ALPHA
GEOSCIENCE
Geology
Hydrology
Remediation
Water Supply

January 31, 2007

Mr. Ramanand Pergardia, P.E.
NYSDEC Region 3
21 South Putt Corners Road
New Paltz, New York 12561-1696

Re: Expanded HRC Injection Report
Revonak Dry Cleaner Site (No. 356021)

Dear Mr. Pergardia:

This report presents the results of the expanded injection of hydrogen releasing compounds (HRC) at the former Revonak dry cleaners site (NYSDEC Site No. 356021) in New Paltz, New York. The work was conducted on September 5 through 8, 2006, and September 11, 2006, in general accordance with the NYSDEC-approved Expanded HRC Injection Plan, dated December 2, 2005. The HRC was injected into the subsurface to stimulate the degradation of chlorinated solvents in soil and ground water. Alpha Geoscience (Alpha) personnel directed and documented the injection of HRC and collected ground water samples from selected wells to monitor parameters that will indicate the onset of chemical changes in the subsurface environment.

A Geoprobe, track-mounted, hydraulic-push drilling rig was used to bore 140 injection points. The locations of the injection points were measured from fixed features (e.g. building corners) and are shown on Figure 1. The space between borings was approximately 10 feet or less (5-foot radius) and was based on the permeability of the subsurface materials and location of utilities. The borings were drilled to the top of bedrock or to the point of hydraulic refusal and ranged from eight to twelve feet deep. Table 1 summarizes the boring depths.

Alpha used design services provided by the HRC manufacturer (REGENESIS) to establish the recommended volume of HRC at each injection location. REGENESIS recommended injecting HRC-Advanced (HRC-A) in a grid pattern within the target area adjacent to the former dry cleaner and injecting HRC-Extended Release Formula (HRC-X) with primer in a series of six rows comprising downgradient barriers.

HRC-A is a relatively low viscosity formulation that promotes product distribution through the granular subsurface and is designed to last 12 to 18 months. REGENESIS recommended an application of 80 pounds of HRC-A in each injection point in the target area, for a planned total of 3,280 pounds of injected HRC-A.

HRC-X is a more viscous formulation that provides a longer-term release and is designed to persist 3 to 4 years. The HRC-X was used to create a series of "barriers" perpendicular to ground water flow, down gradient of the target area. REGENESIS recommended mixing the HRC-X with primer, which is a fast-acting additive that rapidly creates reducing conditions in the subsurface. The primer also thins the HRC-X and promotes better distribution. REGENESIS recommended an application of 40 pounds of HRC-X with 20 pounds of primer in each of 42 injection points, spaced in six rows approximately 60 feet apart, for a planned total of 1,680 pounds of HRC-X and 840 pounds of primer.

The HRC-A was injected into each boring in the core area starting at the bottom of the boring and extending to a depth of approximately 4 feet below grade. The HRC-X was injected into each boring in the barrier area at the bottom of the boring. Repeated attempts were necessary to complete the HRC-X injections in a few borings where excessive resistance was encountered. The amount of HRC injected was generally 40 pounds of HRC-A per point in the target area and 80 pounds of HRC-X per point in the barrier rows (Table 1). The variation in injection intervals and volumes summarized in Table 1 are due to adjustments made in the field to accommodate variable subsurface conditions.

A total of 3,343 pounds of HRC-A was injected into the target area and a total of 1,710 pounds of HRC-X was installed in the barrier rows. Approximately one foot of bentonite chips was placed above the HRC as a seal and the surface was restored with asphalt patch in the parking/traffic areas.Alpha personnel collected ground water samples from key monitoring wells to establish pre-injection concentrations for indicator compounds, as recommended by REGENSIS. Changes in indicator parameters will occur as the HRC begins to react and may be apparent before significant variations in the concentration of volatile organic compounds in the ground water are evident. The results of the baseline sampling are summarized and presented in Alpha's report, Ground Water and Soil Vapor Monitoring Report, dated January 30, 2007.

Ground water samples also were collected from selected monitoring wells in December 2006. The samples were analyzed for indicator compounds and volatile organic compounds. The results for the December 2006 quarterly sampling event also are included in the Ground Water and Soil Vapor Monitoring Report.

Please feel free to contact me with any questions you have regarding this information.

