Olin

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July 22, 1999

Mr. William Wertz
New York State Dept. of Environmental. Conservation
Division of Solid Waste Management
50 Wolf Road
Albany, New York 12233

re: Quarterly Report: Olin Chemicals
Buffalo Ave. Facility, Niagara Falls, NY

Dear Mr. Wertz:

This is the seventh Quarterly report, as required by Olin's Administrative Order on Consent (AOC) for our Niagara Falls Plant, (Index #R9-4171-94-08, Site Registry #9-32-051A, and B). The timeframe for this report covers the period from April 1, 1999 through June 30, 1999.

Operation / Maintenance issues :

Well loss observations: Increased head loss and some pump rate decreases have been observed in several recovery wells (RW-3,4 and 5), indicating that some screen clogging could be developing. Although Olin is currently adding continuous feed of acid (RW -1 and 2) and Calsperse (RW-3,4 and 5) we felt that a mechanical cleaning should be implemented. The Mechanical well cleaning has been scheduled for July. Note that as of this writing, the mechanical well cleaning is complete, and its results will be reported in subsequent quarterly reports. Also note that we plan to convert recovery wells RW-3,4 and 5 to acid feed, because of the greater effectiveness of acid feed, as observed in previous months.

O&M Documentation: Details of the implementation of routine maintenance tasks and trouble shooting activities are included in the monthly memoranda from Olin's consultant, Law Engineering and Environmental Services, included as ***Attachment 1***.

Performance monitoring criteria:

Groundwater capture criteria : Per Olin's recommendations for criteria for capture demonstration, and as agreed by NYSDEC, Olin has installed two additional B-zone piezometers at the north end of Plant 2 (PN9B and PN10B). The locations of the piezometers were also chosen by agreement between Olin and NYSDEC and are shown on the base map included in ***Attachment 2***. Installation of these additional piezometers provide data to directly document inward gradient from the north toward the capture wells. Olin had proposed that this gradient measurement be the criterion for capture demonstration, in lieu of comparing groundwater elevations to the Buffalo Avenue sewer invert. Olin had also proposed to measure Gill Creek stage elevation at three times during the day of piezometric measurements to better identify the highest level of Gill Creek in its diurnal cycle. These levels are being compared to groundwater elevations to determine whether there is the potential for the creek stage to retard groundwater discharge to Gill Creek.

Hydraulic capture: ***Attachment 2*** includes piezometric maps and supporting data for each hydraulic zone for April, May and June, 1999 and includes a summary of well construction and monitored zones.

- The piezometric plots for the first quarter of 1999 indicate that we are achieving capture in the A-zone. This is demonstrated by cones of depression around each of the five recovery wells, by the elevation of Gill Creek being above A-zone groundwater levels west of Gill Creek, and by a dry zone between the northern recovery wells (RW-1 and 2) and Buffalo Avenue.
- B-zone capture is being achieved at the northern end of Plant 2, as data from the new piezometers indicate a gradient toward the recovery wells (RW1 and 2) from Buffalo Avenue. B-zone capture is being achieved along Gill Creek, as evidenced by the piezometric contours. The Gill Creek stage measurements have added to the certainty of this conclusion, as it is consistently greater than B-zone wells west of Gill Creek. The Olin production well captures B-zone groundwater in the western portion of the facility.
- C and CD zone groundwater flow and capture is consistent with prior measurements, with flow being predominantly westward toward the Olin production well.

Groundwater sampling and analysis: The first semiannual sampling was completed in May, 1999. Results will be submitted in the next quarterly report upon receipt of laboratory analytical data.

Extracted groundwater volume and contaminant mass:
The volume of pumped groundwater for the second quarter of 1999 is approximately 4 million gallons. The total volume of groundwater extracted and treated since system startup is approximately 16.2 million gallons.

The Recovery Well flow data, recovery well header concentrations and estimated mass removed for the second quarter of 1999 are included in **Attachment 3**. A summary table is presented below:

Summary: Contaminant Mass and Groundwater Removed

Quarter	organics lb	mercury lb	pesticides lb	groundwater extracted gal
Startup/Q1-98 [est]	27.81	0.02	0.2	210,000
Q2-98	154.5	0.1	1.3	1,175,799
Q3-98	595.5	0.6	4.9	2,583,159
Q4-98	1273.1	0.1	5.2	4,054,996
Q1-99	817.3	0.05	8.5	4,233,521
Q2-99	1034.7	0.05	7.1	3,991,584
TOTAL	**3903**	**1**	**27**	**16,249,059**

We believe that we have made significant progress since system startup in running the remediation system efficiently and effectively. We will continue to improve the system and monitor its effectiveness.

Please direct any questions or comments to me at 423/336-4587.

Sincerely,

Michael J. Bellotti

Michael J. Bellotti

OLIN CORPORATION

List of Attachments

Attachment 1:
Monthly Operation and Maintenance Status Reports

Attachment 2:
Piezometric plots and supporting tables

Attachment 3
Groundwater extracted volume totals and contaminant mass removal data

cc:
Stanley Radon - NYSDEC Buffalo
Kelly McIntosh: Conestoga-Rovers & Associates: Niagara Falls, NY
Vickie Ray: Olin Charleston
Armand Damesimo: Olin Niagara Falls, NY
Dale Carpenter: USEPA: Region II, New York, NY
Rick Marotte: Law Engineering: Kennesaw, GA
Monica L. Fries Esq.- Husch & Eppenberger: St. Louis, MO

ATTACHMENT 1

MEMORANDUM

To: Mike Bellotti @ Olin-Charleston; Don Greer, Karl Rasch, Ben Brayley, and Armand Damesimo @ Olin-Niagara; Andy Clark , and Rick Marotte @ LAW.

From: Anna Moomaw

Date: May 10, 1999

Subject: Monthly O&M Status Update for Ground-Water Collection and Treatment System

In continuing efforts to keep everyone informed, this memo addresses the status of the O&M issues for the ground-water collection and treatment system. This memo follows from the monthly status update memo issued 4/12/99.

System Status

The following table presents general treatment system data obtained from OMNX and during field monitoring for the month of April.

Ground-Water Collection and Treatment System Status					
	RW-1	RW-2	RW-3	RW-4	RW-5
Pumping Systems (Data from 4/1/99-4/30/99)					
Average Flow Rate (gpm)	2.8	5.5	3.0	18.2	3.3
End of Period Flow Rate (gpm)	2.9	5.5	3.1	18.0	3.7
New Target Flow Rate (gpm)	**Highest achievable**	**Highest achievable**	**5**	**Highest achievable (20)**	**5**
Avg GW Elevation (ft above MSL)	Not available	555 (from table below)	552	551	547
End of Period GW Elevation (ft above MSL)	Transducer Off-line	Transducer Off-line	550	550	547
Target GW Elevation (ft above MSL)	**552**	**549**	**551**	**550**	**550**
Comments	Fix Transducer	Fix Transducer	No change	No change	Fix Transducer

Ground-Water Collection and Treatment System Status					
Well Screen Losses (The well screen loss is defined as the difference between the well piezometer outside the casing and the water level inside the casing)					
	RW-1	RW-2	RW-3	RW-4	RW-5
April 8, 1999 Data:					
GW Elevation at Piezometer (ft above MSL)	Not Measured	555	556	552	552
GW Elevation at RW (ft above MSL)	Not Measured	555	551	549	551
Difference (ft)	Not Available	<0.5 ft	5	3	1
Comments	None	None	Acidify Well. Switch from Calsperse to continuous acid feed for at least two weeks.	Acidify Well. Switch from Calsperse to continuous acid feed for at least two weeks.	Acidify Well

Pumping Systems

Well Screen Losses

Well screen losses are significant in RW-3 and RW-4. These wells should be acidified. It would also be beneficial to switch the continuous feed systems to these wells to sulfuric acid similar to RW-1 and RW-2 for at least a couple of weeks or until the flow rates return to the goal flow rates. I recommend starting at a feed rate of approximately 5 gallons per week of sulfuric acid each for RW-3 and RW-4. RW-5 should be acidified as well since the flow rate has been slowly decreasing.

Transducers

The level transducers at RW-1 and RW-2 were taken off-line on January 14. These items will be procured and replaced by plant personnel. The transducer at RW-5 has been malfunctioning since February 10 and needs to be repaired or replaced as soon as possible.

Sampling

Air stripper inlet and outlet samples have been collected. Analytical results have been received and are attached to this memo.

MEMORANDUM

To: Mike Bellotti @ Olin-Charleston; Don Greer, Karl Rasch, Ben Brayley, and Armand Damesimo @ Olin-Niagara; Andy Clark , and Rick Marotte @ LAW.

From: Anna Moomaw

Date: June 14, 1999

Subject: Monthly O&M Status Update for Ground-Water Collection and Treatment System

In continuing efforts to keep everyone informed, this memo addresses the status of the O&M issues for the ground-water collection and treatment system. This memo follows from the monthly status update memo issued 5/10/99.

System Status

The following table presents general treatment system data obtained from OMNX and during field monitoring for the month of May.

Ground-Water Collection and Treatment System Status					
	RW-1	RW-2	RW-3	RW-4	RW-5
Pumping Systems (Data from 5/1/99-5/31/99)					
Average Flow Rate (gpm)	2.6	4.8	2.3	17.8	3.7
End of Month Flow Rate (gpm)	2.7	5.8	2.0	18.0	5.2
New Target Flow Rate (gpm) (Assumes mechanical cleaning)	**3**	**6**	**5**	**20**	**10**
Avg GW Elevation (ft above MSL)	550 (from table below)	547	551	551	547
End of Period GW Elevation (ft above MSL)	Transducer Off-line	547	550	550	547
Target GW Elevation (ft above MSL)	**552**	**549**	**551**	**550**	**550**
Comments	Fix Transducer	Fix Transducer	Mechanically clean well	Mechanically clean well	Fix Transducer; mechanically clean well

Ground-Water Collection and Treatment System Status					
Well Screen Losses (The well screen loss is defined as the difference between the well piezometer outside the casing and the water level inside the casing)					
	RW-1	RW-2	RW-3	RW-4	RW-5
May 17, 1999 Data:					
GW Elevation at Piezometer (ft above MSL)	550	551	551	550	551
GW Elevation at RW (ft above MSL)	551	552	551	552	553
Difference (ft)	1	1	0	2	2
June 4, 1999 Data:					
GW Elevation at Piezometer (ft above MSL)	550	548	552	552	553
GW Elevation at RW (ft above MSL)	551	550	552	553	553
Difference (ft)	1	2	0	1	0
Comments					

Pumping Systems

Well Screen Losses

Based on the flow rate data showing decreasing flow rates over time, well screen losses appear significant in wells RW-3, RW-4, and RW-5. These wells will be mechanically cleaned and then acidified. Andy Clark will be coordinating the well cleaning effort. CRA will be on site to oversee the driller's activities. The plant will be notified of the exact timing in advance of these activities so that they can prepare the wells for the cleaning activities by removing well pumps, transducers, and piping. **Mechanical well cleaning is tentatively scheduled for the week of July 5, 1999.** Procedures will follow those in Section 3.2 of the O&M Plan.

Transducers

The level transducers for RW-1, RW-2, and RW-5 and spares have been ordered. When they are delivered, these items will be replaced by plant personnel.

Metering Pumps

The continuous acid feed metering pumps for RW-1 and RW-2 have been down a few times for repairs in the last month and new pumps and spare parts have been ordered to correct the problems.

LAW

LAWGIBB Group Member

MEMORANDUM

To: Mike Bellotti @ Olin-Charleston; Don Greer, Karl Rasch, Ben Brayley, and Armand Damesimo @ Olin-Niagara; Andy Clark , and Rick Marotte @ LAW.

From: Anna Moomaw

Date: July 12, 1999

Subject: Monthly O&M Status Update for Ground-Water Collection and Treatment System

In continuing efforts to keep everyone informed, this memo addresses the status of the O&M issues for the ground-water collection and treatment system. This memo follows from the monthly status update memo issued 6/14/99.

System Status

The following table presents general treatment system data obtained from OMNX and during field monitoring for the month of June.

Ground-Water Collection and Treatment System Status					
	RW-1	RW-2	RW-3	RW-4	RW-5
Pumping Systems (Data from 6/1/99-6/30/99)					
Average Flow Rate (gpm)	2.6	1.6	2.0	17.3	3.7
End of Month Flow Rate (gpm)	2.8	0.6	1.7	18.9	3.1
New Target Flow Rate (gpm) (Assumes mechanical cleaning)	**3**	**6**	**5**	**20**	**10**
Avg GW Elevation (ft above MSL)	551 (from table below)	547	553	551	549
End of Period GW Elevation (ft above MSL)	Transducer Off-line	547	557	549	549
Target GW Elevation (ft above MSL)	**552**	**549**	**551**	**550**	**550**
Comments	Fix Transducer	Fix Transducer	Mechanically clean well	Mechanically clean well	Mechanically clean well

Ground-Water Collection and Treatment System Status					
Well Screen Losses (The well screen loss is defined as the difference between the well piezometer outside the casing and the water level inside the casing)					
	RW-1	RW-2	RW-3	RW-4	RW-5
June 4, 1999 Data:					
GW Elevation at Piezometer (ft above MSL)	550	548	552	552	553
GW Elevation at RW (ft above MSL)	551	550	552	553	553
Difference (ft)	1	2	0	1	0
Comments					

Well Screen Losses

Based on the flow rate data showing decreasing flow rates over time, well screen losses appeared significant in wells RW-3, RW-4, and RW-5. These wells were mechanically cleaned and then acidified on the week of July 5, 1999. Procedures followed those in Section 3.2 of the O&M Plan. Further information regarding the mechanical well cleaning activities and resulting flow rates will be included in the monthly progress update for July.

Transducers

Level transducers for RW-1, RW-2, and RW-5 and spares have been ordered. When they are delivered, these items will be replaced by plant personnel. The plant will observe the transducer in RW-5. If it appears to be operational following mechanical well cleaning, it will be left in operation and the new transducer will be kept as a spare until needed.

System Down Time

The average flow rates on June 10 and June 11 are lower than that of previous days due to a brief system power loss on the evening of June 10 to the morning of June 11. Power was restored on the morning of June 11. RW-5 was out of service on June 5 and June 6, and RW-2 was out of service on June 12 and June 13 for maintenance.

Other

Other operational issues, maintenance activities, and sampling activities initiated in the month of July will be addressed in the monthly status update for July.

ATTACHMENT 2

Table 1
Summary of A-Zone Water Levels
Olin Chemical
Niagara Falls, NY

Well I.D.	Bottom of A-Zone Elevation (Feet AMSL)	Reference Point Elevation (Feet AMSL)	4/8/99		5/17/99		6/4/99	
			Water Level (Feet BTOC)	Water Elevation (Feet AMSL)	Water Level (Feet BTOC)	Water Elevation (Feet AMSL)	Water Level (Feet BTOC)	Water Elevation (Feet AMSL)
Gill Creek -Stilling Well	NM	571.22	7.62	563.6	7.82	563.4	7.62	563.6
MW-20AR	NM	570.51	NM	NM	DRY	565.6	DRY	565.6
OBA-01A	562.8	571.02	3.21	567.8	3.79	567.2	3.60	567.4
OBA-02A	561.6	572.93	DRY	561.6	DRY	561.6	DRY	561.6
OBA-03A	552.6	572.5	14.56	557.9	14.45	558.1	14.42	558.1
OBA-04A	558.7	572.88	12.20	560.7	12.63	560.3	12.27	560.6
OBA-05A	558.2	572.21	7.56	564.7	7.56	564.7	7.48	564.7
OBA-06A	561.4	569	3.42	565.6	3.47	565.5	3.21	565.8
OBA-07A	563	573.97	7.87	566.1	8.12	565.9	7.89	566.1
OBA-08A	560.2	572.95	11.00	562.0	11.17	561.8	10.38	562.6
OBA-09A	558.3	569.88	6.22	563.7	6.23	563.7	5.94	563.9
OBA-09AR	557.7	569.88	6.72	563.2	6.75	563.1	6.23	563.7
OBA-10A	552.5	568.92	5.93	563.0	5.88	563.0	5.29	563.6
OBA-11A	559.2	573.22	13.03	560.2	13.06	560.2	DRY	559.2
OBA-12A	563.9	573.89	9.37	564.5	9.33	564.6	9.38	564.5
OBA-13A	553.6	573.98	16.27	557.7	16.09	557.9	16.12	557.9
OBA-14A	552.5	571.1	12.95	558.2	12.73	558.4	13.02	558.1
OBA-15A	551	573.08	15.05	558.0	14.84	558.2	14.86	558.2
OBA-16A	560.9	573.55	10.91	562.6	11.00	562.6	10.60	563.0
OBA-18A	559.9	573.85	13.17	560.7	13.13	560.7	12.77	561.1
OBA-19A	558.6	574.34	12.31	562.0	12.72	561.6	12.16	562.2
OBA-23A	561.4	570.72	8.86	561.9	DRY	561.4	8.55	562.2
PN-1A	560.8	571.01	7.16	563.9	7.37	563.6	6.99	564.0
PN-2A	562.1	571.20	DRY	562.1	DRY	562.1	DRY	562.1
PN-3A	559.7	571.43	9.55	561.9	9.56	561.9	8.84	562.6
PN-4A	559.1	568.78	7.04	561.7	7.03	561.8	6.59	562.2
PN-5A	559.1	569.10	6.46	562.6	6.57	562.5	6.23	562.9
PN-6A	559.2	568.93	5.91	563.0	5.85	563.1	5.57	563.4
PN-7A	558.9	568.70	5.83	562.9	5.81	562.9	5.67	563.0
PN-8A	557.8	568.83	4.62	564.2	4.37	564.5	4.20	564.6

NOTES:

* - From 1997 performance monitoring test.

checked by/date: AMC/6-14-99

** Buffalo Avenue Measurement

NM - Not measured.

DRY - Water elevation not applicable.

Bottom of screened interval used in contouring.

