

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 65-13125

Exam Date: 10/7/1993

1. Current Owner: J DENNIS WEAVER
11275 NESBITT LANE
OLA ID 83657
(208)584-3522

JOY WEAVER
11275 NESBITT LANE
OLA ID 83657
(208)584-3522

2. Accompanied by: JOY WEAVER

Phone No: same

Address:

Relationship to Permit Holder: right holder

3. SOURCE

KIMBALL GULCH CREEK
SECOND FORK SQUAW CREEK

TRIBUTARY

SECOND FORK SQUAW CREEK
SQUAW CREEK

B. OVERLAP REVIEW

1. Other water rights with the same place of use: none
2. Other water rights with the same point of diversion: see attachment

C. DIVERSION AND DELIVERY SYSTEM**1. LOCATION OF POINT(S) OF DIVERSION:**

KIMBALL GULCH CREEK	NW1/4SW1/4	Sec. 1,	Twp 11N,	Rge 01E, B.M.
GEM County				
SECOND FORK SQUAW CREEK	NW1/4SW1/4	Sec. 1,	Twp 11N,	Rge 01E, B.M.
GEM County				

Method of Determination: GPS and Field exam

2. PLACE OF USE: IRRIGATION

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
11N	01E	2													1.0				1.0

Total Acres: 1

Method of Determination: Field exam and ArcMap

3. ☒ Delivery System Diagram Attached (required). Indicate all major components and distances between components. Indicate weir size/pipe as applicable.
- ☒ Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater.
- ☒ Aerial Photo Attached (required for irrigation of 10+ acres).
- ☒ Photo of Diversion and System Attached

4. Well or Diversion

<u>ID No.*</u>	<u>Motor Make</u>	<u>Hp</u>	<u>Motor Serial No.</u>	<u>Pump Make</u>	<u>Pump Serial No. or Discharge Size</u>
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Second Fork Squaw Creek	dam in creek to a 10" pipeline and eventually an open ditch				
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Kimble Gulch Creek	Ditch crosses gulch diverting gulch water. All of Kimble Gulch Creek water would be diverted up to the capacity of the ditch.				
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D. FLOW MEASUREMENTS**1. Measurement**

<u>Equipment</u>	<u>Type</u>	<u>Make</u>	<u>Model No.</u>	<u>Serial No.</u>	<u>Size</u>	<u>Calib. Date</u>
Second Fork Squaw Creek	Rectangular Broad Crested weir flume				15 inch	
Kimble Gulch Creek	Channel dry but the Second Fork of Squaw Creek measurement was made within a foot (downstream) of the point where the common ditch crosses Kimble Gulch Creek indicating that 2.45 cfs of Kimble Gulch water could be diverted if available.					

2. Measurements:

Measured 20.4 on the attached staff gage. Based upon the chart I found 2.45 cfs being diverted. This measurement was after the system split and does not include water in the pipeline going south of the Second Fork of Squaw Creek. The system capacity exceeds the combined total of the rights associated with this ditch system. No combined right limits are necessary.

E. FLOW CALCULATIONS

Measured Method:

Permit Rate (irr) =	<u>0.09 cfs</u>
Proof Pd (\$__ \$50.00) (max cfs) =	<u>0.20 cfs</u>
Found POU acres <u>1.0</u> * 0.03 cfs/ac =	<u>0.03 cfs</u>
Measured rate	= <u>2.45 cfs</u>

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation: Surface water right no volume calculated
2. Volume Calculations for Other Uses: N/A

G. NARRATIVE/REMARKS/COMMENTS

Historically there were two points of diversion from Second Fork of Squaw Creek in Sec 1 and/or Sec 2, one to the south and one to the north. Over the years only 2 Squaw Creek PODs existed but the actual points on the stream channel may have shifted because of spring floods and stream bank erosion. The shifting locations were scattered throughout Sec 2 SE1/4 and Sec 1 SW1/4. In 2010 in conjunction with the Forest Service, the two PODs were consolidated into a single POD that included a fish screen at the intake. The Sage Hen Reservoir rights identify the Sec 2 location as a redirection point. Decreed right 65-11248 and permits 65-13125 and 65-13144 also share that legal description. There is one point of diversion from Kimble Gulch where the north ditch crosses the gulch and that location has not changed over the years. That location is approximately 25 ft east of the boundary between Section 1 and 2, putting that POD in Section 1 NWSW.

The current system is a shared Point of diversion from Second Fork of Squaw Creek into a 10 inch pipeline that runs approximately 750 ft southwest where it then splits. There is a screw gate on the POD that can be locked if necessary which would be associated with all rights from this POD. The south segment continues in a pipeline to the south of Second fork of Squaw Creek to the Nesbitt property. The other leg discharges into an open ditch that stays on the north side of Second fork Squaw Creek and serves multiple rights.

That ditch crosses Kimble Gulch approximately 250 ft northwest of the fork in the ditch and about 25 ft east of Section 2. Basically Kimble Gulch ends in the ditch and no longer reaches Second fork of Squaw Creek unless there are flood conditions. Kimble Gulch was dry on the exam date.

NORTH DITCH SYSTEM

I measured the open ditch water just west of the north ditch Kimble Gulch juncture and found 2.45 cfs. At the points along that ditch further downstream that I observed, the ditch it was not quite at full capacity. The ditch continues west northwest to the POU for this right and beyond. The combined total of all rights associated with the diversion from Second Fork of Squaw Creek (including the permits is tentatively 1.97 cfs). This rate includes the four permits at the permitted rate and excludes the Sage Hen Reservoir storage rights as they are not delivered until after some or all of the rights can no longer be delivered.

65-13125 SYSTEM

There are two points where water is diverted out of the main common ditch. The first point is on the east side of the POU and is a gravity diversion through a buried pipeline. A screw headgate controls the amount being diverted. Water is

applied to the east side of the POU via a 1 inch flexible line that has numerous holes drilled into it. That line can be shifted around depending on where the water is needed. It is basically a flood system from that pipe across the irrigated ground to the Second Fork of Squaw Creek channel. The second point of diversion is a pump lifting water out of the ditch and into a manifold that can be regulated to deliver water to three different zones. One zone is the lawn area above the common ditch and mainly east of the home. That area is sprinkle irrigated. The other two zones go to the south of the common ditch to irrigate a pasture on the west side of the property.