Sincerely,
Alpha Geoscience

Thomas M. Johnson
Hydrogeologist

TMJ/dm

attachments

cc: R. Schick
F. Navratil
M. Rivara
P. Kempner
K. Young
M. Ryan
J. Rashak
R. Rusinko

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Table 1
Hydrogen Releasing Compound (HRC)
September 2006 Injection Record

New Paltz Plaza
Alpha Project No. 95141

Date	Boring ID	Total Depth of Boring (feet)	Injection Interval (feet)	Length of Injection Zone (ft.)	Total HRC Injected (pounds)	HRC Lbs./ft.
9/5/2006	HRC-06-1	10 (R)	3 - 10	7	40	5.7
9/5/2006	HRC-06-2	8	7 - 8	1	40	40
9/5/2006	HRC-06-3	8	3 - 8	5	40	8
9/5/2006	HRC-06-4	8 (R)	4 - 8	4	40	10
9/5/2006	HRC-06-5	8	4 - 8	4	40	10
9/5/2006	HRC-06-6	10 (R)	4 - 10	6	40	6.7
9/5/2006	HRC-06-7	8	4 - 8	4	40	10
9/5/2006	HRC-06-8	8.5	6 - 8.5	2.5	40	16
9/5/2006	HRC-06-9	8	4 - 8	4	40	10
9/5/2006	HRC-06-10	8	4 - 8	4	40	10
9/5/2006	HRC-06-11	8	4 - 8	4	40	10
9/5/2006	HRC-06-12	11	6 - 11	4	40	8
9/5/2006	HRC-06-13	12	4 - 12	8	40	5
9/6/2006	HRC-06-14	12	4 - 12	8	40	5
9/6/2006	HRC-06-15	11 (R)	4 - 11	7	40	5.7
9/6/2006	HRC-06-16	11 (R)	4 - 11	7	40	5.7
9/6/2006	HRC-06-17	10.75 (R)	4 - 10.75	6.75	40	5.9
9/6/2006	HRC-06-18	10 (R)	4 - 10	6	40	6.7
9/6/2006	HRC-06-19	10 (R)	4 - 10	6	40	6.7
9/6/2006	HRC-06-20	8	4 - 8	4	40	10
9/6/2006	HRC-06-21	8	4 - 8	4	40	10
9/6/2006	HRC-06-22	8	4 - 8	4	40	10
9/6/2006	HRC-06-23	12	4 - 12	8	40	5
9/6/2006	HRC-06-24	12	4 - 12	8	40	5
9/6/2006	HRC-06-25	12	4 - 12	8	40	5
9/6/2006	HRC-06-26	11.5 (R)	4 - 11.5	7.5	40	5.3
9/6/2006	HRC-06-27	10 (R)	4 - 10	6	40	6.7
9/6/2006	HRC-06-28	11.5 (R)	4 - 11.5	7.5	40	5.3
9/6/2006	HRC-06-29	8	4 - 8	4	40	10
9/6/2006	HRC-06-30	8	4 - 8	4	40	10
9/6/2006	HRC-06-31	8	4 - 8	4	40	10
9/6/2006	HRC-06-32	8	4 - 8	4	40	10
9/6/2006	HRC-06-33	10	4 - 10	6	40	6.7
9/7/2006	HRC-06-34	12	4 - 12	8	40	5
9/7/2006	HRC-06-35	12	4 - 12	8	40	5
9/7/2006	HRC-06-36	12	4 - 12	8	40	5
9/7/2006	HRC-06-37	12	4 - 12	8	40	5
9/7/2006	HRC-06-38	11 (R)	4 - 11	7	40	5.7
9/7/2006	HRC-06-39	11 (R)	4 - 11	7	40	5.7
9/7/2006	HRC-06-40	12	4 - 12	8	40	5
9/7/2006	HRC-06-41	11	4 - 11	7	40	5.7
9/7/2006	HRC-06-42	12	4 - 12	8	70	8.8
9/7/2006	HRC-06-43	8	6.5 - 8	1.5	5	3.3
9/7/2006	HRC-06-44	10 (R)	6.5 - 10	3.5	Approx. 83*	23.7
9/7/2006	HRC-06-45	7.5 (R)	4 - 7.5	3.5	Approx. 83*	23.7
9/7/2006	HRC-06-46	7.0 (R)	4 - 7	3	Approx. 83*	26.7
9/7/2006	HRC-06-47	8.0 (R)	5 - 8	3	Approx. 83*	26.7
9/8/2006	HRC-06-48	8.0 (R)	4 - 8	4	Approx. 83*	20.8
9/8/2006	HRC-06-49	8.0 (R)	4 - 8	4	Approx. 83*	20.8
9/8/2006	HRC-06-50	9.5	7 - 9.5	1.5	Approx. 83*	55.3
9/8/2006	HRC-06-51	8.0 (R)	4 - 8	4	Approx. 83*	20.8

