MALCOLM PIRNIE

Mark

MALCOLM PIRNIE, INC.
INDEPENDENT ENVIRONMENTAL ENGINEERS, SCIENTISTS & CONSULTANTS

October 31, 2000

Mr. Gerald Rider, Jr.
Chief of Operations and Maintenance
New York State Department of
Environmental Conservation
50 Wolf Road
Albany, NY 12233

Re: Annual Report on Roxy Cleaners Treatment System Operation, Maintenance and Monitoring

Dear Mr. Rider:

Transmitted, herewith, are three copies of the third and final annual report on the treatment system operation, maintenance and monitoring work at the Roxy Cleaners Site as required under Malcolm Pirnie's Work Assignment #D002852-26. Our Work Assignment ends as of the date of this letter, and we understand that your office is taking over the operation and maintenance of this system.

Please advise us if you have any questions concerning this report.

Very truly yours,

MALCOLM PIRNIE, INC.

John B. Mulligan, P.E.
Associate

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Enclosures
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15 CORNELL ROAD LATHAM, NY 12110 518-786-7349 518-786-8645 fax http://www.pirnie.com

ANNUAL REPORT ON TREATMENT SYSTEM OPERATION, MAINTENANCE AND MONITORING

September 28, 1999 – October 17, 2000
Roxy Cleaners Site # 4-42-024
New York State Superfund Standby Contract
Work Assignment #D002852-26

Malcolm Pirnie, Inc.
October 17, 2000

GENERAL

The New York State Department of Environmental Conservation authorized Malcolm Pirnie, Inc. to perform Operation, Maintenance and Monitoring Services at the Roxy Cleaners Site by letter dated September 12, 1997. This annual report has been prepared in accordance with the approved Work Plan for this site. It discusses the performance and effectiveness of the treatment system and provides recommendations as to any changes which might be necessary or desirable in the O&M program.

SITE OPERATIONS

Below is a summary of the more significant repairs and modification that were made to the system over the last year. A list of consumable supplies used over the last year and an inventory of equipment and supplies currently at the site are shown in Appendix A.

1) Periodically, the air flow packs the carbon down into the carbon drums and increases the pressure drop across each drum. This can cause the treatment system to shut down. To remedy this problem it is sometimes necessary to shake the drums and redistribute the carbon.

2) The system shut down multiple time during the first quarter of this year. There were no power outages to account for the shut-downs and there were no apparent problems with the system. After further investigations, and speaking to one of the Geopure representatives that constructed the system, it was determined that a high level pressure switch needed adjustment. This switch shuts the system down automatically when the pressure in the system gets too great. Although the air pressure in the system was relatively low, the switch was also set to a low pressure. The switch was adjusted and the problem ceased.

3) On October 12, 1999, the treatment system was shut-down on arrival. An investigation showed that the air stripper was full of water. The air stripper was then disassembled and the rubber flapper valve in the last striper tray was found closed. The ball that keeps the flapper valve open to release the treated water had disconnected from its chain causing the flapper valve to close and the stripper to fill

with water. The ball float was re-connected to its chain and the system was reassembled.

4) The chain on the west gate to the site had been cut on more then one occasion by employees of Roxy Cleaners to access to the storage area at the rear of the dry cleaning building. A key to the gate lock was given to front desk at Roxy Cleaners and the fence has remained secure since then.

5) On June 20, 2000 the pump motor and power cable for RW-2 was replaced. It now functions properly.

TREATMENT SYSTEM PERFORMANCE AND EFFECTIVENESS

Treatment System Evaluation: The results of the sampling and analyses were evaluated to determine the amount of contaminates removed from the groundwater by the three recovery wells. Over the second full year of operation, 1,2 Dichloroethene (DCE) has been removed at an average rate of 11 grams/week, Trichloroethene (TCE) at 3 grams/week and Tetrachloroethene (PCE) at 207 grams/week. Monthly effluent samples have not exceeded the SPDES permitted discharge limitations.

Total Contaminant Recovery: The overall mass of contaminants (1,2 DCE, TCE, PCE) recovered from the groundwater between September 28, 1999 – October 17, 2000 has been approximately 11.82 kg, 93 percent of which is PCE. The total recorded removal for three years of operations is 41.84 kg. This information is summarized in the Contaminant Recovery Summary in Appendix B.

