<5.9	<6.1	5.5	<1.9	<1.2	<1.4	<1.1	<0.9
112 S 33rd St_Main	02/12/18	20180212-C	2.5	<0.085	<5.6	<5.8	6.1	<0.12	<1.1	<1.3	<1	<0.85
112 S 33rd St_Basement	02/12/18	20180212-112S33RDST-02	1.8	<0.064	<5.6	<5.8	5.1	<0.088	<1.1	<1.3	<1	<0.85
112 S 33rd St_Subslab	02/13/18	20180213-112S33RDST-01	1.8	<1.3	<5.7	<5.9	<1.2	<1.8	<1.1	<1.3	<1	<0.86

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**112 S 33RD STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
112 S 33rd St_Main	02/12/18	20180212-112S33RDST-01	<2.9	<2.4	<2	<2	<1.6	<1.6	<1.2	<7	<0.59	<1.5
112 S 33rd St_Main	02/12/18	20180212-C	<2.7	<2.2	<1.9	<1.9	<0.098	<0.098	<1.2	<6.6	<0.55	<1.4
112 S 33rd St_Basement	02/12/18	20180212-112S33RDST-02	<2.7	<2.2	<1.9	<1.9	<0.073	<0.073	23.4	<6.6	<0.55	<1.4
112 S 33rd St_Subslab	02/13/18	20180213-112S33RDST-01	<2.8	<2.3	<2	<2	<1.5	<1.5	<1.2	<6.7	<0.56	<1.4

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**112 S 33RD STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
112 S 33rd St_Main	02/12/18	20180212-112S33RDST-01	<2.6	40	<20.2	<23.5	--	--	--	--	--
112 S 33rd St_Main	02/12/18	20180212-C	<2.5	<19	<19	39.5	--	--	--	--	--
112 S 33rd St_Basement	02/12/18	20180212-112S33RDST-02	<2.5	<19	<19	<22.1	--	--	--	--	--
112 S 33rd St_Subslab	02/13/18	20180213-112S33RDST-01	<2.5	4030 J	<19.3	76.1	<16.1	80	19.3	<2	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA	NA

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**112 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
112 Wyoming Ave_Main	03/05/18	20180305-112WYOMING-01	4.8	<0.88	<1.3	<1.3	<0.42	<0.72	<1.6	1.2 J	<1	<0.8
112 Wyoming Ave_Basement	03/05/18	20180305-112WYOMING-02	4.4	<1.6	<2.4	<2.4	<0.78	<1.4	<3	1.1 J	<1.9	<1.5
112 Wyoming Ave_Subslab	03/06/18	20180306-112WYOMING-01	6510	250	15.7	<1.4	<0.44	<0.76	2.8	<0.55	<1.1	37.3

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**112 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
112 Wyoming Ave_Main	03/05/18	20180305-112WYOMING-01	<1.3	<0.66	<1.4	<1.7	<2.2	<3.4	<1.3	<2.5	<2	<1.5
112 Wyoming Ave_Basement	03/05/18	20180305-112WYOMING-02	<2.5	<1.2	<2.6	<3.2	<4.1	<6.3	<2.4	<4.7	<3.7	<2.8
112 Wyoming Ave_Subslab	03/06/18	20180306-112WYOMING-01	2.7	<0.69	<1.5	<1.8	<2.3	<3.5	<1.3	<2.6	<2	<1.6

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**112 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
112 Wyoming Ave_Main	03/05/18	20180305-112WYOMING-01	<3.5	<6.7	<4.3	<1.1	<6.1	<0.89	26.7 J	6.3	<1.5	0.88
112 Wyoming Ave_Basement	03/05/18	20180305-112WYOMING-02	<6.5	<12.5	<8	<2.1	<11.3	<1.7	22.4 J	<9	<2.8	<1.3
112 Wyoming Ave_Subslab	03/06/18	20180306-112WYOMING-01	<3.6	<7	4.6	<1.2	<6.3	<0.93	21.9	7.8	<1.6	<0.71

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**112 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
112 Wyoming Ave_Main	03/05/18	20180305-112WYOMING-01	721 J	<1.6	2.2	8.6	<0.97	<1.8	<1.6	1.9	<2.8	<1.4
112 Wyoming Ave_Basement	03/05/18	20180305-112WYOMING-02	323	<3	<2.1	<7.5	<1.8	<3.4	<3	<2.1	<5.3	<2.6
112 Wyoming Ave_Subslab	03/06/18	20180306-112WYOMING-01	14.3	<1.7	<1.2	6.5	<1	<1.9	<1.7	<1.2	<3	<1.5

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**112 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
112 Wyoming Ave_Main	03/05/18	20180305-112WYOMING-01	2.2	<1.3	<5.7	<5.9	4.2 J	<1.8	2.7	2.7	<1	<0.86
112 Wyoming Ave_Basement	03/05/18	20180305-112WYOMING-02	<3	<2.4	<10.6	<11	4.2 J	<3.3	3.3	2.5	<1.9	<1.6
112 Wyoming Ave_Subslab	03/06/18	20180306-112WYOMING-01	2.3	<1.4	<5.9	<6.1	1.3	12.3	<1.2	<1.4	<1.1	<0.9

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**112 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
112 Wyoming Ave_Main	03/05/18	20180305-112WYOMING-01	<2.8	<2.3	<2	<2	<1.5	<1.5	1.2	<6.7	<0.56	<1.4
112 Wyoming Ave_Basement	03/05/18	20180305-112WYOMING-02	<5.2	<4.3	<3.7	<3.7	<2.8	<2.8	<2.2	<12.5	<1	<2.6
112 Wyoming Ave_Subslab	03/06/18	20180306-112WYOMING-01	<2.9	<2.4	<2	<2	<1.6	<1.6	<1.2	<7	<0.59	<1.5

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**112 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloroethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
112 Wyoming Ave_Main	03/05/18	20180305-112WYOMING-01	<2.5	<19.3	<19.3	<22.5	--	--	--	--	--
112 Wyoming Ave_Basement	03/05/18	20180305-112WYOMING-02	<4.7	<26.9 R	<26.9 R	<31.4 R	--	--	--	--	--
112 Wyoming Ave_Subslab	03/06/18	20180306-112WYOMING-01	<2.6	6150	<20.2	<23.5	<16.8	78	19.8	2.2	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**112 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)
BPIA43_112 WYOMING AVE	02/04/07	18	0.55	0.029	0.0046	0.0087	1.4	0.53	0.039	0.049	0.52
BPSS43_112 WYOMING AVE	02/03/07	28000	900	53	<73	<73	290	290	12	<73	<290

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**112 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloro-ethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)
BPIA43_112 WYOMING AVE	02/04/07	<0.039	2	0.68	0.037	0.53	0.017	3.8	0.23
BPSS43_112 WYOMING AVE	02/03/07	<73	<290	<290	<73	<290	<73	290	140

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**117 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
117 Custer Ave_2nd Floor	02/09/18	20180209-117CUSTER-02	3	0.14	<0.083	<0.083	<0.054	<0.047	<1.6	1.4	0.28	0.45
117 Custer Ave_Main	02/09/18	20180209-117CUSTER-01	2.4 J+	0.13	<0.084	<0.084	<0.054	0.5	<1.5	1.5	0.35	0.51
117 Custer Ave_Basement/Crawlspace	02/09/18	20180209-117CUSTER-03	2	<0.24	<0.18	<0.18	<0.11	<0.099	<3.5	1.5	0.4	0.27
117 Custer Ave_Subslab	02/10/18	20180210-117CUSTER-01	749	75.1	2.7	<1.2	<0.38	<0.66	<1.5	<0.47	<0.93 UJ	15.9

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**117 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
117 Custer Ave_2nd Floor	02/09/18	20180209-117CUSTER-02	<0.085	0.14	<1.4	<1.7	<0.14	<3.4	<1.3	<0.16	<2	<0.097
117 Custer Ave_Main	02/09/18	20180209-117CUSTER-01	<0.085	0.11	<1.4	<1.6	<0.14	<3.3	<1.2	<0.16 R	<1.9	<0.098
117 Custer Ave_Basement/Crawlspace	02/09/18	20180209-117CUSTER-03	<0.18	<0.18	<3.1	<3.7	<0.3	<7.4	<2.8	<0.35	<4.3	<0.21
117 Custer Ave_Subslab	02/10/18	20180210-117CUSTER-01	<1.2	<0.6	<1.3	<1.5	<2	<3.1	<1.2	<2.3	<1.8	<1.4

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**117 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
117 Custer Ave_2nd Floor	02/09/18	20180209-117CUSTER-02	<3.6	<6.8 UJ	<4.4	<0.14	<6.2	<0.11	38.3	7.2	<1.5	1.2
117 Custer Ave_Main	02/09/18	20180209-117CUSTER-01	<3.4	<6.4 UJ	<4.1	<0.15 R	<5.8	<0.12	47.3	7.2	<1.5	12.9
117 Custer Ave_Basement/Crawlspace	02/09/18	20180209-117CUSTER-03	<7.6	<14.6 UJ	<9.3	<0.31	<13.2	<0.25	18.1	<10.5	<3.3	<1.5
117 Custer Ave_Subslab	02/10/18	20180210-117CUSTER-01	<3.2	<6.1 UJ	<3.9	<1	<5.5	<0.81	30	<4.4	<1.4	<0.61

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**117 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
117 Custer Ave_2nd Floor	02/09/18	20180209-117CUSTER-02	80.6 J	<1.6	2.1	7.1	<0.98	<1.9	<1.6	<1.2	<2.9	<1.4
117 Custer Ave_Main	02/09/18	20180209-117CUSTER-01	70.8 J	<1.5	2.9	7.2	<0.93	<1.8	<1.5	<1.1	<2.7	<1.4
117 Custer Ave_Basement/Crawlspace	02/09/18	20180209-117CUSTER-03	21.7 J	<3.5	3.1	<8.8	<2.1	<4	<3.5	<2.5	<6.2	<3.1
117 Custer Ave_Subslab	02/10/18	20180210-117CUSTER-01	7.1 J	<1.5	<1	<3.6	<0.88	<1.7	<1.5	<1	<2.6	<1.3

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**117 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
117 Custer Ave_2nd Floor	02/09/18	20180209-117CUSTER-02	2.7	<0.083	6.6	<6	3.7	0.16	<1.1	<1.4	<1	<0.88
117 Custer Ave_Main	02/09/18	20180209-117CUSTER-01	2.9	<0.084	17.1	<5.7	4.2	<0.12	<1.1	<1.3	<0.98	<0.83
117 Custer Ave_Basement/Crawlspace	02/09/18	20180209-117CUSTER-03	<3.5	<0.18	20.3	<12.8	4.1	<0.25	<2.5	<2.9	<2.2	<1.9
117 Custer Ave_Subslab	02/10/18	20180210-117CUSTER-01	2.2	<1.2	<5.2	<5.3	<1.1	<1.6	<1	<1.2	<0.92	<0.78

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**117 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo-chloromethane (ug/m3)	1,2-Dichloro-1,1,2,2-tetrafluoroethane (ug/m3)	1,2-Di-chloro-benzene (ug/m3)	1,3-Di-chloro-benzene (ug/m3)	Cis-1,3-dichloro-propene (ug/m3)	trans-1,3-Dichloro-propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl-2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
117 Custer Ave_2nd Floor	02/09/18	20180209-117CUSTER-02	<2.8	<2.3	<2	<2	<0.095	<0.095	<1.2	<6.8	<0.57	<1.4
117 Custer Ave_Main	02/09/18	20180209-117CUSTER-01	<2.7	<2.2	<1.9	<1.9	<0.096	<0.096	<1.1	<6.4	<0.54	<1.3
117 Custer Ave_Basement/Crawlspace	02/09/18	20180209-117CUSTER-03	<6.1	<5	<4.3	<4.3	<0.2	<0.2	<2.6	<14.6	<1.2	<3
117 Custer Ave_Subslab	02/10/18	20180210-117CUSTER-01	<2.5	<2.1	<1.8	<1.8	<1.3	<1.3	<1.1	<6.1	0.66	<1.3

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**117 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloroethane (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
117 Custer Ave_2nd Floor	02/09/18	20180209-117CUSTER-02	<2.6	--	--	--	--	--
117 Custer Ave_Main	02/09/18	20180209-117CUSTER-01	<2.4	--	--	--	--	--
117 Custer Ave_Basement/Crawlspace	02/09/18	20180209-117CUSTER-03	<5.5	--	--	--	--	--
117 Custer Ave_Subslab	02/10/18	20180210-117CUSTER-01	<2.3	<14.6 UJ	79.7	19.6	<2	<3.6

Applicable Residential Screening Levels	520	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	NA	NA	NA	NA	NA	NA

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**117 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)
BPIA41_117 CUSTER AVE	02/02/07	2.8	0.11	0.0063	<0.046	0.0057	1.4	0.2	0.046	0.046	0.78
BPSS41 117 CUSTER AVE	02/02/07	1900	74	4.4	<5.8	<5.8	10	4.5	<5.8	<5.8	<23

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**117 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloro-ethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)
BPIA41_117 CUSTER AVE	02/02/07	<0.046	3.1	0.96	0.027	0.76	0.017	3.3	0.084
BPSS41 117 CUSTER AVE	02/02/07	<5.8	1.6	<23	<5.8	<23	<5.8	1.7	4.8

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**120 S 35TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
120 S 35th St_Main	03/03/18	20180303-120S35THST-01	0.37	<0.09	<0.066	<0.066	<0.043	0.21	<1.6	1	0.42	0.37
120 S 35th St_Basement	03/03/18	20180303-120S35THST-02	0.25	<0.11	<0.082	<0.082	<0.053	0.24	<2	1.2	0.21	0.66
120 S 35th St_Subslab	03/04/18	20180304-120S35THST-01	306	18.3	<1.4	<1.4	<0.44	<0.76	<1.7	<0.55	<1.1	<0.83

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**120 S 35TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
120 S 35th St_Main	03/03/18	20180303-120S35THST-01	<0.067	0.16	<1.4	<4.3	0.12	<3.4	<1.3	<0.13	<2	<0.077
120 S 35th St_Basement	03/03/18	20180303-120S35THST-02	<0.083	0.12	<1.8	<5.3	0.19	<4.3	<1.6	<0.16	<2.5	<0.095
120 S 35th St_Subslab	03/04/18	20180304-120S35THST-01	<1.4	<0.69	<1.5	<1.8	<2.3	<3.5	<1.3	<2.6	<2	<1.6

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**120 S 35TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
120 S 35th St_Main	03/03/18	20180303-120S35THST-01	<3.6	<6.8	<4.4	<0.11	<6.2	<0.091	21.5	<4.9	<1.5	<0.69
120 S 35th St_Basement	03/03/18	20180303-120S35THST-02	<4.4	<8.4	<5.4	<0.14	<7.7	<0.11	14.8	<6.1	<1.9	1.3
120 S 35th St_Subslab	03/04/18	20180304-120S35THST-01	<3.6	<7	<4.5	<1.2	<6.3	<0.93	23.6	<5	<1.6	<0.71

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**120 S 35TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
120 S 35th St_Main	03/03/18	20180303-120S35THST-01	239	<1.6	1.6	<4.1	<0.98	<1.9	<1.6	<1.2	<2.9	<1.4
120 S 35th St_Basement	03/03/18	20180303-120S35THST-02	140	<2	<1.5	<5.1	<1.2	<2.3	<2	<1.5	<3.6	<1.8
120 S 35th St_Subslab	03/04/18	20180304-120S35THST-01	4.7	<1.7	<1.2	<4.2	<1	<1.9	<1.7	<1.2	<3	<1.5

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**120 S 35TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
120 S 35th St_Main	03/03/18	20180303-120S35THST-01	2.2	<0.066	<5.8	<6	3.3	<0.091	<1.1	<1.4	<1	<0.88
120 S 35th St_Basement	03/03/18	20180303-120S35THST-02	2.5	<0.082	<7.2	<7.4	3.8	<0.11	<1.4	<1.7	<1.3	<1.1
120 S 35th St_Subslab	03/04/18	20180304-120S35THST-01	2.5	<1.4	<5.9	<6.1	<1.3	<1.9	<1.2	<1.4	<1.1	<0.9

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**120 S 35TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo-chloromethane (ug/m3)	1,2-Dichloro-1,1,2,2-tetrafluoroethane (ug/m3)	1,2-Dichloro-benzene (ug/m3)	1,3-Dichloro-benzene (ug/m3)	Cis-1,3-dichloro-propene (ug/m3)	trans-1,3-Dichloro-propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl-2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
120 S 35th St_Main	03/03/18	20180303-120S35THST-01	<2.8	<2.3	<2	<2	<0.076	<0.076	5.7	<6.8	<0.57	<1.4
120 S 35th St_Basement	03/03/18	20180303-120S35THST-02	<3.5	<2.9	<2.5	<2.5	<0.094	<0.094	3.1	<8.4	<0.71	<1.8
120 S 35th St_Subslab	03/04/18	20180304-120S35THST-01	<2.9	<2.4	<2	<2	<1.6	<1.6	<1.2	<7	<0.59	<1.5

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**120 S 35TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
120 S 35th St_Main	03/03/18	20180303-120S35THST-01	<2.6	<19.7	<19.7	<23	--	--	--	--	--
120 S 35th St_Basement	03/03/18	20180303-120S35THST-02	<3.2	<19.3	<19.3	<22.5	--	--	--	--	--
120 S 35th St_Subslab	03/04/18	20180304-120S35THST-01	<2.6	400	<20.2	<23.5	<16.8	78.5	19.4	2.1	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**120 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
120 Wyoming Ave_2nd Floor	03/06/18	20180306-120WYOMING-03	12.4	1.3	0.13	<0.065	<0.042	<0.036	9	1.4	0.51	1
120 Wyoming Ave_Main	03/06/18	20180306-120WYOMING-02	12.3	1.4	<0.068	<0.068	<0.044	<0.038	<1.7	1.3	0.19	0.94
120 Wyoming Ave_Basement	03/06/18	20180306-120WYOMING-01	12.9	1.2	<0.068	<0.068	<0.044	<0.038	<1.7	1.2	0.51	0.7
120 Wyoming Ave_Subslab	03/07/18	20180307-120WYOMING-01	10700	692	9.3	0.69	0.063	<0.038	<1.7	0.35	0.3	51.4

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**120 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
120 Wyoming Ave_2nd Floor	03/06/18	20180306-120WYOMING-03	<0.066	0.4	<1.4	<1.7	0.23	<8.5	<1.3	<0.13	<2	<0.076
120 Wyoming Ave_Main	03/06/18	20180306-120WYOMING-02	<0.069	0.36	<1.5	<1.8	0.19	<8.8	<1.3	<0.13	<2	<0.079
120 Wyoming Ave_Basement	03/06/18	20180306-120WYOMING-01	<0.069	0.3	<1.5	<1.8	0.13	<8.8	<1.3	<0.13	<2	<0.079
120 Wyoming Ave_Subslab	03/07/18	20180307-120WYOMING-01	3.7	1.2	<1.5	<1.8	1.1	<8.8	<1.3	<0.13	<2	<0.079

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**120 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
120 Wyoming Ave_2nd Floor	03/06/18	20180306-120WYOMING-03	<3.5	<6.7	5.5	<0.11 UJ	<6.1	<0.089	28.4	<4.8	<1.5	<0.68
120 Wyoming Ave_Main	03/06/18	20180306-120WYOMING-02	<3.6	<7	<4.5	<0.12 UJ	<6.3	<0.093	33.9	<5	<1.6	1.2
120 Wyoming Ave_Basement	03/06/18	20180306-120WYOMING-01	<3.6	<7	<4.5	<0.12 UJ	<6.3	<0.093	19.8	<5	<1.6	<0.71
120 Wyoming Ave_Subslab	03/07/18	20180307-120WYOMING-01	<3.6	<7	<4.5	<0.12 UJ	<6.3	<0.093	13.6	<5	<1.6	<0.71

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**120 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
120 Wyoming Ave_2nd Floor	03/06/18	20180306-120WYOMING-03	1220 J	2.7	2.8	7.2	1.7	1.9	2.4	1.7	8.2	3.8
120 Wyoming Ave_Main	03/06/18	20180306-120WYOMING-02	1270 J	<1.7	2.4	1160 J	1.7	<1.9	<1.7	<1.2	<3	<1.5
120 Wyoming Ave_Basement	03/06/18	20180306-120WYOMING-01	459	<1.7	1.9	<4.2	1.4	<1.9	<1.7	<1.2	<3	<1.5
120 Wyoming Ave_Subslab	03/07/18	20180307-120WYOMING-01	7.9	<1.7	1.4	<4.2	<1	<1.9	<1.7	<1.2	<3	<1.5

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**120 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
120 Wyoming Ave_2nd Floor	03/06/18	20180306-120WYOMING-03	2.8	<0.065	<5.7	<5.9	6.8	<0.089	3.7	1.8	<1	<0.86
120 Wyoming Ave_Main	03/06/18	20180306-120WYOMING-02	2.6	<0.068	<5.9	<6.1	4.9	<0.093	1.7	<1.4	<1.1	<0.9
120 Wyoming Ave_Basement	03/06/18	20180306-120WYOMING-01	2.7	<0.068	<5.9	<6.1	5.2	<0.093	1.9	<1.4	<1.1	<0.9
120 Wyoming Ave_Subslab	03/07/18	20180307-120WYOMING-01	2.8	<0.068	<5.9	<6.1	1.3	16.1	<1.2	<1.4	<1.1	<0.9

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**120 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo-chloromethane (ug/m3)	1,2-Dichloro-1,1,2,2-tetrafluoroethane (ug/m3)	1,2-Di-chloro-benzene (ug/m3)	1,3-Di-chloro-benzene (ug/m3)	Cis-1,3-dichloro-propene (ug/m3)	trans-1,3-Dichloro-propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl-2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
120 Wyoming Ave_2nd Floor	03/06/18	20180306-120WYOMING-03	<2.8	<2.3	<2	<2	<0.074	<0.074 UJ	2.1	<6.7	<0.56	<1.4
120 Wyoming Ave_Main	03/06/18	20180306-120WYOMING-02	<2.9	<2.4	<2	<2	<0.077	<0.077 UJ	2.6	<7	<0.59	<1.5
120 Wyoming Ave_Basement	03/06/18	20180306-120WYOMING-01	<2.9	<2.4	<2	<2	<0.077	<0.077 UJ	1.3	<7	<0.59	<1.5
120 Wyoming Ave_Subslab	03/07/18	20180307-120WYOMING-01	<2.9	<2.4	<2	<2	<0.077	<0.077 UJ	<1.2	<7	<0.59	<1.5

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**120 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
120 Wyoming Ave_2nd Floor	03/06/18	20180306-120WYOMING-03	<2.5	--	--	--	--	--
120 Wyoming Ave_Main	03/06/18	20180306-120WYOMING-02	<2.6	--	--	--	--	--
120 Wyoming Ave_Basement	03/06/18	20180306-120WYOMING-01	<2.6	--	--	--	--	--
120 Wyoming Ave_Subslab	03/07/18	20180307-120WYOMING-01	<2.6	<16.8	79.7	19	<2	<3.6

Applicable Residential Screening Levels	520	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	NA	NA	NA	NA	NA	NA

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**120 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	1,1,2-Trichloro-ethane (ug/m3)	1,1-Dichloro-ethene (ug/m3)
BPIA142_120 WYOMING AVE	04/10/10	19	0.87	<0.18	<0.88	<0.057	3.1	<0.18	0.56	<0.24	0.088
BPSS142_120 WYOMING AVE	04/10/10	3419.83	180.432	--	--	--	21.6476	--	<202.5	--	--

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.12	1.8	0.23	0.021	21
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.53	7.7	0.47	0.088	88

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**120 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Methylene Chloride (ug/m3)	MTBE (ug/m3)	1,1,1-Trichloroethane (ug/m3)
BPIA142_120 WYOMING AVE	04/10/10	<1.5	<0.8	<0.24
BPSS142_120 WYOMING AVE	04/10/10	<17.35	--	--

Applicable Residential Screening Levels	63	11	520
Applicable Industrial Screening Levels	260	47	2,200

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**125 BROADWATER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
125 Broadwater Ave_Main	03/01/18	20180301-125BROADWATER-02	2.1	<0.096	<0.071	<0.071	<0.046	<0.039	2.9	2.4	0.41	2
125 Broadwater Ave_Crawlspace	03/01/18	20180301-125BROADWATER-01	3.7 J	<0.1	<0.074	<0.074	<0.048	<0.041	<1.8	1.9 J	0.4 J	0.53 J
125 Broadwater Ave_Crawlspace	03/01/18	20180301-A	2 J	0.11	<0.068	<0.068	<0.044	<0.038	2.1	1.4 J	0.57 J	0.38 J

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**125 BROADWATER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethylbenzene (ug/m3)	Benzylchloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Dichloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
125 Broadwater Ave_Main	03/01/18	20180301-125BROADWATER-02	<0.072	<0.072	1.6	<4.6	0.62	<3.7	<1.4	<0.14	<2.1	<0.082
125 Broadwater Ave_Crawlspace	03/01/18	20180301-125BROADWATER-01	<0.075	0.2	<1.6	<4.8	0.17	<3.8	<1.4	<0.14	<2.2	<0.086
125 Broadwater Ave_Crawlspace	03/01/18	20180301-A	<0.069	0.19	<1.5	<4.4	0.13	<3.5	<1.3	<0.13	<2	0.086

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**125 BROADWATER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
125 Broadwater Ave_Main	03/01/18	20180301-125BROADWATER-02	<3.8	<7.3	<4.7	<0.12	<6.6	<0.097	31.7	<5.2	<1.6	1.4
125 Broadwater Ave_Crawlspace	03/01/18	20180301-125BROADWATER-01	<4	<7.6	<4.9	<0.13	<6.9	<0.1	14.8 J	<5.5	<1.7	1.3
125 Broadwater Ave_Crawlspace	03/01/18	20180301-A	<3.6	<7	5.7	0.21	<6.3	<0.093	35.5 J	<5	<1.6	1.5

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**125 BROADWATER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
125 Broadwater Ave_Main	03/01/18	20180301-125BROADWATER-02	1170 J	<1.7	2.2	57.9	<1	<2	<1.7	2.3	4.2	<1.5
125 Broadwater Ave_Crawlspace	03/01/18	20180301-125BROADWATER-01	427 J	<1.8	2.3 J	22.4 J	<1.1	<2.1	<1.8	<1.3	<3.2	<1.6
125 Broadwater Ave_Crawlspace	03/01/18	20180301-A	198 J	<1.7	25.3 J	12.2 J	<1	<1.9	<1.7	2.2	4.2	1.7

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**125 BROADWATER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
125 Broadwater Ave_Main	03/01/18	20180301-125BROADWATER-02	2.5	<0.071	<6.2	<6.4	9.6	1	2.5	1.7	<1.1	<0.94
125 Broadwater Ave_Crawlspace	03/01/18	20180301-125BROADWATER-01	2.3	<0.074	<6.5 UJ	<6.7	5.9 J	0.4 J	2.3	<1.5	<1.2	<0.98
125 Broadwater Ave_Crawlspace	03/01/18	20180301-A	3.4	<0.068	372 J	<6.1	7.6 J	0.23 J	1.5	<1.4	<1.1	<0.9

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**125 BROADWATER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
125 Broadwater Ave_Main	03/01/18	20180301-125BROADWATER-02	<3	<2.5	<2.1	<2.1	<0.081	<0.081	13.3	<7.3	<0.61	<1.5
125 Broadwater Ave_Crawlspace	03/01/18	20180301-125BROADWATER-01	<3.2	<2.6	<2.2	<2.2	<0.084	<0.084	2.8	<7.6	<0.64	<1.6
125 Broadwater Ave_Crawlspace	03/01/18	20180301-A	<2.9	<2.4	<2	<2	<0.077	<0.077	3.3	<7	<0.59	<1.5

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**125 BROADWATER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-trifluoro-ethane (ug/m3)
125 Broadwater Ave_Main	03/01/18	20180301-125BROADWATER-02	<2.7
125 Broadwater Ave_Crawlspace	03/01/18	20180301-125BROADWATER-01	<2.9
125 Broadwater Ave_Crawlspace	03/01/18	20180301-A	<2.6

Applicable Residential Screening Levels	520
Applicable Industrial Screening Levels	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**125 BROADWATER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)
BPIA66_125 BROADWATER AVE	12/15/07	9.2	1	<2	<2	<2	3.1	0.92	0.7	<2	1.4
BPCS66_125 BROADWATER AVE	07/15/07	16	<1.8	<1.8	<1.8	<1.8	2.2	0.48	<1.8	<1.8	0.92
BPCS66_125 BROADWATER AVE	12/15/07	5	<1.9	<1.9	<1.9	<1.9	2.4	0.35	<1.9	<1.9	1.2

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**125 BROADWATER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloro-ethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)
BPIA66_125 BROADWATER AVE	12/15/07	<2	5.9	1.7	<2	1.2	<2	8.2	<2
BPCS66_125 BROADWATER AVE	07/15/07	<1.8	3.8	1.3	0.13	0.32	<1.8	5.9	<1.8
BPCS66_125 BROADWATER AVE	12/15/07	<1.9	4.7	1.5	<1.9	2.5	<1.9	9.6	<1.9

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**146 TERRY AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
146 Terry Ave_Main	02/05/18	20180205-146TERRY-01	1.4	0.15 J	<0.078	<0.078	<0.05	<0.043	<1.6	1.2	0.52	0.32
146 Terry Ave_Basement/Crawlspace	02/05/18	20180205-146TERRY-02	0.54	0.35 J	<0.11	<0.11	<0.072	<0.063	<1.5	0.95	0.65	0.21
146 Terry Ave_Subslab	02/06/18	20180206-146TERRY-01	289	10.2	<1.4	<1.4	<0.44	<0.76	6.4	1.9	<1.1 UJ	4.4

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**146 TERRY AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethylbenzene (ug/m3)	Benzylchloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
146 Terry Ave_Main	02/05/18	20180205-146TERRY-01	<0.079	0.091	<1.4	<1.7	<0.13	<3.3	<1.2	<0.15	<1.9	<0.091
146 Terry Ave_Basement/Crawlspace	02/05/18	20180205-146TERRY-02	<0.11	0.14	<1.4	<1.6	<0.19	<3.3	<1.2	<0.22	<1.9	<0.13
146 Terry Ave_Subslab	02/06/18	20180206-146TERRY-01	<1.4	<0.69	19	<1.8	<2.3	<3.5	<1.3	<2.6	<2	<1.6

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**146 TERRY AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
146 Terry Ave_Main	02/05/18	20180205-146TERRY-01	<3.4	<6.6	<4.2	<0.13	<6	<0.11	8.3	<4.7	<1.5	1.6
146 Terry Ave_Basement/Crawlspace	02/05/18	20180205-146TERRY-02	<3.4	<6.4	<4.1	0.43	<5.8	<0.15	5.9	<4.6	<1.5	0.79
146 Terry Ave_Subslab	02/06/18	20180206-146TERRY-01	<3.6	<7 UJ	24.3	<1.2	<6.3	<0.93	20.1	9.5	<1.6	1.1

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**146 TERRY AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
146 Terry Ave_Main	02/05/18	20180205-146TERRY-01	101	<1.6	1.7	<4	<0.95	<1.8	<1.6	<1.1	<2.8	<1.4
146 Terry Ave_Basement/Crawlspace	02/05/18	20180205-146TERRY-02	20.8	<1.5	1.2	<3.9	<0.93	2.5	<1.5	<1.1	<2.7	<1.4
146 Terry Ave_Subslab	02/06/18	20180206-146TERRY-01	<1.6 UJ	16.2	11.7	<4.2	<1	<1.9	<1.7	<1.2	23.4	<1.5

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**146 TERRY AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
146 Terry Ave_Main	02/05/18	20180205-146TERRY-01	1.8	<0.078	<5.6	<5.8	2.8	0.14	<1.1	<1.3	<1	<0.85
146 Terry Ave_Basement/Crawlspace	02/05/18	20180205-146TERRY-02	1.9	<0.11	<5.5	<5.7	1.8	0.18	<1.1	<1.3	<0.98	<0.83
146 Terry Ave_Subslab	02/06/18	20180206-146TERRY-01	1.8	<1.4	<5.9	<6.1	2	4.7	<1.2	13.2	<1.1	<0.9

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**146 TERRY AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
146 Terry Ave_Main	02/05/18	20180205-146TERRY-01	<2.7	<2.2	<1.9	<1.9	<0.089	<0.089	<1.2	<6.6	4.4	<1.4
146 Terry Ave_Basement/Crawlspace	02/05/18	20180205-146TERRY-02	<2.7	<2.2	<1.9	<1.9	<0.13	0.14	<1.1	<6.4	<0.54	<1.3
146 Terry Ave_Subslab	02/06/18	20180206-146TERRY-01	<2.9	<2.4	<2	<2	<1.6	<1.6	<1.2	<7	1.2	<1.5

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**146 TERRY AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloroethane (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
146 Terry Ave_Main	02/05/18	20180205-146TERRY-01	<2.5	--	--	--	--	--
146 Terry Ave_Basement/Crawlspace	02/05/18	20180205-146TERRY-02	<2.4	--	--	--	--	--
146 Terry Ave_Subslab	02/06/18	20180206-146TERRY-01	<2.6	<16.8	77.2	19.7	3.5	<3.6

Applicable Residential Screening Levels	520	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	NA	NA	NA	NA	NA	NA

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**146 TERRY AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	1,1,2-Trichloro-ethane (ug/m3)	1,1-Dichloro-ethene (ug/m3)
BPIA159_146 TERRY AVE	04/11/10	1.7	<0.26	<0.19	<0.97	<0.062	1.4	<0.2	<0.2	<0.27	0.097
BPSS159_146 TERRY AVE	04/11/10	436.157	--	--	--	--	20.8376	--	<202.5	--	--

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.12	1.8	0.23	0.021	21
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.53	7.7	0.47	0.088	88

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**146 TERRY AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Methylene Chloride (ug/m3)	MTBE (ug/m3)	1,1,1-Trichloroethane (ug/m3)
BPIA159_146 TERRY AVE	04/11/10	--	<0.88	<0.27
BPSS159_146 TERRY AVE	04/11/10	<3.6	--	--

Applicable Residential Screening Levels	63	11	520
Applicable Industrial Screening Levels	260	47	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**201 S 37TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
201 S 37th St_Main	02/28/18	20180228-201S37ST-03	0.48	<0.096	<0.071	<0.071	<0.046	<0.039	<1.7	1.7	0.43	0.44
201 S 37th St_Basement	02/28/18	20180228-201S37ST-02	0.49	<0.088	<0.065	<0.065	<0.042	0.28	<1.6	1.6	0.47	0.33
201 S 37th St_Crawlspace	02/28/18	20180228-201S37ST-01	0.46 J	<0.086 UJ	<0.064	<0.064	<0.041	<0.036 UJ	<1.6	1.7	0.32 J	0.37
201 S 37th St_Crawlspace	02/28/18	20180228-C	0.65 J	0.24 J	<0.068	<0.068	<0.044	0.39 J	<1.7	1.7	0.17 J	0.4
201 S 37th St_Subslab	03/01/18	20180301-201S37ST-01	56.1	0.81	<0.083	<0.083	<0.054	<0.046	<2.1	0.16	<0.13	1.3

