



# Glenn Springs Holdings, Inc.

A subsidiary of Occidental Petroleum

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Project Manager  
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January 31, 2023

Reference No. 11225008

Mr. Benjamin J. McPherson  
New York State Department of Environmental Conservation  
270 Michigan Avenue  
Buffalo, NY 14203-2999

Re: Quarterly Progress Report – Fourth Quarter 2022  
Occidental Chemical Corporation, Buffalo Avenue Plant  
NY Permit Number 9-2911-00112/00167-0  
Module II – Corrective Action Requirements

In accordance with Module II of the Niagara Plant's Resource Conservation and Recovery Act (RCRA)/Part 373 Permit, the following is the quarterly data report for the period of October 1, 2022 to December 31, 2022. Table 1 is a summary of the monitoring tasks by quarter that are performed each year along with completion dates where applicable. Table 2 presents a summary of maintenance activities performed during the quarter.

### **Bedrock Groundwater**

The groundwater system was operational 87.8 percent of the time this quarter. The treatment system downtime was due to various alarms (effluent pH issues and calibration, low decanter level), leak detection at BEW705D, annual oxidizer and scrubber maintenance, air stripper sump high level, air compressor failure, and communication issues. Downtime for greater than 72 hours consecutively and/or greater than 120 hours in a month occurred in November (annual oxidizer and scrubber maintenance) and December (communication issues). NYSDEC was notified on November 16 and 21, 2022 and December 27, 2022.

Downtime for all extraction system wells (or most wells at once) occurred due to some of the issues associated with the treatment system, as well as repairs at BEW706C, sand filter repairs (BEW700B and BEW701B), and repairs at BEW706B. Downtime for greater than 72 hours consecutively and/or greater than 120 hours in a month occurred in November and December for BEW706B. NYSDEC was notified on November 8 2022, with follow up communications on November 21, December 6, and December 13, 2022.

Performance monitoring data for the bedrock groundwater system are presented as follows:

Hydraulic Monitoring Locations .....	Figure 1
Chemical Monitoring Locations .....	Figure 2
Recovery Volumes by Zone.....	Tables 3, 4, and 5
Average Monthly Flow Rate Summary .....	Table 6
Groundwater Elevations .....	Table 7
Groundwater Contours (regional containment) by Zone .....	Figures 3, 4, and 5

### **Overburden Groundwater**

The Flow Zone 1 remedial system was operational 85.2 percent of the time for WW1 and 85.2 percent of the time for WW2 this quarter. The Flow Zone 3 remedial system (WWB of the Energy Boulevard Drain Tile System) was operational 87.1 percent of the time this quarter. Downtime occurred due to some of the issues associated with the treatment system, as well as power shut down for maintenance activities in the U-Area (WW1 and WW2) and pump issues at WWB. Downtime for greater than 72 hours consecutively and/or

greater than 120 hours in a month occurred in December. NYSDEC was notified on December 22 and 27, 2022.

Occidental Chemical Corporation (OxyChem) voluntarily operates two additional overburden groundwater collection systems at the Plant. These systems include the abandoned Outfall 005 and adjacent abandoned sanitary sewer in the F- and K-Areas of the Plant (MH159L) and the abandoned D-Area sanitary sewer (MH301).

Performance monitoring data for the overburden groundwater system are presented as follows:

Hydraulic Monitoring Locations .....Figure 6  
 Chemical Monitoring Locations .....Figure 7  
 Weekly Flow Rates ..... Table 8  
 Average Monthly Flow Rate Summary ..... Table 9  
 Groundwater Elevations ..... Table 10  
 Groundwater Contours, Flow Zone 1 ..... Figure 8  
 Groundwater Contours, Flow Zone 3 ..... Figure 9

An analytical data summary and validation for the overburden chemical monitoring program is presented in Attachment A.

**Non-aqueous Phase Liquid (NAPL) Monitoring**

In accordance with the letter to the NYSDEC dated February 26, 2009, OxyChem incorporated quarterly NAPL monitoring and collection from six bedrock monitoring wells installed and monitored under the S-Area Remedial Requisite Technology Program into the Niagara Plant Corrective Action Program. Three other wells were added in accordance with the recommendations of the 2009 Annual Performance Evaluation. An additional well was added during the first quarter of 2012 in accordance with the recommendations of the 2011 Annual Performance Evaluation. These bedrock monitoring wells, designated OW229, OW243, OW618, OW619, OW620, OW621, OW634, OW635, OW638, and OW643, are located within, or immediately adjacent to, the N-Area of the Niagara Plant and contain N-Area NAPL. Quarterly NAPL checks and recovery have continued in 2022.

NAPL monitoring and collection data are presented as follows:

Bedrock NAPL Monitoring Locations .....Figure 10  
 Overburden NAPL Monitoring Locations .....Figure 11  
 Bedrock NAPL Monitoring and Collection ..... Table 11  
 Overburden NAPL Monitoring and Collection..... Table 12

Should you have any questions on the above, please do not hesitate to contact Joseph Branch at 231-670-6809 or email at joseph\_branch@oxy.com or Tim Bathory at 716-278-7679 or email at timothy\_bathory@oxy.com.

Very truly yours,



Joseph Branch  
Project Manager  
Glenn Springs Holdings, Inc.

JP/kf/9/11225008

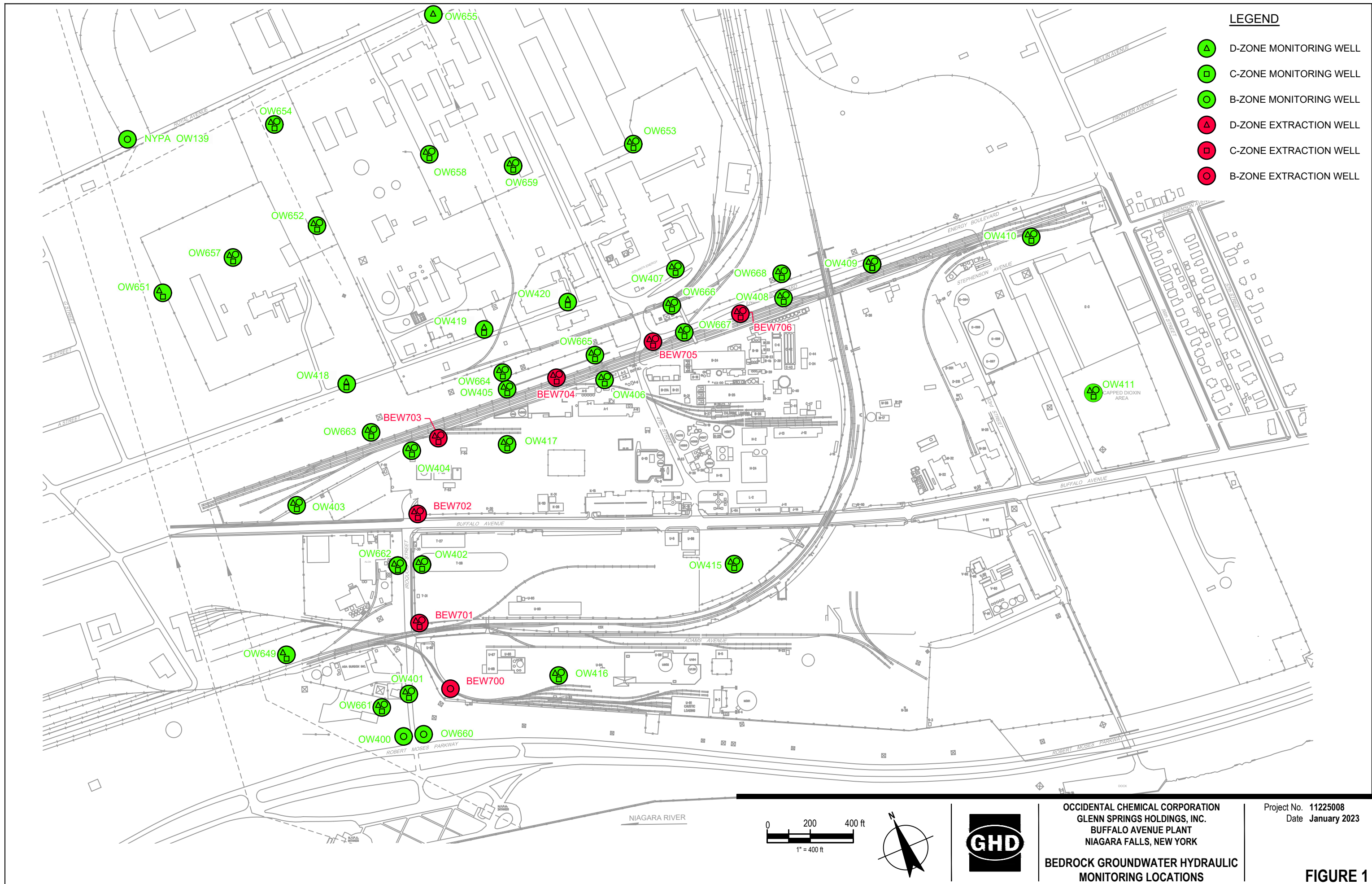
Encl.

January 31, 2023

Reference No. 11225008

- 3 -

cc: A. Caprio, NYSDEC  
L. Winterberger, NYSDEC  
D. Evans, NYSDEC  
A. Everett, USEPA  
T. Bathory, GSH  
J. Pentilchuk, GHD



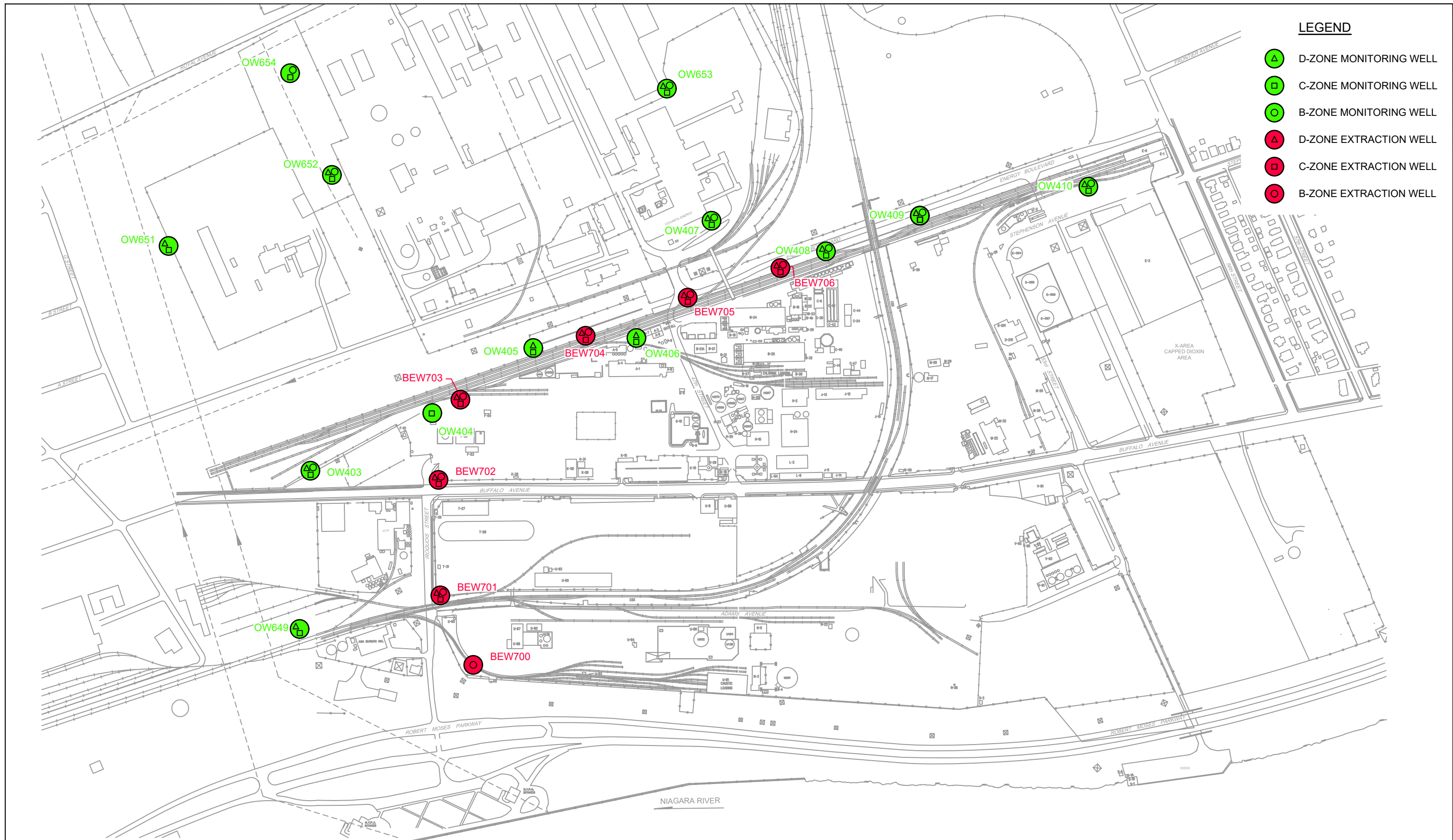
**LEGEND**

- ▲ D-ZONE MONITORING WELL
- ◻ C-ZONE MONITORING WELL
- B-ZONE MONITORING WELL
- ▲ D-ZONE EXTRACTION WELL
- ◻ C-ZONE EXTRACTION WELL
- B-ZONE EXTRACTION WELL