Overlap right

65-11257A is a decreed right utilizing the same sources and delivery systems. A shape was developed for that area that covers 2.4 acres south of the common ditch but that right is limited to 1 acre within that area. This permit (65-13125) is for 3 acres and is identified in the permit to be independent of the acre associated with 65-11257A. I found a 0.4 acre parcel above the common ditch clearly not covered by the decreed right. I also found 0.6 acres below the common ditch being irrigated. As the 1 acre POU for the decreed right was not specifically identified I am recommending this permit for 1 acre of irrigation independent of the decreed 1 acre POU. I am not identifying a POU for the decreed right. Effectively I am not recognizing any POU overlap.

The POD for Kimble Gulch Creek was permitted for Section 2NESE. I found that point of diversion to be just into Section 1 NWSW by approximately 25 ft. POD was GPSed. An amendment will be needed to correct the legal description. The point of diversion for Second Fork of Squaw Creek was shown to the 10-acre tract. I found the POD in the same 40-acre tract but am recommending this permit to the 40-acre tract only as historically there is a reasonable chance of the POD getting washed out and requiring it to be replaced at a slightly different location.

I am recommending the season of use at the departments current standard.

Have conditions of permit approval been met? ☐ Yes ☒ No

There is a lockable device on Second Fork of Squaw Creek but no measuring device. Recommend remark 01M. No measurement device or measurement device on Kimble Gulch Creek but creek is intermittent recommend waiving requirements on that channel or the use of 01M.

H. RECOMMENDATIONS

1. Recommended Amounts

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
IRRIGATION	03/15 to 10/31	0.030 CFS	
<u>Totals:</u>		0.030 CFS	

2. Recommended Amendments

☒ Change P.D. as reflected above ☐ Add P.D. as reflected above ☐ None

☐ Change P.U. as reflected above ☐ Add P.U. as reflected above ☐ Other

I. AUTHENTICATION

Field Examiner's Name Kelly K. Christensen Date Aug 14, 2012

Reviewer _____ Date _____

MEMO

KKC

FROM: Kelly K Christensen
TO: 65-13144, 65-13125, 65-22374, & 65-~~22374~~
SUBJECT: Measurement device requirement 22490

DATE: September 6, 2012

I talked to Eric Herr (watermaster on Squaw Creek) regarding the shared delivery system for the four listed permits. The system historically has not had a measurement device as a part of the delivery system. He felt that a modified remark for future measurement would be acceptable. The point of diversion has a screw gate that can be set and locked as necessary.

Remark R43 (modified)

Upon notification by the Department the right holder shall maintain a measuring device and/or controlling works of a type approved by the Department in a manner that will provide the watermaster suitable control of the diversion(s).

-OK
JR 9/6/12

**SECOND FOR SQUAW CREEK AND/OR KIMBLE GULCH CREEK
POD OVERLAPPING RIGHTS FOR THE
FOUND PODS IN 11N, 1E, Sec 1 NWSW**

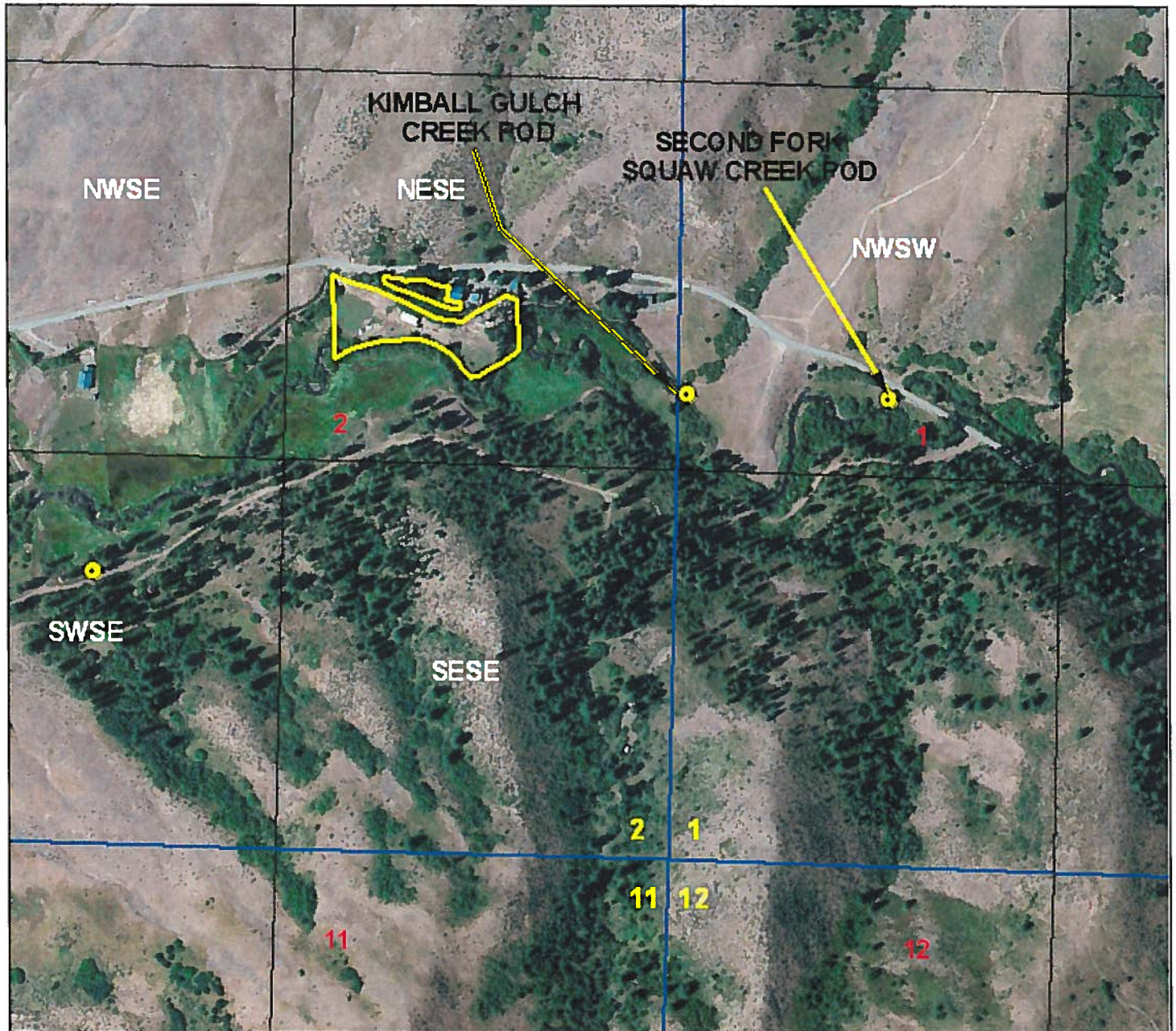
Right	Owner	status	POU	Historic diversion	Sources	*
65-13144	Nesbitt Ranches	Permit	South of 2 nd Fork	Sec 2 to the south	2 nd Fork Squaw Cr Amendment needed	.16 0.16
65-11248	Nesbitt Ranches	Decreed	South of 2 nd Fork	Sec 2 to the south	2 nd Fork Squaw Cr Amendment needed	.14
65-3090	Nesbitt Ranches	Decreed	South of 2 nd Fork	Sec 1 to the south	2 nd Fork Squaw Cr	.24
65-13125	Weaver O.L with 65-11257A	Permit	North of 2 nd Fork	Sec 2 to the north	2 nd Fork Squaw Cr Kimble Gulch Amendment needed	.09 0.03
65-7901	Weaver	Decreed	Dom/stock only		spring	
65-11257A	Weaver	Decreed	North of 2 nd Fork	Sec 1 to the north	2 nd Fork Squaw Cr Kimble Gulch	.02
65-22490	Miller	Permit	North of 2 nd Fork	Sec 1 to the north	2 nd Fork Squaw Cr Kimble Gulch	.08 0.06
65-22374	Howell / Myers	Permit	North of 2 nd Fork	Sec 1 to the north	2 nd Fork Squaw Cr Kimble Gulch	.08 0.08
65-11257C	Howell / Myers	Decreed	North of 2 nd Fork	Sec 1 to the north	2 nd Fork Squaw Cr Kimble Gulch	.02
65-11257B	Dale Nesbitt	Decreed	North of 2 nd Fork	Sec 1 to the north	2 nd Fork Squaw Cr Kimble Gulch	.04
65-3089A	Nesbitt Ranches	Decreed	North of 2 nd Fork, west of subdivision	Sec 1 to the north	2 nd Fork Squaw Cr	.94
65-3089D	Marx	Decreed	North of 2 nd Fork	Sec 1 to the north	2 nd Fork Squaw Cr	.05
65-3089E	Hyde	Decreed	North of 2 nd Fork	Sec 1 to the north	2 nd Fork Squaw Cr	.04
65-3089G	Dale Nesbitt	Decreed	North of 2 nd Fork	Sec 1 to the north		.07
South irrigation system						0.54 cfs
North irrigation system						1.43 cfs
System total						1.97 cfs
* rate shown in red is the recommended rate System total w/ modified permit rates						1.89 cfs
65-2925	Squaw Cr Irr Dist	Decreed	Sage Hen Reservoir		Shares PODs as rediversion	
65-2974	Squaw Cr Irr Dist	Decreed	Sage Hen Reservoir		Shares PODs as rediversion	