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**201 S 37TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
201 S 37th St_Main	02/28/18	20180228-201S37ST-03	<0.072	<0.072	<1.5	<4.6	0.14	<3.7	<1.4	<0.14	<2.1	<0.082
201 S 37th St_Basement	02/28/18	20180228-201S37ST-02	<0.066	0.078	<1.4	<4.2	<0.11	<3.4	<1.3	<0.13	<2	<0.076
201 S 37th St_Crawlspace	02/28/18	20180228-201S37ST-01	<0.065	0.079	<1.4	<4.2	0.11	<3.3	<1.2	<0.12	<1.9	<0.074
201 S 37th St_Crawlspace	02/28/18	20180228-C	<0.069	0.077	<1.5	<4.4	0.12	<3.5	<1.3	<0.13	<2	<0.079
201 S 37th St_Subslab	03/01/18	20180301-201S37ST-01	<0.085	<0.085	<1.8	<5.4	<0.14	<4.3	<1.6	<0.16	<2.5	<0.097

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**201 S 37TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
201 S 37th St_Main	02/28/18	20180228-201S37ST-03	<3.8	<7.3	<4.7	<0.12	<6.6	<0.097	23.9	<5.2	<1.6	1.3
201 S 37th St_Basement	02/28/18	20180228-201S37ST-02	<3.5	<6.7	<4.3	<0.11	<6.1	<0.089	18.8	<4.8	<1.5	<0.68
201 S 37th St_Crawlspace	02/28/18	20180228-201S37ST-01	<3.4	<6.6	<4.2	<0.11	<6	<0.088	14.9 J	<4.7	<1.5	0.9
201 S 37th St_Crawlspace	02/28/18	20180228-C	<3.6	<7	<4.5	<0.12	<6.3	<0.093	20.1 J	<5	<1.6	1.3
201 S 37th St_Subslab	03/01/18	20180301-201S37ST-01	<4.5	<8.6	<5.5	<0.14	<7.8	<0.11	18.7	<6.2	<1.9	<0.87

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**201 S 37TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
201 S 37th St_Main	02/28/18	20180228-201S37ST-03	328	<1.7	2.7	<4.4	<1	<2	<1.7	2	<3.1	<1.5
201 S 37th St_Basement	02/28/18	20180228-201S37ST-02	151	<1.6	2.6	<4	<0.97	<1.8	<1.6	<1.2	<2.8	<1.4
201 S 37th St_Crawlspace	02/28/18	20180228-201S37ST-01	182	<1.6	2.6	<4	<0.95	<1.8	<1.6	<1.1	2.9	<1.4
201 S 37th St_Crawlspace	02/28/18	20180228-C	202	<1.7	2.4	<4.2	<1	<1.9	<1.7	1.3	<3	<1.5
201 S 37th St_Subslab	03/01/18	20180301-201S37ST-01	4.2	<2.1	<1.5	<5.2	<1.2	<2.3	<2.1	1.7	<3.6	<1.8

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**201 S 37TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
201 S 37th St_Main	02/28/18	20180228-201S37ST-03	3.3	<0.071	<6.2	<6.4	4.9	<0.097	3.5	<1.5	<1.1	<0.94
201 S 37th St_Basement	02/28/18	20180228-201S37ST-02	3	<0.065	<5.7	<5.9	4.5	<0.089	3.3	<1.3	<1	<0.86
201 S 37th St_Crawlspace	02/28/18	20180228-201S37ST-01	3.1	<0.064	<5.6	<5.8	4.6	<0.088	3.3 J	<1.3	<1	<0.85
201 S 37th St_Crawlspace	02/28/18	20180228-C	3.2	<0.068	<5.9	<6.1	4.8	<0.093	<1.2 UJ	<1.4	<1.1	<0.9
201 S 37th St_Subslab	03/01/18	20180301-201S37ST-01	2.6	<0.083	<7.3	<7.5	2.8	0.18	<1.4	<1.7	<1.3	<1.1

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**201 S 37TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
201 S 37th St_Main	02/28/18	20180228-201S37ST-03	<3	<2.5	<2.1	<2.1	<0.081	<0.081	<1.3	<7.3	<0.61	<1.5
201 S 37th St_Basement	02/28/18	20180228-201S37ST-02	<2.8	<2.3	<2	<2	<0.074	<0.074	<1.2	<6.7	<0.56	<1.4
201 S 37th St_Crawlspace	02/28/18	20180228-201S37ST-01	<2.7	<2.2	<1.9	<1.9	<0.073	<0.073	<1.2	<6.6	<0.55	<1.4
201 S 37th St_Crawlspace	02/28/18	20180228-C	<2.9	<2.4	<2	<2	<0.077	<0.077	<1.2	<7	<0.59	<1.5
201 S 37th St_Subslab	03/01/18	20180301-201S37ST-01	<3.6	<2.9	<2.5	<2.5	<0.095	<0.095	<1.5	<8.6	<0.72	<1.8

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**201 S 37TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloroethane (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
201 S 37th St_Main	02/28/18	20180228-201S37ST-03	<2.7	--	--	--	--	--
201 S 37th St_Basement	02/28/18	20180228-201S37ST-02	<2.5	--	--	--	--	--
201 S 37th St_Crawlspace	02/28/18	20180228-201S37ST-01	<2.5	--	--	--	--	--
201 S 37th St_Crawlspace	02/28/18	20180228-C	<2.6	--	--	--	--	--
201 S 37th St_Subslab	03/01/18	20180301-201S37ST-01	<3.2	<17.5	76.7	17.6	5.7	<3.6

Applicable Residential Screening Levels	520	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	NA	NA	NA	NA	NA	NA

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**202 9TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
202 9th St W_Main	03/06/18	20180306-2029THST-02	<30.8	<24.4	<36	<36	<11.6	<20.1	<44.7	<14.5	<28.6	<22.2
202 9th St W_Basement	03/06/18	20180306-2029THST-01	<2.2	<1.8	<2.6	<2.6	<0.84	<1.4	<3.2	<1	<2.1	<1.6
202 9th St W_Basement	03/06/18	20180306-A	<1.9	<1.5	<2.2	<2.2	<0.7	<1.2	<2.7	0.92	<1.7	<1.3
202 9th St W_Subslab	03/07/18	20180307-2029THST-01	152	1.3	<1.4	<1.4	<0.47	<0.81	<1.8	<0.58	<1.1	<0.89
202 9th St W_Subslab	03/07/18	20180307-A	163	1.6	<1.3	<1.3	<0.43	<0.74	<1.6	<0.53	<1	<0.81

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**202 9TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
202 9th St W_Main	03/06/18	20180306-2029THST-02	<36.8	<18.4	<39.5	<46.9	<60.8	<93.9	<35.3	<69.7	<54.5	<42
202 9th St W_Basement	03/06/18	20180306-2029THST-01	<2.7	<1.3	<2.8	<3.4	<4.4	<6.8	<2.5	<5	<3.9	<3
202 9th St W_Basement	03/06/18	20180306-A	<2.2	<1.1	<2.4	<2.8	<3.7	<5.6	<2.1	<4.2	<3.3	<2.5
202 9th St W_Subslab	03/07/18	20180307-2029THST-01	<1.5	<0.74	<1.6	<1.9	<2.4	<3.8	<1.4	<2.8	<2.2	<1.7
202 9th St W_Subslab	03/07/18	20180307-A	<1.3	<0.67	<1.4	<1.7	<2.2	<3.4	<1.3	<2.6	<2	<1.5

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**202 9TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
202 9th St W_Main	03/06/18	20180306-2029THST-02	<97	<186	<119	<31.2	<169	<24.8	182	<134	<41.8	<18.8
202 9th St W_Basement	03/06/18	20180306-2029THST-01	<7	<13.4	<8.6	<2.2	<12.1	<1.8	19.4 J	<9.7	<3	<1.4
202 9th St W_Basement	03/06/18	20180306-A	<5.8	<11.2	<7.2	<1.9	<10.1	<1.5	27.5 J	<8.1	<2.5	<1.1
202 9th St W_Subslab	03/07/18	20180307-2029THST-01	<3.9	<7.4	<4.8	<1.2	<6.7	<0.99	6.5 J	<5.4	<1.7	<0.75
202 9th St W_Subslab	03/07/18	20180307-A	<3.6	<6.8	<4.4	<1.1	<6.2	<0.91	9.8 J	<4.9	<1.5	<0.69

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**202 9TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
202 9th St W_Main	03/06/18	20180306-2029THST-02	13700	<44.7	<32	115	<26.8	<51	<44.7	<32	<79.1	<39.5
202 9th St W_Basement	03/06/18	20180306-2029THST-01	1110 J	<3.2	<2.3	12.1	<1.9	5	<3.2	<2.3	<5.7	<2.8
202 9th St W_Basement	03/06/18	20180306-A	1010 J	<2.7	<1.9	10.9	<1.6	4.6	<2.7	2.2	<4.8	<2.4
202 9th St W_Subslab	03/07/18	20180307-2029THST-01	9.6	<1.8	<1.3	<4.5	<1.1	<2	<1.8	<1.3	<3.2	<1.6
202 9th St W_Subslab	03/07/18	20180307-A	9.2	<1.6	<1.2	<4.1	<0.98	<1.9	<1.6	<1.2	<2.9	<1.4

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**202 9TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
202 9th St W_Main	03/06/18	20180306-2029THST-02	<45.1	<36	<158	<164	57.6	<49.6	<31.3	<37.2	<28.3	<24
202 9th St W_Basement	03/06/18	20180306-2029THST-01	<3.3	<2.6	<11.4	<11.8	3.1	<3.6	<2.3	<2.7	<2	<1.7
202 9th St W_Basement	03/06/18	20180306-A	<2.7	<2.2	<9.5	<9.8	3	<3	<1.9	<2.2	<1.7	<1.4
202 9th St W_Subslab	03/07/18	20180307-2029THST-01	2.2	<1.4	14.1 J	<6.6	<1.4	<2	<1.3	<1.5	<1.1	<0.96
202 9th St W_Subslab	03/07/18	20180307-A	1.7	<1.3	<5.8 UJ	<6	<1.3	<1.8	<1.1	<1.4	<1	<0.88

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**202 9TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
202 9th St W_Main	03/06/18	20180306-2029THST-02	<77.3	<63.5	<54.5	<54.5	<41.3	<41.3	44.2	<186	<15.6	<38.7
202 9th St W_Basement	03/06/18	20180306-2029THST-01	<5.6	<4.6	<3.9	<3.9	<3	<3	3.7	<13.4	<1.1	<2.8
202 9th St W_Basement	03/06/18	20180306-A	<4.7	<3.8	<3.3	<3.3	<2.5	<2.5	3.5	<11.2	<0.94	<2.3
202 9th St W_Subslab	03/07/18	20180307-2029THST-01	<3.1	<2.5	<2.2	<2.2	<1.7	<1.7	<1.3	<7.4	<0.63	<1.6
202 9th St W_Subslab	03/07/18	20180307-A	<2.8	<2.3	<2	<2	<1.5	<1.5	<1.2	<6.8	<0.57	<1.4

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**202 9TH STREET WEST VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
202 9th St W_Main	03/06/18	20180306-2029THST-02	<69.7	<17.9 R	<17.9 R	<20.9 R	--	--	--	--	--
202 9th St W_Basement	03/06/18	20180306-2029THST-01	<5	<19.3	<19.3	<22.5	--	--	--	--	--
202 9th St W_Basement	03/06/18	20180306-A	<4.2	<32.3	<32.3	<37.7	--	--	--	--	--
202 9th St W_Subslab	03/07/18	20180307-2029THST-01	<2.8	92.1	<21.5	<25.1	<17.9	78	14.7	7.4	<3.6
202 9th St W_Subslab	03/07/18	20180307-A	<2.6	91.7	<19.7	<23	<16.4	77	15.8	7.2	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**202 S 38TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
202 S 38th St_Main	02/28/18	20180228-202S38THST-02	0.28	<0.088	<0.065	<0.065	<0.042	0.45	<1.6	2.1	0.49	1.1
202 S 38th St_Basement	02/28/18	20180228-202S38THST-01	0.32	<0.086	<0.064	<0.064	<0.041	<0.036	<1.6	2.1	0.47	0.84
202 S 38th St_Subslab	03/01/18	20180301-202S38THST-01	221	2.6	<0.069	0.11	<0.044	<0.038	<1.7	0.14	<0.11	21.3

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**202 S 38TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
202 S 38th St_Main	02/28/18	20180228-202S38THST-02	<0.066	0.11	<1.4	<4.2	0.35	<3.4	<1.3	<0.13	<2	<0.076
202 S 38th St_Basement	02/28/18	20180228-202S38THST-01	<0.065	0.11	<1.4	<4.2	0.26	<3.3	<1.2	<0.12	<1.9	<0.074
202 S 38th St_Subslab	03/01/18	20180301-202S38THST-01	0.093	<0.07	<1.5	<4.5	<0.12	<3.6	<1.3	<0.13	<2.1	<0.08

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**202 S 38TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
202 S 38th St_Main	02/28/18	20180228-202S38THST-02	<3.5	<6.7	<4.3	<0.11	<6.1	<0.089	13.4	<4.8	<1.5	<0.68
202 S 38th St_Basement	02/28/18	20180228-202S38THST-01	<3.4	<6.6	<4.2	<0.11	<6	<0.088	20.2	<4.7	<1.5	<0.66
202 S 38th St_Subslab	03/01/18	20180301-202S38THST-01	<3.7	<7.1	<4.5	<0.12	<6.4	<0.095	39.6	8.2	<1.6	<0.72

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**202 S 38TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
202 S 38th St_Main	02/28/18	20180228-202S38THST-02	416	<1.6	2.8	<4	<0.97	<1.8	<1.6	<1.2	3.3	<1.4
202 S 38th St_Basement	02/28/18	20180228-202S38THST-01	305	<1.6	2.7	<4	<0.95	<1.8	<1.6	<1.1	3.2	<1.4
202 S 38th St_Subslab	03/01/18	20180301-202S38THST-01	16.6	<1.7	2.2	<4.3	<1	<1.9	<1.7	6.9	<3	<1.5

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**202 S 38TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
202 S 38th St_Main	02/28/18	20180228-202S38THST-02	2.6	<0.065	<5.7	<5.9	5.7	<0.089	4.4	<1.3	<1	<0.86
202 S 38th St_Basement	02/28/18	20180228-202S38THST-01	2.4	<0.064	<5.6	<5.8	5.4	<0.088	4.7	1.5	<1	<0.85
202 S 38th St_Subslab	03/01/18	20180301-202S38THST-01	2.7	0.092	<6	<6.3	<1.3	1.5	<1.2	<1.4	<1.1	<0.92

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**202 S 38TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
202 S 38th St_Main	02/28/18	20180228-202S38THST-02	<2.8	<2.3	<2	<2	<0.074	<0.074	<1.2	<6.7	<0.56	<1.4
202 S 38th St_Basement	02/28/18	20180228-202S38THST-01	<2.7	<2.2	<1.9	<1.9	<0.073	<0.073	<1.2	<6.6	<0.55	<1.4
202 S 38th St_Subslab	03/01/18	20180301-202S38THST-01	<3	<2.4	<2.1	<2.1	<0.079	<0.079	<1.3	<7.1	<0.6	<1.5

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**202 S 38TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloroethane (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
202 S 38th St_Main	02/28/18	20180228-202S38THST-02	<2.5	--	--	--	--	--
202 S 38th St_Basement	02/28/18	20180228-202S38THST-01	<2.5	--	--	--	--	--
202 S 38th St_Subslab	03/01/18	20180301-202S38THST-01	<2.7	<17.1	77.9	16.2	5.8	<3.6

Applicable Residential Screening Levels	520	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	NA	NA	NA	NA	NA	NA

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**209 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
209 Miles Ave_Main	02/09/18	20180209-209MILES-01	1.9	0.64	<0.064	<0.064	<0.041	<0.036	<1.6	0.9	0.57	0.6
209 Miles Ave_Basement	02/09/18	20180209-209MILES-03	2.5	0.71	<0.062	<0.062	<0.04	0.25	<1.5	0.99	0.53	0.37
209 Miles Ave_Crawlspace	02/09/18	20180209-209MILES-02	4.6	0.83	<0.073	<0.073	<0.047	<0.041	<1.4	1.1	0.36	0.32
209 Miles Ave_Subslab	02/10/18	20180210-209MILES-01	3040	600 J	<1.2	<1.2	<0.4	<0.7	<1.5 R	<0.5	<0.99 UJ	10.9

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**209 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
209 Miles Ave_Main	02/09/18	20180209-209MILES-01	<0.065	0.09	<1.4	<1.7	0.16	<3.3	<1.2	<0.12	<1.9	<0.074
209 Miles Ave_Basement	02/09/18	20180209-209MILES-03	<0.064	0.086	<1.4	<1.6	<0.11	<3.3	<1.2	<0.12	<1.9	<0.073
209 Miles Ave_Crawlspace	02/09/18	20180209-209MILES-02	<0.074	0.083	<1.2	<1.5	<0.12	<2.9	<1.1	<0.14	<1.7	<0.085
209 Miles Ave_Subslab	02/10/18	20180210-209MILES-01	<1.3	<0.64	<1.4 R	<1.6 R	<2.1	<3.3 R	<1.2	<2.4 R	<1.9 R	<1.5

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**209 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
209 Miles Ave_Main	02/09/18	20180209-209MILES-01	<3.4	<6.6	<4.2 UJ	<0.11	<6 UJ	<0.088	13.2	<4.7	<1.5	1.2
209 Miles Ave_Basement	02/09/18	20180209-209MILES-03	<3.4	<6.4	<4.1 UJ	<0.11	<5.8 UJ	<0.086	12.1	<4.6	<1.5	<0.65
209 Miles Ave_Crawlspace	02/09/18	20180209-209MILES-02	<3	<5.8	<3.7 UJ	<0.13	<5.2 UJ	<0.1	8.4	<4.2	<1.3	0.84
209 Miles Ave_Subslab	02/10/18	20180210-209MILES-01	<3.4 R	<6.4 R	<4.1 UJ	<1.1 R	<5.8 R	<0.86	13.2	<4.6	<1.5 R	<0.65

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**209 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
209 Miles Ave_Main	02/09/18	20180209-209MILES-01	24.8 J	<1.6	2.1	<4	<0.95	<1.8	<1.6	<1.1	<2.8	<1.4
209 Miles Ave_Basement	02/09/18	20180209-209MILES-03	17.6 J	<1.5	2	<3.9	<0.93	<1.8	<1.5	1.9	<2.7	<1.4
209 Miles Ave_Crawlspace	02/09/18	20180209-209MILES-02	14.4 J	<1.4	1.7	<3.5	<0.83	<1.6	<1.4	1.2	<2.5	<1.2
209 Miles Ave_Subslab	02/10/18	20180210-209MILES-01	166 J	<1.5 R	<1.1	<3.9	<0.93	<1.8	<1.5 R	<1.1	<2.7 R	<1.4 R

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**209 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
209 Miles Ave_Main	02/09/18	20180209-209MILES-01	2.6	<0.064	11.6	<5.8	2.4	<0.088	1.6	<1.3	<1	<0.85
209 Miles Ave_Basement	02/09/18	20180209-209MILES-03	2.4	<0.062	<5.5	<5.7	2.2	<0.086	1.7	<1.3	<0.98	<0.83
209 Miles Ave_Crawlspace	02/09/18	20180209-209MILES-02	2.3	<0.073	<4.9	<5.1	1.9	<0.1	1.5	1.2	<0.88	<0.75
209 Miles Ave_Subslab	02/10/18	20180210-209MILES-01	1.9	<1.2	<5.5	<5.7	<1.2	6.6	<1.1	<1.3	<0.98	<0.83

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**209 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo-chloromethane (ug/m3)	1,2-Dichloro-1,1,2,2-tetrafluoroethane (ug/m3)	1,2-Dichloro-benzene (ug/m3)	1,3-Dichloro-benzene (ug/m3)	Cis-1,3-dichloro-propene (ug/m3)	trans-1,3-Dichloro-propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl-2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
209 Miles Ave_Main	02/09/18	20180209-209MILES-01	<2.7	<2.2	<1.9	<1.9	<0.073	<0.073	<1.2	<6.6	<0.55	<1.4
209 Miles Ave_Basement	02/09/18	20180209-209MILES-03	<2.7	<2.2	<1.9	<1.9	<0.071	<0.071	<1.1	<6.4	<0.54	<1.3
209 Miles Ave_Crawlspace	02/09/18	20180209-209MILES-02	<2.4	<2	<1.7	<1.7	<0.083	<0.083	<1	<5.8	<0.49	<1.2
209 Miles Ave_Subslab	02/10/18	20180210-209MILES-01	<2.7 R	<2.2	<1.9 R	<1.9 R	<1.4	<1.4	74.9	<6.4	<0.54	<1.3 R

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**209 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
209 Miles Ave_Main	02/09/18	20180209-209MILES-01	<2.5	<19	<19	<22.1	--	--	--	--	--
209 Miles Ave_Basement	02/09/18	20180209-209MILES-03	<2.4	<18.6	<18.6	<21.7	--	--	--	--	--
209 Miles Ave_Crawlspace	02/09/18	20180209-209MILES-02	<2.2	<16.7	<16.7	<19.5	--	--	--	--	--
209 Miles Ave_Subslab	02/10/18	20180210-209MILES-01	<2.4	1940 J	<18.6	<21.7	<20.8 UJ	80.1	18.5	<2	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA	NA

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**209 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
209 Miles Ave_Main	02/09/18	1.9	0.64	<0.064	<0.064	<0.041	<0.036	<1.6	0.9	0.57	0.6
209 Miles Ave_Basement	02/09/18	2.5	0.71	<0.062	<0.062	<0.04	0.25	<1.5	0.99	0.53	0.37
209 Miles Ave_Crawlspace	02/09/18	4.6	0.83	<0.073	<0.073	<0.047	<0.041	<1.4	1.1	0.36	0.32
209 Miles Ave_Subslab	02/10/18	3040	600 J	<1.2	<1.2	<0.4	<0.7	<1.5 R	<0.5	<0.99 UJ	10.9

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**209 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
209 Miles Ave_Main	02/09/18	<0.065	0.09	<1.4	<1.7	0.16	<3.3	<1.2	<0.12	<1.9	<0.074
209 Miles Ave_Basement	02/09/18	<0.064	0.086	<1.4	<1.6	<0.11	<3.3	<1.2	<0.12	<1.9	<0.073
209 Miles Ave_Crawlspace	02/09/18	<0.074	0.083	<1.2	<1.5	<0.12	<2.9	<1.1	<0.14	<1.7	<0.085
209 Miles Ave_Subslab	02/10/18	<1.3	<0.64	<1.4 R	<1.6 R	<2.1	<3.3 R	<1.2	<2.4 R	<1.9 R	<1.5

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**209 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
209 Miles Ave_Main	02/09/18	<3.4	<6.6	<4.2 UJ	<0.11	<6 UJ	<0.088	13.2	<4.7	<1.5	1.2
209 Miles Ave_Basement	02/09/18	<3.4	<6.4	<4.1 UJ	<0.11	<5.8 UJ	<0.086	12.1	<4.6	<1.5	<0.65
209 Miles Ave_Crawlspace	02/09/18	<3	<5.8	<3.7 UJ	<0.13	<5.2 UJ	<0.1	8.4	<4.2	<1.3	0.84
209 Miles Ave_Subslab	02/10/18	<3.4 R	<6.4 R	<4.1 UJ	<1.1 R	<5.8 R	<0.86	13.2	<4.6	<1.5 R	<0.65

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**209 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
209 Miles Ave_Main	02/09/18	24.8 J	<1.6	2.1	<4	<0.95	<1.8	<1.6	<1.1	<2.8	<1.4
209 Miles Ave_Basement	02/09/18	17.6 J	<1.5	2	<3.9	<0.93	<1.8	<1.5	1.9	<2.7	<1.4
209 Miles Ave_Crawlspace	02/09/18	14.4 J	<1.4	1.7	<3.5	<0.83	<1.6	<1.4	1.2	<2.5	<1.2
209 Miles Ave_Subslab	02/10/18	166 J	<1.5 R	<1.1	<3.9	<0.93	<1.8	<1.5 R	<1.1	<2.7 R	<1.4 R

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**209 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Dichloro- difluoro- methane (ug/m3)	1,1-Dichloro- ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1- Trichloro- ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
209 Miles Ave_Main	02/09/18	2.6	<0.064	11.6	<5.8	2.4	<0.088	1.6	<1.3	<1	<0.85
209 Miles Ave_Basement	02/09/18	2.4	<0.062	<5.5	<5.7	2.2	<0.086	1.7	<1.3	<0.98	<0.83
209 Miles Ave_Crawlspace	02/09/18	2.3	<0.073	<4.9	<5.1	1.9	<0.1	1.5	1.2	<0.88	<0.75
209 Miles Ave_Subslab	02/10/18	1.9	<1.2	<5.5	<5.7	<1.2	6.6	<1.1	<1.3	<0.98	<0.83

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**209 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
209 Miles Ave_Main	02/09/18	<2.7	<2.2	<1.9	<1.9	<0.073	<0.073	<1.2	<6.6	<0.55	<1.4
209 Miles Ave_Basement	02/09/18	<2.7	<2.2	<1.9	<1.9	<0.071	<0.071	<1.1	<6.4	<0.54	<1.3
209 Miles Ave_Crawlspace	02/09/18	<2.4	<2	<1.7	<1.7	<0.083	<0.083	<1	<5.8	<0.49	<1.2
209 Miles Ave_Subslab	02/10/18	<2.7 R	<2.2	<1.9 R	<1.9 R	<1.4	<1.4	74.9	<6.4	<0.54	<1.3 R

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**209 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloroethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
209 Miles Ave_Main	02/09/18	<2.5	<19	<19	<22.1	--	--	--	--	--
209 Miles Ave_Basement	02/09/18	<2.4	<18.6	<18.6	<21.7	--	--	--	--	--
209 Miles Ave_Crawlspace	02/09/18	<2.2	<16.7	<16.7	<19.5	--	--	--	--	--
209 Miles Ave_Subslab	02/10/18	<2.4	1940 J	<18.6	<21.7	<20.8 UJ	80.1	18.5	<2	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**237 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
237 Wyoming Ave_Main	02/05/18	20180205-237WYOMING-03	0.79 J	0.17 J	<0.079	<0.079	<0.051	<0.044	<1.5	0.81	0.27 J	0.85
237 Wyoming Ave_Main	02/05/18	20180205-C	0.44 J	<0.14 UJ	<0.1	<0.1	<0.066	<0.057	<1.5	0.86	0.61 J	0.92
237 Wyoming Ave_Basement	02/05/18	20180205-237WYOMING-02	0.46	0.18 J	<0.12	<0.12	<0.075	<0.065	<1.6	0.73	0.5	0.87
237 Wyoming Ave_Crawlspace	02/05/18	20180205-237WYOMING-01	0.63	<0.1 UJ	<0.076	<0.076	<0.049	<0.042	<1.5	0.64	0.49	0.95
237 Wyoming Ave_Subslab	02/06/18	20180206-237WYOMING-01	554	19.5	<1.2	<1.2	<0.4	<0.68	<1.5	<0.49	<0.97	398

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**237 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
237 Wyoming Ave_Main	02/05/18	20180205-237WYOMING-03	<0.081	0.26	<1.3	<1.5	0.23	<3.1	<1.2	<0.15	<1.8	<0.092
237 Wyoming Ave_Main	02/05/18	20180205-C	<0.1	0.28	<1.3	<1.6	0.27	<3.1	<1.2	<0.2	<1.8	<0.12
237 Wyoming Ave_Basement	02/05/18	20180205-237WYOMING-02	<0.12	0.24	<1.4	<1.7	0.26	<3.4	<1.3	<0.23	<2	<0.14
237 Wyoming Ave_Crawlspace	02/05/18	20180205-237WYOMING-01	<0.077	0.13	<1.3	<1.6	0.2	<3.1	<1.2	<0.15	<1.8	<0.088
237 Wyoming Ave_Subslab	02/06/18	20180206-237WYOMING-01	1.5	<0.62	<1.3	<1.6	32.9	<3.2	<1.2	<2.4	<1.9	<1.4

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**237 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
237 Wyoming Ave_Main	02/05/18	20180205-237WYOMING-03	<3.2	<6.1	<3.9	<0.14	<5.5	<0.11	22.9	<4.4	<1.4	0.8
237 Wyoming Ave_Main	02/05/18	20180205-C	<3.2	<6.2	<4	<0.18	<5.6	<0.14	21.5	<4.5	<1.4	0.88
237 Wyoming Ave_Basement	02/05/18	20180205-237WYOMING-02	<3.5	<6.7	<4.3	<0.2	<6.1	<0.16	11.1	<4.8	<1.5	0.86
237 Wyoming Ave_Crawlspace	02/05/18	20180205-237WYOMING-01	<3.2	<6.2	<4	<0.13	<5.6	<0.1	7.8	<4.5	<1.4	0.67
237 Wyoming Ave_Subslab	02/06/18	20180206-237WYOMING-01	<3.3	<6.3	<4	<1.1	<5.7	<0.84	15.1	<4.6	<1.4	<0.64

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**237 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
237 Wyoming Ave_Main	02/05/18	20180205-237WYOMING-03	193	<1.5	3.1 J	<3.6	<0.88	<1.7	<1.5	<1	<2.6	<1.3
237 Wyoming Ave_Main	02/05/18	20180205-C	193	<1.5	2.2 J	<3.7	<0.89	<1.7	<1.5	<1.1	<2.6	<1.3
237 Wyoming Ave_Basement	02/05/18	20180205-237WYOMING-02	108	<1.6	<1.2	<4	<0.97	<1.8	<1.6	<1.2	<2.8	<1.4
237 Wyoming Ave_Crawlspace	02/05/18	20180205-237WYOMING-01	48.6	<1.5	<1.1	<3.7	<0.89	<1.7	<1.5	<1.1	<2.6	<1.3
237 Wyoming Ave_Subslab	02/06/18	20180206-237WYOMING-01	9.6	<1.5	<1.1	<3.8	<0.91	<1.7	<1.5	<1.1	<2.7	<1.3

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**237 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
237 Wyoming Ave_Main	02/05/18	20180205-237WYOMING-03	2.1	<0.079	43.4 J	<5.3	2.1	<0.11	<1	<1.2	<0.92	<0.78
237 Wyoming Ave_Main	02/05/18	20180205-C	2	<0.1	21.4 J	<5.5	1.8	<0.14	<1	<1.2	<0.94	<0.8
237 Wyoming Ave_Basement	02/05/18	20180205-237WYOMING-02	2.1	<0.12	<5.7	<5.9	<1.2	<0.16	<1.1	<1.3	<1	<0.86
237 Wyoming Ave_Crawlspace	02/05/18	20180205-237WYOMING-01	2	<0.076	<5.3	<5.5	<1.1	<0.1	<1	<1.2	<0.94	<0.8
237 Wyoming Ave_Subslab	02/06/18	20180206-237WYOMING-01	1.6	<1.2	<5.4	<5.6	<1.2	<1.7	<1.1	<1.3	<0.96	<0.81

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**237 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo-chloromethane (ug/m3)	1,2-Dichloro-1,1,2,2-tetrafluoroethane (ug/m3)	1,2-Dichloro-benzene (ug/m3)	1,3-Dichloro-benzene (ug/m3)	Cis-1,3-dichloro-propene (ug/m3)	trans-1,3-Dichloro-propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl-2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
237 Wyoming Ave_Main	02/05/18	20180205-237WYOMING-03	<2.5	<2.1	<1.8	<1.8	<0.09	<0.09	3.1	<6.1	<0.51	<1.3
237 Wyoming Ave_Main	02/05/18	20180205-C	<2.6	<2.1	<1.8	<1.8	<0.12	<0.12	3	<6.2	<0.52	<1.3
237 Wyoming Ave_Basement	02/05/18	20180205-237WYOMING-02	<2.8	<2.3	<2	<2	<0.13	<0.13	<1.2	<6.7	<0.56	<1.4
237 Wyoming Ave_Crawlspace	02/05/18	20180205-237WYOMING-01	<2.6	<2.1	<1.8	<1.8	<0.087	<0.087	<1.1	<6.2	<0.52	<1.3
237 Wyoming Ave_Subslab	02/06/18	20180206-237WYOMING-01	<2.6	<2.2	<1.9	<1.9	<1.4	<1.4	<1.1	<6.3	<0.53	<1.3

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**237 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloroethane (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
237 Wyoming Ave_Main	02/05/18	20180205-237WYOMING-03	<2.3	--	--	--	--	--
237 Wyoming Ave_Main	02/05/18	20180205-C	<2.3	--	--	--	--	--
237 Wyoming Ave_Basement	02/05/18	20180205-237WYOMING-02	<2.5	--	--	--	--	--
237 Wyoming Ave_Crawlspace	02/05/18	20180205-237WYOMING-01	<2.3	--	--	--	--	--
237 Wyoming Ave_Subslab	02/06/18	20180206-237WYOMING-01	<2.4	257	78.4	18.8	2.8	<3.6

Applicable Residential Screening Levels	520	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	NA	NA	NA	NA	NA	NA

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**237 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)
BPIA71_237 WYOMING AVE	12/12/07	0.96	0.43	<1.8	<1.8	<1.8	5.2	1.4	<1.8	<1.8	0.69
BPCS71_237 WYOMING AVE	12/12/07	0.46	0.26	<2	<2	<2	0.87	0.69	<2	<2	0.34

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit
DUP - Field duplicate sample
NA - Not applicable
J+ - Estimated concentration, possibly biased high
UJ - Estimated reporting limit
R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**237 WYOMING AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloro-ethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)
BPIA71_237 WYOMING AVE	12/12/07	<1.8	2.5	0.88	<1.8	83	<1.8	27	0.75
BPCS71_237 WYOMING AVE	12/12/07	<2	1.2	0.44	<2	110	<2	7.2	0.88

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**306 N 30TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
306 N 30th St_2nd Floor	03/08/18	20180308-306N30THST-02	0.4	0.12	<0.065	<0.065	<0.042	<0.036	3.1	5.4	0.49	0.13
306 N 30th St_Main	03/08/18	20180308-306N30THST-03	0.41	<0.088	<0.065	<0.065	<0.042	<0.036	3.2	5.1	0.13	0.14
306 N 30th St_Basement/Crawlspace	03/08/18	20180308-306N30THST-01	0.5	<0.12	<0.085	<0.085	<0.055	<0.048	<2.1	2.5	0.34	0.13
306 N 30th St_Subslab	03/09/18	20180309-306N30THST-01	247	2.7	<0.072	<0.072	<0.047	<0.04	2.6	0.27	0.13	2.4

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**306 N 30TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
306 N 30th St_2nd Floor	03/08/18	20180308-306N30THST-02	<0.066	0.2	2.6	<1.7	<0.11	<8.5	<1.3	<0.13	<2	<0.076
306 N 30th St_Main	03/08/18	20180308-306N30THST-03	<0.066	0.16	2.4	<1.7	<0.11	<8.5	<1.3	<0.13	<2	<0.076
306 N 30th St_Basement/Crawlspace	03/08/18	20180308-306N30THST-01	<0.087	0.091	<1.9	<2.2	<0.14	<11.1	<1.7	<0.17	3.7	<0.1
306 N 30th St_Subslab	03/09/18	20180309-306N30THST-01	<0.074	<0.074	<1.6	<1.9	0.48	<9.4	<1.4	<0.14	<2.2	<0.084

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**306 N 30TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
306 N 30th St_2nd Floor	03/08/18	20180308-306N30THST-02	<3.5	<6.7	<4.3	<0.11 UJ	<6.1	<0.089	21.9	<4.8	<1.5	0.85
306 N 30th St_Main	03/08/18	20180308-306N30THST-03	<3.5	<6.7	<4.3	<0.11 UJ	<6.1	<0.089	31.1	5	<1.5	<0.68
306 N 30th St_Basement/Crawlspace	03/08/18	20180308-306N30THST-01	<4.6	<8.8	<5.6	<0.15 UJ	<8	<0.12	14.5	<6.4	<2	0.9
306 N 30th St_Subslab	03/09/18	20180309-306N30THST-01	<3.9	<7.4	6.3	<0.12 UJ	<6.7	<0.099	32.5	7.9	<1.7	<0.75

