PACIFIC groundwater GROUP

JB1915

August 25, 2020

Racheal Paige
Clearwood Community Association Inc.
21603 N. Clear Lake Blvd. SE
Yelm, WA 98597

Re: Clearwood Community Association Well 6 72-hour Aquifer Test Results and Analysis

Dear Racheal,

We understand that Clearwood Community Association (CCA) desires to increase its available water supply to create redundancy and spread pumping effects more broadly across the water service area. Many municipalities operate their water systems with similar redundancies and distributed source areas so that the likelihood of complete water service disruption due to a catastrophic event is minimized. To achieve these redundancy goals, Wells 5 (DOH Source 06) and 6 (DOH Source 07) were installed south of Clear Lake in 2015 and 2017 to depths of 190 and 199 feet, respectively. Well 5 is 6-inches in diameter and screened from 183.3 to 188.5 feet below ground surface (bgs), and Well 6 is an 8-inch diameter well screened from 184 to 199 feet bgs. It should be noted that the 8-inch well (Well 6, as designated with DOH) is referred to as Well 5 by Clearwood water system personnel, and the 6-inch well (Well 5, as designated with DOH) is referred to as Well 6 by Clearwood personnel. Because this letter will be forwarded on to regulators, this letter will refer to the wells using their regulatory names.

Well 5 was previously tested in 2015 with an 8-hour constant rate pumping test at 252 gpm, and Well 6 previously was tested in 2017 with a 24-hour constant rate test at 500 gpm. The aquifer response during the Well 6 24-hour test was atypical because observed drawdown decreased during the pumping test. PGG reviewed the previous test data and evaluated possible mechanisms (including well development, background pumping impacts, recirculation of discharge water, barometric forcing, and a decline in pumping rate) that could have caused the observed drawdown trend. PGG deemed a pumping rate decrease as the most likely cause of the decrease in drawdown. However, DOH requested that CCA run a follow-up 72-hour constant rate pumping test and collect a Micro Particulate Analysis (MPA) sample due to concerns regarding the possibility of groundwater under the influence of surface water and uncertainty surrounding whether the aquifer is unconfined or leaky confined, as stated in an October 10, 2019 email.

Northwest Water Systems (CCA's water system engineer), PGG, and Tacoma Pump and Drilling (CCA's well contractor) designed an aquifer test protocol for the 72-hour constant rate test, which was reviewed by DOH on October 31, 2019. This letter report presents the results of the

72-hour aquifer test, water quality sampling results, and a sustainability analysis based on the planned operational approach.

AQUIFER TEST SUMMARY

A 72-hour aquifer test was conducted on CCA Well 6 from July 13 to 16, 2020. One week prior to test initiation, PGG installed pressure transducers in Well 6, Well 5, and Blue Lake to collect background water level data, along with a barometric transducer to facilitate barometric compensation. PGG also installed a staff gauge in Blue Lake to manually observe water levels during the test. **Figure 1** shows the monitoring locations, and **Figure 2** plots the barometrically corrected background water level data. Aside from a brief startup test of the newly installed Well 6 pump on July 10, no significant seasonal trends or pumping signatures were observed in the background data.

The 72-hour pumping test commenced on July 13, with Well 6 pumping at an average rate of 436 gpm as shown in **Figure 3**. The observed pumping rate varied from 430 and 448 gpm during the test based on measurements from a calibrated orifice plate flow meter. Manual water level and flow measurements were recorded by PGG for the first several hours of testing, while CCA maintenance personnel continued recording manual measurements for the rest of the pumping period. Water level measurements were recorded using calibrated electronic sounders and transducers, and all CCA maintenance personnel were trained by PGG regarding measurement procedures. Water was conveyed roughly 330 feet from the wellhead to Blue Lake, and was discharged onto an asphalt pad overlain with thick plastic sheeting to both direct flow into Blue Lake and minimize its erosive potential.

The maximum drawdown at both wells was observed at the end of the pumping period, and was 50.7 ft at Well 6 and 12.1 ft at Well 5. **Figure 3** plots of observed water levels during the drawdown and recovery periods of the test. The maximum observed increase in water level at Blue Lake was 1-inch (ponding was limited at Blue Lake because it discharges into Clear Lake).

During the last 17 hours of pumping, PGG collected a MPA sample by diverting a side stream of water through a MPA filter. A total of 834 gallons were purged through the filter at a flow rate of approximately 0.84 gpm. Following MPA sampling, sample bottles were filled for herbicide and pesticide analyses (which by mistake were not sampled for during the previous 24-hour test). Additionally, a field pH measurement was made.

After water quality sampling was completed, the pump was shut off and manual water level measurements were recorded by PGG with assistance from CCA personnel during the first 3.5 hours of the recovery period. The remainder of the recovery data from the wells was measured by transducer, while monitoring at Blue Lake was discontinued since the staff gauge required removal.

AQUIFER TEST ANALYSIS

The drawdown curve observed during the Well 6 72-hour constant rate test differs significantly from the prior 24-hour constant rate test curve. The 24-hour test pumping rate was 500 gpm and

the maximum drawdown of 33 feet was observed roughly 200 minutes into the test (after which drawdown slowly decreased to roughly 32 feet by the end of the test). During the 72-hour test, greater drawdown was observed at 200 minutes (40.6 ft) even though the pumping rate was lower, and by the end of the test 10.1 feet of additional drawdown accrued. Based on the increased drawdown during the 72-hour test, PGG now suspects that recirculation of recharge water is the most likely cause of the atypical water levels observed in the 24-hour test. Recirculation suggests that the aquifer is unconfined, though based on the silt content described in the well log a leaky aquifer component may also be present. The production aquifer appears to be heterogenous and composed of discontinuous layers with varying silt content.

An unconfined aquifer solution that includes boundary effects was analyzed initially for the observation well using the aquifer test analysis software Aqtesolv. **Figure 4** presents the curve match, and it shows that the rate of observed drawdown lags the model curve from about 2 to 100 minutes, then accelerates more quickly than predicted by the model curve. The acceleration of drawdown beginning at about 100 minutes suggests that low permeability boundaries are present in the aquifer, but even with their addition to the solution, the curve matches are inexact during this time period. In late time the observed slope becomes more gentle following the onset of a delayed aquifer yield response. **Figure 5** presents the unconfined solution fit obtained for both Wells 5 and 6, with Well 6 having a well skin factor applied to it so it matches the late-time curve. Based on the unconfined solution, a transmissivity of approximately 33,000 ft^2/day is estimated for the aquifer, with low permeability boundary conditions simulated 2000 feet away from the well in three directions.

In an effort to obtain a better solution fit, a leaky solution was applied to the test data and matched curves are shown in **Figure 6**. The observation well drawdown curve is well matched in intermediate to late time, while the pumping well curve is well matched in late time through use of a well skin factor. From the leaky solution the estimated transmissivity is 2,250 ft^2/day. The transmissivities estimated by the two solutions differ significantly, and bracket the likely hydrogeologic conditions present in the Well 5/6 area.

The model solutions do not include the effects of connection with Clear Lake because such an effect is not observed in the field data.

SUSTAINABILITY ANALYSIS

We understand that CCA's future plans are to pump Wells 5 and 6 concurrently for one week and then rest them for one week (during the week when Wells 5 and 6 are off CCA's current primary water supply wells will be pumped). For weeks when Wells 5 and 6 are pumped, CCA plans to first pump Well 5 at 100 gpm, and if demand exceeds this rate Well 6 will be pumped up to a rate of 425 gpm. Therefore for a sustainability assessment, we assume that all other CCA wells are offline for one year (due to system maintenance or well replacement) and Well 5 is pumped at 100 gpm and Well 6 at 425 gpm constantly for the full year. The unconfined and leaky aquifer solutions derived above from the 72-hour constant test were then used to project an expected drawdown range in this scenario.

