

[illegible]

Method of Determination: Dam and pond area visible on imagery. Information provided by permit holder.

Change in POU? ____Y __X__N Amendment Required? ____Y __X__N

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

Indicate weir size/pipe as applicable.

__ 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 Serial No.	Pump Make	Pump Serial No. or Discharge Size

*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

2. Measurements: < _____ >

E. FLOW CALCULATIONS

____Additional Computation Sheets Attached

Measured Method:

Instream Diversion, no flow measurement required.

Permit allowed = <>.

License <>.

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = \underline{\hspace{2cm}}$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = \underline{\hspace{2cm}}$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = \underline{\hspace{2cm}}$$

2. Volume Calculations for Other Uses:

Based on memorandum and associated pond spreadsheet written by Dan Nelson on Nov. 25, 2013 in association with licensing review of 55-13840, the storage requirement for this pond in 2.43 AF. 55-13840 is for 0.4 AF from 04/01 to 12/31. 0.04 AF is for use from 01/01 to 04/01 not covered by 55-13840 and 2.0 AF needed to match development. A combined use limit is needed for the 0.4 AF covered by both permits.

- **Permit allows 2.4 afa**
- **License recommend for 2.4 afa**

G. PURPOSE OF USE

Irrigation _____N # Stock_350 cattle___ Domestic # of Homes _____

Other: Wildlife

Change in Purpose of Use? ____Y__X__N

Method of Determination: Information provided by permit holder.

If Yes: From Use _____ To Use _____ Amount _____ CFS _____ AFA _____

H. NARRATIVE/REMARKS/COMMENTS**Nickel Creek Allotment, Pasture 2 Reservoir, #9900****No Water District****No Fish and Game, Auto-shutoff, Lockable Device, or Measuring Device condition**

This is the same pond also covered by 55-13840. This permit is for additional storage developed above 55-13840 as well as to cover use of 0.4 AF from 01/01 to 04/01. A combined use limit is needed for the 0.4 AF covered by both permits.

Have conditions of permit approval been met? __X__Yes ____No

I. RECOMMENDATIONS**1. Recommended Amounts**

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
Stockwater Storage	01/01 to 12/31	0.0 CFS	2.4 AFA
Wildlife Storage	01/01 to 12/31	0.0 CFS	2.4 AFA
<u>Totals:</u>		0.0 CFS	2.4 AFA

2. Recommended Amendments

____Change P.D. as reflected above ____Add P.D. as reflected above __X__None

____Change P.U. as reflected above ____Add P.U. as reflected above __X__None

Other:

J. AUTHENTICATIONField Examiner's Name Danville Farnum Date 01-07-14Reviewer Daniel A. Miller Date 1-8-15

Process	Basin Sequence	Draft	Owner	Source	POD/ POU	NENE	NWNE	SWNE	SENE	NENW	NWNW	SWNW	SENW	NESW	NWSW	SWSW	SESW	NESE	NWSE	SWSE	SESE	Total Acres
Water Right	55-12371	N	UNITED STATES OF AMERICA ACTING UNITED STATES OF AMERICA	DEEP CREEK	POD															X		0
Water Right	55-12371	N	UNITED STATES OF AMERICA ACTING UNITED STATES OF AMERICA	DEEP CREEK	POU	X		X	X										X	X		0
Water Right	55-13840	N	US DEPT OF INTERIOR	UNNAMED STREAM	POD						X											0
Water Right	55-13840	N	US DEPT OF INTERIOR	UNNAMED STREAM	POU						X											0
Water Permit	55-13923	N	US DEPT OF INTERIOR	UNNAMED STREAM	POD						X											0
Water Permit	55-13923	N	US DEPT OF INTERIOR	UNNAMED STREAM	POU						X											0
Water Right	55-4051	N	GLENNS FERRY GRAZING	CURRENT CREEK	POU									7.0	15.0		11.0					33
Water Right	55-4052	N	GLENNS FERRY GRAZING	DEEP CREEK	POD														X			0
Water Right	55-4052	N	GLENNS FERRY GRAZING	DEEP CREEK	POU												11.0					11

MEMORANDUM

TO: Danielle Favreau

FROM: Daniel Nelson – Staff Hydrologist

DATE: November 25, 2013, 2013

SUBJECT: Licensing Review of Water Right 55-13840

I was asked to run the Department's Pond Spreadsheet on this pond. The Bureau of Land Management (BLM) representative informed us that the pond has an average depth of 5.5 feet and our GIS information shows the pond at 0.3 acres of surface area. With this information the pond capacity is 1.7 acre feet, and the evaporation for this pond is 0.7 acre feet for a total of 2.4 acre feet of total storage requirement. This is an onstream pond, so no seepage amounts were calculated into the equations.

A new permit will need to be filed by the Bureau of Land Management for the remainder of the storage for this pond, or they will not be able to storage more than the 0.4 acre feet of water allowed by the permit. The pond surface area is 0.3 acres, so they are allowed to fill the pond to a maximum depth of 1.3 feet ($0.4 \text{ acre feet} / 0.3 \text{ acres} = 0.1.333 \text{ feet}$).

