

Addendum 1
Revised Calculations
Support for Application of Transfer
Water Right No. 01-10021

Byron Blakely

Purpose of Addendum

Initial efforts to estimate the proportion of surface water that would contribute to diversion from a pond between the Snake River and the Dry Bed Canal were based on the so-called Glover/Palmer/Jenkins Method (Contor, 2011). The original narrative and calculations are shown in Appendix A. For the purposes of calculations, hydraulic conductivity (K) was used from the Enhanced Snake Plain Aquifer Model, Version 2.1 (ESPAM 2.1) (Idaho Department of Water Resources, 2013).

The ESPAM model is a regional model which is used to simulate the Eastern Snake Plain Aquifer, primarily a basalt bedrock aquifer. In reality, however, a more accurate assessment of K would be based on local conditions, which include a shallow, coarse-grained alluvial aquifer that fluctuates seasonally with the irrigation season and seeps into the pond used as the Point of Diversion (POD). Although directly-measured K values based on well pumping tests are not available locally, it is possible to estimate K based on well logs from nearby wells.

Revised Data

Five wells were identified within approximately 1/4 mile of the pond POD, based on Idaho Department of Water Resources (IDWR) online map locations (IDWR, 2020). The exact locations of these wells are not discernable from the IDWR well location map, but it is assumed that the locations shown on the map are reasonably close to the actual well locations. Five additional wells are located on the map within approximately 1/2 mile southeast of the POD. The locations of the wells are shown in Figure A1 and are based on IDWR map locations. Relevant information from the well logs is provided in Table A1, and the well driller reports are in Appendix B. The first five wells shown in Table A1 are shown on the IDWR online map within approximately 1/4 mile of the pond, and the remaining wells are shown within about 1/2 mile of the pond.

As seen in these well logs, the depth of the alluvial system is at least 64 feet below ground level in the general vicinity of the pond and may be greater than 80 feet in some locations. Four of the wells encountered bedrock between 70 and 78 feet. For the purposes of this evaluation, it is assumed that a typical depth of the alluvial system would be about 75 feet.

Depth to static water level varies but appears to be shallowest in summer months during the irrigation season, and deeper in late fall or early spring when irrigation is not occurring. This is consistent with the annual filling of the pond (which is 8-10 feet deep) from groundwater seepage in summer months; otherwise it would not be used as a POD.

**Table A1
Well Log Information**

Well ID No. & Name	Depth to Bedrock (ft)	Alluvial Material	Depth to Static Water Level (ft)	Date Completed
413726 Cheney	70	Sand and gravel	20	Nov 14, 2006
413728 Reed	77	Sand and gravel	21	Nov 8, 2006
413727 Bagley	>80	Sand, gravel, boulders	20	Nov 11, 2006
360206 J. Ferguson	>60	Sand, gravel, boulders	12	Nov 20, 2002
379470 K. Ferguson	>140	Sand, gravel, clay	48	Oct 24, 2002
393594 Fullmer	72	Gravel	5	Aug 28, 1986
379567 Connaughton	>60	Sand, clay, gravel, boulders	32	Mar 31, 2003
323834 Bowen	>51	Gravel, sediment	13	Mar 11, 1999
326247 Blakely	64	Gravel and clay	10	Jul 16, 1994
424014 Mtn. River Sport Park	78	Sand, gravel, clay	25	Dec 19, 2008

Results

All of the well logs show that the subsurface alluvial material is composed primarily of sand and gravel. Four well logs indicate the presence of clay in some zones (see Appendix B), but it is apparent that sand and gravel are the dominant subsurface components, and clay does not appear to be vertically or horizontally continuous, nor are any distinct layers of clay identified in the logs.

The saturated zone near the pond is entirely within this zone of sand and gravel down to a depth of 70 to 80 feet, and can be defined as an alluvial aquifer system. Because this coarse alluvial zone is present in wells in all directions around the pond, it is reasonable to assume this coarse alluvial aquifer system extends to, and is in hydraulic connection with, both water bodies.

For the purposes of using the Jenkins method to estimate the proportion of surface water that would contribute to pumping from the pond, transmissivity (T) is required. This can be estimated from the equation (Freeze and Cherry, 1979):

$$T = Kb$$

where

T = Transmissivity in ft²/day;
K = Hydraulic Conductivity in ft/day;
b = Aquifer thickness in feet.

For the period of pumping (summer irrigation season), it appears that static water level is 5 to 10 feet below ground surface. Total depth of the alluvial material is typically about 75 feet. Therefore it is assumed that b = 65 ft.

Freeze and Cherry (1979), Table 2.2, provides a range of estimated values of K for different aquifer materials. Coarse sand and gravel values of K range from 0.001 m/sec to 1 m/sec. For the purposes of this estimate, it is assumed that K = 0.01 m/sec, or 2,834 ft/day. Transmissivity is therefore derived as follows:

$$T = (2,834 \text{ ft/day})(65 \text{ ft}) = 184,210 \text{ ft}^2/\text{day}$$

Specific yield (S_y) for an alluvial aquifer typically range from 0.01 to 0.30 (Freeze and Cherry, 1979). For the purpose of this exercise, a value of 0.12 is assumed.

Applying these values of T and S_y to the Glover/Palmer/Jenkins Method and using the distance parameters shown in Figure 2 of the original Narrative, the percent of flow from the two surface water bodies was estimated. The results of calculations are shown in graphical form in Figure A2. On the basis of this estimate, **contribution from the South Fork Snake River exceeds 50% of pumped flow at about 0.77 days, and the sum of flows from both the Snake River and Dry Bed Canal exceeds 50% of pumped flow at about 0.59 days.**

