

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 65-13792
Exam Date: 9/30/2016

1. Current Owner:
JOHN W SWANDER 4333 BUTTE RD EMMETT ID 83617 (208)365-4762
2. Accompanied by: John W Swander
Phone No: (208) 365-4762
Address: 4333 Butte Road, Emmett, Idaho 83617
Relationship to Permit Holder: Owner

3. **SOURCE:**
SPRINGS

TRIBUTARY:
SPRING 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: None

C. DIVERSION AND DELIVERY SYSTEM1. **LOCATION OF POINT(S) OF DIVERSION:**

SPRINGS NE¼ SE¼ NW¼ Sec. 2, Twp 07N, Rge 01W, B.M. GEM County
 SPRINGS NW¼ NE¼ NW¼ Sec. 11, Twp 07N, Rge 01W, B.M. GEM County
 SPRINGS NW¼ NE¼ SW¼ Sec. 2, Twp 07N, Rge 01W, B.M. GEM County
 SPRINGS SW¼ NE¼ SW¼ Sec. 2, Twp 07N, Rge 01W, B.M. GEM County
 SPRINGS SW¼ NE¼ SW¼ Sec. 2, Twp 07N, Rge 01W, B.M. GEM County
 SPRINGS SE¼ SW¼ SW¼ Sec. 2, Twp 07N, Rge 01W, B.M. GEM County
 SPRINGS NW¼ NE¼ SW¼ Sec. 2, Twp 07N, Rge 01W, B.M. GEM County
 SPRINGS NW¼ SE¼ SW¼ Sec. 2, Twp 07N, Rge 01W, B.M. GEM County

Method of Determination: Field exam and PLS data was used to verify the WR permit legal descriptions

2.

PLACE OF USE: IRRIGATION and IRRIGATION FROM STORAGE

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
07N	01W	2							3.0	1.0	5.0	3.5		14.0					26.5
07N	01W	11		0.5			27.0	2.5		21.0	0.5								51.5

Total Acres: 78

PLACE OF USE: IRRIGATION STORAGE

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
07N	01W	2									X			X					

DIVERSION TO STORAGE same as IRRIGATION

Method of Determination: Field exam and PLS data was used to verify the WR permit legal descriptions

3.

Delivery System Diagram Attached (required). Indicate all major components and distances between components.

X 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.

X

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

X

X Photo of Diversion and System Attached

X

4.

Well or Diversion ID No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
NA	NA	NA	NA	NA	NA

*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
NA	NA	NA	NA	NA	NA	NA

2. Measurements:

E. FLOW CALCULATIONS☒ Additional Computation Sheets Attached

Measured Method:

The water source consists of eight springs that are gravity fed into the main 3" irrigation line and ponds. Because the irrigation system is buried and inaccessible, flow measurements were not completed at the time of the exam. The irrigation system consists of 28, 3" sprinkler lines with a nozzle size of 5/32" and an estimated 6 gpm discharge.

IRRIGATION:

28 sprinklers

5/32" nozzle @ 6 gpm

28 X 6 = 168 gpm

168 gpm / 9 = 18.7 miner's inches

18.7 X 0.02 = 0.38 cfs (rounding up)

Theoretical = 0.38

Permit 2.30 cfs

B.U. Standard Allowance 1.56 cfs

B. U. Proof Fee \$150 → 2.01 – 3.00

Measurement or Theoretical Rate 0.38

License Recommendation 0.38 cfs
DIVERSION TO STORAGE (See attached spreadsheet):

Spring 1 to Pond A = 0.50 cfs

Spring 2 to Pond A = 0.38 cfs

Spring 3 to Pond B = 0.57 cfs

Total diversion to storage = 1.45 cfs**F. VOLUME CALCULATIONS**

1. Volume Calculations for Irrigation:

 $V_{IR} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 78 \text{ acres} \times 4.5 \text{ Headgate} = 351.0 \text{ AF}$ $V_{DR} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = 0.38 \text{ cfs} \times 231 \text{ days} \times 1.9835 = 174.1 \text{ AF}$ $V = \text{Smaller of } V_{IR} \text{ and } V_{DR} = 174.1 \text{ AF}$

2. Volume Calculations for Other Uses:

POND ANALYSIS:**POND A**

Surface Area = 0.2 acres

Maximum Depth = 20 FT

Average Depth = 8 FT (20 FT X 0.40)

Pond Capacity = 1.6 AF

Total POND CAPACITY (A + B) = 2.4 AF**POND B**

Surface Area = 0.2 acres

Maximum Depth = 10 FT

Average Depth = 4 FT (10 FT X 0.40)

Pond Capacity = 0.8 AF

Does Refill Occur?

$V_{IR} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 78 \text{ acres} \times 5.0 \text{ AF/AC} = 390.0 \text{ AF}$ (per Idaho Code §42-202)

$V_{DR} = [\text{Diversion Rate (cfs)}] \times (\text{ONE DAY OF IRRIGATION}) \times 1.9835 = 0.38 \text{ cfs} \times 1 \text{ day} \times 1.9835 = 0.76 \text{ AF/Day}$

Pond capacity is greater than the daily use volume, therefore, storage is occurring and will be recommended for licensing.

Seepage and evaporation losses will not be calculated per Administrator's Memorandum # 15. An annual volume limit will be recommended as described above at **78 acres X 5 AF/AC = 390 AF** for irrigation storage and irrigation from storage components.

G. NARRATIVE/REMARKS/COMMENTS

The field exam was conducted on September 30, 2016 by agents Patrick Kelly and Aaron Skinner. They were accompanied the permit holder, John Swander.

Taxlot data indicates Mr. Swander as the current property owner matching ownership of WR permit no. 65-13792.

The water source consists of eight springs that gravity feed into the main irrigation line. Three springs as outlined in the attached map also feed pond A and B. 3" buried perforated pipe collects the spring water and diverts it to the main irrigation line and into the two storage ponds. Pond A is located in the NESW QQ of Section 2. It is filled through the springs above the pond and runoff. It has an average depth of 8 ft. (20 ft. X 0.40), a surface area of 0.2 acres, and a total capacity of 1.6 AF. Pond A has a valve and 3" buried pipe that runs to the main irrigation line to the west. Pond B is located in the SESW QQ of Section 2. The pond receives water from irrigation waste water, spring water not captured by pond A, and the spring in the SWSW QQ of Section 2. The average depth of pond B is 4 ft. (10 ft. X 0.40), has a surface area of 0.2 acres, and a total capacity of 0.8 AF. Irrigation water is diverted from pond B through a valve and buried pipe on the east side of the POU in the NENW QQ of Section 11. The irrigation line then returns to the main line at the creek.

3" risers are located along the creek that allow for a maximum of 28 sprinkler pipes to be used with a nozzle size of 5/32". These 28 sprinklers are moved around the 78 acres and vary in number depending on the area being irrigated. Reviewing the "Sprinkler Discharge in GPM" chart for nozzle size and pressure, an average of 6 gpm was estimated. 6 gpm was used in calculating flow rates for this system. The calculation totaled 0.38 cfs compared to the permitted 2.30 cfs for the irrigation component of the permit for 78 acres. An irrigation storage and irrigation from storage component was added to the license. Since both the total capacity for both ponds is greater than the daily volume used for irrigation, storage is necessary.