65-13125 Change of Address July 20, 2012

J Dennis Joy Weaver
11275 Nesbitt Lane
Ola, Idaho 83657

by Jay Weaver

65-13125 LICENSING PLACE OF USE



0 660 1,320
Feet

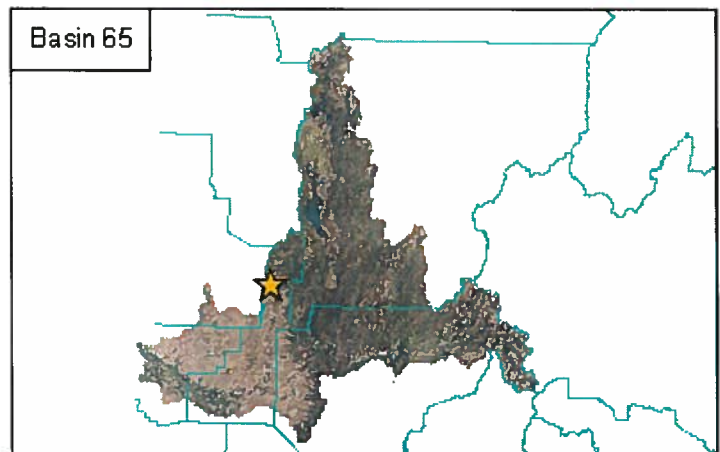
★ LOCATION IN BASIN

PLACE OF USE
TWP 11N, RNG 1E Sec 2
Data Entry on Aug 14, 2012



- Found point of diversion
- Found place of use
- Township lines
- Section lines
- Quarter/quarter lines

GIS PLACE OF USE PRESENTATION
2011 AERIAL PHOTOGRAPHY
BY KELLY K CHRISTENSEN



Permit # 65-13125

Exam date July 20, 2012

Agent KKC

Aerial photo date 2011

Twp	Rng	Sec	QQ
11N	01E	02	NESE



- 1 pic look east fm west side of lawn area
- 1 pic look So east at pump system
- 1 " " west at sprinkler PO4 & dry dike/bank
- 1 " " south east at flood irr. PO4
- 1 " " E SE at delivery system
- 1 pic " SE @ gate valve for irr system (east)
- 1 " " "

SECOND FORK OF SQUAW CREEK AND KIMBLE GULCH DIVERSION SYSTEM

Multiple rights including Squaw Creek Irrigation District storage rights

FIELD EXAM 7-20-2012

BY Kelly K Christensen

Photo 1

This photo is looking east southeast at the POD structure. The water goes into a 10" pipeline approximately 750 ft to where the system splits with a pipeline going across (south) of 2nd Fork of Squaw Creek to eventually reach the POU for 65-13144 and the other leg going into an open ditch and the irrigated ground north of 2nd Fork. The ditch also is utilized for the delivery of the storage water from Sage Hen Reservoir. Close-up of the fish screen



Photo 3

This photo is ≈ 250 ft west of the current POD where the river bends to the south. You are looking south in this photo. This was the approximate location of the original POD with the ditch (and now the pipeline location) paralleling the river to the right.

Old ditch and current pipeline



Photo 4

This photo is looking west at the measurement location for the north POU system. This point is ≈ 250 ft downstream from the ditch system split described in photo 1. This location is also just downstream from where Kimble Gulch enters the ditch. Kimble Gulch water does not enter the pipeline going to the south. Kimble Gulch was dry on this date. The fence in the background is on the quarter/quarter line. Pictured is the department's broad crested flume which is measuring the north system only. I found 20.4 on the staff gage which equates to 2.45 cfs. The ditch below this point was near but not at full capacity.