Administration

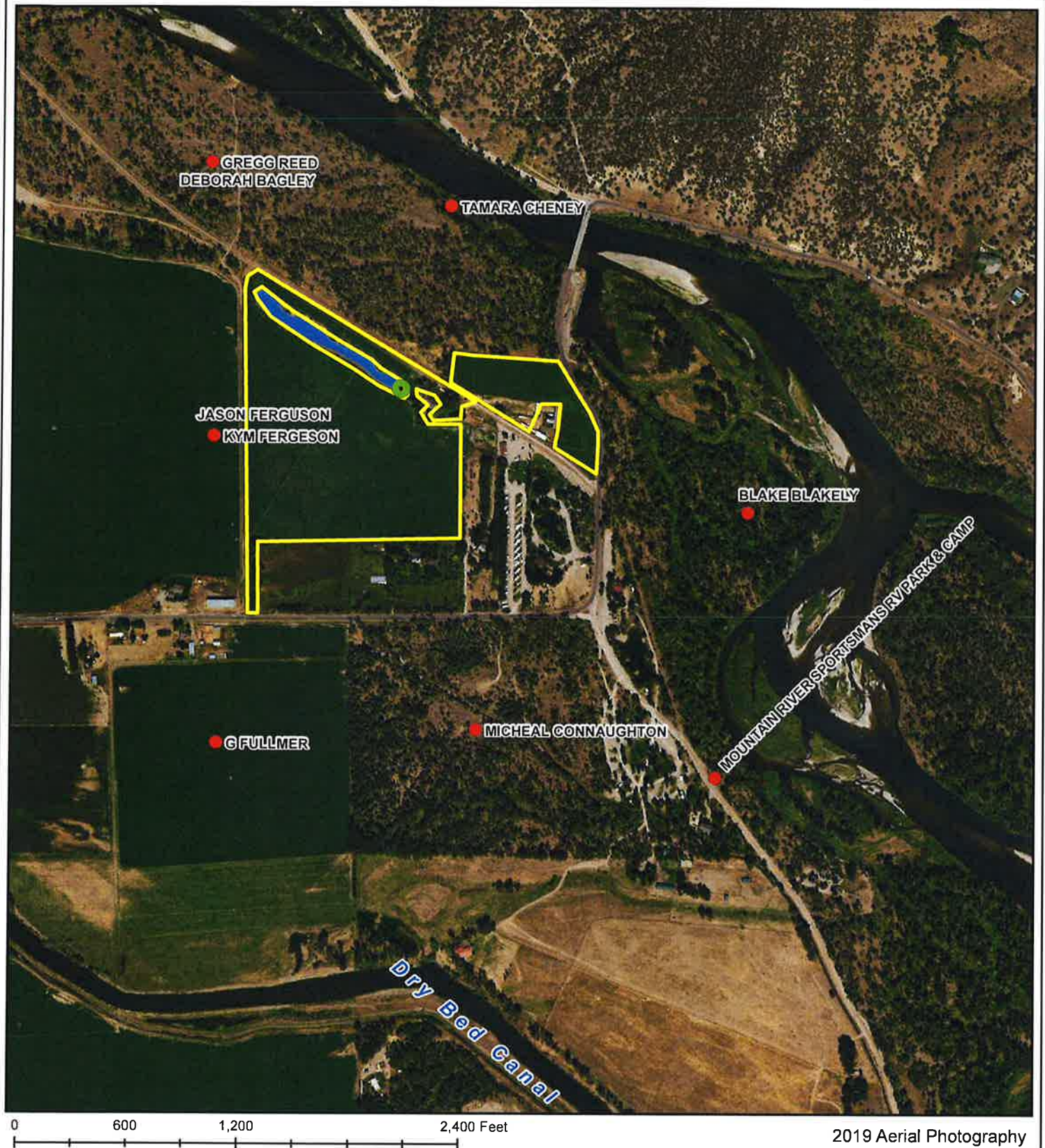
The water right will be accounted to the pump and will no longer be delivered to the Craig-Mattson Canal.

Summary

The existing original POD of the Craig-Mattson Canal will no longer be used for diversion and delivering of the Blakely water right 01-10021. The proposed POD, the existing pump in the pond, will be used as the new point of diversion. The hydrologic analysis described herein shows that 50 percent of the water diverted from the pond comes directly from the SFSR after about 0.8 days of pumping and rises to about 55 percent within 24 hours, exceeding the 50% threshold set by IDWR. Combined flow from the SFSR and Dry Bed Canal exceeds 50 percent of flow after about 0.6 days, is at about 70 percent after 24 hours, and is approximately 100 percent from surface flows after about three days. Diverting directly from the pump while relying upon subsurface seepage from the SFSR will limit delivery losses that would otherwise occur through delivery from the canal. Therefore, whether through the Craig-Mattson Canal or the pond pump, the Blakely water right will be delivered from the SFSR.

Addendum References Cited

- Contor, Bryce A. 2011. Adaptation of the Glover/Balmer/Jenkins Analytical Stream-Depletion Methods for No-flow and Recharge Boundaries. Idaho Water Resources Research Institute Technical Completion Report 201101.
- Freeze, R.A., and J.A. Cherry, 1979. Groundwater. Prentice-Hall, Englewood Cliffs, NJ, 604 pp.
- Idaho Department of Water Resources with guidance from the Eastern Snake Hydrologic Modeling Committee. 2013. Enhanced Snake Plain Aquifer Model Version 2.1 Final Report.
- Idaho Department of Water Resources (IDWR). 2020. Online website, Find a Well Map. <https://idwr.idaho.gov/wells/find-a-well.html>.



