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DEPT. OF WATER RESOURCES
SOUTHERN REGION

April 20, 2012

Mr. Allen Merritt
Idaho Department of Water Resources
1341 Fillmore Street, Suite 200
Twin Falls, ID 83301

RE: Ratliffe- Water Right Permit Application.

Dear Allen,

Attached is a new amended water right permit application involving existing Big Wood River irrigation water right 37-577BY in the name of Kathleen and William Ratliffe. The permit application seeks to offer all of Big Wood River water right 37-577BY (0.10cfs) as mitigation for a new ground water right permit which will allow the Ratliffes to pump 0.075 cfs from an existing well to irrigate their property. Historically, water right 37-577BY has been delivered to the Ratliffe property through the Cove Canal. Because the Cove Canal no longer can convey water to the Ratliffe property, the Ratliffes seek to leave water right 37-577BY in the Big Wood River and irrigate on their property using ground water as outlined in the attached permit application and mitigation plan. For a full explanation, please refer to the mitigation plan attached to the permit application.

Also included is a check for \$100.00 to cover the permit application fee. Please copy our office on all correspondence regarding this water right permit application. Don't hesitate to call our office should you have any further questions or comments. Thanks for your time and assistance on this matter.

CHARLES E.
BROCKWAY,
PH.D., P.E.

CHARLES G.
BROCKWAY,
PH.D., P.E.

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WASHINGTON
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TWIN FALLS,
IDAHO 83301

208•736•8543

FAX: 736•8506

Regards,


C.E. Brockway P.E. PhD.

Enclosures:

Water Right Permit Application and Aerial Photo
Mitigation Plan
Watermaster Records
Brockway Engineering Check # 10635

Cc: Bill Ratliffe
Fritz Haemmerle



Ratliffe- Mitigation Plan for Permit Amended

To: Mr. Allen Merritt, IDWR Southern Region Office
From: Charles E. Brockway, Zach Latham
Cc:
Date: April 20, 2012
Re: Ratliffe Water Right Permit Application- Ground Water Permit with Surface Water Mitigation

This memo serves as a mitigation plan for the permit filed on behalf of William and Kathleen Ratliffe whose intent is to use Big Wood River water right 37-577BY as mitigation for a concurrently filed permit which seeks to allow ground water diversion of .075 cfs (33.7 gpm) for irrigation of 4.4 acres on the Ratliffe property in Bellevue, Blaine County Idaho. Ground water right 37-20450 is also owned by the Ratliffes and water used for irrigation and domestic use for one home is diverted from an existing well in the SWSW T.02N R.19E SEC.31 on the Ratliffe property. The discharge rate on water right 37-20450 is 0.06 cfs for irrigation of 5.0 acres with a decreed priority date of 6/22/1978. Both water rights have been recommended to the SRBA court and have a combined limit of 5.0 acres for irrigation use on the property.

Surface water right 37-577BY is currently recommended in the SRBA with a priority date of 3/24/1883, with 0.10 cfs authorized to be diverted from the Big Wood River from 4/15 through 10/31 for the irrigation of 5.0 acres on Lot 4, SWSW T.02N R.19E SEC.31. Although 37-577BY has historically been diverted from the Big Wood River into the Cove Canal in T.02N R.18E SEC.16 NESE for irrigation on the Ratliffe property, the termination of the Cove canal north of Bellevue prohibits delivery of water right 37-577BY to the Ratliffe property at this time. Therefore, a permit is being filed on behalf of the Ratliffes which proposes to forgo diversion of 0.10 cfs in the Big Wood River as mitigation for the diversion of .075 cfs from the existing well listed under 37-20450 on the Ratliffe property. Because the surface water conveyance ditch is inoperable and cannot physically allow delivery of water right 37-577BY to the Ratliffe property, mitigation of ground water extraction using the 37-577BY right is required. Under this permit, water would no longer be diverted from the Big Wood River at the point of diversion associated with water right 37-577BY.

IDWR will allow the use of surface water for mitigation of ground water withdrawal in instances where surface water delivery is unavailable, leaving the owner of the water right no other option but to apply for a permit to divert ground water as the primary means of delivery. This assumes that the proposed mitigation does, in fact, fully mitigate for any change in ground water withdrawal.

