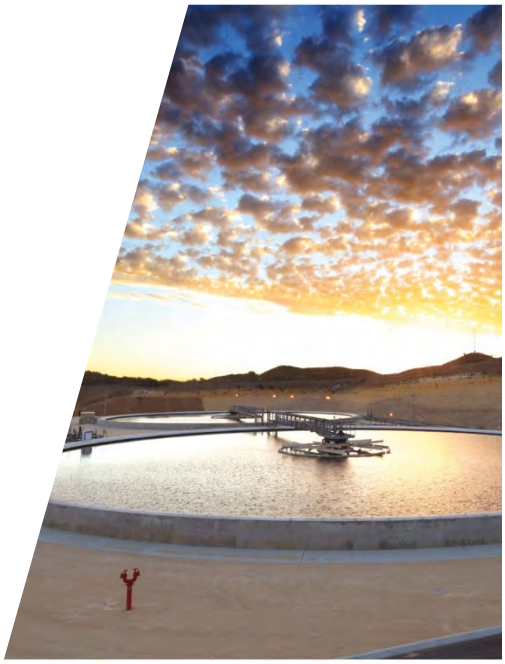
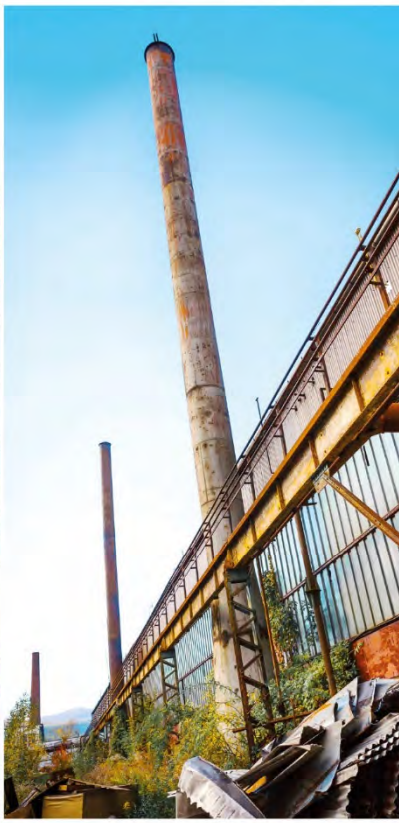


2019 Annual Monitoring Report

Highway 96 Site
White Bear Township, Minnesota

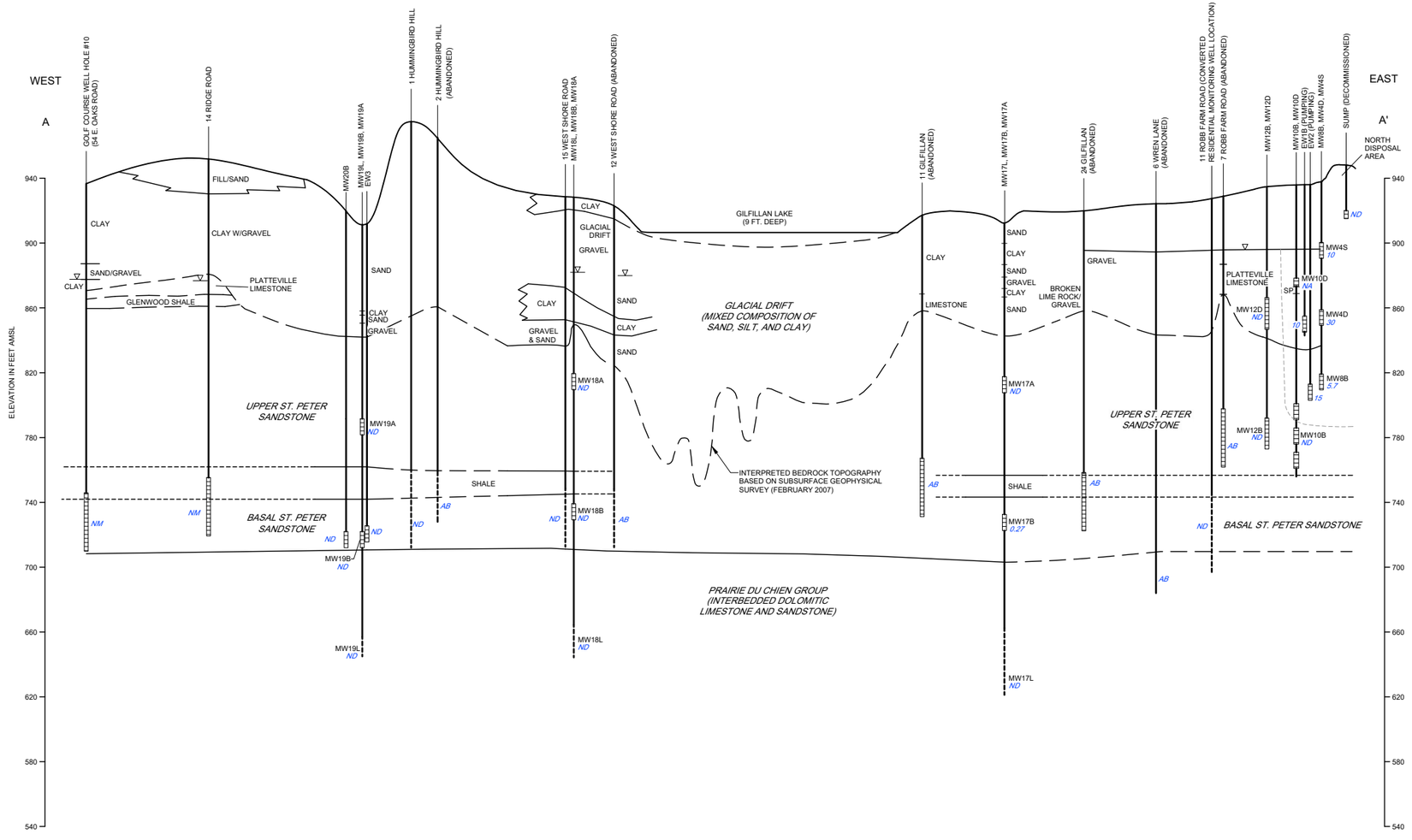
Highway 96 RP Group



Appendix Index

Appendices

Appendix A
Geologic Cross Sections



Nº	Revision	Date	Initial

MAXIMUM VINYL CHLORIDE RESULTS (2019)

ND	NOT DETECTED
NA	NOT ACCESSIBLE
NM	NOT MONITORED (GEOGRAPHIC AREA 2)
AB	ABANDONED
20	VINYL CHLORIDE CONCENTRATION IN ug/L
- - -	ESTIMATED EW1B / EW2 CAPTURE AREA

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

Status	Date	Initial

HIGHWAY 96 SITE

GEOLOGIC CROSS SECTION A-A'

GHD

Source Reference:			
Project Manager: S. ILLI	Reviewed By: K. JENKIN	Date: 2019	
Scale: 1"=400' HOR. 1"=40' VER.	Project Nº: 02012-01	Report Nº: 071	Drawing Nº: A.1

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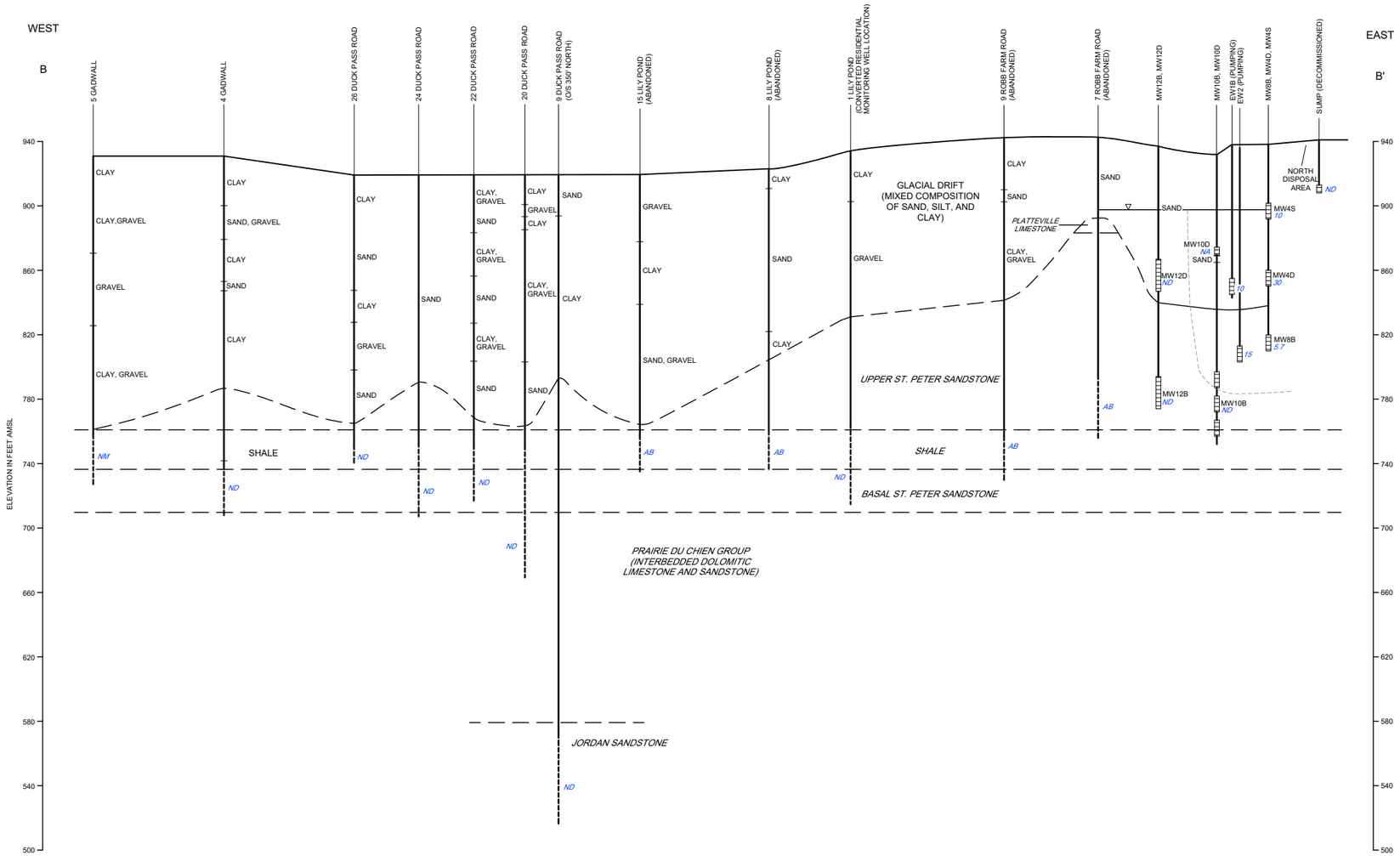

No	Revision	Date	Initial

MAXIMUM VINYL CHLORIDE RESULTS (2019)

ND	NOT DETECTED
NA	NOT ACCESSIBLE
NM	NOT MONITORED (GEOGRAPHIC AREA 2)
AB	ABANDONED
20	VINYL CHLORIDE CONCENTRATION IN ug/L
- - -	ESTIMATED EW1B / EW2 CAPTURE AREA

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

Status	Date	Initial

HIGHWAY 96 SITE

GEOLOGIC CROSS SECTION B-B'

GHD

Source Reference:			
Project Manager: S. ILLI	Reviewed By: K. JENKIN	Date: 2019	
Scale: 1"=200' HOR. 1"=40' VER.	Project No: 02012-01	Report No: 071	Drawing No: A.2

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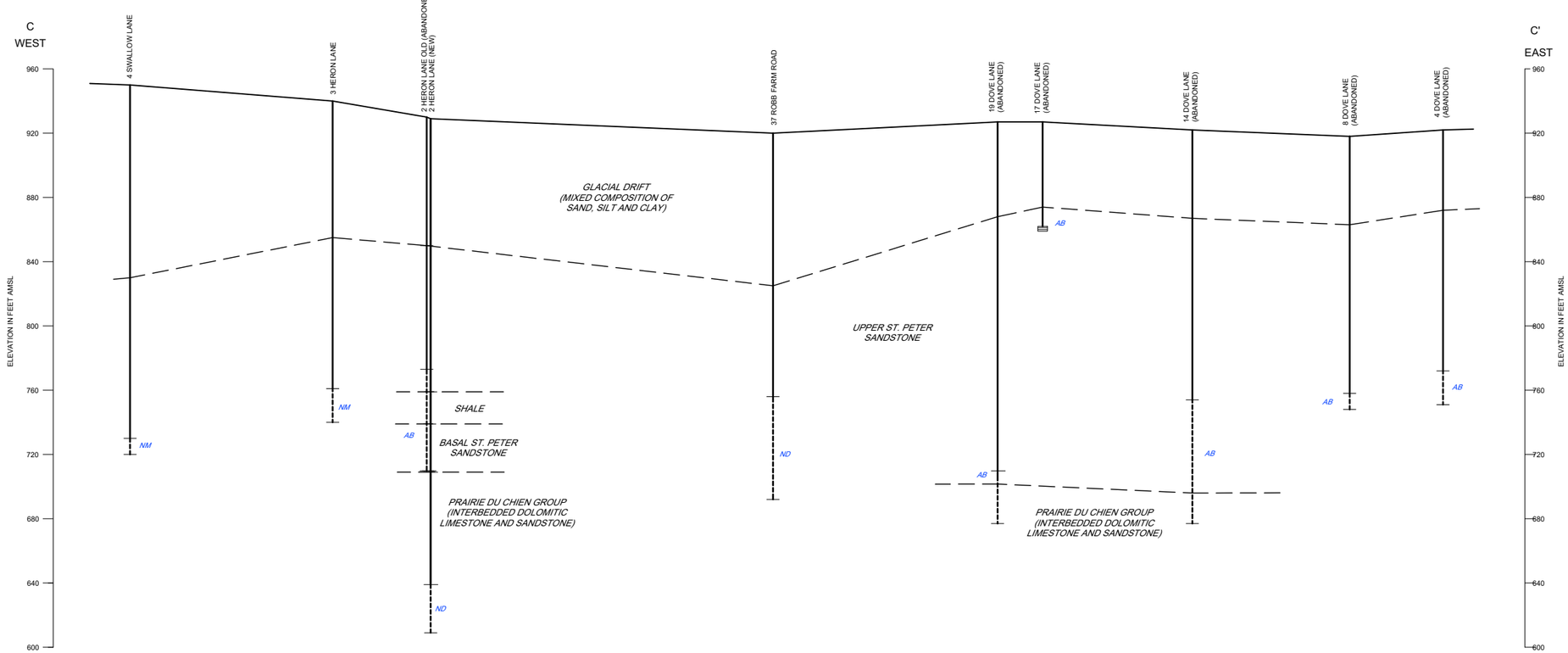

NO	Revision	Date	Initial

MAXIMUM VINYL CHLORIDE RESULTS (2019)

ND	NOT DETECTED
NM	NOT MONITORED (GEOGRAPHIC AREA 2)
AB	ABANDONED

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

Status	Date	Initial

HIGHWAY 96 SITE

GEOLOGIC CROSS SECTION C-C'

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
S. ILLI	K. JENKIN	2019	
Scale: 1"=200' HOR. 1"=40' VER.	Project NO: 02012-01	Report NO: 071	Drawing NO: A.3

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Appendix B
Historical Groundwater Elevations

Appendix B

Historical Summary of Groundwater Elevations
Highway 96 Site
White Bear Township, Minnesota

Location	TOC (ft. AMSL)	1/15/1999 (ft. AMSL)	2/26/1999 (ft. AMSL)	3/19/1999 (ft. AMSL)	4/8/1999 (ft. AMSL)	5/13/1999 (ft. AMSL)	6/9/1999 (ft. AMSL)	7/16/1999 (ft. AMSL)	8/13/1999 (ft. AMSL)	9/17/1999 (ft. AMSL)	10/1/1999 (ft. AMSL)	11/15/1999 (ft. AMSL)	12/3/1999 (ft. AMSL)	1/17/2000 (ft. AMSL)	2/22/2000 (ft. AMSL)
Perched Groundwater Unit															
LW1	938.86	926.43	928.30	928.24	932.28	934.24	931.74	929.56	928.35	929.23	928.34	926.84	926.83	926.82	926.82
LW2	945.66	929.33	929.15	929.42	DRY	931.39	932.00	931.57	931.00	930.89	930.78	929.91	929.77	929.04	928.79
LW3	944.82	928.37	928.47	928.57	930.56	934.16	933.67	931.98	930.74	931.28	930.80	929.29	929.02	928.19	927.84
MW1S	950.65	932.67	932.68	932.67	933.79	936.10	938.14	936.40	935.20	934.58	934.27	933.42	933.14	932.47	932.00
MW4U	939.65	DRY	DRY	DRY	DRY	DRY	DRY	910.19	910.62	910.47	910.49	910.14	910.09	DRY	DRY
MW6S	948.44	926.84	926.12	925.88	926.53	928.53	931.76	930.97	930.08	929.81	929.44	928.29	927.84	926.80	926.03
MW10S	935.94	922.40	924.66	928.95	930.30	931.22	929.02	930.02	928.26	930.01	928.60	929.60	928.86	922.40	919.26
MW11S	936.34	919.49	DRY	DRY	929.43	932.19	932.30	930.88	928.34	931.12	929.33	924.70	923.48	920.32	DRY
P1	941.70	934.22	934.73	935.73	937.29	939.89	937.38	936.15	935.43	935.34	935.11	934.62	934.44	933.90	933.56
P2	946.11	CAP FROZEN	926.39	926.29	927.29	926.70	926.68	926.44	926.50	926.49	926.42	926.41	926.41	NM	926.38
P3	947.11	927.35	927.30	927.29	927.30	927.51	927.42	927.42	927.45	927.45	927.40	927.37	927.36	927.30	927.28
P4	948.16	929.80	929.89	928.54	930.03	930.07	929.98	930.80	929.82	929.92	929.84	929.79	929.76	929.64	929.52
SUMP*	946.71	918.51	913.53	NM	913.08	915.24	914.98	913.80	913.50	913.60	913.44	913.55	913.47	913.90	913.49
Glacial Drift (Lower Sand) Aquifer															
EW1*	936.66	877.68	876.59	875.93	876.14	872.10	871.31	897.35	870.67	869.55	869.05	896.86	896.98	896.67	877.99
EW1A*	938.67	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	897.30	NM	NM	NM
EW1B*	939.99	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW1D	951.02	894.56	897.13	896.74	897.23	897.32	897.88	898.06	897.25	897.25	897.21	897.61	897.79	897.51	897.35
MW4D	940.48	896.34	895.92	895.58	896.07	896.17	896.69	897.32	896.18	896.19	896.20	896.87	897.05	896.71	896.54
MW4S	940.33	899.08	898.49	897.92	898.19	898.16	898.81	899.82	899.42	899.35	899.45	900.15	900.44	899.92	899.68
MW6D	948.15	897.26	896.84	896.49	896.86	896.91	897.47	897.97	897.28	897.20	897.22	897.77	897.89	897.54	897.44
MW10D	935.94	901.77	901.03	900.37	900.69	901.10	902.43	903.02	902.95	902.92	903.05	903.24	903.44	902.43	902.23
MW11D	935.40	900.19	899.49	899.06	899.72	900.49	901.49	902.19	902.31	901.57	901.57	901.29	901.32	900.53	900.14
MW12D	940.52	899.78	899.08	898.68	898.90	899.20	900.09	900.77	900.29	900.14	900.05	900.08	900.03	899.54	899.17
MW13D	937.66	898.45	897.88	897.44	897.90	898.11	898.13	899.46	898.63	898.52	898.51	898.58	898.64	898.21	898.05
MW16D	940.70	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Upper St. Peter Sandstone Aquifer															
EW2*	938.67	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW7B	942.91	898.66	898.21	897.78	898.27	898.30	898.85	898.96	898.15	898.31	898.30	898.59	898.80	898.48	898.31
MW8B	940.91	896.22	895.81	895.47	895.99	896.04	896.59	897.20	896.05	896.08	896.07	896.76	896.89	896.64	896.24
MW10B	936.64	896.21	895.80	895.46	895.96	896.04	896.58	897.07	896.00	896.01	896.02	896.66	896.80	896.52	896.25
MW12B	939.89	896.19	895.74	895.42	895.90	895.97	896.53	895.92	895.89	895.92	895.91	896.47	896.64	896.34	896.12
MW13B	938.34	896.05	895.58	895.29	895.77	895.85	896.42	896.68	895.76	895.78	895.77	896.23	896.36	896.09	895.89
MW16B	940.71	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW17A	914.58	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW18A	925.39	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW19A	913.56	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW21A	909.03	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

Historical Summary of Groundwater Elevations
Highway 96 Site
White Bear Township, Minnesota