Legend

- Wells
- Proposed POD
- POU
- Pond
- County

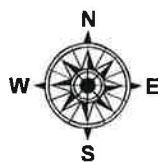


Figure A1. Well Locations

Byron Blakely

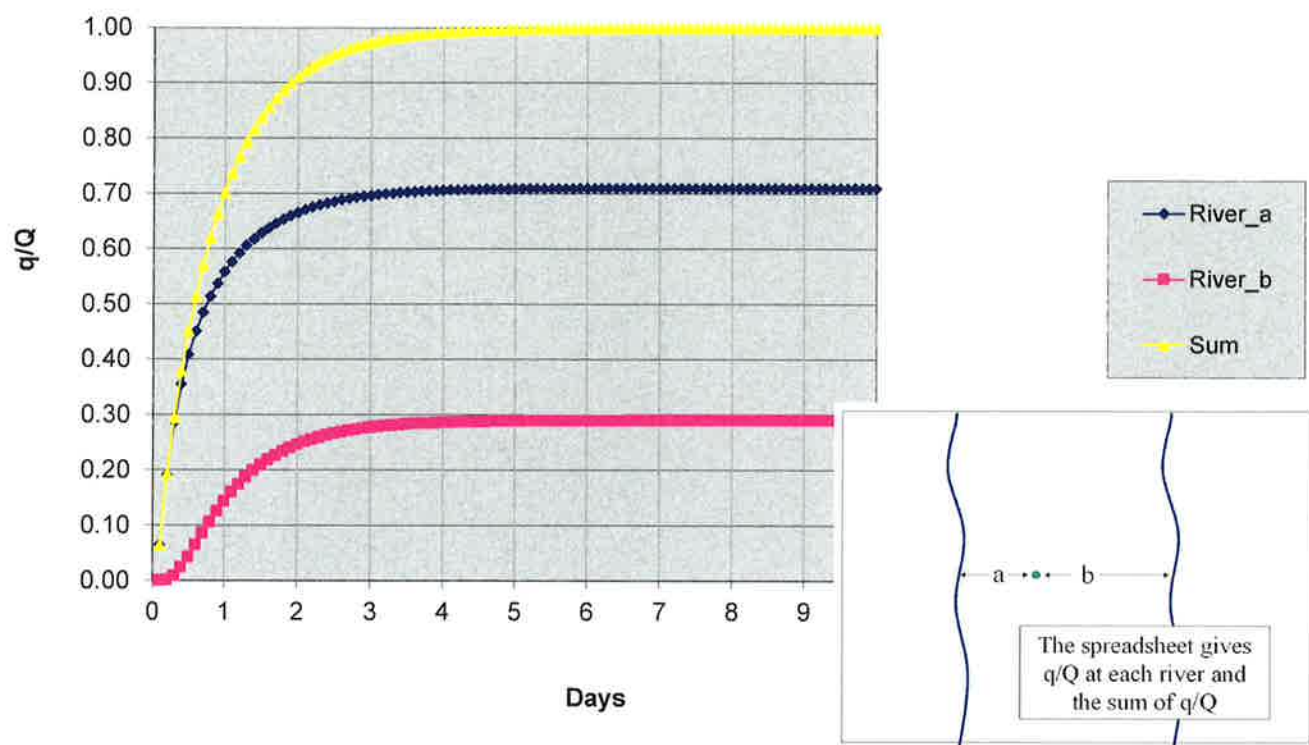
RMEA #17-0215

by: KM

Date: 8/28/2020



Figure A2
Jenkins Two-River Analysis



APPENDIX A

**ORIGINAL NARRATIVE
SUPPORT OF APPLICATION FOR TRANSFER
WATER RIGHT NO. 01-10021
*BYRON BLAKELY***

Support of Application for Transfer Water Right No. 01-10021

Byron Blakely

Byron Blakely is the owner of water right 01-10021 for irrigation from the South Fork of the Snake River (SFSR). The water right diverts surface water from the SFSR into the Craig-Mattson Canal where it is delivered to about 35.3 acres for irrigation. A pond located nearby is presumed to be hydrologically connected to the river via seepage from the river into a pond, shown in Figure 1. The pond is currently being used as the source for a pump which is connected to the pressurized irrigation sprinkler system pertaining to the same lands described on water right 1-10021. Originally, the farm was flood irrigated but has since been updated to pressurized sprinkler. The pond is approximately 1.4 acres in surface area and about 8-10 feet deep on average holding approximately 11.2 acre-feet. Water level in the pond is directly related to water level in the Snake River; the pond fills by itself simultaneously as the Snake River rises above a certain undefined level.

This application proposes to change the point of diversion from which the water right can be legally diverted. Changes in surrounding irrigation practices and land uses have made diversion through the Craig-Mattson Canal less efficient and more difficult. As an alternative, it is proposed to use the existing pump that pertains to the current pressurized irrigation system (located in the pond) as the sole authorized point of diversion. The Craig-Mattson Canal Company has already granted authorization for water right 1-10021 to be removed from the canal. A copy of their statement is attached.

A hydrologic analysis was performed to determine the extent of connectivity of the pond to the South Fork Snake River (SFSR). Figure 2 illustrates the relationship of the location of a pond relative to the SFSR, and between the SFSR and the Dry Bed Canal, located approximately 2,500 feet south of the pond at its closest point. To evaluate the proportional amount of pumping flow that pumping from a pond at the "Proposed POD" location would have relative to flows from the SFSR and the Dry Bed canal, an adaptation of the Glover/Balmer/Jenkins method was employed (Contor, 2011). This adaption was developed by Idaho Water Resources Research Institute for use in a recharge study, and is based on earlier work by Miller, Durnford, Halstead, Altenhofen and Van Flory (2007).

Data

The method used requires three inputs for a scenario characterized by a well located between two linear water features (usually streams) in hydraulic communication with the same aquifer as the well. (While the pond is not a "well", it interacts with the shallow groundwater and for the purposes of the analysis is similar to the function of a well.) The inputs are:

- Geometric relationships (relative distances) between the Point of Diversion and the linear features;
- Aquifer storage coefficient;
- Aquifer transmissivity.

The data for the analysis was obtained from the following sources:

- US Department of Agriculture NAIP aerial photography (2019);
- Enhanced Snake Plain Aquifer Model Version 2.1 (Idaho Department of Water Resources, 2013)

Methods

The connection between the two linear features (the SFSR, and the Dry Bed Canal) and the aquifer was ascertained from visual observation of multiple ponds, apparently groundwater-fed, in the area between the two linear features. Geometric relationships were determined from Geographic Information Systems (GIS) processing using the features visible in the aerial image. Aquifer properties were obtained from the ESPAM2.1 data set.

Results

Figure 2 provides a view of the representations of geometry used in the analysis. The northeast boundary line, representing the SFSR, is drawn to approximate the average linear alignment in the vicinity of the proposed Point of Diversion (pPOD), and more importantly, to be approximately the same distance from the POD as the point is from the closest point of the bank of the SFSR.

The mathematical underpinnings of the method assume parallel linear features. Because the SFSR and the Dry Bed Canal are not parallel linear features, the parallel line representing the Dry Bed Canal was drawn nearer to the pPOD than the actual perpendicular distance, but approximately equal to the radial distance between the pPOD and the closest point of the Dry Bed Canal to the south. This is a conservative assumption in that the nearer the second stream is to the pPOD, the smaller the fraction of pumping that will be attributed to the first stream. The selected SFSR boundary is 1,024 feet from the pPOD and the selected Dry Bed Canal boundary is 2507 feet.

