

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 51-13098

Exam Date: 5/4/18

1. Current Owner:

KRISTY PIGEON 109 GREENHORN RD HAILEY ID 83333 (208) 788-9636 And
JOHN PRUDDEN 109 GREENHORN RD HAILEY ID 83333 (208) 788-9636 And
MATHER CAPITAL CORP 109 GREENHORN RD HAILEY ID 83333

2. Accompanied by: KRISTY PIGEON

Phone No: (208) 788-9636

Address: 109 GREENHORN RD HAILEY ID 83333

Relationship to Permit Holder: PERMIT HOLDER

3. SOURCE:

BRUNEAU RIVER

TRIBUTARY:

SNAKE RIVER

B. OVERLAP REVIEW

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

Water Right No.	Owner	Source	Purpose of Use	Basis
Multiple	Bruneau Buckaroo Coop Ditch Co	Bruneau River	Irrigation	Decreed

POU Overlap: The canal company water rights are for irrigation use so overlap is not a concern. Furthermore, this permit is conditioned, "From March 1 to June 15, this right authorizes the use of Bruneau Buckaroo Canal Ditch Co. shares for wildlife uses but does not authorize an additional diversion of water from the Bruneau River." There is no overlap of water rights for wildlife, wildlife storage or diversion to storage.

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

Water Right No.	Owner	Source	Purpose of Use	Basis
Multiple	Bruneau Buckaroo Coop Ditch Co	Bruneau River	Irrigation	Decreed

POD Overlap: Bruneau Buckaroo Coop Ditch Co water rights overlap at the POD. As explained in condition 5 (079) on the permit, water right 51-13098 does not authorize an additional diversion of water from the Bruneau River, but uses existing canal shares for wildlife uses.

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

BRUNEAU RIVER SW¼SW¼ Sec. 26, Twp 07S, Rge 06E, B.M. OWYHEE County

Method of Determination: The POD location is shown in the application and permit maps. The POD shape file for the license is based on the permit POD shape. Visual confirmation of the POD was not possible because the POD is located on private property that was not accessible the day of the field exam.

This permit's POD is the same as Bruneau Buckaroo Coop Ditch Company's POD.

2. **PLACE OF USE:** DIVERSION TO STORAGE, WILDLIFE, WILDLIFE STORAGE

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			N E	N W	SW	SE	NE	N W	SW	SE	NE	N W	SW	SE	NE	N W	SW	SE	
07S	06E	4											X						
07S	06E	5													X	X	X	X	

Method of Determination: The POU in the permit is validated by PLS data. The POU was verified during the field exam and compared to aerial imagery for accuracy.

3.

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

X 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

X 1:24,000 or greater.

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

X Photo of Diversion and System Attached

4.

Well or Diversion ID No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
N/A					

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

D. **FLOW MEASUREMENTS**

1. N/A

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date

E. **FLOW**X

Additional Computation Sheets Attached

CALCULATIONS**Measured Method:****V-Notch Weir (cfs)**

$$Q = 2.49H^{2.48}$$

H= .93 feet measured at the high water mark

$$Q = 2.08 \text{ cfs}$$

(https://www.usbr.gov/tsc/techreferences/mands/wmm/appendix/A7_4.pdf)

The high water mark was visible in the concrete box behind the weir. This measurement was used as head (H) in the above equation for a v-notch weir and was verified in the table linked above for v-notch weirs.

F. VOLUME CALCULATIONS**1. Volume Calculations for Irrigation:**

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = \text{NA}$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = \text{NA}$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = \text{NA}$$

2. Volume Calculations for Other Uses: *See attachment*

Wildlife- 225 AF

Wildlife Storage- 76 AF

Diversion to Storage- NA per IDAPA Rule 37.03.02.035.01.J

Wildlife storage volume was calculated using the attached pond spreadsheets. Water use for wildlife purposes was calculated using the volume that may be diverted (based on the diversion rate over the permit's season of use) minus the total volume required for the ponds (accounting for pond capacity, seepage and evaporation losses). Per IDAPA Rule 37.03.02.035.01.J, diversion to storage volume is not required.