Location	TOC (ft. AMSL)	1/15/1999 (ft. AMSL)	2/26/1999 (ft. AMSL)	3/19/1999 (ft. AMSL)	4/8/1999 (ft. AMSL)	5/13/1999 (ft. AMSL)	6/9/1999 (ft. AMSL)	7/16/1999 (ft. AMSL)	8/13/1999 (ft. AMSL)	9/17/1999 (ft. AMSL)	10/1/1999 (ft. AMSL)	11/15/1999 (ft. AMSL)	12/3/1999 (ft. AMSL)	1/17/2000 (ft. AMSL)	2/22/2000 (ft. AMSL)
Basal St. Peter Sandstone Aquifer															
EW3	913.88	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW17B	914.50	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW18B	925.24	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW19B	913.33	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW20B	915.04	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
6 Blue Goose Road #	954.15	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
1 Lily Pond Road #	931.18	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
11 Lily Pond Road #	928.54	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
11 Robb Farm Road #	942.63	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
38 East Oaks Road ^	926.25	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
6 West Shore Road ^	920.20	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Prairie du Chien Aquifer															
MW17L	914.65	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW18L	925.44	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW19L	914.18	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

Appendix B

Historical Summary of Groundwater Elevations
Highway 96 Site
White Bear Township, Minnesota

Location	2/28/2000 (ft. AMSL)	3/29/2000 (ft. AMSL)	4/28/2000 (ft. AMSL)	5/26/2000 (ft. AMSL)	6/28/2000 (ft. AMSL)	7/26/2000 (ft. AMSL)	8/31/2000 (ft. AMSL)	9/21/2000 (ft. AMSL)	10/2/2000 (ft. AMSL)	11/17/2000 (ft. AMSL)	12/13/2000 (ft. AMSL)	1/9/2001 (ft. AMSL)	2/28/2001 (ft. AMSL)	3/16/2001 (ft. AMSL)	4/23/2001 (ft. AMSL)
Perched Groundwater Unit															
LW1	928.33	929.15	929.52	928.26	928.31	928.33	928.20	928.05	928.28	929.79	928.33	928.21	928.17	928.66	934.86
LW2	928.73	929.00	DRY	DRY	929.86	929.59	DRY	DRY	DRY	DRY	DRY	<929.42	DRY	<929.31	932.81
LW3	928.09	929.28	930.00	929.54	930.44	929.92	928.80	929.55	929.40	930.83	930.28	929.24	928.44	928.54	937.48
MW1S	932.11	932.40	932.30	932.30	932.40	932.16	931.74	931.86	931.72	932.08	932.04	931.59	931.15	931.09	931.33
MW4U	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	<909.32	<909.37	< 909.6	DRY
MW6S	926.20	926.06	926.12	926.21	927.68	928.00	927.45	927.34	927.21	926.86	926.83	926.44	925.79	925.53	929.51
MW10S	929.53	928.88	928.87	928.28	928.11	927.49	924.71	927.84	926.09	928.49	927.83	923.71	919.70	919.86	932.63
MW11S	918.51	922.29	921.89	920.23	923.74	923.11	919.62	925.41	923.70	923.55	921.19	918.91	<918.60	<918.6	932.68
P1	936.17	934.55	934.48	933.76	933.83	933.49	932.97	933.45	933.25	934.27	933.59	933.13	933.33	933.35	940.76
P2	926.38	926.37	926.38	926.33	926.51	NM	926.51	926.50	926.51	927.35	CAP FROZEN	926.56	CAP FROZEN	926.45	926.56
P3	927.31	927.49	927.45	927.36	927.38	927.39	927.48	927.48	927.46	930.14	929.66	929.38	929.01	928.97	931.66
P4	930.00	929.98	930.02	929.98	929.96	929.90	929.85	929.95	929.89	930.05	929.99	928.40	929.81	929.83	930.11
SUMP*	913.48	913.58	907.71	913.41	914.17	913.47	907.87	913.69	913.53	916.54	917.85	918.84	914.36	913.59	916.38
Glacial Drift (Lower Sand) Aquifer															
EW1*	877.01	867.76	867.94	881.52	882.21	883.24	884.50	894.15	894.51	884.80	884.20	883.80	884.13	883.78	883.95
EW1A*	NM	895.89	895.39	879.98	NM	NM	878.59	878.98	879.18	887.37	887.56	886.98	888.31	888.22	889.77
EW1B*	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW1D	897.10	896.89	896.70	896.10	896.01	895.62	895.25	895.26	895.26	895.10	895.21	895.14	895.34	895.04	896.39
MW4D	896.09	895.82	895.67	894.89	894.93	894.43	894.18	894.35	894.39	893.90	893.98	893.87	894.02	893.84	895.16
MW4S	899.20	898.46	898.19	897.43	897.28	896.81	896.39	896.25	896.40	895.93	896.01	895.91	896.01	895.73	896.63
MW6D	897.18	896.75	896.58	895.96	895.88	895.35	894.91	895.04	895.14	894.71	894.78	894.72	894.85	894.66	895.65
MW10D	901.41	894.97	900.71	900.10	900.42	900.02	899.79	899.86	900.12	899.19	899.25	899.04	898.86	898.57	899.54
MW11D	899.87	899.48	899.24	898.59	898.83	898.36	896.84	898.16	898.22	897.68	897.64	897.37	897.28	896.89	898.79
MW12D	899.12	898.57	898.40	898.04	897.91	897.60	897.19	897.14	897.20	896.68	896.76	896.67	896.51	896.32	897.22
MW13D	897.77	897.42	897.24	896.71	896.73	896.29	895.94	895.91	895.94	895.54	895.65	895.48	895.48	895.21	896.77
MW16D	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Upper St. Peter Sandstone Aquifer															
EW2*	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW7B	898.12	897.89	897.76	897.21	897.09	896.76	896.39	896.30	896.33	896.16	896.29	896.24	896.40	896.10	897.34
MW8B	895.99	895.69	895.52	894.76	894.66	894.30	894.03	894.22	894.26	893.80	893.83	893.77	893.93	893.71	895.01
MW10B	895.96	901.63	895.50	894.76	894.83	894.27	894.00	894.23	894.18	893.78	893.86	893.78	893.92	893.72	895.08
MW12B	895.87	895.58	895.33	894.69	894.72	894.21	893.90	894.09	894.05	893.71	893.86	893.73	893.89	893.63	895.01
MW13B	895.66	895.42	895.18	894.58	894.54	894.05	893.73	893.90	893.84	893.59	893.68	893.62	893.73	893.52	894.93
MW16B	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW17A	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW18A	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW19A	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW21A	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

Appendix B

Historical Summary of Groundwater Elevations
Highway 96 Site
White Bear Township, Minnesota

Location	2/28/2000 (ft. AMSL)	3/29/2000 (ft. AMSL)	4/28/2000 (ft. AMSL)	5/26/2000 (ft. AMSL)	6/28/2000 (ft. AMSL)	7/26/2000 (ft. AMSL)	8/31/2000 (ft. AMSL)	9/21/2000 (ft. AMSL)	10/2/2000 (ft. AMSL)	11/17/2000 (ft. AMSL)	12/13/2000 (ft. AMSL)	1/9/2001 (ft. AMSL)	2/28/2001 (ft. AMSL)	3/16/2001 (ft. AMSL)	4/23/2001 (ft. AMSL)
Basal St. Peter Sandstone Aquifer															
EW3	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW17B	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW18B	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW19B	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW20B	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
6 Blue Goose Road #	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
1 Lily Pond Road #	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
11 Lily Pond Road #	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
11 Robb Farm Road #	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
38 East Oaks Road ^	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
6 West Shore Road ^	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Prairie du Chien Aquifer															
MW17L	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW18L	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW19L	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

Appendix B

Historical Summary of Groundwater Elevations
Highway 96 Site
White Bear Township, Minnesota

Location	5/31/2001 (ft. AMSL)	8/3/2001 (ft. AMSL)	10/1/2001 (ft. AMSL)	2/7/2002 (ft. AMSL)	5/29/2002 (ft. AMSL)	8/8/2002 (ft. AMSL)	9/30/2002 (ft. AMSL)	1/6/2003 (ft. AMSL)	5/20/2003 (ft. AMSL)	9/18/2003 (ft. AMSL)	10/13/2003 (ft. AMSL)	10/18/2004 (ft. AMSL)	11/14/2005 (ft. AMSL)	10/16/2006 (ft. AMSL)	10/1/2007 (ft. AMSL)
Perched Groundwater Unit															
LW1	931.90	929.17	928.30	928.38	931.02	931.13	930.64	928.34	932.72	928.31	928.18	927.67	929.58	926.75	931.06
LW2	933.07	931.96	931.91	932.44	933.71	934.11	933.40	932.15	934.69	933.66	933.45	933.61	932.88	933.56	933.50
LW3	934.61	931.61	929.46	929.22	933.98	934.76	932.86	930.46	935.65	930.25	929.33	929.80	932.08	930.57	930.91
MW1S	938.72	935.66	933.36	932.05	937.84	939.37	935.46	933.59	938.26	933.23	932.40	932.74	932.97	931.85	931.03
MW4U	< 909.6	910.21	910.79	909.83	910.39	912.00	912.63	911.43	910.50	912.30	911.90	911.81	911.97	911.80	DRY
MW6S	933.62	932.57	931.05	928.07	930.01	930.06	928.62	927.03	931.48	928.96	928.62	928.90	930.05	930.11	930.99
MW10S	931.60	929.93	928.93	923.99	931.13	931.40	931.08	928.66	931.36	924.92	926.66	927.81	931.39	928.99	931.13
MW11S	932.04	930.53	923.91	918.77	932.18	932.72	932.43	928.35	932.60	925.64	923.50	924.39	931.86	928.15	931.49
P1	937.80	935.12	934.01	933.48	937.18	937.35	934.73	933.03	939.52	933.09	932.64	933.11	933.95	932.73	932.84
P2	926.78	926.75	926.72	926.54	926.72	926.70	926.62	926.55	926.20	927.56	926.52	926.56	926.53	928.02	927.04
P3	930.28	929.95	929.91	929.59	928.98	928.73	928.57	928.31	928.16	928.18	928.09	927.90	927.85	929.30	928.93
P4	DRY	DRY	DRY	DRY	DRY	930.78	930.64	930.57	930.32	930.64	930.59	930.64	930.65	930.65	930.65
SUMP*	918.96	920.97	921.86	914.84	916.27	913.96	913.61	915.61	919.49	921.30	920.14	917.31	921.92	926.35	923.60
Glacial Drift (Lower Sand) Aquifer															
EW1*	884.02	NM	887.18	884.26	880.00	877.62	887.66	897.35	897.42	895.95	896.11	895.60	891.88	894.36	891.64
EW1A*	890.18	888.91	889.19	894.92	880.39	880.66	877.35	875.58	870.07	859.92	858.50	860.91	857.22	856.97	865.22
EW1B*	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW1D	896.85	896.22	896.01	896.60	897.05	898.01	898.92	898.99	899.04	897.47	897.56	897.04	896.63	895.81	893.55
MW4D	895.71	895.00	894.78	895.46	895.72	896.80	897.89	897.96	898.02	896.46	896.96	896.06	895.58	894.64	892.30
MW4S	897.68	898.55	898.52	898.16	898.20	899.29	900.46	901.07	900.26	900.05	900.12	898.93	898.48	898.36	894.43
MW6D	896.43	896.35	896.08	896.39	896.63	897.63	898.54	898.92	898.72	897.52	897.71	897.02	896.67	896.02	893.38
MW10D	901.02	901.97	901.49	901.37	902.37	904.27	905.36	904.68	904.09	903.49	903.41	902.48	903.74	902.61	898.80
MW11D	900.03	900.25	899.39	898.93	900.53	902.09	903.27	902.90	902.84	901.49	901.30	900.66	901.56	900.50	896.83
MW12D	898.51	899.52	898.94	898.56	899.40	901.38	902.21	902.10	901.17	900.60	900.32	NO ACCESS	899.38	898.63	896.17
MW13D	898.04	898.41	897.92	897.84	899.16	900.72	901.27	900.70	901.09	899.59	899.55	NO ACCESS	898.88	897.69	895.26
MW16D	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	896.38	895.49	893.10
Upper St. Peter Sandstone Aquifer															
EW2*	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NM	851.37	851.76
MW7B	897.80	897.29	897.08	897.60	898.05	898.98	899.83	899.89	899.67	898.49	898.54	898.06	897.67	896.90	894.65
MW8B	895.56	894.92	894.64	895.31	895.57	896.65	897.77	897.84	897.88	896.34	896.77	895.92	895.44	894.51	892.12
MW10B	895.60	894.93	894.64	895.28	895.62	896.71	897.77	897.86	897.93	896.33	896.77	895.94	895.49	894.51	892.21
MW12B	895.53	894.84	894.60	895.21	894.90	896.68	897.70	897.80	897.87	896.24	896.35	NO ACCESS	895.42	894.46	892.18
MW13B	895.48	894.76	894.51	895.09	895.55	896.66	897.61	897.67	897.76	896.10	896.22	NO ACCESS	895.32	894.37	892.13
MW16B	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	895.84	894.94	892.59
MW17A	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	893.22	892.13	890.11
MW18A	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	885.63
MW19A	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
MW21A	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

Historical Summary of Groundwater Elevations
Highway 96 Site
White Bear Township, Minnesota

Location	5/31/2001 (ft. AMSL)	8/3/2001 (ft. AMSL)	10/1/2001 (ft. AMSL)	2/7/2002 (ft. AMSL)	5/29/2002 (ft. AMSL)	8/8/2002 (ft. AMSL)	9/30/2002 (ft. AMSL)	1/6/2003 (ft. AMSL)	5/20/2003 (ft. AMSL)	9/18/2003 (ft. AMSL)	10/13/2003 (ft. AMSL)	10/18/2004 (ft. AMSL)	11/14/2005 (ft. AMSL)	10/16/2006 (ft. AMSL)	10/1/2007 (ft. AMSL)
Basal St. Peter Sandstone Aquifer															
EW3	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	877.14
MW17B	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	886.53	885.09	883.28
MW18B	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	883.73
MW19B	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	878.79	876.90
MW20B	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	876.66
6 Blue Goose Road #	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	890.85	886.20
1 Lily Pond Road #	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	892.13	884.25
11 Lily Pond Road #	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	885.73	884.20
11 Robb Farm Road #	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	892.58	890.56
38 East Oaks Road ^	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
6 West Shore Road ^	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Prairie du Chien Aquifer															
MW17L	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	883.16	880.77	878.79
MW18L	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	875.54
MW19L	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	874.40	872.50

Historical Summary of Groundwater Elevations
Highway 96 Site
White Bear Township, Minnesota

Location	10/6/2008 (ft. AMSL)	12/14/2009 (ft. AMSL)	10/11/2010 (ft. AMSL)	10/10/2011 (ft. AMSL)	10/1/2012 (ft. AMSL)	9/30/2013 (ft. AMSL)	10/6/2014 (ft. AMSL)	10/5/2015 (ft. AMSL)	10/3/2016 (ft. AMSL)	9/27/2017 (ft. AMSL)	10/8/2018 (ft. AMSL)	10/24/2019 (ft. AMSL)
Perched Groundwater Unit												
LW1	927.01	DRY	929.75	928.26	927.95	928.06	932.20	931.10	932.79	929.53	933.35	934.16
LW2	932.58	932.64	931.86	932.62	931.61	931.91	933.44	938.22	934.60	933.60	935.02	938.14
LW3	928.33	929.96	930.85	930.79	928.40	928.86	933.21	937.37	934.59	932.06	934.68	935.76
MW1S	931.63	930.33	931.52	933.96	931.67	932.74	933.31	933.03	937.02	932.44	933.67	937.02
MW4U	909.88	DRY	909.86	913.36	910.24	911.11	914.40	913.81	916.57	915.03	914.99	915.96
MW6S	928.05	928.43	927.94	930.47	928.22	929.66	931.29	930.30	932.68	929.23	929.69	932.02
MW10S	DRY	927.69	929.74	928.71	919.89	920.18	930.74	931.47	932.70	930.98	931.83	932.68
MW11S	920.62	920.32	931.08	928.20	922.34	923.49	932.36	932.17	932.94	931.04	932.94	933.16
P1	932.05	932.36	932.45	933.39	931.67	932.29	933.59	933.33	935.97	932.52	934.94	938.98
P2	928.40	926.68	926.57	928.47	926.62	926.62	930.77	926.78	932.77	929.35	934.69	938.85
P3	929.21	929.06	928.66	929.58	928.75	928.42	930.35	929.59	930.05	928.85	938.82	942.76
P4	930.68	930.65	DRY	930.65	930.68	930.68	930.75	930.81	930.95	931.08	936.15	939.90
SUMP*	924.91	923.21	919.71	921.48	918.52	920.58	924.75	920.81	927.25	926.89	935.76	939.44
Glacial Drift (Lower Sand) Aquifer												
EW1*	892.16	891.96	891.26	894.96	891.26	893.84	896.94	897.05	899.05	899.23	899.02	901.46
EW1A*	861.67	871.43	891.79	895.28	892.74	894.22	897.31	897.31	899.39	899.42	899.03	901.42
EW1B*	NI	NI	888.44	894.88	889.43	891.04	893.42	892.51	887.65	890.44	884.90	877.57
MW1D	893.91	893.26	892.13	896.08	894.04	895.55	898.74	898.97	901.07	901.07	900.82	902.80
MW4D	892.45	892.17	891.93	895.06	892.91	894.39	897.53	897.71	899.99	899.92	899.59	901.79
MW4S	895.39	893.51	894.58	899.26	897.09	898.27	902.57	902.08	905.57	907.63	905.18	907.41
MW6D	893.72	893.15	893.23	896.68	894.62	895.95	898.94	899.10	901.25	901.48	900.93	902.97
MW10D	899.92	897.05	898.59	903.43	900.50	901.00	904.50	904.73	908.49	908.79	NM	NM
MW11D	897.06	894.94	896.46	901.03	897.98	899.22	903.70	903.93	906.65	906.10	NM	908.08
MW12D	896.89	895.62	894.68	900.48	897.80	899.27	902.75	902.60	906.39	905.65	906.00	907.75
MW13D	895.88	894.35	894.10	898.87	896.35	898.28	901.56	901.27	904.07	903.28	899.79	905.43
MW16D	893.15	892.79	892.70	895.84	893.55	895.05	898.35	898.51	900.70	900.69	900.44	902.57
Upper St. Peter Sandstone Aquifer												
EW2*	830.76	844.88	838.11	829.96	855.39	892.30	895.08	895.02	898.46	898.76	898.76	900.91
MW7B	894.69	894.29	894.28	897.41	895.40	896.71	899.80	900.08	902.18	902.17	901.99	903.83
MW8B	892.26	892.01	891.74	892.87	892.72	894.24	897.38	897.53	899.66	899.81	899.43	901.64
MW10B	892.32	892.04	891.76	894.88	892.66	894.27	897.45	897.58	899.74	899.66	899.49	901.64
MW12B	892.28	891.95	891.71	894.82	892.68	894.20	897.41	897.57	899.71	899.64	899.47	901.61
MW13B	892.23	891.89	891.64	894.77	892.59	894.14	897.36	897.52	899.69	899.59	899.40	901.49
MW16B	892.72	892.42	892.16	895.24	893.08	894.61	897.85	898.00	900.13	900.06	900.11	902.01
MW17A	890.16	889.78	889.55	892.56	890.51	892.03	895.36	895.51	897.69	897.56	897.32	899.30
MW18A	885.88	885.39	885.21	888.49	886.64	887.96	891.15	891.31	893.46	893.81	893.14	895.43
MW19A	882.33	881.79	881.75	885.61	883.82	884.96	887.92	888.09	890.28	891.18	889.90	892.36
MW21A	882.51	882.01	881.96	885.80	884.01	885.20	887.90	888.27	890.44	891.32	890.07	892.50

Appendix B

Historical Summary of Groundwater Elevations
Highway 96 Site
White Bear Township, Minnesota