**OCCIDENTAL CHEMICAL CORPORATION**  
**GLENN SPRINGS HOLDINGS, INC.**  
**BUFFALO AVENUE PLANT**  
**NIAGARA FALLS, NEW YORK**  
**BEDROCK GROUNDWATER HYDRAULIC**  
**MONITORING LOCATIONS**

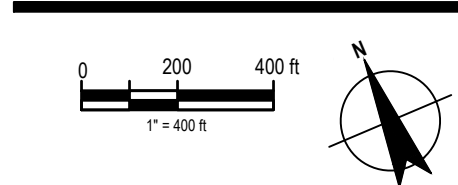
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 Date January 2023

**FIGURE 1**



**LEGEND**

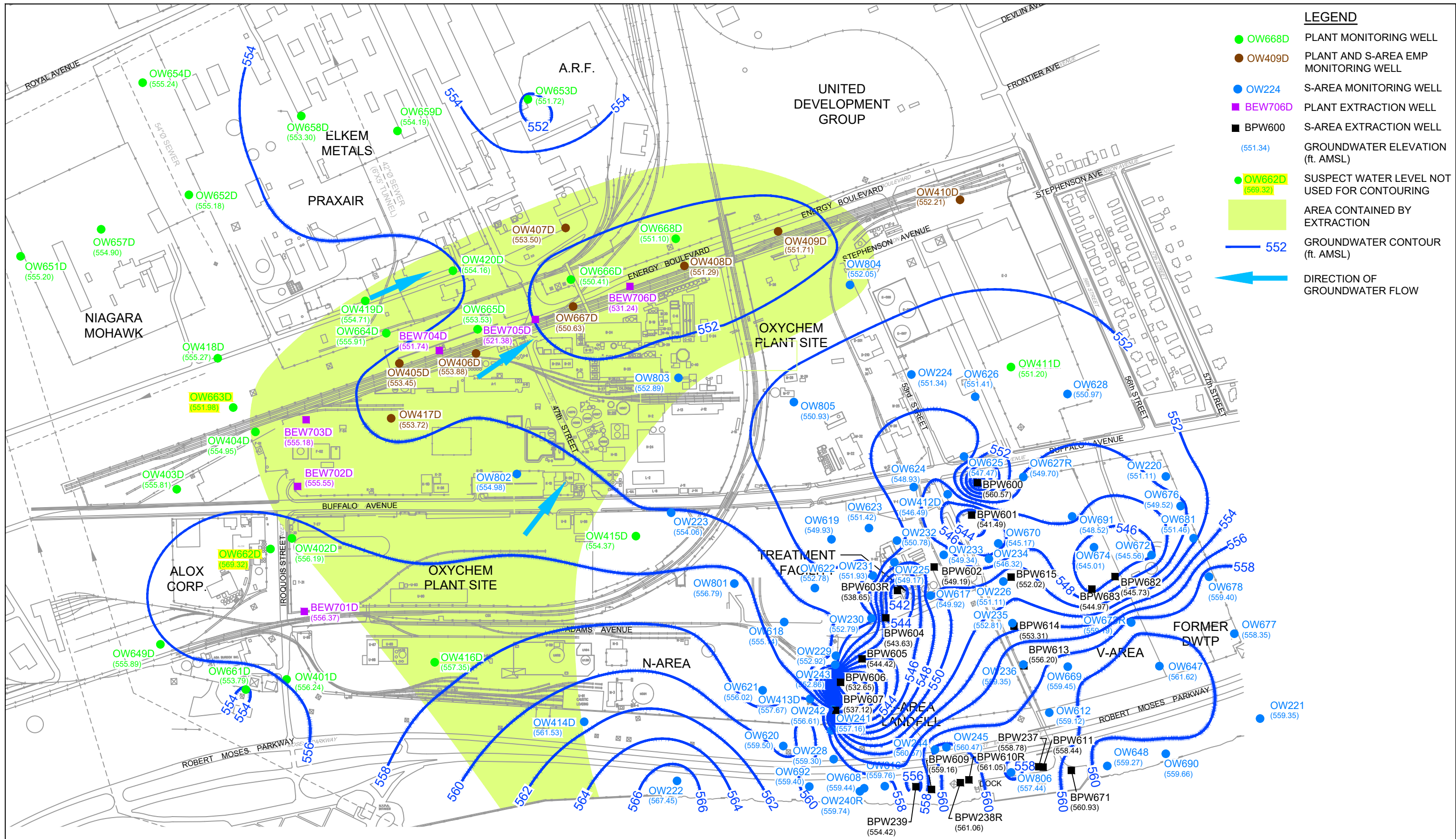
- ▲ D-ZONE MONITORING WELL
- ◻ C-ZONE MONITORING WELL
- B-ZONE MONITORING WELL
- ▲ D-ZONE EXTRACTION WELL
- ◻ C-ZONE EXTRACTION WELL
- B-ZONE EXTRACTION WELL



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 BUFFALO AVENUE PLANT  
 NIAGARA FALLS, NEW YORK  
 BEDROCK GROUNDWATER CHEMICAL  
 MONITORING LOCATIONS

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**FIGURE 2**

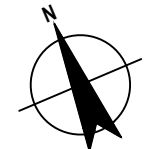
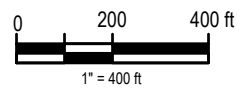


**LEGEND**

- OW668D PLANT MONITORING WELL
- OW409D PLANT AND S-AREA EMP MONITORING WELL
- OW224 S-AREA MONITORING WELL
- BEW706D PLANT EXTRACTION WELL
- BPW600 S-AREA EXTRACTION WELL
- (551.34) GROUNDWATER ELEVATION (ft. AMSL)
- OW662D (569.32) SUSPECT WATER LEVEL NOT USED FOR CONTOURING
- AREA CONTAINED BY EXTRACTION
- 552 GROUNDWATER CONTOUR (ft. AMSL)
- DIRECTION OF GROUNDWATER FLOW

**NOTES:**

- CONTOURS REFLECT AN AVERAGE CONDITION OVER THE DATA COLLECTION PERIOD, APPROXIMATELY 4 HOURS. UNLESS OTHERWISE NOTED, CONTOURS RESPECT ALL WATER LEVEL MEASUREMENTS TO THE LEVEL OF UNCERTAINTY ASSOCIATED WITH COLLECTING LEVELS OVER A PERIOD OF SEVERAL HOURS. THAT UNCERTAINTY IS APPROXIMATELY +/-0.5 FEET FOR NYPA WINTER OPERATING CONDITIONS.
- MEASURED ELEVATIONS FOR PLANT EXTRACTION WELLS BEW701D-BEW706D WERE NOT USED FOR CONTOURING.



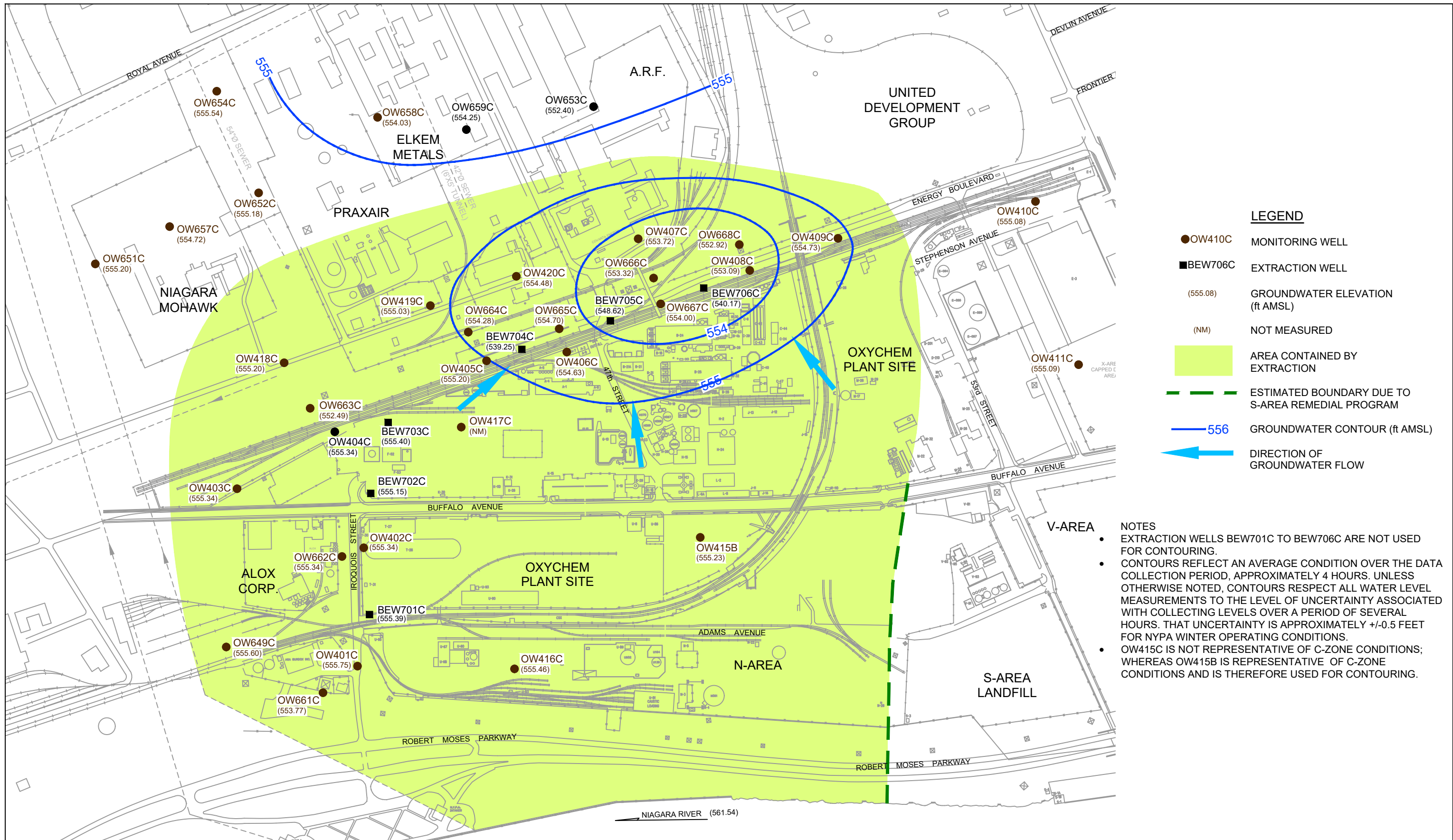
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 NIAGARA FALLS, NEW YORK

**D-ZONE BEDROCK GROUNDWATER  
 CONTOURS - DECEMBER 6, 2022**

Project No. 11225008  
 Date January 2023

**FIGURE 3**

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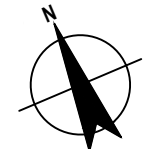
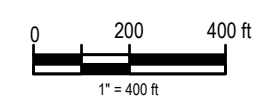


**LEGEND**

- OW410C MONITORING WELL
- BEW706C EXTRACTION WELL
- (555.08) GROUNDWATER ELEVATION (ft AMSL)
- (NM) NOT MEASURED
- AREA CONTAINED BY EXTRACTION
- ESTIMATED BOUNDARY DUE TO S-AREA REMEDIAL PROGRAM
- 556— GROUNDWATER CONTOUR (ft AMSL)
- ← DIRECTION OF GROUNDWATER FLOW

**NOTES**

- EXTRACTION WELLS BEW701C TO BEW706C ARE NOT USED FOR CONTOURING.
- CONTOURS REFLECT AN AVERAGE CONDITION OVER THE DATA COLLECTION PERIOD, APPROXIMATELY 4 HOURS. UNLESS OTHERWISE NOTED, CONTOURS RESPECT ALL WATER LEVEL MEASUREMENTS TO THE LEVEL OF UNCERTAINTY ASSOCIATED WITH COLLECTING LEVELS OVER A PERIOD OF SEVERAL HOURS. THAT UNCERTAINTY IS APPROXIMATELY +/-0.5 FEET FOR NYPA WINTER OPERATING CONDITIONS.
- OW415C IS NOT REPRESENTATIVE OF C-ZONE CONDITIONS; WHEREAS OW415B IS REPRESENTATIVE OF C-ZONE CONDITIONS AND IS THEREFORE USED FOR CONTOURING.

