



State of Idaho

DEPARTMENT OF WATER RESOURCES

322 East Front Street • P.O. Box 83720 • Boise, Idaho 83720-0098

Phone: (208) 287-4800 • Fax: (208) 287-6700 • Website: www.idwr.idaho.gov

C.L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Director

September 8, 2015

SUNNY HEALEY
THE NATURE CONSERVANCY
116 N FIRST AVE
HAILEY ID 83333

RE: Request to Rent Water from the Water Supply Bank

Ms. Healey,

The Department of Water Resources (Department) has concluded our review your application to rent water from the Water Supply Bank (Bank). As proposed, the Department is unable to process your rental request. Your request cannot be approved as proposed because there is insufficient data to confirm the extent of the hydraulic connection between the underlying aquifer, from which water right 37-2580 diverts ground water, and the artesian flows of ground water from the aquifer to Silver Creek. Though the documentation provided demonstrates that the underlying aquifer is hydraulically connected to Silver Creek, the extent of the connection is unclear. Without this information, the Department is unable to evaluate how much water is flowing to the minimum stream flow water right on Silver Creek (37-7727) through the non-diversion of water right 37-2580. Without this information, we are unable to authorize your minimum stream flow rental request.

Please feel free to contact me at (208) 287-4918 if you have any questions about this decision. Additionally, please feel free to resubmit your application if additional information is acquired that clarifies the extent of the relationship between the aquifer and Silver Creek.

Regards,

A handwritten signature in black ink, appearing to be 'Remington Buyer', with a long horizontal line extending to the right.

Remington Buyer
Water Supply Bank Coordinator

MEMORANDUM

To: Water Rights: 37-2580
From: Remington Buyer
Date: Aug 17, 2015
Re: Review & Analysis of Application to Rent Water from the State Water Supply Bank

PURPOSE/NARRATIVE:

Rental applicant is The Nature Conservancy (TNC). TNC is seeking to rent an irrigation water right which they are the owner of, and which has recently been leased into the Water Supply Bank. TNC's rental request is to leave water undiverted at the lease location, so that Bellevue Triangle ground water (that is tributary to artesian springs that feed Silver Creek) can be left in the source and made available to help meet the minimum stream flow water rights of Silver Creek (water rights 37-7727, 37-7728 and 37-7849). The applicant has provided documentation that supports the assertion that the point of diversion of the water right to be rented (37-2580) diverts ground water from an aquifer that is hydraulically connected to Silver Creek, however the documentation does not establish the extent of the connection. As such, this rental request is being denied because the Bank is unable to evaluate the impact that this rental would have on the Silver Creek.

AUTHORITY TO FILE: Application has been submitted by Sunny Healey, an employee of The Nature Conservancy and manager of the Silver Creek Preserve, which is operated by TNC. No concerns about authority to file the rental application.

WATER RIGHT VALIDITY: The water right is leased to the Bank and available for rental. No concerns about water right validity.

INJURY TO OTHER WATER RIGHTS: The rental seeks to leave water undiverted in order to satisfy minimum stream flow water rights. No injury to prior appropriators is apparent through the rental.

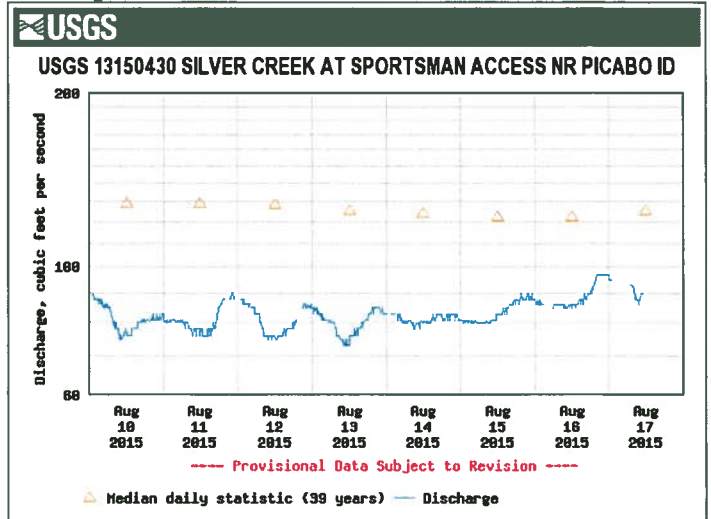
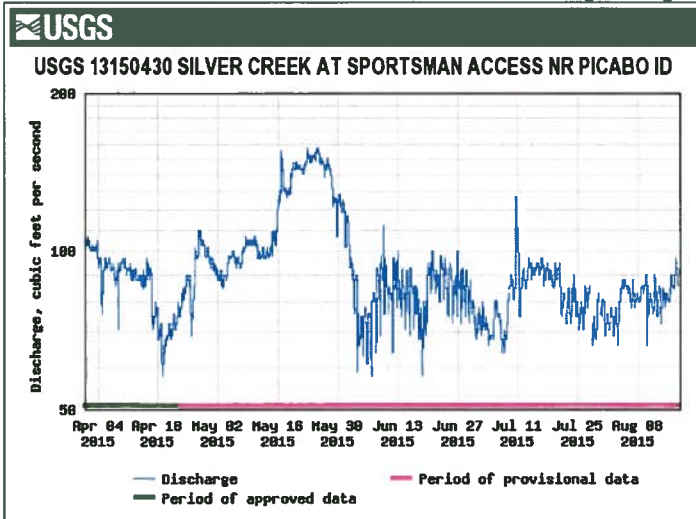
ENLARGEMENT OF USE: Water right 37-2580 is an irrigation water right that authorizes diversion of up to 2.01 cfs and 560 AF per year to irrigate 160 acres (3.5 AF/AC). Applicant is requesting to rent the entire water right during the irrigation season (through the end of October). To avoid an enlargement in the use of water, only the consumptive use component of the irrigation water right (2.5 AF/AC, 1.44 cfs) can be authorized for dedication through rental for the beneficial use of minimum stream flow.

LOCAL PUBLIC INTEREST: The Department is currently reviewing a water call that was issued by surface water appropriators who divert water from the Little Wood River. Silver Creek is a tributary of the Little Wood River. This rental proposes to leave ground water undiverted so that Silver Creek minimum stream flows can be met, which would have a positive impact on surface water flows into Silver Creek and the Little Wood River. This rental is thus in the local public interest.

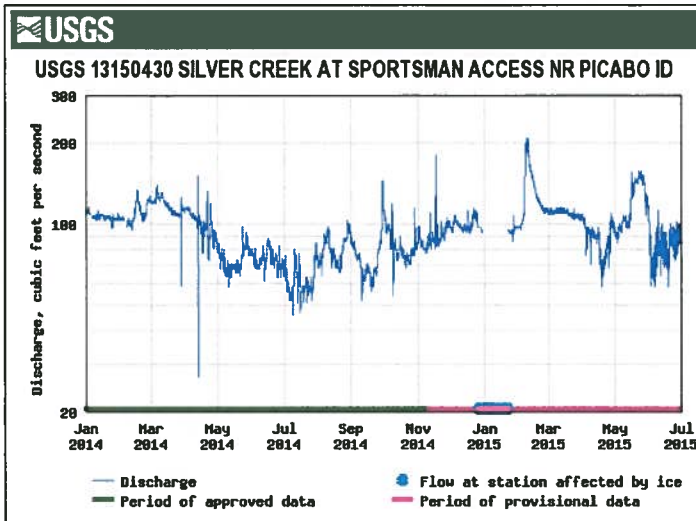
BENEFICIAL USE/CONSERVATION OF WATER RESOURCES: The use of rental water to satisfy a minimum stream flow may be considered a beneficial use of water when a minimum stream flow water right is not being met, or where information indicates that a minimum stream flow water right will likely not be met in the immediate future, insofar as the use of rental water can contribute to meeting and/or maintaining the minimum stream flow. The Silver Creek minimum stream flow water right 37-7727 is for 99 cfs and it is currently not being met; streamflows have been below 99 cfs for most of the current irrigation season and streamflows were below the 99 cfs for most of the irrigation season of 2014 (see graphs on next page).