Location	10/6/2008 (ft. AMSL)	12/14/2009 (ft. AMSL)	10/11/2010 (ft. AMSL)	10/10/2011 (ft. AMSL)	10/1/2012 (ft. AMSL)	9/30/2013 (ft. AMSL)	10/6/2014 (ft. AMSL)	10/5/2015 (ft. AMSL)	10/3/2016 (ft. AMSL)	9/27/2017 (ft. AMSL)	10/8/2018 (ft. AMSL)	10/24/2019 (ft. AMSL)
Basal St. Peter Sandstone Aquifer												
EW3	877.16	878.33	877.05	879.68	877.15	879.48	882.57	882.96	885.98	885.73	885.91	888.40
MW17B	883.10	884.25	882.56	884.78	881.67	884.21	888.54	887.99	891.03	890.21	891.34	892.88
MW18B	883.83	883.58	882.06	885.05	882.39	883.85	887.92	887.43	890.43	890.44	890.17	892.31
MW19B	876.92	877.91	876.65	879.43	876.90	878.67	882.43	882.68	885.71	885.47	885.65	887.62
MW20B	876.64	877.97	877.00	879.83	877.27	879.16	882.19	883.31	886.30	886.28	886.21	888.72
6 Blue Goose Road #	886.12	886.90	885.57	887.63	884.55	887.26	891.56	891.10	893.87	893.12	894.32	896.35
1 Lily Pond Road #	890.31	890.98	883.69	892.68	890.58	892.24	895.72	895.80	898.45	897.83	897.72	899.77
11 Lily Pond Road #	884.20	885.01	883.87	885.94	883.01	885.31	889.63	889.19	891.98	891.35	892.32	894.43
11 Robb Farm Road #	890.63	890.31	890.08	893.14	891.00	892.58	895.85	895.97	898.20	898.04	897.90	899.96
38 East Oaks Road ^	879.73	881.04	879.20	881.82	878.73	880.77	885.36	885.26	888.15	888.07	887.79	890.46
6 West Shore Road ^	880.62	881.12	880.01	882.80	880.18	881.85	886.03	883.46	888.60	888.42	888.67	891.05
Prairie du Chien Aquifer												
MW17L	879.27	881.31	878.52	880.70	876.63	879.25	885.18	883.38	886.99	885.37	888.17	890.21
MW18L	875.53	878.39	874.85	877.31	873.29	875.92	881.19	880.67	884.23	883.29	885.01	887.39
MW19L	872.28	875.15	872.64	875.26	871.40	873.65	878.47	878.51	882.13	880.29	882.57	885.01

Notes:

ft. AMSL - Feet Above Mean Sea Level
NI - Not Installed
NM - Not Measured
TOC - Top of Casing
* - Historical/Current Pumping Well
# - Converted Residential Monitoring Well
^ - Active Residential Well

Appendix C
Annual Monitoring Well Sampling Summary

Appendix C

Monitoring Well Sampling Summary
Oct/Nov/Dec 2019
Highway 96 Site
White Bear Township, Minnesota

Well	Sample No.	QA/QC	pH (--)	Temperature (ºC)	Conductivity (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Comments	Analytical
BLU-06 #	W-191206-KJ-18	--	8.73	7.04	0.684	-190	0.00	21.9	Clear	P1,P3
EW1B	W-191108-SR-01	--	6.80	NM	NM	NM	NM	NM	--	P1,P2
EW2	W-191108-SR-02	--	6.90	NM	NM	NM	NM	NM	--	P1,P2
EW3	W-191205-KJ-07	--	8.68	8.68	0.682	-215	0.00	4.8	Clear	P1,P3
LIL-01 #	W-191206-KJ-12	FD (KJ-14)	9.01	6.10	0.734	-236	0.00	0.0	Clear	P1,P3
LIL-11 #	W-191206-KJ-16	--	8.78	8.62	0.606	-219	0.00	14.4	Clear	P1,P3
LW1	W-191024-KJ-07	MS/MSD	7.80	12.24	0.766	-2	0.00	4.5	--	P1,P2
LW2	W-191024-KJ-12	--	7.86	12.24	1.73	-114	0.00	31.1	--	P1,P2
LW3	W-191024-KJ-11	--	8.00	13.81	1.36	-134	0.00	4.2	--	P1,P2
MW1D	W-191024-KJ-14	--	8.21	9.60	0.762	-217	0.00	13.1	Clear	P1,P2
MW1S	W-191024-KJ-13	--	7.60	10.78	1.22	-121	0.14	47.1	Clear	P1,P2
MW4D	W-191024-KJ-08	--	7.59	9.07	1.79	-187	0.00	45.9	--	P1,P2
MW4S	W-191024-KJ-10	--	7.05	9.70	1.35	-129	0.00	72.1	--	P1,P2
MW4U	W-191024-KJ-04	--	7.80	8.17	1.44	-67	0.00	4.7	--	P1,P2
MW8B	W-191024-KJ-06	RB (KJ-05)	8.46	7.98	0.973	-257	0.00	41.1	--	P1,P2
MW10B	W-191023-KJ-01	FD (KJ-02)	7.75	10.15	0.696	-78	0.00	12.7	--	P1,P2
MW10D	NS	--	--	--	--	--	--	--	--	--
MW11D	W-191024-KJ-03	--	7.97	9.78	0.636	-185	0.00	59.2	--	P1,P2
MW12B	W-191025-KJ-16	FD (KJ-17)	7.99	10.31	0.666	-223	0.00	18.2	--	P1,P2
MW12D	W-191025-KJ-18	--	7.58	7.55	0.436	-109	0.00	32.1	--	P1,P2
MW13B	W-191126-KJ-02	--	7.85	9.55	0.644	-200	0.00	0.0	--	P1,P2
MW13D	W-191126-KJ-01	--	7.40	10.45	0.752	-219	0.00	18.7	--	P1,P2
MW16B	W-191025-KJ-20	RB (KJ-19)	8.77	10.25	0.686	-177	0.00	4.8	--	P1,P2
MW16D	W-191025-KJ-22	--	7.50	12.76	0.911	-195	0.00	54.7	--	P1,P2
MW17A	W-191206-KJ-15	RB (KJ-13)	7.27	6.20	1.09	-185	0.00	3.9	Clear	P1,P3
MW17B	W-191206-KJ-17	MS/MSD	7.53	8.59	0.687	-183	0.00	59.1	Sl. Cloudy	P1,P3
MW17L	W-191206-KJ-21	RB (KJ-19), FD (KJ-23)	7.62	7.96	0.570	-124	0.00	2.6	--	P1,P3

Appendix C

Monitoring Well Sampling Summary
Oct/Nov/Dec 2019
Highway 96 Site
White Bear Township, Minnesota

Well	Sample No.	QA/QC	pH (--)	Temperature (ºC)	Conductivity (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Comments	Analytical
MW18A	W-191205-KJ-06	RB (KJ-04)	7.44	9.26	0.862	-211	0.00	0.9	Clear	P1,P3
MW18B	W-191205-KJ-08	--	7.57	9.30	0.782	-190	0.00	0.0	Clear	P1,P3
MW18L	W-191205-KJ-10	--	10.62	9.32	0.212	-253	0.00	4.9	Clear	P1,P3
MW19A	W-191205-KJ-05	--	7.24	8.80	0.829	-191	0.00	0.0	--	P1,P3
MW19B	W-191205-KJ-01	--	7.05	9.72	0.668	-153	0.00	4.8	Clear	P1,P3
MW19L	W-191205-KJ-09	RB (KJ-03)	7.10	8.01	0.569	-141	0.00	19.2	Clear	P1,P3
MW20B	W-191205-KJ-02	--	8.30	8.73	0.622	-181	0.00	0.0	Clear	P1,P3
MW21A	W-191205-KJ-11	--	8.87	8.24	0.593	-227	0.00	3.8	Clear	P1,P3
ROB-11 #	W-191126-KJ-01	--	7.30	10.09	0.560	-181	0.00	6.0	--	P1,P3
SUMP	W-191025-KJ-21	--	9.52	10.47	1.10	25	4.66	66.0	--	P1,P2

Notes:

- Converted residential monitoring well.

DO - Dissolved Oxygen
FD - Field Duplicate
mg/L - Milligrams per Liter
mS/cm - Millisiemens per Centimeter
MS/MSD - Matrix Spike/Matrix Spike Duplicate
mV - Millivolts
NM - Not Measured
NS - Not Sampled (Access/Equipment Issue)
NTU - Nephelometric Turbidity Units
ORP - Oxidation Reduction Potential
P1 - Chloride (Method 300.0A)
P2 - Volatile Organic Compounds (VOCs) (Method 8260C)
P3 - Low-Level VOCs (Method 524.2)
QA/QC - Quality Assurane/Quality Control Sample Type
RB - Rinsate Blank

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	December 6, 2019
Ref. No.:	002012-01-050	Personnel:	SR

Well Data:

Well Name:	BLU-06	Midscreen Depth (ft BTOC):	214.15
Well Depth (ft BTOC):	232.15	Well Diameter, D (in):	4
Screen Length (ft):	36.00	Purge Method:	Grundfos Pump
Other Well Info:	Openhole	Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1330	STATIC	57.63								
1335	~250	57.83	0.20	8.91	5.90	0.621	-186	0.00	90.2	Cloudy, Black
1340	250 #	57.84	0.21	8.83	6.27	0.692	-177	0.00	95.7	Cloudy, Black
1345	250	57.83	0.20	8.82	6.00	0.692	-181	0.00	66.5	Cloudy, Black
1350	250	57.84	0.21	8.79	6.56	0.687	-183	0.00	55.7	Sl Cloudy
1355	250	57.83	0.20	8.78	6.52	0.691	-186	0.00	48.7	Sl Cloudy
1400	250	57.83	0.20	8.77	6.65	0.687	-186	0.00	43.4	Sl Cloudy
1405	250	57.83	0.20	8.76	6.77	0.687	-187	0.00	38.5	Sl Cloudy
1410	250	57.84	0.21	8.75	6.81	0.686	-188	0.00	33.8	Sl Cloudy
1415	250	57.83	0.20	8.74	7.10	0.683	-189	0.00	30.1	Sl Cloudy
1420	250	57.83	0.20	8.73	6.97	0.686	-189	0.00	27.0	Clear
1425	250	57.83	0.20	8.73	6.87	0.685	-189	0.00	23.3	Clear
1430 X	250	57.83	0.20	8.73	7.04 T	0.684	-190	0.00	21.9 Y	Clear

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
T - Temperature stabilization affected by ambient conditions
X - Sampled per protocol (partial stabilization; max 1-hr purge time)
Y - Turbidity > 5 [lowest possible purge rate]

Sample Collection: VOCs (524.2) + Chloride

Time	Sample ID	QA/QC
1433	W-191206-KJ-18	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	November 8, 2019
Ref. No.:	002012-01-050	Personnel:	WO

Well Data:

Well Name:	EW1B	Midscreen Depth (ft BTOC):	NA (Grab Sample)
Well Depth (ft BTOC):	96.99	Well Diameter, D (in):	6
Screen Length (ft):	10.00	Purge Method:	Pump House Spigot
Other Well Info:	2-ft Tail Piece; Pump set ~84 ft BTOC	Dedicated Tubing:	NA

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1420	GRAB			6.80	NM	NM	NM	NM	NM	

Notes:

* - ≤ 250 mL/min for sample collection

Sample Collection: VOCs (8260C) + Chloride + pH (field) + COD + TSS

Time	Sample ID	QA/QC
1420	W-191108-SR-01	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	November 8, 2019
Ref. No.:	002012-01-050	Personnel:	WO

Well Data:

Well Name:	EW2	Midscreen Depth (ft BTOC):	NA (Grab Sample)
Well Depth (ft BTOC):	140.17	Well Diameter, D (in):	6 (down to 4)
Screen Length (ft):	10.30	Purge Method:	Pump House Spigot
Other Well Info:	5-ft Tail Piece, Pump set ~89 ft BTOC	Dedicated Tubing:	NA

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1425	GRAB			6.90	NM	NM	NM	NM	NM	

Notes:

* - ≤ 250 mL/min for sample collection

Sample Collection: VOCs (8260C) + Chloride + pH (field) + COD + TSS

Time	Sample ID	QA/QC
1425	W-191108-SR-02	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	December 5, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/SA

Well Data:

Well Name:	EW3	Midscreen Depth (ft BTOC):	198.23
Well Depth (ft BTOC):	203.38	Well Diameter, D (in):	6
Screen Length (ft):	10.30	Purge Method:	Grundfos Pump
Other Well Info:	5-ft Tail Piece	Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1336	STATIC	25.18								
1348	500	25.80	0.62	8.41	9.31	0.657	-186	0.11	40.1	Clear
1353	200	26.30	1.12	8.58	9.20	0.666	-200	0.00	30.1	Clear
1358	100	26.15	0.97	8.64	8.80	0.672	-206	0.00	16.9	Clear
1405	100	26.14	0.96	8.69	8.79	0.677	-208	0.00	12.5	Clear
1408	100	26.10	0.92	8.71	8.39	0.680	-216	0.00	9.9	Clear
1413	<100 #	26.08	0.90	8.87	8.70	0.683	-211	0.00	6.9	Clear
1418	<100	26.01	0.83	8.66	8.68	0.683	-214	0.00	5.1	Clear
1423	<100	25.97	0.79 DS	8.68	8.68	0.682	-215	0.00	4.8	Clear

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
D - Drawdown > 0.3 [lowest possible purge rate]
S - Sample collected because other parameters have stabilized

Sample Collection: VOCs (524.2) + Chloride

Time	Sample ID	QA/QC
1423	W-191205-KJ-07	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	December 6, 2019
Ref. No.:	002012-01-050	Personnel:	SR

Well Data:

Well Name:	LIL-01	Midscreen Depth (ft BTOC):	196.18
Well Depth (ft BTOC):	221.18	Well Diameter, D (in):	5
Screen Length (ft):	50.00	Purge Method:	Grundfos Pump
Other Well Info:	Openhole	Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1003	STATIC	31.08								
1008	500	31.14	0.06	10.13	7.49	0.360	-223	1.17	8.9	Clear
1013	500	31.14	0.06	9.72	7.82	0.613	-226	0.23	4.3	Clear
1018	500	31.14	0.06	9.35	7.92	0.675	-231	0.00	1.1	Clear
1023	500	31.15	0.07	9.21	7.85	0.693	-234	0.00	1.4	Clear
1028	500	31.15	0.07	9.13	7.81	0.703	-236	0.00	1.7	Clear
1033	500	31.14	0.06	9.06	7.86	0.709	-238	0.00	2.7	Clear
1038	250 #	31.11	0.03	9.05	6.50	0.733	-237	0.00	0.0	Clear
1043	250	31.11	0.03	9.03	6.37	0.731	-237	0.00	0.0	Clear
1048	250	31.11	0.03	9.01	6.10 TS	0.734	-236	0.00	0.0	Clear

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
S - Sample collected because other parameters have stabilized
T - Temperature stabilization affected by ambient conditions

Sample Collection: VOCs (524.2) + Chloride

Time	Sample ID	QA/QC
1050	W-191206-KJ-12	
1051	W-191206-KJ-14	FD

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	December 6, 2019
Ref. No.:	002012-01-050	Personnel:	SR

Well Data:

Well Name:	LIL-11	Midscreen Depth (ft BTOC):	193.04
Well Depth (ft BTOC):	210.54	Well Diameter, D (in):	4
Screen Length (ft):	35.00	Purge Method:	Grundfos Pump
Other Well Info:	Openhole	Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1144	STATIC	33.92								
1149	~500	34.08	0.16	9.76	8.39	0.255	-279	1.56	62.3	
1154	500	34.09	0.17	9.11	8.81	0.557	-220	0.00	102.0	Sl Cloudy
1159	250 #	34.05	0.13	8.90	8.42	0.602	-216	0.00	88.5	Sl Cloudy
1204	250	34.04	0.12	8.86	8.55	0.606	-217	0.00	56.5	Sl Cloudy
1209	250	34.05	0.13	8.84	8.61	0.309	-218	0.00	48.9	Sl Cloudy
1214	250	34.05	0.13	8.79	8.58	0.616	-209	0.00	41.8	Sl Cloudy
1219	250	34.05	0.13	8.79	8.57	0.612	-215	0.00	30.8	Clear
1224	250	34.05	0.13	8.79	8.63	0.611	-216	0.00	24.9	Clear
1229	250	34.05	0.13	8.78	8.71	0.608	-217	0.00	19.8	Clear
1234	250	34.05	0.13	8.78	8.71	0.608	-218	0.00	17.9	Clear
1239	250	34.05	0.13	8.78	8.76	0.606	-218	0.00	16.3	Clear
1244 X	250	34.05	0.13	8.78	8.62 T	0.606	-219	0.00	14.4 Y	Clear

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
T - Temperature stabilization affected by ambient conditions
X - Sampled per protocol (partial stabilization; max 1-hr purge time)
Y - Turbidity > 5 [lowest possible purge rate]

Sample Collection: VOCs (524.2) + Chloride

Time	Sample ID	QA/QC
1246	W-191206-KJ-16	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	October 24, 2019
Ref. No.:	002012-01-050	Personnel:	KJ

Well Data:

Well Name:	LW1	Midscreen Depth (ft BTOC):	10.76
Well Depth (ft BTOC):	13.26	Well Diameter, D (in):	2
Screen Length (ft):	5.00	Purge Method:	Peristaltic Pump
Other Well Info:	2.5-ft Tail Piece	Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
10:30	STATIC	4.69								
1035	250	4.97	0.28	8.04	11.24	0.756	-19	0.00	25.6	clear
1040	150	4.93	0.24	7.94	11.33	0.761	-12	0.00	11.5	clear
1045	150	4.93	0.24	7.88	11.49	0.765	-8	0.00	14.4	clear
1050	100	4.88	0.19	7.85	12.16	0.766	-3	0.00	6.5	clear
1055	100	4.88	0.19	7.81	12.20	0.766	-3	0.00	5.0	clear
1100	100	4.87	0.18	7.80	12.24	0.766	-2	0.00	4.5	clear

Notes:

* - ≤ 250 mL/min for sample collection

Sample Collection: VOCs (8260C) + Chloride

Time	Sample ID	QA/QC
1100	W-191024-KJ-07	MS/MSD

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	October 24, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/CM

Well Data:

Well Name:	LW2	Midscreen Depth (ft BTOC):	14.11
Well Depth (ft BTOC):	16.61	Well Diameter, D (in):	2
Screen Length (ft):	5.00	Purge Method:	Peristaltic Pump
Other Well Info:	2.5-ft Tail Piece	Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
12:21	STATIC	7.52								
12:26	150	10.69	3.17	8.16	12.18	1.480	-114	0.00	71.4	
12:31	150 #	10.58	3.06	8.03	12.49	1.580	-113	0.00	55.9	
12:36	150	10.55	3.03	7.97	12.61	1.610	-114	0.00	56.4	
12:41	150	10.55	3.03	7.93	12.16	1.680	-114	0.00	37.5	
12:46	150	10.55	3.03	7.91	12.00	1.700	-114	0.00	31.7	
12:51	150	10.56	3.04	7.90	11.85	1.710	-114	0.00	39.2	
12:56	150	10.59	3.07	7.88	12.53	1.710	-114	0.00	30.9	
13:01	150	10.58	3.06 DS	7.86	12.24 TS	1.730	-114	0.00	31.1 YS	

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
D - Drawdown > 0.3 [lowest possible purge rate]
S - Sample collected because other parameters have stabilized
T - Temperature stabilization affected by ambient conditions
Y - Turbidity > 5 [lowest possible purge rate]

Sample Collection: VOCs (8260C) + Chloride

Time	Sample ID	QA/QC
1302	W-191024-KJ-12	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	October 24, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/CM

Well Data:

Well Name:	LW3	Midscreen Depth (ft BTOC):	18.52
Well Depth (ft BTOC):	21.02	Well Diameter, D (in):	2
Screen Length (ft):	5.00	Purge Method:	Peristaltic Pump
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1107	STATIC	9.37								
1112	250	9.50	0.13	7.69	12.31	1.460	-109	0.00	42.7	
1117	250	9.50	0.13	7.95	12.53	1.420	-129	0.00	12.5	
1122	250	9.50	0.13	9.00	12.73	1.410	-131	0.00	10.8	
1127	150	9.40	0.03	8.00	13.75	1.360	-135	0.00	6.8	
1132	150	9.40	0.03	8.00	13.79	1.360	-134	0.00	4.8	
1137	150	9.40	0.03	8.00	13.81	1.360	-134	0.00	4.2	

Notes:

* - ≤ 250 mL/min for sample collection

Sample Collection: VOCs (8260C) + Chloride

Time	Sample ID	QA/QC
1137	W-191024-KJ-11	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	October 24, 2019
Ref. No.:	002012-01-050	Personnel:	RA

Well Data:

Well Name:	MW1D	Midscreen Depth (ft BTOC):	101.61
Well Depth (ft BTOC):	106.61	Well Diameter, D (in):	2
Screen Length (ft):	10.00	Purge Method:	Hurricane Pump
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1245	STATIC	48.22								
1250	200	48.59	0.37	8.23	9.58	0.759	-217	0.00	13.2	Clear
1255	200 #	48.55	0.33	8.22	9.60	0.761	-217	0.00	13.3	Clear
1300	200	48.55	0.33 DS	8.21	9.60	0.762	-217	0.00	13.1 YS	Clear

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
D - Drawdown > 0.3 [lowest possible purge rate]
S - Sample collected because other parameters have stabilized
Y - Turbidity > 5 [lowest possible purge rate]

Sample Collection: VOCs (8260C) + Chloride

Time	Sample ID	QA/QC
1300	W-191024-KJ-14	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	October 24, 2019
Ref. No.:	002012-01-050	Personnel:	RA

Well Data:

