

Page _____ of _____

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCESTransfer No. 74716**AMENDED**
APPLICATION FOR TRANSFER OF WATER RIGHT
PART 1Name of applicant Catherine S. Dawson Revocable Trust Phone (847) 605-4012Post Office address 526 Mall Dr., Schaumburg, IL 60173**RECEIVED****A. PURPOSE OF TRANSFER**

1. ☒ Change point of diversion ☐ Add diversion point ☐ Change place of use
☐ Change nature of use ☐ Change period of use ☐ Other _____

FEB 24 2009**DEPT. OF WATER RESOURCES
SOUTHERN REGION**

2. Describe the reason for the proposed changes To allow diversion of surface water right from
~~existing groundwater well.~~

PER 2/27/09 TELECON WITH C.B. BRADWAY**B. DESCRIPTION OF RIGHT(S) OR PORTION THEREOF, AFTER THE REQUESTED CHANGE**

1. Right Number 37-276F Priority 6/1/1885 Amount (cfs/ac-ft) 0.14 cfs Nature of Use Irrigation Period of Use 4/1 to 11/1

2. Total amount of water being transferred 0.14 cubic feet per second and/or _____ acre-feet per annum.
3. Source of water Groundwater tributary to _____
4. Point(s) of Diversion:

Lot	1/4	1/4	1/4	Sec.	Twp.	Rge	County	Local name for diversion
	SW	NW	NW	14	5N	17E	Blaine	New irrigation well

5. Lands irrigated or place of use:

Twp.	Rge.	Sec.	NE 1/4				NW 1/4				SW 1/4				SE 1/4				Totals
			NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	
5N	17E	14						2	5										7.0

PART 1

6. General Information:

- a. Description of diversion system New well and pump to sprinkler irrigation system.
- b. Are the lands from which you propose to transfer the water right subject to any liens, deeds of trust, mortgages, or contracts?
☐ Yes ☒ No. If yes, provide a notarized statement from the holder of the lien, deed of trust, mortgage or contract agreeing to the proposed changes.
- c. Describe the effect on the land now irrigated if the place of use is changed pursuant to this transfer:
No change. Land will continue to be irrigated.
- d. Remarks:
Surface right to be transferred to groundwater source within approximately 175 feet of the river. See attached hydrologic analysis showing that the well meets the "50% impact in 24 hours" criteria.

ACTION OF THE DIRECTOR, DEPARTMENT OF WATER RESOURCES

This is to certify that I have examined Application for Transfer of Water Rights No. _____

And said application is hereby _____, subject to the following limitations and conditions:

Witness my hand this _____ day of _____, 19 _____.

Page _____ of _____

Transfer No. _____

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
APPLICATION FOR TRANSFER OF WATER RIGHT
PART 2

(Attach one copy for each right)

A. DESCRIPTION OF RIGHT AS RECORDED

1. Right evidenced by:

- a. Decree No. 37-276F Decreed to Gooding
in case of Frost Decree (SRBA recommended) vs. _____
dated _____ in _____ county of _____
- b. License No. _____ issued by the Idaho Department of Water Resources.
- c. Claim No. _____ on file with the Idaho Department of Water Resources.
- d. Transfer No. _____ which produced this right.

2. Attach a copy of last year's tax notice for the property to which the water right is appurtenant or other documents which show ownership. Label document as attachment A. check appropriate box below.

☐ Tax notice ☐ Warranty Deed ☐ Other _____

3. Source of water Big Wood River tributary to _____

4. Date of priority 6/1/1885

5. Water is used for the following purpose:

Amount 0.14 cfs for Irrigation purposes from 4/1 to 11/1
(cfs/ac-ft)
Amount _____ for _____ purposes from _____ to _____
(cfs/ac-ft)
Amount _____ for _____ purposes from _____ to _____
(cfs/ac-ft)

6. Total amount of water under right 0.14 cubic feet per second and/or _____ acre-feet per annum.

7. Point(s) of Diversion:

Lot	1/4	1/4	1/4	Sec.	Twp.	Rge	County	Local name for diversion
		NW	NW	14	5N	17E	Blaine	Candy pump

8. Lands irrigated or place of use:

Twp.	Rge.	Sec.	NE 1/4				NW 1/4				SW 1/4				SE 1/4				Totals
			NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	
5N	17E	14						2	5										7

Total acres 7

9. Describe any other water rights used for the same purpose as described above 37-8574

10. To your knowledge, has any portion of this water right undergone a period of five or more consecutive years of non-use?

