



Consulting  
Engineers  
and Scientists

May 30, 2013

Project P111.01095

Mr. Chris Moretti  
Gershman Brown Crowley, Inc.  
14 Breakneck Hill Road, Suite 101  
Lincoln, Rhode Island 02865

RE: Seasonally High Groundwater Elevation Evaluation  
Proposed Subsurface Stormwater Infiltration System  
Proposed CVS Pharmacy/Store No. 10129  
Washington and Swanton Streets  
Winchester, Massachusetts

Dear Mr. Moretti:

Ransom Consulting, Inc. (Ransom) prepared this letter providing our comments regarding the determination of the seasonally high groundwater elevation at the proposed CVS Pharmacy, Store No. 10129, in Winchester, Massachusetts (the Site). The seasonally high groundwater elevation has been used in designing and modeling a proposed Site subsurface stormwater infiltration system. Our evaluation is based on a review of historical groundwater elevation data observations made in a network of Site monitoring wells and a review of observations made during test pit activities.

## **DATA EVALUATION**

Ransom reviewed groundwater monitoring well elevation data for Site monitoring wells located in the vicinity of the proposed subsurface stormwater infiltration system (B102-MW, B103-MW, MW-4, MW103, MW214, MW215, MW216, MW301, MW302, MW303, and MW304). Monitoring well elevation data indicated high groundwater elevations in the monitoring wells ranging from elevation (El.) 28.69 feet at monitoring well MW-214, to El. 35.64 feet at monitoring well B103-MW. Monitoring well groundwater elevation data reviewed was recorded nearly annually, in some cases up to three observations per year were recorded, dating back to April 2005. Groundwater monitoring well data is attached as well as a Figure indicating monitoring well locations at the Site.

Ransom conducted test pit TP104 on January 19, 2013 in the proposed subsurface stormwater infiltration system area to make observations for indicators of seasonally high groundwater. Test pit TP104 was excavated to a total depth of approximately 12 feet below ground surface. Ransom observed the soil to generally consist of fill material over native glacial till. Groundwater was not encountered in the test pit during the excavation activities. However, soil mottling was observed in the 11 foot to 12 foot range of the test pit which is an indicator of seasonally high groundwater. Following an elevation survey of the test pit, the soil mottling was located from approximately El. 35.8 feet to 34.8 feet.

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Mr. Chris Moretti  
Gershman Brown Crowley, Inc.

### SEASONALLY HIGH GROUNDWATER ELEVATION

Ransom evaluated the seasonally high groundwater elevation at the Site based on data collected from Site monitoring wells and test pit observations. Historic Site monitoring well groundwater elevation data reviewed indicated that the highest groundwater elevation at the Site previously recorded was El. 35.64 feet. Observations made in test pit TP104, located in the proposed Site subsurface stormwater infiltration system, detected soil mottling ranging from El. 35.8 feet to El. 34.8 feet, indicating that seasonally high groundwater had previously been as high as El. 35.8. Therefore, Ransom believes El. 35.8 feet is a conservative representation of the seasonally high groundwater elevation in the area of the Site subsurface stormwater infiltration system.

Ransom is pleased to provide project assistance services to Gershman Brown Crowley, Inc. If you have any questions, please feel free to contact Mike Abbott at (207) 772-2891 or Jay Johonnett at (603) 436-1490.

Sincerely,

RANSOM CONSULING, INC.



Jay P. Johonnett, EIT  
Project Engineer



Michael D. Abbott, P.E., C.G.  
Senior Project Engineer/Geologist

Attachments:

Figure 1 – Site Plan

Table – Summary of Groundwater Level Data

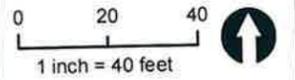
Legend

-  Site Boundary
-  Water Service
-  Sewer Service
-  Gas Service
-  Soil Boring / Monitoring Well
-  Test Pit

Notes

1. Site Plan based on 2008 Orthophotography
2. Some features are approximate in location and scale
3. This plan has been prepared for Gershman Brown Crowley, Inc. All other uses are not authorized unless written permission is obtained from Ransom Environmental Consultants, Inc.