RW-1: In the past, analytical analysis for RW-1 has demonstrated that it has the greatest average concentration of contamination. Contaminate concentrations in RW-1 have been approximately two to three times as high as in RW-2 or RW-3. However, RW-1 well has a very low recovery rate, and therefore, a very low yield. This well has recovered approximately 0.20 kg, or 1.7 percent, of the total contaminants removed over the last year.

RW-2: The contaminant concentration for RW-2 started at 642 µg/l in the first quarter, decreased to 381 µg/l, in the second quarter and has remained at approximately the same concentration for the remainder of the year. This well removed approximately 3.41 kg, or 30 percent, of the total contaminants removed over the last year.

RW-3: The contaminant concentration in this well ranged between 380 µg/l and 294 µg/l in the last year. The pumping rate at RW-3 is much higher than the other wells and, therefore, the greatest recovery of contaminants has occurred at this well. During the last year of operations RW-3 has removed approximately 69 percent of the total contaminants removed.

Monitoring Well Sampling and Analyses: The NYSDEC has organized a team to sample and arrange for analyses of monitoring wells at the Roxy Site. Samples of water from monitoring wells 103A, 107, 107A, 111, 2, 2B, 108 and 108A are collected and analyzed every 6 months. Samples were collected in July and November of 1997,1998, and 1999. Monitoring wells 3, 3B, 106, 106A, 109, 105, 105A, 104, and 104A are sampled once a year. A summary of the analytical results is included in Appendix C.

Monitoring Recovery Well Capture Zones: Beginning on November 5, 1997, groundwater elevations have been measured to insure that the cones of influence created by the recovery wells are maintained. The overburden wells were used to create water elevation contour maps. Group A Wells were measured at one month intervals for the first six months and then quarterly thereafter; group B Wells have been measured quarterly. A map for the last quarter's measurements is included in Appendix D. The ground water contour maps indicate that the recovery wells are capturing the majority of the contaminated plume at the site.

CONCLUSIONS AND RECOMMENDATIONS

The analytical results from the influent and effluent samples demonstrate that the system is effectively removing the contaminants from the ground water.

The total amount of contaminants recovered this year is consistent with the amount that was recovered last year. Contaminant concentrations for RW-2 and RW-3 have shown minor fluctuations. However, they have shown a downward trend since the start-up of this treatment system. Alternatively, the bedrock well RW-1 has fluctuated from a concentration of 996 µg/l at start-up, to 252 µg/l in June 1999, and then back up to 1157 µg/l during the June 2000 sampling. The yield of this well is very low. Therefore, the variation in concentration has not had much of an effect on contaminant recovery.

Monitoring wells are sampled on a annual and semi-annual basis by the NYSDEC. The analytical results from the water sampling demonstrate that many of the wells from the spill location are not displaying any contamination and have not displayed any contamination for over six sampling events. Since the potentiometric maps display that the recovery wells are effectively capturing the plume, the NYSDEC may wish to limit sampling to an annual event or decommission some of the monitoring wells that have consistently shown no contamination.

APPENDIX A

Consumable Supplies and Inventory

Roxy Cleaners Site No. 442024
Malcolm Pirnie Project No. 0266330

CONSUMABLE SUPPLIES USED

September 28, 1999 - October 17, 2000

ITEM	Quantity Used	DESCRIPTION
Water Filters TOTAL	15	50 Micron, Polypropylene Filter
Water Filters RW1	*5*	
Water Filters RW2	*5*	
Water Filters RW3	*5*	
Air Filters	6	10 Micron, Polyester Filter
Carbon Drums	1	200 Lb., GAC Canisters
Control Panel Light Bulbs	10	Control Panel Bulbs, 24 V

Miscellaneous Supplies Include, but are not limited to: Bailer cord and tubing, buckets, paper towels, polyethylene sheets, logbooks, clear tape, zip lock bags, disposable cameras, film developing, cleaning supplies for the air stripper, Hnu calibration gas.