No _____

If yes, describe _____

B. DESCRIPTION OF PORTION OF RIGHT BEING TRANSFERRED

(if the entire right is to be changed by the applicant, omit part B and C)

1. Amount _____ for _____ purposes from _____ to _____
 (cfs/ac-ft)
 Amount _____ for _____ purposes from _____ to _____
 (cfs/ac-ft)
 Amount _____ for _____ purposes from _____ to _____
 (cfs/ac-ft)

2. Point(s) of Diversion:

Lot	1/4	1/4	1/4	Sec.	Twp.	Rge	County	Local name for diversion

3. Lands irrigated or place of use:

Twp.	Rge.	Sec.	NE 1/4				NW 1/4				SW 1/4				SE 1/4				Totals
			NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	

Total acres _____

C. DESCRIPTION OF UNCHANGED PORTION OF RIGHT *(omit if there is no change)*

1. Amount _____ for _____ purposes from _____ to _____
 (cfs/ac-ft)
 Amount _____ for _____ purposes from _____ to _____
 (cfs/ac-ft)
 Amount _____ for _____ purposes from _____ to _____
 (cfs/ac-ft)

2. Point(s) of Diversion:

Lot	1/4	1/4	1/4	Sec.	Twp.	Rge	County	Local name for diversion

3. Lands irrigated or place of use:

Twp.	Rge.	Sec.	NE 1/4				NW 1/4				SW 1/4				SE 1/4				Totals
			NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	

Total acres _____



DAWSON, HANLEY NAIP 2004 AERIAL

1 inch equals 500 feet

BROCKWAY ENGINEERING, PLLC.
ALR - Jan. 3, 2008

Legend

Well	
Id	
●	Existing Well
●	New Well
	Dawson_Trust
	Sections
	t05n17e



PART 3**B. CHANGES IN NATURE OF USE**

1.

<u>New Nature of Use</u>	<u>Amount</u> (cfs/ac-ft)	<u>Hours/days/year</u>	<u>Period of Use</u>
_____	_____	_____	_____ to _____
_____	_____	_____	_____ to _____
2. Quantity and quality of return flows and location of discharge:
 None _____

3. Describe the effects on other water uses resulting from the proposed change:
 None _____

I hereby assert that no one will be injured by such change and that the change does not constitute an enlargement in use of the original right. The information contained in this application is true to the best of my knowledge.

I understand that any willful misrepresentations made in this application may result in voiding its approval.

Ch. C. Blum Power of Atty.
 (Signature of Applicant)

Subscribed and sworn to before me this 24th day of February, 2009.

Sandra Doneff
 (Notary Public)

SANDRA DONEFF
NOTARY PUBLIC
STATE OF IDAHO

My commission expires 11/3/2014

FOR DEPARTMENT USE ONLY

Transfer contains _____ pages and _____ attachments

Received by P. SKINNER Date 2/24/2009 Protest filed by _____

Prelim. check by P. SKINNER Fee * _____

Receipted by * Date * _____

Published in _____ Copies of protest forwarded by _____

Pub. dates _____ Hearing held by _____ Date _____

Watermaster recommendation requested on _____ Recommended for ☐ Approval ☐ Denial

_____ rec'd. _____ by _____

Copy of transfer sent to lien holder _____

* AMENDED APPLICATION REPLACES APPLICATION SUBMITTED ON 1/4/2008
 SEE RECEIPT # 5029913

Technical Memorandum

Analysis of river-aquifer hydrology and timing for Dawson water right transfer

RECEIVED

FEB 24 2009

DEPT. OF WATER RESOURCES
SOUTHERN REGION

Brockway Engineering, PLLC
Charles G. Brockway, P.E.