Scale and Orientation



Prepared For

Gershman Brown Crowley, Inc  
14 Breakneck Road, Suite 101  
Lincoln, Rhode Island

Site Address

Washington Street &  
Swanton Street  
Winchester, Massachusetts

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Figure 1  
Site Plan



**TABLE SUMMARY OF GROUNDWATER LEVEL DATA**  
**Proposed CVS Pharmacy/Store No. 10129**  
**Washington Street and Swanton Street**  
**Winchester, Massachusetts**

Monitoring Well I.D.	Date	Reference Elevation (feet)	Elevation (feet)	Depth to Water (feet)	Groundwater Reference Elevation (feet)	Groundwater Elevation (feet)	Ground Surface Reference Elevation (feet)	Ground Surface Elevation (feet)	
MW-1	24-Oct-00	nm	nm	13.7	88.42	33.43	nm	nm	
	1-Apr-05	nm	nm	10.87	91.25	36.26	nm	nm	
	19-Dec-06	nm	nm	12.37	89.75	34.76	nm	nm	
	10-Aug-07	102.12	nm	13.08	89.04	34.05	nm	nm	
	31-Dec-07	nm	nm	12.97	89.15	34.16	nm	nm	
	4-Mar-08	nm	nm	11.05	91.07	36.08	nm	nm	
	3-Jul-08	nm	nm	12.87	89.25	34.26	nm	nm	
	15-Dec-08	nm	nm	12.09	90.03	35.04	nm	nm	
	31-Mar-09	nm	nm	11.93	90.19	35.20	nm	nm	
	8-Jun-09	nm	nm	12.66	89.46	34.47	nm	nm	
	3-Sep-09	nm	nm	12.79	89.33	34.34	nm	nm	
	15-Jan-10	nm	nm	12.48	89.64	34.65	nm	nm	
	23-Dec-12	nm	nm	nm	---	---	nm	nm	
	17-Jan-13	nm	nm	12.05	90.07	35.08	nm	nm	
	* 18-Jan-13	nm	47.13	12.21	89.91	34.92	nm	nm	
	MW-4	24-Oct-00	nm	nm	13.34	87.18	32.19	nm	nm
		1-Apr-05	nm	nm	10.43	90.09	35.10	nm	nm
19-Dec-06		nm	nm	11.58	88.94	33.95	nm	nm	
10-Aug-07		100.52	nm	12.28	88.24	33.25	nm	nm	
4-Mar-08		nm	nm	10.5	90.02	35.03	nm	nm	
3-Jul-08		nm	nm	12.06	88.46	33.47	nm	nm	
15-Dec-08		nm	nm	11.05	89.47	34.48	nm	nm	
31-Mar-09		nm	nm	11.22	89.30	34.31	nm	nm	
