



Clearwater Geosciences, LLP
Ground Water Development and Exploration

March 4, 2012

Mr. James Cefalo
Idaho Department of Water Resources
900 North Skyline Drive, Suite A
Idaho Falls, ID 83402-1718

RE: AQUIFER ANALYSIS FOR SHAWN BARBER WATER RIGHTS APPLICATION

Dear Mr. Cefalo:

A groundwater impact assessment is provided in this letter report for the Shawn Barber's Water Right Application. He has 14 acres of farm land north of Malad, Idaho (Figure 1), which he plans to irrigate. For this impact analysis I conducted a computer simulation to predict the potential impacts to neighboring wells within ½ mile of the proposed point of diversion (POD). The results of the computer analysis show that the proposed diversion rate will have a minimal or negligible impact on neighboring wells.

Nearby Wells

An evaluation was made for existing wells and springs within ½ miles radius of the proposed well location. Figure 2 shows a circle of ½ miles radius centered on the proposed Barber well location. The circle encompasses almost all of Section 3, T14S, R36E (see Figure 3). A search of the IDWR on-line data base indicates that there are six water rights in Section 3, one spring and five groundwater sources. The results of the water right search are provided in Table 1. The diversion rate ranges from 0.06 cfs to 1.2 cfs. Only one water right is for irrigation, the other permits are for domestic or stockwater.

A search was performed of the IDWR drillers' log database for wells within ½ mile of the proposed well location and 15 logs were found. The summary list is provided in Table 2 and the complete logs are provided in Attachment 1. The well depths range from 80 to 400 ft with an average depth of 178 ft. The average depth to water is 68 ft. There may be other wells within a ½ mile of the proposed location but they are not on record by either water right or drillers' logs in the IDWR data base.

Geology

The Malad Valley is surrounded by mountains of old crystalline rock which were uplifted and formed a deep valley between them. Figure 4, 5 and 6 show a geologic map, a location map for an east-west cross section line north of Malad and the geologic cross section, respectively. During the ice ages, the entire Salt Lake Basin was filled with water forming a vast inland lake on several occasions. The water extended into the area of the subject property. During periods of high water fine sediment and sand were deposited. During periods of low water the soft sediments were incised by surface streams, which also deposited coarse sands and gravels.

Two of the most prominent lake levels were the Bonneville at about 5200 ft and the Provo at about 4800 ft above mean sea level. The elevation of the subject property is about 4860 ft, so it is expected that fine lake bed sediments from the Bonneville Lake Level exist in the shallow subsurface below the Barber property. The lake bed sediments were probably cut by the ancestral Devils Creek. This stream also deposited sands and gravels as reported on the well drillers logs.

The geology described on Driller's well logs is consistent with the regional geologic setting. They describe a series of unconsolidated sands, gravels, cobbles and clays. There is not a marker layer or geologic unit that can be correlated over distances between wells (~ ½ mile). The inability to correlate geologic layers is consistent with the area being situated in a cut and fill sequence of Devils Creek that



Clearwater Geosciences, LLP

Ground Water Development and Exploration

meandered across the landscape during low water. The geology is complicated by waxing and waning cycles of Lake Bonneville, which deposited layers of fine sediment (shown in Figure 6). For the purposes of this investigation it is assumed that the aquifer thickness is 100 ft in this area. This is based on driller logs and regional geologic studies including two reports by the U.S. Geologic Survey on water supply (Pluhowski, 1970) and ground water availability (Burnham, Harder and Dion, 1969). These reports describe an aquifer thickness of greater than 100 ft but since there are no deep wells in the vicinity to prove this, only a 100 ft thick aquifer is considered here. It should be noted that the aquifer is not a homogenous layer but a sequence of permeable sand and gravel stringers, which are primarily confined. However, locally parts of the aquifer are unconfined.

Impact Assessment

Mr. Barber requires 0.28 cfs or 126 gpm to irrigate his 14 acres. A forward solution using the AQTESOLV Ground Water Software was employed to estimate the drawdown and impact to neighboring wells from pumping of the proposed Barber Well at a rate of 126 gpm, 24 hours per day for 180 days.

The subject property is located near the mouth of the Devil Creek Valley, which is tributary to the Upper Malad Valley. The calculations must represent the geometry of the aquifer for this location. Figure 7 shows the modeled domain. It is one mile wide and 2 miles long. The northeast, northwest and southeast boundaries are considered to be a no flow boundaries because the mountains, being composed of Paleozoic and Mesozoic sedimentary rock, have significantly less permeability (northwest and southeast sides of the model domain). The Devils Creek Valley narrows considerable to the northeast, yet its contribution to the model domain is not zero. However, without additional information it is not possible to model its contribution accurately. This boundary was set to be a no-flow boundary. The no flow boundary condition is very conservative because it over predicts the impact from the Barber well. It is likely that the modeled drawdown will less than predicted. The southwest boundary, which is open to the Malad Valley, is maintained at a fixed head. This is a reasonable approximation of the actual conditions as the Malad Valley widens considerably at this location. This boundary condition also helps account for valley underflow from Deep Creek, which is not otherwise accounted for in the model.

Typical aquifer parameters for transmissivity and storativity were taken from the literature for sediments representative of the materials penetrated by wells in the area (Freeze and Cherry, 1979). The value for a clean sand aquifer was selected even though significant gravel layers are reported in wells. This value is lower than measured in pumping tests south and southwest of Malad. The thickness of the aquifer is not well known but it probably exceeds 100 ft as a cumulative thickness in most locations. Two aquifer thicknesses were considered, 50 ft and 100 ft. In a similar manner, the aquifer confining conditions are not known, so both water table (unconfined) and artesian (confined) conditions were evaluated. The input parameters to the model are listed in Table 2-1 and the model boundaries are given in Table 2-2 (see Attachment 2).

Figures 2-1 to 2-4 shows the AQTESOLV® output plots of the forward calculation for the proposed well pumping at 0.28 cfs (126 gpm) constantly for 6 months (the maximum period of time and flow rate requested in the application). The predictions are based on idealized, 100% efficient wells. In the proposed Shawn Barber Well, at the end of the time period, the predicted drawdown is estimated to range from 1.5 to 2.5 feet depending on the aquifer scenario considered. The maximum calculated drawdown for a well ½ mile south of the proposed well is less than 0.5 ft for the most conservative aquifer scenario considered. This amount of drawdown will be negligible to other groundwater users in the area.

It is my professional opinion that Mr. Barber's water right application will not excessively impact his neighbors' right to divert water. I believe that the calculated drawdown over estimates the actual drawdown to be expected for several reasons: 1) Mr. Barber will not pump his well continuously at the maximum rate for 180 days nor will he consume 100 acre – ft in a single year; 2) the Paleozoic/Mesozoic



Clearwater Geosciences, LLP
Ground Water Development and Exploration

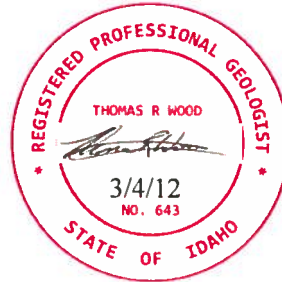
rocks of the mountains are not totally impermeable and will provide some water to the system, thus reducing drawdown, 3) Devil's Creek and Deep Creek are within the domain of the model and no credit was taken for recharge/leakage and no credit was taken for valley under-flow from the Devil Creek Valley (i.e. considered a no-flow boundary). All of these factors will reduce the predicted drawdown presented here.

Please do not hesitate to call me if you have any questions about this letter or the calculations presented.

Respectfully,

A handwritten signature in black ink, appearing to read "Thomas R. Wood".

Thomas R. Wood, PhD, PG



cc

Mr. Shawn Barber, 435 East 3320 North, Malad, ID 83252

References

- Burnam, W. L., Harder, A.H., and Dion, N.P., 1969, Availability of ground water for large-scale use in the Malad Valley-Bear River areas of Southeastern Idaho-an initial assessment, USGS Open-file Report, 1969, 69-28.
- Freeze, R.A. and J.A. Cherry, 1979, Groundwater, ISBN 0-13-365312-9, Prentice-Hall, Inc., Englewood Cliffs, New Jersey 07632.
- Pluhowski, E.J., 1970, Hydrology of the Upper Malad River Basin, Southeastern Idaho, USGS Water-Supply Paper, 1970; 1888.

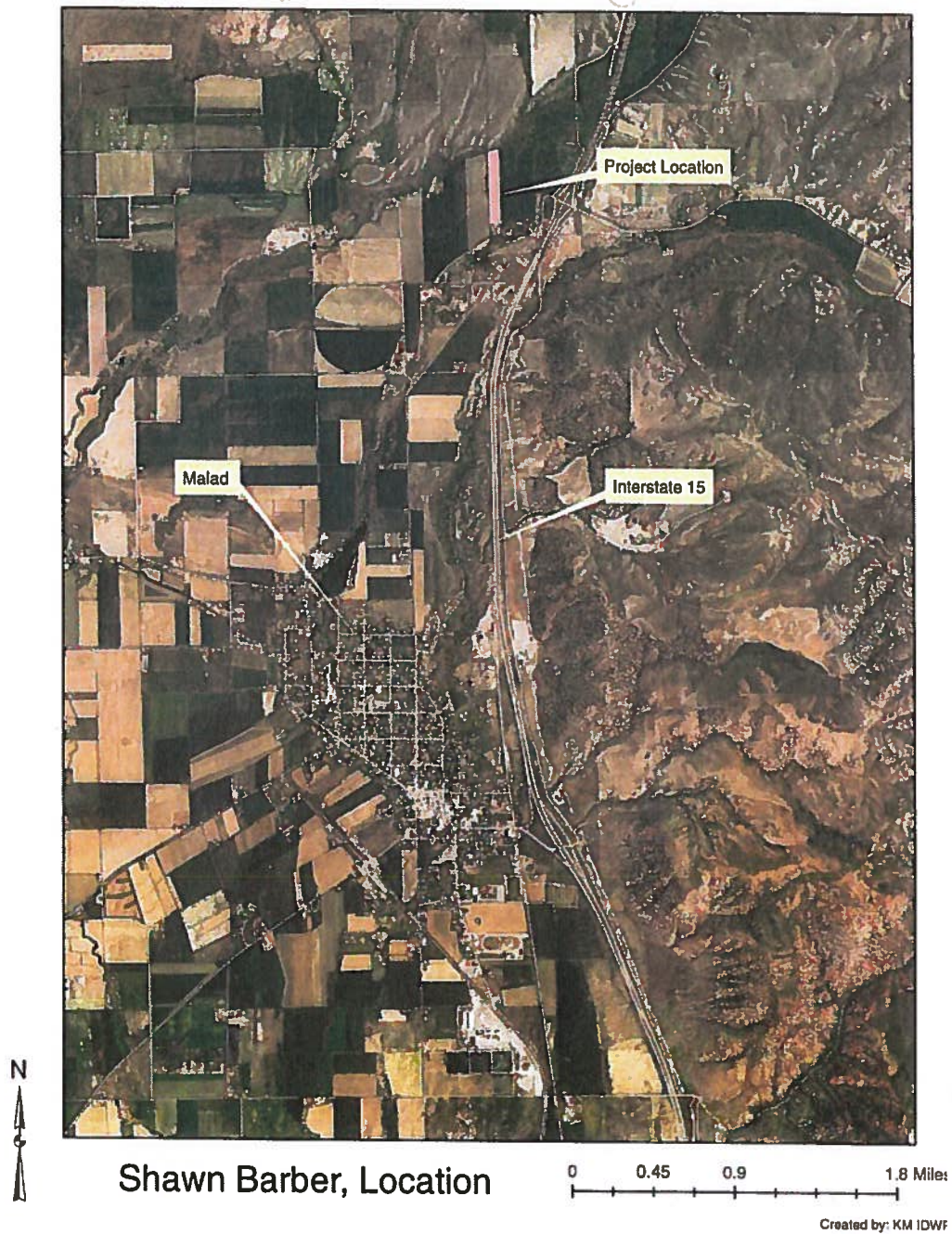


Figure 1. Map showing locations of the Proposed Barber Well, Malad and Interstate 15. (map by IDWR)