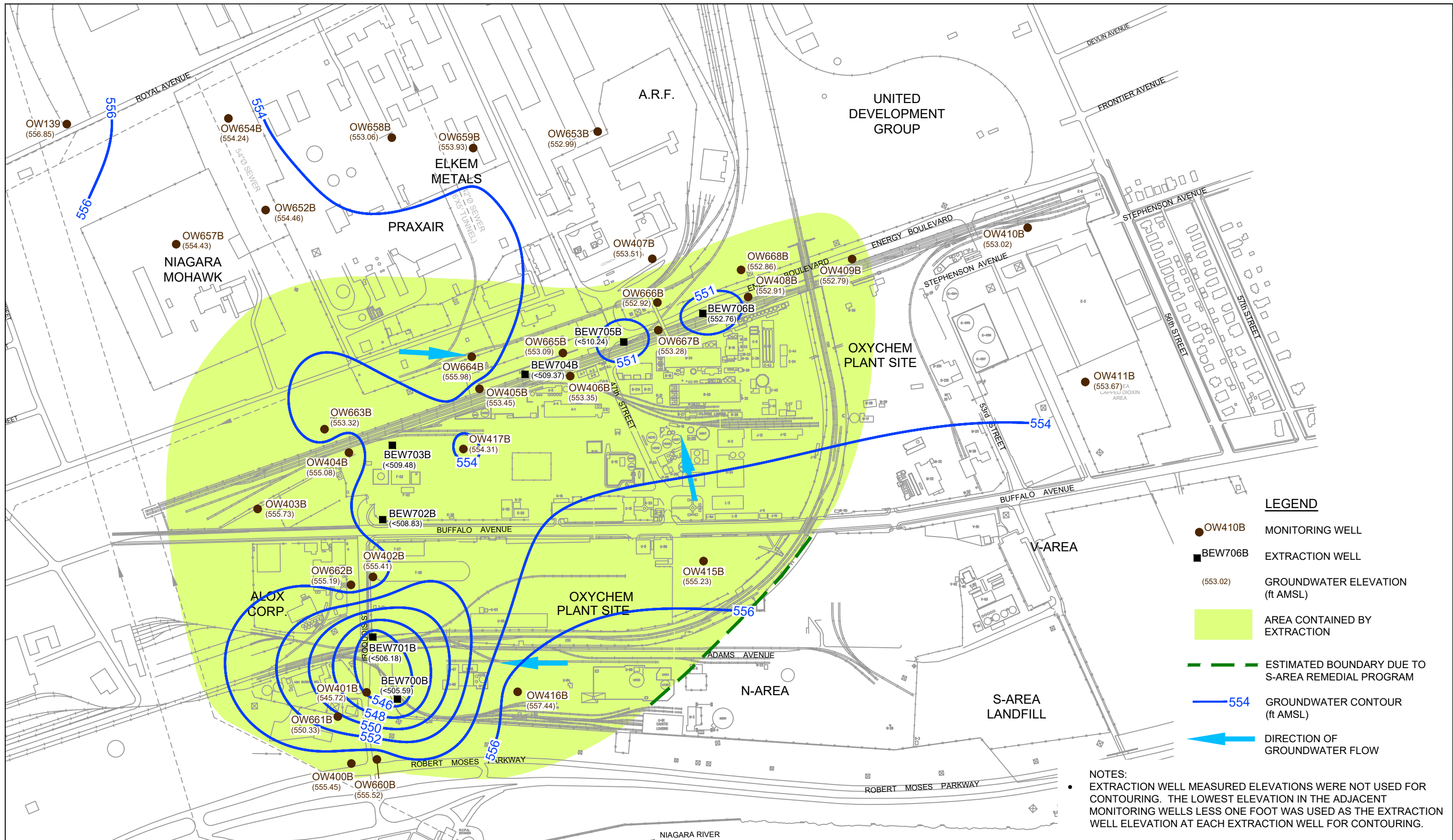


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 NIAGARA FALLS, NEW YORK

**C-ZONE BEDROCK GROUNDWATER  
 CONTOURS - DECEMBER 6, 2022**

Project No. 11225008  
 Date January 2023

**FIGURE 4**



**LEGEND**

- OW410B MONITORING WELL
- BEW706B EXTRACTION WELL
- (553.02) GROUNDWATER ELEVATION (ft AMSL)
- AREA CONTAINED BY EXTRACTION
- - - ESTIMATED BOUNDARY DUE TO S-AREA REMEDIAL PROGRAM
- 554 GROUNDWATER CONTOUR (ft AMSL)
- ← DIRECTION OF GROUNDWATER FLOW

**NOTES:**

- EXTRACTION WELL MEASURED ELEVATIONS WERE NOT USED FOR CONTOURING. THE LOWEST ELEVATION IN THE ADJACENT MONITORING WELLS LESS ONE FOOT WAS USED AS THE EXTRACTION WELL ELEVATION AT EACH EXTRACTION WELL FOR CONTOURING.

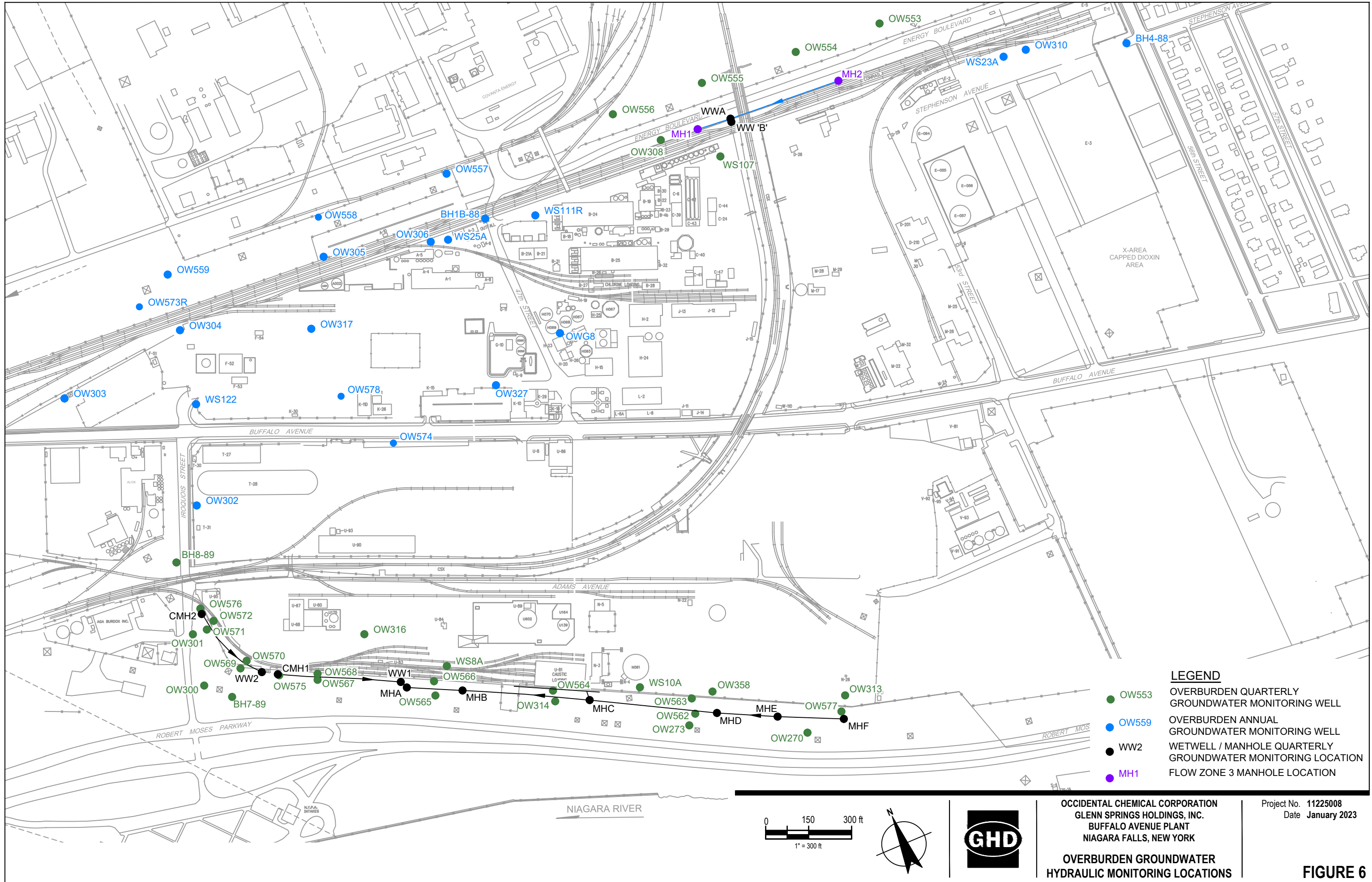
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BUFFALO AVENUE PLANT  
NIAGARA FALLS, NEW YORK**