G. NARRATIVE/REMARKS/COMMENTS**History:**

Water permit 51-13098 authorizes diversion of 2.6 cfs for wildlife and diversion to storage with 77 AF for wildlife storage. The permit authorizes an alternative use of existing irrigation canal shares from March 1 until June 15. According to the attachment to the Application for Permit in the backfile, after June 15th, an existing 2,300 shares in the Bruneau Buckaroo Canal Ditch Co. (BBCDC) (1.9 cfs) are used to 1) irrigate grassland areas both inside and outside of the project area and 2) for livestock use in the late summer and fall. In conjunction with the Application for Permit in 2012, a *License Agreement for Water Carriage, and Ditch and Diversion Works Use* was submitted documenting the agreement between Bruneau Buckaroo Cooperative Ditch Company and Mather Capitol Corp giving the licensee the right to use the ditch company's diversion for wildlife purposes.

There was not any infrastructure for conventional irrigation at the site at the time of the field exam. Use of Bruneau Buckaroo Canal Ditch Co. irrigation shares for wildlife purposes rather than irrigation was discussed with administration at IDWR and the use was approved. Conditions related to the irrigation shares will be carried over to the license.

System Description:

The Bruneau Buckaroo Ditch diverts from the Bruneau River approximately 5.2 miles southeast of the permit's POU. This permit's diversion from the Bruneau Buckaroo Ditch consists of a lockable headgate and a V-notch weir. The ditch flows south and then west to two slide gates. Diversion of water from the permit holder's main ditch and control between ponds is achieved with slide gates. The main ditch ultimately returns to the Bruneau River to the north of the ponds (see attached map).

The ponds are constructed by earthen berms and vary in depth. Some of the shallow ponds were not full at the time of the field examination and the average pond depth was estimated at 2 feet.

Place of Use:

The permit POU was used to locate the property. Available tax parcel information shows that John Prudden is the owner of the property at the POU. The physical address is 31766 Hot Creek Rd. The POU shape for the license is based on current aerial imagery and visual confirmation at the time of field examination. The permit POU overlaps with BBCDC water rights for irrigation.

Point of Diversion:

The diversion is from the Bruneau River and is shared with BBCDC. The POD for this permit is located approximately 5.2 miles southeast of the POU. The POD shape file for the license is based on the permit POD shape. Visual confirmation of the POD was not possible because the POD is located on private property that was not accessible the day of the field exam.

Diversion Rate and Volume:

The diversion rate was measured at the time of field inspection using the existing V-notch weir and the high water mark shown on the weir (see attached photos). Volume calculations were based on the pond surface area, evaporation and seepage losses and the maximum diversion rate. Sections E and F above and the attached spreadsheets further detail the rate and volume calculations.

Conditions/ Recommendations:

Condition 1 (051) will be removed for licensing as it is no longer active. Condition 2 (26A) will be removed for licensing. Conditions 3-7 and 9-13 will be retained for the license. Condition 12 (220) will be modified to reflect actual pond capacity and surface area. Condition 8 (01J) will be changed to R43 which consists of wording for a license rather than a permit.

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>
WILDLIFE	03/01 to 06/15	2.08 CFS	225 AF
DIVERSION TO STORAGE	03/01 to 06/15	2.08 CFS	
WILDLIFE STORAGE	01/01 to 12/31		76 AF
<u>Totals:</u>		2.08 CFS	301 AF

