

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 96-8762
Exam Date: 07/13/1999

1. Current Owner:
NICK E WOODS 182 FOREST RIVER LN SANDPOINT ID 83864 AND/OR
JULIE A WOODS 182 FOREST RIVER LN SANDPOINT ID 83864
2. Accompanied by: Nick Woods
Relationship to permit Holder: Applicant

3. **SOURCE:**
CARIBOU CREEK

Tributary
PACK RIVER

Method of Determination: Arcmap and DRG.

B. OVERLAP REVIEW

1. Other water rights with the same place of use: None

Water Right No.	Source	Purpose of Use	Basis

Comments: _____

2. Other water rights with the same point-of-diversion: None

Water Right No.	Source	Purpose of Use	Basis

Comments: _____

C. DIVERSION AND DELIVERY SYSTEM

1. **LOCATION OF POINT(S) OF DIVERSION:**

CARIBOU CREEK NE¼ NE¼ NW¼, Sec. 14, Twp 59N, Rge 02W, B.M. BONNER County

Method of Determination: Maps and GPS. Point of diversion is located at -116° 33.593, 48° 28.335

PLACE OF USE: IRRIGATION STORAGE

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
59N	02W	11												X					

PLACE OF USE: IRRIGATION FROM STORAGE

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
59N	02W	11												0.5					0.5

Total Acres: 0.5

PLACE OF USE: RECREATION STORAGE

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
59N	02W	11												X					

PLACE OF USE: FIRE PROTECTION STORAGE

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
59N	02W	11												X					

Method of Determination: Google Earth and Arcmap.

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.

XX Aerial Photo Attached (required for irrigation of 10+ acres).XX Photo of Diversion and System AttachedX

4.

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

D. FLOW MEASUREMENTS

1.

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

2. Measurements: N/A

E. FLOW CALCULATIONSX Additional Computation Sheets Attached

Measured Method: Unable to perform measurement as system was not kept up and was silted in. Original field exam measurement was not an approved measurement and could not be used. Manning's Flow Equation was used to determine a flow rate for license. See attached Manning's Equation.

F. VOLUME CALCULATIONS

1. Volume Calculations for irrigation:

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 0.5 \text{ AC} \times 3.0 \text{ AF} = 1.5 \text{ AF}$$

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

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

2. Volume Calculations for Other Uses: See attached pond analysis sheet for storage volumes.

G. NARRATIVE/REMARKS/COMMENTS

Northern Region was tasked with licensing permits that had been examined during the late 1990's and early 2000's. This file required a 2nd field exam to try and verify the diversion rate, place of use, and annual volume. The original field exam was performed on 7/13/1999 by Wayne Baldwin.

The 2nd field exam was performed on 9/14/2018 with Nick Woods. Mr. Woods had sold the property that the pond was located on but did still own the land where the point of diversion was located. The diversion system had not been working the last 2-3 years because Mr. Woods ceased cleaning out the diversion point and it became clogged with sediment from the creek. The point of diversion was a 10 inch metal pipe that led to two settling pools. The next culvert was an 8 inch culvert that led to the last settling pool. From the last settling pool, a buried 6 inch pipe carried water to the pond. From the pond, water returned to the creek through a ditch.

The two settling ponds were full of sand and sediment from the creek. Mr. Woods said the creek was very flashy and full of big boulders that would not catch any sediment. Because there was no diversion occurring I was unable to verify the diversion to storage rate. The original field exam showed a 5 gallon bucket filled in 3 seconds. Unfortunately, this is not an approved method for determining a diversion rate because of the rate of flow. During my exam, I could not find where a 5 gallon bucket test could be performed. The inlet pipe was below the pond level and the return flow was down a ditch.

The Northern Region now had to decide how to license the diversion to storage component of the permit. We discussed numerous ways to try and determine a suitable flow rate since one could not be taken. We discussed whether we could proceed using the original field examiners diversion rate and decided we should not use his recommendation. We then decided to try using the Manning's Flow Equation to help determine a flow rate. We decided that we should use the smallest pipe (6 inch) in the equation because it would control how much flow entered through the 10 inch point of diversion. The Manning's Calculator showed a diversion rate of 0.43 cfs through the 6 inch pipe with a minimal rise and 45 foot run. The Northern Region felt the Manning's Flow Equation gave as best of a flow rate as could be found without performing some other measurement at site. The license will be issued with a diversion rate of 0.43 cfs.