Roxy Cleaners Site No. 442024
Malcolm Pirnie Project No. 0266330

Inventory Sheet
(October 6, 2000)

EQUIPMENT
10 ft. Aluminum Ladder
18" Push Broom
12" Crescent Wrench
Two,18" Heavy Duty Pipe Wrenches
Six, Screw Drivers (3 Flat, 3 Phillips)
11 Piece Socket Set and 6" Driver
Portable Water Pump
Garden Hose (25 ft.)
32 Gallon Trash Can
Corning pH Sensor
Sheet Rock Knife
Guardian Variable Speed Controller
Solinst Water Level Probe

CONSUMABLE SUPPLIES	QUANTITY
Air Filters	13
Water Filters	17
GAC Drums	3
Canisters Calibration Gas	1
2oz., Pipe Thread Compound	1
32 oz., Mineral Spirits	1
Replacement O-Rings for Drum Caps	4
Coarse Grit Sandpaper Sheets	3
Replacement Stripper Gaskets (9ft) and Adhesive	1
Partially Filled 500ml Bottles of pH Buffer (7.0, 4.0, and 10.01)	3
Tyvek Suits	2
Box of Large Rubber Gloves (100 Gloves/Box)	1
Pairs Large Rubber Boot Covers	3
Water Filter O-Rings	2
Pitless Adapter O-Ring	1
WD-40 Lubricant	1
Electrical Tape	1
Power Cable and Pump Motor Fitting	1
Wire Connectors	1 Box

CLEANING MATERIALS	QUANTITY
Scrub Brushes	4
Metal Scrapers	2
1/4" Dia. Cylinder Brushes	2
1" Dia. Cylinder Brushes	2
Sponges	6
Gallon Bottles of Muriatic Acid	2
Gallon Bottles of Calcium, Lime, and Rust Remover	2
Large Bag of Rags	1

APPENDIX B

Contaminant Recovery and Concentration Summary

Roxy Cleaners Site No. 442024
Malcolm Pirnie Project No. 0266330

CONTAMINANT RECOVERY SUMMARY

September 30, 1997 - October 17, 2000
(Three years of recovery)

	1997-1998 CONTAMINANT RECOVERY (kg)	1998-1999 CONTAMINANT RECOVERY (kg)	1999-2000 CONTAMINANT RECOVERY (kg)	TOTAL RECOVER 1997-2000	% OF TOTAL RECOVERY RECOVERY
APPROXIMATE RW1 RECOVERY	0.34	0.20	0.21	0.76	1.81
APPROXIMATE RW2 RECOVERY	5.49	2.72	3.41	11.72	28.01
APPROXIMATE RW3 RECOVERY	12.40	8.49	8.20	29.38	70.18
APPROXIMATE TOTAL DCE RECOVERY	0.75	0.68	0.61	2.06	4.91
APPROXIMATE TOTAL TCE RECOVERY	0.13	0.16	0.17	0.46	1.11
APPROXIMATE TOTAL PCE RECOVERY	17.34	10.57	11.04	39.32	93.98
TOTAL RECOVERY	**18.22**	**11.41**	**11.82**	**41.84**	

AVERAGE CONTAMINANT CONCENTRATION

September 28, 1999 - October 17, 2000

RECOVERY WELLS	1ST QUARTER MCG/L	2ND QUARTER MCG/L	3RD QUARTER MCG/L	4TH QUARTER MCG/L
RW1 CONTAMINANT CONCENTRATION	926	931	1,149	1,149
RW2 CONTAMINANT CONCENTRATION	642	381	356	356
RW3 CONTAMINANT CONCENTRATION	353	333	373	373

Notes:

1) Contaminate recovery is based on weekly pump flow measurements and quarterly influent water analysis.

2) Total recovery is calculated as the sum of DCE, TCE, and PCE.

3) The results of the quarterly influent water samples for the September water analysis are not yet available. Contaminant concentrations were assumed to be consistent with June's influent water analysis.