2. Recommended Amendments

☐ Change POD as reflected above

☐ Add POD as reflected above

☒ None

☐ Change POU as reflected above

☐ Add POU as reflected above

☒ None

I. AUTHENTICATION - Rachael Smith, Water Resource Agent Sr.

Field Examiner's Name Rachael Smith

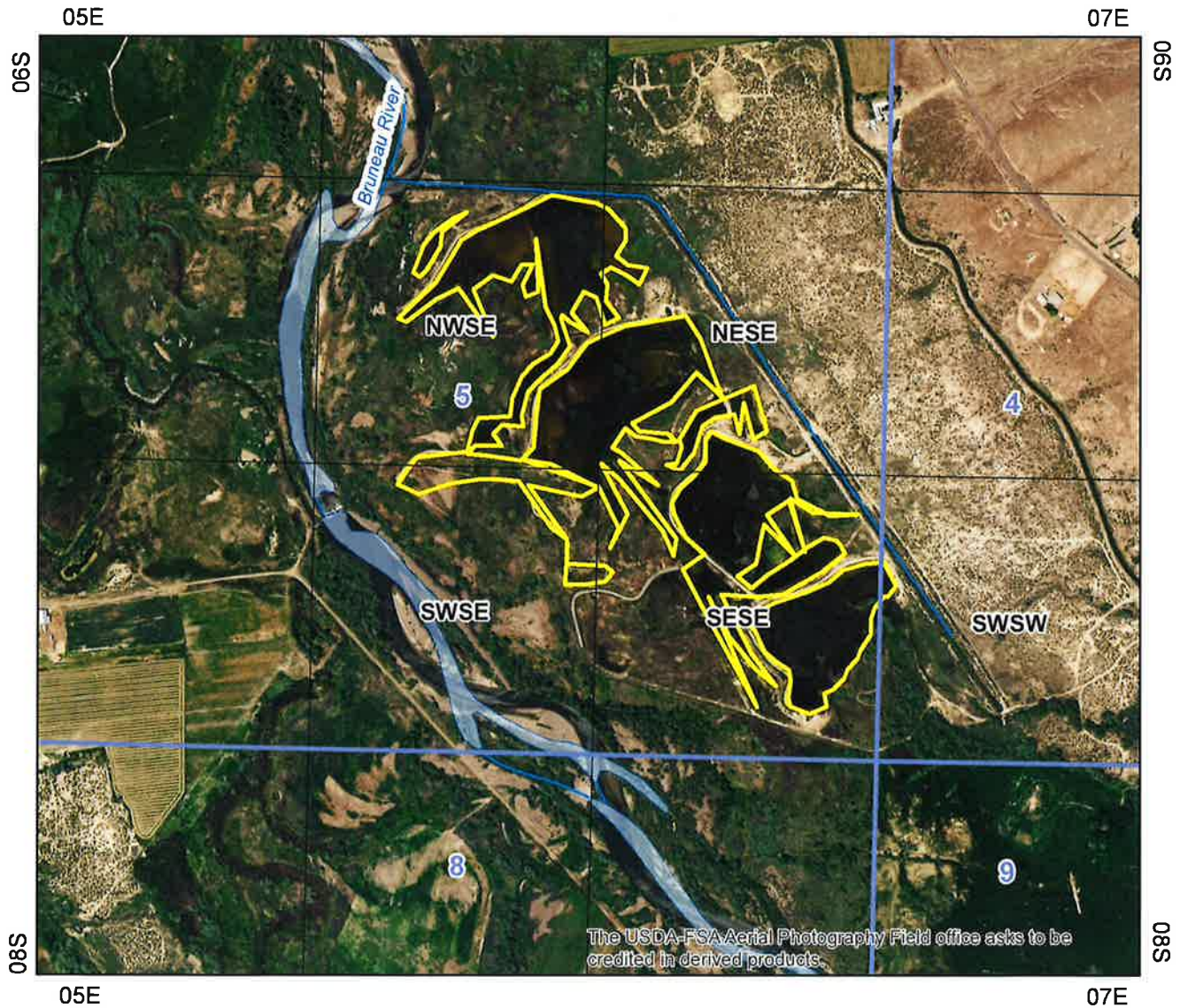
Date 6/6/18

Reviewer Daniel H. Smith

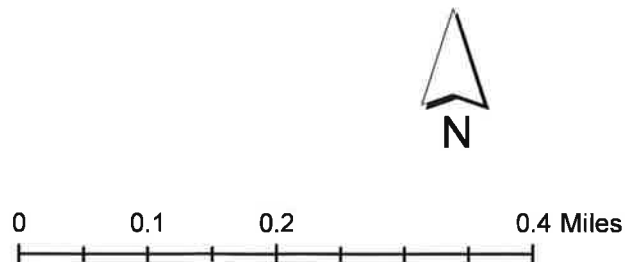
Date 6-6-18

State of Idaho
Department of Water Resources
Attachment to Field Exam
51-13098

This map depicts the WILDLIFE, WILDLIFE STORAGE, DIVERSION TO STORAGE place of use boundary for this water right at the time of this approval and is attached to the approval document solely for illustrative purposes.