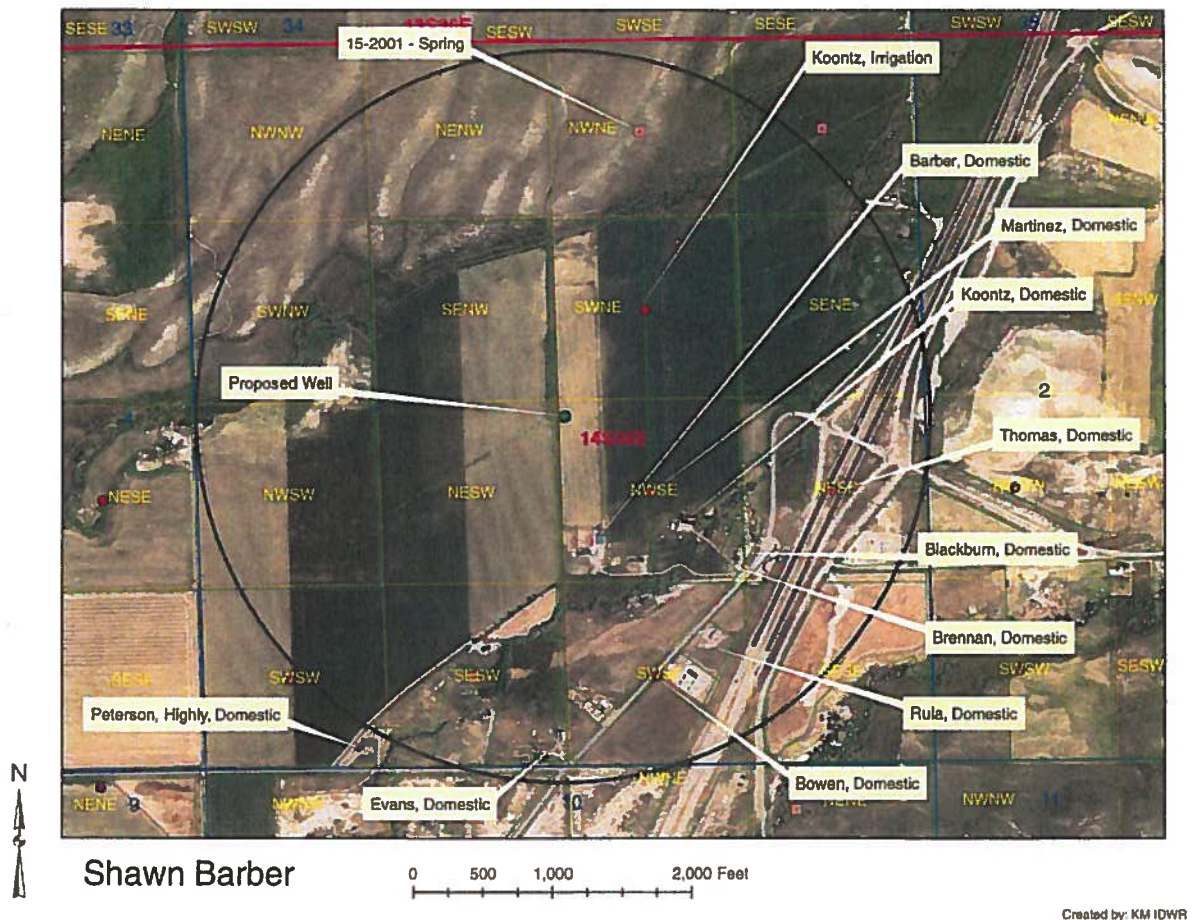


Figure 2 Earth image of area with a circle of $\frac{1}{2}$ mile diameter centered on Barber proposed well. Recorded locations of neighboring wells are posted. Locations of wells are only approximate as location descriptions are general in the IDWR data base. (map by IDWR)

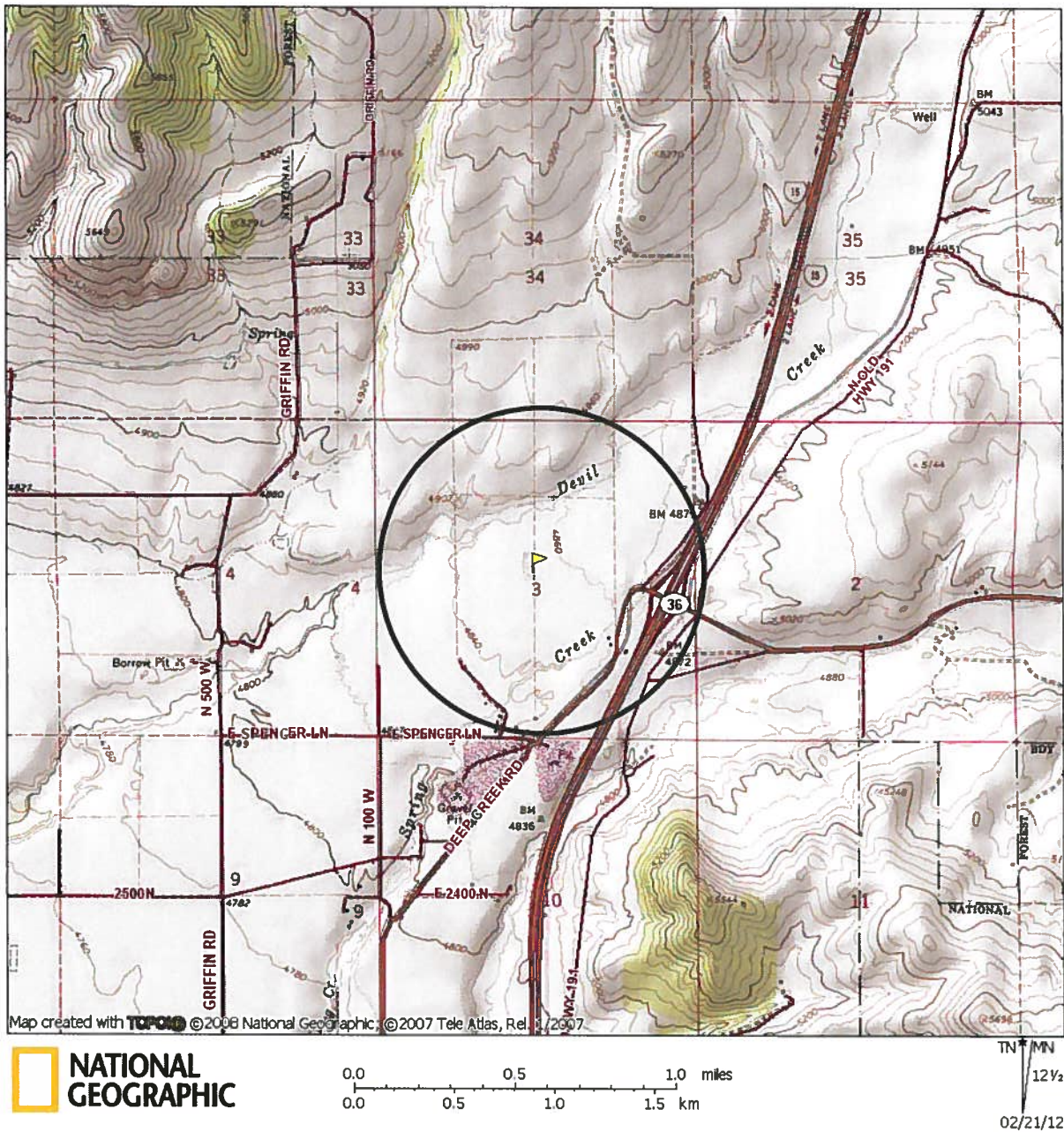


Figure 3. Barber proposed well location shown with yellow flag and approximate 1/2 mile radius circle shown with black circle.

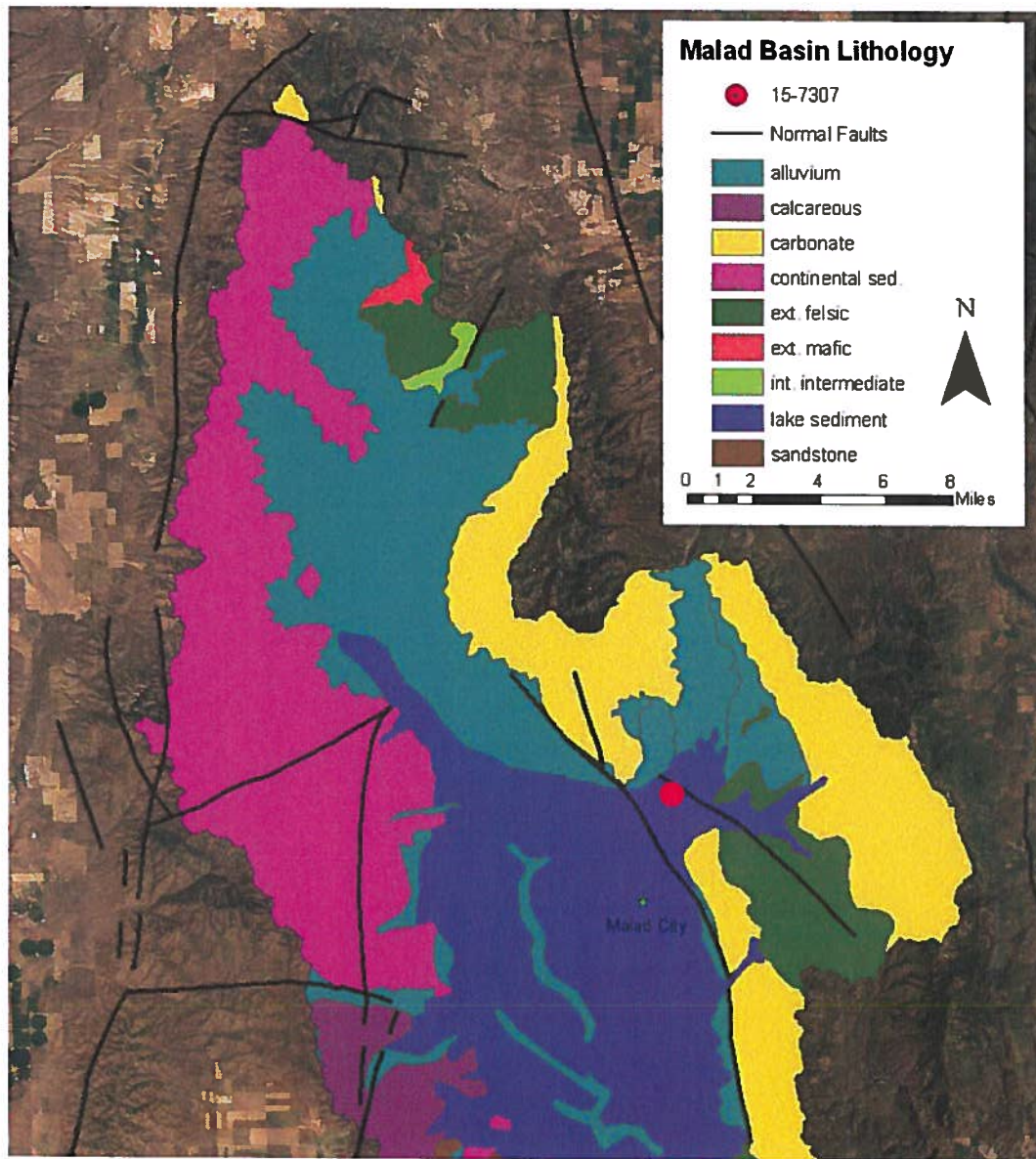


Figure 4 General geology of the Malad Basin. General location of the Shawn Barbara proposed well shown with red dot.

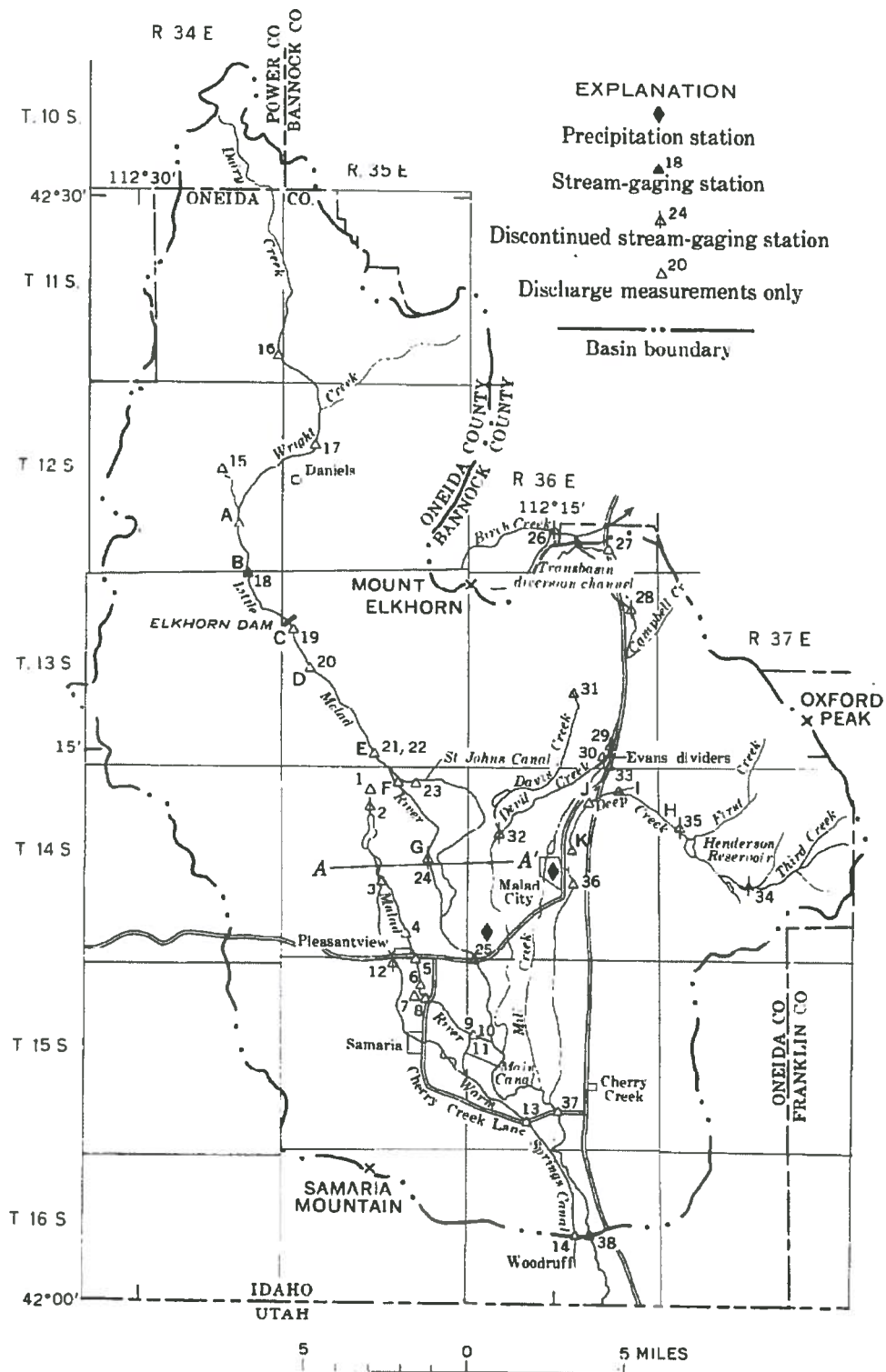


Figure 5. Note location of cross-section A to A' for cross-section on the following page.