Fence

Kimble Gulch



By Kelly K Christensen

Photo 1

This photo shows where Weaver takes his water out of the main ditch. You are looking southeast in this photo. This is located just east of the private road swinging around the home to the lower pasture on the east side of the property. The main ditch generally flows east to west.

Gate



Photo 2

You are looking southeast in this photo. Shown is the pasture in the southeast corner of the property. Water is applied via a 1" flexible line with multiple holes drilled into it.



Photo 3

You are looking east in this photo at the lawn area above the ditch. This ground is irrigate via a pump system lifting water out of the ditch to a buried sprinkler system.

Pump site



Photo 4

You are looking east in this photo at the pump station. The main ditch is to the right in this photo.



Photo 5

You are looking west in this photo at southwest portion of the POU. The main ditch lays to the right of the shed in this photo. The steep portion of the slope to the green pasture is not irrigated. Also the ground in the bottom left of this photo although appearing green is not irrigated.

Not irrigated

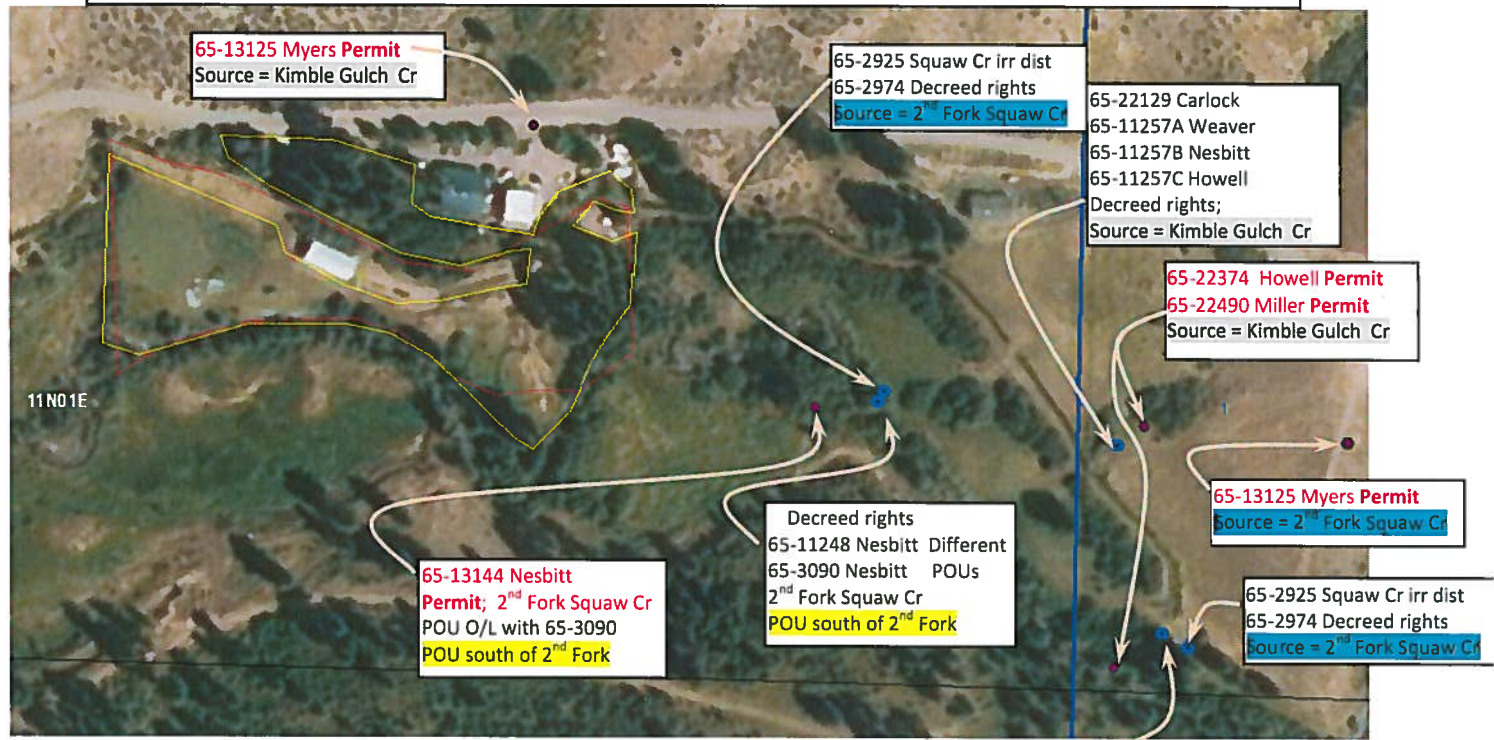
Irrigated pasture

Non irrigated slope



1 ac in

Permit # <u>65-13125 Weaver</u>	O/L 65-11257A & Squaw Creek Irrigation dist
65-13144 Nesbitt	O/L 65-3090 & Squaw Creek Irrigation dist
	65-11257B Does not overlap with 13144
65-22374 Howell	O/L 65-11257C & Squaw Creek Irrigation dist
65-22490 Miller	no overlap
Exam date _____	Agent _____ 11N 01E 02 Aerial photo date <u>2009</u>



Yellow outlined POU ≈ 2.6 acres.

Red outline = Decreed POU for 65-11257A. Shape ≈ 2.4 acres. The right is for 1 acre within the PPU.

Tax lot ≈ 4.7 acres.

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

Staff Analysis Sheet
Beneficial Use Field Report

65-13125
Permit No.