Well Name:	MW1S	Midscreen Depth (ft BTOC):	20.40
Well Depth (ft BTOC):	25.40	Well Diameter, D (in):	2
Screen Length (ft):	10.00	Purge Method:	Peristaltic/Monsoon Pump
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1205	STATIC	13.63								
1210	300	15.18	1.55	8.03	10.25	1.210	-160	1.60	112.0	Clr
1215	300	15.21	1.58	7.84	10.57	1.210	-150	1.14	121.0	Clr
1220	200 #	15.18	1.55	7.79	10.61	1.210	-143	1.09	77.7	Clr
1225	200	15.18	1.55	7.71	10.01	1.210	-140	1.09	63.0	Clr
1230	200	15.22	1.59	7.65	10.80	1.220	-123	0.20	47.8	Clr
1235	200	15.22	1.59	7.62	10.79	1.220	-122	0.17	45.1	Clr
1240	200	15.23	1.60 DS	7.60	10.78	1.220	-121	0.14	47.1 YS	Clr

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
D - Drawdown > 0.3 [lowest possible purge rate]
S - Sample collected because other parameters have stabilized
Y - Turbidity > 5 [lowest possible purge rate]

Sample Collection: VOCs (8260C) + Chloride

Time	Sample ID	QA/QC
1240	W-191024-KJ-13	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	October 24, 2019
Ref. No.:	002012-01-050	Personnel:	RA/CM

Well Data:

Well Name:	MW4D	Midscreen Depth (ft BTOC):	85.23
Well Depth (ft BTOC):	90.23	Well Diameter, D (in):	2
Screen Length (ft):	10.00	Purge Method:	Grundfos
Other Well Info:	Partial Obstruction (lip @ top of screen)	Dedicated Tubing:	New

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1105	STATIC	38.69								
1110	300	42.57	3.88	7.45	8.23	1.680	-174	1.50	56.7	
1115	300	42.67	3.98	7.53	8.03	1.520	-173	0.00	57.8	
1120	200 #	46.71	8.02	7.57	9.08	1.760	-181	0.00	47.1	
1125	200	47.12	8.43	7.57	9.06	1.770	-181	0.00	47.1	
1130	200	48.12	9.43 DS	7.59	9.07	1.790	-187	0.00	45.9 YS	

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
D - Drawdown > 0.3 [lowest possible purge rate]
S - Sample collected because other parameters have stabilized
Y - Turbidity > 5 [lowest possible purge rate]

Sample Collection: VOCs (8260C) + Chloride

Time	Sample ID	QA/QC
1130	W-191024-KJ-08	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	December 24, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/CM

Well Data:

Well Name:	MW4S	Midscreen Depth (ft BTOC):	42.88
Well Depth (ft BTOC):	47.88	Well Diameter, D (in):	2
Screen Length (ft):	10.00	Purge Method:	Monsoon Pump
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
0937	STATIC	32.90								
0957	~500	Dry								
1140	200	Recharge		7.05	9.70	1.350	-129	0.00	72.1	

Notes:

* - ≤ 250 mL/min for sample collection

Sample Collection: VOCs (8260C) + Chloride

Time	Sample ID	QA/QC
1140	W-191024-KJ-10	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	October 24, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/CM

Well Data:

Well Name:	MW4U	Midscreen Depth (ft BTOC):	28.80
Well Depth (ft BTOC):	31.30	Well Diameter, D (in):	2
Screen Length (ft):	5.00	Purge Method:	Peristaltic
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
08:47	STATIC	24.24								
08:52	500	24.73	0.49	10.44	8.47	1.370	-137	0.00	150.0	
09:07	200	24.52	0.28	8.44	8.23	1.350	-79	0.00	38.7	
09:12	200	24.48	0.24	8.26	8.25	1.350	-74	0.00	32.5	
09:17	200	24.47	0.23	8.12	8.19	1.380	-71	0.00	23.6	
09:22	200	24.47	0.23	8.01	8.19	1.400	-70	0.00	13.9	
09:27	200	24.47	0.23	7.95	8.19	1.410	-69	0.00	9.8	
09:32	200	24.48	0.24	7.89	8.17	1.420	-69	0.00	7.6	
09:39	200	24.52	0.28	7.83	8.17	1.430	-68	0.00	5.5	
09:45	150	24.50	0.26	7.80	8.17	1.440	-67	0.00	4.7	

Notes:

* - ≤ 250 mL/min for sample collection

Sample Collection: VOCs (8260C) + Chloride

Time	Sample ID	QA/QC
0946	W-191024-KJ-04	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	October 24, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/CM

Well Data:

Well Name:	MW8B	Midscreen Depth (ft BTOC):	129.61
Well Depth (ft BTOC):	134.61	Well Diameter, D (in):	4
Screen Length (ft):	10.00	Purge Method:	Grundfos Pump
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
10:13	STATIC	39.27								
10:18	500	39.82	0.55	8.38	9.27	0.935	-224	0.00	4.0	
10:23	400	39.60	0.33	8.43	8.31	0.962	-239	0.00	41.2	
10:28	300 #	39.57	0.30	8.47	8.05	0.965	-247	0.00	40.8	
10:33	300	39.62	0.35	8.48	7.95	0.965	-253	0.00	39.1	
10:37	300	39.57	0.30	8.49	7.95	0.967	-256	0.00	39.5	
10:43	300 *	39.61	0.34 DS	8.46	7.98	0.973	-257	0.00	41.1 YS	

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
D - Drawdown > 0.3 [lowest possible purge rate]
S - Sample collected because other parameters have stabilized
Y - Turbidity > 5 [lowest possible purge rate]

Sample Collection: VOCs (8260C) + Chloride

Time	Sample ID	QA/QC
0959	W-191024-KJ-05	RB
1044	W-191024-KJ-06	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	October 23, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/CM

Well Data:

Well Name:	MW10B	Midscreen Depth (ft BTOC):	177.00 (bottom screen)
Well Depth (ft BTOC):	182.00	Well Diameter, D (in):	5
Screen Length (ft):	10.00	Purge Method:	Grundfos Pump
Other Well Info:	5-ft Tail Piece; Three Screens	Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1239	STATIC	35.00								
1247	400	35.13	0.13	8.77	9.98	0.697	-55	0.00	21.0	
1252	400	35.13	0.13	8.28	9.94	0.697	-53	0.00	18.4	
1800	300	35.06	0.06	8.09	10.01	0.696	-56	0.00	16.4	
1305	300	35.12	0.12	7.99	10.05	0.696	-59	0.00	17.0	
1314	500	35.14	0.14	7.83	10.16	0.695	-69	0.00	16.4	
1319	500	35.14	0.14	7.78	10.15	0.695	-75	0.00	14.4	
1324	500 *	35.15	0.15	7.75	10.15	0.696	-78	0.00	12.7 YS	

Notes:

* - ≤ 250 mL/min for sample collection
S - Sample collected because other parameters have stabilized
Y - Turbidity > 5 [lowest possible purge rate]

Sample Collection: VOCs (8260C) + Chloride

Time	Sample ID	QA/QC
1324	W-191023-KJ-01	
1325	W-191023-KJ-02	FD

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	October 23, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/CM

Well Data:

Well Name:	MW10D	Midscreen Depth (ft BTOC):	59.74
Well Depth (ft BTOC):	62.24	Well Diameter, D (in):	2
Screen Length (ft):	5.00	Purge Method:	Hurricane Pump
Other Well Info:	Obstruction @ 13.5 ft BTOC	Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
	STATIC									

Notes:

* - ≤ 250 mL/min for sample collection

Sample Collection: VOCs (8260C) + Chloride

Time	Sample ID	QA/QC
	NS (obstruction above water table)	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	October 24, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/CM

Well Data:

Well Name:	MW11D	Midscreen Depth (ft BTOC):	60.40
Well Depth (ft BTOC):	62.90	Well Diameter, D (in):	2
Screen Length (ft):	5.00	Purge Method:	Hurricane Pump
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
09:01	STATIC	27.32								
09:06	400	32.80	5.48	8.31	11.16	0.546	-102	1.86	2.0	
09:16	100 #	40.81	13.49	7.98	9.91	0.636	-161	0.00	56.3	
09:21	100	43.10	15.78	7.98	9.87	0.636	-171	0.00	56.7	
09:26	100	45.87	18.55 DS	7.97	9.78 S	0.636	-185 S	0.00	59.2 YS	

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
D - Drawdown > 0.3 [lowest possible purge rate]
S - Sample collected because other parameters have stabilized
Y - Turbidity > 5 [lowest possible purge rate]

Sample Collection: VOCs (8260C) + Chloride

Time	Sample ID	QA/QC
0936	W-191024-KJ-03	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	October 25, 2019
Ref. No.:	002012-01-050	Personnel:	KJ

Well Data:

Well Name:	MW12B	Midscreen Depth (ft BTOC):	155.69
Well Depth (ft BTOC):	165.69	Well Diameter, D (in):	4
Screen Length (ft):	20.00	Purge Method:	Grundfos Pump
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
0913	STATIC	38.28								
0918	500	38.82	0.54	8.11	10.51	0.666	-207	0.00	16.9	
0923	500	38.64	0.36	8.09	10.56	0.666	-214	0.00	17.0	
0928	200 #	38.57	0.29	8.07	10.42	0.660	-217	0.00	15.2	
0933	200	38.54	0.26	7.99	10.34	0.666	-223	0.00	17.2	
0938	200	38.54	0.26	7.99	10.31	0.666	-223	0.00	18.2 YS	

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
S - Sample collected because other parameters have stabilized
Y - Turbidity > 5 [lowest possible purge rate]

Sample Collection: VOCs (8260C) + Chloride

Time	Sample ID	QA/QC
0938	W-191025-KJ-16	
0939	W-191025-KJ-17	FD

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	October 25, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/RA

Well Data:

Well Name:	MW12D	Midscreen Depth (ft BTOC):	82.92
Well Depth (ft BTOC):	92.92	Well Diameter, D (in):	2
Screen Length (ft):	20.00	Purge Method:	Monsoon Pump
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
0911	STATIC	32.72								
0916	250	32.72	0.00	7.43	8.89	0.317	-93	0.00	51.7	
0921	150 #	32.76	0.04	7.55	8.38	0.387	-99	0.00	46.3	
0926	150	32.76	0.04	7.57	8.11	0.397	-102	0.00	38.2	
0931	150	32.75	0.03	7.60	7.75	0.428	-106	0.00	33.8	
0936	150	32.75	0.03	7.59	7.65	0.435	-106	0.00	33.0	
0941	150	32.76	0.04	7.58	7.57	0.435	-108	0.00	32.1	
0946	150	32.76	0.04	7.58	7.55	0.436	-109	0.00	32.1 YS	

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
S - Sample collected because other parameters have stabilized
Y - Turbidity > 5 [lowest possible purge rate]

Sample Collection: VOCs (8260C) + Chloride

Time	Sample ID	QA/QC
0946	W-191025-KJ-18	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	November 26, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/CM

Well Data:

Well Name:	MW13B	Midscreen Depth (ft BTOC):	138.24
Well Depth (ft BTOC):	148.24	Well Diameter, D (in):	4
Screen Length (ft):	20.00	Purge Method:	Grundfos Pump
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1020	STATIC	36.83								
1025	500	37.06	0.23	8.24	9.56	0.650	-198	0.00	0.0	
1030	500	37.04	0.21	8.05	9.49	0.648	-199	0.00	0.0	
1035	500	37.02	0.19	7.95	9.56	0.648	-200	0.00	0.0	
1040	500	37.02	0.19	7.89	9.57	0.645	-201	0.00	0.0	
1045	500 *	37.02	0.19	7.85	9.55	0.644	-200	0.00	0.0	

Notes:

* - ≤ 250 mL/min for sample collection

Sample Collection: VOCs (8260C) + Chloride

Time	Sample ID	QA/QC
1045	W-191126-KJ-02	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	November 26, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/CM

Well Data:

Well Name:	MW13D	Midscreen Depth (ft BTOC):	74.86
Well Depth (ft BTOC):	84.86	Well Diameter, D (in):	2
Screen Length (ft):	20.00	Purge Method:	Hurricane Pump
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
0930	STATIC	32.56								
0955	~300	Dry								
1030	250	Recharge		7.40	10.45	0.752	-219	0.00	18.7	

Notes:

* - ≤ 250 mL/min for sample collection

Sample Collection: VOCs (8260C) + Chloride

Time	Sample ID	QA/QC
1036	W-191126-KJ-01	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	October 25, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/RA

Well Data:

Well Name:	MW16B	Midscreen Depth (ft BTOC):	157.61
Well Depth (ft BTOC):	162.61	Well Diameter, D (in):	2
Screen Length (ft):	10.00	Purge Method:	Grundfos Pump
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1221	STATIC	38.95								
1243	500	39.70	0.75	8.89	10.28	0.631	-173	0.00	12.3	
1248	500	39.20	0.25	8.79	10.26	0.656	-175	0.00	9.6	
1253	500	39.20	0.25	8.78	10.25	0.679	-177	0.00	6.2	
1258	500	39.20	0.25	8.78	10.25	0.682	-177	0.00	4.2	
1303	500 *	39.20	0.25	8.77	10.25	0.686	-177	0.00	4.8	

Notes:

* - ≤ 250 mL/min for sample collection

Sample Collection: VOCs (8260C) + Chloride

Time	Sample ID	QA/QC
1303	W-191025-KJ-19	RB
1304	W-191025-KJ-20	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	October 25, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/RA

Well Data:

Well Name:	MW16D	Midscreen Depth (ft BTOC):	77.50
Well Depth (ft BTOC):	82.50	Well Diameter, D (in):	2
Screen Length (ft):	10.00	Purge Method:	Monsoon Pump
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1226	STATIC	38.13								
1241	250	41.12	2.99	7.50	13.34	0.905	-165	0.00	48.8	
1246	200	41.45	3.32	7.51	13.08	0.909	-183	0.00	47.5	
1251	150 #	41.48	3.35	7.50	12.81	0.908	-194	0.00	51.3	
1256	150	41.40	3.27	7.50	12.79	0.910	-195	0.00	54.5	
1301	150	41.40	3.27 DS	7.50	12.76	0.911	-195	0.00	54.7 YS	

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
D - Drawdown > 0.3 [lowest possible purge rate]
S - Sample collected because other parameters have stabilized
Y - Turbidity > 5 [lowest possible purge rate]

Sample Collection: VOCs (8260C) + Chloride

Time	Sample ID	QA/QC
1301	W-191025-KJ-22	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	December 6, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/CM

Well Data:

Well Name:	MW17A	Midscreen Depth (ft BTOC):	101.98
Well Depth (ft BTOC):	106.98	Well Diameter, D (in):	2
Screen Length (ft):	10.00	Purge Method:	Hurricane Pump
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
0909	STATIC	15.23								
0930	200	15.54	0.31	7.95	8.74	1.020	-183	0.00	57.9	Clear
0935	200	15.54	0.31	7.59	7.27	1.030	-187	0.00	46.0	Clear
0940	150	15.52	0.29	7.44	6.36	1.070	-175	0.00	22.8	Clear
0945	150	15.41	0.18	7.35	6.27	1.080	-182	0.00	18.4	Clear
0950	150	15.40	0.17	7.30	6.22	1.080	-184	0.00	7.2	Clear
0955	150	15.40	0.17	7.27	6.20	1.090	-185	0.00	3.9	Clear

Notes:

* - ≤ 250 mL/min for sample collection

Sample Collection: VOCs (524.2) + Chloride

Time	Sample ID	QA/QC
0840	W-191206-KJ-13	RB
0955	W-191206-KJ-15	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	December 6, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/CM

Well Data:

Well Name:	MW17B	Midscreen Depth (ft BTOC):	186.90
Well Depth (ft BTOC):	191.90	Well Diameter, D (in):	2
Screen Length (ft):	10.00	Purge Method:	Grundfos Pump
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
0921	STATIC	21.27								
0950	300	28.42	7.15	7.48	8.96	0.711	-138	0.00	147.0	
0955	150 #	27.96	6.69	7.59	8.69	0.692	-190	0.00	119.0	Sl Cloudy
1000	150	27.63	6.36	7.59	8.59	0.679	-188	0.00	87.5	Sl Cloudy
1005	150	27.42	6.15	7.56	8.62	0.687	-186	0.00	60.1	Sl Cloudy
1010	150	27.40	6.13	7.56	8.57	0.689	-185	0.00	56.2	Sl Cloudy
1015	150	27.40	6.13	7.54	8.54	0.688	-183	0.00	58.7	Sl Cloudy
1020 X	150	27.39	6.12 D	7.53	8.59	0.687	-183	0.00	59.1 Y	Sl Cloudy

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
D - Drawdown > 0.3 [lowest possible purge rate]
X - Sampled per protocol (partial stabilization; max 1-hr purge time)
Y - Turbidity > 5 [lowest possible purge rate]

Sample Collection: VOCs (524.2) + Chloride

Time	Sample ID	QA/QC
1020	W-191206-KJ-17	MS/MSD

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	December 6, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/CM

Well Data:

Well Name:	MW17L	Midscreen Depth (ft BTOC):	271.95
Well Depth (ft BTOC):	291.95	Well Diameter, D (in):	4
Screen Length (ft):	40.00	Purge Method:	Grundfos Pump
Other Well Info:	Openhole	Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1100	STATIC	24.21								
1125	400	25.07	0.86	7.55	8.61	0.567	-120	0.00	4.5	
1130	300 #	25.10	0.89	7.67	8.04	0.570	-125	0.00	4.3	
1135	300	25.12	0.91	7.64	7.91	0.570	-125	0.00	3.6	
1140	300	25.15	0.94	7.63	7.91	0.571	-124	0.00	2.8	
1145	300 *	25.17	0.96 DS	7.62	7.96	0.570	-124	0.00	2.6	

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
D - Drawdown > 0.3 [lowest possible purge rate]
S - Sample collected because other parameters have stabilized

Sample Collection: VOCs (524.2) + Chloride

Time	Sample ID	QA/QC
1030	W-191206-KJ-19	RB
1145	W-191206-KJ-21	
1146	W-191206-KJ-23	FD

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	December 5, 2019
Ref. No.:	002012-01-050	Personnel:	SR

Well Data:

Well Name:	MW18A	Midscreen Depth (ft BTOC):	110.89
Well Depth (ft BTOC):	115.89	Well Diameter, D (in):	2
Screen Length (ft):	10.00	Purge Method:	Hurricane Pump
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1515	STATIC	29.73								
1553	~500	30.40	0.67	7.39	9.65	0.865	-210	0.00	0.8	Clear
1510	~250	29.99	0.26	7.41	9.42	0.865	-210	0.00	0.5	Clear
1606	250	29.98	0.25	7.43	9.32	0.863	-210	0.00	1.0	Clear
1611	250	29.96	0.23	7.44	9.26	0.862	-211	0.00	0.9	Clear

Notes:

* - ≤ 250 mL/min for sample collection

Sample Collection: VOCs (524.2) + Chloride

Time	Sample ID	QA/QC
1535	W-191205-KJ-04	RB
1612	W-191205-KJ-06	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	December 5, 2019
Ref. No.:	002012-01-050	Personnel:	SR

Well Data:

Well Name:	MW18B	Midscreen Depth (ft BTOC):	191.04
Well Depth (ft BTOC):	196.04	Well Diameter, D (in):	2
Screen Length (ft):	10.00	Purge Method:	Grundfos Pump
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1548	STATIC	32.81								
1615	~500	33.85	1.04	7.50	10.58	0.768	-192	0.00	4.7	Clear
1620	~500	33.85	1.04	7.71	9.95	0.776	-199	0.00	1.1	Clear
1625	~250	33.98	1.17	7.60	9.73	0.779	-193	0.00	0.8	Clear
1630	~250	33.89	1.08	7.57	9.64	0.782	-192	0.00	0.0	Clear
1635	~100 #	34.15	1.34	7.59	9.40	0.779	-192	0.00	0.0	Clear
1640	100	34.13	1.32	7.57	9.30	0.780	-191	0.00	0.0	Clear
1645	100	34.38	1.57 DS	7.57	9.30	0.782	-190	0.00	0.0	Clear

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
D - Drawdown > 0.3 [lowest possible purge rate]
S - Sample collected because other parameters have stabilized

Sample Collection: VOCs (524.2) + Chloride

Time	Sample ID	QA/QC
1646	W-191205-KJ-08	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	December 5, 2019
Ref. No.:	002012-01-050	Personnel:	SR

Well Data:

Well Name:	MW18L	Midscreen Depth (ft BTOC):	272.14
Well Depth (ft BTOC):	281.14	Well Diameter, D (in):	4
Screen Length (ft):	18.00	Purge Method:	Grundfos Pump
Other Well Info:	Openhole	Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1530	STATIC	38.11								
1550	~300	38.16	0.05	10.53	9.17	0.212	-228	0.00	12.0	Clear
1558	300	38.17	0.06	10.57	9.28	0.212	-251	0.00	6.9	Clear
1603	300	38.18	0.07	10.59	9.35	0.212	-242	0.00	5.4	Clear
1608	300	38.18	0.07	10.61	9.37	0.212	-248	0.00	5.2	Clear
1613	300 *	38.19	0.08	10.62	9.32	0.212	-253	0.00	4.9	Clear