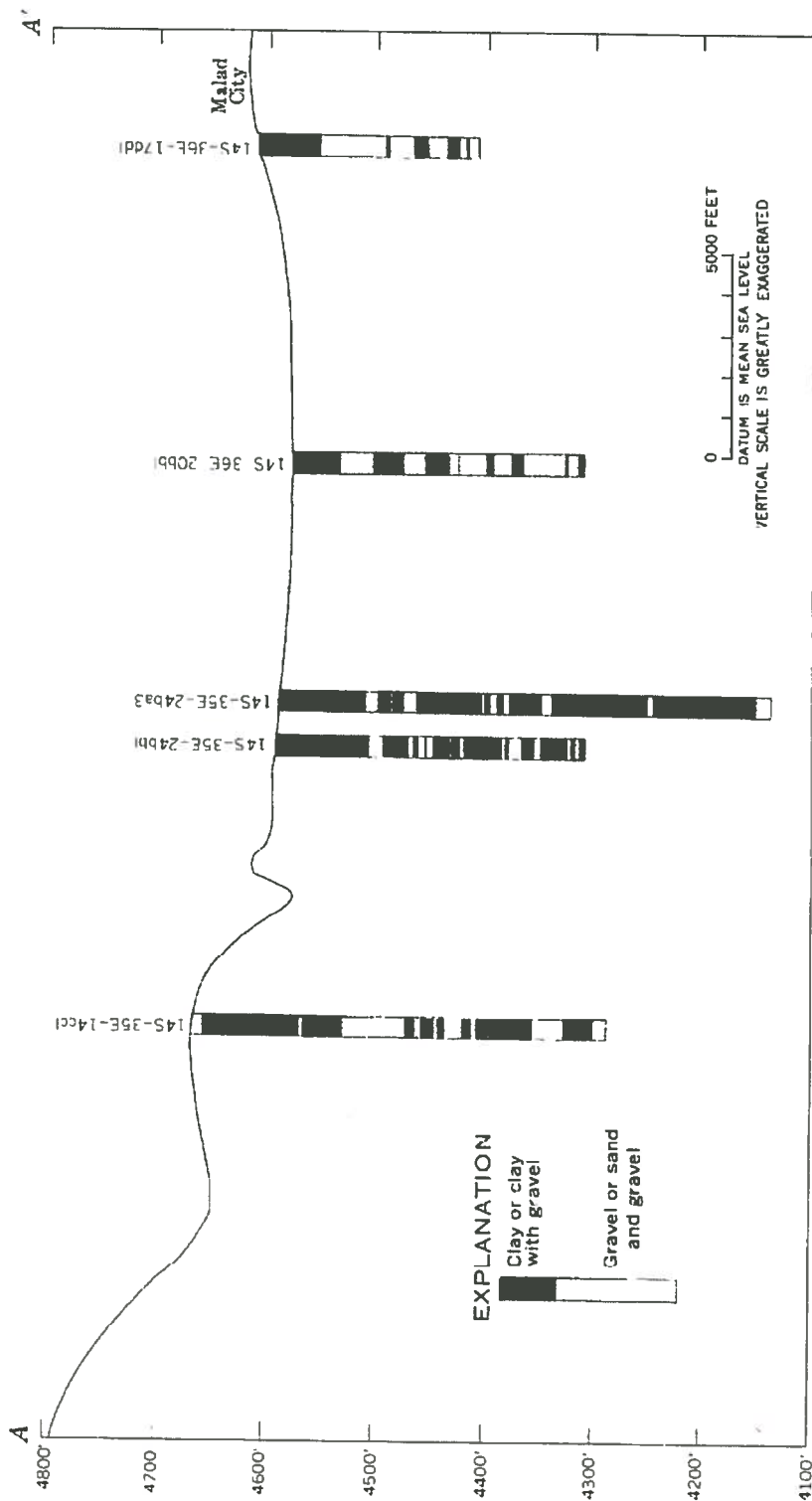


Figure 6. This cross section shows the clay layers deposited in large lakes that filled the Salt Lake Basin during the Ice Ages.

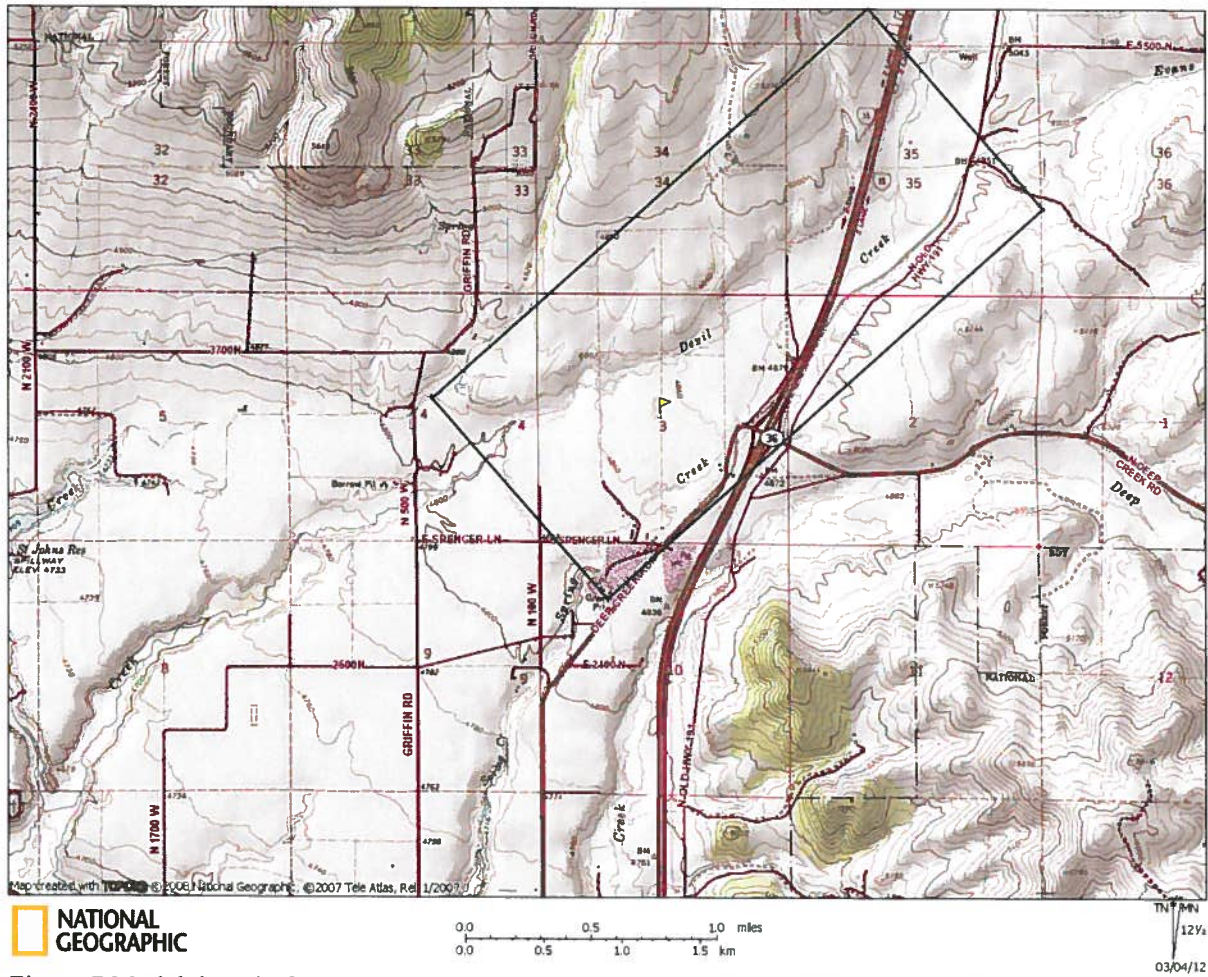


Figure 7 Model domain for AQTESOLV calculation. The domain is 5280 ft by 10560 ft.



Clearwater Geosciences, LLP
Ground Water Development and Exploration

Table 1 IDWR Search results for point of diversions in T14S, R36E, Section 3

Record	Basin	Sequence	Suffix	Version	Basis	Status	Priority Date	Diversions Rate	Source List	Water Uses	Owner List
1	15	2001			License	Active	6/18/1909	0.06	SPRINGS	DOMESTIC, IRRIGATION	NIEFFENEGGER, HENRY (Current)
2	15	2045	A		License	Active	11/12/1954	0.9	GROUND WATER	IRRIGATION	EVANS, RAYMOND J (Current); JONES, PERRY L (Current)
3	15	2045	B		License	Active	11/12/1954	0.25	GROUND WATER	IRRIGATION	KOONTZ, DORIS D (Current); KOONTZ, THOMAS S (Current)
4	15	4040			Statutory Claim	Active	4/1/1908	0.06	GROUND WATER	IRRIGATION	EVANS, DON W (Current); PALMER, GEORGE L (Current); PALMER, JENKIN (Current); RICHARDS, MELVIN (Current)
5	15	7047			License	Active	12/2/1977	0.06	GROUND WATER	DOMESTIC, STOCKWATER	EVANS, ROBERT H (Current)
6	15	7190				Active	8/29/2000	1.2	GROUND WATER	IRRIGATION	KOONTZ, DORIS D (Current); KOONTZ, THOMAS S (Current)

Number of records = 6

Table 2 Wells on file with IDWR for T14S, R36E Section 3.

Contact	Use	TWP	RNG	SEC	Tract	WellAddress	Gallons Per Minute	Static Water Level	Total Depth	Casing Depth	CSG. DIA.	Construct ion Date	Permit Number
KOONTZ, THOMAS S, KOONTZ, DORIS D	Irrigation, Irrigation	14S	36E		3 SWNE	3325 N DEEP CREEK RD		69	117	117	12	3/30/2001	768145
PETERSON, DARYL	Domestic- Single Residence	14S	36E		3 SWSW	100 E 3000 W	25	96	160	160	6	8/18/2006	841576
HIGLEY, LINN R	Domestic- Single Residence	14S	36E		3 SWSW	73 E SPENCER LN	10	135	280	234	6	10/5/1995	700352
EVANS, ROBERT	Domestic	14S	36E		3 SESW		0	103	120			1/14/1978	809855
THOMAS, GARY	Domestic- Single Residence	14S	36E		3 NESE	540 N DEVIL CREEK RD	5	85	260	260	6	4/15/1996	700360
THOMAS, GARY	Domestic- Single Residence	14S	36E		3 NESE	540 N DEVIEL CREEK RD	0	Above Ground Level	260			4/12/1996	700359
BLACKBURN, NEDRA	Domestic- Single Residence	14S	36E		3 NWSE	3320-1 N DEEP CREEK RD	20	73	120	120	6	4/22/2004	813693
BRENNAN, ROBERT W	Domestic- Single Residence	14S	36E		3 NWSE	3321 N DEEP CREEK RD	30	72	120	-120	6	7/29/2000	765835
BARBER, SHAWN	Domestic- Single Residence	14S	36E		3 NWSE	3323 1/2 DEEP CREEK RD		75	120	-120	8	7/27/2000	765771
KOONTZ, THOMAS S	Domestic- Single Residence	14S	36E		3 NWSE	3325 N DEEP CREEK RD	50	70	110	100	6	7/15/1996	700369
MARTINEZ, MARTIN	Domestic- Single Residence	14S	36E		3 NWSE		50	20	80	20	6	5/17/1996	700366
THOMAS, RULA J	Domestic- Single Residence	14S	36E		3 SWSE	EXIT 17-I-15	0	0	0				700239
THOMAS, RULA J	Domestic- Single Residence	14S	36E		3 SWSE	DEEP CREEK RD	50	70	110	105	8	6/14/1995	700337
THOMAS, RULA J	Domestic- Single Residence	14S	36E		3 SWSE	DEEP CREEK RD	10	Above Ground Level	400	120	8	6/1/1995	700336
BOWEN, CLYDELL J, BOWEN, PAMELA M	Domestic- Single Residence	14S	36E		3 SWSE		22	86	245	175	6	8/2/1991	700232



Clearwater Geosciences, LLP
Ground Water Development and Exploration

Attachment 1

WELL LOGS



Clearwater Geosciences, LLP
Ground Water Development and Exploration

Form 238-7
11/97

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only
Inspected by _____
Twp _____ Rge _____ Sec _____
1/4 _____ 1/4 _____ 1/4 _____
Lat: _____ Long: _____

1. WELL TAG NO. D 0014816
DRILLING PERMIT NO. 7-68145
Other IDWR No. 15-7190

2. OWNER:
Name Doris & Tam Koontz
Address 3325 N Deep Cr. Rd
City Malad State ID Zip 83252

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location.

