NORTHWEST
Land & Water, INC.
Consulting in Hydrogeology

6556 37th Ave. NE
Seattle, WA 98115
206-525-0049 p
www.nlwinc.com

Draft Memorandum

Date: June 24, 2016

To: Steven Patten, Environmental Scientist, Walla Walla Basin Watershed Council (WWBWC)

From: Jim Mathieu, RG, Northwest Land & Water, Inc. (NLW)

Re: Interim Results of Hydrostratigraphic Assessment and Pumping Tests, Aquifer Storage and Recovery (ASR) Feasibility Investigation, Eastside Milton-Freewater, OR

INTRODUCTION

This memorandum documents our progress on an ASR investigation for the relatively shallow alluvial-fluvial aquifer beneath the "Eastside" area of Milton-Freewater. It builds on our previous memorandum that summarizes the drilling and construction of five monitoring wells (NLW, 2015). We plan to continue characterizing the Eastside area through spring 2017 and issue a final report, which will be substantially more detailed and comprehensive than this memo, in June 2017.

The area of investigation shown on **Figure 1** occupies the flat and locally undulating topography east of the mainstem Walla Walla River. The WWBWC would like to better understand the subsurface hydraulic properties and groundwater flow conditions of the Eastside area. The ultimate goal of this project is to store surplus river water in the subsurface and recover it for irrigation while raising groundwater levels to augment river baseflow. The Eastside pipeline that is currently used by irrigators would serve as the conveyance line to deliver water from the river to potential aquifer storage sites.

HYDROSTRATIGRAPHIC ASSESSMENT

Methodology

We used data from 15 wells for this investigation: five wells that we constructed (NLW, 2015) plus 10 additional wells, which were selected because of their potential for pumping or monitoring and for their geographic locations throughout the study area. **Appendix A** contains logs for these wells. Well log data was digitized and incorporated into a project database constructed using Viewlog, a tool that not only allows us to

organize and interpret subsurface data but also produces images that are useful for visualization. The well log data included:

- Borehole drilled depth
- Texture of sediment or rock layer
- Relative permeability based on texture
- Water bearing zones
- Well construction depth
- Open interval (screen or perforations)
- Water level

Eleven of the wells and one river gage station were surveyed by WWBWC using the methods described in **Appendix B**.

Results

Two cross sections were constructed using Viewlog, as shown in **Figures 2 and 3**. The cross section alignments are shown on **Figure 1** (note: alignment C-C' is mapped but its cross section is not included in this memo). In general, the sections show the following hydrostratigraphy, in order of increasing depth:

- An unsaturated zone of loose, locally compact silt and gravel, 20–60 feet thick, that thins from south to north
- A saturated zone of loose, locally compact silt, sand, and gravel, 5–35 feet thick
- A dry to damp (locally wet) layer of very compact silt/clay and gravel, over 20 feet thick and locally underlain by a 5- to 20-foot clay layer
- Hard and fractured (water-bearing) basalt

At the local scale, groundwater may be separated by a low permeable layer. This is the case for the two water-bearing zones encountered at the GW_162/163 site (162 and 163 on **Figure 1**), which are separated by an 11-foot-thick layer of soft, clayey silt. This clayey silt is competent and extensive enough at this location to cause a difference in groundwater levels of about 9 feet.

HYDRAULIC PROPERTIES

Methodology

To obtain data for estimating hydraulic properties, we conducted pumping tests at two irrigation wells and a "passive test" at a third well.

Pumping tests. Pumping tests were conducted at irrigation wells 56140 and 5239 on March 14 and May 3–4, respectively. The rate and duration of these tests was designed to accommodate the irrigator so he could apply the pumped water to a field or orchard. Pumping rates were measured using a BM Technologie ultrasonic flow meter, which was strapped to the discharge line at each well. Groundwater levels were monitored in observation wells located at distances ranging from 200 to 2,500 feet from the pumped well using nonvented Solinst sensors compensated for barometric pressure. At one location, irrigation well 5239, a micro-Diver sensor was used. Manual water levels measurements were also made using Waterline and Solinst sounders.

Passive test. For the "passive" test, irrigation well 6475 was equipped with a Seametrics DL-76W datalogger to record continuous flow measurements from an existing Seametrics AG2000-400-GPM-AF flow meter. This test was conducted from May 9 to June 3, 2016. Groundwater level was recorded in nearby GW_152 using a Solinst sensor. Manual water level measurements were also made in GW_152 using a Waterline sounder.

Results

Well 56140. The hydrograph for this test (**Figure 4**) shows a response in both the pumped well and in well GW_161, located approximately 250 feet away. No other response is discernable in other observation wells. A preliminary analysis of the GW_161 response indicates a transmissivity of 150,000 gallons per day per foot (gpd/ft) and storage coefficient of 0.01 (**Appendix C**). Analysis of the manual data from the pumped well indicates a transmissivity of 125,000 gpd/ft (**Appendix C**).

Well 5239. The hydrograph for this test (**Figure 5**) shows a response in the pumped well — but none significant in the observation wells except possibly for wells 161 and 5232. These subtle responses will be evaluated further to attribute them to well 5239 pumping or not. A preliminary analysis of the early time response in well 5239 indicates a transmissivity of 125,000 gpd/ft (**Appendix C**). Note that the drawdown trend steepens after approximately 250 minutes, suggesting an aquifer boundary. This response will be further analyzed and discussed in subsequent reporting.

Well 6475. The hydrograph for the "passive" test (**Figure 6**) shows a small undulating trend in GW_152. Wells 6475 and GW_152 are being currently monitored as the irrigation season ramps up. Assessment of a hydraulic relationship between these two wells, if discernible, will be made after substantial summer irrigation followed by reduced pumping in fall 2016.

RECOMMENDATIONS

We recommend conducting the following ongoing tasks trough winter 2017:

Hydrostratigraphy

- Digitize data for wells in Oregon's database that can accurately located — at least to the tax lot or parcel, but ideally with an air photo — and integrate it into the project database (Viewlog).
- Survey the elevations and locations of selected wells added to the project database.
- Develop more detailed cross sections to show the potential hydrostratigraphic controls on the storage and movement of recharged water.

Hydraulic Properties

- Using the detailed cross sections and conceptual model, identify locations where additional hydrostratigraphic information and/or monitoring is needed. Develop a plan to construct additional wells or piezometers or to equip existing unused wells.
- Continue to identify existing irrigation wells that could be used for aquifer testing so hydraulic parameters can be estimated for the shallow water-table aquifer.
- Investigate the use of Walla Walla River stage to estimate aquifer parameters.

Pilot Testing

- Engage with landowners in the area between and near GW_152 and GW_160 who would be amenable to the construction of a pilot or permanent infiltration facility (basin/pond, injection well, or gallery).

SUPPORTING INFORMATION

List of Table, Figures & Appendices

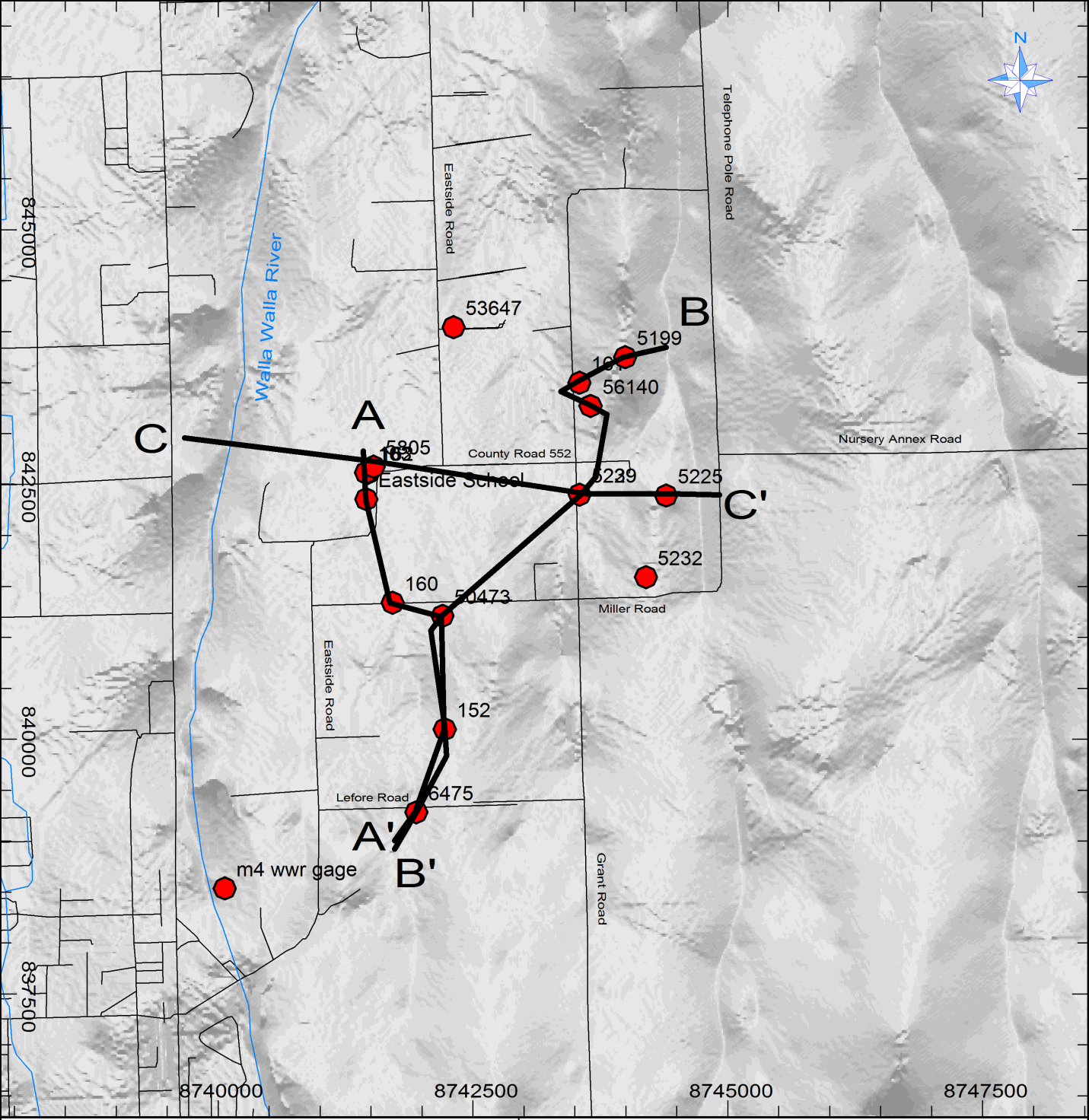
Figure 1: Well Location Map, Eastside Milton-Freewater
Figure 2: Cross Section A – A'
Figure 3: Cross Section B – B'
Figure 4: Hydrograph for Wells Monitored, Pumped Well 56140, March 14, 2016
Figure 5: Hydrograph for Wells Monitored, Pumped Well 5239, May 3-4, 2016
Figure 6: Hydrograph for Well GW_152, Pumped Well 6475, May 2016
Appendix A: Well Logs
Appendix B: Survey Report
Appendix C: Pumping Test Analyses

Reference

Northwest Land & Water, 2015, *Drilling and Monitoring Well Construction, Aquifer Storage and Recovery (ASR) Feasibility Investigation, Eastside Milton-Freewater, OR*, Memorandum to WWBWC, dated June 30, 2015

Warranty / Disclaimer

Our professional services were performed, our findings obtained, and this memorandum prepared in accordance with generally accepted hydrogeologic practices at this time and in this area, exclusively for the use of the WWBWC. This warranty is in lieu of all other warranties, expressed, or implied.



Legend:

- Wells
- Rivers
- Roads

Topography (ft)

800 1000 1200 1400 1600

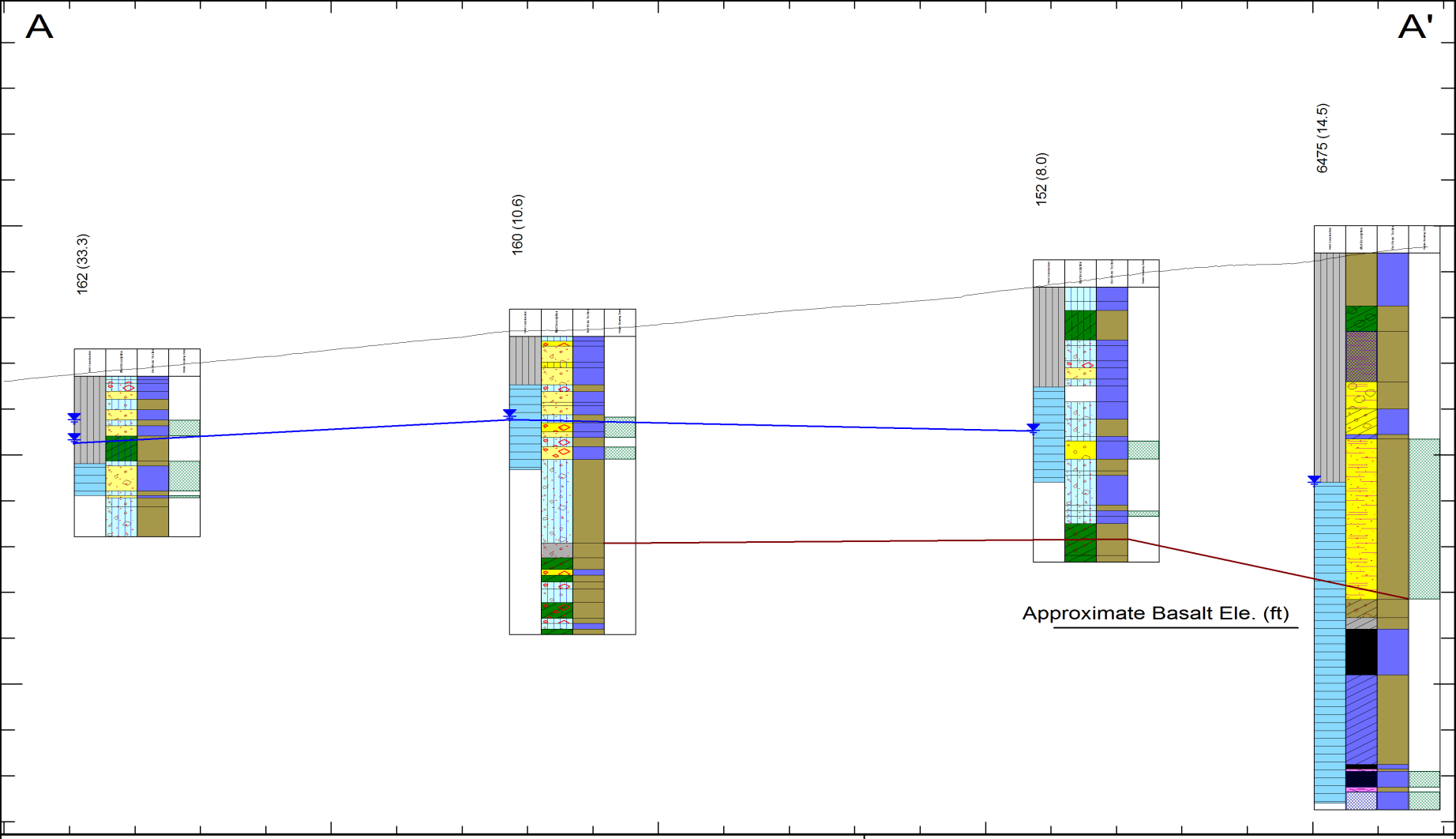
0 1000 2000

Draft Figure 1

Cross Section Alignments

NORTHWEST Land & Water, INC.

Earthfx Incorporated



Legend:

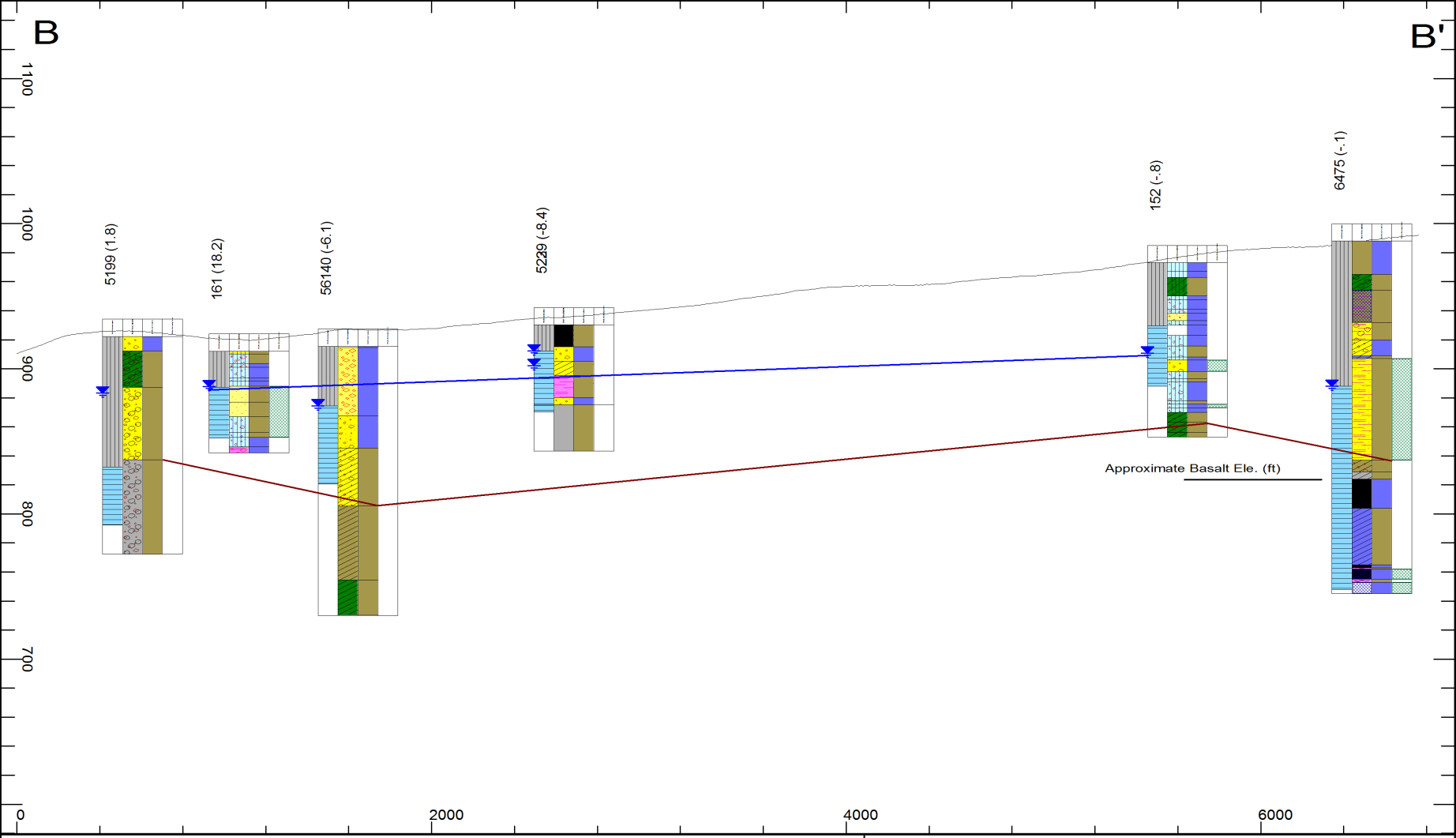
- Head Elevation (ft)
- Projection of surface onto section
- Topography (ft)
- Water Table
- Permeability Separation (Above: Higher, Below: Lower)

Draft Figure 2

Cross Section A

NORTHWEST Land & Water, INC.