11N 1E S.1 SWNWSW } P/D
S.2 N6SE }
P/L

3 Aves,
weaver
Profile Rpt.

A. Prior to Conducting the Exam, the File Contains:

- ☒ Blank Field Report Form
- ☒ Copy of Permit
- ☒ Copy of Proof of Beneficial Use
- ☒ Copies of any Amendments/Orders with Conditions of Approval
- ☒ Well Inspection Form (If Needed)
- ☒ Aerial Photo Required? ☐ yes ☒ no If yes: ☐ copy attached
- ☒ SRBA Claim Required (required if proof filed by 11-19-1987)
- ☐ Yes ☒ No If yes: ☐ claim filed?
- (check AJ5, AJQ1, AJQ4, non-data claims)
- ☒ Copy of U.S.G.S. Quad
- ☒ Check for Government Lots. If so, make a copy of government plat
- ☒ Check of P/D index SL 10/6/93 (initial & date)
- Overlap ☒ yes ☐ no If yes: ☐ copy of exam(s) attached?*
- Type of Overlap: ☐ Same source
- ☐ Other source
- ☒ Check of P/U index SL 10/6/93 (initial & date)
- Overlap? ☒ yes ☐ no If yes: ☐ copy of water right(s) attached?*
- Type of Overlap: ☐ Same land, same source
- ☐ Same land, other source
- ☐ Other land &/or other uses
- *copies attached only if needed for analysis

M'fiche
+ Profile Report

- ☒ Scheduling Letter Sent? — (initial & date)
- ☒ Appointment Made and Telephone Conversation Memo Attached

B. After Conducting the Exam, the File Contains:

- ☐ Fully Completed and Signed Field Report Form
- ☐ Photographs of Point of Diversion and Place of Use

C. Review and Processing:

- Exam Completed Steve Lester 10/8/93 (signature of examiner & date)
- Exam Reviewed by Senior Water Resource Agent N/A (initial & date)
- Exam Reviewed by Manager of Regional Office — (initial & date)
- Exam Sent to State Office — (initial & date)

1993 FIELD Exam Notes - USE 2012 Report
for license - SL

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No. 65-13125

1. Owner: J. Dennis & Joy Weaver Phone No. 584-3522

Current Address: MC 78 Box 3755 OIA, ID 83657

2. Accompanied by: Joy Weaver EXAM DATE: 10/7/93

Address: — Phone No. —

Relationship to Permit Holder: —

3. Source: Snow Creek, Second Fork tributary to Snow Creek
Kinnall gulch Snow Creek, Second Fork

B. OVERLAP REVIEW

1. Other water rights with the same place of use: —

2. Other water rights with the same point of diversion: —

C. DIVERSION AND DELIVERY SYSTEM

1. Point(s) of Diversion: *

Ident No.	Gov't Lot	1/4	1/4	1/4	Sec.	Twp.	Rge.	County	Method of Determination/Remarks
01	—	SW	NW	SW	01	11N	1E	gem	7 1/2' topog - creek pld on
		NW	SW	SW	01				Q&Q line
02	—	SW	NW	SW	01				1/2 K. gulch pld on Q&Q line
		SE	NE	SE	02				

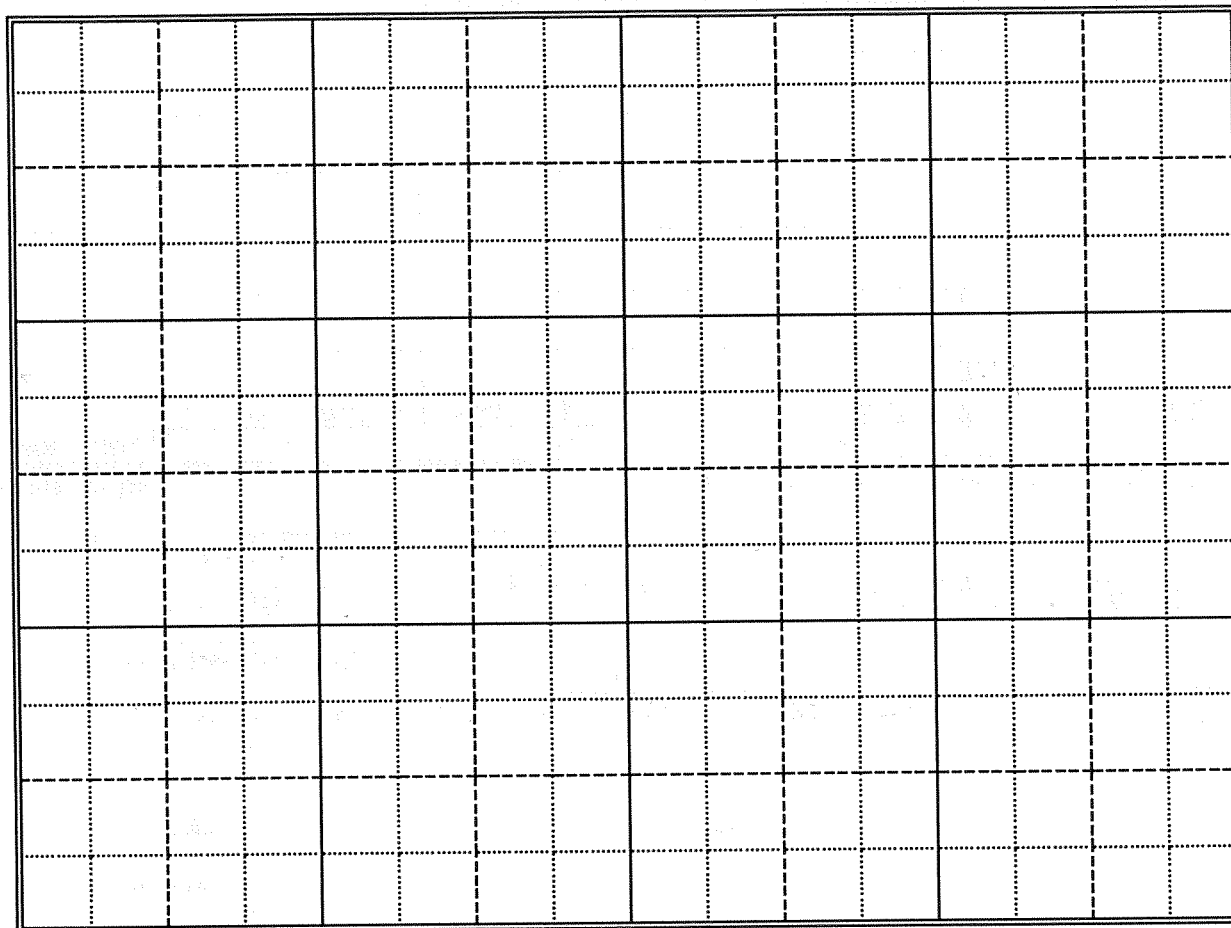
2. Place(s) of Use:

Indicate Method of Determination as is pld

TWP	RGE	SEC	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
11N	1E	2													2.6				2.6

* Subsequent point of withdrawal from ditch is in SWNESE S.2

3. **Delivery System Diagram:** Indicate all major components and distances between components. Indicate weir size/ditch size/pipe i.d. as applicable.