February 24, 2009

Transfer application #74716 proposes to change a portion of water right 37-276F from a surface water diversion from the Big Wood River at the applicant's property to a groundwater diversion from a proposed new well to be located on the applicant's property within 200 feet of the Big Wood River east bank (see attached map). IDWR policy is that such transfers may be allowed if there is a direct and rapid response of the river gain or loss due to pumping at the proposed groundwater source. This circumstance might be expected if the well is very near to the river and if the hydraulic connection between the aquifer and the surface stream is very direct.

In the Dawson case, the perpendicular distance from the well to the water edge will be 200 feet or less. Static water level at this location is anticipated to be approximately 10 feet or less. Water level below ground in the existing domestic and irrigation well was measured on 11/26/07 to be 12.7 feet. At the time of drilling, the water level was reported as 9 feet below ground. This distance is approximate equal to the topographic relief between the land surface and river water surface. For analytical purposes, it was assumed that the average water level in the well is approximately coincident with the river elevation.

The aquifer at the well site is unconfined, and is comprised of unconsolidated alluvial deposits, chiefly sand, gravel, and boulders, underlain by granitic or limestone bedrock. The drilling record of the Dawson well, included with this report, does not indicate the presence of fine-grained materials, which could act as confining or semi-confining layers. The Dawson well record indicates that "soft brown sandstone" was encountered from 53 feet to the bottom of the hole at 61 feet, which may indicate the beginning of the bedrock. Most other wells in the immediate area are not drilled to the bedrock, but generally indicate that the alluvial aquifer is at least 60 feet deep. Two wells in Eagle Creek Meadows show bedrock at 70 feet and 55 feet, and one well in Chocolate Gulch subdivision indicates 63 feet. The saturated depth at the Dawson property was assumed to be 50 feet.

The new well will be fully cased and fully penetrating in the alluvium, i.e. either perforated or screened from the water table to bedrock. This is necessary so that water withdrawn will affect the piezometric head in the alluvium and therefore the river reach gain.

Water drawn from the well will cause a local drawdown in the aquifer, increasing in magnitude with time and decreasing with distance from the well. When this drawdown reaches the river boundary, it will cause an increase in gradient at the boundary, thereby reducing the reach gain (or increasing reach loss). In lieu of developing a full numerical groundwater model with a very short time step, analytical techniques were employed to estimate the timing and magnitude of this river influence. In this approach, the Theis equation is used with the method of images to estimate the gradient at the river

boundary, and the method developed by Glover and Balmer (1954) is used to estimate the percentage of total pumping supplied by the river.

This simplification requires making several assumptions:

1. The Theis assumptions are reasonably valid.
2. The river acts as a constant-head boundary in the local vicinity of the well.
3. The method of superposition using image wells is valid to determine drawdown patterns in the presence of the constant-head boundary.
4. The influence of the well on the river discharge is indicated by the computed gradient of the water table at the river boundary.
5. The change in river-aquifer exchange compared to the no-pumping case is proportional to the gradient at the river boundary, i.e. Darcy's Law holds.

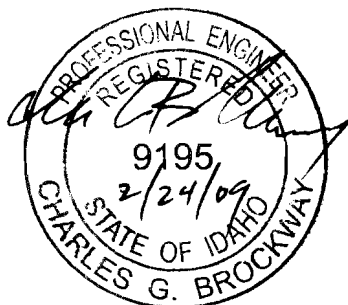
The analytical approach is illustrated by the attached conceptual diagram taken from Todd (1980) showing the pumping well, the river, and an image recharge well that results in a constant-head condition along the river. In this diagram, the discharging well is the Dawson well and x_1 is 200 feet. Initially, the water table is assumed to be horizontal in the x-direction with no gradient toward the well. As the well begins pumping, the water table remains coincident with the river level at $x=0$, but a gradient toward the Dawson well will be established at this point. This analysis applies only in the very local vicinity of the well, i.e. within 1000 feet or so. The main objective is to determine how quickly the river responds to well pumping. This information will allow IDWR to decide whether the diversion is essentially equivalent to a surface water diversion so that a direct surface-to-groundwater transfer can be made.