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**306 N 30TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
306 N 30th St_2nd Floor	03/08/18	20180308-306N30THST-02	54.5	<1.6	7.3	<4	<0.97	3.3	<1.6	<1.2	10.4	3.1
306 N 30th St_Main	03/08/18	20180308-306N30THST-03	49.2	<1.6	7.6	5	<0.97	4	<1.6	<1.2	10.1	3.1
306 N 30th St_Basement/Crawlspace	03/08/18	20180308-306N30THST-01	36.2	<2.1	5.3	<5.3	<1.3	5.1	<2.1	<1.5	4.4	<1.9
306 N 30th St_Subslab	03/09/18	20180309-306N30THST-01	18.7	<1.8	1.9	<4.5	<1.1	<2	<1.8	4.6	<3.2	<1.6

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**306 N 30TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
306 N 30th St_2nd Floor	03/08/18	20180308-306N30THST-02	<1.6	<0.065	<5.7	<5.9	20.3	<0.089	15.7	3.4	<1	<0.86
306 N 30th St_Main	03/08/18	20180308-306N30THST-03	2.8	<0.065	<5.7	<5.9	19.2	<0.089	14.4	3.3	<1	<0.86
306 N 30th St_Basement/Crawlspace	03/08/18	20180308-306N30THST-01	<2.1	<0.085	<7.5	<7.8	7	<0.12	6.8	2.2	<1.3	<1.1
306 N 30th St_Subslab	03/09/18	20180309-306N30THST-01	2.6	<0.072	<6.3	<6.6	2.8	<0.099	<1.3	<1.5	<1.1	<0.96

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**306 N 30TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
306 N 30th St_2nd Floor	03/08/18	20180308-306N30THST-02	<2.8	<2.3	<2	<2	<0.074	<0.074 UJ	<1.2	<6.7	<0.56	<1.4
306 N 30th St_Main	03/08/18	20180308-306N30THST-03	<2.8	<2.3	<2	<2	<0.074	<0.074 UJ	<1.2	<6.7	<0.56	<1.4
306 N 30th St_Basement/Crawlspace	03/08/18	20180308-306N30THST-01	<3.7	<3	<2.6	<2.6	<0.098	<0.098 UJ	<1.6	<8.8	<0.74	<1.8
306 N 30th St_Subslab	03/09/18	20180309-306N30THST-01	<3.1	<2.5	<2.2	<2.2	<0.083	<0.083 UJ	<1.3	<7.4	<0.63	<1.6

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**306 N 30TH STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloroethane (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
306 N 30th St_2nd Floor	03/08/18	20180308-306N30THST-02	<2.5	--	--	--	--	--
306 N 30th St_Main	03/08/18	20180308-306N30THST-03	<2.5	--	--	--	--	--
306 N 30th St_Basement/Crawlspace	03/08/18	20180308-306N30THST-01	<3.3	--	--	--	--	--
306 N 30th St_Subslab	03/09/18	20180309-306N30THST-01	<2.8	<17.9	78.1	21.2	<2	<3.6

Applicable Residential Screening Levels	520	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	NA	NA	NA	NA	NA

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**308 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
308 Miles Ave_Main	02/05/18	20180205-308MILES-01	3.3	0.62 J	<0.088	<0.088	<0.057	<0.049	<1.6	5.2	0.39	2.9
308 Miles Ave_Basement	02/05/18	20180205-308MILES-02	4.4	0.75 J	<0.064	<0.064	<0.041	<0.71	<1.6	3.5	0.42	0.85
308 Miles Ave_Subslab	02/06/18	20180206-308MILES-01	120000	12200	56.5	1.4	<0.4	<0.7	<1.5	1.4	<0.99	33.8

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**308 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
308 Miles Ave_Main	02/05/18	20180205-308MILES-01	<0.09	0.44	1.4	<1.7	1.1	<3.4	<1.3	<0.17	<2	<0.1
308 Miles Ave_Basement	02/05/18	20180205-308MILES-02	<0.065	0.41	<1.4	<1.7	0.26	<3.3	<1.2	<0.12	<1.9	<0.074
308 Miles Ave_Subslab	02/06/18	20180206-308MILES-01	11.9	<0.64	<1.4	<1.6	<2.1	<3.3	<1.2	<2.4	<1.9	<1.5

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**308 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
308 Miles Ave_Main	02/05/18	20180205-308MILES-01	<3.5	<6.7	<4.3	<0.15	<6.1	<0.12	28.2	5.8	<1.5	5.5
308 Miles Ave_Basement	02/05/18	20180205-308MILES-02	<3.4	<6.6	<4.2	<0.11	<6	<0.088	19	<4.7	<1.5	3.8
308 Miles Ave_Subslab	02/06/18	20180206-308MILES-01	<3.4	<6.4	<4.1	<1.1	<5.8	<0.86	9.7	<4.6	<1.5	<0.65

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**308 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
308 Miles Ave_Main	02/05/18	20180205-308MILES-01	205	<1.6	1.8	23.2	<0.97	<1.8	<1.6	<1.2	4.4	<1.4
308 Miles Ave_Basement	02/05/18	20180205-308MILES-02	182	<1.6	<1.1	8.3	<0.95	<1.8	<1.6	<1.1	2.8	<1.4
308 Miles Ave_Subslab	02/06/18	20180206-308MILES-01	2.8	<1.5	1.2	<3.9	<0.93	<1.8	<1.5	<1.1	<2.7	<1.4

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**308 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
308 Miles Ave_Main	02/05/18	20180205-308MILES-01	1.9	<0.088	<5.7	<5.9	10.6	<0.12	<1.1	<1.3	<1	<0.86
308 Miles Ave_Basement	02/05/18	20180205-308MILES-02	1.9	<0.064	<5.6	<5.8	6.9	<0.088	<1.1	<1.3	<1	<0.85
308 Miles Ave_Subslab	02/06/18	20180206-308MILES-01	1.6	<1.2	<5.5	<5.7	7.7	71.3	<1.1	<1.3	<0.98	<0.83

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**308 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo-chloromethane (ug/m3)	1,2-Dichloro-1,1,2,2-tetrafluoroethane (ug/m3)	1,2-Di-chloro-benzene (ug/m3)	1,3-Di-chloro-benzene (ug/m3)	Cis-1,3-dichloro-propene (ug/m3)	trans-1,3-Dichloro-propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl-2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
308 Miles Ave_Main	02/05/18	20180205-308MILES-01	<2.8	<2.3	<2	<2	<0.1	<0.1	<1.2	<6.7	18.9	1.8
308 Miles Ave_Basement	02/05/18	20180205-308MILES-02	<2.7	<2.2	<1.9	<1.9	<0.073	<0.073	2.3	<6.6	12.6	<1.4
308 Miles Ave_Subslab	02/06/18	20180206-308MILES-01	<2.7	<2.2	<1.9	<1.9	<1.4	<1.4	<1.1	<6.4	<0.54	<1.3

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**308 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
308 Miles Ave_Main	02/05/18	20180205-308MILES-01	<2.5	109	<19.3	<22.5	--	--	--	--	--
308 Miles Ave_Basement	02/05/18	20180205-308MILES-02	<2.5	<19	<19	<22.1	--	--	--	--	--
308 Miles Ave_Subslab	02/06/18	20180206-308MILES-01	<2.4	<35700	<35700	<41700	678000 J	78.6	18.9	2.5	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**308 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	1,1,2-Trichloro-ethane (ug/m3)	1,1-Dichloro-ethene (ug/m3)
BPIA158_308 MILES AVE	04/12/10	6.6	0.66	<0.16	<0.78	<0.05	<0.19	<0.16	1.3	<0.21	0.078
BPSS158_308 MILES AVE	04/12/10	20340	--	--	--	--	<244	--	<2025	--	--

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.12	1.8	0.23	0.021	21
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.53	7.7	0.47	0.088	88

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit
DUP - Field duplicate sample
NA - Not applicable
J+ - Estimated concentration, possibly biased high
UJ - Estimated reporting limit
R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**308 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Methylene Chloride (ug/m3)	MTBE (ug/m3)	1,1,1-Trichloroethane (ug/m3)
BPIA158_308 MILES AVE	04/12/10	<1.4	<0.71	<0.21
BPSS158_308 MILES AVE	04/12/10	--	--	--

Applicable Residential Screening Levels	63	11	520
Applicable Industrial Screening Levels	260	47	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**311 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
311 Howard Ave_Main	02/28/18	20180228-311HOWARD-02	3.2	<0.86	<1.3	<1.3	<0.41	<0.71	1.7	3.1	<1	3
311 Howard Ave_Basement	02/28/18	20180228-311HOWARD-01	3.8	<0.88	<1.3	<1.3	<0.42	<0.72	<1.6	2.3	<1	1.3
311 Howard Ave_Subslab	03/01/18	20180301-311HOWARD-01	122	4.7	0.27	<0.12	<0.074	<0.064	<1.6	0.36	0.6	0.55

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**311 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
311 Howard Ave_Main	02/28/18	20180228-311HOWARD-02	<1.3	3.5	<1.4	<1.7	<2.1	<3.3	<1.2	<2.5	<1.9	<1.5
311 Howard Ave_Basement	02/28/18	20180228-311HOWARD-01	<1.3	1.8	<1.4	<1.7	<2.2	<3.4	<1.3	<2.5	<2	<1.5
311 Howard Ave_Subslab	03/01/18	20180301-311HOWARD-01	<0.12	0.47	<1.4	<1.7	0.22	<3.4	<1.3	<0.22	<2	<0.13

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**311 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
311 Howard Ave_Main	02/28/18	20180228-311HOWARD-02	<3.4	<6.6	<4.2	<1.1	<6	<0.88	542	9.8	<1.5	1.2
311 Howard Ave_Basement	02/28/18	20180228-311HOWARD-01	<3.5	<6.7	<4.3	<1.1	<6.1	<0.89	374	8	<1.5	0.79
311 Howard Ave_Subslab	03/01/18	20180301-311HOWARD-01	<3.6	<6.8	<4.4	<0.2	<6.2	<0.16	5.7	<4.9	<1.5	<0.69

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**311 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
311 Howard Ave_Main	02/28/18	20180228-311HOWARD-02	3830	<1.6	8.9	132	1.5	<1.8	<1.6	<1.1	<2.8	<1.4
311 Howard Ave_Basement	02/28/18	20180228-311HOWARD-01	1360 J	<1.6	4.1	67.1	2.6	<1.8	<1.6	<1.2	<2.8	<1.4
311 Howard Ave_Subslab	03/01/18	20180301-311HOWARD-01	14.8	<1.6	<1.2	<4.1	<0.98	<1.9	<1.6	<1.2	<2.9	<1.4

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**311 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
311 Howard Ave_Main	02/28/18	20180228-311HOWARD-02	2.8	<1.3	13.7	<5.8	16.4	<1.8	<1.1	2.7	<1	<0.85
311 Howard Ave_Basement	02/28/18	20180228-311HOWARD-01	2.3	<1.3	<5.7	<5.9	15.1	<1.8	<1.1	2.6	<1	<0.86
311 Howard Ave_Subslab	03/01/18	20180301-311HOWARD-01	2.2	<0.12	<5.8	<6	1.3	<0.16	<1.1	<1.4	<1	<0.88

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**311 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo-chloromethane (ug/m3)	1,2-Dichloro-1,1,2,2-tetrafluoroethane (ug/m3)	1,2-Di-chloro-benzene (ug/m3)	1,3-Di-chloro-benzene (ug/m3)	Cis-1,3-dichloro-propene (ug/m3)	trans-1,3-Dichloro-propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl-2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
311 Howard Ave_Main	02/28/18	20180228-311HOWARD-02	<2.7	<2.2	<1.9	<1.9	<1.5	<1.5	62.1	<6.6	<0.55	<1.4
311 Howard Ave_Basement	02/28/18	20180228-311HOWARD-01	<2.8	<2.3	<2	<2	<1.5	<1.5	36.4	<6.7	<0.56	<1.4
311 Howard Ave_Subslab	03/01/18	20180301-311HOWARD-01	<2.8	<2.3	<2	<2	<0.13	<0.13	<1.2	<6.8	<0.57	<1.4

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**311 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
311 Howard Ave_Main	02/28/18	20180228-311HOWARD-02	<2.5	166	<19	529	--	--	--	--	--
311 Howard Ave_Basement	02/28/18	20180228-311HOWARD-01	<2.5	44.5	<19.3	43.8	--	--	--	--	--
311 Howard Ave_Subslab	03/01/18	20180301-311HOWARD-01	<2.6	<19.7	<19.7	<23	26.4	79.3	20.4	<2	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**311 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)
BPIA45_311 HOWARD AVE	02/03/07	120	2.5	0.26	<0.037	0.0079	1.6	2	0.037	0.29	1.3
BPIA45_311 HOWARD AVE	06/07/07	120	2.3	0.23	0.0077	0.0056	0.65	2.3	0.019	0.18	0.95
BPIA45_311 HOWARD AVE	03/05/08	24	0.872	<7.7	<7.7	<7.7	1.8	2.99	<7.7	<7.7	1.2
BPSS45_311 HOWARD AVE	02/03/07	47000	1100	68	<88	<88	<350	<350	<88	<88	54
BPSS45_311 HOWARD AVE	03/05/08	8400	340	40	<57	<57	<57	<57	<57	<57	<57

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**311 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloro-ethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)
BPIA45_311 HOWARD AVE	02/03/07	<0.037	3.6	1.6	0.051	12	0.016	10	0.17
BPIA45_311 HOWARD AVE	06/07/07	0.034	2.5	0.94	0.051	29	0.013	8.7	0.11
BPIA45_311 HOWARD AVE	03/05/08	<7.7	3.54	1.66	<7.7	8	<7.7	17	<7.7
BPSS45_311 HOWARD AVE	02/03/07	<88	330	160	<88	<350	<88	<350	56
BPSS45_311 HOWARD AVE	03/05/08	<57	<57	<57	<57	10	<57	8.7	8.2

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**312 N 33RD STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
312 N 33rd St_Main	02/28/18	20180228-312N33ST-03	0.41	<0.088	<0.065	<0.065	<0.042	<0.036	<1.6	2.3	0.52	0.27
312 N 33rd St_Basement	02/28/18	20180228-312N33ST-01	0.64	<0.088	<0.065	<0.065	<0.042	0.43	<1.6	3.1	0.4	0.2
312 N 33rd St_Crawlspace	02/28/18	20180228-312N33ST-02	0.43	<0.088	<0.065	<0.065	<0.042	0.27	<1.6	2	0.46	0.18
312 N 33rd St_Subslab	03/01/18	20180301-312N33ST-01	663	1.8	<0.066	<0.066	<0.043	<0.037	<1.6	0.24	0.32	40.6

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**312 N 33RD STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
312 N 33rd St_Main	02/28/18	20180228-312N33ST-03	<0.066	0.6	<1.4	<4.2	<0.11	<3.4	<1.3	<0.13	<2	<0.076
312 N 33rd St_Basement	02/28/18	20180228-312N33ST-01	<0.066	0.83	<1.4	<4.2	<0.11	<3.4	<1.3	<0.13	<2	<0.076
312 N 33rd St_Crawlspace	02/28/18	20180228-312N33ST-02	<0.066	0.15	<1.4	<4.2	<0.11	<3.4	<1.3	<0.13	<2	<0.076
312 N 33rd St_Subslab	03/01/18	20180301-312N33ST-01	0.12	<0.067	<1.4	<4.3	0.37	<3.4	<1.3	<0.13	<2	<0.077

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**312 N 33RD STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
312 N 33rd St_Main	02/28/18	20180228-312N33ST-03	<3.5	<6.7	<4.3	<0.11	<6.1	<0.089	18.7	<4.8	<1.5	<0.68
312 N 33rd St_Basement	02/28/18	20180228-312N33ST-01	<3.5	<6.7	<4.3	<0.11	<6.1	<0.089	12.4	<4.8	<1.5	<0.68
312 N 33rd St_Crawlspace	02/28/18	20180228-312N33ST-02	<3.5	<6.7	<4.3	<0.11	<6.1	<0.089	8.4	<4.8	<1.5	<0.68
312 N 33rd St_Subslab	03/01/18	20180301-312N33ST-01	<3.6	<6.8	<4.4	<0.11	<6.2	<0.091	19.4	<4.9	<1.5	<0.69

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**312 N 33RD STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
312 N 33rd St_Main	02/28/18	20180228-312N33ST-03	703 J	<1.6	2.5	9.3	<0.97	<1.8	<1.6	1.6	2.9	<1.4
312 N 33rd St_Basement	02/28/18	20180228-312N33ST-01	44.8	<1.6	3.1	<4	<0.97	<1.8	<1.6	<1.2	<2.8	<1.4
312 N 33rd St_Crawlspace	02/28/18	20180228-312N33ST-02	27.3	<1.6	2.1	<4	<0.97	<1.8	<1.6	<1.2	<2.8	<1.4
312 N 33rd St_Subslab	03/01/18	20180301-312N33ST-01	3.4	<1.6	<1.2	<4.1	<0.98	<1.9	<1.6	1.2	<2.9	<1.4

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**312 N 33RD STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
312 N 33rd St_Main	02/28/18	20180228-312N33ST-03	2.3	<0.065	<5.7	<5.9	4.3	3	2.4	1.4	<1	<0.86
312 N 33rd St_Basement	02/28/18	20180228-312N33ST-01	2.2	<0.065	<5.7	<5.9	4.4	11.3	3.1	<1.3	<1	<0.86
312 N 33rd St_Crawlspace	02/28/18	20180228-312N33ST-02	2.4	<0.065	<5.7	<5.9	4.5	1.2	2.4	<1.3	<1	<0.86
312 N 33rd St_Subslab	03/01/18	20180301-312N33ST-01	2.5	<0.066	<5.8	<6	<1.3	5.4	<1.1	<1.4	<1	<0.88

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**312 N 33RD STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
312 N 33rd St_Main	02/28/18	20180228-312N33ST-03	<2.8	<2.3	<2	<2	<0.074	<0.074	2.5	<6.7	<0.56	<1.4
312 N 33rd St_Basement	02/28/18	20180228-312N33ST-01	<2.8	<2.3	<2	<2	<0.074	<0.074	<1.2	<6.7	<0.56	<1.4
312 N 33rd St_Crawlspace	02/28/18	20180228-312N33ST-02	<2.8	<2.3	<2	<2	<0.074	<0.074	<1.2	<6.7	<0.56	<1.4
312 N 33rd St_Subslab	03/01/18	20180301-312N33ST-01	<2.8	<2.3	<2	<2	<0.076	<0.076	<1.2	<6.8	<0.57	<1.4

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**312 N 33RD STREET VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloroethane (ug/m3)	Methane (ppmv)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
312 N 33rd St_Main	02/28/18	20180228-312N33ST-03	<2.5	--	--	--	--
312 N 33rd St_Basement	02/28/18	20180228-312N33ST-01	<2.5	--	--	--	--
312 N 33rd St_Crawlspace	02/28/18	20180228-312N33ST-02	<2.5	--	--	--	--
312 N 33rd St_Subslab	03/01/18	20180301-312N33ST-01	<2.6	<16.4	18.6	<3.3	<5.9

Applicable Residential Screening Levels	520	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	NA	NA	NA	NA

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**317 TERRY AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
317 Terry Ave_Main	02/05/18	20180205-317TERRY-01	0.46	0.49 J	<0.062	<0.062	<0.04	0.15	<1.5	0.89	0.35	1.5
317 Terry Ave_Basement	02/05/18	20180205-317TERRY-02	0.48	0.17 J	<0.06	<0.06	<0.039	0.13	<1.5	0.87	0.54	1.6
317 Terry Ave_Crawlspace	02/05/18	20180205-317TERRY-03	0.48	0.21 J	<0.093	<0.093	<0.06	<0.052	<1.4	0.96	0.59	1.7
317 Terry Ave_Subslab	02/06/18	20180206-317TERRY-01	6.3	0.3	<0.084	<0.084	<0.054	<0.047	<1.6	0.3	0.66	0.39

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**317 TERRY AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
317 Terry Ave_Main	02/05/18	20180205-317TERRY-01	<0.064	0.09	<1.4	<1.6	0.45	<3.3	<1.2	<0.12	<1.9	<0.073
317 Terry Ave_Basement	02/05/18	20180205-317TERRY-02	<0.061	0.089	<1.3	<1.6	0.39	<3.1	<1.2	<0.12	<1.8	<0.07
317 Terry Ave_Crawlspace	02/05/18	20180205-317TERRY-03	<0.095	0.12	<1.2	<1.5	0.42	<3	<1.1	<0.18	<1.7	<0.11
317 Terry Ave_Subslab	02/06/18	20180206-317TERRY-01	<0.086	<0.086	<1.4	<1.7	<0.14	<3.4	<1.3	<0.16	<2	<0.098

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**317 TERRY AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
317 Terry Ave_Main	02/05/18	20180205-317TERRY-01	<3.4	<6.4	<4.1	<0.11	<5.8	<0.086	16.7	4.7	<1.5	0.79
317 Terry Ave_Basement	02/05/18	20180205-317TERRY-02	<3.2	<6.2	<4	<0.1	<5.6	<0.083	14.1	<4.5	<1.4	1
317 Terry Ave_Crawlspace	02/05/18	20180205-317TERRY-03	<3.1	<5.9	<3.8	<0.16	<5.3	<0.13	17.9	4.4	<1.3	1
317 Terry Ave_Subslab	02/06/18	20180206-317TERRY-01	<3.5	<6.7 UJ	<4.3	<0.15	<6.1	<0.12	9.9	<4.8	20.4	<0.68

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**317 TERRY AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
317 Terry Ave_Main	02/05/18	20180205-317TERRY-01	1090 J	<1.5	1.9	7.6	2.5	<1.8	<1.5	<1.1	<2.7	<1.4
317 Terry Ave_Basement	02/05/18	20180205-317TERRY-02	680 J	<1.5	2	6.4	3	<1.7	<1.5	<1.1	<2.6	<1.3
317 Terry Ave_Crawlspace	02/05/18	20180205-317TERRY-03	775 J	<1.4	2.6	12.2	3	<1.6	<1.4	<1	<2.5	<1.2
317 Terry Ave_Subslab	02/06/18	20180206-317TERRY-01	5.5 J	<1.6	<1.2	<4	<0.97	<1.8	<1.6	<1.2	<2.8	<1.4

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**317 TERRY AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
317 Terry Ave_Main	02/05/18	20180205-317TERRY-01	1.8	<0.062	<5.5	<5.7	2.5	<0.086	<1.1	<1.3	<0.98	<0.83
317 Terry Ave_Basement	02/05/18	20180205-317TERRY-02	1.9	<0.06	<5.3	<5.5	2.6	<0.083	<1	1.4	<0.94	<0.8
317 Terry Ave_Crawlspace	02/05/18	20180205-317TERRY-03	2	<0.093	<5	<5.2	3.1	<0.13	<0.99	1.3	<0.89	<0.76
317 Terry Ave_Subslab	02/06/18	20180206-317TERRY-01	2.1	<0.084	<5.7	<5.9	2	<0.12	<1.1	<1.3	<1	<0.86

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**317 TERRY AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo-chloromethane (ug/m3)	1,2-Dichloro-1,1,2,2-tetrafluoroethane (ug/m3)	1,2-Di-chloro-benzene (ug/m3)	1,3-Di-chloro-benzene (ug/m3)	Cis-1,3-dichloro-propene (ug/m3)	trans-1,3-Dichloro-propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl-2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
317 Terry Ave_Main	02/05/18	20180205-317TERRY-01	<2.7	<2.2	<1.9	<1.9	<0.071	<0.071	4.3	<6.4	<0.54	<1.3
317 Terry Ave_Basement	02/05/18	20180205-317TERRY-02	<2.6	<2.1	<1.8	<1.8	<0.069	<0.069	2.6	<6.2	<0.52	<1.3
317 Terry Ave_Crawlspace	02/05/18	20180205-317TERRY-03	<2.4	<2	<1.7	<1.7	<0.11	<0.11	3.1	<5.9	<0.49	<1.2
317 Terry Ave_Subslab	02/06/18	20180206-317TERRY-01	<2.8	<2.3	<2	<2	<0.096	<0.096	<1.2	<6.7	<0.56	<1.4

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**317 TERRY AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloroethane (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
317 Terry Ave_Main	02/05/18	20180205-317TERRY-01	<2.4	--	--	--	--	--
317 Terry Ave_Basement	02/05/18	20180205-317TERRY-02	<2.3	--	--	--	--	--
317 Terry Ave_Crawlspace	02/05/18	20180205-317TERRY-03	<2.2	--	--	--	--	--
317 Terry Ave_Subslab	02/06/18	20180206-317TERRY-01	<2.5	273	80.5	19.7	<2	<3.6

Applicable Residential Screening Levels	520	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	NA	NA	NA	NA	NA	NA

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**317 TERRY AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)
BPIA153_317 TERRY AVE	04/11/10	37	5.6	<0.82	<4.1	<0.26	--	4.1	<0.83	<0.83	--
BPIA153_317 TERRY AVE	03/17/11	2.6	1.6	<0.28	<1.4	<0.092	0.79	6.8	<0.29	<0.29	1.6
BPSS153_317 TERRY AVE	04/11/10	47758.3	--	--	--	--	--	<244	--	<202.5	--
BPSS153_317 TERRY AVE	03/17/11	460	69	5.3	<3.3	<2.1	<2.7	4.4	<3.4	<3.4	<3.6

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**317 TERRY AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloro-ethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)
BPIA153_317 TERRY AVE	04/11/10	<1.1	--	--	<0.41	<7.2	<3.7	--	<1.1
BPIA153_317 TERRY AVE	03/17/11	<0.39	6.1	1.1	<0.14	<2.5	<1.3	8.4	<0.39
BPSS153_317 TERRY AVE	04/11/10	--	--	--	--	--	--	--	--
BPSS153_317 TERRY AVE	03/17/11	<4.6	4.6	<3.6	<3.3	<2.9	<3	4.2	<4.6

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**319 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
319 Custer Ave_Main	02/09/18	20180209-319CUSTER-02	0.54	<0.088	<0.065	<0.065	<0.042	<0.036	<1.6	1.2	0.49	0.54
319 Custer Ave_Basement/Crawlspace	02/09/18	20180209-319CUSTER-01	0.32	<0.079	<0.058	<0.058	<0.037	0.33	<1.4	1.2	0.34	0.29
319 Custer Ave_Subslab	02/10/18	20180210-319CUSTER-01	271	3.7	<1.2	<1.2	<0.39	<0.67	<1.5	<0.48	<0.95 UJ	83.6

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**319 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethylbenzene (ug/m3)	Benzylchloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Dichloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
319 Custer Ave_Main	02/09/18	20180209-319CUSTER-02	<0.066	0.11	<1.4	<1.7	0.14	<3.4	<1.3	<0.13	<2	<0.076
319 Custer Ave_Basement/Crawlspace	02/09/18	20180209-319CUSTER-01	<0.059	0.1	<1.3	<1.5	<0.098	<3	<1.1	<0.11	15.4	<0.068
319 Custer Ave_Subslab	02/10/18	20180210-319CUSTER-01	<1.2	<0.61	<1.3	<1.6	3.7	<3.1 UJ	<1.2	<2.3	<1.8	<1.4

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**319 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro-butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2-Tetrachloro-ethane (ug/m3)	1,2,4-Trichloro-benzene (ug/m3)	1,1,2-Trichloro-ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
319 Custer Ave_Main	02/09/18	20180209-319CUSTER-02	<3.5	<6.7	<4.3 UJ	<0.11	<6.1 UJ	<0.089	90.5	21.3	<1.5	1.2
319 Custer Ave_Basement/Crawlspace	02/09/18	20180209-319CUSTER-01	<3.1	<6	<3.8 UJ	<0.1	<5.4 UJ	<0.08	64.1	16.3	1.5	1.1
319 Custer Ave_Subslab	02/10/18	20180210-319CUSTER-01	<3.2	<6.2	<4	<1	<5.6	<0.83	62.3	10	<1.4	<0.63

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**319 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
319 Custer Ave_Main	02/09/18	20180209-319CUSTER-02	670 J	<1.6	1.6	51.9	103	3.2	<1.6	<1.2	<2.8	<1.4
319 Custer Ave_Basement/Crawlspace	02/09/18	20180209-319CUSTER-01	273 J	<1.4	1.7	30.8	71.2	3.6	<1.4	1.4	<2.5	<1.3
319 Custer Ave_Subslab	02/10/18	20180210-319CUSTER-01	27 J	<1.5	1.9	<3.7	7	<1.7	<1.5	<1.1	<2.6	<1.3

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**319 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
319 Custer Ave_Main	02/09/18	20180209-319CUSTER-02	2.3	<0.065	<5.7	<5.9	3.5	<0.089	1.5	<1.3	<1	<0.86
319 Custer Ave_Basement/Crawlspace	02/09/18	20180209-319CUSTER-01	2.4	<0.058	<5.1	<5.3	3.5	<0.08	1.6	1.3	<0.91	<0.77
319 Custer Ave_Subslab	02/10/18	20180210-319CUSTER-01	1.7	<1.2	<5.3	<5.5	3.5	<1.7	1.1	<1.2	<0.94	<0.8

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**319 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo-chloromethane (ug/m3)	1,2-Dichloro-1,1,2,2-tetrafluoroethane (ug/m3)	1,2-Dichlorobenzene (ug/m3)	1,3-Dichlorobenzene (ug/m3)	Cis-1,3-dichloropropene (ug/m3)	trans-1,3-Dichloropropene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl-2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
319 Custer Ave_Main	02/09/18	20180209-319CUSTER-02	<2.8	<2.3	<2	<2	<0.074	<0.074	4.4	<6.7	<0.56	<1.4
319 Custer Ave_Basement/Crawlspace	02/09/18	20180209-319CUSTER-01	<2.5	<2	9.1	<1.8	<0.066	<0.066	1.7	<6	<0.5	<1.2
319 Custer Ave_Subslab	02/10/18	20180210-319CUSTER-01	<2.6	<2.1	<1.8	<1.8	<1.4	<1.4	<1.1	<6.2	<0.52	<1.3

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**319 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
319 Custer Ave_Main	02/09/18	20180209-319CUSTER-02	<2.5	78.5	<19.3	44.9	--	--	--	--	--
319 Custer Ave_Basement/Crawlspace	02/09/18	20180209-319CUSTER-01	<2.2	33.7	<17.3	21.8	--	--	--	--	--
319 Custer Ave_Subslab	02/10/18	20180210-319CUSTER-01	<2.3	238	<17.9	<20.9	30.8 J	79.8	18.6	<2	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**319 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethylbenzene (ug/m3)
BPIA96_319 CUSTER AVE	03/05/08	0.44	<1.8	<1.8	<1.8	<1.8	1.6	3.6	<1.8	<1.8	0.9
BPCS96_319 CUSTER AVE	03/05/08	0.59	<1.6	<1.6	<1.6	<1.6	2.1	2.1	<1.6	<1.6	0.66

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**319 CUSTER AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloroethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloroethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloroethane (ug/m3)
BPIA96_319 CUSTER AVE	03/05/08	<1.8	2.6	0.89	<1.8	0.5	<1.8	6.2	<1.8
BPCS96_319 CUSTER AVE	03/05/08	<1.6	2.3	0.75	<1.6	0.59	<1.6	4.8	<1.6

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit
DUP - Field duplicate sample
NA - Not applicable
J+ - Estimated concentration, possibly biased high
UJ - Estimated reporting limit
R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**323 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
323 Miles Ave_Main	02/27/18	20180227-323MILES-02	9.2	0.41	<0.068	<0.068	0.069	0.38	<1.7	1.8	0.52	0.49
323 Miles Ave_Crawlspace	02/27/18	20180227-323MILES-01	11.6	0.51	<0.084	<0.084	<0.054	0.34	<1.5	2.5 J	0.25 J	0.31
323 Miles Ave_Crawlspace	02/27/18	20180227-A	12.1	0.51	<0.062	<0.062	<0.04	0.4	<1.5	1.9 J	0.33 J	0.29

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**323 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
323 Miles Ave_Main	02/27/18	20180227-323MILES-02	<0.069	0.46	<1.5	<4.4	<0.11	<3.5	<1.3	<0.13	<2	<0.079
323 Miles Ave_Crawlspace	02/27/18	20180227-323MILES-01	<0.085	0.19	<1.4	<1.6 UJ	<0.14	<3.3	<1.2	<0.16	<1.9	<0.098
323 Miles Ave_Crawlspace	02/27/18	20180227-A	<0.064	0.17	<1.4	<4.1	<0.11	<3.3	<1.2	<0.12	<1.9	<0.073

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**323 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
323 Miles Ave_Main	02/27/18	20180227-323MILES-02	<3.6	<7	4.9	<0.12	<6.3	<0.093	30.8	<5	<1.6	1.6
323 Miles Ave_Crawlspace	02/27/18	20180227-323MILES-01	<3.4	<6.4	<4.1	<0.15	<5.8	<0.12	23.9 J	<4.6	<1.5	1.8 J
323 Miles Ave_Crawlspace	02/27/18	20180227-A	<3.4	<6.4	4.4	<0.11	<5.8	<0.086	15.6 J	<4.6	<1.5	0.93 J

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**323 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
323 Miles Ave_Main	02/27/18	20180227-323MILES-02	267	<1.7	1.9	25.3	<1	<1.9	<1.7	1.9	4.1	1.5
323 Miles Ave_Crawlspace	02/27/18	20180227-323MILES-01	118 J	<1.5	3.5 J	11.6 J	<0.93	2.1	<1.5	<1.1	3.9	1.5
323 Miles Ave_Crawlspace	02/27/18	20180227-A	60.3 J	<1.5	2.1 J	8.3 J	<0.93	<1.8	<1.5	1.2	3.7	<1.4

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**323 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
323 Miles Ave_Main	02/27/18	20180227-323MILES-02	2.2	<0.068	<5.9	<6.1	10.4	<0.093	<1.2	1.7	<1.1	<0.9
323 Miles Ave_Crawlspace	02/27/18	20180227-323MILES-01	3.5 J	<0.084	6.9	<5.7	8.7	<0.12	4.9 J	1.8	<0.98	<0.83
323 Miles Ave_Crawlspace	02/27/18	20180227-A	2.2 J	<0.062	<5.5	<5.7	6.9	0.088	<1.1 UJ	<1.3	<0.98	<0.83

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**323 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo-chloromethane (ug/m3)	1,2-Dichloro-1,1,2,2-tetrafluoroethane (ug/m3)	1,2-Di-chloro-benzene (ug/m3)	1,3-Di-chloro-benzene (ug/m3)	Cis-1,3-dichloro-propene (ug/m3)	trans-1,3-Dichloro-propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl-2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
323 Miles Ave_Main	02/27/18	20180227-323MILES-02	<2.9	<2.4	<2	<2	<0.077	<0.077	<1.2	<7	<0.59	<1.5
323 Miles Ave_Crawlspace	02/27/18	20180227-323MILES-01	<2.7	<2.2	<1.9	<1.9	<0.096	<0.096	<1.1	<6.4	<0.54	<1.3
323 Miles Ave_Crawlspace	02/27/18	20180227-A	<2.7	<2.2	<1.9	<1.9	<0.071	<0.071	<1.1	<6.4	<0.54	<1.3

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**323 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichlorotrifluoroethane (ug/m3)
323 Miles Ave_Main	02/27/18	20180227-323MILES-02	<2.6
323 Miles Ave_Crawlspace	02/27/18	20180227-323MILES-01	<2.4
323 Miles Ave_Crawlspace	02/27/18	20180227-A	<2.4