TOTAL STORAGE

FILE NUMBER	55-13840
REVIEWER	Dan Nelson
DATE	11/25/2013

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

Surface Area (In Acres)	0.3	"Surface Area" is automatically carried over from the "Seepage Loss Sheet"
Average Pond Depth (In feet)	5.5	"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
Pond Capacity (In acre feet)	1.65	you know the capacity, divide the capacity by surface area and enter the average pond depth in the space above.

Volume Needed Above Initial Fill to Fulfill From Storage Needs- "Multiple Fills" (In acre feet)	0	The "Volume Needed Above Initial Fill" is the acre-feet of water required to meet <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). PLEASE 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 (In acre feet)	0.00	The "Estimated Seepage Loss" is automatically carried over from the Seepage Loss Sheet
Estimated Evaporation Loss (In acre feet)	0.65	The "Estimated Evaporation Loss" is automatically carried over from the Evaporation Loss Sheet
Total Volume Required (In acre feet)	2.3	"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 (In cfs)	1.00	The "Flow Rate" into the Pond depicts the actual flow either measured or estimated into the pond.
Highest Daily Evaporation Rate From Evaporation Tab. (In mm/day)	4.44	This number is automatically selected by picking the highest recorded number in the "Precipitation Deficit Table".
Maximum Required Daily Maintenance Volume (In acre feet per day)	0.00	"Maximum Required Daily Maintenance Volume" is the maximum volume of water needed on any given day during the year, and 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 (In 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. This number should be between 1 and 365 days for a project to be successful.
Days Required to Fill the Pond at 13,000 gallons per day	46	The "Days Required to Fill the Pond at 13,000 gallons per day" is calculated converting the "Pond Capacity" and the "Maximum Daily Maintenance Volume" to gallons. The "Pond Capacity" is then divided by 13,000 gallons minus the "Maximum Daily Maintenance Volume" in gallons to determine the number of days to fill pond. This number should be between 1 and 365 if this pond is to be described as a domestic use.

User Input
Calculated value
Formula Explanations

Evaporation Loss Calculation

FILE NUMBER	55-13840
REVIEWER	Dan Nelson
DATE	11/25/2013

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

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

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

User Input
Calculated value
Formula Explanations

USING THIS SPREADSHEET

To ascertain the evaporation from a pond, you will need to go to the Kimberley Research Center website. The link is found below. This web site provides the Precipitation Deficit for the area where the pond is located. The Precipitation Deficit is the total amount of free pan 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, and the entire state is pretty much covered. 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.

Found at: <http://www.kimberly.uidaho.edu/ETIdaho/online.php>

Precipitation Deficit

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

Month	mm/day ¹	Days per month	mm/Month
Jan	0.00	31	0.00
Feb	0.44	28	12.32
March	1.07	31	33.17
April	1.97	30	59.10
May	2.21	31	68.51
June	3.00	30	90.00
July	4.44	31	137.64
August	4.06	31	125.86
September	2.50	30	75.00
October	1.64	31	50.84
November	0.24	30	7.20
December	0.03	31	0.93

PLEASE NOTE: We cannot use the season average, because there are several areas in Northern Idaho with a negative Precipitation Deficit. Therefore, we must enter each monthly deficit, and enter in a zero (0) for each negative month. The reason for this is that precipitation can only offset evaporation to the extent of the evaporation.

Please enter the daily average Precipitation Deficit as shown in the example below.

Although it has sometimes been useful to consider wintertime evaporation to be zero, Allen and Robison (2007, p. 169) noted, "Evaporation during nongrowing (wintertime) periods varies widely . . ."

¹Negative monthly mean values should be entered in the above table as "0".

Total mm/year = 660.57

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

(660.57 ÷ 304.8) X 0.30 = 0.7 AFA

Surface Area of Pond Is automatically Carried over from the Seepage Loss Sheet.

SEEPAGE CALCULATIONS

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

FILE NUMBER	55-13840
REVIEWER	Dan Nelson
DATE	11/25/2013

User Input
Calculated value
Formula Explanations

INPUTS

SQ. FT. Calculator
Pond Surface area in acres
0.3

POND SURFACE AREA (SQ. FT.)	13068
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SUGGESTED SEEPAGE RATE (FT/DAY)	0.0000
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Use the table below to find the
"SUGGESTED SEEPAGE RATES".

FORMULA: (Surface Area X Seepage Rate) / 7.48 = Gallons Per Day loss

CONVERT TO GPD	0	GPD
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TOTAL SEEPAGE LOSS (AFA)	0.0	AFA
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SUGGESTED SEEPAGE RATES FOR DIFFERENT SOIL TYPES:
GW, GP, GM, GC, SW, SP and SM (silty sand, sand silt mixtures and gravel mixtures) = 0.20 ft per day
OL and ML (inorganic silts - very fine sands, silty, or clayey fine sands) = 0.016 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 with shallow 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 X:\Spatial\Soils\USCS\PondSoils.lyr. Use "0" if the ponds intersect the water table.

SEEPAGE CALCULATIONS

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

FILE NUMBER	55-13840
REVIEWER	Dan Nelson
DATE	11/25/2013

User Input
Calculated value
Formula Explanations

INPUTS

SQ. FT. Calculator
Pond Surface area in acres
0.3

POND SURFACE AREA (SQ. FT.)	13068
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SUGGESTED SEEPAGE RATE (FT/DAY)	0.0000
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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
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