Table 2
Summary of B-Zone Water Levels
Olin Chemical
Niagara Falls, NY

Well I.D.	Bottom of A-Zone Elevation	Reference Point Elevation (Feet AMSL)	4/8/99		5/17/99		6/4/99	
			Water Level (Feet BTOC)	Water Elevation (Feet AMSL)	Water Level (Feet BTOC)	Water Elevation (Feet AMSL)	Water Level (Feet BTOC)	Water Elevation (Feet AMSL)
BH-1	557.53	574.38	15.71	558.7	16.07	558.3	16.10	558.3
OBA-01B	563.3	570.9	13.17	557.7	13.05	557.9	13.13	557.8
OBA-02B	561.7	573.07	15.12	558.0	14.98	558.1	14.96	558.1
OBA-03B	552.9	572.17	16.07	556.1	15.90	556.3	16.10	556.1
OBA-04B	558.3	573.49	13.54	560.0	13.87	559.6	13.61	559.9
OBA-05B	558.4	572.7	13.23	559.5	13.39	559.3	13.27	559.4
OBA-06B	561.7	569.49	10.97	558.5	11.06	558.4	11.08	558.4
OBA-07B	560	574.47	10.68	563.8	10.86	563.6	10.74	563.7
OBA-08B	560.1	573.24	14.60	558.6	14.61	558.6	14.48	558.8
OBA-11B	559.5	573.29	16.08	557.2	16.08	557.2	15.99	557.3
OBA-12B	563.9	574.04	15.55	558.5	15.51	558.5	15.51	558.5
OBA-13B	552.1	574.26	16.71	557.6	16.60	557.7	16.55	557.7
OBA-14B	552.3	571.26	13.31	558.0	13.19	558.1	13.14	558.1
OBA-16B	560.9	573.47	14.87	558.6	14.83	558.6	15.11	558.4
OBA-21AB	559	572.46	7.96	564.5	8.32	564.1	7.77	564.7
OBA-23B	561.3	570.54	12.30	558.2	12.45	558.1	12.37	558.2
PN-1B	560.8	570.87	12.54	558.3	12.73	558.1	12.61	558.3
PN-2B	562	571.01	12.91	558.1	12.95	558.1	12.89	558.1
PN-3B	559.7	571.36	13.45	557.9	13.35	558.0	13.27	558.1
PN-4B	559.1	568.89	10.85	558.0	10.81	558.1	10.76	558.1
PN-5B	559.1	569.10	11.07	558.0	11.00	558.1	10.95	558.2
PN-6B	559.2	569.07	11.04	558.0	10.93	558.1	10.88	558.2
PN-7B	558.9	568.95	10.25	558.7	10.93	558.0	10.25	558.7
PN-8B	557.8	568.38	10.41	558.0	10.30	558.1	10.21	558.2
PN-9B	560.22	571.90	NI	NI	13.15	558.8	13.06	558.8
PN-10B	561.53	571.63	NI	NI	13.61	558.0	13.55	558.1
MW-20B		570.09	NM	NM	11.53	558.6	11.61	558.5
MW-22B		569.86	NM	NM	13.59	556.3	13.5	556.4

NOTES:
NM - Not Measured
NI - Not Installed

checked by/date: AMC/6-14-99

Table 3
Summary of C-Zone Water Levels
Olin Chemical
Niagara Falls, NY

Well I.D.	Reference Point Elevation (Feet AMSL)	4/8/99		5/17/99		6/4/99	
		Water Level (Feet BTOC)	Water Elevation (Feet AMSL)	Water Level (Feet BTOC)	Water Elevation (Feet AMSL)	Water Level (Feet BTOC)	Water Elevation (Feet AMSL)
OBA-01C	570.96	15.06	555.9	14.97	556.0	14.42	556.5
OBA-04C	573.54	15.56	558.0	15.40	558.1	15.41	558.1
OBA-07C	574.85	19.04	555.8	18.91	555.9	18.47	556.4
OBA-12C	574.31	20.30	554.0	20.20	554.1	20.38	553.9
OBA-14C	570.61	12.66	558.0	12.50	558.1	12.55	558.1
OBA-15B	573.58	15.60	558.0	15.50	558.1	15.43	558.2
MW-22C	570.09	NM	NM	16.72	553.4	16.16	553.9

checked by/date: AMC/6-14-99

Table 4
Summary of CD-Zone Water Levels
Olin Chemical
Niagara Falls, NY

Well I.D.	Reference Point Elevation (Feet AMSL)	4/8/99		5/17/99		6/4/99	
		Water Level (Feet BTOC)	Water Elevation (Feet AMSL)	Water Level (Feet BTOC)	Water Elevation (Feet AMSL)	Water Level (Feet BTOC)	Water Elevation (Feet AMSL)
OBA-02C	573.12	17.32	555.8	17.14	556.0	17.23	555.9
OBA-03C	573.14	15.41	557.7	15.35	557.8	15.37	557.8
OBA-05C	572.46	16.69	555.8	16.39	556.1	16.39	556.1
OBA-06C	569.49	13.50	556.0	13.28	556.2	13.50	556.0
OBA-08C	573.26	19.17	554.1	19.08	554.2	18.40	554.9
OBA-11C	573.37	17.30	556.1	17.23	556.1	17.25	556.1
OBA-13C	574.08	22.32	551.8	21.88	552.2	22.35	551.7
MW-22D	570.67	NM	NM	NM	NM	NM	NM

Notes:
NM - Not Measured.

checked by/date: AMC/6-14-99

Table 5
Summary of Recovery and Passive Relief Well
Water Levels
Olin Chemical
Niagara Falls, NY

Well I.D.	Bottom of A-Zone Elevation (Feet AMSL)	Reference Point Elevation (Feet AMSL)	4/8/99		5/17/99		6/4/99	
			Water Level (Feet BTOC)	Water Elevation (Feet AMSL)	Water Level (Feet BTOC)	Water Elevation (Feet AMSL)	Water Level (Feet BTOC)	Water Elevation (Feet AMSL)
RW-1	561.2	573.69	NM [1]	557.1	24.05	549.6	NM [1]	549.6
RW-1-PZ	561.2	572.73	NM [1]	557.1	21.62	551.1	NM [1]	551.1
RW-2	557	572.49	17.94	554.6	21.52	551.0	24.85	547.6
RW-2-PZ	557	572.22	17.39	554.8	20.20	552.0	22.34	549.9
RW-3	557.1	570.09	19.55	550.5	19.41	550.7	18.07	552.0
RW-3-PZ	557.1	570.03	19.27	550.8	19.06	551.0	17.78	552.3
RW-4	557.3	569.77	20.80	549.0	20.00	549.8	17.92	551.9
RW-4-PZ	557.3	569.81	18.19	551.6	17.50	552.3	16.79	553.0
RW-5	557.3	569.79	18.85	550.9	18.83	551.0	16.49	553.3
RW-5-PZ	557.3	569.74	18.12	551.6	16.35	553.4	16.39	553.4
PR-1	561.8	572.82	14.81	558.0	14.73	558.1	14.69	558.1
PR-1-PZ	561.8	571.58	13.58	558.0	NM	NM	13.44	558.1
PR-2	561.7	572.72	14.58	558.1	14.65	558.1	14.58	558.1
PR-2-PZ	561.7	572.70	14.63	558.1	14.65	558.1	14.58	558.1
PR-3	558.2	572.79	14.71	558.1	14.72	558.1	14.66	558.1
PR-3-PZ	558.2	572.16	14.11	558.1	14.12	558.0	14.06	558.1
PR-4	556.7	570.21	7.99	562.2	7.95	562.3	6.70	563.5
PR-4-PZ	556.7	570.14	10.85	559.3	11.02	559.1	9.55	560.6
PR-5	559.1	570.68	11.52	559.2	11.61	559.1	11.52	559.2
PR-5-PZ	559.1	569.69	10.99	558.7	11.11	558.6	10.95	558.7

NOTES:

Below bottom of A-zone

checked by/date: AMC/6-14-99

NM - Not Measured

1 - Water level from previous month with simil

TABLE 7

MONITORING WELL CONSTRUCTION SUMMARY
OLIN BUFFALO AVENUE PLANT SITE
NIAGARA FALLS, NEW YORK

Monitoring Well	Installation Date	Type of Well	Coordinates Easting	Coordinates Northing	Top of Riser Elevation (Ft. AMSL)	Ground Elevation (Ft. AMSL)	Top of Bedrock Elevation (Ft. AMSL)	Depth to Bedrock (Ft. BGS)	Screened Interval (Ft. BGS)		Zone Monitored
BH-1	1978-Harza	1 1/4" st. steel well point	5323	20055	574.38	570.63	560.53	10.1	12.1 - 16.1		B
BH-3	1978-Harza	1 1/4" st. steel well point	5315	19553	573.15	569.13	560.63	8.5	14.0 - 18.0		B
BH-9	1978-Harza	1 1/4" st. steel well point	5162	19494	574.49	570.06	561.66	8.4	4.4 - 8.4		Overburden
OBA-1A	6/22/89-WCC	screened-4"PVC	4201.15	19999.64	571.02	571.3	565.8	5.5	2.5 - 8.5		A-Bedrock
OBA-1B	6/23/89-WCC	open-4"rockhole	4213.82	20000.06	570.9	571.3	566.3	5	10.0 - 25.0	(OH)	B
OBA-1C	6/27/89-WCC	open-4"rockhole	4225.16	20000.67	570.96	571.3	566.3	5	25.0 - 38.5	(OH)	C
OBA-2A	8/22/89-WCC	screened-4"PVC	5088.62	20086.17	572.93	570.4	564.6	5.8	2.8 - 8.8		A-Bedrock
OBA-2B	8/24/89-WCC	open-4"rockhole	5096.54	20086.61	573.07	570.5	564.7	5.8	11.0 - 25.0	(OH)	B
OBA-2C	8/30/89-WCC	open-4"rockhole	5077.08	20085.85	573.12	570.3	564.6	5.7	25.0 - 50.0	(OH)	C/CD (1)
OBA-3A	6/30/89-WCC	screened-4"PVC	5750.81	20086.02	572.5	569.9	555.6	14.3	11.4 - 17.4		A-Bedrock
OBA-3B	7/7/89-WCC	open-4"rockhole	5689.02	20066.19	572.17	569.9	555.9	14	19.0 - 33.5	(OH)	B (1)
OBA-3C	7/11/89-WCC	open-4"rockhole	5675.18	20066.79	573.14	569.8	555.8	14	33.0 - 58.0	(OH)	C/CD (1)
OBA-4A	7/14/89-WCC	screened-4"PVC	5433.18	19816.72	572.88	570.1	561.7	8.4	5.5 - 11.5		A-Bedrock
OBA-4B	7/20/89-WCC	open-4"rockhole	5433.3	19828.33	573.49	570.3	561.3	9	13.9 - 21.5	(OH)	B
OBA-4C	7/24/89-WCC	open-4"rockhole	5435.37	19840.19	573.54	570.4	561.9	8.5	22.0 - 30.5	(OH)	C
OBA-5A	8/7/89-WCC	screened-4"PVC	5116.7	19479.39	572.21	569.6	561.2	8.4	4.5 - 11.3		A-Bedrock
OBA-5B	8/8/89-WCC	open-4"rockhole	5106.73	19479.42	572.7	569.7	561.4	8.3	12.2 - 23.5	(OH)	B
OBA-5C	8/10/89-WCC	open-4"rockhole	5124.83	19478.7	572.46	569.7	561.4	8.3	23.0 - 53.0	(OH)	CD
OBA-6A	8/15/89-WCC	screened-4"PVC	4925.19	19649.53	569	569.5	564.4	5.1	2.1 - 8.1		A-Bedrock
OBA-6B	8/15/89-WCC	open-4"rockhole	4919.74	19649.33	569.49	569.9	564.7	4.9	10.0 - 22.5	(OH)	B
OBA-6C	8/18/89-WCC	open-4"rockhole	4930.18	19650.24	569.49	569.5	565	4.5	22.5 - 48.0	(OH)	C/CD (1)
OBA-7A	6/7/89-WCC	screened-4"PVC	4417.99	19808.26	573.97	571.5	566	5.5	2.3 - 8.3		A-Bedrock
OBA-7B	6/13/89-WCC	open-4"rockhole	4428.31	19809.3	574.47	571.5	563	8.5	10.4 - 24.8	(OH)	B
OBA-7C	6/20/89-WCC	open-4"rockhole	4399.6	19807.47	574.85	571.7	567.7	4	25.0 - 40.0	(OH)	C
OBA-8A	7/26/89-WCC	screened-4"PVC	3479.17	19572.73	572.95	570.7	563.2	7.5	4.5 - 10.5		A-Bedrock
OBA-8B	7/28/89-WCC	open-4"rockhole	3488.1	19566.78	573.24	570.6	563.1	7.5	12.4 - 25.0	(OH)	B
OBA-8C	8/4/89-WCC	open-4"rockhole	3469.86	19578.04	573.26	570.6	563.1	7.5	24.9 - 52.0	(OH)	CD
OBA-9A	11/2/92-WCC	screened-4"PVC	5342.71	19481.13	569.88	568.33	561.3	7	3.8 - 10.0		A-Bedrock
OBA-9AR	11/30/92-WCC	screened-6"st. steel	5343.11	19477.83	569.88	568.23	560.7	7.5	4.5 - 10.8		A-Bedrock (2)
OBA-10A	11/4/92-WCC	screened-4"PVC	5417.11	19454.63	568.92	569.24	555.5 (3)	13.7 (3)	10.4 - 16.4		A-Bedrock/B-Bedrock
OBA-11A	11/30/93-WCC	screened-4"PVC	3249.8	20019.5	573.22	571	562.2	8.8	6.2 - 12.0		A-Bedrock
OBA-11B	12/2/93-WCC	open-4"rockhole	3225.6	20015.4	573.29	571	562.5	8.5	13.5 - 24.5	(OH)	B
OBA-11C	12/6/93-WCC	open-4"rockhole	3239.1	20017.9	573.37	571	562.7	8.3	22.5 - 47.8	(OH)	CD
OBA-12A	12/7/93-WCC	screened-4"PVC	4777.5	20298.3	573.89	571.5	568.5	3	2.3 - 7.6		A-Bedrock

Monitoring Well	Installation Date	Type of Well	Coordinates Easting	Coordinates Northing	Top of Riser Elevation (Ft. AMSL)	Ground Elevation (Ft. AMSL)	Top of Bedrock Elevation (Ft. AMSL)	Depth to Bedrock (Ft. BGS)	Screened Interval (Ft. BGS)		Zone Monitored
OBA-12B	12/20/93-WCC	open-4"rockhole	4803.2	20292.8	574.04	571.5	567.5	4	9.0 - 19.6	(OH)	B
OBA-12C	12/20/93-WCC	open-4"rockhole	4789.4	20295.9	574.31	571.5	567.3	4.2	18.4 - 44.5	(OH)	C/CD (1)
OBA-13AOB	4/18/94-WCC	screened-4"PVC	5486.8	20202.9	574.29	572	557	15	9.4 - 15.0		Overburden
OBA-13A	4/18/94-WCC	screened-4"PVC	5483.2	20203.2	573.98	572	556.6	15.4	12.6 - 19.0		A-Bedrock
OBA-13B	4/19/94-WCC	open-4"rockhole	5500.9	20202.1	574.26	572	555.1	16.9	20.9 - 29.7	(OH)	B
OBA-13C	4/26/94-WCC	open-4"rockhole	5493.7	20202.6	574.08	572	556.5	15.5	29.0 - 48.4	(OH)	C/CD (1)
OBA-14A	4/25/94-WCC	screened-4"PVC	5784.3	19867.8	571.1	568.9	555.5	13.4	9.0 - 14.5		A-Bedrock
OBA-14B	4/25/94-WCC	open-4"rockhole	5783.6	19886.2	571.26	568.9	555.3	13.6	17.3 - 24.2	(OH)	B
OBA-14C	4/27/94-WCC	open-4"rockhole	5784.1	19876.9	570.61	568.9	555.2	13.7	25.1 - 41.7	(OH)	C
OBA-15A	4/13/94-WCC	screened-4"PVC	5476.4	20060.7	573.08	570.9	554	16.9	14.0 - 20.2		A
OBA-15B	4/20/94-WCC	open-4"rockhole	5473.2	19978.2	573.58	570.9	553.4	17.5	22.5 - 32.1	(OH)	C
OBA-16A	4/5/94-WCC	screened-4"PVC	5214.8	19955.6	573.55	571.1	563.9	7.2	3.2 - 9.2		A-Bedrock
OBA-16B	4/20/94-WCC	open-4"rockhole	5215.3	19950.1	573.47	571.1	563.9	7.2	11.6 - 21.8	(OH)	B
OBA-18A	-CRA		3344.93	20033.60	573.85	571.35	562.95	8.4	5.3 - 11.3		A-Bedrock
OBA-19A	-CRA		3221.30	19788.90	574.34	571.74	561.64	10.1	7.0 - 12.8		A-Bedrock
OBA-21AB	-CRA	screened-4"PVC	5160.88	19469.01	572.46	570	562	8	4.0 - 24.0		A-Bedrock/B-Bedrock
OBA-23A	8/4/97-LAW	screened-4" st. steel	4982.9	19974.72	570.72	570.92	564.42	6.5	6.1 - 9.5	**	A
OBA-23B	8/1/97-CRA	screened-4" st. steel	4982.86	19968.04	570.54	570.84	564.34	6.5	12.0 - 20.0		B
Olin Caustic Wells											
OCW-6BR (4)	-WCC		4689.71	19906.43	571.26	571.69	566.1	5.6	6.1 - 9.5		A-Bedrock
OCW-1 (4)	-WCC		4670.11	20021.43	570.79	571.12	565.7	5.4	1.2 - 5.2		Overburden
OCW-2 (4)	-WCC		4610.31	19881.13	572.27	572.7	568.5	4.2	0.9 - 3.9		Overburden
OCW-3 (4)	-WCC		4611.01	19806.53	572.42	572.81	569	3.9	1.0 - 3.8		Overburden
OCW-4 (4)	-WCC		4649.41	19755.33	571.63	572.2	564.2	7.9	2.0 - 7.9		Overburden
OCW-5 (4)	-WCC		4689.11	19614.63	571.92	572.29	566.9	5.4	1.0 - 5.4		Overburden
OCW-6 (4)	-WCC		4690.01	19880.13	571.17	571.5	565.6	5.9	1.2 - 5.9		Overburden
Olin Collection Wells and Piezometers											
RW-1	8/5/97-LAW	screened-6" st. steel	5002.98	19908.13	573.69	570.69	564.19	6.5	7.3 - 20.8		A/B
RW-1-PZ	8/5/97-LAW	screened-1 1/4" st. steel			572.73				13.6 - 23.4		
PR-1	8/7/97-LAW	screened-6" st. steel	4992.24	19816.04	572 82	570.82	564.82	6	8.1 - 21.5		A/B
PR-1-PZ	8/7/97-LAW	screened-1 1/4" st. steel			571.58				15.0 - 24.5		
PN-1			4941.1	19864.32		571.3	563.8	7.5			
PN-1A	8/13/97-LAW	screened-1 1/4" st. steel			571.01				5.3 - 10.1		A
PN-1B	8/13/97-LAW	screened-1 1/4" st. steel			570.87				16.8 - 21.6		B
RW-2	8/7/97-LAW	screened-6" st. steel	5176.11	20000.04	572.49	571.49	559.99	11.5	8.7 - 22.1		A/B
RW-2-PZ	8/7/97-LAW	screened-1 1/4" st. steel			572.22				14.9 - 24.8		