8-Jun-09		nm	nm	11.93	88.59	33.60	nm	nm	
3-Sep-09		nm	nm	11.94	88.58	33.59	nm	nm	
15-Jan-10		nm	nm	11.66	88.86	33.87	nm	nm	
23-Dec-12		nm	nm	nm	---	---	nm	nm	
* 18-Jan-13		nm	45.53	nm	---	---	nm	nm	
B101-MW		1-Apr-05	100.00	nm	9.99	90.01	35.02	nm	nm
	19-Dec-06	nm	nm	11.15	88.85	33.86	nm	nm	
	10-Aug-07	nm	nm	11.83	88.17	33.18	nm	nm	
	31-Dec-07	nm	nm	11.72	88.28	33.29	nm	nm	
	4-Mar-08	nm	nm	10.07	89.93	34.94	nm	nm	
	3-Jul-08	nm	nm	11.6	88.40	33.41	nm	nm	
	15-Dec-08	nm	nm	10.58	89.42	34.43	nm	nm	
	31-Mar-09	nm	nm	10.78	89.22	34.23	nm	nm	
	8-Jun-09	nm	nm	11.52	88.48	33.49	nm	nm	
	3-Sep-09	nm	nm	11.52	88.48	33.49	nm	nm	
	15-Jan-10	nm	nm	11.26	88.74	33.75	nm	nm	
	23-Dec-12	nm	nm	nm	---	---	nm	nm	
	18-Jan-13	nm	45.01	nm	---	---	nm	nm	
	B102B-MW	1-Apr-05	100.96	nm	11.35	89.61	34.61	nm	nm
19-Dec-06		nm	nm	11.83	89.13	34.13	nm	nm	
10-Aug-07		nm	nm	dry	dry	dry	nm	nm	
31-Dec-07		nm	nm	--	--	--	nm	nm	
4-Mar-08		nm	nm	11.44	89.52	34.52	nm	nm	
3-Jul-08		nm	nm	dry	dry	dry	nm	nm	
15-Dec-08		nm	nm	dry	dry	dry	nm	nm	
31-Mar-09		nm	nm	dry	dry	dry	nm	nm	
8-Jun-09		nm	nm	dry	dry	dry	nm	nm	
3-Sep-09		nm	nm	dry	dry	dry	nm	nm	
15-Jan-10		nm	nm	dry	dry	dry	nm	nm	
23-Dec-12		nm	nm	dry (11.85)	---	---	101.29	nm	
18-Jan-13		nm	45.96	dry (11.84)	---	---	nm	46.29	
B103-MW		1-Apr-05	101.04	nm	10.39	90.65	35.64	nm	nm
	19-Dec-06	nm	nm	11.72	89.32	34.31	nm	nm	
	10-Aug-07	nm	nm	12.42	88.62	33.61	nm	nm	
	31-Dec-07	nm	nm	12.53	88.51	33.50	nm	nm	
	4-Mar-08	nm	nm	10.64	90.40	35.39	nm	nm	
	3-Jul-08	nm	nm	12.21	88.83	33.82	nm	nm	
	15-Dec-08	nm	nm	11.43	89.61	34.60	nm	nm	
	31-Mar-09	nm	nm	11.36	89.68	34.67	nm	nm	
	8-Jun-09	nm	nm	12.04	89.00	33.99	nm	nm	