Figure 2 also illustrates the aquifer properties derived from ESPAM2.1. The transmissivity values (bold, italic print in light green) are the base-10 logarithm of transmissivity, and the value in both of the model cells of interest is 4.04. Hence, a transmissivity of $10^{4.04}$, or 10,064.78, feet²/day is used in the analysis. The storage coefficients are in gray regular font with a white halo. The cell containing the perpendicular line has a modeled storage coefficient of 0.120174. A value of 0.12 was used in the analysis.

Figure 3 shows the results of the analysis. The horizontal axis is time in days, and the calculations were done on a 0.1 day basis. The vertical axis is " q/Q ," which represents the ratio of pumping rate expressed at the linear boundary (q) to pumping from the well (Q). After 9.7 days, 50 percent of the pumped flow is projected to be from the combined flows of the SFSR and the Dry Bed Canal. **After 12.7 days of pumping, 50 percent of the pumped flow is indicated to be from the SFSR.** After 30 days of pumping, approximately 65 percent of the pumping rate is indicated to be from the SFSR, and approximately 23 percent is expected to be from the Dry Bed Canal. **After less than 60 days of pumping, approximately 70 percent of flow is expected to be from the SFSR and this percentage increases very slowly through 120 days of pumping.** The contribution from the Dry Bed Canal increases to about 29 percent after 60 days and to about 30 percent by 120 days. The value of 50.0 percent, projected after 12.7 days of pumping, is the measured threshold set by IDWR for determining a sufficient hydraulic connection of a well (or in this case, a hydraulically connected pond) to a surface water source of which the water right pertains thereto.

Administration

The water right will be accounted to the pump and will no longer be delivered to the Craig-Mattson Canal.

Summary

The existing original POD of the Craig-Mattson Canal will no longer be used for diversion and delivering of the Blakely water right 01-10021. The proposed POD, the existing pump in the pond, will be used as the new point of diversion. The hydrologic analysis described herein shows that 50 percent of the water diverted from the pond comes directly from the SFSR after 12.7 days of pumping and rises to about 70 percent within 60 days, exceeding the 50% threshold set by IDWR. Diverting directly from the pump while relying upon subsurface seepage from the SFSR will limit delivery losses that would otherwise occur through delivery from the canal. Therefore, whether through the Craig-Mattson Canal or the pond pump, the Blakely water right will be delivered from the SFSR.

References

- Contor, Bryce A. 2011. Adaptation of the Glover/Balmer/Jenkins Analytical Stream-Depletion Methods for No-flow and Recharge Boundaries. Idaho Water Resources Research Institute Technical Completion Report 201101.
- Idaho Department of Water Resources with guidance from the Eastern Snake Hydrologic Modeling Committee. 2013. Enhanced Snake Plain Aquifer Model Version 2.1 Final Report.
- Miller, C.D., D. Durnford, M.R. Halstead, J. Altenhofen and Val Flory. 2007. *Stream Depletion in Alluvial Valleys Using the SDF Semianalytical Model*. Ground Water 45, no. 4. 506-514.
- US Department of Agriculture Farm Service Agency. 2019. National Agricultural Imagery Program image for Jefferson County Idaho, 2019.
<https://www.fsa.usda.gov/programs-and-services/aerial-photography/imagery-programs/naip-imagery/>

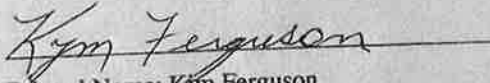
April 15, 2020

To: Idaho Department of Water Resources

From: Kim Ferguson, President, Craig-Mattson Canal Company

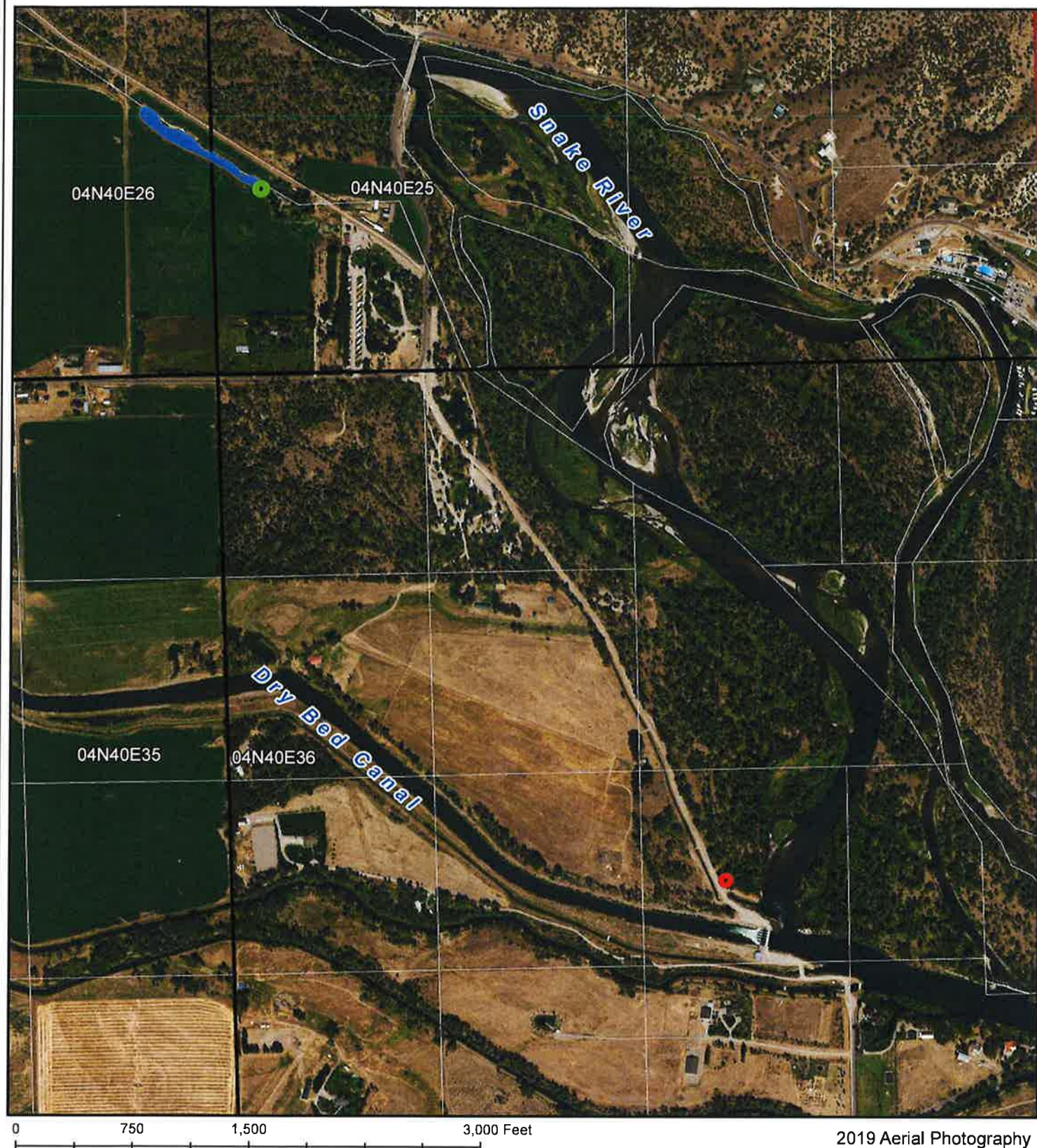
Subject: Transfer of Water Right No. 01-10021 in the name of Byron Blakely