Projected drawdown for the unconfined solution is presented in **Figure 7**, and estimates that close to 80 feet of drawdown will be observed at Well 6. At Well 5 approximately 57 feet of

drawdown is estimated. It should be noted that well loss effects are not simulated at Well 5, therefore applying an additional safety factor to account for 20 feet of additional drawdown (calculated based on the specific capacity observed in the prior Well 5 test) is recommended.

Projected drawdown for the leaky solution is presented in **Figure 8**, where approximately 53 feet of drawdown is expected to occur at Well 6 and 15 feet of drawdown is expected at Well 5. Similarly, because Well 5 water levels do not account for well loss, applying an additional safety factor to account for 20 feet of additional drawdown is recommended.

At Well 6 roughly 131 feet of available drawdown exists (calculated as the distance from the static water level on the well log and screen top) and at Well 5 roughly 134 feet exists (calculated similarly). The expected worst case drawdown at Well 6 is 80 feet and at Well 5 is 77 feet (57 feet plus a 20 foot safety factor). Therefore under current conditions both wells should have adequate available drawdown to support the proposed water withdrawals. Currently no pump is installed in Well 5, and at Well 6 the pump intake is set at 114 feet. Therefore we recommend that the Well 6 pump be lowered to between 150 and 180 feet bgs. The Well 5 pump intake should be installed at least 130 feet bgs

Because well yields can decline in time, regular water level and flow measurements from wells are often recorded to form a historical record that can be reviewed when making well maintenance decisions. Therefore we recommend that weekly water level and flow measurements from both wells be recorded, with static water levels recorded immediately before the well pumps are turned on, and pumping water levels and rates recorded at the end of each weekly pumping session.

Based on this sustainability analysis, if pump intakes are installed at appropriate depths Wells 5 and 6 should be able to pump continuously at 100 and 425 gpm for one year. Regular pumping and maintenance on these wells should extend their lifetimes, and will help provide greater water supply security for the CCA water system.

WATER QUALITY SAMPLING RESULTS

The MPA sample was analyzed by Analytical Laboratories, Inc. in Boise, ID, and the associated lab report is included as an attachment. A risk factor of zero was calculated for Well 6 source water, which indicates that the well has a very low risk of being contaminated by surface water contamination.

Herbicides using EPA Method 515 and pesticides using EPA Method 525 were analyzed by Water Management Laboratories, Inc. of Tacoma, Washington. Sample results are included as an attachment, and indicate that no pesticides or herbicides were detected in the sample.

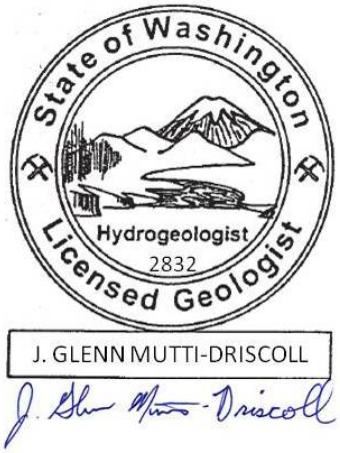
The field-measured pH value observed was 7.23 standard units.

LIMITATIONS

This work was performed, and this report prepared, in accordance with hydrogeologic practices generally accepted at this time in this area, for the exclusive use of the Clearwood Community Association and their agents, for specific application to the Wells 5 and 6 area. No other warranty, express or implied, is made. Please call Glenn Mutti-Driscoll at (206) 329-0141, if you have any questions about this report.

Sincerely,

Pacific Groundwater Group



Glenn Mutti-Driscoll, LHG
Hydrogeologist

Attachments: Figures 1 through 8
Analytical Laboratories, Inc. Laboratory Report
Water Management Laboratories, Inc. Laboratory Report