Beyond the reach of the 28 sprinkler lines, dry crop farming is incorporated. The largest dry crop area is located at the NW corner of the NENW QQ of Section 11. Imagery reveals plowed acreage, but, during the exam, Mr. Swander mentioned the current system does not have enough water pressure to reach the higher ground. To estimate that area and establish a boundary for POU, the DRG layer was used with historical imagery. A contour line was followed to be consistent across the QQ. The POU was decreased from the permitted 115 acres to 78 acres.

Overlap analysis exposed five (5) WRs with the same POU; WR nos. 65-12248, 65-404, 65-405, 65-407, and 65-408. WR nos. 65-12248, 65-404 and 65-405 are stockwater rights, therefore, not applicable. WR no. 65-408 is a domestic right and not pertinent to irrigation. WR no. 65-407 is an irrigation and stockwater WR. WR no. 65-407 is associated to five (5) acres for irrigation at 0.10 cfs. These five acres were then taken out of the POU for WR permit no. 65-13792. This will alleviate any combined use limits that would otherwise be necessary.

Beneficial use for permit no. 65-13792 is for irrigation only. Because water is diverted to storage, irrigation water is stored in the ponds, and water from the storage is used for irrigation. These three (3) categories were added to the BU list and executed through the licensing amendment.

BU diversion to storage will be adjusted from the permitted 2.30 cfs to 1.45 cfs as calculated in the attached spreadsheet using a modified version of the Bernoulli equation. The velocity was obtained for each of the three springs and added together to total 1.45 cfs. Irrigation storage and irrigation from storage are restricted to 78 acres and a volume limit of 390 AF. Irrigation is limited to 0.38 cfs and a volume of 174.1 AF. These uses were calculated by the methods shown above in Section E and F.

Season of use dates were changed to match current season of use dates and identify water use as it was developed according to the field exam. Irrigation was changed from 03/15 – 11/15 to 03/15 to 10/31 per Season of Use layer in ArcMap.

POD overlap analysis does not suggest any overlap. **At the time of the field exam, it was confirmed using GPS that some permitted PODs were in the wrong QQ.** An amendment was obtained to correct this. Below are the coordinates for each spring location.

1. NE¼ SE¼ NW¼ Sec. 2, 43.971759, -116.427725
2. NW¼ NE¼ NW¼ Sec. 11, 43.575373, -116.253826
3. NW¼ NE¼ SW¼ Sec. 2, 43.581823, -116.252984
4. SW¼ NE¼ SW¼ Sec. 2, 43.581024, -116.253813
5. SW¼ NE¼ SW¼ Sec. 2, 43.580989, -116.253715

- 6. SE¼ SW¼ SW¼ Sec. 2, 43.575710, -116.254156
- 7. NW¼ NE¼ SW¼ Sec. 2, 43.582258, -116.253708
- 8. NW¼ SE¼ SW¼ Sec. 2, 43.580857, -116.253822

Condition 120 was changed to 103 and referred to licensing. Condition 01J was replaced by the modified version of R43 since a waiver request was received by the watermaster, Ron Shurtleff. Condition R04 was replaced by R05 and added Water District 65 in the language. Condition R65 was forwarded to licensing. Condition 220 was added to identify storage pond dimensions. Condition X23 was linked to the correct condition number and is forwarded to licensing.

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

H. RECOMMENDATIONS

1. Recommended Amounts

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
IRRIGATION FROM STORAGE	03/15 to 10/31		390.0 AF
IRRIGATION STORAGE	01/01 to 12/31		390.0 AF
DIVERSION TO STORAGE	01/01 to 12/31	1.45 CFS	
IRRIGATION	03/15 to 10/31	0.38 CFS	174.1 AF
	<u>Totals:</u>	1.450 CFS	390.00 AF

2. Recommended Amendments

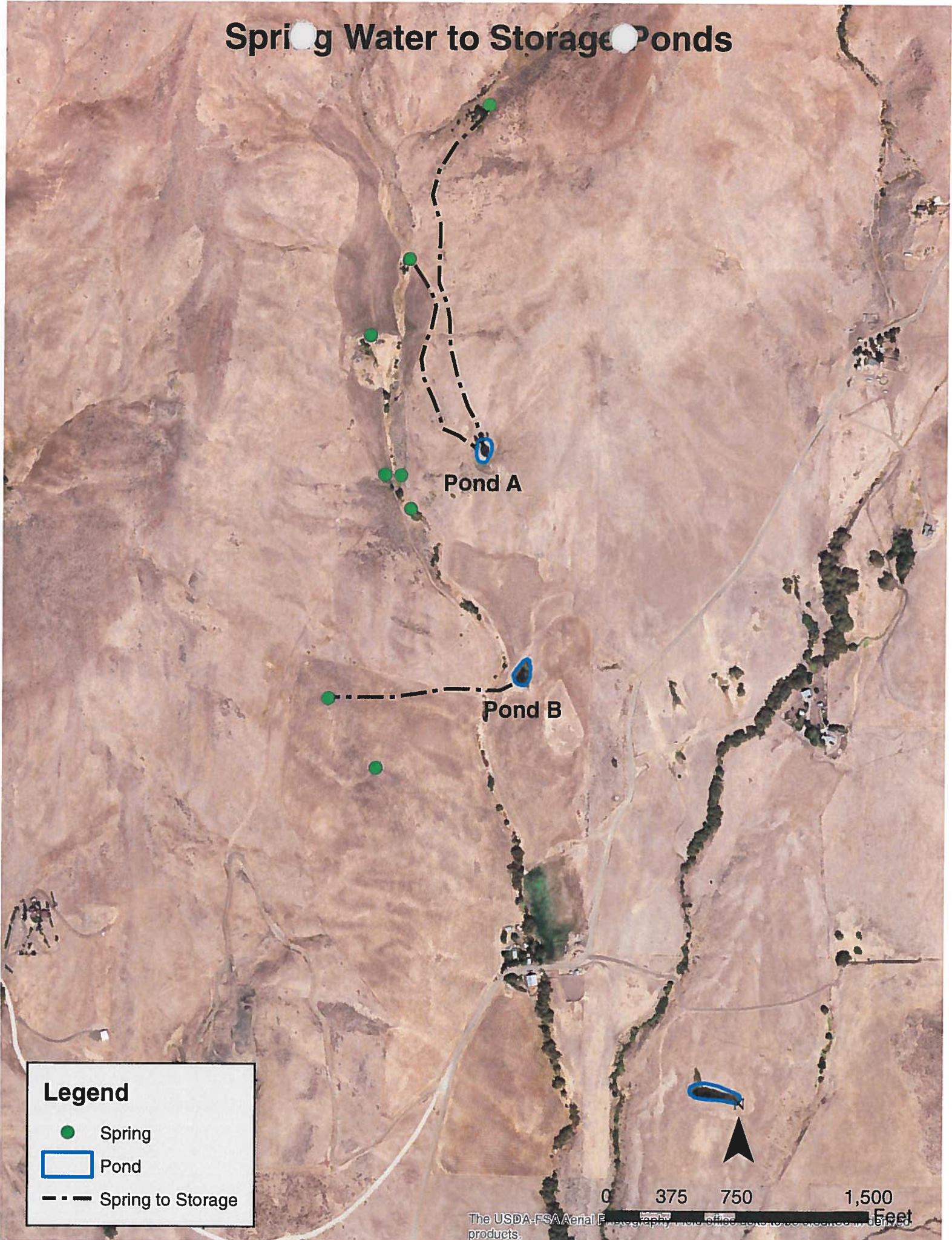
☒ Change P.D. as reflected above ☐ Add P.D. as reflected above ☐ None