Earthfx Incorporated



Legend:

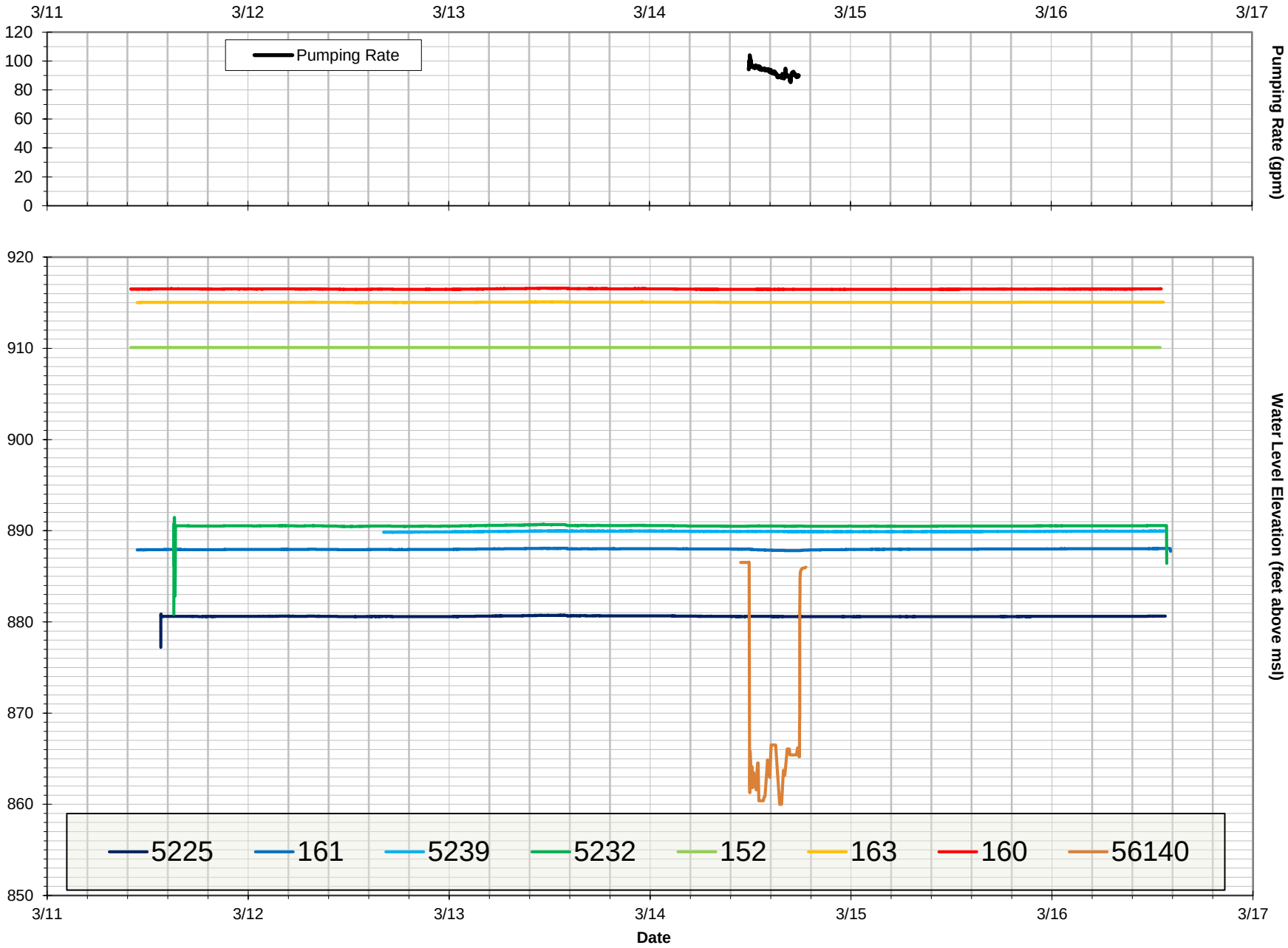
- Head Elevation (ft)
- Projection of surface onto section
- Topography (ft)
- Water Table
- Permeability Separation (Above: Higher, Below: Lower)

Draft Figure 3

Cross Section B

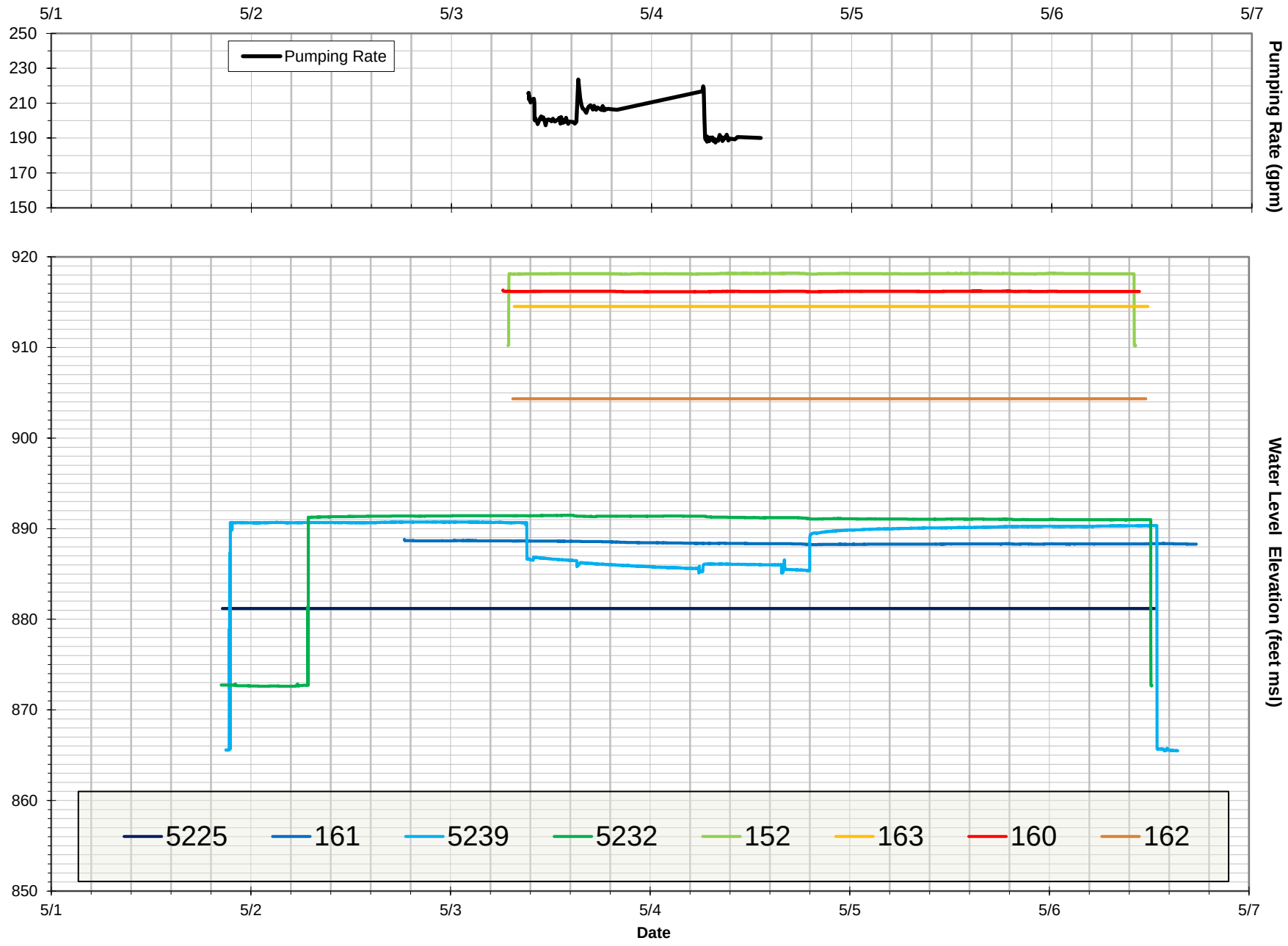
NORTHWEST Land & Water, INC.

Earthfx Incorporated



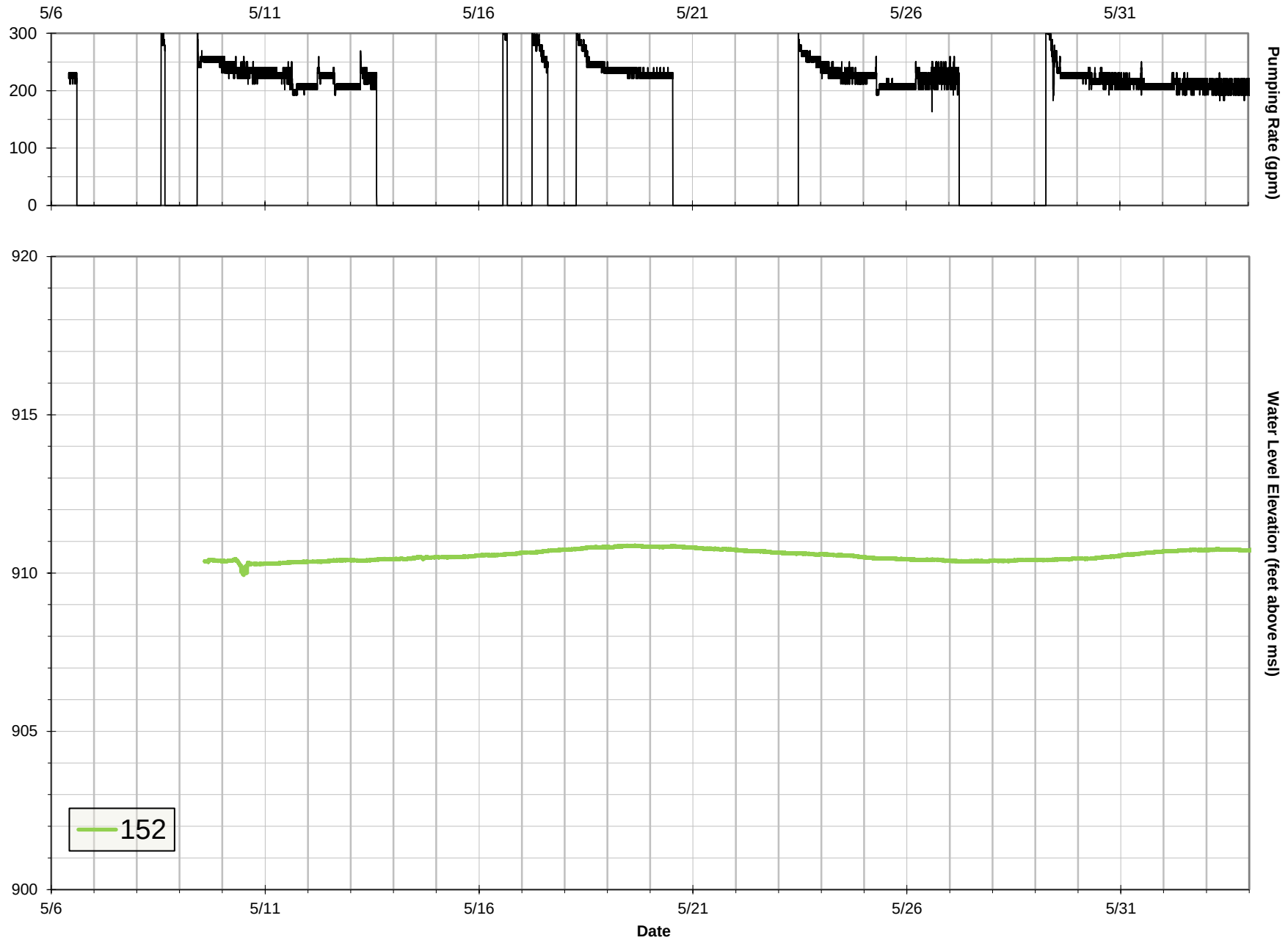
Draft Figure 4. Hydrographs for Wells Monitored, Pumped Well 56140, March 14, 2016

March 2016 Pumping Test
Eastside Milton Freewater ASR
WWBWC



Draft Figure 5. Hydrographs for Monitored Wells, Pumped Well 5239, May 3 - 4, 2016

May 2016 Pumping Test
Eastside Milton Freewater ASR
WWBWC



Draft Figure 6. Hydrograph for Well GW_152, Pumped Well 6475, May 9 - June 3, 2016

May - June Monitoring
Eastside Milton Freewater ASR
WWBWC

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the WATER RESOURCES DEPARTMENT, SALEM, OREGON 97310 within 30 days from the date of well completion.

Appendix A

WATER WELL REPORT
STATE OF OREGON

UMAT 5199

(Please type or print)

(Do not write above this line)

UMAT 5199

State Well No. 6N/36E-30bb

State Permit No.

RECEIVED
JUN 15 1979
WATER RESOURCES DEPT.
SALEM, OREGON

(1) OWNER:
Name L.E. Von Der Ahe
Address RT# 1 Box 145
Milton-Freewater, OR 97862

(2) TYPE OF WORK (check):
New Well [X] Deepening [ ] Reconditioning [ ] Abandon [ ]
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary [X] Driven [ ]
Cable [ ] Jetted [ ]
Dug [ ] Bored [ ]

(4) PROPOSED USE (check):
Domestic [ ] Industrial [ ] Municipal [ ]
Irrigation [X] Test Well [ ] Other [ ]

CASING INSTALLED:
Threaded [ ] Welded [X]
8 " Diam. from plus 1 ft. to 130 ft. Gage 0.250
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

PERFORATIONS:
Perforated? [X] Yes [ ] No.
Type of perforator used Torch
Size of perforations 3/8 in. by 14 in.
64 perforations from 90 ft. to 130 ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:
Well screen installed? [ ] Yes [X] No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? [ ] Yes [ ] No If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 54° Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used Cement
Well sealed from land surface to 19 ft.
Diameter of well bore to bottom of seal 12 in.
Diameter of well bore below seal 8 in.
Number of sacks of cement used in well seal 5 sacks
How was cement grout placed? Pumped
Was a drive shoe used? [X] Yes [ ] No Plugs Size: location ft.
Did any strata contain unusable water? [ ] Yes [X] No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? [ ] Yes [ ] No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County Umatilla Driller's well number
NW ¼ NW ¼ Section 30 T. 6N R. 36 E W.M.
Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.
Depth at which water was first found 85 ft.
Static level 39 ft. below land surface. Date 3-3-79
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 8
Depth drilled 150 ft. Depth of completed well 140 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Soil, Gravel	0	10	
Clay, Gravel Boulders	10	35	
Gravel, Boulders	35	85	
Cement Gravel & Boulders	85	150	39'

RECEIVED
MAR 28 1979
WATER RESOURCES DEPT.
SALEM, OREGON

Work started 3-2-79 19 Completed 3-3-79 19
Date well drilling machine moved off of well 3-5-79 19

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Todd Horn (Drilling Machine Operator) Date 3-7, 1979
Drilling Machine Operator's License No. 1345

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name C.W. Summers Well Drilling (Person, firm or corporation) (Type or print)
Address Rt #3 Box 143-A-1 M & F OR 97862
[Signed] (Water Well Contractor)
Contractor's License No. 575 Date 3-7-79, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the
WATER RESOURCES DEPARTMENT, SALEM, OREGON 97310 within 30 days from the date of well completion.