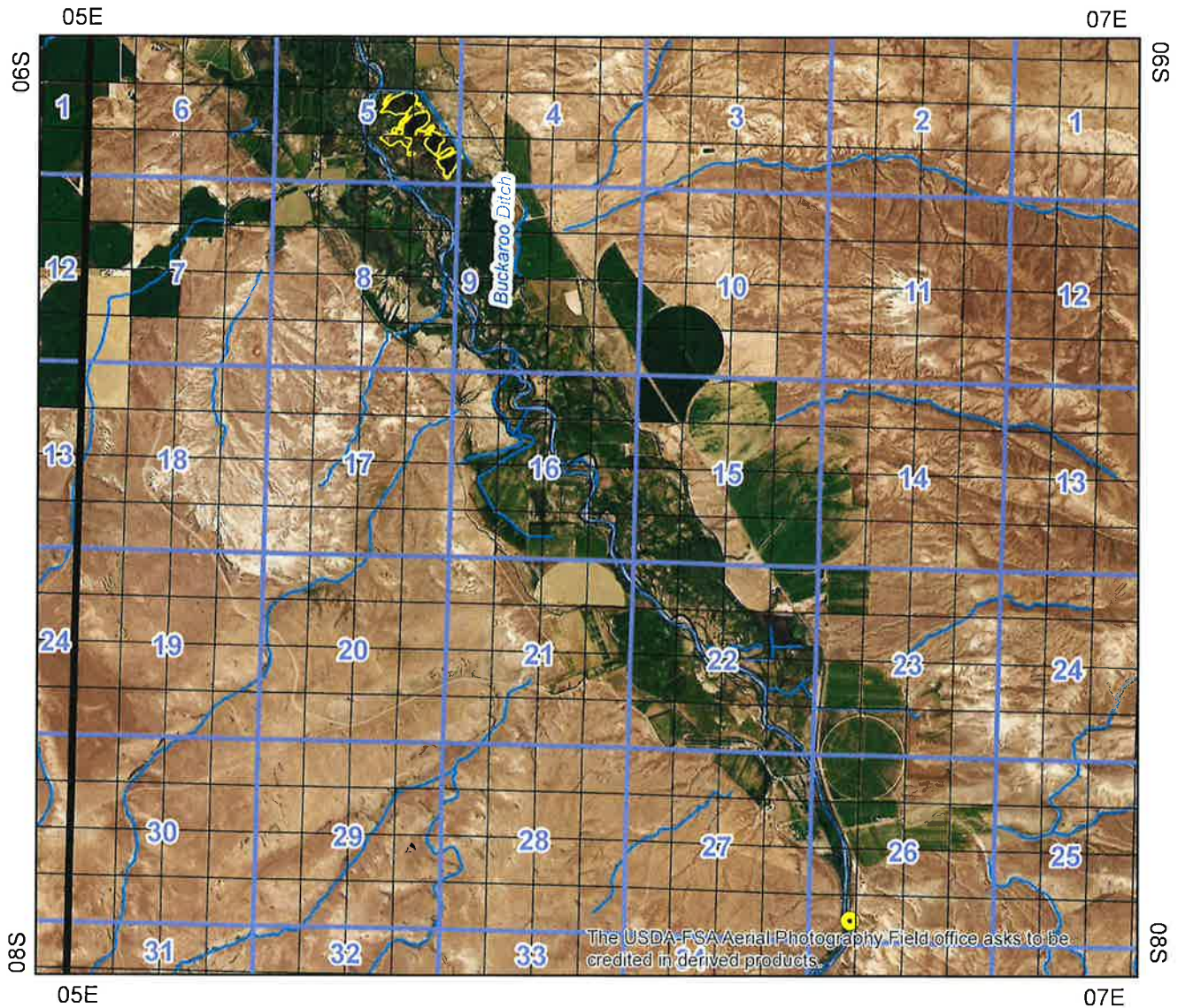


- PLS Sections
- Places of Use
- Quarter Quarters

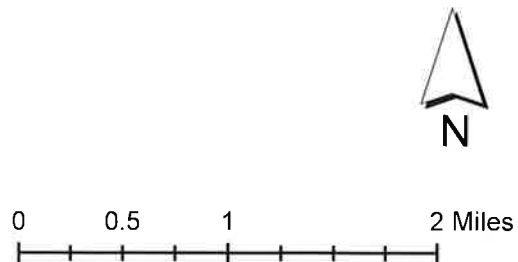


State of Idaho
Department of Water Resources
Attachment to Field Exam
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This map depicts the WILDLIFE, WILDLIFE STORAGE, DIVERSION TO STORAGE place of use boundary for this water right at the time of this approval and is attached to the approval document solely for illustrative purposes.



