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2009 ANNUAL GROUNDWATER MONITORING PROGRAM EVALUATION REPORT

AKZO NOBEL POLYMER CHEMICALS LLC
2153 LOCKPORT-OLCOTT ROAD
BURT, NEW YORK

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2009 ANNUAL GROUNDWATER MONITORING PROGRAM EVALUATION REPORT

AKZO NOBEL POLYMER CHEMICALS LLC
2153 LOCKPORT-OLCOTT ROAD
BURT, NEW YORK

JANUARY 2010
REF. NO. 044016 (19)

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1.0 INTRODUCTION

Akzo Nobel Polymer Chemicals, LLC (Akzo Nobel) has a Part 373 Permit, Number 9-02928-00001/0003, which required a Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) and a RCRA Facility Investigation (RFI) to determine the nature and extent of contamination associated with the Site (Site). These studies were conducted from 1994 to 2002. Based on the findings of the RFI, groundwater impacts were identified at the Site. A Corrective Measures Study (CMS) was conducted to evaluate remedial alternatives. Monitored Natural Attenuation (MNA) and institutional controls were selected as the final corrective measures for the Site. Akzo Nobel's Part 3 Permit was renewed in December 2005. The Permit authorized Akzo Nobel to implement corrective action measures to address the groundwater contamination at the Site.

The remedial goals of the corrective action are:

i) eliminate the future risk to human health posed by the contaminated soil and remaining source materials present within the industrialized area of the Facility;

ii) eliminate the future risk to human health posed by the contaminated overburden groundwater present beneath the industrialized area of the Facility; and

iii) control migration of the contaminated groundwater.

The remedial criteria of the correction action are:

i) maintain a long-term Groundwater Monitoring Program (GMP) to ensure that the concentration of contaminants continues to decline in the central area of the Facility; and

ii) continue groundwater monitoring in the perimeter wells to ensure that there is no off-Site contaminant migration.

The GMP and the effectiveness of the MNA as the selected remedy for the Site will be evaluated annually. The GMP Evaluation Report will evaluate the contaminant concentration trends and natural attenuation parameters to determine if the remedy is effective in meeting the remedial goals and permit criteria. If an annual review shows that any well or wells consistently has results of non-detect for all parameters for at last four sampling events, Akzo Nobel may request that the New York State Department of Environmental Conservation (NYSDEC) allow Akzo Nobel to modify this GMP to reduce the sampling frequency for those wells.

If concentrations of Site contaminants are observed to be increasing at any of the source area wells or contaminants are detected at any of the perimeter wells at concentrations above the 6 New York Code of Rules and Regulations (NYCRR) Part 703.5 Standards, Akzo Nobel will develop and implement an Interim Corrective Measures (ICM) as required by Module II Section 1(a)(ii).

As required in the GMP, this annual report evaluates the performance of the remedial system at the Site. This performance evaluation includes:

i) a comparison of 2009 monitoring data to determine remediation trends; and

ii) an evaluation of water level data to determine overburden and bedrock groundwater flow.

Conestoga-Rovers & Associates (CRA) was notified by Akzo Nobel on February 6, 2009, that the NYSDEC had agreed to reduce groundwater monitoring from four times per year (quarterly) to three times per year. This report, therefore, summarizes three groundwater monitoring events for 2009.

Figure 1 presents a Site Plan and Figure 2 presents the monitoring well locations. This is the fourth annual report prepared for the Site, and summarizes data collected for 2009.

2.0 GROUNDWATER QUALITY DATA

The existing monitoring well network consists of 17 groundwater monitoring wells. All monitoring wells were sampled three times in 2009, May, August, and November. Groundwater samples were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), general chemistry, and specific field parameters. The TCL VOCs were analyzed by United States Environmental Protection Agency (USEPA) SW-846 Method 8260. Analyzing for the TCL VOC list of parameters indicates if the contaminants identified at the Site were decreasing in concentration as well as if daughter-products were being produced, providing an indication of degradation of contaminants by natural attenuation. Additionally, the following natural attenuation parameters were analyzed to assess whether conditions continue to be favorable for continued degradation or if enhancement of the natural attenuation may be necessary:

i) dissolved oxygen (field measurement)

ii) iron (II) (field measurement)

iii) dissolved iron (USEPA Method SW-846 200.7 Series)

iv) manganese, dissolved (USEPA Method SW-846 200.7 Series)

v) nitrate (USEPA Method SW-846 300.0)

vi) nitrite (USEPA Method SW-846 354.1)

vii) sulfate (USEPA Method SW-846 300.0)

viii) methane (Method RSK 175)

Analytical reports are summarized in Appendix A. Appendix D contains field measurement data.

3.0 COMPARISON OF 2009 TCL VOCs IN GROUNDWATER WITH NYCRR 703.5 GROUNDWATER STANDARDS

The analytical results comparing TCL VOCs in groundwater with NYCRR 703.5 Groundwater Standards obtained in 2009 for the 17 monitoring wells are summarized briefly below.

Well	*Comparison of TCL VOCs in Groundwater with NYCRR 703.5 Groundwater Standards*	
MW-1	No results above action limits	
MW-1B	No results above action limits.	
MW-2	1,1,1 Trichloroethane (5.7 µg/L versus action limit of 5 µg/L)	5/12/09
	1,1,1 Dichloroethane (73 µg/L versus action limit of 5 µg/L)	5/12/09
	Acetone (58 µg/L versus action limit of 50 µg/L)	5/12/09
	Benzene (58 µg/L versus action limit of 1 µg/L)	5/12/09
	Chlorobenzene (6.2 µg/L versus action limit of 5 µg/L)	5/12/09
	Chloroethane (270 µg/L versus action limit of 5 µg/L)	5/12/09
	Chloroethane (41 µg/L versus action limit of 5 µg/L)	8/20/09
	Chloroethane (15 µg/L versus action limit of 5 µg/L)	11/17/09
	Ethylbenzene (25 µg/L versus action limit of 5 µg/L)	5/12/09
	Toluene (6300 µg/L versus action limit of 5 µg/L)	5/12/09
	Xylene (67 µg/L versus action limit of 5 µg/L)	5/12/09
MW-3*	No results above action limits	
MW-3B*	No results above action limits	
MW-4*	No results above action limits	
MW-4B*	No results above action limits	
MW-5	Acetone (1500 µg/L versus action limit of 50 µg/L)	8/20/09
	Acetone (720 µg/L versus action limit of 50 µg/L)	11/17/09
MW-6	No results above action limits	
MW-7	No results above action limits	
MW-8	1,1 Dichloroethane (5.7 µg/L versus action limit of 5 µg/L)	11/17/09
MW-9*	1,1,1-Trichloroethane (12 µg/L versus action limit of 5 µg/L)	5/12/09
	1,1,1-Trichloroethane (17 µg/L [17 µg/L duplicate] versus action limit of 5 µg/L)	8/20/09
	1,1,1-Trichloroethane 14 µg/L versus action limit of 5 µg/L)	11/18/09
MW-9B*	No results above action limits	
MW-10*	No results above action limits	
MW-10B*	No results above action limits	
MW-11*	1,1,1-Trichloroethane (6.8 µg/L versus action limit of 5 µg/L)	5/13/09
MW-11B*	No results above action limits	

Notes:
* Denotes downgradient boundary well
J Estimated value
µg/L Micrograms per liter

A summary of the analytical reports for 2009 can be found in Appendix A.

A comparison of 2007 and 2008 TCL VOCs in groundwater data with NYCRR 703.5 groundwater standards can be found in Appendix F.

With the exception of MW-9 and MW-11, none of the specified boundary wells exceeded 6 NYCRR Part 703.5 standards during 2009. 1,1,1-Trichloroethane was detected in MW-9 above the 6 NYCRR Part 703.5 action limit of 5 μg/L during all sampling events. A boundary well cluster designated MW-11 and MW-11B, downgradient of MW-9, depicted on Figure 2, was installed in February 2007 and was sampled during all 2009 sampling programs. 1,1,1-Trichloroethane was detected in MW-11 at a concentration of 6.8 μg/L versus the 6NYCRR Part 703.5 action limit of 5 μg/L. NYSDEC was notified by CRA on June 8, 2009 of this sampling result and agreed no further action during the sampling event was required. All other sampling results for boundary wells MW-11 and MW-11B were below NYCRR 703.5 New York State groundwater standards. Performance at downgradient boundary wells, including MW-9, will continue to be tracked through scheduled monitoring programs.

Interior monitoring well MW-2 has historically had concentrations of several groundwater monitoring constituents above 6NYCRR Part 703.5 standards. Data for 2009, summarized below, continues to illustrate a pronounced decrease in measured concentrations for the 2009 data.

MW-2 ANALYTICAL RESULTS HIGHER THAN 6 NYCRR PART 703.5 STANDARDS

Parameter	*Action Limits for 6NYCRR Part 703.5 (µg/L)*	*May 2009 (µg/L)*	*August 2009 (µg/L)*	*November 2009 (µg/L)*
1,1,1-Trichloroethane	5	5.7	ND at associated value for sample	ND at associated value for sample
1,1-Dichloroethane	5	73	ND at associated value for sample	ND at associated value for sample
Benzene	1	58	Below action limit for sample	ND at associated value for sample
Chlorobenzene	5	6.2	Below action limit for sample	Below action limit for sample
Chloroethane	5	270	41	15
Ethyl Benzene	5	25	ND at associated value for sample	ND at associated value for sample
Toluene	5	6300	ND at associated value for sample	ND at associated value for sample
Xylene (Total)	5	67	ND at associated value for sample	ND at associated value for sample

ND – Not detected.

4.0 MONITORED NATURAL ATTENUATION EVALUATION

Based on the findings of the RFI conducted from 1994 to 2002, groundwater impacts were identified at the Site. A CMS was conducted to evaluate remedial alternatives. MNA and institutional controls were subsequently selected as the final corrective measures at the Site.

Site groundwater MNA data were evaluated to determine whether conditions suitable for reductive dechlorination exist at the Site.

Several indicators of anaerobic conditions were measured during the groundwater sampling at the Site. Dissolved oxygen is a direct measurement of oxygen in the groundwater. Oxidation Reduction Potential (ORP) was also measured. Methane gas was analyzed. Dissolved metals such as iron and manganese were also measured. An assessment of current groundwater conditions is presented below.

1,1, dichloroethane and chloroethane are formed when 1,1,1- trichloroethane (1,1,1, TCA) is degraded by reductive dechlorination. The presence of these compounds in well MW-2 suggests that reductive dechlorination of 1,1,1, TCA has occurred in this area.

The 1,1,1-TCA present in the source area has been degraded to chloroethane to the point where the parent compound is no longer detected in the source area. The chloroethane is either continuing to degrade under anaerobic conditions in the source area or degrading aerobically as it migrates towards the Site boundary. Some anaerobic degradation of the BTEX compounds present in the source area appears to be occurring. Any BTEX not degraded in the source area will be degraded after they migrate to the aerobic area west of the source area. Therefore, off-Site migration of BTEX should not occur. 1,1,1-TCA is already present in the aerobic boundary area. The data indicate that natural attenuation of the 1,1,1-TCA is occurring in this area and that concentrations continue to decrease. Please see Appendix E of this report for the detailed evaluation of MNA.

5.0 GROUNDWATER HYDRAULICS

Appendix B presents the overburden groundwater contours for 2009 and Appendix C presents the bedrock groundwater contours for 2009. Based on the assessment of 2009 groundwater monitoring data, the direction of overburden groundwater flow was generally west-northwest. The direction of bedrock groundwater flow was generally west-southwest.

An upward gradient was observed at the MW-1/MW-1B cluster. A downward vertical gradient was observed at the MW-3/MW-3B, MW-4/MW-4B, MW-9/MW-9B and MW-11/MW-11B clusters. The downward vertical gradient observed on the western boundary of the Site may be the result of a nearby bedrock groundwater discharge area (Eighteen Mile Creek northwest of the Site).

The Site monitoring wells were initially surveyed in 2006 with a reference elevation of 100.00'. The wells were resurveyed in the spring of 2007 in State Plane NY West NAD83, Vertical Datum NAVD88. Water level measurements used to assess groundwater hydraulics for 2009 are found in Appendix G.