Table 1
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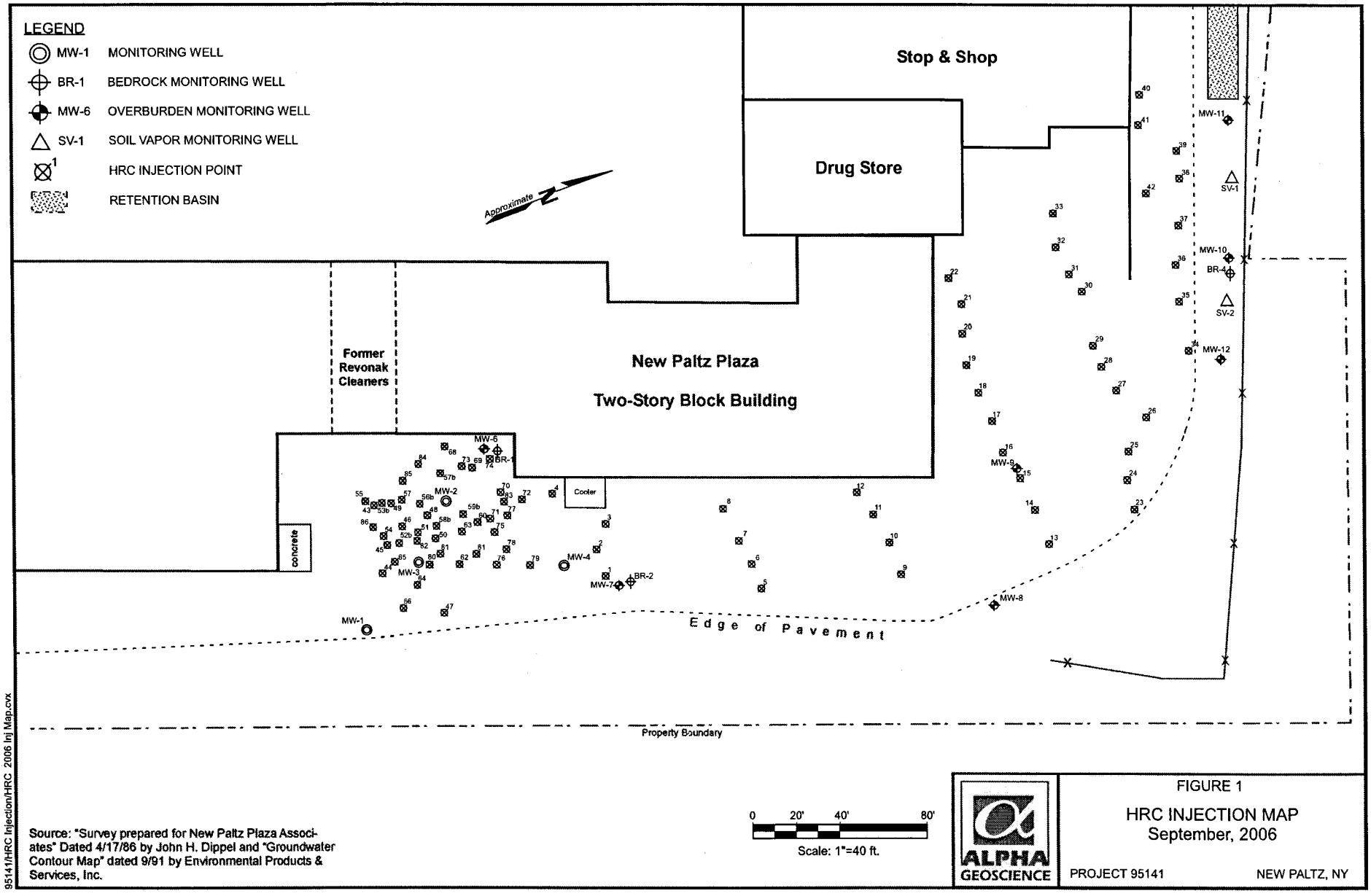
September 2006 Injection Record