-  Townships
-  PLS Sections
-  Point of Diversion
-  Places of Use



Field Exam 5/4/18

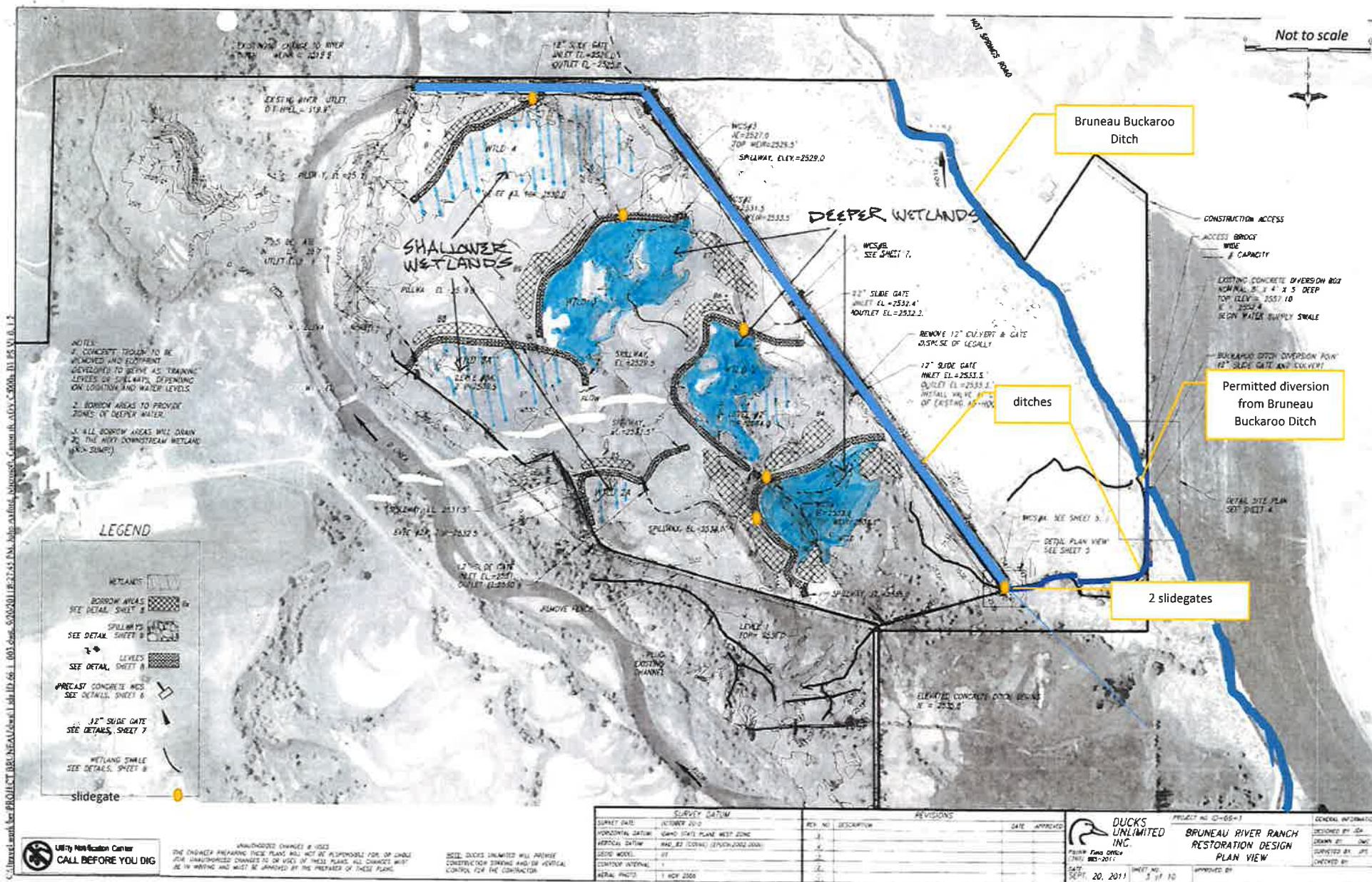


Table A7-4. Discharge of 90° V-notch weirs, in ft³/sec, computed from the formula $Q=2.49h_1^{2.48}$.

Head H, ft	Discharge Q, ft ³ /sec	Head H, ft	Discharge Q, ft ³ /sec	Head H, ft	Discharge Q, ft ³ /sec	Head H, ft	Discharge Q, ft ³ /sec
0.20	0.046	0.65	0.856	1.10	3.15	1.55	7.36
.21	.052	.66	.889	1.11	3.23	1.56	7.50
.22	.058	.67	.922	1.12	3.30	1.57	7.62
.23	.065	.68	.957	1.13	3.37	1.58	7.74
.24	.072	.69	.992	1.14	3.45	1.59	7.86
.25	.080	.70	1.03	1.15	3.52	1.60	7.99
.26	.088	.71	1.06	1.16	3.60	1.61	8.11
.27	.097	.72	1.10	1.17	3.68	1.62	8.24
.28	.106	.73	1.14	1.18	3.75	1.63	8.36
.29	.116	.74	1.18	1.19	3.83	1.64	8.49
.30	.126	.75	1.22	1.20	3.91	1.65	8.62
.31	.136	.76	1.26	1.21	3.99	1.66	8.75
.32	.148	.77	1.30	1.22	4.08	1.67	8.88
.33	.159	.78	1.34	1.23	4.16	1.68	9.02
.34	.172	.79	1.39	1.24	4.25	1.69	9.15
.35	.184	.80	1.43	1.25	4.33	1.70	9.28
.36	.198	.81	1.48	1.26	4.42	1.71	9.42
.37	.212	.82	1.52	1.27	4.50	1.72	9.56