#10 - Umatilla - per WWC

WATER WELL REPORT

STATE OF OREGON
(Please type or print)
(Do not write above this line)

RECEIVED
JAN 5 1981
WATER RESOURCES DEPT
SALEM, OREGON

State Well No. Con 36E-31bc
State Permit No. UMAT 5225

(1) OWNER:
Name Robert Leeper
Address C/6 N Evans
Milton-Freewater, OR 97862

(2) TYPE OF WORK (check):
New Well [X] Deepening [ ] Reconditioning [ ] Abandon [ ]
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary [X] Driven [ ]
[redacted] [ ] Jetted [ ]
[redacted] [ ] Bored [ ]

(4) PROPOSED USE (check):
Domestic [ ] Industrial [X] Municipal [ ]
Irrigation [X] Test Well [ ] Other [ ]

(5) CASING INSTALLED:
Threaded [ ] Welded [X]
10 " Diam. from +1 ft. to 14 ft. Gage .250
8 " Diam. from +1½ ft. to 58½ ft. Gage .250
" Diam. from ft. to ft. Gage

(6) PERFORATIONS:
Perforated? [ ] Yes [X] No
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:
Well screen installed? [ ] Yes [X] No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level
AIR test
[redacted] a pump test made? [ ] Yes [ ] No If yes, by whom? Some
Yield: 100 gal./min. with 3 ft. drawdown after 1 hrs.
" " " "
" " " "
[redacted]er test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 54 Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used Cement
Well sealed from land surface to 19 ft.
Diameter of well bore to bottom of seal 12 in.
Diameter of well bore below seal 8 in.
Number of sacks of cement used in well seal 8 sacks
How was cement grout placed? Pumped

Was a drive shoe used? [X] Yes [ ] No Plugs Size: location ft.
Did any strata contain unusable water? [ ] Yes [X] No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? [ ] Yes [X] No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County Driller's well number
SW ¼ NW ¼ Section 31 T. 6N R. 36 E W.M.
Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.
Depth at which water was first found 70 ft.
Static level 54 ft. below land surface. Date 11-30-80
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 8"
Depth drilled 100 ft. Depth of completed well 100 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Soil	0	15	
Gravel, Clay & Boulders	15	70	
Boulders	70	76	
Clay & Gravel	76	85	
Cement Gravel	85	100	54

Work started 11-25- 1980 Completed 11-30- 1980
Date well drilling machine moved off of well 11-30 - 1980

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] C.W. Summers (Drilling Machine Operator) Date 12-29, 1980
Drilling Machine Operator's License No. 821

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name Summers Well Drilling (Person, firm or corporation) (Type or print)
Address RT#3 Box 163A1 Mfd. OR
[Signed] C.W. Summers (Water Well Contractor)
Contractor's License No. 575 Date 12-29-, 1980

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

STATE ENGINEER
Salem, Oregon

UMAT 5229

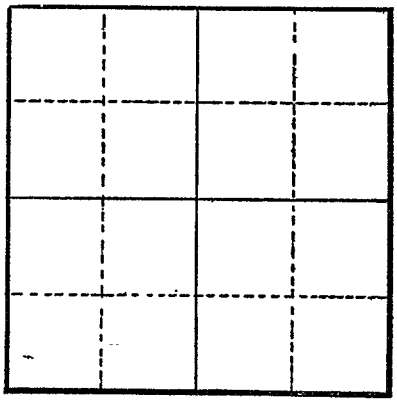
Well Record

STATE WELL NO. 6N/36E-31
COUNTY Umatilla
APPLICATION NO. .....

OWNER: Lawrence W. Timmons
MAILING ADDRESS: RT. 1, Box 149
CITY AND STATE: Milton-Freewater, Oregon

LOCATION OF WELL: Owner's No. .....
.....¼ .....¼ Sec. 31 T. 6 N., R. 36 E., W.M.
Bearing and distance from section or subdivision corner .....

Altitude at well .....



TYPE OF WELL: Dr. & DG Date Constructed 1927
Depth drilled 55 ft. Depth cased 20 ft.
Section 31

CASING RECORD:
6 inch casing set in bottom of old dug well. 18 ft. below land surface.

FINISH:
Perforated

AQUIFERS:

WATER LEVEL:
18 ft.

PUMPING EQUIPMENT: Type Fairbanks Morse (Pressure system) H.P. 10
Capacity 400 G.P.M.

WELL TESTS:
Drawdown 4 ft. after ..... hours 400 G.P.M.
Drawdown ..... ft. after ..... hours ..... G.P.M.

USE OF WATER Dom. & irrigation Temp. ..... °F. ....., 19....
SOURCE OF INFORMATION Belated registration statement
DRILLER or DIGGER Tom Walker
ADDITIONAL DATA:
Log ..... Water Level Measurements ..... Chemical Analysis ..... Aquifer Test .....

REMARKS:

Log:		
	Black clay	0 to 15 ft.
	Gravel	15 to 25 ft.
	Yellow clay	25 to 35 ft.
	Hard pan	35 to 50 ft.
	Some coarse gravel-sand	50 to 55 ft.

State Printing 89316

RECEIVED
SEP 7 1961
STATE ENGINEER
SALEM, OREGON

UMAT 5232

File Original and First Copy with the STATE ENGINEER, SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON

State Well No. 6N/36-31E

State Permit No.

(1) OWNER:
Name MARVIN TIMMONS
Address R1 Box 149
Milton, Oregon

(2) LOCATION OF WELL:
County UMATILLA Owner's number, if any—
¼ NW ¼ Section T. 6N R. 36 E W.M.
Bearing and distance from section or subdivision corner
from the N.W. Corner of N.W Quarter of Sec. 31 664 ft East. then 180 ft North

(3) TYPE OF WORK (check):
New Well ☑ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 11.

(4) PROPOSED USE (check):
Domestic ☑ Industrial ☐ Municipal ☐
Irrigation ☑ Test Well ☐ Other ☐

(5) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☑ Jetted ☐
Dug ☐ Bored ☐

(6) CASING INSTALLED: Threaded ☑ Welded ☐
6" Diam. from 0 ft. to 44½ ft. Gage
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(7) PERFORATIONS: Perforated? ☐ Yes ☒ No
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(8) SCREENS: Well screen installed ☐ Yes ☒ No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(9) CONSTRUCTION:
Was well gravel packed? ☐ Yes ☒ No Size of gravel:
Gravel placed from ft. to ft.
Was a surface seal provided? ☐ Yes ☒ No To what depth? ft.
Material used in seal—
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? Depth of strata
Method of sealing strata off

(10) WATER LEVELS:
Static level 46 ft. below land surface Date 9-4-61
Artesian pressure lbs. per square inch Date

Log Accepted by:
[Signed] Marvin Timmons (Owner) Date 9-4, 1961

(11) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☐ Yes ☒ No If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "
Bailer test 45 gal./min. with 2 ft. drawdown after 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? ☐ Yes ☒ No

(12) WELL LOG: Diameter of well 6 inches.
Depth drilled 84 ft. Depth of completed well 84 ft.
Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Soil-Brown-Silty	0	44
Coarse Conglomerate	44	75
Water-Course-Medium-Conglomerate	75	84

Work started Sept 9 1952 Completed Sept 16 1952

(13) PUMP:
Manufacturer's Name Peerless
Type: Centrifugal H.P. 3

Well Driller's Statement:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
NAME EARL G. SHORTRIDGE (Person, firm, or corporation) (Type or print)
Address R-3-Box-348 Milton-Free Water
Driller's well number
[Signed] Earl G. Shortridge (Well Driller)
License No. 156 Date Sept 4, 1961

(USE ADDITIONAL SHEETS IF NECESSARY)

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the
WATER RESOURCES DEPARTMENT
SALEM, OREGON 97310
within 30 days from the date of well completion.

UMAT 5229

WATER WELL REPORT

STATE OF OREGON
(Please type or print)
(Do not write above this line)

RECEIVED
JUN - 6 1977
WATER RESOURCES DEPT.
SALEM, OREGON

State Well No. 6N/36E-31bc
State Permit No.

(1) OWNER:

Name Mrs Lawrence Timmons
Address RT #1 Box 149
Milton-Freewater, OR 97862

(2) TYPE OF WORK (check):

New Well ☐ Deepening ☒ Reconditioning ☒ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:

Rotary ☒ Driven ☐
Cable ☒ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):

Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED:

Threaded ☐ Welded ☒

8 " Diam. from +1 ft. to 64 ft. Gage 0.250
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(6) PERFORATIONS:

Perforated? ☒ Yes ☐ No.

Type of perforator used
Size of perforations in. by in.
64 perforations from 40 ft. to 60 ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:

Well screen installed? ☐ Yes ☒ No

Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WELL TESTS:

Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☐ No If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water Depth artesian flow encountered ft.

(9) CONSTRUCTION:

Well seal—Material used Bentonite
Well sealed from land surface to ft.
Diameter of well bore to bottom of seal Dug in.
Diameter of well bore below seal 8 in.
Number of sacks of cement used in well seal sacks
How was cement grout placed?

Was a drive shoe used? ☒ Yes ☐ No Plugs Size: location ft.
Did any strata contain unusable water? ☐ Yes ☐ No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☒ No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:

County Umatilla Driller's well number
SW ¼ NW ¼ Section 31 T. 6N R. 36 E W.M.
Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.

Depth at which water was first found 40 ft.
Static level 28 ft. below land surface. Date 5-18-77
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:

Diameter of well below casing 8
Depth drilled 87 ft. Depth of completed well 87 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Gravel + Boulders	25	27	
Gravel, med	27	40	
Gravel, Cement	40	87	28

Work started 5-10 - 1977 Completed 5-17 - 1977
Date well drilling machine moved off of well 5-18 1977

Drilling Machine Operator's Certification:

This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.

[Signed] Clarence Summers (Drilling Machine Operator) Date 5-23-, 1977
Drilling Machine Operator's License No. 821

Water Well Contractor's Certification:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Name C. W. Summers Well Drilling (Person, firm or corporation) (Type or print)
Address RT #3 Box 143-A-1 Mdf, OR
[Signed] Clarence W. Summers (Water Well Contractor)
Contractor's License No. 575 Date 5-23-, 1977

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

5 STATE OF OREGON

WATER WELL REPORT

(as required by ORS 537.765)

UMAT 5805 Start Card # W 26411

RECEIVED MAR 31 1993 WATER RESOURCES DEPT. SALEM, OREGON

6N/35E/36ab

PLEASE TYPE or PRINT (for official use only)

(1) OWNER:

Name Merrill Stolz

Address Rt 1 Box 136D

City Milton Freewater State ORe

(2) TYPE OF WORK (check):

New Well ☐ Deepening ☐ Reconditioning ☒ Abandon ☐

If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:

Rotary Air ☐ Driven ☐

Rotary Mud ☐ Dug ☐

Cable ☒ Bored ☐

(4) PROPOSED USE (check):

Domestic ☐ Industrial ☐ Municipal ☐

Irrigation ☒ Thermal: Withdrawal ☐ Reinjection ☐

Other: Piezometric ☐ Grounding ☐ Test ☐

(5) CASING INSTALLED:

Steel ☐ Threaded ☐ Plastic ☐ Welded ☐

" Diam. from ft. to ft. Gauge

" Diam. from ft. to ft. Gauge

LINER INSTALLED:

Steel ☐ Threaded ☐ Plastic ☒ Welded ☐

6 " Diam. from -4 ft. to 233 ft. Gauge

(6) PERFORATIONS:

Perforated? ☒ Yes ☐ No

Size of perforations 18 in. by 7 in.

1026 perforations from 65 ft. to 233 ft.

perforations from ft. to ft.

perforations from ft. to ft.

(7) SCREENS:

Well screen installed? ☐ Yes ☒ No

Manufacturer's Name

Type Model No.

Diam. Slot Size Set from ft. to ft.

Diam. Slot Size Set from ft. to ft.

(8) WELL TESTS:

Drawdown is amount water level is lowered below static level

Was a pump test made? ☒ Yes ☐ No If yes, by whom? Driller

Yield: 275 gal./min. with 163 ft. drawdown after 4 hrs.

" " " "

Air test gal./min. with drill stem at ft. hrs.

Bailer test gal./min. with ft. drawdown after hrs.

Artesian flow g.p.m.

Temperature of water 53° Depth artesian flow encountered ft.

(9) CONSTRUCTION:

Special standards: Yes ☐ No ☐

Well seal—Material used

Well sealed from land surface to ft.

Diameter of well bore to bottom of seal in.

Diameter of well bore below seal in.

Amount of sealing material sacks ☐ pounds ☐

How was cement grout placed?

Was pump installed? Type HP Depth ft.

Was a drive shoe used? ☐ Yes ☐ No Plugs Size: location ft.

Did any strata contain unusable water? ☐ Yes ☒ No

Type of Water? depth of strata

Method of sealing strata off

Was well gravel packed? ☐ Yes ☐ No Size of gravel:

Gravel placed from ft. to ft.

(10) LOCATION OF WELL by legal description:

County Umatilla NW¼ NE¼ of Section 36 of

Township 6N (Township is North or South), Range 35E (Range is East or West), WM.

Tax Lot Lot Block Subdivision

MAILING ADDRESS OF WELL (or nearest address) Rt 1 Box 136 D MF, ORE

(11) WATER LEVEL of COMPLETED WELL:

Depth at which water was first found 22 ft.

Static level 22 ft. below land surface. Date 3-26-93

Artesian pressure lbs. per square inch. Date

(12) WELL LOG:

Diameter of well below casing 8"

Depth drilled 58 ft. Depth of completed well 233 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Brown silt & med gravel	175	217	37
Brown silt Lg cobbles	217	230	22
Blue clay	230	233	

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Date work started 3-18-93 /completed 3-26-93

Date well drilling machine moved off of well 3-26 1993

(unbonded) Water Well Constructor Certification (if applicable):

This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.

[Signed] Donald L Harding Date 3-26, 1993

(bonded) Water Well Constructor Certification:

Bond # 30382713 (number) Issued by: Fidelity & Deposit Co. (Surety Company Name)

On behalf of Harding Drilling Co (type or print name of Water Well Constructor)

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

(Signed) Raymond Harding (Water Well Constructor)

(Dated) 3-26-93

NOTICE TO WATER WELL CONSTRUCTOR

The original and first copy of this report are to be filed with the

WATER RESOURCES DEPARTMENT, SALEM, OREGON 97310 within 30 days from the date of well completion.

SP*46866-690

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the
WATER RESOURCES DEPARTMENT,
SALEM, OREGON 97310
within 30 days from the date of well completion.

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

RECEIVED
APR 20 1981
WATER RESOURCES DEPT
SALEM, OREGON

PAGE #1.
State Well No. 6N/35E-36bd
State Permit No.
UMAT 6475

(1) OWNER:
Name Sam LeFore
Address Rt.1 Box 174 East side Rd.
Milton Freewater Oregon.

(2) TYPE OF WORK (check):
New Well [X] Deepening [ ] Reconditioning [ ] Abandon [ ]
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary [X] Driven [ ]
Cable [ ] Jetted [ ]
Dug [ ] Bored [ ]

(4) PROPOSED USE (check):
Domestic [ ] Industrial [ ] Municipal [ ]
Irrigation [X] Test Well [ ] Other [ ]

(5) CASING INSTALLED:
Threaded [ ] Welded [X]
10 " Diam. from 0 ft. to 40 ft. Gage 0250
8 " Diam. from 20 ft. to 240 ft. Gage SCH 160
" Diam. from ft. to ft. Gage

PERFORATIONS:
Perforated? [X] Yes [ ] No.
Type of perforator used Whole Saw
Size of perforations 1 in. by 1 in.
500 perforations from 100 ; ft. to 240 ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:
Well screen installed? [ ] Yes [X] No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? [X] Yes [ ] No If yes, by whom?
Yield: 450 gal./min. with 26 ft. drawdown after 4 hrs.
" " " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 54 Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used ~~Kxxxxx~~ Cement
Well sealed from land surface to 28 ft.
Diameter of well bore to bottom of seal 12 in.
Diameter of well bore below seal 10 in.
Number of sacks of cement used in well seal 23 sacks
How was cement grout placed? pumped
Was a drive shoe used? [X] Yes [ ] No Plugs Size: location ft.
Did any strata contain unusable water? [ ] Yes [X] No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? [ ] Yes [X] No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County Umitilla Driller's well number
SW ¼ NW ¼ Section 36 T. 6 R. 35E W.M.
Bearing and distance from section or subdivision corner
Tax Lot 1400 Rt 1 B 174 East side Rd

(11) WATER LEVEL: Completed well.
Depth at which water was first found 80 ft.
Static level 100 ft. below land surface. Date Jan 29-81
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 10
Depth drilled 243 ft. Depth of completed well 240 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Brown loam top soil	0	23	
Tan clay and bolders loose and cavy	23	34	
Brown hard pan with 2" to4" rocks hard.	34	56	
Boulders 1 ft and larger in hard pan tan and brown in color.	56	68	
Yellow clay small gravel simi soft with a trace of sand in the clay.	68	79	
Blue clay muck	79	81	
Yellow sandy hard pan porus and waterbearing.	81	151	
Dark brown clay and gravel 1"-3" Soft.	151	159	
Grey clay Soft	159	164	
Black basalt	164	184	
Blue clay	184	223	continue

Work started 1-26-81 19 Completed 1-29-81 19
Date well drilling machine moved off of well 1-29-81 19

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] (Drilling Machine Operator) Date 1-29-81 19
Drilling Machine Operator's License No. 1298

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name Goral LaPorte Well Drilling (Person, firm or corporation) (Type or print)
Address ~~RR~~ Rt 1 Box 101 M.F Oregon
[Signed] (Water Well Contractor)
Contractor's License No. 756 Date 1-29-81, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the WATER RESOURCES DEPARTMENT SALEM, OREGON 97310 within 30 days from the date of well completion.

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APR 20 1981
WATER RESOURCES DEPT
SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

Page # 2

State Well No. 6N/35E-36bc

State Permit No. .....

(1) OWNER:
Name Sam LeFore Page # 2

Address .....