Hydraulic properties of the aquifer were assumed to be as follows:

- Hydraulic conductivity (K) = 104 ft/day – based on a controlled well test and analysis performed by Brockway Engineering on a large well drilled in 2006 approximately 1200 feet northwest of the proposed Dawson well.
- Storage coefficient (S) = 0.15 – typical of unconfined sand and gravel aquifers.
- Saturated depth = 50 feet – based on drilling record of the Dawson well.

A continuous pumping rate of 62.8 gpm (0.14 cfs) from the well was assumed, which is the diversion rate allowed by 37-276F. The time lag between commencement of pumping and the effect at the river is illustrated by the attached plot. A gradient at the river adjacent to the well begins after 2 hours of pumping and increases over time according to the pattern shown. Of the total water pumped, a portion will be supplied by the aquifer and a portion will be supplied by the river, until equilibrium is reached at which point all of the water is supplied by the river. This fraction Q_r / Q , where Q_r is the portion supplied by the river, is shown on the attached plot. 50% of the effect is seen after 10 hours of pumping, and 68% is seen after 24 hours.

This analysis indicates that criteria set forth by IDWR can be met: more than 50% of the river response will occur after 24 hours of pumping.



STATE OF IDAHO
DEPARTMENT OF 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.

RECEIVED
FEB 4 1985
Department of Water Resources
Southern District Office

1. WELL OWNER Name <u>HANLEY DAWSON III</u> <u>410 DATES FRYBERGER 83353</u> Address <u>P.O. Box 564, SUN VALLEY, IDA</u> Owner's Permit No. _____	7. WATER LEVEL Static water level <u>9</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 _____ of. Quality _____ Describe artesian or temperature zones below.																																														
2. NATURE OF WORK ☒ New well ☐ Deepened ☐ Replacement ☐ Abandoned (describe abandonment procedures such as materials, plug depths, etc. in lithologic log)	8. WELL TEST DATA ☐ Pump ☐ Bailer ☐ Air ☐ Other _____ <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Discharge G.P.M.</th><th>Pumping Level</th><th>Hours Pumped</th></tr> </thead> <tbody> <tr> <td colspan="3" style="text-align: center;">UNTESTED</td></tr> </tbody> </table>	Discharge G.P.M.	Pumping Level	Hours Pumped	UNTESTED																																										
Discharge G.P.M.	Pumping Level	Hours Pumped																																													
UNTESTED																																															