The Craig-Mattson Canal Company has approved a request from Byron Blakely to change the point of diversion for his water right, 01-10021, from the Craig-Mattson Canal to a location near his home. I have the authority on behalf of Craig-Mattson Canal Company to consent to the transfer of this water right.

A handwritten signature in cursive script, appearing to read "Kim Ferguson", written over a horizontal line.

Printed Name: Kim Ferguson

Position: President, Craig-Mattson



Legend

- Mattson-Craig Canal
- Proposed POD
- Pond
- Twp & Rng
- Section
- QQ

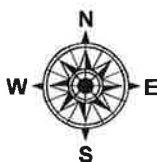


Figure 1. Site Location

Byron Blakely

RMEA #17-0215

by: KM

Date: 2/27/2020





Legend

- Proposed POD
- Perpendicular
- Boundaries
- Log 10 Transmissivity

Storage Coefficient

Pond

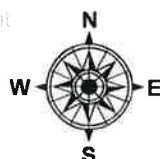


Figure 2. Aquifer Properties

Byron Blakely

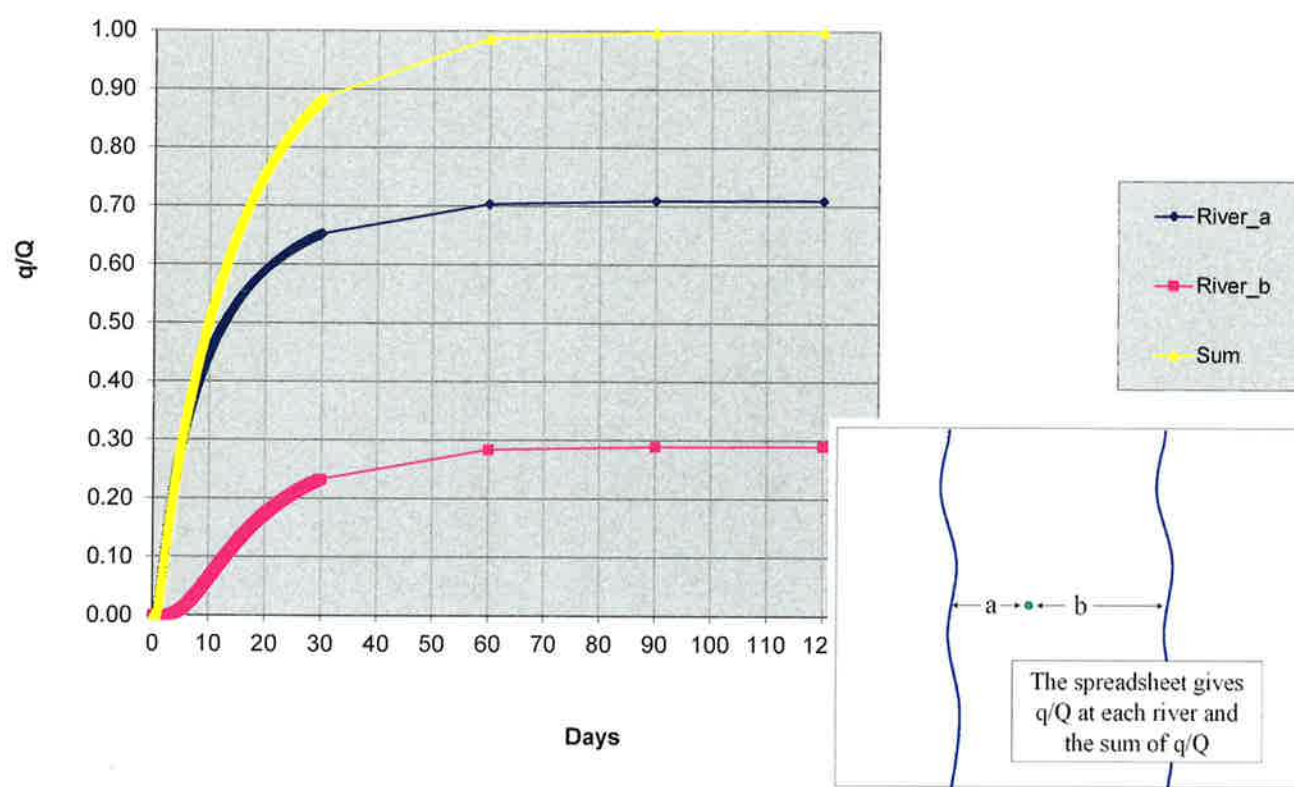
RMEA #17-0215

by: KM

Date: 2/27/2020



Figure 3
Jenkins Two-River Analysis



APPENDIX B
WELL LOGS

IDAHO DEPARTMENT OF WATER RESOURCES

WELL DRILLER'S REPORT

Office Use Only

Well ID No. _____

Inspected by _____

Twp _____ Rge _____ Sec _____

1/4 1/4 1/4

Lat: : : Long: : :

1. WELL TAG NO. D

45552

DRILLING PERMIT NO. _____

Water Right or Injection Well No. _____

2. OWNER:

Name

Address

City

State

Zip

3. LOCATION OF WELL by legal description:

You must provide address or Lot, Blk, Sub, or Directions to well.