Applicable Residential Screening Levels	520
Applicable Industrial Screening Levels	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**323 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)
BPIA97_323 MILES AVE	03/04/08	23	0.58	<2	<2	<2	1.5	0.53	<2	<2	0.91
BPCS97_323 MILES AVE	03/04/08	38	0.98	<1.8	<1.8	<1.8	1.3	<1.8	<1.8	<1.8	0.52

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**323 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloro-ethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)
BPIA97_323 MILES AVE	03/04/08	<2	3.2	0.95	<2	0.46	<2	4.3	0.37
BPCS97_323 MILES AVE	03/04/08	<1.8	2.1	0.67	<1.8	0.33	<1.8	2.8	0.46

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**342 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
342 Miles Ave_Main	03/01/18	20180301-342MILES-01	13.5	1.8	<1.4	<1.4	<0.44	<0.77	1.9	9	<1.1	2.7
342 Miles Ave_Basement	03/01/18	20180301-342MILES-02	17.1	2.4	<1.2	<1.2	<0.4	<0.7	<1.5	5.2	<0.99	1.5
342 Miles Ave_Basement	03/01/18	20180301-A	17.9	2.3	<1.4	<1.4	<0.44	<0.76	<1.7	4.7	<1.1	1.6
342 Miles Ave_Furnace Room	03/01/18	20180301-342MILES-03	17.7	2.4	<1.4	<1.4	<0.44	<0.76	<1.7	4.6	<1.1	1.6
342 Miles Ave_Subslab	03/02/18	20180302-342MILES-01	143000	18700	238	12.8	<0.47	<0.81	5.2 J+	3.5	<1.1	40.7

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**342 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
342 Miles Ave_Main	03/01/18	20180301-342MILES-01	<1.4	<0.7	3.3	<1.8	<2.3	<3.6	<1.3	<2.7	<2.1	<1.6
342 Miles Ave_Basement	03/01/18	20180301-342MILES-02	<1.3	<0.64	2.4	<1.6	<2.1	<3.3	<1.2	<2.4	<1.9	<1.5
342 Miles Ave_Basement	03/01/18	20180301-A	<1.4	<0.69	2.6	<1.8	<2.3	<3.5	<1.3	<2.6	<2	<1.6
342 Miles Ave_Furnace Room	03/01/18	20180301-342MILES-03	<1.4	<0.69	2.6	<1.8	<2.3	<3.5	<1.3	<2.6	<2	<1.6
342 Miles Ave_Subslab	03/02/18	20180302-342MILES-01	28	<0.74	2.5 J+	<1.9 R	<2.4	<3.8 R	<1.4	<2.8 R	<2.2 R	<1.7

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**342 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
342 Miles Ave_Main	03/01/18	20180301-342MILES-01	<3.7	<7.1	<4.5	<1.2	<6.4	<0.95	80.7	10.3	<1.6	12
342 Miles Ave_Basement	03/01/18	20180301-342MILES-02	<3.4	<6.4	<4.1	<1.1	<5.8	<0.86	53.4 J	9.3 J	<1.5	5.4
342 Miles Ave_Basement	03/01/18	20180301-A	<3.6	<7	<4.5	<1.2	<6.3	<0.93	114 J	6.6 J	<1.6	4.5
342 Miles Ave_Furnace Room	03/01/18	20180301-342MILES-03	<3.6	<7	<4.5	<1.2	<6.3	<0.93	45.4	6.6	<1.6	4.8
342 Miles Ave_Subslab	03/02/18	20180302-342MILES-01	<3.9 R	<7.4 R	<4.8	<1.2 R	<6.7 R	<0.99	384	49.4	<1.7 R	<0.75

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**342 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
342 Miles Ave_Main	03/01/18	20180301-342MILES-01	898 J	<1.7	2.2	228	<1	<1.9	<1.7	<1.2	9.1	<1.5
342 Miles Ave_Basement	03/01/18	20180301-342MILES-02	818 J	<1.5	1.5	185	<0.93	<1.8	<1.5	<1.1	6.6	<1.4
342 Miles Ave_Basement	03/01/18	20180301-A	1110 J	<1.7	1.9	223	<1	<1.9	<1.7	<1.2	7.1	<1.5
342 Miles Ave_Furnace Room	03/01/18	20180301-342MILES-03	1070 J	<1.7	1.3	222	<1	<1.9	<1.7	<1.2	7.1	<1.5
342 Miles Ave_Subslab	03/02/18	20180302-342MILES-01	119	<1.8 R	2.6	25.8	2.1	<2	<1.8 R	<1.3	7.2 J+	2.3 J+

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**342 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
342 Miles Ave_Main	03/01/18	20180301-342MILES-01	2.6	<1.4	<6	<6.3	24.4	<1.9	<1.2	50	<1.1	<0.92
342 Miles Ave_Basement	03/01/18	20180301-342MILES-02	2.5	<1.2	<5.5	<5.7	19.2	<1.7	<1.1 UJ	20.1 J	<0.98	<0.83
342 Miles Ave_Basement	03/01/18	20180301-A	2.2	<1.4	<5.9	<6.1	21.9	<1.9	3.5 J	14.7 J	<1.1	<0.9
342 Miles Ave_Furnace Room	03/01/18	20180301-342MILES-03	2.5	<1.4	<5.9	<6.1	21.2	<1.9	<1.2	14.5	<1.1	<0.9
342 Miles Ave_Subslab	03/02/18	20180302-342MILES-01	2.4	<1.4	<6.3	<6.6	14.1	154	<1.3	<1.5	<1.1	<0.96

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**342 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo-chloromethane (ug/m3)	1,2-Dichloro-1,1,2,2-tetrafluoroethane (ug/m3)	1,2-Dichlorobenzene (ug/m3)	1,3-Dichlorobenzene (ug/m3)	Cis-1,3-dichloropropene (ug/m3)	trans-1,3-Dichloropropene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl-2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
342 Miles Ave_Main	03/01/18	20180301-342MILES-01	<3	<2.4	<2.1	<2.1	<1.6	<1.6	4	<7.1	41.7	2.5
342 Miles Ave_Basement	03/01/18	20180301-342MILES-02	<2.7	<2.2	<1.9	<1.9	<1.4	<1.4	3.7	<6.4	<0.54	<1.3
342 Miles Ave_Basement	03/01/18	20180301-A	<2.9	<2.4	<2	<2	<1.6	<1.6	4.7	<7	<0.59	<1.5
342 Miles Ave_Furnace Room	03/01/18	20180301-342MILES-03	<2.9	<2.4	<2	<2	<1.6	<1.6	4.2	<7	<0.59	<1.5
342 Miles Ave_Subslab	03/02/18	20180302-342MILES-01	<3.1 R	<2.5	<2.2 R	<2.2 R	<1.7	<1.7	<1.3	17.5	<0.63	<1.6 R

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**342 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloroethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
342 Miles Ave_Main	03/01/18	20180301-342MILES-01	<2.7	906	<20.5	<23.9	--	--	--	--	--
342 Miles Ave_Basement	03/01/18	20180301-342MILES-02	<2.4	366 J	<18.6	<21.7	--	--	--	--	--
342 Miles Ave_Basement	03/01/18	20180301-A	<2.6	267 J	<20.2	<23.5	--	--	--	--	--
342 Miles Ave_Furnace Room	03/01/18	20180301-342MILES-03	<2.6	243	<20.2	<23.5	--	--	--	--	--
342 Miles Ave_Subslab	03/02/18	20180302-342MILES-01	<2.8	5160 J+	<21.5 R	180 J+	135	78.1	17.9	4.1	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA	NA

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**342 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethylbenzene (ug/m3)
BPIA22_342 MILES AVE	02/02/07	100	8.7	0.21	0.011	0.01	1.2	0.63	0.025	1.4	0.4
BPIA22_342 MILES AVE	06/06/07	6.5	0.47	0.087	<0.05	<0.05	<0.2	<0.2	0.033	0.07	0.48
BPIA22_342 MILES AVE	03/05/08	0.57	<1.5	<1.5	<1.5	<1.5	1.4	0.6	<1.5	0.67	0.52
BPSS22_342 MILES AVE	09/22/06	120000	9500	<310	<310	<200	<250	<230	<310	<310	<340
BPSS22_342 MILES AVE	02/01/07	--	--	--	--	--	<1600	--	--	--	<1600
BPSS22_342 MILES AVE	02/21/07	110000	8000	420	<390	<390	--	<1600	<390	<390	--
BPSS22_342 MILES AVE	03/05/08	510	54	2.7	<1.6	<1.6	1.6	2	<1.6	0.25	0.97

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**342 MILES AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloro-ethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)
BPIA22_342 MILES AVE	02/02/07	<0.043	1.6	0.52	0.099	0.2	0.013	2.5	0.2
BPIA22_342 MILES AVE	06/06/07	0.021	1.9	0.67	0.031	0.28	0.0094	2.7	0.045
BPIA22_342 MILES AVE	03/05/08	<1.5	1.7	0.55	<1.5	0.41	<1.5	3.7	<1.5
BPSS22_342 MILES AVE	09/22/06	<420	<340	<340	<310	<270	<280	<290	<420
BPSS22_342 MILES AVE	02/01/07	--	<1600	<1600	--	--	--	<1600	--
BPSS22_342 MILES AVE	02/21/07	<390	--	--	<390	<1600	<390	--	200
BPSS22_342 MILES AVE	03/05/08	<1.6	3.9	1.2	<1.6	0.5	<1.6	2.3	<1.6

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**408 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
408 Howard Ave_Main	03/03/18	20180303-408HOWARD-02	1.4	<0.88	<1.3	<1.3	<0.42	<0.72	<1.6	0.53	<1	<0.8
408 Howard Ave_Main	03/03/18	20180303-A	<1.4	<1.1	<1.6	<1.6	<0.53	<0.91	<2	<0.66	<1.3	<1
408 Howard Ave_Basement	03/03/18	20180303-408HOWARD-01	6.5	2.4	0.11	<0.062	<0.04	<0.035	<1.5	0.61	0.51	0.25
408 Howard Ave_Subslab	03/04/18	20180304-408HOWARD-01	21400	8930	213	<176	<56.7	<98.2	<218	<70.9	<139	<108

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**408 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
408 Howard Ave_Main	03/03/18	20180303-408HOWARD-02	<1.3	<0.66	<1.4	<1.7	<2.2	<3.4	<1.3	<2.5	<2	<1.5
408 Howard Ave_Main	03/03/18	20180303-A	<1.7	<0.83	<1.8	<2.1	<2.8	<4.3	<1.6	<3.2	<2.5	<1.9
408 Howard Ave_Basement	03/03/18	20180303-408HOWARD-01	<0.064	0.2	<1.4	<1.6	<0.11	<3.3	<1.2	<0.12	<1.9	<0.073
408 Howard Ave_Subslab	03/04/18	20180304-408HOWARD-01	<180	<89.7	<193	<229	<297	<458	<172	<340	<266	<205

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**408 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
408 Howard Ave_Main	03/03/18	20180303-408HOWARD-02	<3.5	<6.7	<4.3	<1.1	<6.1	<0.89	38.3 J	<4.8	<1.5	1.3
408 Howard Ave_Main	03/03/18	20180303-A	<4.4	<8.4	<5.4	<1.4	<7.7	<1.1	21.4 J	<6.1	<1.9	0.99
408 Howard Ave_Basement	03/03/18	20180303-408HOWARD-01	<3.4	<6.4	<4.1	<0.11	<5.8	<0.086	13.9	<4.6	<1.5	1.1
408 Howard Ave_Subslab	03/04/18	20180304-408HOWARD-01	<473	<907	<580	<152	<822	<121	<526	<654	<204	<91.6

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**408 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
408 Howard Ave_Main	03/03/18	20180303-408HOWARD-02	901 J	<1.6	<1.2	5.1	<0.97	<1.8	<1.6	<1.2	<2.8	<1.4
408 Howard Ave_Main	03/03/18	20180303-A	518 J	<2	<1.5	<5.1	<1.2	<2.3	<2	<1.5	<3.6	<1.8
408 Howard Ave_Basement	03/03/18	20180303-408HOWARD-01	90.9	<1.5	<1.1	<3.9	<0.93	<1.8	<1.5	<1.1	<2.7	<1.4
408 Howard Ave_Subslab	03/04/18	20180304-408HOWARD-01	230	<218	<156	<545	<131	<249	<218	<156	<386	<193

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**408 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
408 Howard Ave_Main	03/03/18	20180303-408HOWARD-02	2.5	<1.3	<5.7	<5.9	2.8 J	<1.8	<1.1	<1.3	<1	<0.86
408 Howard Ave_Main	03/03/18	20180303-A	2.4	<1.6	<7.2	<7.4	2.1 J	<2.3	<1.4	<1.7	<1.3	<1.1
408 Howard Ave_Basement	03/03/18	20180303-408HOWARD-01	2.3	<0.062	<5.5	<5.7	6.4	<0.086	<1.1	<1.3	<0.98	<0.83
408 Howard Ave_Subslab	03/04/18	20180304-408HOWARD-01	<220	<176	<770	<798	<167	<242	<153	<182	<138	<117

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**408 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
408 Howard Ave_Main	03/03/18	20180303-408HOWARD-02	<2.8	<2.3	<2	<2	<1.5	<1.5	2.1	<6.7	<0.56	<1.4
408 Howard Ave_Main	03/03/18	20180303-A	<3.5	<2.9	<2.5	<2.5	<1.9	<1.9	<1.5	<8.4	<0.71	<1.8
408 Howard Ave_Basement	03/03/18	20180303-408HOWARD-01	<2.7	<2.2	<1.9	<1.9	<0.071	<0.071	<1.1	<6.4	<0.54	<1.3
408 Howard Ave_Subslab	03/04/18	20180304-408HOWARD-01	<377	<310	<266	<266	<201	<201	<160	<907	<76.3	<189

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**408 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloroethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
408 Howard Ave_Main	03/03/18	20180303-408HOWARD-02	<2.5	<19.3	<19.3	<22.5	--	--	--	--	--
408 Howard Ave_Main	03/03/18	20180303-A	<3.2	<19.3	<19.3	<22.5	--	--	--	--	--
408 Howard Ave_Basement	03/03/18	20180303-408HOWARD-01	<2.4	<18.6	<18.6	<21.7	--	--	--	--	--
408 Howard Ave_Subslab	03/04/18	20180304-408HOWARD-01	<340	3040 J+	<17.9 R	<20.9 R	<14.9	76.9	19.8	<2	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA	NA

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**408 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	1,1,2-Trichloro-ethane (ug/m3)	1,1-Dichloro-ethene (ug/m3)
BPIA154_408 HOWARD AVE	04/11/10	4	2.4	<0.43	<2.2	<0.14	3	<0.44	0.7	<0.6	<0.22
BPSS154_408 HOWARD AVE	04/11/10	20292.5	--	--	--	--	<244	--	<202.5	--	--

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.12	1.8	0.23	0.021	21
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.53	7.7	0.47	0.088	88

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit
 DUP - Field duplicate sample
 NA - Not applicable
 J+ - Estimated concentration, possibly biased high
 UJ - Estimated reporting limit
 R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**408 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Methylene Chloride (ug/m3)	MTBE (ug/m3)	1,1,1-Trichloroethane (ug/m3)
BPIA154_408 HOWARD AVE	04/11/10	5.5	<2	<0.6
BPSS154_408 HOWARD AVE	04/11/10	--	--	--

Applicable Residential Screening Levels	63	11	520
Applicable Industrial Screening Levels	260	47	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**425 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
425 Howard Ave_Main	03/01/18	20180301-425HOWARD-02	1.9	0.5	0.077	<0.065	<0.042	<0.036	<1.6	1.6	0.44	0.46
425 Howard Ave_Crawlspace	03/01/18	20180301-425HOWARD-01	1.5	0.38	0.067	<0.062	<0.04	<0.035	<1.5	1.5	0.46	0.23

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**425 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
425 Howard Ave_Main	03/01/18	20180301-425HOWARD-02	<0.066	0.18	<1.4	<4.2	0.14	<3.4	<1.3	<0.13	<2	<0.076
425 Howard Ave_Crawlspace	03/01/18	20180301-425HOWARD-01	<0.064	0.11	<1.4	<4.1	<0.11	<3.3	<1.2	<0.12	<1.9	<0.073

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**425 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
425 Howard Ave_Main	03/01/18	20180301-425HOWARD-02	<3.5	<6.7	<4.3	<0.11	<6.1	<0.089	38.2	<4.8	<1.5	<0.68
425 Howard Ave_Crawlspace	03/01/18	20180301-425HOWARD-01	<3.4	<6.4	<4.1	<0.11	<5.8	<0.086	20.7	<4.6	<1.5	<0.65

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**425 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
425 Howard Ave_Main	03/01/18	20180301-425HOWARD-02	1090 J	<1.6	5.6	<4	<0.97	<1.8	<1.6	2.8	4.7	<1.4
425 Howard Ave_Crawlspace	03/01/18	20180301-425HOWARD-01	402	<1.5	6.4	6.1	<0.93	<1.8	<1.5	<1.1	2.9	<1.4

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**425 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
425 Howard Ave_Main	03/01/18	20180301-425HOWARD-02	2.4	0.14	<5.7	<5.9	15	0.15	2.7	1.8	<1	<0.86
425 Howard Ave_Crawlspace	03/01/18	20180301-425HOWARD-01	2.4	0.066	<5.5	<5.7	18	0.19	<1.1	1.5	<0.98	<0.83

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**425 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
425 Howard Ave_Main	03/01/18	20180301-425HOWARD-02	<2.8	<2.3	<2	<2	<0.074	<0.074	2	<6.7	<0.56	<1.4
425 Howard Ave_Crawlspace	03/01/18	20180301-425HOWARD-01	<2.7	<2.2	<1.9	<1.9	<0.071	<0.071	<1.1	<6.4	<0.54	<1.3

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**425 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichlorotrifluoroethane (ug/m3)
425 Howard Ave_Main	03/01/18	20180301-425HOWARD-02	<2.5
425 Howard Ave_Crawlspace	03/01/18	20180301-425HOWARD-01	<2.4

Applicable Residential Screening Levels	520
Applicable Industrial Screening Levels	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**425 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)
BPIA12_425 HOWARD AVE	02/02/07	4.4	1.3	0.0062	<0.041	0.011	0.96	0.25	0.041	0.082	0.37
BPCS12_425 HOWARD AVE	09/19/06	44	12	<0.41	<2	<0.13	1.1	<0.5	<0.42	<0.42	<0.45
BPCS12_425 HOWARD AVE	02/02/07	6.9	2	0.0088	<0.039	0.0053	1	0.17	0.039	0.09	0.37

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**425 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloro-ethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)
BPIA12_425 HOWARD AVE	02/02/07	<0.041	1.3	0.45	0.36	0.19	0.086	18	2.6
BPCS12_425 HOWARD AVE	09/19/06	<0.56	1.2	<0.45	<0.2	<3.6	<1.9	270	4.2
BPCS12_425 HOWARD AVE	02/02/07	<0.039	1.4	0.49	0.3	0.18	<0.039	64	1.6

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**518 COOK AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
518 Cook Ave_Main	02/07/18	20180207-518COOK-02	1.5	0.43	<0.064	<0.064	<0.041	<0.036	41.6	4.2	0.52	0.64
518 Cook Ave_Crawlspace	02/07/18	20180207-518COOK-01	2.1	0.64	<0.077	<0.077	<0.05	0.45	<1.5	1.2	0.62	0.28

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**518 COOK AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
518 Cook Ave_Main	02/07/18	20180207-518COOK-02	<0.065	1.5	9.5	<1.7	0.21	<3.3	<1.2	<0.12 R	<1.9	<0.074
518 Cook Ave_Crawlspace	02/07/18	20180207-518COOK-01	<0.079	0.37	<1.3	<1.6	<0.13	<3.2	<1.2	<0.15	<1.9	0.12

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**518 COOK AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
518 Cook Ave_Main	02/07/18	20180207-518COOK-02	<3.4	<6.6 UJ	8.3	1.5 J+	<6	<0.088	45.3	7.6	<1.5	4.3
518 Cook Ave_Crawlspace	02/07/18	20180207-518COOK-01	<3.3	<6.3 UJ	<4	<0.13	<5.7	<0.11	16.4	<4.6	<1.4	1.5

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**518 COOK AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
518 Cook Ave_Main	02/07/18	20180207-518COOK-02	211	9.9	3	14.8	<0.95	<1.8	11.3	<1.1	38	15
518 Cook Ave_Crawlspace	02/07/18	20180207-518COOK-01	33 J	<1.5	1.2	3.8	<0.91	<1.7	<1.5	<1.1	<2.7	<1.3

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**518 COOK AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro- difluoro- methane (ug/m3)	1,1-Dichloro- ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1- Trichloro- ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
518 Cook Ave_Main	02/07/18	20180207-518COOK-02	2.4	<0.064	<5.6	<5.8	31.2	<0.088	<1.1	4.6	1.7	<0.85
518 Cook Ave_Crawlspace	02/07/18	20180207-518COOK-01	2.5	<0.077	<5.4	<5.6	2.8	<0.11	<1.1	<1.3	<0.96	<0.81

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**518 COOK AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
518 Cook Ave_Main	02/07/18	20180207-518COOK-02	<2.7	<2.2	<1.9	<1.9	<0.073	<0.073	5.5	<6.6	<0.55	<1.4
518 Cook Ave_Crawlspace	02/07/18	20180207-518COOK-01	<2.6	<2.2	<1.9	<1.9	<0.089	<0.089	<1.1	<6.3	<0.53	<1.3

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**518 COOK AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-trifluoro-ethane (ug/m3)
518 Cook Ave_Main	02/07/18	20180207-518COOK-02	<2.5
518 Cook Ave_Crawlspace	02/07/18	20180207-518COOK-01	<2.4

Applicable Residential Screening Levels	520
Applicable Industrial Screening Levels	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**518 COOK AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)
BPIA77_518 COOK AVE	12/13/07	9.9	0.38	<1.9	<1.9	<1.9	2.5	0.51	<1.9	0.44	2.8
BPCS77_518 COOK AVE	12/13/07	9.9	0.38	<1.5	<1.5	<1.5	1.4	0.34	<1.5	<1.5	0.83

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**518 COOK AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloro-ethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)
BPIA77_518 COOK AVE	12/13/07	<1.9	12	4.5	<1.9	0.58	<1.9	21	<1.9
BPCS77_518 COOK AVE	12/13/07	<1.5	3.5	1.2	<1.5	0.37	<1.5	5.7	<1.5

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**522 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
522 Howard Ave_Main	03/02/18	20180302-522HOWARD-02	0.17	0.11	<0.068	<0.068	<0.044	<0.038	<1.7	1.3	0.47	1.4
522 Howard Ave_Basement	03/02/18	20180302-522HOWARD-01	5 J	1.4 J	0.066	<0.065	<0.042	0.21 J	<1.6	1.3	<0.1 UJ	1.2
522 Howard Ave_Basement	03/02/18	20180302-B	0.17 J	<0.09 UJ	<0.066	<0.066	<0.043	<0.037 UJ	<1.6	1.2	0.67 J	1.2
522 Howard Ave_Subslab	03/03/18	20180303-522HOWARD-01	14.3	0.25	0.12	0.093	<0.05	0.12	<1.9	0.86	0.16	1.5

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**522 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
522 Howard Ave_Main	03/02/18	20180302-522HOWARD-02	<0.069	1.2	<1.5	<4.4	0.4	<3.5	<1.3	<0.13	<2	0.087
522 Howard Ave_Basement	03/02/18	20180302-522HOWARD-01	<0.066	0.61 J	<1.4	<4.2	0.29	<3.4	<1.3	<0.13	<2	<0.076
522 Howard Ave_Basement	03/02/18	20180302-B	<0.067	<0.067 UJ	<1.4	<4.3	0.35	<3.4	<1.3	<0.13	<2	<0.077
522 Howard Ave_Subslab	03/03/18	20180303-522HOWARD-01	<0.079	0.2	<1.7	<5.1	0.16	<4	<1.5	0.88	<2.3	0.094

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**522 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
522 Howard Ave_Main	03/02/18	20180302-522HOWARD-02	<3.6	<7	<4.5	<0.12	<6.3	<0.093	29.6	<5	<1.6	<0.71
522 Howard Ave_Basement	03/02/18	20180302-522HOWARD-01	<3.5	<6.7	<4.3	<0.11	<6.1	<0.089	29.7	<4.8	<1.5	<0.68 UJ
522 Howard Ave_Basement	03/02/18	20180302-B	<3.6	<6.8	<4.4	<0.11	<6.2	<0.091	23.3	<4.9	<1.5	1.6 J
522 Howard Ave_Subslab	03/03/18	20180303-522HOWARD-01	<4.2	<8	6.5	0.34	8.6	0.2	7.6	<5.8	<1.8	<0.81

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**522 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
522 Howard Ave_Main	03/02/18	20180302-522HOWARD-02	1250 J	<1.7	<1.2	34.9	<1	<1.9	<1.7	3.1	4	<1.5
522 Howard Ave_Basement	03/02/18	20180302-522HOWARD-01	818 J	<1.6	1.4	22.3	<0.97	<1.8	<1.6	2.9 J	2.9	<1.4
522 Howard Ave_Basement	03/02/18	20180302-B	782 J	<1.6	<1.2	20	<0.98	<1.9	<1.6	1.8 J	<2.9	<1.4
522 Howard Ave_Subslab	03/03/18	20180303-522HOWARD-01	4.9	<1.9	2.6	<4.8	<1.2	<2.2	<1.9	<1.4	<3.4	<1.7

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**522 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
522 Howard Ave_Main	03/02/18	20180302-522HOWARD-02	2.5	<0.068	<5.9	<6.1	3.6	<0.093	<1.2	<1.4	<1.1	<0.9
522 Howard Ave_Basement	03/02/18	20180302-522HOWARD-01	2.5	<0.065	<5.7	<5.9	2.7	<0.089	<1.1	<1.3	<1	<0.86
522 Howard Ave_Basement	03/02/18	20180302-B	2.3	<0.066	<5.8	<6	2.7	<0.091	<1.1	<1.4	<1	<0.88
522 Howard Ave_Subslab	03/03/18	20180303-522HOWARD-01	2.4	<0.077	12.4	<7	<1.5	0.58	<1.3	<1.6	<1.2	<1

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**522 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
522 Howard Ave_Main	03/02/18	20180302-522HOWARD-02	<2.9	<2.4	<2	<2	<0.077	<0.077	7.9	<7	<0.59	<1.5
522 Howard Ave_Basement	03/02/18	20180302-522HOWARD-01	<2.8	<2.3	<2	<2	<0.074	<0.074	4.6	<6.7	<0.56	<1.4
522 Howard Ave_Basement	03/02/18	20180302-B	<2.8	<2.3	<2	<2	<0.076	<0.076	4.2	<6.8	<0.57	<1.4
522 Howard Ave_Subslab	03/03/18	20180303-522HOWARD-01	<3.3	<2.7	<2.3	<2.3	0.2	0.47	<1.4	<8	<0.67	<1.7

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**522 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloroethane (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
522 Howard Ave_Main	03/02/18	20180302-522HOWARD-02	<2.6	--	--	--	--	--
522 Howard Ave_Basement	03/02/18	20180302-522HOWARD-01	<2.5	--	--	--	--	--
522 Howard Ave_Basement	03/02/18	20180302-B	<2.6	--	--	--	--	--
522 Howard Ave_Subslab	03/03/18	20180303-522HOWARD-01	<3	53	76.8	19.4	4.1	<3.6

Applicable Residential Screening Levels	520	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	NA	NA	NA	NA	NA	NA

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**522 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)
BPIA79_522 HOWARD AVE	12/11/07	0.36	<1.9	<1.9	<1.9	<1.9	3.1	0.84	<1.9	<1.9	1.6
BPSS79_522 HOWARD AVE	12/10/07	<67.8	<53.7	--	--	--	--	<48.8	<405	<2025	--
BPSS79_522 HOWARD AVE	12/11/07	--	--	--	--	--	<10	--	--	--	<10
BPSS79_522 HOWARD AVE_AREA 1	12/11/07	7.4	<10	<10	<10	<10	--	<10	<10	<10	--
BPSS79_522 HOWARD AVE AREA 2	12/11/07	<67.8	<53.7	--	--	--	--	<48.8	<405	<2025	--

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**522 HOWARD AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloroethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloroethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloroethane (ug/m3)
BPIA79_522 HOWARD AVE	12/11/07	<1.9	6.7	2.1	<1.9	7.3	<1.9	10	<1.9
BPSS79_522 HOWARD AVE	12/10/07	<54.6	--	--	<39.7	<34.7	--	--	<54.6
BPSS79_522 HOWARD AVE	12/11/07	--	2.4	<10	--	--	--	2.3	--
BPSS79_522 HOWARD AVE_AREA 1	12/11/07	<10	--	--	<10	<10	<10	--	<10
BPSS79_522 HOWARD AVE AREA 2	12/11/07	<54.6	--	--	<39.7	<34.7	--	--	<54.6

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**527 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
527 St Johns Ave_Main	02/08/18	20180208-527STJOHN-02	1.4	0.15	<0.081	<0.081	<0.053	<0.045	<1.5	1.1	0.4	1.8
527 St Johns Ave_Basement	02/08/18	20180208-527STJOHN-01	1.4	0.17	<0.061	<0.061	<0.04	0.17	<1.5	1.8	0.66	1.6
527 St Johns Ave_Subslab	02/09/18	20180209-527STJOHN-01	14600 J	237	3.5	<1.2	<0.38	<0.66	<1.5	0.6 J	<0.93 UJ	64
527 St Johns Ave_Subslab	02/09/18	20180209-A	7280 J	227	3.5	<1.2	<0.37	<0.65	<1.4	1.4 J	<0.92 UJ	61.7

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**527 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
527 St Johns Ave_Main	02/08/18	20180208-527STJOHN-02	<0.083	0.9	<1.4	<1.6	0.55	<3.3	<1.2	<0.16	<1.9	<0.095
527 St Johns Ave_Basement	02/08/18	20180208-527STJOHN-01	<0.062	0.31	<1.3	<1.6	0.52	<3.2	<1.2	<0.12	<1.9	0.083
527 St Johns Ave_Subslab	02/09/18	20180209-527STJOHN-01	<1.2	<0.6	<1.3	<1.5	<2	<3.1	<1.2	<2.3	<1.8	<1.4
527 St Johns Ave_Subslab	02/09/18	20180209-A	<1.2	<0.59	<1.3	<1.5	<2	<3	<1.1	<2.2	<1.8	<1.4

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**527 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
527 St Johns Ave_Main	02/08/18	20180208-527STJOHN-02	<3.4	<6.4	<4.1 UJ	<0.14	<5.8 UJ	<0.11	22.3	5.6	<1.5	1.2
527 St Johns Ave_Basement	02/08/18	20180208-527STJOHN-01	<3.3	<6.3	<4 UJ	<0.11	<5.7 UJ	<0.084	15.3	<4.6	<1.4	<0.64
527 St Johns Ave_Subslab	02/09/18	20180209-527STJOHN-01	<3.2	<6.1	<3.9 UJ	<1	<5.5 UJ	<0.81	12.2	<4.4	<1.4	<0.61
527 St Johns Ave_Subslab	02/09/18	20180209-A	<3.1	<6	<3.8 UJ	<1	<5.4 UJ	<0.8	12.5	<4.3	<1.3	<0.6

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**527 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
527 St Johns Ave_Main	02/08/18	20180208-527STJOHN-02	285 J	<1.5	7.8	5.2	<0.93	<1.8	<1.5	3.1	<2.7	<1.4
527 St Johns Ave_Basement	02/08/18	20180208-527STJOHN-01	147 J	<1.5	5.7	<3.8	<0.91	<1.7	<1.5	1.6	<2.7	<1.3
527 St Johns Ave_Subslab	02/09/18	20180209-527STJOHN-01	14.1 J	<1.5	<1 UJ	<3.6	<0.88	<1.7	<1.5	3 J	<2.6	<1.3
527 St Johns Ave_Subslab	02/09/18	20180209-A	379 J	<1.4	4.2 J	<3.6	<0.86	<1.6	<1.4	2.3 J	<2.5	<1.3

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**527 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
527 St Johns Ave_Main	02/08/18	20180208-527STJOHN-02	2.5	<0.081	62.3	<5.7	2.9	<0.11	<1.1	<1.3	<0.98	<0.83
527 St Johns Ave_Basement	02/08/18	20180208-527STJOHN-01	2.6	<0.061	52.8	<5.6	2.7	<0.084	7.4	1.7	<0.96	<0.81
527 St Johns Ave_Subslab	02/09/18	20180209-527STJOHN-01	2.1	<1.2	<5.2 UJ	<5.3	<1.1 UJ	<1.6	<1	<1.2	<0.92	<0.78
527 St Johns Ave_Subslab	02/09/18	20180209-A	2.4	<1.2	20.9 J	<5.3	2.7 J	<1.6	<1	<1.2	<0.91	<0.77

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**527 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo-chloromethane (ug/m3)	1,2-Dichloro-1,1,2,2-tetrafluoroethane (ug/m3)	1,2-Di-chloro-benzene (ug/m3)	1,3-Di-chloro-benzene (ug/m3)	Cis-1,3-dichloro-propene (ug/m3)	trans-1,3-Dichloro-propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl-2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
527 St Johns Ave_Main	02/08/18	20180208-527STJOHN-02	<2.7	<2.2	<1.9	<1.9	<0.093	<0.093	3.8	<6.4	<0.54	<1.3
527 St Johns Ave_Basement	02/08/18	20180208-527STJOHN-01	<2.6	<2.2	<1.9	<1.9	<0.07	<0.07	1.4	<6.3	<0.53	<1.3
527 St Johns Ave_Subslab	02/09/18	20180209-527STJOHN-01	<2.5	<2.1	<1.8	<1.8	<1.3	<1.3	<1.1 UJ	<6.1	<0.51	<1.3
527 St Johns Ave_Subslab	02/09/18	20180209-A	<2.5	<2	<1.8	<1.8	<1.3	<1.3	86.6 J	<6	<0.5	<1.2

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**527 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
527 St Johns Ave_Main	02/08/18	20180208-527STJOHN-02	<2.4	26.4	<18.6	<21.7	--	--	--	--	--
527 St Johns Ave_Basement	02/08/18	20180208-527STJOHN-01	<2.4	63.3	<18.2	71.4	--	--	--	--	--
527 St Johns Ave_Subslab	02/09/18	20180209-527STJOHN-01	<2.3	2110 J	<17.5	<20.4	16.8 J	79	20.3	<2	<3.6
527 St Johns Ave_Subslab	02/09/18	20180209-A	<2.2	2100 J	<17.3	<20.2	68.5 J	80	19.5	<2	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA	NA

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**527 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)
BPIA120_527 SAINT JOHNS AVE	04/07/10	32	6.9	<0.3	<1.5	<0.098	--	2.1	<0.31	0.34	--
BPIA120_527 SAINT JOHNS AVE	03/17/11	2.9	0.72	<0.42	<2.1	<0.14	1	3.1	<0.43	0.45	0.79
BPSS120_527 SAINT JOHNS AVE	04/07/10	83800.8	39383.5	--	--	--	--	<488	--	<4050	--
BPSS120_527 SAINT JOHNS AVE	03/17/11	18	<4.6	<3.4	<3.4	<2.2	<2.7	4.2	<3.5	<3.5	<3.7

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**527 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloroethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloroethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloroethane (ug/m3)
BPIA120_527 SAINT JOHNS AVE	04/07/10	<0.42	--	--	<0.15	<2.6	<1.4	--	<0.42
BPIA120_527 SAINT JOHNS AVE	03/17/11	<0.58	2.3	0.67	<0.21	6.1	<1.9	15	<0.58
BPSS120_527 SAINT JOHNS AVE	04/07/10	--	--	--	--	<17.35	--	--	--
BPSS120_527 SAINT JOHNS AVE	03/17/11	<4.7	<3.7	<3.7	<3.4	<3	<3.1	4.4	<4.7