.38	.226	.83	1.57	1.28	4.59	1.73	9.70
.39	.241	.84	1.62	1.29	4.68	1.74	9.83
.40	.257	.85	1.66	1.30	4.77	1.75	9.98
.41	.273	.86	1.71	1.31	4.86	1.76	10.1
.42	.290	.87	1.76	1.32	4.96	1.77	10.3
.43	.307	.88	1.81	1.33	5.05	1.78	10.4
.44	.325	.89	1.87	1.34	5.15	1.79	10.6
.45	.344	.90	1.92	1.35	5.24	1.80	10.7
.46	.363	.91	1.97	1.36	5.34	1.81	10.8
.47	.383	.92	2.02	1.37	5.44	1.82	11.0
.48	.403	.93	2.08	1.38	5.53	1.83	11.1
.49	.425	.94	2.14	1.39	5.63	1.84	11.3
.50	.446	.95	2.19	1.40	5.74	1.85	11.4
.51	.469	.96	2.25	1.41	5.84	1.86	11.6
.52	.492	.97	2.31	1.42	5.94	1.87	11.8
.53	.516	.98	2.37	1.43	6.05	1.88	11.9
.54	.540	.99	2.43	1.44	6.15	1.89	12.1
.55	.565	1.00	2.49	1.45	6.26	1.90	12.2
.56	.591	1.01	2.55	1.46	6.36	1.91	12.4
.57	.618	1.02	2.62	1.47	6.47	1.92	12.6
.58	.645	1.03	2.68	1.48	6.58	1.93	12.7
.59	.673	1.04	2.74	1.49	6.69	1.94	12.9
.60	.701	1.05	2.81	1.50	6.81	1.95	13.0
.61	.731	1.06	2.88	1.51	6.92	1.96	13.2
.62	.761	1.07	2.94	1.52	7.03	1.97	13.4
.63	.792	1.08	3.01	1.53	7.15	1.98	13.5
.64	.823	1.09	3.08	1.54	7.27	1.99	13.7