APPENDIX C

Monitoring Well Contaminant Study

Roxy Cleaners Site No. 442024
Malcolm Pirnie Project No. 0266330

Monitoring Well Contamination Summary

MONITORING WELLS	07/17/1997			11/04/1997			07/14/1998			11/04/1998			07/14/1999			12/08/1999		
	I,2 DCE	TCE	PCE	I,2 DCE	TCE	PCE	I,2 DCE	TCE	PCE	I,2 DCE	TCE	PCE	I,2 DCE	TCE	PCE	I,2 DCE	TCE	PCE
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
MW-103A	18	24	3200	0	7	560	12	8	1200	0	2.6	160	6.1	6	690	2	10	250
MW-107A	19.5	11	360	30	12	440	24	11	500	18	11	340	14	6.7	230	14	6.7	230
MW-2	5.6	0.5	160	9	0	140	9	0	170	2.1	0	57	0	0	32	4	0	66
MW-107	20.9	20	150	30	12	440	15	20	88	14	17	120	6	19	44	7	20	42
MW-111	0.5	0.7	8.9	8	4	58	1	2	19	5.3	5.2	57	0	0	22	4	4	40
MW-2B	0	0	0	0	0	1	0.3	0	0	0	0	0	0	0	0	1	0	0
MW-108	0	0	0	0	0	3	0	0	5	0	0	2	0	0	2.2	0	0	3
MW-108A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW-106	0	0	0	*	*	*	0	0	0	*	*	*	0	0	0	*	*	*
MW-106A	0	0	0	*	*	*	0	0	0	*	*	*	0	0	0	*	*	*
MW-109	0	0	0	*	*	*	0	0	0	*	*	*	0	0	0	*	*	*
MW-105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*	*
MW-105A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*	*
MW-104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*	*
MW-3	0	0	0	*	*	*	0	0	0	*	*	*	0	0	0	*	*	*
MW-3B	0	0	0	*	*	*	0	0	0.6	*	*	*	0	0	0	*	*	*

Notes:

1) 1,2 DCE = Cis/Trans 1,2 Dichloroethene
   TCE = Trichloroethene
   PCE = Tetrachloroethene

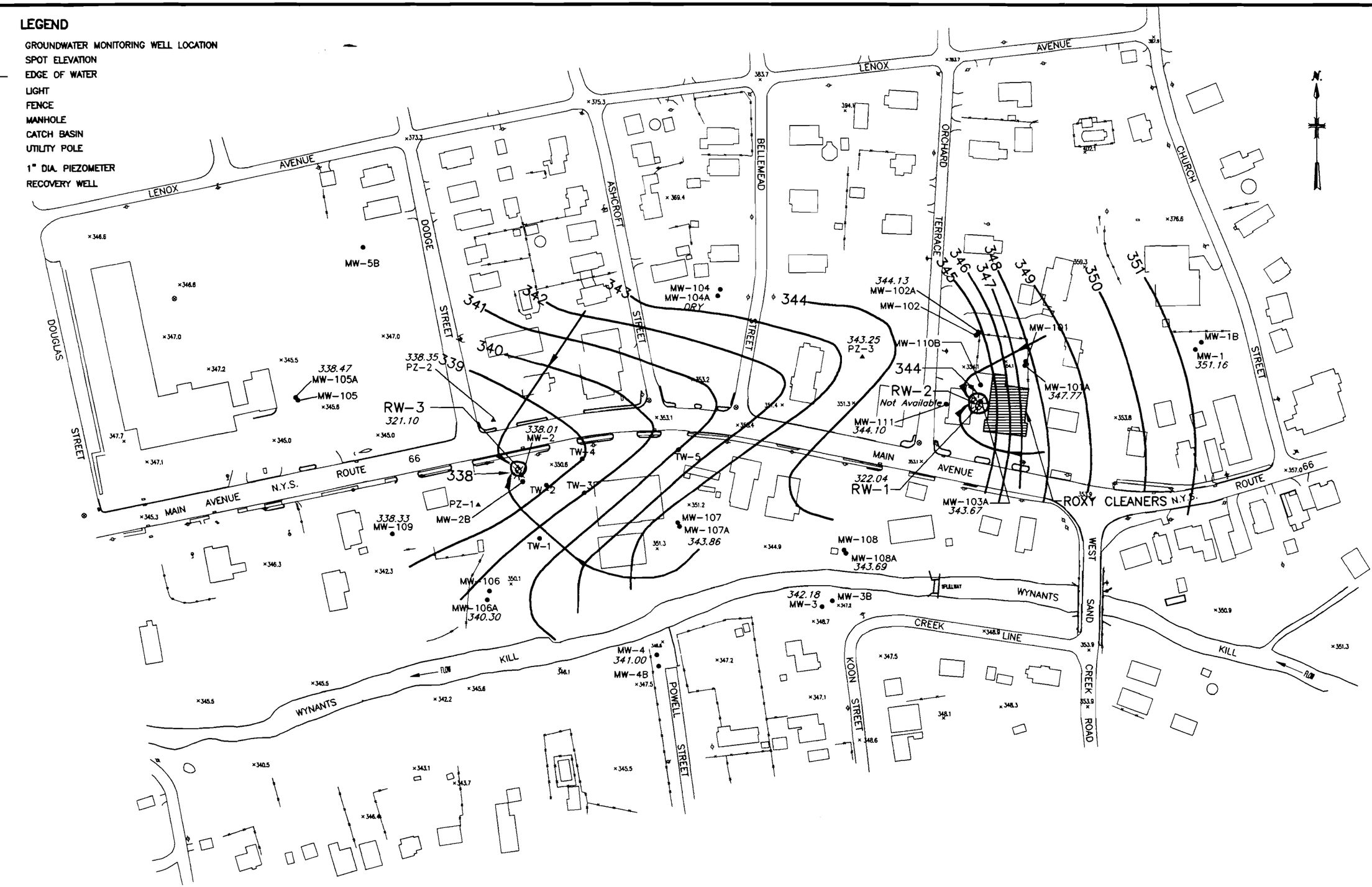
* The following wells were not sampled during this event