The pond's surface area was equal to 0.1 acres with an average depth of 2.5 feet. The pond has a total capacity of 0.3 acre-feet with 0.1 acre-feet for evaporation. At time of exam, the pond was full and it is believed the pond is filled by the elevation of the creek and the water table. Mr. Woods said he would use a ½ hp pump to irrigate around the pond and house. The area was traced out by Mr. Woods during the exam and it was equal to 0.5 acres of irrigation. Fire protection storage and recreation storage will be given a volume of 0.4 acre-feet. The irrigation storage and irrigation from storage will be given a volume of 1.5 acre-feet. The license will be issued with no maximum annual volume to allow for a flow through of the pond. I believe that back in 1993 it was unclear how to apply for ponds and allow for a flow through component.

Conditions 18B and 26A were removed from the license and all other conditions remained. Conditions 218, 259, and 220 were added about fire protection storage and the storage component of the license. Condition 004 was added because the point of diversion and place of use are now owned by two parties.

It was evaluated whether a minimum stream flow condition should be added regarding the Pack River. The Pack River minimum stream flow has a priority date 6/15/1992 and this license has a priority date of 5/25/1993. This rights permit was issued 10/25/1993 and the minimum stream flow permit was not issued until 12/20/1993. So because there was no established permit for the minimum stream flow prior to the issuance of this permit, we do not need to add a minimum stream flow condition at licensing.

There are no overlap concerns.

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

H. RECOMMENDATIONS

1. Recommended Amounts

<u>Beneficial Use</u>	<u>Period of Use</u>	<u>Rate of Diversion</u>	<u>Annual Volume</u>
IRRIGATION STORAGE	04/01 to 10/31		1.5 AF
IRRIGATION FROM STORAGE	04/01 to 10/31		1.5 AF
RECREATION STORAGE	1/01 to 12/31		0.4 AF
FIRE PROTECTION STORAGE	1/01 to 12/31		0.4 AF
DIVERSION TO STORAGE	1/01 to 12/31	0.43 CFS	