(2) TYPE OF WORK (check):
New Well ☐ Deepening ☐ Reconditioning ☐ Abandon ☐

If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

CASING INSTALLED:
Threaded ☐ Welded ☐

..." Diam. from ..... ft. to ..... ft. Gage .....

..." Diam. from ..... ft. to ..... ft. Gage .....

..." Diam. from ..... ft. to ..... ft. Gage .....

PERFORATIONS:
Perforated? ☐ Yes ☐ No.

Type of perforator used .....

Size of perforations ..... in. by ..... in.

..... perforations from ..... ft. to ..... ft.

..... perforations from ..... ft. to ..... ft.

..... perforations from ..... ft. to ..... ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☐ No

Manufacturer's Name .....

Type ..... Model No. .....

Diam. ..... Slot size ..... Set from ..... ft. to ..... ft.

Diam. ..... Slot size ..... Set from ..... ft. to ..... ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☐ No If yes, by whom? .....

Yield: ..... gal./min. with ..... ft. drawdown after ..... hrs.

" " " "

" " " "

Bailer test ..... gal./min. with ..... ft. drawdown after ..... hrs.

Artesian flow ..... g.p.m.

Temperature of water ..... Depth artesian flow encountered ..... ft.

(9) CONSTRUCTION:
Well seal—Material used .....

Well sealed from land surface to ..... ft.

Diameter of well bore to bottom of seal ..... in.

Diameter of well bore below seal ..... in.

Number of sacks of cement used in well seal ..... sacks

How was cement grout placed? .....

.....

.....

.....

Was a drive shoe used? ☐ Yes ☐ No Plugs ..... Size: location ..... ft.

Did any strata contain unusable water? ☐ Yes ☐ No .....

Type of water? ..... depth of strata .....

Method of sealing strata off .....

Was well gravel packed? ☐ Yes ☐ No Size of gravel: .....

Gravel placed from ..... ft. to ..... ft.

(10) LOCATION OF WELL:
County Umatilla Driller's well number .....

SW ¼ NW ¼ Section 36 T. 6 R. 35E W.M.

Bearing and distance from section or subdivision corner

Tax Lot 1400 RT 1 Box 174 East Side Rd

(11) WATER LEVEL: Completed well.
Depth at which water was first found ..... ft.

Static level ..... ft. below land surface. Date .....

Artesian pressure ..... lbs. per square inch. Date .....

(12) WELL LOG:
Diameter of well below casing .....

Depth drilled ..... ft. Depth of completed well ..... ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Continued from Page # 1.			
Broken Black basalt mixed with soft blue clay and small gravel	223	225	
Hard black basalt	225	226	
Broken black basalt with streaks of red and black cinder and lava rock in layers. Water bearing	226	233	
hard black basalt dense	233	235	
Brokem and very porus lava rock water bearing very cavy	235	243	

Work started ..... 19 Completed 19

Date well drilling machine moved off of well 19

Drilling Machine Operator's Certification:

This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.

[Signed] ..... (Drilling Machine Operator) Date 1-29-81, 19

Drilling Machine Operator's License No. 1298

Water Well Contractor's Certification:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Name Goral M. LaPorte Well Drilling. (Person, firm or corporation) (Type or print)

Address Rt 1 Box 101 M.F. Oregon

[Signed] ..... (Water Well Contractor)

Contractor's License No. 756 Date 1-29-81, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

UMAT 50473

WELL I.D.# 105072

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)

MAR - 5 1997

(START CARD) # W90209

Instructions for completing this report are on the last page of this form. WATER RESOURCES DEPT. SALEM, OREGON

(1) OWNER: Well Number SA

Name Jimmy Bier, Harold Bier, Buddy Bier

Address Rt 4 Box 743

City Milton-Freewater State Or Zip 97862

(2) TYPE OF WORK

[X] New Well [ ] Deepening [ ] Alteration (repair/recondition) [ ] Abandonment

(3) DRILL METHOD:

[ ] Rotary Air [ ] Rotary Mud [X] Cable [ ] Auger

[ ] Other

(4) PROPOSED USE:

[ ] Domestic [ ] Community [ ] Industrial [X] Irrigation

[ ] Thermal [ ] Injection [ ] Livestock [ ] Other

(5) BORE HOLE CONSTRUCTION:

Special Construction approval [ ] Yes [ ] No Depth of Completed Well 105 ft.

Explosives used [ ] Yes [X] No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
12"	0	22	Bentonite	0	22	1600 lbs

How was seal placed: Method [ ] A [ ] B [ ] C [ ] D [ ] E

[X] Other

Backfill placed from 0 ft. to 22 ft. Material Bentonite

Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	8	+1.5	67	250	[X]	[ ]	[X]	[ ]
					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]
Liner:	6" PVC	53	105	S 40	[ ]	[X]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]

Final location of shoe(s) 67' from surface

(7) PERFORATIONS/SCREENS:

[X] Perforations Method Saw

[ ] Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
53	105	4" x 3/16	6/ft	6"		[ ]	[X]
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]

(8) WELL TESTS: Minimum testing time is 1 hour

[X] Pump [ ] Bailer [ ] Air [ ] Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
125	11 feet		1 hr.
125	11 feet		4 hr

Temperature of water 54 Depth Artesian Flow Found

Was a water analysis done? [ ] Yes By whom

Did any strata contain water not suitable for intended use? [ ] Too little

[ ] Salty [ ] Muddy [ ] Odor [ ] Colored [ ] Other

Depth of strata:

(9) LOCATION OF WELL by legal description:

County Umatilla Latitude Longitude

Township 6 (N) or S Range 35 (E) or W. WM.

Section 36 NW 1/4 SE 1/4

Tax Lot 00200 Lot Block Subdivision

Street Address of Well (or nearest address) Rt 1 Box 158

Miller Rd.; Milton-Freewater, Or. 97862

(10) STATIC WATER LEVEL:

38 ft. below land surface. Date 3/1/97

Artesian pressure lb. per square inch. Date

(11) WATER BEARING ZONES:

Depth at which water was first found

From	To	Estimated Flow Rate	SWL
66	94	200+	38
99	105	100+	38

(12) WELL LOG:

Ground Elevation 950

Material	From	To	SWL
Large Gravel	0	18	0
Cemented Gravel	18	66	0
Gravel (Water)	66	94	38 '
Brown Clay & Gravel	94	99	
Gravel (Water)	99	105	38 '

Date started 1/22/97 Completed 3/1/97

(unbonded) Water Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

WWC Number

Signed Date

(bonded) Water Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

WWC Number 374

Signed Thomas R Parker Date 3/1/97

ORIGINAL & FIRST COPY-WATER RESOURCES DEPARTMENT SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER

UMAT 53647

RECEIVED
NOV 0 8 1999
WATER RESOURCES DEPT.
SALEM, OREGON

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)

Instructions for completing this report are on the last page of this form

WELL I.D. # L 30335
START CARD # 412123

(1) OWNER: Well Number 2
Name Jim Frank
Address 53630 Stiller Lane
City Milton Freewater State ORE Zip 97862

(2) TYPE OF WORK
[X] New Well [ ] Deepening [ ] Alteration (repair/recondition) [ ] Abandonment

(3) DRILL METHOD:
[ ] Rotary Air [ ] Rotary Mud [X] Cable [ ] Auger
[ ] Other

(4) PROPOSED USE:
[X] Domestic [ ] Community [ ] Industrial [X] Irrigation
[ ] Thermal [ ] Injection [ ] Livestock [ ] Other

(5) BORE HOLE CONSTRUCTION:
Special Construction approval [ ] Yes [X] No Depth of Completed Well 120 ft.
Explosives used [ ] Yes [X] No Type ____ Amount ____

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
12"	0	18	Bentmite	0	18	2500#
8"	18'	120'				

How was seal placed: Method [ ] A [ ] B [ ] C [ ] D [ ] E
[X] Other Poured
Backfill placed from ____ ft. to ____ ft. Material ____
Gravel placed from ____ ft. to ____ ft. Size of gravel ____

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	8"	+1	119	.280	[X]	[ ]	[X]	[ ]
					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]
Liner:					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]

Final location of shoe(s) ____

(7) PERFORATIONS/SCREENS:
[X] Perforations Method cutting torch
[ ] Screens Type ____ Material ____

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
80'	110'	[illegible]"	120	3/8"		[X]	[ ]
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]

(8) WELL TESTS: Minimum testing time is 1 hour
[X] Pump [ ] Bailer [ ] Air [ ] Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
50 g/m	2'		1 hr.

Temperature of water 49° Depth Artesian Flow Found ____
Was a water analysis done? [ ] Yes By whom ____
Did any strata contain water not suitable for intended use? [ ] Too little
[ ] Salty [ ] Muddy [ ] Odor [ ] Colored [X] Other Sand
Depth of strata: 45'-65'

(9) LOCATION OF WELL by legal description:
County Umatilla Latitude ____ Longitude ____
Township 6 (N) or S Range 35 (E) or W. WM.
Section 36 A NW 1/4 NE 1/4
Tax Lot 300 Lot ____ Block ____ Subdivision ____
Street Address of Well (or nearest address) 53630 Stiller Lane Milton Freewater OR 97862

(10) STATIC WATER LEVEL:
34' ft. below land surface. Date 11-1-99
Artesian pressure ____ lb. per square inch. Date ____

(11) WATER BEARING ZONES:
Depth at which water was first found 46'

From	To	Estimated Flow Rate	SWL
46	65	5 gpm	46
70	120	100 gpm	34

(12) WELL LOG:
Ground Elevation ____

Material	From	To	SWL
clay - Loam - Black	0	5	0
cobbles Large	5	26	0
cobbles small clay - Br.	26	31	0
cobbles small	31	46	0
sand med. - water	46	65	45
gravel - Fine Brn clay	65	69	45
clay - Brown - gravel - Fine	69	80	45
cobbles small clay Brown	80	105	34
cobbles - med.	105	120	34

Date started 10-18-1999 Completed 11-1-1999

(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
WWC Number 1598
Signed Gerald L Harding Date 11-1-99

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
WWC Number 1639
Signed Mike Harding Date 11-2-99

ORIGINAL & FIRST COPY-WATER RESOURCES DEPARTMENT SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER

UMAT 56140

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765 & OAR 690-205-0210)

WELL LABEL # L 82245

START CARD # W194814

Instructions for completing this report are on the last page of this form.

(1) LAND OWNER Owner Well I.D. _____
First Name _____ Last Name _____
Company VONDERAHE, Inc.
Address 401 PARKVIEW STREET
City Milton Freewater State ORE Zip 97862

(2) TYPE OF WORK ☒ New Well ☐ Deepening ☐ Conversion ☐ Alteration (repair/recondition) ☐ Abandonment

(3) DRILL METHOD ☐ Rotary Air ☐ Rotary Mud ☒ Cable ☐ Auger ☐ Cable Mud ☐ Reverse Rotary ☐ Other _____

(4) PROPOSED USE ☐ Domestic ☒ Irrigation ☐ Community ☐ Industrial/Commercial ☐ Livestock ☐ Dewatering ☐ Injection ☐ Thermal ☐ Other _____

(5) BORE HOLE CONSTRUCTION Special Standard: ☐ Yes (attach copy)
Depth of Completed Well 185 ft.

BORE HOLE Dia	From	To	SEAL Material	From	To	Amount	sacks/lbs
12	0	19	Bentonite	0	19		35
8	19	185					

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E
☒ Other Poured
Backfill placed from _____ ft. to _____ ft. Material _____
Filter pack from _____ ft. to _____ ft. Material _____ Size _____
Explosives used: ☐ Yes Type _____ Amount _____

(6) CASING/LINER

Csng	Linr	Dia	+	From	To	Gauge	Steel	Plastic	Welded	Thrd
X		8	X	2	99	.250	X		X	

Shoe ☐ Inside ☒ Outside ☐ Other Location of shoe(s) 99
Temporary casing ☐ Yes Diameter _____ From _____ To _____

(7) PERFORATIONS/SCREENS
Perforations Method Tourch
Screens Type _____ Material _____

Perf	Scrn	Csng	Linr	Screen Dia	From	To	Screen/ slot width	Slot length	# of slots	Tele/ pipe size
X		X		8	41	95	1/4	7	216	

(8) WELL TESTS: Minimum testing time is 1 hour
☒ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
75	7	100	4
100	49	100	4 1/2

Temperature 54 °F Lab analysis ☐ Yes By _____
Water quality concerns? ☐ Yes (describe below)

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)
County Umatilla Twp 6 ☒ N or S Range 36 ☐ E or W W.M.
Sec 31 NW 1/4 of the NW 1/4 Tax Lot 6900
Tax Map Number _____ Lot _____
Lat ___° ___ ___.___" or _____ DMS or DD
Long ___° ___ ___.___" or _____ DMS or DD
Street Address of Well (or nearest address) 84387 Grant Road

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL (ft)
Existing Well/Predeepening				
Completed Well	4-21-08			41

Flowing Artesian? ☐ Yes Dry Hole? ☐ Yes

WATER BEARING ZONES Depth water was first found 41

SWL Date	From	To	Est Flow	SWL (psi)	+	SWL (ft)
4-18-08	41	100	100gpm			41

(11) WELL LOG Ground Elevation _____

Material	From	To
Top Soil	0	1
cobbles	1	48
gravel-sand	48	70
gravel-Brown clay	70	110
Brown clay	110	161
gray clay-sand	161	185

RECEIVED
MAY 29 2008
WATER RESOURCES DEPT.
SALEM, OREGON

Date Started 3-31-08 Completed 4-21-08

(unbonded) Water Well Constructor Certification
I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

License Number 1869 Date 4-21-08
Signed Blake Hardin

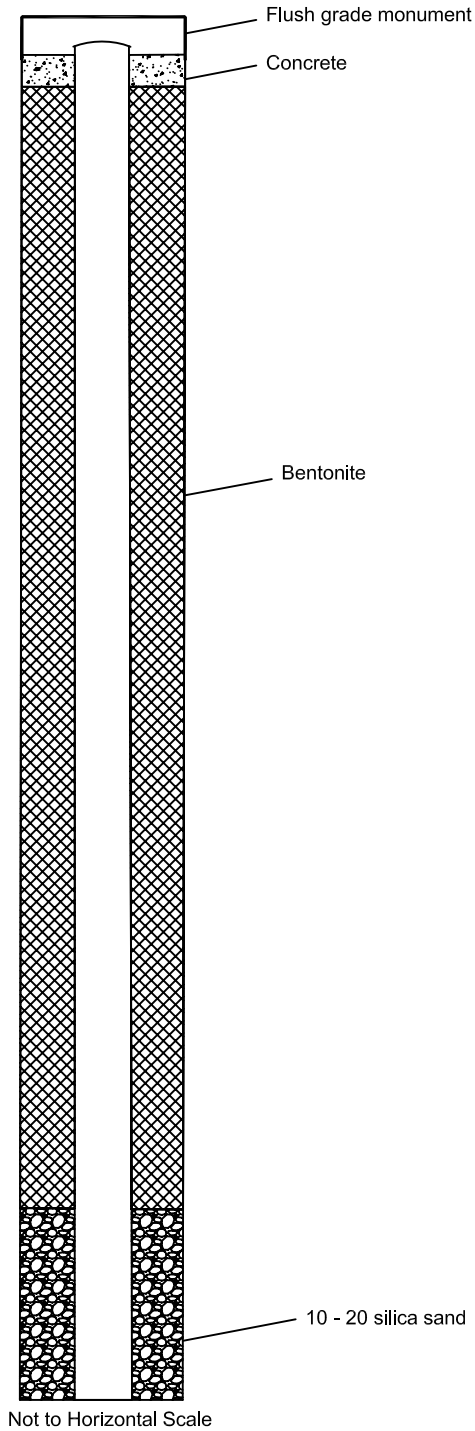
(bonded) Water Well Constructor Certification
I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

License Number 1639 Date 4-25-08
Signed Mike Harding
Contact Info. (optional)

ORIGINAL – WATER RESOURCES DEPARTMENT ONE COPY FOR CONSTRUCTOR ONE COPY FOR CUSTOMER
THIS REPORT MUST BE SUBMITTED TO THE WATER RESOURCES DEPARTMENT WITHIN 30 DAYS OF COMPLETION OF WORK 10/16/2006

Depth Below Ground (feet)	GEOLOGIC LOG	HG unit or Zone	Sample
	Ground Elevation: Approx 970 feet msl		
0	*Pale to dk yel-brn, dry, ls, SILT; cemented? and friable from 3.5 to 4.5 feet*	*Soil*	*tbd*
5	*Dk yel-brn, dry, very stiff, SILT with occ cbl*	*Unsaturated*	*tbd*
10	*Dk to mod yel-brn, damp, soft to md stf, silty CLAY*		*tbd*
15			
20	*Lt to brn-gry, dry, ls, v silty, c SAND to f GRAVEL; pale orange layer*		*tbd*
25	*Md gry to ol blk, sli damp, ls, silty, c SAND to c GRAVEL; cbl from 31 to 32 ft*		
30	*Md gry to ol blk, sli damp, ls, silty, c SAND to COBBLE*		*tbd*
35	*Md gry to dk md gry, damp, ls, sli silty, c SAND to c GRAVEL; occ cbl* *hard drilling 38 to 40 ft*		*tbd*
40	*Med gry to sli ol gry, damp, ls, v silty c SAND to c GRVL; occ cbl*		
45	*Sample from 43 - 50 ft was "mixed" during extrusion*		*tbd*
50			

Log continues on next page



PROJECT NAME: Eastside ASR Feasiblity
DRILLING METHOD: Sonic, 6-inch casing, 4-inch sample
DRILLER: Pete Rosenberg (driller), Jacob, Josh (helpers)
FIRM: Holt Services, Inc
CONSULTING FIRM: Northwest Land & Water, Inc
REPRESENTATIVE: Jim Mathieu, Hydrogeologist
LOCATION: NW 1/4 SE 1/4 Sec 36 T6N, R35E
WELL NAME: GW_152; aka LF-1
WELL TAG & START CARD: L111668 & 1024795

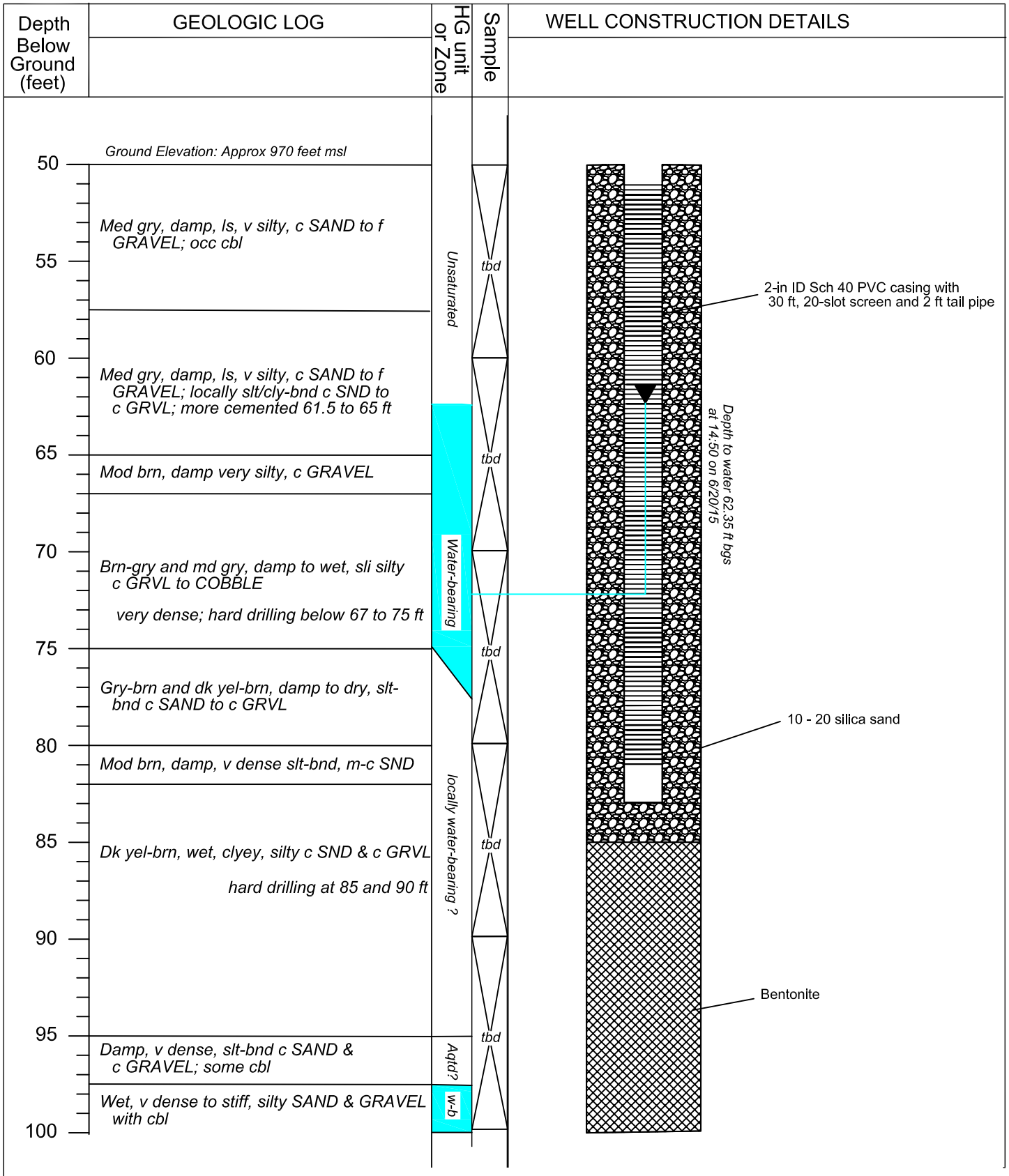
Figure 2 (page 1 of 3)
GW_152 Geologic Log & Monitoring Well As-Built

Eastside Milton-Freewater, OR
Walla Walla Basin Watershed Council

NORTHWEST Land & Water, INC.

version 06/30/15

C:\Projects\WWBW\C\...\GeoLog&Asbuilt_LF-1pg1of3.dwg



version 06/30/15

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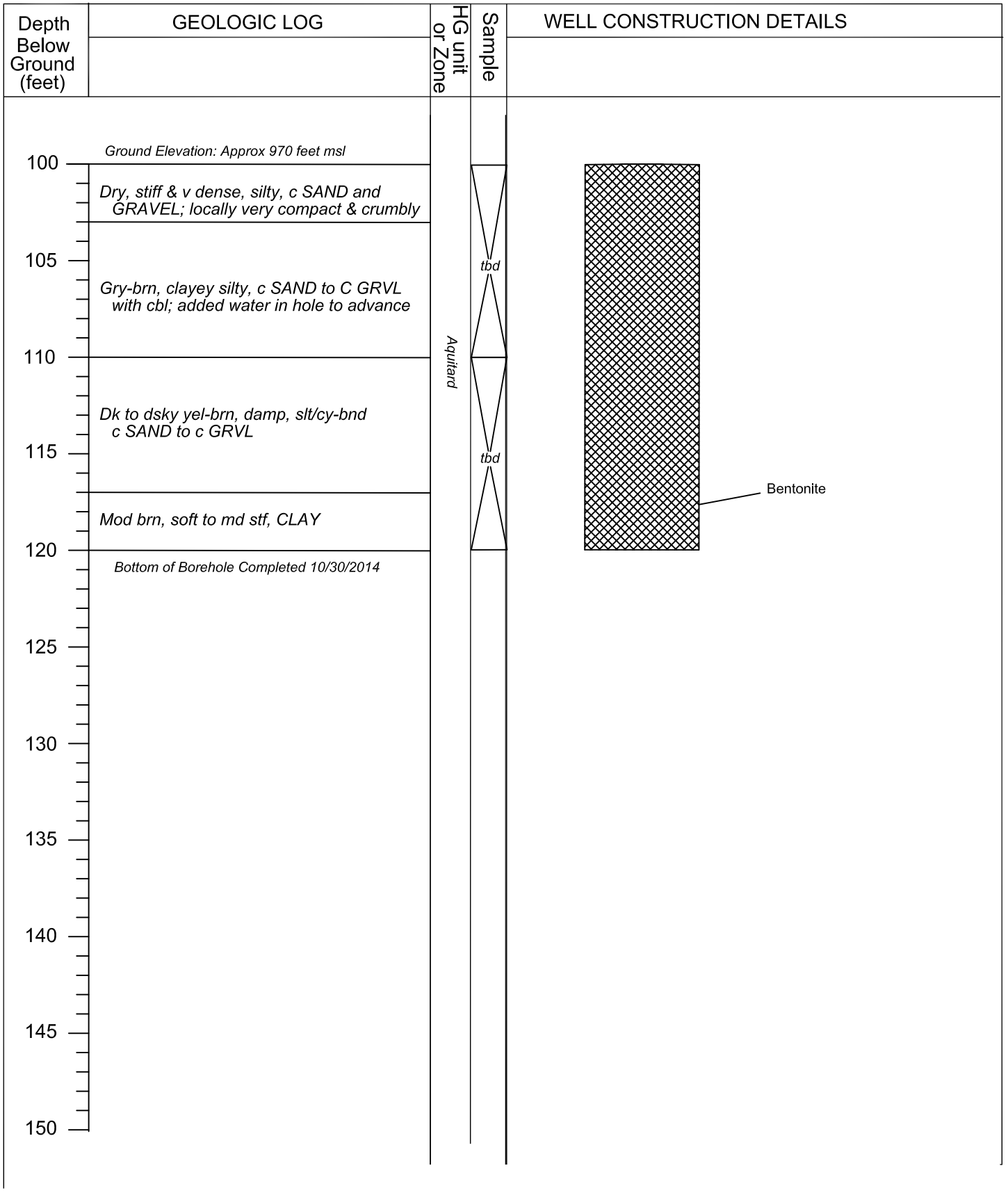
PROJECT NAME: Eastside ASR Feasiblity
DRILLING METHOD: Sonic, 6-inch casing, 4-inch sample
DRILLER: Pete Rosenberg (driller), Jacob, Josh (helpers)
FIRM: Holt Services, Inc
CONSULTING FIRM: Northwest Land & Water, Inc
REPRESENTATIVE: Jim Mathieu, Hydrogeologist
LOCATION: NW 1/4 SE 1/4 Sec 36 T6N, R35E
WELL NAME: GW_152; aka LF-1
WELL TAG & START CARD: L111668 & 1024795

Figure 2 (page 2 of 3)
GW_152 Geologic Log & Monitoring Well As-Built

Eastside Milton-Freewater, OR
Walla Walla Basin Watershed Council

NORTHWEST Land & Water, INC.



PROJECT NAME: Eastside ASR Feasiblity
DRILLING METHOD: Sonic, 6-inch casing, 4-inch sample
DRILLER: Pete Rosenberg (driller), Jacob, Josh (helpers)
FIRM: Holt Services, Inc
CONSULTING FIRM: Northwest Land & Water, Inc
REPRESENTATIVE: Jim Mathieu, Hydrogeologist
LOCATION: NW 1/4 SE 1/4 Sec 36 T6N, R35E
WELL NAME: GW_152; aka FL-1
WELL TAG & START CARD: L111668 & 1024795

Figure 2 (page 3 of 3)
GW_152 Geologic Log & Monitoring Well As-Built

Eastside Milton-Freewater, OR
Walla Walla Basin Watershed Council

NORTHWEST Land & Water, INC.

version 06/30/15

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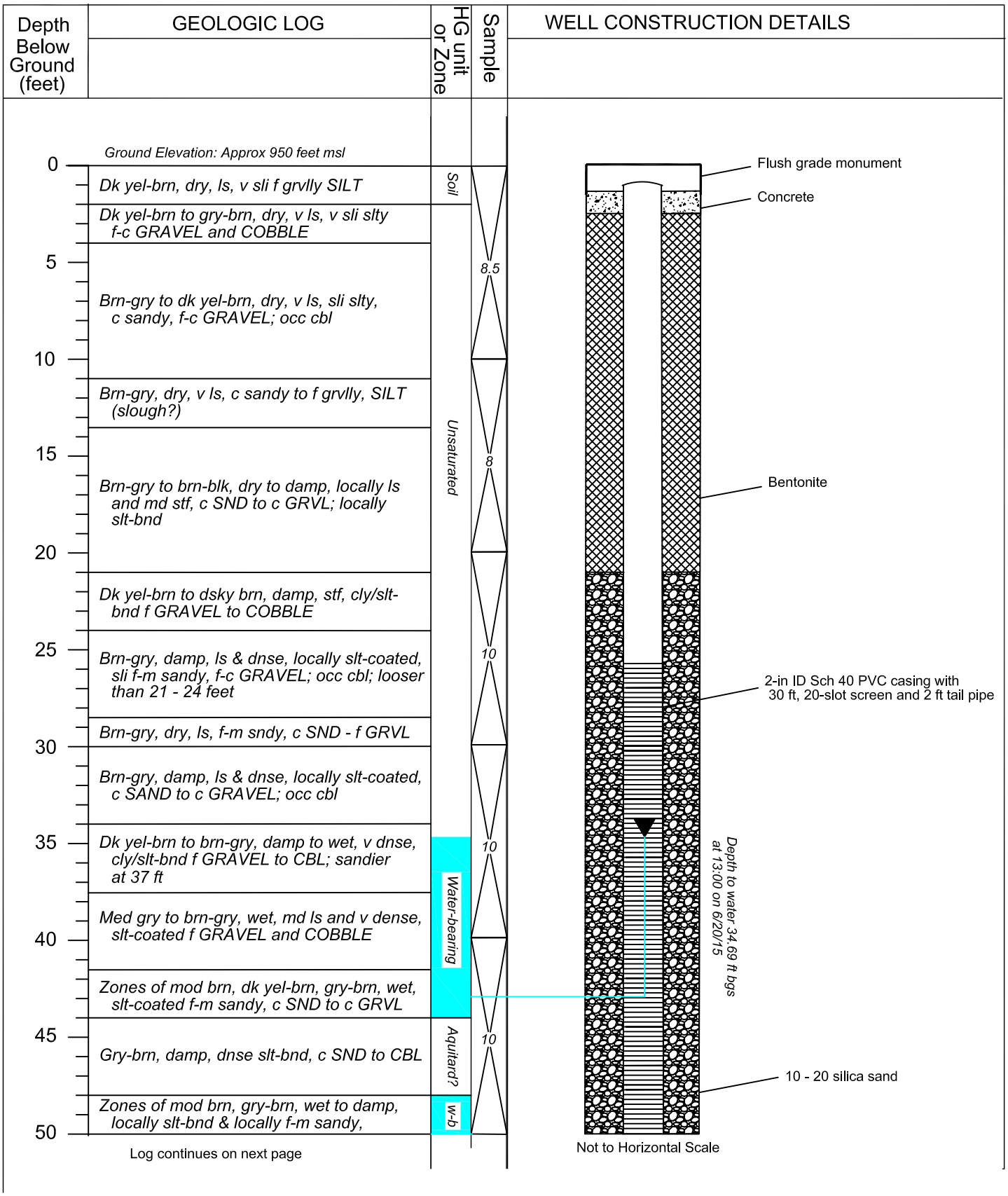

PROJECT NAME: Eastside ASR Feasiblity
DRILLING METHOD: Sonic, 6-inch casing, 4-inch sample
DRILLER: Pete Rosenberg (driller), Jacob, Josh (helpers)
FIRM: Holt Services, Inc
CONSULTING FIRM: Northwest Land & Water, Inc
REPRESENTATIVE: Jim Mathieu, Hydrogeologist
LOCATION: SE 1/4 NE 1/4 Sec 36 T6N, R35E
WELL NAME: GW_160; aka CR-1
WELL TAG & START CARD: L111671 & 1026739

Figure 3 (page 1 of 3)
GW_160 Geologic Log & Monitoring Well As-Built

Eastside Milton-Freewater, OR
Walla Walla Basin Watershed Council

NORTHWEST Land & Water, INC.

version 06/30/15

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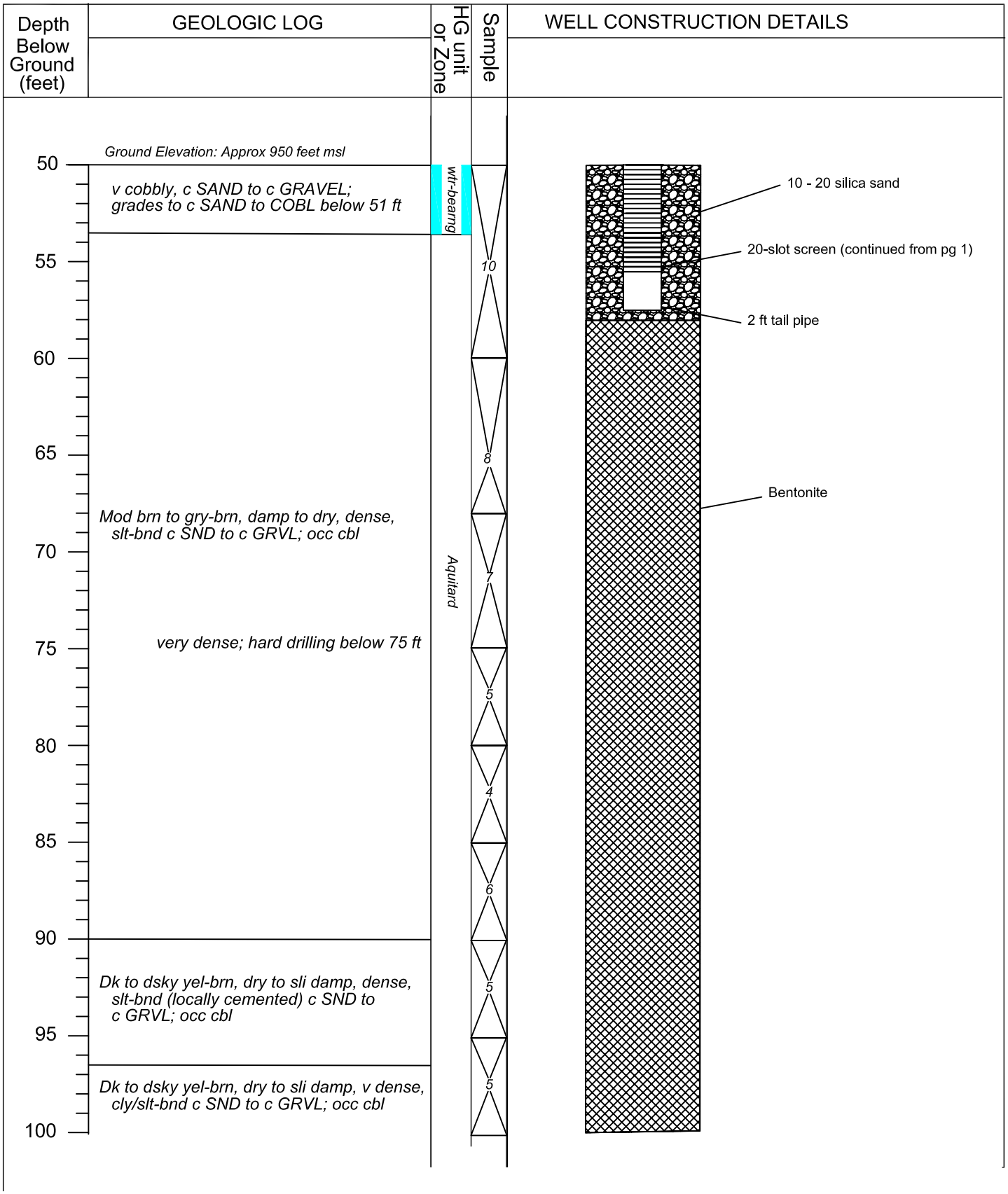

PROJECT NAME: Eastside ASR Feasiblity
DRILLING METHOD: Sonic, 6-inch casing, 4-inch sample
DRILLER: Pete Rosenberg (driller), Jacob, Josh (helpers)
FIRM: Holt Services, Inc
CONSULTING FIRM: Northwest Land & Water, Inc
REPRESENTATIVE: Jim Mathieu, Hydrogeologist
LOCATION: SW 1/4 NE 1/4 Sec 36 T6N, R35E
WELL NAME: GW_160; aka CR-1
WELL TAG & START CARD: L111671 & 1026739

Figure 3 (page 2 of 3)
GW_160 Geologic Log & Monitoring Well As-Built

Eastside Milton-Freewater, OR
Walla Walla Basin Watershed Council

NORTHWEST Land & Water, INC.

version 06/30/15

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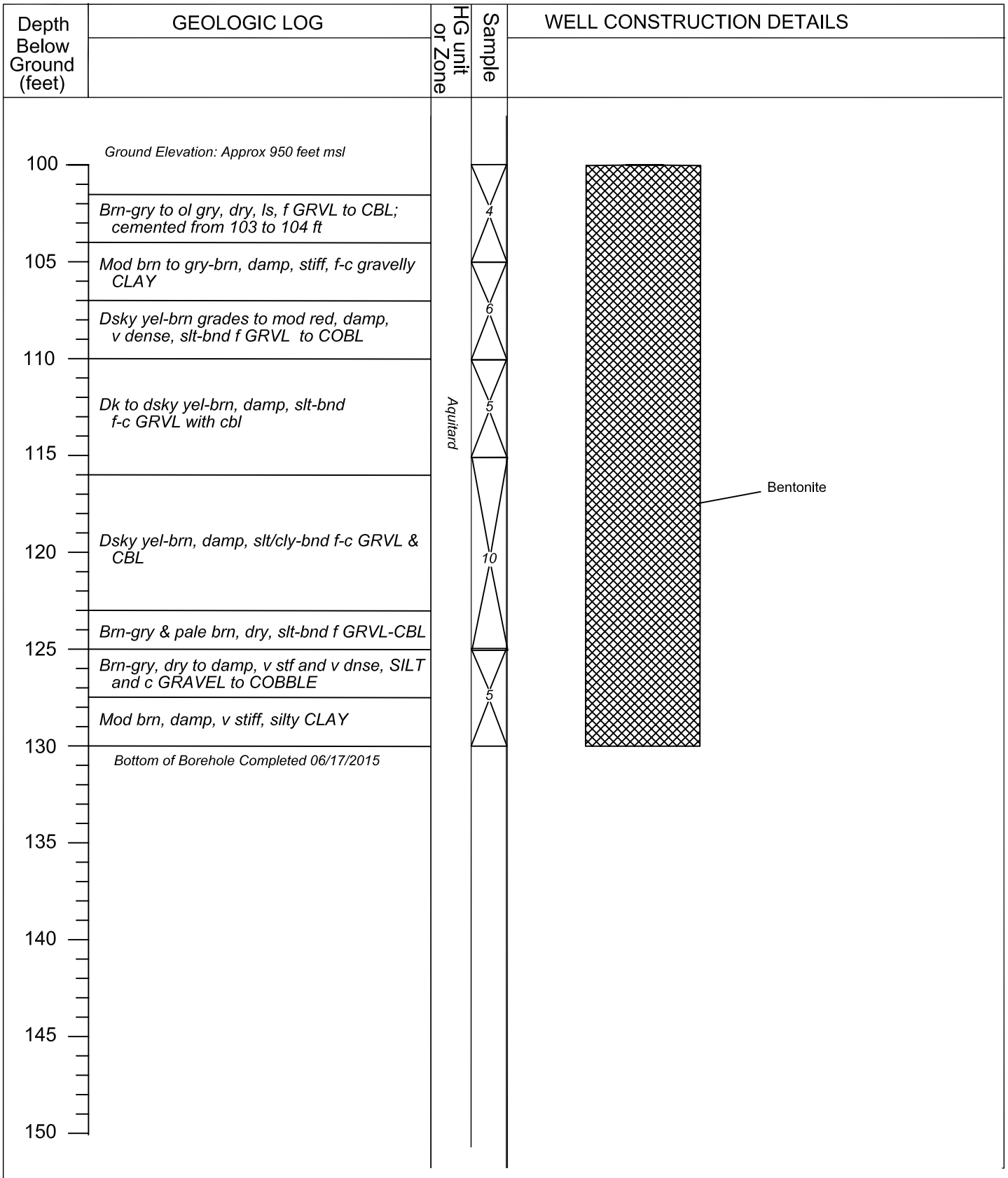

version 06/30/15

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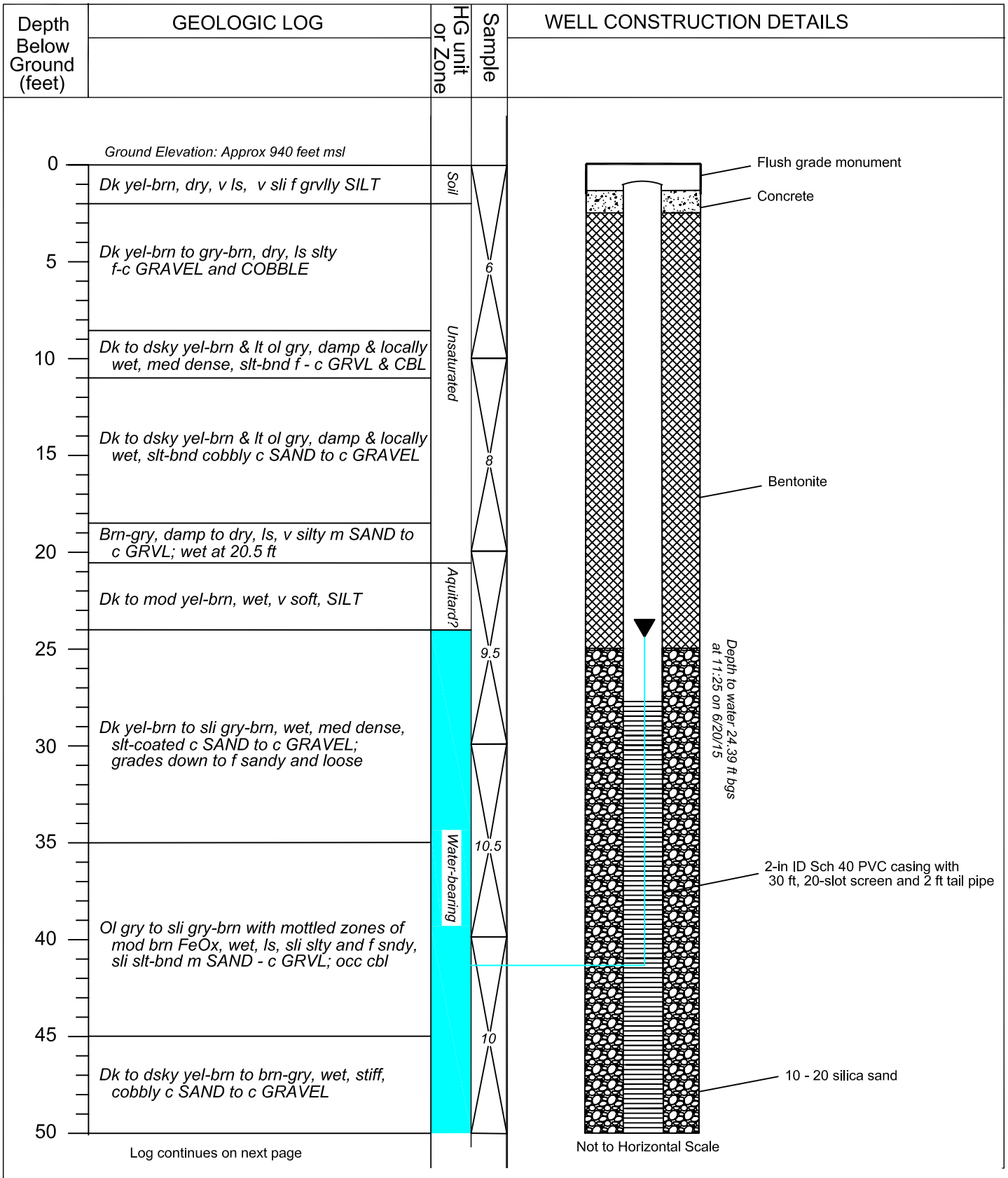
PROJECT NAME: Eastside ASR Feasiblity
DRILLING METHOD: Sonic, 6-inch casing, 4-inch sample
DRILLER: Pete Rosenberg (driller), Jacob, Josh (helpers)
FIRM: Holt Services, Inc
CONSULTING FIRM: Northwest Land & Water, Inc
REPRESENTATIVE: Jim Mathieu, Hydrogeologist
LOCATION: SW 1/4 NE 1/4 Sec 36 T6N, R35E
WELL NAME: GW_160; aka CR-1
WELL TAG & START CARD: L111671 & 1026739

Figure 3 (page 3 of 3)
GW_160 Geologic Log & Monitoring Well As-Built

Eastside Milton-Freewater, OR
Walla Walla Basin Watershed Council

NORTHWEST Land & Water, INC.



PROJECT NAME: Eastside ASR Feasiblity
DRILLING METHOD: Sonic, 6-inch casing, 4-inch sample
DRILLER: Pete Rosenberg (driller), Jacob, Josh (helpers)
FIRM: Holt Services, Inc
CONSULTING FIRM: Northwest Land & Water, Inc
REPRESENTATIVE: Jim Mathieu, Hydrogeologist
LOCATION: NW 1/4 NW 1/4 Sec 31 T6N, R36E
WELL NAME: GW_161; aka JB-1
WELL TAG & START CARD: L111672 & 1026740

Figure 4 (page 1 of 2)
GW_161 Geologic Log & Monitoring Well As-Built

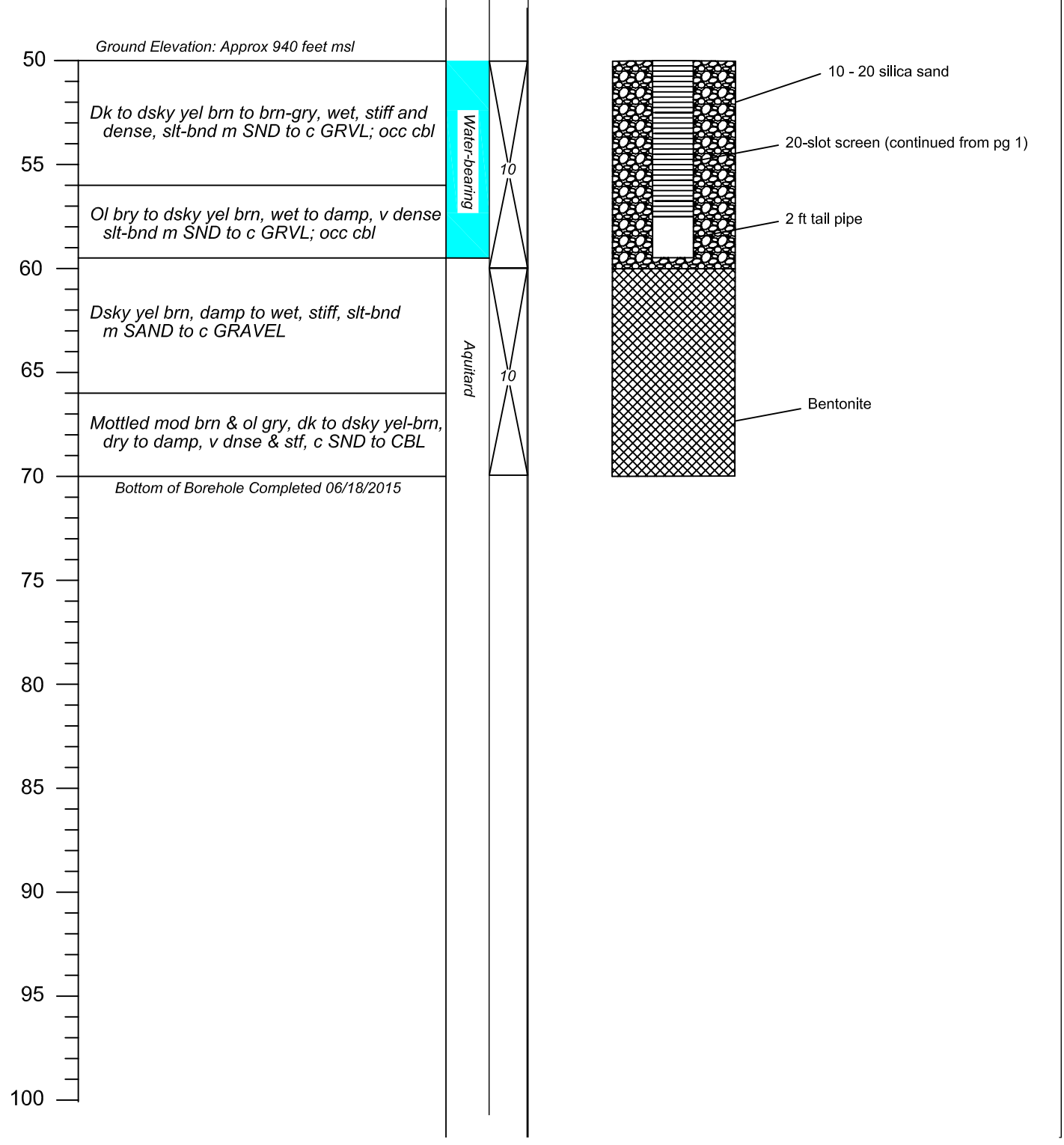
Eastside Milton-Freewater, OR
Walla Walla Basin Watershed Council

NORTHWEST Land & Water, INC.

version 06/30/15

C:\Projects\WWBWC\...\GeoLog&Asbuilt_JB-1pg1of2.dwg

Depth Below Ground (feet)	GEOLOGIC LOG	HG unit or Zone	Sample	WELL CONSTRUCTION DETAILS



PROJECT NAME: Eastside ASR Feasiblity
DRILLING METHOD: Sonic, 6-inch casing, 4-inch sample
DRILLER: Pete Rosenberg (driller), Jacob, Josh (helpers)
FIRM: Holt Services, Inc
CONSULTING FIRM: Northwest Land & Water, Inc
REPRESENTATIVE: Jim Mathieu, Hydrogeologist
LOCATION: NW 1/4 NW 1/4 Sec 31 T6N, R36E
WELL NAME: GW_161; aka JB-1
WELL TAG & START CARD: L111672 & 1026740

Figure 4 (page 2 of 2)
GW_161 Geologic Log & Monitoring Well As-Built

Eastside Milton-Freewater, OR
Walla Walla Basin Watershed Council

NORTHWEST Land & Water, INC.

version 06/30/15

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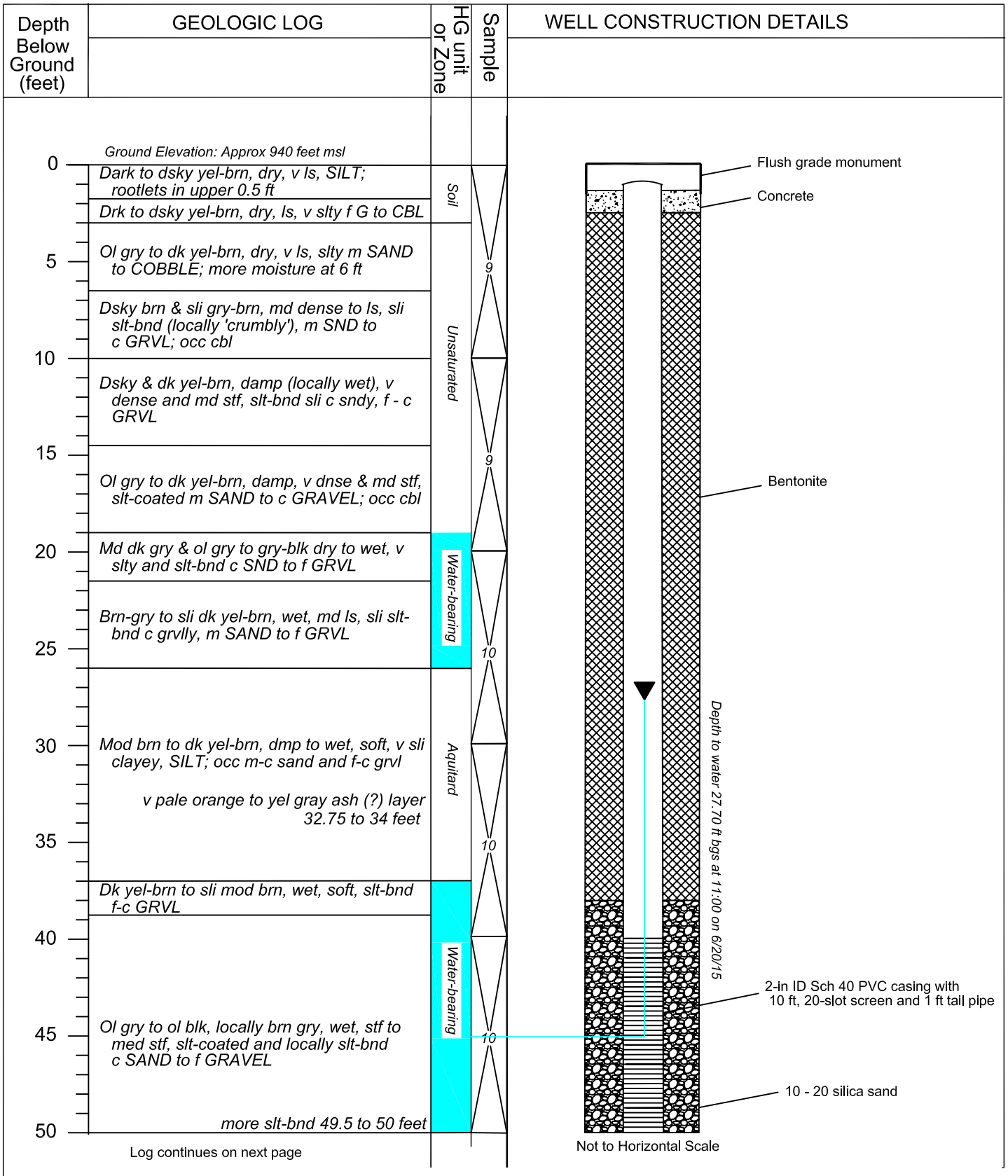

PROJECT NAME: Eastside ASR Feasiblity
DRILLING METHOD: Sonic, 6-inch casing, 4-inch sample
DRILLER: Pete Rosenberg (driller), Jacob, Josh (helpers)
FIRM: Holt Services, Inc
CONSULTING FIRM: Northwest Land & Water, Inc
REPRESENTATIVE: Jim Mathieu, Hydrogeologist
LOCATION: SW 1/4 NE 1/4 Sec 36 T6N, R35E
WELL NAME: GW_162; aka MFS-1
WELL TAG & START CARD: L111673 & 1026828

Figure 5 (page 1 of 2)
GW_162 Geologic Log & Monitoring Well As-Built

Eastside Milton-Freewater, OR
Walla Walla Basin Watershed Council

NORTHWEST Land & Water, INC.

version 06/30/15

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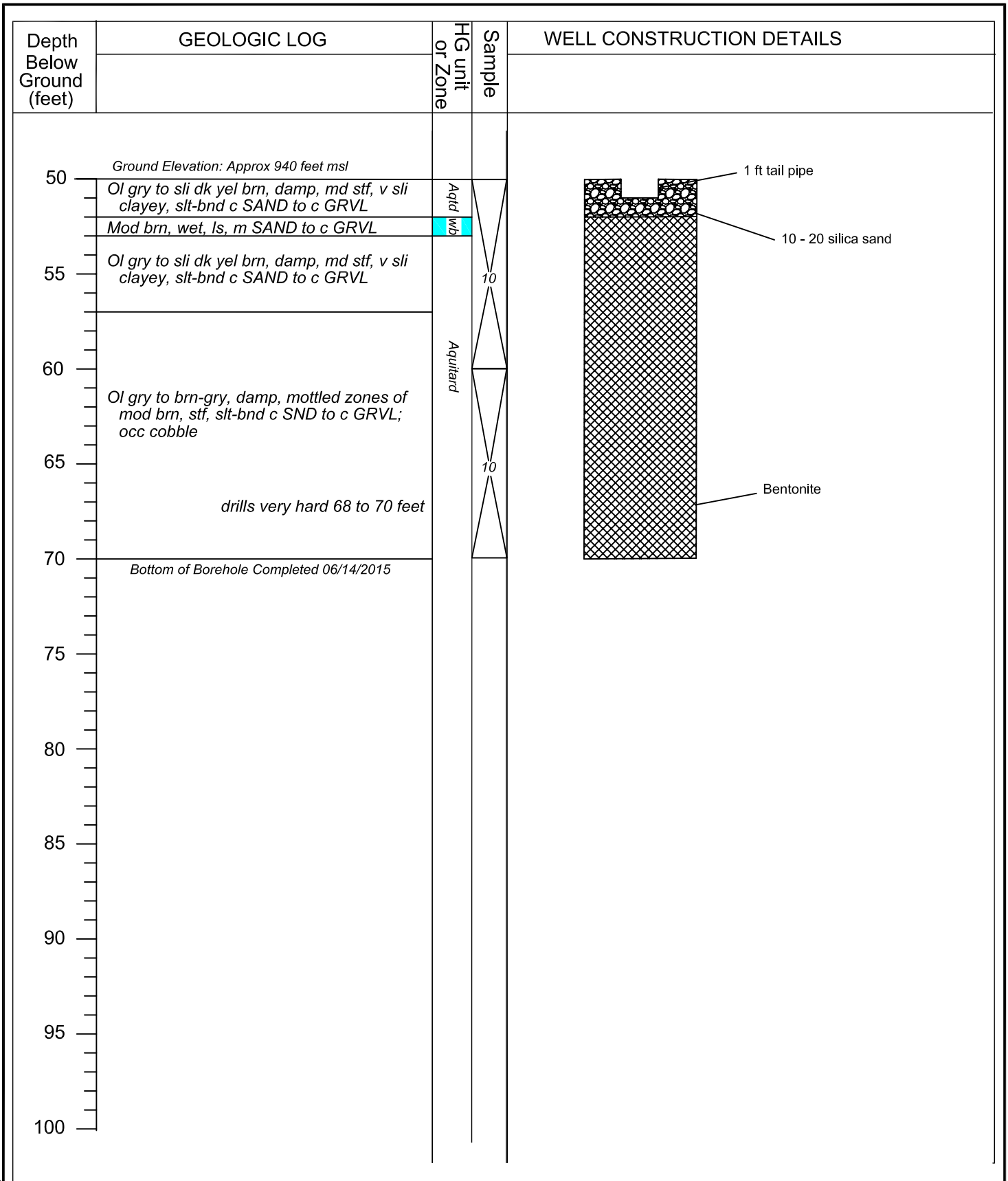


PROJECT NAME: Eastside ASR Feasiblity
DRILLING METHOD: Sonic, 6-inch casing, 4-inch sample
DRILLER: Pete Rosenberg (driller), Jacob, Josh (helpers)
FIRM: Holt Services, Inc
CONSULTING FIRM: Northwest Land & Water, Inc
REPRESENTATIVE: Jim Mathieu, Hydrogeologist
LOCATION: SW 1/4 NE 1/4 Sec 36 T6N, R35E
WELL NAME: GW_162; aka MFS-1
WELL TAG & START CARD: L111673 & 1026828

Figure 5 (page 2 of 2)
GW_162 Geologic Log & Monitoring Well As-Built

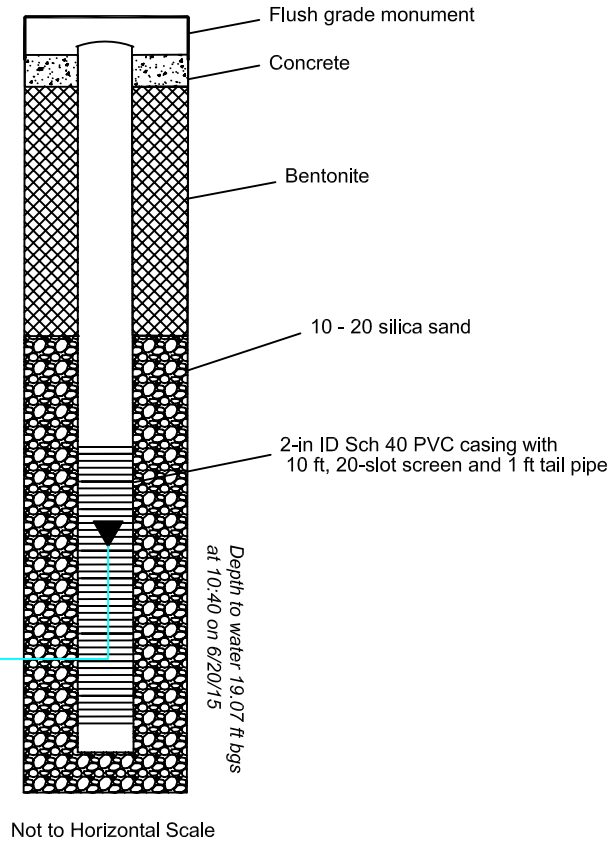
Eastside Milton-Freewater, OR
Walla Walla Basin Watershed Council

NORTHWEST Land & Water, INC.

version 06/30/15

C:\Projects\WWBW\C\...\GeoLog&Asbuilt_MFS-1(deep)_pg2of2.dwg

Depth Below Ground (feet)	GEOLOGIC LOG	HG unit or Zone	Sample
	Ground Elevation: Approx 940 feet msl		
0	*Dark to dsky yel-brn, dry, v ls, SILT; rootlets in upper 0.5 ft*	*Soil*	*Samples reviewed in loader for consistency with GW_162*
	Drk to dsky yel-brn, dry, ls, v slty f G to CBL		
5	*Ol gry to dk yel-brn, dry, v ls, slty m SAND to COBBLE; more moisture at 6 ft*	*Unsaturated*	
	Dsky brn & sli gry-brn, md dense to ls, sli slt-bnd (locally 'crumbly'), m SND to c GRVL; occ cbl		
10	*Dsky & dk yel-brn, damp (locally wet), v dense and md stf, slt-bnd sli c sndy, f - c GRVL*		
15	*Ol gry to dk yel-brn, damp, v dnse & md stf, slt-coated m SAND to c GRAVEL; occ cbl*		
20	*Md dk gry & ol gry to gry-blk dry to wet, v slty and slt-bnd c SND to f GRVL*	*Water-bearing*	
	Brn-gry to sli dk yel-brn, wet, md ls, sli slt-bnd c grvlly, m SAND to f GRVL		
25	*Mod brn , damp to wet, soft to med stiff, v sli clayey, SILT*	*Aquitard*	
	Bottom of Borehole Completed 06/14/2015		
30			
35			
40			
45			
50			



PROJECT NAME: Eastside ASR Feasiblity
DRILLING METHOD: Sonic, 6-inch casing, 4-inch sample
DRILLER: Pete Rosenberg (driller), Jacob, Josh (helpers)
FIRM: Holt Services, Inc
CONSULTING FIRM: Northwest Land & Water, Inc
REPRESENTATIVE: Jim Mathieu, Hydrogeologist
LOCATION: SW 1/4 NE 1/4 Sec 36 T6N, R35E
WELL NAME: GW_163; aka MFS-2
WELL TAG & START CARD: L112703 & 1026829

Figure 6 (page 1 of 1)
GW_163 Geologic Log & Monitoring Well As-Built

Eastside Milton-Freewater, OR
Walla Walla Basin Watershed Council

NORTHWEST Land & Water, INC.

version 06/30/15

C:\Projects\WWBWC\...\GeoLog&Asbuilt_MFS-2(shallow)_pg1of2.dwg

Appendix B

Walla Walla Basin Watershed Council

Eastside ASR Characterization Pumping Test GPS Survey Report

DRAFT Report

Steven Patten – Sr. Environmental Scientist

Submitted: June 2016

In Cooperation with:

WASHINGTON STATE DEPARTMENT OF ECOLOGY

NORTHWEST Land & Water, INC. Consulting in Hydrogeology

Overview

The Walla Walla Basin Watershed Council conducted a survey-grade GPS survey of surface and groundwater monitoring sites in the spring of 2016 to establish accurate coordinates and elevations for the Eastside ASR Characterization Pumping Test project. Establishing an accurate location (longitude/latitude and elevation) of each monitoring site is vital for analyzing data accurately from each of the pumping tests. The survey included pumping wells, monitoring wells and river stage location.

Methods

The Walla Walla Basin Watershed Council utilized a set of survey-grade GPS units. These survey-grade GPS units (Magellan ProMark 3) were used to establish location and elevation for pumping wells, monitoring wells and river stage locations. The ProMark 3 measures locations with an accuracy of 5 centimeters or less (if given the correct conditions). Two units were used, a BASE unit and a ROVR unit. Both units used 2 meter SECO rods. The BASE unit was set up at established control points that were tied back to published control points. At each control point, a stake with a screw on top was put into the ground so the BASE station could be placed in the same location each time it was set up (Figure 1). The BASE unit was started first and allowed to run during surveying activities without interruption. The ROVR unit was set up and placed on the monitoring site. Well locations were either measured at ground surface (for purpose built monitoring wells – see Figure 2) or at the measurement point (for non-purpose built monitoring/pumping wells – see Figure 3). River stage locations were measured at the bottom of the staff gauge (see Figure 4). Data were downloaded and post-processed using GNSS Solutions software. Data were processed in UTM 11N, NAD83 Spatial Reference System with units of meters. Data were imported into ArcGIS and displayed visually for a quality check of the data and to create a map.

Summary

The GPS survey provided accurate location and elevation information for pumping, monitoring and river stage monitoring sites for the Eastside ASR Characterization Pumping Test project. Establishing extremely accurate locations (average of <1.5 cm accuracy for horizontal confidence) and elevations (average of <1.0 cm accuracy for vertical confidence) for monitoring sites allows for better analysis of pumping test data. LIDAR flight information is available for most of the project area, which may be utilized for additional analysis.

Figure 1. BASE unit located at HBDIC Aquifer Recharge Project site. Notice the bottom of the BASE unit is on a stake with a screw (green circle) for accuracy when repeatedly setting up the BASE unit.

Figure 2. Typical location for GPS measurement at purpose built groundwater monitoring locations.

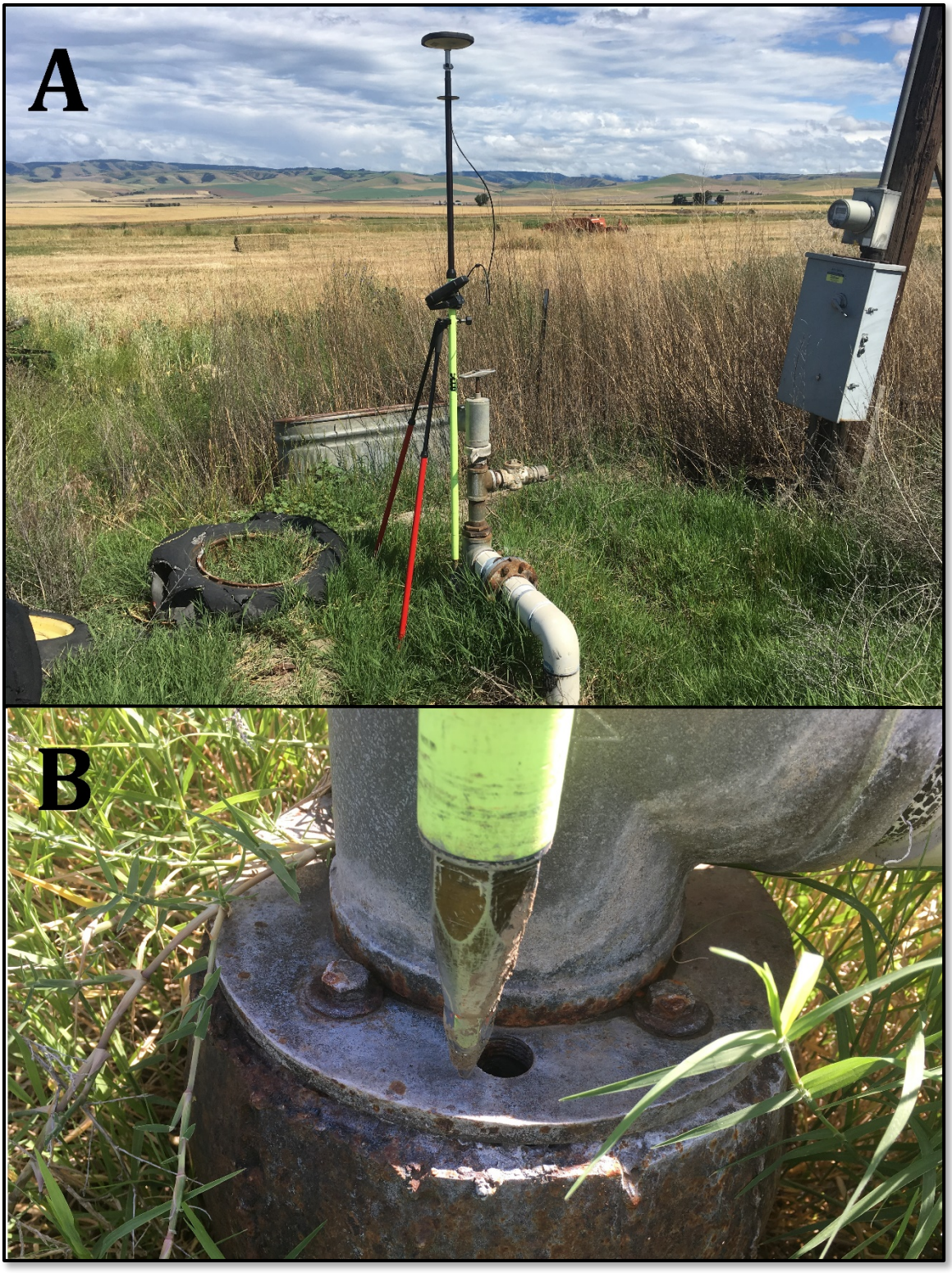


Figure 3. Typical location for GPS measurement at non-purpose built groundwater monitoring and pumping well locations. A – Well head and survey equipment. B – Tip of survey rod at measurement point

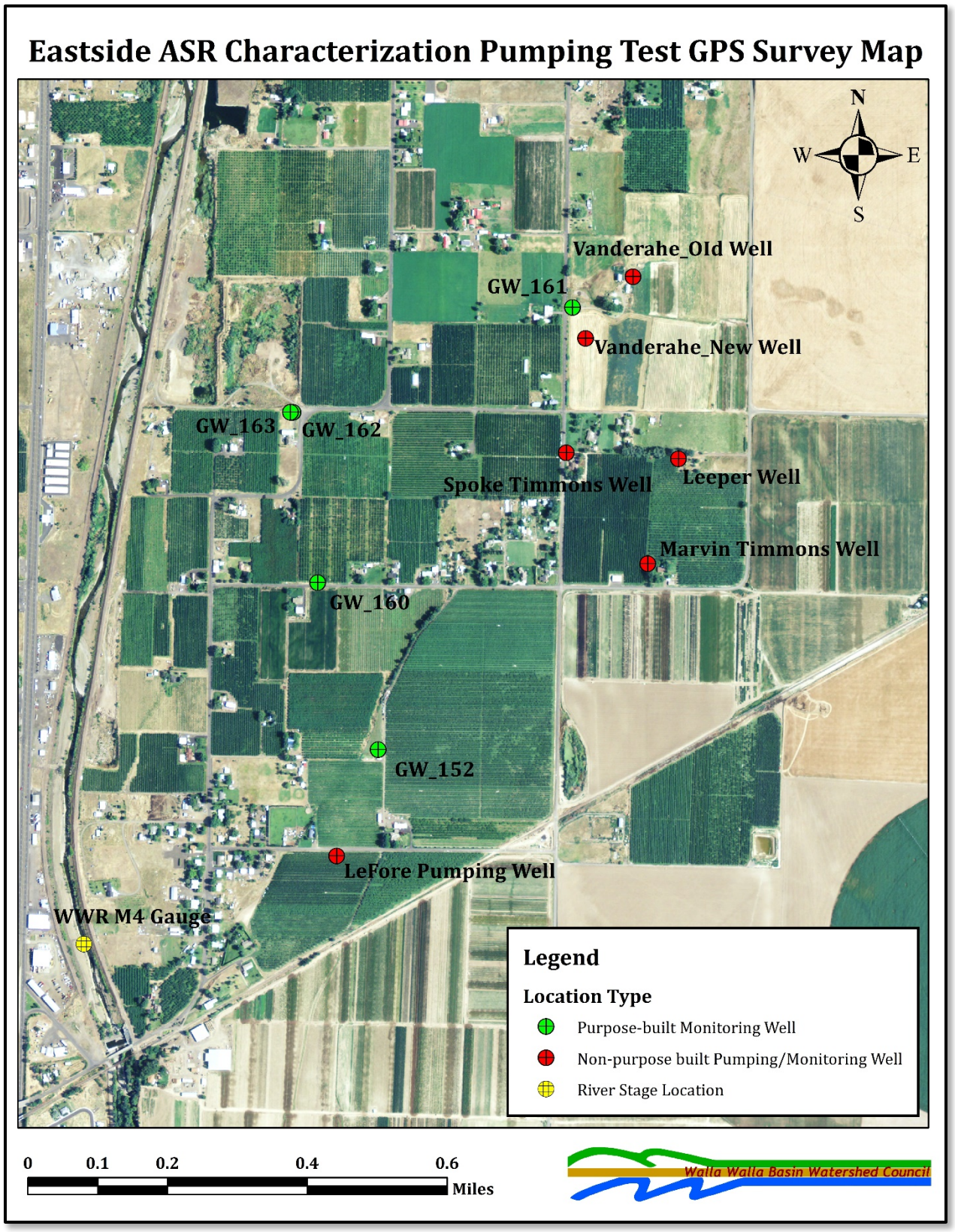
Figure 4. Typical location for GPS measurement at river stage monitoring site. GPS would be placed next to the staff gauge and on the stream/canals substrate. Staff gauge reading and water depth (on survey rod) were also recorded.

Appendix A – GPS Survey Results

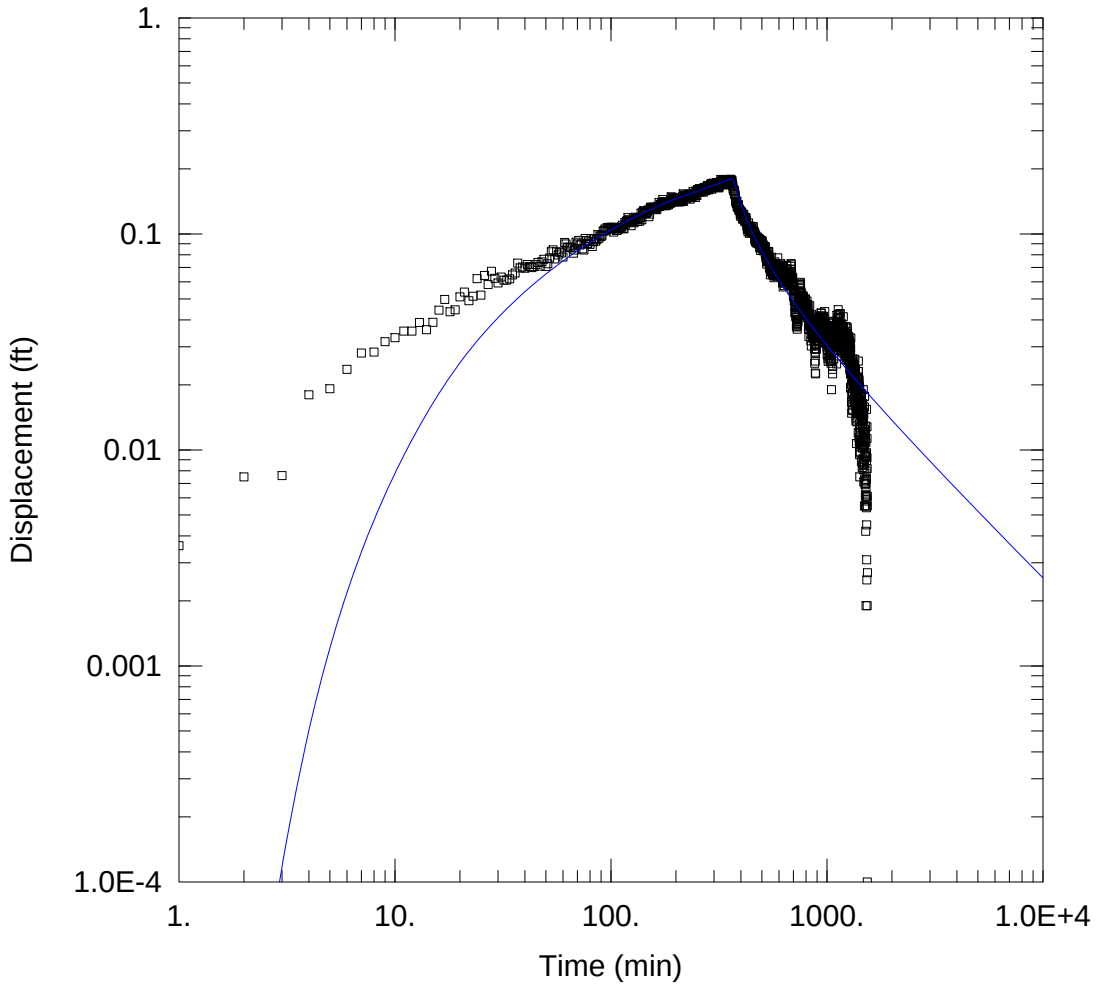
Name	East (meters)	North (meters)	Elevation (meters)	Constraints	Surv_Horz_Conf	Surv_Height_Conf	Type	Warning	TOG_Adjustment
LeFore Pumping Well	393191.362	5089327.026	301.147	No constraints	0.003	0.002	Logged Point	No	(+) 0.10 feet
Marvin Timmons Well	393907.356	5089999.746	288.345	No constraints	0.108	0.07	Logged Point	No	None
Leeper Well	393978.022	5090240.809	286.299	No constraints	0.004	0.002	Logged Point	No	None
Spoke Timmons Well	393719.995	5090254.791	283.53	No constraints	0.004	0.003	Logged Point	No	(+) 0.2 feet
Vanderahe_New Well	393764.138	5090518.286	279.059	No constraints	0.003	0.003	Logged Point	No	None
Vanderahe_Old Well	393873.662	5090659.709	281.111	No constraints	0.003	0.004	Logged Point	No	None
GW_152	393286.724	5089571.48	296.604	No constraints	0.015	0.011	Control Point	No	(-) 0.26 feet
GW_160	393147.417	5089956.004	290.045	No constraints	0.003	0.003	Logged Point	No	(-) 0.33 feet
GW_161	393734.325	5090589.237	278.018	No constraints	0.003	0.004	Logged Point	No	(-) 0.35 feet
GW_162	393090.749	5090347.905	284.768	No constraints	0.003	0.003	Logged Point	No	(-) 0.32 feet
GW_163	393084.789	5090347.965	284.814	No constraints	0.003	0.003	Logged Point	No	(-) -.22 feet
WWR M4 Gauge	392609.137	5089124.399	296.576	No constraints	0.014	0.009	Logged Point	No	None

Survey Datum Info: UTM 11N, NAD83-CORS96, units = meters

Appendix B – Survey Map



Appendix C



Well 56140 EASTSIDE AQUIFER CHARACTERIZATION

Data Set: C:\...\Q__ DD_GW_161.aqt
Date: 05/04/16 Time: 20:43:22

PROJECT INFORMATION

Company: NLW
Client: WWBWC
Project: 1601
Location: M-F, OR
Test Well: Well 56140
Test Date: 3/14/16

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well 56140	0	0

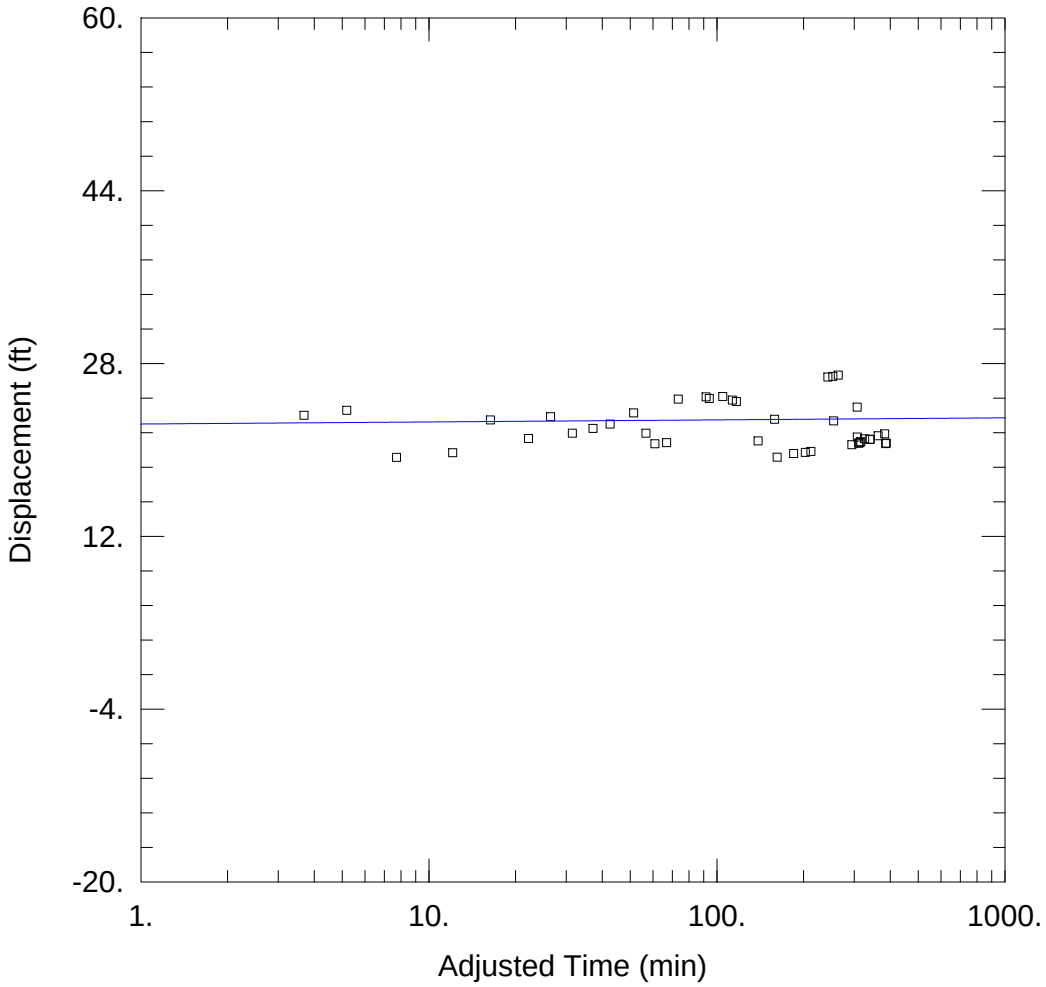
Observation Wells

Well Name	X (ft)	Y (ft)
GW_161	250	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 1.525E+5 gal/day/ft
Kz/Kr = 1.
S = 0.01401
b = 35. ft



WELL TEST ANALYSIS

Data Set: C:\...\Q_ Well 56140 _new_DD_ Well 56140 .aqt
Date: 06/24/16 Time: 18:43:36

PROJECT INFORMATION

Company: NLW
Client: WWBWC
Project: 1601
Location: M-F, OR
Test Well: Well 56140
Test Date: 3/14/16

AQUIFER DATA

Saturated Thickness: 1. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well 56140	0	0

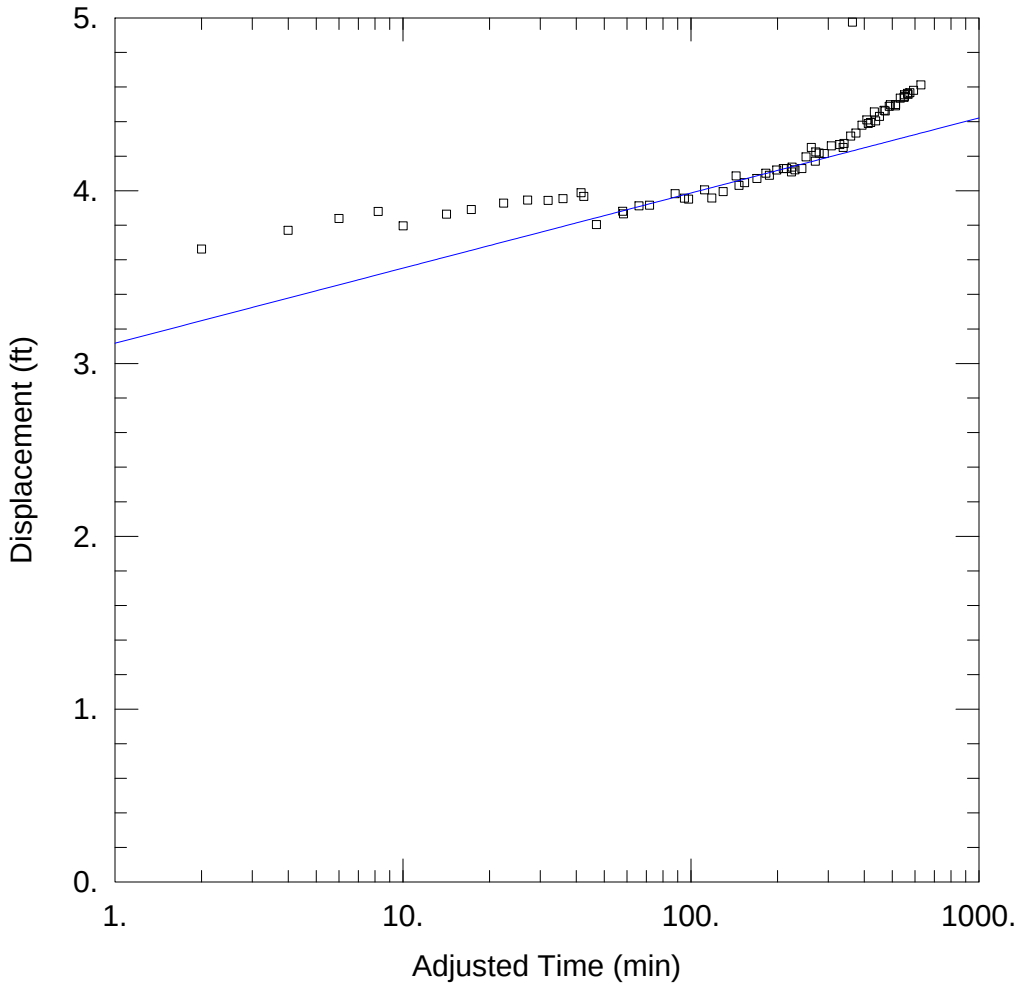
Observation Wells

Well Name	X (ft)	Y (ft)
Well 56140	0	0

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 1.245E+5 gal/day/ft S = 1.207E-116



EASTSIDE AQUIFER CHARACTERIZATION

Data Set: C:\...\Q_ **Well 5239** _DD_ **Well 5239** .aqt
Date: 05/04/16 Time: 20:46:12

PROJECT INFORMATION

Company: NLW
Client: WWBWC
Project: 1601
Location: M-F, OR
Test Well: **Well 5239**
Test Date: 5/3/16

AQUIFER DATA

Saturated Thickness: 1. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well 5239	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
Well 5239	0	0

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 1.251E+5 gal/day/ft S = 1.761E-6