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

I. AUTHENTICATION

Field Examiner's Name Aaron Skinner Date 2/9/2017
 Reviewer Angela M Gumm Date 9/7/17

Spring Water to Storage Ponds



Water System for Permit No. 67-13792

Pond A

Pond B

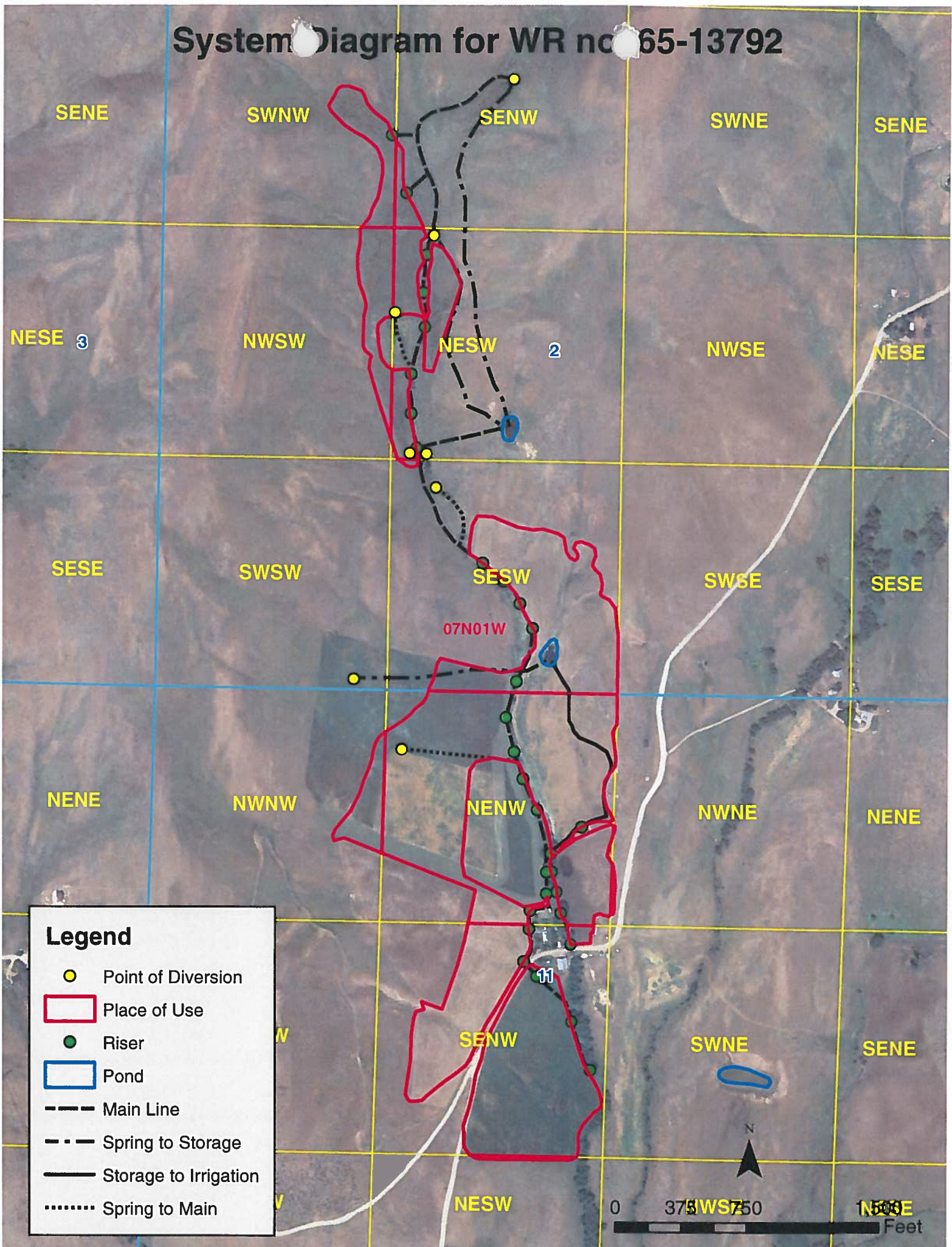
Legend

- Spring
- Pond
- - - Spring to Storage
- Spring to Main
- - - Main Line
- Storage to Irrigation

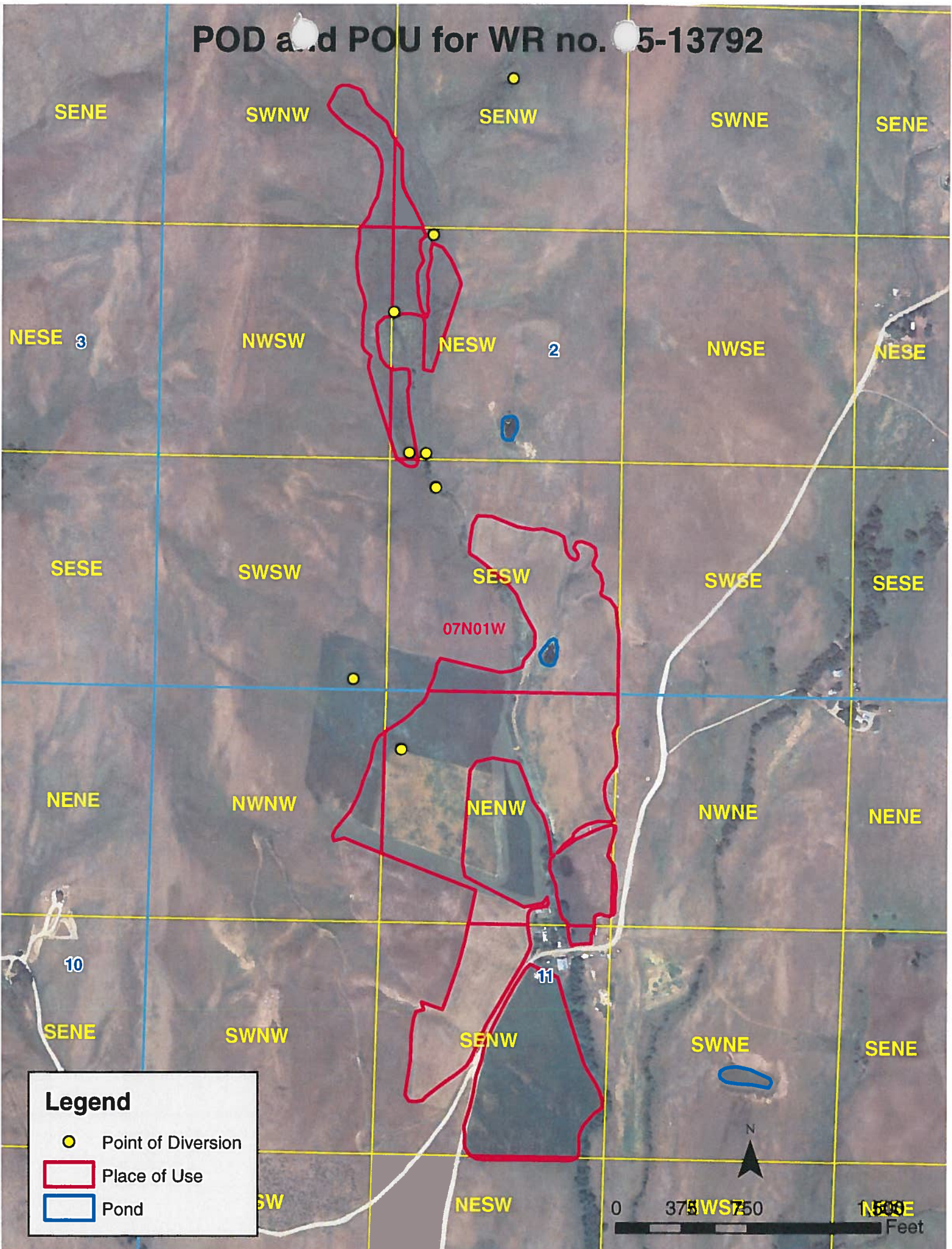
0 375 750 1,500

N

System Diagram for WR no 65-13792



POD and POU for WR no. 5-13792



Estimating Pipeline Flow Rates for WR Permit No. 65-13792

POD	Pond A	
Pipe Diameter (in.)	3	
Elevation (ft.)	3,900	3,678
$z_1 - z_2$	222	
Length (ft.)	2,094	
Area of Pipe (ft ²); A	0.0491	
Q (cfs); Q = VA	0.50	