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**611 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
611 St Johns Ave_Main	02/27/18	20180227-611STJOHNSAVE-02	1.6	0.15	<0.072	<0.072	<0.047	0.49	<1.8	2.7	0.5	0.63
611 St Johns Ave_Basement	02/27/18	20180227-611STJOHNSAVE-01	1.5	0.11	<0.062	<0.062	<0.04	0.44	<1.5 R	2.8 J+	0.37	0.48
611 St Johns Ave Subslab	02/28/18	20180228-611STJOHNSAVE-01	1880	116	4.5	<1.4	<0.44	<0.76	<1.7	<0.55	<1.1	12.5

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**611 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
611 St Johns Ave_Main	02/27/18	20180227-611STJOHNSAVE-02	<0.074	0.46	<1.6	<1.9 UJ	0.18	<3.8	<1.4	<0.14	6.6	<0.084
611 St Johns Ave_Basement	02/27/18	20180227-611STJOHNSAVE-01	<0.064	0.33	<1.4 R	<1.6 R	0.13	<3.3 R	<1.2 R	<0.12	8.6 J+	<0.073
611 St Johns Ave Subslab	02/28/18	20180228-611STJOHNSAVE-01	<1.4	<0.69	<1.5	<1.8	<2.3	<3.5	<1.3	<2.6	<2	<1.6

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**611 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
611 St Johns Ave_Main	02/27/18	20180227-611STJOHNSAVE-02	<3.9	<7.4	<4.8	<0.12	<6.7	<0.099	67.8	6.3	<1.7	2.1
611 St Johns Ave_Basement	02/27/18	20180227-611STJOHNSAVE-01	<3.4 R	<6.4 R	<4.1 R	<0.11	<5.8 R	<0.086	56.6 J+	5.7 J+	<1.5 R	2.8 J+
611 St Johns Ave Subslab	02/28/18	20180228-611STJOHNSAVE-01	<3.6	<7	12.9	<1.2	12.9	<0.93	5	<5	<1.6	<0.71

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**611 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
611 St Johns Ave_Main	02/27/18	20180227-611STJOHNSAVE-02	344	<1.8	3.3	19	<1.1	4.4	<1.8	<1.3	4.3	1.7
611 St Johns Ave_Basement	02/27/18	20180227-611STJOHNSAVE-01	308 J+	<1.5 R	3.6 J+	11.9 J+	<0.93 R	4.2 J+	<1.5 R	<1.1 R	4.1 J+	1.6 J+
611 St Johns Ave Subslab	02/28/18	20180228-611STJOHNSAVE-01	<1.6	<1.7	<1.2	<4.2	<1	<1.9	<1.7	<1.2	<3	<1.5

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**611 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro- difluoro- methane (ug/m3)	1,1-Dichloro- ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1- Trichloro- ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
611 St Johns Ave_Main	02/27/18	20180227-611STJOHNSAVE-02	3.5	<0.072	15	<6.6	12.3	0.78	4.9	3.3	<1.1	<0.96
611 St Johns Ave_Basement	02/27/18	20180227-611STJOHNSAVE-01	3.8 J+	<0.062	23.3 J+	<5.7 R	11.1 J+	0.85	4.8 J+	3.3 J+	<0.98 R	<0.83 R
611 St Johns Ave Subslab	02/28/18	20180228-611STJOHNSAVE-01	<1.7	<1.4	56.9	<6.1	1.6	<1.9	<1.2	<1.4	<1.1 UJ	<0.9

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**611 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo-chloromethane (ug/m3)	1,2-Dichloro-1,1,2,2-tetrafluoroethane (ug/m3)	1,2-Di-chloro-benzene (ug/m3)	1,3-Di-chloro-benzene (ug/m3)	Cis-1,3-dichloro-propene (ug/m3)	trans-1,3-Dichloro-propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl-2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
611 St Johns Ave_Main	02/27/18	20180227-611STJOHNSAVE-02	<3.1	<2.5	<2.2	<2.2	<0.083	<0.083	4	<7.4	<0.63	1.6
611 St Johns Ave_Basement	02/27/18	20180227-611STJOHNSAVE-01	<2.7 R	<2.2 R	<1.9 R	<1.9 R	<0.071	<0.071	2.8 J+	<6.4 R	<0.54 R	<1.3 R
611 St Johns Ave Subslab	02/28/18	20180228-611STJOHNSAVE-01	<2.9	<2.4	3.1	9.8	<1.6	1.7	<1.2	<7	<0.59	<1.5

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**611 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
611 St Johns Ave_Main	02/27/18	20180227-611STJOHNSAVE-02	<2.8	--	--	--	--	--
611 St Johns Ave_Basement	02/27/18	20180227-611STJOHNSAVE-01	<2.4 R	--	--	--	--	--
611 St Johns Ave Subslab	02/28/18	20180228-611STJOHNSAVE-01	<2.6	<16.8	79.6	19.2	<2	<3.6

Applicable Residential Screening Levels	520	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	NA	NA	NA	NA	NA	NA

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**611 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	1,1,2-Trichloro-ethane (ug/m3)	1,1-Dichloro-ethene (ug/m3)
BPIA149_611 SAINT JOHNS AVE	04/11/10	1.1	<0.24	<0.18	<0.88	<0.057	2	<0.18	0.71	<0.24	0.088
BPSS149_611 SAINT JOHNS AVE	04/11/10	3255.75	--	--	--	--	<24.4	--	<202.5	--	--

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.12	1.8	0.23	0.021	21
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.53	7.7	0.47	0.088	88

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**611 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Methylene Chloride (ug/m3)	MTBE (ug/m3)	1,1,1-Trichloroethane (ug/m3)
BPIA149_611 SAINT JOHNS AVE	04/11/10	2.8	<0.8	<0.24
BPSS149_611 SAINT JOHNS AVE	04/11/10	--	--	--

Applicable Residential Screening Levels	63	11	520
Applicable Industrial Screening Levels	260	47	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**632 ST. JOHNS AVENUE #6 VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
632 St Johns Ave No6_Main	03/07/18	20180307-632STJOHNS6-02	3.4	<0.88	<1.3	<1.3	<0.42	<0.72	<1.6	1.2	<1	2.6
632 St Johns Ave No6_Basement	03/07/18	20180307-632STJOHNS6-01	3.2	<0.86	<1.3	<1.3	<0.41	<0.71	<1.6	1.2	<1	1.5
632 St Johns Ave No6_Subslab	03/08/18	20180308-632STJOHNS6-01	685	224	<1.4	<1.4	<0.46	<0.79	<1.7	<0.57	<1.1	3.3

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**632 ST. JOHNS AVENUE #6 VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
632 St Johns Ave No6_Main	03/07/18	20180307-632STJOHNS6-02	<1.3	<0.66	<1.4	<1.7	<2.2	<3.4	<1.3	<2.5	<2	<1.5
632 St Johns Ave No6_Basement	03/07/18	20180307-632STJOHNS6-01	<1.3	<0.65	<1.4	<1.7	<2.1	<3.3	<1.2	<2.5	<1.9	<1.5
632 St Johns Ave No6_Subslab	03/08/18	20180308-632STJOHNS6-01	<1.4	<0.72	<1.5	<1.8	<2.4	<3.7	<1.4	<2.7	<2.1	<1.6

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**632 ST. JOHNS AVENUE #6 VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
632 St Johns Ave No6_Main	03/07/18	20180307-632STJOHNS6-02	<3.5	<6.7	<4.3	<1.1	<6.1	<0.89	35.9	<4.8	<1.5	0.89
632 St Johns Ave No6_Basement	03/07/18	20180307-632STJOHNS6-01	<3.4	<6.6	<4.2	<1.1	<6	<0.88	17.8	<4.7	<1.5	1.1
632 St Johns Ave No6_Subslab	03/08/18	20180308-632STJOHNS6-01	<3.8	<7.3	<4.7	<1.2	<6.6	<0.97	14.1	<5.2	<1.6	<0.74

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**632 ST. JOHNS AVENUE #6 VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofura n (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
632 St Johns Ave No6_Main	03/07/18	20180307-632STJOHNS6-02	773 J	<1.6	2.1	18.7	<0.97	<1.8	<1.6	2.7	<2.8	<1.4
632 St Johns Ave No6_Basement	03/07/18	20180307-632STJOHNS6-01	366	<1.6	2	37.4	<0.95	<1.8	<1.6	<1.1	<2.8	<1.4
632 St Johns Ave No6_Subslab	03/08/18	20180308-632STJOHNS6-01	2.4	<1.7	<1.3	<4.4	<1	<2	<1.7	<1.3	<3.1	<1.5

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**632 ST. JOHNS AVENUE #6 VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro- difluoro- methane (ug/m3)	1,1-Dichloro- ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1- Trichloro- ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
632 St Johns Ave No6_Main	03/07/18	20180307-632STJOHNS6-02	2.2	<1.3	<5.7	<5.9	5.1	<1.8	1.9	<1.3	<1	<0.86
632 St Johns Ave No6_Basement	03/07/18	20180307-632STJOHNS6-01	2.3	<1.3	<5.6	<5.8	4.1	<1.8	2	<1.3	<1	<0.85
632 St Johns Ave No6_Subslab	03/08/18	20180308-632STJOHNS6-01	2.3	<1.4	<6.2	<6.4	<1.3	<1.9	<1.2	<1.5	<1.1	<0.94

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**632 ST. JOHNS AVENUE #6 VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
632 St Johns Ave No6_Main	03/07/18	20180307-632STJOHNS6-02	<2.8	<2.3	<2	<2	<1.5	<1.5	3.6	<6.7	<0.56	<1.4
632 St Johns Ave No6_Basement	03/07/18	20180307-632STJOHNS6-01	<2.7	<2.2	<1.9	<1.9	<1.5	<1.5	1.5	<6.6	<0.55	<1.4
632 St Johns Ave No6_Subslab	03/08/18	20180308-632STJOHNS6-01	<3	<2.5	<2.1	<2.1	<1.6	<1.6	<1.3	<7.3	<0.61	<1.5

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**632 ST. JOHNS AVENUE #6 VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
632 St Johns Ave No6_Main	03/07/18	20180307-632STJOHNS6-02	<2.5	<19.3	<19.3	<22.5	--	--	--	--	--
632 St Johns Ave No6_Basement	03/07/18	20180307-632STJOHNS6-01	<2.5	<19	<19	<22.1	--	--	--	--	--
632 St Johns Ave No6_Subslab	03/08/18	20180308-632STJOHNS6-01	<2.7	865	<21	<24.5	<17.5	78.6	20.7	<2	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA	NA

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**708 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
708 St Johns Ave_Main	02/08/18	20180208-708STJOHN-04	0.27	<0.11	<0.08	<0.08	<0.051	<0.045	<1.5	1	0.46	1.6
708 St Johns Ave_Basement	02/08/18	20180208-708STJOHN-02	0.32	0.12	<0.084	<0.084	<0.054	<0.047	<1.6	0.85	0.23	0.73
708 St Johns Ave_Crawlspace N	02/08/18	20180208-708STJOHN-01	0.12	<0.084	<0.062	<0.062	<0.04	0.071	<1.4	0.55	0.5	0.12
708 St Johns Ave_Crawlspace S	02/08/18	20180208-708STJOHN-03	0.14	<0.08	<0.059	<0.059	<0.038	<0.033	<1.5	0.96	0.38	0.12
708 St Johns Ave_Subslab	02/09/18	20180209-708STJOHN-01	212	<0.81	<1.2	<1.2	<0.39	<0.67	<1.5	<0.48	<0.95 UJ	<0.74

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**708 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
708 St Johns Ave_Main	02/08/18	20180208-708STJOHN-04	<0.081	0.53	<1.3	<1.6	0.39	<3.2	<1.2	<0.15	<1.9	<0.093
708 St Johns Ave_Basement	02/08/18	20180208-708STJOHN-02	<0.086	0.37	<1.4	<1.7	0.17	<3.4	<1.3	<0.16	<2	<0.098
708 St Johns Ave_Crawlspace N	02/08/18	20180208-708STJOHN-01	<0.063	0.11	<1.2	<1.5	<0.1	<3	<1.1	<0.12	<1.7	<0.072
708 St Johns Ave_Crawlspace S	02/08/18	20180208-708STJOHN-03	<0.06	0.098	<1.3	<1.5	<0.099	<3.1	<1.2	<0.11	<1.8	<0.069
708 St Johns Ave_Subslab	02/09/18	20180209-708STJOHN-01	<1.2	<0.61	<1.3	<1.6	<2	<3.1	<1.2	<2.3	<1.8	<1.4

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**708 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
708 St Johns Ave_Main	02/08/18	20180208-708STJOHN-04	<3.3	<6.3	<4 UJ	<0.14	<5.7 UJ	0.15	702 J	5.1	<1.4	<0.64
708 St Johns Ave_Basement	02/08/18	20180208-708STJOHN-02	<3.5	<6.7	<4.3 UJ	<0.15	<6.1 UJ	<0.12	184	<4.8	<1.5	0.72
708 St Johns Ave_Crawlspace N	02/08/18	20180208-708STJOHN-01	<3.1	<5.9	<3.8 UJ	<0.11	<5.3 UJ	<0.085	19.7	<4.2	<1.3	<0.59
708 St Johns Ave_Crawlspace S	02/08/18	20180208-708STJOHN-03	<3.2	<6.1	<3.9 UJ	<0.1	<5.5 UJ	<0.081	6.6	<4.4	<1.4	<0.61
708 St Johns Ave_Subslab	02/09/18	20180209-708STJOHN-01	<3.2	<6.2	<4 UJ	<1	<5.6 UJ	<0.83	10.1	<4.5	<1.4	<0.63

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**708 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
708 St Johns Ave_Main	02/08/18	20180208-708STJOHN-04	1440 J	<1.5	3	8.5	<0.91	1.9	<1.5	2.2	<2.7	<1.3
708 St Johns Ave_Basement	02/08/18	20180208-708STJOHN-02	606 J	<1.6	1.2	8.8	3.4	<1.8	<1.6	<1.2	<2.8	<1.4
708 St Johns Ave_Crawlspace N	02/08/18	20180208-708STJOHN-01	107 J	<1.4	<1	<3.5	<0.85	<1.6	<1.4	1.4	<2.5	<1.2
708 St Johns Ave_Crawlspace S	02/08/18	20180208-708STJOHN-03	10.8 J	<1.5	1.8	<3.6	<0.88	1.7	<1.5	<1	<2.6	<1.3
708 St Johns Ave_Subslab	02/09/18	20180209-708STJOHN-01	4.9 J	<1.5	<1.1	<3.7	<0.89	<1.7	<1.5	1.6	<2.6	<1.3

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**708 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
708 St Johns Ave_Main	02/08/18	20180208-708STJOHN-04	1.9	<0.08	13.6	<5.6	13.3	0.76	1.8	10.9	<0.96	<0.81
708 St Johns Ave_Basement	02/08/18	20180208-708STJOHN-02	2.2	0.28	7.9	<5.9	4.7	0.52	<1.1	8.5	<1	<0.86
708 St Johns Ave_Crawlspace N	02/08/18	20180208-708STJOHN-01	2.4	<0.062	<5	<5.2	<1.1	<0.085	<0.99	<1.2	<0.89	<0.76
708 St Johns Ave_Crawlspace S	02/08/18	20180208-708STJOHN-03	2.4	<0.059	5.9	<5.3	3.4	<0.081	3.2	<1.2	<0.92	<0.78
708 St Johns Ave_Subslab	02/09/18	20180209-708STJOHN-01	1.9	<1.2	<5.3	<5.5	1.2	<1.7	<1	<1.2	<0.94	<0.8

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**708 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo-chloromethane (ug/m3)	1,2-Dichloro-1,1,2,2-tetrafluoroethane (ug/m3)	1,2-Di-chloro-benzene (ug/m3)	1,3-Di-chloro-benzene (ug/m3)	Cis-1,3-dichloro-propene (ug/m3)	trans-1,3-Dichloro-propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl-2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
708 St Johns Ave_Main	02/08/18	20180208-708STJOHN-04	<2.6	<2.2	<1.9	<1.9	<0.091	<0.091	5.6	<6.3	<0.53	<1.3
708 St Johns Ave_Basement	02/08/18	20180208-708STJOHN-02	<2.8	<2.3	<2	<2	<0.096	<0.096	1.3	<6.7	<0.56	<1.4
708 St Johns Ave_Crawlspace N	02/08/18	20180208-708STJOHN-01	<2.4	<2	<1.7	<1.7	<0.071	<0.071	15.7	<5.9	<0.49	<1.2
708 St Johns Ave_Crawlspace S	02/08/18	20180208-708STJOHN-03	<2.5	<2.1	<1.8	<1.8	<0.067	<0.067	<1.1	<6.1	<0.51	<1.3
708 St Johns Ave_Subslab	02/09/18	20180209-708STJOHN-01	<2.6	<2.1	<1.8	<1.8	<1.4	<1.4	<1.1	<6.2	<0.52	<1.3

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**708 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloroethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
708 St Johns Ave_Main	02/08/18	20180208-708STJOHN-04	<2.4	384	<18.2	76	--	--	--	--	--
708 St Johns Ave_Basement	02/08/18	20180208-708STJOHN-02	<2.5	120	<19.3	<22.5	--	--	--	--	--
708 St Johns Ave_Crawlspace N	02/08/18	20180208-708STJOHN-01	<2.2	<16.9	<16.9	<19.7	--	--	--	--	--
708 St Johns Ave_Crawlspace S	02/08/18	20180208-708STJOHN-03	<2.3	<17.5	<17.5	<20.4	--	--	--	--	--
708 St Johns Ave_Subslab	02/09/18	20180209-708STJOHN-01	<2.3	233	<17.9	30.6	1780 J	79.2	18.8	<2	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA	NA

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**708 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)
BPIA03_708 SAINT JOHNS AVE	07/11/06	0.68	0.089	<0.085	<0.085	<0.085	1.8	1.1	0.085	0.17	2.5
BPIA03_708 SAINT JOHNS AVE	02/02/07	0.32	0.055	<0.038	<0.038	0.0082	1.4	0.59	0.038	0.072	1.7
BPSS03_708 SAINT JOHNS AVE	07/11/06	1300	0.74	<1.8	<1.8	<1.8	<7	<7	<1.8	<1.8	12
BPSS03_708 SAINT JOHNS AVE	02/01/07	340	0.085	<0.38	<0.38	<0.38	<1.5	<1.5	<0.38	<0.38	2.5

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**708 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloro-ethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)
BPIA03_708 SAINT JOHNS AVE	07/11/06	<0.085	7.8	2.3	0.085	11	<0.085	130	2
BPIA03_708 SAINT JOHNS AVE	02/02/07	<0.038	5.3	1.8	0.15	6.8	0.018	60	0.32
BPSS03_708 SAINT JOHNS AVE	07/11/06	<1.8	58	17	<1.8	<7	<1.8	100	4
BPSS03_708 SAINT JOHNS AVE	02/01/07	<0.38	14	5	0.14	0.73	<0.38	6.2	0.39

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**708 1/2 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
708 1/2 St Johns Ave_Main	02/08/18	20180208-7081/2STJOHN-01	1.4	<0.11	<0.081	<0.081	<0.053	<0.045	<1.5	2	0.6	1.8
708 1/2 St Johns Ave_Crawlspace	02/08/18	20180208-7081/2STJOHN-02	0.15	<0.1	<0.076	<0.076	<0.049	<0.042	<1.5	1.6	0.5	0.86

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**708 1/2 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethylbenzene (ug/m3)	Benzylchloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
708 1/2 St Johns Ave_Main	02/08/18	20180208-7081/2STJOHN-01	<0.083	0.2	<1.4	<1.6	0.56	<3.3	<1.2	<0.16	<1.9	<0.095
708 1/2 St Johns Ave Crawlspc	02/08/18	20180208-7081/2STJOHN-02	<0.077	0.15	<1.3	<1.6	0.26	<3.1	<1.2	<0.15	<1.8	<0.088

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**708 1/2 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
708 1/2 St Johns Ave_Main	02/08/18	20180208-7081/2STJOHN-01	<3.4	<6.4	<4.1 UJ	<0.14	<5.8 UJ	<0.11	1180 J	9.1	<1.5	0.79
708 1/2 St Johns Ave_Crawlspace	02/08/18	20180208-7081/2STJOHN-02	<3.2	<6.2	<4 UJ	<0.13	<5.6 UJ	<0.1	303	<4.5	<1.4	<0.63

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**708 1/2 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
708 1/2 St Johns Ave_Main	02/08/18	20180208-7081/2STJOHN-01	423 J	<1.5	18.6	14	<0.93	<1.8	<1.5	6.8	<2.7	<1.4
708 1/2 St Johns Ave Crawlspc	02/08/18	20180208-7081/2STJOHN-02	220 J	<1.5	15.4	6.9	<0.89	<1.7	<1.5	<1.1	<2.6	<1.3

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**708 1/2 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
708 1/2 St Johns Ave_Main	02/08/18	20180208-7081/2STJOHN-01	2.1	<0.081	7.3	<5.7	2	<0.11	10.1	10.1	<0.98	<0.83
708 1/2 St Johns Ave Crawlspc	02/08/18	20180208-7081/2STJOHN-02	2	<0.076	6.1	<5.5	2.2	<0.1	8.4	7.7	<0.94	<0.8

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**708 1/2 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
708 1/2 St Johns Ave_Main	02/08/18	20180208-7081/2STJOHN-01	<2.7	<2.2	<1.9	<1.9	<0.093	<0.093	82.2	<6.4	<0.54	<1.3
708 1/2 St Johns Ave Crawlspc	02/08/18	20180208-7081/2STJOHN-02	<2.6	<2.1	<1.8	<1.8	<0.087	<0.087	21	<6.2	<0.52	<1.3

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**708 1/2 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)
708 1/2 St Johns Ave_Main	02/08/18	20180208-7081/2STJOHN-01	<2.4	535	<18.6	71.7
708 1/2 St Johns Ave Crawlspc	02/08/18	20180208-7081/2STJOHN-02	<2.3	166	<17.9	<20.9

Applicable Residential Screening Levels	520	94	10	44
Applicable Industrial Screening Levels	2,200	94	10	44

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**708 1/2 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)
BPIA04_708 1/2 SAINT JOHNS AVE	07/11/06	0.52	0.16	<0.085	<0.085	<0.085	5.6	2.7	0.085	1.7	1.8
BPIA04_708 1/2 SAINT JOHNS AVE	02/02/07	0.19	0.039	<0.036	<0.036	0.0068	3	0.35	0.036	0.26	0.44
BPCS04_708 1/2 ST JOHNS AVE	07/11/06	0.44	<0.066	<0.16	<0.16	<0.16	17	1.1	<0.16	0.33	1.6
BPCS04_708 1/2 ST JOHNS AVE	02/02/07	0.18	0.026	<0.039	<0.039	0.0053	3.1	0.2	0.039	0.15	0.33

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**708 1/2 ST. JOHNS AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloro-ethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)
BPIA04_708 1/2 SAINT JOHNS AVE	07/11/06	<0.085	7.5	3.2	0.085	0.43	<0.085	0	0.59
BPIA04_708 1/2 SAINT JOHNS AVE	02/02/07	<0.036	1.9	0.69	0.1	0.18	<0.036	6.5	0.13
BPCS04_708 1/2 ST JOHNS AVE	07/11/06	<0.16	7.4	2.5	<0.16	<0.66	<0.16	15	0.21
BPCS04_708 1/2 ST JOHNS AVE	02/02/07	<0.039	1.4	0.49	0.058	0.16	<0.039	3.6	0.082

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**711 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
711 Central Ave_Main East Wing	02/07/18	20180207-711CENTRAL-06	7.5	0.47	<0.084	<0.084	<0.054	0.18	<1.6	1.1	0.54	0.25
711 Central Ave_Main West Wing	02/07/18	20180207-711CENTRAL-05	3.9	<0.14	<0.1	<0.1	<0.066	<0.057	<2	0.89	0.51	0.2
711 Central Ave_Basement Church	02/07/18	20180207-711CENTRAL-02	18.4	0.17	<0.066	<0.066	<0.043	<0.037	<1.6	0.9	0.57 J	0.23
	02/07/18	20180207-A	21.3	0.21	<0.066	<0.066	<0.043	<0.037	<1.6	0.9	0.33 J	0.24
711 Central Ave_Basement East Wing	02/07/18	20180207-711CENTRAL-04	46.6	0.34	<0.086	<0.086	<0.055	<0.048	<1.6	1.1	0.3	0.17
711 Central Ave_Basement Hallway	02/07/18	20180207-711CENTRAL-01	12.7	1.1	<0.068	<0.068	<0.044	<0.038	4.3	0.99	0.42	0.37
711 Central Ave_Basement Utility Room	02/07/18	20180207-711CENTRAL-03	48.1	1.1	<0.068	<0.068	<0.044	<0.038	<1.7	0.99	0.58	0.66
711 Central Ave_Subslab Church	02/07/18	20180207-711CENTRAL-07	26200	47.3	<1.3	<1.3	<0.42	<0.72	<1.6	<0.52	<1	17.8
711 Central Ave_Subslab Utility Room	02/07/18	20180207-711CENTRAL-08	1650000 J	12600	4430	13.7	<0.4	<0.7	<1.5 R	4.7	<0.99	69.6

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit
DUP - Field duplicate sample
NA - Not applicable
J+ - Estimated concentration, possibly biased high
UJ - Estimated reporting limit
R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues
MT DEQ - Montana Department of Environmental Quality
APH - Air-phase petroleum hydrocarbons

**711 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
711 Central Ave_Main East Wing	02/07/18	20180207-711CENTRAL-06	<0.086	0.11	<1.4	<1.7	<0.14	<3.4	<1.3	<0.16	<2	<0.098
711 Central Ave_Main West Wing	02/07/18	20180207-711CENTRAL-05	<0.1	0.11	<1.8	<2.1	<0.17	<4.2	<1.6	<0.2	<2.5	<0.12
711 Central Ave_Basement Church	02/07/18	20180207-711CENTRAL-02	<0.067	0.1	<1.4	<1.7	<0.11	<3.4	<1.3	<0.13	<2	<0.077
	02/07/18	20180207-A	<0.067	0.1	<1.4	<1.7	<0.11	<3.4	<1.3	<0.13	<2	<0.077
711 Central Ave_Basement East Wing	02/07/18	20180207-711CENTRAL-04	<0.088	0.2	<1.4	<1.7	<0.15	<3.4	<1.3	<0.17	<2	<0.1
711 Central Ave_Basement Hallway	02/07/18	20180207-711CENTRAL-01	<0.069	0.12	<1.5	<1.8	<0.11	<3.5	<1.3	<0.13	<2	<0.079
711 Central Ave_Basement Utility Room	02/07/18	20180207-711CENTRAL-03	<0.069	0.1	<1.5	<1.8	<0.11	<3.5	<1.3	<0.13	<2	<0.079
711 Central Ave_Subslab Church	02/07/18	20180207-711CENTRAL-07	<1.3	<0.66	<1.4	<1.7	<2.2	<3.4	<1.3	<2.5	<2	<1.5
711 Central Ave_Subslab Utility Room	02/07/18	20180207-711CENTRAL-08	<1.3	<0.64	<1.4 R	<1.6 R	<2.1	<3.3 R	<1.2	<2.4 R	<1.9 R	<1.5

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues
- MT DEQ - Montana Department of Environmental Quality
- APH - Air-phase petroleum hydrocarbons

**711 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzen e (ug/m3)	Chloromethan e (ug/m3)
711 Central Ave_Main East Wing	02/07/18	20180207-711CENTRAL-06	<3.5 UJ	<6.7	<4.3 UJ	<0.15	<6.1 UJ	<0.12	20.3	<4.8	<1.5	0.89
711 Central Ave_Main West Wing	02/07/18	20180207-711CENTRAL-05	<4.4 UJ	<8.4	<5.3 UJ	<0.18	<7.6 UJ	<0.14	13.5	<6	<1.9	1
711 Central Ave_Basement Church	02/07/18	20180207-711CENTRAL-02	<3.6 UJ	<6.8	<4.4 UJ	<0.11	<6.2 UJ	<0.091	13.4 J	<4.9	<1.5	0.95
	02/07/18	20180207-A	<3.6 UJ	<6.8	<4.4 UJ	<0.11	<6.2 UJ	<0.091	9.2 J	<4.9	<1.5	0.83
711 Central Ave_Basement East Wing	02/07/18	20180207-711CENTRAL-04	<3.6 UJ	<6.8	<4.4 UJ	<0.15	<6.2 UJ	<0.12	9.8	<4.9	<1.5	1
711 Central Ave_Basement Hallway	02/07/18	20180207-711CENTRAL-01	<3.6 UJ	<7	<4.5 UJ	<0.12	<6.3 UJ	<0.093	17.8	<5	<1.6	0.87
711 Central Ave_Basement Utility Room	02/07/18	20180207-711CENTRAL-03	<3.6 UJ	<7	<4.5 UJ	<0.12	<6.3 UJ	<0.093	11.6	<5	<1.6	0.77
711 Central Ave_Subslab Church	02/07/18	20180207-711CENTRAL-07	<3.5 UJ	<6.7	4.6 J+	<1.1	<6.1 UJ	<0.89	12.1	<4.8	<1.5	<0.68
711 Central Ave_Subslab Utility Room	02/07/18	20180207-711CENTRAL-08	<3.4 R	<6.4 R	<4.1 UJ	<1.1 R	<5.8 R	<0.86	9.5	<4.6	1.8 J+	<0.65

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit
DUP - Field duplicate sample
NA - Not applicable
J+ - Estimated concentration, possibly biased high
UJ - Estimated reporting limit
R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues
MT DEQ - Montana Department of Environmental Quality
APH - Air-phase petroleum hydrocarbons

**711 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5- Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
711 Central Ave_Main East Wing	02/07/18	20180207-711CENTRAL-06	38.5	<1.6	13.4	<4	<0.97	<1.8	<1.6	1.5	<2.8	<1.4
711 Central Ave_Main West Wing	02/07/18	20180207-711CENTRAL-05	97.4	<2	<1.4	8.4	<1.2	<2.3	<2	<1.4	<3.6	<1.8
711 Central Ave_Basement Church	02/07/18	20180207-711CENTRAL-02	25.4	<1.6	<1.2	<4.1	<0.98	<1.9	<1.6	<1.2	<2.9	<1.4
	02/07/18	20180207-A	31.7	<1.6	<1.2	<4.1	<0.98	<1.9	<1.6	<1.2	<2.9	<1.4
711 Central Ave_Basement East Wing	02/07/18	20180207-711CENTRAL-04	24.1	<1.6	4.3	<4.1	<0.98	<1.9	<1.6	<1.2	<2.9	<1.4
711 Central Ave_Basement Hallway	02/07/18	20180207-711CENTRAL-01	64.7	1.8	<1.2	<4.2	<1	<1.9	1.7	<1.2	<3	<1.5
711 Central Ave_Basement Utility Room	02/07/18	20180207-711CENTRAL-03	15.1	<1.7	<1.2	<4.2	<1	<1.9	<1.7	3	<3	<1.5
711 Central Ave_Subslab Church	02/07/18	20180207-711CENTRAL-07	6.2	<1.6	<1.2	392	8.3	<1.8	<1.6	1.4	2.9	<1.4
711 Central Ave_Subslab Utility Room	02/07/18	20180207-711CENTRAL-08	3.6	<1.5 R	<1.1	<3.9	<0.93	<1.8	<1.5 R	1.8	<2.7 R	<1.4 R

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit
DUP - Field duplicate sample
NA - Not applicable
J+ - Estimated concentration, possibly biased high
UJ - Estimated reporting limit
R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues
MT DEQ - Montana Department of Environmental Quality
APH - Air-phase petroleum hydrocarbons

**711 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro- difluoro- methane (ug/m3)	1,1-Dichloro- ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1- Trichloro- ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
711 Central Ave_Main East Wing	02/07/18	20180207-711CENTRAL-06	3.5	<0.084	105	<5.9	7.5	<0.12	<1.1	<1.3	<1	<0.86
711 Central Ave_Main West Wing	02/07/18	20180207-711CENTRAL-05	2.4	<0.1	<7.1	<7.4	1.9	<0.14	<1.4	<1.7	<1.3	<1.1
711 Central Ave_Basement Church	02/07/18	20180207-711CENTRAL-02	8.1	<0.066	<5.8	<6	2.1	<0.091	<1.1	<1.4	<1	<0.88
	02/07/18	20180207-A	7.4	<0.066	<5.8	<6	2	<0.091	<1.1	<1.4	<1	<0.88
711 Central Ave_Basement East Wing	02/07/18	20180207-711CENTRAL-04	6.7	<0.086	28.7	<6	3.8	<0.12	<1.1	<1.4	<1	<0.88
711 Central Ave_Basement Hallway	02/07/18	20180207-711CENTRAL-01	5.8	<0.068	<5.9	<6.1	3	<0.093	<1.2	<1.4	<1.1	<0.9
711 Central Ave_Basement Utility Room	02/07/18	20180207-711CENTRAL-03	4	<0.068	<5.9	<6.1	1.8	<0.093	<1.2	<1.4	<1.1	<0.9
711 Central Ave_Subslab Church	02/07/18	20180207-711CENTRAL-07	2.3	<1.3	<5.7	<5.9	1.9	<1.8	<1.1	<1.3	<1	<0.86
711 Central Ave_Subslab Utility Room	02/07/18	20180207-711CENTRAL-08	15.7	<1.2	<5.5	<5.7	1.7	3.6	<1.1	<1.3	<0.98	<0.83

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit
 DUP - Field duplicate sample
 NA - Not applicable
 J+ - Estimated concentration, possibly biased high
 UJ - Estimated reporting limit
 R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues
 MT DEQ - Montana Department of Environmental Quality
 APH - Air-phase petroleum hydrocarbons

**711 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
711 Central Ave_Main East Wing	02/07/18	20180207-711CENTRAL-06	<2.8	<2.3	<2	<2	<0.096	<0.096	<1.2	<6.7	<0.56	<1.4
711 Central Ave_Main West Wing	02/07/18	20180207-711CENTRAL-05	<3.5	<2.9	<2.5	<2.5	<0.12	<0.12	<1.5	<8.4	<0.7	<1.7
711 Central Ave_Basement Church	02/07/18	20180207-711CENTRAL-02	<2.8	<2.3	<2	<2	<0.076	<0.076	<1.2	<6.8	<0.57	<1.4
	02/07/18	20180207-A	<2.8	<2.3	<2	<2	<0.076	<0.076	<1.2	<6.8	<0.57	<1.4
711 Central Ave_Basement East Wing	02/07/18	20180207-711CENTRAL-04	<2.8	<2.3	<2	<2	<0.098	<0.098	<1.2	<6.8	<0.57	<1.4
711 Central Ave_Basement Hallway	02/07/18	20180207-711CENTRAL-01	<2.9	<2.4	<2	<2	<0.077	<0.077	<1.2	<7	<0.59	<1.5
711 Central Ave_Basement Utility Room	02/07/18	20180207-711CENTRAL-03	<2.9	<2.4	<2	<2	<0.077	<0.077	<1.2	<7	<0.59	<1.5
711 Central Ave_Subslab Church	02/07/18	20180207-711CENTRAL-07	<2.8	<2.3	<2	<2	<1.5	<1.5	<1.2	<6.7	<0.56	<1.4
711 Central Ave_Subslab Utility Room	02/07/18	20180207-711CENTRAL-08	<2.7 R	<2.2	<1.9 R	<1.9 R	<1.4	<1.4	<1.1	<6.4	<0.54	<1.3 R