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Date January 2023

**B-ZONE BEDROCK GROUNDWATER CONTOURS - DECEMBER 6, 2022**

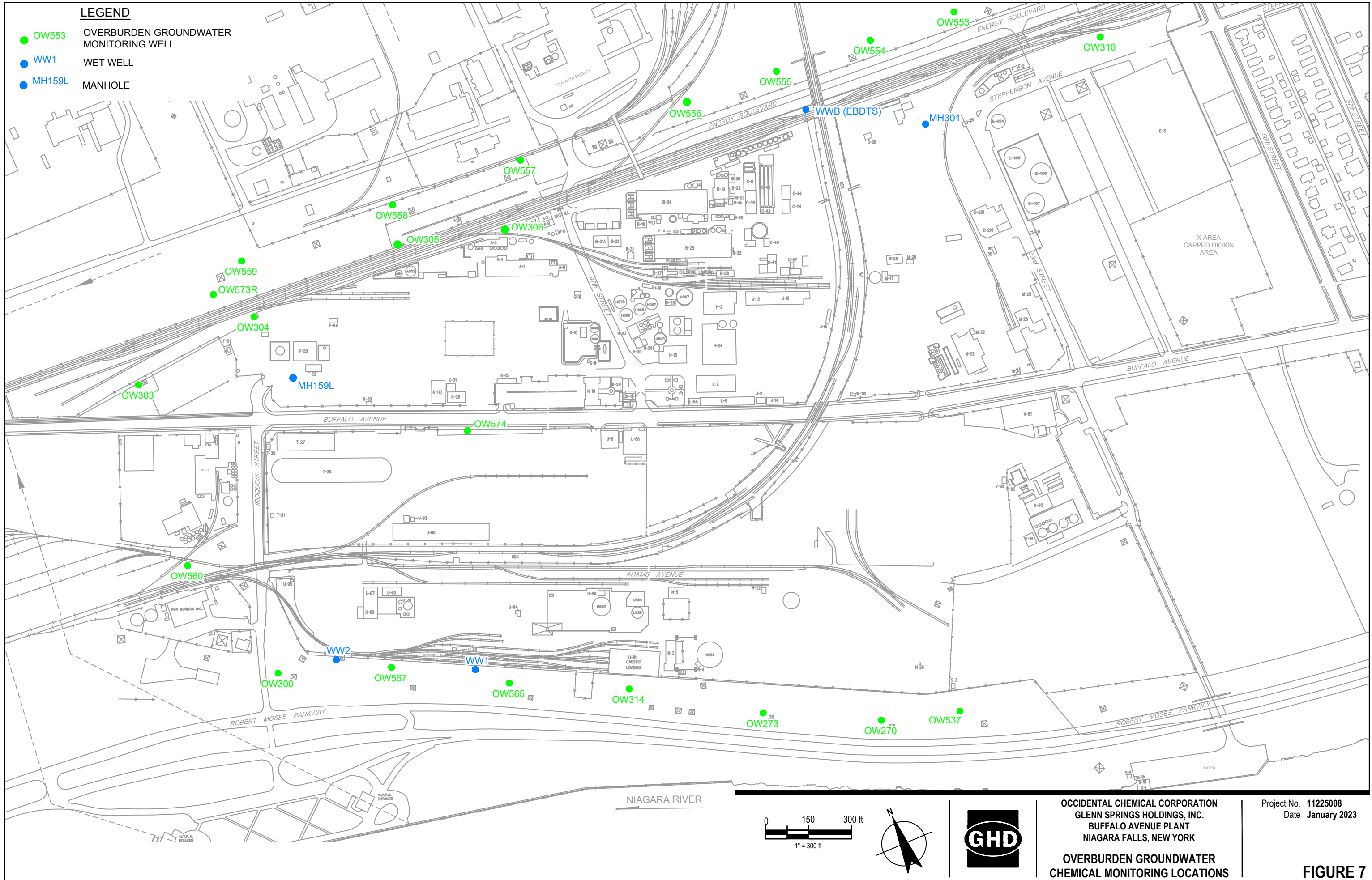
**FIGURE 5**



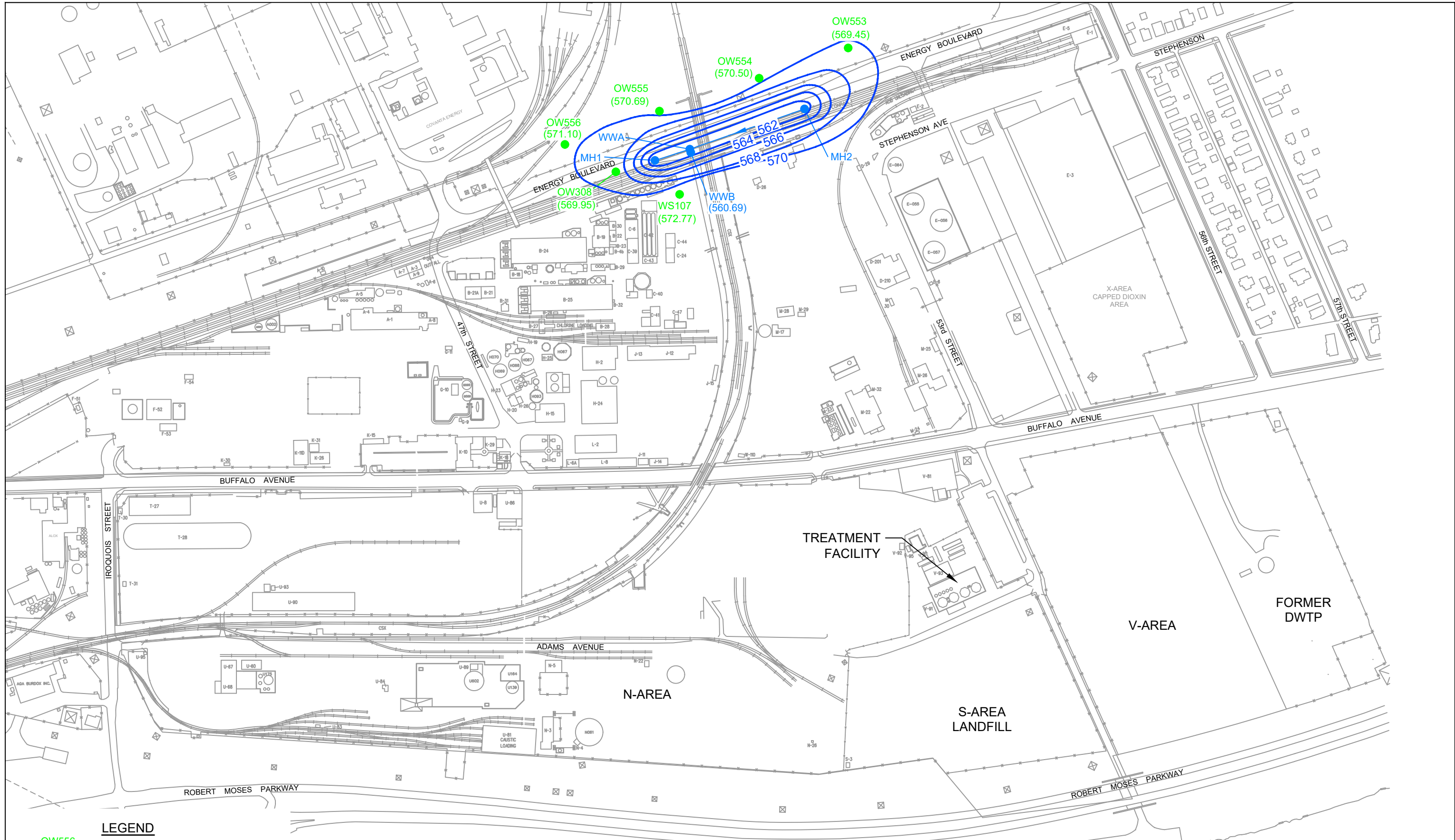


**LEGEND**

- OW553 OVERBURDEN GROUNDWATER MONITORING WELL
- WW1 WET WELL
- MH159L MANHOLE

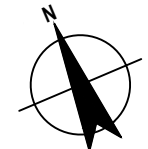
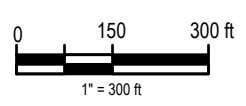






- LEGEND**
- OW556 OVERBURDEN GROUNDWATER MONITORING WELL
  - (571.10) GROUNDWATER ELEVATION (ft AMSL)
  - 568 GROUNDWATER CONTOUR (ft AMSL)

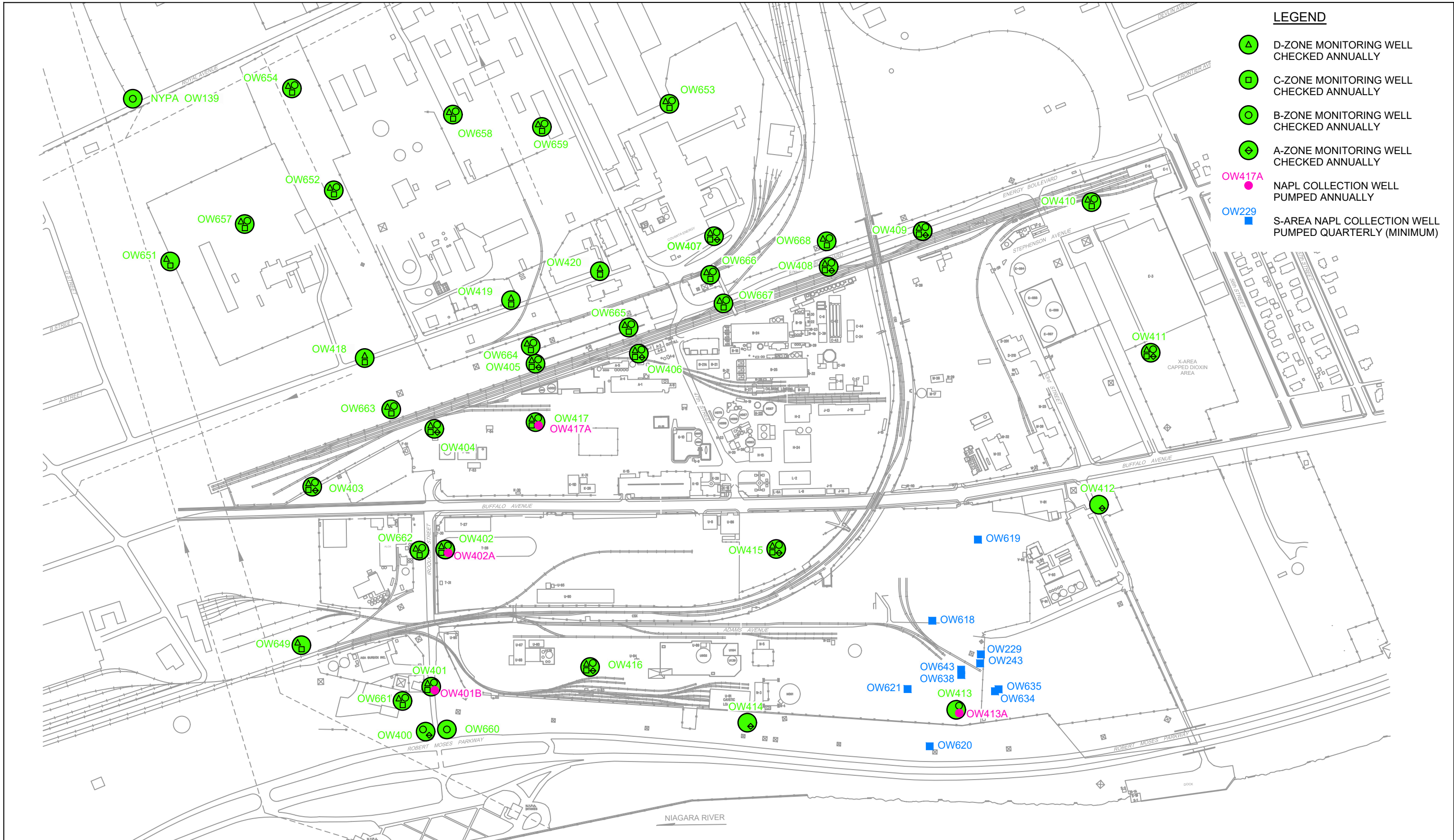
NIAGARA RIVER



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 FLOW ZONE 3 OVERBURDEN GROUNDWATER  
 CONTOURS - DECEMBER 7, 2022

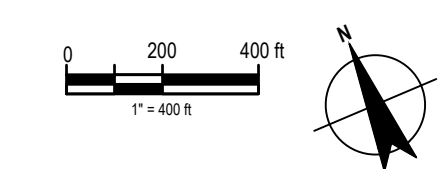
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**FIGURE 9**



**LEGEND**

- ▲ D-ZONE MONITORING WELL CHECKED ANNUALLY
- C-ZONE MONITORING WELL CHECKED ANNUALLY
- B-ZONE MONITORING WELL CHECKED ANNUALLY
- ⊗ A-ZONE MONITORING WELL CHECKED ANNUALLY
- OW417A NAPL COLLECTION WELL PUMPED ANNUALLY
- OW229 S-AREA NAPL COLLECTION WELL PUMPED QUARTERLY (MINIMUM)

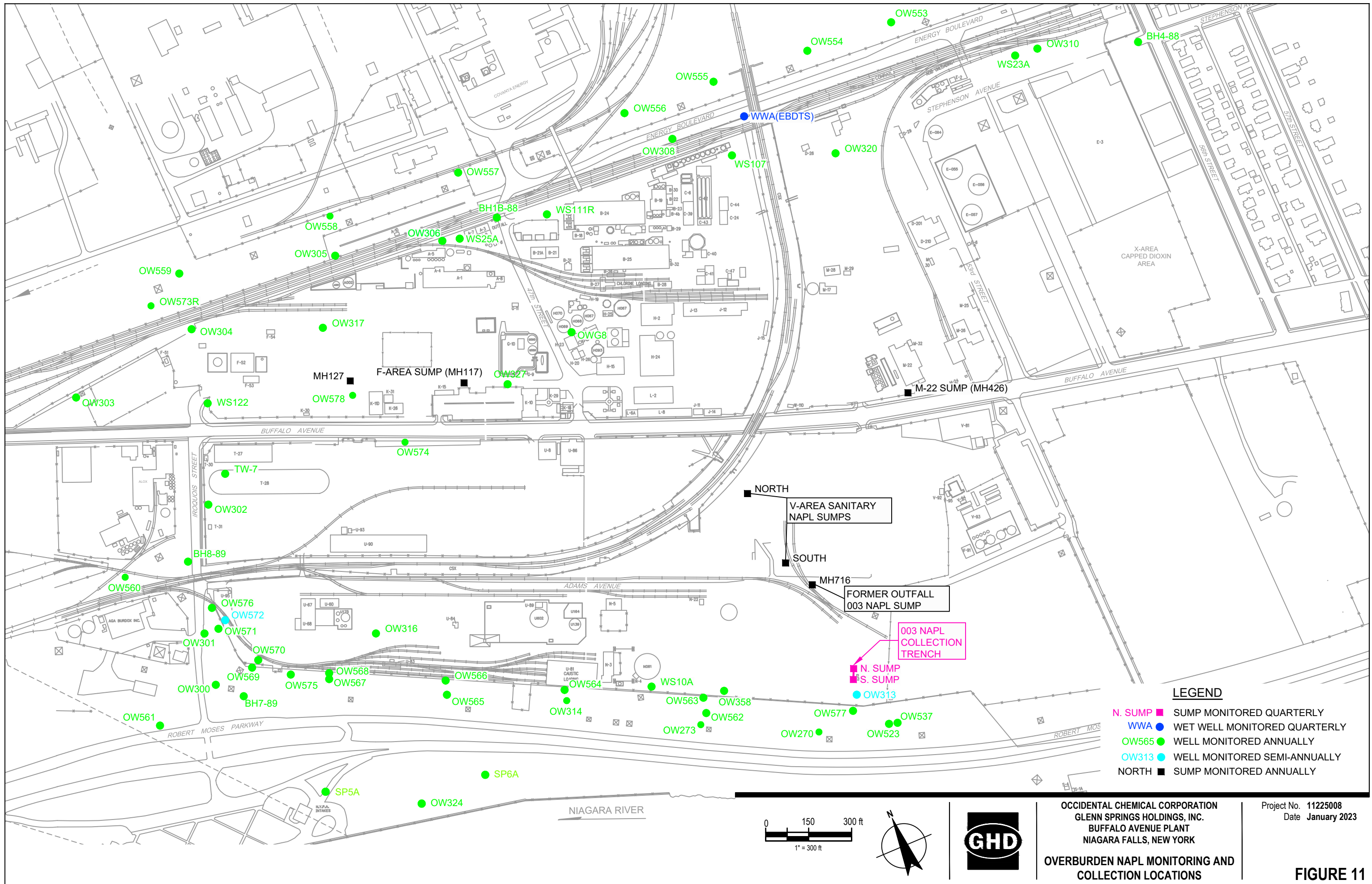


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 GLENN SPRINGS HOLDINGS, INC.  
 BUFFALO AVENUE PLANT  
 NIAGARA FALLS, NEW YORK  
 BEDROCK NAPL MONITORING AND  
 COLLECTION LOCATIONS

Project No. 11225008  
 Date January 2023

**FIGURE 10**

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- LEGEND**
- N. SUMP ■ SUMP MONITORED QUARTERLY
  - WWA ● WET WELL MONITORED QUARTERLY
  - OW565 ● WELL MONITORED ANNUALLY
  - OW313 ● WELL MONITORED SEMI-ANNUALLY
  - NORTH ■ SUMP MONITORED ANNUALLY