Monitoring Well	Installation Date	Type of Well	Coordinates Easting	Coordinates Northing	Top of Riser Elevation (Ft. AMSL)	Ground Elevation (Ft. AMSL)	Top of Bedrock Elevation (Ft. AMSL)	Depth to Bedrock (Ft. BGS)	Screened Interval (Ft. BGS)	Zone Monitored
PR-2	8/6/97-LAW	screened-6" st. steel	5075.32	19971.4	572.72	571.72	564.72	7	8.1 - 21.5	A/B
PR-2-PZ	8/6/97-LAW	screened-1 1/4" st. steel			572.7				14.8 - 25.6	
PN-2			5136.33	19977.88		571.5	565	6.5		
PN-2A	8/13/97-LAW	screened-1 1/4" st. steel			571.2				4.6 - 9.4	A
PN-2B	8/13/97-LAW	screened-1 1/4" st. steel			571.01				17.2 - 22.0	B
RW-3	8/5/97-LAW	screened-6" st. steel	5331.82	19957.65	570.09	569.09	560.09	9	6.5 - 19.9	A/B
RW-3-PZ	8/5/97-LAW	screened-1 1/4" st. steel			570.03				13.2 - 23.0	
PR-3	8/11/97-LAW	screened-6" st. steel	5271.84	19983.45	572.79	571.67	561.17	10.5	9.0 - 22.4	A/B
PR-3-PZ	8/11/97-LAW	screened-1 1/4" st. steel			572.16				15.2 - 25.0	
PN-3			5278.6	19961.62		571.65	562.65	9		
PN-3A	8/12/97-LAW	screened-1 1/4" st. steel			571.43				6.3 - 11.1	A
PN-3B	8/12/97-LAW	screened-1 1/4" st. steel			571.36				20.5 - 25.3	B
RW-4	8/8/97-LAW	screened-6" st. steel	5321.62	19758.67	569.77	568.77	560.27	8.5	10.4 - 23.8	A/B
RW-4-PZ	8/8/97-LAW	screened-1 1/4" st. steel			569.81				17.0 - 26.8	
PR-4	8/6/97-LAW	screened-6" st. steel	5329.77	19859.85	570.21	569.21	559.71	9.5	7.3 - 20.7	A/B
PR-4-PZ	8/6/97-LAW	screened-1 1/4" st. steel			570.14				13.9 - 23.7	
PN-4			5336.66	19902.25		569.08	562.08	7		
PN-4A	8/14/97-LAW	screened-1 1/4" st. steel			568.78				4.7 - 9.5	A
PN-4B	8/14/97-LAW	screened-1 1/4" st. steel			568.89				15.9 - 20.7	B
RW-5	8/8/97-LAW	screened-6" st. steel	5305.61	19561.54	569.79	568.79	560.29	8.5	7.6 - 21.0	A/B
RW-5-PZ	8/8/97-LAW	screened-1 1/4" st. steel			569.74				14.8 - 24.6	
PR-5	8/13/97-LAW	screened-6" st. steel	5315.12	19646.18	570.68	569.08	562.08	7	8.8 - 22.2	A/B
PR-5-PZ	8/13/97-LAW	screened-1 1/4" st. steel			569.69				15.3 - 25.1	
PN-5			5333.68	19817.17		569.1	562.1	7		
PN-5A	8/15/97-LAW	screened-1 1/4" st. steel			569.1				5.2 - 10.0	A
PN-5B	8/15/97-LAW	screened-1 1/4" st. steel			569.1				19.2 - 24.0	B
PN-6			5312.54	19693.77		569.15	562.15	7		
PN-6A	8/18/97-LAW	screened-1 1/4" st. steel			568.93				5.2 - 10.0	A
PN-6B	8/18/97-LAW	screened-1 1/4" st. steel			569.07				19.2 - 24.0	B

Monitoring Well	Installation Date	Type of Well	Coordinates Easting	Coordinates Northing	Top of Riser Elevation (Ft. AMSL)	Ground Elevation (Ft. AMSL)	Top of Bedrock Elevation (Ft. AMSL)	Depth to Bedrock (Ft. BGS)	Screened Interval (Ft. BGS)	Zone Monitored
PN-7			5308.86	19604.91		568.93	561.93	7	5.4 - 10.2	A
PN-7A	8/19/97-LAW	screened-1 1/4" st. steel			568.7				16.8 - 21.6	B
PN-7B	8/19/97-LAW	screened-1 1/4" st. steel			568.95					
PN-8			5310.35	19515.78		568.83	560.83	8		
PN-8A	8/20/97-LAW	screened-1 1/4" st. steel			568.83				5.4 - 10.2	A
PN-8B	8/20/97-LAW	screened-1 1/4" st. steel			568.38				16.7 - 21.5	B
PN-9B	5/14/99-CRA		5271.67	20023.21	571.9	572.32	563.22	9.1	16.0 - 26.0	B
PN-10B	5/17/99-CRA		5055.19	20005.85	571.63	572.01	564.53	7.1	14.1 - 24.1	B

Notes:

OBA - Water Quality Monitoring Well

RW - Groundwater Recovery Well (Coordinates apply to both Recovery well and adjacent piezometer)

PN - Piezometer Nest (Coordinates apply to both A and B piezometers located in nest (which are 12" diameter road boxes))

PZ - Piezometer

PR - Passive Relief Well (Coordinates apply to both Passive Relief well and adjacent piezometer)

(1) No major waterbearing fractures encountered during drilling of the monitored interval.

(2) OBA-9AR was installed as a possible NAPL recovery well.

(3) OBA-10A was most likely installed in a sewer line trench excavated into rock, thus the top of rock elevation does not accurately reflect bedrock elevation in the surrounding area.

(4) OCW wells were installed as part of the investigation of the caustic spill of February 21, 1993.

(5) Competent bedrock; the depth to bedrock is questionable in this location due to the presence of an old foundation which may have been constructed on or into the bedrock surface.

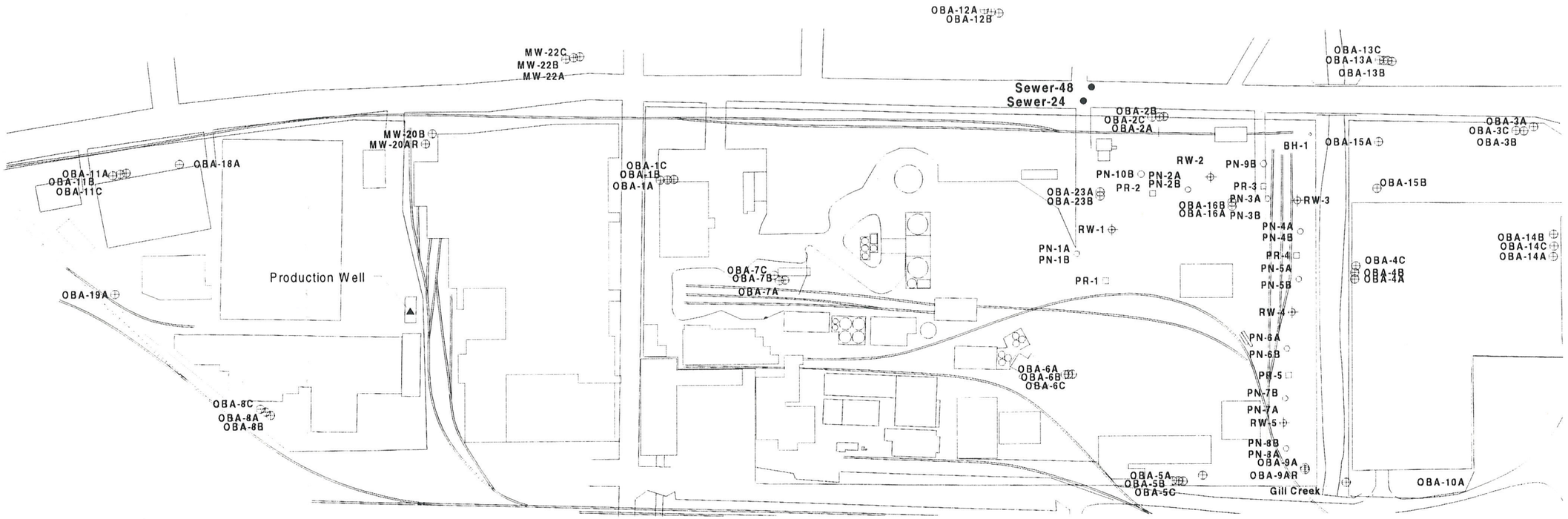
** Total depth of well OBA-23A was re-measured on 11/??/98 at 9.5 feet bgs. (The original measurement was 9.0 feet bgs.)

AMSL Above Mean Sea Level.

BGS Below Ground Surface.

OH Open Hole.

Gill Creek stilling well reference elevation = 571.22. Ft. AMSL.



LEGEND

- ◇ GILL CREEK MONITORING POINT
- ▲ OLIN PRODUCTION WELL
- ⊕ WATER QUALITY MONITORING WELLS
- ○ A/B ZONE PIEZOMETER NESTS
- ⊕ GROUND WATER RECOVERY WELLS
- □ PASSIVE RELIFF WELLS
- ● SEWER INVERT ELEVATION
- ——— PROPERTY LINE

0 200 400

Scale 1 inch = 200 feet

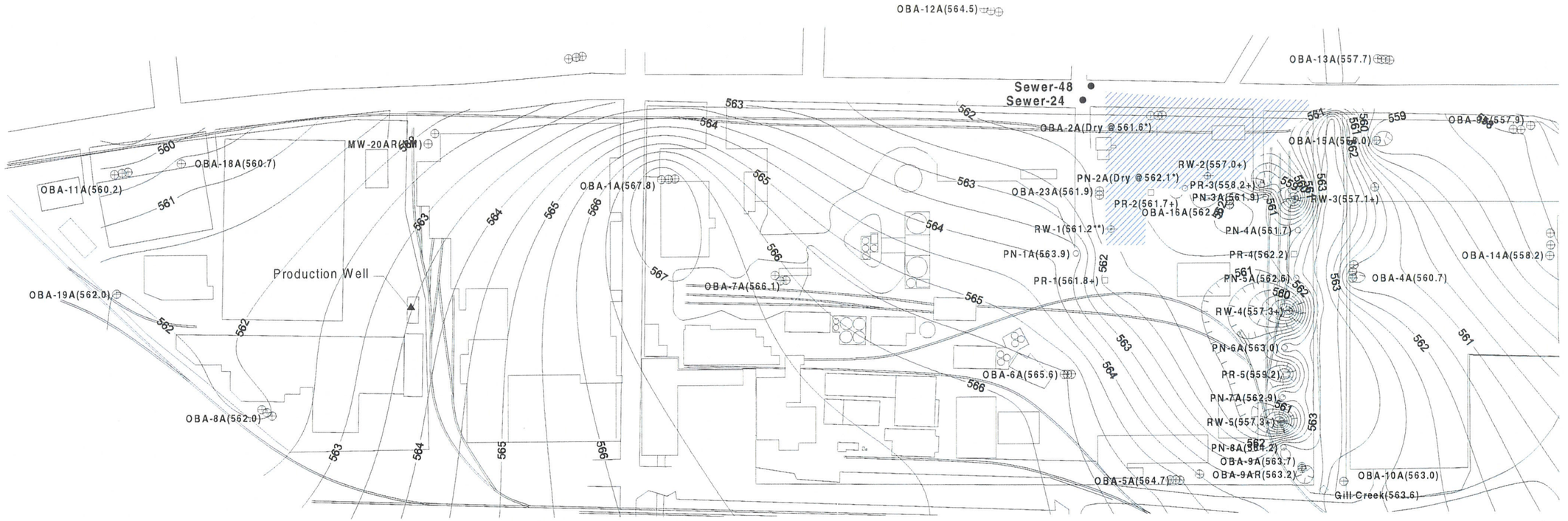
OLIN CHEMICAL
NIAGARA FALLS, NEW YORK

LAW
LAWGIBB Group Member

BASE MAP

Job No.: 12000-8-0030

Figure 0



LEGEND

- ◇ GILL CREEK MONITORING POINT
- ▲ OLIN PRODUCTION WELL (FLOW RATE FROM DUPONT)
- ⊕ WATER QUALITY MONITORING WELLS
- ○ A/B ZONE PIEZOMETER NESTS
- ⊕ GROUND WATER RECOVERY WELLS
- □ PASSIVE RELIEF WELLS
- ● SEWER INVERT
- PROPERTY LINE
- 565 ESTIMATED GROUND-WATER CONTOUR LINES (CONTOUR INTERVAL: 0.5 FEET)
- ESTIMATED DRY AREA IN ZONE A

Well	Average Flow Rate(gpm)*
RW-1	2.8
RW-2	5.5
RW-3	3
RW-4	18.2
RW-5	3.3

*: Averaged using daily flow rates since previous monthly field measurements.

0 200 400

Scale 1 inch = 200 feet

NOTE

*: Well dry, elevation of bottom of A-Zone used in contouring.
**: RW-1 elevation not measured but estimated based on February, 1999 measurements when pump was operating at similar flow rate.
+: Bottom of A-Zone elevation used in contouring.
▲: Water Elevation not obtained from Olin Production Well.
●: Buffalo Avenue Sewer invert is assumed to be a groundwater sink. The piezometric surface is estimated as the bottom of the A-zone. The bottom of the A-zone along Buffalo Avenue was estimated from borings OBA-1A, OBA-2A, OBA-3A, and OBA-11A.

Three water level measurements were obtained in Gill Creek throughout the day at 10:45am (563.9 feet), 1:30pm (563.79 feet), and 5:00pm (563.6 feet). The Gill Creek elevation (563.6 feet) coinciding with the time water level measurements were obtained in the piezometers along Gill Creek was used in contouring in A zone.

POTENTIOMETRIC SURFACE CONTOUR GENERATED USING SURFER FOR WINDOWS BY GOLDEN SOFTWARE, INC. 1995.

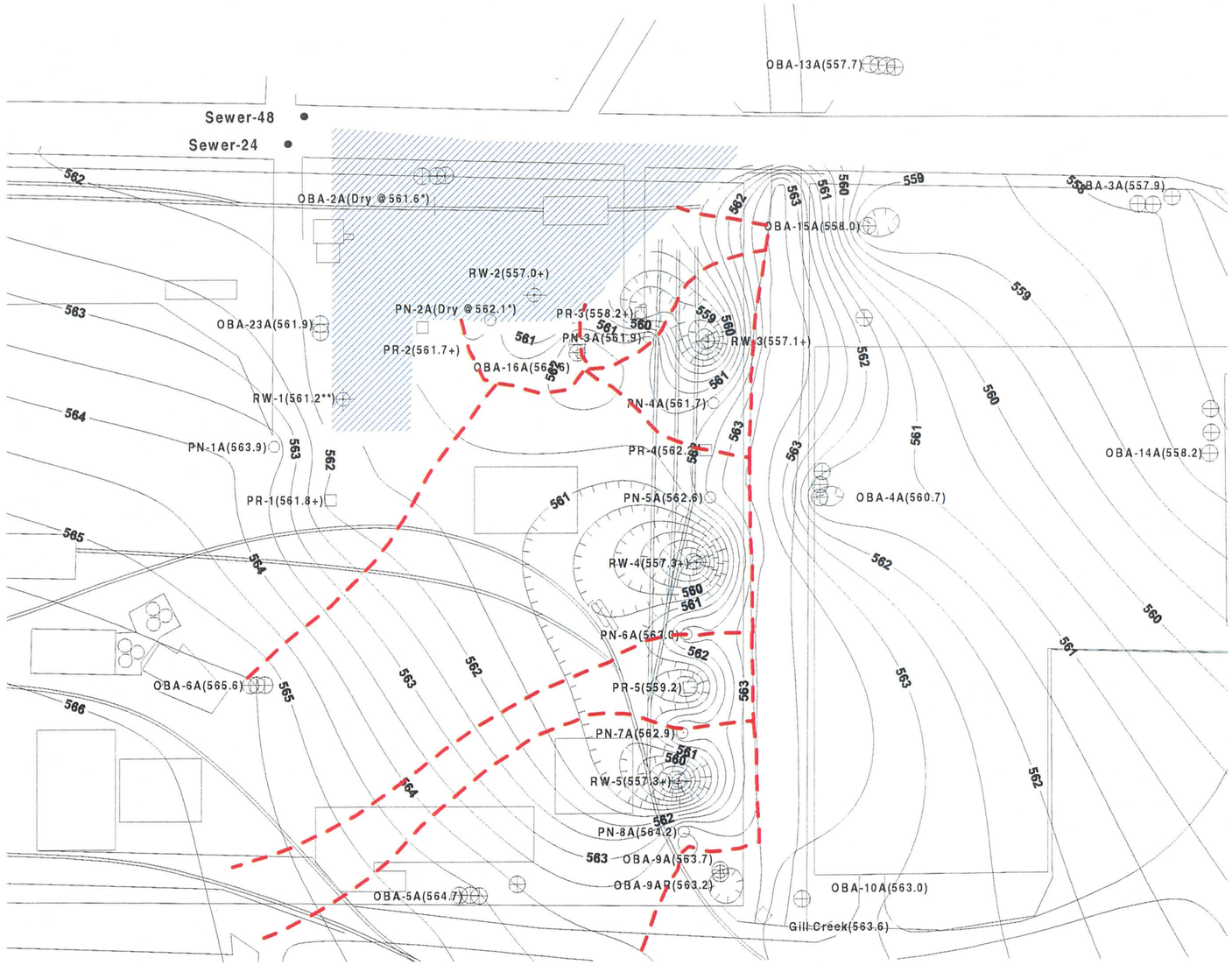
OLIN CHEMICAL
NIAGARA FALLS, NEW YORK

LAW
LAWGIBB Group Member

POTENTIOMETRIC SURFACE -- A ZONE (APRIL 8, 1999)

Job No.: 12000-8-0030

Figure 1



Well	Average Flow Rate(gpm)*
RW-1	2.8
RW-2	5.5
RW-3	3
RW-4	18.2
RW-5	3.3

*: Averaged using daily flow rates since previous monthly field measurements.

LEGEND

- GILL CREEK MONITORING POINT
- OLIN PRODUCTION WELL (FLOW RATE FROM DUPONT)
- WATER QUALITY MONITORING WELLS
- A/B ZONE PIEZOMETER NESTS
- GROUND WATER RECOVERY WELLS
- PASSIVE RELIEF WELLS
- SEWER INVERT
- PROPERTY LINE
- 565 — ESTIMATED GROUND-WATER CONTOUR LINES (CONTOUR INTERVAL: 0.5 FEET)
- ESTIMATED CAPTURE ZONE BOUNDARY
- ESTIMATED DRY AREA IN ZONE A

0 120 240

Scale 1 inch = 120 feet

NOTE

*: Well dry, elevation of bottom of A-Zone used in contouring.
**: RW-1 elevation not measured but estimated based on February, 1999 measurements when pump was operating at similar flow rate.
+: Bottom of A-Zone elevation used in contouring.
●: Buffalo Avenue Sewer invert is assumed to be a groundwater sink. The piezometric surface is estimated as the bottom of the A-zone. The bottom of the A-zone along Buffalo Avenue was estimated from borings OBA-1A, OBA-2A, OBA-3A, and OBA-11A.

Three water level measurements were obtained in Gill Creek throughout the day at 10:45am (563.9 feet), 1:30pm (563.79 feet), and 5:00pm (563.6 feet). The Gill Creek elevation (563.6 feet) coinciding with the time water level measurements were obtained in the piezometers along Gill Creek was used in contouring in A zone.

POTENTIOMETRIC SURFACE CONTOUR GENERATED USING SURFER FOR WINDOWS BY GOLDEN SOFTWARE, INC. 1995. CAPTURE ZONE BOUNDARY WAS DRAWN BASED THE FLOW PATHLINES GENERATED BY GWPATH.