Though the leased point of diversion draws from a water source that is hydraulically connected to Silver Creek, the extent of the impact on Silver Creek from the non-diversion of water is unclear. Without such information, a rental to minimum stream flow is not authorized.

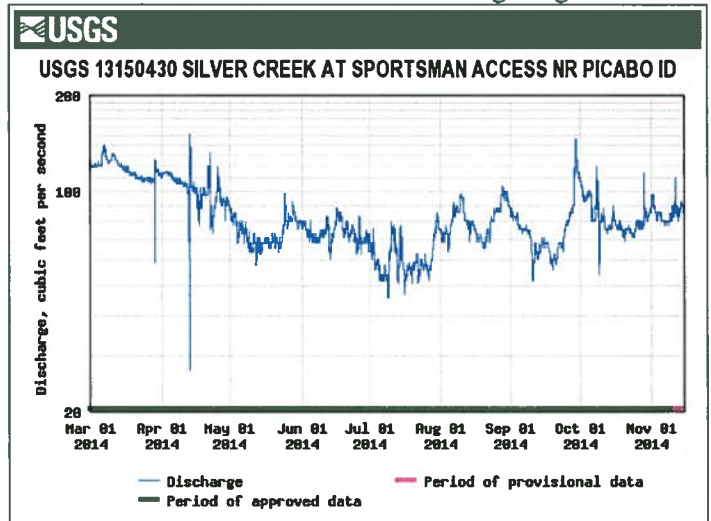
2015 streamflow measurements since the beginning of the irrigation season



2014 streamflow measurements



2014 streamflow measurements during irrigation season



DEPARTMENT STAFF OR WATERMASTER COMMENTS: Neither IDWR Southern Region staff, nor the Water District 37 Watermaster were opposed to this rental request.

STATE OF IDAHO
WATER RESOURCE BOARD

RECEIVED

MAY 01 2015

DEPARTMENT OF
WATER RESOURCESAPPLICATION TO RENT WATER
FROM THE BOARD'S WATER SUPPLY BANKApplicant Name: The Nature ConservancyIs this application being submitted with a lease application as a lease/rental package? Yes ☒ No ☐

An *Application to Rent Water from the Board's Water Supply Bank* must be completed in accordance with the minimum requirement checklist below to be acceptable for processing by the Idaho Department of Water Resources (IDWR). This checklist is part of the rental application and must be included with the rental application. **Applications that do not meet the minimum requirements will not be placed in the processing queue and may be returned until all minimum requirements have been met.**

Applications to rent water should be submitted well in advance of the desired start date for the use of water. Rental applications may be submitted as early as November 1 of the year prior to the intended use of rental water. Rental applications submitted more than one year in advance of the proposed start date for water use will not be accepted and will be returned to applicants. Rental applications will not be processed if they are received after the end of the rental season of use.

One rental application per beneficial use of water. One rental application can be submitted if you propose to rent water from multiple sources. For multiple beneficial uses of water, individual rental requests should be submitted for each unique beneficial use of water.

For additional instructions on completing a rental application, visit the Department's website at www.idwr.idaho.gov.

Checked All Items as Either Attached (Yes) or Not Applicable (N/A)

YES

☒ Completed *Application to Rent Water from the Board's Water Supply Bank*

Attachment N/A YES

- | | | |
|----|-------------------------------------|--|
| 2 | ☒ | A map showing the proposed point(s) of diversion, place(s) of use, and water diversion and distribution systems proposed to be used with your rental request |
| 3A | ☐ | ☒ Detailed information on a proposed use of rental water |
| 3E | ☐ | ☒ Authorization from the owner/operator of the rental point(s) of diversion |
| 3G | ☒ | ☐ Water modeling to account for the impacts of the rental request |
| 3J | ☒ | ☐ Documents justifying a need to rent water for irrigation at a rate of flow greater than 0.02 cfs/acre |
| 3K | ☐ | ☒ Authorization from the owner/operator of the property at the proposed rental place(s) of use |
| 4B | ☐ | ☒ Explanation of how the rental water will sufficiently accomplish your rental purposes |
| 4C | ☐ | ☒ Explanation of consumptive use amounts for water rights experiencing a change in nature of use |

Department Use Only – Proposed Water Right(s)

37-2580

STATE OF IDAHO
WATER RESOURCE BOARD

Application to Rent Water (Continued)

1. CONTACT INFORMATION

A. Applicant The Nature Conservancy

Mailing Address 116 N First Ave Hailey, ID 83333

Email Address shealey@tnc.org

Phone Number 208-788-7910

B. Is this application being completed by an authorized representative on behalf of the applicant? Yes ☒ No ☐

If yes, representatives (includes company employees if the applicant is a corporation, as well as legal counsel or consultants) should provide their information below if they desire to be included on correspondence with the rental applicant.

Representative Sunny Healey

Professional Title Silver Creek Preserve Manager

Organization Silver Creek Preserve

Relationship to Applicant employee

Mailing Address P.O. Box 624 Picabo, ID 83348

Email Address shealey@tnc.org

Phone Number 208-788-7910

2. MAP

Create a map of the proposed point(s) of diversion, place(s) of use, and water diversion, delivery and distribution systems. Make sure the place of use is outlined with an obvious, bolded line. For irrigation purposes, note that the place of use outlined on your map cannot exceed the number of acres you are proposing to rent. Attach the map to this application and label it **Attachment 2**.

3. DESCRIPTION OF PROPOSED USE FOR RENTAL WATER

A. Describe the purpose of your rental request. Include any anticipated rates of water application, water use practices or number of stock (if any). If the proposed use is not for irrigation, please provide a detailed description of the proposed use and how you determined the amount of rental water required. Attach additional sheets if required and label it **Attachment 3A**:

For use to meet minimum streamflow of Silver Creek during times when the instream flows are below the minimum stream flow right(s) held by the Idaho Water Resource Board (37-7849, 37-7727, 37-7728). Purpose: protection of fish and wildlife habitat, aquatic life, recreation, aesthetic beauty, transportation, navigation and water quality.

B. Enter the desired and/or minimum necessary rates of flow, volume, or irrigable acres requested for your rental purposes:

Desired Rate (Cubic Feet/Second)	Desired Volume (Acre-Foot)	Minimum Rate* (Cubic Feet/Second)	Minimum Volume* (Acre-Foot)	Acres (if applicable) (Acre)
2.01 CFS	560 AF	CFS	AF	AC

Sometimes water rights available for rent provide an exceptionally low rate per acre and/or low volume per acre. This section is meant to establish an acceptable range of water sufficient for your proposed water use. Please see question 4B and complete if necessary.

C. Enter the proposed start date and latest possible start date for using rental water. Also provide the number of years you would like to rent water:

Proposed Start Date (month/day/year)	Latest Possible Start (month/day/year)	* Proposed Rental Duration (Max 5 Years)	** For multi-year rentals, indicate whether you desire to rent water for remaining years if a rental request cannot be approved for the first year?
4/15/2015	10/31/2015	5 yrs	☒ Yes, approve rental for all remaining future years. ☐ No, return rental request if first year is unapprovable.

* The number of years permissible for a rental is subject to the lease contract duration for the water right(s) being rented.
** Subject to the availability of rentable water. A multi-year rental that cannot begin during the first year requested may be approved for some or all remaining years, depending on availability. Rental requests will be returned if no water is available to rent in the first and/or subsequent years of the rental request.

**STATE OF IDAHO
WATER RESOURCE BOARD**

Application to Rent Water (Continued)

- D. Refer to the map you created in item 2 and specify the location of the point(s) of diversion (POD) from which rental water is proposed to be diverted:

Water Source	TWP	RGE	SEC	¼	¼	¼	County	Other water rights for the same purpose diverted from this POD
Groundwater	01S	19E	26		NE	NE	Blaine	None

The entry in this grid must match the map from item 2 on the application.