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 NIAGARA FALLS, NEW YORK

**OVERBURDEN NAPL MONITORING AND  
 COLLECTION LOCATIONS**

Project No. 11225008  
 Date January 2023

**FIGURE 11**

Table 1

**Summary of Monitoring Tasks and Associated Completion Dates  
Fourth Quarter 2022  
Buffalo Avenue Plant**

Quarter	Program	Task	Date(s) Task was Completed (2022)
First	Bedrock Groundwater	Weekly Flow Measurements	1/3, 1/10, 1/17, 1/24, 1/31, 2/7, 2/14, 2/21, 2/28, 3/7, 3/14, 3/21, 3/28
		Quarterly Hydraulic Monitoring	3/10
		Annual Chemical Monitoring	
	Overburden Groundwater	Weekly Flow Measurements	1/3, 1/10, 1/17, 1/24, 1/31, 2/7, 2/14, 2/21, 2/28, 3/7, 3/14, 3/21, 3/28
		Quarterly Hydraulic Monitoring - Flow Zones 1 and 3	3/7
	NAPL Monitoring	Quarterly NAPL Monitoring/Collection in 003 Collection Trench	3/7
		Quarterly NAPL Monitoring/Collection - N-Area Bedrock Wells	3/11
		Quarterly NAPL Monitoring/Collection of EBDTS	1/24
		Annual NAPL Monitoring/Collection of Overburden Monitoring Wells	3/7
	Second	Bedrock Groundwater	Weekly Flow Measurements
Quarterly Hydraulic Monitoring			6/2
Overburden Groundwater		Weekly Flow Measurements	4/4, 4/11, 4/18, 4/25, 5/2, 5/9, 5/16, 5/23, 5/30, 6/6, 6/13, 6/20, 6/27
		Quarterly Hydraulic Monitoring - Flow Zones 1 and 3	6/3
		Annual Chemical Monitoring - Mercury Cell Area (OW304, OW305, OW306, and OW574)	5/6
		Annual Chemical Monitoring - Plant Wells	7/18 - 7/19
NAPL Monitoring		Quarterly NAPL Monitoring/Collection in 003 Collection Trench	5/12
		Quarterly NAPL Monitoring/Collection - N-Area Bedrock Wells	6/9
		Quarterly NAPL Monitoring/Collection of EBDTS	6/3
Third		Bedrock Groundwater	Weekly Flow Measurements
	Quarterly Hydraulic Monitoring		9/8
	Overburden Groundwater	Weekly Flow Measurements	7/4, 7/11, 7/18, 7/25, 8/1, 8/8, 8/15, 8/22, 8/29, 9/5, 9/12, 9/19
		Quarterly Hydraulic Monitoring - Flow Zones 1 and 3	9/9
		Annual Hydraulic Monitoring - Other Areas	9/9
	NAPL Monitoring	Quarterly NAPL Monitoring/Collection in 003 Collection Trench	7/15
		Quarterly NAPL Monitoring/Collection of EBDTS	9/9
		Quarterly NAPL Monitoring/Collection - N-Area Bedrock Wells	8/5
		Semiannual NAPL Monitoring/Collection of Overburden Monitoring Wells	9/9
		Annual NAPL Check - OW401B, OW402A, OW413A, and OW417A	8/15
Annual Sump/Manhole NAPL Checks	(1)		
Fourth	Bedrock Groundwater	Weekly Flow Measurements	10/3, 10/10, 10/17, 10/24, 10/31, 11/7, 11/21, 11/28, 12/5, 12/12, 12/19, 12/26, 1/2
		Quarterly Hydraulic Monitoring	12/6
		Annual Well Inspections	10/17 - 12/7
	Overburden Groundwater	Weekly Flow Measurements	10/3, 10/10, 10/17, 10/24, 10/31, 11/7, 11/21, 11/28, 12/5, 12/12, 12/19, 12/26, 1/2
		Quarterly Hydraulic Monitoring - Flow Zones 1 and 3	12/7
		Semiannual Chemical Monitoring - Mercury Cell Area (OW574)	11/10
		Annual Well Inspections	10/17 - 12/7
	NAPL Monitoring	Quarterly NAPL Monitoring/Collection in 003 Collection Trench	10/28
		Quarterly NAPL Monitoring/Collection of EBDTS	12/7
		Quarterly NAPL Monitoring/Collection - N-Area Bedrock Wells	11/30

## Notes:

(1) - To be completed in the next quarter

Table 2

**Summary of Maintenance Activities  
Fourth Quarter 2022  
Buffalo Avenue Plant**

<b>Date</b>	<b>Location</b>	<b>Maintenance Activity</b>
10/4	F-Area	Performed trouble shooting of the effluent pH probe. A new probe was installed.
10/10	F-Area	Calibrated the effluent pH probe
10/21	F-Area	Leak detection at BEW-703D. Pumped out the well chamber.
10/24	F-Area	Cleaned out the pipe between MH-A and WW-1
10/26	F-Area	Replaced sand filter backwash pump with a temporary part.
10/27	F-Area	Pulled and replaced BEW-706C pump, motor and wires.
11/7	F-Area	Performed calibrations for the effluent, scrubber and air stripper.
11/11	F-Area	Performed trouble shooting of the backwash system.
11/14/22-11/17/22	F-Area	Completed annual vendor inspection of the thermal oxidizer and scrubber
12/13	F-Area	Pulled and replaced BEW-706B pump, motor and wires.
12/21/22-12/31/22	F-Area	Power shutoff in the U Area. WW-1 and WW-2 were down.
12/30	F-Area	Leak detection at BEW-704D. Pumped out the well chamber.



Table 3

D-Zone Extraction Well Flow Rates  
 Fourth Quarter 2022  
 Buffalo Avenue Plant

Date	BEW701D		BEW702D		BEW703D		BEW704D		BEW705D		BEW706D	
	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)
10/3/2022							397000	40.59	230000	24.89	289000	31.28
10/10/2022							399000	40.80	119000	25.76	147000	31.82
10/17/2022							401000	39.78	217000	25.65	273000	32.27
10/24/2022							384000	39.51	257000	25.50	320000	31.75
10/31/2022							396000	39.29	253000	25.10	316000	31.35
11/7/2022							389000	38.82	252000	25.37	313000	31.47
11/21/2022							610000	38.80	256000	25.33	315000	31.51
11/28/2022							386000	38.52	257000	25.50	319000	31.65
12/5/2022							321000	38.21	198000	23.57	248000	29.52
12/12/2022							386000	38.29	241000	23.91	304000	30.34
12/19/2022							377000	37.40	238000	23.61	298000	29.56
12/26/2022							241000	37.54	150000	23.36	186000	28.70
1/2/2023							302000	45.35	158000	23.72	209000	31.38

Notes:

GPM - gallons per minute  
 BEW701D, 702D, and 703D were shut down on October 9, 2008 following NYSDEC approval.  
 Target rates for BEW704D, 705D, and 706D are 40 GPM each.

**Table 4**  
**C-Zone Extraction Well Flow Rates**  
**Fourth Quarter 2022**  
**Buffalo Avenue Plant**

Date	BEW701C		BEW702C		BEW703C		BEW704C		BEW705C		BEW706C	
	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)
10/3/2022							1048992	107.26	1040992	107.10	394000	40.53
10/10/2022							1055008	107.87	1052000	106.91	409000	41.57
10/17/2022							1067008	105.85	1064992	105.65	370000	36.71
10/24/2022							1024992	105.45	1025008	105.45	320000	33.13
10/31/2022							1062000	105.36	1058992	105.06	737000	74.44
11/7/2022							1009008	105.10	1002016	104.38	1027000	106.98
11/21/2022							1648000	104.44	1640000	103.93	1649000	104.50
11/28/2022							1048000	105.22	1036000	104.02	1019000	101.70
12/5/2022							873984	103.31	856992	101.30	848000	100.95
12/12/2022							1055008	104.66	1044000	103.57	1020000	101.19
12/19/2022							1040992	103.27	1031008	102.28	987000	97.92
12/26/2022							668000	104.05	660992	102.96	631000	98.29
1/2/2023							703008	69.74	692992	68.75	681000	67.56

Notes:

GPM - gallons per minute.

BEW701C, 702C, and 703C were shut down on May 22, 2007 following NYSDEC approval.

Target rates for BEW704C, 705C, and 706C are 100 GPM each.

(1) The totalizer for BEW706C malfunctioned the week of January 27, 2020. The average flow of the weeks before and after was used.

**Table 5**  
**B-Zone Extraction Well Flow Rates**  
**Fourth Quarter 2022**  
**Buffalo Avenue Plant**

Date	BEW700B		BEW701B		BEW702B		BEW703B		BEW704B		BEW705B		BEW706B	
	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)
10/3/2022	33000	3.27	33000	3.27	15	0.001	23	0.002	91000	9.36	36000	3.68	1000	0.10
10/10/2022	33000	3.37	35000	3.58	17	0.002	24	0.002	92000	9.35	36000	3.68	3000	0.31
10/17/2022	36000	3.57	33000	3.27	20	0.002	27	0.003	92000	9.13	34000	3.37	0	0.00
10/24/2022	34000	3.37	32000	3.17	18	0.002	25	0.002	89000	9.21	34000	3.50	1000	0.10
10/31/2022	32000	3.31	30000	3.11	18	0.002	25	0.002	91000	9.03	34000	3.37	1000	0.10
11/7/2022	34000	3.41	31000	3.11	17	0.002	27	0.003	90000	8.98	33000	3.29	0	0.00
11/21/2022	54000	3.42	49000	3.11	36	0.002	55	0.003	140000	8.87	54000	3.44	0	0.00
11/28/2022	33000	3.29	30000	2.99	19	0.002	36	0.004	90000	9.04	33000	3.29	0	0.00
12/5/2022	30000	3.27	26000	2.83	17	0.002	37	0.004	74000	8.75	29000	3.45	0	0.00
12/12/2022	34000	3.37	27000	2.68	17	0.002	25	0.002	89000	8.83	33000	3.27	0	0.00
12/19/2022	32000	3.17	25000	2.48	19	0.002	26	0.003	88000	8.73	31000	3.08	56000	6.86
12/26/2022	20000	3.12	14000	2.18	18	0.002	26	0.003	55000	8.57	20000	3.12	44000	6.85
1/2/2023	23000	3.25	20000	2.98	18	0.002	26	0.004	61000	9.08	23000	3.42	46000	6.85

Notes:

GPM - gallons per minute.

(1) Totalizer malfunction occurred for BEW706B. The average flow of the weeks before and after was used.

Table 6

**Bedrock Extraction System Monthly Flow Rate Summary  
Fourth Quarter 2022  
Buffalo Avenue Plant**

<b>System Component</b>	<b>Target Flow Rates (gpm)</b>	<b>Month</b>			<b>Quarterly Average (gpm)</b>
		<b>Oct-22 (gpm)</b>	<b>Nov-22 (gpm)</b>	<b>Dec-22 (gpm)</b>	
B-Zone	40	19	19	21	20
C-Zone	300	258	311	281	283
D-Zone	120	97	95	93	95
Operational Average	460	375	425	395	398
<b><u>Treatment Plant</u></b>					
Operational Average		375	425	395	398
Operating Time		98.5%	86.4%	84.9%	87.8%
<b>Quarterly Average Operating Time =</b>		87.8%			
<b>Total Volume Treated in Quarter =</b>		52,084,800	<b>gallons</b>		

## Notes:

GPM - gallons per minute.

Flow rates shown are the average flow rate while the pump/treatment system is operational.