POD to Pond A	
Velocity; V=	10.21
Pipe Length; L=	2,094
Pipe Diameter (ft); D=	0.25
f(x) =	222

POD	Pond A	
Pipe Diameter (in.)	3	
Elevation (ft.)	3,760	3,678
$z_1 - z_2$	82	
Length (ft.)	1,312	
Area of Pipe (ft ²); A	0.0491	
Q (cfs); Q = VA	0.38	

POD to Pond A	
Velocity; V=	7.65
Pipe Length; L=	1,312
Pipe Diameter (ft); D=	0.25
f(x)=	82

POD	Pond B	
Pipe Diameter (in.)	3	
Elevation (ft.)	3,605	3,451
$z_1 - z_2$	154	
Length (ft.)	1,115	
Area of Pipe (ft ²); A	0.05	
Q (cfs); Q = VA	0.57	

POD to Pond B	
Velocity; V=	11.71
Pipe Length; L=	1,115
Pipe Diameter (ft); D=	0.25
f(x)=	154

Diversion rate for Ponds A and B total 1.45 cfs

$$(z_1 - z_2) = (0.0232919) \cdot (v^2) + (0.0002816) \left(\frac{L}{D^{1.167}} \right) (v^{1.852})$$

Overlap Analysis for WR Permit 65-13792 POD

Process	BasinSequence	Draft	Owner	Source	NENE	NWNE	SWNE	SENE	NENW	NWNW	SWNW	SENW	NESW	NWSW	SWSW	SESW	NESE	NWSE	SWSE	SESE
Water Permit	65-13780	N	SWANDER, JOHN W	SPRING CREEK			X													
Water Permit	65-13792	N	SWANDER, JOHN W	SPRINGS					X	X										
Water Right	65-12124	N	JARMIN, CAROL; JARMIN, ROBERT D; MOSIER, FRED	GROUND WATER											X					
Water Right	65-12125	N	FELICIEN, MAVIS C	GROUND WATER											X					
Water Right	65-2040	N	BELFORD, DANNY R; EATON, MARTHA M; THOMAS, C W; THOMAS, JUDY; THOMAS, MICHAEL H	SPRING CREEK															X	
Water Right	65-404	N	SWANDER, ALBERT W; SWANDER, DOROTHY L; SWANDER, JOHN W	SPRING					X											
Water Right	65-407	N	SWANDER, ALBERT W; SWANDER, DOROTHY L; SWANDER, JOHN W	SPRINGS					X											
Water Right	65-408	N	SWANDER, ALBERT W; SWANDER, DOROTHY L; SWANDER, JOHN W	SPRING					X											
Water Right	65-5189	N	BELFORD, DANNY R; EATON, MARTHA M; THOMAS, C W; THOMAS, JUDY; THOMAS, MICHAEL H	SPRING															X	
Water Right	65-7368	N	DAVIS, EUGENE E; DRAKE, GREGORY L; DRAKE, JACKIE	SPRING							X									

Overlap Analysis for WR Permit 65-13792 POD

Process	BasinSequence	Draft	Owner	Source	NENE	NWNE	SWNE	SENE	NENW	NWNW	SWNW	SENW	NESW	NWSW	SWSW	SESW	NESE	NWSE	SWSE	SESE
Water Permit	65-13792	N	SWANDER, JOHN W	SPRINGS								X	X	X	X					
Water Right	65-12248	N	SWANDER, A W; SWANDER, JOHN W	SPRING									X							
Water Right	65-1485	N	CARNEY ENGLAND, HAZEL C; ENGLAND, JAMES; KLINGBACK, ALBERTA; KLINGBACK, JOHN M	GROUND WATER															X	
Water Right	65-1487	N	ENGLAND, HAZEL; ENGLAND, JAMES; KLINGBACK, ALBERTA; KLINGBACK, JOHN M	SPRING CREEK																X
Water Right	65-1488	N	BENNETT, CLEO SUE; BENNETT, GARY L; KLINGBACK, ALBERTA; KLINGBACK, JOHN M	SPRING				X												
Water Right	65-1662	N	KLINGBACK, BEATRICE; KLINGBACK, ELDON	SPRING		X														
Water Right	65-1884	N	LEGG, KAREN B; LEGG, PATRICIA L; LEGG, RONNIE R	SPRING																X
Water Right	65-1885	N	LEGG, KAREN B; LEGG, PATRICIA L; LEGG, RONNIE R	SPRING				X												
Water Right	65-4029	N	KLINGBACK, ALBERTA; KLINGBACK, JOHN M	SPRING																X
Water Right	65-405	N	SWANDER, ALBERT W; SWANDER, DOROTHY L; SWANDER, JOHN W	SPRING											X					
Water Right	65-406	N	SWANDER, ALBERT W; SWANDER, DOROTHY L; SWANDER, JOHN W	SPRING							X									
Water Right	65-407	N	SWANDER, ALBERT W; SWANDER, DOROTHY L; SWANDER, JOHN W	SPRINGS							X		X							

Seepage Loss Calculations **Pond A**

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the total annual seepage losses from a pond.

FILE NUMBER	65-13780
REVIEWER	Aaron Skinner
DATE	9/30/2016

User Input
Calculated value
Formula Explanations

INPUTS

Pond Surface Area (AC.)	0.2	AC.
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Pond Surface Area (SQ. FT.)	8712	SQ. FT.
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I used the following method to obtain my Soil Classification information:	NRCS Web Soil Survey	
My Soil Classification is	SC	
Suggested Seepage Rate (FT./DAY)	0.0070	FT./DAY

Formula: (Surface Area X Seepage Rate) X 7.48 = Gallons Per Day Loss
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Convert to GPD	456	GPD
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Total Seepage Loss (AFA)	0.5	AFA
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Though sand and gravel seepage rates may actually be higher, the maximum allowable rate is 0.2 ft/day, pursuant to Administrative Memo "Seepage Loss Standards for Ponds and Reservoirs."