Notes:

* - ≤ 250 mL/min for sample collection

Sample Collection: VOCs (524.2) + Chloride

Time	Sample ID	QA/QC
1615	W-191205-KJ-10	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	December 5, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/SA

Well Data:

Well Name:	MW19A	Midscreen Depth (ft BTOC):	126.55
Well Depth (ft BTOC):	131.55	Well Diameter, D (in):	2
Screen Length (ft):	10.00	Purge Method:	Hurricane Pump
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1235	STATIC	20.79								
1305	500	21.26	0.47	7.23	8.81	0.830	-190	0.00	0.6	
1310	300 #	21.25	0.46	7.23	8.82	0.829	-190	0.00	0.0	
1315	300 *	21.27	0.48 DS	7.24	8.80	0.829	-191	0.00	0.0	

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
D - Drawdown > 0.3 [lowest possible purge rate]
S - Sample collected because other parameters have stabilized

Sample Collection: VOCs (524.2) + Chloride

Time	Sample ID	QA/QC
1315	W-191205-KJ-05	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	December 5, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/SA

Well Data:

Well Name:	MW19B	Midscreen Depth (ft BTOC):	196.33
Well Depth (ft BTOC):	201.33	Well Diameter, D (in):	2
Screen Length (ft):	10.00	Purge Method:	Grundfos Pump
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1203	STATIC	24.95								
1213	400	26.53	1.58	9.01	12.15	0.485	-282	0.00	23.8	Clear
1218	200	25.83	0.88	8.37	12.09	0.508	-262	0.00	5.6	Clear
1223	150 #	25.60	0.65	7.58	11.47	0.570	-206	0.00	5.1	Clear
1228	150	25.43	0.48	7.59	10.97	0.612	-187	0.00	4.1	Clear
1235	150	25.59	0.64	7.51	10.29	0.630	-168	0.00	10.9	Clear
1238	150	25.59	0.64	7.26	10.35	0.643	-149	0.00	6.0	Clear
1243	150	25.61	0.66	7.20	10.25	0.645	-153	0.00	5.4	Clear
1248	150	25.60	0.65	7.11	10.00	0.657	-154	0.00	4.6	Clear
1253	150	25.60	0.65	7.07	9.85	0.664	-153	0.00	4.5	Clear
1258	150	25.62	0.67 DS	7.05	9.72 TS	0.668	-153	0.00	4.8	Clear

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
D - Drawdown > 0.3 [lowest possible purge rate]
S - Sample collected because other parameters have stabilized
T - Temperature stabilization affected by ambient conditions

Sample Collection: VOCs (524.2) + Chloride

Time	Sample ID	QA/QC
1258	W-191205-KJ-01	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	December 5, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/SA

Well Data:

Well Name:	MW19L	Midscreen Depth (ft BTOC):	263.28
Well Depth (ft BTOC):	269.28	Well Diameter, D (in):	4
Screen Length (ft):	12.00	Purge Method:	Grundfos Pump
Other Well Info:	Openhole	Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1306	STATIC	28.96								
1330	500	29.18	0.22	7.37	9.25	0.548	-190	0.00	68.0	Clear
1335	200	29.08	0.12	7.24	8.81	0.550	-168	0.00	42.2	Clear
1340	100 #	29.07	0.11	7.20	8.62	0.560	-162	0.00	40.5	Clear
1345	100	29.08	0.12	7.17	8.55	0.558	-156	0.00	31.2	Clear
1350	100	29.08	0.12	7.14	8.39	0.560	-151	0.00	25.9	Clear
1355	100	29.08	0.12	7.11	8.06	0.567	-144	0.00	19.8	Clear
1400	100	29.08	0.12	7.10	8.03	0.568	-143	0.00	19.1	Clear
1405 X	100	29.08	0.12	7.10	8.01	0.569	-141	0.00	19.2 Y	Clear

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
X - Sampled per protocol (partial stabilization; max 1-hr purge time)
Y - Turbidity > 5 [lowest possible purge rate]

Sample Collection: VOCs (524.2) + Chloride

Time	Sample ID	QA/QC
1250	W-191205-KJ-03	RB
1405	W-191205-KJ-09	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	December 5, 2019
Ref. No.:	002012-01-050	Personnel:	SR

Well Data:

Well Name:	MW20B	Midscreen Depth (ft BTOC):	197.84
Well Depth (ft BTOC):	202.84	Well Diameter, D (in):	2
Screen Length (ft):	10.00	Purge Method:	Grundfos Pump
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1203	STATIC	26.13								
1218	~250	29.34	3.21	8.47	8.95	0.588	-158	0.84	0.0	Clear
1223	250	29.31	3.18	8.55	9.13	0.590	-173	0.00	0.0	Clear
1228	250	29.31	3.18	8.47	9.22	0.596	-177	0.00	0.0	Clear
1233	~150 #	28.57	2.44	8.43	8.75	0.603	-180	0.00	0.0	Clear
1238	150	28.53	2.40	8.42	8.55	0.608	-181	0.00	0.0	Clear
1243	150	28.53	2.40	8.38	8.65	0.612	-182	0.00	0.0	Clear
1248	150	28.55	2.42	8.32	8.63	0.617	-180	0.00	0.0	Clear
1253	150	28.56	2.43 DS	8.30	8.73	0.622	-181	0.00	0.0	Clear

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
D - Drawdown > 0.3 [lowest possible purge rate]
S - Sample collected because other parameters have stabilized

Sample Collection: VOCs (524.2) + Chloride

Time	Sample ID	QA/QC
1254	W-191205-KJ-02	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	December 5, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/SA

Well Data:

Well Name:	MW21A	Midscreen Depth (ft BTOC):	127.13
Well Depth (ft BTOC):	132.13	Well Diameter, D (in):	2
Screen Length (ft):	10.00	Purge Method:	Hurricane Pump
Other Well Info:		Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
1411	STATIC	16.11								
1423	500	16.90	0.79	8.75	8.91	0.588	-219	0.00	35.8	Clear
1428	200 #	16.78	0.67	8.86	8.24	0.590	-226	0.00	11.9	Clear
1433	200	16.78	0.67	8.87	8.24	0.592	-226	0.00	6.2	Clear
1438	200	16.78	0.67 DS	8.87	8.24	0.593	-227	0.00	3.8	Clear

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
D - Drawdown > 0.3 [lowest possible purge rate]
S - Sample collected because other parameters have stabilized

Sample Collection: VOCs (524.2) + Chloride

Time	Sample ID	QA/QC
1438	W-191205-KJ-11	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	November 26, 2019
Ref. No.:	002012-01-050	Personnel:	KJ/CM

Well Data:

Well Name:	ROB-11	Midscreen Depth (ft BTOC):	209.63
Well Depth (ft BTOC):	233.63	Well Diameter, D (in):	4
Screen Length (ft):	48.00	Purge Method:	Grundfos Pump
Other Well Info:	Openhole	Dedicated Tubing:	Yes

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
11:28	STATIC	42.62								
1128	500	42.68	0.06	7.46	10.13	0.560	-173	0.00	58.2	
1133	500	42.68	0.06	7.39	10.18	0.560	-58	0.00	58.6	
1138	500	42.68	0.06	7.36	10.19	0.559	-55	0.00	58.0	
1143	500	42.68	0.06	7.32	10.23	0.559	-180	0.00	25.8	
1148	500	42.68	0.06	7.30	10.26	0.559	-180	0.00	15.2	
1153	100 #	42.68	0.06	7.31	10.18	0.560	-180	0.00	17.3	
1158	100	42.68	0.06	7.31	10.12	0.560	-180	0.00	6.3	
1203	100	42.68	0.06	7.30	10.12	0.560	-180	0.00	6.3	
1208	100	42.68	0.06	7.30	10.09	0.560	-181	0.00	6.0 YS	

Notes:

* - ≤ 250 mL/min for sample collection
\# - Lowest possible purge rate for pump operation
S - Sample collected because other parameters have stabilized
Y - Turbidity > 5 [lowest possible purge rate]

Sample Collection: VOCs (524.2) + Chloride

Time	Sample ID	QA/QC
1208	W-191126-KJ-01	

FIELD RECORD FOR LOW-FLOW GROUNDWATER SAMPLING

Project Data:

Project Name:	Highway 96 Site	Date:	October 25, 2019
Ref. No.:	002012-01-050	Personnel:	KJ

Well Data:

Well Name:	SUMP	Midscreen Depth (ft BTOC):	38.21
Well Depth (ft BTOC):	42.71	Well Diameter, D (in):	8
Screen Length (ft):	9.00	Purge Method:	Peristaltic/Monsoon Pump
Other Well Info:		Dedicated Tubing:	

Time (hh:mm)	*Purge Rate (mL/min)*	*Depth to Water (ft BTOC)*	*Drawdown from Static (ft)*	*pH*	*Temp (°C)*	*Cond (mS/cm)*	*ORP (mV)*	*DO (mg/L)*	*Turbidity (NTU)*	*Comments*
	*≤ 500 **		*≤ 0.3*	*± 0.1*	*± 0.1*	*± 5%*	*± 20*	*± 0.5*	*≤ 5*	
	STATIC									
1048	Grab ^	6.16		9.52	10.47	1.100	25	4.66	66.0	

Notes:

* - ≤ 250 mL/min for sample collection

^ - To avoid interference with existing downhole equipment (to be removed)

Sample Collection: VOCs (8260C) + Chloride

Time	Sample ID	QA/QC
1048	W-191025-KJ-21	

Appendix D
Documentation of Site Cleanup Levels

Appendix D.1
Amended Table 1 of 1993 MDD

	AMENDED TABLE 1			October 10, 1994
HIGHWAY 96 DUMP	GROUNDWATER CLEANUP LEVELS			
		HRL(2)	MCL(3)	LEVEL
		ug/l	ug/l	ug/l
MATRIX/COMPOUND	CARC. (1)			
METALS				
Barium		2000	2000	2000
Beryllium	c	0.08	1	0.08
Cadmium		4	5	4
Chromium VI		100	100	100
Chromium III		20000		20000
Copper		1000	1300	1000
Manganese		100		100
Mercury		2	2	2
Thallium		0.6	2/1	0.6
Zinc		2000	5000	2000
VOLATILE ORGANICS				
Acetone		700		700
Benzene	c	10	5	5
Bromodichloromethane	c	6	100	6
Bromoform	c	40	100	40
Bromomethane		10		10
Carbon Tetrachloride	c	3	5	3
Chlorobenzene		100		100
Chloroform	c	60	100	60
Dibromochloromethane		10		10
Dichlorodifluoromethane		1000		1000
1,1-Dichloroethane		70		70
1,2-Dichloroethane	c	4	5	4
1,1-Dichloroethene		6	7	6
1,2-Dichloroethene, trans		100	100	100
1,2-Dichloroethene, cis		70	70	70
1,2-Dichloropropane	c	5	5	5
1,3-Dichloropropene (cis-, trans-, mix)	c	2		2
Ethylbenzene		700	700	700
Ethyl Ether		1000		1000
Isopropylbenzene (cumene)		300		300
Methyl Ethyl Ketone (MEK, 2-butanone)		4000		4000
Methyl Isobutyl Ketone (MIBK)		300		300
Methylene Chloride (Dichloromethane)	c	50	5	5
1,1,1,2-Tetrachloroethane	c	70		70
1,1,2,2-Tetrachloroethane	c	2		2
1,1,2,2-Tetrachloroethene	c	7	5	5
Toluene		1000	1000	1000
1,2,4-Trichlorobenzene			70	70
1,1,1-Trichloroethane		600	200	200
1,1,2-Trichloroethane		3	5	3
1,1,2-Trichloroethene (TCE)	c	30	5	5
Trichlorofluoromethane		2,000		2000
1,1,2-Trichloro-1,2,2-trifluoroethane		200000		200,000
Vinyl Chloride	c	0.2	2	2*
Xylenes (total)		10000	10000	10000
SEMI-VOLATILE ORGANICS				
PAHs (total carcinogenic) (6)	c	0.03		0.03
NOTES:				
* - The clean-up level for vinyl chloride was adjusted for Site specific reasons. It is not MCL based.				
(1) Carcinogeneity - A "c" denotes a potential carcinogen.				
(2) HRL - Health Risk Limit established by the MN Department of Health.				
(3) MCL - Federal Maximum Contaminant Level				

Appendix D.2
Pages from 2008 MDD Amendment

MINNESOTA DECISION DOCUMENT
AMENDMENT

1.0 INTRODUCTION

1.1 Statement of Purpose

This Minnesota Decision Document (MDD) Amendment to the 1993 MDD presents the selected remedial action and cleanup levels for the Highway 96 Dump Superfund site (Highway 96 Site), and summarizes the facts and determinations made by the Minnesota Pollution Control Agency (MPCA) in approving the selected response actions. In 1993, MPCA issued a MDD, which identified selected remedies for three operable units associated with the Site:

- Operable Unit 1 – Source Control
- Operable Unit 2 – Ground Water Remediation
- Operable Unit 3 - Residential Drinking Water (east of Gilfillan Lake)

Since 1993, Reynolds Metals Company and Whirlpool Corporation, the RPs, have implemented the selected remedies for Operable Units 1, 2 and 3 pursuant to the MDD and under the direction of the MPCA.

The MDD Amendment selects a remedy for the following additional Operable Unit associated with the Site:

- Operable Unit 4 – Residential Drinking Water (west of Gilfillan Lake)

The MPCA established Operable Unit 4 based on residential well monitoring conducted since 2004, which detected low level (i.e., less than or equal to the health-based standard) vinyl chloride contamination in four wells west of Gilfillan Lake. This new Operable Unit includes approximately eighty-two (82) homes west of the lake with wells that could potentially be impacted by vinyl chloride contamination from the Highway 96 Dump Site.

The remedial actions and obligations of the RPs identified in the 1993 MDD for Operable Units 1, 2, and 3 will continue to be implemented, and will not be altered by the establishment of Operable Unit 4 or the MDD Amendment.

This MDD Amendment:

- Summarizes historical Site investigation, and remedial action activities conducted by the RPs in accordance with the 1993 MDD;
- Summarizes current groundwater conditions associated with Operable Unit 4 and potential changes at the Site;
- Discusses the risks to human health and the environment that may be present at the Site;
- Outlines the remedial action alternatives evaluated in the July 2007 Feasibility Study (FS) Report; and
- Identifies the MPCA's selected remedial action plan for Operable Unit 4 and explains why the MPCA selected this remedy.

On October 2, 2006, the MPCA approved a revised two-year residential well monitoring plan. On October 16, 2006, the MPCA approved an investigation plan and a geophysical logging plan for residential wells for the area west of Gilfillan Lake. The MPCA also approved a geophysical survey work plan for the area underlying Gilfillan Lake on February 1, 2007.

On June 8, 2007, the MPCA requested that the RPs prepare and submit to the MPCA a FS addressing two potential scenarios for Operable Unit 4:

(1) remedial action alternatives where the concentrations of vinyl chloride and other Site-related VOCs in water samples from residential wells west of Gilfillan Lake remain at or below the MDH HRLs; and

(2) remedial action alternatives where the concentrations of vinyl chloride and/or other Site-related VOCs in water samples from residential wells west of Gilfillan Lake (singly, or through additivity) exceed the MDH HRLs and a well advisory is issued by the Minnesota Department of Health.

On September 25, 2007, after receiving comments on the FS from the City of North Oaks, the MPCA requested the RPs modify the FS. The RPs responded on October 25, 2007 with responses to the MPCA comments. The MPCA approved the FS with modifications on November 7, 2007.

The MPCA published a Proposed Plan Fact Sheet on February 19, 2008, and requested the public to comment on the recommended remedy for Operable Unit 4. The public comment period ended on March 21, 2008.

2.2 Contaminants of Concern and Cleanup Standards

Contaminants of concern at the Site include the following VOCs: 1,1-dichloroethane (DCA), benzene, toluene, trichloroethene, methyl ethyl ketone (MEK), trans-1,2-dichloroethene (DCE), and vinyl chloride, which are hazardous substances under MERLA. VOCs at the Site derive from waste paints and solvents.

In 1994, MDH enacted a HRL for vinyl chloride of 0.2 ug/L. A HRL is a promulgated rule that sets a health standard for vinyl chloride and represents a level of contamination in drinking water that MDH considers acceptable for daily human consumption over a lifetime. The HRLs are health-based criteria and are often used by the MPCA, as a regulatory agency, as the basis for decisions regarding the investigation and remediation of contaminated ground water. This HRL is the cleanup standard used by the MPCA for vinyl chloride for OU4. See the MPCA Remediation Program's table of drinking water criteria at http://www.pca.state.mn.us/publications/risk-drinkingwatercriteria.xls.

4.4.7 Alternative B4 - Installation of a municipal water system for homes with a well advisory

Alternative B4 would require the installation of a municipal water system. The most feasible scenario would be to connect homes with well advisories to the existing water line, which ends on the south side of Gilfillan Lake. This Alternative meets the threshold criteria, but would have short-terms risks to the community during construction of the water system. In addition, this Alternative is not easy to implement as it would require a new or amended agreement between White Bear Township and North Oaks, City Engineer review and approval of a design, North Oaks Home Owner's Association (NOHOA) approvals for roadway and utility easements, design approval by MDH, North Oaks, NOHOA and White Bear Township, and individual agreements with property owners. This Alternative is the least cost-effective of the Scenario B alternatives, particularly if there are only a few residences with well advisories.

5.0 SELECTED RESPONSE ACTION ALTERNATIVE AND CONCEPTUAL DESIGN

Having evaluated the remedy alternatives presented in the FS, the MPCA has determined that Alternative 4.4.2 and 4.4.6, installation of a new residential well into a different/deeper aquifer at the homes with a well advisory in conjunction with long-term ground water monitoring best satisfies those criteria for selection as the remedial action at the Site. In addition, in the event that vinyl chloride or another Site-related VOC (See Section 2.2 above) exceeds its respective HRL in any of the Ski Lane Ravine monitoring wells, and is confirmed with a follow-up sample within 30 days, the MCPA has determined that Alternative A3, installation and operation of a pumpout system in the Ski Lane ravine area, should be implemented as a supplemental response action at the Site.

This selected remedy includes the remedy components described in Section 4.4.2 and 4.4.6. This Section also describes how the selected remedy satisfies other requirements that must be addressed under MERLA.

The MPCA has determined that implementation of the selected remedy is reasonable and necessary to protect the public health or welfare from actual or threatened releases of hazardous substances into the environment at the Site. The selected remedy must be implemented to meet the Response Action Objective (RAO) identified for that alternative. Prior to implementation of the selected remedial action, the Responsible Party must obtain MPCA approval of a final Remedial Design/Response Action Plan.

5.2 Remedial Action Elements

The selected remedial action shall include the following elements:

5.2.1 Installation of a New Residential Well into a Deeper Aquifer at the Homes with a Well Advisory

The St. Peter Sandstone is the primary source of drinking water in North Oaks and is the aquifer in North Oaks that is impacted by vinyl chloride contamination from the Site. The homes that receive well advisories will be provided with new wells in a deeper aquifer.

The Prairie du Chien aquifer is the next deeper aquifer below the St. Peter. Based on monitoring data from North Oaks, and specifically from the Gilfillan Lake area, the Prairie du Chien aquifer is not impacted by vinyl chloride contamination from the Site. Therefore, homes in Operable Unit 4 that receive well advisories will be provided with new Prairie du Chien aquifer wells. MDH-licensed well drillers will install these new wells approximately 100 feet deeper than the old St. Peter wells. During well installation, the drillers will take precautions to seal off the St. Peter from the Prairie du Chien aquifer, to assure that contamination does not spread from the St. Peter into the Prairie du Chien.

5.2.2. Long-Term Ground Water Monitoring

To help establish and confirm ground water contamination plume stability, additional ground water monitoring is required, including the following:

- Semi-annual sampling of thirty-three (33) residential wells located in Geographic Area 3 - west of Gilfillan Lake (See Figure 2 attached hereto and herein incorporated by reference;
- Annual sampling of twenty (20) residential wells located in Geographic Area 4 - north and west of Gilfillan Lake and fourteen (14) residential wells located in Geographic Area 5 - west of Gilfillan Lake (residential wells located along the shoreline of Gilfillan Lake, including wells along West Shore Road and Duck Pass);
- Biennial sampling of eleven (11) residential wells located in Geographic Area 4 - east and west of Gilfillan Lake and four (4) residential wells located in Geographic Area 5 - west of Gilfillan Lake;
- Annual sampling of the nine (9) off-Site monitoring wells and four (4) converted residential monitoring wells located in North Oaks;
- In addition, four to five new upper St. Peter Sandstone aquifer monitoring wells would be installed west of Gilfillan Lake as part of an expanded monitoring program; two of these wells would be installed in the Ski Lane Ravine and two to three wells would be installed at an angle under the west shore of Gilfillan Lake;
- A monitoring period of approximately twenty (20) years is planned; however, the MPCA will determine the appropriate scope and frequency of monitoring.