North ☐ or South ☒
East ☒ or West ☐
Twp. 14 Rge. 36 Sec. 3
Gov't Lot _____ County Oneida NE 1/4
Lat: _____ Long: _____
Address of Well Site 3325 N Deep Cr. City Malad
(Give at least name of road + distance to road or landmark)

Lt. _____ Blk. _____ Sub. _____ Name _____

4. USE:
☐ Domestic ☐ Municipal ☐ Monitor ☒ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD
☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK			AMOUNT		METHOD
Material	From	To	Sacks or Pounds		
Bentonite	0	20	15		Over Bore

Was drive shoe used? ☒ N Shoe Depth(s) 117
Was drive shoe seal tested? ☐ Y ☐ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
12"	0	117	12.50	Steel	☒	☐	☒	☐

Length of Headpipe _____ Length of Tailpipe _____

9. PERFORATIONS/SCREENS

Perforations Method Machine
Screens Screen Type _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
90	116	1/4x1/4"	30	12"	Steel	☒	☐
115	160	1/4x1/4"	30	12"	Steel	☒	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

69 ft. below ground Artesian pressure _____ lb.
Depth flow encountered _____ ft. Describe access port or control devices: _____

11. WELL TESTS:

☐ Pump ☐ Bailor ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Pumping Level	Time
Let of water			

Water Temp. cold Bottom hole temp. cold

Water Quality test or comments: good

Depth first Water Encounter 40

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
16"	0	12	clay		X
16"	12	20	Gravel		X
12"	20	25	Gravel		X
12"	25	40	clay & Gravel		X
12"	40	60	Gravel	X	
12"	60	80	Blue Clay		X
12"	80	90	Brown clay		X
12"	90	95	Shell & Gravel	X	
12"	95	100	Shell		X
12"	100	105	hard cobbles	X	
12"	105	108	Shell		X
12"	108	111	Cobbles & Shell	X	
12"	111	115	Shell		X
12"	115	117	Cobbles & Shell	X	

RECEIVED

MAY 21 2001

RECEIVED

MAY 10 2001

Department of Water Resources
Eastern Region

Completed Depth 117 (Measurable)

Date: Started 3-19-01 Completed 3-30-01

13. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Mountain Well Drilling Firm No. 543

Firm Official Michael Franden Date 4-5-01

and
Driller or Operator _____ Date _____

(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

Figure 1-1 Well log for Koontz Irrigation Well.



Clearwater Geosciences, LLP
Ground Water Development and Exploration

Form 230-2
6/02

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

15

Office Use Only
Well ID No. _____
Inspected by _____
Twp _____ Rge _____ Sec _____
1/4 1/4 1/4
Lat: _____ Long: _____

1. WELL TAG NO. D 0044063
DRILLING PERMIT NO. _____
Water Right or Injection Well No. _____

2. OWNER:
Name Pard Peterson
Address PO Box 103
City Mulad State ID Zip 83252

3. LOCATION OF WELL by legal description:
You must provide address or Lot, Blk, Sub or Directions to well.
Twp 14 North ☐ or South ☒
Rge 36 East ☒ or West ☐
Sec. 3 1/4 SW 1/4 SW 1/4
Gov'l Lot _____
County Oneida Long: _____
Lat: _____
Address of Well Site _____
City _____

4. USE:
☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD:
☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other _____

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method
<u>Benitite</u>	<u>0</u>	<u>30</u>	<u>15 bags</u>	<u>Drum</u>

Was drive shoe used? ☒ Y ☐ N Shoe Depth(s) 160
Was drive shoe seal tested? ☐ Y ☐ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
<u>6</u>	<u>0</u>	<u>160</u>	<u>250</u>	<u>St-304</u>	☒	☐	☒	☐

Length of Headpipe _____ Length of Tail pipe _____
Packer ☐ Y ☐ N Type _____

9. PERFORATIONS/SCREENS PACKER TYPE

Perforation Method Machine
Screen Type & Method of Installation _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
<u>105</u>	<u>135</u>	<u>1/4" x 1/8"</u>	<u>2406</u>			☒	☐

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

26 ft. below ground Artesian pressure _____ lb.
Depth flow encountered _____ ft. Describe access port or control devices: _____

12. WELL TESTS:

Yield gal./min.	Drawdown	Pumping Level	Time
<u>35</u>			

Water Temp. 60 Bottom Hole Temp. _____
Water Quality test or comments: _____

13. LITHOLOGIC LOG: (Describe repairs or abandonment) Water

Elev. Da.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
<u>10</u>	<u>0</u>	<u>13</u>	<u>Brown clay & Gravel</u>	☒	☐
<u>10</u>	<u>13</u>	<u>20</u>	<u>Gravel & Brown clay</u>	☒	☐
<u>10</u>	<u>20</u>	<u>30</u>	<u>Gravel & Brown clay</u>	☒	☐
<u>6</u>	<u>30</u>	<u>55</u>	<u>Gray clay</u>	☒	☐
<u>6</u>	<u>55</u>	<u>95</u>	<u>Brown clay & Sand</u>	☒	☐
<u>6</u>	<u>95</u>	<u>160</u>	<u>Gravel & Cobble clay</u>	☒	☐

RECEIVED

OCT 24 2006

Department of Water Resources
Eastern Region

Complete Depth 160 (Measurable)
Date: Started 8-17-06 Completed 8-18-06

14. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Mountain West Well Drilling Firm No. 543

Principal Driller Michael Frandson Date 8-27-06

Driller or Operator II Mike Frandson Date 8-27-06

Operator I _____ Date _____

Principal Driller and Rig Operator Required.
Operator I must have signature of Driller/Operator II.

FORWARD WHITE COPY TO WATER RESOURCES

Figure 1-2 Well log for Peterson Well.



Clearwater Geosciences, LLP
Ground Water Development and Exploration

Form 238-7
7/84

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Use Typewriter
or
Ball Point Pen

1. DRILLING PERMIT NO. 15-95-E-026-000
Other IDWR No. _____

2. OWNER:
Name Luan Higley
Address 73 East Spencer Lane
City Malad State Id Zip 83252

3. LOCATION OF WELL by legal description:

Sketch map location must agree with written location.

N		Twp. <u>14</u> North ☐ or South ☒	
E		Rge. <u>36</u> East ☐ or West ☐	
S		Sec. <u>3</u> 1/4 SW 1/4 SW 1/4	
W		Gov't Lot _____ County _____	

Address of Well Site _____
City _____
Lt. _____ Blk. _____ Sub. Name _____

4. PROPOSED USE:

☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK

☒ New Well ☐ Modify or Repair ☐ Replacement ☐ Abandonment

6. DRILL METHOD

☐ Mud Rotary ☒ Air Rotary ☐ Cable ☐ Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK			AMOUNT		METHOD
Material	From	To	Backs or Pounds		
Bentonite	0	18	3		

Was drive shoe used? ☒ Y ☐ N Shoe Depth(s) 234
Was drive shoe seal tested? Y ☐ N ☐ How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
6"	0	234	250	Steel	☒	☐	☒	☐

Length of Headpipe _____ Length of Tailpipe _____

9. PERFORATIONS/SCREENS

☐ Perforations Method _____
☐ Screens Screen Type _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
140	150	1/2"	80	250	Steel	☒	☐
215	233	1/2"	120	250	Steel	☒	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

125 ft. below ground Artesian pressure _____ lb.
Depth flow encountered _____ ft. Describe access port or control devices: _____

11. WELL TESTS:

☐ Pump ☐ Bailor ☒ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
10			

Water Temp. _____ Bottom hole temp. _____
Water Quality test or comments: _____

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
	0	10	coarse clay		X
	10	20	Brown clay		X
	20	37	blue clay		X
	37	40	quartz sand	little	X
	40	55	blue clay		X
	55	60	sand		X
	60	70	blue clay		X
	70	73	sand	little	X
	73	75	gravel	little	X
	75	90	gravel & coarse sand		X
	90	95	gravel & coarse		X
	95	100	gravel & sand		X
	100	137	coarse		X
	137	140	gravel		X
	140	160	coarse		X
	160	180	clay & gravel		X
	180	198	sandstone		X
	198	200	coarse		X
	200	228	white shale		X
	228	234	gravel & sand		X
	234	255	white shale		X
	255	260	gravel		X
	260	280	brown sandstone		X

Completed Depth 280 (Measurable)
Date: Started 9-29-95 Completed 10-5-95

13. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name Mountain West Drilling Firm No. 547

Firm Official Mike Zandbergen Date 10-6-95

and Supervisor or Operator _____ Date _____

(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

Figure 1-3 Well log for Higley Well.



Clearwater Geosciences, LLP
Ground Water Development and Exploration

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

USE TYPEWRITER OR BALLPOINT PEN

State law requires that this report be filed with the Director, Department of Water Resources within 30 days after the completion or abandonment of the well.

JUN 27 1978

1. WELL OWNER
Name ROBERT EVANS
Address Malad Ida
Owner's Permit No. _____

2. NATURE OF WORK
☐ New well ☐ Deepened ☒ Replacement
☐ Abandoned (describe method of abandoning)

3. PROPOSED USE
☒ Domestic ☐ Irrigation ☐ Test ☐ Other (specify type)
☐ Municipal ☐ Industrial ☐ Stock ☐ Waste Disposal or Injection

4. METHOD DRILLED
☐ Cable ☒ Rotary ☐ Dug ☐ Other

5. WELL CONSTRUCTION
Diameter of hole 6 inches Total depth 120 feet
Casing schedule: ☐ Steel ☐ Concrete
Thickness 250 inches Diameter 6 inches From 1 feet To 120 feet
Was casing drive shoe used? ☒ Yes ☐ No
Was a packer or seal used? ☐ Yes ☒ No
Perforated? ☐ Yes ☒ No
How perforated? ☐ Factory ☐ Knife ☐ Torch
Size of perforation _____ inches by _____ inches
Number _____ perforations From _____ feet To _____ feet
_____ perforations _____ feet _____ feet
_____ perforations _____ feet _____ feet
Well screen installed? ☐ Yes ☐ No
Manufacturer's name _____
Type _____ Model No. _____
Diameter _____ Slot size _____ Set from _____ feet to _____ feet
Diameter _____ Slot size _____ Set from _____ feet to _____ feet
Gravel packed? ☐ Yes ☐ No Size of gravel _____
Placed from _____ feet to _____ feet
Surface seal depth 29 Material used in seal: ☐ Cement grout
☒ Budding clay ☐ Wall cuttings
Sealing procedure used: ☐ Slurry pit ☒ Temporary surface casing
☐ Overbore to seal depth

6. LOCATION OF WELL
Sketch map location must agree with written location.
Subdivision Name _____
Lot No. _____ Block No. _____
County Owada
SE 1/4 SW 1/4 Sec. 3 T. 14 N/S. R. 36 E/M

7. WATER LEVEL
Static water level 103 feet below land surface.
Flowing? ☐ Yes ☐ No G.P.M. flow _____
Temperature _____ °F. Quality _____
Artesian closed-in pressure _____ p.s.i.
Controlled by: ☐ Valve ☐ Cap ☐ Plug

8. WELL TEST DATA
☒ Pump ☐ Balier ☐ Other
Discharge G.P.M. 17 Drawdown 115 Hours Pumped 2 hr

9. LITHOLOGIC LOG 044920

Hole Diam.	Depth		Material	Water	
	From	To		Yes	No
8	0	7	CLAY GROWN		
8	7	40	GRAVEL & SAND		
6	40	60	BLU. CLAY		
6	60	80	SAND & GRAVEL		
8	80	85	BLU. CLAY		
8	85	90	BLU. CLAY		
8	90	120	SAND		

10. Work started 1-11-78 finished 1-14-78

11. DRILLERS CERTIFICATION
Firm Name Landmark well drilling Firm No. 118
Address 441 So 11th Date 1-14-78
Signed by (Firm Official) Donald Landmark
and _____
(Operator) Donald Landmark

USE ADDITIONAL SHEETS IF NECESSARY - FORWARD THE WHITE COPY TO THE DEPARTMENT

Figure 1-4 Well log for Evans well



Clearwater Geosciences, LLP
Ground Water Development and Exploration

Form 238-7
3/95
BMD

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT
Use Typewriter or Ballpoint Pen

093081

Office Use Only
Inspected by _____
Twp _____ Rge _____ Sec _____
1/4 1/4 1/4
Lat: : : Long: : : :

1. DRILLING PERMIT NO. 15-96-E-0003-000

Other IDWR No. _____

2. OWNER:

Name Gary Thomas

Address Box 205

City Maga State Id Zip 84044

3. LOCATION OF WELL by legal description:

Sketch map location must agree with written location.