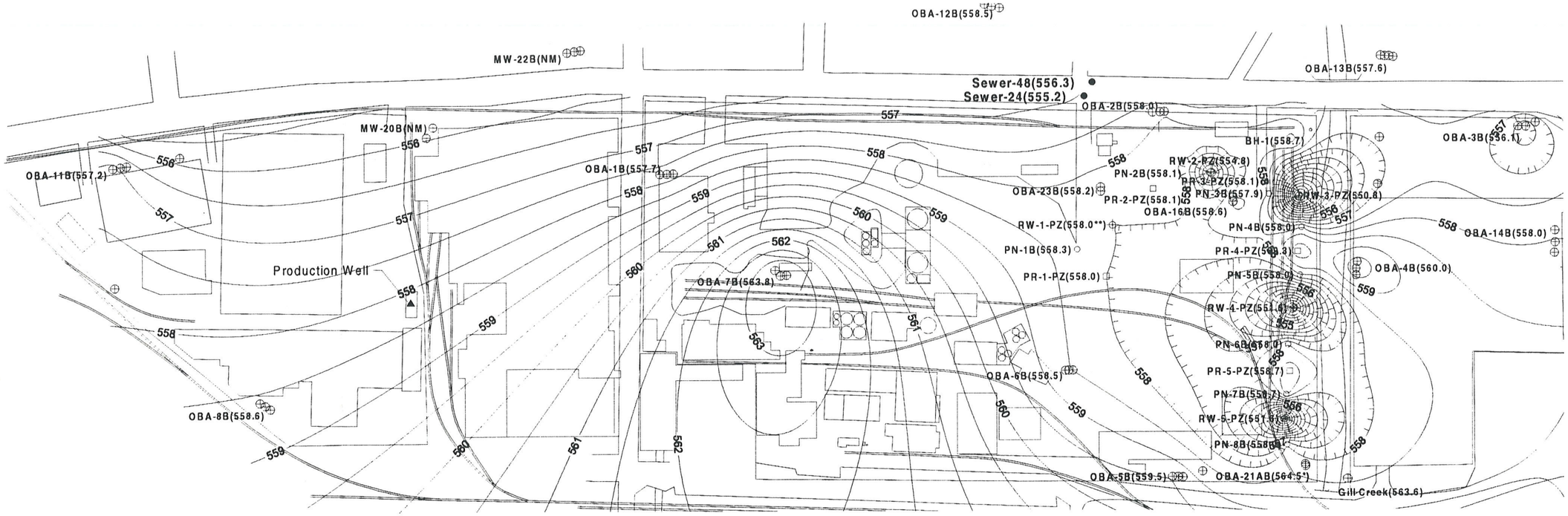
OLIN CHEMICAL
NIAGARA FALLS, NEW YORK

LAW
LAWGIBB Group Member

ESTIMATED CAPTURE ZONE AND
POTENTIOMETRIC SURFACE -- A ZONE
(APRIL 8, 1999)

Job No.: 12000-8-0030

Figure 1A



LEGEND

- ◇ GILL CREEK MONITORING POINT
- ▲ OLIN PRODUCTION WELL (FLOW RATE FROM DUPONT)
- ⊕ WATER QUALITY MONITORING WELLS
- ○ A/B ZONE PIEZOMETER NESTS
- ⊕ GROUND WATER RECOVERY WELLS
- □ PASSIVE RELIEF WELLS
- ● SEWER INVERT ELEVATION
- ——— PROPERTY LINE
- ——— 565 ——— ESTIMATED GROUND-WATER CONTOUR LINES (CONTOUR INTERVAL: 0.5 FEET)

Well	Average Flow Rate(gpm)*
RW-1	2.8
RW-2	5.5
RW-3	3
RW-4	18.2
RW-5	3.3

*: Averaged using daily flow rates since previous monthly field measurements.

NOTE

*: Elevation not used in contouring.
**: RW-1 elevation not measured but estimated based on February, 1999 measurements when pump was operating at similar flow rate.
▲: Olin Production Well.
●: Buffalo Avenue Sewer invert is assumed to be a ground-water sink. The piezometric surface is not known. The ground water contours were estimated based on the sewer invert elevation.
PN-2B elevation used as dummy points north of RW-2.

Three water level measurements were obtained in Gill Creek throughout the day at 10:45am (563.9 feet), 1:30pm (563.79 feet), and 5:00pm (563.6 feet). The Gill Creek elevation was not used in contouring the B zone but is included on the map for comparative purposes.

POTENTIOMETRIC SURFACE CONTOUR GENERATED USING SURFER FOR WINDOWS BY GOLDEN SOFTWARE, INC. 1995.

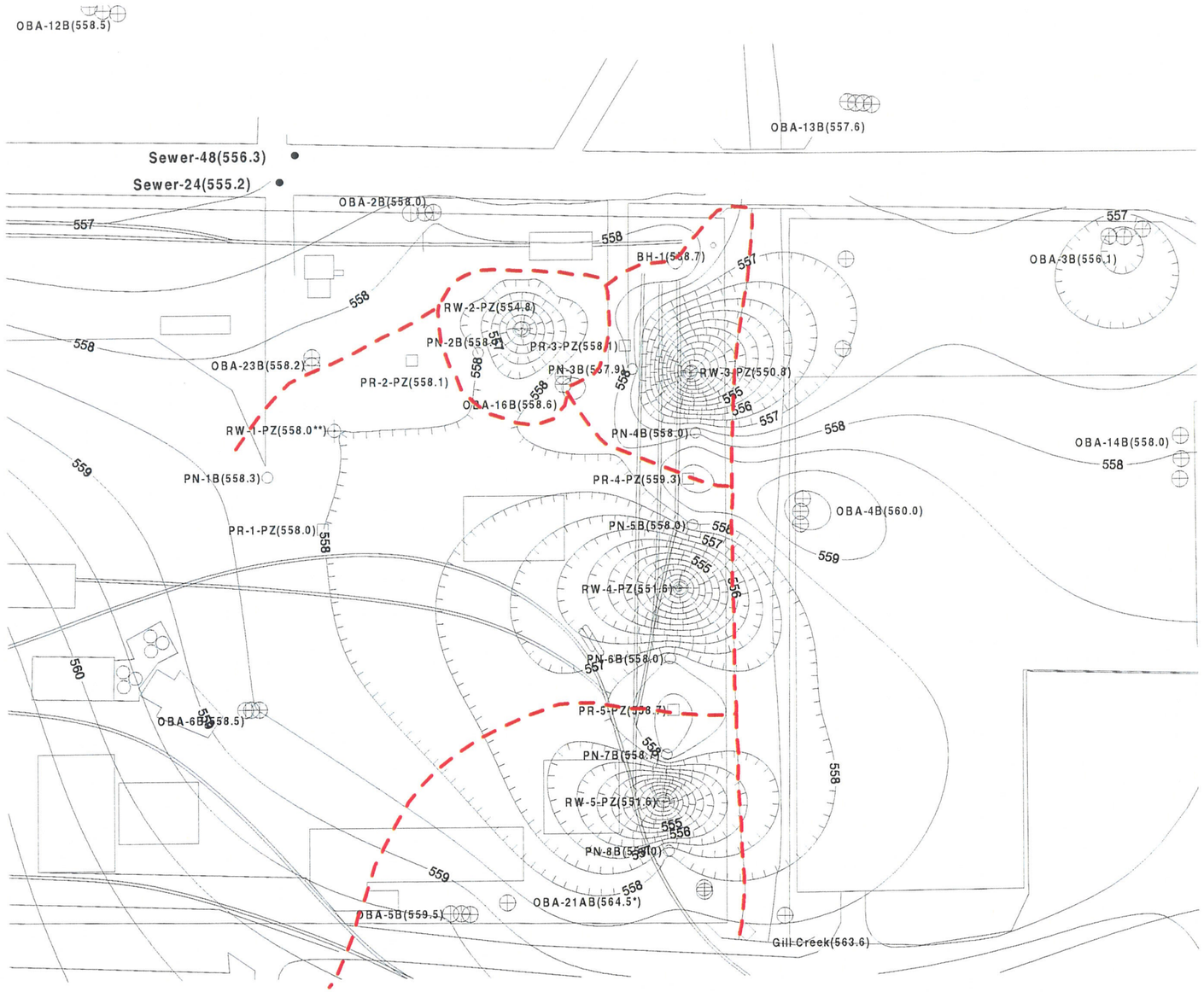
OLIN CHEMICAL
NIAGARA FALLS, NEW YORK

LAW
LAWGIBB Group Member

POTENTIOMETRIC SURFACE -- B ZONE
(APRIL 8, 1999)

Job No.: 12000-8-0030

Figure 2



Well	Average Flow Rate(gpm)*
RW-1	2.8
RW-2	5.5
RW-3	3
RW-4	18.2
RW-5	3.3

*: Averaged using daily flow rates since previous monthly field measurements.

LEGEND

- ◇ GILL CREEK MONITORING POINT
- ▲ OLIN PRODUCTION WELL (FLOW RATE FROM DUPONT)
- ⊕ WATER QUALITY MONITORING WELLS
- ○ A/B ZONE PIEZOMETER NESTS
- ⊕ GROUND WATER RECOVERY WELLS (FLOW RATE FROM OMNX SYSTEM)
- □ PASSIVE RELIEF WELLS
- ● SEWER INVERT ELEVATION
- PROPERTY LINE
- 565 ESTIMATED GROUND-WATER CONTOUR LINES (CONTOUR INTERVAL: 0.5 FEET)
- ESTIMATED CAPTURE ZONE BOUNDARY

0 120 240

Scale 1 inch = 120 feet

NOTE

*: Elevation not used in contouring.
**: RW-1 elevation not measured but estimated based on February, 1999 measurements when pump was operating at similar flow rate.
▲: Olin Production Well.
●: Buffalo Avenue Sewer invert is assumed to be a ground-water sink. The piezometric surface is not known. The ground water conturs were estimated based on the sewer invert elevation. PN-2B elevation used as dummy points north of RW-2.

Three water level measurements were obtained in Gill Creek throughout the day at 10:45am (563.9 feet), 1:30pm (563.79 feet), and 5:00pm (563.6 feet). The Gill Creek elevation was not used in contouring the B zone but is included on the map for comparative purposes.

POTENTIOMETRIC SURFACE CONTOUR GENERATED USING SURFER FOR WINDOWS BY GOLDEN SOFTWARE, INC. 1995. CAPTURE ZONE BOUNDARY WAS DRAWN BASED THE FLOW PATHLINES GENERATED BY GWPATH.

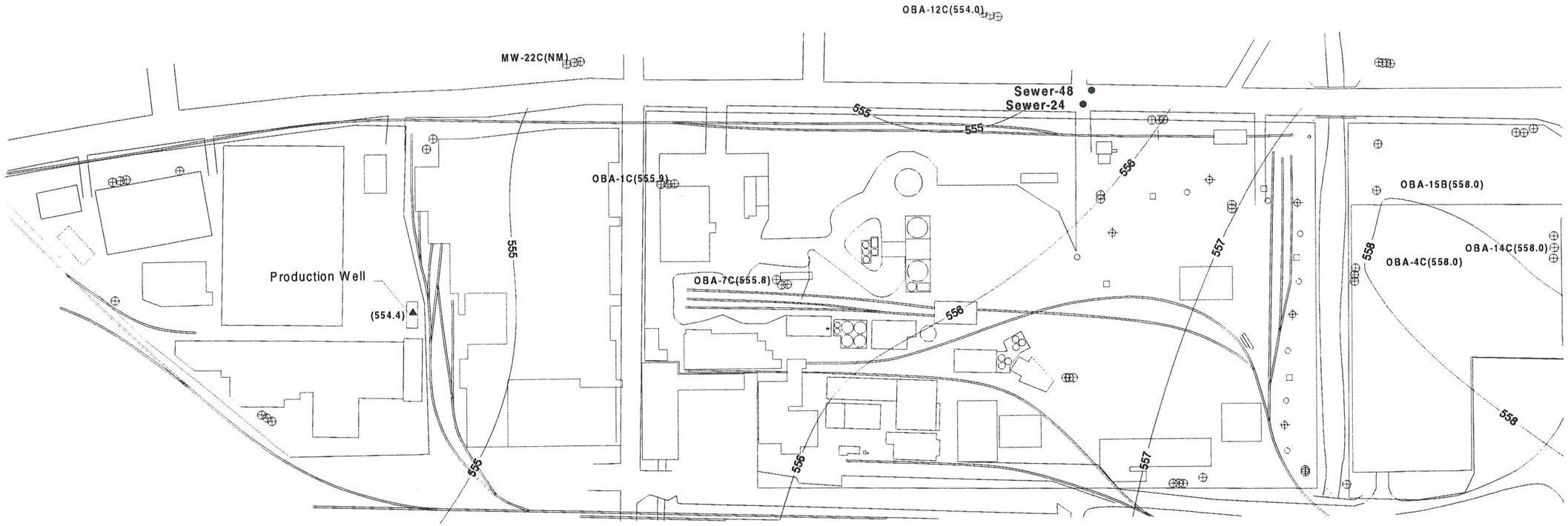
OLIN CHEMICAL
NIAGARA FALLS, NEW YORK

LAW
LAWGIBB Group Member

ESTIMATED CAPTURE ZONE AND
POTENTIOMETRIC SURFACE -- B ZONE
(APRIL 8, 1999)

Job No.: 12000-8-0030

Figure 2A



N

LEGEND

- ◇ GILL CREEK MONITORING POINT
- ▲ OLIN PRODUCTION WELL (FLOW RATE FROM DUPONT)
- ⊕ WATER QUALITY MONITORING WELLS
- ○ A/B ZONE PIEZOMETER NESTS
- ⌖ GROUND WATER RECOVERY WELLS (FLOW RATE FROM OMNX SYSTEM)
- □ PASSIVE RELIEF WELLS
- ● SEWER INVERT
- ——— PROPERTY LINE
- —— 565 —— ESTIMATED GROUND-WATER CONTOUR LINES (CONTOUR INTERVAL: 1 FEET)

Well	Average Flow Rate(gpm)
Olin Production Well	563

0 200 400

Scale 1 inch = 200 feet

NOTE

▲: Water Elevation not obtained from Olin Production Well. Water elevation estimated from pumping rate of 563.0 gpm on April 8, 1999 using Figure 4-17 from Phase I RFI.

POTENTIOMETRIC SURFACE CONTOUR GENERATED USING SURFER FOR WINDOWS BY GOLDEN SOFTWARE, INC. 1995.

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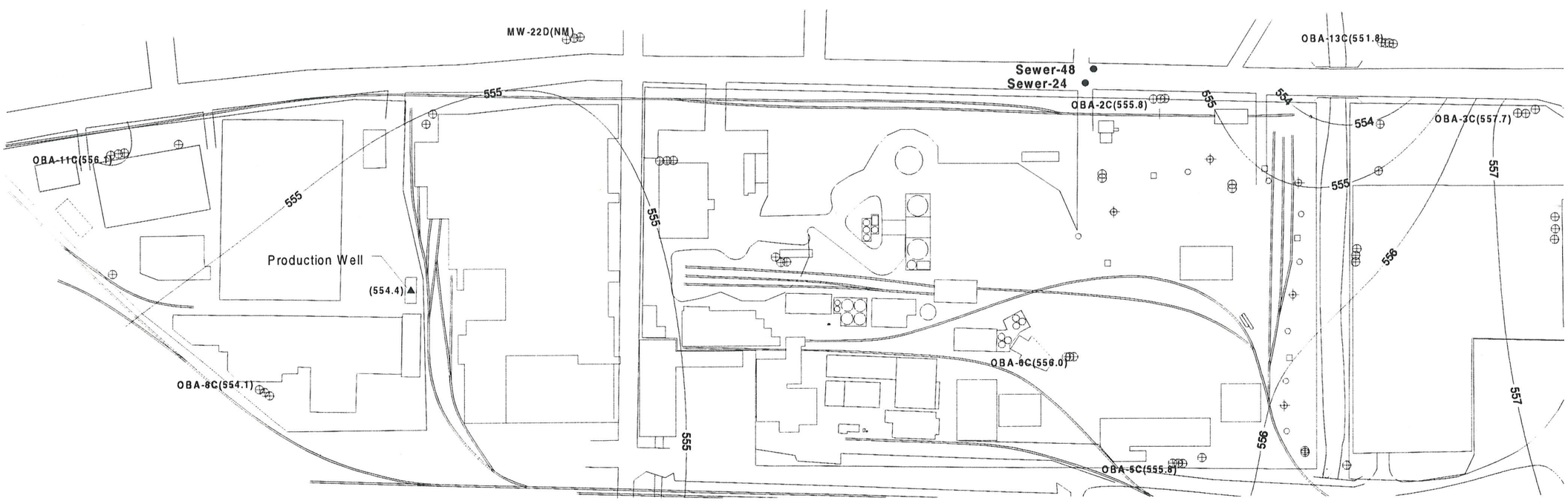
POTENTIOMETRIC SURFACE -- C ZONE (APRIL 8, 1999)

Job No.: 12000-8-0030

Figure 3



LEGEND

- ◇ GILL CREEK MONITORING POINT
- ▲ OLIN PRODUCTION WELL (FLOW RATE FROM DUPONT)
- ⊕ WATER QUALITY MONITORING WELLS
- ○ A/B ZONE PIEZOMETER NESTS
- ⊕ GROUND WATER RECOVERY WELLS (FLOW RATE FROM OMNX SYSTEM)
- □ PASSIVE RELIEF WELLS
- ● SEWER INVERT
- PROPERTY LINE
- 565 ESTIMATED GROUND-WATER CONTOUR LINES (CONTOUR INTERVAL: 1 FEETS)

Well	Average Flow Rate(gpm)
Olin Production Well	563

0 200 400

Scale 1 inch = 200 feet

NOTE

▲: Water Elevation not obtained from Olin Production Well. Water elevation estimated from pumping rate of 563.0 gpm on April 8. 2, 1999 using Figure 4-17 from Phase I RFI.

POTENTIOMETRIC SURFACE CONTOUR GENERATED USING SURFER FOR WINDOWS BY GOLDEN SOFTWARE, INC. 1995.

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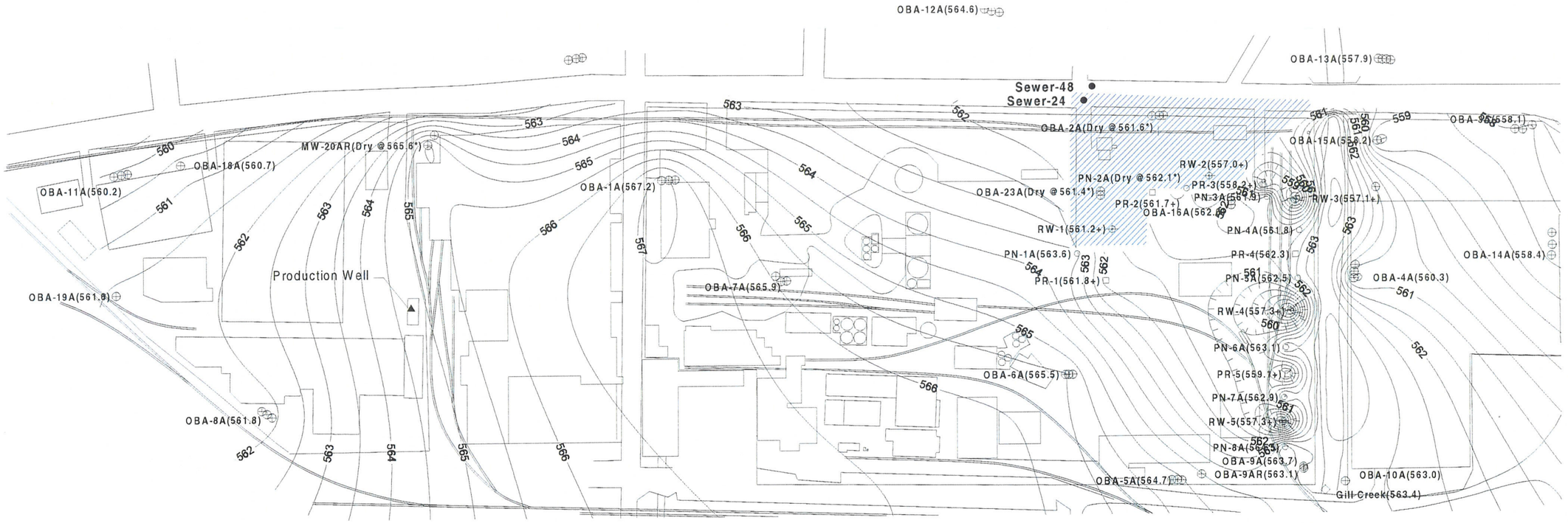
POTENTIOMETRIC SURFACE -- CD ZONE
(APRIL 8, 1999)

Job No.: 12000-8-0030

Figure 4



LEGEND

- ◇ GILL CREEK MONITORING POINT
- ▲ OLIN PRODUCTION WELL (FLOW RATE FROM DUPONT)
- ⊕ WATER QUALITY MONITORING WELLS
- ○ A/B ZONE PIEZOMETER NESTS
- ⊕ GROUND WATER RECOVERY WELLS
- □ PASSIVE RELIEF WELLS
- ● SEWER INVERT
- PROPERTY LINE
- 565 ESTIMATED GROUND-WATER CONTOUR LINES (CONTOUR INTERVAL: 0.5 FEET)
- ESTIMATED DRY AREA IN ZONE A

Well	Average Flow Rate(gpm)*
RW-1	2.7
RW-2	5.0
RW-3	2.8
RW-4	18.0
RW-5	3.4

*: Averaged using daily flow rates since previous monthly field measurements.