3. PROPOSED USE ☒ Domestic ☐ Irrigation ☐ Test ☐ Municipal ☐ Industrial ☐ Stock ☐ Waste Disposal or Injection ☐ Other _____ (specify type)	9. LITHOLOGIC LOG <table border="1" style="width:100%; border-collapse: collapse;"> <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>8"</td><td>0</td><td>1</td><td>BROWN TOP SOIL & GRAVEL</td><td></td><td></td></tr> <tr> <td>"</td><td>1</td><td>22</td><td>LARGE BOULDERS & GRAVEL</td><td>X</td><td></td></tr> <tr> <td>"</td><td>22</td><td>38</td><td>LARGE GRAVEL & SAND</td><td>X</td><td></td></tr> <tr> <td>"</td><td>38</td><td>42</td><td>COARSE SAND</td><td>X</td><td></td></tr> <tr> <td>"</td><td>42</td><td>53</td><td>COARSE SAND & FINE GRAVEL</td><td>X</td><td></td></tr> <tr> <td>"</td><td>53</td><td>61</td><td>SOFT BROWN SANDSTONE</td><td></td><td></td></tr> </tbody> </table>	Bore Diam.	Depth		Material	Water		From	To	Yes	No	8"	0	1	BROWN TOP SOIL & GRAVEL			"	1	22	LARGE BOULDERS & GRAVEL	X		"	22	38	LARGE GRAVEL & SAND	X		"	38	42	COARSE SAND	X		"	42	53	COARSE SAND & FINE GRAVEL	X		"	53	61	SOFT BROWN SANDSTONE		
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4. METHOD DRILLED ☐ Rotary ☐ Air ☐ Hydraulic ☐ Reverse rotary ☒ Cable ☐ Dug ☐ Other _____	10. Work started <u>16 SEP 84</u> finished <u>19 SEP 84</u>																																														
5. WELL CONSTRUCTION Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____ <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Thickness</th><th>Diameter</th><th>From</th><th>To</th></tr> </thead> <tbody> <tr> <td><u>2.50</u> inches</td><td><u>8</u> inches</td><td><u>1</u> feet</td><td><u>60</u> 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 Size of perforation <u>5/16</u> inches by <u>4</u> inches Number _____ From _____ To _____ <u>78</u> perforations <u>40</u> feet <u>53</u> 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 <u>18</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 _____	Thickness	Diameter	From	To	<u>2.50</u> inches	<u>8</u> inches	<u>1</u> feet	<u>60</u> feet	_____ inches	_____ inches	_____ feet	_____ feet	_____ inches	_____ inches	_____ feet	_____ feet	_____ inches	_____ inches	_____ feet	_____ feet	11. DRILLERS CERTIFICATION <u>OR</u> I/We certify that all minimum well construction standards were complied with at the time the rig was removed. <u>RAY KOESSLER</u> Firm Name <u>WELL DRILLING</u> Firm No. <u>262</u> <u>129 5TH AVE E.</u> Address <u>GOODING, IDAHO 83330</u> Date <u>20 SEP 84</u> Signed by (Firm Official) <u>Ray Koessler</u> and (Operator) <u>Ray Koessler</u>																										
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6. LOCATION OF WELL Sketch map location <u>must</u> agree with written location. <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">N</td><td colspan="2"></td></tr> <tr> <td style="text-align: center;">W</td><td style="text-align: center;">E</td><td></td></tr> <tr> <td style="text-align: center;">S</td><td colspan="2"></td></tr> </table> County <u>BLAINE</u> <u>SW</u> $\frac{1}{4}$ <u>NW</u> $\frac{1}{4}$ Sec. <u>14</u>, T. <u>5</u> N. R. <u>17</u> E.	N			W	E		S			Subdivision Name _____ Lot No. _____ Block No. _____																																					
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W	E																																														
S																																															