Suggested Seepage Rates for Different Soil Types:
GW, GP, GM, GC, SW, SP and SM (silty sand, sand silt mixtures and gravel mixtures) = 0.2 ft per day
OL and ML (inorganic silts - very fine sands, silty, or clayey fine sands) = 0.02 ft per day
SC (clayey sands, sand clay mixtures) = 0.007 ft per day
CL (Low to medium plasticity clays) = 0.003 ft per day
MH, OH, PT and CH (high plasticity clays) = 0.0003 ft per day
LINED PONDS (liners can be chemical, fabric, or bentonite) = 0 ft per day
Ponds Intercepting Groundwater (excavated ponds filled by ground water) = 0 ft per day

PLEASE NOTE: The initial basis for the Suggested Seepage Rates in the table above is found on Page 16 of Seepage from Fish Ponds, Bulletin 599, August 1989 Alabama Agricultural experiment Station, Auburn University, Auburn University Alabama. If you don't know the soil type, please refer to the map provided at the NRCS Web Soil Survey (Tab #1), an ArcMap Soil Classification Map (Tab #1.1), or published NRCS Soil Survey (Tab #1.2). Use "0" if the pond fill relies on the water table.

Evaporation Loss Calculations Pond A

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the annual evaporation losses from a pond.

FILE NUMBER	65-13780
REVIEWER	Aaron Skinner
DATE	9/30/2016

User Input
Calculated value
Formula Explanations

The acronyms used on the Kimberly Research Center website are defined below:

P = Precipitation
ET = Evapotranspiration
P _d = Precipitation deficit
P _d = ET - P

USING THIS SPREADSHEET

Use the link below to access the Kimberly Research Center website. This website provides the Precipitation Deficit for a station most representative of the pond under examination. The Precipitation Deficit is the total amount of free water surface evaporation minus the precipitation for a given area, which gives the total amount of evaporative losses incurred by the pond. There are several weather sites that are used throughout the state. IDWR staff can find the nearest site using Arc Map. The shape file containing the sites can be found at <X:/Spatial/Climate/ETIdahostations.shp>.

Instructions:

1. Use the link below to navigate to ET Idaho 2012.
2. Select the station which is most representative to your pond location.
3. Click Submit Query.
4. Under "Land Covers with Evapotranspiration Estimates," select "Open Water - Shallow Systems (ponds, streams)" or "Open Water - small stock ponds" depending on the pond size.
5. Click the link to "Precipitation Deficit."
6. Reference and copy (ctrl + C) the first subheading "Mean" values.
7. Click the "Paste Values from ET Idaho" button. The table will automatically enter a zero (0) for any

Found at: <http://data.kimberly.uidaho.edu/ETIdaho/>

Precipitation Deficit

Station:

Emmett 2 E (NWS -- 102942)

Month	mm/day ¹	Days per month	mm/Month
Jan	-1.06	31	0.00
Feb	-0.25	28	0.00
March	0.64	31	19.84
April	1.84	30	55.20
May	2.60	31	80.60
June	3.23	30	96.90
July	4.08	31	126.48
August	3.52	31	109.12
September	2.11	30	63.30
October	1.01	31	31.31
November	-0.70	30	0.00
December	-1.42	31	0.00

PLEASE NOTE: The seasonal average for precipitation deficit should not be used for calculations because precipitation often exceeds evaporation during wetter months of the year. If the pond is kept full, excess precipitation during wetter months does not serve to refill the pond during drier months.

For example, see Sandpoint KSPT (NWS -- 108137), the annual precipitation deficit is -106 mm. However, April through September have positive precipitation deficit values. To properly estimate the annual volume of water necessary to refill a pond due to evaporation losses, the table will automatically enter a zero (0) for each month that the precipitation value is reported as a negative value.

As described above, precipitation offsets evaporation in winter months, so the net effect is that wintertime precipitation deficit is usually zero.

Total mm/year = 582.75

$[(\text{mm/yr}) \div (\text{convert to feet})] \times (\text{Surface area of pond, in acres}) = \text{Evaporation Loss in Acre Feet}$

$$\left(\frac{582.75}{12} \right) \times 304.8 = 0.4 \text{ AFA}$$

Total Storage Calculations - Pond A

FILE NUMBER	65-13792
REVIEWER	Aaron Skinner
DATE	9/30/2016

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the total seepage, evaporation and fill capacity required for a pond.

User Input
Calculated value
Formula Explanations

Surface Area (AC.)	0.2	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	8	"Average Pond Depth" depicts the actual depth of the pond either measured or estimated. Note: If you know the maximum depth and not the average depth, the Field Examiner's Handbook suggests multiplying the maximum depth by 0.4 to get the average depth, or you can use any method that seems reasonable to attain average depth.
Pond Capacity (AF)	1.6	Pond Capacity is calculated by multiplying the Pond Surface Area by the Average Pond Depth. If you know the capacity, divide the capacity by surface area and enter the average pond depth in the space above. Note: If pond capacity is determined using a method shown on the "Pond Capacity" sheet, the user may need to modify the value of "Pond Capacity" (cell B9) manually. Note that if the value is modified manually, the formula will be altered for future use.
Multiple Fill Volume Above Initial Fill to Fulfill From Storage Needs- "Multiple Fills" (AF)	390	The "Multiple Fill Volume Above Initial Fill" is the acre-feet of water required to meet a <i>from storage</i> component if the <i>from storage</i> component exceeds a one time fill. This section should not include the amount of water needed to fill the pond initially or the amount of water needed to maintain the pond level due to evaporation or seepage. For example: if a pond has a capacity of 5 acre feet and 2.5 acre feet of seepage and evaporation, but the pond is used for irrigation that requires 10 acre feet of from storage for the irrigation use, then you would insert 5 acre feet into this location (10 acre feet needed - 5 acre feet from the initial fill = 5 acre feet of additional storage needed). Note: You must have a "From Storage" component exceeding the initial fill on the permit to include a volume in this space.
Estimated Seepage Loss (AF)	0.5	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.
Estimated Evaporation Loss (AF)	0.4	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	392.5	The "Total Volume Required" is calculated by adding the Pond Capacity, Multiple Fills, Seepage Loss, and Evaporation Loss amounts to determine the total amount of storage required.

Flow Rate into Pond (CFS)	0.88	The "Flow Rate into Pond" depicts the actual flow, either measured or estimated, into the pond. For offstream facilities, this will be equivalent to "diversion to storage" rate.
Highest Daily Evaporation Rate From Evaporation Tab. (mm/Day)	4.08	This number is carried over from the "Evaporation Loss" sheet. It is the highest recorded number in the "Precipitation Deficit Table".
Required Daily Maintenance Volume (AF/Day)	0.00	"Required Daily Maintenance Volume" is the maximum volume of water needed on any given day during the year to maintain pond volume. It is calculated by adding the highest daily evaporation loss to the average daily seepage loss in acre feet. The average daily seepage loss is calculated by dividing the "Estimated Seepage Loss" by 365 days. This is acceptable, since the seepage rate shouldn't vary throughout the season unless the pond completely freezes over during the winter months. The highest daily evaporation loss is calculated by dividing the Highest Daily Evaporation Rate by the 304.8 conversion factor and multiplying this number by the pond surface area to attain a combined daily acre feet requirement.
Minimum Maintenance Flow (CFS)	0.00	The "Minimum Maintenance Flow" is the minimum amount of flow required to maintain the level of the pond. This number is determined by dividing the "Maximum Required Daily Maintenance Volume" by 1.9835. This flow can be used to determine if the flow rate into the pond is adequate to maintain the pond level.
Days Required to Fill the Pond	1	The "Days Required to Fill the Pond" is calculated by dividing the "Pond Capacity" by the "Flow Rate" minus "Minimum Maintenance Flow" multiplied by 1.9835. This section will assist you in determining if the flow rate being diverted to the pond is adequate to fill the pond while maintaining the pond level. The length of time to fill the pond will help determine if the flow rate is adequate for the size of pond being proposed. <i>If this number is approximately 6 months (180 days) or more, the reviewer should have a discussion with the applicant to make sure he/she understands that it will take a significant length of time to fill the pond.</i>
Days Required to Fill the Pond at 13,000 Gallons per Day	45	Some water users may want to fill a pond under the 13,000 gallons per day domestic exemption. The "Days Required to Fill the Pond at 13,000 Gallons per Day" is calculated by converting the "Pond Capacity" and the "Required Daily Maintenance Volume" to gallons. The "Pond Capacity" is then divided by 13,000 gallons minus the "Required Daily Maintenance Volume" in gallons to determine the number of days to fill pond. <i>If this number is approximately 6 months (180 days) or more, the reviewer should have a discussion with the applicant to make sure he/she understands that it will take a significant length of time to fill the pond.</i> Negative values indicate that the supply of 13,000 gallons per day is not enough volume to overcome the required daily maintenance volume; the pond will never fill.