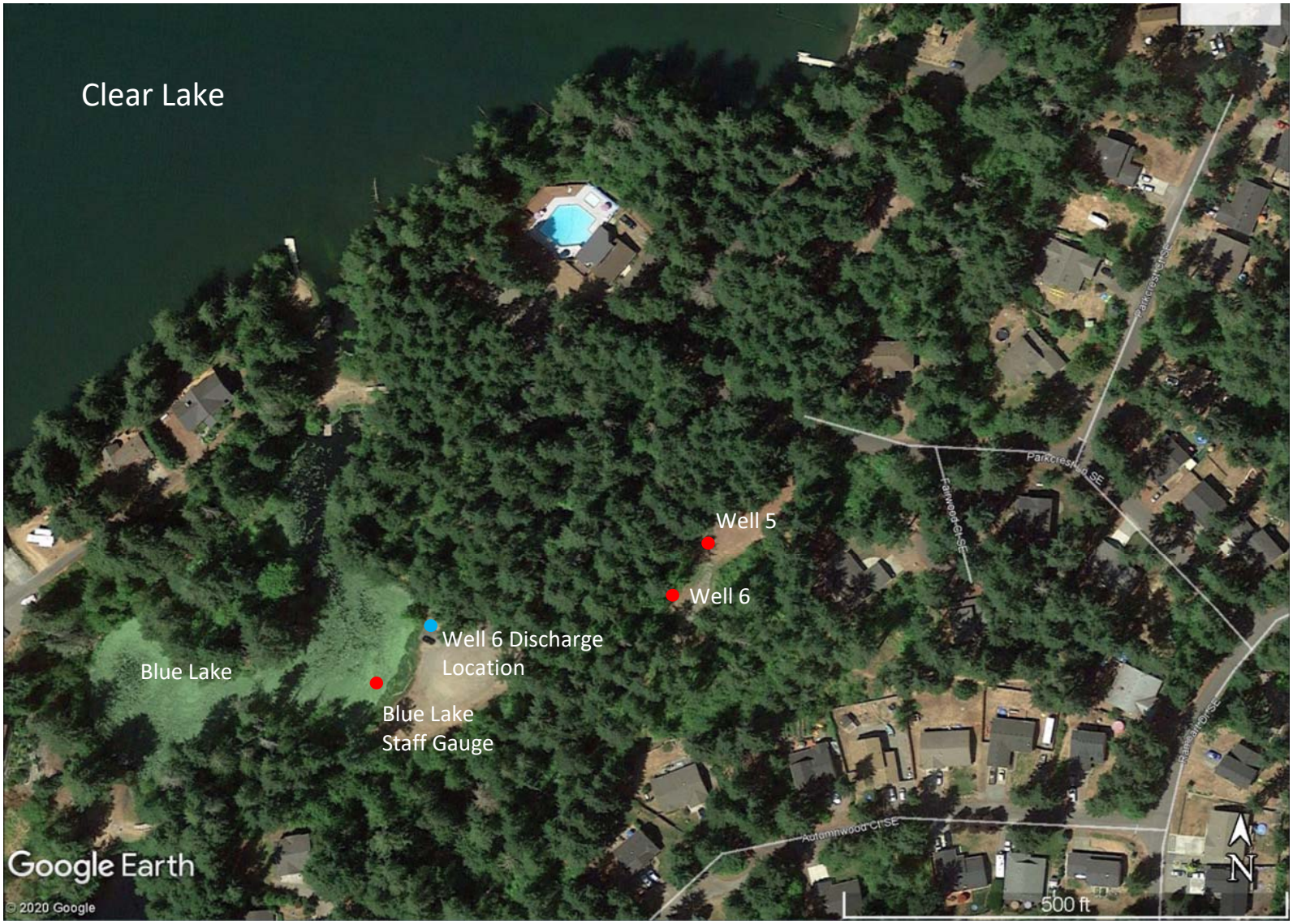
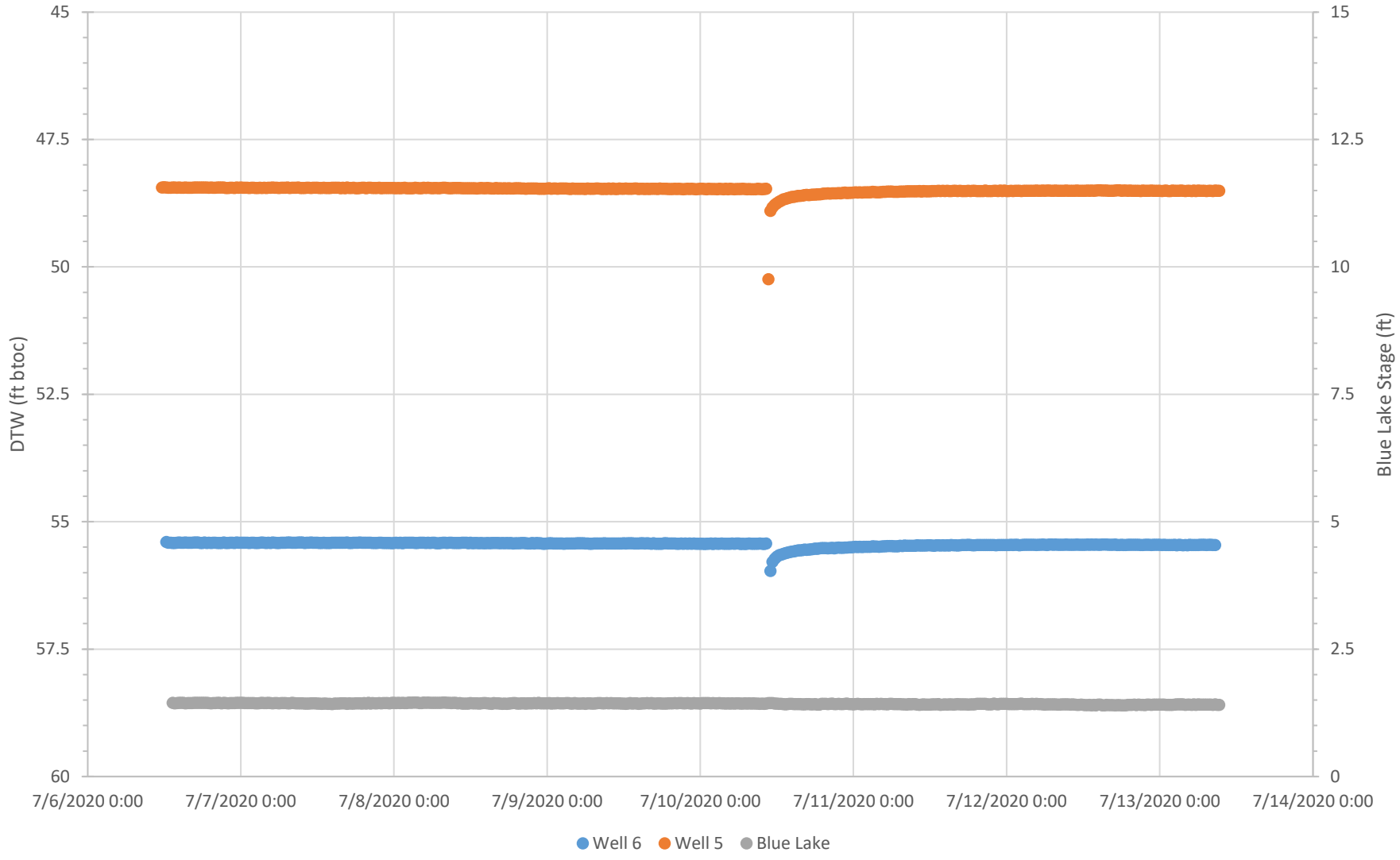


Figure 1. Clearwood Well 6 Vicinity

PgG

JB1915 Clearwood



Notes:

Transducer data are barometrically corrected.

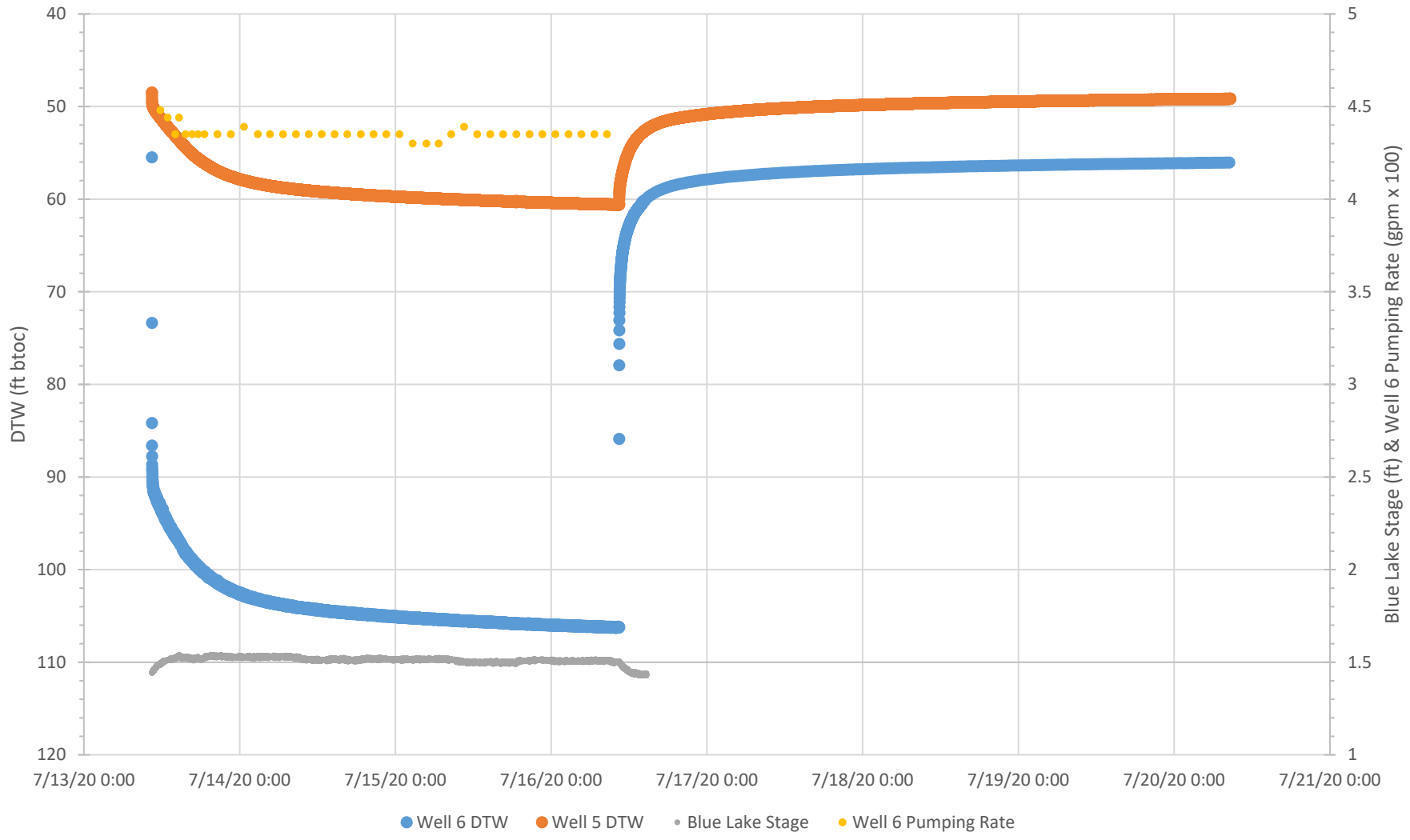
DTW = Depth to Water

btoc = below top of casing

Figure 2. Background Water Levels

PgG

JB1915 Clearwood



Notes:

Transducer data are barometrically corrected.