6.0 CONCLUSIONS

The three reports issued for 2009 included a summary of groundwater monitoring field activities, a summary of the analytical data compared to the New York State Groundwater Standards in 6NYCRR 703.5, groundwater contour maps for both the overburden groundwater and bedrock groundwater, and an interpretation of the data.

A review of the 2009 data has concluded that:

- concentrations of TCL VOC analytes in groundwater collected from the Site monitoring well network in most cases were either not detected or detected below NYCRR 703.5 Groundwater Standards;
- due to the slightly elevated levels of 1,1,1-trichloroethane above NYCRR 703.5 Groundwater Standards observed in MW-9 in all 2006 quarterly sampling programs, a new boundary well cluster designated MW-11 and MW-11B was installed in February 2007 downgradient of MW-9, as depicted in Figure 2. During the May, 2009 monitoring event, 1,1,-trichloroethane was detected in MW-11, slightly above groundwater standards, but it was not detected in MW-11B and was not detected in MW-11 or 11-B during the August and November sampling events;
- the direction of overburden groundwater flow was generally west-northwest. The direction of bedrock groundwater flow was generally west-southwest;

  An upward gradient was observed at the MW-1/MW-1B cluster. A downward vertical gradient was observed at the MW-3/MW-3B, MW-4/MW-4B, MW-9/MW-9B and MW-11/MW-11B clusters. The downward vertical gradient observed on the western boundary of the Site may be the result of a nearby bedrock groundwater discharge area (Eighteen Mile Creek northwest of the Site);
- The 1,1,1-TCA present in the source area has been degraded to chloroethane. The chloroethane will either continue to degrade under anaerobic conditions in the source area or will be degraded aerobically as it migrates towards the Site boundary. Some anaerobic degradation of the BTEX compounds present in the source area appears to be occurring. Any BTEX not degraded in the source area will be degraded after they migrate to the aerobic area west of the source area. Therefore, off-Site migration of BTEX should not occur. 1,1,1-TCA is already present in the aerobic boundary area. The data indicate that natural attenuation of the 1,1,1-TCA is occurring in this area and that concentrations continue to decrease.
- the remedial goals of the corrective action that continue to be addressed are:
  - eliminate the future risk to human health posed by the contaminated soil and remaining source materials present within the industrialized area of the Facility;

- eliminate the future risk to human health posed by the contaminated overburden groundwater present beneath the industrialized area of the Facility; and
- control migration of the contaminated groundwater.

SOURCE REFERENCE

NEW YORK STATE GIS CLEARINGHOUSE, 2008

figure 1

SITE LOCATION MAP
AKZO NOBEL POLYMER CHEMICALS LLC
Burt, New York

44016-08(019)GN-BU001 DEC 21/2009

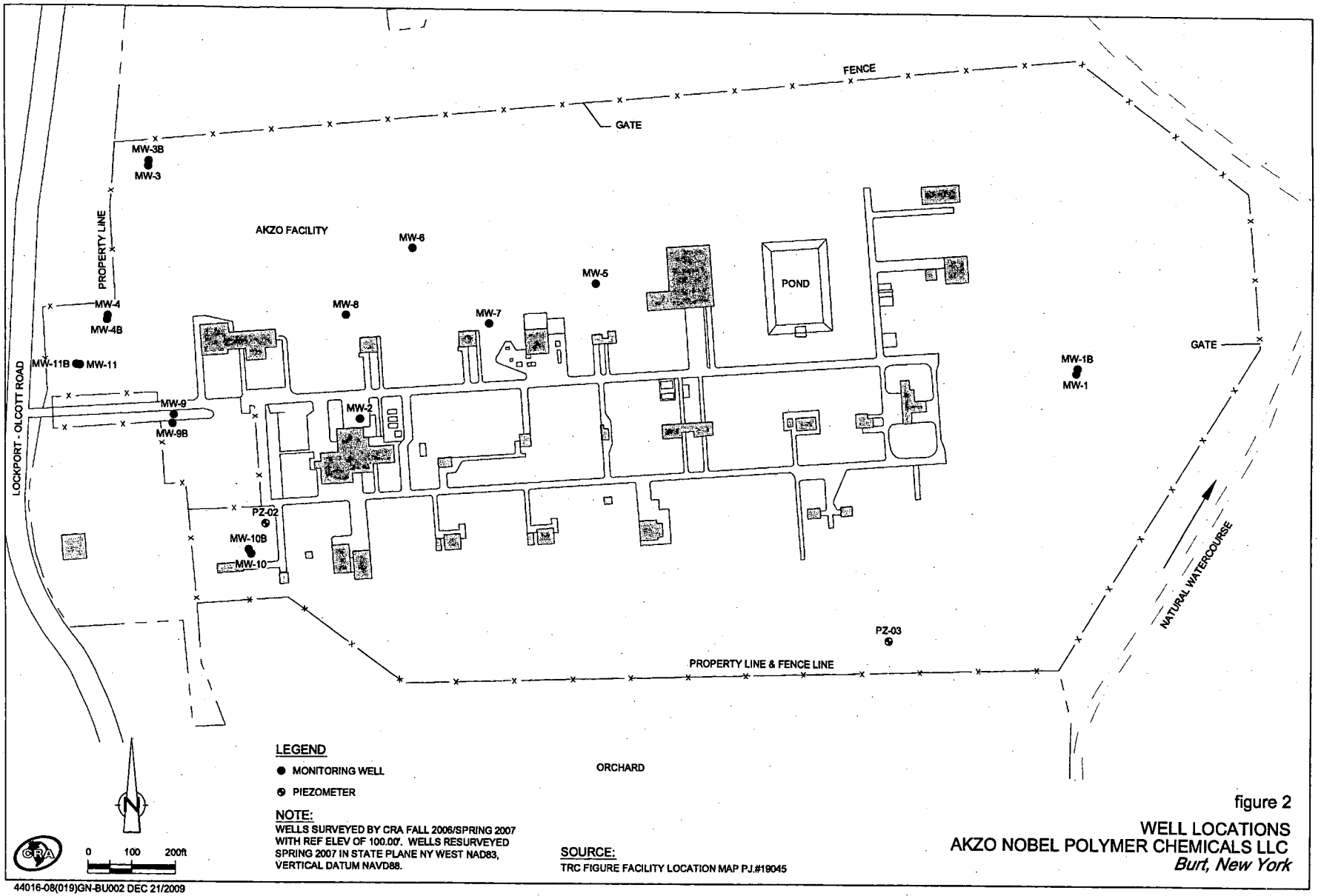


figure 2

WELL LOCATIONS
AKZO NOBEL POLYMER CHEMICALS LLC
Burt, New York

44016-08(019)GN-BU002 DEC 21/2009

APPENDICES

A

APPENDIX A

ANALYTICAL REPORTS - 2009

ANALYTICAL RESULTS SUMMARY
AKZO NOBEL GROUNDWATER SAMPLING
BURT, NEW YORK

Location ID:			MW-1	MW-1B	MW-2	MW-3	MW-3B	MW-4	MW-4B	MW-5
Sample Name:			WG-44016-051109-001	WG-44016-051309-014	WG-44016-051109-005	WG-44016-051109-008	WG-44016-051109-009	WG-44016-051309-016	WG-44016-051309-015	WG-44016-051309-011
Sample Date:			5/12/2009	5/13/2009	5/12/2009	5/12/2009	5/12/2009	5/13/2009	5/13/2009	5/13/2009
Parameter	*Units*	*Action Limits 6NYCRR Part 703.5 Stds. For Analyte Samples*								
Volatile Organic Compounds										
1,1,1-Trichloroethane	µg/L	5	0.26 U	0.26 U	5.7	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
1,1,2,2-Tetrachloroethane	µg/L	5	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
1,1,2-Trichloroethane	µg/L	1	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
1,1-Dichloroethane	µg/L	5	0.75 U	0.75 U	73	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene	µg/L	5	0.29 U	0.29 U	1.3	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U
1,2-Dichloroethane	µg/L	0.6	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
1,2-Dichloroethene (total)	µg/L	5	0.74 J	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U
1,2-Dichloropropane	µg/L	1	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
2-Hexanone	µg/L	50	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U
Acetone	µg/L	50	1.3 U	1.3 U	5.3	1.3 U	1.3 U	1.3 U	9.1	6.5
Benzene	µg/L	1	0.16 U	0.16 U	58	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
Bromodichloromethane	µg/L	50	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
Bromoform	µg/L	50	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Bromomethane (Methyl Bromide)	µg/L	5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Carbon disulfide	µg/L	-	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
Carbon tetrachloride	µg/L	5	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Chlorobenzene	µg/L	5	0.32 U	0.32 U	6.2	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloroethane	µg/L	5	0.32 U	0.32 U	270	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloroform (Trichloromethane)	µg/L	7	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Chloromethane (Methyl Chloride)	µg/L	-	0.35 U	0.35 U	1.4	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
cis-1,3-Dichloropropene	µg/L	0.4	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Dibromochloromethane	µg/L	50	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Ethylbenzene	µg/L	5	0.18 U	0.18 U	25	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Methylene chloride	µg/L	5	0.44 U	0.44 U	3.2	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
Styrene	µg/L	5	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Tetrachloroethene	µg/L	5	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Toluene	µg/L	5	0.51 U	0.51 U	6300	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U
trans-1,3-Dichloropropene	µg/L	0.4	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Trichloroethene	µg/L	5	0.18 U	0.18 U	0.70 J	0.52 J	0.18 U	0.18 U	0.18 U	0.18 U
Vinyl chloride	µg/L	2	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Xylene (total)	µg/L	5	0.66 U	0.66 U	67	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U
Dissolved Gases										
Methane	µg/L		5.8	0.32 J	1500 J	0.42 J	5.0	1.0 U	1.7	1.0 U
Metals										
Iron (Dissolved)	µg/L	-	50 U	50 U	4760	134	308	50 U	50 U	50 U
Manganese (Dissolved)	µg/L	-	26.2	249	1930	165	25.2	48.3	106	77.4
General Chemistry										
Nitrate (as N)	mg/L		0.050 U	0.081	0.050 U	0.050 U	0.045 J	0.013 J	0.334	4.37
Nitrite (as N)	mg/L		0.05 U	0.15	0.05 U	0.05 U	0.03 J	0.05 U	0.18	0.05 U
Sulfate	mg/L		48.0	1340	5.0 U	180	53.1	40.2	1070	43.5

Notes:

- Not analyzed.
- J Estimated.
- U Not detected.
- Above 6 NYCRR Part 703.5 Standards.