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit
 DUP - Field duplicate sample
 NA - Not applicable
 J+ - Estimated concentration, possibly biased high
 UJ - Estimated reporting limit
 R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues
 MT DEQ - Montana Department of Environmental Quality
 APH - Air-phase petroleum hydrocarbons

**711 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-trifluoro-ethane (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)
711 Central Ave_Main East Wing	02/07/18	20180207-711CENTRAL-06	<2.5	--	--	--	--	--	<19.3	<19.3	<22.5
711 Central Ave_Main West Wing	02/07/18	20180207-711CENTRAL-05	<3.1	--	--	--	--	--	<24.1	<24.1	<28.1
711 Central Ave_Basement Church	02/07/18	20180207-711CENTRAL-02	<2.6	--	--	--	--	--	<19.7	<19.7	<23
	02/07/18	20180207-A	<2.6	--	--	--	--	--	<19.7	<19.7	<23
711 Central Ave_Basement East Wing	02/07/18	20180207-711CENTRAL-04	<2.6	--	--	--	--	--	<19.7	<19.7	<23
711 Central Ave_Basement Hallway	02/07/18	20180207-711CENTRAL-01	<2.6	--	--	--	--	--	<20.2	<20.2	<23.5
711 Central Ave_Basement Utility Room	02/07/18	20180207-711CENTRAL-03	<2.6	--	--	--	--	--	<20.2	<20.2	<23.5
711 Central Ave_Subslab Church	02/07/18	20180207-711CENTRAL-07	<2.5	<16.1	79.9	19.1	<2	<3.6	3850 J	<19.3	<22.5
711 Central Ave_Subslab Utility Room	02/07/18	20180207-711CENTRAL-08	<2.4	121	80.6	18.5	<2	<3.6	673000	<18.6 R	<21.7 R

Applicable Residential Screening Levels	520	NA	NA	NA	NA	NA	NA	94	10	44
Applicable Industrial Screening Levels	2,200	NA	NA	NA	NA	NA	NA	94	10	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit
DUP - Field duplicate sample
NA - Not applicable
J+ - Estimated concentration, possibly biased high
UJ - Estimated reporting limit
R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues
MT DEQ - Montana Department of Environmental Quality
APH - Air-phase petroleum hydrocarbons

**711 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)
BPIA18_711 CENTRAL AVE CHURCH	06/06/07	85	1.1	0.06	0.0052	0.0044	--	<0.17	<0.17	0.043	0.11
	06/19/08	18	<6.2	<4.6	<4.6	<2.9	--	<3.7	<3.4	<4.6	<4.6
BPIA47_711 CENTRAL AVE CHURCH SERVICE ROOM	02/02/07	130	0.24	<0.36	<0.36	<0.36	--	<1.5	<1.5	<0.36	0.11
BPIA18_711 CENTRAL AVE WIC ROOM	09/21/06	16	<0.28	<0.2	<1	<0.066	--	1.3	0.45	<0.21	<0.21
	06/19/08	7.8	<5	<3.7	<3.7	<2.4	--	<3	<2.7	<3.8	<3.8
BPIA38_711 CENTRAL AVE WIC ROOM	12/03/06	18	<0.17	<0.13	<0.64	<0.041	--	3.3	0.28	<0.13	<0.13
BPIA37_711 CENTRAL AVE BASEMENT FLOOR HALL	12/03/06	120	6.3	<0.13	<0.67	<0.043	--	3	<0.16	<0.14	<0.14
	06/06/07	70	7.2	0.057	0.0066	0.0053	--	0.51	<0.16	<0.04	0.14
BPIA18_711 CENTRAL BOILER ROOM	09/21/06	100	0.13	0.19	<0.74	0.048	--	1.3	0.22	<0.15	<0.15
BPS-IA-3_711 CENTRAL AVE_Lower level in chapel	03/26/01	6.2	<0.18	<0.26	--	<0.28	0.37	0.43	<0.24	--	--
BPSS18_711 CENTRAL AVE BOILER ROOM	09/22/06	180000	25000	11000	<4900	<3200	--	<4000	<3600	<5000	<5000
BPSS18_711 CENTRAL AVE CHURCH	06/07/07	820000	16000	16000	<16000	16000	--	<16000	16000	16000	<16000
BPSS18_711 CENTRAL AVE WIC ROOM COOLER	06/07/07	75000	92	<950	<950	<950	--	<950	<950	<950	<950
BPSS18_711 CENTRAL AVE WIC ROOM FOUNTAIN	06/07/07	220000	1100	<3200	<3200	<3200	--	<3200	<3200	<3200	<3200
BPSS18_711 CENTRAL AVENUE ELEVATOR	06/07/07	6700	2100	15	<94	<94	--	<94	<94	<94	<94

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	6.3	1.3	0.12	1.8	0.23
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	26	1.6	0.53	7.7	0.47

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

MT DEQ - Montana Department of Environmental Quality

APH - Air-phase petroleum hydrocarbons

**711 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Ethyl- benzene (ug/m3)	1,4-Di- chloro- benzene (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chloromethane (ug/m3)	4-Ethyltoluene (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)
BPIA18_711 CENTRAL AVE CHURCH	06/06/07	0.71	--	--	<0.043	--	--	--	--	--	--
	06/19/08	<5	--	--	<6.3	--	--	--	--	--	--
BPIA47_711 CENTRAL AVE CHURCH SERVICE ROOM	02/02/07	0.42	--	--	<0.36	--	--	--	--	--	--
BPIA18_711 CENTRAL AVE WIC ROOM	09/21/06	0.68	--	--	<0.28	--	--	--	--	--	--
	06/19/08	<4	--	--	<5.1	--	--	--	--	--	--
BPIA38_711 CENTRAL AVE WIC ROOM	12/03/06	1.3	--	--	<0.18	--	--	--	--	--	--
BPIA37_711 CENTRAL AVE BASEMENT FLOOR HALL	12/03/06	1.4	--	--	<0.18	--	--	--	--	--	--
	06/06/07	1	--	--	<0.04	--	--	--	--	--	--
BPIA18_711 CENTRAL BOILER ROOM	09/21/06	0.47	--	--	<0.2	--	--	--	--	--	--
BPS-IA-3_711 CENTRAL AVE_Lower level in chapel	03/26/01	<0.25	<0.29	<0.26	--	<5.8	0.3	0.64	<0.27	0.39	<0.32
BPSS18_711 CENTRAL AVE BOILER ROOM	09/22/06	<5400	--	--	<6800	--	--	--	--	--	--
BPSS18_711 CENTRAL AVE CHURCH	06/07/07	<16000	--	--	<16000	--	--	--	--	--	--
BPSS18_711 CENTRAL AVE WIC ROOM COOLER	06/07/07	<950	--	--	<950	--	--	--	--	--	--
BPSS18_711 CENTRAL AVE WIC ROOM FOUNTAIN	06/07/07	<3200	--	--	<3200	--	--	--	--	--	--
BPSS18_711 CENTRAL AVENUE ELEVATOR	06/07/07	<94	--	--	<94	--	--	--	--	--	--

Applicable Residential Screening Levels	1.1	0.26	0.21	0.021	3,200	520	9.4	NA	1.3	6.3
Applicable Industrial Screening Levels	4.9	1.1	0.88	0.088	14,000	2,200	39	NA	1.3	26

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues
- MT DEQ - Montana Department of Environmental Quality
- APH - Air-phase petroleum hydrocarbons

**711 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	Dichloro- difluoro- methane (ug/m3)	1,1-Dichloro- ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1- Trichloro- ethane (ug/m3)	Carbon Disulfide (ug/m3)	1,2-Di- chloro- benzene (ug/m3)
BPIA18_711 CENTRAL AVE CHURCH	06/06/07	2.8	0.78	--	0.031	0.25	0.017	2.6	0.072	--	--
	06/19/08	<5	<5	--	<4.6	<4	<4.1	<4.3	<6.3	--	--
BPIA47_711 CENTRAL AVE CHURCH SERVICE ROOM	02/02/07	1.6	0.56	--	<0.36	0.25	<0.36	2.7	0.091	--	--
BPIA18_711 CENTRAL AVE WIC ROOM	09/21/06	2.1	0.77	--	<0.1	<1.8	<0.93	4.6	<0.28	--	--
	06/19/08	<4.1	<4.1	--	<3.7	<3.2	<3.4	<3.5	<5.1	--	--
BPIA38_711 CENTRAL AVE WIC ROOM	12/03/06	4.4	1.6	--	0.064	<1.1	<0.58	7.9	<0.18	--	--
BPIA37_711 CENTRAL AVE BASEMENT FLOOR HALL	12/03/06	4.3	1.5	--	0.067	<1.2	<0.6	18	<0.18	--	--
	06/06/07	3.3	0.98	--	0.027	0.35	0.043	10	0.064	--	--
BPIA18_711 CENTRAL BOILER ROOM	09/21/06	1.7	0.58	--	0.074	<1.3	<0.67	3.1	<0.2	--	--
BPS-IA-3_711 CENTRAL AVE_Lower level in chapel	03/26/01	0.58	<0.27	4.3	--	<0.23	--	1	<0.22	<0.25	<0.24
BPSS18_711 CENTRAL AVE BOILER ROOM	09/22/06	<5400	<5400	--	4900	6700	<4500	59000	<6800	--	--
BPSS18_711 CENTRAL AVE CHURCH	06/07/07	<16000	<16000	--	16000	<16000	<16000	<16000	16000	--	--
BPSS18_711 CENTRAL AVE WIC ROOM COOLER	06/07/07	<950	<950	--	<950	<950	<950	<950	<950	--	--
BPSS18_711 CENTRAL AVE WIC ROOM FOUNTAIN	06/07/07	<3200	<3200	--	3200	<3200	<3200	<3200	<3200	--	--
BPSS18_711 CENTRAL AVENUE ELEVATOR	06/07/07	<94	<94	--	<94	<94	<94	<94	<94	--	--

Applicable Residential Screening Levels	10	10	10	21	63	11	520	520	73	21
Applicable Industrial Screening Levels	44	44	44	88	260	47	2,200	2,200	310	88

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

MT DEQ - Montana Department of Environmental Quality

APH - Air-phase petroleum hydrocarbons

**711 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Styrene (ug/m3)	1,1,2- Trichloro- trifluoro- ethane (ug/m3)
BPIA18_711 CENTRAL AVE CHURCH	06/06/07	--	--
	06/19/08	--	--
BPIA47_711 CENTRAL AVE CHURCH SERVICE ROOM	02/02/07	--	--
BPIA18_711 CENTRAL AVE WIC ROOM	09/21/06	--	--
	06/19/08	--	--
BPIA38_711 CENTRAL AVE WIC ROOM	12/03/06	--	--
BPIA37_711 CENTRAL AVE BASEMENT FLOOR HALL	12/03/06	--	--
	06/06/07	--	--
BPIA18_711 CENTRAL BOILER ROOM	09/21/06	--	--
BPS-IA-3_711 CENTRAL AVE_Lower level in chapel	03/26/01	<0.22	<0.27
BPSS18_711 CENTRAL AVE BOILER ROOM	09/22/06	--	--
BPSS18_711 CENTRAL AVE CHURCH	06/07/07	--	--
BPSS18_711 CENTRAL AVE WIC ROOM COOLER	06/07/07	--	--
BPSS18_711 CENTRAL AVE WIC ROOM FOUNTAIN	06/07/07	--	--
BPSS18_711 CENTRAL AVENUE ELEVATOR	06/07/07	--	--

Applicable Residential Screening Levels	100	520
Applicable Industrial Screening Levels	440	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

MT DEQ - Montana Department of Environmental Quality

APH - Air-phase petroleum hydrocarbons

**715 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
715 Central Ave_Main East Process	02/12/18	20180212-715CENTRAL-01	85.1	<0.83	<1.2	<1.2	<0.4	<0.68	4.1	0.72	<0.97 UJ	0.88
715 Central Ave_Main Mid Process	02/12/18	20180212-715CENTRAL-02	40.2	0.24	<0.088	<0.088	<0.057	0.19	2.6	0.89	<0.14	1.2
715 Central Ave_Main Office	02/12/18	20180212-715CENTRAL-03	26.1	1.4	0.47	0.76	<0.24	<0.2	638	1.4	<0.58	0.67
715 Central Ave_Subslab Mid Process	02/12/18	20180212-715CENTRAL-06	209	<0.85	<1.2	<1.2	<0.4	<0.7	2.5	<0.5	<0.99 UJ	<0.77
715 Central Ave_Subslab NE Process	02/12/18	20180212-715CENTRAL-05	3310000 J	<9050	<13400	<13400	<4310	<7460	<16600	<5380	<10600 UJ	<8220
715 Central Ave_Subslab NE Process	02/12/18	20180212-A	1390000 J	<8880	<13100	<13100	<4230	<7320	<16200	<5280	<10400 UJ	<8070
715 Central Ave_Subslab Office	02/12/18	20180212-715CENTRAL-04	833	1.1	<1.2	<1.2	<0.4	<0.7	2.1	<0.5	<0.99 UJ	<0.77
715 Central Ave_Subslab SE Process	02/12/18	20180212-715CENTRAL-07	1420000	<9050	<13400	<13400	<4310	<7460	<16600	<5380	<10600 UJ	<8220

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**715 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
715 Central Ave_Main East Process	02/12/18	20180212-715CENTRAL-01	<1.3	<0.62	2.7	<1.6	<2.1	<3.2	<1.2	<2.4	<1.9	<1.4
715 Central Ave_Main Mid Process	02/12/18	20180212-715CENTRAL-02	<0.09	0.1	1.7	<1.8	<0.15	<3.5	<1.3	<0.17	<2	<0.1
715 Central Ave_Main Office	02/12/18	20180212-715CENTRAL-03	<0.37	0.44	33.6	<9.5	<0.62	<19	<7.1	1.9	<11.1	<0.43
715 Central Ave_Subslab Mid Process	02/12/18	20180212-715CENTRAL-06	<1.3	<0.64	<1.4	<1.6	<2.1	<3.3	<1.2	<2.4	<1.9	<1.5
715 Central Ave_Subslab NE Process	02/12/18	20180212-715CENTRAL-05	<13600	<6810	<14600	<17400	<22500	<34800	<13100	<25800	<20200	<15600
715 Central Ave_Subslab NE Process	02/12/18	20180212-A	<13400	<6680	<14400	<17100	<22100	<34100	<12800	<25400	<19800	<15300
715 Central Ave_Subslab Office	02/12/18	20180212-715CENTRAL-04	<1.3	<0.64	<1.4	<1.6	<2.1	<3.3	<1.2	<2.4	41.6	<1.5
715 Central Ave_Subslab SE Process	02/12/18	20180212-715CENTRAL-07	<13600	<6810	<14600	<17400	<22500	<34800	<13100	<25800	<20200	<15600

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**715 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
715 Central Ave_Main East Process	02/12/18	20180212-715CENTRAL-01	<3.3	<6.3	<4	<1.1	<5.7	<0.84	42	<4.6	<1.4	1
715 Central Ave_Main Mid Process	02/12/18	20180212-715CENTRAL-02	<3.6	<7	<4.5	<0.15	<6.3	<0.12	8.6	<5	<1.6	0.77
715 Central Ave_Main Office	02/12/18	20180212-715CENTRAL-03	<19.7	<37.7	<24.1	<0.63	<34.2	<0.5	31.1	<27.2	<8.5	<3.8
715 Central Ave_Subslab Mid Process	02/12/18	20180212-715CENTRAL-06	<3.4	<6.4	<4.1	<1.1	<5.8	<0.86	10.6	<4.6	<1.5	<0.65
715 Central Ave_Subslab NE Process	02/12/18	20180212-715CENTRAL-05	<36000	<68900 UJ	<44100	<11600	<62500	<9200	<39900	<49700	<15500	<6960
715 Central Ave_Subslab NE Process	02/12/18	20180212-A	<35300	<67600 UJ	<43300	<11300	<61300	<9020	<39200	<48800	<15200	<6830
715 Central Ave_Subslab Office	02/12/18	20180212-715CENTRAL-04	<3.4	<6.4	<4.1	<1.1	<5.8	<0.86	93.7	20.1	2.4	<0.65
715 Central Ave_Subslab SE Process	02/12/18	20180212-715CENTRAL-07	<36000	<68900 UJ	<44100	<11600	<62500	<9200	<39900	<49700	<15500	<6960

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**715 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofura n (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
715 Central Ave_Main East Process	02/12/18	20180212-715CENTRAL-01	50.6	<1.5	2.4	18.4	<0.91	<1.7	<1.5	<1.1	12	4.8
715 Central Ave_Main Mid Process	02/12/18	20180212-715CENTRAL-02	31.2	<1.7	<1.2	<4.2	<1	<1.9	<1.7	<1.2	7.3	2.7
715 Central Ave_Main Office	02/12/18	20180212-715CENTRAL-03	383	131	<6.5	<22.6	<5.4	<10.3	185	<6.5	390	150
715 Central Ave_Subslab Mid Process	02/12/18	20180212-715CENTRAL-06	4	<1.5	2.1	<3.9	<0.93	<1.8	<1.5	<1.1	<2.7	<1.4
715 Central Ave_Subslab NE Process	02/12/18	20180212-715CENTRAL-05	<15900	<16600	<11900	<41400	<9940	<18900	<16600	<11900	<29300	<14600
715 Central Ave_Subslab NE Process	02/12/18	20180212-A	<15600	<16200	<11600	<40700	<9760	<18500	<16200	<11600	<28800	<14400
715 Central Ave_Subslab Office	02/12/18	20180212-715CENTRAL-04	32.7	<1.5	<1.1	<3.9	2.3	<1.8	<1.5	<1.1	<2.7	<1.4
715 Central Ave_Subslab SE Process	02/12/18	20180212-715CENTRAL-07	<15900	<16600	<11900	<41400	<9940	<18900	<16600	<11900	<29300	<14600

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**715 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro- difluoro- methane (ug/m3)	1,1-Dichloro- ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1- Trichloro- ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
715 Central Ave_Main East Process	02/12/18	20180212-715CENTRAL-01	1.8	<1.2	8	<5.6	11.7	<1.7	<1.1	4.1	<0.96	<0.81
715 Central Ave_Main Mid Process	02/12/18	20180212-715CENTRAL-02	1.8	<0.088	<5.9	<6.1	3.1	<0.12	<1.2	2.7	<1.1	<0.9
715 Central Ave_Main Office	02/12/18	20180212-715CENTRAL-03	<9.2	<0.37	<32	<33.2	46.3	<0.5	<6.3	<7.5	<5.7	<4.9
715 Central Ave_Subslab Mid Process	02/12/18	20180212-715CENTRAL-06	2	<1.2	<5.5	<5.7	<1.2	<1.7	<1.1	1.6	5.2	<0.83
715 Central Ave_Subslab NE Process	02/12/18	20180212-715CENTRAL-05	<16700	<13400	<58500	<60600	<12700	<18400	<11600	<13800	<10500	<8880
715 Central Ave_Subslab NE Process	02/12/18	20180212-A	<16400	<13100	<57400	<59500	<12500	<18000	<11400	<13500	<10300	<8720
715 Central Ave_Subslab Office	02/12/18	20180212-715CENTRAL-04	<1.6	<1.2	<5.5	<5.7	1.8	<1.7	<1.1	<1.3	<0.98	<0.83
715 Central Ave_Subslab SE Process	02/12/18	20180212-715CENTRAL-07	<16700	<13400	<58500	<60600	<12700	<18400	<11600	<13800	<10500	<8880

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**715 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo-chloromethane (ug/m3)	1,2-Dichloro-1,1,2,2-tetrafluoroethane (ug/m3)	1,2-Dichlorobenzene (ug/m3)	1,3-Dichlorobenzene (ug/m3)	Cis-1,3-dichloropropene (ug/m3)	trans-1,3-Dichloropropene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl-2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
715 Central Ave_Main East Process	02/12/18	20180212-715CENTRAL-01	<2.6	<2.2	<1.9	<1.9	<1.4	<1.4	1.8	<6.3	<0.53	29.1
715 Central Ave_Main Mid Process	02/12/18	20180212-715CENTRAL-02	<2.9	<2.4	<2	<2	<0.1	<0.1	<1.2	<7	<0.59	<1.5
715 Central Ave_Main Office	02/12/18	20180212-715CENTRAL-03	<15.7	<12.9	<11.1	<11.1	<0.42	<0.42	<6.6	<37.7	<3.2	<7.8
715 Central Ave_Subslab Mid Process	02/12/18	20180212-715CENTRAL-06	<2.7	<2.2	<1.9	<1.9	<1.4	<1.4	<1.1	<6.4	3.4	<1.3
715 Central Ave_Subslab NE Process	02/12/18	20180212-715CENTRAL-05	<28700	<23500	<20200	<20200	<15300	<15300	<12100	<68900	<5800	<14300
715 Central Ave_Subslab NE Process	02/12/18	20180212-A	<28100	<23100	<19800	<19800	<15000	<15000	<11900	<67600	<5690	<14100
715 Central Ave_Subslab Office	02/12/18	20180212-715CENTRAL-04	<2.7	<2.2	42.1	4.3	<1.4	<1.4	<1.1	<6.4	<0.54	<1.3
715 Central Ave_Subslab SE Process	02/12/18	20180212-715CENTRAL-07	<28700	<23500	<20200	<20200	<15300	<15300	<12100	<68900	<5800	<14300

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**715 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
715 Central Ave_Main East Process	02/12/18	20180212-715CENTRAL-01	<2.4	107	<18.2	50	--	--	--	--	--
715 Central Ave_Main Mid Process	02/12/18	20180212-715CENTRAL-02	<2.6	<20.2	<20.2	<23.5	--	--	--	--	--
715 Central Ave_Main Office	02/12/18	20180212-715CENTRAL-03	<14.1	141	2750	2480	--	--	--	--	--
715 Central Ave_Subslab Mid Process	02/12/18	20180212-715CENTRAL-06	<2.4	99.3 J+	<18.6 R	25.2 J+	24.6	79.7	19.6	<2	<3.6
715 Central Ave_Subslab NE Process	02/12/18	20180212-715CENTRAL-05	<25800	1490000 J	<199000	247000	<21.5	79.2	20.7	<2	<3.6
715 Central Ave_Subslab NE Process	02/12/18	20180212-A	<25400	<195000 R	<195000 R	<228000 R	<15.8	78.7	20.9	<2	<3.6
715 Central Ave_Subslab Office	02/12/18	20180212-715CENTRAL-04	<2.4	761	<18.6	151	<20.8	78.9	21.1	<2	<3.6
715 Central Ave_Subslab SE Process	02/12/18	20180212-715CENTRAL-07	<25800	<199000	<199000	242000	<16.1	79.7	19.3	<2	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA	NA

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**715 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)
BPSS55_715 CENTRAL AVE BOILER ROOM	06/07/07	260000	470	<4200	<4200	<4200	<4200	<4200	<4200	<4200	<4200
BPSS55_715 CENTRAL AVE NE CORNER	06/07/07	290000	1300	<3000	<3000	<3000	<3000	<3000	<3000	<3000	<3000
BPSS55_715 CENTRAL AVE NW CORNER	06/07/07	110000	1400	<1200	<1200	<1200	<1200	<1200	<1200	<1200	<1200
BPSS55_715 CENTRAL AVE SE WALL	06/07/07	970000	12000	12000	<12000	12000	<12000	12000	12000	<12000	<12000
BPSS55_715 CENTRAL AVE_AREA 1	07/16/07	161.567	<537	--	--	--	--	<488	<405	<2025	--
BPSS55_715 CENTRAL AVE_AREA 2	07/16/07	524.026	<537	--	--	--	--	<488	<405	<2025	--
BPSS55_715 CENTRAL AVE_AREA 3	07/16/07	3804.25	37.745	--	--	--	--	57.828	<405	<2025	--
BPSS55_715 CENTRAL AVE_AREA 4	07/16/07	20712.9	53700	--	--	--	--	48800	40500	202500	--
BPSS55_715 CENTRAL AVE_AREA 5	07/16/07	99055.8	53700	--	--	--	--	48800	40500	202500	--
BPSS55_715 CENTRAL AVE_AREA 6	07/16/07	547.959	<5370	--	--	--	--	<4880	<4050	<20250	--
BPSS55F_715 CENTRAL AVE NW CORNER	07/16/07	334932	53700	--	--	--	--	48800	40500	202500	--
BPSS55I_715 CENTRAL AVE	07/16/07	5642.99	<537	--	--	--	--	<976	<405	<4050	--
BPSS55J_715 CENTRAL AVE	07/16/07	67244	537000	--	--	--	--	488000	405000	202500	--

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**715 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2- Trichloro- ethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloro- ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1- Trichloro- ethane (ug/m3)
BPSS55_715 CENTRAL AVE BOILER ROOM	06/07/07	<4200	<4200	<4200	4200	<4200	<4200	<4200	<4200
BPSS55_715 CENTRAL AVE NE CORNER	06/07/07	<3000	<3000	<3000	3000	<3000	<3000	<3000	<3000
BPSS55_715 CENTRAL AVE NW CORNER	06/07/07	<1200	<1200	<1200	1200	<1200	<1200	<1200	<1200
BPSS55_715 CENTRAL AVE SE WALL	06/07/07	<12000	<12000	<12000	12000	<12000	<12000	<12000	12000
BPSS55_715 CENTRAL AVE_AREA 1	07/16/07	<546	--	--	<397	<347	--	--	--
BPSS55_715 CENTRAL AVE_AREA 2	07/16/07	<546	--	--	3970	<347	--	--	--
BPSS55_715 CENTRAL AVE_AREA 3	07/16/07	<546	--	--	<397	<347	--	--	--
BPSS55_715 CENTRAL AVE_AREA 4	07/16/07	<54600	--	--	39700	<34700	--	--	--
BPSS55_715 CENTRAL AVE_AREA 5	07/16/07	<54600	--	--	39700	<34700	--	--	--
BPSS55_715 CENTRAL AVE_AREA 6	07/16/07	<5460	--	--	3970	<3470	--	--	--
BPSS55F_715 CENTRAL AVE NW CORNER	07/16/07	<54600	--	--	39700	<34700	--	--	--
BPSS55I_715 CENTRAL AVE	07/16/07	<1092	--	--	<397	<694	--	--	--
BPSS55J_715 CENTRAL AVE	07/16/07	546000	--	--	39700	347000	--	--	--

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**820 DIVISION STREET VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
820 Division St_Main	02/12/18	20180212-820DIVISION-01	1.5	0.098	<0.066	<0.066	<0.043	<0.037	4	0.76	0.63 J	0.22
820 Division St_Basement	02/12/18	20180212-820DIVISION-02	13.7	0.78	<0.068	<0.068	<0.044	<0.038	29.9	0.74	0.46 J	1

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**820 DIVISION STREET VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
820 Division St_Main	02/12/18	20180212-820DIVISION-01	<0.067	0.15	<1.4	<1.7	<0.11	<3.4	<1.3	<0.13	<2	<0.077
820 Division St_Basement	02/12/18	20180212-820DIVISION-02	<0.069	0.097	<1.5	<1.8	<0.11	<3.5	<1.3	<0.13	<2	<0.079

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**820 DIVISION STREET VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
820 Division St_Main	02/12/18	20180212-820DIVISION-01	<3.6	<6.8	<4.4	<0.11	<6.2	<0.091	21.8	<4.9	<1.5	<0.69
820 Division St_Basement	02/12/18	20180212-820DIVISION-02	<3.6	<7	<4.5	<0.12	<6.3	<0.093	<4	10.1	<1.6	<0.71

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**820 DIVISION STREET VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
820 Division St_Main	02/12/18	20180212-820DIVISION-01	388	1.7	<1.2	56	<0.98	<1.9	<1.6	<1.2	<2.9	<1.4
820 Division St_Basement	02/12/18	20180212-820DIVISION-02	36.2	10.8	<1.2	<4.2	<1	<1.9	7.8	<1.2	<3	<1.5

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**820 DIVISION STREET VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
820 Division St_Main	02/12/18	20180212-820DIVISION-01	<1.7	<0.066	<5.8	<6	<1.3	<0.091	<1.1	<1.4	<1	<0.88
820 Division St_Basement	02/12/18	20180212-820DIVISION-02	<1.7	<0.068	<5.9	<6.1	<1.3	0.11	<1.2	<1.4	<1.1	<0.9

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**820 DIVISION STREET VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
820 Division St_Main	02/12/18	20180212-820DIVISION-01	<2.8	<2.3	<2	<2	<0.076	<0.076	<1.2	<6.8	<0.57	<1.4
820 Division St_Basement	02/12/18	20180212-820DIVISION-02	<2.9	<2.4	<2	<2	<0.077	<0.077	<1.2	<7	<0.59	<1.5

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**820 DIVISION STREET VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichlorotrifluoroethane (ug/m3)
820 Division St_Main	02/12/18	20180212-820DIVISION-01	<2.6
820 Division St_Basement	02/12/18	20180212-820DIVISION-02	<2.6

Applicable Residential Screening Levels	520
Applicable Industrial Screening Levels	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**820 DIVISION STREET VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)
BPIA100_820 DIVISION ST	03/04/08	2.9	<1.5	<1.5	<1.5	<1.5	1.4	0.33	<1.5	<1.5	0.45
BPCS10_820 DIVISION ST	03/04/08	8.8	0.23	<1.8	<1.8	<1.8	--	<1.8	<1.8	<1.8	--

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit
 DUP - Field duplicate sample
 NA - Not applicable
 J+ - Estimated concentration, possibly biased high
 UJ - Estimated reporting limit
 R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**820 DIVISION STREET VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloro-ethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)
BPIA100_820 DIVISION ST	03/04/08	<1.5	1.7	0.69	<1.5	0.35	<1.5	1.8	<1.5
BPCS10_820 DIVISION ST	03/04/08	<1.8	--	--	<1.8	0.35	<1.8	--	<1.8

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1020 COOK AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
1020 Cook Ave_Main East Wing	02/08/18	20180208-1020COOK-04	0.13	<0.088	<0.065	<0.065	<0.042	<0.036	<1.6	0.69	0.52	1.1
1020 Cook Ave_Main West Wing	02/08/18	20180208-1020COOK-03	0.14	<0.11	<0.081	<0.081	<0.053	<0.045	<1.5	0.78	0.59	1.1
1020 Cook Ave_Crawlspace East Wing	02/08/18	20180208-1020COOK-02	0.33	0.22	<0.064	<0.064	<0.041	<0.036	<1.6	0.59	0.43	0.37
1020 Cook Ave_Crawlspace West Wing	02/08/18	20180208-1020COOK-01	0.24	<0.081	<0.06	<0.06	<0.039	<0.034	<1.5	0.57	0.53	0.36

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1020 COOK AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethylbenzene (ug/m3)	Benzylchloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Dichloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
1020 Cook Ave_Main East Wing	02/08/18	20180208-1020COOK-04	<0.066	0.17	<1.4	<1.7	0.26	<3.4	<1.3	<0.13	<2	<0.076
1020 Cook Ave_Main West Wing	02/08/18	20180208-1020COOK-03	<0.083	0.19	<1.4	<1.6	0.25	<3.3	<1.2	<0.16	<1.9	<0.095
1020 Cook Ave_Crawlspace East Wing	02/08/18	20180208-1020COOK-02	<0.065	0.11	<1.4	<1.7	<0.11	<3.3	<1.2	<0.12	<1.9	<0.074
1020 Cook Ave_Crawlspace West Wing	02/08/18	20180208-1020COOK-01	<0.061	0.11	<1.3	<1.6	<0.1	<3.1	<1.2	<0.12	<1.8	<0.07

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1020 COOK AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
1020 Cook Ave_Main East Wing	02/08/18	20180208-1020COOK-04	<3.5 UJ	<6.7	<4.3 UJ	<0.11	<6.1 UJ	<0.089	37.5	<4.8	<1.5	<0.68
1020 Cook Ave_Main West Wing	02/08/18	20180208-1020COOK-03	<3.4 UJ	<6.4	<4.1 UJ	<0.14	<5.8 UJ	<0.11	20.7	<4.6	<1.5	0.77
1020 Cook Ave_Crawlspace East Wing	02/08/18	20180208-1020COOK-02	<3.4 UJ	<6.6	<4.2 UJ	<0.11	<6 UJ	<0.088	10.6	<4.7	<1.5	<0.66
1020 Cook Ave_Crawlspace West Wing	02/08/18	20180208-1020COOK-01	<3.2 UJ	<6.2	<4 UJ	0.11	<5.6 UJ	<0.083	15.3	<4.5	<1.4	<0.63

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1020 COOK AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
1020 Cook Ave_Main East Wing	02/08/18	20180208-1020COOK-04	669 J	<1.6	<1.2	182	<0.97	<1.8	<1.6	2.8	<2.8	<1.4
1020 Cook Ave_Main West Wing	02/08/18	20180208-1020COOK-03	753 J	<1.5	<1.1	127	<0.93	<1.8	<1.5	<1.1	<2.7	<1.4
1020 Cook Ave_Crawlspace East Wing	02/08/18	20180208-1020COOK-02	178	<1.6	<1.1	13	<0.95	<1.8	<1.6	<1.1	<2.8	<1.4
1020 Cook Ave_Crawlspace West Wing	02/08/18	20180208-1020COOK-01	188	<1.5	<1.1	17.8	<0.89	<1.7	<1.5	2	<2.6	<1.3

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1020 COOK AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
1020 Cook Ave_Main East Wing	02/08/18	20180208-1020COOK-04	2.4	<0.065	<5.7	<5.9	1.7	<0.089	<1.1	<1.3	<1	<0.86
1020 Cook Ave_Main West Wing	02/08/18	20180208-1020COOK-03	2.4	<0.081	<5.5	<5.7	1.3	<0.11	<1.1	<1.3	<0.98	<0.83
1020 Cook Ave_Crawlspace East Wing	02/08/18	20180208-1020COOK-02	5.9	<0.064	<5.6	<5.8	<1.2	<0.088	<1.1	<1.3	<1	<0.85
1020 Cook Ave_Crawlspace West Wing	02/08/18	20180208-1020COOK-01	4.3	<0.06	<5.3	<5.5	<1.1	<0.083	<1	<1.2	<0.94	<0.8

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1020 COOK AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
1020 Cook Ave_Main East Wing	02/08/18	20180208-1020COOK-04	<2.8	<2.3	<2	<2	<0.074	<0.074	2.1	<6.7	<0.56	<1.4
1020 Cook Ave_Main West Wing	02/08/18	20180208-1020COOK-03	<2.7	<2.2	<1.9	<1.9	<0.093	<0.093	1.8	<6.4	<0.54	<1.3
1020 Cook Ave_Crawlspace East Wing	02/08/18	20180208-1020COOK-02	<2.7	<2.2	<1.9	<1.9	<0.073	<0.073	<1.2	<6.6	<0.55	<1.4
1020 Cook Ave_Crawlspace West Wing	02/08/18	20180208-1020COOK-01	<2.6	<2.1	<1.8	<1.8	<0.069	<0.069	<1.1	<6.2	<0.52	<1.3

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1020 COOK AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)
1020 Cook Ave_Main East Wing	02/08/18	20180208-1020COOK-04	<2.5	<19.3	<19.3	<22.5
1020 Cook Ave_Main West Wing	02/08/18	20180208-1020COOK-03	<2.4	<18.6	<18.6	<21.7
1020 Cook Ave_Crawlspace East Wing	02/08/18	20180208-1020COOK-02	<2.5	<19	<19	<22.1
1020 Cook Ave_Crawlspace West Wing	02/08/18	20180208-1020COOK-01	<2.3	<17.9	<17.9	<20.9

Applicable Residential Screening Levels	520	94	10	44
Applicable Industrial Screening Levels	2,200	94	10	44