DTW = Depth to Water

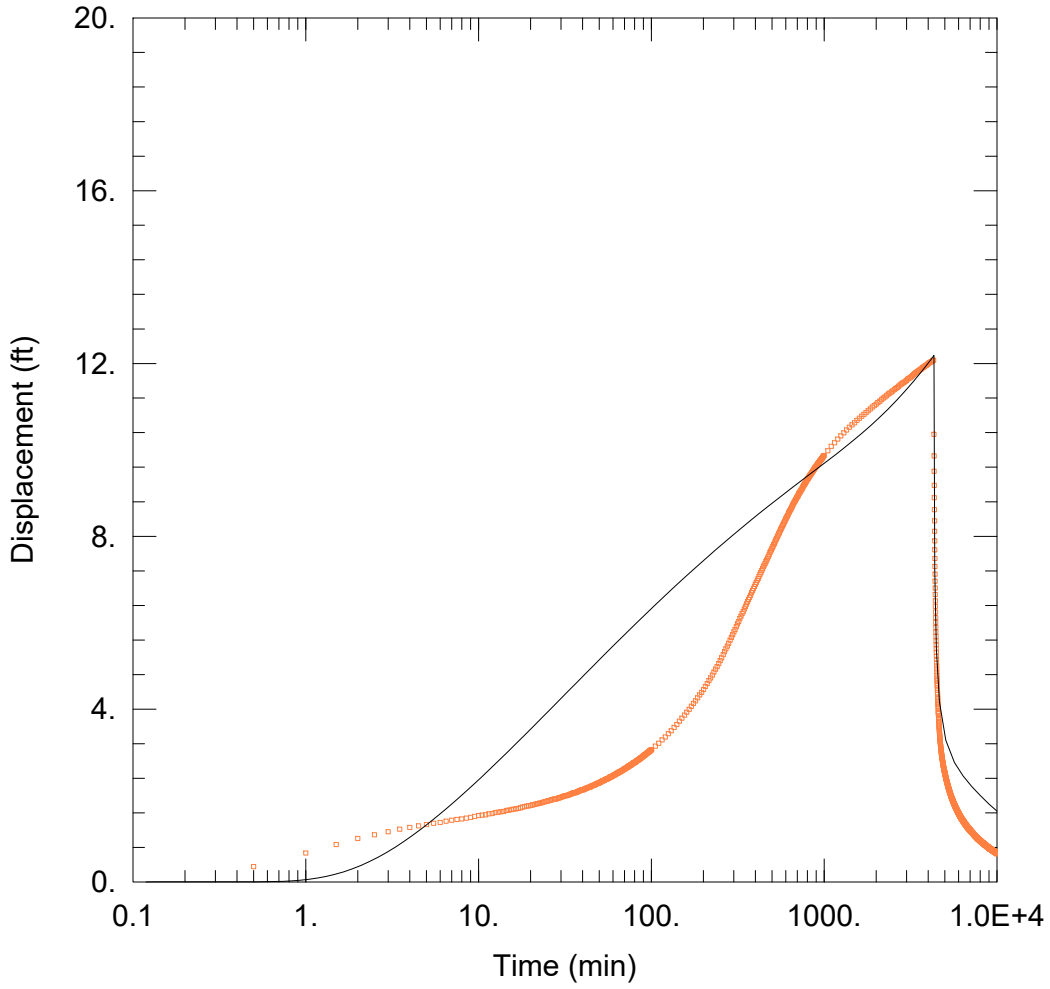
btoc = below top of casing

Figure 3. 72-Hour Pumping Test
Water Level and Pumping Rate Data

PgG

JB1915 Clearwood

Figure 4. Unconfined Solution Match for Well 5



WELL TEST ANALYSIS

Data Set: K:\...\Moench Unconfined Highly Bounded+jgmd filtered lowK.aqt
Date: 08/13/20 Time: 22:29:01

PROJECT INFORMATION

Test Well: Well 6
Test Date: 7/13/2020

AQUIFER DATA

Saturated Thickness: 144. ft Anisotropy Ratio (Kz/Kr): 4.884E-5

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well 6	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
Well 5	88	0

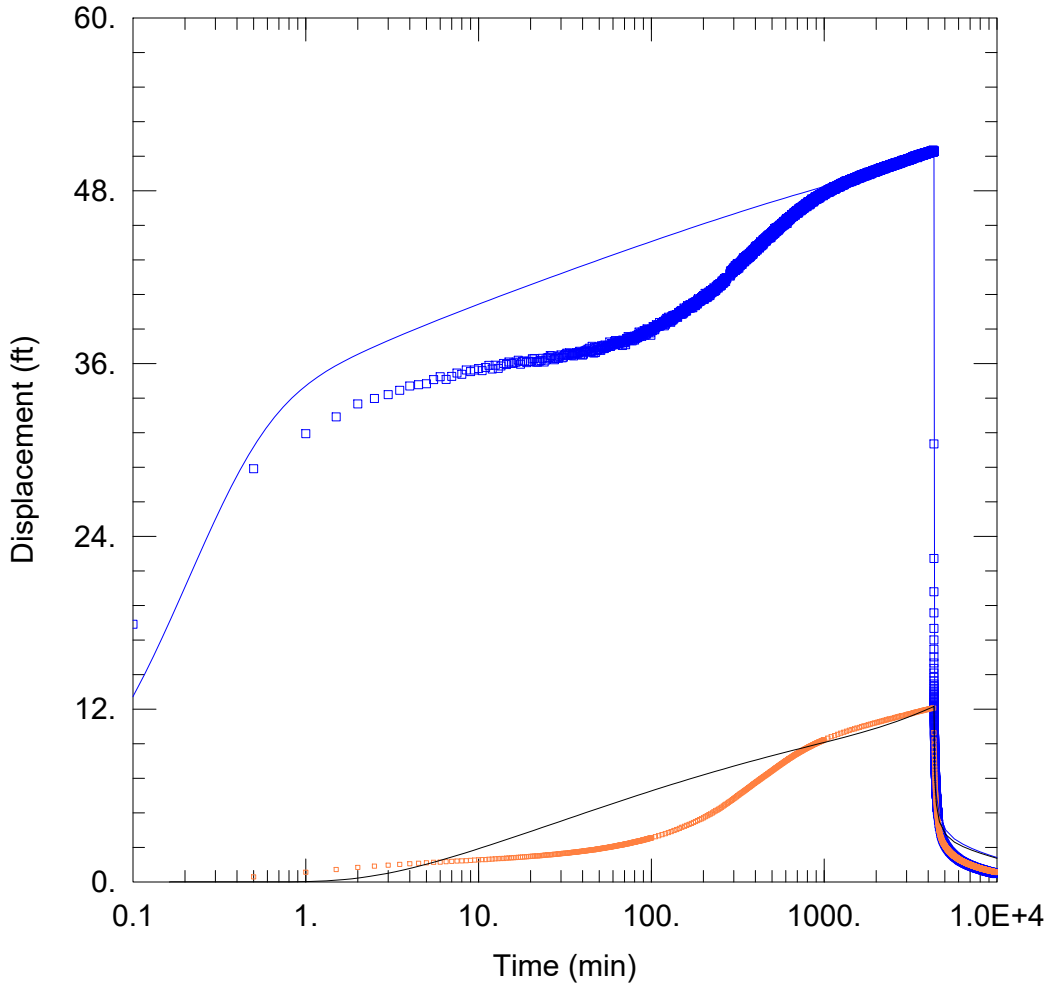
SOLUTION

Aquifer Model: Unconfined Solution Method: Moench

T = 3.287E+4 ft^2/day
Sy = 0.09438
Sw = -3.35
r(c) = 0.33 ft

S = 0.02328
ß = 1.824E-5
r(w) = 0.33 ft
alpha = 1.585E-10 min^{-1}

Figure 5. Unconfined Solution Match for Wells 5 and 6



WELL TEST ANALYSIS

Data Set: K:\...\Moench Unconfined Highly Bounded+jgmd filtered lowK+6.aqt
Date: 08/13/20 Time: 22:13:43