APPENDIX D

Potentiometric Contour Maps

LEGEND

- MW ○ GROUNDWATER MONITORING WELL LOCATION
- ×347.5 SPOT ELEVATION
- EDGE OF WATER
- LIGHT
- FENCE
- MANHOLE
- CATCH BASIN
- UTILITY POLE
- 1" DIA. PIEZOMETER
- RECOVERY WELL



BASE MAP SOURCE: METCALF & EDDY OF NEW YORK, INC. (1992)

SCALE: 1"=150'

MALCOLM PIRNIE

ROXY CLEANERS SITE (NYSDEC #442024)
RENSSELAER COUNTY, NEW YORK

UNCONSOLIDATED AQUIFER POTENTIOMETRIC CONTOUR MAP (SEPTEMBER 29, 2000)

ANNUAL REPORT ON TREATMENT SYSTEM OPERATION, MAINTENANCE AND MONITORING

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APPENDIX B

Contaminant Recovery and Concentration Summary

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Malcolm Pirnie Project No. 0266330

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(Three years of recovery)

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September 28, 1999 - October 17, 2000

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3) The results of the quarterly influent water samples for the September water analysis are not yet available. Contaminant concentrations were assumed to be consistent with June's influent water analysis.

APPENDIX C

Monitoring Well Contaminant Study

Roxy Cleaners Site No. 442024
Malcolm Pirnie Project No. 0266330

Monitoring Well Contamination Summary

MONITORING WELLS	07/17/1997			11/04/1997			07/14/1998			11/04/1998			07/14/1999			12/08/1999		
	I,2 DCE	TCE	PCE	I,2 DCE	TCE	PCE	I,2 DCE	TCE	PCE	I,2 DCE	TCE	PCE	I,2 DCE	TCE	PCE	I,2 DCE	TCE	PCE
	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
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MW-107	20.9	20	150	30	12	440	15	20	88	14	17	120	6	19	44	7	20	42
MW-111	0.5	0.7	8.9	8	4	58	1	2	19	5.3	5.2	57	0	0	22	4	4	40
MW-2B	0	0	0	0	0	1	0.3	0	0	0	0	0	0	0	0	1	0	0
MW-108	0	0	0	0	0	3	0	0	5	0	0	2	0	0	2.2	0	0	3
MW-108A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW-106	0	0	0	*	*	*	0	0	0	*	*	*	0	0	0	*	*	*
MW-106A	0	0	0	*	*	*	0	0	0	*	*	*	0	0	0	*	*	*
MW-109	0	0	0	*	*	*	0	0	0	*	*	*	0	0	0	*	*	*
MW-105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*	*
MW-105A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*	*
MW-104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*	*
MW-3	0	0	0	*	*	*	0	0	0	*	*	*	0	0	0	*	*	*
MW-3B	0	0	0	*	*	*	0	0	0.6	*	*	*	0	0	0	*	*	*