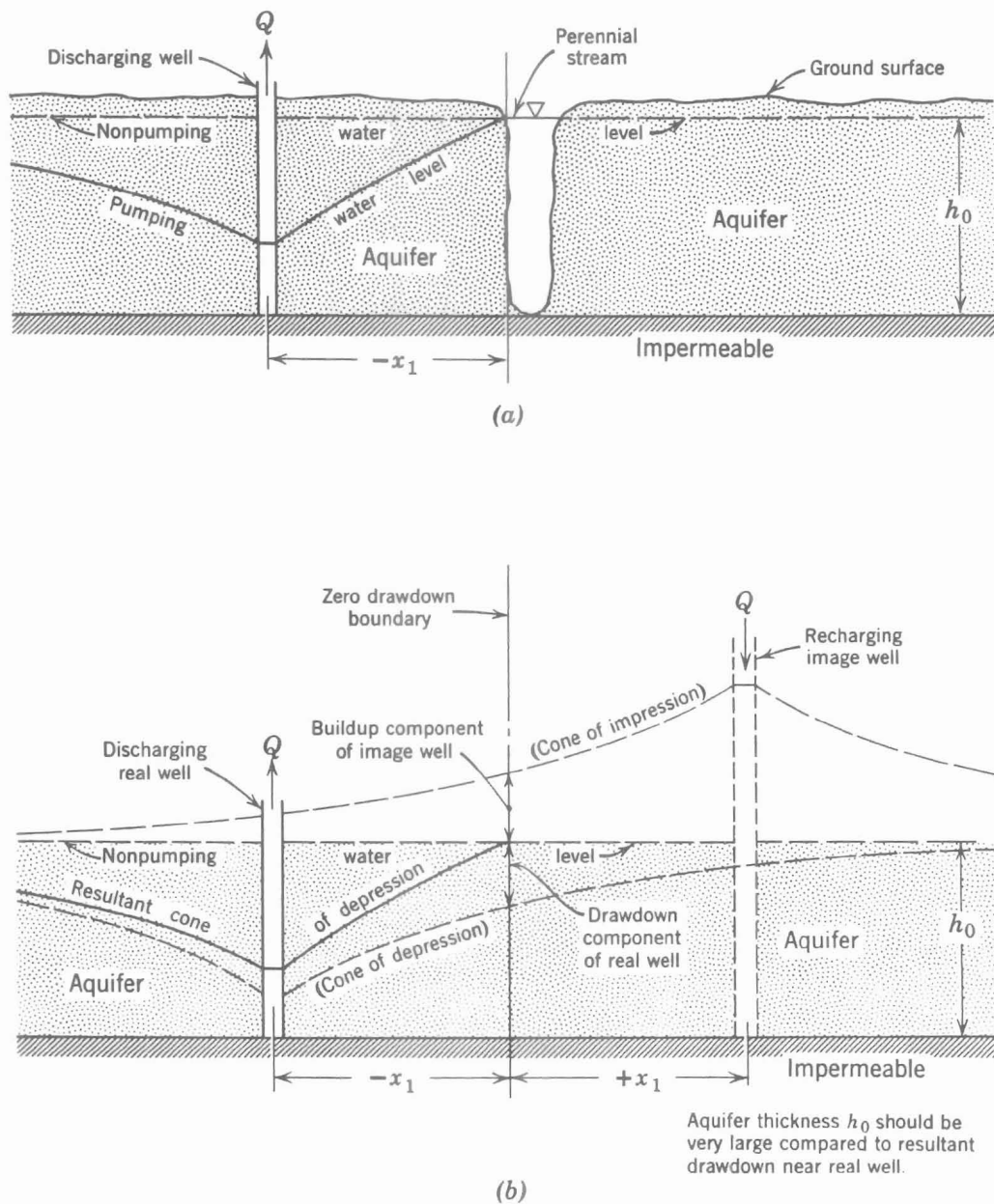


Fig. 4.19 Sectional views. (a) Discharging well near a perennial stream. (b) Equivalent hydraulic system in an aquifer of infinite areal extent (after Ferris, et al.¹⁶).

exactly cancel. This furnishes a constant head along the stream, which is equivalent to the constant elevation of the stream forming the aquifer boundary. Thus, in the plan view of the resulting flow net, illustrated by Fig. 4.20, a single equipotential line is coincident with the axis of the stream. The resultant asymmetrical drawdown of the real well is given at any point by the algebraic sum of the drawdown of the real well and the buildup of the recharge well, as if these wells were located in an infinite aquifer.

Todd, D.K. (1980). Groundwater Hydrology.

Estimation of Timing of Aquifer-Stream Interaction

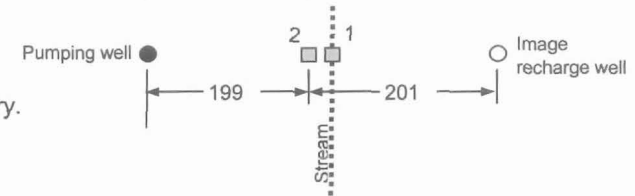
Dawson well - Big Wood River near Chocolate Gulch
Brockway Engineering, PLLC 2/24/09

Hydraulic conductivity 104 ft/day
Aquifer saturated thickness 50 feet
Transmissivity 5200 ft²/d
Storage coefficient 0.15

These assumptions apply.
Method of images used to estimate
gradient at constant-head stream boundary.