PROJECT INFORMATION

Test Well: Well 6
Test Date: 7/13/2020

AQUIFER DATA

Saturated Thickness: 144. ft Anisotropy Ratio (Kz/Kr): 4.884E-5

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well 6	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
Well 6	0	0
Well 5	88	0

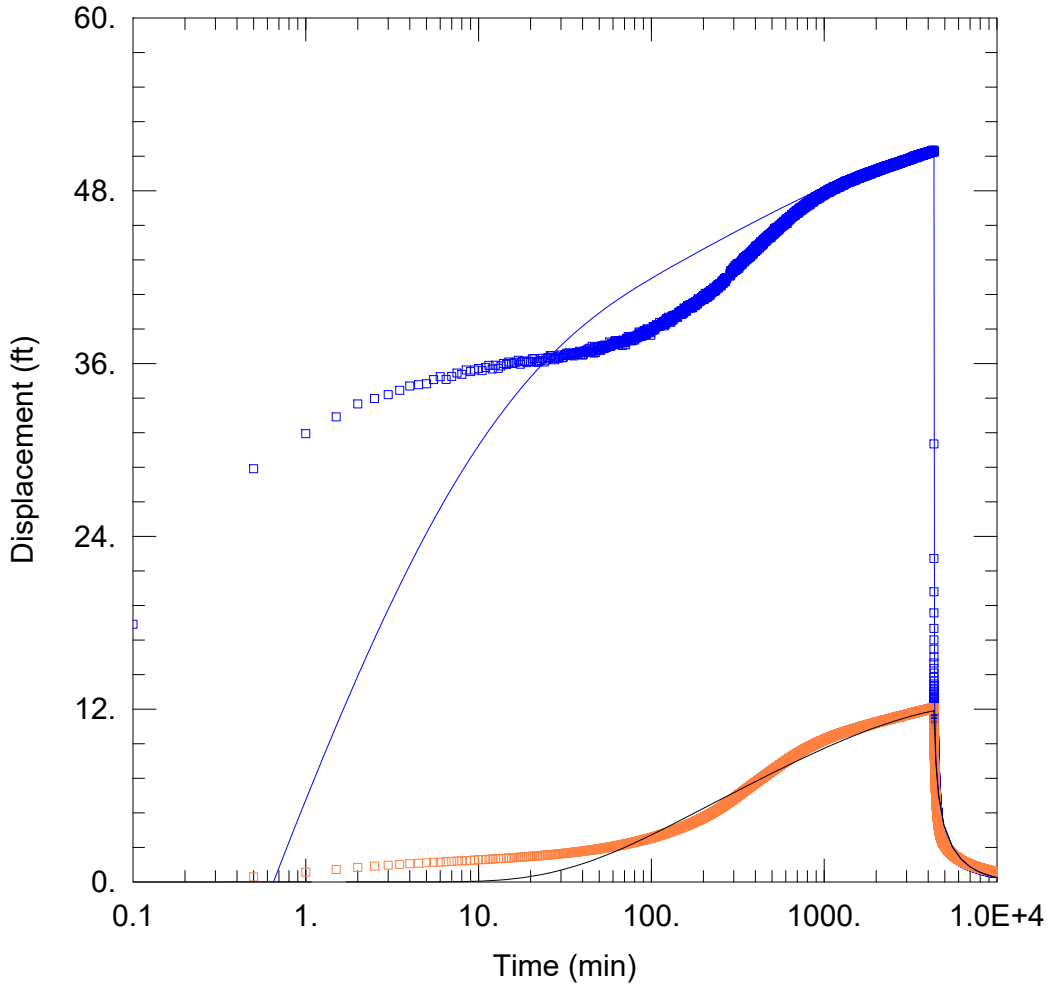
SOLUTION

Aquifer Model: Unconfined Solution Method: Moench

T = 3.287E+4 ft^2/day
Sy = 0.09438
Sw = 4.225
r(c) = 0.33 ft

S = 0.02328
Kz/Kr = 4.884E-5
r(w) = 0.33 ft
alpha = 1.585E-10 min^{-1}

Figure 6. Leaky Solution Match for Wells 5 and 6



WELL TEST ANALYSIS

Data Set: K:\...\Partialpen_leaky_HJ_ObsWellv3 well6 fit.aqt
Date: 08/14/20 Time: 11:59:15

PROJECT INFORMATION

Test Well: Well 6
Test Date: 7/13/2020

AQUIFER DATA

Saturated Thickness: 79. ft
Aquitard Thickness (b'): 37. ft
Anisotropy Ratio (Kz/Kr): 0.1
Aquitard Thickness (b"): 1. ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well 6	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
Well 6	0	0
Well 5	88	0

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

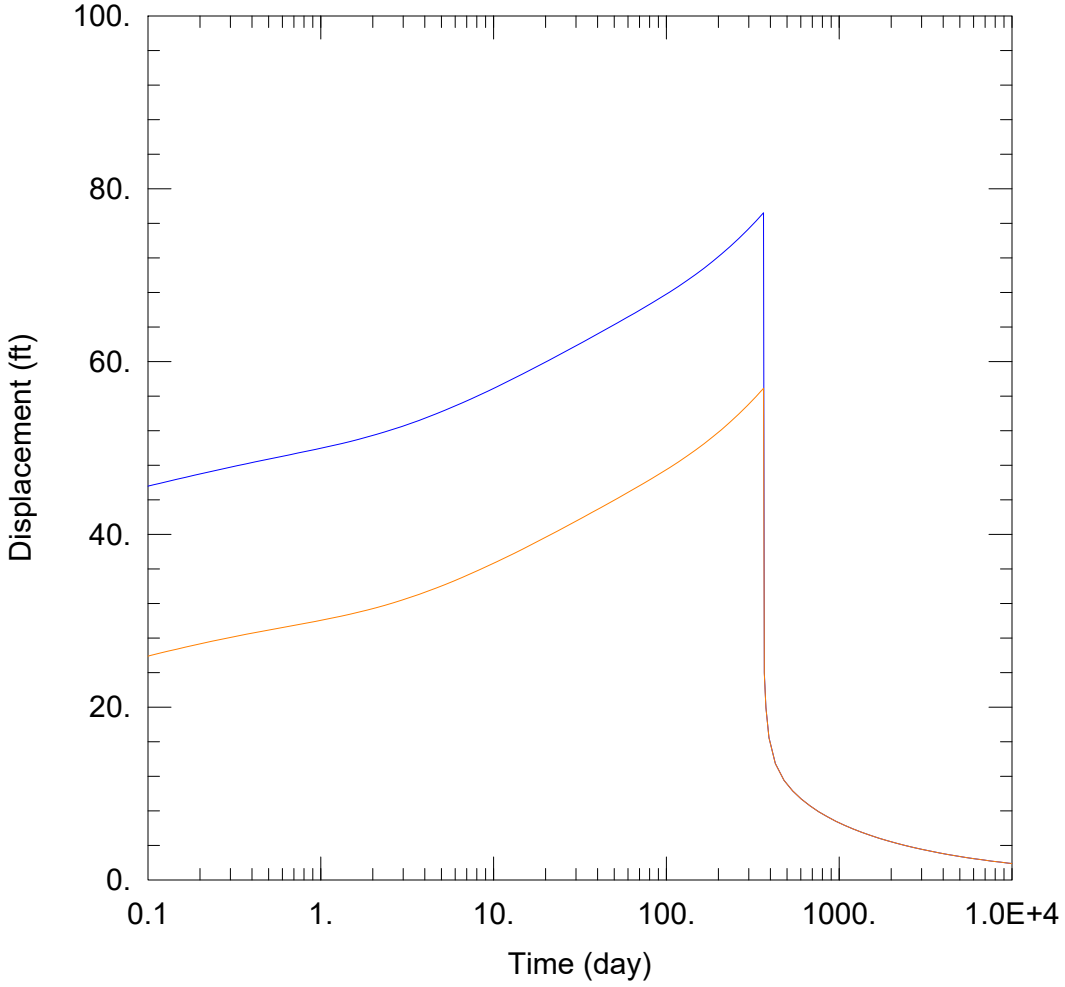
T = 2250. ft^2/day
1/B = 0.001051 ft^{-1}
C = 0. min^2/ft^5