The Ratliff property is Lot 21A Muldoon Ranch Subdivision No 2 located on the south side of the City of Bellevue and more specifically it is Lot 4 Section 31 T02N R19E. The existing well from which water right 37-20450 is diverted is located on the property as shown on the accompanying aerial photograph(Figure 1). The NAIP 2011 aerial photo shows approximately 4.4 acres of the 5 acre property either currently or previously irrigated. Since the well has been utilized for irrigation because the surface water right cannot be secured, the diversion rate for the irrigated area is proposed to be limited to about 7.5 gpm/acre which a reasonable rate for sprinkler irrigation. It is therefore proposed for the proposed ground water permit with mitigation that the discharge rate be 0.075 cfs and the acre limit be 4.4 acres.

Ratliffe will provide the full 0.10 cfs of the surface water right for mitigation of the ground water diversion. It is proposed to provide 0.02 cfs for carrying water in the Cove Canal and forgo diversion of 0.08 cfs from the Big Wood River. This provision is consistent with IDWR policy to assure no injury to remaining users in the canal. This leaves an additional 0.08 cfs in the Big Wood River from Hailey downstream and decreases the decreed water right diversion from 0.10 cfs from the Big Wood River to 0.075 cfs from ground water or a 25 percent reduction in diversion. This decrease in diversion rate provides additional flow in the Big Wood river and enhances the river discharge from the Cove Canal diversion downstream. The historical ground water diversion at the Ratliffe well under water right 37-20450 is assumed to be equal to the licensed discharge rate of 0.06 cfs and the historical net aquifer depletion is assumed to be equal to the consumptive use on turf grass of 702 mm/year or 2.30 af/a on 4.4 acres or 10.12 acre feet per year total. Diversion of water right (37-577BY) into the Cove Canal headgate from the Big Wood River apparently ceased at the end of the 1990 irrigation season or when the Cove Canal was blocked off at Bellevue. Water master records show diversions under this right to the former owner, Buchanan, through water year 1990 and no diversions since 1990 to subsequent owners or to Ratliffe.

Deferring diversion of 0.08 cfs over a 180 day irrigation season leaves 28.5 acre feet in the river.

Ratliffe and predecessors have been irrigating from the ground water well (water right 37-29450) about 4.4 acres since about 1978 resulting in the net depletion from the aquifer of 10.12 acre feet per year. Increasing the proposed diversion from the well to 0.075 cfs from the 0.06 cfs allowed under 37-20450 will not increase net aquifer depletion over the historical depletion of 10.12 acre feet since the total irrigated acreage has not increased. Any water pumped in excess of the current and historical consumptive use will return to the aquifer. A report by Brockway Engineering PLLC included a ground water flow model of the Big Wood River aquifer from East Fork downstream to Bellevue (Development of a Groundwater Flow Model for the Big Wood River Aquifer: East Fork to Bellevue, 2009). This report showed aquifer underflow at Bellevue to be about 20,830 acre feet per year (28.8 cfs). The net historical depletion of the aquifer from pumping of the Ratliffe well since 1978 and proposed depletion with this proposed permit (10.12 af) is 0.05% of the aquifer flow. The impact of that magnitude of depletion cannot be modeled. The increase in diversion rate to 0.075 cfs will allow some flexibility in irrigation management on the property but provide only 0.017 cfs/acre (0.85 miners inches/acre) or less than the normal 0.02 cfs/acre(1.0 inch/acre).

The net effect of the proposed permit and mitigation is to essentially maintain the water balance in the aquifer relative to the ground water use. There is a concern for a decrease in carrying water in the Cove Canal as a result of decreasing the diversion by 0.10 cfs. Therefore, it is proposed to leave 0.02 cfs in the Cove Canal to maintain remaining water rights equal to the historical flow as it has been since 1990.