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1044 COOK AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
1044 Cook Ave_Main Annex	02/11/18	20180211-1044COOK-06	0.21	<0.092	<0.068	<0.068	<0.044	<0.038	<1.7	0.54	<0.11	<0.083
1044 Cook Ave_Main East Wing	02/11/18	20180211-1044COOK-02	0.2	<0.1	<0.075	<0.075	<0.049	<0.042	<1.4	0.94	0.32	0.16
1044 Cook Ave_Main West Wing	02/11/18	20180211-1044COOK-01	0.12	<0.085	<0.062	<0.062	<0.04	0.058	<1.5	1.1	0.24	0.19
1044 Cook Ave_Basement Boiler Room	02/11/18	20180211-1044COOK-05	0.16	<0.11	<0.081	<0.081	<0.053	<0.045	<1.5	0.51	0.57	<0.1
1044 Cook Ave_Crawlspace East Wing	02/11/18	20180211-1044COOK-03	0.36	0.11	<0.065	<0.065	<0.042	<0.036	<1.6	0.22	0.62	0.16
1044 Cook Ave_Crawlspace West Wing	02/11/18	20180211-1044COOK-04	<0.27	<0.21	<0.16	<0.16	<0.1	<0.087	<3.8	0.46	0.38	<0.19
1044 Cook Ave_Subslab Annex	02/12/18	20180212-1044COOK-01	107	<0.86	<1.3	<1.3	<0.41	<0.71	<1.6	<0.51	<1 UJ	<0.78

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1044 COOK AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethylbenzene (ug/m3)	Benzylchloride (ug/m3)	Bromodichloromethane (ug/m3)	Bromoform (ug/m3)	Bromomethane (ug/m3)	1,2-Dibromoethane (ug/m3)	1,4-Dichlorobenzene (ug/m3)	1,2-Dichloropropane (ug/m3)
1044 Cook Ave_Main Annex	02/11/18	20180211-1044COOK-06	<0.069	0.12	<1.5	<1.8	<0.11	<3.5	<1.3	<0.13	<2	<0.079
1044 Cook Ave_Main East Wing	02/11/18	20180211-1044COOK-02	<0.077	0.13	<1.3	<1.5	<0.13	<3	<1.1	<0.15	<1.8	<0.088
1044 Cook Ave_Main West Wing	02/11/18	20180211-1044COOK-01	<0.064	0.13	<1.4	<1.6	<0.11	<3.3	<1.2	<0.12	<1.9	<0.073
1044 Cook Ave_Basement Boiler Room	02/11/18	20180211-1044COOK-05	<0.083	0.14	<1.4	<1.6	<0.14	<3.3	<1.2	<0.16	<1.9	<0.095
1044 Cook Ave_Crawlspace East Wing	02/11/18	20180211-1044COOK-03	<0.066	0.081	<1.4	<1.7	<0.11	<3.4	<1.3	<0.13	<2	<0.076
1044 Cook Ave_Crawlspace West Wing	02/11/18	20180211-1044COOK-04	<0.16	<0.16	<3.4	<4	<0.26	<8.1	<3	<0.3	<4.7	<0.18
1044 Cook Ave_Subslab Annex	02/12/18	20180212-1044COOK-01	<1.3	<0.65	<1.4	<1.7	<2.1	<3.3	<1.2	<2.5	<1.9	<1.5

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1044 COOK AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
1044 Cook Ave_Main Annex	02/11/18	20180211-1044COOK-06	<3.6	<7	<4.5	<0.12	<6.3	<0.093	8.5	<5	<1.6	<0.71
1044 Cook Ave_Main East Wing	02/11/18	20180211-1044COOK-02	4.4	<6	<3.8	<0.13	<5.4	<0.1	3.6	<4.3	<1.3	0.65
1044 Cook Ave_Main West Wing	02/11/18	20180211-1044COOK-01	<3.4	<6.4	<4.1	<0.11	<5.8	<0.086	20.9	<4.6	<1.5	1.1
1044 Cook Ave_Basement Boiler Room	02/11/18	20180211-1044COOK-05	<3.4	<6.4	<4.1	<0.14	<5.8	<0.11	8.3	<4.6	<1.5	<0.65
1044 Cook Ave_Crawlspace East Wing	02/11/18	20180211-1044COOK-03	<3.5	<6.7	<4.3	<0.11	<6.1	<0.089	14.3	<4.8	<1.5	<0.68
1044 Cook Ave_Crawlspace West Wing	02/11/18	20180211-1044COOK-04	<8.4	<16	<10.2	<0.27	<14.5	<0.21	22	<11.6	<3.6	<1.6
1044 Cook Ave_Subslab Annex	02/12/18	20180212-1044COOK-01	<3.4	<6.6	<4.2	<1.1	<6	<0.88	32.3	10.2	<1.5	<0.66

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1044 COOK AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
1044 Cook Ave_Main Annex	02/11/18	20180211-1044COOK-06	63.7	<1.7	<1.2	4.4	<1	<1.9	<1.7	<1.2	<3	<1.5
1044 Cook Ave_Main East Wing	02/11/18	20180211-1044COOK-02	40.6	<1.4	1.4	<3.6	<0.86	<1.6	<1.4	<1	<2.5	<1.3
1044 Cook Ave_Main West Wing	02/11/18	20180211-1044COOK-01	144	<1.5	1.9	30	<0.93	<1.8	<1.5	<1.1	<2.7	<1.4
1044 Cook Ave_Basement Boiler Room	02/11/18	20180211-1044COOK-05	12.2	<1.5	<1.1	<3.9	<0.93	1.9	<1.5	<1.1	<2.7	<1.4
1044 Cook Ave_Crawlspace East Wing	02/11/18	20180211-1044COOK-03	5.1	<1.6	<1.2	312	<0.97	10.1	<1.6	<1.2	<2.8	<1.4
1044 Cook Ave_Crawlspace West Wing	02/11/18	20180211-1044COOK-04	62.7	<3.8	<2.8	<9.6	<2.3	<4.4	<3.8	<2.8	<6.8	<3.4
1044 Cook Ave_Subslab Annex	02/12/18	20180212-1044COOK-01	20.8	<1.6	<1.1	4.5	<0.95	<1.8	<1.6	<1.1	<2.8	<1.4

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1044 COOK AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
1044 Cook Ave_Main Annex	02/11/18	20180211-1044COOK-06	2.1	<0.068	<5.9	<6.1	<1.3	<0.093	<1.2	<1.4	<1.1	<0.9
1044 Cook Ave_Main East Wing	02/11/18	20180211-1044COOK-02	1.8	<0.075	<5.1	<5.3	5.6	<0.1	<1	<1.2	<0.91	<0.77
1044 Cook Ave_Main West Wing	02/11/18	20180211-1044COOK-01	2	<0.062	5.8	<5.7	5.5	<0.086	<1.1	<1.3	<0.98	<0.83
1044 Cook Ave_Basement Boiler Room	02/11/18	20180211-1044COOK-05	1.9	<0.081	<5.5	<5.7	2.3	0.46	<1.1	<1.3	<0.98	<0.83
1044 Cook Ave_Crawlspace East Wing	02/11/18	20180211-1044COOK-03	2.2	<0.065	<5.7	<5.9	<1.2	<0.089	<1.1	<1.3	<1	<0.86
1044 Cook Ave_Crawlspace West Wing	02/11/18	20180211-1044COOK-04	<3.9	<0.16	<13.6	<14.1	<2.9	<0.21	<2.7	<3.2	<2.4	<2.1
1044 Cook Ave_Subslab Annex	02/12/18	20180212-1044COOK-01	<1.6	<1.3	<5.6	<5.8	<1.2	<1.8	<1.1	<1.3	11.4	<0.85

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1044 COOK AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
1044 Cook Ave_Main Annex	02/11/18	20180211-1044COOK-06	<2.9	<2.4	<2	<2	<0.077	<0.077	<1.2	<7	<0.59	<1.5
1044 Cook Ave_Main East Wing	02/11/18	20180211-1044COOK-02	<2.5	<2	<1.8	<1.8	<0.086	<0.086	<1.1	<6	<0.5	<1.2
1044 Cook Ave_Main West Wing	02/11/18	20180211-1044COOK-01	<2.7	<2.2	<1.9	<1.9	<0.071	<0.071	<1.1	<6.4	<0.54	<1.3
1044 Cook Ave_Basement Boiler Room	02/11/18	20180211-1044COOK-05	<2.7	<2.2	<1.9	<1.9	<0.093	<0.093	<1.1	<6.4	<0.54	<1.3
1044 Cook Ave_Crawlspace East Wing	02/11/18	20180211-1044COOK-03	<2.8	<2.3	<2	<2	<0.074	<0.074	<1.2	<6.7	<0.56	<1.4
1044 Cook Ave_Crawlspace West Wing	02/11/18	20180211-1044COOK-04	<6.7	<5.5	<4.7	<4.7	<0.18	<0.18	<2.8	<16	<1.3	<3.3
1044 Cook Ave_Subslab Annex	02/12/18	20180212-1044COOK-01	<2.7	<2.2	<1.9	<1.9	<1.5	<1.5	<1.2	<6.6	0.68	<1.4

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1044 COOK AVENUE VAPOR INVESTIGATION RESULTS - SENSITIVE RECEPTOR PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
1044 Cook Ave_Main Annex	02/11/18	20180211-1044COOK-06	<2.6	<20.2	<20.2	46.6	--	--	--	--	--
1044 Cook Ave_Main East Wing	02/11/18	20180211-1044COOK-02	<2.2	<17.3	<17.3	<20.2	--	--	--	--	--
1044 Cook Ave_Main West Wing	02/11/18	20180211-1044COOK-01	<2.4	<18.6	<18.6	<21.7	--	--	--	--	--
1044 Cook Ave_Basement Boiler Room	02/11/18	20180211-1044COOK-05	<2.4	<18.6	<18.6	<21.7	--	--	--	--	--
1044 Cook Ave_Crawlspace East Wing	02/11/18	20180211-1044COOK-03	<2.5	59.5	<19.3	<22.5	--	--	--	--	--
1044 Cook Ave_Crawlspace West Wing	02/11/18	20180211-1044COOK-04	<6	<46.2	<46.2	<53.9	--	--	--	--	--
1044 Cook Ave_Subslab Annex	02/12/18	20180212-1044COOK-01	<2.5	329	<19	1000	<21.2	80.9	19.4	<2	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA	NA

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1140 LYNN AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
1140 Lynn Ave_Main	02/27/18	20180227-1140LYNN-02	0.28	1.1	<0.069	<0.069	<0.044	<0.038	4.1 J+	3.7 J+	0.77	0.44
1140 Lynn Ave_Crawlspace	02/27/18	20180227-1140LYNN-01	0.43	<0.086	<0.064	<0.064	<0.041	0.34	4.3	4	0.47	0.29

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1140 LYNN AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
1140 Lynn Ave_Main	02/27/18	20180227-1140LYNN-02	<0.07	0.15	2.4 J+	<1.8 R	<0.12	<3.6 R	<1.3 R	<0.13	<2.1 R	<0.08
1140 Lynn Ave_Crawlspace	02/27/18	20180227-1140LYNN-01	<0.065	0.11	2.8	<1.7 UJ	<0.11	<3.3	<1.2	<0.12	<1.9	<0.074

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1140 LYNN AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
1140 Lynn Ave_Main	02/27/18	20180227-1140LYNN-02	<3.7 R	<7.1 R	<4.5 R	0.33	<6.4 R	<0.095	32.8 J+	<5.1 R	<1.6 R	<0.72 R
1140 Lynn Ave_Crawlspace	02/27/18	20180227-1140LYNN-01	<3.4	<6.6	<4.2	<0.11	<6	<0.088	31.4	<4.7	<1.5	<0.66

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1140 LYNN AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
1140 Lynn Ave_Main	02/27/18	20180227-1140LYNN-02	191 J+	<1.7 R	9.7 J+	6.3 J+	<1 R	2.1 J+	<1.7 R	<1.2 R	9.4 J+	3.5 J+
1140 Lynn Ave_Crawlspace	02/27/18	20180227-1140LYNN-01	106	<1.6	10.9	7.4	<0.95	2	<1.6	<1.1	10.7	3.9

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1140 LYNN AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
1140 Lynn Ave_Main	02/27/18	20180227-1140LYNN-02	12.6 J+	<0.069	<6 R	<6.3 R	17.9 J+	0.1	9.9 J+	3.9 J+	<1.1 R	<0.92 R
1140 Lynn Ave_Crawlspace	02/27/18	20180227-1140LYNN-01	12.5	<0.064	<5.6	<5.8	19.3	<0.088	11	4	<1	<0.85

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1140 LYNN AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
1140 Lynn Ave_Main	02/27/18	20180227-1140LYNN-02	<3 R	<2.4 R	<2.1 R	<2.1 R	<0.079	<0.079	4.7 J+	<7.1 R	<0.6 R	<1.5 R
1140 Lynn Ave_Crawlspace	02/27/18	20180227-1140LYNN-01	<2.7	<2.2	<1.9	<1.9	<0.073	<0.073	<1.2	<6.6	<0.55	<1.4

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1140 LYNN AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-ethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)
1140 Lynn Ave_Main	02/27/18	20180227-1140LYNN-02	<2.7 R	<20.5	<20.5	<23.9
1140 Lynn Ave_Crawlspace	02/27/18	20180227-1140LYNN-01	<2.5	35.3	<19	<22.1

Applicable Residential Screening Levels	520	94	10	44
Applicable Industrial Screening Levels	2,200	94	10	44

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1246 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
1246 Central Ave_Main	02/05/18	20180205-1246CENTRAL-01	4.7	0.41 J	<0.16	<0.16	<0.1	2	<2.2	1.9	0.71	0.54
1246 Central Ave Subslab	02/05/18	20180205-1246CENTRAL-02	74800	13.4	<1.5	<1.5	<0.48	<0.82	1.9	<0.59	<1.2	<0.91

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1246 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
1246 Central Ave_Main	02/05/18	20180205-1246CENTRAL-01	<0.17	0.69	<2	<2.4	<0.27	<4.7	<1.8	<0.31	<2.7	0.55
1246 Central Ave Subslab	02/05/18	20180205-1246CENTRAL-02	<1.5	<0.75	<1.6	<1.9	<2.5	<3.8	<1.4	<2.9	<2.2	<1.7

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1246 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
1246 Central Ave_Main	02/05/18	20180205-1246CENTRAL-01	<4.9	<9.3	<6	<0.28	<8.4	<0.22	51.2	<6.7	<2.1	1.6
1246 Central Ave Subslab	02/05/18	20180205-1246CENTRAL-02	<4	<7.6	<4.9	<1.3	<6.9	<1	85.1	9.8	<1.7	<0.77

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1246 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
1246 Central Ave_Main	02/05/18	20180205-1246CENTRAL-01	161	<2.2	16.1	28.7	<1.3	<2.6	<2.2	<1.6	<4	<2
1246 Central Ave Subslab	02/05/18	20180205-1246CENTRAL-02	42.7	<1.8	<1.3	876 J	<1.1	<2.1	<1.8	<1.3	<3.2	<1.6

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1246 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
1246 Central Ave_Main	02/05/18	20180205-1246CENTRAL-01	2.5	<0.16	143	<8.2	10.2	<0.22	<1.6	4.9	<1.4	<1.2
1246 Central Ave Subslab	02/05/18	20180205-1246CENTRAL-02	<1.8	<1.5	<6.5	<6.7	2.3	<2	<1.3	<1.5	<1.2	<0.98

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1246 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
1246 Central Ave_Main	02/05/18	20180205-1246CENTRAL-01	<3.9	<3.2	<2.7	<2.7	<0.19	<0.19	9	<9.3	<0.78	<1.9
1246 Central Ave Subslab	02/05/18	20180205-1246CENTRAL-02	<3.2	<2.6	<2.2	<2.2	<1.7	<1.7	<1.3	<7.6	0.98	<1.6

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1246 CENTRAL AVENUE VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloroethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
1246 Central Ave_Main	02/05/18	20180205-1246CENTRAL-01	<3.5	313	<36	<42	--	--	--	--	--
1246 Central Ave Subslab	02/05/18	20180205-1246CENTRAL-02	<2.9	<42200	<42200	<49200	<1170	78.6	20.3	<2	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA	NA

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1307 CONCORD DRIVE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
1307 Concord Dr_Main	03/05/18	20180305-1307CONCORDDR-02	0.16	<0.092	<0.068	<0.068	<0.044	<0.038	<1.7	0.72 J	0.76 J	2 J
1307 Concord Dr_Main	03/05/18	20180305-A	0.35	<0.2	<0.15	<0.15	<0.095	<0.083	<3.7	2.3 J	1.1 J	1.5 J
1307 Concord Dr_Crawlspace	03/05/18	20180305-1307CONCORDDR-01	0.26	<0.092	<0.068	<0.068	<0.044	0.14	<1.7	0.73 J	0.45	0.15

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
 Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1307 CONCORD DRIVE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
1307 Concord Dr_Main	03/05/18	20180305-1307CONCORDDR-02	<0.069	0.18 J	<1.5	<4.4	0.53 J	<3.5	<1.3	<0.13	<2	0.088
1307 Concord Dr_Main	03/05/18	20180305-A	<0.15	0.26 J	<3.2	<9.7	0.39 J	<7.7	<2.9	<0.29	<4.5	<0.17
1307 Concord Dr Crawlspc	03/05/18	20180305-1307CONCORDDR-01	<0.069	0.085	<1.5	<4.4	<0.11	<3.5	<1.3	<0.13	<2	<0.079

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1307 CONCORD DRIVE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
1307 Concord Dr_Main	03/05/18	20180305-1307CONCORDDR-02	<3.6	<7	<4.5	<0.12	<6.3	<0.093	21.2 J	<5	<1.6	1.1
1307 Concord Dr_Main	03/05/18	20180305-A	<8	<15.3	<9.8	<0.26	<13.8	<0.2	96.9 J	<11	<3.4	2.1
1307 Concord Dr Crawlspc	03/05/18	20180305-1307CONCORDDR-01	<3.6	<7	<4.5	<0.12	<6.3	<0.093	23.2 J	<5	<1.6	0.79

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1307 CONCORD DRIVE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
1307 Concord Dr_Main	03/05/18	20180305-1307CONCORDDR-02	1470 J	<1.7	<1.2 UJ	15.8 J	<1	<1.9	<1.7	2.2	<3	<1.5
1307 Concord Dr_Main	03/05/18	20180305-A	1010 J	<3.7	38.6 J	21.1 J	<2.2	<4.2	<3.7	3.1	<6.5	<3.2
1307 Concord Dr Crawlspc	03/05/18	20180305-1307CONCORDDR-01	21.6	<1.7	4.6	<4.2	<1	<1.9	<1.7	<1.2	<3	<1.5

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1307 CONCORD DRIVE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
1307 Concord Dr_Main	03/05/18	20180305-1307CONCORDDR-02	2.5	<0.068	<5.9 UJ	<6.1	1.9 J	<0.093	<1.2	<1.4	<1.1	<0.9
1307 Concord Dr_Main	03/05/18	20180305-A	4.9	<0.15	560 J	<13.4	11.8 J	<0.2	<2.6	<3.1	<2.3	<2
1307 Concord Dr CrawlSpace	03/05/18	20180305-1307CONCORDDR-01	2.7	<0.068	57.6	<6.1	2 J	<0.093	<1.2	<1.4	<1.1	<0.9

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1307 CONCORD DRIVE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
1307 Concord Dr_Main	03/05/18	20180305-1307CONCORDDR-02	<2.9	<2.4	<2	<2	<0.077	<0.077	3.9	<7	<0.59	<1.5
1307 Concord Dr_Main	03/05/18	20180305-A	<6.3	<5.2	<4.5	<4.5	<0.17	<0.17	4.6	<15.3	<1.3	<3.2
1307 Concord Dr Crawlspace	03/05/18	20180305-1307CONCORDDR-01	<2.9	<2.4	<2	<2	<0.077	<0.077	2.6	<7	<0.59	<1.5

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**1307 CONCORD DRIVE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
 REMEDIAL INVESTIGATION REPORT
 BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloro-trifluoro-ethane (ug/m3)
1307 Concord Dr_Main	03/05/18	20180305-1307CONCORDDR-02	<2.6
1307 Concord Dr_Main	03/05/18	20180305-A	<5.7
1307 Concord Dr_Crawlspace	03/05/18	20180305-1307CONCORDDR-01	<2.6

Applicable Residential Screening Levels	520
Applicable Industrial Screening Levels	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**3119 MONTANA AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
3119 Montana Ave_Main	02/12/18	20180212-3119MONTANA-02	1.2	<0.88	<1.3	<1.3	<0.42	<0.72	<1.6	1.1	<1 UJ	1.2
3119 Montana Ave_Basement	02/12/18	20180212-3119MONTANA-01	<1.1	<0.88	<1.3	<1.3	<0.42	<0.72	<1.6	1	<1 UJ	1.3
3119 Montana Ave_Subslab	02/13/18	20180213-3119MONTANA-01	2090 J	273	10.9	<1.2	<0.4	<0.7	<1.5	<0.5	<0.99 UJ	11.5
3119 Montana Ave_Subslab	02/13/18	20180213-A	6630 J	233	9.6	<1.2	<0.4	<0.7	<1.5	<0.5	<0.99	9.6

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**3119 MONTANA AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
3119 Montana Ave_Main	02/12/18	20180212-3119MONTANA-02	<1.3	<0.66	<1.4	<1.7	<2.2	<3.4	<1.3	<2.5	<2	<1.5
3119 Montana Ave_Basement	02/12/18	20180212-3119MONTANA-01	<1.3	<0.66	<1.4	<1.7	<2.2	<3.4	<1.3	<2.5	<2	<1.5
3119 Montana Ave_Subslab	02/13/18	20180213-3119MONTANA-01	3.1	<0.64	<1.4	<1.6	<2.1	<3.3	<1.2	<2.4	<1.9	<1.5
3119 Montana Ave_Subslab	02/13/18	20180213-A	2.7	<0.64	<1.4	<1.6	<2.1	<3.3	<1.2	<2.4	<1.9	<1.5

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**3119 MONTANA AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
3119 Montana Ave_Main	02/12/18	20180212-3119MONTANA-02	<3.5	<6.7 UJ	<4.3	<1.1	<6.1	<0.89	25	8	<1.5	1.6
3119 Montana Ave_Basement	02/12/18	20180212-3119MONTANA-01	<3.5	<6.7	<4.3	<1.1	<6.1	<0.89	19.8	276	<1.5	1.3
3119 Montana Ave_Subslab	02/13/18	20180213-3119MONTANA-01	<3.4	<6.4 UJ	<4.1	<1.1	<5.8	<0.86	17	4.9	<1.5	<0.65
3119 Montana Ave_Subslab	02/13/18	20180213-A	<3.4	<6.4	<4.1	<1.1	<5.8	<0.86	18.9	<4.6	<1.5	<0.65

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**3119 MONTANA AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
3119 Montana Ave_Main	02/12/18	20180212-3119MONTANA-02	573 J	<1.6	1.3	17.5	1	<1.8	<1.6	<1.2	<2.8	<1.4
3119 Montana Ave_Basement	02/12/18	20180212-3119MONTANA-01	442	<1.6	1.4	14	84	<1.8	<1.6	<1.2	<2.8	<1.4
3119 Montana Ave_Subslab	02/13/18	20180213-3119MONTANA-01	10.8	<1.5	<1.1	<3.9	<0.93	<1.8	<1.5	<1.1	<2.7	<1.4
3119 Montana Ave_Subslab	02/13/18	20180213-A	9	<1.5	<1.1	<3.9	<0.93	<1.8	<1.5	<1.1	<2.7	<1.4

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**3119 MONTANA AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
3119 Montana Ave_Main	02/12/18	20180212-3119MONTANA-02	2.2	<1.3	<5.7	<5.9	3	<1.8	<1.1	<1.3	<1	<0.86
3119 Montana Ave_Basement	02/12/18	20180212-3119MONTANA-01	2.1	<1.3	<5.7	<5.9	2.3	<1.8	<1.1	<1.3	<1	<0.86
3119 Montana Ave_Subslab	02/13/18	20180213-3119MONTANA-01	2.1	<1.2	<5.5	<5.7	3.6	10.4	<1.1	<1.3	<0.98	<0.83
3119 Montana Ave_Subslab	02/13/18	20180213-A	2	<1.2	<5.5	<5.7	2.8	9	<1.1	<1.3	<0.98	<0.83

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**3119 MONTANA AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo-chloromethane (ug/m3)	1,2-Dichloro-1,1,2,2-tetrafluoroethane (ug/m3)	1,2-Dichlorobenzene (ug/m3)	1,3-Dichlorobenzene (ug/m3)	Cis-1,3-dichloropropene (ug/m3)	trans-1,3-Dichloropropene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl-2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
3119 Montana Ave_Main	02/12/18	20180212-3119MONTANA-02	<2.8	<2.3	<2	<2	<1.5	<1.5	7.2	<6.7	<0.56	<1.4
3119 Montana Ave_Basement	02/12/18	20180212-3119MONTANA-01	<2.8	<2.3	<2	<2	<1.5	<1.5	3.9	<6.7	<0.56	<1.4
3119 Montana Ave_Subslab	02/13/18	20180213-3119MONTANA-01	<2.7	<2.2	<1.9	<1.9	<1.4	<1.4	<1.1	<6.4	0.6	<1.3
3119 Montana Ave_Subslab	02/13/18	20180213-A	<2.7	<2.2	<1.9	<1.9	<1.4	<1.4	<1.1	<6.4	<0.54	<1.3

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**3119 MONTANA AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloroethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
3119 Montana Ave_Main	02/12/18	20180212-3119MONTANA-02	<2.5	<19.3	<19.3	103	--	--	--	--	--
3119 Montana Ave_Basement	02/12/18	20180212-3119MONTANA-01	<2.5	209	<19.3	29.1	--	--	--	--	--
3119 Montana Ave_Subslab	02/13/18	20180213-3119MONTANA-01	<2.4	1590	<18.6	71.3 J	<15.5	77.5	19.8	<2	<3.6
3119 Montana Ave_Subslab	02/13/18	20180213-A	<2.4	1800 J	<18.6	<21.7 UJ	<15.5	78.6	18.7	<2	<3.6

Applicable Residential Screening Levels	520	94	10	44	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	94	10	44	NA	NA	NA	NA	NA	NA

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**3119 MONTANA AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	Benzene (ug/m3)	Chloroform (ug/m3)	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)
BPIA103_3119 MONTANA AVE	03/04/08	1.2	<3.8	<3.8	<3.8	<3.8	2.6	<3.8	<3.8	<3.8	7.2
BPSS103_3119 MONTANA AVE	03/04/08	1700	210	3.2	<17	<17	<17	100	6.1	<17	<17

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	1.3	0.12	1.8	0.23	1.1
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	1.6	0.53	7.7	0.47	4.9

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**3119 MONTANA AVENUE VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	1,1,2-Trichloro-ethane (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)
BPIA103_3119 MONTANA AVE	03/04/08	<3.8	60	24	<3.8	0.64	<3.8	13	<3.8
BPSS103_3119 MONTANA AVE	03/04/08	<17	4.5	1.7	<17	<17	<17	2.4	15

Applicable Residential Screening Levels	0.021	10	10	21	63	11	520	520
Applicable Industrial Screening Levels	0.088	44	44	88	260	47	2,200	2,200

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

Historical result (prior to 2018) data quality is unknown; historical data validation reports unavailable. Historical results are presented for qualitative comparison with 2018 investigation data.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**4011 2ND AVENUE SOUTH VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
4011 2nd Ave S_Main	02/27/18	20180227-40112NDAVES-01	0.52	1.7 J+	<0.066	<0.066	<0.043	<0.037	<1.6 R	2.2 J+	0.61	1.3
4011 2nd Ave S_Basement	02/27/18	20180227-40112NDAVES-03	0.34	1.1	<0.059	<0.059	<0.038	<0.033	<1.5 R	2.1 J+	0.72	0.69
4011 2nd Ave S_Crawlspace	02/27/18	20180227-40112NDAVES-02	0.44	1.4	<0.065	<0.065	<0.042	<0.036	<1.6 R	2.2 J+	0.54	0.8
4011 2nd Ave S_Subslab	02/28/18	20180228-40112NDAVES-01	546	13	<1.3	<1.3	<0.42	<0.72	13.8	<0.52	<1	45

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**4011 2ND AVENUE SOUTH VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
4011 2nd Ave S_Main	02/27/18	20180227-40112NDAVES-01	<0.067	0.78	2.1 J+	<1.7 R	0.33	<3.4 R	<1.3 R	<0.13	<2 R	<0.077
4011 2nd Ave S_Basement	02/27/18	20180227-40112NDAVES-03	<0.06	0.33	2.1 J+	<1.5 R	0.16	<3.1 R	<1.2 R	<0.11	<1.8 R	<0.069
4011 2nd Ave S_Crawlspace	02/27/18	20180227-40112NDAVES-02	<0.066	0.49	1.8 J+	<1.7 R	0.2	<3.4 R	<1.3 R	<0.13	<2 R	<0.076
4011 2nd Ave S_Subslab	02/28/18	20180228-40112NDAVES-01	<1.3	<0.66	<1.4	<1.7	<2.2	<3.4	<1.3	<2.5	<2	<1.5

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**4011 2ND AVENUE SOUTH VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
4011 2nd Ave S_Main	02/27/18	20180227-40112NDAVES-01	<3.6 R	<6.8 R	<4.4 R	<0.11	<6.2 R	<0.091	153 J+	<4.9 R	<1.5 R	1.9 J+
4011 2nd Ave S_Basement	02/27/18	20180227-40112NDAVES-03	<3.2 R	<6.1 R	<3.9 R	<0.1	<5.5 R	<0.081	126 J+	<4.4 R	<1.4 R	1.7 J+
4011 2nd Ave S_Crawlspace	02/27/18	20180227-40112NDAVES-02	<3.5 R	<6.7 R	<4.3 R	<0.11	<6.1 R	<0.089	111 J+	<4.8 R	<1.5 R	1.8 J+
4011 2nd Ave S_Subslab	02/28/18	20180228-40112NDAVES-01	<3.5	<6.7	<4.3	<1.1	<6.1	<0.89	10.7	<4.8	<1.5	<0.68

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**4011 2ND AVENUE SOUTH VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
4011 2nd Ave S_Main	02/27/18	20180227-40112NDAVES-01	3120 J+	<1.6 R	11.9 J+	23 J+	<0.98 R	7.5 J+	<1.6 R	2.1 J+	7.4 J+	3.2 J+
4011 2nd Ave S_Basement	02/27/18	20180227-40112NDAVES-03	2110 J+	<1.5 R	13.8 J+	19.5 J+	<0.88 R	5.8 J+	<1.5 R	<1 R	7 J+	3.1 J+
4011 2nd Ave S_Crawlspace	02/27/18	20180227-40112NDAVES-02	1880 J+	<1.6 R	9.9 J+	16.4 J+	<0.97 R	4.8 J+	<1.6 R	<1.2 R	6.5 J+	2.8 J+
4011 2nd Ave S_Subslab	02/28/18	20180228-40112NDAVES-01	9.1	9.6	<1.2	<4	<0.97	<1.8	7.4	<1.2	4.8	3.8

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**4011 2ND AVENUE SOUTH VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
4011 2nd Ave S_Main	02/27/18	20180227-40112NDAVES-01	3.6 J+	0.083	49 J+	<6 R	15.5 J+	<0.091	5.2 J+	4.1 J+	<1 R	<0.88 R
4011 2nd Ave S_Basement	02/27/18	20180227-40112NDAVES-03	3.7 J+	<0.059	64.4 J+	<5.3 R	14.8 J+	<0.081	4.9 J+	3.7 J+	<0.92 R	<0.78 R
4011 2nd Ave S_Crawlspace	02/27/18	20180227-40112NDAVES-02	3.8 J+	<0.065	38.3 J+	<5.9 R	13.2 J+	<0.089	5.4 J+	3.5 J+	<1 R	<0.86 R
4011 2nd Ave S_Subslab	02/28/18	20180228-40112NDAVES-01	<1.6	<1.3	<5.7	<5.9	21.6	<1.8	<1.1	<1.3	<1 UJ	<0.86

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**4011 2ND AVENUE SOUTH VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
4011 2nd Ave S_Main	02/27/18	20180227-40112NDAVES-01	<2.8 R	<2.3 R	<2 R	<2 R	<0.076	<0.076	9.7 J+	<6.8 R	<0.57 R	2.4 J+
4011 2nd Ave S_Basement	02/27/18	20180227-40112NDAVES-03	<2.5 R	<2.1 R	<1.8 R	<1.8 R	<0.067	<0.067	7.3 J+	<6.1 R	<0.51 R	3.2 J+
4011 2nd Ave S_Crawlspace	02/27/18	20180227-40112NDAVES-02	<2.8 R	<2.3 R	<2 R	<2 R	<0.074	<0.074	6.4 J+	<6.7 R	<0.56 R	1.8 J+
4011 2nd Ave S_Subslab	02/28/18	20180228-40112NDAVES-01	<2.8	<2.3	<2	<2	<1.5	<1.5	<1.2	<6.7	<0.56	<1.4

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**4011 2ND AVENUE SOUTH VAPOR INVESTIGATION RESULTS - RESIDENTIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloroethane (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
4011 2nd Ave S_Main	02/27/18	20180227-40112NDAVES-01	<2.6 R	--	--	--	--	--
4011 2nd Ave S_Basement	02/27/18	20180227-40112NDAVES-03	<2.3 R	--	--	--	--	--
4011 2nd Ave S_Crawlspace	02/27/18	20180227-40112NDAVES-02	<2.5 R	--	--	--	--	--
4011 2nd Ave S_Subslab	02/28/18	20180228-40112NDAVES-01	<2.5	<16.1	78.6	17.6	4.1	<3.6

Applicable Residential Screening Levels	520	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	NA	NA	NA	NA	NA

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

- < - Analyte below detection limit
- DUP - Field duplicate sample
- NA - Not applicable
- J+ - Estimated concentration, possibly biased high
- UJ - Estimated reporting limit
- R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**4211 1ST AVENUE SOUTH VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
4211 1st Ave S_Stock Room	02/28/18	20180228-42111STAVES-02	0.45	0.17	<0.087	<0.087	<0.056	0.56	<2.2	1.9	0.39 J	0.16
4211 1st Ave S_Stock Room	02/28/18	20180228-B	0.46	<0.086	<0.064	<0.064	<0.041	0.56	2.3	1.8	0.24 J	0.16
4211 1st Ave S_Office Lobby	02/28/18	20180228-42111STAVES-01	0.58	<0.085	<0.062	<0.062	<0.04	<0.035	<1.5	1.8	0.45	0.16
4211 1st Ave S_Subslab	03/01/18	20180301-42111STAVES-01	23.1	0.38	<0.079	<0.079	<0.051	<0.044	<1.5	0.16	0.46	<0.097

Applicable Residential Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**4211 1ST AVENUE SOUTH VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
4211 1st Ave S_Stock Room	02/28/18	20180228-42111STAVES-02	<0.089	<0.089	<1.9	<5.7	<0.15	<4.5	<1.7	<0.17	<2.6	<0.1
4211 1st Ave S_Stock Room	02/28/18	20180228-B	<0.065	0.084	<1.4	<4.2	<0.11	<3.3	<1.2	<0.12	<1.9	<0.074
4211 1st Ave S_Office Lobby	02/28/18	20180228-42111STAVES-01	<0.064	0.11	<1.4	<4.1	<0.11	<3.3	<1.2	<0.12	<1.9	<0.073
4211 1st Ave S_Subslab	03/01/18	20180301-42111STAVES-01	<0.08	<0.08	<1.4	<1.6	<0.13	<3.3	<1.2	<0.15	<1.9	<0.092