S = 0.007499
Sw = -3.83
P = 2.

Step Test Model: Jacob-Rorabaugh
Time (t) = 1. min Rate (Q) in cu. ft/min

$s(t) = 0.09753Q + 0.Q^{2.}$
W.E. = 500.% (Q from last step)

Figure 7. Predicted Well Drawdown After 365 Days of Pumping, Unconfined Solution



WELL TEST ANALYSIS

Data Set: K:\...\Moench Unconfined Highly Bounded+jgmd filtered lowK+6 365.aqt
Date: 08/13/20 Time: 22:47:00

PROJECT INFORMATION

Test Well: Wells 5 & 6

AQUIFER DATA

Saturated Thickness: 144. ft Anisotropy Ratio (Kz/Kr): 4.884E-5

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well 6	0	0
Well 5	88	0

Observation Wells

Well Name	X (ft)	Y (ft)
Well 6	0	0
Well 5	88	0

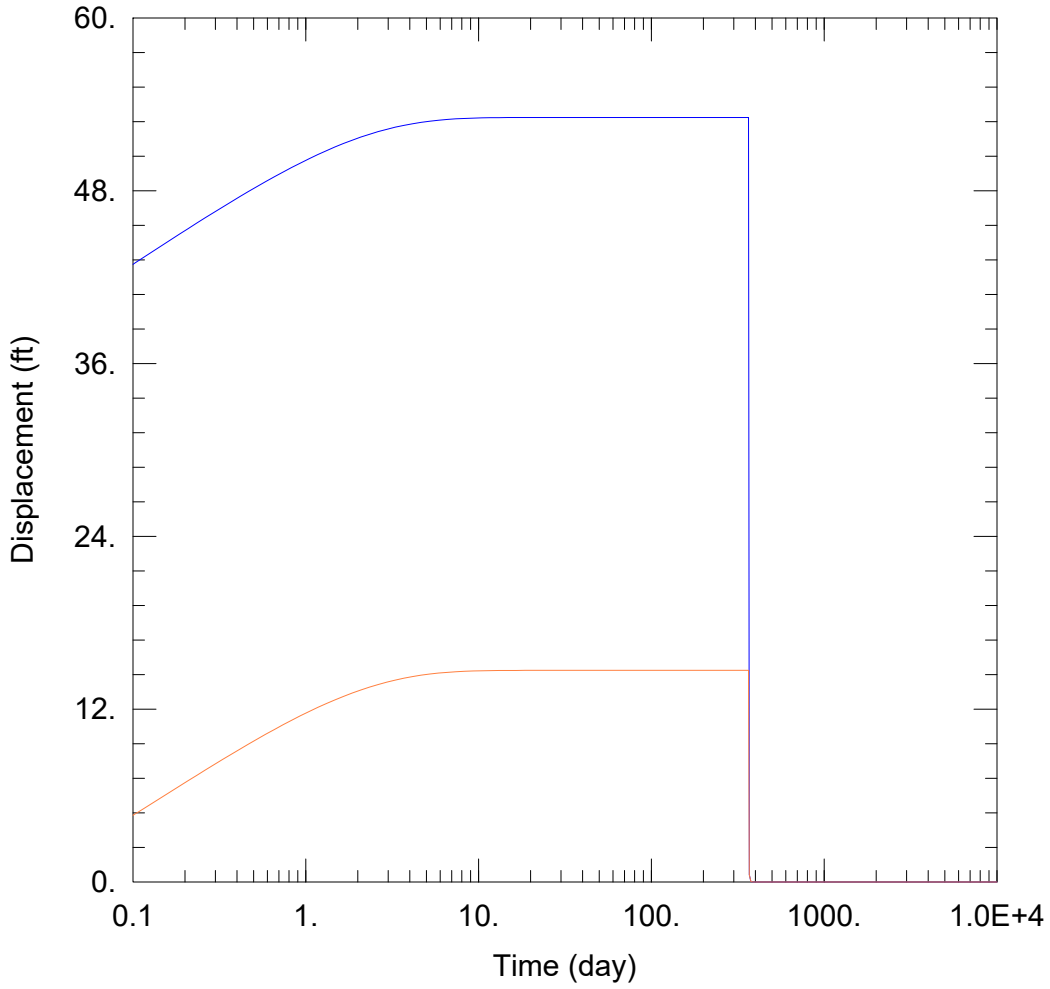
SOLUTION

Aquifer Model: Unconfined Solution Method: Moench

T = 3.287E+4 ft^2/day
Sy = 0.09438
Sw = 4.225
r(c) = 0.33 ft

S = 0.02328
Kz/Kr = 4.884E-5
r(w) = 0.33 ft
alpha = 1.585E-10 day^{-1}

Figure 8. Predicted Well Drawdown After 365 Days of Pumping, Leaky Solution



WELL TEST ANALYSIS

Data Set: K:\...\Partialpen_leaky_HJ_ObsWellv3 well6 fit 365 days.aqt
Date: 08/13/20 Time: 22:37:06

PROJECT INFORMATION

Test Well: Wells 5 & 6

AQUIFER DATA

Saturated Thickness: 79. ft
Anisotropy Ratio (Kz/Kr): 0.1
Aquitard Thickness (b'): 37. ft
Aquitard Thickness (b"): 1. ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well 6	0	0
Well 5	88	0

Observation Wells

Well Name	X (ft)	Y (ft)
Well 6	0	0
Well 5	88	0

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 2250. ft^2/day
1/B = 0.001051 ft^{-1}
C = 0. day^2/ft^5

S = 0.007499
Sw = -3.83
P = 2.

Step Test Model: Jacob-Rorabaugh
Time (t) = 1. day Rate (Q) in cu. ft/day

$s(t) = 0.0006125Q + 0.Q^{2.}$
W.E. = 144.2% (Q from last step)

Analytical Laboratories, Inc.

1804 N. 33rd Street Boise, Idaho 83703 Phone (208) 342-5515

Microscopic Particulate Analysis for the Determination of Groundwater under the Direct Influence of Surface Water Report # 2033921

PWS: 13615U
Date of Collection: 7/16/2020
Time of Collection: 10:09
Collected By:
Date Received: 7/17/2020
Submitted By: UPS
Report Date: 7/31/2020

Attn:
PACIFIC GROUND WATER GROUP
2377 EASTLAKE AVE E #200
SEATTLE, WA 98102

Source of Sample: RAW GROUND WATER

Sediment obtained from the filter was examined microscopically for the presence of bioindicators. The number and type of primary bioindicators were used to determine the risk factor for the water system. All bioindicators are quantified as number of organisms per 100 gallons.