N
W E S
Twp. 14 North ☐ or South ☒
Rge. 36 East ☒ or West ☐
Sec. 3 1/4 NE 1/4 SE 1/4
Gov't Lot _____ County Oneida
Lat: _____ Long: _____
Address of Well Site 540 N Apple Creek
City Maga
(One at least name of road - Distance to Road or Landmark)

Lt. _____ Blk. _____ Sub. Name _____

4. USE:

☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)

☒ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD

☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK			AMOUNT		METHOD
Material	From	To	Backs	Pounds	
<u>Bentonite</u>	<u>0</u>	<u>20</u>	<u>4</u>		

Was drive shoe used? ☐ Y ☐ N Shoe Depth(s) _____

Was drive shoe seal tested? ☐ Y ☐ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
<u>6"</u>	<u>0</u>	<u>260'</u>	<u>360</u>	<u>Steel</u>	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe _____ Length of Tailpipe _____

9. PERFORATIONS/SCREENS

☒ Perforations Method Air Perforator
☐ Screens Screen Type _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
<u>180</u>	<u>200</u>	<u>1 1/2"</u>	<u>120</u>	<u>200</u>	<u>Steel</u>	☒	☐
						☐	☐
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

85 ft. below ground Artesian pressure _____ lb.

Depth flow encountered _____ ft. Describe access port or control devices: _____

11. WELL TESTS:

☐ Pump ☐ Bailor ☒ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
<u>56 GPM</u>			

Water Temp. cold

Bottom hole temp. _____

Water Quality test or comments: _____

Depth first Water Encountered _____

12. LITHOLOGIC LOG: (Describe repairs or abandonment) Water

Bore Dia	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
<u>8"</u>	<u>0</u>	<u>3</u>	<u>clay</u>		☒
<u>8"</u>	<u>3</u>	<u>40</u>	<u>clay & gravel</u>		☒
<u>8"</u>	<u>40</u>	<u>45</u>	<u>clay</u>		☒
<u>8"</u>	<u>45</u>	<u>80</u>	<u>clay</u>		☒
<u>8"</u>	<u>80</u>	<u>90</u>	<u>Blue clay</u>		☒
<u>8"</u>	<u>90</u>	<u>100</u>	<u>clay & gravel</u>		☒
<u>8"</u>	<u>100</u>	<u>120</u>	<u>sandstone</u>		☒
<u>8"</u>	<u>120</u>	<u>190</u>	<u>Gray clay & gravel</u>		☒
<u>8"</u>	<u>190</u>	<u>195</u>	<u>clay & gravel</u>	☒	
<u>8"</u>	<u>195</u>	<u>260</u>	<u>White shell</u>		☒

RECEIVED

APR 24 1996

Department of Water Resources
Eastern Region

RECEIVED

MAY 3 - 1996

Department of Water Resources

Completed Depth 260 (Measurable)
Date: Started 4-12-96 Completed 4-15-96

13. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name Mountain West Drilling Firm No 543

Firm Official Mike Frandsen Date 4-16-96

and
Supervisor or Operator _____ Date _____

(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

Figure 1-5 Well log for Thomas Well.



Clearwater Geosciences, LLP
Ground Water Development and Exploration

Idaho 238-7
3/95
BMP

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT
Use Typewriter or Ballpoint Pen

093080

Office Use Only
Inspected by _____
Twp _____ Rge _____ Sec _____
1/4 1/4 1/4
Lat: : : Long: : :

1. DRILLING PERMIT NO. 15-96-E-0002-000
Other IDWR No. _____

2. OWNER:
Name Gary Thomas
Address Box 205
City Magna State UT Zip 84044

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location.

N
W E S
Twp. 14 North ☐ or South ☒
Rge. 36 East ☒ or West ☐
Sec. 3 1/4 NE 1/4 SE 1/4
Gov't Lot _____ County Oneida
Lat: : : Long: : :
Address of Well Site 540 N
Devil Creek Rd City Malden
(Give at least name of road - Distance to Road or Landmark)
Lt. _____ Blk. _____ Sub. Name _____

4. USE:
☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☒ Abandonment ☐ Other _____

6. DRILL METHOD
☐ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK			AMOUNT	METHOD
Material	From	To	Sacks or Pounds	
None				

Was drive shoe used? ☐ Y ☐ N Shoe Depth(s) _____
Was drive shoe seal tested? ☐ Y ☐ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
None								

Length of Headpipe _____ Length of Tailpipe _____

9. PERFORATIONS/SCREENS

☐ Perforations Method _____
☐ Screens Screen Type _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
None							

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

_____ ft. below ground Artesian pressure _____ lb.
Depth flow encountered _____ ft. Describe access port or control devices: _____

11. WELL TESTS:

☐ Pump	☐ Baller	☐ Air	☐ Flowing Artesian
Yield gal./min.	Drawdown	Pumping Level	Time

Water Temp. Cold Bottom hole temp. _____
Water Quality test or comments: _____

12. LITHOLOGIC LOG: (Describe repairs or abandonment) Water

Bore Dia	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
0	10		clay		X
10	25		clay & gravel		X
25	50		Brown clay		X
50	53		gravel		X
53	80		clay		X
80	85		wet clay		X
85	110		sandstone & sand		X
110	118		cobbles		X
118	160		large clay & gravel		X
160	183		sandstone & gravel		X
183	194		Cobbles		X
194	246		sandstone		X
246	253		Cobbles		X
253	260		sandstone		X

RECEIVED

APR 24 1996

Department of Water Resources
Eastern Region

RECEIVED

MAY 3 - 1996

AUG 21 1996

Department of Water Resources

Completed Depth _____ (Measurable)
Date: Started 4-3-96 Completed 4-12-96

13. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name Mountain West Drilling Firm No. 543

Firm Official Mike Frandsen Date 4-16-95

and Supervisor or Operator _____ Date _____

(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

Figure 1-6 Well log for Thomas #2 Well.



Clearwater Geosciences, LLP
Ground Water Development and Exploration

Form 838-7
6/02 IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

15

Office Use Only
Well ID No. _____
Inspected by _____
Twp _____ Rge _____ Sec _____
1/4 _____ 1/4 _____ 1/4 _____
Lat: _____ Long: _____

1. WELL TAG NO. D CO32124
DRILLING PERMIT NO. _____
Water Right or Injection Well No. _____

2. OWNER:
Name Nedra Blackburn
Address 3320-1 N. Deep Creek Rd
City Meridian State ID Zip 83202

3. LOCATION OF WELL by legal description:
You must provide address or Lot, Blk. Sub. or Directions to well.
Twp. 14 North ☐ or South ☒
Rge. 36 East ☒ or West ☐
Sec. 3 NW 1/4 SE 1/4
Gov't Lot _____
County Carroll
Lat: _____ Long: _____
Address of Well Site _____
City Meridian

Lt. _____ Blk. _____ Sub. Name _____

4. USE:
☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD:
☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other _____

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method
Bentonite	0	20	8 bags	overbore

Was drive shoe used? ☒ Y ☐ N Shoe Depth(s) _____
Was drive shoe seal tested? ☐ Y ☐ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
10"	0	120	250	steel	☒	☐	☒	☐

Length of Headpipe _____ Length of Tailpipe _____
Packer ☐ Y ☐ N Type _____

9. PERFORATIONS/SCREENS PACKER TYPE

Perforation Method mill chuck

Screen Type & Method of Installation _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
105	120	1/4-1"	180	6"	steel	☒	☐

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

23 ft below ground Artesian pressure _____ lb.
Depth flow encountered _____ ft Describe access port or control devices: _____

12. WELL TESTS:

☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Pumping Level	Time
20			

Water Temp. cold Bottom hole temp cold

Water Quality test or comments: good
Depth first Water Encounter 50

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore D.A.	From	To	Remarks: Lithology Water Quality & Temperature	Y	N
10"	0	15	Brown Clay		X
10"	15	20	Brown clay gravel		X
10"	20	30	Brown clay gravel		X
10"	30	50	grey clay		X
10"	50	90	Brown clay gravel	X	
10"	90	115	granular brown clay	X	
10"	115	120	Shale		

RECEIVED

JUL 14 2004

Department of Water Resources
Eastern Region

Completed Depth 120' (Measurable)

Date Started 7-22-04 Completed 7-22-04

14. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Midwest Well Drilling Firm No. 543

Principal Driller Michael Traudner Date 7-25-04

Driller or Operator II Theresa Traudner Date 7-25-04

Operator I _____ Date _____

Principal Driller and Rig Operator Required.
Operator I must have signature of Driller/Operator II

FORWARD WHITE COPY TO WATER RESOURCES

Figure 1-7 Well log for Blackburn Well.



Clearwater Geosciences, LLP
Ground Water Development and Exploration

Form 238-7
11/97

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only
Inspected by _____
Twp _____ Rge _____ Sec _____
1/4 _____ 1/4 _____ 1/4 _____
Lat _____ Long _____

1. WELL TAG NO. D 0014337
DRILLING PERMIT NO. 765835
Other IDWR No. _____

2. OWNER:
Name ROBERT W. BRENNAN
Address 156 W 500 N
City MALAD State ID Zip 83252

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location.

North ☐ or South ☒
Rge. 36 East ☒ or West ☐
Sec. 3 1/4 NW 1/4 SE 1/4
Gov't Lot _____ County ONEIDA 10 sec 100 acres
Lat: _____ Long: _____
Address of Well Site 3321 N. Deep
City MALAD
Creek RD
(Give at least name of road - Distance to Road or Landmark)

Lt. _____ Blk. _____ Sub. Name _____

4. USE:
☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD
☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other _____

7. SEALING PROCEDURES

SEA/FILTER PACK		AMOUNT		METHOD
Material	From	To	Sacks or Pounds	
BENTONITE	0	20	5	OVERBORE

Was drive shoe used? ☒ Y ☐ N Shoe Depth(s) _____
Was drive shoe seal tested? ☐ Y ☐ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Linier	Welded	Threaded
6"	0	120	.250	STEEL	☒	☐	☒	☐

Length of Headpipe _____ Length of Tailpipe _____

9. PERFORATIONS/SCREENS

Perforations Method MACHINE
Screens Screen Type _____

From	To	Slot Size	Number	Diameter	Material	Casing	Linier
40'	110'	1/4"	60			☒	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

72 ft. below ground Artesian pressure _____ lb.
Depth flow encountered _____ ft. Describe access port or control devices: _____

11. WELL TESTS:

Yield gal/min	Drawdown	Pumping Level	Time
30			

Water Temp. COLD Bottom hole temp. _____
Water Quality test or comments: _____

12. LITHOLOGIC LOG: (Describe repairs or abandonment) Water

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
6"	0	10	BROWN CLAY		X
	10	15	COBBLES		X
	15	32	BROWN CLAY		X
	32	34	GRAVEL	X	
	34	45	Blue Clay		X
	45	58	Brown Clay		X
	58	80	Gravel & Brown Clay		X
	80	110	Gravel	X	
	110	115	SHALE	X	
	115	120	SHALE	X	X

RECEIVED
OCT 13 2000
Department of Water Resources
RECEIVED
SEP 29 2000
Department of Water Resources
Eastern Region

Completed Depth 120' (Measurable)
Date: Started 7-26-00 Completed 7-29-00

13. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name MTN. West Drilling Firm No. 543

Firm Official Michael Frandson Date 7-28-00

and
Driller or Operator _____ Date _____
(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

Figure 1-8 Well log for Brennan Well.



Clearwater Geosciences, LLP
Ground Water Development and Exploration

Form 238-7
11/97

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

1. WELL TAG NO. D 0014083
DRILLING PERMIT NO. _____
Other IDWR No. _____

2. OWNER:
Name Shawn Barber
Address 3323 1/2 Deep Creek Rd.
City Malad State ID Zip 83252

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location.