Pumping rate 62.8 gpm = 12090 ft³/d
Pumping time 48 hrs

Point 1: Constant-head, drawdown = 0, 200 feet from well.
Point 2: 1 foot from constant-head boundary.
Find gradient between points 1 and 2.



PUMPING WELL						
Time (hrs)	R = 201 feet		z (feet)	R = 199 feet		z (feet)
	u	W(u)		u	W(u)	
0	--	--	0.000	--	--	0.000
1	7.0E+00	0.000	0.000	6.9E+00	0.000	0.000
2	3.5E+00	0.007	0.001	3.4E+00	0.008	0.001
3	2.3E+00	0.031	0.006	2.3E+00	0.033	0.006
4	1.7E+00	0.070	0.013	1.7E+00	0.073	0.014
5	1.4E+00	0.117	0.022	1.4E+00	0.122	0.022
6	1.2E+00	0.167	0.031	1.1E+00	0.174	0.032
7	1.0E+00	0.220	0.041	9.8E-01	0.227	0.042
8	8.7E-01	0.272	0.050	8.6E-01	0.281	0.052
9	7.8E-01	0.324	0.060	7.6E-01	0.333	0.062
10	7.0E-01	0.374	0.069	6.9E-01	0.384	0.071
11	6.4E-01	0.423	0.078	6.2E-01	0.434	0.080
12	5.8E-01	0.471	0.087	5.7E-01	0.482	0.089
13	5.4E-01	0.516	0.096	5.3E-01	0.528	0.098
14	5.0E-01	0.560	0.104	4.9E-01	0.573	0.106
15	4.7E-01	0.603	0.112	4.6E-01	0.616	0.114
16	4.4E-01	0.644	0.119	4.3E-01	0.657	0.122
17	4.1E-01	0.684	0.127	4.0E-01	0.697	0.129
18	3.9E-01	0.722	0.134	3.8E-01	0.736	0.136
19	3.7E-01	0.759	0.140	3.6E-01	0.773	0.143
20	3.5E-01	0.795	0.147	3.4E-01	0.809	0.150
21	3.3E-01	0.830	0.154	3.3E-01	0.844	0.156
22	3.2E-01	0.863	0.160	3.1E-01	0.878	0.162
23	3.0E-01	0.896	0.166	3.0E-01	0.911	0.168
24	2.9E-01	0.927	0.172	2.9E-01	0.942	0.174
25	2.8E-01	0.958	0.177	2.7E-01	0.973	0.180
26	2.7E-01	0.988	0.183	2.6E-01	1.003	0.186

IMAGE WELL

R = 201 feet

z (feet)

0.000
0.000
-0.001
-0.006
-0.013
-0.022
-0.031
-0.041
-0.050
-0.060
-0.069
-0.078
-0.087
-0.096
-0.104
-0.112
-0.119
-0.127
-0.134
-0.140
-0.147
-0.154
-0.160
-0.166
-0.172
-0.177
-0.183

RESULTANT using
R = 199' (pumping) and
R = 201' (image)

z (feet)	Gradient at river
0.0000	0.0000
0.0000	0.0000
0.0001	0.0001
0.0004	0.0004
0.0007	0.0007
0.0009	0.0009
0.0012	0.0012
0.0014	0.0014
0.0016	0.0016
0.0017	0.0017
0.0019	0.0019
0.0020	0.0020
0.0021	0.0021
0.0022	0.0022
0.0023	0.0023
0.0023	0.0023
0.0024	0.0024
0.0025	0.0025
0.0025	0.0025
0.0026	0.0026
0.0026	0.0026
0.0027	0.0027
0.0027	0.0027
0.0027	0.0027
0.0028	0.0028
0.0028	0.0028
0.0028	0.0028