Gallons Filtered	834
# of Slides Examined	10
Dilution Ratio of Final Pellet	1:10
Volume of Final Pellet	60
# of Primary Bioindicators/100 gallons	
Giardia	UNDETECTED
Coccidia	UNDETECTED
Diatoms	UNDETECTED
Other Algae	UNDETECTED
Insect larvae	UNDETECTED
Rotifers	UNDETECTED
Plant debris	UNDETECTED
# of Secondary Particulates/100 gallons	
Large Amorphous debris	LOW
Fine Amorphous debris	MODERATE
Minerals	LOW
Plant Pollen	UNDETECTED
Nematodes	UNDETECTED
Crustacia	UNDETECTED
Amoeba	UNDETECTED
Cilliates/Flagellates	UNDETECTED
Other	
Risk Factor	**0**

. **Interpretation of the risk factor is as follows:** Analyst: RB

Risk of surface water contamination:
≥20 – high risk
10 – 19 moderate risk
≤9 - low risk

It is important to realize that the determination of direct surface water influence should not be based entirely upon the results of one or two Microscopic Particulate Analyses. Other pertinent information, such as water quality data and on site surveys, should be used in conjunction with these results to make this determination.

c/oBMM 7/31/2020

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions about this report, or any future analytical needs, please contact your client manager: **Brian McGovern**

Date Report Printed: 7/31/2020 3:10:02 PM

Analytical Laboratories, Inc. 1804 N. 33rd Boise, ID 83703
Phone: 208.342.5515 Fax: 208.342.5591
email: micro@analyticallaboratories.com

Pacific Groundwater Group.

33921

Chain of Custody for MPA Test

Name of Water System: Clearwood **PWS #:** 136154

Address: 2377 Eastlake Ave E **City/State/Zip:** Seattle, WA 98102

Phone Number: (206) 329-0141 **Email Address:** glenn@pgwg.com

Name of Collector: Travis Klaas **Date of Sample:** 7/16/2020

Sampling Source: ground water **Type of filter used:**

Time of Sampling: **Start:** 7/15/20 17:37 **Finish:** 7/16/20 10:09 **Total Time of Sampling:** 16 hrs 28 minutes (988 minutes)

Flow Meter Reading: **Start:** 0030021.8 **Finish:** 0030855.4 **Total Gallons Sampled:** 833.6 gallons

Average Flow Rate: 0.81 gpm measured 0.84 calculated total gall / total minutes

Water Treatment: (Check one)

X : Raw Water ____ : Filtered

____ : Disinfected ____ : Filtered and Disinfected

Location of Nearest Surface Water:

Blue lake approximately 330 ft

Lab use only:

1° pellet volume:

2° pellet volume:

Rcvd 7/17/20 @ 1025
MPS

WATER MANAGEMENT LABORATORIES INC.

1515 80th St. E.
Tacoma, WA 98404
(253) 531-3121

Herbicides
Report of Analysis

Date Collected: 07-16-2020	System Group Type: (circle one) (A) B Other
Water System ID Number: 13615U	System Name: Clearwood
Lab Number / Sample Number: 089 / 03812	County: Thurston
Sample Location: Wellhead	Source Number(s): (list all sources if blended or composited) S07
Sample Purpose: (check appropriate box) ☐ RC - Routine/Compliance (satisfies monitoring requirements) ☐ C - Confirmation (confirmation of chemical result)* ☒ I - Investigative (does not satisfy monitoring requirements) ☐ O - Other (specify - does not satisfy monitoring requirements)	Date Received: 07-16-2020 Date Analyzed: 07-29-2020 Date Reported: 08-07-2020 Supervisor Initials: RL
Sample Composition: (check appropriate box) ☒ S - Single Source ☐ B - Blended (list source numbers in "Source Number" field) ☐ C - Composite (list source numbers in "Source Number" field) ☐ D - Distribution Sample	Sample Type: (check one) ☒ Pre-treatment/Untreated (Raw) ☐ Post-treatment (Finished) ☐ Unknown or Other Sample Collected by: Travis Phone Number: 206-619-0639
Send Report & Bill to: Pacific Groundwater Group 2377 Eastlake Ave E, Seattle WA 98102	Comments:

ANALYTICAL RESULTS

DOH#	ANALYTE	DATA QUALIFIER	RESULTS	SDRL	TRIGGER	MCL	UNITS	EXCEEDS MCL?	METHOD/ INITIALS
0137	Dalapon	--	ND	1	1	200	µg/L	No	515.1/JA
0037	2,4-D	--	ND	0.1	0.1	70	µg/L	No	515.1/JA
0038	2,4,5-TP (Silvex)	--	ND	0.2	0.2	50	µg/L	No	515.1/JA
0134	Pentachlorophenol	--	ND	0.04	0.04	1	µg/L	No	515.1/JA
0139	Dinoseb	--	ND	0.2	0.2	7	µg/L	No	515.1/JA
0140	Picloram	--	ND	0.1	0.1	500	µg/L	No	515.1/JA
0138	Dicamba	--	ND	0.2	0.2	--	µg/L	--	515.1/JA
0135	2,4 DB	--	ND	1	1	--	µg/L	--	515.1/JA
0136	2,4,5 T	--	ND	0.4	0.4	--	µg/L	--	515.1/JA
0220	Bentazon	--	ND	0.5	0.5	--	µg/L	--	515.1/JA
0221	Dichlorprop	--	ND	0.5	0.5	--	µg/L	--	515.1/JA
0223	Acifluorfen	--	ND	2	2	--	µg/L	--	515.1/JA
0225	DCPA (Acid Metabolites)	--	ND	0.1	0.1	--	µg/L	--	515.1/JA
0226	3,5-Dichlorobenzoic Acid	--	ND	0.5	0.5	--	µg/L	--	515.1/JA

Lab Number / Sample Number: 089 / 03812

Herbicides (cont)

NOTES:

*** Confirmation:** Include the original lab number, sample number, and collection date of original sample in either comment section.

µg/L: micrograms per liter or parts per billion.

ANALYTE: The name of an analyte being tested for.

DATA QUALIFIER: A symbol or letter to denote addtional information about the result.

DOH#: Department assigned analyte number.

EXCEED MCL: (Maximum Contamination Level): Marked if the contaminant amount exceeds the MCL under chapters 246-290 and 246-291 WAC. Please contact the department's drinking water regional office in your area to determine follow-up actions.

METHOD/INITIALS: Analytical method used. / Initials of the analyst that performed the analysis.

RESULT: The laboratory reported result.

SDRL: (State Detection Reporting Limit): The minimum reportable detection of an analyte as established by the Department of Health

TRIGGER: The department's drinking water response level. Systems with contaminants detected at concentrations in excess of this level may be required to take additional samples or monitor more frequently. Please contact the department's drinking water regional office in your area for further information.

LAB COMMENTS:

WATER MANAGEMENT LABORATORIES INC.