Seepage Loss Calculations Pond B

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the total annual seepage losses from a pond.

FILE NUMBER	65-13780
REVIEWER	Aaron Skinner
DATE	9/30/2016

User Input
Calculated value
Formula Explanations

INPUTS

Pond Surface Area (AC.)	0.2	AC.
-------------------------	-----	-----

Pond Surface Area (SQ. FT.)	8712	SQ. FT.
-----------------------------	------	---------

I used the following method to obtain my Soil Classification information:	NRCS Web Soil Survey	
My Soil Classification is	SC	
Suggested Seepage Rate (FT./DAY)	0.0070	FT./DAY

Formula: (Surface Area X Seepage Rate) X 7.48 = Gallons Per Day Loss
--

Convert to GPD	456	GPD
----------------	-----	-----

Total Seepage Loss (AFA)	0.5	AFA
--------------------------	-----	-----

Though sand and gravel seepage rates may actually be higher, the maximum allowable rate is 0.2 ft/day, pursuant to Administrative Memo "Seepage Loss Standards for Ponds and Reservoirs."

Suggested Seepage Rates for Different Soil Types:
GW, GP, GM, GC, SW, SP and SM (silty sand, sand silt mixtures and gravel mixtures) = 0.2 ft per day
OL and ML (inorganic silts - very fine sands, silty, or clayey fine sands) = 0.02 ft per day
SC (clayey sands, sand clay mixtures) = 0.007 ft per day
CL (Low to medium plasticity clays) = 0.003 ft per day
MH, OH, PT and CH (high plasticity clays) = 0.0003 ft per day
LINED PONDS (liners can be chemical, fabric, or bentonite) = 0 ft per day
Ponds Intercepting Groundwater (excavated ponds filled by ground water) = 0 ft per day

PLEASE NOTE: The initial basis for the Suggested Seepage Rates in the table above is found on Page 16 of Seepage from Fish Ponds, Bulletin 599, August 1989 Alabama Agricultural experiment Station, Auburn University, Auburn University Alabama. If you don't know the soil type, please refer to the map provided at the NRCS Web Soil Survey (Tab #1), an ArcMap Soil Classification Map (Tab #1.1), or published NRCS Soil Survey (Tab #1.2). Use "0" if the pond fill relies on the water table.

Evaporation Loss Calculations Pond B

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the annual evaporation losses from a pond.

FILE NUMBER	65-13780
REVIEWER	Aaron Skinner
DATE	9/30/2016

User Input
Calculated value
Formula Explanations

The acronyms used on the Kimberly Research Center website are defined below:

P = Precipitation
ET= Evapotranspiration
P _d = Precipitation deficit
P _d =ET-P

USING THIS SPREADSHEET

Use the link below to access the Kimberly Research Center website. This website provides the Precipitation Deficit for a station most representative of the pond under examination. The Precipitation Deficit is the total amount of free water surface evaporation minus the precipitation for a given area, which gives the total amount of evaporative losses incurred by the pond. There are several weather sites that are used throughout the state. IDWR staff can find the nearest site using Arc Map. The shape file containing the sites can be found at [X:/Spatial/Climate/ETIdahostations.shp](#).

Instructions:

1. Use the link below to navigate to ET Idaho 2012.
2. Select the station which is most representative to your pond location.
3. Click Submit Query.
4. Under "Land Covers with Evapotranspiration Estimates," select "Open Water - Shallow Systems (ponds, streams)" or "Open Water - small stock ponds" depending on the pond size.
5. Click the link to "Precipitation Deficit."
6. Reference and copy (ctrl + C) the first subheading "Mean" values.
7. Click the "Paste Values from ET Idaho" button. The table will automatically enter a zero (0) for any

Found at: <http://data.kimberly.uidaho.edu/ETIdaho/>

Precipitation Deficit

Station:

Emmett 2 E (NWS -- 102942)

Month	mm/day ¹	Days per month	mm/Month
Jan	-1.06	31	0.00
Feb	-0.25	28	0.00
March	0.64	31	19.84
April	1.84	30	55.20
May	2.60	31	80.60
June	3.23	30	96.90
July	4.08	31	126.48
August	3.52	31	109.12
September	2.11	30	63.30
October	1.01	31	31.31
November	-0.70	30	0.00
December	-1.42	31	0.00

Total mm/year = 582.75

PLEASE NOTE: The seasonal average for precipitation deficit should not be used for calculations because precipitation often exceeds evaporation during wetter months of the year. If the pond is kept full, excess precipitation during wetter months does not serve to refill the pond during drier months.

For example, see Sandpoint KSPT (NWS -- 108137), the annual precipitation deficit is -106 mm. However, April through September have positive precipitation deficit values. To properly estimate the annual volume of water necessary to refill a pond due to evaporation losses, the table will automatically enter a zero (0) for each month that the precipitation value is reported as a negative value.

As described above, precipitation offsets evaporation in winter months, so the net effect is that wintertime precipitation deficit is usually zero.

$[(\text{mm/yr}) \div (\text{convert to feet})] \times (\text{Surface area of pond, in acres}) = \text{Evaporation Loss in Acre Feet}$