Portion of total discharge
supplied by the stream
(after Glover and Balmer, 1954)

x'	Qs / Q
0.000	
0.000	
0.031	
0.097	1.527
0.173	1.322
0.244	1.183
0.307	1.080
0.362	0.999
0.410	0.935
0.451	0.881
0.487	0.836
0.519	0.797
0.547	0.763
0.572	0.733
0.594	0.707
0.614	0.683
0.632	0.661
0.648	0.641
0.663	0.623
0.676	0.607
0.689	0.591
0.700	0.577
0.711	0.564
0.721	0.551
0.730	0.540
0.738	0.529
0.746	0.519

27	2.6E-01	1.017	0.188	2.5E-01	1.032	0.191	-0.188	0.0029	0.0029	0.754	0.509	0.70
28	2.5E-01	1.045	0.193	2.4E-01	1.061	0.196	-0.193	0.0029	0.0029	0.760	0.500	0.71
29	2.4E-01	1.073	0.198	2.4E-01	1.088	0.201	-0.198	0.0029	0.0029	0.767	0.491	0.71
30	2.3E-01	1.099	0.203	2.3E-01	1.115	0.206	-0.203	0.0029	0.0029	0.773	0.483	0.72
31	2.3E-01	1.125	0.208	2.2E-01	1.141	0.211	-0.208	0.0030	0.0030	0.779	0.475	0.72
32	2.2E-01	1.151	0.213	2.1E-01	1.167	0.216	-0.213	0.0030	0.0030	0.784	0.467	0.73
33	2.1E-01	1.176	0.218	2.1E-01	1.192	0.221	-0.218	0.0030	0.0030	0.789	0.460	0.73
34	2.1E-01	1.200	0.222	2.0E-01	1.216	0.225	-0.222	0.0030	0.0030	0.794	0.453	0.73
35	2.0E-01	1.224	0.226	2.0E-01	1.240	0.229	-0.226	0.0030	0.0030	0.799	0.447	0.74
36	1.9E-01	1.247	0.231	1.9E-01	1.263	0.234	-0.231	0.0031	0.0031	0.803	0.441	0.74
37	1.9E-01	1.269	0.235	1.9E-01	1.286	0.238	-0.235	0.0031	0.0031	0.808	0.435	0.74
38	1.8E-01	1.291	0.239	1.8E-01	1.308	0.242	-0.239	0.0031	0.0031	0.812	0.429	0.75
39	1.8E-01	1.313	0.243	1.8E-01	1.330	0.246	-0.243	0.0031	0.0031	0.815	0.423	0.75
40	1.7E-01	1.334	0.247	1.7E-01	1.351	0.250	-0.247	0.0031	0.0031	0.819	0.418	0.75
41	1.7E-01	1.355	0.251	1.7E-01	1.372	0.254	-0.251	0.0031	0.0031	0.822	0.413	0.76
42	1.7E-01	1.375	0.254	1.6E-01	1.392	0.258	-0.254	0.0031	0.0031	0.826	0.408	0.76
43	1.6E-01	1.395	0.258	1.6E-01	1.412	0.261	-0.258	0.0032	0.0032	0.829	0.403	0.76
44	1.6E-01	1.415	0.262	1.6E-01	1.432	0.265	-0.262	0.0032	0.0032	0.832	0.399	0.77
45	1.6E-01	1.434	0.265	1.5E-01	1.451	0.269	-0.265	0.0032	0.0032	0.835	0.394	0.77
46	1.5E-01	1.453	0.269	1.5E-01	1.470	0.272	-0.269	0.0032	0.0032	0.838	0.390	0.77
47	1.5E-01	1.472	0.272	1.5E-01	1.489	0.275	-0.272	0.0032	0.0032	0.840	0.386	0.77
48	1.5E-01	1.490	0.276	1.4E-01	1.507	0.279	-0.276	0.0032	0.0032	0.843	0.382	0.78
49	1.4E-01	1.508	0.279	1.4E-01	1.525	0.282	-0.279	0.0032	0.0032	0.845	0.378	0.78
50	1.4E-01	1.525	0.282	1.4E-01	1.543	0.285	-0.282	0.0032	0.0032	0.848	0.374	0.780

Timing of Influence on Big Wood River by Dawson Well Pumping