Totals: 0.43 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 ☒ None

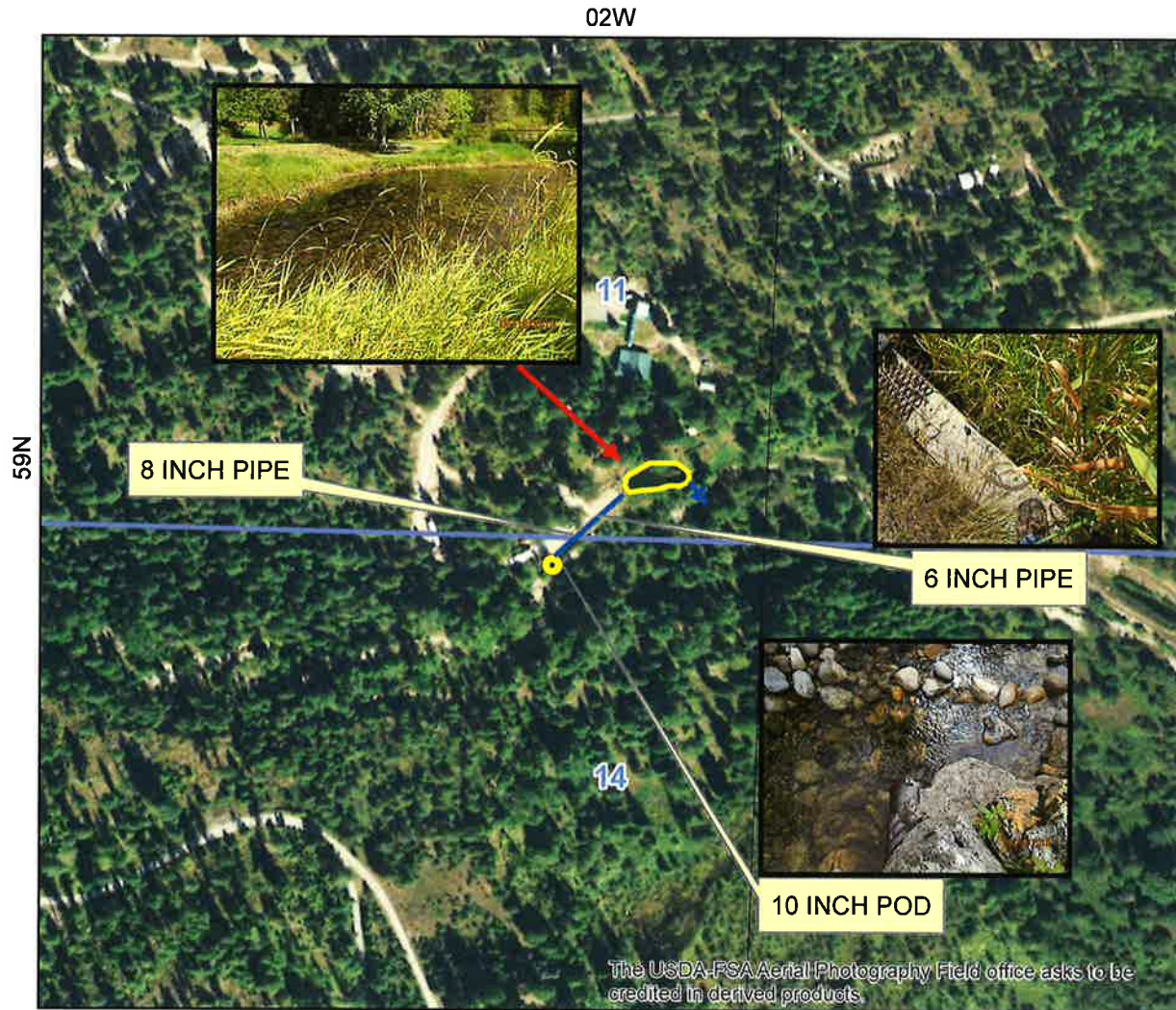
I. AUTHENTICATION Adam Frederick - Water Resource Agent, Senior

Field Examiner's Name Adam Frederick Date 2/25/2019

Reviewer Douglas Jones P.E. Date 2/28/2019

State of Idaho
Department of Water Resources
Attachment to Field Exam
96-8762

RECREATION STORAGE, IRRIGATION STORAGE, and FIRE PROTECTION STORAGE / SYSTEM DIAGRAM



-  Point of Diversion
-  Place Of Use Boundary
-  Townships
-  PLS Sections
-  Quarter Quarters

0 0.035 0.07 0.14 Miles



State of Idaho
Department of Water Resources
Attachment to Field Exam
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IRRIGATION FROM STORAGE / SYSTEM DIAGRAM

02W



-  Point of Diversion
-  Place Of Use Boundary
-  Townships
-  PLS Sections
-  Quarter Quarters

0 0.035 0.07 0.14 Miles



Manning's Equation Calculator for Flow Rate in a Circular Conduit Flowing Full

S = 0.0200 ft/ft
 n = 0.024 manning's coefficient
 d = 6.0 pipe diameter (inches)
 D = 0.50 pipe diameter (feet)
 r = 0.25 pipe radius (feet)
 A = 0.20 area (ft²)
 WP = 1.57 wetted perimeter (ft)
 R = 0.13 hydraulic radius (ft)

Q = 0.43 flow rate (CFS)

Channel Slope

Slope Options

☐ Manual Entry
 ☒ Slope Calculator

Slope Calculator

Rise = 0.9 feet
 Run = 45 feet
 Slope, S = 0.0200 ft/ft

Pipe Material, (n):

welded steel pipe

Pipe Diameter (inches)

6.0 inches

READ ME

Manning's Equation (1), is an empirical formula that solves for velocity (v) in a open channel under uniform flow. The continuity equation (2) when combined with equation (1) allows for the computation of the flow rate (Q) in an open channel under uniform flow.

In equations (1) and (3), η refers to Manning's Coefficient of Roughness and can be found in tabulated form for many open channel types. R is the hydraulic radius of the open channel and is equal to the area of the open channel divided by the wetted perimeter, $R = A/P$. S is the slope of the energy grade line which is often assumed to be equal to the slope of the channel.