5.3 Other Considerations Under Minnesota Environmental Response and Liability Act

5.3.1 Long Term Assurance of Protectiveness

5.3.1.1 Long Term Monitoring

The remedy shall be implemented as set forth in the approved FS and in accordance with a long-term monitoring plan approved by the MPCA as part of the final RD/RA Plan. These plans shall meet all of the requirements set forth in the Response Action Objective for the selected remedy and other requirements set forth in this MDD Amendment.

5.3.1.2 Planned Use of the Property

MERLA provides that, in determining the standards to be achieved by response actions to protect public health and welfare and the environment from a release of hazardous substances, the MPCA must consider the planned use of the property where the release is located. The purpose of this provision of MERLA is to allow the MPCA to select cleanup standards that provide a level of protection that is compatible with the uses of the Site that can be reasonably foreseen. As set forth in this MDD Amendment, and based upon the factors that the MPCA is required to consider, the MPCA has determined that cleanup to 0.2 ug/L in ground water is appropriate at this Site and would provide protection of public health and welfare and the environment that is consistent with the current and planned residential use of the property.

6.0 ESTABLISHMENT OF RESPONSE ACTION OBJECTIVES AND CLEANUP LEVELS

The Response Action Objectives for Operable Unit 4 are to protect the public from exposure to ground water contamination, which exceeds the HRLs, and to protect residential wells from the release or threatened release of contaminated ground water, using reasonable and necessary response actions. An additional response action objective is to provide safe drinking water for the residents in Operable Unit 4 of North Oaks who have received drinking water advisories.

Since one or more of the above response actions are required in the event of an MDH well advisory and since the well advisory is precipitated by a HRL exceedance (singly or through additivity) in a residential well, the HRLs are therefore the criteria that dictate a response action. Thus, the HRLs for the site-related contaminants, including benzene, toluene, MEK, DCA, DCE, and vinyl chloride, are the appropriate cleanup/action levels for the Site, and are provided in Table 1, attached hereto and herein incorporated by reference**.** These cleanup levels apply to the quality of water in the new residential wells required by the remedial action. It is important to acknowledge that future HRL revisions may require additional response actions.

7.0 RESPONSIVENESS SUMMARY

Pursuant to Minn. Stat. § 115B.17, subd. 2b (2006), the MPCA issued a public notice on February 19, 2008 describing the recommended response action. The notice was sent to the Shoreview News paper for publication on February 19, 2008. The MPCA accepted comments regarding the selected response action until March 21, 2008.

On February 26, 2008, at the East Recreational Center in North Oaks, the MPCA held a public meeting to discuss the draft MDD Amendment. Approximately sixty-five (65) citizens attended the public meeting, including Senator Sandy Rummel, Representative Paul Gardner, the Mayor of North Oaks, members of the North Oaks City Council, and representatives for the Responsible Parties. Questions during the meeting focused primarily on the reasons for amending the 1993 MDD, and the two potential contingency remedies: municipal water and the Ski Lane Ravine pumpout system.

2. This MDD Amendment is incorporated in and made an integral part of the Consent Order and shall be implemented in accordance with an MPCA-approved Remedial Design/Response Action Plan and Amendments.

B d Moore

Brad Moore
Commissioner
Minnesota Pollution Control Agency

8/26/08

Date

AG: #2266214-v1

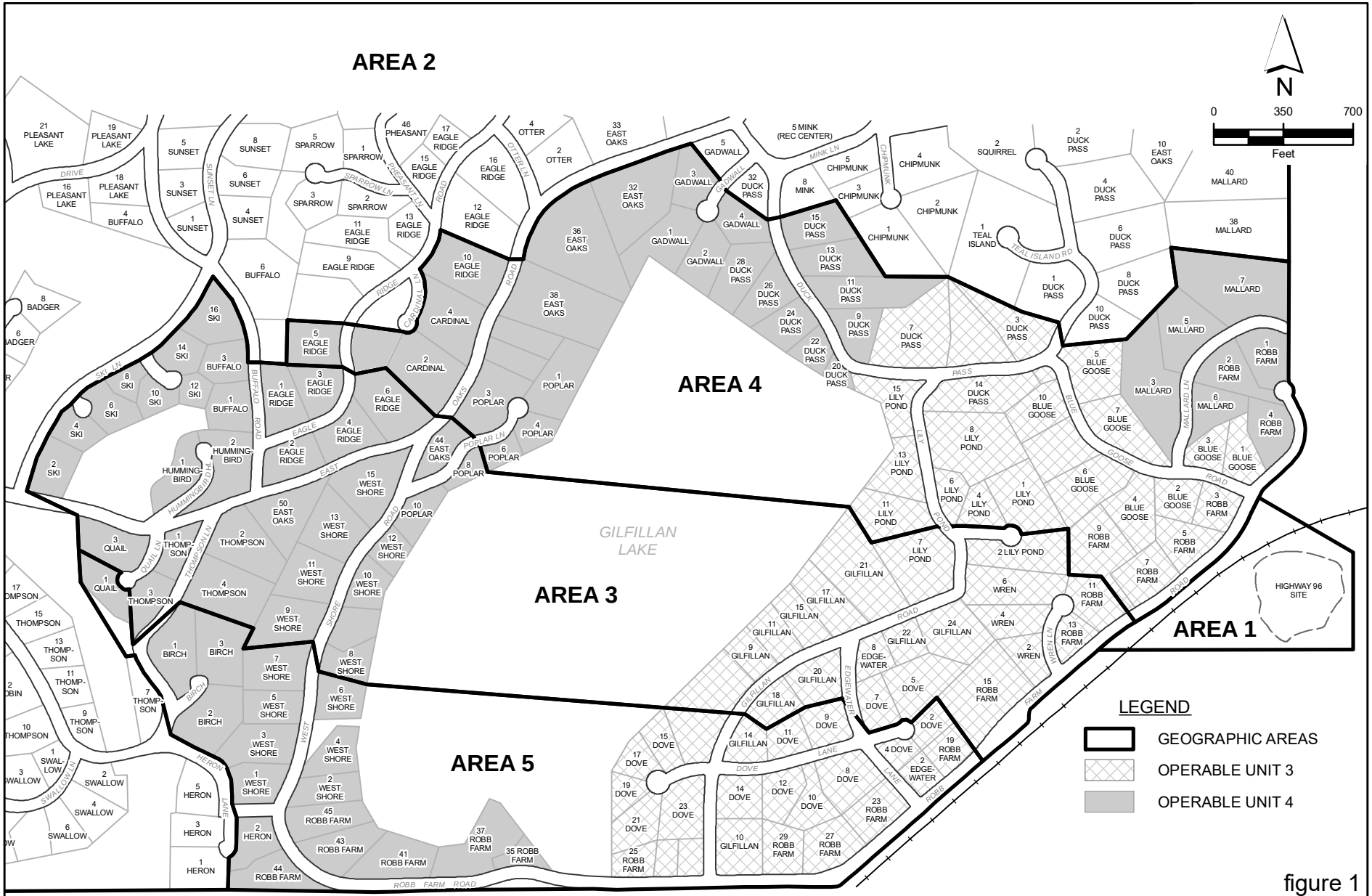


figure 1

GEOGRAPHIC AREAS AND OPERABLE UNITS
(NORTH OAKS, MINNESOTA)
Highway 96 Landfill Site

2012-00(MISC023)GIS-SP001 JAN 30/2008

TABLE 1

Highway 96 Dump Site Ground Water Cleanup Goals

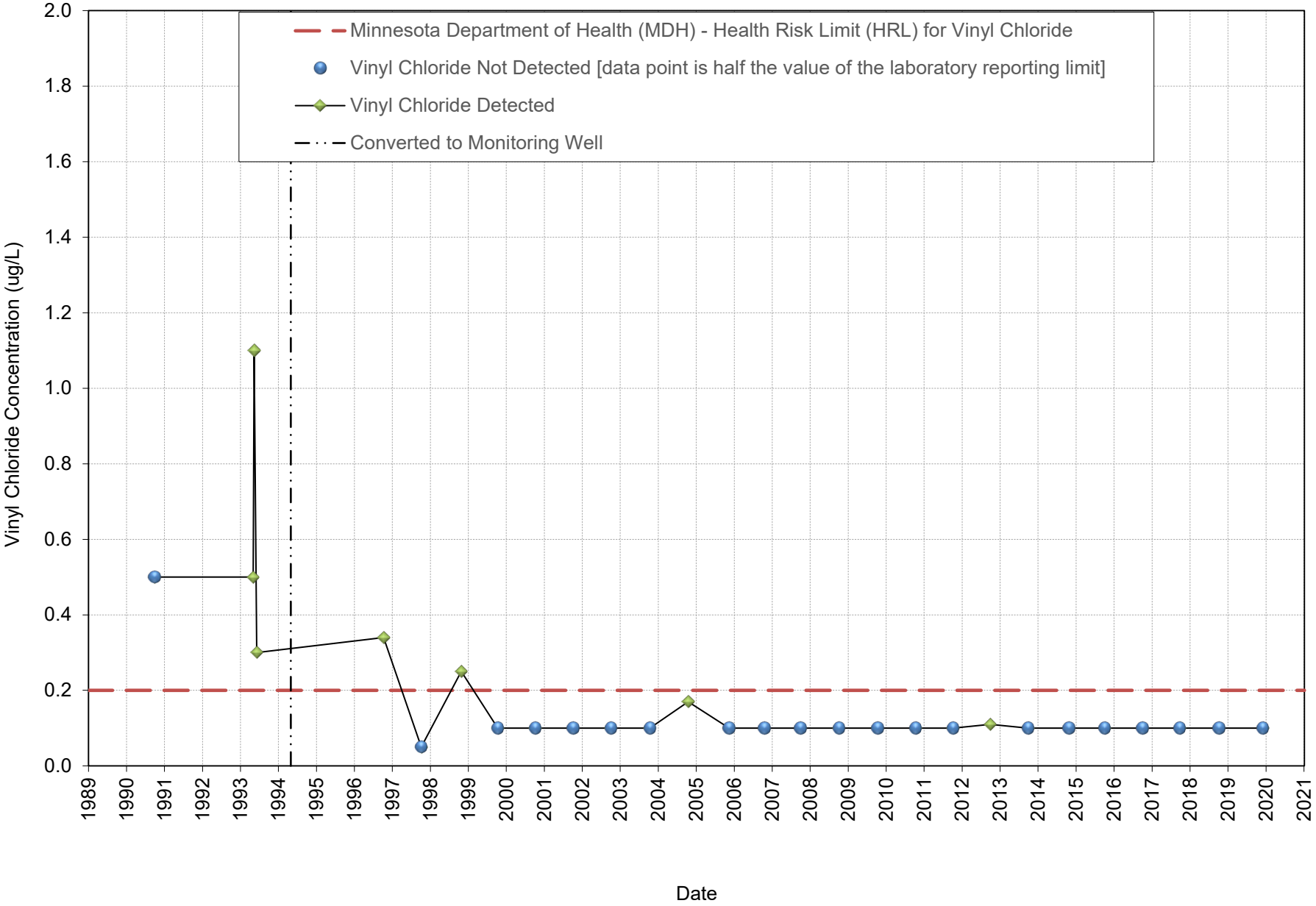
Volatile Organic Compound (VOC)	Cleanup Goal	Source
1,1,2-Trichloroethene (TCE)	5 ug/l	Minnesota Department of Health, Health Risk Limit
Vinyl chloride	0.2 ug/l	"
trans-1,2-Dichloroethene (DCE)	100 ug/l	"
1,1-Dichloroethane (DCA)	70 ug/l	"
Benzene	5 ug/l	"
Toluene	1000 ug/l	"
Methyl Ethyl Ketone (MEK)	4000 ug/l	"

Appendix E
Historical Data Summary
(Available at the MPCA)

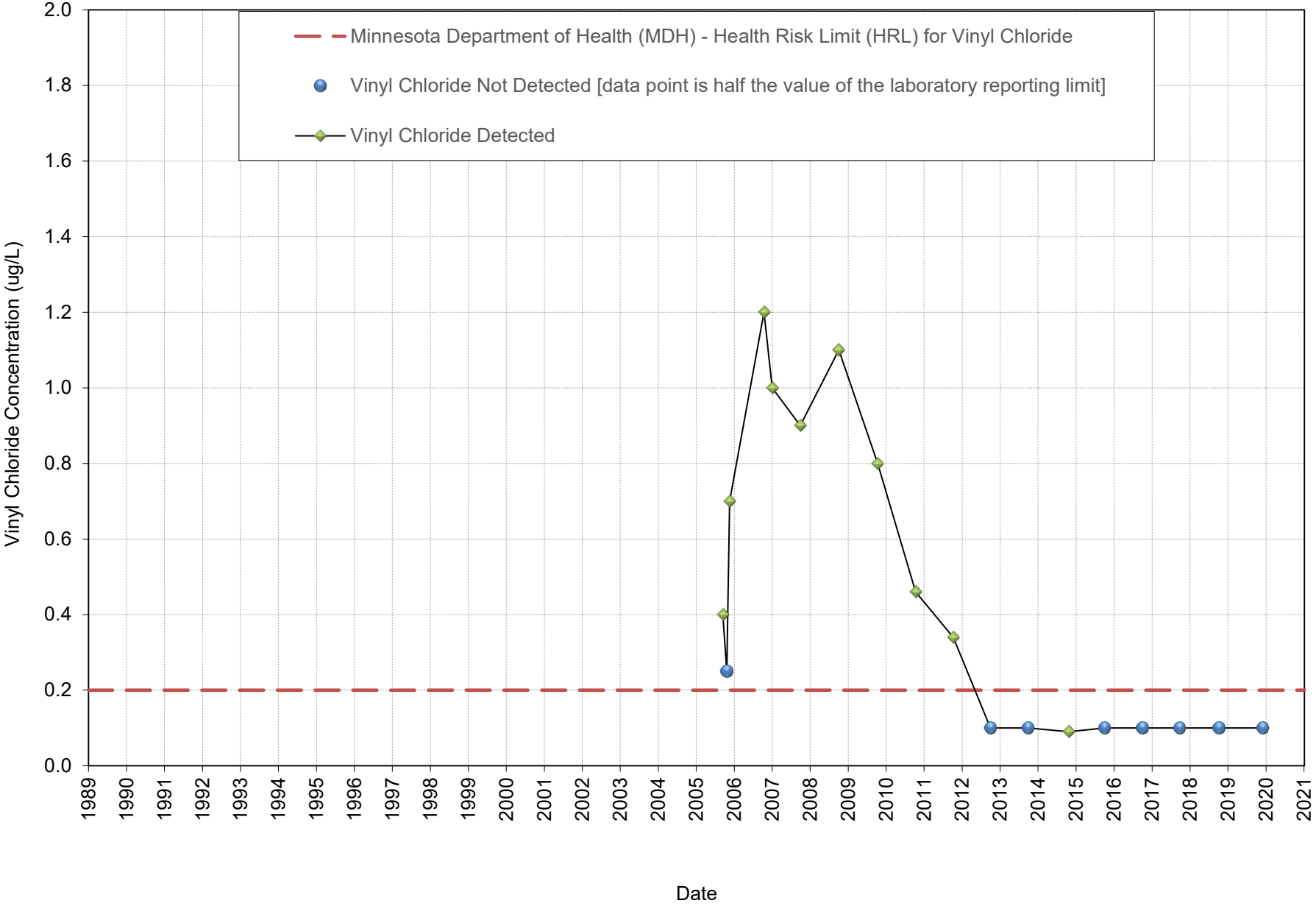
Appendix F
Laboratory Analytical Reports and Data Quality Assessment & Validation Memos
(Available at the MPCA)

Appendix G
Graphs of Vinyl Chloride Detections (Off-Site Monitoring Well Locations and Residential Wells)

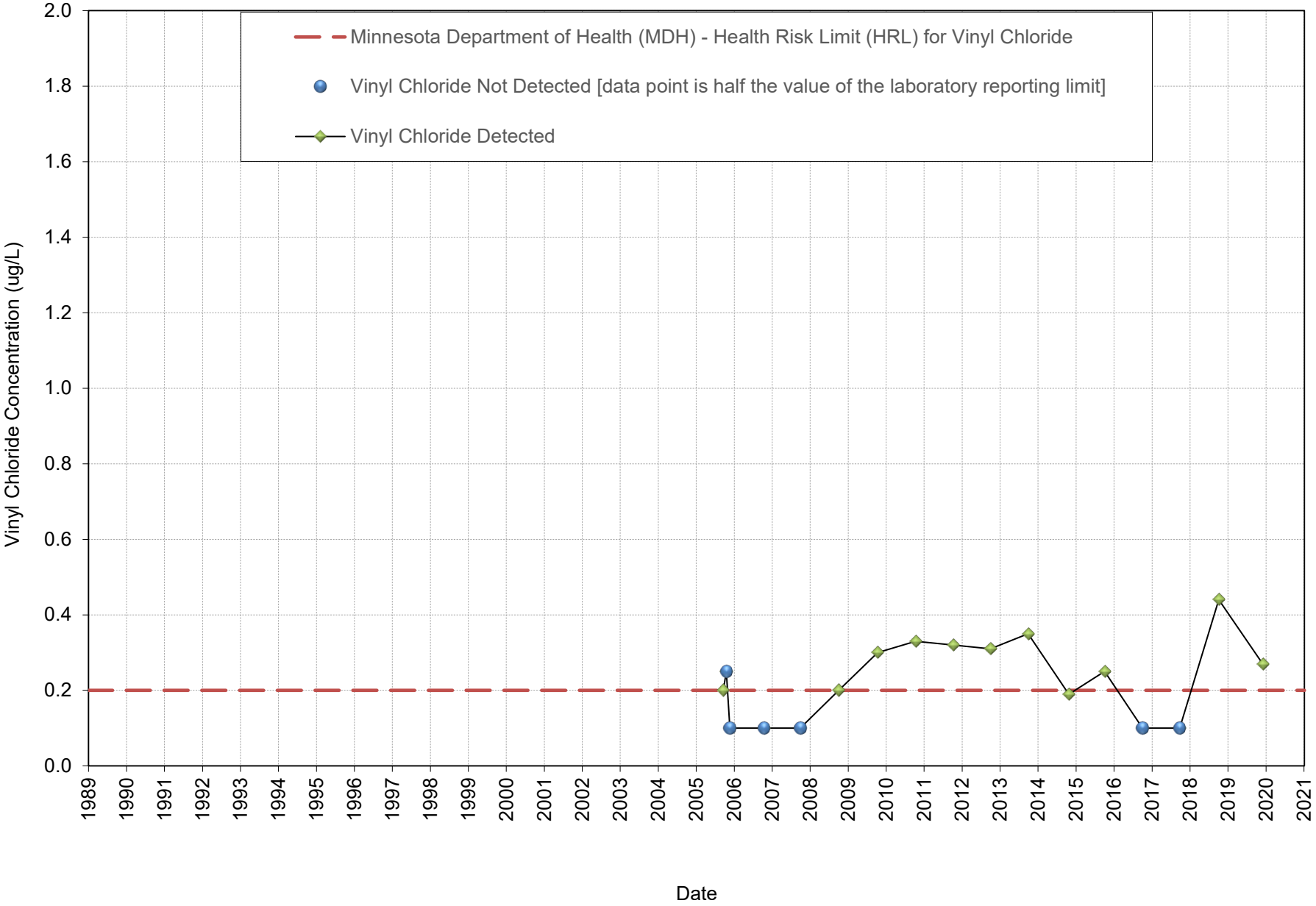
Historical Vinyl Chloride Concentrations
1 Lily Pond Road
North Oaks, Minnesota