Twp.

North

or

South

Rge.

East

or

West

Sec.

1/4

or

1/4

Gov't Lot

Lat:

Long:

Address of Well Site

City

(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 Material	From	To	Weight / Volume	Seal Placement Method
bentonite	0	20	180	overbore

Was drive shoe used?

☒ Y☐ N

Shoe Depth(s)

80

Was drive shoe seal tested?

☐ Y☒ N

How?

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
6	4	2	80	250	steel	☒	☐	☒

Length of Headpipe

Length of Tailpipe

Packer

☐ Y☒ N

Type

9. PERFORATIONS/SCREENS PACKER TYPE

Perforation Method

Screen Type & Method of Installation

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						☐	☐

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

20 ft. below ground

Artesian pressure _____ lb.

Depth flow encountered

ft. Describe access port or control devices:

well cap

12. WELL TESTS:

☐ Pump☐ Bailer☐ Air☐ Flowing Artesian

Yield gal / min.	Drawdown	Pumping Level	Time
30			

Water Temp. 51°

Bottom hole temp. _____

Water Quality test or comments: _____

Depth first Water Encounter 20

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Water

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
8	0	20	sand & gravel		X
6	20	60	sand & gravel	X	
6	60	70	gravel	X	
6	70	74	lava broken	X	
6	74	80	cinders	X	

RECEIVED

JAN 03 2007

Department of Water Resources
Eastern Region

Completed Depth

80

(Measurable)

Date: Started

11-13-06

Completed

11-14-06

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

High Plains

Firm No.

299

Principal Driller

Marco Franks

Date

12-30-06

and

Driller or Operator II

Date

Operator I

Tyler Rich

Date

12-30-06

Principal Driller and Rig Operator Required.

Operator I must have signature of Driller/Operator II.

FORWARD WHITE COPY TO WATER RESOURCES

Form 238-7
6/02

IDAHO DEPARTMENT OF WATER RESOURCES

WELL DRILLER'S REPORT

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

22

1. WELL TAG NO. D 45551
 DRILLING PERMIT NO. _____
 Water Right or Injection Well No. _____

2. OWNER:
 Name Deborah Bagley
 Address 384 N 1085 E
 City Sinden State UT Zip 84042

3. LOCATION OF WELL by legal description:
 You must provide address or Lot, Blk, Sub. or Directions to well.
 Twp. 4 North ☒ or South ☐
 Rge. 40 East ☒ or West ☐
 Sec. 26 1/4 NE 1/4 SE 1/4
 Gov't Lot _____
 Lat: _____ Long: _____
 Address of Well Site 4983E 100N
 City Pine
 (Give at least name of road + Distance to Road or Landmark)
 LI. _____ 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
<u>bentonite</u>	<u>0</u>	<u>20</u>	<u>150</u>	<u>overbore</u>

Was drive shoe used? ☒ Y ☐ N Shoe Depth(s) 80
 Was drive shoe seal tested? ☐ Y ☒ X How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
<u>6</u>	<u>12</u>	<u>80</u>	<u>250</u>	<u>steel</u>	☒	☐	☒	☐

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

9. PERFORATIONS/SCREENS PACKER TYPE

Perforation Method _____
 Screen Type & Method of Installation _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						☐	☐
						☐	☐
						☐	☐

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

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

12. WELL TESTS:

☐ Pump ☐ Bailor ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
<u>30</u>			

Water Temp. 51° Bottom hole temp. _____

Water Quality test or comments: _____

Depth first Water Encounter 20

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water	Y	N
<u>8</u>	<u>0</u>	<u>20</u>	<u>sand gravel</u>			☒
<u>6</u>	<u>20</u>	<u>52</u>	<u>gravel & sand</u>	☒		
<u>6</u>	<u>52</u>	<u>55</u>	<u>big boulder</u>	☒		
<u>6</u>	<u>55</u>	<u>75</u>	<u>gravel & sand</u>	☒		
<u>6</u>	<u>75</u>	<u>77</u>	<u>boulder</u>	☒		
<u>6</u>	<u>77</u>	<u>80</u>	<u>gravel</u>	☒		

RECEIVED

JAN 03 2007

Department of Water Resources
 Eastern Region

Completed Depth 80 (Measurable)
 Date: Started 11-11-06 Completed 11-01-06

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 High Plains Firm No. 288
 Principal Driller and Operator Marcus Zambra Date 12-30-06
 Driller or Operator II _____ Date _____
 Operator I Tyler Ricks Date 12-30-06

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

FORWARD WHITE COPY TO WATER RESOURCES

Form 2387
6/02

IDAHO DEPARTMENT OF WATER RESOURCES

WELL DRILLER'S REPORT

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

1. WELL TAG NO. D 0026332
DRILLING PERMIT NO. 789180
Water Right or Injection Well No. 22

2. OWNER:

Name Jason Ferguson
Address 4966 E 100 N
City Rigby State Id Zip 83442

3. LOCATION OF WELL by legal description:

You must provide address or Lot, Blk, Sub. or Directions to well.