In any case, the proposed decrease in diversion to the Cove Canal will increase the flow in the Big Wood River from the Cove Canal headgate downstream. According to the Watermaster, District 37 there are 20.75 cfs of recommended or decreed water rights in the Cove Canal. The allowed diversion of 0.10 cfs under water right 37-577BY is equal to 0.48% percent of the total allowed diversion into the Cove Canal. An estimate of the seepage loss in the Cove Canal from the Big Wood diversion downstream to Bellevue (4 mi), using a seepage rate of 2 ft/day and a width of 6 feet is 3.5 cfs or 17% of the total water rights in the canal. If the transmission loss in the Cove Canal from the Big Wood River diversion to the current end of the canal (4 miles) is the estimated 17% of the diversion rate, then the transmission loss attributable to the diversion of 0.10 cfs under 37-577BY is 0.017 cfs(0. 85 miners inch) or less. This difference in discharge rate is not measureable by the Watermaster.

Studies by the USGS (J. Morland, , Ground Water-Surface Water Relations in the Silver Creek Area, Blaine County, Idaho, 1997) show that the aquifer underlying the Ratliffe property is the alluvial system which extends south and west to the Big Wood River(Figure 2). This study also shows that the Big Wood River gains water from the aquifer from Bellevue downstream to Glendale at the diversion of the Baseline Canal and the Banning Canal (Figure 3) The seepage loss from the Cove Canal enters the aquifer and moves down gradient toward the Ratliffe well and can eventually return to Silver Creek or the Big Wood River in the gaining reach above Glendale. Studies by the Idaho Department of Water Administratin (Chapman et al, 1972) show the water table configuration south of Bellevue and outline a ground water divide which purports to delineate the west part of the aquifer as tributary to the Big Wood River and the east part to Silver Creek. That divide is shown to occur about 2 miles south of Bellevue. Skinner et al, (2007), Frenzel (1989), and Smith (1956) show similar water table contours and data. Water table contours prepared by Morland(Figure 2) show the downstream and south westerly gradient in the aquifer which supports the gaining reach measurements and the opinion that the proposed pumping at the Ratliffe property and the proposed mitigation will not impact existing diversions and can enter the Big Wood River above Stanton Crossing.

Mitigation of the proposed ground water permit with the 3/17/1883 water right from the Big Wood River will improve the priority of the right and assure that irrigation can occur from the well at the 0.075 cfs rate whenever the 37-577BY water right is in priority. It is proposed that the 0.1 cfs allowed diversion under water right 37-557BY be dedicated to mitigation of ground water pumping under this permit and mitigation of Cove Canal carrying water . A reasonable rate of loss in the Cove Canal is seventeen (17%) percent of the 0.1 cfs or 0.02 cfs. The 0.02 cfs would be dedicated to carrying water in the Cove Canal with 0.08 cfs remaining in the Big Wood River. The seepage loss of 0.02 cfs, which would amount to about 7.1 af during a 180 day irrigation season would enter the aquifer immediately up-gradient of the Ratliff well and would, in effect, mitigate for most of the aquifer depletion attributable to the Ratliff ground water diversion.

The Watermaster would essentially assure that the 0.08 left in the river would not be diverted by junior surface water right holders upstream of a point in the river where any impacts from ground water pumping at the Ratliff property were manifested. This assures that the additional flow in the Big Wood River is utilized to meet senior water rights downstream.

Water use for irrigation from the existing well would be administered by the Watermaster, District 37 and an acceptable flow meter would be installed on the well.

The existing ground water right 37-29450 will not be withdrawn. The decreed ground water right will allow continued extraction from the aquifer in case there are any concerns about local

aquifer impacts attributable to the new permit which will be valid for diversion anytime the surface water right 37-577BY is in priority.



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

IDAHO DEPARTMENT OF WATER ADMINISTRATION
WATER INFORMATION BULLETIN NO. 28

NOVEMBER 1972

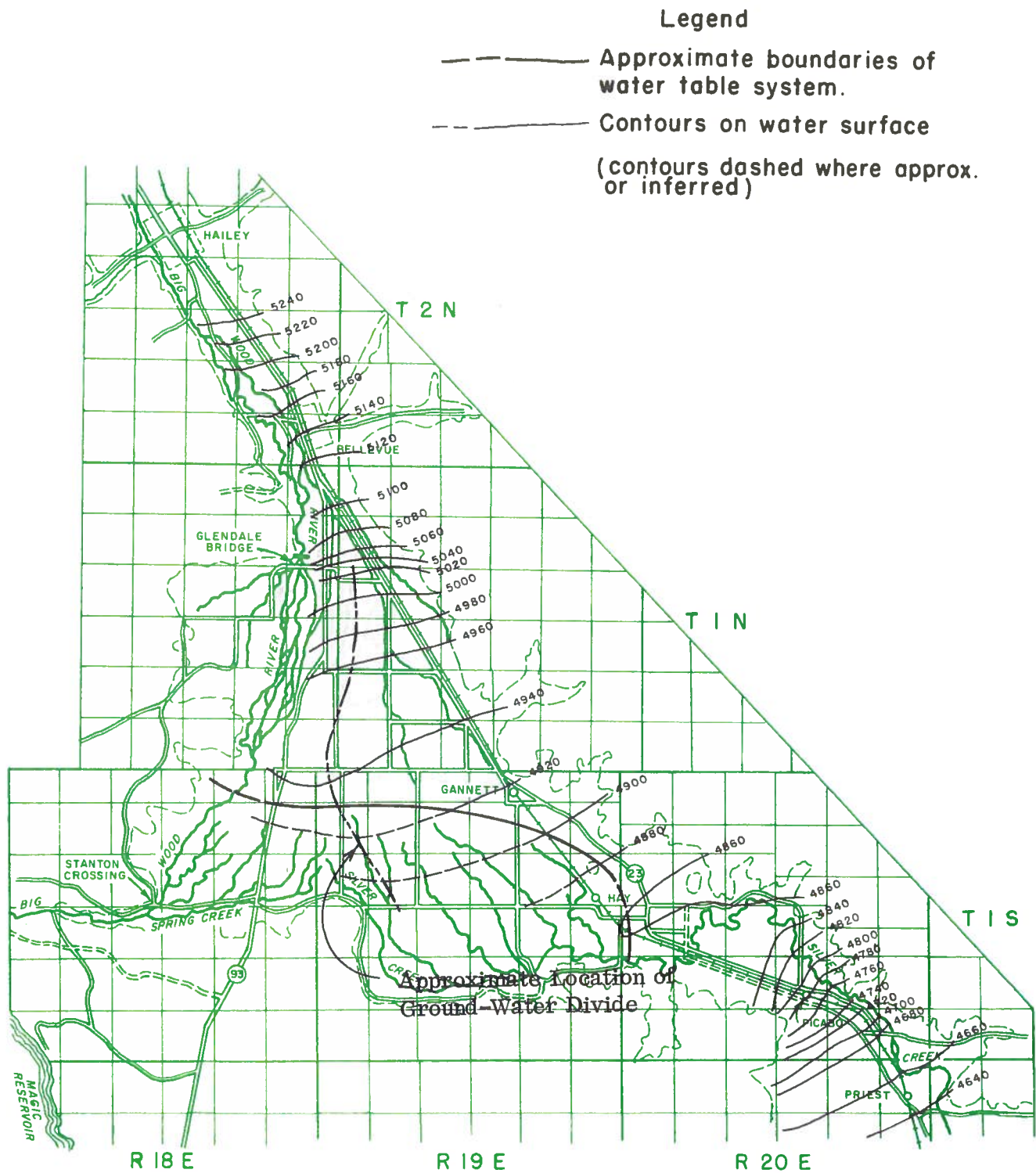


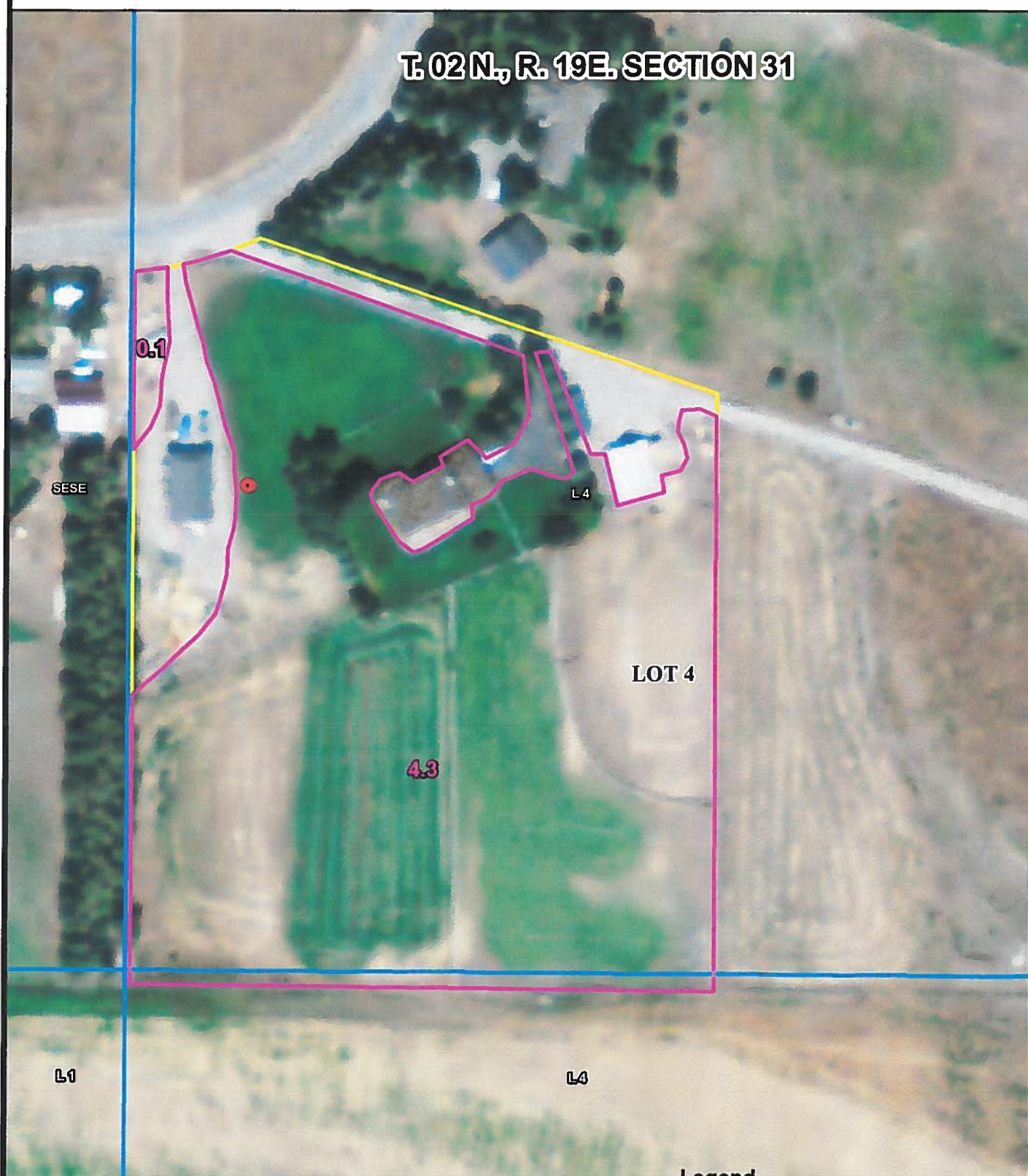
FIGURE 15. Approximate boundaries of water-table system and contours on water surface, Big Wood River-Silver Creek area.

Ratliffe Estimate of Cove Canal Seepage

C.E. Brockway 3/22/2012

Length	4 mi	21120 ft	Cove Canal Diverstion down to Bellevue
width avg		6 ft	
Wetted Perimeter		7.2 ft	
Depth		1.5 ft	
Area		152064 ft ²	
Seepage rate		2 ft/day	Worstell
Seepage loss		304128 ft ³ /day	
		3.52 cfs	
Total Water Rights		20.75 cfs	
%loss		17%	
37-577BY Divesion		0.1 cfs	
% of 37-577BY loss		0.02 cfs	

T. 02 N., R. 19 E. SECTION 31



Legend

- Proposed POD for Permit, Existing Well
- Potential Irrigated Area = 4.4 Ac.
- Proposed Place of Use
- Section_Lines
- ladesc

RATLIFFE, WILLIAM AND/OR KATHLEEN
APPLICATION FOR PERMIT
NAIP 2011 AERIAL

N
BROCKWAY ENGINEERING, PLLC.
ALR - OCT. 4, 2011
(ZL- 1/27/12)

0 50 100 200 Feet

Figure 2
from Maryland
(1997)

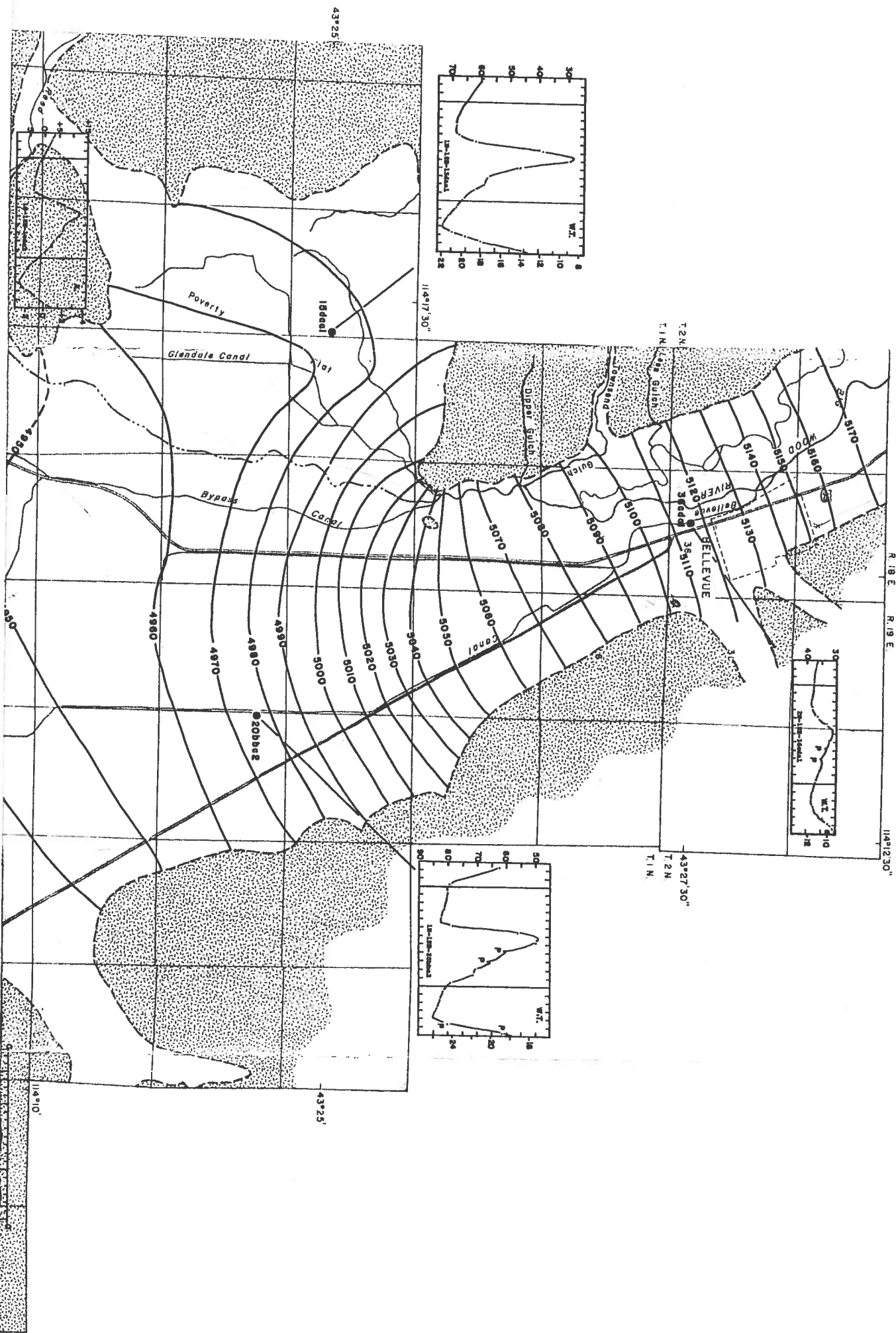


FIGURE 6.-- POTENTIOMETRIC AND WATER-TABLE CONTOURS, FALL, 1975, AND WATER-LEVEL FLUCTUATIONS IN SELECTED WELLS IN THE SILVER CREEK AREA, BLAINE COUNTY, IDAHO.

EXPLANATION

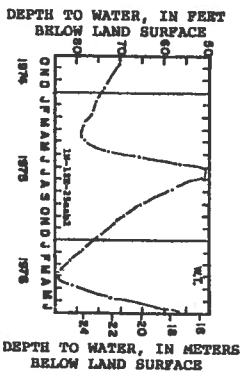


Basement complex, consisting of consolidated sedimentary, volcanic, and intrusive rocks of Tertiary and older age

— 4900 —
Potentialmetric contour, main aquifer— shows altitude of water table in unconfined areas and altitude at which water level would have stood in tightly cased wells in confined areas. Contour interval is 10 feet (3 meters). Datum is mean sea level

--- 4900 ---
Water-table contour, shallow or perched aquifer— shows altitude of water table in shallow aquifer overlying confined aquifer or in perched aquifer. Contour interval is 10 feet (3 meters). Datum is mean sea level

20ebb1 ● Well used for observation of water-level fluctuations



Hydrograph of selected observation well— shows depth to water below or above (+) land surface

- Measured depth to water
- ⊙ Questionable measurement
- P Pumping during measurement
- ⊙ Obstruction in well, no measurement
- ▲ Artesian well
- W.T. Water-table well

1/2 0 1/2 1 1 1/2 MILES
1/2 0 1/2 1 1 1/2 KILOMETERS

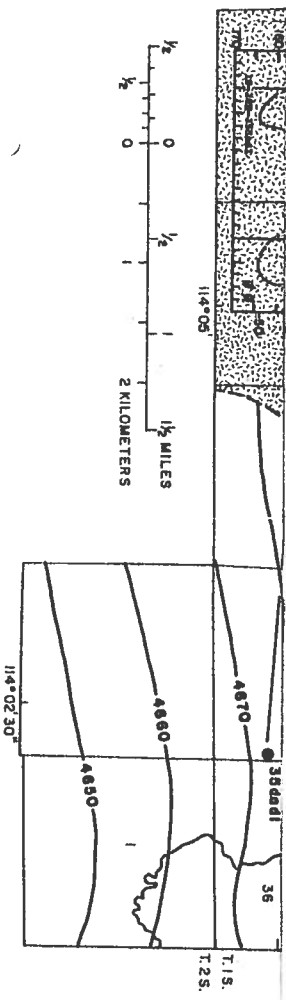
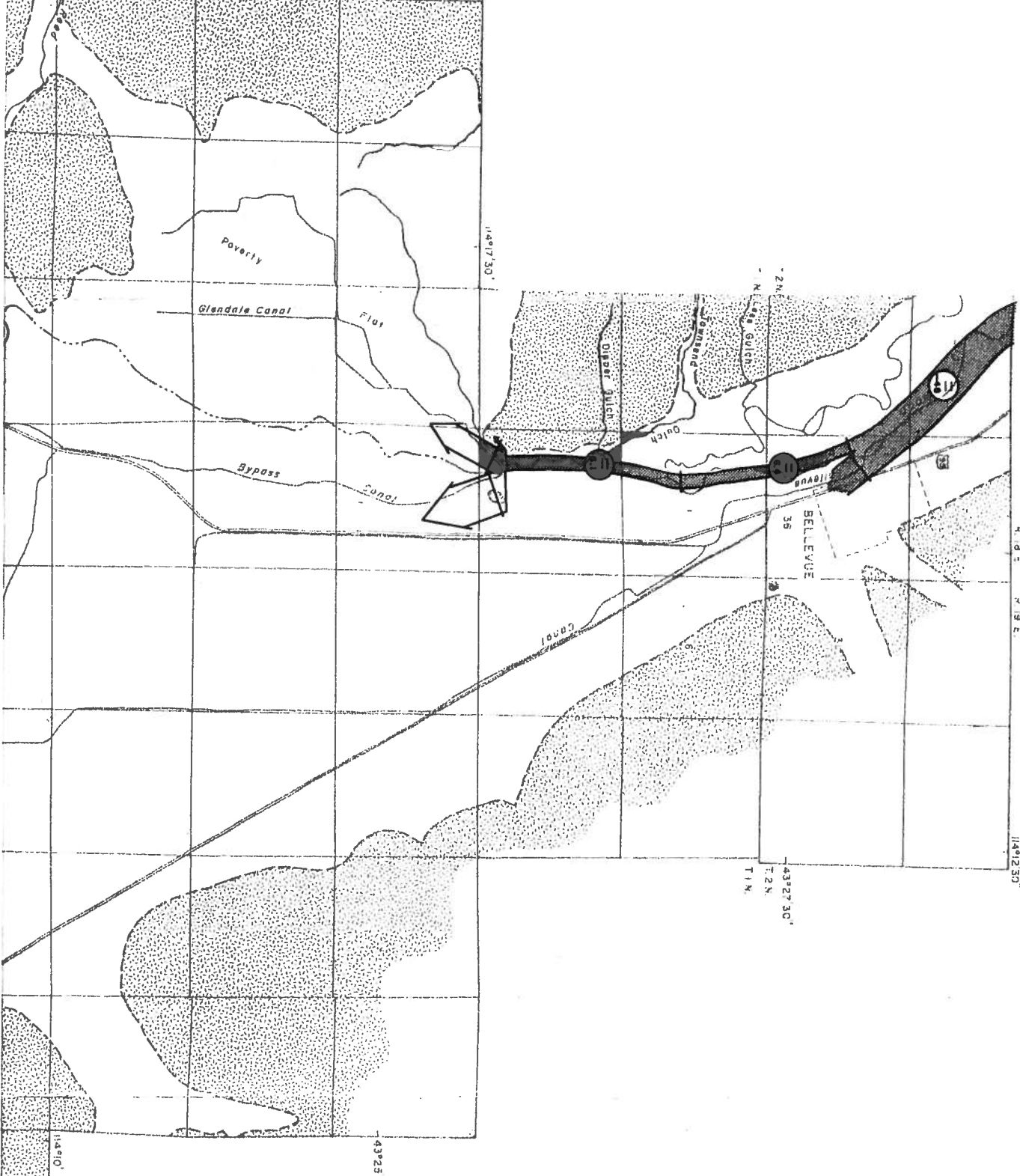


Figure 3
from Powell
(1997)



EXPLANATION

Basement complex, consisting of Cretaceous sedimentary, volcanic, and intrusive rocks of Tertiary and older age

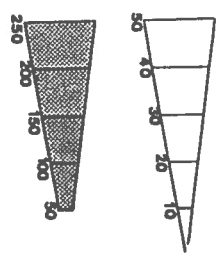
Schematic diagram of total measured flow September 29-October 3, 1975; arrow indicates measured diversion from the stream. Cross lines indicate approximate location of measuring sites. Width of diagram indicates total flow in stream (see scales below)

Gain or loss (+), in cubic feet per second between measuring points (to convert to cubic meters per second, multiply by 0.0283)

Top number--gain or loss May 19-22, 1975
Middle number--gain or loss June 23-27, 1975
Bottom number--gain or loss Sept. 29-Oct. 3, 1975

130 Estimated gain or loss distributed between two or more reaches due to lack of midpoint measurement

-180 Computed loss but unmeasured diversion suspected within the reach



Total flow, in cubic feet per second (to convert to cubic meters per second, multiply by 0.0283)

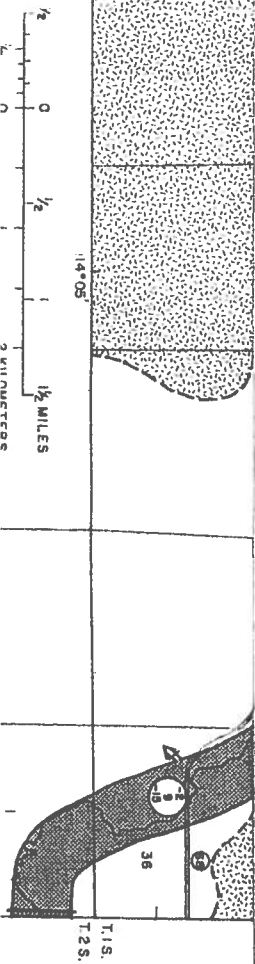


FIGURE 12--SCHEMATIC DIAGRAM OF SURFACE-WATER FLOW
AND GAINS OR LOSSES IN THE SILVER CREEK AREA,
BLAINE COUNTY, IDAHO.