Map showing location of well (X) on a grid. Twp. 14 North ☐ or South ☒
Rge. 36 East ☒ or West ☐
Sec. 3 1/4 NW 1/4 SE 1/4
Gov't Lot _____ County Oneida Long: _____
Lat: _____ Address of Well Site SAME City Malad
(Give at least name of road - Distance to Road or Landmark)

Lt. _____ Blk. _____ Sub. Name _____

4. USE:
☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD
☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK			AMOUNT	METHOD
Material	From	To	Sacks or Pounds	
Bentonite	0	20	4	Overbore

Was drive shoe used? ☒ Y ☐ N Shoe Depth(s) 120
Was drive shoe seal tested? ☐ Y ☐ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
6"	0	120	1.315	Steel	☒	☐	☒	☐

Length of Headpipe _____ Length of Tailpipe _____

9. PERFORATIONS/SCREENS

Perforations _____ Method _____
Screens _____ Screen Type _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
85	110	1/4"	120	6"	Steel	☒	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
75' ft. below ground Artesian pressure _____ lb.
Depth flow encountered _____ ft. Describe access port or control devices: _____

11. WELL TESTS:

☐ Pump	☐ Bailer	☐ Air	☐ Flowing Artesian
Yield gal/min. <u>30</u>	Drawdown	Pumping Level	Time

Water Temp. cold Bottom hole temp. cold
Water Quality test or comments: good

Depth first Water Encounter 80
12. LITHOLOGIC LOG: (Describe repairs or abandonment) Water

Bore Dia	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
8"	0	20	clay + Gravel		X
6"	20	35	Brown clay		X
6"	35	45	Blue clay		X
6"	45	80	Brown clay + Gravel		X
6"	80	110	Gravel + water	X	
6"	110	120	Blue shale	X	X

RECEIVED

OCT 10 2000

Department of Water Resources

Completed Depth 120 (Measurable)
Date: Started 7-27-00 Completed 7-27-00

13. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name MTN. West Drilling Firm No. 543

Firm Official Michael Friedman Date 10-1-00

and Driller or Operator _____ Date _____
(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

Figure 1-9 Well log for Shawn Barber Well.



Clearwater Geosciences, LLP
Ground Water Development and Exploration

Form 208-7
3/95

IDAHO DEPARTMENT OF WATER RESOURCES

WELL DRILLER'S REPORT

Use Typewriter or Ballpoint Pen

058444

Office Use Only			
Inspected by _____			
Twp	Rge	Sec	
1/4	1/4	1/4	
Lat: _____	Long: _____		
☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian			

1. DRILLING PERMIT NO. 15-96-E-0012-000
Other IDWR No. _____

2. OWNER:

Name Thomas S Koontz
Address 3325 N Deep Gr Rd
City Malad City State ID Zip 83252

3. LOCATION OF WELL by legal description:

Sketch map location must agree with written location.

N		Twp. <u>14</u> North ☐ or South ☒	
E		Rge. <u>36</u> East ☒ or West ☐	
S		Sec. <u>33</u> 1/4 <u>NW</u> 1/4 <u>SE</u> 1/4	
W		Gov't Lot _____ County _____	
S		Lat: _____ Long: _____	

Address of Well Site Same as above
City _____
(Give at least name of road or landmark)

Lt. _____ Blk. _____ Sub. Name _____

4. USE:

☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)

☒ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD

☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK			AMOUNT		METHOD
Material	From	To	Sacks or Pounds		
Bentonite	0	20	41		Over Bore

Was drive shoe used? ☒ Y ☐ N Shoe Depth(s) 100

Was drive shoe seal tested? ☐ Y ☐ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
6"	0	100	200	Steel	☒	☐	☒	☐

Length of Headpipe _____ Length of Tailpipe _____

9. PERFORATIONS/SCREENS

☒ Perforations Method Machine
☐ Screens Screen Type _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
75	80	1/2"	50	1/4	Steel	☒	☐
95	100	1/2"	50	1/4	Steel	☒	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

20 ft. below ground Artesian pressure _____ lb.
Depth flow encountered _____ ft. Describe access port or control devices: _____

11. WELL TESTS:

☐ Pump ☐ Bailer

Yield gal/min	Drawdown	Pumping Level	Time
50			

Water Temp. cold Bottom hole temp. _____

Water Quality test or comments good (iron)

Depth first Water Encountered 50

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
	0	20	Clay		X
	20	27	clay + cobbles		X
	27	39	Cobbles + clay		X
	39	50	Clay + Gravel		X
	50	56	Sand	X	
	56	76	clay + Gravel		X
	76	80	Gravel + water	X	
	80	82	Clay		X
	82	93	Clay		X
	93	103	Cobbles + clay + water	X	
	103	110	white shell		X

RECEIVED

FEB 21 1997

Department of Water Resources

RECEIVED

FEB 11 1997

Department of Water Resources
Eastern Region

Completed Depth 100 (Measurable)
Date: Started 7-12-96 Completed 7-15-96

13. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name Mountain West Drilling Firm No. 543

Firm Official Mike Frandson Date 1-27-97

and
Supervisor or Operator _____ Date _____

(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

Figure 1-11 Well log for Koontz Domestic Well.



Clearwater Geosciences, LLP
Ground Water Development and Exploration

Form 238-7
6/83

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Use Typewriter
or
Ball Point Pen

49359

1. DRILLING PERMIT NO. 15-95-E-0010-100

Other IDWR No. _____

2. OWNER:

Name Rula Thomas

Address 540 Deep Creek Rd

City Malad State ID Zip 83252

3. LOCATION OF WELL by legal description:

Sketch map location must agree with written location.

N		T. <u>14</u> North ☐ or South ☒	
W		E. R. <u>36</u> East ☒ or West ☐	
S		Sec. <u>3</u> 1/4 <u>SW</u> 1/4 <u>SE</u> 1/4	
		Gov't Lot _____ County <u>Oneida</u>	

Address of Well Site Deep Creek Rd

(Give at least Direction + Distance to Road or Landmark)

Lot No. _____ Block No. _____ Subd. Name _____

4. PROPOSED USE:

☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation

☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK

☒ New Well ☐ Modify or Repair ☐ Replacement ☐ Abandonment

6. DRILL METHOD

☐ Mud Rotary ☒ Air Rotary ☐ Cable ☐ Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK		AMOUNT		METHOD
Material	From	To	Sacks or Pounds	
Bentonite	0	18	5	

Was drive shoe seal tested? ☐ YES ☐ NO How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Casting	Liner	Steel	Plastic	Welded	Threaded
8"	0	105	250	X		☒	☐	☒	☐
						☐	☐	☐	☐
						☐	☐	☐	☐

Final location of shoes 105

Top Packer or Headpipe _____ Bottom Tailpipe _____

9. PERFORATIONS/SCREENS

☒ Perforations Method _____
☐ Screens Type _____ Material _____

From	To	Slot Size	Number	Diameter	Tele/Pipe Size	Casing	Liner
95	105	1"	180	250		☒	☐
						☐	☐
						☐	☐

10. WELL TESTS:

☐ Pump ☐ Bailor ☒ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Depth	Time
30			

Temperature of water 60 Was a water analysis done? Yes ☐ No ☐

By whom? _____

Water Quality (odor, etc.) _____

Bottom Hole Temperature cold

11. STATIC WATER LEVEL:

20 ft. below surface Depth artesian flow found _____

Artesian pressure _____ lb. Describe access port _____

Describe Controlling Devices: _____

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	GPM	SWL
10	0	2	Clay		
10	2	30	Clay & cobbles		
8	30	38	Sand & clay		
8	38	40	Clay		
8	40	46	Gravel & 1/4" water		
8	46	52	Blue clay		
8	52	65	Gray clay		
8	65	68	Gravel & Brown clay		
8	68	75	Soft Brown clay		
8	75	97	Gravel & clay		
8	97	99	Cobbles & gravel & clay		
8	99	105	Gravel & water	50	
8	105	110	Gravel & water		

RECEIVED

RECEIVED

JUL 06 1995

AUG 23 1995

Department of Water Resources
Eastern District Office

Date Started 6-12-95 Completed 6-14-95

13. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name Mountain West Drilling Firm No. 543

Firm Official Mike Frandsen Date 7-4-95

and

Supervisor or Operator _____ Date _____

(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

Figure 1-13 Well log for Rula Thomas Well.



Clearwater Geosciences, LLP
Ground Water Development and Exploration

Form 736
8/93

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Use Typewriter
or
Ball Point Pen

RECEIVED
093182
MAR 07 1996

1. DRILLING PERMIT NO. 15-95-E-009-000
Other IDWR No. _____

2. OWNER:
Name Rula Thomas
Address 540 Deep Creek Rd
City Mohand State Id Zip 83252

3. LOCATION OF WELL by legal description:

Sketch map location must agree with written location.

N					
W					
S					

T. 14 North ☐ or South E
E.R. 36 East ☒ or West ☐
Sec. 3 1/4 SW 1/4 SE 1/4
Gov't Lot _____ County Oneida

Address of Well Site Deep Creek Rd
(Give at least Direction + Distance to Road or Landmark)

Lot No. _____ Block No. _____ Subd. Name _____

4. PROPOSED USE:
☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK
☒ New Well ☐ Modify or Repair ☐ Replacement ☐ Abandonment

6. DRILL METHOD
☐ Mud Rotary ☒ Air Rotary ☐ Cable ☐ Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK			AMOUNT		METHOD
Material	From	To	Sacks or Pounds		
<u>Bentonite</u>	<u>0</u>	<u>90</u>	<u>5</u>		

Was drive shoe seal tested? Y ☐ N ☒ How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Casing	Liner	Steel	Plastic	Welded	Threaded
<u>8"</u>	<u>0</u>	<u>120</u>	<u>120</u>			☒	☐	☒	☐
						☐	☐	☐	☐
						☐	☐	☐	☐
						☐	☐	☐	☐

Final location of shoes 120
Top Packer or Headpipe _____ Bottom Tailpipe _____

9. PERFORATIONS/SCREENS

☒ Perforations Method _____
☐ Screens Type _____ Material _____

From	To	Slot Size	Number	Diameter	Yield/Pipe Size	Casing	Liner
<u>40</u>	<u>45</u>	<u>1"</u>	<u>60</u>	<u>1250</u>		☐	☐
<u>110</u>	<u>120</u>	<u>1"</u>	<u>120</u>	<u>1250</u>		☐	☐
						☐	☐
						☐	☐

10. WELL TESTS:

☐ Pump	☐ Bailer	☒ Air	☐ Flowing Artesian
Yield gal./min.	Drawdown	Department of Water Resources	Time
<u>10</u>			

Temperature of water cold Was a water analysis done? Yes ☐ No ☐
By whom? _____

Water Quality (odor, etc.) _____

Bottom Hole Temperature cold

11. STATIC WATER LEVEL:

Cold ft. below surface Depth artesian flow found _____

Artesian pressure _____ lb. Describe access port _____

Describe Controlling Devices: _____

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	GPM	SWL
<u>8"</u>	<u>0</u>	<u>40</u>	<u>clay & 1 1/2" sand</u>		
<u>8"</u>	<u>40</u>	<u>41</u>	<u>gravel & 1 1/2" water</u>		
<u>8"</u>	<u>41</u>	<u>55</u>	<u>Blue clay & quick sand</u>		
<u>8"</u>	<u>55</u>	<u>118</u>	<u>Caliche & gravel</u>		
<u>8"</u>	<u>118</u>	<u>130</u>	<u>loose Caliche & gravel & water</u>	<u>5</u>	
<u>8"</u>	<u>130</u>	<u>130</u>	<u>Caliche & Gravel</u>		
<u>8"</u>	<u>130</u>	<u>150</u>	<u>Gray clay & Gravel</u>		
<u>8"</u>	<u>150</u>	<u>170</u>	<u>Blue clay</u>		
	<u>170</u>	<u>180</u>	<u>Gray clay</u>		
	<u>180</u>	<u>195</u>	<u>Caliche & clay</u>		
	<u>195</u>	<u>250</u>	<u>Brown sandstone & clay</u>		
	<u>250</u>	<u>255</u>	<u>Blue shell & Gravel</u>		
	<u>255</u>	<u>256</u>	<u>Blue shell</u>		
	<u>340</u>	<u>400</u>	<u>Brown shell & sandstone</u>		

DISCOVERED
FEB 28 1996
Department of Water Resources
Eastern District Office

Date: Started 6-2-95 Completed _____

13. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name Mountain West Drilling Firm No. 5242

Firm Official Mike Franden Date _____

and _____

Supervisor or Operator _____ Date _____

(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

Figure 1-14 Well log for Rula Thomas 2 Well.



Clearwater Geosciences, LLP
Ground Water Development and Exploration

RECEIVED
AUG 15 1991

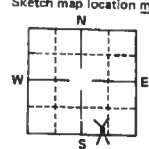
Form 899

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

USE TYPEWRITER OR
BALLPOINT PEN

WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department of Water Resources within 30 days after the completion or abandonment of the well.