Twp. 4 North ☒ or South ☐
Rge. 40 East ☒ or West ☐
Sec. 26 1/4 SE 1/4 SE 1/4
Gov't Lot _____
County Jefferson
Lat: _____ Long: _____

Address of Well Site _____

(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 Material	From	To	Weight / Volume	Seal Placement Method
<u>bentonite</u>	<u>0</u>	<u>20</u>	<u>3 bag</u>	<u>overbore</u>

Was drive shoe used? ☒ ☐ N Shoe Depth(s) 600

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

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
<u>6 +2</u>	<u>60</u>	<u>250</u>	<u>steel</u>	<u>steel</u>	☒	☐	☒	☐

Length of Headpipe _____ Length of Tailpipe _____

Packer ☐ Y ☒ N Type _____

9. PERFORATIONS/SCREENS PACKER TYPE

Perforation Method _____

Screen Type & Method of Installation _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						☐	☐
						☐	☐
						☐	☐

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

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

12. WELL TESTS:

☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
<u>50</u>	<u>0</u>	<u>12</u>	<u>1 hr.</u>

Water Temp. 49°

Bottom hole temp. _____

Water Quality test or comments: good

Depth first Water Encounter 12

13. 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>20</u>	<u>gravel</u>	☒	☐
<u>6</u>	<u>20</u>	<u>50</u>	<u>gravel & sand</u>	☒	☐
<u>6</u>	<u>50</u>	<u>54</u>	<u>boulder</u>	☒	☐
<u>6</u>	<u>54</u>	<u>60</u>	<u>gravel</u>	☒	☐

Completed Depth 600 (Measurable)

Date: Started 11-19-02 Completed 11-20-02

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 High Plains Firm No. 299

Principal Driller Marcus Franden Date 1-13-03

and Driller or Operator II Marcus Franden Date 1-13-03

Operator I Travis Franden Date 1-13-03

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

FORWARD WHITE COPY TO WATER RESOURCES

Form 238-7
1/02

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Location Corrected by IDWR To:
T04N R40E Sec. 26 SESE
By: mciscell 2012-02-27

1. WELL TAG NO. D 21644
DRILLING PERMIT NO. 808677
Water Right or Injection Well No. _____

2. OWNER:
Name Kym Ferguson
Address 15533 Ririe Hwy
City Ririe State Id Zip 834

3. LOCATION OF WELL by legal description:

You must provide address or Lot, Blk, Sub. or Directions to well.

Twp. 4 North ☒ or South ☐
Rge. 40 East ☒ or West ☐
Sec. 35 1/4 NW 1/4 NE 1/4
Gov't Lot _____
County Jefferson
Lat: _____ Long: _____
Address of Well Site 4973 E 100N

(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 Material	From	To	Weight / Volume	Seal Placement Method
<u>bentonite</u>	<u>0</u>	<u>30</u>	<u>200</u>	<u>overbur</u>

Was drive shoe used? ☒ Y ☐ N Shoe Depth(s) 140'
Was drive shoe seal tested? ☐ Y ☒ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
<u>8</u>	<u>+2</u>	<u>140</u>	<u>250</u>	<u>steel</u>	☒	☐	☒	☐

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

9. PERFORATIONS/SCREENS PACKER TYPE

Perforation Method _____
Screen Type & Method of Installation _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						☐	☐
						☐	☐
						☐	☐

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

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

well cap

12. WELL TESTS:

☒ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
<u>38</u>	<u>10</u>	<u>58</u>	<u>4 hrs</u>

Water Temp. 52° Bottom hole temp. _____

Water Quality test or comments: iron water #4

Depth first Water Encounter 48

13. 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>20</u>	<u>clay gravel</u>		☒
<u>8</u>	<u>20</u>	<u>48</u>	<u>clay + sand</u>		☒
<u>8</u>	<u>48</u>	<u>67</u>	<u>gravel & clay</u>	☒	
<u>8</u>	<u>67</u>	<u>105</u>	<u>clay & sand</u>	☒	
<u>6</u>	<u>105</u>	<u>140</u>	<u>gravel & a little clay</u>	☒	
			<u>blew 1 in. to get it to clean up</u>		
			<u>looks good now</u>		