Table 7

**Bedrock Groundwater Elevation Summary**  
**Fourth Quarter 2022**  
**Buffalo Avenue Plant**

Well	Top of Riser Elevation	Ground Surface Elevation	Date of Installation	Riser Diameter (inches)	Monitored Interval				Well Bottom		Water Level Data 12/6/2022	
					Top (AMSL)	Bottom (AMSL)	Top (BGS)	Bottom (BGS)	Elev. of (AMSL)	Depth to (BGS)	(ft BTOC)	(ft AMSL)
BEW700B	565.59	568.69	12/2/1994	8	457.1	- 414.0	111.6	- 154.7	414.0	154.7	>60	<505.59
BEW701B	566.18	569.15	12/9/1994	8	458.8	- 413.8	110.4	- 155.4	413.8	155.4	>60	<506.18
BEW701C	566.33	569.60	11/17/1994	8	498.4	- 460.9	71.2	- 108.7	460.9	108.7	10.94	555.39
BEW701D	565.86	569.03	12/7/1994	8	545.9	- 500.9	23.1	- 68.1	500.9	68.1	9.49	556.37
BEW702B	568.83	572.24	8/15/1994	8	452.9	- 415.9	119.3	- 156.3	415.9	156.3	>60	<508.83
BEW702C	568.86	571.95	8/8/1994	8	496.4	- 455.9	75.6	- 116.1	455.9	116.1	13.71	555.15
BEW702D	569.20	572.17	7/6/1994	8	548.6	- 499.4	23.6	- 72.8	499.4	72.8	13.65	555.55
BEW703B	569.48	572.57	9/8/1994	8	450.8	- 410.8	121.8	- 161.8	410.8	161.8	>60	>509.48
BEW703C	569.00	572.10	9/15/1994	8	501.8	- 453.7	70.3	- 118.4	453.7	118.4	13.60	555.40
BEW703D	569.87	572.77	9/16/1994	8	550.0	- 504.2	22.8	- 68.6	504.2	68.6	14.69	555.18
BEW704B	569.37	573.41	10/14/1994	8	452.3	- 417.3	121.1	- 156.1	417.3	156.1	>60	<509.37
BEW704C	569.24	573.31	10/14/1994	8	498.3	- 454.3	75.0	- 119.0	454.3	119.0	29.99	539.25
BEW704D	570.24	573.10	9/30/1994	8	546.3	- 501.3	26.8	- 71.8	501.3	71.8	18.50	551.74
BEW705B	570.24	573.26	10/11/1994	8	453.7	- 416.0	119.6	- 157.3	416.0	157.3	>60	<510.24
BEW705C	570.06	573.15	9/30/1994	8	502.0	- 456.5	71.2	- 116.7	456.5	116.7	21.44	548.62
BEW705D	570.66	573.65	10/10/1994	8	550.2	- 505.2	23.4	- 68.4	505.2	68.4	49.28	521.38
BEW706B	569.58	572.69	9/19/1994	8	452.9	- 416.4	119.8	- 156.3	416.4	156.3	16.82	552.76
BEW706C	568.97	571.9	10/11/1994	8	504.1	- 455.6	67.8	- 116.3	455.6	116.3	28.80	540.17
BEW706D	569.46	572.49	9/26/1994	8	550.7	- 504.2	21.8	- 68.3	504.2	68.3	38.22	531.24
OW139	570.63	569.08	1958	12	559.2	435.2	9.9	- 133.9	435.2	133.9	13.78	556.85
OW400B	579.25	579.61	5/10/1989	4	454.6	- 424.5	125.0	- 155.1	424.5	155.1	23.80	555.45
OW401B	568.54	568.95	5/24/1989	4	462.9	- 413.9	106.1	- 155.1	413.9	155.1	22.82	545.72
OW401C	568.55	568.94	5/25/1989	4	492.3	- 462.8	76.6	- 106.1	462.8	106.1	12.80	555.75
OW401D	568.42	568.87	5/26/1989	6.25	545.9	- 507.9	23.0	- 61.0	507.9	61.0	12.18	556.24
OW402B	569.46	570.33	6/28/1989	4	473.8	- 409.9	96.5	- 160.4	409.9	160.4	14.05	555.41
OW402C	569.48	570.3	6/26/1989	4	488.5	- 473.8	81.8	- 96.5	473.8	96.5	14.14	555.34
OW402D	569.22	570.01	6/29/1989	6.25	544.7	- 518.8	25.3	- 51.2	518.8	51.2	13.03	556.19
OW403B	570.04	570.48	5/16/1989	4	457.8	- 427.8	112.7	- 142.7	427.8	142.7	14.31	555.73
OW403C	570.02	570.26	5/22/1989	4	487.3	- 457.7	83.0	- 112.6	457.7	112.6	14.29	555.73
OW403D	570.08	570.31	5/23/1989	6.25	546.8	- 502.8	23.5	- 67.5	502.8	67.5	14.27	555.81
OW404B	571.03	571.53	6/9/1989	4	438.3	- 404.8	133.2	- 166.7	404.8	166.7	15.95	555.08
OW404C	570.82	571.38	6/7/1989	4	498.5	- 468.2	72.9	- 103.2	468.2	103.2	15.48	555.34

Table 7

**Bedrock Groundwater Elevation Summary  
Fourth Quarter 2022  
Buffalo Avenue Plant**

Well	Top of Riser Elevation	Ground Surface Elevation	Date of Installation	Riser Diameter (inches)	Monitored Interval				Well Bottom		Water Level Data 12/6/2022	
					Top (AMSL)	Bottom (AMSL)	Top (BGS)	Bottom (BGS)	Elev. of (AMSL)	Depth to (BGS)	(ft BTOC)	(ft AMSL)
OW404D	570.45	571.85	6/23/1989	6.25	549.3	- 498.0	22.6	- 73.9	498.0	73.9	15.50	554.95
OW405B	572.78	573.14	3/27/1989	4	453.3	- 408.3	119.8	- 164.8	408.3	164.8	19.33	553.45
OW405C	572.7	573.07	5/31/1989	4	501.2	- 453.2	71.9	- 119.9	453.2	119.9	17.50	555.20
OW405D	572.6	573.11	6/9/1989	6.25	545.6	- 501.2	27.5	- 71.9	501.2	71.9	18.19	554.41
OW406B	571.52	571.77	6/8/1989	4	467.9	- 404.4	103.9	- 167.4	404.4	167.4	18.17	553.35
OW406C	571.44	571.73	6/14/1989	4	497.6	- 467.8	74.1	- 103.9	467.8	103.9	16.81	554.63
OW406D	571.81	572.1	6/16/1989	6.25	548.6	- 497.2	23.5	- 74.9	497.2	74.9	17.93	553.88
OW407B	572.05	572.46	5/2/1989	4	465.4	- 450.4	107.1	- 122.1	450.4	122.1	18.54	553.51
OW407C	571.27	572.12	5/1/1989	4	479.8	- 465.2	92.3	- 106.9	465.2	106.9	17.55	553.72
OW407D	571.32	571.72	5/4/1989	6.25	552.9	- 510.4	18.8	- 61.3	510.4	61.3	17.82	553.50
OW408B	575.04	571.98	7/20/1989	4	445.2	- 403.6	126.8	- 168.4	403.6	168.4	22.13	552.91
OW408C	575.68	572.71	7/11/1989	4	494.5	- 445.9	78.2	- 126.8	445.9	126.8	22.59	553.09
OW408D	576.2	573.12	7/6/1989	6.25	552.1	- 525.0	21.0	- 48.1	525.0	48.1	24.91	551.29
OW409B	575.7	572.79	6/20/1989	3	461.8	- 415.9	111.0	- 156.9	415.9	156.9	22.91	552.79
OW409C	575.57	572.95	6/26/1989	4	510.1	- 462.0	62.9	- 111.0	462.0	111.0	20.84	554.73
OW409D	575.46	575.76	6/28/1989	6.25	552.0	- 509.8	23.8	- 66.0	509.8	66.0	23.75	551.71
OW410B	572.32	572.62	6/26/1989	4	441.4	- 407.7	131.2	- 164.9	407.7	164.9	19.30	553.02
OW410C	572.57	572.72	7/17/1989	4	486.5	- 471.5	86.2	- 101.2	471.5	101.2	17.49	555.08
OW410D	571.96	572.64	6/27/1989	6.25	547.1	- 516.3	25.5	- 56.3	516.3	56.3	19.75	552.21
OW411B	574.08	574.82	4/4/1989	4	454.9	- 406.6	119.9	- 168.2	406.6	168.2	20.41	553.67
OW411C	574.39	574.78	4/11/1989	4	500.0	- 470.0	74.8	- 104.8	470.0	104.8	19.30	555.09
OW411D	574.51	574.84	4/14/1989	6.25	546.7	- 515.2	28.1	- 59.6	515.2	59.6	23.31	551.20
OW415B	571.38	571.73	5/31/1989	4	482.1	- 467.1	89.6	- 104.6	467.1	104.6	16.15	555.23
OW415C	571.26	571.56	5/30/1989	4	511.9	- 497.1	59.7	- 74.5	497.1	74.5	16.39	554.87
OW415D	571.3	571.6	5/31/1989	6.25	548.7	- 511.8	22.9	- 59.8	511.8	59.8	16.93	554.37
OW416B	570	570.69	5/22/1989	6.25	470.8	- 455.8	99.9	- 114.9	455.8	114.9	12.56	557.44
OW416C	569.9	570.57	~5/22/1989	6.25	500.7	- 470.7	69.9	- 99.9	470.7	99.9	14.44	555.46
OW416D	569.68	570.32	~5/22/1989	6.25	539.6	- 500.5	30.7	- 69.8	500.5	69.8	12.33	557.35
OW417B	572.93	572.7	~5/19/1989	6.25	461.1	- 412.6	111.6	- 160.1	412.6	160.1	18.62	554.31
OW417C	572.23	572.9	~5/19/1989	6.25	490.1	- 460.8	82.8	- 112.1	460.8	112.1	(1)	(1)
OW417D	572.26	572.5	~5/19/1989	6.25	545.5	- 505.9	27.0	- 66.6	505.9	66.6	18.54	553.72
OW418C	569.62	570.08	5/29/2003	4	501.0	- 458.7	69.1	- 111.4	458.7	111.4	14.42	555.20

Table 7

**Bedrock Groundwater Elevation Summary  
Fourth Quarter 2022  
Buffalo Avenue Plant**

Well	Top of Riser Elevation	Ground Surface Elevation	Date of Installation	Riser Diameter (inches)	Monitored Interval				Well Bottom		Water Level Data 12/6/2022	
					Top (AMSL)	Bottom (AMSL)	Top (BGS)	Bottom (BGS)	Elev. of (AMSL)	Depth to (BGS)	(ft BTOC)	(ft AMSL)
OW418D	569.72	570.14	1/11/2002	6	547.0	- 504.3	23.1	- 65.8	504.3	65.8	14.45	555.27
OW419C	570.4	570.7	6/4/2003	4	502.7	- 455.7	68.0	- 115.0	455.7	115.0	15.37	555.03
OW419D	570.22	570.75	1/10/2002	6	550.3	- 505.6	20.5	- 65.2	505.6	65.2	15.51	554.71
OW420C	571.03	571.28	6/2/2003	4	500.3	- 452.5	71.0	- 118.8	452.5	118.8	16.55	554.48
OW420D	570.67	571.24	1/4/2002	6	548.7	- 503.1	22.5	- 68.1	503.1	68.1	16.51	554.16
OW649C	567.52	568.04	~10/31/1991	4	488.5	- 458.1	79.6	- 110.0	458.1	110.0	11.92	555.60
OW649D	568.29	568.35	10/31/1991	4	549.2	- 510.4	19.1	- 57.9	510.4	57.9	12.40	555.89
OW651C	568.62	568.91	10/10/1991	4	507.9	- 477.6	61.1	- 91.3	477.6	91.3	13.42	555.20
OW651D	568.53	568.72	~9/16/1991	6	553.2	- 507.7	15.5	- 61.0	507.7	61.0	13.33	555.20
OW652B	570.48	570.83	~9/16/1991	4	473.8	- 443.8	97.1	- 127.1	443.8	127.1	16.02	554.46
OW652C	570.18	570.64	2/5/1993	4	509.4	- 477.4	61.3	- 93.3	477.4	93.3	15.00	555.18
OW652D	569.98	570.25	9/16/1991	4	552.7	- 509.7	17.6	- 60.6	509.7	60.6	14.80	555.18
OW653B	572.19	572.55	~2/12/1993	4	475.4	- 451.4	97.2	- 121.2	451.4	121.2	19.20	552.99
OW653C	572.12	572.49	2/12/1993	4	503.1	- 478.1	69.4	- 94.4	478.1	94.4	19.72	552.40
OW653D	572	572.38	9/10/1991	6	552.1	- 503.7	20.3	- 68.7	503.7	68.7	20.28	551.72
OW654B	569.53	569.91	~8/27/1991	4	478.8	- 444.3	91.1	- 125.6	444.3	125.6	15.29	554.24
OW654C	570.14	570.39	~8/27/1991	4	509.7	- 481.8	60.7	- 88.6	481.8	88.6	14.60	555.54
OW654D	570.16	570.41	8/27/1991	6	556.0	- 510.7	14.4	- 59.7	510.7	59.7	14.92	555.24
OW655D	571.23	571.46	8/22/1991	6	552.7	- 507.4	18.8	- 64.1	507.4	64.1	0.78	570.45
OW657B	570.22	570.59	~4/9/1993	4	472.9	- 439.5	97.7	- 131.1	439.5	131.1	15.79	554.43
OW657C	570.42	570.83	~4/9/1993	4	503.7	- 475.7	67.2	- 95.2	475.7	95.2	15.70	554.72
OW657D	571.65	570.21	~4/9/1993	4	553.6	- 507.6	16.6	- 62.6	507.6	62.6	16.75	554.90
OW658B	570.48	570.93	~4/6/1993	4	473.4	- 439.9	97.6	- 131.1	439.9	131.1	17.42	553.06
OW658C	570.66	570.94	~4/6/1993	4	502.9	- 475.8	68.0	- 95.1	475.8	95.1	16.63	554.03
OW658D	570.75	571.1	~4/6/1993	4	552.6	- 506.1	18.6	- 65.1	506.1	65.1	17.45	553.30
OW659B	570.02	570.49	~3/30/1993	4	474.0	- 440.4	96.5	- 130.1	440.4	130.1	16.09	553.93
OW659C	570	570.41	~3/30/1993	4	503.9	- 475.8	66.5	- 94.6	475.8	94.6	15.75	554.25
OW659D	570.01	570.29	~3/30/1993	4	549.7	- 505.8	20.6	- 64.5	505.8	64.5	15.82	554.19
OW660B	579.42	579.85	10/19/1994	4	454.8	- 409.5	125.0	- 170.3	409.5	170.3	23.90	555.52
OW661B	568.63	569.05	12/15/1994	4	451.0	- 419.0	118.1	- 150.1	419.0	150.1	18.30	550.33
OW661C	568.87	569.22	10/24/1994	4	502.2	- 454.2	67.0	- 115.0	454.2	115.0	15.10	553.77
OW661D	568.88	569.25	11/1/1994	4	546.9	- 505.1	22.3	- 64.1	505.1	64.1	15.09	553.79