Applicable Residential Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**4211 1ST AVENUE SOUTH VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Hexachloro- butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2- Tetrachloro- ethane (ug/m3)	1,2,4- Trichloro- benzene (ug/m3)	1,1,2- Trichloro- ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
4211 1st Ave S_Stock Room	02/28/18	20180228-42111STAVES-02	<4.7	<9	<5.7	<0.15	<8.1	<0.12	61.3	13.9	<2	<0.91
4211 1st Ave S_Stock Room	02/28/18	20180228-B	<3.4	<6.6	<4.2	<0.11	<6	<0.088	64.4	17	<1.5	<0.66
4211 1st Ave S_Office Lobby	02/28/18	20180228-42111STAVES-01	<3.4	<6.4	<4.1	<0.11	<5.8	<0.086	53.3	10.7	<1.5	<0.65
4211 1st Ave S_Subslab	03/01/18	20180301-42111STAVES-01	<3.4	<6.4	<4.1	<0.14	<5.8	<0.11	39.3	6.6	<1.5	<0.65

Applicable Residential Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**4211 1ST AVENUE SOUTH VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro- fluoromethane (ug/m3)	1,3,5-Trimethyl- benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
4211 1st Ave S_Stock Room	02/28/18	20180228-42111STAVES-02	182	<2.2	4.4 J	<5.4	33.4	<2.5	<2.2	<1.5	<3.8	<1.9
4211 1st Ave S_Stock Room	02/28/18	20180228-B	177	<1.6	2.2 J	7.4	34.9	<1.8	<1.6	1.6	3.3	<1.4
4211 1st Ave S_Office Lobby	02/28/18	20180228-42111STAVES-01	324	<1.5	2.2	<3.9	20.3	<1.8	<1.5	1.7	3	<1.4
4211 1st Ave S_Subslab	03/01/18	20180301-42111STAVES-01	2.8	<1.5	<1.1	4.8	1.1	<1.8	<1.5	<1.1	<2.7	<1.4

Applicable Residential Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**4211 1ST AVENUE SOUTH VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
4211 1st Ave S_Stock Room	02/28/18	20180228-42111STAVES-02	2.4	<0.087	9	<7.9	5.4	<0.12	5.3	<1.8	<1.4	<1.2
4211 1st Ave S_Stock Room	02/28/18	20180228-B	2.2	<0.064	<5.6	<5.8	5.7	<0.088	4.4	<1.3	<1	<0.85
4211 1st Ave S_Office Lobby	02/28/18	20180228-42111STAVES-01	2.4	<0.062	<5.5	<5.7	6.7	<0.086	2.9	<1.3	<0.98	<0.83
4211 1st Ave S_Subslab	03/01/18	20180301-42111STAVES-01	2.6	<0.079	<5.5	<5.7	<1.2	0.15	<1.1	<1.3	<0.98	<0.83

Applicable Residential Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**4211 1ST AVENUE SOUTH VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	Dibromo- chloromethane (ug/m3)	1,2-Dichloro- 1,1,2,2- tetrafluoro- ethane (ug/m3)	1,2-Di- chloro- benzene (ug/m3)	1,3-Di- chloro- benzene (ug/m3)	Cis-1,3- dichloro- propene (ug/m3)	trans-1,3- Dichloro- propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl- 2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
4211 1st Ave S_Stock Room	02/28/18	20180228-42111STAVES-02	<3.7	<3.1	<2.6	<2.6	<0.099	<0.099	<1.6	<9	<0.76 UJ	32.5
4211 1st Ave S_Stock Room	02/28/18	20180228-B	<2.7	<2.2	<1.9	<1.9	<0.073	<0.073	<1.2	<6.6	35.8 J	34.6
4211 1st Ave S_Office Lobby	02/28/18	20180228-42111STAVES-01	<2.7	<2.2	<1.9	<1.9	<0.071	<0.071	<1.1	<6.4	<0.54	33.1
4211 1st Ave S_Subslab	03/01/18	20180301-42111STAVES-01	<2.7	<2.2	<1.9	<1.9	<0.09	<0.09	<1.1	<6.4	<0.54	<1.3

Applicable Residential Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**4211 1ST AVENUE SOUTH VAPOR INVESTIGATION RESULTS - COMMERCIAL PROPERTY
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Field Sample ID	1,1,2-Trichloroethane (ug/m3)	Methane (ppmv)	Nitrogen (%)	Oxygen (%)	CO2 by Headspace (%)	Helium (%)
4211 1st Ave S_Stock Room	02/28/18	20180228-42111STAVES-02	<3.4	--	--	--	--	--
4211 1st Ave S_Stock Room	02/28/18	20180228-B	<2.5	--	--	--	--	--
4211 1st Ave S_Office Lobby	02/28/18	20180228-42111STAVES-01	<2.4	--	--	--	--	--
4211 1st Ave S_Subslab	03/01/18	20180301-42111STAVES-01	<2.4	<15.5	80.1	19.4	<2	<3.6

Applicable Residential Screening Levels	520	NA	NA	NA	NA	NA	NA
Applicable Industrial Screening Levels	2,200	NA	NA	NA	NA	NA	NA

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**AMBIENT AIR VAPOR INVESTIGATION RESULTS
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Type	Tetrachloro-ethene (ug/m3)	Trichloro-ethene (ug/m3)	cis-1,2-Dichloro-ethene (ug/m3)	trans-1,2-Dichloro-ethene (ug/m3)	Vinyl Chloride (ug/m3)	1,3-Butadiene (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Benzene (ug/m3)	Carbon tetrachloride (ug/m3)	Chloroform (ug/m3)
Ambient Air-01	02/05/18		0.2	<0.11 UJ	<0.081	<0.081	<0.053	<0.045	<1.5	0.74	0.33	0.12
Ambient Air-01	02/07/18		0.13	<0.093	<0.069	<0.069	<0.044	<0.038	<1.7	0.82	0.46	0.12
Ambient Air-01	02/08/18		0.11	<0.079	<0.058	<0.058	<0.037	<0.032	<1.4	0.67	0.51	0.11
Ambient Air-01	02/09/18		0.7	<0.095	<0.07	<0.07	<0.045	<0.039	<1.3	1.5	0.58	1.1
Ambient Air-01	02/11/18		<0.099	<0.079	<0.058	<0.058	<0.037	0.069	<1.4	0.87	0.48	0.12
Ambient Air-01	02/12/18		0.32	<0.12	<0.087	<0.087	<0.056	<0.049	<1.6	0.91	0.25 J	0.13
Ambient Air-01	02/22/18		0.14	<0.079	<0.058	<0.058	<0.037	0.21	<1.4	1.6	0.63	0.13
Ambient Air-01	02/27/18		0.22	<0.085	<0.062	<0.062	<0.04	0.45	<1.5	2.3	0.29	0.14
Ambient Air-01	02/28/18		0.24	<0.083	<0.061	<0.061	<0.04	<0.034	<1.5	1.7	0.27	0.15
Ambient Air-01	03/01/18		0.17	1.2	<0.08	<0.08	<0.051	<0.044	<1.5	1	0.65	0.22
Ambient Air-01	03/02/18		0.28	0.52	<0.087	<0.087	<0.056	<0.049	<1.6	1	0.68	0.26
Ambient Air-01	03/03/18		0.3	<0.079	<0.058	<0.058	<0.037	<0.032	<1.4	0.91	0.41	0.15
Ambient Air-01	03/05/18		0.14	0.26	<0.054	<0.054	<0.035	<0.03	<1.3	1.1 J	0.61	0.21
Ambient Air-01	03/06/18		0.15	0.17	<0.065	<0.065	<0.042	<0.036	<1.6	1.1	0.34	0.14
Ambient Air-01	03/07/18		0.58	<0.079	<0.058	<0.058	<0.037	<0.032	<1.4	1.8	0.37	0.15
Ambient Air-01	03/08/18		0.85	<0.11	<0.078	<0.078	<0.05	<0.044	<1.9	1.6	0.16	0.15
Ambient Air-02	02/05/18		<0.13	<0.1 UJ	<0.074	<0.074	<0.048	<0.041	<1.5	0.76	0.45	0.12
Ambient Air-02	02/07/18		<0.1	<0.083	<0.061	<0.061	<0.04	<0.034	<1.5	0.65	0.44	0.11
Ambient Air-02	02/08/18		0.12	<0.08	<0.059	<0.059	<0.038	<0.033	<1.5	0.93	0.49	0.11
Ambient Air-02	02/09/18		0.16	<0.081	<0.06	<0.06	<0.039	<0.034	<1.5	1.2	0.5	0.13
Ambient Air-02	02/12/18		0.2	<0.15	<0.11	<0.11	<0.07	<0.061	<2	1.1	0.67 J	0.13
Ambient Air-02	02/27/18		0.22	<0.1	<0.074	<0.074	<0.048	<0.041	<1.5	1.9	0.62	0.14
Ambient Air-02	02/28/18		0.47	0.12	<0.079	<0.079	<0.051	<0.044	<1.5	1.9	0.54	0.19
Ambient Air-02	03/02/18		0.6	0.13	0.1	0.092	0.067	<0.04	<1.4	1.1	0.15	0.23
Ambient Air-02	03/03/18		<0.14	<0.11	<0.082	<0.082	<0.053	<0.046	<1.5	0.68	0.22	0.16

Applicable Residential Air Screening Levels	4.2	0.21	NA	NA	0.17	0.094	6.3	1.3	0.47	0.12
Applicable Industrial Air Screening Levels	18	0.88	NA	NA	2.8	0.41	26	1.6	2	0.53

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**AMBIENT AIR VAPOR INVESTIGATION RESULTS
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Type	1,1-Dichloro-ethane (ug/m3)	1,2-Dichloro-ethane (ug/m3)	Ethyl-benzene (ug/m3)	Benzyl-chloride (ug/m3)	Bromo-dichloro-methane (ug/m3)	Bromoform (ug/m3)	Bromo-methane (ug/m3)	1,2-Dibromo-ethane (ug/m3)	1,4-Di-chloro-benzene (ug/m3)	1,2-Dichloro-propane (ug/m3)
Ambient Air-01	02/05/18		<0.083	0.092	<1.4	<1.6	<0.14	<3.3	<1.2	<0.16	<1.9	<0.095
Ambient Air-01	02/07/18		<0.07	0.093	<1.5	<1.8	<0.12	<3.6	<1.3	<0.13	<2.1	<0.08
Ambient Air-01	02/08/18		<0.059	0.086	<1.3	<1.5	<0.098	<3	<1.1	<0.11	<1.8	<0.068
Ambient Air-01	02/09/18		<0.072	0.12	<1.2	<1.4	<0.12	<2.8	<1.1	<0.14	<1.6	<0.082
Ambient Air-01	02/11/18		<0.059	0.1	<1.3	<1.5	<0.098	<3	<1.1	<0.11	<1.8	<0.068
Ambient Air-01	02/12/18		<0.089	0.11	<1.4	<1.7	<0.15	<3.4	<1.3	<0.17	<2	<0.1
Ambient Air-01	02/22/18		<0.059	0.086	<1.3	<1.5 UJ	<0.098	<3	<1.1	<0.11	<1.8	<0.068
Ambient Air-01	02/27/18		<0.064	0.085	1.4	<1.6 UJ	<0.11	<3.3	<1.2	<0.12	<1.9	<0.073
Ambient Air-01	02/28/18		<0.062	0.089	<1.3	<1.6	<0.1	<3.2	<1.2	<0.12	<1.9	<0.071
Ambient Air-01	03/01/18		<0.081	0.12	<1.3	<1.6	<0.13	<3.2	<1.2	<0.15	<1.9	<0.093
Ambient Air-01	03/02/18		<0.089	0.13	<1.4	<1.7	<0.15	<3.4	<1.3	<0.17	<2	0.1
Ambient Air-01	03/03/18		<0.059	0.088	<1.3	<1.5	<0.098	<3	<1.1	<0.11	<1.8	<0.068
Ambient Air-01	03/05/18		<0.055	0.1	<1.2	<3.5	<0.091	<2.8	<1.1	<0.1	<1.6	<0.063
Ambient Air-01	03/06/18		<0.066	0.073	<1.4	<4.2	<0.11	<3.4	<1.3	<0.13	<2	<0.076
Ambient Air-01	03/07/18		<0.059	0.074	7.2	<3.8	<0.098	<3	<1.1	<0.11	<1.8	<0.068
Ambient Air-01	03/08/18		<0.08	0.081	<1.7	<5.1	<0.13	<4.1	<1.5	<0.15	<2.4	<0.091
Ambient Air-02	02/05/18		<0.076	0.091	<1.3	<1.5	<0.13	<3.1	<1.2	<0.14	<1.8	<0.086
Ambient Air-02	02/07/18		<0.062	0.1	<1.3	<1.6	<0.1	<3.2	<1.2	<0.12	<1.9	<0.071
Ambient Air-02	02/08/18		<0.06	0.087	<1.3	<1.5	<0.099	<3.1	<1.2	<0.11	<1.8	<0.069
Ambient Air-02	02/09/18		<0.061	0.089	<1.3	<1.6	<0.1	<3.1	<1.2	<0.12	<1.8	<0.07
Ambient Air-02	02/12/18		<0.11	0.11	<1.8	<2.1	<0.18	<4.2	<1.6	<0.21	<2.5	<0.13
Ambient Air-02	02/27/18		<0.076	0.098	<1.3	<1.5 UJ	<0.13	<3.1	<1.2	<0.14	<1.8	<0.086
Ambient Air-02	02/28/18		<0.08	0.094	<1.3	<1.5	<0.13	<3.1	<1.2	<0.15	<1.8	<0.092
Ambient Air-02	03/02/18		0.092	0.16	<1.3	<1.5	0.15	<3	<1.1	0.16	<1.8	0.13
Ambient Air-02	03/03/18		<0.084	0.09	<1.3	<1.6	<0.14	<3.2	<1.2	<0.16	<1.9	<0.096

Applicable Residential Air Screening Levels	1.8	0.23	1.1	0.057	0.076	2.6	0.52	0.0047	0.26	0.42
Applicable Industrial Air Screening Levels	7.7	0.47	4.9	0.25	0.33	11	2.2	0.02	1.1	1.8

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**AMBIENT AIR VAPOR INVESTIGATION RESULTS
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Type	Hexachloro-butadiene (ug/m3)	2-Hexanone (ug/m3)	Naphthalene (ug/m3)	1,1,2,2-Tetrachloro-ethane (ug/m3)	1,2,4-Trichloro-benzene (ug/m3)	1,1,2-Trichloro-ethane (ug/m3)	Acetone (ug/m3)	2-Butanone (ug/m3)	Chlorobenzene (ug/m3)	Chloromethane (ug/m3)
Ambient Air-01	02/05/18		<3.4	<6.4	<4.1	<0.14	<5.8	<0.11	37.8	12.7	<1.5	0.71
Ambient Air-01	02/07/18		<3.7 UJ	<7.1	<4.5 UJ	<0.12	<6.4 UJ	<0.095	8.6	<5.1	<1.6	0.95
Ambient Air-01	02/08/18		<3.1 UJ	<6	<3.8 UJ	<0.1	<5.4 UJ	<0.08	5.4	<4.3	<1.3	<0.6
Ambient Air-01	02/09/18		<2.9	<5.6	<3.6 UJ	<0.12	<5.1 UJ	<0.097	5.3	<4	<1.3	0.72
Ambient Air-01	02/11/18		<3.1	<6	<3.8	<0.1	<5.4	<0.08	3.9	<4.3	<1.3	0.72
Ambient Air-01	02/12/18		<3.5	<6.7 UJ	<4.3	<0.15	<6.1	<0.12	7.2	<4.8	<1.5	0.91
Ambient Air-01	02/22/18		<3.1	<6	<3.8	<0.1	<5.4	<0.08	10.9	<4.3	<1.3	1.6
Ambient Air-01	02/27/18		<3.4	<6.4	<4.1	<0.11	<5.8	<0.086	4.8	<4.6	<1.5	1.6
Ambient Air-01	02/28/18		<3.3	<6.3	<4	<0.11	<5.7	<0.084	6.6	<4.6	<1.4	1
Ambient Air-01	03/01/18		<3.3	<6.3	<4	<0.14	<5.7	<0.11	5.1	<4.6	<1.4	1.4
Ambient Air-01	03/02/18		<3.5	<6.7	<4.3	<0.15	<6.1	<0.12	13.9	<4.8	<1.5	0.94
Ambient Air-01	03/03/18		<3.1	<6	<3.8	<0.1	<5.4	<0.08	4.1	<4.3	<1.3	<0.6
Ambient Air-01	03/05/18		<2.9	<5.6	<3.6	<0.094	<5.1	<0.074	25.2 J	<4	<1.3	1.1
Ambient Air-01	03/06/18		<3.5	<6.7	<4.3	<0.11	<6.1	<0.089	9.5	<4.8	<1.5	1
Ambient Air-01	03/07/18		<3.1	<6	<3.8	<0.1	<5.4	<0.08	20.1	8.1	<1.3	0.94
Ambient Air-01	03/08/18		<4.2	<8.1	<5.2	<0.14	<7.3	<0.11	15.8	<5.8	<1.8	1.2
Ambient Air-02	02/05/18		<3.2	<6.1	<3.9	<0.13	<5.5	<0.1	4.3	<4.4	<1.4	0.74
Ambient Air-02	02/07/18		<3.3 UJ	<6.3	<4 UJ	<0.11	<5.7 UJ	<0.084	6.4	<4.6	<1.4	<0.64
Ambient Air-02	02/08/18		<3.2 UJ	<6.1	<3.9 UJ	<0.1	<5.5 UJ	<0.081	5.9	<4.4	<1.4	0.93
Ambient Air-02	02/09/18		<3.2	<6.2	<4 UJ	<0.1	<5.6 UJ	<0.083	18.1	<4.5	<1.4	0.96
Ambient Air-02	02/12/18		<4.4	<8.4 UJ	<5.3	<0.19	<7.6	<0.15	13.6	<6	<1.9	1.2
Ambient Air-02	02/27/18		<3.2	<6.1	<3.9	<0.13	<5.5	<0.1	12.5	<4.4	<1.4	1.2
Ambient Air-02	02/28/18		<3.2	<6.1	<3.9	<0.14	<5.5	<0.11	<3.5	<4.4	<1.4	1
Ambient Air-02	03/02/18		<3.1	<6	<3.8	0.32	<5.4	0.22	8.9	<4.3	<1.3	1
Ambient Air-02	03/03/18		<3.3	<6.3	<4	<0.14	<5.7	<0.11	<3.7	<4.6	<1.4	1.2

Applicable Residential Air Screening Levels	0.13	3.1	0.39	0.048	0.21	0.021	3,200	520	5.2	9.4
Applicable Industrial Air Screening Levels	0.56	13	0.39	0.21	0.88	0.088	14,000	2,200	22	39

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**AMBIENT AIR VAPOR INVESTIGATION RESULTS
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Type	Ethanol (ug/m3)	4-Ethyltoluene (ug/m3)	Hexane (ug/m3)	Isopropanol (ug/m3)	Tetrahydrofuran (ug/m3)	Trichloro-fluoromethane (ug/m3)	1,3,5-Trimethyl-benzene (ug/m3)	Vinyl Acetate (ug/m3)	m,p-Xylene (ug/m3)	o-Xylene (ug/m3)
Ambient Air-01	02/05/18		10.8	<1.5	<1.1	12	<0.93	<1.8	<1.5	<1.1	<2.7	<1.4
Ambient Air-01	02/07/18		9.1	<1.7	<1.2	<4.3	<1	<1.9	<1.7	<1.2	<3	<1.5
Ambient Air-01	02/08/18		3.3	<1.4	<1	<3.6	<0.86	<1.6	<1.4	<1	<2.5	<1.3
Ambient Air-01	02/09/18		18.1 J	<1.3	3.3	<3.4	<0.8	<1.5	<1.3	<0.96	2.4	<1.2
Ambient Air-01	02/11/18		10.4	<1.4	<1	<3.6	<0.86	<1.6	<1.4	<1	<2.5	<1.3
Ambient Air-01	02/12/18		14.3	<1.6	1.2	<4	<0.97	<1.8	<1.6	<1.2	<2.8	<1.4
Ambient Air-01	02/22/18		12	<1.4	14.2	<3.6	<0.86	2.4	<1.4	<1	<2.5	<1.3
Ambient Air-01	02/27/18		48.6	<1.5	3.4	<3.9	<0.93	1.9	<1.5	<1.1	3.7	1.5
Ambient Air-01	02/28/18		46.4	<1.5	1.4	<3.8	<0.91	<1.7	<1.5	<1.1	<2.7	<1.3
Ambient Air-01	03/01/18		27.2	<1.5	<1.1	<3.8	<0.91	<1.7	<1.5	<1.1	<2.7	<1.3
Ambient Air-01	03/02/18		15	<1.6	<1.2	<4	<0.97	<1.8	<1.6	<1.2	<2.8	<1.4
Ambient Air-01	03/03/18		12.8	<1.4	5.3	<3.6	<0.86	<1.6	<1.4	<1	<2.5	<1.3
Ambient Air-01	03/05/18		12.8	<1.3	40.5	<3.4	<0.8	<1.5	<1.3	<0.96	<2.4	<1.2
Ambient Air-01	03/06/18		16	<1.6	3.8	<4	<0.97	<1.8	<1.6	<1.2	<2.8	<1.4
Ambient Air-01	03/07/18		98.1	<1.4	3.4	<3.6	<0.86	<1.6	<1.4	2.8	3	<1.3
Ambient Air-01	03/08/18		35.2	<1.9	2	<4.8	<1.2	<2.2	<1.9	<1.4	<3.4	<1.7
Ambient Air-02	02/05/18		5.7	<1.5	<1	<3.6	<0.88	<1.7	<1.5	<1	<2.6	<1.3
Ambient Air-02	02/07/18		8.9	<1.5	<1.1	<3.8	<0.91	<1.7	<1.5	<1.1	<2.7	<1.3
Ambient Air-02	02/08/18		5.5	<1.5	<1	46.1	<0.88	<1.7	<1.5	<1	<2.6	<1.3
Ambient Air-02	02/09/18		14 J	<1.5	1.4	<3.7	<0.89	<1.7	<1.5	<1.1	<2.6	<1.3
Ambient Air-02	02/12/18		10.5	<2	17.5	<5	<1.2	<2.3	<2	<1.4	<3.6	<1.8
Ambient Air-02	02/27/18		51.4	<1.5	2.2	<3.6	<0.88	2	<1.5	<1	<2.6	<1.3
Ambient Air-02	02/28/18		40.7	<1.5	1.9	<3.6	<0.88	<1.7	<1.5	<1	<2.6	<1.3
Ambient Air-02	03/02/18		32	<1.4	6.9	<3.6	<0.86	<1.6	<1.4	<1	<2.5	<1.3
Ambient Air-02	03/03/18		6.5	<1.5	<1.1	<3.8	<0.91	<1.7	<1.5	<1.1	<2.7	<1.3

Applicable Residential Air Screening Levels	769	NA	73	29	210	1.3	6.3	21	10	10
Applicable Industrial Air Screening Levels	769	NA	310	88	880	1.3	26	88	44	44

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**AMBIENT AIR VAPOR INVESTIGATION RESULTS
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Type	Dichloro-difluoro-methane (ug/m3)	1,1-Dichloro-ethene (ug/m3)	Methylene Chloride (ug/m3)	MTBE (ug/m3)	Toluene (ug/m3)	1,1,1-Trichloro-ethane (ug/m3)	Cyclohexane (ug/m3)	Heptane (ug/m3)	Carbon Disulfide (ug/m3)	Chloroethane (ug/m3)
Ambient Air-01	02/05/18		1.8	<0.081	<5.5	<5.7	<1.2	<0.11	<1.1	<1.3	<0.98	<0.83
Ambient Air-01	02/07/18		1.9	<0.069	<6	<6.3	1.5	<0.095	<1.2	<1.4	<1.1	<0.92
Ambient Air-01	02/08/18		2.1	<0.058	<5.1	<5.3	<1.1	<0.08	<1	<1.2	<0.91	<0.77
Ambient Air-01	02/09/18		2	<0.07	10.8	<4.9	8	<0.097	2.6	<1.1	<0.85	<0.72
Ambient Air-01	02/11/18		1.9	<0.058	<5.1	<5.3	<1.1	<0.08	<1	<1.2	<0.91	<0.77
Ambient Air-01	02/12/18		2.5	<0.087	<5.7	<5.9	1.5	<0.12	<1.1	<1.3	<1	<0.86
Ambient Air-01	02/22/18		4	<0.058	153	<5.3	6.6	<0.08	1.5	1.3	<0.91	<0.77
Ambient Air-01	02/27/18		3.4	<0.062	<5.5	<5.7	7.6	<0.086	6	2.4	<0.98	<0.83
Ambient Air-01	02/28/18		2.3	<0.061	<5.4	<5.6	5.8	<0.084	<1.1	<1.3	<0.96	<0.81
Ambient Air-01	03/01/18		2.4	<0.08	<5.4	<5.6	2	<0.11	<1.1	<1.3	<0.96	<0.81
Ambient Air-01	03/02/18		2.5	<0.087	<5.7	<5.9	2.7	<0.12	<1.1	<1.3	<1	<0.86
Ambient Air-01	03/03/18		2.2	<0.058	31.1	<5.3	4.5	<0.08	<1	<1.2	<0.91	<0.77
Ambient Air-01	03/05/18		2.9	0.18	354	<4.9	8.2 J	<0.074	<0.94	<1.1	<0.85	<0.72
Ambient Air-01	03/06/18		2.7	<0.065	24	<5.9	3.5	<0.089	<1.1	<1.3	<1	<0.86
Ambient Air-01	03/07/18		2.2	<0.058	<5.1	<5.3	4.6	<0.08	<1	1.9	<0.91	<0.77
Ambient Air-01	03/08/18		2.5	<0.078	<6.8	<7.1	4.2	<0.11	<1.4	<1.6	<1.2	<1
Ambient Air-02	02/05/18		2.1	<0.074	<5.2	<5.3	1.6	<0.1	<1	<1.2	<0.92	<0.78
Ambient Air-02	02/07/18		2	<0.061	<5.4	<5.6	<1.2	<0.084	<1.1	<1.3	<0.96	<0.81
Ambient Air-02	02/08/18		2.2	<0.059	<5.2	<5.3	<1.1	<0.081	<1	<1.2	<0.92	<0.78
Ambient Air-02	02/09/18		2.2	<0.06	<5.3	<5.5	2.7	<0.083	1.4	<1.2	<0.94	<0.8
Ambient Air-02	02/12/18		3.4	<0.11	149	<7.4	5.6	<0.15	<1.4	<1.7	<1.3	<1.1
Ambient Air-02	02/27/18		3.3	<0.074	<5.2	<5.3	4.7	<0.1	<1	1.5	<0.92	<0.78
Ambient Air-02	02/28/18		2.4	<0.079	<5.2	<5.3	4.9	<0.11	<1	<1.2	<0.92	<0.78
Ambient Air-02	03/02/18		2.5	0.096	33.7	<5.3	4.7	0.13	<1	1.5	<0.91	<0.77
Ambient Air-02	03/03/18		2.5	<0.082	<5.4	<5.6	<1.2	<0.11	<1.1	<1.3	<0.96	<0.81

Applicable Residential Air Screening Levels	10	21	63	11	520	520	630	42	73	1,000
Applicable Industrial Air Screening Levels	44	88	260	47	2,200	2,200	2,600	180	310	4,400

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**AMBIENT AIR VAPOR INVESTIGATION RESULTS
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Type	Dibromo-chloromethane (ug/m3)	1,2-Dichloro-1,1,2,2-tetrafluoroethane (ug/m3)	1,2-Di-chloro-benzene (ug/m3)	1,3-Di-chloro-benzene (ug/m3)	Cis-1,3-dichloro-propene (ug/m3)	trans-1,3-Dichloro-propene (ug/m3)	Ethyl acetate (ug/m3)	4-Methyl-2-Pentanone (ug/m3)	Propene (ug/m3)	Styrene (ug/m3)
Ambient Air-01	02/05/18		<2.7	<2.2	<1.9	<1.9	<0.093	<0.093	1.2	<6.4	<0.54	<1.3
Ambient Air-01	02/07/18		<3	<2.4	<2.1	<2.1	<0.079	<0.079	<1.3	<7.1	<0.6	<1.5
Ambient Air-01	02/08/18		<2.5	<2	<1.8	<1.8	<0.066	<0.066	<1.1	<6	<0.5	<1.2
Ambient Air-01	02/09/18		<2.3	<1.9	<1.6	<1.6	<0.08	<0.08	1.2	<5.6	<0.47	<1.2
Ambient Air-01	02/11/18		<2.5	<2	<1.8	<1.8	<0.066	<0.066	<1.1	<6	0.9	<1.2
Ambient Air-01	02/12/18		<2.8	<2.3	<2	<2	<0.1	<0.1	<1.2	<6.7	<0.56	<1.4
Ambient Air-01	02/22/18		<2.5	<2	<1.8	<1.8	<0.066	<0.066	<1.1	<6	<0.5	<1.2
Ambient Air-01	02/27/18		<2.7	<2.2	<1.9	<1.9	<0.071	<0.071	<1.1	<6.4	<0.54	<1.3
Ambient Air-01	02/28/18		<2.6	<2.2	<1.9	<1.9	<0.07	<0.07	<1.1	<6.3	<0.53	<1.3
Ambient Air-01	03/01/18		<2.6	<2.2	<1.9	<1.9	<0.091	<0.091	<1.1	<6.3	<0.53	<1.3
Ambient Air-01	03/02/18		<2.8	<2.3	<2	<2	<0.099	<0.099	<1.2	<6.7	<0.56	<1.4
Ambient Air-01	03/03/18		<2.5	<2	<1.8	<1.8	<0.066	<0.066	<1.1	<6	<0.5	<1.2
Ambient Air-01	03/05/18		<2.3	<1.9	<1.6	<1.6	<0.062	<0.062	<0.98	<5.6	<0.47	<1.2
Ambient Air-01	03/06/18		<2.8	<2.3	<2	<2	<0.074	<0.074	<1.2	<6.7	<0.56	<1.4
Ambient Air-01	03/07/18		<2.5	<2	<1.8	<1.8	<0.066	<0.066	<1.1	<6	<0.5	<1.2
Ambient Air-01	03/08/18		<3.4	<2.8	<2.4	<2.4	<0.089	<0.089	<1.4	<8.1	4.7	<1.7
Ambient Air-02	02/05/18		<2.5	<2.1	<1.8	<1.8	<0.085	<0.085	<1.1	<6.1	<0.51	<1.3
Ambient Air-02	02/07/18		<2.6	<2.2	<1.9	<1.9	<0.07	<0.07	<1.1	<6.3	<0.53	<1.3
Ambient Air-02	02/08/18		<2.5	<2.1	<1.8	<1.8	<0.067	<0.067	<1.1	<6.1	<0.51	<1.3
Ambient Air-02	02/09/18		<2.6	<2.1	<1.8	<1.8	<0.069	<0.069	<1.1	<6.2	<0.52	3.8
Ambient Air-02	02/12/18		<3.5	<2.9	<2.5	<2.5	<0.12	<0.12	<1.5	<8.4	<0.7	<1.7
Ambient Air-02	02/27/18		<2.5	<2.1	<1.8	<1.8	<0.085	<0.085	<1.1	<6.1	<0.51	<1.3
Ambient Air-02	02/28/18		<2.5	<2.1	<1.8	<1.8	<0.09	<0.09	<1.1	<6.1	<0.51	<1.3
Ambient Air-02	03/02/18		<2.5	<2	<1.8	<1.8	0.098	0.096	<1.1	<6	<0.5	<1.2
Ambient Air-02	03/03/18		<2.6	<2.2	<1.9	<1.9	<0.094	<0.094	<1.1	<6.3	<0.53	<1.3

Applicable Residential Air Screening Levels	NA	NA	21	NA	NA	NA	NA	8.6	310	310	100
Applicable Industrial Air Screening Levels	NA	NA	88	NA	NA	NA	NA	31	1,300	1,300	440

Notes:
Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues

**AMBIENT AIR VAPOR INVESTIGATION RESULTS
REMEDIAL INVESTIGATION REPORT
BILLINGS PCE GROUNDWATER FACILITY, BILLINGS, MT**

Location	Date Sampled	Type	1,1,2-Trichloro-trifluoro-ethane (ug/m3)	C5-C8, Aliphatic, Unadjusted (ug/m3)	C9-C10, Aromatic, Unadjusted (ug/m3)	C9-C12, Aliphatic, Unadjusted (ug/m3)
Ambient Air-01	02/05/18		<2.4	21	<18.6	<21.7
Ambient Air-01	02/07/18		<2.7	<20.5	<20.5	<23.9
Ambient Air-01	02/08/18		<2.2	<17.3	<17.3	<20.2
Ambient Air-01	02/09/18		<2.1	<16.1	<16.1	<18.8
Ambient Air-01	02/11/18		<2.2	<17.3	<17.3	<20.2
Ambient Air-01	02/12/18		<2.5	<19.3	<19.3	31.4
Ambient Air-01	02/22/18		<2.2	<17.3	<17.3	<20.2
Ambient Air-01	02/27/18		<2.4	<18.6	<18.6	<21.7
Ambient Air-01	02/28/18		<2.4	<18.2	<18.2	<21.3
Ambient Air-01	03/01/18		<2.4	<18.2	<18.2	<21.3
Ambient Air-01	03/02/18		<2.5	<19.3	<19.3	<22.5
Ambient Air-01	03/03/18		<2.2	<17.3	<17.3	<20.2
Ambient Air-01	03/05/18		<2.1	<16.7	<16.7	<19.5
Ambient Air-01	03/06/18		<2.5	<19.3	<19.3	<22.5
Ambient Air-01	03/07/18		<2.2	<17.3	<17.3	<20.2
Ambient Air-01	03/08/18		<3	<17.9	<17.9	<20.9
Ambient Air-02	02/05/18		<2.3	<17.5	<17.5	<20.4
Ambient Air-02	02/07/18		<2.4	<18.2	<18.2	<21.3
Ambient Air-02	02/08/18		<2.3	<17.5	<17.5	<20.4
Ambient Air-02	02/09/18		<2.3	<17.9	<17.9	<20.9
Ambient Air-02	02/12/18		<3.1	<24.1 R	<24.1 R	<28.1 R
Ambient Air-02	02/27/18		<2.3	<17.5	<17.5	<20.4
Ambient Air-02	02/28/18		<2.3	<17.5	<17.5	<20.4
Ambient Air-02	03/02/18		<2.2	<17.3	<17.3	<20.2
Ambient Air-02	03/03/18		<2.4	<18.2	<18.2	<21.3

Applicable Residential Air Screening Levels	520	94	10	44
Applicable Industrial Air Screening Levels	2,200	94	10	44

Notes:

Indoor air in residential structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: 1,2-dichloroethane, benzene, ethanol, ethyl acetate, isopropanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ Typical Indoor Air concentrations (TIAC) are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics (for which the DEQ Generic APH Fraction Screening Levels are used). Indoor air in industrial structures is screened using the 2018 EPA November Residential Air RSLs HQ=0.1 except for the following analytes: ethanol, naphthalene, and trichlorofluoromethane (for which the 2012 DEQ TIAC are used) and C5-C8 aliphatics, C9-C10 aromatics, and C9-C12 aliphatics, for which the DEQ Generic APH Fraction Screening Levels are used.

Exceedances of Applicable Residential screening levels are bolded. Exceedances of Applicable Industrial screening levels are bolded and highlighted in gray.

< - Analyte below detection limit

DUP - Field duplicate sample

NA - Not applicable

J+ - Estimated concentration, possibly biased high

UJ - Estimated reporting limit

R - Rejected data, not usable for decision making purposes due to laboratory QA/QC issues