RECEIVED

JUL 07 2004

Department of Water Resources
Eastern Region

Completed Depth 140 (Measurable)
Date: Started 10-19-02 Completed 10-24-02

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 High Plains Firm No. 289

Principal Driller Marcus Franke Date 7-5-04

Driller or Operator II Danny Franke Date 7-5-04

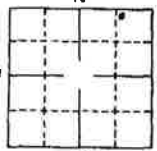
Operator I [Signature] Date _____

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

FORWARD WHITE COPY TO WATER RESOURCES

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>Growth Fulmer</u> Address <u>P.O. Box 71 St. Anthony, Ida. 83445</u> Owner's Permit No. _____ 2. NATURE OF WORK ☒ New well ☐ Deepened ☐ Replacement ☐ Abandoned (describe abandonment procedures such as materials, plug depths, etc. in lithologic log) 3. PROPOSED USE ☒ Domestic ☐ Irrigation ☐ Test ☐ Municipal ☐ Industrial ☐ Stock ☐ Waste Disposal or Injection ☐ Other _____ (specify type) 4. METHOD DRILLED ☒ Rotary ☐ Air ☐ Hydraulic ☐ Reverse rotary ☐ Cable ☐ Dug ☐ Other _____ 5. WELL CONSTRUCTION Casing schedule: ☒ Steel ☐ Concrete ☐ Other <table style="width: 100%; font-size: small;"> <thead> <tr> <th>Thickness</th> <th>Diameter</th> <th>From</th> <th>To</th> </tr> </thead> <tbody> <tr> <td><u>.250</u> inches</td> <td><u>6</u> inches + <u>1</u> feet <u>23</u> feet</td> <td></td> <td></td> </tr> <tr> <td>_____ inches</td> <td>_____ inches _____ feet _____ feet</td> <td></td> <td></td> </tr> <tr> <td>_____ inches</td> <td>_____ inches _____ feet _____ feet</td> <td></td> <td></td> </tr> <tr> <td>_____ inches</td> <td>_____ inches _____ feet _____ feet</td> <td></td> <td></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 Size of perforation _____ inches by _____ inches <table style="width: 100%; font-size: x-small;"> <thead> <tr> <th>Number</th> <th>From</th> <th>To</th> </tr> </thead> <tbody> <tr> <td>_____ perforations</td> <td>_____ feet _____ feet</td> <td></td> </tr> <tr> <td>_____ perforations</td> <td>_____ feet _____ feet</td> <td></td> </tr> <tr> <td>_____ perforations</td> <td>_____ feet _____ feet</td> <td></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>18</u> Material used in seal: ☐ Cement grout ☒ Bentonite ☐ Pudding 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 _____ 6. LOCATION OF WELL Skip map location must agree with written location.  Subdivision Name _____ Lot No. _____ Block No. _____ County <u>Jefferson</u> <u>N.E.</u> ¼ Sec. <u>35</u>, T. <u>4</u> N., R. <u>40</u> E.W.	Thickness	Diameter	From	To	<u>.250</u> inches	<u>6</u> inches + <u>1</u> feet <u>23</u> feet			_____ inches	_____ inches _____ feet _____ feet			_____ inches	_____ inches _____ feet _____ feet			_____ inches	_____ inches _____ feet _____ feet			Number	From	To	_____ perforations	_____ feet _____ feet		_____ perforations	_____ feet _____ feet		_____ perforations	_____ feet _____ feet		7. WATER LEVEL Static water level <u>5</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 _____ <i>Describe artesian or temperature zones below.</i> 8. WELL TEST DATA ☐ Pump ☐ Bailor ☐ Air ☐ Other _____ <table style="width: 100%; font-size: small;"> <thead> <tr> <th>Discharge G.P.M.</th> <th>Pumping Level</th> <th>Hours Pumped</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table> 9. LITHOLOGIC LOG <table style="width: 100%; font-size: x-small;"> <thead> <tr> <th rowspan="2">Bore Diam.</th> <th colspan="2">Depth</th> <th rowspan="2">Material</th> <th colspan="2">Water</th> </tr> <tr> <th>From</th> <th>To</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td><u>6"</u></td> <td><u>0</u></td> <td><u>2</u></td> <td><u>Overburden</u></td> <td></td> <td>☒</td> </tr> <tr> <td></td> <td><u>2</u></td> <td><u>72</u></td> <td><u>Gravel</u></td> <td></td> <td></td> </tr> <tr> <td></td> <td><u>72</u></td> <td><u>90</u></td> <td><u>BASALT</u></td> <td></td> <td></td> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table> 82393 RECEIVED OCT 9 1986 Department of Water Resources Eastern District Office OCT 16 1986 Department of Water Resources 10. Work started <u>Aug 28</u> finished <u>Aug 28 86</u> 11. DRILLERS CERTIFICATION I/we certify that all minimum well construction standards were complied with at the time the lg was removed. Firm Name <u>Jennings Drilling</u> Firm No. <u>10</u> Address <u>Box 460 Ucon</u> Date <u>Aug-28 &</u> Signed by (Firm Official) <u>[Signature]</u> and (Operator) <u>[Signature]</u>	Discharge G.P.M.	Pumping Level	Hours Pumped										Bore Diam.	Depth		Material	Water		From	To	Yes	No	<u>6"</u>	<u>0</u>	<u>2</u>	<u>Overburden</u>		☒		<u>2</u>	<u>72</u>	<u>Gravel</u>				<u>72</u>	<u>90</u>	<u>BASALT</u>																																																																																																																										
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USE ADDITIONAL SHEETS IF NECESSARY - FORWARD THE WHITE COPY TO THE DEPARTMENT

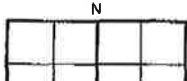
1. DRILLING PERMIT NO. 23-94-E-014-000
Other IDWR No. _____

2. OWNER:

Name Blake Blakely
Address P.O. Box 2739
City Danville State IN Zip 46019

3. LOCATION OF WELL by legal description:

Sketch map location must agree with written location.


 Twp. 4 North ☒ or South ☐
 Rge. 40 East ☒ or West ☐
 Sec. 25 $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$
 Gov't Lot _____ County Jefferson
 Address of Well Site 5005 E 100 N
Elgin Idaho
 (Give at least name of road + Distance to Road, or Landmark)

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	
Kenomite	0	20	100 #	Overbone

Was drive shoe used? Y ☒ N ☐

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

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Linear	Welded	Threaded
6"	+2	64	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
						☐	☐
						☐	☐
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

10 ft. below ground Artesian pressure _____ lb.
Depth flow encountered 75 ft. Describe access port or
control devices:

11. WELL TESTS:

☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian[illegible]

Water Temp. _____ Bottom hole temp. _____

Water Quality test or comments:

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

[illegible]

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 11th Avenue Firm No 579

Firm Official John J. Bennett Date 9/16/94

and 

Supervisor or Operator _____ Date _____

(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

3. LOCATION OF WELL by legal description:

You must provide address or Lot, Blk, Sub. or Directions to well.

Twp. 4 North ☒ or South ☐
 Rge. 40 East ☒ or West ☐
 Sec. 36 SW 1/4 NE 1/4 NW 1/4
 Gov't Lot _____ County Safferson

Lat: : : Long: : :

Address of Well Site _____ City Ririe

(Give at least name of road + Distance to Road or Landmark)
 Lt. _____ Blk. _____ Sub. Name _____

4. USE:

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

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
Neat Cement	15'	60'	9 yards	conductor casing
ben tonite	0'	15'	5500 lbs	conductor casing

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
12"	+1'	60'	.365	steel pulled back	☒	☐	☒	☐
8"	+1'	142'	.365	steel pulled back	☐	☐	☐	☐

Length of Headpipe 5' Length of Tailpipe 1 1/2'

Packer ☒ Y ☐ N Type Triple K

9. PERFORATIONS/SCREENS PACKER TYPE

Perforation Method _____

Screen Type & Method of Installation wire wrap/lowered to bottom-pulled 20' of 18" casing

From	To	Slot Size	Number	Diameter	Material	Casing
120'	140'				stainless	☐

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

25 ft. below ground Artesian pressure _____ lb.

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

Water Quality test or comments: _____

Depth first Water Encounter _____

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
12"	0'	20'	clay-sand-gravels		☒
12"	20'	35'	conglomerated gravels	☒	
12"	35'	40'	sand gravels	☒	
12"	40'	60'	sand-gravels	☒	
8"	60'	75'	sand gravels	☒	
8"	75'	78'	clay		☒
8"	78'	90'	light grey rock		☒
8"	90'	100'	coarse sand-gravels	☒	
8"	100'	120'	gravels	☒	
8"	120'	142'	gravels	☒	

RECEIVED

JAN 23 2009

Department of Water Resources
 Eastern Region

Completed Depth 142' (Measurable)

Date: Started 11-26-08 Completed 12-19-08

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 Deaning Well Drilling Firm No. 518

Principal Driller [Signature] Date 12-30-08

and Driller or Operator II [Signature] Date 12-30-08

Operator I _____ Date _____

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

FORWARD WHITE COPY TO WATER RESOURCES