1. WELL OWNER Name <u>Clyde J. & Pamela M. Bowen</u> Address <u>91 N. 8 E. Preston, ID 83263</u> Drilling Permit No. <u>15-91-E-003</u> Water Right Permit No. _____		7. WATER LEVEL Static water level <u>86</u> feet below land surface. Flowing? ☐ Yes ☒ No G.P.M. flow _____ Artesian closed-in pressure _____ p.s.i. Controlled by: ☐ Valve ☐ Cap ☐ Plug Temperature _____ °F. Quality _____ Describe artesian or temperature zones below																																																																																																																																			
2. NATURE OF WORK ☒ New well ☐ Deepened ☐ Replacement ☐ Well diameter increase ☐ Abandoned (describe abandonment procedures such as materials, plug depths, etc. in lithologic log)		8. WELL TEST DATA ☐ Pump ☐ Bailor ☒ Air ☐ Other _____ <table border="1"><thead><tr><th>Discharge G.P.M.</th><th>Pumping Level</th><th>Hours Pumped</th></tr></thead><tbody><tr><td>22</td><td>130</td><td>3</td></tr></tbody></table>		Discharge G.P.M.	Pumping Level	Hours Pumped	22	130	3																																																																																																																												
Discharge G.P.M.	Pumping Level	Hours Pumped																																																																																																																																			
22	130	3																																																																																																																																			
3. PROPOSED USE ☒ Domestic ☐ Irrigation ☐ Test ☐ Municipal ☐ Industrial ☐ Stock ☐ Waste Disposal or Injection ☐ Other _____ (specify type)		9. LITHOLOGIC LOG <u>023365</u> <table border="1"><thead><tr><th>Bore Diam.</th><th>Depth From</th><th>To</th><th>Material</th><th>Water Yes/No</th></tr></thead><tbody><tr><td>9"</td><td>0</td><td>9</td><td>gravel</td><td></td></tr><tr><td></td><td>9</td><td>20</td><td>clay</td><td></td></tr><tr><td></td><td>20</td><td>28</td><td>gravel</td><td></td></tr><tr><td>6"</td><td>28</td><td>37</td><td>clay brown</td><td></td></tr><tr><td></td><td>37</td><td>39</td><td>clay gray</td><td></td></tr><tr><td></td><td>39</td><td>42</td><td>gravel</td><td></td></tr><tr><td></td><td>42</td><td>54</td><td>clay</td><td></td></tr><tr><td></td><td>54</td><td>57</td><td>gravel clay</td><td></td></tr><tr><td></td><td>57</td><td>68</td><td>clay</td><td></td></tr><tr><td></td><td>68</td><td>69</td><td>gravel</td><td></td></tr><tr><td></td><td>69</td><td>78</td><td>clay</td><td></td></tr><tr><td></td><td>78</td><td>116</td><td>cobbles water</td><td>X</td></tr><tr><td></td><td>116</td><td>127</td><td>clay white</td><td></td></tr><tr><td></td><td>127</td><td>134</td><td>clay brown</td><td></td></tr><tr><td></td><td>134</td><td>154</td><td>clay greenish</td><td></td></tr><tr><td></td><td>154</td><td>176</td><td>clay brown</td><td></td></tr><tr><td></td><td>176</td><td>179</td><td>cobbles & clay</td><td></td></tr><tr><td></td><td>179</td><td>187</td><td>clay greenish</td><td></td></tr><tr><td></td><td>187</td><td>190</td><td>cobbles & clay</td><td></td></tr><tr><td></td><td>190</td><td>192</td><td>clay</td><td></td></tr><tr><td></td><td>192</td><td>200</td><td>cobbles water</td><td>X</td></tr><tr><td></td><td>200</td><td>227</td><td>clay greenish</td><td></td></tr><tr><td></td><td>227</td><td>233</td><td>sandstone soft</td><td></td></tr><tr><td></td><td>233</td><td>238</td><td>cobbles & sandstone</td><td></td></tr><tr><td></td><td>238</td><td>245</td><td>clay</td><td></td></tr></tbody></table>		Bore Diam.	Depth From	To	Material	Water Yes/No	9"	0	9	gravel			9	20	clay			20	28	gravel		6"	28	37	clay brown			37	39	clay gray			39	42	gravel			42	54	clay			54	57	gravel clay			57	68	clay			68	69	gravel			69	78	clay			78	116	cobbles water	X		116	127	clay white			127	134	clay brown			134	154	clay greenish			154	176	clay brown			176	179	cobbles & clay			179	187	clay greenish			187	190	cobbles & clay			190	192	clay			192	200	cobbles water	X		200	227	clay greenish			227	233	sandstone soft			233	238	cobbles & sandstone			238	245	clay	
Bore Diam.	Depth From	To	Material	Water Yes/No																																																																																																																																	
9"	0	9	gravel																																																																																																																																		
	9	20	clay																																																																																																																																		
	20	28	gravel																																																																																																																																		
6"	28	37	clay brown																																																																																																																																		
	37	39	clay gray																																																																																																																																		
	39	42	gravel																																																																																																																																		
	42	54	clay																																																																																																																																		
	54	57	gravel clay																																																																																																																																		
	57	68	clay																																																																																																																																		
	68	69	gravel																																																																																																																																		
	69	78	clay																																																																																																																																		
	78	116	cobbles water	X																																																																																																																																	
	116	127	clay white																																																																																																																																		
	127	134	clay brown																																																																																																																																		
	134	154	clay greenish																																																																																																																																		
	154	176	clay brown																																																																																																																																		
	176	179	cobbles & clay																																																																																																																																		
	179	187	clay greenish																																																																																																																																		
	187	190	cobbles & clay																																																																																																																																		
	190	192	clay																																																																																																																																		
	192	200	cobbles water	X																																																																																																																																	
	200	227	clay greenish																																																																																																																																		
	227	233	sandstone soft																																																																																																																																		
	233	238	cobbles & sandstone																																																																																																																																		
	238	245	clay																																																																																																																																		
4. METHOD DRILLED ☒ Rotary ☐ Air ☐ Hydraulic ☐ Reverse rotary ☐ Cable ☐ Dug ☐ Other _____																																																																																																																																					
5. WELL CONSTRUCTION Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____ <table border="1"><thead><tr><th>Thickness</th><th>Diameter</th><th>From</th><th>To</th></tr></thead><tbody><tr><td>.250 inches</td><td>6 1/2 inches</td><td>1 1/2 feet</td><td>175 feet</td></tr><tr><td>_____ inches</td><td>_____ inches</td><td>_____ feet</td><td>_____ feet</td></tr><tr><td>_____ inches</td><td>_____ inches</td><td>_____ feet</td><td>_____ feet</td></tr><tr><td>_____ inches</td><td>_____ inches</td><td>_____ feet</td><td>_____ feet</td></tr></tbody></table> Was casing drive shoe used? ☒ Yes ☐ No Was a packer or seal used? ☐ Yes ☒ No Perforated? ☐ Yes ☒ No How perforated? ☐ Factory ☒ Knife ☐ Torch ☐ Gun Size of perforation <u>1/8</u> inches by <u>3</u> inches <table border="1"><thead><tr><th>Number</th><th>From</th><th>To</th></tr></thead><tbody><tr><td>70 perforations</td><td>110 feet</td><td>117 feet</td></tr><tr><td>_____ perforations</td><td>_____ feet</td><td>_____ feet</td></tr><tr><td>_____ perforations</td><td>_____ feet</td><td>_____ feet</td></tr></tbody></table> Well screen installed? ☐ Yes ☒ No Manufacturer's name _____ Type _____ Model No. _____ Diameter _____ Slot size _____ Set from _____ feet to _____ feet Diameter _____ Slot size _____ Set from _____ feet to _____ feet Gravel packed? ☐ Yes ☒ No ☐ Size of gravel _____ Placed from _____ feet to _____ feet Surface seal depth <u>28</u> Material used in seal: ☐ Cement grout ☐ Bentonite ☒ Puddling clay ☐ _____ Sealing procedure used: ☐ Slurry pit ☐ Temp. surface casing ☒ Overbore to seal depth Method of joining casing: ☐ Threaded ☒ Welded ☐ Solvent Weld _____ ☐ Cemented between strata Describe access port <u>well cap</u>		Thickness	Diameter	From	To	.250 inches	6 1/2 inches	1 1/2 feet	175 feet	_____ inches	_____ inches	_____ feet	_____ feet	_____ inches	_____ inches	_____ feet	_____ feet	_____ inches	_____ inches	_____ feet	_____ feet	Number	From	To	70 perforations	110 feet	117 feet	_____ perforations	_____ feet	_____ feet	_____ perforations	_____ feet	_____ feet																																																																																																				
Thickness	Diameter	From	To																																																																																																																																		
.250 inches	6 1/2 inches	1 1/2 feet	175 feet																																																																																																																																		
_____ inches	_____ inches	_____ feet	_____ feet																																																																																																																																		
_____ inches	_____ inches	_____ feet	_____ feet																																																																																																																																		
_____ inches	_____ inches	_____ feet	_____ feet																																																																																																																																		
Number	From	To																																																																																																																																			
70 perforations	110 feet	117 feet																																																																																																																																			
_____ perforations	_____ feet	_____ feet																																																																																																																																			
_____ perforations	_____ feet	_____ feet																																																																																																																																			
6. LOCATION OF WELL Sketch map location must agree with written location.  Subdivision Name _____ Lot No. _____ Block No. _____ County <u>Oneida</u> SW 1/4 SE 1/4 Sec. 3, T. 14, S. 2, R. 38, W. 4		10. Work started <u>7/29/91</u> finished <u>8/02/91</u>																																																																																																																																			
11. DRILLERS CERTIFICATION I/We certify that all minimum well construction standards were complied with at the time the rig was removed. Firm Name <u>Westlake Drilling</u> Firm No. <u>114</u> Address <u>184 N. 7 St.</u> <u>Montpelier, ID</u> Date <u>8/14/91</u> Signed by (Firm Official) <u>E. Ray Westlake</u> and (Operator) <u>E. Ray Westlake</u>																																																																																																																																					

USE ADDITIONAL SHEETS IF NECESSARY - FORWARD THE WHITE COPY TO THE DEPARTMENT

Figure 1-15 Well log for Bowen Well.



Clearwater Geosciences, LLP
Ground Water Development and Exploration

Attachment 2

AQUIFER IMPACT ANALYSIS



Table 2-1 Table of values used in AQTESOLV simulation.

Parameter	Value	Unit	Comment
Tranmissivity (100 ft thick)	33,400	ft ² /d	K=2500 gal/day/ft ² from Freeze and Cherry, a clean sand aquifer
Tranmissivity (50 ft thick)	16,700	ft ² /d	K=2500 gal/day/ft ² from Freeze and Cherry, a clean sand aquifer
Storativity	0.05	unitless	
Flow Rate	126	gpm	
Duration	259,200	min	
Total volume	100	ac-ft	
aquifer thickness (b)	100	ft	
kz/Kr	0.1	na	

Table 2-2 Table of locations for various boundary corners and wells used in the AQESOLV simulation.

Location	x	y
W Corner	0	5280
N Corner	10560	5280
S Corner	0	0
E Corner	0	10560
Barber POD	3168	2100
Well 1/2 mile South	3168	0
Well 1/4 mile East	5808	2100



Clearwater Geosciences, LLP
Ground Water Development and Exploration

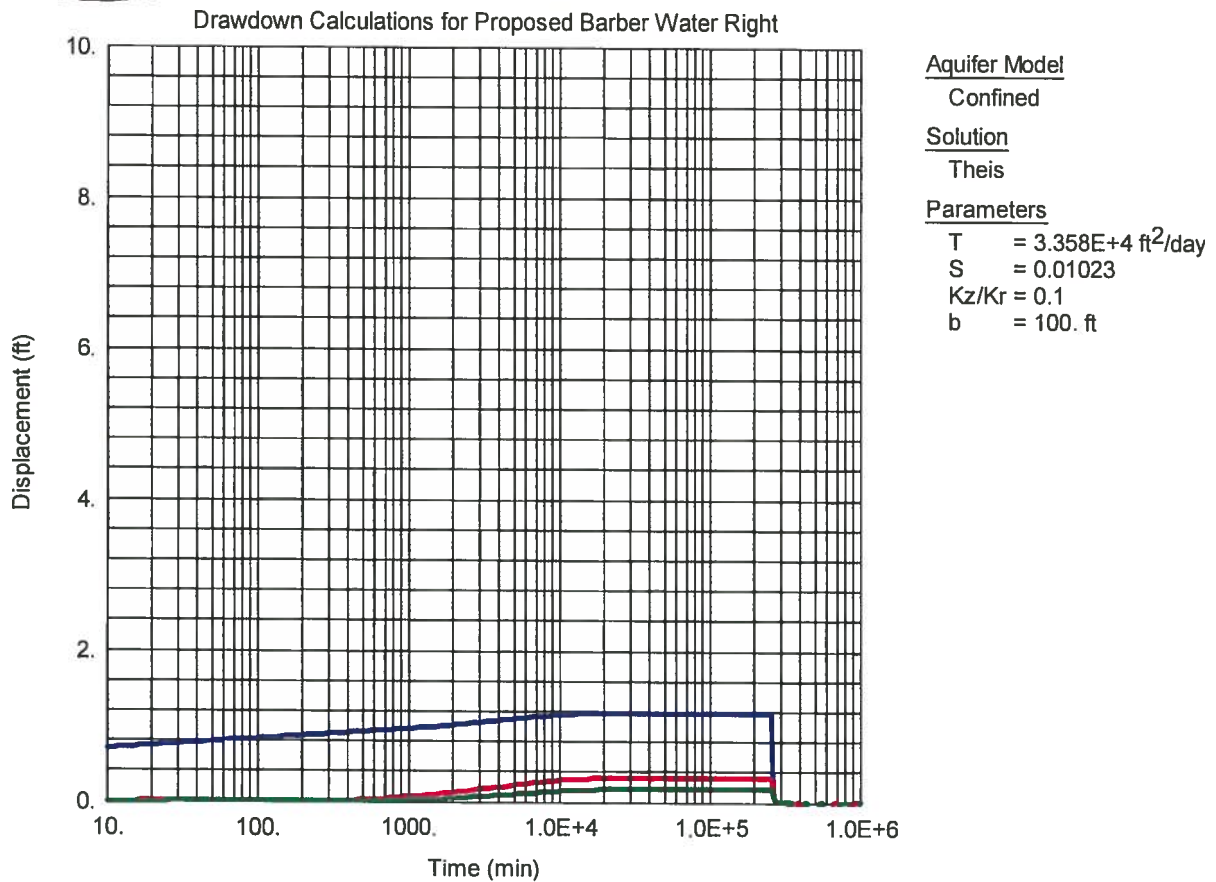


Figure 2-1 Predictive plot of drawdown at 126 gpm or 0.28 cfs for the full period of use 180 days. The blue line is for the water level in the proposed Barber Well under 100 ft thick aquifer with water table (unconfined) conditions.