NOTE

*: Well dry, elevation of bottom of A-Zone used in contouring.
+: Bottom of A-Zone elevation used in contouring.
▲: Water Elevation not obtained from Olin Production Well.
●: Buffalo Avenue Sewer invert is assumed to be a groundwater sink. The piezometric surface is estimated as the bottom of the A-zone. The bottom of the A-zone along Buffalo Avenue was estimated from borings OBA-1A, OBA-2A, OBA-3A, and OBA-11A.

Three water level measurements were obtained in Gill Creek throughout the day at 1:00pm (563.68 feet), 3:30pm (563.47 feet), and 4:30pm (563.4 feet). The Gill Creek elevation (563.4 feet) coinciding with the time water level measurements were obtained in the piezometers along Gill Creek was used in contouring in A zone.

POTENTIOMETRIC SURFACE CONTOUR GENERATED USING SURFER FOR WINDOWS BY GOLDEN SOFTWARE, INC. 1995.

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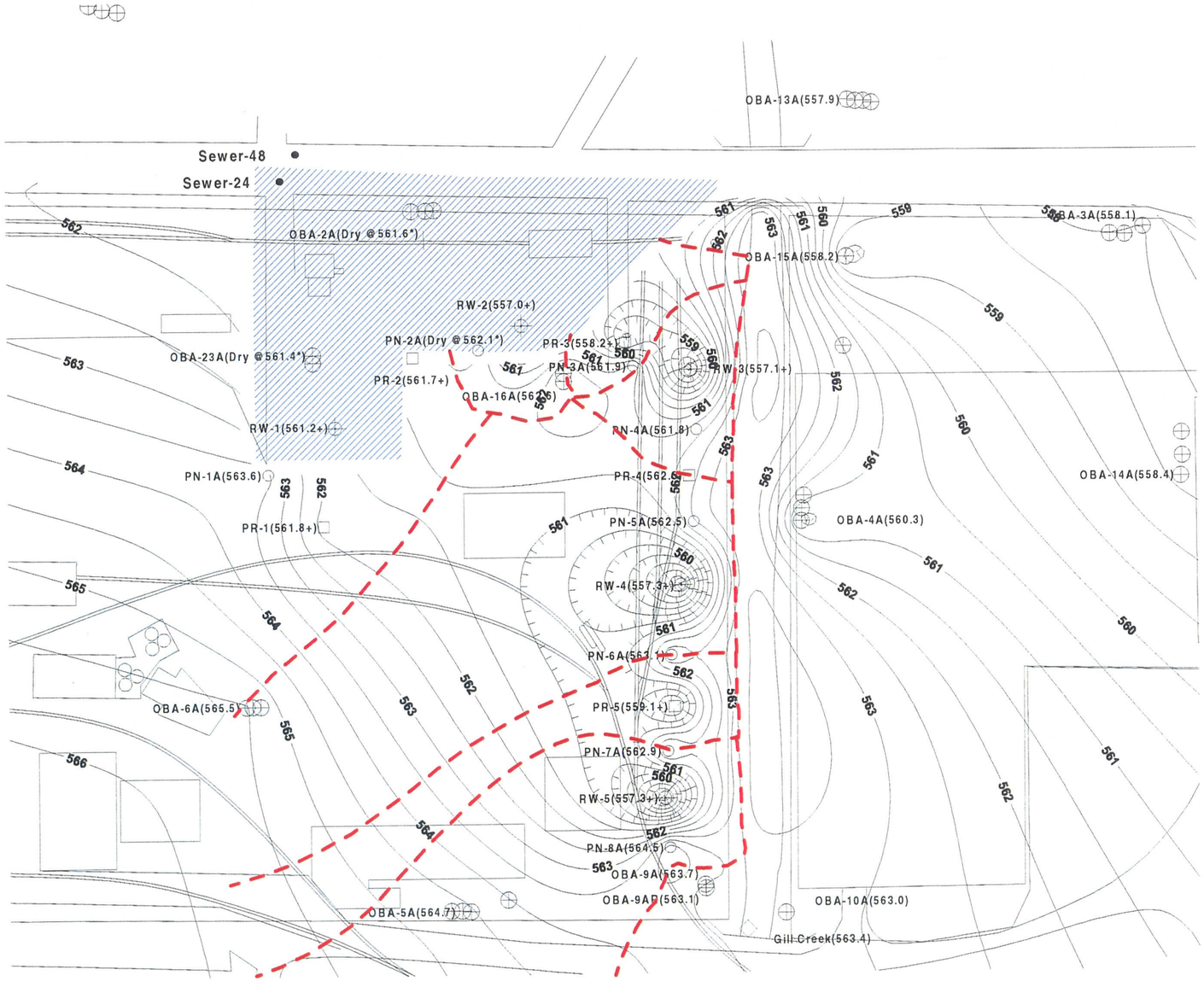
LAW
LAWGIBB Group Member

POTENTIOMETRIC SURFACE -- A ZONE
(MAY 17, 1999)

Job No.: 12000-8-0030

Figure 5



Well	Average Flow Rate(gpm)*
RW-1	2.7
RW-2	5.0
RW-3	2.8
RW-4	18.0
RW-5	3.4

*: Averaged using daily flow rates since previous monthly field measurements.

LEGEND

- GILL CREEK MONITORING POINT
- OLIN PRODUCTION WELL (FLOW RATE FROM DUPONT)
- WATER QUALITY MONITORING WELLS
- A/B ZONE PIEZOMETER NESTS
- GROUND WATER RECOVERY WELLS
- PASSIVE RELIEF WELLS
- SEWER INVERT
- PROPERTY LINE
- 565 — ESTIMATED GROUND-WATER CONTOUR LINES (CONTOUR INTERVAL: 0.5 FEET)
- ESTIMATED CAPTURE ZONE BOUNDARY
- ESTIMATED DRY AREA IN ZONE A

0 120 240

Scale 1 inch = 120 feet

NOTE

*: Well dry, elevation of bottom of A-Zone used in contouring.
+: Bottom of A-Zone elevation used in contouring.
●: Buffalo Avenue Sewer invert is assumed to be a groundwater sink.
The piezometric surface is estimated as the bottom of the A-zone.
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POTENTIOMETRIC SURFACE CONTOUR GENERATED USING SURFER FOR WINDOWS BY GOLDEN SOFTWARE, INC. 1995. CAPTURE ZONE BOUNDARY WAS DRAWN BASED THE FLOW PATHLINES GENERATED BY GWPATH.

OLIN CHEMICAL
NIAGARA FALLS, NEW YORK

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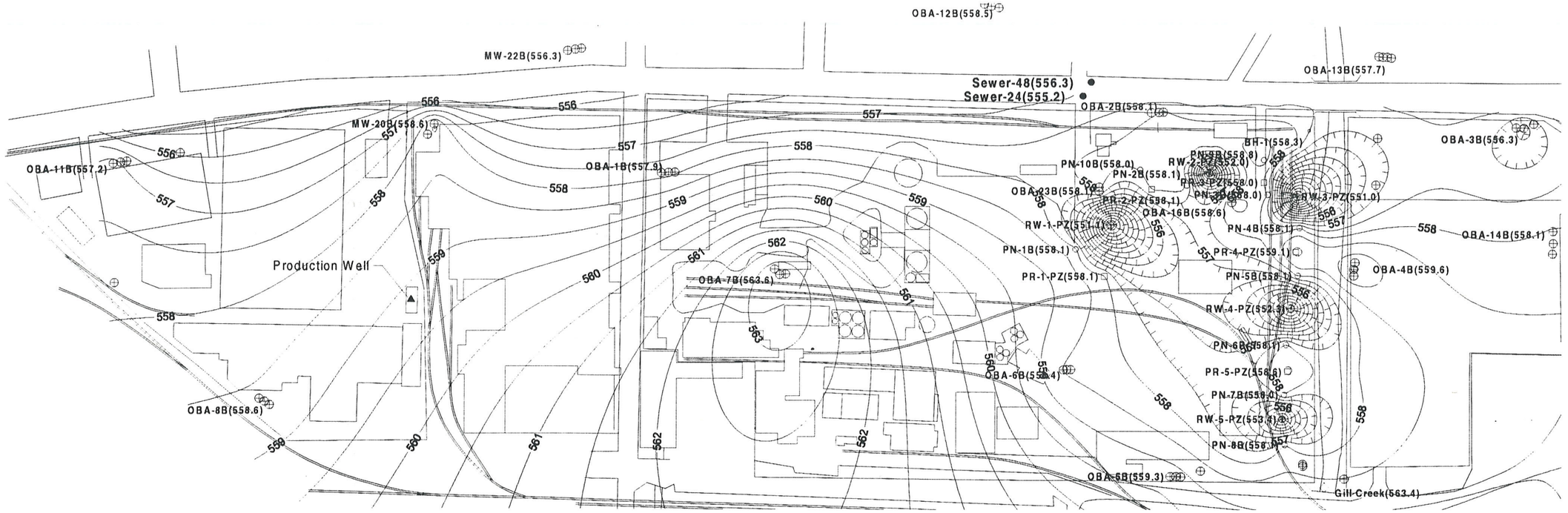
ESTIMATED CAPTURE ZONE AND
POTENTIOMETRIC SURFACE -- A ZONE
(MAY 17, 1999)

Job No : 12000-8-0030

Figure 5A



0 200 400

Scale 1 inch = 200 feet

LEGEND

- ◇ GILL CREEK MONITORING POINT
- ▲ OLIN PRODUCTION WELL (FLOW RATE FROM DUPONT)
- ⊕ WATER QUALITY MONITORING WELLS
- ○ A/B ZONE PIEZOMETER NESTS
- ⊕ GROUND WATER RECOVERY WELLS
- □ PASSIVE RELIEF WELLS
- ● SEWER INVERT ELEVATION
- PROPERTY LINE
- 565 ESTIMATED GROUND-WATER CONTOUR LINES (CONTOUR INTERVAL: 0.5 FEET)

Well	Average Flow Rate(gpm)*
RW-1	2.7
RW-2	5.0
RW-3	2.8
RW-4	18.0
RW-5	3.4

*: Averaged using daily flow rates since previous monthly field measurements.

NOTE

▲: Olin Production Well.
●: Buffalo Avenue Sewer invert is assumed to be a ground-water sink. The piezometric surface is not known. The ground water contours were estimated based on the sewer invert elevation. PN-2B elevation used as dummy points north of RW-2.

Three water level measurements were obtained in Gill Creek throughout the day at 1:00am (563.68 feet), 3:30pm (563.47 feet), and 4:30pm (563.4 feet). The Gill Creek elevation was not used in contouring the B zone but is included on the map for comparative purposes.

POTENTIOMETRIC SURFACE CONTOUR GENERATED USING SURFER FOR WINDOWS BY GOLDEN SOFTWARE, INC. 1995.

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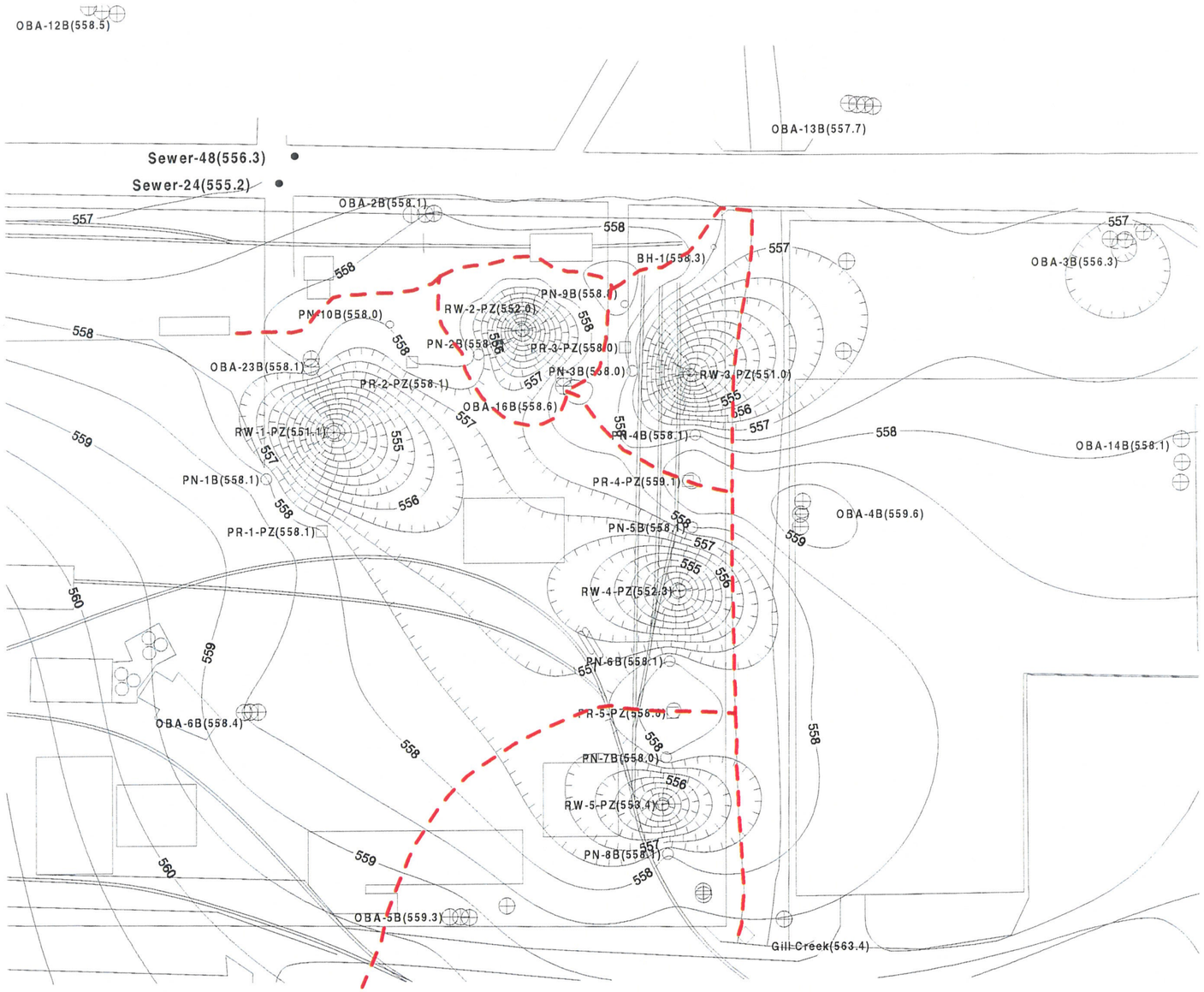
POTENTIOMETRIC SURFACE -- B ZONE
(MAY 17, 1999)

Job No.: 12000-8-0030

Figure 6



Well	Average Flow Rate(gpm)*
RW-1	2.7
RW-2	5.0
RW-3	2.8
RW-4	18.0
RW-5	3.4

*: Averaged using daily flow rates since previous monthly field measurements.

LEGEND

- ◇ GILL CREEK MONITORING POINT
- ▲ OLIN PRODUCTION WELL (FLOW RATE FROM DUPONT)
- ⊕ WATER QUALITY MONITORING WELLS
- ○ A/B ZONE PIEZOMETER NESTS
- ⊕ GROUND WATER RECOVERY WELLS (FLOW RATE FROM OMNX SYSTEM)
- □ PASSIVE RELIEF WELLS
- ● SEWER INVERT ELEVATION
- ——— PROPERTY LINE
- 565 ESTIMATED GROUND-WATER CONTOUR LINES (CONTOUR INTERVAL: 0.5 FEET)
- - - - ESTIMATED CAPTURE ZONE BOUNDARY

0 120 240

Scale 1 inch = 120 feet

NOTE

▲: Olin Production Well.
●: Buffalo Avenue Sewer invert is assumed to be a ground-water sink. The piezometric surface is not known. The ground water conturs were estimated based on the sewer invert elevation. PN-2B elevation used as dummy points north of RW-2.

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POTENTIOMETRIC SURFACE CONTOUR GENERATED USING SURFER FOR WINDOWS BY GOLDEN SOFTWARE, INC. 1995. CAPTURE ZONE BOUNDARY WAS DRAWN BASED THE FLOW PATHLINES GENERATED BY GWPATH.

OLIN CHEMICAL
NIAGARA FALLS, NEW YORK

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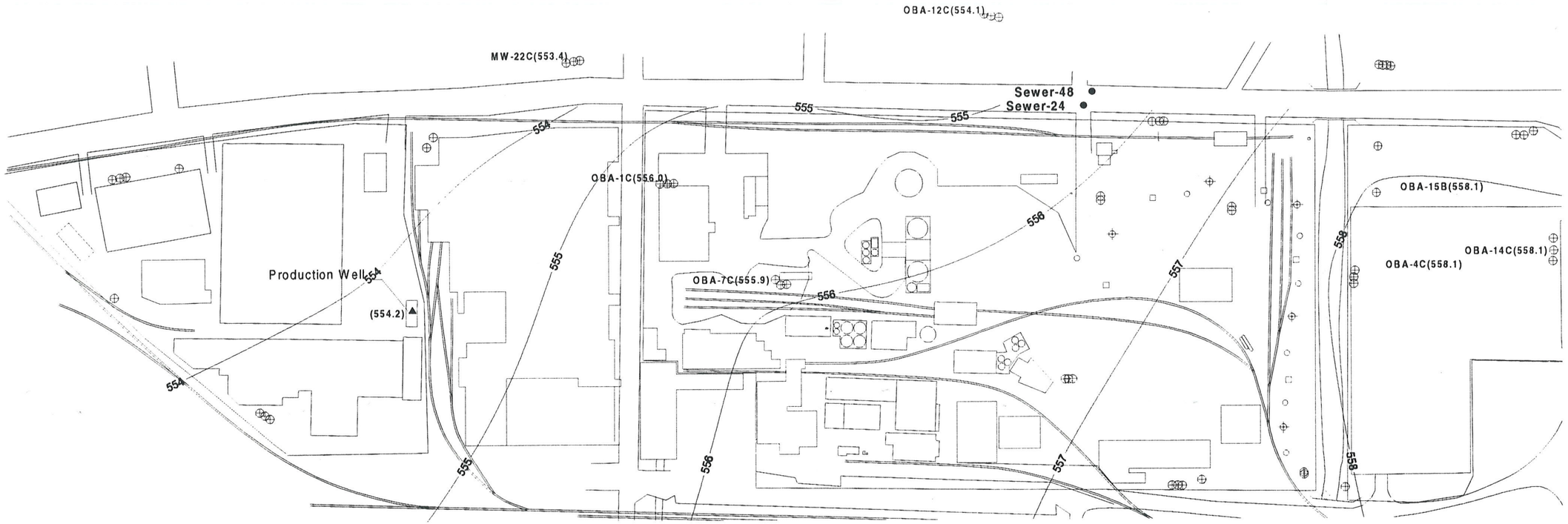
ESTIMATED CAPTURE ZONE AND
POTENTIOMETRIC SURFACE -- B ZONE
(MAY 17, 1999)

Job No.: 12000-8-0030

Figure 6A



LEGEND

- ◇ GILL CREEK MONITORING POINT
- ▲ OLIN PRODUCTION WELL (FLOW RATE FROM DUPONT)
- ⊕ WATER QUALITY MONITORING WELLS
- ○ A/B ZONE PIEZOMETER NESTS
- ⊕ GROUND WATER RECOVERY WELLS (FLOW RATE FROM OMNX SYSTEM)
- □ PASSIVE RELIEF WELLS
- ● SEWER INVERT
- ——— PROPERTY LINE
- —— 565 —— ESTIMATED GROUND-WATER CONTOUR LINES (CONTOUR INTERVAL: 1 FEET)

Well	Average Flow Rate(gpm)
Olin Production Well	613

0 200 400

Scale 1 inch = 200 feet

NOTE

▲: Water Elevation not obtained from Olin Production Well. Water elevation estimated from pumping rate of 613 gpm on May 17, 1999 using Figure 4-17 from Phase I RFI.