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**Washington Street and Swanton Street**  
**Winchester, Massachusetts**

Monitoring Well I.D.	Date	Reference Elevation (feet)	Elevation (feet)	Depth to Water (feet)	Groundwater Reference Elevation (feet)	Groundwater Elevation (feet)	Ground Surface Reference Elevation (feet)	Ground Surface Elevation (feet)
	3-Sep-09	nm	nm	12.13	88.91	33.90	nm	nm
	15-Jan-10	nm	nm	11.84	89.20	34.19	nm	nm
	23-Dec-12	nm	nm	12.45	88.59	33.58	101.34	nm
	18-Jan-13	nm	46.03	11.62	89.42	34.41	nm	46.33
<b>B104-MW</b>	1-Apr-05	101.68	nm	10.77	90.91	35.92	nm	nm
	19-Dec-06	nm	nm	12.18	89.50	34.51	nm	nm
	10-Aug-07	nm	nm	12.9	88.78	33.79	nm	nm
	31-Dec-07	nm	nm	12.96	88.72	33.73	nm	nm
	4-Mar-08	nm	nm	11.08	90.60	35.61	nm	nm
	3-Jul-08	nm	nm	12.68	89.00	34.01	nm	nm
	15-Dec-08	nm	nm	11.91	89.77	34.78	nm	nm
	31-Mar-09	nm	nm	11.78	89.90	34.91	nm	nm
	8-Jun-09	nm	nm	12.48	89.20	34.21	nm	nm
	3-Sep-09	nm	nm	12.64	89.04	34.05	nm	nm
	15-Jan-10	nm	nm	12.34	89.34	34.35	nm	nm
	23-Dec-12	nm	nm	12.95	88.73	33.74	101.91	nm
	* 18-Jan-13	nm	46.69	12.12	89.56	34.57	nm	47.22
<b>MW204</b>	08-Aug-12	nm	nm	13.37	88.51	33.52	nm	nm
	17-Jan-13	nm	nm	12.57	89.31	34.32	nm	nm
	18-Jan-13	101.88	46.89	12.60	89.28	34.29	nm	nm
<b>MW213</b>	17-Jan-19	nm	nm	13.45	---	---	nm	nm
<b>MW214</b>	08-Aug-12	nm	nm	dry (16.00)	---	---	nm	nm
	17-Jan-13	nm	nm	dry (15.74)	---	---	nm	nm
	18-Jan-13	99.49	44.50	15.81	83.68	28.69	nm	nm
<b>MW215</b>	08-Aug-12	nm	nm	dry (13.60)	---	---	nm	nm
	17-Jan-13	nm	nm	12.90	87.18	32.19	nm	nm
	18-Jan-13	100.08	45.09	12.90	87.18	32.19	nm	nm
<b>MW216</b>	08-Aug-12	nm	nm	11.59	87.90	32.91	nm	nm
	23-Dec-12	99.49	nm	11.64	87.85	32.86	99.82	nm
	17-Jan-13	nm	nm	10.93	88.56	33.57	nm	nm
	* 18-Jan-13	nm	44.50	10.94	88.55	33.56	nm	44.83
<b>MW301</b>	03-Dec-12	nm	nm	dry (13.80)	---	---	nm	nm
	23-Dec-12	101.40	nm	dry (13.80)	---	---	101.66	nm
	* 18-Jan-13	nm	46.41	12.99	88.41	33.42	nm	46.67
<b>MW302</b>	03-Dec-12	nm	nm	13.03	87.65	32.66	nm	nm
	23-Dec-12	100.68	nm	12.92	87.76	32.77	100.92	nm
	17-Jan-13	nm	nm	12.50	88.18	33.19	nm	nm
	18-Jan-13	nm	45.69	12.20	88.48	33.49	nm	45.93
<b>MW303</b>	03-Dec-12	nm	nm	dry (12.40)	---	---	nm	nm
	23-Dec-12	100.30	nm	dry (12.40)	---	---	100.83	nm
	17-Jan-13	nm	nm	dry (12.20)	---	---	nm	nm
	* 18-Jan-13	nm	45.31	12.33	87.97	32.98	nm	45.84
<b>MW304</b>	03-Dec-12	nm	nm	11.82	87.28	32.29	nm	nm
	23-Dec-12	99.10	nm	11.73	87.37	32.38	99.36	nm
	17-Jan-13	nm	nm	11.50	87.60	32.61	nm	nm
	* 18-Jan-13	nm	44.11	11.11	87.99	33.00	nm	44.37

**Notes:**

- 200 and 300 series monitoring wells were installed by Ransom, remaining wells were installed by others.
- Reference elevation is highest point of the PVC riser pipe at each well location.
- Reference elevations surveyed relative to an assumed elevation of 100.00 ft taken at top of PVC in well B101-MW.
- Depth to groundwater measured from top of PVC riser pipe using an electronic water level indicator.
- Groundwater elevation and survey data prior to August 8, 2012 measured by others.
- 1/19/2013 elevation survey reference datum is the northeast corner of the concrete sidewalk in front of dry cleaner building shown as El. 46.85 feet on ALTA/ACSM Land Title Survey Plan prepared by RJ O'Connell & Associates, Inc., dated July 20, 2012.
- \* indicates that location not included in 1/18/2013 elevation survey, elevation based on adjustment to site elevation datum established during 1/19/2013 site elevation survey.
- nm = not measured; na = not applicable.
- Dry indicates the well was dry to the bottom of the well (depth to bottom of well).