ANALYTICAL RESULTS SUMMARY
AKZO NOBEL GROUNDWATER SAMPLING
BURT, NEW YORK

Location ID:			MW-6	MW-7	MW-8	MW-9	MW-9B	MW-10	MW-10	MW-10B
Sample Name:			WG-44016-051109-007	WG-44016-051309-012	WG-44016-051109-006	WG-44016-051109-002	WG-44016-051309-017	WG-44016-051109-003	WG-44016-051109-004	WG-44016-051309-018
Sample Date:			5/12/2009	5/13/2009	5/12/2009	5/12/2009	5/13/2009	5/12/2009	5/12/2009	5/13/2009
Parameter	*Units*	*Action Limits 6NYCRR Part 703.5 Stds. For Analyte Samples*							*(Duplicate)*	
Volatile Organic Compounds										
1,1,1-Trichloroethane	µg/L	5	0.26 U	0.26 U	1.4	12	0.26 U	0.26 U	0.26 U	0.26 U
1,1,2,2-Tetrachloroethane	µg/L	5	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
1,1,2-Trichloroethane	µg/L	1	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
1,1-Dichloroethane	µg/L	5	0.75 U	0.75 U	4.0	0.79 J	0.75 U	0.75 U	0.75 U	2.6
1,1-Dichloroethene	µg/L	5	0.29 U	0.29 U	1.3	2.7	0.29 U	0.29 U	0.29 U	1.4
1,2-Dichloroethane	µg/L	0.6	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
1,2-Dichloroethene (total)	µg/L	5	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U
1,2-Dichloropropane	µg/L	1	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
2-Hexanone	µg/L	50	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U
Acetone	µg/L	50	1.3 U	11	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Benzene	µg/L	1	0.67 J	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
Bromodichloromethane	µg/L	50	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
Bromoform	µg/L	50	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Bromomethane (Methyl Bromide)	µg/L	5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Carbon disulfide	µg/L	-	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
Carbon tetrachloride	µg/L	5	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Chlorobenzene	µg/L	5	1.2	0.32 U	0.75 J	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloroethane	µg/L	5	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloroform (Trichloromethane)	µg/L	7	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Chloromethane (Methyl Chloride)	µg/L	-	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
cis-1,3-Dichloropropene	µg/L	0.4	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Dibromochloromethane	µg/L	50	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Ethylbenzene	µg/L	5	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Methylene chloride	µg/L	5	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
Styrene	µg/L	5	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Tetrachloroethene	µg/L	5	0.36 U	0.36 U	0.36 U	0.65 J	0.36 U	0.36 U	0.36 U	0.36 U
Toluene	µg/L	5	1.5	0.51 U	1.9	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U
trans-1,3-Dichloropropene	µg/L	0.4	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Trichloroethene	µg/L	5	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Vinyl chloride	µg/L	2	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Xylene (total)	µg/L	5	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U
Dissolved Gases										
Methane	µg/L		300	140 J	7.7	1.0 U	3.9	1.0 U	-	22
Metals										
Iron (Dissolved)	µg/L	-	204	2140	1250	50 U	50 U	93	-	50 U
Manganese (Dissolved)	µg/L	-	507	1070	1020	168	33.5	10.5	-	53.1
General Chemistry										
Nitrate (as N)	mg/L		0.050 U	0.050 U	0.050 U	5.77	0.144	6.71	-	0.050 U
Nitrite (as N)	mg/L		0.05 U	0.05 U	0.05 U	0.05 U	0.05 J	0.05 U	-	0.05 U
Sulfate	mg/L		78.1	97.5	99.8	71.5	684	56.4	-	94.3

Notes:
- \- Not analyzed.
- J Estimated.
- U Not detected.
- [ ] Above 6 NYCRR Part 703.5 Standards.

ANALYTICAL RESULTS SUMMARY
AKZO NOBEL GROUNDWATER SAMPLING
BURT, NEW YORK

Location ID:			*MW-11*	*MW-11B*
Sample Name:			*WG-44016-051309-013*	*WG-44016-051109-010*
Sample Date:			*5/13/2009*	*5/12/2009*
Parameter	*Units*	*Action Limits 6NYCRR Part 703.5 Stds. For Analyte Samples*		
Volatile Organic Compounds				
1,1,1-Trichloroethane	µg/L	5	6.8	0.26 U
1,1,2,2-Tetrachloroethane	µg/L	5	0.21 U	0.21 U
1,1,2-Trichloroethane	µg/L	1	0.23 U	0.23 U
1,1-Dichloroethane	µg/L	5	0.95 J	0.75 U
1,1-Dichloroethene	µg/L	5	1.6	0.29 U
1,2-Dichloroethane	µg/L	0.6	0.21 U	0.21 U
1,2-Dichloroethene (total)	µg/L	5	0.70 U	0.70 U
1,2-Dichloropropane	µg/L	1	0.14 U	0.14 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	1.3 U	1.3 U
2-Hexanone	µg/L	50	1.2 U	1.2 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	0.91 U	0.91 U
Acetone	µg/L	50	1.3 U	1.3 U
Benzene	µg/L	1	0.16 U	0.16 U
Bromodichloromethane	µg/L	50	0.39 U	0.39 U
Bromoform	µg/L	50	0.26 U	0.26 U
Bromomethane (Methyl Bromide)	µg/L	5	0.28 U	0.28 U
Carbon disulfide	µg/L	-	0.19 U	0.19 U
Carbon tetrachloride	µg/L	5	0.27 U	0.27 U
Chlorobenzene	µg/L	5	0.32 U	0.32 U
Chloroethane	µg/L	5	0.32 U	0.32 U
Chloroform (Trichloromethane)	µg/L	7	0.34 U	0.34 U
Chloromethane (Methyl Chloride)	µg/L	-	0.35 U	0.35 U
cis-1,3-Dichloropropene	µg/L	0.4	0.36 U	0.36 U
Dibromochloromethane	µg/L	50	0.32 U	0.32 U
Ethylbenzene	µg/L	5	0.18 U	0.18 U
Methylene chloride	µg/L	5	0.44 U	0.44 U
Styrene	µg/L	5	0.18 U	0.18 U
Tetrachloroethene	µg/L	5	0.36 U	0.36 U
Toluene	µg/L	5	0.51 U	0.51 U
trans-1,3-Dichloropropene	µg/L	0.4	0.37 U	0.37 U
Trichloroethene	µg/L	5	0.18 U	0.18 U
Vinyl chloride	µg/L	2	0.24 U	0.24 U
Xylene (total)	µg/L	5	0.66 U	0.66 U
Dissolved Gases				
Methane	µg/L		0.45 J	6.6
Metals				
Iron (Dissolved)	µg/L	-	50 U	50 U
Manganese (Dissolved)	µg/L	-	97.0	13.2
General Chemistry				
Nitrate (as N)	mg/L		1.26	0.073
Nitrite (as N)	mg/L		0.05 U	0.05 U
Sulfate	mg/L		60.3	114

Notes:

- Not analyzed.
- J Estimated.
- U Not detected.
- [ ] Above 6 NYCRR Part 703.5 Standards.

ANALYTICAL RESULTS SUMMARY
AKZO NOBEL GROUNDWATER MONITORING
BURT, NEW YORK

Parameters	Units	Action Limits 6NYCRR Part 703.5 Stds. For Analyte Samples	Location ID: MW-1 Sample Name: WG-44016-082009-008 Sample Date: 8/20/2009	MW-1B WG-44016-082009-001 8/20/2009	MW-2 WG-44016-082009-014 8/20/2009	MW-3 WG-44016-082009-006 8/20/2009	MW-3B WG-44016-082009-007 8/20/2009	MW-4 WG-44016-082009-005 8/20/2009	MW-4B WG-44016-082009-004 8/20/2009	MW-5 WG-44016-082009-018 8/20/2009
Volatile Organic Compounds										
1,1,1-Trichloroethane	µg/L	5	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	1.1 U
1,1,2,2-Tetrachloroethane	µg/L	5	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.85 U
1,1,2-Trichloroethane	µg/L	1	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.92 U
1,1-Dichloroethane	µg/L	5	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	1.5 U
1,1-Dichloroethene	µg/L	5	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	1.2 U
1,2-Dichloroethane	µg/L	0.6	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.86 U
1,2-Dichloroethene (total)	µg/L	5	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	2.8 U
1,2-Dichloropropane	µg/L	1	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	1.3 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	5.3 U
2-Hexanone	µg/L	50	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	5.0 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	3.6 U
Acetone	µg/L	50	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1500
Benzene	µg/L	1	0.41 U	0.41 U	0.66 J	0.41 U	0.41 U	0.41 U	0.41 U	1.6 U
Bromodichloromethane	µg/L	50	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	1.5 U
Bromoform	µg/L	50	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	1.0 U
Bromomethane (Methyl Bromide)	µg/L	5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	1.1 U
Carbon disulfide	µg/L	-	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.78 U
Carbon tetrachloride	µg/L	5	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	1.1 U
Chlorobenzene	µg/L	5	0.32 U	0.32 U	0.95 J	0.32 U	0.32 U	0.32 U	0.32 U	1.3 U
Chloroethane	µg/L	5	0.32 U	0.32 U	41	0.32 U	0.32 U	0.32 U	0.32 U	1.3 U
Chloroform (Trichloromethane)	µg/L	7	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	1.3 U
Chloromethane (Methyl Chloride)	µg/L	-	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	1.4 U
cis-1,3-Dichloropropene	µg/L	0.4	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	1.4 U
Dibromochloromethane	µg/L	50	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	1.3 U
Ethylbenzene	µg/L	5	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.74 U
Methylene chloride	µg/L	5	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	1.8 U
Styrene	µg/L	5	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.74 U
Tetrachloroethene	µg/L	5	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	1.5 U
Toluene	µg/L	5	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	2.0 U
trans-1,3-Dichloropropene	µg/L	0.4	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	1.5 U
Trichloroethene	µg/L	5	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	1.8 U
Vinyl chloride	µg/L	2	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.97 U
Xylene (total)	µg/L	5	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	2.6 U
Gases										
Methane	µg/L	-	10	0.50 J	1200	1.0 U	14	1.0 U	3.7	1.0 U
Metals										
Iron (Dissolved)	µg/L	-	225	50 U	2760	50 U	80	50 U	50 U	50 U
Manganese (Dissolved)	µg/L	-	87.2	151	1470	11.0	19.2	80.1	280	5.5
Wet Chemistry										
Nitrate (as N)	mg/L	-	0.050 U	0.195	0.050 U	0.013 J	0.066	0.051	0.311	3.57
Nitrite (as N)	mg/L	-	0.05 U	0.05 U	0.05 U	0.05 U	0.03 J	0.05 U	0.17	0.05 U
Sulfate	mg/L	-	46.0	1330	60.0	130	40.9	45.4	840	60.9

Notes:

- \- Not analyzed
- J Estimated.
- U Not present at or above the associated value.
- Above 6 NYCRR Part 703.5 Standards.

ANALYTICAL RESULTS SUMMARY
AKZO NOBEL GROUNDWATER MONITORING
BURT, NEW YORK

Parameters	Units	Action Limits 6NYCRR Part 703.5 Stds. For Analyte Samples	MW-6 WG-44016-082009-016 8/20/2009	MW-7 WG-44016-082009-017 8/20/2009	MW-8 WG-44016-082009-015 8/20/2009	MW-9 WG-44016-082009-011 8/20/2009	MW-9 WG-44016-082009-012 8/20/2009 Duplicate	MW-9B WG-44016-082009-003 8/20/2009	MW-10 WG-44016-082009-013 8/20/2009	MW-10B WG-44016-082009-002 8/20/2009
Volatile Organic Compounds										
1,1,1-Trichloroethane	µg/L	5	0.26 U	0.26 U	0.26 U	17	17	0.26 U	0.26 U	0.26 U
1,1,2,2-Tetrachloroethane	µg/L	5	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
1,1,2-Trichloroethane	µg/L	1	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
1,1-Dichloroethane	µg/L	5	0.38 U	0.38 U	1.5	1.0	1.0	0.38 U	0.38 U	1.7
1,1-Dichloroethene	µg/L	5	0.29 U	0.29 U	0.29 U	0.61 J	0.59 J	0.29 U	0.29 U	0.29 U
1,2-Dichloroethane	µg/L	0.6	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
1,2-Dichloroethene (total)	µg/L	5	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U
1,2-Dichloropropane	µg/L	1	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
2-Hexanone	µg/L	50	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U
Acetone	µg/L	50	15	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Benzene	µg/L	1	0.63 J	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U
Bromodichloromethane	µg/L	50	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
Bromoform	µg/L	50	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Bromomethane (Methyl Bromide)	µg/L	5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Carbon disulfide	µg/L	-	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
Carbon tetrachloride	µg/L	5	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Chlorobenzene	µg/L	5	2.5	0.61 J	1.4	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloroethane	µg/L	5	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloroform (Trichloromethane)	µg/L	7	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Chloromethane (Methyl Chloride)	µg/L	-	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
cis-1,3-Dichloropropene	µg/L	0.4	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Dibromochloromethane	µg/L	50	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Ethylbenzene	µg/L	5	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Methylene chloride	µg/L	5	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
Styrene	µg/L	5	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Tetrachloroethene	µg/L	5	0.36 U	0.36 U	0.36 U	0.83 J	0.86 J	0.36 U	0.36 U	0.36 U
Toluene	µg/L	5	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U
trans-1,3-Dichloropropene	µg/L	0.4	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Trichloroethene	µg/L	5	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U
Vinyl chloride	µg/L	2	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Xylene (total)	µg/L	5	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U
Gases										
Methane	µg/L	-	100	230	63	0.78 J	--	5.1	1.0 U	8.3
Metals										
Iron (Dissolved)	µg/L	-	182	2110	1790	88	--	50 U	50 U	56
Manganese (Dissolved)	µg/L	-	1960	963	1280	247	--	34.1	0.5 J	55.2
Wet Chemistry										
Nitrate (as N)	mg/L	-	0.050 U	0.050 U	0.050 U	4.92	--	0.047 J	5.61	0.050 U
Nitrite (as N)	mg/L	-	0.05 U	0.05 U	0.05 U	0.05 U	--	0.06	0.05	0.05 U
Sulfate	mg/L	-	95.1	89.1	78.4	69.6	--	604	50.3	87.4

Notes:

- Not analyzed
- J Estimated.
- U Not present at or above the associated value.
- Above 6 NYCRR Part 703.5 Standards.

ANALYTICAL RESULTS SUMMARY
AKZO NOBEL GROUNDWATER MONITORING
BURT, NEW YORK

Parameters	Units	Action Limits 6NYCRR Part 703.5 Stds. For Analyte Samples	Location ID: MW-11 Sample Name: WG-44016-082009-009 Sample Date: 8/20/2009	Location ID: MW-11B Sample Name: WG-44016-082009-010 Sample Date: 8/20/2009
Volatile Organic Compounds				
1,1,1-Trichloroethane	µg/L	5	0.26 U	0.26 U
1,1,2,2-Tetrachloroethane	µg/L	5	0.21 U	0.21 U
1,1,2-Trichloroethane	µg/L	1	0.23 U	0.23 U
1,1-Dichloroethane	µg/L	5	1.3	0.38 U
1,1-Dichloroethene	µg/L	5	0.29 U	0.29 U
1,2-Dichloroethane	µg/L	0.6	0.21 U	0.21 U
1,2-Dichloroethene (total)	µg/L	5	0.70 U	0.70 U
1,2-Dichloropropane	µg/L	1	0.32 U	0.32 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	1.3 U	1.3 U
2-Hexanone	µg/L	50	1.2 U	1.2 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	0.91 U	0.91 U
Acetone	µg/L	50	1.3 U	1.3 U
Benzene	µg/L	1	0.41 U	0.41 U
Bromodichloromethane	µg/L	50	0.39 U	0.39 U
Bromoform	µg/L	50	0.26 U	0.26 U
Bromomethane (Methyl Bromide)	µg/L	5	0.28 U	0.28 U
Carbon disulfide	µg/L	-	0.19 U	0.19 U
Carbon tetrachloride	µg/L	5	0.27 U	0.27 U
Chlorobenzene	µg/L	5	0.32 U	0.32 U
Chloroethane	µg/L	5	0.32 U	0.32 U
Chloroform (Trichloromethane)	µg/L	7	0.34 U	0.34 U
Chloromethane (Methyl Chloride)	µg/L	-	0.35 U	0.35 U
cis-1,3-Dichloropropene	µg/L	0.4	0.36 U	0.36 U
Dibromochloromethane	µg/L	50	0.32 U	0.32 U
Ethylbenzene	µg/L	5	0.18 U	0.18 U
Methylene chloride	µg/L	5	0.44 U	0.44 U
Styrene	µg/L	5	0.18 U	0.18 U
Tetrachloroethene	µg/L	5	0.36 U	0.36 U
Toluene	µg/L	5	0.51 U	0.51 U
trans-1,3-Dichloropropene	µg/L	0.4	0.37 U	0.37 U
Trichloroethene	µg/L	5	0.46 U	0.46 U
Vinyl chloride	µg/L	2	0.24 U	0.24 U
Xylene (total)	µg/L	5	0.66 U	0.66 U
Gases				
Methane	µg/L	-	59	18
Metals				
Iron (Dissolved)	µg/L	-	234	50 U
Manganese (Dissolved)	µg/L	-	292	17.2
Wet Chemistry				
Nitrate (as N)	mg/L	-	0.050 U	0.070
Nitrite (as N)	mg/L	-	0.05 U	0.02 J
Sulfate	mg/L	-	78.8	161

Notes:

- \- Not analyzed
- J Estimated.
- U Not present at or above the associated value.
- Above 6 NYCRR Part 703.5 Standards.

ANALYTICAL RESULTS SUMMARY
AKZO NOBEL QUARTERLY GROUNDWATER SAMPLING
BURT, NEW YORK

	Location ID:		MW-1	MW-1B	MW-2	MW-3	MW-3B	MW-4	MW-4B	MW-5	MW-6
	Sample Name:		WG-44016-111709-009	WG-44016-111809-014	WG-44016-111709-008	WG-44016-111809-016	WG-44016-111809-017	WG-44016-111809-015	WG-44016-111809-010	WG-44016-111709-006	WG-44016-111709-003
	Sample Date:	Action Limits 6NYCRR Part 703.5 Stds. For Analyte Samples	11/17/2009	11/18/2009	11/17/2009	11/18/2009	11/18/2009	11/18/2009	11/18/2009	11/17/2009	11/17/2009
Parameters	*Units*										
Volatile Organic Compounds											
1,1,1-Trichloroethane	µg/L	5	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
1,1,2,2-Tetrachloroethane	µg/L	5	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
1,1,2-Trichloroethane	µg/L	1	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
1,1-Dichloroethane	µg/L	5	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
1,1-Dichloroethene	µg/L	5	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U
1,2-Dichloroethane	µg/L	0.6	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
1,2-Dichloroethene (total)	µg/L	5	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U
1,2-Dichloropropane	µg/L	1	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
2-Hexanone	µg/L	50	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U
Acetone	µg/L	50	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	720	5.6
Benzene	µg/L	1	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U
Bromodichloromethane	µg/L	50	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
Bromoform	µg/L	50	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Bromomethane (Methyl Bromide)	µg/L	5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Carbon disulfide	µg/L	-	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
Carbon tetrachloride	µg/L	5	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Chlorobenzene	µg/L	5	0.32 U	0.32 U	0.56 J	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	1.4
Chloroethane	µg/L	5	0.32 U	0.32 U	15	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloroform (Trichloromethane)	µg/L	7	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Chloromethane (Methyl Chloride)	µg/L	-	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
cis-1,3-Dichloropropene	µg/L	0.4	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Dibromochloromethane	µg/L	50	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Ethylbenzene	µg/L	5	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Methylene chloride	µg/L	5	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
Styrene	µg/L	5	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Tetrachloroethene	µg/L	5	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Toluene	µg/L	5	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U
trans-1,3-Dichloropropene	µg/L	0.4	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Trichloroethene	µg/L	5	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U
Vinyl chloride	µg/L	2	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Xylene (total)	µg/L	5	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U
Dissolved Gas											
Methane	µg/L	-	29	0.62 J	560	1.0 U	18	0.65 J	2.3	1.0 U	33
Metals (Dissolved)											
Iron (Dissolved)	µg/L	-	287	50	2100	50 U	50 U	70	50 U	50 U	215
Manganese (Dissolved)	µg/L	-	575	184	1430	5.6	11.8	96.1	62.2	10.3	1980
Wet Chemistry											
Nitrate (as N)	mg/L	-	0.050 U	0.084	0.028 J	0.018 J	0.118	0.050	0.044 J	0.812	0.015 J
Nitrite (as N)	mg/L	-	0.050 U	0.288	0.050 U	0.050 U	0.050 U	0.050 U	0.115	0.050 U	0.050 U
Sulfate	mg/L	-	62.1 U	1390	86.4	153 U	45.3 U	67.4 U	741	70.7 U	109

Notes:

- Not analyzed.
- J Estimated.
- U Not present at or above the associated value.
- Above 6 NYCRR Part 703.5 Standards.

ANALYTICAL RESULTS SUMMARY
AKZO NOBEL QUARTERLY GROUNDWATER SAMPLING
BURT, NEW YORK

Parameters	Units	Action Limits 6NYCRR Part 703.5 Stds. For Analyte Samples	Location ID: MW-6 Sample Name: WG-44016-111709-004 Sample Date: 11/17/2009 Duplicate	Location ID: MW-7 Sample Name: WG-44016-111709-005 Sample Date: 11/17/2009	Location ID: MW-8 Sample Name: WG-44016-111709-002 Sample Date: 11/17/2009	Location ID: MW-9 Sample Name: WG-44016-111809-012 Sample Date: 11/18/2009	Location ID: MW-9B Sample Name: WG-44016-111809-013 Sample Date: 11/18/2009	Location ID: MW-10 Sample Name: WG-44016-111709-007 Sample Date: 11/17/2009	Location ID: MW-10B Sample Name: WG-44016-111809-018 Sample Date: 11/18/2009	Location ID: MW-11 Sample Name: WG-44016-111709-011 Sample Date: 11/17/2009	Location ID: MW-11B Sample Name: WG-44016-111709-001 Sample Date: 11/17/2009
Volatile Organic Compounds											
1,1,1-Trichloroethane	µg/L	5	0.26 U	0.26 U	2.4	14	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
1,1,2,2-Tetrachloroethane	µg/L	5	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
1,1,2-Trichloroethane	µg/L	1	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
1,1-Dichloroethane	µg/L	5	0.38 U	0.38 U	5.7	1.3	0.38 U	0.38 U	1.3	1.3	0.38 U
1,1-Dichloroethene	µg/L	5	0.29 U	0.29 U	0.29 U	1.2	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U
1,2-Dichloroethane	µg/L	0.6	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
1,2-Dichloroethene (total)	µg/L	5	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U
1,2-Dichloropropane	µg/L	1	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
2-Hexanone	µg/L	50	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U
Acetone	µg/L	50	5.6	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Benzene	µg/L	1	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U
Bromodichloromethane	µg/L	50	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
Bromoform	µg/L	50	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Bromomethane (Methyl Bromide)	µg/L	5	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Carbon disulfide	µg/L	-	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
Carbon tetrachloride	µg/L	5	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Chlorobenzene	µg/L	5	1.6	0.52 J	0.82 J	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloroethane	µg/L	5	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloroform (Trichloromethane)	µg/L	7	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Chloromethane (Methyl Chloride)	µg/L	-	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
cis-1,3-Dichloropropene	µg/L	0.4	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Dibromochloromethane	µg/L	50	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Ethylbenzene	µg/L	5	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Methylene chloride	µg/L	5	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
Styrene	µg/L	5	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Tetrachloroethene	µg/L	5	0.36 U	0.36 U	0.36 U	0.72 J	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Toluene	µg/L	5	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U
trans-1,3-Dichloropropene	µg/L	0.4	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Trichloroethene	µg/L	5	0.46 U	0.46 U	0.46 U	0.57 J	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U
Vinyl chloride	µg/L	2	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Xylene (total)	µg/L	5	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U
Dissolved Gas											
Methane	µg/L		--	91	63	1.0 U	2.3	1.0 U	17	83	18
Metals (Dissolved)											
Iron (Dissolved)	µg/L		--	2310	623	62	34 J	65	50 U	253	50 U
Manganese (Dissolved)	µg/L	-	--	914	945	112	34.6	3.8	49.2	236	29.3
Wet Chemistry											
Nitrate (as N)	mg/L		--	0.050 U	0.170	5.96	0.070	3.86	0.027 J	0.050 U	0.026 J
Nitrite (as N)	mg/L	-	--	0.050 U	0.050 U	0.050 U	0.061 U	0.050 U	0.050 U	0.050 U	0.050 U
Sulfate	mg/L	-	--	104	85.6	80.8 U	666	61.1 U	109	95.2	352

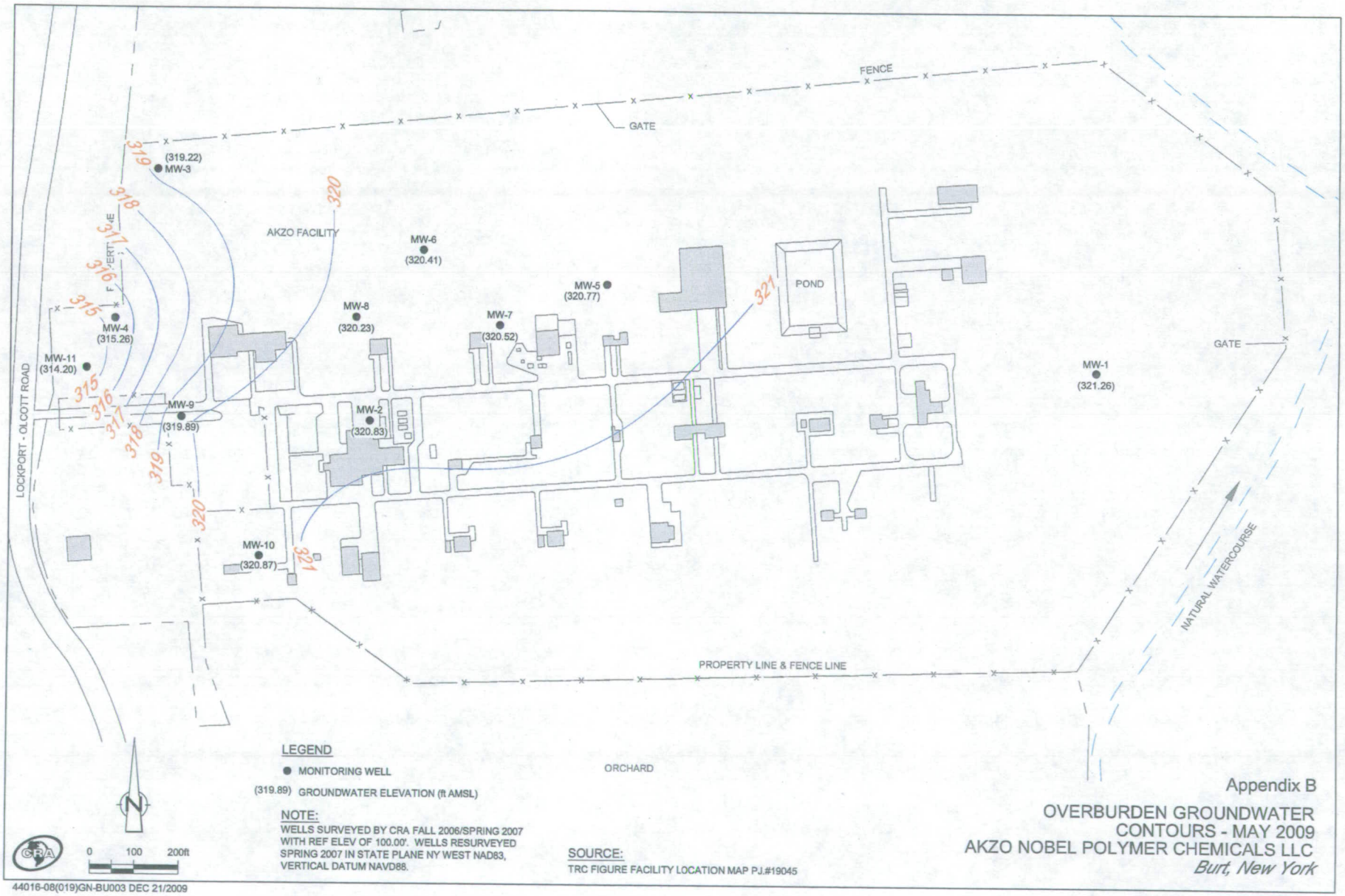
Notes:

- Not analyzed.
J Estimated.
U Not present at or above the associated value.
Above 6 NYCRR Part 703.5 Standards.

B

APPENDIX B

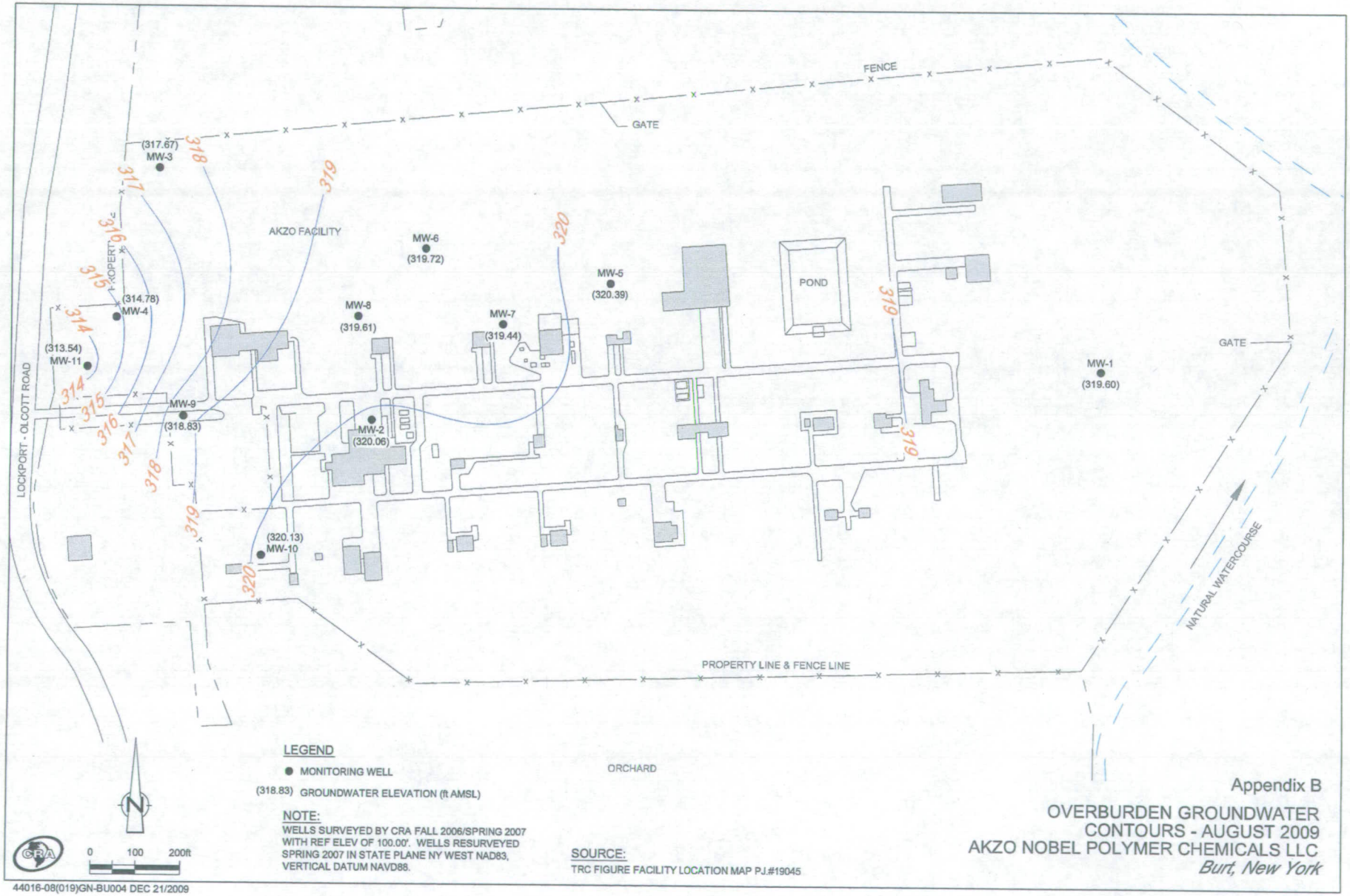
OVERBURDEN GROUNDWATER CONTOURS - 2009



Appendix B

OVERBURDEN GROUNDWATER CONTOURS - MAY 2009
AKZO NOBEL POLYMER CHEMICALS LLC
Burt, New York

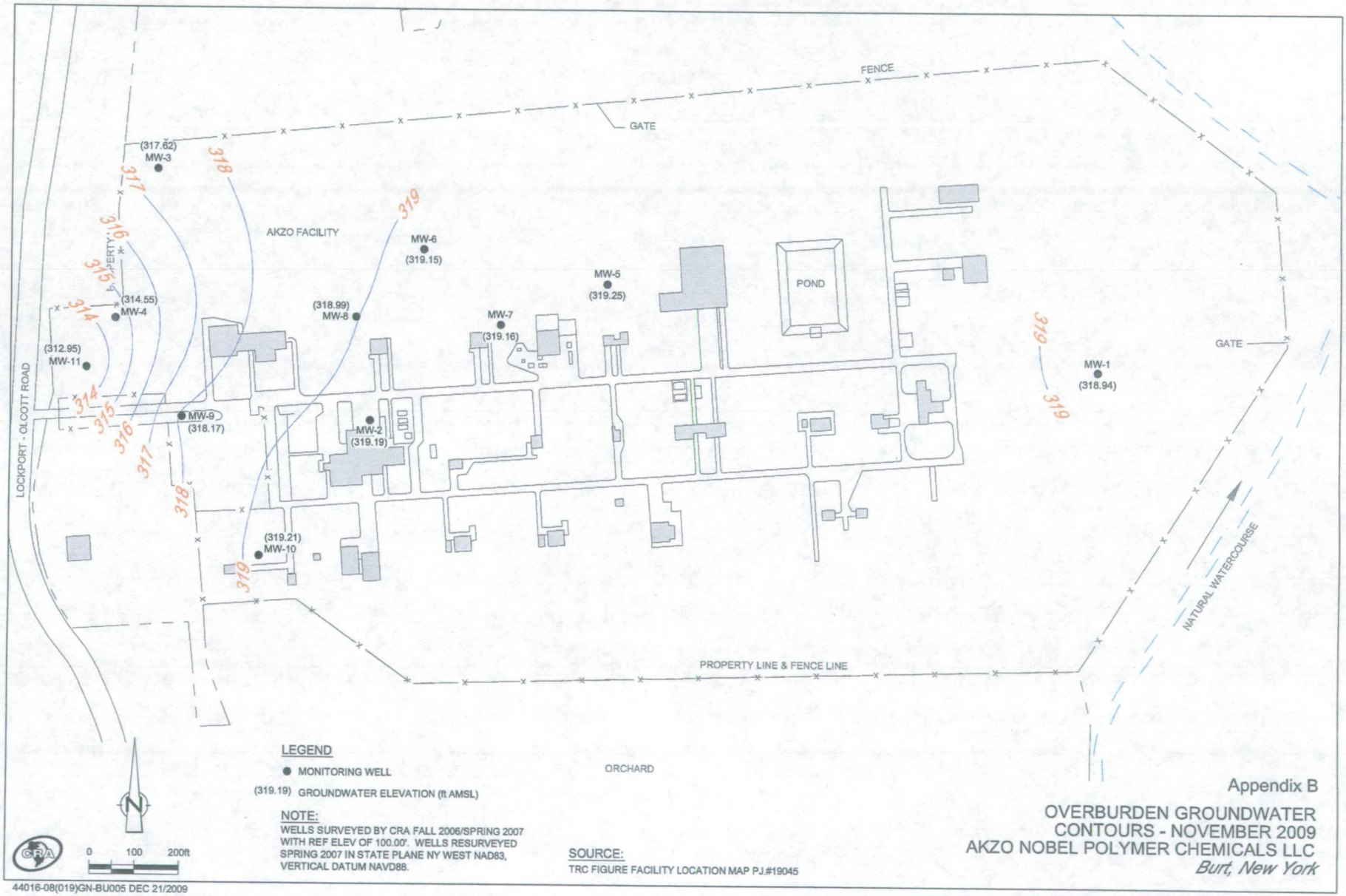
44016-08(019)GN-BU003 DEC 21/2009



Appendix B

OVERBURDEN GROUNDWATER CONTOURS - AUGUST 2009
AKZO NOBEL POLYMER CHEMICALS LLC
Burt, New York

44016-08(019)GN-BU004 DEC 21/2009



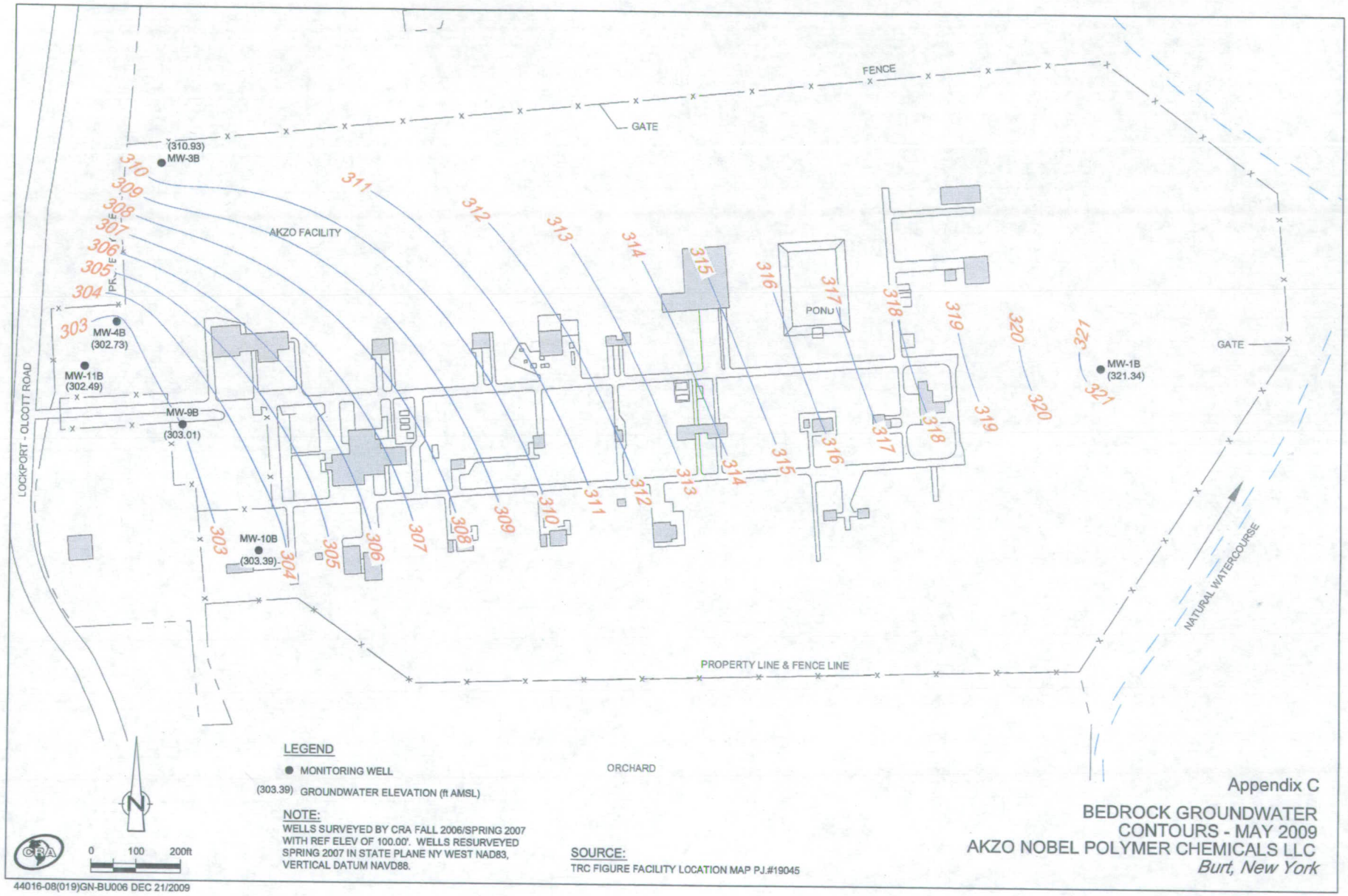
Appendix B

OVERBURDEN GROUNDWATER CONTOURS - NOVEMBER 2009
AKZO NOBEL POLYMER CHEMICALS LLC
Burt, New York

44016-08(019)GN-BU005 DEC 21/2009

APPENDIX C

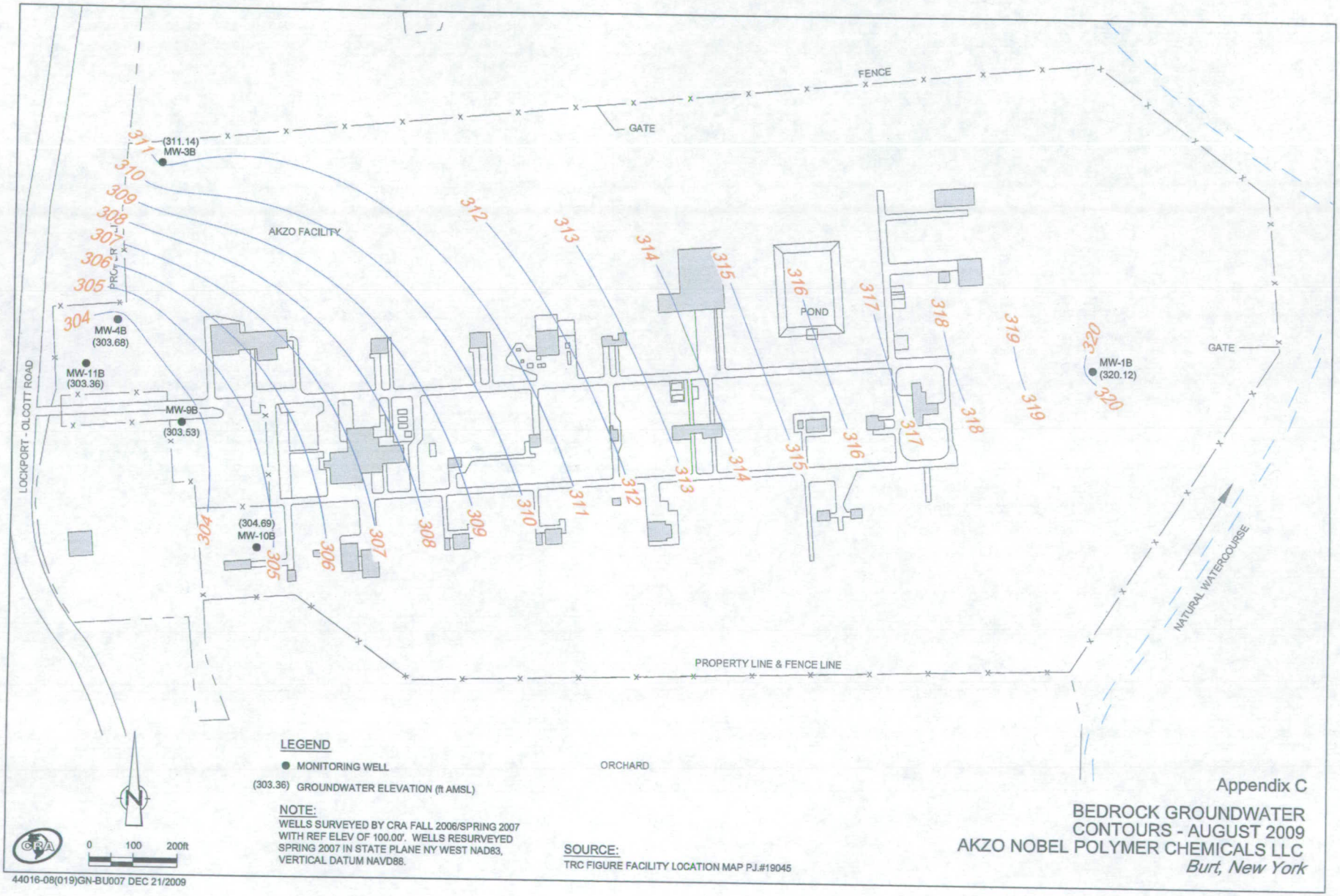
BEDROCK GROUNDWATER CONTOURS - 2009



Appendix C

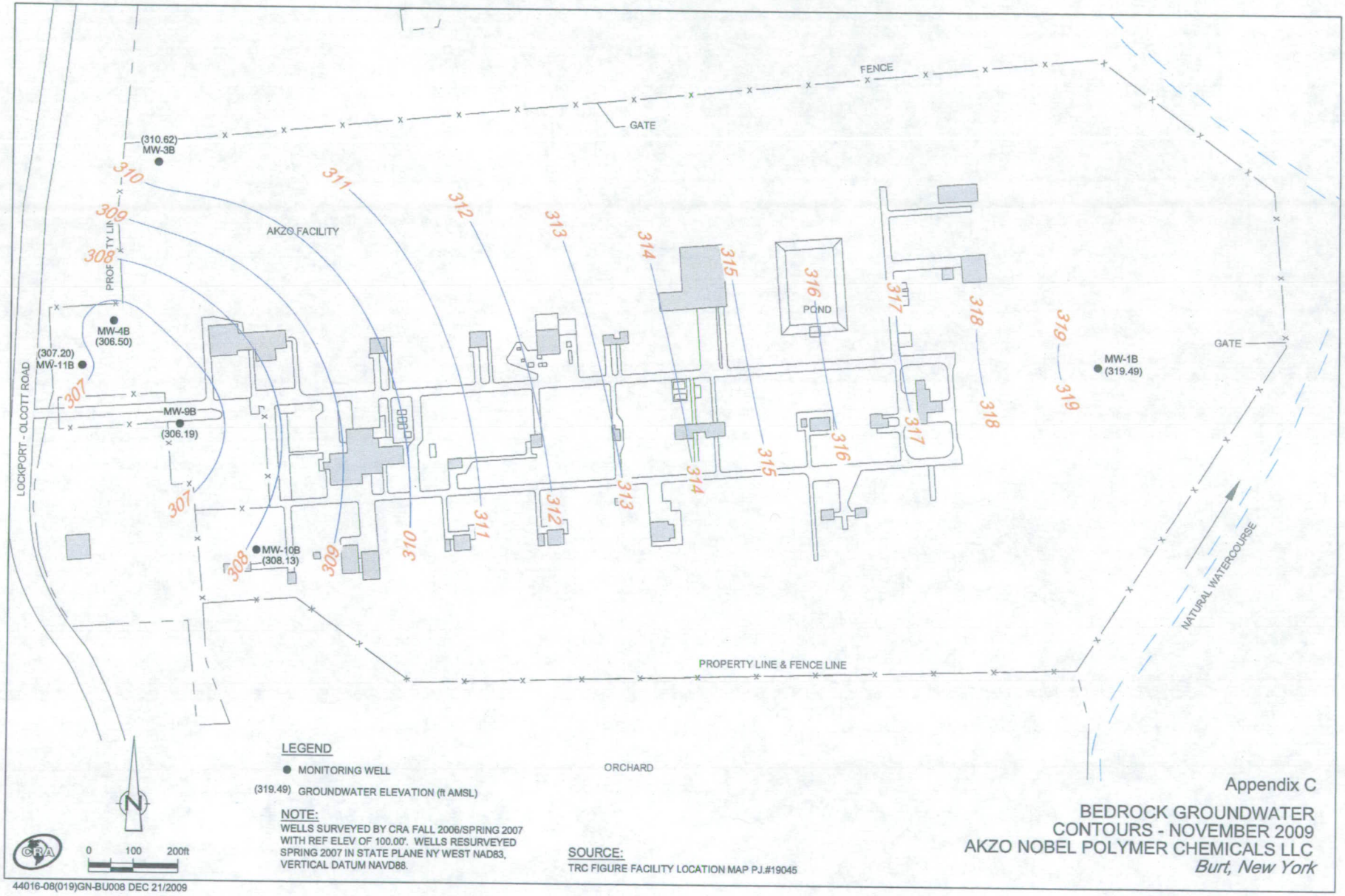
BEDROCK GROUNDWATER CONTOURS - MAY 2009
AKZO NOBEL POLYMER CHEMICALS LLC
Burt, New York

44016-08(019)GN-BU006 DEC 21/2009



Appendix C

BEDROCK GROUNDWATER CONTOURS - AUGUST 2009
AKZO NOBEL POLYMER CHEMICALS LLC
Burt, New York



44016-08(019)GN-BU008 DEC 21/2009

Appendix C

BEDROCK GROUNDWATER CONTOURS - NOVEMBER 2009
AKZO NOBEL POLYMER CHEMICALS LLC
Burt, New York

APPENDIX D

FIELD MEASUREMENTS - 2009

FIELD MEASUREMENTS
AKZO NOBEL QUARTERLY GROUNDWATER MONITORING
BURT, NEW YORK

Well ID	*Type*	*pH*	*Temp. °C*	*Conductivity mS/cm*	*ORP Millivolts*	*Turbidity NTU*	*Dissolved Oxygen mg/L*	*Ferrous Iron mg/L*
MW-1	Background - Overburden	7.38	13.45	0.740	50	17.1	1.91	0.05
MW-1B	Background - Bedrock	7.88	12.52	4.16	58	39.1	4.12	0.15
MW-2	Source Area - Overburden	7.52	19.88	0.927	-94	19.5	1.94	1.26
MW-3	Downgradient Boundary - Overburden	7.21	20.56	1.070	57	18.8	4.34	0.10
MW-3B	Downgradient Boundary - Bedrock	7.81	16.97	0.612	41	15.8	2.58	0.00
MW-4	Downgradient Boundary - Overburden	7.44	16.20	0.932	93	7.00	4.16	0.00
MW-4B	Downgradient Boundary - Bedrock	8.10	12.91	4.40	77	32.7	3.21	0.48
MW-5	Source Area - Overburden	8.06	16.20	1.212	43	4.65	1.99	0.00
MW-6	Downgradient Offset - Overburden	7.87	17.18	1.327	-43	4.95	1.60	0.29
MW-7	Source Area - Overburden	7.92	16.26	1.267	-121	11.4	2.07	0.85
MW-8	Source Area - Overburden	7.70	16.83	1.296	-80	10.2	1.63	0.29
MW-9	Downgradient Boundary - Overburden	7.57	20.02	1.304	94	10.8	2.41	0.00
MW-9B	Downgradient Boundary - Bedrock	8.41	15.18	1.92	65	23.1	3.51	0.00
MW-10	Downgradient Offset - Overburden	7.76	17.78	0.899	87	25.4	1.92	0.11
MW-10B	Downgradient Offset - Bedrock	8.37	14.01	1.59	88	16.0	1.70	0.00
MW-11	Downgradient Boundary - Overburden	7.51	14.13	2.12	105	66.9	2.25	0.20
MW-11B	Downgradient Boundary - Bedrock	8.47	12.98	1.101	76	17.9	1.43	0.00

Notes:
mg/L Milligram/liter.
mS/cm Millisiemens/centimeter.
NTU Nephelometric Turbidity Unit.
ORP - Oxygen Release Potential

APPENDIX E

EVALUATION OF NATURAL ATTENUATION DATA

CONESTOGA-ROVERS & ASSOCIATES

2055 Niagara Falls Blvd., Suite #3
Niagara Falls, New York 14304
Telephone: (716) 297-6150 Fax: (716) 297-2265
www.CRAworld.com

MEMORANDUM

Sent via email

TO:	Bill Doebler	REF. NO.:	044016
FROM:	Alan Weston/Sophia Dore/adh/4	DATE:	January 20, 2010
RE:	**Evaluation of 2009 Natural Attenuation Data** **Akzo Nobel Polymer Chemicals, LLC, Burt, New York**		

1.0 INTRODUCTION

Groundwater at the Akzo Nobel Polymer Chemicals, LLC Site in Burt, New York (Site) contains volatile organic compounds (VOCs) in some areas. Monitored Natural Attenuation (MNA) is currently in progress at this Site.

Conestoga-Rovers & Associates' (CRA's) Innovative Technology Group (ITG) was requested to review the MNA data and assess the current groundwater conditions.

2.0 BACKGROUND

1,1,1-trichloroethane (1,1,1-TCA), chloroethane, and benzene have been detected above regulatory criteria at the Site. 1,1,1-TCA degrades under anaerobic conditions by reductive dechlorination to form chloroethane. During this reductive dechlorination, bacteria with the necessary enzymes are able to utilize the chlorinated compounds as an electron acceptor. 1,1,1-TCA can also be degraded aerobically, although bacteria that perform this degradation pathway are rare. Chloroethane itself can be further degraded under anaerobic conditions to ethane and under aerobic conditions through 1-chloroethanol to acetaldehyde. Benzene can be degraded under aerobic conditions and also under anaerobic sulfate reducing conditions. In both cases, the benzene is degraded to carbon dioxide and water.

Several indicators of anaerobic conditions were measured during the groundwater sampling at the Site. Dissolved oxygen (DO) is a direct measurement of oxygen in the groundwater. Oxidation reduction potential (ORP) was also measured. A negative ORP indicates that groundwater conditions are anaerobic, while a positive ORP indicates that conditions are aerobic. Reductive dechlorination occurs best at an ORP of less than -200 millivolts (mV). Methane gas was analyzed. The production of methane by anaerobic biodegradation can only occur under highly anaerobic conditions when the ORP is less than -200 mV. Therefore, when methane is produced, it can be assumed that conditions are favorable for reductive dechlorination. Dissolved metals such as iron and manganese were also measured. These metals are soluble only in their reduced forms, which suggest that groundwater conditions are anaerobic (ORP less than 0 mV). Nitrate and nitrite were also measured. At ORP values of less than +300 mV, nitrate is converted to nitrite and then to nitrogen gas. Therefore, under conditions favorable for reductive dechlorination, nitrate levels are likely to be low, since any nitrate present would have been converted to nitrogen gas.

3.0 EVALUATION OF SITE MNA DATA

Site groundwater MNA data were evaluated to determine whether conditions suitable for reductive dechlorination exist at the Site.

Redox Conditions

In most of the wells monitored, the MNA data showed that conditions were likely aerobic. Methane gas is produced only under highly anaerobic conditions, and significant levels of methane gas were found during all three of the 2009 sampling events only in wells MW-2, MW-6, and MW-7. Methane was also detected in MW-8 and MW-11 during the August and November sampling events. Similarly high levels of dissolved iron and manganese were found in the same wells during the same sampling events. Therefore, it appears that an anaerobic zone exists in the source area stretching from well MW-2 to well MW-6 in the north and well MW-7 to the northeast. The 2007 and 2008 monitoring data showed a similar trend. Conditions at well MW-5 remained highly aerobic during the May and August sampling events, although a slightly negative ORP was measured in MW-5 during the November sampling event. This suggests that the anaerobic zone may extend past well MW-7. Another anaerobic zone appears to be developing in the area of MW-11. Conditions in the anaerobic zone appear to be sulfate reducing/methanogenic. Reductive dechlorination occurs at sulfate reducing and methanogenic reduction potentials; therefore, conditions in this zone are favorable for the degradation of the chloroethanes.

The ORP measurements taken in the field are in basic agreement with the findings described above. Negative ORP values were measured at all three sampling events in wells MW-2, MW-6, MW-7, and MW-8. Negative ORP values were also recorded for wells MW-1, MW-5, and MW-11 during the November sampling event. Positive ORP values were measured at the remaining wells. Some of the negative ORP values were higher than would have been expected based on the levels of methane and dissolved metals present. DO levels were generally high for all the wells at all three sampling events and often appeared incompatible with the methane, dissolved metals, and ORP data. These data are suspect; some of the readings are greater than 10 milligrams per liter (mg/L). The maximum solubility of oxygen in groundwater is between 8 and 9 mg/L. The measurement of ORP and DO is conducted with a probe that is submersed in the well. The probes are sensitive to motion in the water and to particulate matter. The detection of degradation products such as methane and dissolved metals, however, is less sensitive to transient conditions in the wells. Therefore, the degradation product and metals data are typically more representative of actual conditions and were used to assess anaerobic conditions rather than the DO and ORP data.

Degradation Products

1,1-dichloroethane and chloroethane are formed when 1,1,1-TCA is degraded by reductive dechlorination. These compounds have both been detected in MW-2 during previous sampling events. The presence of these compounds in well MW-2 suggests that reductive dechlorination of 1,1,1-TCA has occurred in this area.

Both 1,1-dichloroethane and chloroethane were present in MW-2 during the May sampling event. 1,1-dichloroethane was present at 173 micrograms per liter (µg/L) and chloroethane was present at 270 µg/L. By the August sampling event, however, only chloroethane was detected in MW-2 (at 41 µg/L).

No other VOCs were detected above their analytical detection limits. By the November sampling event, chloroethane had dropped to 15 µg/L and no other VOCs were detected.

During 2007 and 2008, chloroethane levels decreased at MW-2. These data suggested that levels of 1,1,1-TCA upgradient of well MW-2 had decreased significantly, resulting in much lower concentrations of degradation products being detected at well MW-2. This hypothesis is supported by the 2009 data. 1,1,1-TCA and 1,1-dichloroethane were not detected in MW-2 at either the August or November sampling events, and chloroethane levels continued to drop. Conditions at well MW-2, which is located in the source area, appeared to be highly anaerobic as discussed above. Therefore, it is likely that the 1,1,1-TCA was degraded to chloroethane by reductive dechlorination. The chloroethane also degraded over time by an anaerobic mechanism. Since the flow of groundwater from the source area is towards the aerobic areas to the west, it is likely that any residual chloroethane will be degraded by the faster, aerobic mechanisms once it migrates further west. Since aerobic degradation of chloroethane is a faster mechanism, it is expected that chloroethane will not be detected at the boundary wells, and the analytical data supports this conclusion, since chloroethane has not been detected in any of the boundary wells.

Benzene, toluene, ethylbenzene, and xylenes (BTEX) was detected in groundwater from well MW-2 during the April and June 2008 sampling events and during the May 2009 sampling event. In May 2009, benzene was detected at 58 µg/L, ethylbenzene at 25 µg/L, toluene at 6,300 µg/L, and xylene at 67 µg/L. These levels are higher than those detected in the 2008 events. Similar trends were observed in 2007 and 2008 when BTEX compounds present during the spring sampling events were not detected during later sampling events. The seasonality of the data suggests that groundwater level fluctuations may contribute to the apparent decline in BTEX concentrations. In all 3 years, groundwater levels were high during the spring sampling events and lower during subsequent sampling events. BTEX compounds are not highly water soluble and will tend to adsorb on soil. During the spring when the groundwater is high, BTEX adsorbed to the soil may be solubilized into groundwater; however, when the groundwater is lower, this does not occur and, therefore, the measured levels are lower. These data suggest that there is some BTEX adsorbed to the soil in the source area and that it is slowly degrading under the anaerobic conditions present in the area. As discussed above, anaerobic conditions appear to exist around well MW-2, and BTEX compounds can degrade under anaerobic conditions by nitrate or sulfate reduction. Aerobic degradation of BTEX compounds is much faster than anaerobic degradation. Like the chloroethane migration described above, any benzene not degraded in the source area is likely to migrate with the groundwater into the aerobic area to the west and be degraded there by aerobic microorganisms. Therefore, benzene should also not be detected at the boundary wells. The analytical data supports this conclusion, since benzene has not been detected in any of the boundary wells.

The groundwater level fluctuations are less likely to affect chloroethane concentrations in groundwater since chloroethane is an order of magnitude more water soluble than the BTEX compounds, and, therefore, is not likely to become sorbed to soil but will remain dissolved in the groundwater as the groundwater levels rise and fall.

At the November sampling event, a small amount of 1,1-dichloroethane was detected at MW-8. MW-8 is downgradient from MW-2. 1,1-dichloroethane was not detected in MW-2 during the August or November sampling events but it was detected in May. The 1,1-dichloroethane detected in MW-8 likely traveled with the groundwater from MW-2. Conditions at MW-8 are fairly anaerobic; therefore, this 1,1-dichloroethane is likely degrading.

1,1,1-TCA was detected in samples from well MW-9, one of the downgradient boundary wells, during all three sampling events. As discussed above, conditions at well MW-9 are highly aerobic. 1,1,1-TCA degrades most readily under anaerobic conditions, but aerobic degradation of 1,1,1-TCA to carbon dioxide is possible. 1,1,1-TCA concentrations in 2007 ranged from 32-40 µg/L; in 2008, ranged from 9-19 µg/L; and in 2009, ranged from 12-17 µg/L. Therefore, it appears that some natural attenuation of 1,1,1-TCA, either by aerobic degradation or abiotic processes, is occurring in this area.

During the May 2009 sampling event, 1,1,1-TCA was detected at 6.8 µg/L at MW-11. This level had fallen to 1.3 µg/L during the August and November sampling events. The 1,1,1-TCA detected in May likely moved downgradient from MW-9. The fact that the 1,1,1-TCA dropped between MW-9 and MW-11 and declined at MW-11 over time is further evidence that natural attenuation of 1,1,1-TCA is occurring even in the aerobic zone.

Acetone was detected at MW-5 during the August and November sampling events. Acetone is a common laboratory contaminant; therefore, a single detection would likely be attributed to laboratory error. However, acetone was detected in the same well at two successive sampling events. Therefore, it appears likely that this acetone is present at the Site. Acetone degrades under the aerobic conditions present in the area of MW-5. The concentration in November is less than 50 percent of the concentration present in August. Therefore, it appears that the acetone is degrading.

4.0 CONCLUSIONS

The 1,1,1-TCA present in the source area has been degraded to chloroethane to the point where the parent compound is no longer detected in the source area. The chloroethane is either continuing to degrade under anaerobic conditions in the source area or degrading aerobically as it migrates towards the Site boundary. Some anaerobic degradation of the BTEX compounds present in the source area appears to be occurring. Any BTEX not degraded in the source area will be degraded after they migrate to the aerobic area west of the source area. Therefore, off-Site migration of BTEX should not occur. 1,1,1-TCA is already present in the aerobic boundary area. The data indicate that natural attenuation of the 1,1,1-TCA is occurring in this area and that concentrations continue to decrease.

APPENDIX F

COMPARISON OF 2006, 2007 AND 2008 TCL VOCs IN GROUNDWATER WITH NYCRR 703.5 GROUNDWATER STANDARDS

COMPARISON OF 2006 TCL VOCs IN GROUNDWATER WITH NYCRR 703.5 GROUNDWATER STANDARDS

Well	*Comparison of TCL VOCs in Groundwater with NYCRR 703.5 Groundwater Standards*	
MW-1	No results above action limits.	
MW-1B	No results above action limits.	
MW-2	Benzene (4.8 µg/L versus action limit of 1 µg/L)	05/26/06
	Benzene (16 µg/L versus action limit of 1 µg/L)	11/30/06
	Chloroethane (38 µg/L versus action limit of 5 µg/L)	05/26/06
	Chloroethane (30 µg/L versus action limit of 5 µg/L)	08/29/06
	Chloroethane (100 µg/L versus action limit of 5 µg/L)	11/30/06
MW-3*	No results above action limits	
MW-3B*	No results above action limits	
MW-4*	No results above action limits	
MW-4B*	No results above action limits	
MW-5	Acetone (100 µg/L versus action limit of 50 µg/L)	08/29/06
MW-6	No results above action limits	
MW-7	No results above action limits	
MW-8	Chloroethane (8.0 µg/L [8.1 µg/L duplicate] versus action limit of 5 µg/L)	05/26/06
MW-9*	1,1,1-Trichloroethane (21 µg/L versus action limit of 5 µg/L)	05/26/06
	1,1,1-Trichloroethane (31 µg/L [resample])	07/12/06
	1,1,1-Trichloroethane (34 µg/L versus action limit of 5 µg/L)	08/29/06
	1,1,1-Trichloroethane (19 µg/L [resample])	10/10/06)
MW-9B*	No results above action limits	
MW-10*	No results above action limits	
MW-10B*	No results above action limits	

Notes:

* Denotes downgradient boundary well

µg/L Micrograms per liter

COMPARISON OF 2007 TCL VOCs IN GROUNDWATER WITH NYCRR 703.5 GROUNDWATER STANDARDS

Well	*Comparison of TCL VOCs in Groundwater with NYCRR 703.5 Groundwater Standards*	
MW-1	1,2 Dichloroethane (1.0 µg/L versus permit limit of 0.6 µg/L)	10/30/07
MW-1B	No results above action limits.	
MW-2	Benzene (33 µg/L [33 µg/L duplicate]versus action limit of 1 µg/L)	04/19/07
	Benzene (7.8 µg/L versus action limit of 1 µg/L)	06/07/07
	Benzene (5.7 µg/L [6.4 µg/L duplicate] versus action limit of 1 µg/L)	08/13/07
	Chloroethane (600 µg/L[560 µg/L duplicate] versus action limit of 5 µg/L)	04/19/07
	Chloroethane (56 µg/L versus action limit of 5 µg/L)	06/07/07
	Chloroethane (74 µg/L [78 µg/L duplicate] versus action limit of 5 µg/L)	08/14/07
	Chloroethane (73 µg/L [73 µg/L duplicate] versus action limit of 5 µg/L)	10/31/07
	1,1 Dichloroethane (11 µg/L [11 µg/L duplicate] versus action limit of 5 µg/L)	04/19/07
	Toluene (150 µg/L [140 µg/L duplicate] versus action limit of 5 µg/L)	04/19/07
	Toluene (5.9 µg/L versus action limit of 5 µg/L)	06/07/07
	Xylene (13 µg/L [13 µg/L duplicate] versus action limit of 5µg/L)	04/19/07
MW-3*	No results above action limits	
MW-3B*	No results above action limits	
MW-4*	No results above action limits	
MW-4B*	No results above action limits	
MW-5	Acetone (450 µg/L versus action limit of 50 µg/L)	08/14/07
	Acetone (170 µg/L versus action limit of 50 µg/L)	10/31/07
MW-6	No results above action limits	
MW-7	No results above action limits	
MW-8	No results above action limits	
MW-9*	1,1,1-Trichloroethane (38 µg/L versus action limit of 5 µg/L)	04/20/07
	1,1,1-Trichloroethane (34 µg/L [33 µg/L duplicate] versus action limit of 5 µg/L)	06/06/07
	1,1,1-Trichloroethane (40 µg/L versus action limit of 5 µg/L)	08/14/07
	1,1,1-Trichloroethane (32 µg/L versus action limit of 5 µg/L)	10/31/07
MW-9B*	No results above action limits	
MW-10*	No results above action limits	
MW-10B*	No results above action limits	
MW-11*	1,1,1 - Trichloroethane (16 µg/L versus action limit of 5 µg/L)	04/23/07
MW-11B*	No results above action limits	

Notes:

* Denotes downgradient boundary well

µg/L micrograms per liter

COMPARISON OF 2008 TCL VOCS IN GROUNDWATER WITH NYCRR 703.5 GROUNDWATER STANDARDS

Well	*Comparison of TCL VOCs in Groundwater with NYCRR 703.5 Groundwater Standards*	
MW-1	1,2 Dichloroethane (0.69 µg/L versus action limit of 0.6 µg/L)	8/14/08
MW-1	1,2 Dichloroethane (0.68J µg/L versus action limit of 0.6 µg/L)	10/29/08
MW-1B	No results above action limits	
MW-2	Benzene (26 µg/versus action limit of 1 µg/L)	04/21/08
	Benzene (32 µg/versus action limit of 1 µg/L)	06/06/08
	Benzene (5.1µg/L [4.0 µg/L duplicate] versus action limit of 1 µg/L)	08/14/08
	Chloroethane (160 µg/L versus action limit of 5 µg/L)	04/21/08
	Chloroethane (96 µg/L versus action limit of 5 µg/L)	06/06/08
	Chloroethane (19 µg/L[17 µg/L duplicate] versus action limit of 5 µg/L)	08/14/08
	1,1-Dichloroethane (100 µg/L versus action limit of 5 µg/L)	09/21/08
	1,1-Dichloroethane (160 µg/L versus action limit of 5 µg/L)	06/06/08
	1,2-Dichloroethane (1.0 µg/L versus action limit of 0.6 µg/L)	04/21/08
	1,2-Dichloroethane (0.91J µg/L versus action limit of 0.6 µg/L)	06/06/08
	1,2-Dichloroethane (total) (17 µg/L versus action limit of 5 µg/L)	04/21/08
	1,2-Dichloroethene (total) (15 µg/L versus action limit of 5 µg/L)	06/06/08
	Ethylbenzene (9.8 µg/L versus action limit of 5 µg/L)	06/06/08
	Methylene chloride (76 µg/L versus action limit of 5 µg/L)	04/21/08
	Methylene chloride (86 µg/L versus action limit of 5 µg/L)	06/06/08
	Toluene (780 µg/L versus action limit of 5 µg/L)	04/21/08
	Toluene (1500 µg/L versus action limit of 5 µg/l)	06/06/08
	Trichloroethene (5.7 µg/L versus action limit of 5 µg/L)	06/06/08
	Vinyl chloride (16 µg/L versus action limit of 2 µg/L)	04/21/08
	Vinyl chloride (12 µg/L versus action limit of 2 µg/L)	06/06/08
	Xylene (total) (14 µg/L versus action limit of 5 µg/L)	04/21/08
	Xylene (total) (21 µg/L versus action limit of 5 µg/L)	06/06/08
MW-3*	No results above action limits	
MW-3B*	No results above action limits	
MW-4*	No results above action limits	
MW-4B*	No results above action limits	
MW-5	Acetone (100 µg/L versus action limit of 50 µg/L)	04/21/08
	Acetone (350 µg/L versus action limit of 50 µg/L)	08/15/08
	Acetone (270J µg/L versus action limit of 50 µg/L)	10/28/08
MW-6	No results above action limits	
MW-7	No results above action limits	
MW-8	1,1,1 Trichloroethane (7.2 µg/L versus action limit of 5 µg/L)	04/17/08
MW-9*	1,1,1-Trichloroethane (19 µg/L versus action limit of 5 µg/L)	04/21/08
	1,1,1-Trichloroethane (10 µg/L [11 µg/L duplicate] versus action limit of 5 µg/L)	06/06/08
	1,1,1-Trichloroethane (13 µg/L versus action limit of 5 µg/L)	08/14/08
	1,1,1-Trichloroethane (9.12 µg/L [8.77 µg/L duplicate] versus action limit of 5 µg/L	10/29/08
MW-9B*	No results above action limits	
MW-10*	No results above action limits	
MW-10B*	No results above action limits	
MW-11*	No results above action limits	
MW-11B*	No results above action limits	

Notes:

*	Denotes downgradient boundary well
J	Estimated value
µg/L	Micrograms per liter

APPENDIX G

WATER LEVEL MEASUREMENTS - 2009

APPENDIX G - MAY 2009

WATER LEVEL MEASUREMENTS
AKZO NOBEL GROUNDWATER MONITORING
AKZO NOBEL POLYMER CHEMICALS LLC

Well ID	*Type*	*Top of Casing (feet)*	*Depth to Water (feet BTOC)*	*Water Level Elevation (feet)*
MW-1	Background - Overburden	328.51	7.25	321.26
MW-1B	Background - Bedrock	328.29	6.95	321.34
MW-2	Source Area - Overburden	327.58	6.75	320.83
MW-3	Downgradient Boundary - Overburden	322.58	3.36	319.22
MW-3B	Downgradient Boundary - Bedrock	321.85	10.92	310.93
MW-4	Downgradient Boundary - Overburden	323.12	7.86	315.26
MW-4B	Downgradient Boundary - Bedrock	323.66	20.93	302.73
MW-5	Source Area - Overburden	324.68	3.91	320.77
MW-6	Downgradient Offset - Overburden	325.31	4.90	320.41
MW-7	Source Area - Overburden	324.10	3.58	320.52
MW-8	Source Area - Overburden	326.23	6.00	320.23
MW-9	Downgradient Boundary - Overburden	325.03	5.14	319.89
MW-9B	Downgradient Boundary - Bedrock	325.21	22.20	303.01
MW-10	Downgradient Offset - Overburden	328.39	7.52	320.87
MW-10B	Downgradient Offset - Bedrock	328.12	24.73	303.39
MW-11	Downgradient Boundary - Overburden	325.76	11.56	314.20
MW-11B	Downgradient Boundary - Bedrock	325.32	22.83	302.49

Note:
BTOC Below Top of Casing.