- E. Do you own and/or possess the authority to divert water from the above POD(s)? Yes ☒ No ☐
If no, provide documentation from the owner/operator confirming your authorization to use the POD(s) and label it **Attachment 3E**.

- F. Do any POD(s) identified in Question 3D divert from a water source that may require water modeling? Yes ☐ No ☒
Refer to the Water Modeling Requirements Information Sheet to determine if a rental POD may require water modeling.

- G. Has water modeling been provided with your rental request? Yes ☐ No ☒

If yes, include as **Attachment 3G**. Otherwise please explain why modeling was not provided:

There is no distance between the lease and rental POD. They are from the same location in the same water source.

Rental applications that require modeling will be returned if modeling is not provided.

- H. Specify the proposed beneficial use: ☐ Irrigation ☐ Commercial ☐ Industrial ☐ Municipal
☐ Groundwater Recharge ☐ Mining ☐ Stockwater ☒ Other: Minimum Stream Flow
- I. Refer to the map you created in item 2 and specify below the places you propose to use water. If for irrigation, specify the number of acres to be irrigated per ¼ ¼ tract. Otherwise indicate usage by marking the ¼ ¼ tracts with the first letter of your proposed use identified above:

TWP	RGE	SEC	NE				NW				SW				SE				TOTALS
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
01S	19E	26	M																
02S	21E	22													M				
The entry in this grid must match the map from item 2 on the application.																			Total Acres (for irrigation)
																			N/A

- J. For irrigation uses, do you propose a water diversion rate greater than 0.02 cfs/acre? N/A ☒ Yes ☐ No ☐
If yes, explain the justification for this rate of flow and attach any supporting documents as **Attachment 3J**:

- K. Do you own the land at the proposed rental place of use (POU)? Yes ☐ No ☒
If no, attach documentation from the POU owner/operator confirming your authorization to use the POU and label it **Attachment 3K**.

- L. Describe your water distribution system and how water will be delivered from the POD(s) to the proposed POU(s):
Groundwater will flow naturally in a SE direction toward Silver Creek where it will become surface water and help maintain minimum stream flows from the POD near Sullivan's Lake down to the confluence with the Little Wood River, a distance of approximately 21 miles.

STATE OF IDAHO
WATER RESOURCE BOARD

Application to Rent Water (Continued)

M. List all other water rights and sources of water at the rental place of use for the same purpose and explain why additional water is required. Include privately owned water rights and water received from a municipal supplier, an irrigation district, a canal company, or any other water deliver entity:

37-7849 Silver Creek, 37-7727 Silver Creek, 37-7728 Silver Creek. Additional water is required because minimum stream flows are not being met.

4. RENTAL REQUESTS FOR SPECIFIC WATER RIGHTS

A. Are you requesting to rent specific water rights?

Yes ☒ No ☐

If yes, specify below the water rights you are requesting to rent. Otherwise continue to Section 5 of this application form.

Please note: Diversion rates and volumes to be rented from a leased water right must be proportionate to the per acre diversion rates and per acre volume limits of the water right leased to the Bank. Applicants should query a water right's rental availability by reviewing active lease and rental documents, searchable via [IDWR's website](#), to ensure all elements of a water right remain available in sufficient quantity to satisfy a rental request.

Water rights identified below must either already be leased to the Bank or a lease proposal should accompany the rental request. **Rental requests for water rights not yet leased to the Bank will be returned if companion lease applications are not provided with the rental request.**

For leased rights with combined limits, applicants should request to rent against the combined limit diversion rate, volume or acre limits.

Elements of Water Rights Leased to the Bank (Contract Details)								Rental Request		
Water Right Number	Nature of Use	Water Source	Rate (CFS)	Volume (AF)	Acres (AC)	Start (year)	End (year)	Rate (CFS)	Vol. (AF)	Acres (AC)
37-2580	Irrigation	Groundwater	2.01	560	160	2015	2020	2.01	560	N/A
Applicants must ensure the requested rate per acre and volume per acre do not exceed the rate per acre and volume per acre that have been leased to the Water Supply Bank								TOTAL	2.01 CFS	560 AF N/A AC

Attach multiple copies of this page if space above is insufficient to list all water rights requested to be rented on this application.

B. If water right conditions, combined limits, or the sum of all water right elements being requested provide an unconventional duty of water (e.g., an unusually low rate per acre or volume per acre for irrigation use), explain how your proposed rental will sufficiently accomplish your intended purposes. Attach a separate page if space is insufficient and label it **Attachment 4B:** Water delivery will occur under natural groundwater flow conditions.

STATE OF IDAHO
WATER RESOURCE BOARD

Application to Rent Water (Continued)

- C. Does your rental request propose to change the nature of use for any water right(s) being requested? Yes ☒ No ☐
If yes, explain how the water right(s) will be converted to new uses. Include the historic, consumptive use amounts for the water right being rented, as well as the new consumptive use amount for your proposed beneficial use. Attach a separate page if space is insufficient and label it **Attachment 4C**:
The proposed changed is from irrigation to minimum stream flow. The consumptive use will change from 2.01 cfs to non-consumptive.

5. ADDITIONAL INFORMATION

- A. Is this the first time that rental water is being requested for this purpose at the rental place of use? Yes ☒ No ☐
If no, list previous rental requests/agreements and explain why you have not secured a permanent water right for your needs:
- B. Have you or do you intend to submit an application for permit or transfer proposing a similar use as this rental? Yes ☐ No ☒
If yes, describe:
- C. Was this rental application submitted in response to a Notice of Violation (NOV) or a pending NOV? Yes ☐ No ☒
If yes, describe the date and location of the NOV.

DECLARATION

I hereby assert that 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 rejection of the application or cancellation of an approval. I understand that if this rental application is approved, it will be subject to the provisions of Section 42-1766, Idaho Code and all applicable state and federal laws.

Signature of Applicant

Printed Name of Applicant

Date

Signature of Representative

Printed Name of Representative

Date

Mail to:

Idaho Department of Water Resources
P.O. Box 83720
Boise, ID 83720-0098

**STATE OF IDAHO
WATER RESOURCE BOARD**

Water Modeling Requirement Information Sheet

Information on water modeling requirements for rental requests within special administrative areas

Important information on requesting rental water within the Eastern Snake Plain Aquifer (ESPA) and other selected administrative areas: If your proposed rental falls within the boundaries of the ESPA or other selected administrative area (as explained below) you must identify specific water rights leased into the Bank to use for your rental. Item 4 of the rental application can be used for this purpose. Use the information below to determine whether modeling the potential impacts of your proposed rental is necessary. If you submit an application to rent water from within the ESPA and/or a special administrative area and it is determined that your rental request requires water modeling, your rental request will be returned if water modeling is not provided.

Water modeling may be required when an application to rent water involves one of two scenarios:

Scenario 1: The application proposes the use of a regulated water source within an administrative area and the distance between the rental point(s) of diversion (POD) and the POD(s) for the leased water right(s) is greater than the administratively established, acceptable distance.

Regulated water sources areas may include:

- A. Ground water within the Eastern Snake Plain Aquifer (ESPA);
- B. Ground water within Ground Water Management Areas (GWMAs) or Critical Ground Water Areas (CGWAs);
- C. Water resources within other specified administrative areas, as established by the Idaho Water Resource Board (IWRB) or the Idaho Department of Water Resources.

The distance between any rental POD(s) and the POD(s) for a leased water right is important. On the ESPA, distance is measured in terms of model cells that cover an area of one square mile. Ground water modeling is not required if lease POD(s) and rental POD(s) are within the same or adjacent model cells. If lease and rental POD(s) are separated by more than one model cell, however, groundwater modeling must be completed and submitted with the rental application. ESPA modeling tools can be accessed and freely downloaded from IDWR's website by visiting:

www.idwr.idaho.gov/WaterManagement/WaterRights/WaterRightTransfers/resources.htm.

Ground water modeling may be required within GWMAs, CGWAs or other regulated administrative areas. Applicants who desire to rent water within an established GWMA, CGWA or other regulated administrative area should consult IDWR's website before submitting their application to review the current status of administrative orders related to regulated administrative areas. Consult www.idwr.idaho.gov/WaterInformation/GroundWaterManagement/designated_areas.htm for information on GWMAs or CGWAs, visit www.idwr.idaho.gov/AboutIDWR/legal.htm for information on other regulated areas.

Applicants interested in renting water within a GWMA, CGWA or other regulated administrative areas should request water rights that have been leased into the Bank from within the same administrative area. Generally, the Bank will not permit a rental of water within a regulated administrative area if the leased water rights are not located within that same administrative area.

Scenario 2: A rental request proposes to divert water from a different but hydraulically connected water source.

Modeling situations may include:

- A. Rental requests that propose to divert surface water rights via ground water POD(s) (wells); and
- B. Rental requests that propose to divert ground water from one aquifer when the right being rented is authorized to divert ground water from a hydraulically connected, tributary aquifer.

Rental requests that propose to divert surface water rights from ground water points of diversion may be considered if ground water modeling establishes that the surface and ground water resources are sufficiently hydraulically connected. The ground water and surface water sources must have a direct and immediate hydraulic connection (at least 50 percent of the total depletion must be detectable in the original source in one day). The existing POD and proposed POD must be proximate such that diversion and use of water from the proposed POD would have substantially the same effect on the hydraulically-connected source as diversion and use of water from the original POD.

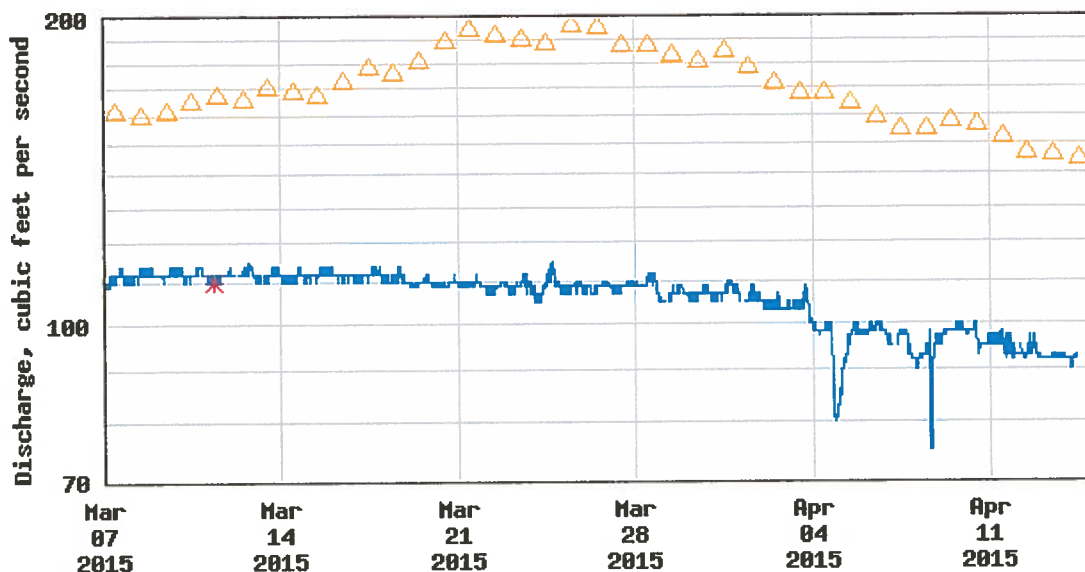
Requests to rent ground water across tributary aquifer sources may be considered if ground water modeling is provided to demonstrate that two aquifers are hydraulically connected and the anticipated impacts of diverting ground water from one source through the other is modeled accordingly.

For more information about rental application requirements, contact IDWR at (208) 287-4800.

Discharge, cubic feet per second

Most recent instantaneous value: 92 04-14-2015 08:45 MDT

USGS 13150430 SILVER CREEK AT SPORTSMAN ACCESS NR PICABO ID

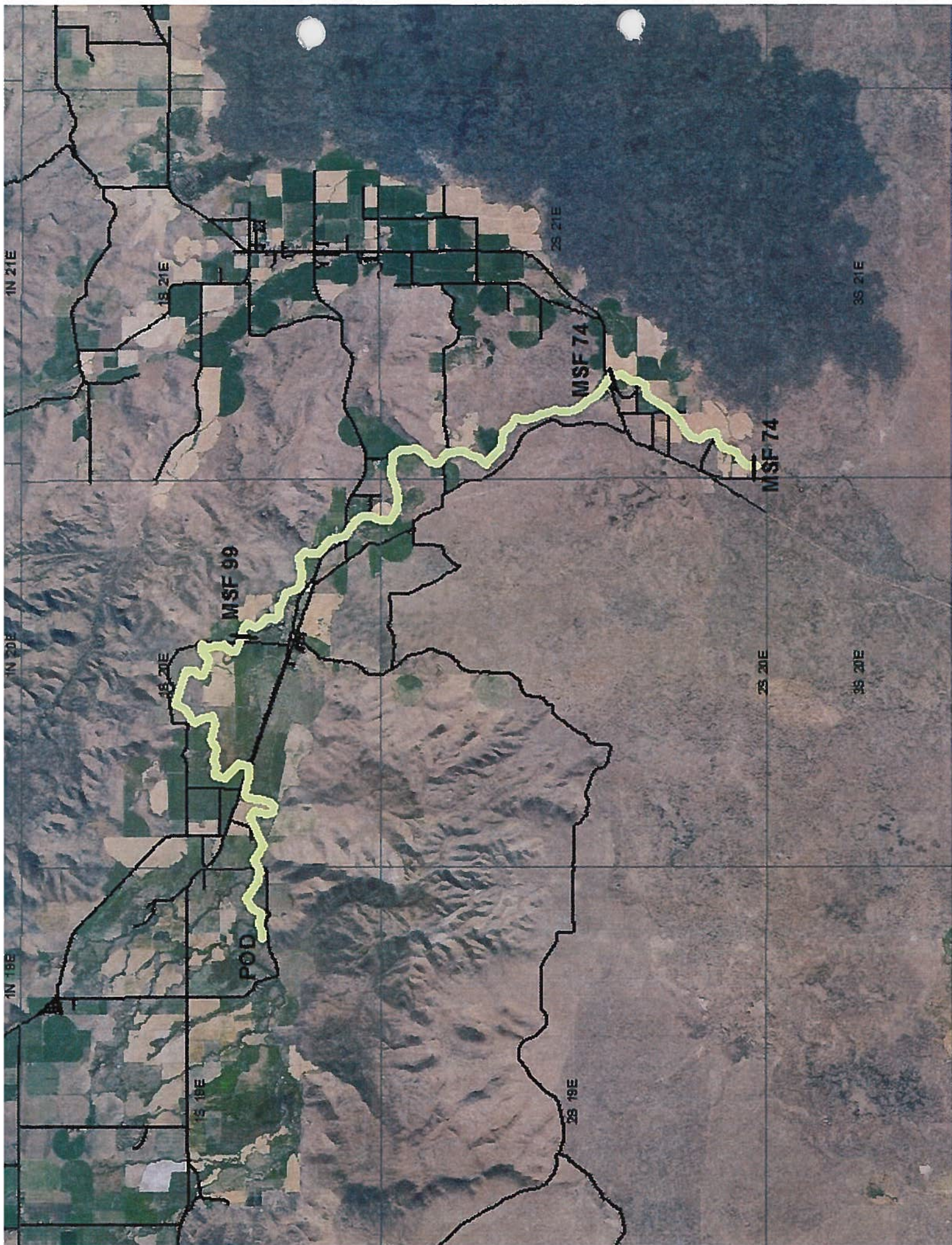


----- Provisional Data Subject to Revision -----

△ Median daily statistic (39 years) * Measured discharge
— Discharge

Daily discharge, cubic feet per second -- statistics for Apr 14 based on 39 years of record [more](#)

Min (1992)	Most Recent Instantaneous Value Apr 14	25th percentile	Median	Mean	75th percentile	Max (1985)
89	92	130	145	160	198	249



Time: 11:00am

width

DO mg/L 11.60
Turbidity n/a
Conduct. n/a
Total P n/a
F&D SED n/a

salinity n/a

FLOW

Provisional data subject to review and revision

Main Stem Silver Creek MSF Picabo Bridge

Recorded by: S. Healey Z. McStay Date 4/21/2015

Air Temp: 65 F Water Temp C: 12.50

Sed Sample (y/n) no pH 8.55

Gauge Height ft: n/a Nitrate n/a

S SED n/a BOD n/a

Time: 11:30am

width 36.8'

DO 15.50

Turbidity

Conduct. n/a

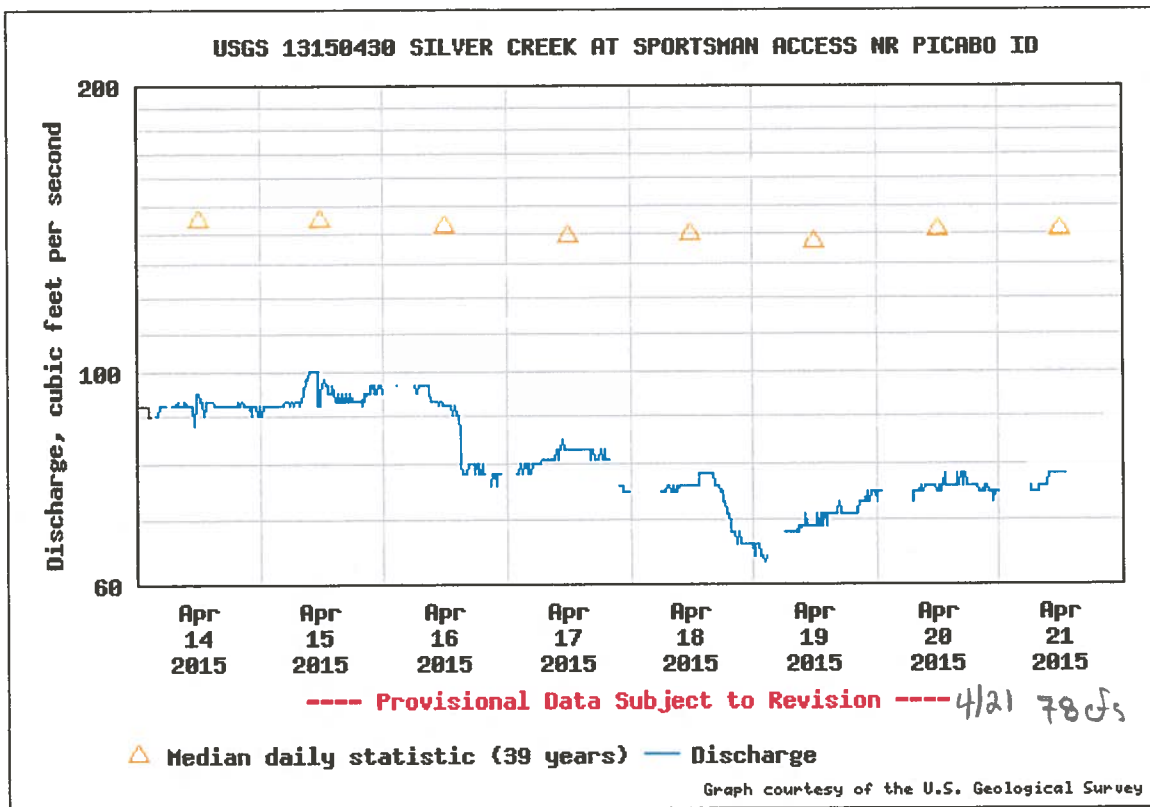
Total P n/a

F&D SED n/a

salinity n/a

Tape	Distance	Depth (ft.)		Velocity (f/s)	Velocity (f/s) 60%	Velocity (f/s) 80%	Velocity (f/s) 20%	Average 20/80	Width		Area (ft/2)	Flow (Q) cfs
		10ths	60%						(ft)	(ft)		
	REW=6.5	0.6	0.09						2	1.2		0.108
	8.5	1.5	0.08						2	3		0.24
	10.5	1.8	0.09						2	3.6		0.324
	12.5	2.6	0.65	0.48		0.82		0.65	2	5.2		3.38
	14.5	3.1	0.825	1.1		0.55		0.825	2	6.2		5.115
	16.5	3.3	1.055	0.86		1.25		1.055	2	6.6		6.963
	18.5	3.3	1.17	1.35		0.99		1.17	2	6.6		7.722
	20.5	3.5	1.11	1.05		1.17		1.11	2	7		7.77
	22.5	3.4	0.995	0.95		1.04		0.995	2	6.8		6.766
	24.5	3.6	0.91	1.15		0.67		0.91	2	7.2		6.552
	26.5	3.8	0.905	0.84		0.97		0.905	2	7.6		6.878
	28.5	3.8	0.695	0.7		0.69		0.695	2	7.6		5.282
	30.5	3.1	0.82	0.78		0.86		0.82	2	6.2		5.084
	32.5	3.1	0.865	0.83		0.9		0.865	2	6.2		5.363
	34.5	2.4	0.91						2	4.8		4.368
	36.5	2.2	0.83						2	4.4		3.652
	38.5	1.4	0.85						2	2.8		2.38
	40.5	0.5	0						2	1		0
	42.5	0.5	0									0
	43.3	0										
											FLOW	77.947

Provisional data subject to review and revision



RECEIVED

AUG 03 2015

DEPARTMENT OF
WATER RESOURCES

July 24th, 2015

IDAHO DEPARTMENT OF WATER RESOURCES
WATER SUPPLY BANK
ATTN REMINGTON BUYER
322 EAST FRONT STREET
PO BOX 83720
BOISE ID 83702-0098

RE: Request for information establishing hydraulic connection

Mr. Buyer,

Thank you for considering this application. I included links below and attached copies of referenced documentation for your review. We believe that these all support the conclusion that the two aquifers are hydrologically connected in the vicinity of the referenced well. Please let me know if additional documentation is needed to establish hydraulic connection between the ground water and surface water sources.

Bartolino, J.R., and Adkins, C.B., 2012, Hydrogeologic framework of the Wood River Valley aquifer system, south-central Idaho: U.S. Geological Survey Scientific Investigations Report 2012-5053, 46 p. <http://pubs.er.usgs.gov/publication/sir20125053> *"The hydrogeologic section A-A' in figure 5 generally agrees with Moreland's (1977) section B-B' and shows fine-grained sediment of the confining unit extending and thinning over Quaternary basalt, thus allowing the coarse-grained sediment of the unconfined and confined aquifers to hydraulically reconnect in the area south of Gannett."*

Hydrogeologic Framework of the Wood River Valley Aquifer System, page 17

Moreland, J.A. 1977. Ground Water-Surface Water Relations in the Silver Creek Area, Blaine County, Idaho. U.S. Geological Survey Open-File Report 77-456.

<http://pubs.er.usgs.gov/publication/ofr77456> *"The basalt underlies the valley fill and is a part of the aquifer system in the southern part of the valley."* Ground Water-Surface Water Relations in the Silver Creek Area, page 20.

Castelin, P.M. and S.L. Chapman. 1972. Water Resources of the Big Wood River – Silver Creek Area, Blaine County, Idaho. Idaho Department of Water Administration Water Information Bulletin 28. 44 p.

http://www.idwr.idaho.gov/WaterInformation/Publications/wib/wib28-big_wood_river-silver_creek_area.pdf *"Since these sediments do not transmit water as readily as the sand and gravel to the north, they inhibit the flow of ground water, resulting in upward leakage and a rise in water levels which contribute materially to the discharge of Silver, Spring and Crystal Creeks. Silver Creek is a gaining stream from its most westerly source in Section 18, Township 1 South, Range 18 East, to approximately Section 20, Township 1 South, Range 20 East..."* Water Information Bulletin No. 28 Water Resources of the Big Wood River-Silver Creek Area, page 33

Loinaz, M.C. 2012. Integrated Hydrologic Model of the Wood River Valley and Stream Temperature Model of the Silver Creek Basin; Model Development, Calibration and Scenarios Report. The Nature Conservancy. 39 p. <http://www.nature.org/media/idaho/silver-creek-model-report.pdf>

In the south-central portion of the valley thick, extensive layers of fine grained material serve as barriers to groundwater flow. Springs form in the central area of the valley where the confining units constrain the movement of groundwater. Some of these springs flow to the west into the Big Wood River and some form tributaries that flow southeast to Silver Creek. Page 4

Groundwater flow is unconfined in the northern areas of the valley; transmissivity decreases towards the south due to fine sediment layers beginning at the center of the valley and increasing in thickness to the south. The fine sediment layers in the south form a confining unit. The flow direction is split into the southeast and southwest areas of the valley where some of it discharges as springs. In the southeast corner of the valley the transmissivities are higher due to basalt formations through which groundwater flows out of the valley. Page 6

Thickness of unconfined aquifer 10-30 meters 30-100ft page 11

Thickness of confining layer in area of well 20-30 meters 65-100ft. Page 11

Thickness of confined aquifer 30-60 meters 100-200 ft Page 12

Hydraulic conductivity of confining unit 1×10^{-8}

Well depth 267ft

Well casing not perforated 45ft-150ft (105ft)

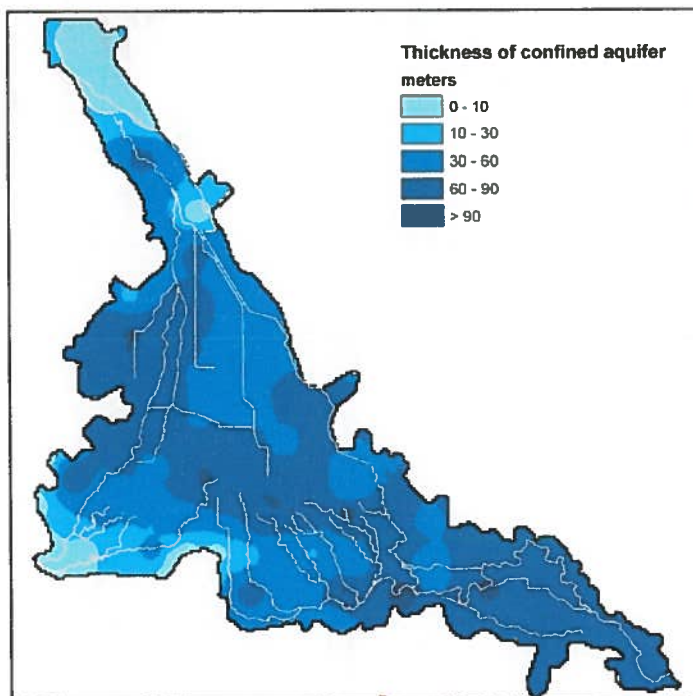


Figure 6. Interpolated thickness of the confined aquifer from borehole data

Hydrogeologic Framework of the Wood River Valley Aquifer System, South-Central Idaho

By James R. Bartolino and Candice B. Adkins

Prepared in cooperation with Blaine County, City of Hailey, City of Ketchum,
The Nature Conservancy, City of Sun Valley, Sun Valley Water and Sewer District,
Blaine Soil Conservation District, and City of Bellevue

Scientific Investigations Report 2012–5053

**U.S. Department of the Interior
U.S. Geological Survey**

(2005). These rocks probably have similar values of hydraulic conductivity to other Challis Volcanic rocks. Where they cut more permeable rocks they may serve as barriers to flow.

Idavada Volcanics (Miocene)

Outcrops of the Miocene Idavada Volcanics are found in the Timmerman Hills, Picabo Hills, and the area southeast of Gannett (Worl and others, 1991) (figs. 1 and 4). These rocks were mapped as Picabo Tuff by Schmidt (1962), Kauffman and Othberg (2007), and Garwood and others (2010, 2011). Garwood and others (2010) describe these rocks as “light gray, tan, and purplish tan crystal-poor rhyolite tuff” although Schmidt (1962) also included interbedded tuffaceous sediments. Sanford (2005) indicated that the Idavada Volcanics are up to 700 ft thick in the Little Wood River drainage immediately east of the study area. Although these rocks have primary porosity due to vesicles and intergranular voids, they are likely not a source of water to wells or springs except possibly in the Timmerman and Picabo Hills area where a number of springs are mapped. Values of hydraulic conductivity may range from about 4.0×10^{-5} to 130 ft/d (Spitz and Moreno, 1996).

Quaternary Sedimentary Deposits and Basalt

Quaternary-age sediments and basalt are the primary sources of groundwater in the Wood River Valley aquifer system. As described in section, “[Quaternary History](#),” a sequence of deposition and erosion by the Big Wood River, basalt flows in the Picabo and Stanton Crossing areas, and glaciation in the upper Big Wood River drainage and tributary canyons created the bulk of the Wood River Valley aquifer system. In addition to two basalt units, Schmidt (1962) mapped and informally named 12 units of unconsolidated Quaternary sediment in the Bellevue area; these units fall into three main groups: deposits impounded by lava dams, deposits related to glacial activity, and deposits formed by erosional processes. Subsequent authors (such as Moreland, 1977, and Brockway and Kahlown, 1994) primarily concerned with defining hydrostratigraphic units within the aquifer system have tended to divide the alluvial material into a coarse-grained sand and gravel unit, a fine-grained silt and clay unit, and a single basalt unit. This fairly simple textural/lithologic division adequately describes the aquifer system, and difficulties associated with the use of well-driller reports hinder further subdivision.

Coarse-Grained Sedimentary Deposits

The coarse-grained sediment of the Wood River Valley aquifer system is composed of rounded sand and gravel and is usually poorly sorted. Most of these coarse-grained deposits are of alluvial origin and resulted from the deposition of glacially derived sediment by the Big Wood River and its

tributary streams. Because these larger sediment sizes require greater streamflow for transport, they typically represent deposition in the main stream channel. As the Big Wood River and tributary streams shifted and meandered across valley bottoms and the Bellevue fan, this alluvial sediment was deposited, often eroded, and then redeposited. Consequently, the coarse-grained deposits tend to be horizontally and vertically discontinuous (fig. 5).

A relatively minor portion of the coarse-grained deposits represent active erosional processes by colluvial transport of sediment down slopes and across pediments, as described by Smith (1962). In general, these surficial sedimentary deposits are thin and do not serve as a source of water to wells, they may, however, play a role in transporting rainfall and snowmelt to the Wood River Valley aquifer system.

Most of the water produced from the Wood River Valley aquifer system is from the coarse-grained deposits because of their greater productivity due to larger values of hydraulic conductivity. Estimated hydraulic conductivity values are discussed in section, “[Hydraulic Conductivity](#),” the estimated values tend to represent flow from coarse-grained intervals rather than fine-grained intervals.

Fine-Grained Sedimentary Deposits

Fine-grained sediment is found in most areas of the Wood River Valley aquifer system and is either lake sediment deposited as a result of damming of the Big Wood River by lava flows or as overbank and flood deposits of the Big Wood River and its tributary streams. These fine-grained deposits commonly act as confining units of limited areal extent but also form the more areally extensive confining unit underlying the southern Bellevue fan.

Previous workers have described a confining unit that separates the unconfined aquifer from the underlying confined aquifer in the area south of about Baseline Road (fig. 1). Moreland (1977) described the unit as dipping to the south, about 120 ft thick, and generally lying at a depth of about 150 ft. For the current study, well-driller reports were evaluated in order to construct hydrogeologic sections (fig. 5), and a map of the estimated altitude of the top and corresponding thickness of the uppermost unit of fine-grained sediment (fig. 6) was prepared (as described in the section, “[Compilation of Fine-Grained Sediment Map](#)”).

* The hydrogeologic section A-A' in figure 5 generally agrees with Moreland's (1977) section B-B' and shows fine-grained sediment of the confining unit extending and thinning over Quaternary basalt, thus allowing the coarse-grained sediment of the unconfined and confined aquifers to hydraulically reconnect in the area south of Gannett. Figure 6 confirms the general dip of the top of the fine-grained sediment to the south and southeast but also shows significant variability in the thickness of this unit. In general, the thickness of the uppermost fine-grained sediment unit increases to the south and decreases where it overlies Quaternary basalt.

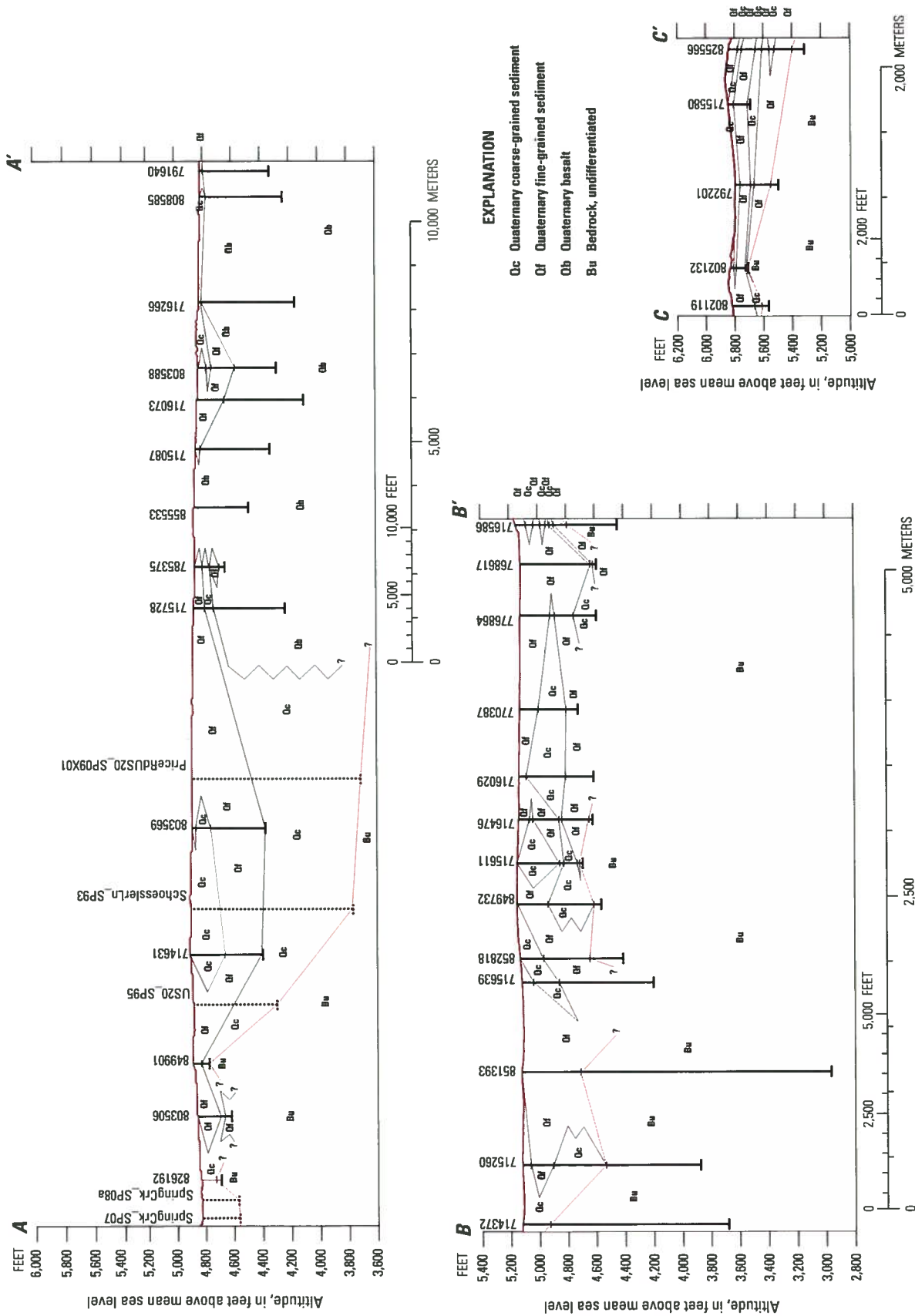


Figure 5. Hydrogeologic sections showing generalized lithologic units. Section A-A' trends west to east in the vicinity of U.S. 20, section B-B' trends west to east in the vicinity of Glendale and Pero Roads, section C-C' trends northwest to southeast through Ketchum. Lines of section are shown on plate 1.

GROUND WATER-SURFACE WATER RELATIONS
IN THE SILVER CREEK AREA,
BLAINE COUNTY, IDAHO

By
Joe A. Moreland, 1943-

Prepared by the U.S. Geological Survey
in cooperation with
the Idaho Department of Water Resources

Statehouse
Boise, Idaho

been identified (Schmidt, 1961). Flows are fractured and jointed and contain numerous contact zones between individual flows. Several high-yield wells have been completed in the basalt. The basalt underlies the valley fill and is a part of the aquifer system in the southern part of the valley.

WATER INFORMATION BULLETIN NO. 28

**WATER RESOURCES OF THE BIG WOOD RIVER-SILVER CREEK AREA,
BLAINE COUNTY, IDAHO**

by

Paul M. Castelin

and

Sherl L. Chapman

Prepared and Published by

Idaho Department of Water Administration

R Keith Higginson

Director

November 1972

several small areas in the basin. The rise in water throughout the rest of the area is believed to be the result of (1) recharge from snowmelt and runoff entering the ground-water system and (2) a lack of large ground-water withdrawal for irrigation. Water-level declines occurred in two small areas in Township 1 South, Range 19 East (figs. 20 and 21) during this period. Both of these areas are near the mountain front and are believed to respond more quickly to runoff effects than areas further into the main valley. It is probable that the water levels in these wells would rise more rapidly in the spring and decline more rapidly than wells further from the valley walls.

Water-level fluctuations from May to October had a different pattern. Three areas of decline became evident; one in the Poverty Flats area, one in the south-central portion of the area, and one southeast of Picabo (fig. 18). The Poverty Flats decline almost certainly resulted from a lack of sufficient recharge to the area to balance the withdrawal from pumpage. The area containing the steep gradient southeast of Picabo corresponds approximately with the southeastern limit of irrigated lands. Application of water on crop and pasture land would tend to hold water levels at an artificially high level in those areas masking any natural decline which would have occurred earlier. The area of decline in the south-central portion of the area is believed to result from: (1) withdrawal of water by wells from the ground-water system for late summer irrigation and (2) a greater amount of clay and silt in the geologic section in this area, reducing transmissivity, thus slowing the movement of water through the aquifer. Water levels in the majority of the wells in the rest of area rose during the period from May to October 1970.

GROUND WATER-SURFACE WATER RELATIONSHIP

The ground water-surface water relationship in the upper portion of the study area is less complex than in the lower, or artesian, portion.

Between the Glendale Bridge and Hailey, the Big Wood River is a gaining stream; ie, it receives water from the ground-water system. Most of the tributary streams do not reach the Big Wood River as streams except during periods of peak runoff but rather as underflow through the coarse valley fill material of the Big Wood River Valley. Downstream from the Glendale Bridge for a distance of approximately four to five miles the Big Wood River is braided, and becomes a losing stream (plate 2). During certain portions of the year, the Big Wood Channel below Glendale Bridge is totally dry because of diversions into the Bypass Canal. Below the braided reach of the river a substantial amount of ground water from underflow as well as excess irrigation water begins to enter the channel once again, replenishing the flow through the southwest outlet of the valley.

Silver Creek and its associated feeder streams, springs and seeps are formed by the discharge of ground water in an area south of the Baseline Road, extending from Highway 93 to Gannett (plates 2 & 3). The overlying sediments become progressively finer in a down-valley, or southerly direction, becoming extremely fine south of Baseline Road. Since these sediments do not transmit water as readily as the sand and gravel to the north, they inhibit the flow of ground water, resulting in upward leakage and a rise in water levels which contribute materially to the discharge of Silver, Spring and Crystal creeks. Silver Creek is a gaining stream from its most westerly source in Section 18, Township 1 South, Range 18 East to approximately Section 20, Township 1 South, Range 20 East, at which time it

**Integrated Hydrologic Model of the Wood River Valley and Stream Temperature Model of
the Silver Creek Basin**

Model Development, Calibration and Scenarios Report

by

Maria C. Loinaz

Submitted to

The Nature Conservancy

aquifer system consists of unconfined and confined aquifers comprised primarily of the fluvial and glacial sediments of the Quaternary period (Skinner et al., 2007). The valley is filled to depths of as much as 150 m with a sequence of interbedded clay, silt, sand, and gravel (Moreland, 1977). In the south-central portion of the valley thick, extensive layers of fine-grained material serve as barriers to groundwater flow. Springs form in the central area of the valley where the confining units constrain the movement of groundwater. Some of these springs flow to the west into the Big Wood River and some form tributaries that flow southeast to Silver Creek.

The climate of the Lower Wood River Valley is semi-arid with low precipitation and high evapotranspiration (Brockway and Kahlown, 1994). The average annual precipitation during the study period (2003-2009) was 31 cm. Approximately 60% of the precipitation falls during winter, mostly as snow (Bartolino, 2009). The average annual potential evapotranspiration for the crops in the valley ranges from 66 to 115 cm. Average air temperature is -4°C in the winter months and 19°C in the summer months.

The valley is intensely cultivated (approximately 64% of the area) and approximately 80% of the crop area is irrigated (Brockway and Kahlown, 1994). The types of crops (and percentage of the total agricultural area) are: alfalfa (34.5%), other hays (6.9%), barley (20.6%), corn (0.3%), spring wheat (0.5%), winter wheat (0.2%), oats (0.6%), beans (0.2%), potatoes (0.6%), peas (0.1%), unclassified cultivated crops (10%), and pasture (19.9%). Urban areas, grassland, and forests and wetlands occupy 9.7%, 19.4%, 6.5% of the study area, respectively.

The growing season typically occurs from May until the end of September. Over half of the irrigation water applied is diverted from streams by irrigation canals and the rest is abstracted by groundwater pumping. Irrigation water is distributed based on a system of water rights which is regulated by a local water distribution authority (Water Master) based on water right priorities and water availability. According to the Idaho Department of Water Resources database, there are over a thousand irrigation water rights in the study area (http://www.idwr.idaho.gov/GeographicInfo/GISdata/water_rights.htm). The total maximum permitted rates of groundwater abstractions and surface water diversions are approximately 13 and $37\text{ m}^3/\text{s}$, respectively. The average annual surface water diversions during the study period are 128 million m^3 (Mm^3) (Water District 37 and 37M, 2010). Actual groundwater abstraction volumes for the study period are not available, however, Brockway and Kahlown (1994) measured groundwater abstraction volumes for irrigation in 1993 to be 63.5 Mm^3 and Bartolino (2009) estimated a total of $67.8\text{ Mm}^3/\text{yr}$ based on the maximum diversion volumes permitted. Approximately one quarter of this groundwater is pumped from the confined (artesian) aquifer and the rest from the unconfined aquifer. In the lower valley domestic and commercial water use is a small portion of the total water use ($\sim 4.2\text{ Mm}^3$ annually) (Brockway and Kahlown, 1994) and it is highest in the northern areas of the valley where the largest population centers are located.

The flow in the Big Wood River at the city of Hailey is on average $\sim 10\text{ m}^3/\text{s}$. The peak flows occur from the middle to the end of May and can be as high as $190\text{ m}^3/\text{s}$. At the southwest outlet, flow in the BWR averages about 34% of the flow in Hailey as a result of seepage losses and canal diversions. The Silver Creek hydrograph is relatively smooth throughout the year because



State of Idaho

DEPARTMENT OF WATER RESOURCES

322 East Front Street • P.O. Box 83720 • Boise, Idaho 83720-0098

Phone: (208) 287-4800 • Fax: (208) 287-6700 • Website: www.idwr.idaho.gov

C.L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Director

July 13, 2015

SUNNY HEALEY
THE NATURE CONSERVANCY
116 N FIRST AVE
HAILEY ID 83333

RE: Request to Rent Water from the Water Supply Bank

Ms. Healey,

The Department of Water Resources (Department) has reviewed your application to rent water from the Water Supply Bank (Bank) and requires additional information to conclude or review of your rental request. Specifically, the Department requires information establishing the hydraulic connection between the ground water source for water right 37-2580 and the surface waters of the right for which you are seeking a rental.

Idaho Code 42-222 does not provide for a change from a ground water to surface water source, or from a surface water to ground water source. A rental request proposing such a change in source is not approvable unless the Department is provided with evidence to establish a hydraulic connection between the sources. Typically, a depletion analysis is acceptable to establish the level of interconnectedness; the Department accepts that a ground water and surface water source are immediately hydraulically connected when a fifty percent depletion occurs in one source through the diversion of water from the other source. Because your rental is requesting to supplement a surface water right with water from a ground water source, a change in source analysis is required. However, because your rental proposes the non-diversion of ground water, documentation other than a depletion analysis may be acceptable. The Department will accept for review documentation that establishes the hydraulic connection between the ground water and surface water sources, including, but not limited to: engineering reports, water modeling studies, hydrogeology research or site-specific research.

The Department requests that you provide our office with any of the above referenced documentation within the next thirty days so that we might further consider your rental request. Alternatively, if you are unable to provide documentation to establish the hydraulic connection between the ground and surface water sources, the Department offers that your rental request might be satisfied through the direct pumping of ground water from the aquifer and the release of such water into Sullivan Lake. I can be reached by phone at (208) 392-7788 if you have any questions pertaining to this matter.

Regards,

Remington Buyer
Water Supply Bank Coordinator



State of Idaho

DEPARTMENT OF WATER RESOURCES

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GARY SPACKMAN
Director

C.L. "BUTCH" OTTER
Governor

May 4, 2015

THE NATURE CONSERVANCY
116 N 1ST AVE
HAILEY ID 83333-8411

RE: APPLICATION(S) TO RENT WATER FROM THE WATER SUPPLY BANK

Dear Applicant:

The Idaho Department of Water Resources (Department) acknowledges receipt of your application(s) to rent water from the Idaho Water Resource Board's Water Supply Bank (Bank) for varied uses of 560 acre-feet. Filing a Bank rental application does not automatically result in approval. Before a rental application can be approved, the rental request must be reviewed, a rental agreement must be prepared, the agreement must be approved by the applicant and the Department, and the rental fee must be paid. To maximize the number of rental applications processed while managing competing priorities, the Department begins accepting rental applications on November 1 for use in the next calendar year, and it processes as many applications as it can before the start of the irrigation season in March or April. Once the irrigation season begins, Department staff members are reassigned to address field work and other duties.

Because your application was received near the beginning of the irrigation season, which is now well underway, it is unlikely the Department will be able to process your application in time for approval in 2015 unless you have proposed a start date late in the year. If your application was for 2015 only and the latest possible start date on your application has passed, the application will be returned to you. If your application requests a rental for more than one year, the rental application may be retained by the Department and evaluated for 2016.

In future years, we encourage you to file your rental applications as soon as possible after November 1 to improve the chances that they will be processed.

Additional information about the Bank may be found on the Department's website at http://idwr.idaho.gov/WaterManagement/WaterRights/WaterSupply/ws_default.htm.

If you have questions regarding this matter, please contact me at 287-4910.

Sincerely,

For -

Clay Webster
Water Resource Agent
WSB Process Point of Contact

C: Sunny Healey – Silver Creek Preserve