$$(582.75 \div 304.8) \times 0.20 = 0.4 \text{ AFA}$$

Total Storage Calculations - Pond B

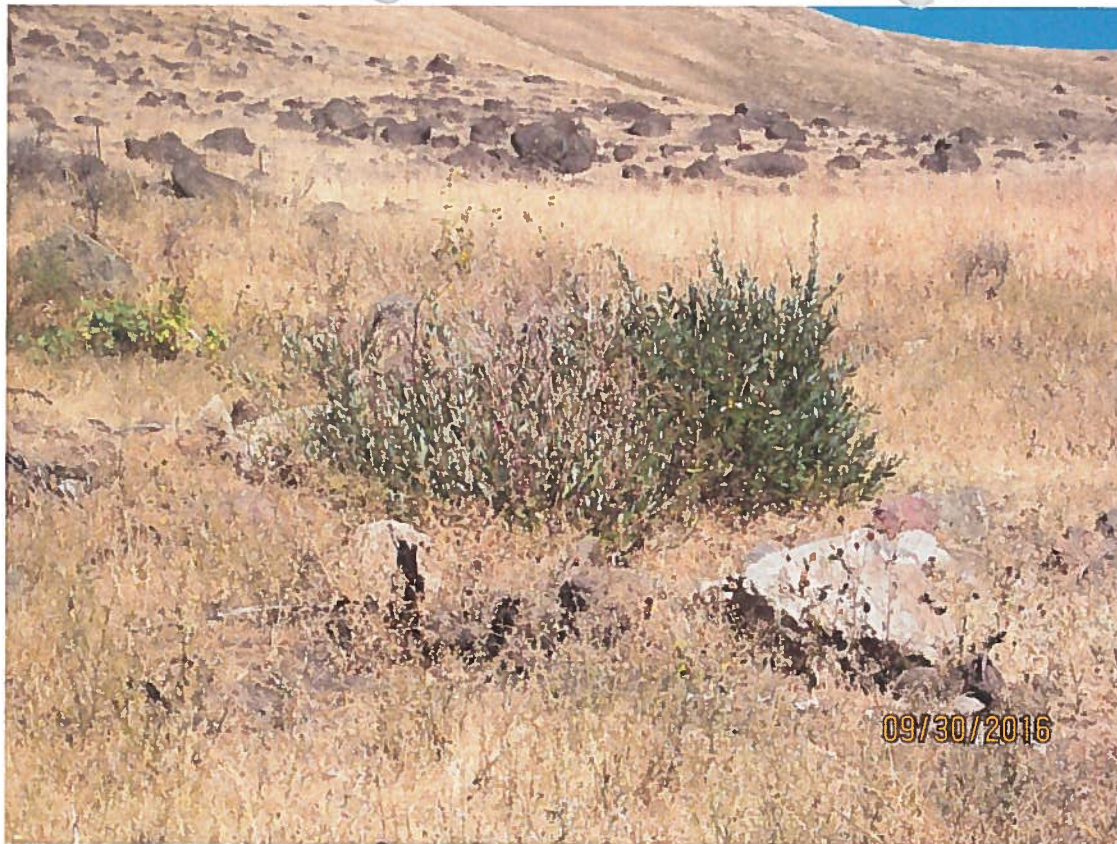
FILE NUMBER	65-13792
REVIEWER	Aaron Skinner
DATE	9/30/2016

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the total seepage, evaporation and fill capacity required for a pond.

User Input
Calculated value
Formula Explanations

Surface Area (AC.)	0.2	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	4	"Average Pond Depth" depicts the actual depth of the pond either measured or estimated. Note: If you know the maximum depth and not the average depth, the Field Examiner's Handbook suggests multiplying the maximum depth by 0.4 to get the average depth, or you can use any method that seems reasonable to attain average depth.
Pond Capacity (AF)	0.8	Pond Capacity is calculated by multiplying the Pond Surface Area by the Average Pond Depth. If you know the capacity, divide the capacity by surface area and enter the average pond depth in the space above. <i>Note: If pond capacity is determined using a method shown on the "Pond Capacity" sheet, the user may need to modify the value of "Pond Capacity" (cell B9) manually. Note that if the value is modified manually, the formula will be altered for future use.</i>
Multiple Fill Volume Above Initial Fill to Fulfill From Storage Needs- "Multiple Fills" (AF)	390	The "Multiple Fill Volume Above Initial Fill" is the acre-feet of water required to meet a <i>from storage</i> component if the <i>from storage</i> component exceeds a one time fill. This section should not include the amount of water needed to fill the pond initially or the amount of water needed to maintain the pond level due to evaporation or seepage. For example: if a pond has a capacity of 5 acre feet and 2.5 acre feet of seepage and evaporation, but the pond is used for irrigation that requires 10 acre feet of from storage for the irrigation use, then you would insert 5 acre feet into this location (10 acre feet needed - 5 acre feet from the initial fill = 5 acre feet of additional storage needed). <i>Note: You must have a "From Storage" component exceeding the initial fill on the permit to include a volume in this space.</i>
Estimated Seepage Loss (AF)	0.5	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.
Estimated Evaporation Loss (AF)	0.4	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	391.7	The "Total Volume Required" is calculated by adding the Pond Capacity, Multiple Fills, Seepage Loss, and Evaporation Loss amounts to determine the total amount of storage required.

Flow Rate into Pond (CFS)	0.57	The "Flow Rate into Pond" depicts the actual flow, either measured or estimated, into the pond. For offstream facilities, this will be equivalent to "diversion to storage" rate.
Highest Daily Evaporation Rate From Evaporation Tab. (mm/Day)	4.08	This number is carried over from the "Evaporation Loss" sheet. It is the highest recorded number in the "Precipitation Deficit Table".
Required Daily Maintenance Volume (AF/Day)	0.00	"Required Daily Maintenance Volume" is the maximum volume of water needed on any given day during the year to maintain pond volume. It is calculated by adding the highest daily evaporation loss to the average daily seepage loss in acre feet. The average daily seepage loss is calculated by dividing the "Estimated Seepage Loss" by 365 days. This is acceptable, since the seepage rate shouldn't vary throughout the season unless the pond completely freezes over during the winter months. The highest daily evaporation loss is calculated by dividing the Highest Daily Evaporation Rate by the 304.8 conversion factor and multiplying this number by the pond surface area to attain a combined daily acre feet requirement.
Minimum Maintenance Flow (CFS)	0.00	The "Minimum Maintenance Flow" is the minimum amount of flow required to maintain the level of the pond. This number is determined by dividing the "Maximum Required Daily Maintenance Volume" by 1.9835. This flow can be used to determine if the flow rate into the pond is adequate to maintain the pond level.
Days Required to Fill the Pond	1	The "Days Required to Fill the Pond" is calculated by dividing the "Pond Capacity" by the "Flow Rate" minus "Minimum Maintenance Flow" multiplied by 1.9835. This section will assist you in determining if the flow rate being diverted to the pond is adequate to fill the pond while maintaining the pond level. The length of time to fill the pond will help determine if the flow rate is adequate for the size of pond being proposed. <i>If this number is approximately 6 months (180 days) or more, the reviewer should have a discussion with the applicant to make sure he/she understands that it will take a significant length of time to fill the pond.</i>
Days Required to Fill the Pond at 13,000 Gallons per Day	22	Some water users may want to fill a pond under the 13,000 gallons per day domestic exemption. The "Days Required to Fill the Pond at 13,000 Gallons per Day" is calculated by converting the "Pond Capacity" and the "Required Daily Maintenance Volume" to gallons. The "Pond Capacity" is then divided by 13,000 gallons minus the "Required Daily Maintenance Volume" in gallons to determine the number of days to fill pond. <i>If this number is approximately 6 months (180 days) or more, the reviewer should have a discussion with the applicant to make sure he/she understands that it will take a significant length of time to fill the pond.</i> Negative values indicate that the supply of 13,000 gallons per day is not enough volume to overcome the required daily maintenance volume; the pond will never fill.



Spring at the very top of the system. Located in the SENW QQ of section 2.



Draw below the spring in the SWNW QQ of section 2. This takes the water to the top half of the POU that is irrigated and runs into the spring found in section 2 NWESW area.



Spring found in the NWNESW QQQ of section 2. The underground pipe diverts water to pond "A" that is located at the bottom of the draw. There is also a faucet tied in here that allows for stockwater use and irrigation.



Pond "A" located in the NESW QQ of section 2. Max depth is 20 feet or the high water mark just above the cows. This pond has a buried pipe that supplies the main irrigation line just west of this location.



Valve box
used to turn
the water
on/off at the
main line.



Air vent for
the three
springs that
connect to
the main
irrigation
line. This is
found in the
SESW QQ of
section 2.