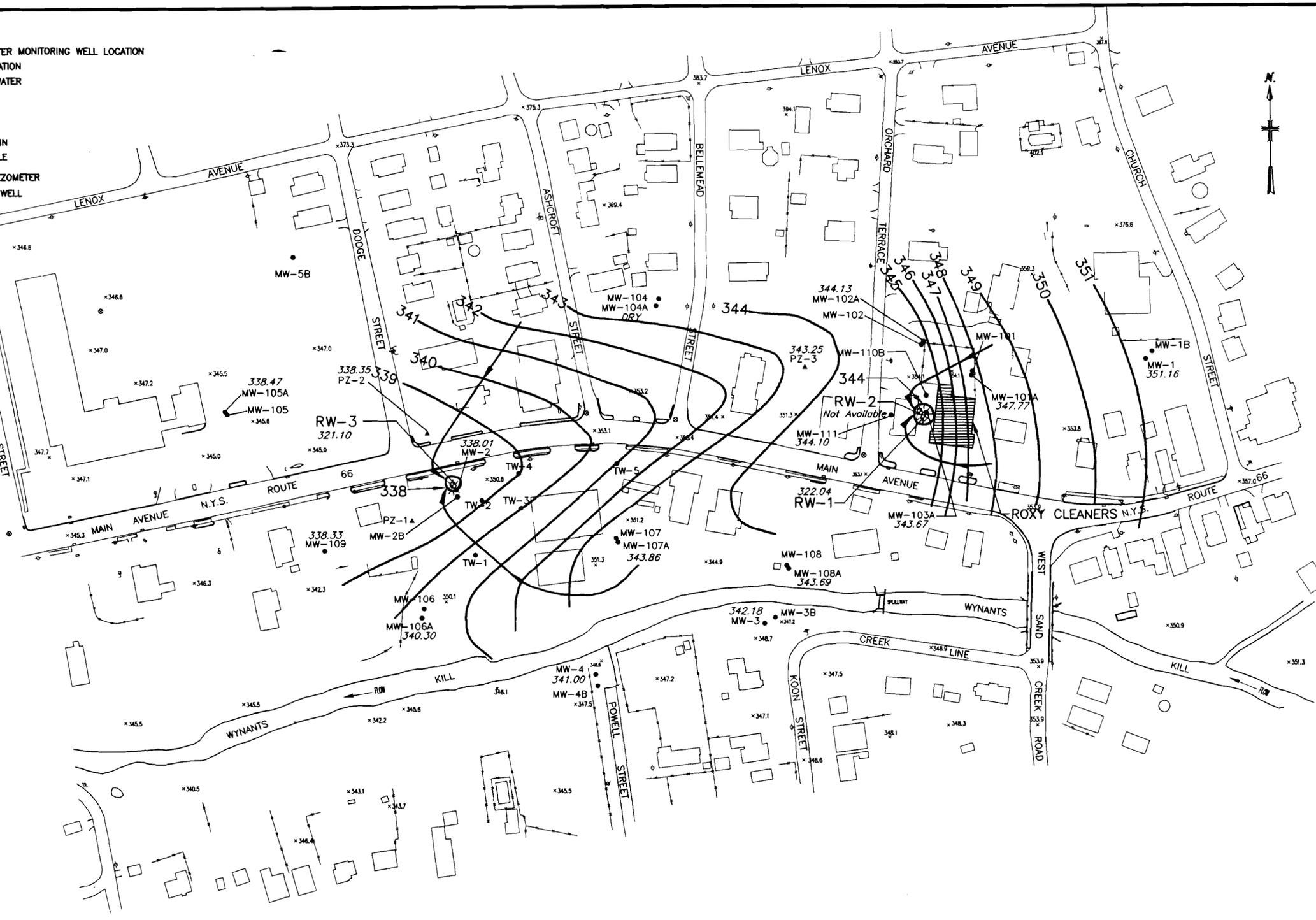
Notes:
1) 1,2 DCE = Cis/Trans 1,2 Dichloroethene
TCE = Trichloroethene
PCE = Tetrachloroethene
* The following wells were not sampled during this event

APPENDIX D

Potentiometric Contour Maps

LEGEND

- MW ○ — GROUNDWATER MONITORING WELL LOCATION
- ×347.5 — SPOT ELEVATION
- EDGE OF WATER
- LIGHT
- FENCE
- MANHOLE
- CATCH BASIN
- UTILITY POLE
- 1" DIA. PIEZOMETER
- RECOVERY WELL



BASE MAP SOURCE: METCALF & EDDY OF NEW YORK, INC. (1992)

SCALE: 1"=150'

MALCOLM PIRNIE

ROXY CLEANERS SITE (NYSDEC #442024)
RENSSELAER COUNTY, NEW YORK

UNCONSOLIDATED AQUIFER POTENTIOMETRIC CONTOUR MAP (SEPTEMBER 29, 2000)