Scale: 1" = 80

☒ Copy of USGS Quadrangle Attached Showing location(s) of point(s) of diversion and place(s) of use (required).

☒ Aerial Photo Attached (required for irrigation of 10+ acres)

☐ Photo of Diversion and System Attached

4.

Well or Diversion Identification No.*	Motor Make	Hp	Motor ^{mod.} Serial No.	Pump Make	Pump Serial No. or Discharge Size
NOT P/O - this is point of withdrawal from ditch	GE	2	SKCR39UN301CT	I can't read tag; three 2"	main 3"

*Code to correspond with No. on map and aerial photo

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
Sprinkler gauge w/ pitot						
5 g. bucket/stop watch						

2. Measurements: 7 hds., 1/32" nozzles (dual) psi: 15/15 - 14/14 - 16/18 - 18/18

a) West 260 - 54261 5 roundw, ~~equivalent to RB~~. Can't find

equivalent on RB sprinkler chart so use sprinkler formula.

b) 5 gallons/24 seconds - all 3 hoses at once measured

a = sprinkler heads b = 3 hoses & bucket (measured while pop-up line was off)

E. NARRATIVE/REMARKS/COMMENTS

System consists of a pump from "Nesbitt Ditch" from Second Fork Snow Creek. Ditch intercepts Kimball gulch & thus acts as diversion works for gulch water which is usually available through mid-late June (runoff). The main source remains 2nd Fk Sq. Creek.

A 2" line to 2 hp pump with three 2" lines to various sprinklers allows irrigation from the ditch.

Three lines:

South side of ditch { 1) one to 7 RB type sprinkler, dual forward facing 7/32" nozzles for pasture.

2) one to c 10 pop-up lawn sprinkler along south side of ditch.

North side of ditch - 3) one to riser with 3 valves for 3 garden hoses for min. portable sprinklers.

Usually operate 3 lines at once & must operate ~~any~~ any 2 at once or pressure increases & pump will shut off.

P/O at 2nd Fk. Sq. Cr: rock channel to divert water from creek to earth ditch. Ditch is 2'-4' wide & now flowing 1/2'-1' deep so obvious can carry permit amount. No controlling device or measuring device found on ditch. * Switchbox for pump in ditch can be locked but no flowmeter or other measuring device found on pump.

"Nesbitt Ditch" also serves other areas than in permit.

No other irrig. water on these areas. Pasture @ (350' x 200') / 43,560 = 1.6 acres; other misc areas total @ 1 more acre; Total ≈ 2.6 acres.

Have conditions of permit approval been met? ___ yes ☒ no Watermaster control & measure of ditch; watermaster measure of pump.

* This ditch control at creek will be addressed in 1994 water district meeting (re: Nesbitt rights).

✓ Additional Computation Sheets Attached

SEE Hyd. Formulas
for Sprinklers

$$b) \frac{5g}{245} \times \frac{605}{19} = 12.5 \text{ gpm}$$

Grand TOTAL $\frac{46 + 12.5 \text{ gpm}}{448.8 \text{ gpm/cfs}} = .117 = .12 \text{ cfs}$
CAPACITY Σ

3 NOSES together

$$V_{IR} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = (2.6)(3.0) = 7.8$$

$$V_{DR} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation Season}) \times 1.9835 = (0.09)(184)(1.9835) = 32.8$$

$$V = \text{Smaller of } V_{LB} \text{ and } V_{DB} = 7.8$$

allow 109 cfs for 2.6 acres

HP Eq. where $h_p = 2$, $1.1\text{ ft} \approx 10'$, $psi = 44$ (gauge when 2 mainlines were on & third main for pop-ups was off)

$$Q = \frac{(8.8)(6.7)(2)}{(2.31)(44) + 10} = .11 \text{ cfs}, \text{ } \pm \text{ agrees with actual measurement.}$$

Permitted under old standard
of 4/1-11/1 so use new
standard B

Beneficial Use

Irrigation

Period of Use
From 4/15 To 10/15

Rate of Diversion
Q (cfs)
.09

Annual Volume
V (afa)
7.8

Totals: .09 7.8

___ Change P.D. as reflected above ___ Add P.D. as reflected above ___ None
 ___ Change P.U. as reflected above ___ Add P.U. as reflected above ___ Other

no pld amendment - is
clarification of pld locations
on/near lines

Field Examiner's Name

Steve Latta

Date 12/7/93

Reviewer

Date _____

SEAL

$$GPM = (D)^2 (\sqrt{P}) (29.82 \text{ HEADS}) (C)$$

$D = \text{No } 3 \frac{1}{2} \text{ size}$

$P = \text{psi}$

$C = 1.0 \text{ new hds.}$
 $= .96 \text{ worn hds.}$ } assume

HYDRAULIC FORMULAS FOR SPRINKLERS

DISCHARGE FROM NOZZLES

$$G.P.M. = \sqrt{P} \times D^2 \times 29.82 \times C$$

$$D = \frac{\sqrt{G.P.M.}}{\sqrt{C \times \sqrt{P} \times 29.82}}$$

$$P = \left[\frac{G.P.M.}{C \times D^2 \times 29.82} \right]^2$$

G.P.M. = Gallons Per Minute

D = Diameter of nozzle in inches

P = Pressure in pounds per square inch

C = Coefficient of discharge

LOSS OF PRESSURE THROUGH SPRINKLER AND NOZZLE

$$L = P - (C \times P)$$

$$C = \frac{P - L}{P}$$

L = Lost pressure

P = Gage Pressure

C = Coefficient of discharge

PRECIPITATION

$$Pr. = \frac{G.P.M. \times 96.3}{A}$$

$$G.P.M. = \frac{Pr. \times A}{96.3}$$

Pr. = Precipitation in inches per hour

A = Area or Distance between sprinklers on line x distance between lines

G.P.M. = Gallons per minute per sprinkler

96.3 = inches per sq. ft. per hour

Derived as follows:

One gallon = 231 cu. inches—144 sq. in. per sq. ft.

$$\frac{231}{144} = 1.604 \text{ inches per sq. ft. per gallon per min.}$$

$$1.604 \times 60 \text{ min.} = 96.3 \text{ inches per sq. ft. per hour.}$$

VELOCITY

$$V = \sqrt{\frac{P}{.00674}}$$

$$P = .00674 \times V^2$$

$$V = \frac{G.P.M.}{2.45 \times D^2}$$

V = Velocity in feet per second

P = Pressure in lbs.