One of the many risers found throughout the system that 3" irrigation pipe connect to.



Valve and pipe connected to one of the risers diverting water to the POU.



This image was taken from the top of the draw in the NWNESW QQQ of section 2. Pond "B" is in the distance.



Pond "B" found in the SESW QQ of section 2. This pond has a max depth of 10 feet. It receives water from the irrigation waste water and spring water not captured from pond "A." The spring in the SWSW QQ of section 2 also feeds into this pond.



On the east bank of pond "B" is a valve that is covered by this barrel. Pond water is diverted through this line to irrigate the acreage below the pond.



Sprinkler line running along the creek in the NENW QQ of section 11.



Sprinkler running from the east to west tees to the north/south to irrigate acreage down by the house and barns.



POU in the NENW QQ of section 11. The acreage at the top half of the image is dry crop because water cannot make it up that high with the current system.



POU in the SENW QQ of section 11. This acreage is irrigated with sprinklers as there are risers along the tree line in the distance.



Riser that is connected to 3" sprinkler pipe at the tail end of the system in the SENW QQ of section 11.



The very last riser in the irrigation system. This riser is found along the creek in the SENW QQ of section 11.



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

March 2, 2017

re-sent application for amendment.

JOHN W SWANDER
4333 BUTTE RD
EMMETT ID 83617

RE: Water Right Permit No. 65-13792

Dear Permit Holder(s):

The Department of Water Resources is reviewing the permit(s) referenced above prior to issuing water right license(s). By issuing a license, the Department confirms the extent of development that has been established in compliance with the terms of the permit.

The examiner who verified your water use reported that certain elements of the permit(s) have been developed differently than described on your permit(s). Changes that do not increase the authorized use of water under the permit(s) can be requested and approved in accordance with Section 42-211, Idaho Code. Before license(s) can be issued, your permit(s) must be amended to depict your water use as it was actually developed.

Based on the examiner's report, the following elements were developed differently than described on your permit(s):

☐ Point(s) of Diversion

☒ Place(s) of Use

☐ Other

The enclosed Application for Amendment form depicts the elements of the water right as they will appear on the license when issued. Please review the amendment for carefully. If you concur with the information presented, please sign and return the form with the \$100.00 filing fee within 14 days.

If you have any questions, please call me at (208) 334-2190.

Sincerely,

Aaron Skinner
Water Resource Agent

Enclosure(s): Application for Amendment



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

February 14, 2017

COPY

JOHN W SWANDER
4333 BUTTE RD
EMMETT ID 83617

RE: Water Right Permit No. 65-13792

Dear Permit Holder(s):

The Department of Water Resources is reviewing the permit(s) referenced above prior to issuing water right license(s). By issuing a license, the Department confirms the extent of development that has been established in compliance with the terms of the permit.

The examiner who verified your water use reported that certain elements of the permit(s) have been developed differently than described on your permit(s). Changes that do not increase the authorized use of water under the permit(s) can be requested and approved in accordance with Section 42-211, Idaho Code. Before license(s) can be issued, your permit(s) must be amended to depict your water use as it was actually developed.

Based on the examiner's report, the following elements were developed differently than described on your permit(s):

_____ **Point(s) of Diversion**

☒ **Place(s) of Use**

_____ **Other**

The enclosed Application for Amendment form depicts the elements of the water right as they will appear on the license when issued. Please review the amendment for carefully. If you concur with the information presented, please sign and return the form with the \$100.00 filing fee within 14 days.

If you have any questions, please call me at (208) 334-2190.

Sincerely,

Aaron Skinner
Water Resource Agent

Enclosure(s): Application for Amendment

**REQUEST TO WAIVE/MODIFY
CONDITION OF APPROVAL**

Permit # 65-13792

I request the condition(s) of approval requiring (select 1 or more):

- ☒ measuring device
☒ lockable controlling works
☐ Annual measuring/reporting or power records alternative
☐ Other – identify in space below

be waived or modified because:

Since mitigation for consumption under this water right has not been required I believe it is ap-
propriate to waive the condition to install measuring devices and lockable control devices on
the springs under this water right until a time when mitigation may become necessary.

Ron Shurtleff
Signature

February 6, 2017
Date

Ron Shurtleff, Watermaster
Print name



State of Idaho

DEPARTMENT OF WATER RESOURCES

Western Region, 2735 Airport Way, Boise, Idaho 83705-5082

PHONE: (208) 334-2190 FAX: (208) 334-2348 www.idwr.idaho.gov

C.L. "BUTCH" OTTER, Governor

GARY SPACKMAN, Director

April 16, 2014

John W. Swander
4333 Butte Road
Emmett, ID 83617

RE: Scheduling Field Exam for Water Right Permit No. 65-13792

Dear Permit Holder:

The Idaho Department of Water Resources (IDWR) is planning to conduct water right field examinations in the vicinity of the above-referenced permit **during the week of May 5**. An examination is needed to verify water use(s) developed under the permit in order to issue a water right license.

Your permit authorizes the diversion of water from springs for irrigation. If you developed a beneficial use of water and still own the place of use property identified in the permit, please contact me at your earliest convenience to schedule an examination.

If you developed a beneficial use of water under the permit but no longer own the place of use property, please use the enclosed Assignment of Permit form (\$25 fee). This will allow IDWR to work with the new permit owner through the water right licensure process.

A water right license cannot be issued if beneficial use of water was not developed or if use was developed but abandoned. In either of these cases, please relinquish the permit by using the enclosed Relinquishment of Permit form (no fee required). The permit will be voided if a relinquishment form is not submitted within thirty (30) days. If you no longer own the property and do not assign or relinquish your permit, IDWR will work with the current property owner to issue a license or to void the permit.

Please contact me to schedule a field examination for a day and time that is convenient for you. **Please call me at (208) 334-2190 by May 2 to conduct the field exam during the week of May 5.** If there is a problem with scheduling or conducting the field examination at this time, please let me know so we can reschedule.

Please call me at (208) 334-2190 if you have any questions. I appreciate your attention to this matter and look forward to hearing from you.

Sincerely,

Rick Collingwood, P.E.
Staff Engineer

Enclosure: Relinquishment and Assignment of Permit Forms



State of Idaho

DEPARTMENT OF WATER RESOURCES

Western Region, 2735 Airport Way • Boise, Idaho 83705-5082

Phone: (208) 334-2190 • Fax: (208) 334-2348 • Web Site: www.idwr.idaho.gov

C. L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Interim Director

May 3, 2013

John W. Swander
4333 Butte Road
Emmett, ID 83617

RE: Scheduling Field Exam for Water Right Permit No. 65-13792

We are planning to **conduct water right field examinations** in the vicinity of the above-referenced permit **during the week of May 13, 2013**. An examination is needed to verify your water use in order to issue a water right license.

Please be advised that you will need to operate your system under normal operating conditions during the examination. The permit authorizes the diversion of 2.3 cfs of spring water for irrigation of 115.0 acres.

In order to conduct your exam as efficiently as possible, we ask that you call this office to schedule a day and time convenient for you. **Please call me at 208-334-2190 by May 10, 2013, to conduct the exam during the week of May 13, 2013.** If there is a problem with scheduling or conducting the examination at this time, please let me know so we can reschedule or make other arrangements.

I appreciate your attention to this matter and I look forward to hearing from you.

Sincerely,

Rick Collingwood, P.E.
Water Resource Agent, Sr.