Miller Hydrogeologic Incorporated

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July 27, 2017

Shinrin Yoku, LLC
c/o Phillip Rapoport
3 Wythe Lane
Brooklyn, NY 11249

Re: Final Report
Bedrock Well Testing and Results
Heartwood Lodge
Town of Gardiner
Ulster County, New York
MHI Project No. 118-017.1

Dear Mr. Rapoport

Miller Hydrogeologic, Incorporated (**MHI**) is pleased to present this final aquifer test results letter report pertaining to the referenced property site. All work was conducted according to the guidelines of the New York State Department of Health (NYSDOH), Part 5, Subpart 5-D. Our project understanding and scope of work were developed based on a request from the project engineer, Barry Medenbach, PE, Medenbach and Eggers Civil Engineering and Land Surveying, PC, Stone Ridge, NY.

INTRODUCTION

Shinrin Yoku, LLC is currently evaluating a 141 acre site off of USHY 44/55 in the Town of Gardiner for ground water supply. Figure 1 shows the site location. A bedrock well installed during the spring of 2017 was tested to determine its long term yield and for permitting by the Ulster County Department of Health (UCDOH). Prior to the conclusion of the required pumping portion of the aquifer test a water quality sample will need to be obtained and submitted for analysis according to the NYSDOH Part-5 Drinking Water Quality Standards. The projects

Environmental Conservation Water Well completion Report is given in Attachment 1. The well driller's log supports the general description of the local site hydrogeology with an overburden layer of approximately eight feet above fractured shale bedrock.

Aquifer Test

Aquifer testing was conducted on the test production well BW-1 for a 24 hour pumping period from June 5-6, 2017. The withdrawal rate was determined for the pumping well with an inline totalizing flow meter and confirmed with timing flow into a five (5) gallon graduated container. For the BW-1 test production well the average pumping rate during the 24 hour pumping period was approximately 8.9 gpm. The flow rate for the BW-1 well was checked with the graduated container timing at intermittent periods during testing. A blockage in the pump discharge line of shale drill cuttings was observed after approximately seven hours of pumping and was removed without stopping the test. The pumping rate reduced to approximately 8.6 gpm due to the blockage but increased and remained constant at approximately 8.95 gpm for the remainder of the pumping period. The variation in pumping over the entire test period was less than 4 percent of the average flow rate.

The discharge water from the test production wells was piped to a discharge location toward an unnamed surface drainage approximately 300 feet to the west and downslope of the test production well.

Precipitation for the aquifer test period was obtained from a private meteorological station located on Albany Post Road in the Town of Gardiner.

In addition to water level data collected in the BW-1 bedrock test well, water levels were also monitored in four (4) surrounding private bedrock wells. The general locations of the

NYSDOH Guidance

The NYSDOH guidance requires that, for a 24 hour test, during the last four (4) hours of pumping the water level in any pumping well should not exceed a drawdown of 0.5 feet of water for every 100 feet of water in the pumping well prior to pumping. For the BW-1 test production well the approximate total depth of water in the well was determined prior to testing. Assuming a total well depth of approximately 320 feet (well driller's log) and a depth to water of 5.86 feet (measured just prior to the start of pumping) for the BW-1 test production well equates to a NYSDOH maximum allowable drawdown of 1.57 feet. The total drawdown for the final four hours of pumping in the BW-1 well was 0.63 feet which meets the NYSDOH guidance values for maximum allowable drawdown. Table 1 summarizes calculation of the NYSDOH guidance value.

Hydraulic Properties

The selection of the mathematical method used to determine aquifer properties is based on comparing the general assumptions which are used to formulate the mathematical solution describing the flow of ground water toward a discharging (or recharging) well and true field conditions. Because no mathematical solution can take into account exactly the true field conditions the results of the mathematical methods are considered approximate. The greater the number of borings and observation wells that are used to collect data concerning the site hydrogeology and used to collect water level change data during individual well and aquifer testing the closer the selection of the mathematical approximation will be to true field conditions. For the proposed Heartwood property site the selection method is based on the site geology and depth to bedrock. Groundwater flow within the bedrock is assumed to be flowing within the fractures in the bedrock under water table conditions.

groundwater flow in fracture bedrock assuming a pumping period of 180 days with no groundwater recharge (drought conditions). The planned pumping rate is specified and the Moench (1984) groundwater flow in fracture bedrock equation is solved for drawdown in the pumping well. Since the well is assumed to pump continuously for the 180 day time period the pumping rate is determined as the total water usage for any day converted to gallons per minute. As described earlier the project has determined a total daily water requirement of approximately 12,600 gpd. This converts to a continuous pumping rate of approximately 8.75 gpm.

The values of transmissivity and storage computed for the PW-1 production well as described above were substituted into the Moench (1984) method for groundwater flow in fracture bedrock and solved for water level drawdowns at a long term average pumping rate of 8.75 gpm, which is the proposed total daily average water usage. Figure 5 shows a plot of time verses drawdown for the BW-1 pumping well. The predicted drawdown of approximately 280 feet would represent a maximum drawdown assuming drought conditions.