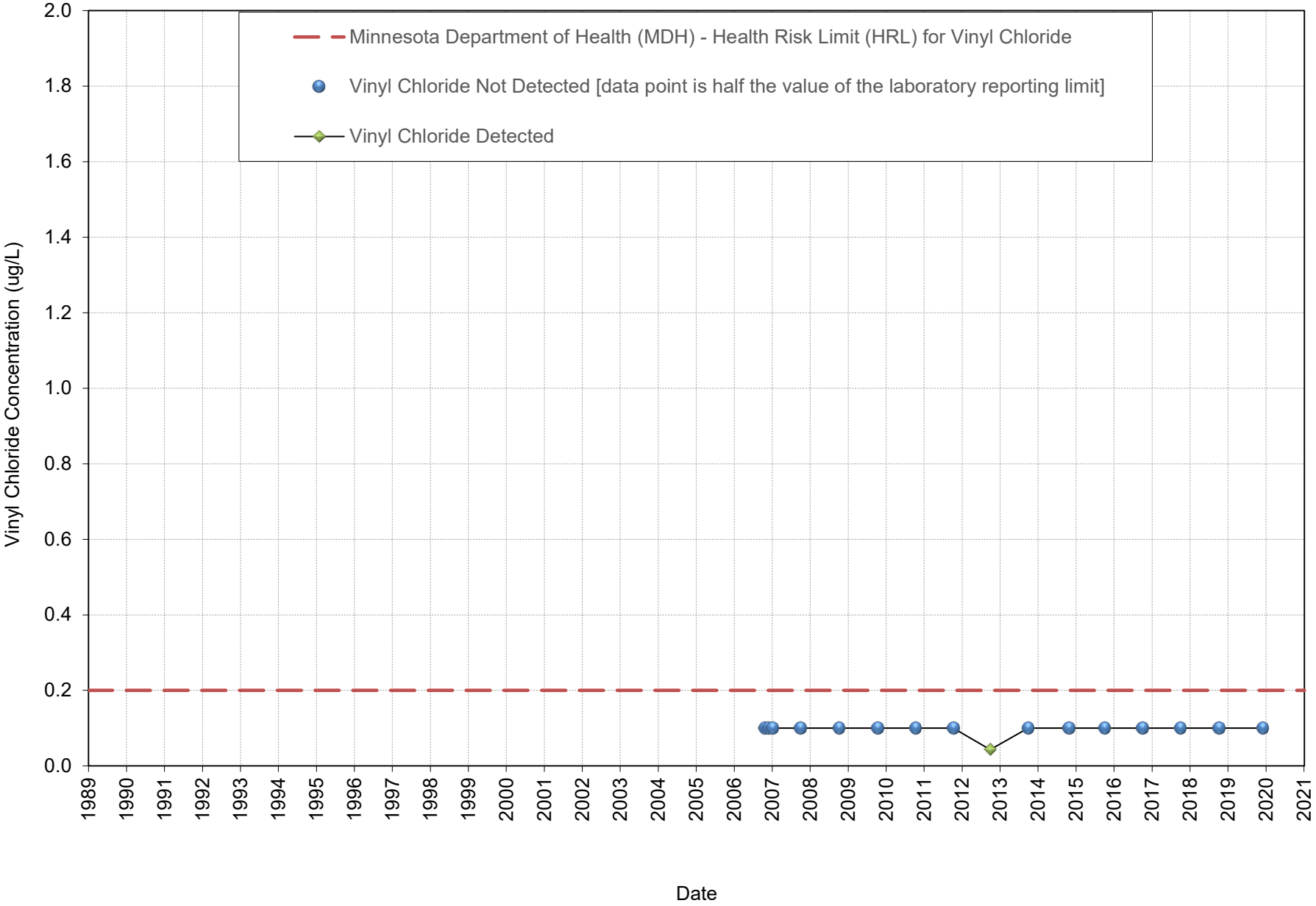
Historical Vinyl Chloride Concentrations
MW17A
North Oaks, Minnesota



Historical Vinyl Chloride Concentrations
MW17B
North Oaks, Minnesota



Historical Vinyl Chloride Concentrations
MW18A
North Oaks, Minnesota



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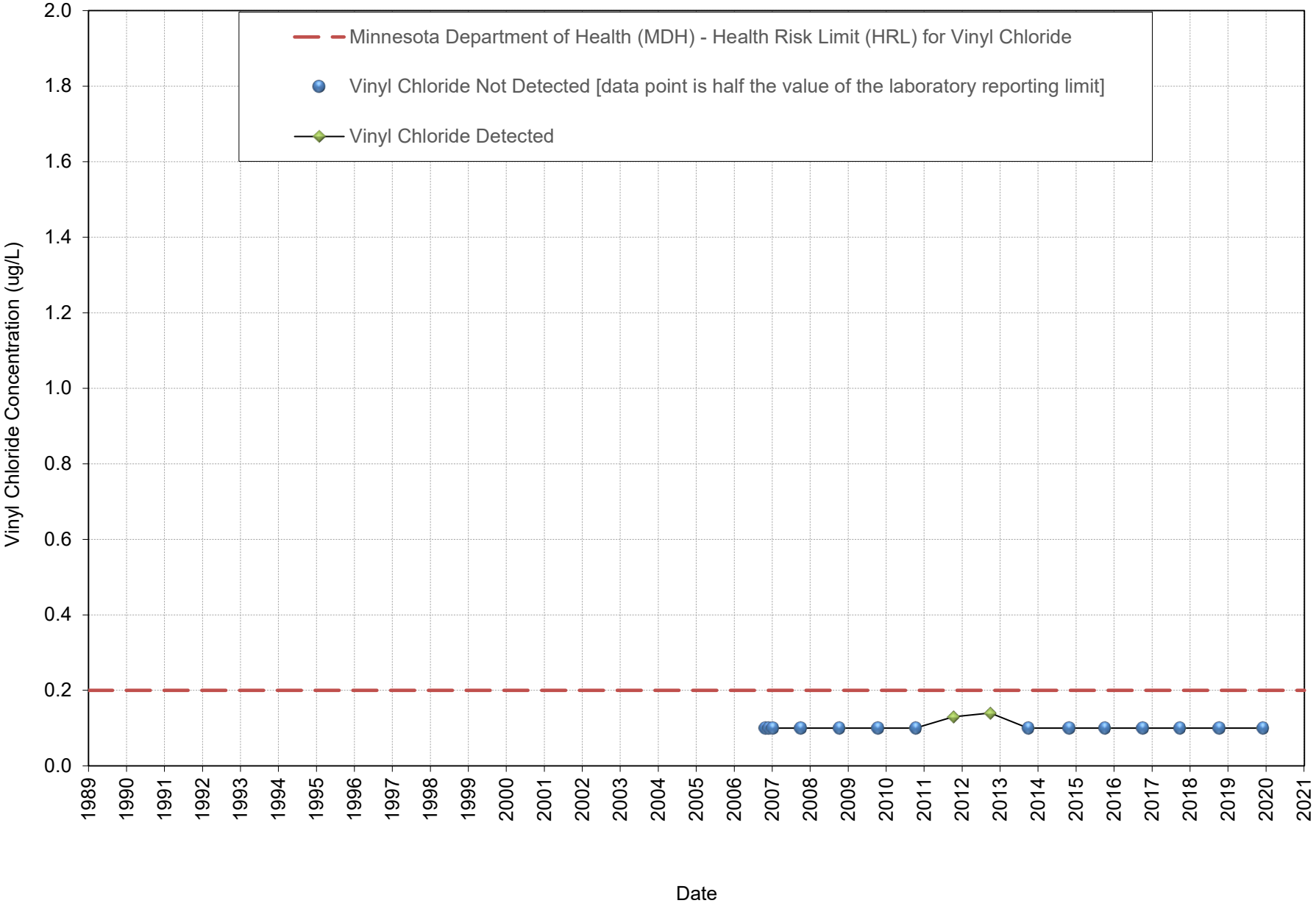
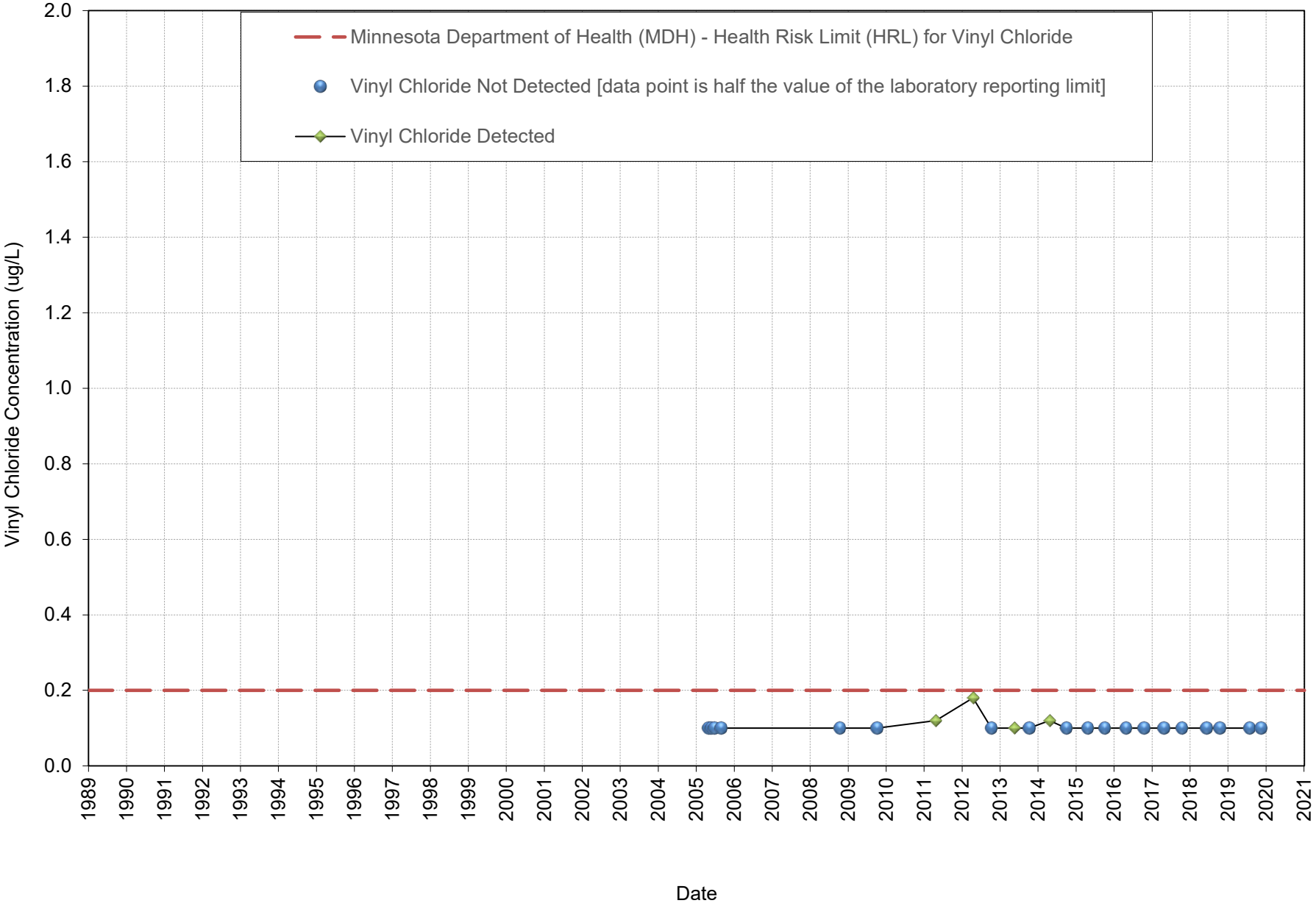
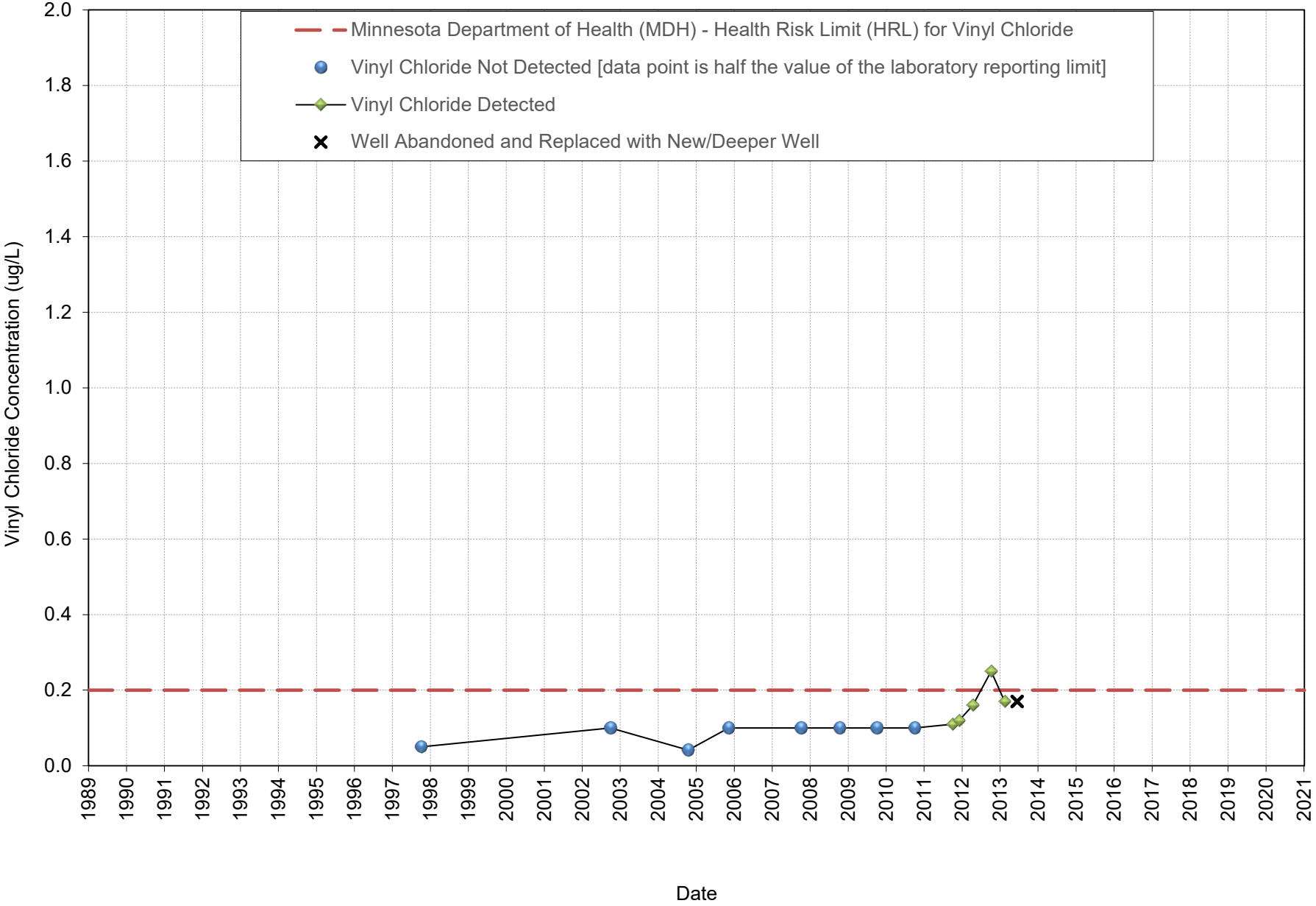
North Oaks, Minnesota



Historical Vinyl Chloride Concentrations
50 East Oaks Road
North Oaks, Minnesota

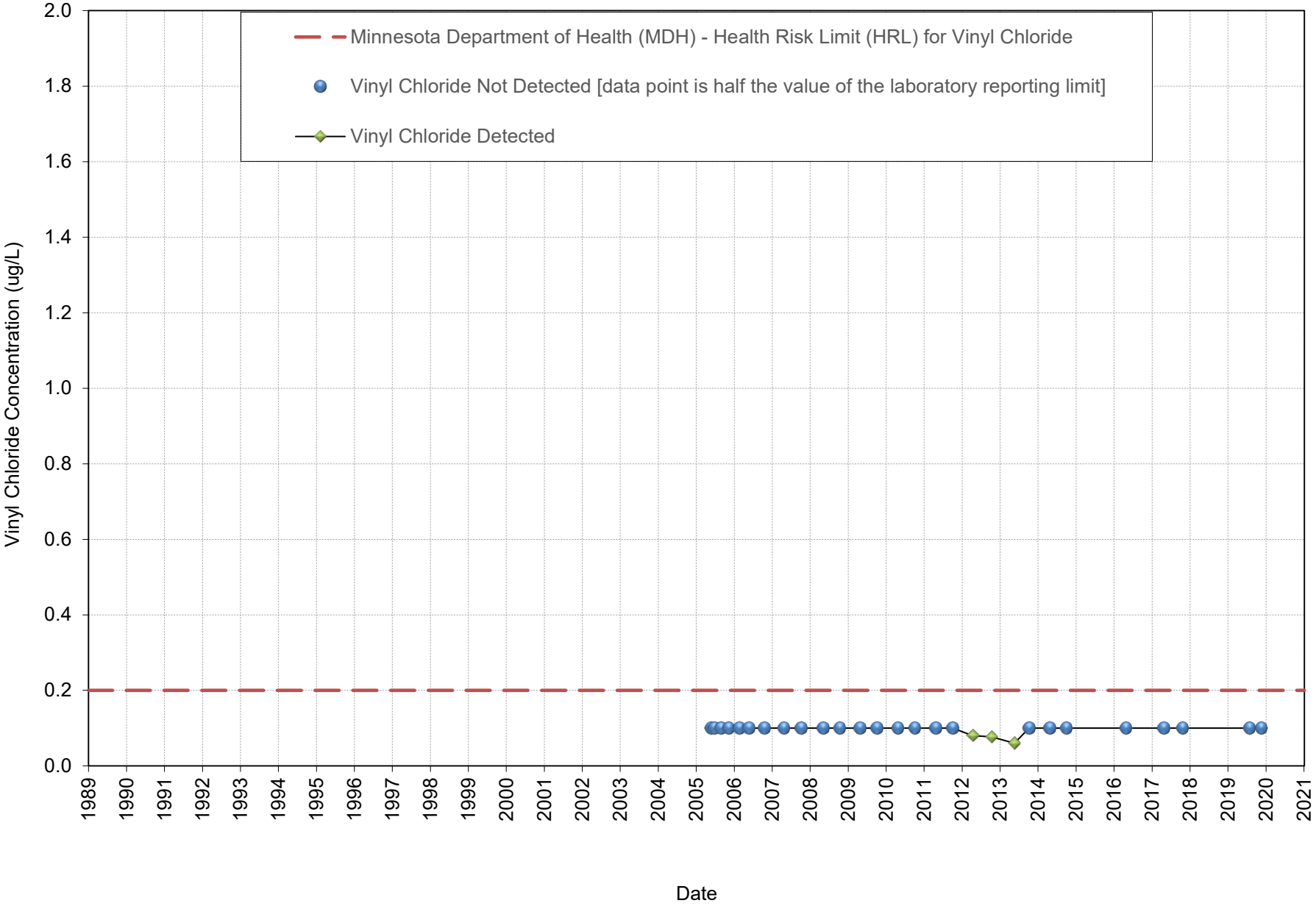


Historical Vinyl Chloride Concentrations
2 Heron Lane (Old Well)
North Oaks, Minnesota