D = Dia. of pipe or nozzle in inches

POWER FORMULA

1 H.P. = 550 foot pounds per second

= 746 watts or 0.746 KW

= 1 second foot of water falling 8.8'

Water H.P. = $\frac{\text{Second foot of water} \times \text{head in feet}}{8.8}$

$$= \frac{\text{Gal. per min. of water} \times \text{head in feet}}{3960}$$

Brake H.P. = $\frac{\text{Water H.P.}}{\text{Eff. of Pump}}$

1 kilowatt (kw) = 1000 watts

= 1.341 H.P.

= 737.5 foot pounds per second

NOTES

A column of water 1 foot high equals .4331 pounds pressure.

1 pound pressure equals a column of water 2.309 feet high.

1 acre equals 43,560 square feet.

1 acre inch equals 27,154 gallons.

1 cubic foot equals 7.48 gallons.

The height of an equilateral triangle is .866 times its base.

The discharge of a nozzle is in proportion to the square of its diameter and the square root of the pressure.

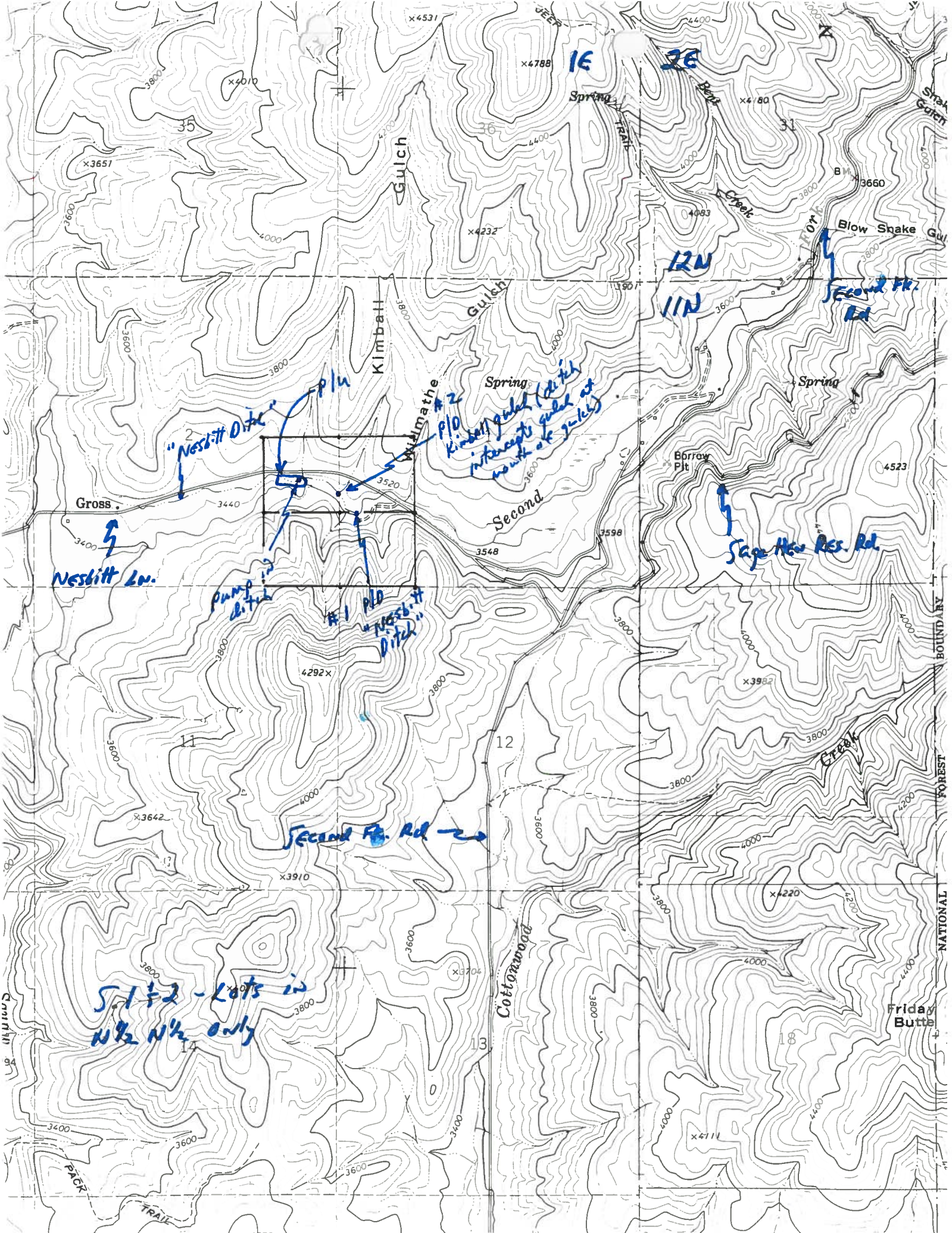
For greatest economy a pipe system should be so designed that the annual cost of power lost by pipe friction equals 40% of annual fixed cost of pipe.

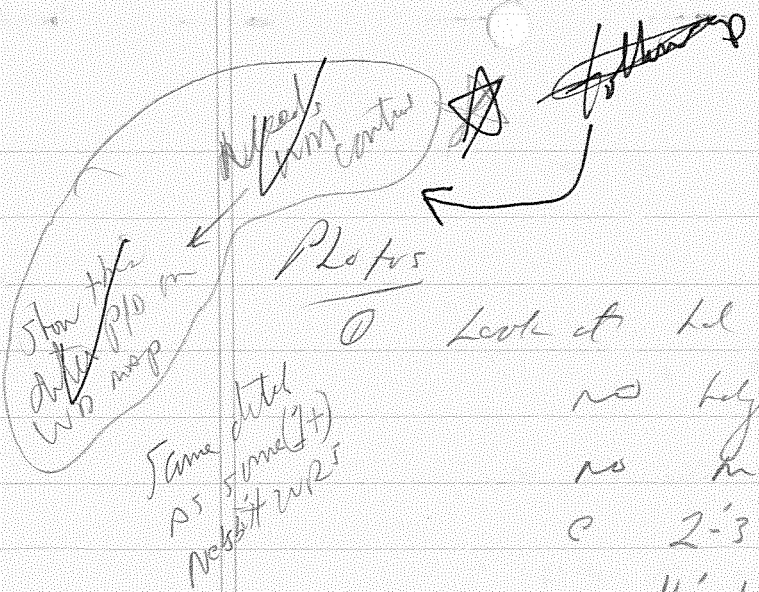
7 hds, each with dual nozzles @ $\approx 16 \text{ psi/nozzle}$
yields 40 gpm total

40/7 = 5.7 gpm/hd or 2.85 gpm/nozzle; seems

not a great loss there. nozzles as found during exam

65-13125





Along: pasture 350x200
+ misc other areas = same
Amount = 2 acres
2-3 acres?