1515 80th St. E.
Tacoma, WA 98404
(253) 531-3121

Pesticides
Report of Analysis

Date Collected: 07-16-2020	System Group Type: (circle one) (A) B Other
Water System ID Number: 13615U	System Name: Clearwood
Lab Number / Sample Number: 089 / 03812	County: Thurston
Sample Location: Wellhead	Source Number(s): (list all sources if blended or composited) S07
Sample Purpose: (check appropriate box) ☐ RC - Routine/Compliance (satisfies monitoring requirements) ☐ C - Confirmation (confirmation of chemical result)* ☒ I - Investigative (does not satisfy monitoring requirements) ☐ O - Other (specify - does not satisfy monitoring requirements)	Date Received: 07-16-2020 Date Analyzed: 07-31-2020 Date Reported: 08-07-2020 Supervisor Initials: ML
Sample Composition: (check appropriate box) ☒ S - Single Source ☐ B - Blended (list source numbers in "Source Number" field) ☐ C - Composite (list source numbers in "Source Number" field) ☐ D - Distribution Sample	Sample Type: (check one) ☒ Pre-treatment/Untreated (Raw) ☐ Post-treatment (Finished) ☐ Unknown or Other Sample Collected by: Travis Phone Number: 206-619-0639
Send Report & Bill to: Pacific Groundwater Group 2377 Eastlake Ave E, Seattle WA 98102	Comments:

ANALYTICAL RESULTS

DOH#	ANALYTE	DATA QUALIFIER	RESULTS	SDRL	TRIGGER	MCL	UNITS	EXCEEDS MCL?	METHOD/ INITIALS
0033	Endrin	--	ND	0.01	0.01	2	µg/L	No	525.2/EW
0034	Lindane (BHC-gamma)	--	ND	0.02	0.02	0.2	µg/L	No	525.2/EW
0035	Methoxychlor	--	ND	0.1	0.1	40	µg/L	No	525.2/EW
0036	Toxaphene	--	ND	1	1	3.0	µg/L	No	508.1/EW
0117	Alachlor	--	ND	0.2	0.2	2	µg/L	No	525.2/EW
0119	Atrazine	--	ND	0.1	0.1	3	µg/L	No	525.2/EW
0120	Benzo(a)pyrene	--	ND	0.02	0.02	0.2	µg/L	No	525.2/EW
0122	Chlordane (total)	--	ND	0.2	0.2	2	µg/L	No	508.1/EW
0124	Di(2-ethylhexyl)adipate	--	ND	0.6	0.6	400	µg/L	No	525.2/EW
0125	Di(2-ethylhexyl)phthalate	--	ND	0.6	0.6	6	µg/L	No	525.2/EW
0126	Heptachlor	--	ND	0.04	0.04	0.4	µg/L	No	525.2/EW
0127	Heptachlor epoxide	--	ND	0.02	0.02	0.2	µg/L	No	525.2/EW
0128	Hexachlorobenzene	--	ND	0.1	0.1	1	µg/L	No	525.2/EW
0129	Hexachlorocyclopentadiene	--	ND	0.1	0.1	50	µg/L	No	525.2/EW
0133	Simazine	--	ND	0.07	0.07	4	µg/L	No	525.2/EW
0118	Aldrin	--	ND	0.1	0.1	--	µg/L	--	525.2/EW
0121	Butachlor	--	ND	0.1	0.1	--	µg/L	--	525.2/EW
0123	Dieldrin	--	ND	0.1	0.1	--	µg/L	--	525.2/EW
0130	Metolachlor	--	ND	0.1	0.1	--	µg/L	--	525.2/EW
0131	Metribuzin	--	ND	0.1	0.1	--	µg/L	--	525.2/EW
0132	Propachlor	--	ND	0.1	0.1	--	µg/L	--	525.2/EW
0254	Fluorene	--	ND	0.2	0.2	--	µg/L	--	525.2/EW
0173	Arochlor 1221'	--	ND	20	20	--	µg/L	--	508.1/EW
0174	Arochlor 1232'	--	ND	0.5	0.5	--	µg/L	--	508.1/EW

DOH#	ANALYTE	DATA QUALIFIER	RESULTS	SDRL	TRIGGER	MCL	UNITS	EXCEEDS MCL?	METHOD/ INITIALS
0175	Arochlor 1242'	--	ND	0.3	0.3	--	µg/L	--	508.1/EW
0176	Arochlor 1248'	--	ND	0.1	0.1	--	µg/L	--	508.1/EW
0177	Arochlor 1254'	--	ND	0.1	0.1	--	µg/L	--	508.1/EW
0178	Arochlor 1260'	--	ND	0.2	0.2	--	µg/L	--	508.1/EW
0179	Bromacil	--	ND	0.1	0.1	--	µg/L	--	525.2/EW
0180	Arochlor 1016'	--	ND	0.08	0.08	--	µg/L	--	508.1/EW
0190	Terbacil	--	ND	0.1	0.1	--	µg/L	--	525.2/EW
0208	EPTC	--	ND	0.1	0.1	--	µg/L	--	525.2/EW
0218	Molinate	--	ND	0.1	0.1	--	µg/L	--	525.2/EW
0232	4,4 DDD	--	ND	0.1	0.1	--	µg/L	--	525.2/EW
0233	4,4 DDE	--	ND	0.1	0.1	--	µg/L	--	525.2/EW
0234	4,4 DDT	--	ND	0.1	0.1	--	µg/L	--	525.2/EW
0243	Trifluralin	--	ND	0.1	0.1	--	µg/L	--	525.2/EW
0244	Acenaphthylene	--	ND	0.2	0.2	--	µg/L	--	525.2/EW
0246	Anthracene	--	ND	0.2	0.2	--	µg/L	--	525.2/EW
0247	Benzo(a)anthracene	--	ND	0.2	0.2	--	µg/L	--	525.2/EW
0248	Benzo(b)fluoroanthene	--	ND	0.2	0.2	--	µg/L	--	525.2/EW
0250	Benzo(k)fluoranthene	--	ND	0.2	0.2	--	µg/L	--	525.2/EW
0251	Chrysene	--	ND	0.2	0.2	--	µg/L	--	525.2/EW
0253	Fluoranthene	--	ND	0.2	0.2	--	µg/L	--	525.2/EW
0256	Phenanthrene	--	ND	0.2	0.2	--	µg/L	--	525.2/EW
0257	Pyrene	--	ND	0.2	0.2	--	µg/L	--	525.2/EW
0258	Benzyl butyl phthalate	--	ND	1.0	1.0	--	µg/L	--	525.2/EW
0259	Di-n-butyl phthalate	--	ND	1.0	1.0	--	µg/L	--	525.2/EW
0260	Diethyl phthalate	--	ND	1.0	1.0	--	µg/L	--	525.2/EW
0261	Dimethyl phthalate	--	ND	1.0	1.0	--	µg/L	--	525.2/EW

Lab Number / Sample Number: 089 / 03812

Pesticides (cont)

NOTES:

*** Confirmation:** Include the original lab number, sample number, and collection date of original sample in either comment section.

If Arochlors are detected using 505, 508, or 508.1, sample must be reanalyzed using Method 508A to quantify PCBs (as decachlorobiphenyl).

-- No exisiting value.

µg/L: micrograms per liter or parts per billion.

ANALYTE: The name of an analyte being tested for.

DATA QUALIFIER: A symbol or letter to denote addtional information about the result.

DOH#: Department assigned analyte number.

EXCEED MCL: (Maximum Contamination Level): Marked if the contaminant amount exceeds the MCL under chapters 246-290 and 246-291 WAC. Please contact the department's drinking water regional office in your area to determine follow-up actions.

METHOD/INITIALS: Analytical method used. / Initials of the analyst that performed the analysis.

RESULT: The laboratory reported result.

SDRL: (State Detection Reporting Limit): The minimum reportable detection of an analyte as established by the Department of Health

TRIGGER: The department's drinking water response level. Systems with contaminants detected at concentrations in excess of this level may be required to take additional samples or monitor more frequently. Please contact the department's drinking water regional office in your area for further information.

LAB COMMENTS: