G4-36165 Hydrogeologic Analysis

The applicant's well is located approximately 1000 ft East of the Teanaway River, at an area that is approximately 0.6 mile upstream from its confluence with the Yakima River (figure 1). The well is completed at a depth of 175 ft below ground surface into an aquifer composed of glacial outwash deposits of sands and gravels (figure 2). The aquifer is overlain by thick layers of clay and silt that were likely deposited in a Pleistocene age glacio-lacustrine environment.

Wells in the area tend to be completed either in the clay layers or the underlying sands and gravels. The sands and gravels aquifer seems to be highly heterogeneous and intermixed with thin discontinuous layers of clay. Yields for wells completed into the sands and gravels aquifer vary from 5 to 75 gpm. The closest mapped well is the Jene Monroe well at approximately 650 ft ft to the southeast from the applicant's well (figure 1). The Jene Monroe well is also completed into the sands and gravels aquifer at a depth of 290 ft below ground surface. The drawdown response in this well due to pumping at the applicant's well was estimated using a Theis formula driven spreadsheet model with horizontal hydraulic conductivity set at 35 ft/d and Storativity at 0.0003. The result shows that impairment is not expected at the neighboring well.

The applicant plans to rely on purchased Teanaway River waters from the Bourne water bank as mitigation for the consumptive portion of the requested volume. This is considered suitable mitigation because the applicants well would capture groundwater that would have otherwise discharged to either the Teanaway or the Yakima Rivers.

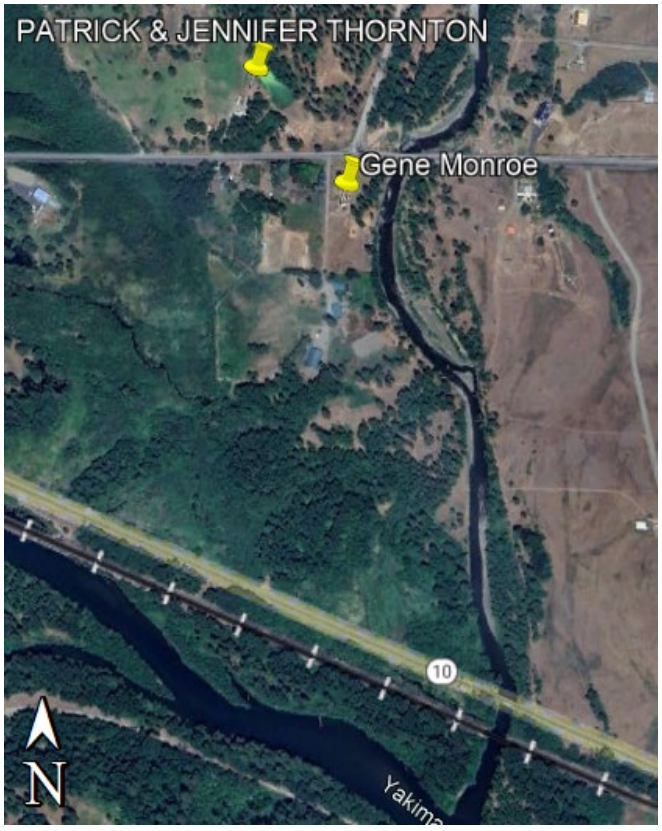

Figure 1

WATER WELL REPORT

ECOLOGY Original & 1st copy Ecology 2nd copy owner 3rd copy driller

Construction/Decommission (x in circle) 145331
- ○ Construction
- ○ Decommission *ORIGINAL CONSTRUCTION Notice of Intent Number*

CURRENT Notice of Intent No W163951

Unique Ecology Well ID Tag No AKI 966

Water Right Permit No

Property Owner Name Don Osmonovich

Well Street Address 211 Seaton rd

City Ellensburg County Kittitas

Location SE 1/4 1/4 SE 1/4 Sec 33 Twn 20 R 16 EWM or WWM *circle one*

Lat/Long (s,t,r still REQUIRED) Lat Deg Lat Min/Sec Long Deg Long Min/Sec

Tax Parcel No 20 16 33 040011

PROPOSED USE ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other

TYPE OF WORK Owner's number of well (if more than one)
☒ New Well ☐ Reconditioned *Method* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS Diameter of well 6" inches drilled 175 ft
Depth of completed well 172 ft

CONSTRUCTION DETAILS
Casing Installed ☒ Welded 6 Diam from +2 ft to 164 ft
☐ Liner installed Diam from ft to ft
☐ Threaded Diam from ft to ft

Perforations ☐ Yes ☒ No
Type of perforator used
SIZE of perfs in by in and no of perfs from ft to ft

Screens ☒ Yes ☐ No ☒ K Pac Location 164'
Manufacturer's Name S. Johnson
Type Model No
Diam 5" Slot Size 20 from -170 ft to -175 ft
Diam Slot Size from ft to ft

Gravel/Filter packed ☐ Yes ☒ No ☐ Size of gravel/sand
Materials placed from ft to ft

Surface Seal ☒ Yes ☐ No To what depth? 24' ft
Materials used in seal Benonite
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? Depth of strata
Method of sealing strata off

PUMP Manufacturer's Name
Type H P

WATER LEVELS Land surface elevation above mean sea level ft
Static level 60 ft below top of well Date 2/9/04
Artesian pressure lbs per square inch Date
Artesian water is controlled by (cap valve etc)

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
Yield gal/min with ft drawdown after hrs
Yield gal/min with ft drawdown after hrs
Recovery data (time taken as zero when pump turned off)(water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
	Aprox 4 to 5 gpm Air Lift				

Date of test
Bailer test 4-5 gpm with ft drawdown after hrs
Airtest gal/min with stem set at ft for hrs
Artesian flow g p m Date
Temperature of water Was a chemical analysis made? ☐ Yes ☐ No

CONSTRUCTION OR DECOMMISSION PROCEDURE
Formation Describe by color character size of material and structure and the kind and nature of the material in each stratum penetrated with at least one entry for each change of information Indicate all water encountered (USE ADDITIONAL SHEETS IF NECESSARY)

MATERIAL	FROM	TO
Topsoil	0	14
Sandy gray clay + multi color mH	14	35
Silty gravel grey w clay lenses S	35	70
Clay + Shale Gry S	70	82
Silty Sand Grey S	82	88
Multi Color Gravels Grey m#	88	96
Clay grey w trace shale S	96	110
Clay multi color gr. Grey MH	110	112
sandy clay trace of gravel Blue S	112	132
Clay Blue Gray Bl Gray m	132	169
Silty Sand Gravel Multy C m	169	175

Start Date 2/2/2004 Completed Date 2/9/2004

DEPT OF ECOLOGY Received FEB 13 2004 CENTRAL REGIONAL OFFICE

WELL CONSTRUCTION CERTIFICATION I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Steve Mills
Driller/Engineer/Trainee Signature Steve Mills
Driller or Trainee License No 1335

Drilling Company Waterman Well Drill Inc
Address PO Box 246
City, State, Zip Selah Wa 98942
Contractor's Registration No WATERWD022DB Date 2/9/04

If trainee, licensed driller's Signature and License no

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Figure 2 Proposed well.

WATER WELL REPORT

RECEIVED

ECOLOGY Original & 1st copy Ecology 2nd copy owner 3rd copy driller

JUL 05 2002

DEPARTMENT OF ECOLOGY WELL DRILLING UNIT

Construction/Decommission (x in circle) 118953

☒ Construction

○ Decommission *ORIGINAL CONSTRUCTION Notice of Intent Number*

CURRENT Notice of Intent No W113308

Unique Ecology Well ID Tag No AFE 105

Water Right Permit No

Property Owner Name Gene Monroe A

Well Street Address 1130 Lambert Road

City Cle Elum **County** Kittitas

Location NE 1/4 1/4 NE 1/4 Sec 4 Twn 19 R 16 EWM or WWM (circle one)

Lat/Long (s t,r still REQUIRED) Lat Deg ____ Lat Min/Sec ____ Long Deg ____ Long Min/Sec ____

Tax Parcel No

PROPOSED USE ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other

TYPE OF WORK Owner s number of well (if more than one)

☒ New Well ☐ Reconditioned *Method* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS Diameter of well 6 inches drilled 295 ft

Depth of completed well 292 ft

CONSTRUCTION DETAILS

Casing Installed ☒ Welded 6 Diam from +2 ft to 287 ft

☐ Liner installed 5 Diam from 281 ft to 287 ft

☐ Threaded ____ Diam from ____ ft to ____ ft

Perforations ☐ Yes ☒ No

Type of perforator used

SIZE of perfs ____ in by ____ in and no of perfs ____ from ____ ft to ____ ft

Screens ☒ Yes ☐ No ☒ K Pac Location 281

Manufacturer s Name Johnson

Type Stainless Steel Model No

Diam 5 Slot Size 025 from 287 ft to 292 ft

Diam ____ Slot Size ____ from ____ ft to ____ ft

Gravel/Filter packed ☐ Yes ☒ No ☐ Size of gravel/sand

Materials placed from ____ ft to ____ ft

Surface Seal ☒ Yes ☐ No To what depth? 23 ft

Materials used in seal Bentonite

Did any strata contain unusable water? ☐ Yes ☒ No

Type of water? Depth of strata

Method of sealing strata off

PUMP Manufacturer s Name

Type H P

WATER LEVELS Land surface elevation above mean sea level ft

Static level 15 ft below top of well Date 6/11/02

Artesian pressure ____ lbs per square inch Date

Artesian water is controlled by (cap valve etc)

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

Yield ____ gal /min with ____ ft drawdown after ____ hrs

Yield ____ gal /min with ____ ft drawdown after ____ hrs

Recovery data (time taken as zero when pump turned off)(water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test

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

Airtest 75 gal /min with stem set at 291 ft for 2 hrs

Artesian flow ____ g p m Date

Temperature of water ____ Was a chemical analysis made? ☐ Yes ☒ No

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation Describe by color character size of material and structure and the kind and nature of the material in each stratum penetrated with at least one entry for each change of information Indicate all water encountered (USE ADDITIONAL SHEETS IF NECESSARY)

MATERIAL	FROM	TO
Cobbles & Bolders w/silt	0	13
Sand(moist) w/gravel	13	17
Clay(blue)	17	18
Clay(brown)	18	19
Clay(blue)	19	25
Sand(grey) Fine W B.	25	36
Sand & Gravel W.B.	36	38
Clay(blue)	38	61
Sand(grey) Fine W.B.	61	67
Clay(blue)	67	73
Sand(grey) Fine W.B.	73	77
Clay(blue)	77	104
Sand(grey) Fine W B	104	108
Clay(blue)	108	125
Sand(grey) Fine W.B.	125	131
Clay(blue)	131	223
Sand(grey) Fine W B	223	226
Clay(blue)	226	257
Clay(blue)w/sand & gravel	257	263
Sand & Gravel w/silt W.B.	263	271
Sand & Gravel Coarse w/water	271	295
6" Drive shoe utilized		

DEPT OF ECOLOGY WELL DRILLING SECTION JUL 10 2002

Start Date 6/11/02 Completed Date 6/18/02

WELL CONSTRUCTION CERTIFICATION I constructed and/or accept responsibility for construction of this well and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Michael Robinson

Driller/Engineer/Trainee Signature

Driller or Trainee License No 1514

Drilling Company Pratt Bros Well & Pump

Address 2309 S 3rd Ave

City State Zip Yakima, WA 98903

Contractor s Registration No PRATBI0334S Date 6/28/02

If trainee licensed driller s Signature and License no

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Figure 3 Neighboring well.