POTENTIOMETRIC SURFACE CONTOUR GENERATED USING SURFER FOR WINDOWS BY GOLDEN SOFTWARE, INC. 1995.

OLIN CHEMICAL
NIAGARA FALLS, NEW YORK

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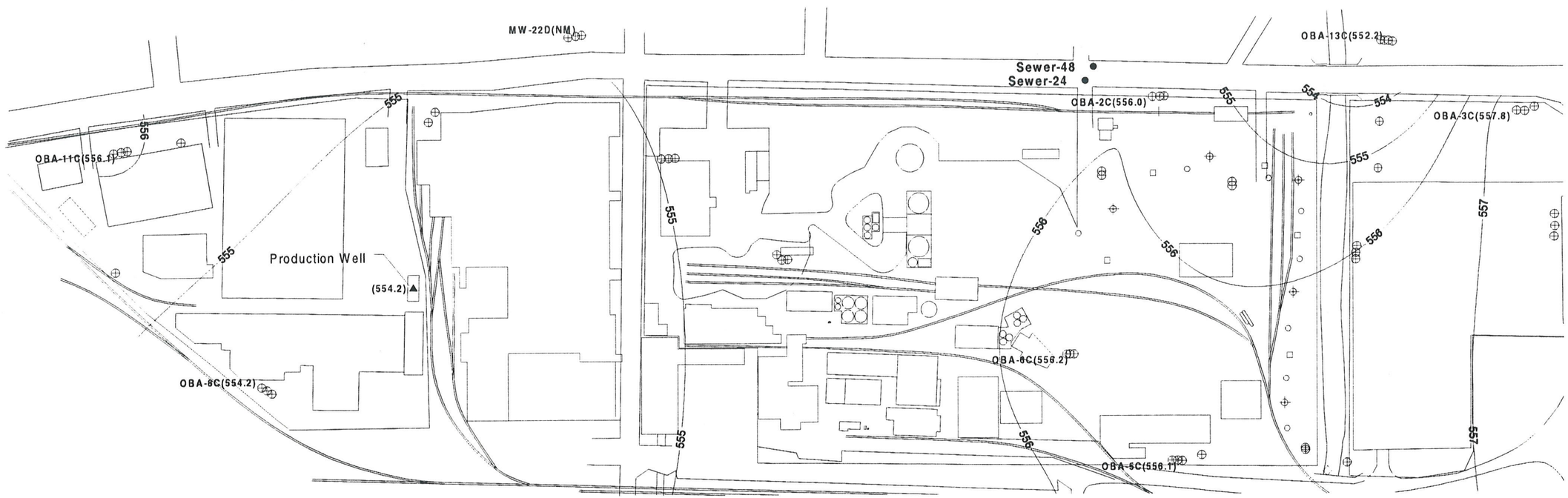
POTENTIOMETRIC SURFACE -- C ZONE
(MAY 17, 1999)

Job No.: 12000-8-0030

Figure 7



LEGEND

- ◇ GILL CREEK MONITORING POINT
- ▲ OLIN PRODUCTION WELL (FLOW RATE FROM DUPONT)
- ⊕ WATER QUALITY MONITORING WELLS
- ○ A/B ZONE PIEZOMETER NESTS
- ⊕ GROUND WATER RECOVERY WELLS (FLOW RATE FROM OMNX SYSTEM)
- □ PASSIVE RELIEF WELLS
- ● SEWER INVERT
- ——— PROPERTY LINE
- —— 565 —— ESTIMATED GROUND-WATER CONTOUR LINES (CONTOUR INTERVAL: 1 FEETS)

Well	Average Flow Rate(gpm)
Olin Production Well	613

0 200 400

Scale 1 inch = 200 feet

NOTE

▲: Water Elevation not obtained from Olin Production Well. Water elevation estimated from pumping rate of 613.0 gpm on May 17, 1999 using Figure 4-17 from Phase I RFI.

POTENTIOMETRIC SURFACE CONTOUR GENERATED USING SURFER FOR WINDOWS BY GOLDEN SOFTWARE, INC. 1995.

OLIN CHEMICAL
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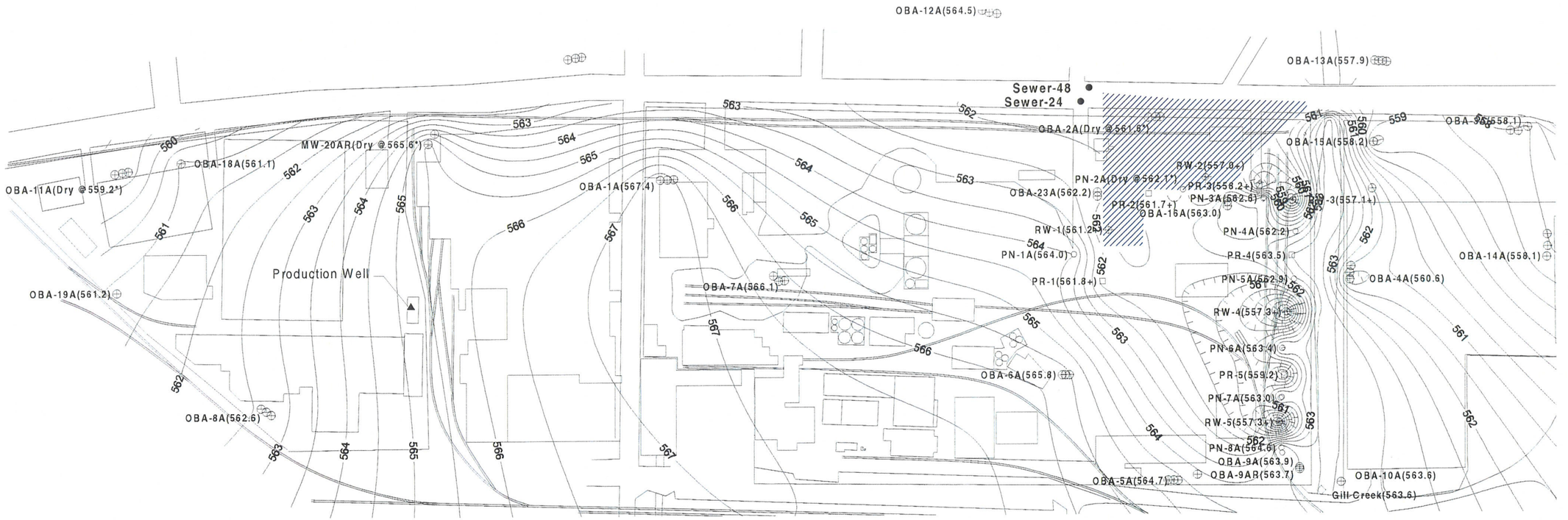
POTENTIOMETRIC SURFACE -- CD ZONE (MAY 17, 1999)

Job No.: 12000-8-0030

Figure 8



Scale 1 inch = 200 feet

LEGEND

- ◇ GILL CREEK MONITORING POINT
- ▲ OLIN PRODUCTION WELL (FLOW RATE FROM DUPONT)
- ⊕ WATER QUALITY MONITORING WELLS
- ○ A/B ZONE PIEZOMETER NESTS
- ⊕ GROUND WATER RECOVERY WELLS
- □ PASSIVE RELIEF WELLS
- ● SEWER INVERT
- PROPERTY LINE
- 565 ESTIMATED GROUND-WATER CONTOUR LINES (CONTOUR INTERVAL: 0.5 FEET)
- ESTIMATED DRY AREA IN ZONE A

Well	Average Flow Rate(gpm)*
RW-1	2.8
RW-2	5.2
RW-3	2.0
RW-4	17.9
RW-5	4.1

* : Averaged using daily flow rates since previous monthly field measurements.

NOTE

* : Well dry, elevation of bottom of A-Zone used in contouring.
+ : Bottom of A-Zone elevation used in contouring.
▲ : Water Elevation not obtained from Olin Production Well.
● : Buffalo Avenue Sewer invert is assumed to be a groundwater sink. The piezometric surface is estimated as the bottom of the A-zone. The bottom of the A-zone along Buffalo Avenue was estimated from borings OBA-1A, OBA-2A, OBA-3A, and OBA-11A.

Three water level measurements were obtained in Gill Creek throughout the day at 8:50am (564.08 feet), 12:25pm (563.98 feet), and 5:45pm (563.6 feet). The Gill Creek elevation (563.6 feet) coinciding with the time water level measurements were obtained in the piezometers along Gill Creek was used in contouring in A zone.

POTENTIOMETRIC SURFACE CONTOUR GENERATED USING SURFER FOR WINDOWS BY GOLDEN SOFTWARE, INC. 1995.

OLIN CHEMICAL
NIAGARA FALLS, NEW YORK

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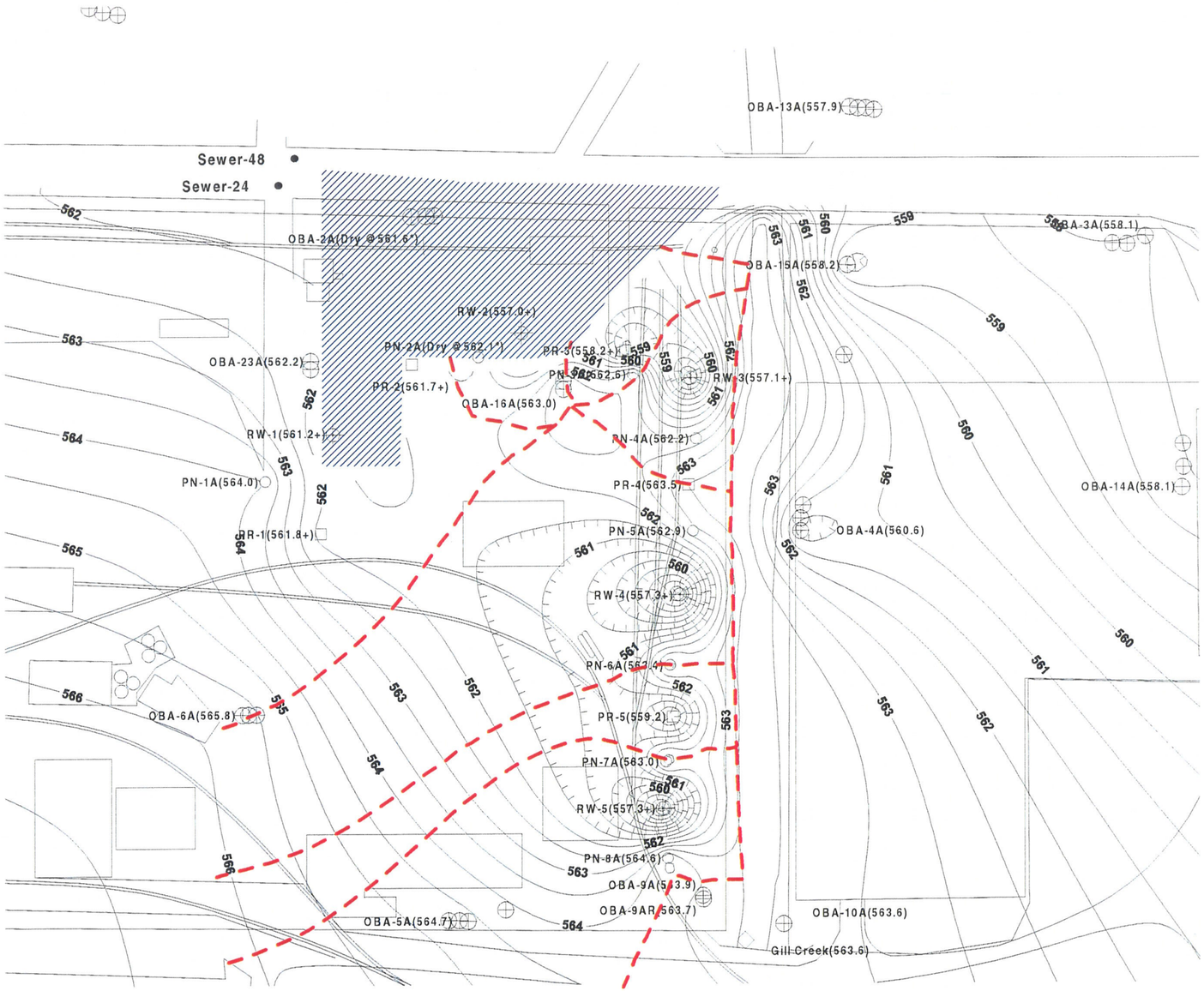
POTENTIOMETRIC SURFACE -- A ZONE
(JUNE 4, 1999)

Job No.: 12000-8-0030

Figure 9



Well	Average Flow Rate(gpm)*
RW-1	2.8
RW-2	5.2
RW-3	2.0
RW-4	17.9
RW-5	4.1

*: Averaged using daily flow rates since previous monthly field measurements.

LEGEND

- GILL CREEK MONITORING POINT
- OLIN PRODUCTION WELL (FLOW RATE FROM DUPONT)
- WATER QUALITY MONITORING WELLS
- A/B ZONE PIEZOMETER NESTS
- GROUND WATER RECOVERY WELLS
- PASSIVE RELIEF WELLS
- SEWER INVERT
- PROPERTY LINE
- 565 — ESTIMATED GROUND-WATER CONTOUR LINES (CONTOUR INTERVAL: 0.5 FEET)
- ESTIMATED CAPTURE ZONE BOUNDARY
- ESTIMATED DRY AREA IN ZONE A

0 120 240

Scale 1 inch = 120 feet

NOTE

*: Well dry, elevation of bottom of A-Zone used in contouring.
+: Bottom of A-Zone elevation used in contouring.
●: Buffalo Avenue Sewer invert is assumed to be a groundwater sink.
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POTENTIOMETRIC SURFACE CONTOUR GENERATED USING SURFER FOR WINDOWS BY GOLDEN SOFTWARE, INC. 1995. CAPTURE ZONE BOUNDARY WAS DRAWN BASED THE FLOW PATHLINES GENERATED BY GWPATH.

OLIN CHEMICAL
NIAGARA FALLS, NEW YORK

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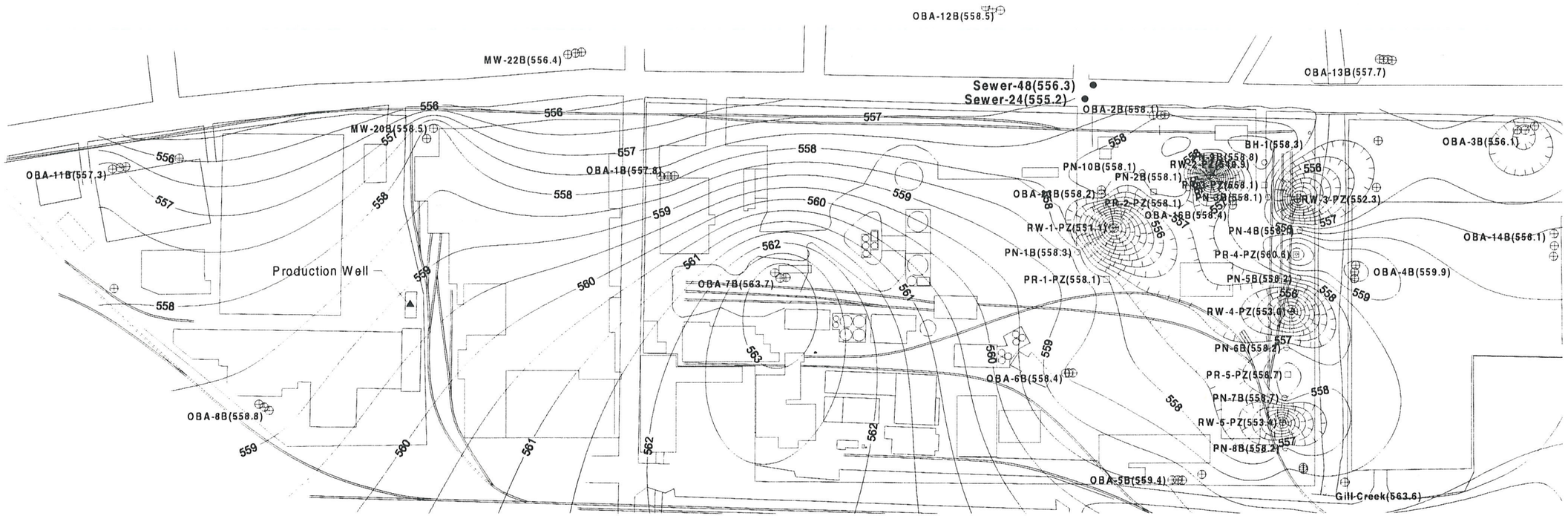
LAWGIBB Group Member

ESTIMATED CAPTURE ZONE AND
POTENTIOMETRIC SURFACE -- A ZONE
(JUNE 4, 1999)

Job No.: 12000-8-0030

Figure 9A



LEGEND

- ◇ GILL CREEK MONITORING POINT
- ▲ OLIN PRODUCTION WELL (FLOW RATE FROM DUPONT)
- ⊕ WATER QUALITY MONITORING WELLS
- ○ A/B ZONE PIEZOMETER NESTS
- ⌖ GROUND WATER RECOVERY WELLS
- □ PASSIVE RELIEF WELLS
- ● SEWER INVERT ELEVATION
- PROPERTY LINE
- 565 ESTIMATED GROUND-WATER CONTOUR LINES (CONTOUR INTERVAL: 0.5 FEET)

Well	Average Flow Rate(gpm)*
RW-1	2.8
RW-2	5.2
RW-3	2.0
RW-4	17.9
RW-5	4.1

*: Averaged using daily flow rates since previous monthly field measurements.