New Paltz Plaza
Alpha Project No. 95141

Date	Boring ID	Total Depth of Boring (feet)	Injection Interval (feet)	Length of Injection Zone (ft.)	Total HRC Injected (pounds)	HRC Lbs./ft.
9/8/2006	HRC-06-52a	8.0 (R)	4 - 8	4	Approx. 2.6*	0.7
9/11/2006	HRC-06-52b	8	7 - 8	1	80	80
9/11/2006	HRC-06-53b	9	8 - 9	1	80	80
9/8/2006	HRC-06-54	11.0 (R)	4 - 11	7	Approx. 83*	11.9
9/8/2006	HRC-06-55	7.5 (R)	4 - 7.5	3.5	Approx. 83*	23.7
9/11/2006	HRC-06-56b	9	7.5 - 8.5	1	80	80
9/11/2006	HRC-06-57b	8	7 - 8	1	80	80
9/11/2006	HRC-06-58b	8.5	7.5 - 8.5	1	80	80
9/11/2006	HRC-06-59b	7.5	6 - 7.5	1.5	80	53.3
9/8/2006	HRC-06-60	7.5 (R)	7.5	1	Approx. 65*	80
9/8/2006	HRC-06-61	7 (R)	7	1	80	80
9/8/2006	HRC-06-62	8 (R)	8	1	80	80
9/8/2006	HRC-06-63	8 (R)	8	1	80	80
9/8/2006	HRC-06-64	7 (R)	8	1	80	80
9/8/2006	HRC-06-65	8 (R)	8	1	80	80
9/8/2006	HRC-06-66	5 (R)	5	1	80	80
9/11/2006	HRC-06-67	8 (R)	7 - 8	1	80	80
9/11/2006	HRC-06-68	8 (R)	7 - 8	1	80	80
9/11/2006	HRC-06-69	8 (R)	7 - 8	1	80	80
9/11/2006	HRC-06-70	7 (R)	6 - 7	1	80	80
9/11/2006	HRC-06-71	9 (R)	8 - 9	1	80	80
9/11/2006	HRC-06-72	9 (R)	8 - 9	1	Approx. 15	15
9/11/2006	HRC-06-73	8.5 (R)	7.5 - 8.5	1	65	65
9/11/2006	HRC-06-74	7 (R)	6 - 7	1	80	80
9/11/2006	HRC-06-75	7 (R)	6 - 7	1	80	80
9/11/2006	HRC-06-76	7 (R)	6 - 7	1	80	80
9/11/2006	HRC-06-77	8.5 (R)	7.5 - 8.5	1	80	80
9/11/2006	HRC-06-78	7 (R)	6 - 7	1	80	80
9/11/2006	HRC-06-79	8 (R)	7 - 8	1	80	80
9/11/2006	HRC-06-80	10 (R)	8 - 10	2	80	40
9/11/2006	HRC-06-81	7 (R)	6 - 7	1	80	80
9/11/2006	HRC-06-82	9 (R)	8 - 9	1	80	80
9/11/2006	HRC-06-83	9 (R)	8 - 9	1	80	80
9/11/2006	HRC-06-84	8 (R)	7 - 8	1	80	80
9/11/2006	HRC-06-85	8 (R)	7 - 8	1	80	80
9/11/2006	HRC-06-86	7.5 (R)	6.5 - 7.5	1	40	40

Notes: 1. (R) = penetrated to refusal
2. * = volume of HRC was calculated based on 1 gallon of primer (emulsion) mixture that contains approximately 2.6 pounds of HRC-X.



Source: "Survey prepared for New Paltz Plaza Associates" Dated 4/17/86 by John H. Dippel and "Groundwater Contour Map" dated 9/91 by Environmental Products & Services, Inc.

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FIGURE 1

HRC INJECTION MAP
September, 2006

PROJECT 95141 NEW PALTZ, NY

95141/HRC Injection/HRC 2006 Inj Map.cvx