Because Manning's Equation is empirical the units are not arbitrary. To obtain a velocity in ft/s and a flow rate in ft³/s, area must be reported in ft², hydraulic radius must be reported in ft, and S must be reported in ft/ft. Manning's Coefficient of Roughness is a unitless constant.

$$(1) \quad v = 1.49 \left(\frac{1}{\eta} \right) \left(R^{\frac{2}{3}} \right) \sqrt{S}$$

$$(2) \quad Q = vA$$

$$(3) \quad Q = 1.49 \left(\frac{1}{\eta} \right) (A) \left(R^{\frac{2}{3}} \right) \sqrt{S}$$

Total Storage Calculations

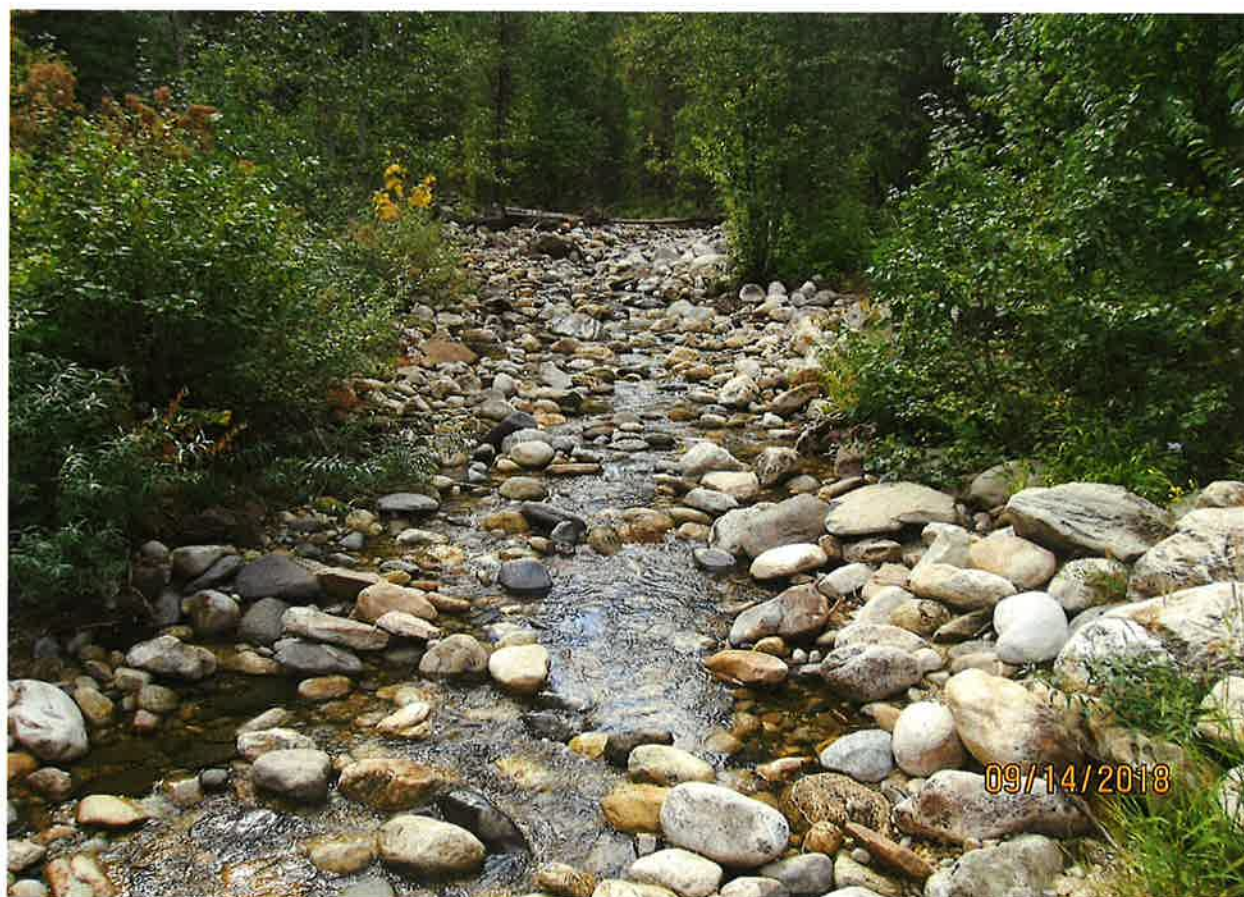
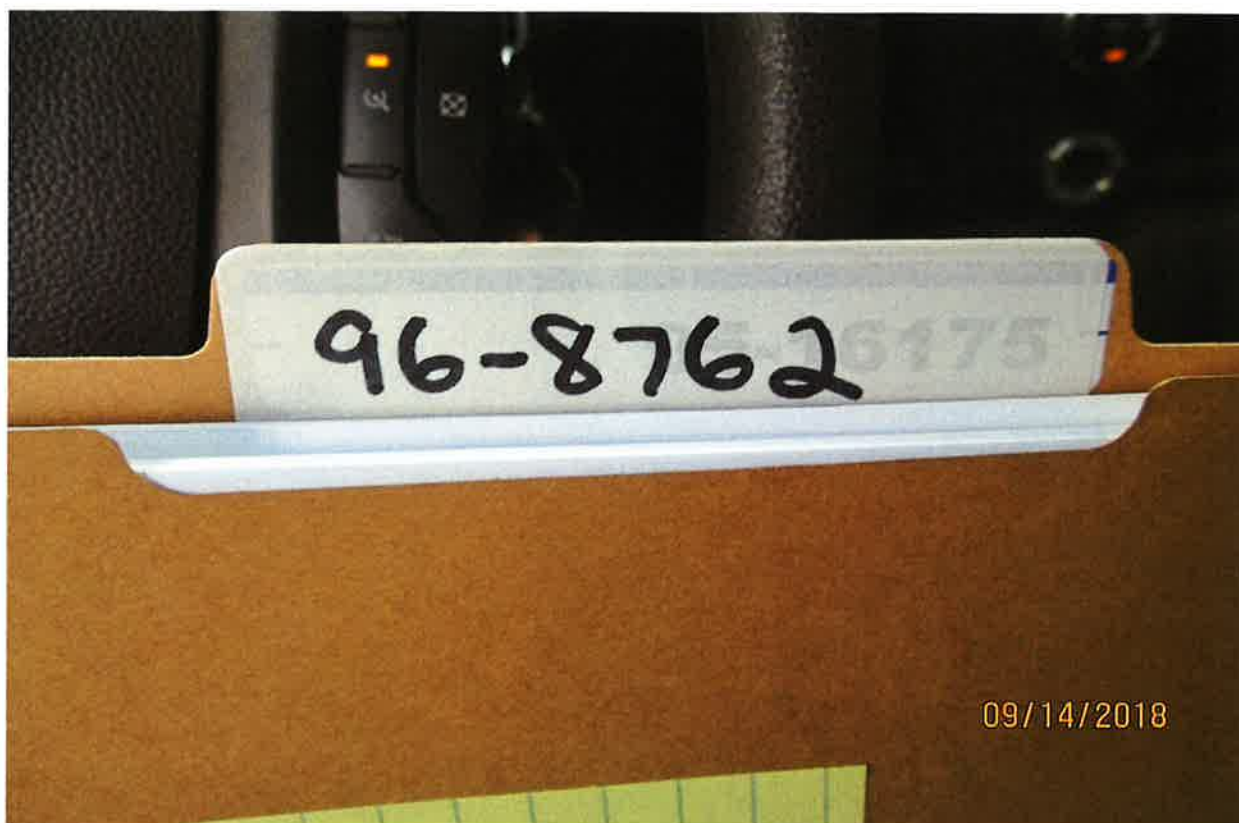
FILE NUMBER	95-8762
REVIEWER	Adam Frederick
DATE	2/22/2019