NOTE

▲: Olin Production Well.
●: Buffalo Avenue Sewer invert is assumed to be a ground-water sink. The piezometric surface is not known. The ground water contours were estimated based on the sewer invert elevation.
PN-2B elevation used as dummy points north of RW-2.

Three water level measurements were obtained in Gill Creek throughout the day at 8:50am (564.08 feet), 12:25pm (563.98 feet), and 5:45pm (563.6 feet). The Gill Creek elevation was not used in contouring the B zone but is included on the map for comparative purposes.

POTENTIOMETRIC SURFACE CONTOUR GENERATED USING SURFER FOR WINDOWS BY GOLDEN SOFTWARE, INC. 1995.

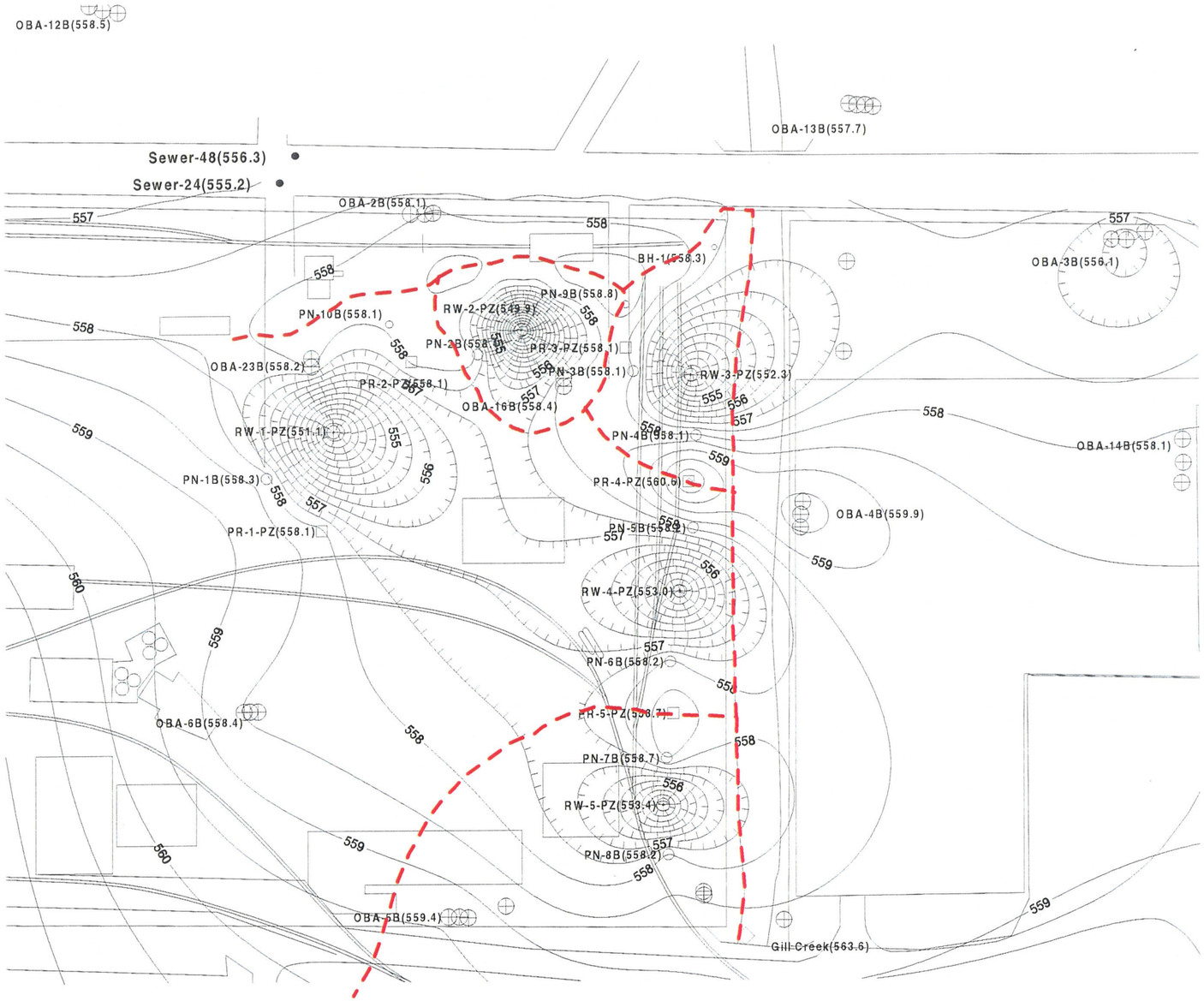
OLIN CHEMICAL
NIAGARA FALLS, NEW YORK

LAW
LAWGIBB Group Member

POTENTIOMETRIC SURFACE -- B ZONE
(JUNE 4, 1999)

Job No.: 12000-8-0030

Figure 10



Well	Average Flow Rate(gpm)*
RW-1	2.8
RW-2	5.2
RW-3	2.0
RW-4	17.9
RW-5	4.1

*: Averaged using daily flow rates since previous monthly field measurements.

LEGEND

- ◇ GILL CREEK MONITORING POINT
- ▲ OLIN PRODUCTION WELL (FLOW RATE FROM DUPONT)
- ⊕ WATER QUALITY MONITORING WELLS
- ○ A/B ZONE PIEZOMETER NESTS
- ⊕ GROUND WATER RECOVERY WELLS (FLOW RATE FROM OMNX SYSTEM)
- □ PASSIVE RELIEF WELLS
- ● SEWER INVERT ELEVATION
- PROPERTY LINE
- 565 ESTIMATED GROUND-WATER CONTOUR LINES (CONTOUR INTERVAL: 0.5 FEET)
- ESTIMATED CAPTURE ZONE BOUNDARY

0 120 240

Scale 1 inch = 120 feet

NOTE

*: Elevation not used in contouring.
▲: Olin Production Well.
●: Buffalo Avenue Sewer invert is assumed to be a ground-water sink. The piezometric surface is not known. The ground water conturs were estimated based on the sewer invert elevation. PN-2B elevation used as dummy points north of RW-2.

Three water level measurements were obtained in Gill Creek throughout the day at 8:50am (564.08 feet), 12:25pm (563.98 feet), and 5:45pm (563.6 feet). The Gill Creek elevation was not used in contouring the B zone but is included on the map for comparative purposes.

POTENTIOMETRIC SURFACE CONTOUR GENERATED USING SURFER FOR WINDOWS BY GOLDEN SOFTWARE, INC. 1995. CAPTURE ZONE BOUNDARY WAS DRAWN BASED THE FLOW PATHLINES GENERATED BY GWPATH.

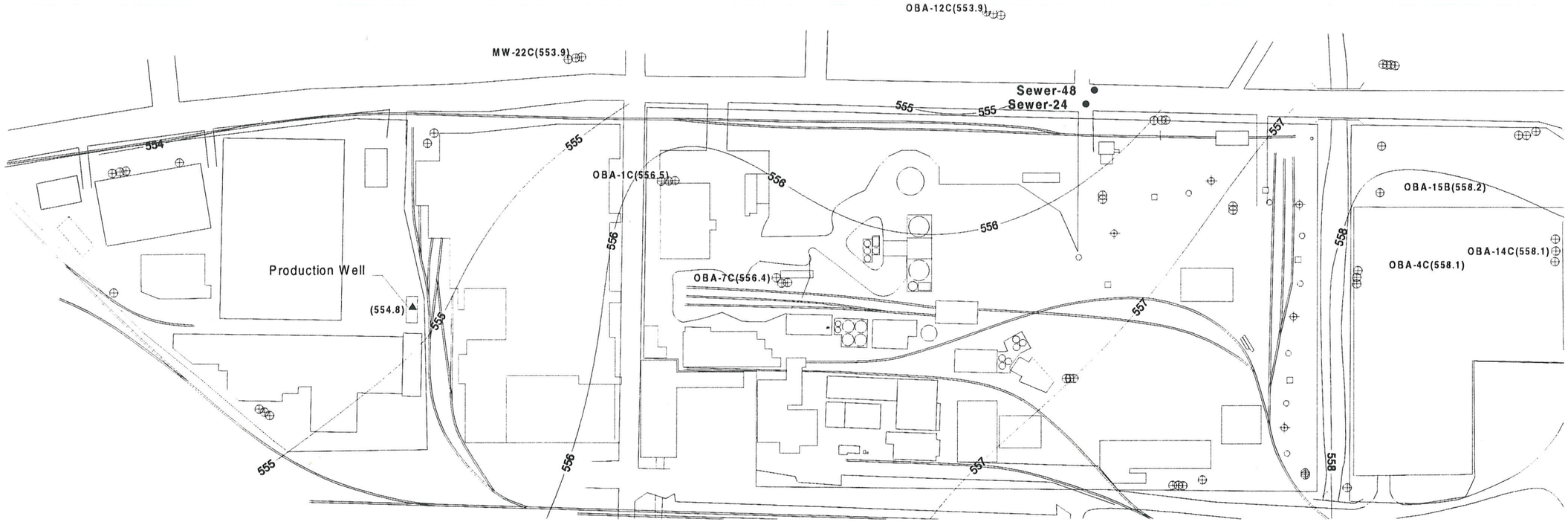
OLIN CHEMICAL
NIAGARA FALLS, NEW YORK

LAW
LAWGIBB Group Member

ESTIMATED CAPTURE ZONE AND
POTENTIOMETRIC SURFACE -- B ZONE
(JUNE 4, 1999)

Job No.: 12000-8-0030

Figure 10A



LEGEND

- ◇ GILL CREEK MONITORING POINT
- ▲ OLIN PRODUCTION WELL (FLOW RATE FROM DUPONT)
- ⊕ WATER QUALITY MONITORING WELLS
- ○ A/B ZONE PIEZOMETER NESTS
- ⊕ GROUND WATER RECOVERY WELLS (FLOW RATE FROM OMNX SYSTEM)
- □ PASSIVE RELIEF WELLS
- ● SEWER INVERT
- ——— PROPERTY LINE
- ——— 565 ——— ESTIMATED GROUND-WATER CONTOUR LINES (CONTOUR INTERVAL: 1 FEET)

Well	Average Flow Rate(gpm)
Olin Production Well	519

0 200 400

Scale 1 inch = 200 feet

NOTE

▲: Water Elevation not obtained from Olin Production Well. Water elevation estimated from pumping rate of 519 gpm on June 4, 1999 using Figure 4-17 from Phase I RFI.

POTENTIOMETRIC SURFACE CONTOUR GENERATED USING SURFER FOR WINDOWS BY GOLDEN SOFTWARE, INC. 1995.

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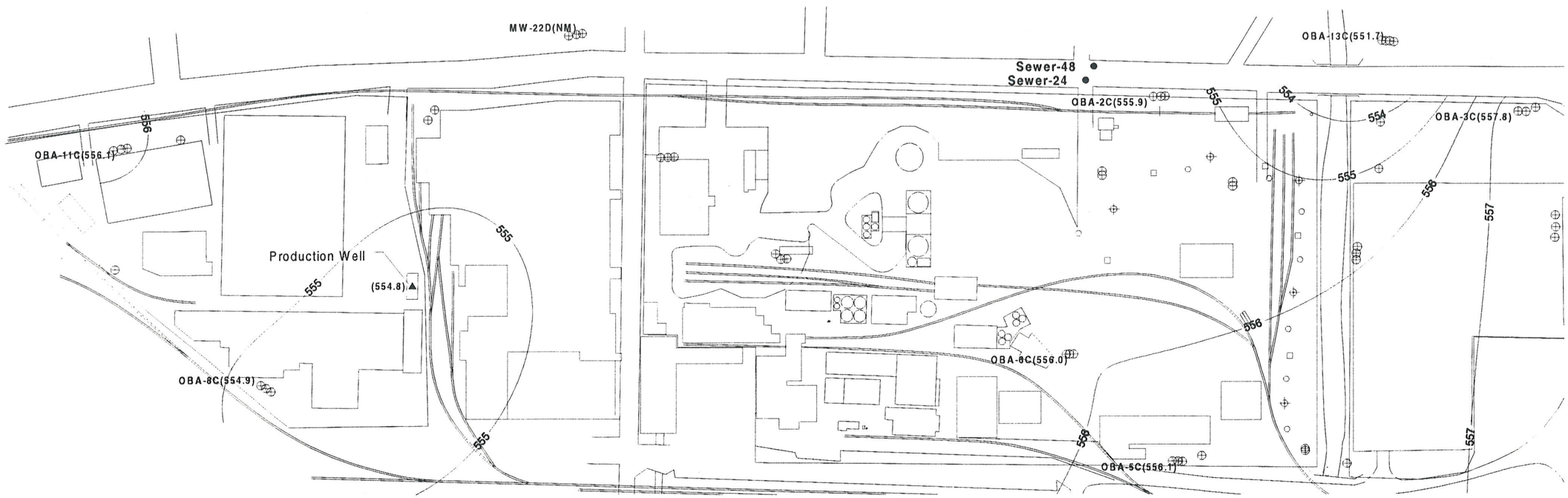
POTENTIOMETRIC SURFACE -- C ZONE
(JUNE 4, 1999)

Job No.: 12000-8-0030

Figure 11



N

LEGEND

- ◇ GILL CREEK MONITORING POINT
- ▲ OLIN PRODUCTION WELL (FLOW RATE FROM DUPONT)
- ⊕ WATER QUALITY MONITORING WELLS
- ○ A/B ZONE PIEZOMETER NESTS
- ⊕ GROUND WATER RECOVERY WELLS (FLOW RATE FROM OMNX SYSTEM)
- □ PASSIVE RELIEF WELLS
- ● SEWER INVERT
- ——— PROPERTY LINE
- ——— 565 ——— ESTIMATED GROUND-WATER CONTOUR LINES (CONTOUR INTERVAL: 1 FEETS)

Well	Average Flow Rate(gpm)
Olin Production Well	519

0 200 400

Scale 1 inch = 200 feet

NOTE

▲: Water Elevation not obtained from Olin Production Well. Water elevation estimated from pumping rate of 519 gpm on June 4, 1999 using Figure 4-17 from Phase I RFI.

POTENTIOMETRIC SURFACE CONTOUR GENERATED USING SURFER FOR WINDOWS BY GOLDEN SOFTWARE, INC. 1995.

OLIN CHEMICAL
NIAGARA FALLS, NEW YORK

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LAWGIBB Group Member

POTENTIOMETRIC SURFACE -- CD ZONE
(JUNE 4, 1999)

Job No.: 12000-8-0030

Figure 12

ATTACHMENT 3

Olin Niagara Falls
Plant 2 Area Remediation

Summary: Contaminant Mass and Groundwater Removed

Quarter	organics lb	mercury lb	pesticides lb	groundwater extracted gal
Startup/Q1-98 [est]	27.81	0.02	0.2	210,000
Q2-98	154.5	0.1	1.3	1,175,799
Q3-98	595.5	0.6	4.9	2,583,159
Q4-98	1273.1	0.1	5.2	4,054,996
Q1-99	817.3	0.05	8.5	4,233,521
Q2-99	1034.7	0.05	7.1	3,991,584
TOTAL	**3903**	**1**	**27**	**16,249,059**

Olin Niagara Falls Plant Site: Plant 2 Area Remediation
Groundwater Contaminant Mass Removed

ORGANICS — **Q2-99**

WELL	conc [A] mg/l	conv liter / gal	conv lb /mg	conversion lb/gallon	conversion gal/lb	flow gal/qtr	MASS lb/qtr
RW1	39.0	3.8	2.20E-06	0.00032604	1190476.19	352,554	114.95
RW2	19.5	3.8	2.20E-06	0.00016302	1190476.19	521,719	85.05
RW3	24.9	3.8	2.20E-06	0.00020816	1190476.19	319,904	66.59
RW4	37.5	3.8	2.20E-06	0.00031350	1190476.19	2,331,435	730.90
RW5	9.5	3.8	2.20E-06	0.00007975	1190476.19	465,972	37.16
TOTAL							**1034.7**

MERCURY — **Q2-99**

WELL	conc [A] mg/l	conv liter / gal	conv lb /mg	conversion lb/gallon	conversion gal/lb	flow gal/qtr	MASS lb/qtr
RW1	0.013	3.8	2.20E-06	0.00000011	1190476.19	352,554	0.04
RW2	0.001	3.8	2.20E-06	0.00000001	1190476.19	521,719	0.00
RW3	0.000	3.8	2.20E-06	0.00000000	1190476.19	319,904	0.00
RW4	0.0003	3.8	2.20E-06	0.00000000	1190476.19	2,331,435	0.01
RW5	0.0000	3.8	2.20E-06	0.00000000	1190476.19	465,972	0.00
TOTAL							**0.05**

PESTICIDES — **Q2-99**

WELL	conc [A] mg/l	conv liter / gal	conv lb /mg	conversion lb/gallon	conversion gal/lb	flow gal/qtr	MASS lb/qtr
RW1	0.012	3.8	2.20E-06	0.00000010	1190476.19	352,554	0.03
RW2	0.191	3.8	2.20E-06	0.00000159	1190476.19	521,719	0.83
RW3	0.075	3.8	2.20E-06	0.00000062	1190476.19	319,904	0.20
RW4	0.286	3.8	2.20E-06	0.00000239	1190476.19	2,331,435	5.58
RW5	0.113	3.8	2.20E-06	0.00000094	1190476.19	465,972	0.44
TOTAL							**7.1**

[A] = TOTAL OF PARAMETER GROUP IN QUARTERLY GRAB SAMPLE FROM DISCHARGE HEADER

Olin - Niagara Falls
OMNX Systems Check
Summary of Total Flow, Average System Flow Rates, and Average Ground-Water Elevations

Period	Total Flow (gal/month)	Total Quarterly Flow (gal)	Average Flow Rate (gpm)						Flow Contribution Per Well (gal/month)					Notes
			RW-1	RW-2	RW-3	RW-4	RW-5	Total	RW-1	RW-2	RW-3	RW-4	RW-5	
Dec-97	60,000		0.1	0.0	0.4	0.4	0.4	1.3	4,720	810	19,098	18,902	16,471	1,3
4th Qtr 97		**60,000**												
Jan-98	60,000		0.1	0.0	0.4	0.4	0.4	1.3	4,720	810	19,098	18,902	16,471	1,3
Feb-98	45,000		0.1	0.0	0.4	0.4	0.3	1.1	3,540	607	14,323	14,176	12,353	1,3
Mar-98	45,000		0.1	0.0	0.3	0.3	0.3	1.0	3,540	607	14,323	14,176	12,353	1,3
1st Qtr 98		**150,000**												
Apr-98	365,297		0.7	0.1	2.7	2.7	2.3	8.5	28,735	4,931	116,271	115,080	100,280	1,3
May-98	334,862		0.6	0.1	2.4	2.4	2.1	7.5	26,341	4,520	106,584	105,492	91,925	2,3
Jun-98	475,640		0.9	0.1	3.5	3.5	3.0	11.0	37,415	6,421	151,393	149,841	130,570	2,3
2nd Qtr 98		**1,175,799**												
Jul-98	921,665		1.6	0.3	6.6	6.5	5.7	20.6	72,501	12,441	293,359	290,353	253,011	2,3
Aug-98	526,034		0.1	0.6	3.7	3.8	3.4	11.6	5,554	26,894	169,255	172,032	152,300	2, 4
Sep-98	1,135,460		2.4	2.5	7.0	7.1	7.1	26.0	104,479	107,966	306,316	309,076	307,623	2, 4
3rd Qtr 98		**2,583,159**												
Oct-98	1,252,945		0.4	1.1	6.8	10.1	9.7	28.1	18,288	48,816	302,400	451,872	431,568	2, 4
Nov-98	1,408,950		2.2	0.7	5.0	14.4	10.5	32.8	94,806	31,590	213,858	618,408	450,288	2, 4
Dec-98	1,393,101		0.3	1.0	4.5	15.4	9.8	31.1	15,642	44,072	203,121	691,082	439,185	2, 4
4th Qtr 98		**4,054,996**												
Jan-99	1,295,192		0.02	0.41	3.6	17.2	7.8	29.0	860	18,178	162,181	767,148	346,826	2, 4
Feb-99	1,362,751		2.9	3.1	4.2	18.0	5.6	33.8	117,795	123,770	171,019	725,571	224,596	2, 4
Mar-99	1,575,578		3.0	5.1	4.1	18.7	4.4	35.3	134,877	229,745	181,540	833,892	195,524	2, 4
1st Qtr 99		**4,233,521**												
Apr-99	1,419,313		2.8	5.5	3.0	18.2	3.3	32.8	123,042	237,750	129,803	785,958	142,761	2, 4
May-99	1,394,656		2.6	4.8	2.3	17.8	3.7	31.2	116,709	213,374	102,340	796,659	165,574	2, 4
Jun-99	1,177,615		2.6	1.6	2.0	17.3	3.6	27.3	112,803	70,596	87,762	748,818	157,637	2, 4
2nd Qtr 99		**3,991,584**												
Average	**855,214**		**1.2**	**1.4**	**3.3**	**9.2**	**4.4**	**19.5**	**54,019**	**62,310**	**145,476**	**401,444**	**191,964**	
Total	**16,249,058**								**1,026,366**	**1,183,897**	**2,764,041**	**7,627,438**	**3,647,316**	

1. Estimated total flow
2. Monthly flow totalizer data
3. Average % for totalized flow for Dec-97 through Jul-98.
4. % flow calculated from monthly totalizer data
- Data not available.