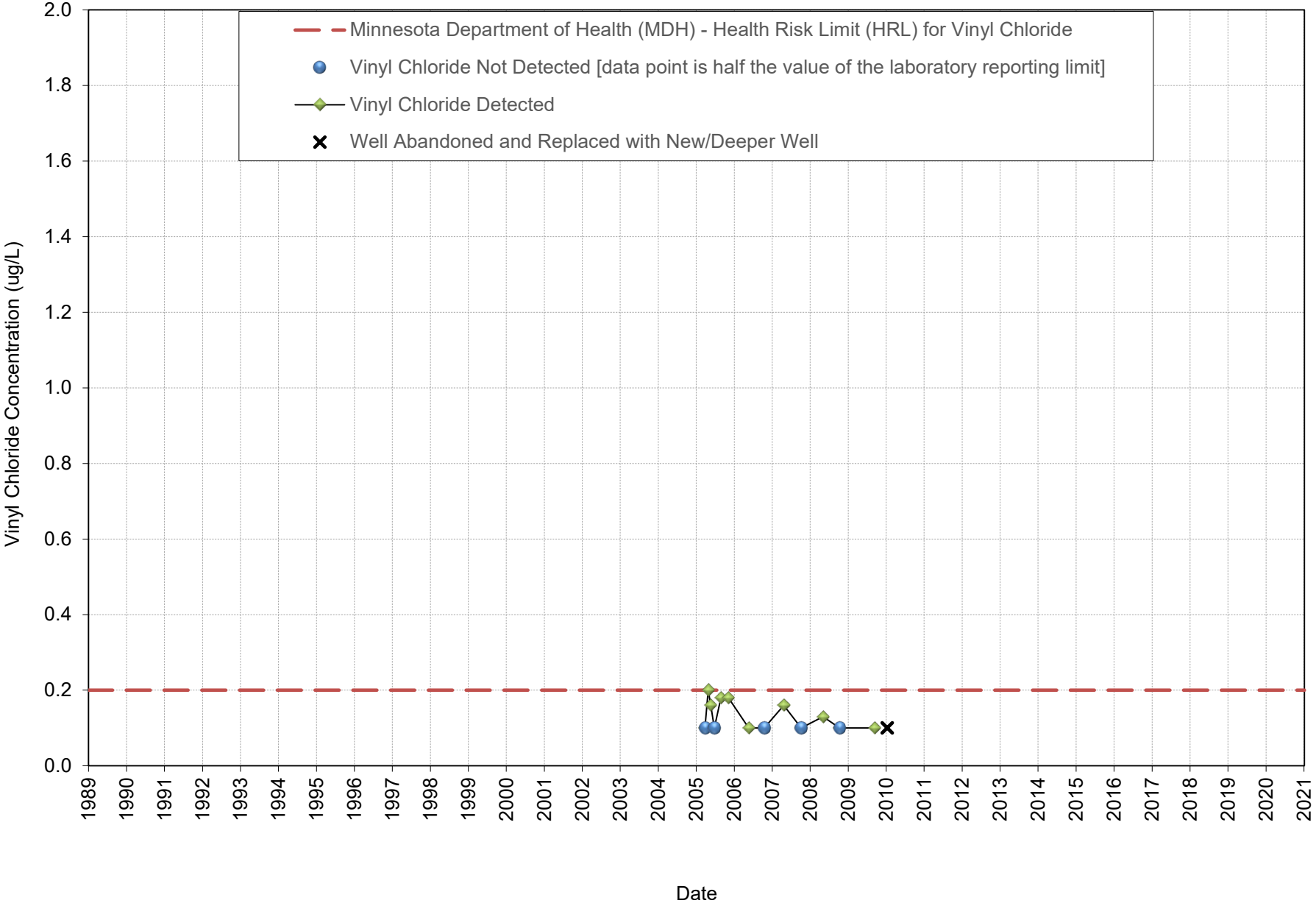


Historical Vinyl Chloride Concentrations
3 Heron Lane
North Oaks, Minnesota

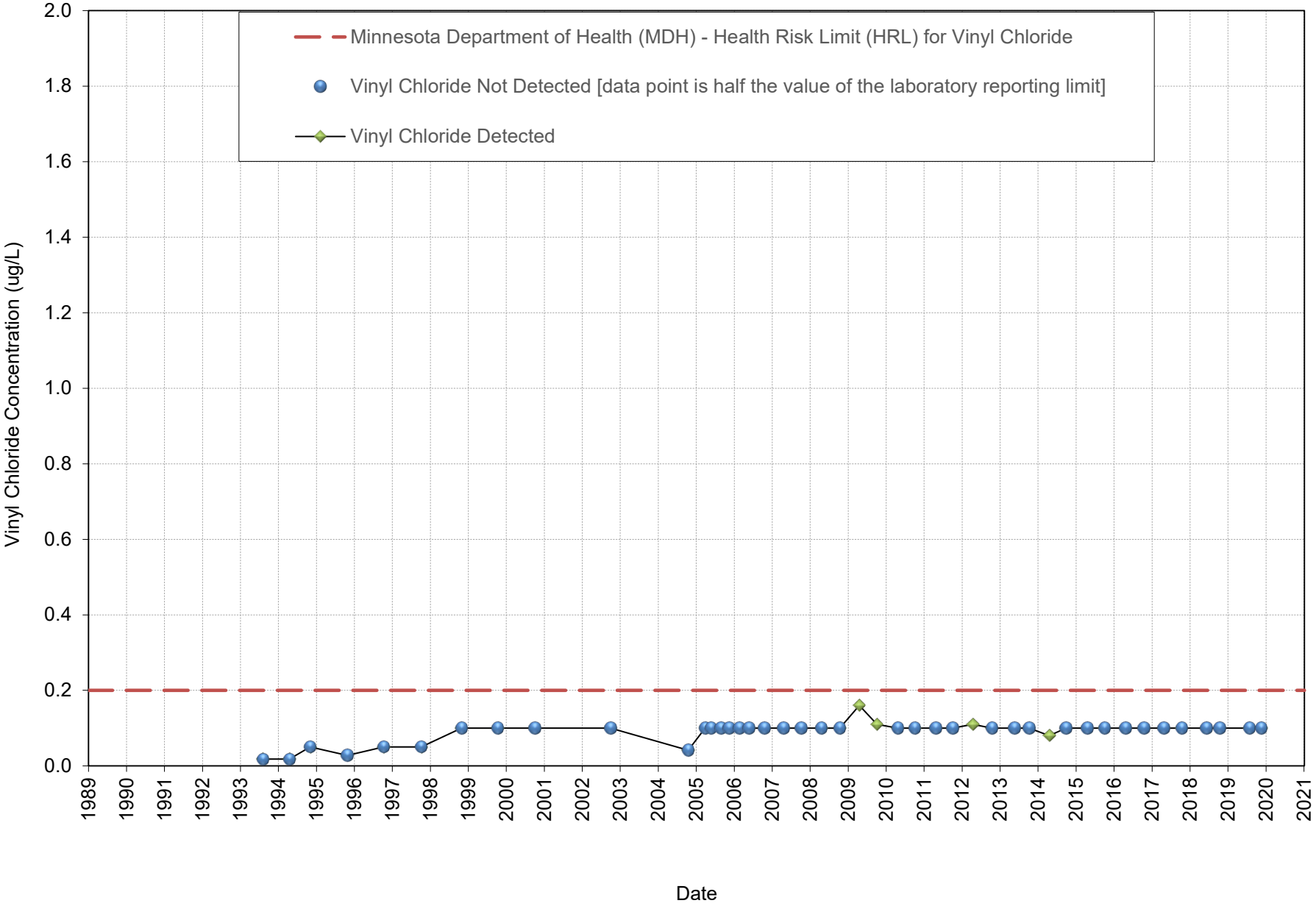
Historical Vinyl Chloride Concentrations
1 Hummingbird Hill
North Oaks, Minnesota



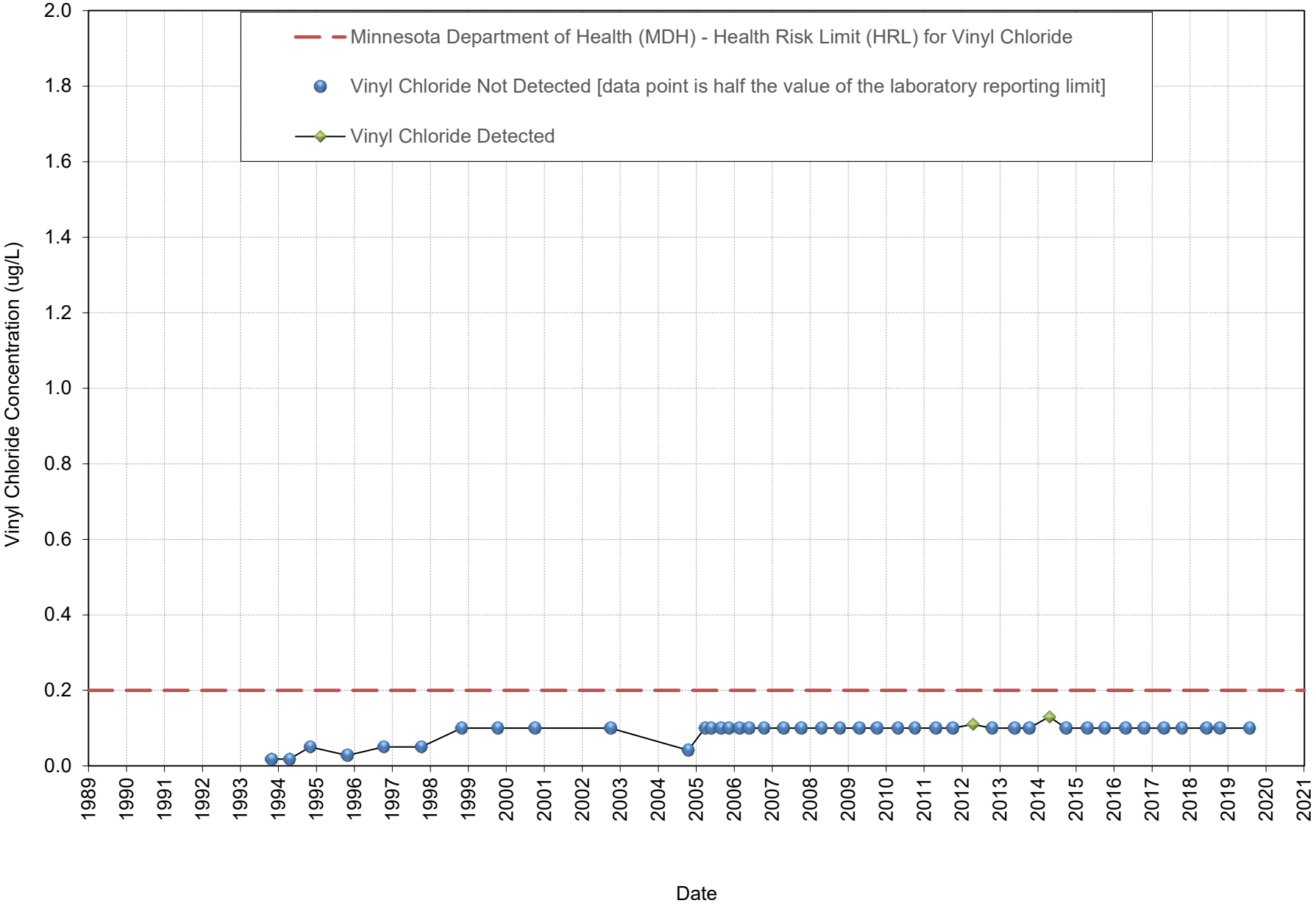
Historical Vinyl Chloride Concentrations
2 Hummingbird Hill (Old Well)
North Oaks, Minnesota



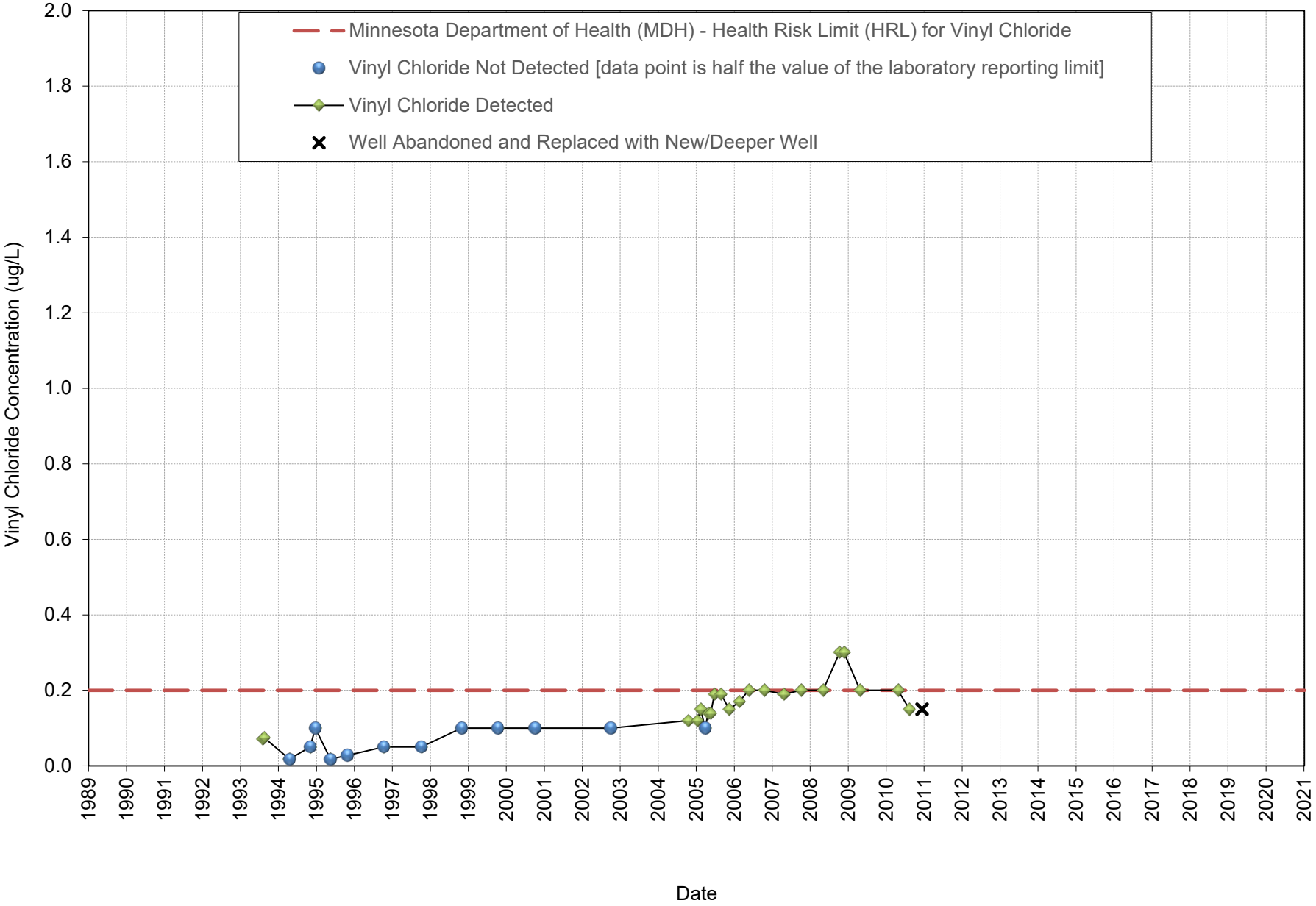
Historical Vinyl Chloride Concentrations
10 West Shore Road
North Oaks, Minnesota



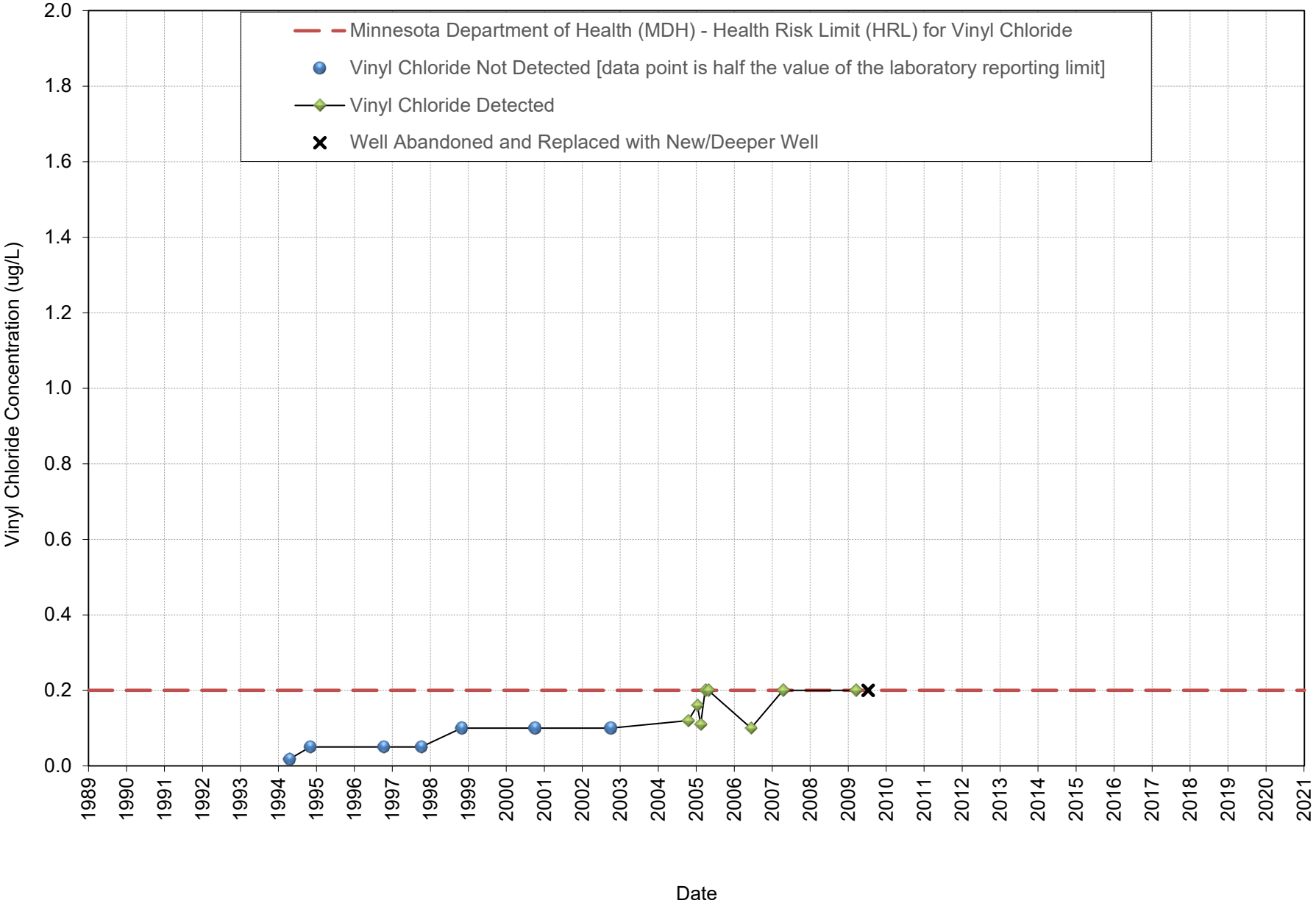
Historical Vinyl Chloride Concentrations
11 West Shore Road
North Oaks, Minnesota



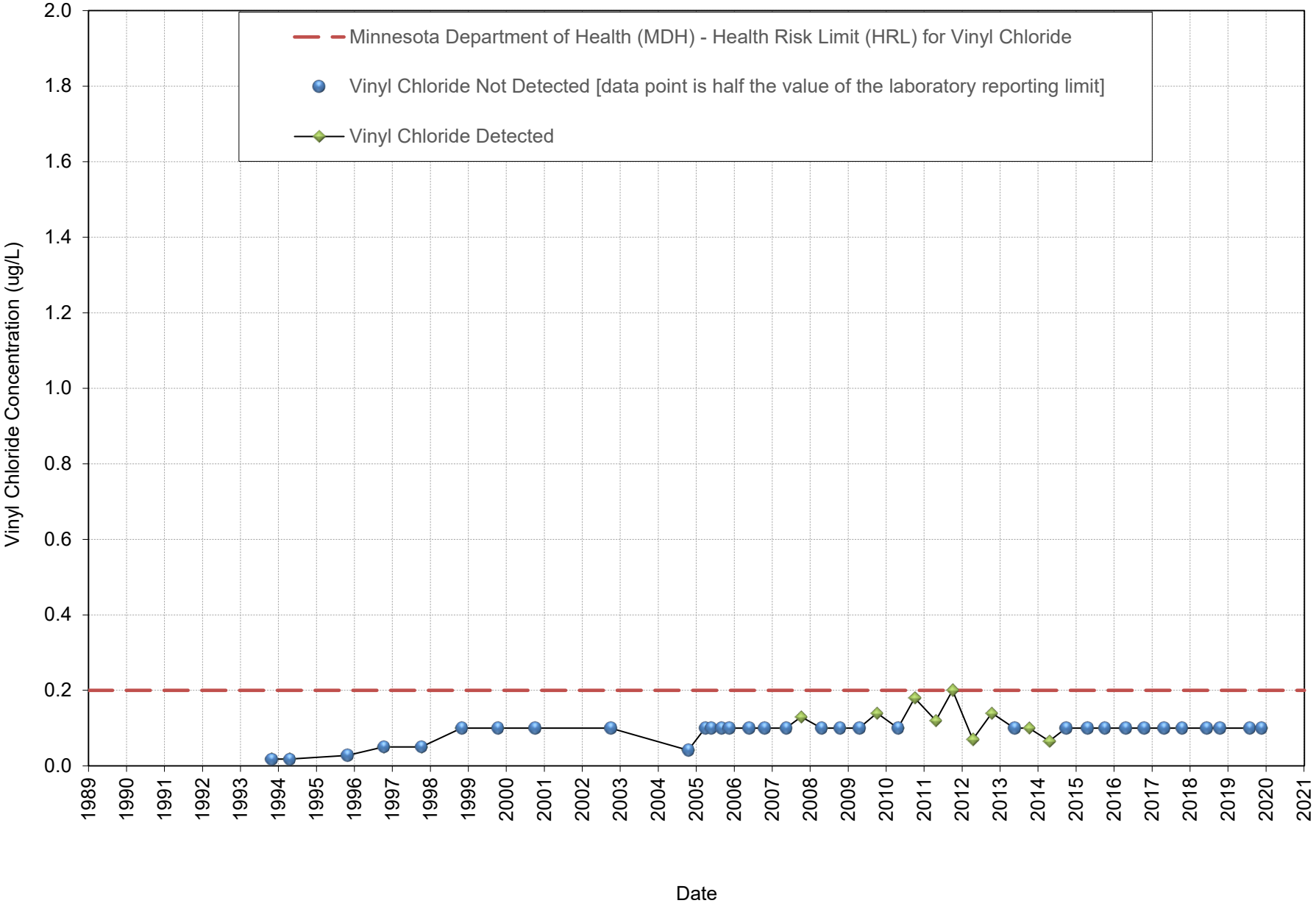
Historical Vinyl Chloride Concentrations
12 West Shore Road (Old Well)
North Oaks, Minnesota



Historical Vinyl Chloride Concentrations
13 West Shore Road (Old Well)
North Oaks, Minnesota



Historical Vinyl Chloride Concentrations
15 West Shore Road
North Oaks, Minnesota



about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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