Same ditch
PS
Nessit
WDS

Plots

- ① Look at hel p lateral in CK
no left or other contour
no in d.
2-3' wide (varies greatly) ;
1/2'-1' deep, outer ditch
- ② Look down ditch at pipe to pump (3 mains for left) . RB going in background
- ③ Look "down" at pasture of RB type hds
- ④ Look S. at rise for 3 hoses, 2" pipe from pump
ditch: mid bk ; Pump L BKgrd
- ⑤ Look SE at ditch & monitor p. gold coming in.
Creek out of view behind ditch

Kimberly gold - flows into ditch during runoff,
(usually quite in end there)

✓ Somewhere pt.

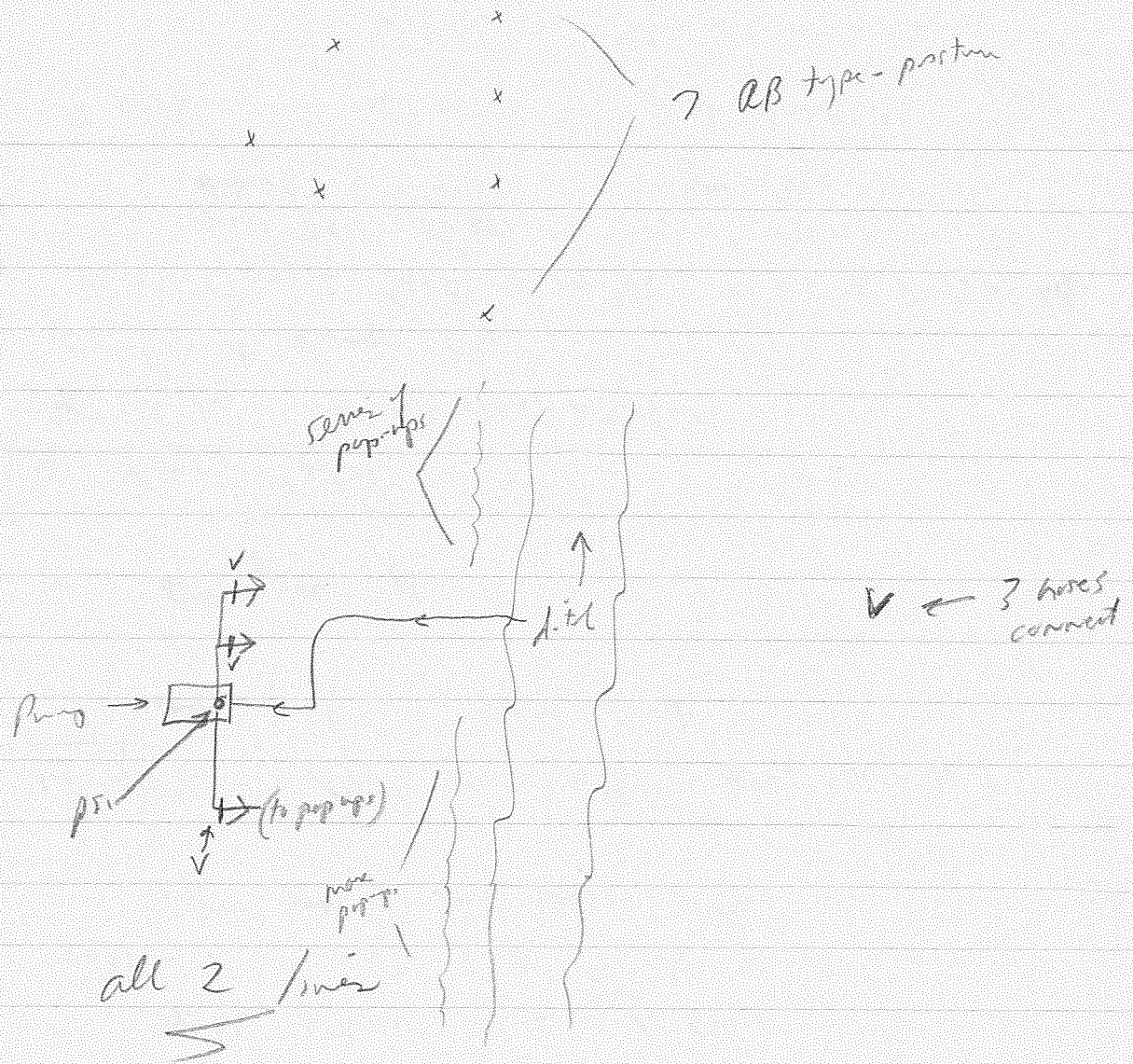
Pump from ditch

GE 2 hp mod. # 5KCR39UN3013CT
Can't read pump tag

Five
MEAS
from
pump
in
ditch

- 7 dual nozzle (both 1 direction) in use + 3 hose lines
West 260 - 5u261
RAinter 5u261
PSI : 15/15 14/14 16/18 18/18
nozzles = 7/32
- 3 hoses & 5 gal meas
- ① } all 3 hoses at
② } once
③ }

55/24.5



operating pressure ≈ 44 w/ 2 lines on

any 2 of 3 hoses on at 1 time

Found on Pop-up line also, pressure went to 38 PSI,
then near 5 gal bucket 3 hoses

IO R M/L # 41-094-013 (also for house)

Switch box & Power pole for pump - can be
located

no m. device in place

CONVERSATION MEMORANDUM

DATE 10/6/93

FILE 65-13125

NAME OF PARTY J. Dennis Weaver 584.3522

EMPLOYEE Steve Lester

RE: Exam

9:05 Busy

9:15 Tentative Appt. Thurs. 10/7 afternoon - stop
by if may be available. If not, try
some other time

Look for Log House on Nesbitt Lane, only one
e there. no house #.

Pump is sprinklers.

Can turn on system to measure leaks.