Well	ConstituentClass	ParameterName	Result	Qualifier	Units	SampleDate	pesticide ug/l	mercury mg/l	organics ug/l
RW-1	Cyanide, Total	CYANIDE		ND	MG/L	5/19/99			
RW-1	Metals, Dissolved	BARIUM		ND	MG/L	5/19/99			
RW-1	Metals, Dissolved	COPPER		ND	MG/L	5/19/99			
RW-1	Metals, Dissolved	LEAD		ND	MG/L	5/19/99			
RW-1	Metals, Dissolved	MERCURY	0.013		MG/L	5/19/99		0.013	
RW-1	Metals, Dissolved	ZINC		ND	MG/L	5/19/99			
RW-1	Metals, Total	BARIUM		ND	MG/L	5/19/99			
RW-1	Metals, Total	COPPER		ND	MG/L	5/19/99			
RW-1	Metals, Total	LEAD		ND	MG/L	5/19/99			
RW-1	Metals, Total	MERCURY	0.029		MG/L	5/19/99			
RW-1	Metals, Total	ZINC		ND	MG/L	5/19/99			
RW-1	Pesticide/PCB	ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	7		UG/L	5/19/99	7		
RW-1	Pesticide/PCB	BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	3.8		UG/L	5/19/99	3.8		
RW-1	Pesticide/PCB	DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)		ND	UG/L	5/19/99			
RW-1	Pesticide/PCB	GAMMA BHC (LINDANE)	0.72		UG/L	5/19/99	0.72		
RW-1	Volatiles	1,1,1-TRICHLOROETHANE		ND	UG/L	5/19/99			
RW-1	Volatiles	1,1,2,2-TETRACHLOROETHANE		ND	UG/L	5/19/99			
RW-1	Volatiles	1,1,2-TRICHLOROETHANE		ND	UG/L	5/19/99			
RW-1	Volatiles	1,1-DICHLOROETHENE		ND	UG/L	5/19/99			
RW-1	Volatiles	1,2,4-TRICHLOROBENZENE	3400		UG/L	5/19/99			3400
RW-1	Volatiles	1,2-DICHLOROBENZENE		ND	UG/L	5/19/99			
RW-1	Volatiles	1,3-DICHLOROBENZENE		ND	UG/L	5/19/99			
RW-1	Volatiles	1,4-DICHLOROBENZENE		ND	UG/L	5/19/99			
RW-1	Volatiles	BENZENE		ND	UG/L	5/19/99			
RW-1	Volatiles	CARBON TETRACHLORIDE		ND	UG/L	5/19/99			
RW-1	Volatiles	CHLOROBENZENE		ND	UG/L	5/19/99			
RW-1	Volatiles	CHLOROMETHANE		ND	UG/L	5/19/99			
RW-1	Volatiles	cis-1,2-DICHLOROETHYLENE	2500		UG/L	5/19/99			2500
RW-1	Volatiles	METHANOL (METHYL ALCOHOL)	1.6		MG/L	5/19/99			1.6
RW-1	Volatiles	METHYLENE CHLORIDE	3100	B	UG/L	5/19/99			3100
RW-1	Volatiles	TETRACHLOROETHENE (PCE)	4000		UG/L	5/19/99			4000
RW-1	Volatiles	trans-1,2-DICHLOROETHENE		ND	UG/L	5/19/99			
RW-1	Volatiles	TRICHLOROETHYLENE (TCE)	26000		UG/L	5/19/99			26000
RW-1	Volatiles	VINYL CHLORIDE		ND	UG/L	5/19/99			
		TOTALS					11.52	0.013	39001.6

Olin Niagara Falls Recovery Well Analyses Q2-99

Well	ConstituentClass	ParameterName	Result	Qualifier	Units	SampleDate	pesticide ug/l	mercury mg/l	organics ug/l
RW-2	Cyanide, Total	CYANIDE	0.024		MG/L	5/19/99			
RW-2	Metals, Dissolved	BARIUM		ND	MG/L	5/19/99			
RW-2	Metals, Dissolved	COPPER		ND	MG/L	5/19/99			
RW-2	Metals, Dissolved	LEAD		ND	MG/L	5/19/99			
RW-2	Metals, Dissolved	MERCURY	0.00091		MG/L	5/19/99		0.00091	
RW-2	Metals, Dissolved	ZINC	0.023		MG/L	5/19/99			
RW-2	Metals, Total	BARIUM		ND	MG/L	5/19/99			
RW-2	Metals, Total	COPPER		ND	MG/L	5/19/99			
RW-2	Metals, Total	LEAD		ND	MG/L	5/19/99			
RW-2	Metals, Total	MERCURY	0.01		MG/L	5/19/99			
RW-2	Metals, Total	ZINC	0.031		MG/L	5/19/99			
RW-2	Pesticide/PCB	ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	92		UG/L	5/19/99	92		
RW-2	Pesticide/PCB	BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	6.5		UG/L	5/19/99	6.5		
RW-2	Pesticide/PCB	DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	12		UG/L	5/19/99	12		
RW-2	Pesticide/PCB	GAMMA BHC (LINDANE)	80		UG/L	5/19/99	80		
RW-2	Volatiles	1,1,1-TRICHLOROETHANE		ND	UG/L	5/19/99			
RW-2	Volatiles	1,1,2,2-TETRACHLOROETHANE		ND	UG/L	5/19/99			
RW-2	Volatiles	1,1,2-TRICHLOROETHANE		ND	UG/L	5/19/99			
RW-2	Volatiles	1,1-DICHLOROETHENE		ND	UG/L	5/19/99			
RW-2	Volatiles	1,2,4-TRICHLOROBENZENE	1200		UG/L	5/19/99			1200
RW-2	Volatiles	1,2-DICHLOROBENZENE		ND	UG/L	5/19/99			
RW-2	Volatiles	1,3-DICHLOROBENZENE		ND	UG/L	5/19/99			
RW-2	Volatiles	1,4-DICHLOROBENZENE		ND	UG/L	5/19/99			
RW-2	Volatiles	BENZENE		ND	UG/L	5/19/99			
RW-2	Volatiles	CARBON TETRACHLORIDE		ND	UG/L	5/19/99			
RW-2	Volatiles	CHLOROBENZENE		ND	UG/L	5/19/99			
RW-2	Volatiles	CHLOROMETHANE		ND	UG/L	5/19/99			
RW-2	Volatiles	cis-1,2-DICHLOROETHYLENE	1700		UG/L	5/19/99			1700
RW-2	Volatiles	METHANOL (METHYL ALCOHOL)		ND	MG/L	5/19/99			
RW-2	Volatiles	METHYLENE CHLORIDE	1100	B	UG/L	5/19/99			1100
RW-2	Volatiles	TETRACHLOROETHENE (PCE)	5800		UG/L	5/19/99			5800
RW-2	Volatiles	trans-1,2-DICHLOROETHENE		ND	UG/L	5/19/99			
RW-2	Volatiles	TRICHLOROETHYLENE (TCE)	9700		UG/L	5/19/99			9700
RW-2	Volatiles	VINYL CHLORIDE		ND	UG/L	5/19/99			
		TOTALS					190.5	0.00091	19500

Well	ConstituentClass	ParameterName	Result	Qualifier	Units	SampleDate	pesticide ug/l	mercury mg/l	organics ug/l
RW-3	Cyanide, Total	CYANIDE		ND	MG/L	5/20/99			
RW-3	Metals, Dissolved	BARIUM		ND	MG/L	5/20/99			
RW-3	Metals, Dissolved	COPPER		ND	MG/L	5/20/99			
RW-3	Metals, Dissolved	LEAD		ND	MG/L	5/20/99			
RW-3	Metals, Dissolved	MERCURY		ND	MG/L	5/20/99		0	
RW-3	Metals, Dissolved	ZINC	0.23		MG/L	5/20/99			
RW-3	Metals, Total	BARIUM		ND	MG/L	5/20/99			
RW-3	Metals, Total	COPPER		ND	MG/L	5/20/99			
RW-3	Metals, Total	LEAD		ND	MG/L	5/20/99			
RW-3	Metals, Total	MERCURY	0.00021		MG/L	5/20/99			
RW-3	Metals, Total	ZINC	0.22		MG/L	5/20/99			
RW-3	Pesticide/PCB	ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	33		UG/L	5/20/99	33		
RW-3	Pesticide/PCB	BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	4		UG/L	5/20/99	4		
RW-3	Pesticide/PCB	DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	8.5		UG/L	5/20/99	8.5		
RW-3	Pesticide/PCB	GAMMA BHC (LINDANE)	29		UG/L	5/20/99	29		
RW-3	Volatiles	1,1,1-TRICHLOROETHANE		ND	UG/L	5/20/99			
RW-3	Volatiles	1,1,2,2-TETRACHLOROETHANE	2500		UG/L	5/20/99			2500
RW-3	Volatiles	1,1,2-TRICHLOROETHANE		ND	UG/L	5/20/99			
RW-3	Volatiles	1,1-DICHLOROETHENE		ND	UG/L	5/20/99			
RW-3	Volatiles	1,2,4-TRICHLOROBENZENE		ND	UG/L	5/20/99			
RW-3	Volatiles	1,2-DICHLOROBENZENE		ND	UG/L	5/20/99			
RW-3	Volatiles	1,3-DICHLOROBENZENE		ND	UG/L	5/20/99			
RW-3	Volatiles	1,4-DICHLOROBENZENE		ND	UG/L	5/20/99			
RW-3	Volatiles	BENZENE		ND	UG/L	5/20/99			
RW-3	Volatiles	CARBON TETRACHLORIDE		ND	UG/L	5/20/99			
RW-3	Volatiles	CHLOROBENZENE		ND	UG/L	5/20/99			
RW-3	Volatiles	CHLOROMETHANE		ND	UG/L	5/20/99			
RW-3	Volatiles	cis-1,2-DICHLOROETHYLENE	2400		UG/L	5/20/99			2400
RW-3	Volatiles	METHANOL (METHYL ALCOHOL)		ND	MG/L	5/20/99			
RW-3	Volatiles	METHYLENE CHLORIDE	1000	B	UG/L	5/20/99			1000
RW-3	Volatiles	TETRACHLOROETHENE (PCE)	6000		UG/L	5/20/99			6000
RW-3	Volatiles	trans-1,2-DICHLOROETHENE		ND	UG/L	5/20/99			
RW-3	Volatiles	TRICHLOROETHYLENE (TCE)	13000		UG/L	5/20/99			13000
RW-3	Volatiles	VINYL CHLORIDE		ND	UG/L	5/20/99			
		TOTALS					74.5	0	24900

Well	ConstituentClass	ParameterName	Result	Qualifier	Units	SampleDate	pesticide ug/l	mercury mg/l	organics ug/l
RW-4	Cyanide, Total	CYANIDE		ND	MG/L	5/20/99			
RW-4	Metals, Dissolved	BARIUM		ND	MG/L	5/20/99			
RW-4	Metals, Dissolved	COPPER		ND	MG/L	5/20/99			
RW-4	Metals, Dissolved	LEAD		ND	MG/L	5/20/99			
RW-4	Metals, Dissolved	MERCURY		ND	MG/L	5/20/99			
RW-4	Metals, Dissolved	ZINC	0.039		MG/L	5/20/99			
RW-4	Metals, Total	BARIUM		ND	MG/L	5/20/99			
RW-4	Metals, Total	COPPER		ND	MG/L	5/20/99			
RW-4	Metals, Total	LEAD		ND	MG/L	5/20/99			
RW-4	Metals, Total	MERCURY	0.00028		MG/L	5/20/99		0.00028	
RW-4	Metals, Total	ZINC	0.052		MG/L	5/20/99			
RW-4	Pesticide/PCB	ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	140		UG/L	5/20/99	140		
RW-4	Pesticide/PCB	BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	7.3		UG/L	5/20/99	7.3		
RW-4	Pesticide/PCB	DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	19		UG/L	5/20/99	19		
RW-4	Pesticide/PCB	GAMMA BHC (LINDANE)	120		UG/L	5/20/99	120		
RW-4	Volatiles	1,1,1-TRICHLOROETHANE		ND	UG/L	5/20/99			
RW-4	Volatiles	1,1,2,2-TETRACHLOROETHANE	2800		UG/L	5/20/99			2800
RW-4	Volatiles	1,1,2-TRICHLOROETHANE		ND	UG/L	5/20/99			
RW-4	Volatiles	1,1-DICHLOROETHENE		ND	UG/L	5/20/99			
RW-4	Volatiles	1,2,4-TRICHLOROBENZENE		ND	UG/L	5/20/99			
RW-4	Volatiles	1,2-DICHLOROBENZENE		ND	UG/L	5/20/99			
RW-4	Volatiles	1,3-DICHLOROBENZENE		ND	UG/L	5/20/99			
RW-4	Volatiles	1,4-DICHLOROBENZENE		ND	UG/L	5/20/99			
RW-4	Volatiles	BENZENE		ND	UG/L	5/20/99			
RW-4	Volatiles	CARBON TETRACHLORIDE		ND	UG/L	5/20/99			
RW-4	Volatiles	CHLOROBENZENE		ND	UG/L	5/20/99			
RW-4	Volatiles	CHLOROMETHANE		ND	UG/L	5/20/99			
RW-4	Volatiles	cis-1,2-DICHLOROETHYLENE	2300		UG/L	5/20/99			2300
RW-4	Volatiles	METHANOL (METHYL ALCOHOL)		ND	MG/L	5/20/99			
RW-4	Volatiles	METHYLENE CHLORIDE	2400	B	UG/L	5/20/99			2400
RW-4	Volatiles	TETRACHLOROETHENE (PCE)	13000		UG/L	5/20/99			13000
RW-4	Volatiles	trans-1,2-DICHLOROETHENE		ND	UG/L	5/20/99			
RW-4	Volatiles	TRICHLOROETHYLENE (TCE)	17000		UG/L	5/20/99			17000
RW-4	Volatiles	VINYL CHLORIDE		ND	UG/L	5/20/99			
		TOTALS					286.3	0.00028	37500

Well	ConstituentClass	ParameterName	Result	Qualifier	Units	SampleDate	pesticide ug/l	mercury mg/l	organics ug/l
RW-5	Cyanide, Total	CYANIDE	0.11		MG/L	5/20/99			
RW-5	Metals, Dissolved	BARIUM		ND	MG/L	5/20/99			
RW-5	Metals, Dissolved	COPPER		ND	MG/L	5/20/99			
RW-5	Metals, Dissolved	LEAD		ND	MG/L	5/20/99			
RW-5	Metals, Dissolved	MERCURY		ND	MG/L	5/20/99		0	
RW-5	Metals, Dissolved	ZINC	0.025		MG/L	5/20/99			
RW-5	Metals, Total	BARIUM		ND	MG/L	5/20/99			
RW-5	Metals, Total	COPPER		ND	MG/L	5/20/99			
RW-5	Metals, Total	LEAD		ND	MG/L	5/20/99			
RW-5	Metals, Total	MERCURY	0.0046		MG/L	5/20/99			
RW-5	Metals, Total	ZINC	0.07		MG/L	5/20/99			
RW-5	Pesticide/PCB	ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	52		UG/L	5/20/99	52		
RW-5	Pesticide/PCB	BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	3.3		UG/L	5/20/99	3.3		
RW-5	Pesticide/PCB	DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	5.4		UG/L	5/20/99	5.4		
RW-5	Pesticide/PCB	GAMMA BHC (LINDANE)	52		UG/L	5/20/99	52		
RW-5	Volatiles	1,1,1-TRICHLOROETHANE		ND	UG/L	5/20/99			
RW-5	Volatiles	1,1,2,2-TETRACHLOROETHANE	580		UG/L	5/20/99			580
RW-5	Volatiles	1,1,2-TRICHLOROETHANE		ND	UG/L	5/20/99			
RW-5	Volatiles	1,1-DICHLOROETHENE		ND	UG/L	5/20/99			
RW-5	Volatiles	1,2,4-TRICHLOROBENZENE	460		UG/L	5/20/99			460
RW-5	Volatiles	1,2-DICHLOROBENZENE		ND	UG/L	5/20/99			
RW-5	Volatiles	1,3-DICHLOROBENZENE		ND	UG/L	5/20/99			
RW-5	Volatiles	1,4-DICHLOROBENZENE		ND	UG/L	5/20/99			
RW-5	Volatiles	BENZENE		ND	UG/L	5/20/99			
RW-5	Volatiles	CARBON TETRACHLORIDE		ND	UG/L	5/20/99			
RW-5	Volatiles	CHLOROBENZENE		ND	UG/L	5/20/99			
RW-5	Volatiles	CHLOROMETHANE		ND	UG/L	5/20/99			
RW-5	Volatiles	cis-1,2-DICHLOROETHYLENE	1700		UG/L	5/20/99			1700
RW-5	Volatiles	METHANOL (METHYL ALCOHOL)		ND	MG/L	5/20/99			
RW-5	Volatiles	METHYLENE CHLORIDE	400	B	UG/L	5/20/99			400
RW-5	Volatiles	TETRACHLOROETHENE (PCE)	2600		UG/L	5/20/99			2600
RW-5	Volatiles	trans-1,2-DICHLOROETHENE		ND	UG/L	5/20/99			
RW-5	Volatiles	TRICHLOROETHYLENE (TCE)	3800		UG/L	5/20/99			3800
RW-5	Volatiles	VINYL CHLORIDE		ND	UG/L	5/20/99			
		TOTALS					112.7	0	9540