Calculator - Read Me

Step 1 - Calculate No. of Days

Is It a Leap Year?

☐ YES

☒ NO

Enter Starting Date:

March ▼

1 ▼

March - 1

Enter Ending Date:

June ▼

15 ▼

June - 15

Total Number of Days (Starting and Ending Dates Inclusive)

107

Step 2 - Input Flow Rate Value

Select Units

Cubic Feet per Second ▼

Input Flow Rate

2.08 CFS

Step 3 - Select Units of Output Volume

Select Units

Ac-Ft ▼

Output Volume

441 Ac-Ft

441 AF allowed to be diverted with from 3/1-6/15 (using field measurement flow rate)

216 AF total volume required per pond spreadsheet (accounts for pond capacity, seepage/evap)

225 AF remaining for wildlife purposes

76 AF pond capacity

Seepage Loss Calculations

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

FILE NUMBER	51-13098
REVIEWER	Rachael Smith
DATE	5/4/2018

User Input
Calculated value
Formula Explanations

INPUTS

Pond Surface Area (AC.)	38	AC.
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Pond Surface Area (SQ. FT.)	1655280	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	CL	
Suggested Seepage Rate (FT./DAY)	0.0030	FT./DAY

Formula: (Surface Area X Seepage Rate) X 7.48 = Gallons Per Day Loss
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Convert to GPD	37144	GPD
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Total Seepage Loss (AFA)	41.6	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

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

FILE NUMBER	51-13098
REVIEWER	Rachael Smith
DATE	5/4/2018

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 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 negative precipitation deficit values.

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

<http://data.kimberly.uidaho.edu/ETIdaho/stcwrstats.py?station=101195&>

Precipitation Deficit

Station: Twin Falls 2 NNE (NWS -- 109294)

Month	mm/day ¹	Days per month	mm/Month
Jan	-0.17	31	0.00
Feb	0.54	28	15.12
March	1.53	31	47.43
April	2.63	30	78.90
May	3.41	31	105.71
June	4.15	30	124.50
July	5.07	31	157.17
August	4.04	31	125.24
September	2.85	30	85.50
October	1.68	31	52.08
November	0.03	30	0.90
December	-0.21	31	0.00

Total mm/year = 792.55

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.

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

$$(792.55 \div 304.8) \times 38.00 = 98.8 \text{ AFA}$$

Total Storage Calculations

FILE NUMBER	51-13098
REVIEWER	Rachael Smith
DATE	5/4/2018

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.)	38	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	2	"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)	76	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)	0	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)	41.6	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.
Estimated Evaporation Loss (AF)	98.8	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	216.4	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)	2.08	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)	5.07	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)	0.75	"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)	0.38	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	22	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. 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.
Days Required to Fill the Pond at 13,000 Gallons per Day	-108	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. 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. 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.

Water Permit 51-13098

Field Examination Completed 5/4/18
IDWR Staff: Rachael Smith & Dan Nelson



V-notch weir at permit holder's diversion from Bruneau Buckaroo Ditch



Typical slide gate used to divert water into ponds 1, 2 and 3 from the ditch on the eastern side of the ponds



Slide gate used to allow flow between ponds



Water level behind V-notch weir after headgate diversion from Bruneau Buckaroo Ditch
High water mark is shown at 0.93 feet



Ponds average 2 feet in depth and cover approximately 76 AF