Water Quality Analysis Results

As described above, a groundwater quality sample were obtained at the conclusion 24 hour aquifer test for test well BW-1. Review of the analytical results from the test production well indicates that no water quality parameters were above the NYSDOH Part 5 drinking water standards. Table 2 summarizes the sampling results for the BW-1 test production well. Attachment 3 presents the complete laboratory analytical data for the sampling event.

SUMMARY

A 24 hour aquifer test was conducted on the proposed Heartwood project site well BW-1. The BW-1 well was completed to a depth of approximately 320 feet with 60 feet of six inch diameter casing. Depth to water level data was collected during the test with a closed pressure

TABLES

TABLE 2

WATER QUALITY SAMPLING RESULTS FOR THE HEARTWOOD BW-1 MONITORING WELL

Contaminant	MCL (mg/L)	BW-1 7/6/2017 Results (mg/L)
504.1 GCS, EDB and DBCP		
1,2-Dibromo 3-Chloropropane	0.005	<0.000061
1,2-Dibromoethane (EDB)	0.005	<0.0000072
508.1 GCS Pesticides		
Alachlor		<0.000034
Atrazine	0.005	<0.000061
gamma-BHC Lindane	0.0002	<0.0000029
Butachlor	0.005	<0.000026
Chlordane		<0.000046
Dieldrin		<0.000019
Endrin	0.002	<0.0000068
Heptachlor		<0.000012
Heptachlor epoxide		<0.0000029
Hexachlorobenzene		<0.000019
Hexachlorocyclopentadiene		<0.000031
Methoxychlor	0.04	<0.000050
Metolachlor	0.005	<0.000046
PCB, Total		<0.000078
Propachlor	0.005	<0.000029
Simazine	0.005	<0.000067
Toxaphene	0.003	<0.00059
515.3 Chlorinated Herbicides		
2,4-D	0.05	<0.000081
Dalapon	0.005	<0.00089
Dicamba	0.005	<0.000067
Dinoseb	0.005	<0.00016
Pentachlorophenol	0.005	<0.000030
Picloram	0.005	<0.000094
2,4,5-TP (Silvex)	0.01	<0.00016
531.1 HPLC Carbamates		
Aldicarb	0.005	<0.00064
Aldicarb sulfone	0.005	<0.00037
Aldicarb sulfoxide	0.005	<0.00059
Carbofuran	0.005	<0.00032
3-Hydroxycarbofuran	0.005	<0.00045
Methomyl	0.005	<0.00057
Oxamyl	0.005	<0.00055
Carbaryl	0.005	<0.00027

TABLE 2

WATER QUALITY SAMPLING RESULTS FOR THE HEARTWOOD BW-1 MONITORING WELL

Contaminant	MCL (mg/L)	BW-1 7/6/2017 Results (mg/L)
Method 524.2 (Continued)		
Ethylbenzene	0.005	<0.00050 U
Dichlorodiflouromethane	0.005	<0.00050 U
Hexaclorobutadiene	0.005	<0.00050 U
Isopropylbenzene	0.005	<0.00050 U
p-Isopropyltoluene	0.005	<0.00050 U
Methylene Chloride	0.005	<0.00050 U
m-Xylene & p-Xylene	0.005	<0.001 U
Methyl tert-butyl ether	0.005	<0.00050 U
o-Xylene	0.005	<0.00050 U
Tetrachloroethene	0.005	<0.00050 U
Toluene	0.005	<0.00050 U
Trans-1,2-Dichloroethene	0.005	<0.00050 U
Trans-1,3-Dichloropropene	0.005	<0.00050 U
Trichloroethene	0.005	<0.00050 U
tert-Butylbenzene	0.005	<0.00050 U
Trichloroflouromethane	0.005	<0.00050 U
Vinyl Chloride	0.005	<0.00050 U
Xylenes, Total		<0.0015 U
Styrene	0.005	<0.00050 U
sec-Butylbenzene	0.005	<0.00050 U
1,3,5-Trimethylbenzene	0.005	<0.00050 U
N-Propylbenzene	0.005	<0.00050 U
1,3-Dichlorobenzene	0.005	<0.00050 U
2-Chlorotoluene	0.005	<0.00050 U
4-Chlorotoluene	0.005	<0.00050 U
Method: 200.7, Rev 4.4, Prep Method: 200.7/200.8		
Iron	0.30	0.19
Manganese	0.30	0.085
Sodium	No designated limits	51
Zinc	5.00	<0.020 U
Method: 200.8, Rev 5.4, Prep Method: 200.7/200.8		
Arsenic	0.01	<0.0014 U
Beryllium	0.004	<0.00030 U
Cadmium	0.005	<0.001 U
Chromium	0.10	<0.007 U
Nickel	NDL*	0.00098
Antimony	0.006	<0.00040 U
Thallium	0.002	<0.00030 U
Barium		0.096
Selenium	0.05	<0.002 U
Method: 200.7, Rev 4.4, Prep Method: 200.7		
Silver (Ag)	0.005	<0.010 U

FIGURES