Table 7

**Bedrock Groundwater Elevation Summary  
Fourth Quarter 2022  
Buffalo Avenue Plant**

Well	Top of Riser Elevation	Ground Surface Elevation	Date of Installation	Riser Diameter (inches)	Monitored Interval				Well Bottom		Water Level Data 12/6/2022	
					Top (AMSL)	Bottom (AMSL)	Top (BGS)	Bottom (BGS)	Elev. of (AMSL)	Depth to (BGS)	(ft BTOC)	(ft AMSL)
OW662B	569.79	570.08	7/6/1994	4	456.1	- 415.1	114.0	- 155.0	415.1	155.0	14.60	555.19
OW662C	569.75	570.02	7/5/1994	4	501.0	- 459.0	69.0	- 111.0	459.0	111.0	14.41	555.34
OW662D	569.92	570.24	7/1/1994	4	546.1	- 503.2	24.1	- 67.0	503.2	67.0	0.60	569.32
OW663B	571.79	572.15	8/9/1994	4	452.7	- 413.6	119.5	- 158.6	413.6	158.6	18.47	553.32
OW663C	572.08	572.37	8/10/1994	4	501.4	- 455.9	71.0	- 116.5	455.9	116.5	19.59	552.49
OW663D	572.21	572.33	8/9/1994	4	549.5	- 504.5	22.8	- 67.8	504.5	67.8	20.23	551.98
OW664B	571.53	571.85	12/14/1994	4	449.9	- 418.9	122.0	- 153.0	418.9	153.0	15.55	555.98
OW664C	571.5	571.84	12/5/1994	4	499.8	- 452.8	72.0	- 119.0	452.8	119.0	17.22	554.28
OW664D	571.56	571.9	12/12/1994	4	548.1	- 502.9	23.8	- 69.0	502.9	69.0	15.65	555.91
OW665B	573.06	573.37	7/22/1994	4	450.0	- 415.0	123.4	- 158.4	415.0	158.4	19.97	553.09
OW665C	573.04	573.33	7/25/1994	4	498.9	- 453.4	74.4	- 119.9	453.4	119.9	18.34	554.70
OW665D	573.13	573.42	7/22/1994	4	547.0	- 502.3	26.4	- 71.2	502.3	71.2	19.60	553.53
OW666B	571.37	571.59	1/12/1995	4	453.2	- 410.2	118.4	- 161.4	410.2	161.4	18.45	552.92
OW666C	571.29	571.69	1/10/1995	4	504.7	- 456.2	67.0	- 115.5	456.2	115.5	17.97	553.32
OW666D	571.2	571.57	1/10/1995	4	552.5	- 507.1	19.1	- 64.5	507.1	64.5	20.79	550.41
OW667B	576.28	573.48	10/6/1994	4	453.4	- 413.4	120.1	- 160.1	413.4	160.1	23.00	553.28
OW667C	575.78	572.97	10/5/1994	4	503.8	- 456.2	69.2	- 116.8	456.2	116.8	21.78	554.00
OW667D	576.31	573.48	10/6/1994	4	552.2	- 506.2	21.3	- 67.3	506.2	67.3	25.68	550.63
OW668B	570.86	571.29	1/4/1995	4	454.3	- 420.8	117.0	- 150.5	420.8	150.5	18.00	552.86
OW668C	570.95	571.2	1/4/1995	4	502.9	- 457.7	68.3	- 113.5	457.7	113.5	18.03	552.92
OW668D	571.1	571.25	12/23/1994	4	551.0	- 506.0	20.3	- 65.3	506.0	65.3	20.00	551.10
River	568.91	N/A	N/A	N/A	N/A	- N/A	N/A	- N/A	N/A	N/A	7.37	561.54

## Notes:

ft BTOC – feet below top of casing  
ft AMSL – feet above mean sea level  
NM - Not measured  
NC - Not calculated  
N/A - Not applicable



**Table 8**  
**Overburden Weekly Flow Rates**  
**Fourth Quarter 2022**  
**Buffalo Avenue Plant**

Date	Flow Zone 1						Flow Zone 3		Abandoned Outfall 005		Abandoned D-Area Sanitary Sewer	
	System Total		Wet Well 2		Wet Well 1		WWB		MH159L		MH301	
	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)	Total Flow (gallons)	Average Flow Rate (gpm)
10/3/2022	528000	54.03	17000	3.33	511000	50.69	106000	10.91	36000	3.57	68000	8.10
10/10/2022	493000	50.47	14000	1.79	479000	48.68	30000	3.03	37000	3.67	20000	2.03
10/17/2022	395000	39.67	7000	1.18	388000	38.49	61000	6.09	38000	3.77	39000	3.87
10/24/2022	449000	47.74	17000	4.89	432000	42.86	145000	14.92	35000	3.47	96000	9.88
10/31/2022	202000	22.83	18000	3.66	184000	19.17	56000	5.56	35000	3.47	36000	3.57
11/7/2022	45000	4.53	16000	1.62	29000	2.91	46000	4.59	35000	3.47	28000	2.79
11/21/2022	302000	28.09	14000	1.72	288000	26.37	118000	7.51	53000	5.26	74000	4.82
11/28/2022	634000	64.15	20000	2.51	614000	61.65	77000	7.64	29000	2.88	43000	4.29
12/5/2022	82000	65.29	18000	1.79	583000	63.51	118000	13.95	21000	2.08	78000	9.42
12/12/2022	622000	61.78	13000	1.36	609000	60.42	48000	4.76	29000	2.88	28000	2.78
12/19/2022	618000	61.31	13000	1.29	605000	60.02	69000	6.85	29000	2.88	41000	4.07
12/26/2022	313000	52.56	4000	2.56	309000	50.00	36000	5.50	17000	1.69	34000	5.25
1/2/2023	354000	35.12	0	0.00	354000	35.12	0	0.00	15000	1.49	5000	0.64

Notes:

GPM - gallons per minute.  
 Flow rates shown are the average flow rate while the pump is operational.

Table 9

**Overburden Performance Summary  
Fourth Quarter 2022  
Buffalo Avenue Plant**

**Flow Rate Summary**

System Component	Average Flow				Quarterly Total (gallons)
	Oct-22	Nov-22	Dec-22	Quarterly	
<b><u>Flow Zone 1</u></b>					
Wet Well 1	40.0	52.3	51.4	47.9	5,385,000
Wet Well 2	1.4	1.7	0.9	1.34	171,000
<b>TOTAL</b>	<b>53.2</b>	<b>38.8</b>	<b>46.2</b>	<b>46.1</b>	<b>5,556,000</b>
<b><u>Flow Zone 3</u></b>					
WWB	8.1	8.4	4.3	6.9	910,000
<b><u>Abandoned Outfall 005</u></b>					
MH159L	3.6	3.4	3.0	3.3	409,000
<b><u>Abandoned D-Area Sanitary Sewer</u></b>					
MH301	2.3	3.8	2.2	2.8	590,000

**Operating Time Summary**

System Component	Average Percent Operational			
	Oct-22	Nov-22	Dec-22	Quarterly
<b><u>Flow Zone 1</u></b>				
Wet Well 1	97.6%	88.6%	69.4%	85.2%
Wet Well 2	97.6%	88.6%	69.4%	85.2%
<b><u>Flow Zone 3</u></b>				
WWB	98.6%	88.6%	74.0%	87.1%
<b><u>Abandoned Outfall 005</u></b>				
MH159L	98.6%	88.6%	87.2%	91.5%
<b><u>Abandoned D-Area Sanitary Sewer</u></b>				
MH301	98.6%	88.6%	73.8%	87.0%

Notes:

GPM - gallons per minute.

Table 10

**Overburden Groundwater Elevation Summary  
Fourth Quarter 2022  
Buffalo Avenue Plant**

Well	Top of Riser Elevation	Ground Surface Elevation	Date of Installation	Riser Diameter (inches)	Screened Interval				Well Bottom		Water Level Data 12/7/2022	
					Top (ft AMSL)	Bottom (ft AMSL)	Top (ft BGS)	Bottom (ft BGS)	Elev. of (ft AMSL)	Depth to (ft BGS)	(ft BTOC)	(ft AMSL)
BH1B-88 <sup>(1)</sup>	572.53	572.70	12/20/1988	2	568.8	- 557.8	3.9	- 14.9	557.8	14.9	( <sup>1</sup> )	( <sup>1</sup> )
BH4-88 <sup>(1)</sup>	572.12	572.45	12/9/1988	2	568.2	- 565.2	4.3	- 7.3	565.2	7.3	( <sup>1</sup> )	( <sup>1</sup> )
BH7-89	572.32	572.67	5/24/1989	2	560.6	- 553.2	12.1	- 19.5	553.2	19.5	14.99	557.33
BH8-89	568.00	568.23	1/6/1989	2	563.4	- 549.4	4.8	- 18.8	549.4	18.8	4.75	563.25
CMH1	569.50	568.53	1997	NA	NA	- 558.0	NA	- 10.5	558.0	10.5	1.69	567.81
CMH2	569.42	568.49	1997	NA	NA	- 562.5	NA	- 6.0	562.5	6.0	6.11	563.31
MH-A	568.89	569.85	Unknown	NA	NA	- 556.5	NA	- 13.4	556.5	13.4	7.22	561.67
MH-B	568.87	568.72	Unknown	NA	NA	- 556.5	NA	- 12.2	556.5	12.2	7.10	561.77
MH-C	568.88	568.59	Unknown	NA	NA	- 557.0	NA	- 11.6	557.0	11.6	7.08	561.80
MH-D	569.89	568.50	Unknown	NA	NA	- 556.3	NA	- 12.2	556.3	12.2	8.08	561.81
MH-E	568.81	567.48	Unknown	NA	NA	- 555.8	NA	- 11.7	555.8	11.7	7.01	561.80
MH-F	568.90	567.83	1998	NA	NA	- 553.5	NA	- 14.4	553.5	14.4	6.20	562.70
OW270	571.55	570.88	10/16/1987	2	564.5	- 545.5	6.4	- 25.4	545.5	25.4	7.48	564.07
OW273	570.00	570.28	10/20/1987	2	563.5	- 551.5	6.8	- 18.8	551.5	18.8	7.45	562.55
OW300	567.07	567.56	5/25/1989	2	560.5	- 545.0	7.1	- 22.6	545.0	22.6	5.44	561.63
OW301	568.38	568.95	7/24/1989	2	564.8	- 557.8	4.2	- 11.2	557.8	11.2	2.00	566.38
OW302 <sup>(1)</sup>	569.98	570.10	10/26/1988	2	565.6	- 563.6	4.5	- 6.5	563.6	6.5	( <sup>1</sup> )	( <sup>1</sup> )
OW303 <sup>(1)</sup>	570.81	570.10	11/2/1988	2	566.3	- 562.3	3.8	- 7.8	562.3	7.8	( <sup>1</sup> )	( <sup>1</sup> )
OW304 <sup>(1)</sup>	571.50	571.40	10/20/1988	2	565.3	- 560.3	6.1	- 11.1	560.3	11.1	( <sup>1</sup> )	( <sup>1</sup> )
OW305 <sup>(1)</sup>	572.75	573.20	10/31/1988	2	569.4	- 564.4	3.8	- 8.8	564.4	8.8	( <sup>1</sup> )	( <sup>1</sup> )
OW306 <sup>(1)</sup>	571.85	571.90	11/15/1988	2	567.9	- 564.9	4.0	- 7.0	564.9	7.0	( <sup>1</sup> )	( <sup>1</sup> )
OW308	574.24	571.40	11/17/1988	2	567.6	- 564.6	3.8	- 6.8	564.6	6.8	4.29	569.95
OW310 <sup>(1)</sup>	572.28	572.80	11/22/1988	2	569.3	- 564.3	3.5	- 8.5	564.3	8.5	( <sup>1</sup> )	( <sup>1</sup> )
OW313	569.26	568.70	10/13/1988	2	550.8	- 545.8	17.9	- 22.9	545.8	22.9	5.62	563.64
OW314	569.04	568.90	6/12/1989	2	565.4	- 553.4	3.5	- 15.5	553.4	15.5	5.46	563.58
OW316	569.77	570.10	11/9/1988	2	566.1	- 559.1	4.0	- 11.0	559.1	11.0	1.30	568.47
OW317 <sup>(1)</sup>	572.60	572.50	9/26/1988	2	568.8	- 563.8	3.7	- 8.7	563.8	8.7	( <sup>1</sup> )	( <sup>1</sup> )
OW327 <sup>(1)</sup>	570.75	571.40	2/9/1990	2	567.4	- 565.4	4.0	- 6.0	565.4	6.0	( <sup>1</sup> )	( <sup>1</sup> )
OW358	571.49	569.02	9/26/1989	2	563.9	- 550.9	5.1	- 18.1	550.9	18.1	6.22	565.27
OW553	573.51	573.77	8/27/1991	2	570.1	- 565.1	3.7	- 8.7	565.1	8.7	4.06	569.45
OW554	573.83	572.35	9/3/1991	2	568.4	- 563.4	4.0	- 9.0	563.4	9.0	3.33	570.50
OW555	571.51	571.65	9/3/1991	2	568.5	- 563.5	3.2	- 8.2	563.5	8.2	.82	570.69
OW556	571.73	571.93	8/30/1991	2	567.8	- 562.8	4.1	- 9.1	562.8	9.1	.63	571.10
OW557 <sup>(1)</sup>	571.69	572.16	5/16/1991	2	567.5	- 562.5	4.7	- 9.7	562.5	9.7	( <sup>1</sup> )	( <sup>1</sup> )
OW558 <sup>(1)</sup>	571.28	571.21	5/16/1991	2	567.4	- 562.4	3.8	- 8.8	562.4	8.8	( <sup>1</sup> )	( <sup>1</sup> )
OW559 <sup>(1)</sup>	569.73	570.35	9/10/1991	2	566.7	- 561.7	3.7	- 8.7	561.7	8.7	( <sup>1</sup> )	( <sup>1</sup> )

Table 10

Overburden Groundwater Elevation Summary  
Fourth Quarter 2022  
Buffalo Avenue Plant

Well	Top of Riser Elevation	Ground Surface Elevation	Date of Installation	Riser Diameter (inches)	Screened Interval				Well Bottom		Water Level Data 12/7/2022	
					Top (ft AMSL)	Bottom (ft AMSL)	Top (ft BGS)	Bottom (ft BGS)	Elev. of (ft AMSL)	Depth to (ft BGS)	(ft BTOC)	(ft AMSL)
OW562	568.49	568.48	12/9/1996	2	555.2	- 550.2	13.3	- 18.3	550.2	18.3	6.79	561.70
OW563	567.67	568.02	12/5/1996	2	560.6	- 555.6	7.4	- 12.4	555.6	12.4	2.81	564.86
OW564	569.05	569.58	12/11/1996	2	560.4	- 555.4	9.2	- 14.2	555.4	14.2	4.89	564.16
OW565	568.89	569.53	12/10/1996	2	557.0	- 552.0	12.5	- 17.5	552.0	17.5	6.90	561.99
OW566	568.55	568.83	12/5/1996	2	559.4	- 554.4	9.4	- 14.4	554.4	14.4	1.17	567.38
OW567	569.12	569.15	4/23/1998	2	560.1	- 555.1	9.0	- 14.0	555.1	14.0	1.43	567.69
OW568	568.26	568.95	4/23/1998	2	560.3	- 555.3	8.7	- 13.7	555.3	13.7	.47	567.79
OW569	567.20	567.74	4/23/1998	2	562.7	- 559.7	5.0	- 8.0	559.7	8.0	3.70	563.50
OW570	568.46	568.70	4/23/1998	2	563.6	- 560.6	5.1	- 8.1	560.6	8.1	4.52	563.94
OW571	567.80	568.52	4/24/1998	2	566.2	- 561.2	2.3	- 7.3	561.2	7.3	2.11	565.69
OW572	567.95	568.30	4/24/1998	2	565.9	- 560.9	2.4	- 7.4	560.9	7.4	1.47	566.48
OW573R <sup>(1)</sup>	573.02	573.48	6/29/2004	2	569.0	- 564.0	4.5	- 9.5	564.0	9.5	(1)	(1)
OW574 <sup>(1)</sup>	571.16	571.24	11/15/1999	2	560.8	- 555.8	10.4	- 15.4	555.8	15.4	(1)	(1)
OW575	568.40	568.45	1/15/2002	1	564.6	- 559.8	3.9	- 8.7	559.8	8.7	1.50	566.90
OW576	568.32	568.52	1/15/2002	1	565.6	- 560.9	2.9	- 7.6	560.9	7.6	1.71	566.61
OW577	567.53	567.59	1/15/2002	1	563.3	- 558.0	4.3	- 9.6	558.0	9.6	4.85	562.68
OW578 <sup>(1)</sup>	572.21	572.48	6/6/2002	1	568.6	- 564.6	3.9	- 7.9	564.6	7.9	(1)	(1)
OWG8 <sup>(1)</sup>	570.66	571.10	6/3/1986	2	566.2	- 564.2	4.9	- 6.9	564.2	6.9	(1)	(1)
WS107	573.18	573.73	7/30/1980	1.5	565.6	- 563.6	8.1	- 10.1	563.6	10.1	.41	572.77
WS10A	572.58	569.78	1/16/1979	1.5	567.9	- 552.9	1.9	- 16.9	552.9	16.9	6.71	565.87
WS111R <sup>(1)</sup>	572.35	572.70	6/6/2002	1	568.2	- 565.2	4.5	- 7.5	565.2	7.5	(1)	(1)
WS122 <sup>(1)</sup>	571.57	572.25	7/7/1980	1.5	564.6	- 562.6	7.7	- 9.7	562.6	9.7	(1)	(1)
WS23A <sup>(1)</sup>	572.30	572.74	1/29/1979	1.5	570.5	- 565.5	2.2	- 7.2	565.5	7.2	(1)	(1)
WS25A <sup>(1)</sup>	571.10	571.67	1/26/1979	1.5	569.3	- 564.3	2.4	- 7.4	564.3	7.4	(1)	(1)
WS8A	570.10	570.20	3/19/1979	1.5	566.3	- 551.3	3.9	- 18.9	551.3	18.9	2.11	567.99
WW1	570.30	569.26	1997	NA	NA	- 545.3	NA	- 24.0	545.3	24.0	11.59	558.71
WW2	569.27	568.82	1997	NA	NA	- 553.8	NA	- 15.0	553.8	15.0	11.94	557.33
WWB	573.74	572.68	1980	NA	NA	- 556.7	NA	- 16.0	556.7	16.0	13.05	560.69

Notes:

- ft BGS - Feet below ground surface
- ft BTOC - Feet below top of casing
- ft AMSL - Feet above mean sea level
- MH - Manhole chamber
- NA - Not applicable
- NM - Not measured
- "-" Not measured per monitoring schedule
- (1) - Annual measurements only

Table 11

**Summary of Bedrock NAPL Monitoring and Collection  
Fourth Quarter 2022  
Buffalo Avenue Plant**

Date	Bedrock A-Wells				S-Area Bedrock Wells in the N-Area									
	OW402A (Gallons)	OW413A (Gallons)	OW417A (Gallons)	OW401B (Gallons)	Shallow				Intermediate		Deep			
					OW229 (Gallons)	OW243 (Gallons)	OW618 (Gallons)	OW619 (Gallons)	OW620 (Gallons)	OW621 (Gallons)	OW634 (Gallons)	OW638 (Gallons)	OW635 (Gallons)	OW643 (Gallons)
November 30, 2022	--	--	--	--	0.1	0.85	NR	ND	NR	0.5	NR	0.1	NR	0.2
Cumulative Volume (as of September 30, 2022)	6164.15	579.75	<40.80	6.00	12.65	60.05	21.45	0.00	0.00	36.35	5.50	147.90	8.75	242.90
Cumulative Volume (as of December 31, 2022)	6164.15	579.75	<40.80	6.00	12.75	60.90	21.45	0.00	0.00	36.85	5.50	148.00	8.75	243.10
Monitoring Frequency <sup>(1)</sup>	Annual	Annual	Annual	Annual	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly

## Notes:

-- Not checked per schedule.

ND None detected.

NR Not recoverable

<sup>(1)</sup> Frequency revised in second quarter 2010 to reflect NYSDEC's May 4, 2010 letter.

Table 12

**Summary of Overburden NAPL Monitoring and Collection  
Fourth Quarter 2022  
Buffalo Avenue Plant**

Date	003 NAPL Collection Trench (Gallons)	OW313 (Gallons)	OW572 (Gallons)	OW317 (Gallons)	OW320 (Gallons)	OW358 (Gallons)	OW523 (Gallons)	OW562 (Gallons)	OW563 (Gallons)	TW-7 (Gallons)	OW306 (Gallons)	BH8-89 (Gallons)	OW564 (Gallons)	OW537 (Gallons)	OW577 (Gallons)	Energy Boulevard Drain Tile System (Gallons)
October 28, 2022	NR	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
December 7, 2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND
Subtotal (Fourth Quarter)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cumulative volume (as of September 30, 2022)	959.75	46.50	39.28	0.21	1.50	0.50	0.30	0.00	9.00	0.56	0.00	0.00	0.00	0.00	0.25	6011.25
Cumulative volume (as of December 31, 2022)	950.00	46.50	39.28	0.21	1.50	0.50	0.30	0.00	9.00	0.56	0.00	0.00	0.00	0.00	0.25	6011.25
Monitoring Frequency <sup>(1)</sup>	Quarterly	Semiannual	Semiannual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Quarterly

## Notes:

-- Not checked per schedule.

ND - None detected.

NR - Not recoverable.

<sup>(1)</sup> Frequency revised in second quarter 2010 to reflect NYSDEC's May 4, 2010 letter.

# Attachment A



# Technical Memorandum

December 8, 2022

<b>To</b>	John Pentilchuk	<b>Tel</b>	716-205-1942
<b>Copy to</b>	John Sweeney	<b>Email</b>	Kathleen.Willy@ghd.com
<b>From</b>	Kathy Willy/cs/49	<b>Ref. No.</b>	11215553
<b>Subject</b>	Analytical Results and Reduced Validation Overburden Monitoring Wells Chemical Monitoring Program Niagara Falls, New York November 2022		

## 1. Introduction

This document details a reduced validation of analytical results for a groundwater sample collected in support of the Glenn Springs Holdings, Inc. (GSH) Chemical Monitoring Program for the Overburden Monitoring Wells at the Buffalo Avenue Plant Site during November 2022. The sample was submitted to ALS Environmental Laboratory, located in Rochester, New York. A sample collection and analysis summary is presented in Table 1. The validated analytical result is summarized in Table 2. A summary of the analytical methodology is presented in Table 3.

Standard Level II report deliverables were submitted by the laboratory. The final result and supporting quality assurance/quality control (QA/QC) data were assessed. Evaluation of the data was based on information obtained from the chain of custody form, finished report forms, method blank data, and recovery data from laboratory control samples (LCS).

The QA/QC criteria by which these data have been assessed are outlined in the analytical method referenced in Table 3 and applicable guidance from the documents entitled:

- i) "Chemical Sampling and Quality Assurance Plan Niagara Plant Supplemental Data Collection Program," March 1998 (Revised 1997) (QAPP)
- ii) "National Functional Guidelines for Inorganic Superfund Methods Data Review", USEPA 542-R-20-006, November 2020.

These items will subsequently be referred to as the "Guidelines" in this Memorandum.

## 2. Sample Holding Time and Preservation

The sample holding time criteria for the analysis is summarized in Table 3. The sample chain of custody document and analytical report was used to determine the sample holding time. The sample was prepared and analyzed within the required holding time.



The sample was properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

### **3. Laboratory Method Blank Analyses**

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

The method blank result was non-detect, indicating that laboratory contamination was not a factor for this investigation.

### **4. Laboratory Control Sample Analyses**

LCS are prepared and analyzed as samples to assess the analytical efficiency of the method employed, independent of sample matrix effects.

For this study, LCS were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

The LCS contained the analyte of interest. The recovery was assessed per the "Guidelines" and was within the control limits, demonstrating acceptable analytical accuracy.

### **5. Field QA/QC Samples**

Field QA/QC samples were not submitted for this sampling event.

### **6. Analyte Reporting**

The laboratory reported detected results down to the laboratory's method detection limit (MDL) for the analyte.

### **7. Conclusion**

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are acceptable without qualification.

Regards,

*Kathy Willy*

**Kathy Willy**  
**Digital Intelligence-Data Management-Chemist**

Table 1

**Sample Collection and Analysis Summary  
Overburden Monitoring Wells  
Chemical Monitoring Program  
Niagara Falls, New York  
November 2022**

Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters
					Mercury
OW574-1122	OW574	Water	11/10/2022	09:35	x

**Analytical Results Summary  
Overburden Monitoring Wells  
Chemical Monitoring Program  
Niagara Falls, New York  
November 2022**

**Location ID: OW574  
Sample Name: OW574-1122  
Sample Date: 11/10/2022**

<b>Parameters</b>	<b>Unit</b>	
<b>Metals</b>		
Mercury	µg/L	36.1
<b>Field Parameters</b>		
Temperature, sample	Deg C	14.9
Volume purged	gal	5.76
Conductivity, field	mS/cm	5.56
Turbidity, field	NTU	53.6
pH, field	s.u.	11.60

Notes:

s.u. - Standard Units

NTU - Nephelometric Turbidity Unit

Table 3

**Analytical Methods  
Overburden Monitoring Wells  
Chemical Monitoring Program  
Niagara Falls, New York  
November 2022**

<b>Parameter</b>	<b>Method</b>	<b>Matrix</b>	<b>Holding Time</b>
			<b>Collection to Analysis (Days)</b>
Mercury	SW-846 7470	Water	28

Notes:

Method References:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods",  
SW-846, Third Edition, 1986, with subsequent revisions