Key to line colors

- Blue Proposed POD for Shawn Barber
- Red Imaginary well $\frac{1}{2}$ mile southeast of the proposed POD
- Green Imaginary well $\frac{1}{4}$ mile northeast of the proposed POD

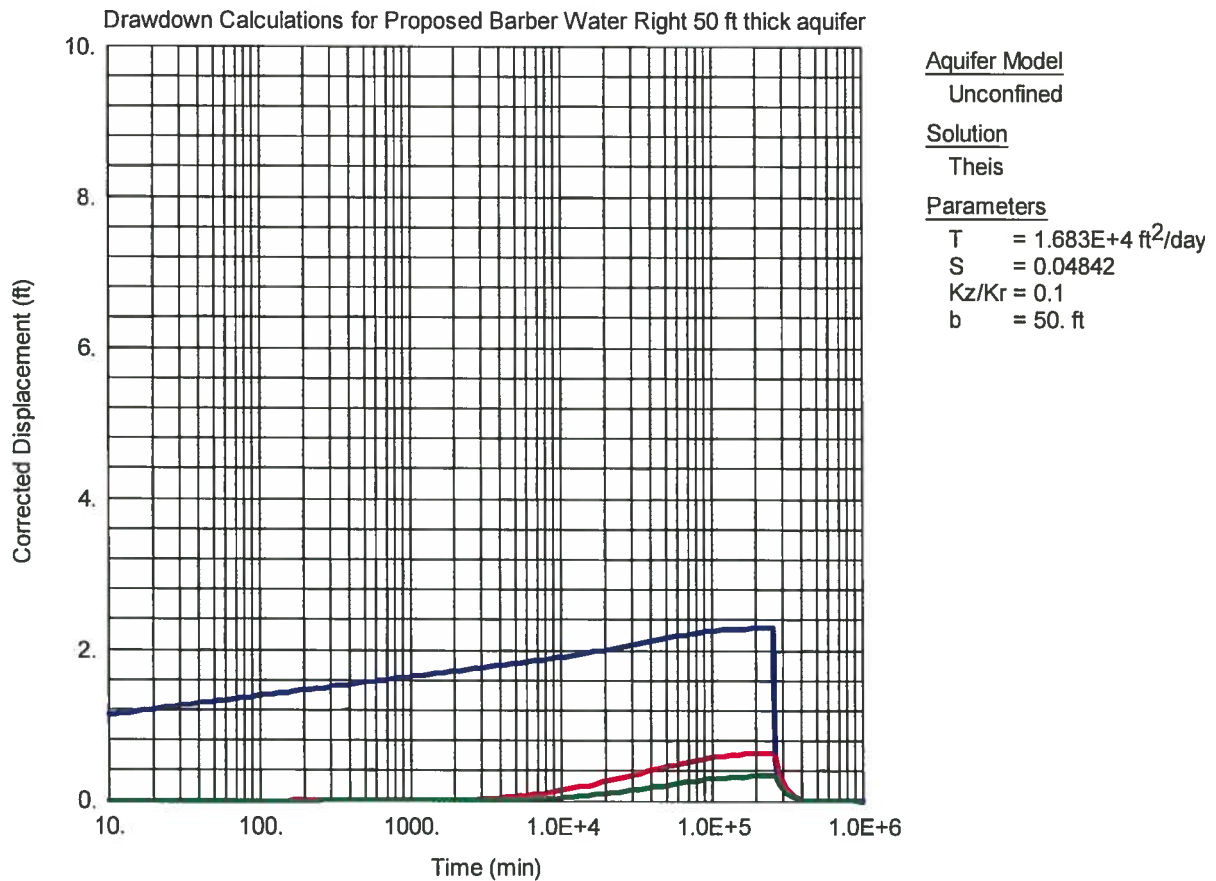


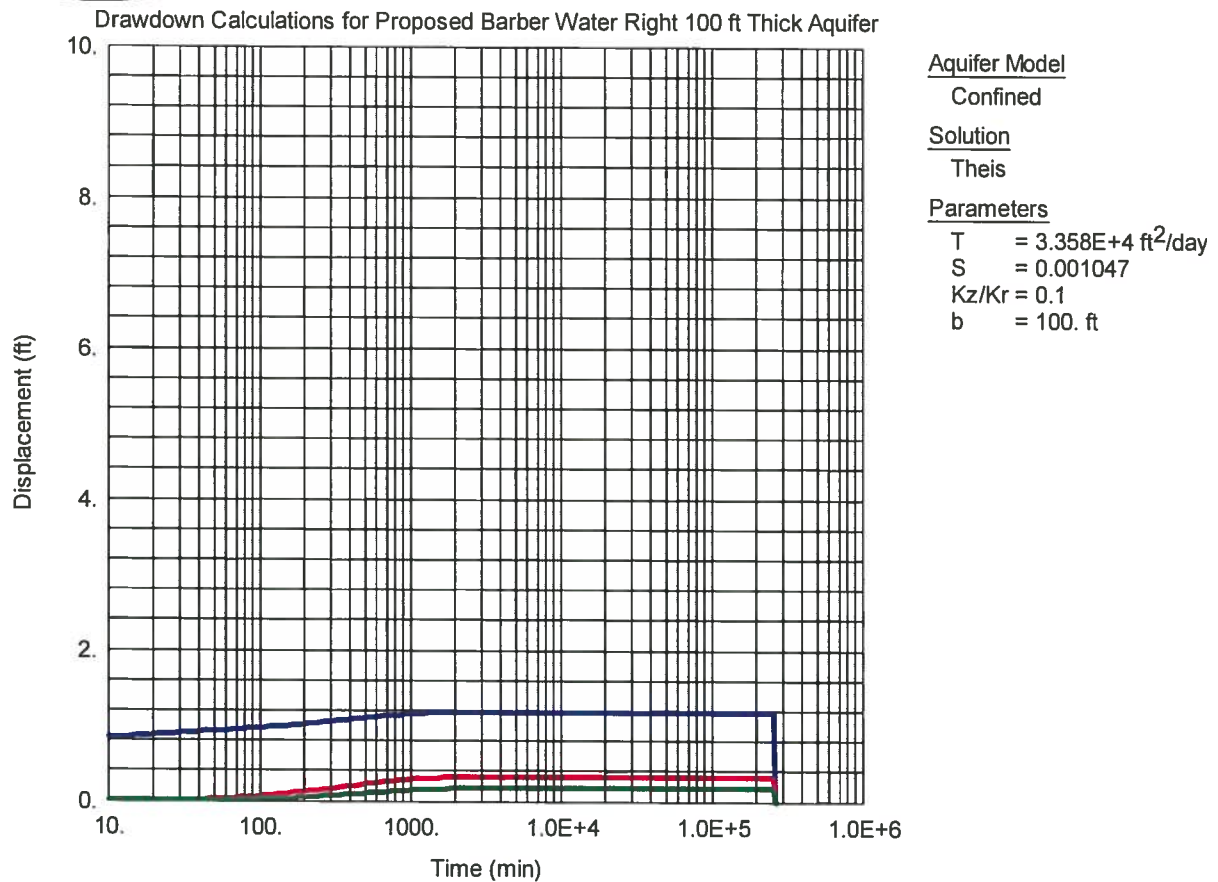
Figure 2-2 Predictive plot of drawdown at 126 gpm or 0.28 cfs for the full period of use 180 days. The blue line is for the water level in the proposed Barber Well under 50 ft thick aquifer with water table (unconfined) conditions.

Key to line colors

- Blue Proposed POD for Shawn Barber
- Red Imaginary well $\frac{1}{2}$ mile southeast of the proposed POD
- Green Imaginary well $\frac{1}{4}$ mile northeast of the proposed POD



Clearwater Geosciences, LLP
Ground Water Development and Exploration



2

Figure 4-3 Predictive plot of drawdown at 126 gpm or 0.28 cfs for the full period of use 180 days. The blue line is for the water level in the proposed Barber Well under 100 ft thick aquifer with artesian (confined) conditions.

Key to line colors

- Blue Proposed POD for Shawn Barber
- Red Imaginary well $\frac{1}{2}$ mile southeast of the proposed POD
- Green Imaginary well $\frac{1}{4}$ mile northeast of the proposed POD



Clearwater Geosciences, LLP
Ground Water Development and Exploration

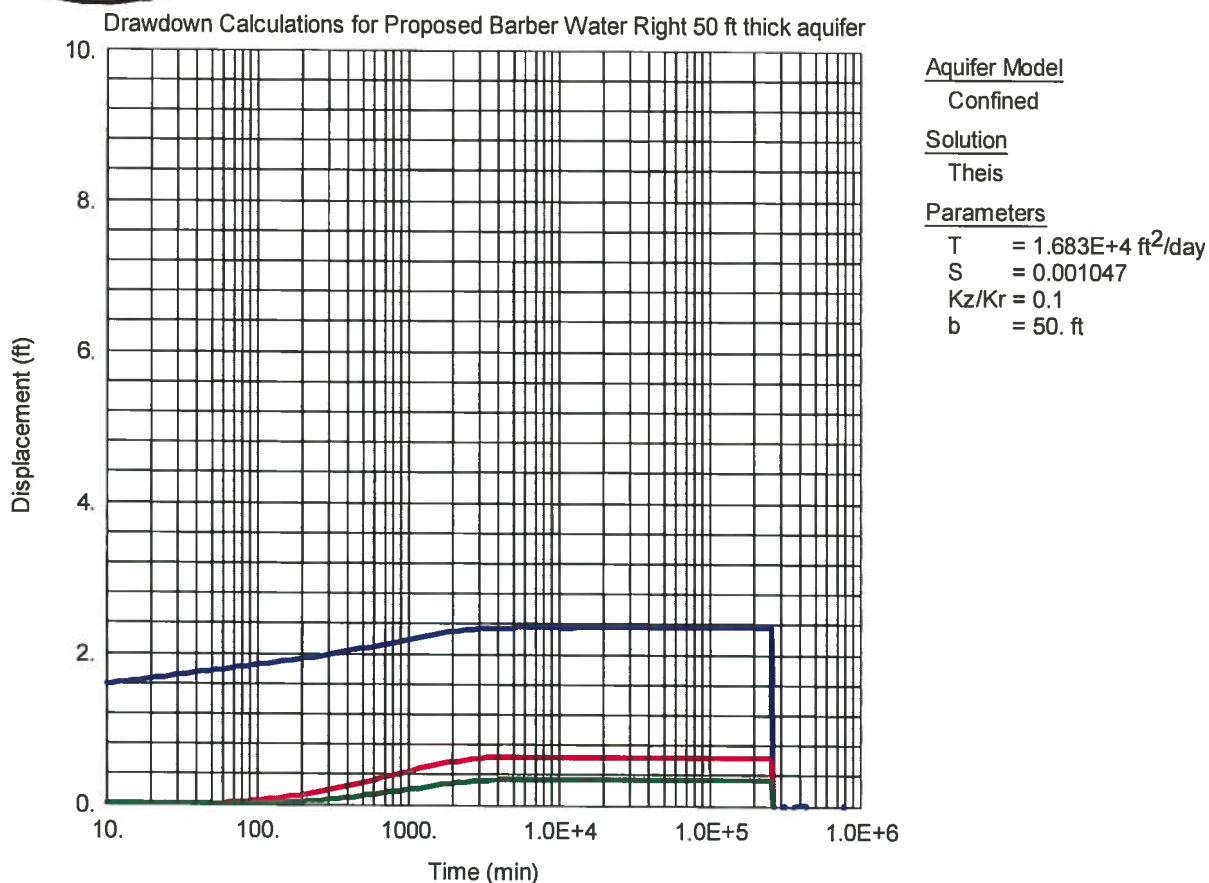


Figure 2-4 Predictive plot of drawdown at 126 gpm or 0.28 cfs for the full period of use 180 days. The blue line is for the water level in the proposed Barber Well under 50 ft thick aquifer with artesian (confined) conditions.

Key to line colors

- Blue Proposed POD for Shawn Barber
- Red Imaginary well $\frac{1}{2}$ mile southeast of the proposed POD
- Green Imaginary well $\frac{1}{4}$ mile northeast of the proposed POD