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

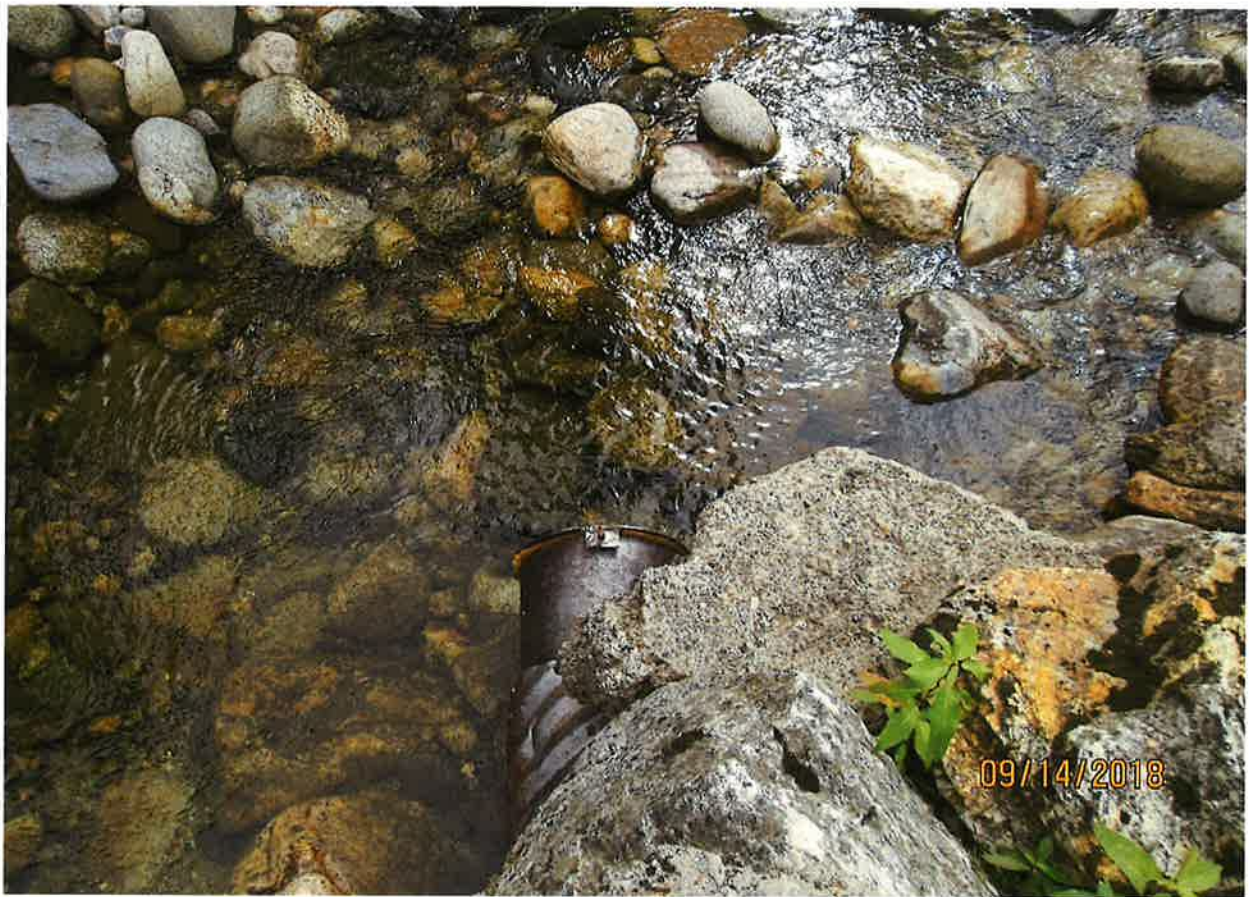
User Input
Calculated value
Formula Explanations

Surface Area (AC.)	0.1	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	2.5	"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 seems reasonable to attain average depth.
Pond Capacity (AF)	0.3	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)	1.5	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)	0.0	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.
Estimated Evaporation Loss (AF)	0.1	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	1.9	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)	0.43	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)	3.79	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	0	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	6	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.



View upstream from point of diversion.



Point of diversion, 10 inch pipe.



10 inch pipe on inside of diversion wall. Water not diverted at time of exam due to sand in settling pool.



Build-up of sand and sediments and grasses in settling pool.



6 inch intake from settling pool to pond.



Storage place of use and irrigation place of use.





Storage place of use and irrigation place of use.



Return flow ditch from pond overgrown from no maintenance.



Exit point of ditch back to creek.

PERMIT # 96-0876.

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
FIELD REPORT SUPPLEMENT

96-08762



PD

Pond



Back
To creek

over



pu



pu



pu